Wolfgang Wörndl
Chulmo Koo
Jason L. Stienmetz *Editors*

Information and Communication Technologies in Tourism 2021

Proceedings of the ENTER 2021
eTourism Conference, January 19–22,
2021

ifitt International Federation
for IT and Travel & Tourism

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Preface

The 28th Annual International eTourism Conference ENTER21@yourplace features new research, innovative systems, and industry case studies on the application of Information and Communication Technologies (ICT) in travel and tourism. Organized by the International Federation for IT and Travel & Tourism (IFITT), ENTER21@yourplace takes place online, January 19–22, 2021, with the theme "eTourism: Development Opportunities and Challenges in an Unpredictable World."

The research track of ENTER21@yourplace received a total of 88 full and short paper submissions, covering a diverse variety of fields within the area of ICT and tourism. Each research paper submission went through a rigorous double-blind review process. As a result, 32 full papers and 23 short papers were accepted for presentation at the conference and are included in these proceedings.

While still maintaining a broad topic, the papers presented in this volume advance the current knowledge base of ICT and tourism in the following areas: social media and sharing economy, technology including AI-driven technologies, research related to destination management and innovations, COVID-19 repercussions, and others. We hope these proceedings will serve as a valuable source of information on the state of the art in ICT and tourism research.

We greatly appreciate the considerable time and effort put in by all members of the ENTER21@yourplace Scientific Committee who helped us to ensure that the content of the research papers is of high quality. We also would like to thank the panel of experts who helped with additional reviews in order to select candidates for the best paper award.

Furthermore, we are thankful to the ENTER21@yourplace conference chair Claudia Brözel and the rest of the conference organization team, the IFITT President Zheng Xiang, and the IFITT Board for their support while managing the research track. Finally, we would also like to thank all the authors for their

willingness to disseminate their latest research at ENTER21@yourplace. This conference would not be possible without their efforts.

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Organization

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The Evolution of Chatbots in Tourism: A Systematic Literature Review

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Abstract. In the last decade, Information and Communication Technologies have revolutionized the tourism and hospitality sector. One of the latest innovations shaping new dynamics and fostering a remarkable behavioral change in the interaction between the service provider and the tourist is the employment of increasingly sophisticated chatbots. This work analyzes the most recent systems presented in the literature (since 2016) investigated via 12 research questions. The often appreciated quick evolution of such solutions is the primary outcome. However, such technological and financial fast-pace requires continuous investments, upskilling, and system innovation to tackle the eTourism challenges, which are shifting towards new dimensions.

Keywords: Chatbots · Tourism · Virtual assistants · Virtual agents · Hospitality · eTourism

1 Introduction

The fast-paced evolution of Information and Communication Technologies (ICTs) has radically transformed the dynamics and business models of the tourism and hospitality industry [32]. This leads to new levels/forms of competitiveness among service providers and transforms the customer experience through new services. Creating unique experiences and providing convenient services to customers leads to satisfaction and, eventually, customer loyalty to the service provider or brand (i.e., hotels) [4]. In particular, the most recent *technological* boost received by the tourism sector is represented by mobile applications [16]. Indeed, empowering tourists with mobile access to services such as hotel reservations, airline ticketing, and recommendations for local attractions generates fervent interest and considerable revenues [8,37].

On the one hand, immediate access, automation, and ease of use have made these applications an irreplaceable part of many tourists' daily lives. On the other hand, beyond automation-related features, there is a need for personalization. To do so, several Artificial Intelligence (AI)-based solutions (e.g., chatbots)

are getting space in the market [2]. A chatbot is a computer program able to *entertain* a natural language-based conversation with a human. The ancestor of modern chatbots dates back to the 60s when Joseph Weizenbaum developed ELIZA [38]. Its goal was to simulate a psychotherapist with a bounded knowledge and several workarounds to avoid dead-ends in the conversation. Although more than 50 years have passed since that revolutionary idea, chatbot technologies (CBTs) have only recently reached sufficient maturity to be widely deployed and used in diverse real-life scenarios. Today, chatbots are intended to be programs understanding one or more human languages by using Natural Language Processing (NLP) or AI Markup Languages leveraging on a knowledge-base consisting of a collection of dialogue management rules that use different techniques for processing the user's input [37].

In the last five years, early prototypes were mainly based on simple state machines, offering simple interactions simulating conversations with humans [2,7]. In the tourism sector, the first interactions delegated to a chatbot were used to support the search for tips and information (e.g., opening hours) of local restaurants [17] and customer-care basic support (i.e., 85% of customer care in tourism are today handled by chatbots/AI-based systems [37]). Besides the main *characteristic* of CBT (i.e., anytime-anywhere availability) and the main *objective* (i.e., providing information) chatbots have also been used for data collection. In the era of data-driven AI, this capability is priceless, enabling the provision of tailored recommendations and dialogues, which were/are expected to boost the user experience. For example, in the hospitality sector, Mercure, the AccorHotels brand, has chosen Facebook Messenger to host its virtual assistant. Guests can discover anecdotes about the surrounding area and secret addresses thanks to geolocation. Booking.com's new service and support chatbot is now widely available to English-language bookings, handling 30% of those customer questions automatically in less than five minutes.

In the context of the tourism industry, to provide a reconciling view on the most advanced solutions presented in the literature, we aim at analyzing **how far have the current solutions and research gone?** and **what is targeted or envisioned by the tourism sector and the related research?** This study aims at fostering the understanding of what stands behind those interactive dialogues between chatbot technologies and customers, beyond the well-known *buying tickets online* or *book hotels support* in the tourism industry. To do so, we have conducted a Systematic Literature Review, following a well-defined methodology. The methodology identifies a series of research questions against which existing works are analyzed.

The remainder of the paper is organized as follows. Section 2 presents the review methodology employed in this study. Section 3 reports the results and evidence. Section 4 discusses the aggregated and generated knowledge produced by this study. Finally, Sect. 5 concludes the paper.

2 Review Methodology

This paper adheres to the original procedure for literature review presented in [24] and further adopted and adapted by [5] and [6] (see Fig. 1). This methodology applied to conduct the Systematic Literature Review (SLR) is meant to be rigorous and reproducible (i.e., replicate the retrieval, selection, and analysis processes).
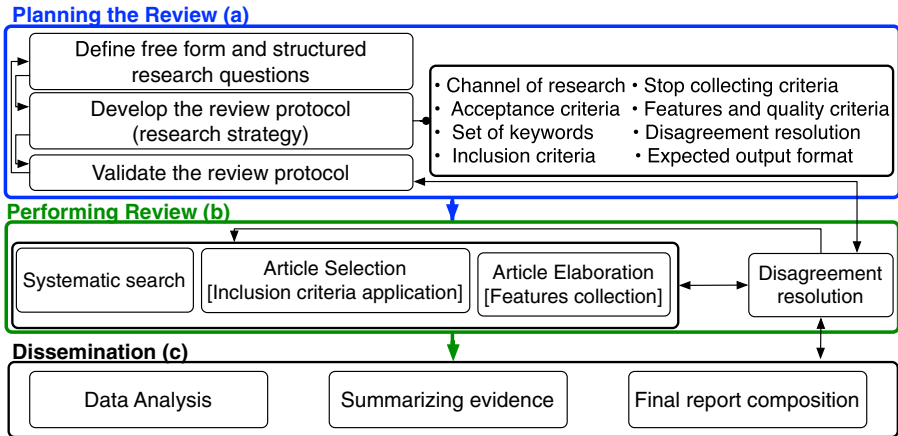
Fig. 1. Review methodology adapted from [5].

Following the Goal-Question-Metric (GQM) [25], the generic free-form question *"How is the evolution of chatbots in Tourism characterized?"* is broken down into the following structured research questions (SRQs):

– *SRQ1: Demographics.* How **time-** and **geographic-**wise are the research efforts distributed? i.e., when (year) and where (the geographical indication of the scientific institute).
– *SRQ2: Abstraction.* What is the **abstraction level** of the elaborated scientific contributions? e.g., at which level the contribution is: conceptual (C), prototype (P), or tested (T).
– *SRQ2: Application scenarios.* Which **applications/areas** of the tourism domain have employed CBT-solutions? (e.g., hospitality, travel agency, and transportation).
– *SRQ3: Recipients.* Who are the *users* of CBT-solutions?
– *SQR4: Desiderata.* Which are the **requirements** standing behind the employment of CBT?
– *SQR5: Goals.* Which are the objectives set for CBT-solutions?
– *SQR6: Services realized.* Which CBT **functionalities** have been **realized**?
– *SQR7: Services envisioned.* Which CBT **functionalities** are **desired** and **envisioned**?

- *SQR8: Technology.* Which underlying **technologies** have been employed to realize the CBTs?
- *SQR9: Benefits.* Which **advantages** do CBTs provide? (from both user and provider sanding points).
- *SQR10: Drawbacks.* Which **limitations** have CBTs shown?
- *SQR11: Open challenges.* Which **open challenges** concern the next generation of CBTs?

To increase the accuracy of the semi-automatic research, some keywords have been contextualized (i.e., some contextual words have been associated with queried keywords). In particular, the queries have been realized by combining the two sets listed below:

- Contextual keywords: tourism + hospitality + traveling;
- Targeted keywords: chatbot + virtual assistant + online assistant + automated assistance + conversational agent.

The research of the articles has been conducted using the following sources: IEEExplore, Science Direct, ACM Library, and Google Scholar. Ninety-three relevant papers have been initially collected. Performing a coarse-grained and successively fine-grained examination, the primary studies to be elaborated have been reduced to 27. Such filtering has been performed by briefly parsing the title, abstract, and the core contribution of the paper, which had to comply with the following criteria:

a) Recency (post-2016): The aim is to identify the current trends and understand recent works addressing CBT in tourism. Given the recent technological advancement and the tangible contribution of chatbots to the tourism industry, we set 2016 as the starting year of the collection.
b) Relevance: The paper must confer relevant information and contribution to the tourism sector (solely scholarly papers without a link to the tourism domain have been excluded).
c) Accessibility: To be included, the content of the article should be accessible via one of the portals mentioned above.
d) Singularity/Originality: Duplicate papers or papers having an extended follow-up version are not included. Only the complete version is included.

3   Results Presentation

SRQ1 and SRQ2: Demographics and Abstraction
The paper selection and elaboration have been conducted in late July 2020. That justifies the only 11 papers collected in that year. However, the projection suggests the exponential trend, manifesting a significant interest from the scientific community.

Figure 2(b) shows the papers distribution per country. The abstraction level of the elaborated studies is quite significant. Indeed, most of them propose practical and tested solutions (16 studies), only five studies present systems at a prototype level, and six solely conceptual contributions.
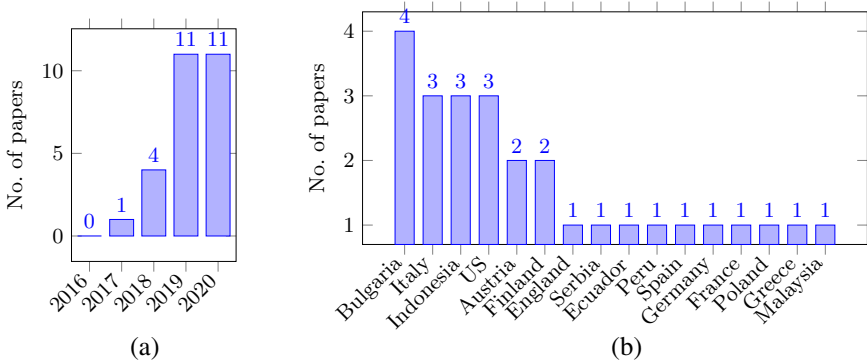
Fig. 2. (a) Number of papers per year. (b) Number of papers per country.

SRQ3 and SRQ4: Application Scenario and Recipients

The majority of the elaborated studies focus on hotel, airline, and travel agency sub-domains (20 studies). Four focus on promoting specific areas or cultural heritage sites (e.g., CBT for promoting the city of Manta in Ecuador [2] and Pompeii's archaeological park in Italy [26]). Finally, one study focuses on medical tourism (i.e., a chatbot identifying medicines available in the visited location compared with those, possibly unavailable, sold in the tourist's origin location).

All the elaborated studies aim to *smoothly handle high volumes of customers* [37], *simplify the use of chatbots* for end-users (i.e., investigating and identifying new ways to drive the user through a booking [32]), finding the right answers [33] and the right –tone-aware– approach [18]) and *satisfying the functional requirements* indicated by the service providers (i.e., enhance the system performance [3], automating and testing new functionalities [3], and improve the data collection (i.e., preferences and feedback [18,37]). Although in most cases, the chatbots aim at satisfying any kind of user interacting with them, some tourism offices targeted the *Millennials* as an unquestionable vector of information and technology itself, impending dedicated chatbot-campaigns over social media and a major messaging platform (i.e., Telegram) [1].

SRQ5: Desiderata

The requirements elicited from the primary studies have been classified into four categories: Financial (F), Technological (T), Socio-Technical (ST), and Socio-Management (SM). Implementing a competitive solution can require considerable *financial investments* [4] For example, the costs can vary between $30.000 and $150.000 [27]. Moreover, to gather the data needed for the user request, many CBTs make commercial use of services such as Avis, Uber, IBM Watson, and Google Dialogflow, and Google Maps, which also require financial expenses [2].

CBTs also require a remarkable *technical knowledge*. For example, modelling user and system dynamics [3], identifying and designing the right architecture [2],

modelling and automating processes and testing [3, 29], and modelling and implementing data collection, compliance, and organization [2, 17, 35].

From a *socio-technical* point of view, the semantic interactions demand most of the effort. For example, enhance interactions when dealing with structured FAQs in more dynamic, explicative, and user-friendly manners [1, 4]. Identify the conversations' tones are of paramount benefit for customer care. Indeed, Hu et al. [18] highlighted the significance and impact of using different tones in the context of social media customer care. Moreover, it can be mentioned defining, classifying, and representing the context (i.e., via context dimension tree) [11, 26]. Furthermore, seamlessly transferring the conversation from the chatbot to a human operator agent is extremely needed if it is stalled [17]. Finally, other issues to mention are solving ambiguities, data and error handling [17], and monitoring and evaluating the chatbot effectiveness and efficiency [3].

The *socio-management requirements* concern the procedural and management qualifications, as well as the user-based analysis to be conducted for a more personalized experience and marketing response [19, 21, 26]. In particular, it can be mentioned maintenance and update of the service manuals and all concerned staff about the relevant changes of the system [21]. Furthermore, training staff to use the system at its best and addressing their concerns and resistance to change is inevitable. [21]. In turn, developing a marketing communications program to inform customers, suppliers, and other stakeholders on the changes [21] become priority requirements. Finally, data analysis is crucial to better understanding users' and the market's behavior [29].

SRQ6: Goals

To have a better understanding of the goals of these chatbots, we classified the papers in *Industry*-related (i.e., 9 studies mainly focusing on the current state of CBTs in the tourism industry), and purely *Academic*-related (i.e., 11 studies focusing on the technical aspects and the development of the chatbot itself).

Promoting a seamless and automated anytime-anywhere support for the tourists vising cultural and heritage sites is a common objective (i.e., city of Manta in Ecuador [2] and Pompeii's archaeological park in Italy [26]). Moreover, providing local information is also combined with the need for leveraging on social media (i.e., using the Messenger platform to provide continuous interactive tourism information about Yogyakarta [1]). Given that CBTs are evolving at a fast pace, to deliver incremental functionalities or adding new ones to enhance the user experience has often been set as a priority goal. Examples include creating a novel tone-aware chatbot that generates toned responses to user requests [18], automatizing testing the functionalities of CBTs [3], introducing a chatbot based on a context-aware system able to recommend contents and services to increase the promotion of cultural heritage [11], or the realization of a companion chatbot to help travelers decoding medical drug boxes sold in the host country, linking them with the corresponding trade name sold in the traveler's home country [35].

SRQ7: Services Realized

The services presented by the elaborated studies can be classified as purely technological and socio-technical functionalities. Concerning the *technological* ones, they focus mainly on the back-ends (i.e., functionalities *inside* the chatbot) that are not interacting nor visible to the end-user. For instance, we can cite mining and manipulating the acquired data [36] or automating the tests of chatbots through emulation using Java-based implementations that automatically parse plans and generate concrete test cases at run-time [3]. Moreover, the architecture in [2] aims at extracting the user's intent and expectations searching for text patterns in the user's messages, and using more advanced AI techniques applied to human conversation. Finally, other services to mention are hotel-related forecasting (i.e., tourist arrivals, demand, and hotel occupancy) and analyzing the impact of online reviews on hotel performance to offer the provider a better and clearer vision in the long run [19]. In general, chatbot interfaces are just composed of the chat showing the messages exchanged and the keyboard or the interaction menu prizing simplicity and efficiency. Nevertheless, a few applications opted for dedicating an important portion of the screen/window to the profile picture (i.e., a cartoonized icon of a flight assistant [23]).

On the one hand, the *socio-technical* functionalities (STF) address what can be related to the service management by performing basic tasks such as booking a room, answering FAQs [4,12,33], understand and answer customer queries instantly [33], ordering meals or drinks [31], controlling the room temperature, lighting, taxi booking, and itinerary planning [10,31], and identifying a corresponding medical product from the user's home market [35]. On the other hand, they can solely communicate to the client messages pre-arrival, throughout their stay and post-checkout [4], generating toned responses to user requests based on their humor using the seq2seq model implemented with recurrent neural networks (RNN), such as the Long Short-Term Memory (LSTM) or the Gated Recurrent Units (GRU) model [18], providing necessary information to offer a better touristic experience [26], even adapting the user interface according to the visitor's backgrounds for better personalization [11].

Marketing and sales play a significant role in the STF of a CB as they can create personalized travel recommendations of touristic sites and attractions [2,32], promote marketing campaign based on consumer involvement [1], suggest special dishes [31], greet guests at check-in at the hotel and remind them about the services available in the hotel [21]. Finally, analysis tools are strategic for a CB. Indeed, they allow the provider to extract the user's intent and expectations and to identify the user's preferences [2], to learn, based on previous choices made by the visitor, what information he/she can be further interested in [11], to forecast tourism arrivals, demand, and hotel occupancy, and to analyze the impact of online reviews on hotel performance [19].

SRQ8: Services Envisioned

The functionalities which have not been designed/implemented—yet conceived—have been classified as socio-technical and technological. The envisioned socio-technical functionalities concern *personalization* by tailoring guest's stay and

experience and integrating voice command functions [4], enhancing the *level of interaction* with tourists during their visits and acting as a personal guide [2]. Other examples are *smart* hotel rooms' amenities and services customization directly via chatbots [4], using AI and ML for *emotions*-based mechanisms to develop *proactive* chatbots [4], training the chatbot to learn the *styles* characterizing different brands and behave accordingly [18], training the system with new *heterogeneous sources* of data and services, more complex environments and improvements based on the feedback received [11]. The envisioned technological functionalities focus on the automation side, leveraging on extensive testing to achieve more *generalizable* approaches [3] and studying the principles and pillars of CBT—enabling a deeper understanding of the technology can enhance future solutions for modern needs [17].

SRQ9: Technology

The spectrum of the technologies employed is quite broad. Many systems have *stand-alone* back-ends, entirely developed/commissioned by the service provider. However, in some more complex cases, chatbots are integrated with existing third-party solutions (e.g., integrating IBM Watson in the back-end [31]). The majority of the chatbots have been implemented using Python libraries. Concerning the *front-end*, they use either customized implementations or rely on existing platforms such as Telegram [13] and Facebook messenger [1, 2, 17, 32].

SRQ10: Benefits

The advantages brought by CBT are multiple (e.g., time- and quality-wise) and measurable. The *perception of time* is very important in the tourism sector, and it has a great influence on customer satisfaction. Chatbots are perceived as a 24/7 working concierge always available and providing instant support [4, 12]. Chatbots reduce and simplify the human-machine interaction process (i.e., $\backsim 80\%$ of all customer requests are automatically processed, delegating to the human personnel only the remaining $\backsim 20\%$ [33]). Chatbots can usually undertake numerous simultaneous and personalized conversations—only limited by the hosting machine [4]. The quality of the service provided is constant, and it is not affected by common employee-related risks (i.e., strikes, discrimination, quitting the job with no notice, showing negative emotions, shirk from work, and getting ill [4, 19]). To date, despite explicit or implicit ethics implementation [3], no chatbot on the market has raised complaints about its fairness or misconduct. Conversely, in some cases, the tests have indicated that the responses generated by the bots have been perceived as more empathetic than those provided by human agents, thus raising customer appreciation [18].

Indeed, CBs have received positive feedback for the dynamic dissemination of various information, services, or narrative content (textual and multimedia), which has made possible to integrate and adapt them to the users' needs and dynamic behavior, rarely raising questions on the respect of the users' privacy [1, 11, 31]. Another highly appreciated advantage is a short time required

to perform sophisticated analysis. Enabling a prompt understanding of the customer requirements can enable prompt predictions and more accurate replies and overall interactions [29]. Finally, chatbots provide tangible financial benefits. For example, savings employees' time from tedious and repetitive tasks [21] –therefore contributing to reduce personnel demand and staff workload [12,27]–, automatizing the advertising activities, recording growth in sales, and, overall, increasing the brand's value [27].

SRQ11: Drawbacks

The limitations elicited from the primary studies can be grouped into 3 categories (i.e., *user-*, *provider-* and *system*-related). Concerning the providers, small businesses have significant difficulties in fitting the design, development, and maintenance of CB into their business plan. Hence, as mentioned above, costs can start from $30,000 and up to $150,000 if more complex analysis and integration with third-party services are required [19,27,32]. A given chatbot could be the only way to contact the service provider, representing the single point of failure of the communication, raising frustration and delusion in the user.

Concerning the chatbot limitations, the *incapability of processing complex information*, providing *scattered* and *artificial/unnatural* interactions, *looping on inappropriate suggestions*, and the difficulty to *interpret (in)satisfaction* (e.g., sarcasm) still foster reluctance on the employment of these technologies [4]. The users might also need to share private information about their complaints or financial situation (considered sensitive), which raises the fear of having them compromised or, if possibly misinterpreted, misused [4]. Moreover, current chatbots have been criticized for the lack of creativity, involvement, and personal touch, especially in the case of misinterpretations of a request [3,4]. Therefore, it is a common belief that chatbots will still have to rely on human intervention/supervision [19]. Finally, in certain circumstances, chatbots can be perceived as threats: either from the "powerless" misunderstood user or the service provider employees (i.e., help-desk) who see their work positions endangered [4,29].

SRQ12: Open Challenges

As for the advantages, the open challenges are mainly provider-, user-, and system-related. Within the dynamics of a chatbot, the human user plays a crucial role. Nevertheless, chatbots still struggle with lexical and semantic ambiguity [37]. Therefore, the most impelling challenges are user-related. For example, *aligning* the CB with the *user's perspective*, prevent *user's uncertainty* and *resistance* [4], determining the user's *perception* via NLP[9], promote *clarity* and *wording* to match or compensate the users' feelings [29], *pace the conversation* –choosing number and length of the words– (e.g., longer words are more calming and associated with positive emotions) [29], and avoiding annoying *repetitions* [37]. However, humans' change their communication style when interacting with chatbots [29]. Thus, to understand to which extent a designer should chase

the human-like feeling rather then a more *clear/structured* interaction is still an open question [26].

From the provider perspective, the main open challenges are to find the right trade-off between chatbot- and human-delegated tasks (i.e., managing the loss of jobs [4]) and enabling knowledge sharing [4]. In turn, realizing an effective business plan, which must generate a considerable return of interest (ROI), is considered a chatbot-delegated task [4]. Finally, considering the nature of the primary studies (more tourism-oriented than technology-oriented), the system-wise open challenges have not been fully explored. Indeed, the challenges identified by the elaborated papers focus on data extraction and data representation [18], ensure data correctness and bias-free [1], and AI-related features [33].

4   Discussion

Although the concept of conversational agents dates back to the 60s, modern CBTs still mirror certain aspects of that original vision [32]. While chatbots reached a remarkable degree of automation and efficiency (e.g., ordering meals and booking flights), handling sophisticated conversations has not been mastered yet. Indeed, misunderstandings and lack of user-chatbot alignment may generate distress, frustration, and skepticism on a given chatbot or on the technology itself. For example, the Henn-na Hotel (Japan) is known for having a futuristic staff mainly composed of robots. Nevertheless, in 2015 they had to "fire" 50% of their robotic workforce. The project failed to reduce costs and employees' workload. Moreover, a number of tourists reported those bots as annoying and incapable to process even simple requests [34].

Overall, the most common (entry-level) CBTs rely on rule-based interactions, for instance, exploiting standardized menus (i.e., no need to **produce** and **parse** –via NLP– custom verbal text) [20]. Although it limits remarkably the expressiveness of the conversations, this *workaround* limits possible errors and misunderstandings, appearing satisfying for a broad set of scenarios.

More complex chatbots perform an in-depth analysis of both provided data and the human interlocutor's profile. Advanced AI-based NLPs are not limited to understanding *what* the user is saying, but also *strive* to understand tone, mood, etc., enabling ML-based predictions. However, to have good results with ML approaches, a large amount of data are required. This process is laborious and, to date, human intense. A common objective is indeed to reduce the human implication in data extraction and pre-processing. Notwithstanding, having a deeper understanding of a tourist and his/her interests/preferences, financial capabilities, and personality can exploit ML predictions for more tailored assistance and, more importantly, shaping future interactions. Indeed, e-communications outperformed conventional methods. Thus, in general, hotels and the tourism industry had to evolve bridging their systems messaging platforms and social media (which, in turn, have remarkably invested in developing APIs fostering the development of chatbots on their platforms). For example, Facebook Messenger counted 66.000, 100.000, and 300.000 active chatbots in

2016, 2017 ,and 2018 respectively [28,37]. Recently, the users of the Telegram platform skyrocketed (300 million bots in 2018). The high-quality APIs and services of this platform are attracting an increasing number of businesses [30]. The Slack platform provides an *early*-version of CBTs, allowing the configuration of auto-replies and personal-tasks automation (i.e., reminders). However, the bot does not support conversations [15]. Finally, Whatsapp is still relatively behind (APIs development phase) w.r.t. the other big competitors [22] The investments to facilitate CBTs made by these ICT colossi reflect the CBTs hype and, in most cases, fully justified interest.

CBTs led industries operating in the tourism sector to *impose* their *presence* in this new technological competition, preserving the distinctive traits of their *brand*. For example, hotels are investing in virtual concierges, providing the most innovative functionalities off the shelf. CBTs added a new dimension to already harsh competition. CBTs can both strengthen or destroy customers' satisfaction, henceforth loyalty. Creativity, originality, and efficiency play a crucial role in this new quest. Rule-based chatbots are quickly becoming outdated as AI advances. Thus, chatbots that represented an initial advantage might backfire if not evolving alongside the users' expectations. For example, KLM Royal Dutch Airlines introduced a novel chatbot supporting the tourists in packing for their trip [32], via knowing the destination, date, and trip length. In [18], the authors have foreseen that the strategical transition from rule-based systems to fully NLP-based chatbots needs a touch of empathy and social engineering [14]. Indeed, their early study anticipates the benefits of this direction in terms of user satisfaction.

Summarizing, 24/7 data availability, and menu-based interactions are only the entry-level features that a modern chatbot must provide. Solving data integration, storage, and manipulation are challenges that will continuously evolve alongside the higher abstraction goals such as *(i)* anticipating the user, *(ii)* debating with both content- and tone-aware, and *(iii)* delineating personality traits (possibly embracing the brand etiquette and overall style). The development of both front-end and back-end functionalities will represent a remarkable investment shift in tourism and hospitality. Finally, it must be highlighted that none of the elaborated studies has addressed ethical concerns about CBs' behaviors and/or data-management plans (DMPs). Considering the sensitive nature of the data handled, tackling such aspects is impelling.

5   Conclusions

Chatbot technologies require considerable investments, which are a barrier for many medium-small enterprises (SMEs). However, for those who can afford the development of chatbots, providing simple menu-based solutions no longer confers a plus to the investors. Hence, the users' expectations (led and incited by technological advancements) go way beyond what only two years ago was considered cutting-edge technology. This study systematically elaborated the most relevant recent literature in studies' abstraction, demographic details, application scenarios, recipients, requirements, services realized and desired, technology,

advantages, limitations, and open challenges, concluding with a discussion elaborated over the aggregated understanding provided by our investigation.

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Blockchain Technology's Potential for Sustainable Tourism

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Abstract. Achieving sustainable tourism is a process that focuses on numerous goals and faces many challenges. The advent of disruptive technology like blockchain could help to tackle some challenges in sustainable tourism development and address its goals. This conceptual paper aims to discuss how blockchain technology could contribute to sustainable tourism. Precisely, the authors investigate the potential benefits of blockchain technology to disrupt tourism operations and boost local economy, manage food supply chain and mitigate food waste, achieve tourists' satisfaction, affect the tourists' sustainable behaviour, and address awareness rise issues. The authors conclude that blockchain technology has a potential to contribute to sustainable tourism development as well as the SDGs and propose the directions for future research.

Keywords: Blockchain technology · Sustainable tourism · SDGs

1 Introduction

The UN 2030 Agenda for Sustainable Development sets 17 sustainable development goals (SDGs) with the aim to end poverty, protect the planet, and ensure prosperity for all. Tourism, with its possible positive economic, social, and environmental effects, is influenced by the Agenda, though it is mentioned only three times - in the contexts of job creation, responsible production and consumption, and sustainable use of marine resources.

Sustainable tourism has been a major focus of tourism policy makers, destination marketing organisations, and tourism scholars for years. To highlight the significance of the sustainable tourism, United Nations Organisations proclaimed the year 2017 as the International Year of Sustainable Tourism for Development. Many scholars demonstrate their interest in the subject by publishing numerous papers that focus on different aspects of sustainable tourism. However, despite such interest, the empirical research shows that tourism is actually less sustainable than ever at the global scale [1, 2]. Therefore, the question how to achieve sustainable tourism is still open. Besides, the academia agrees that sustainable tourism implementation is under-researched area [3].

The scholars [4] suggest that the nature and achievement of sustainable tourism can be considered in a variety of ways. A great emphasis is put on the improved management and use of technological advancements that can efficiently respond to economic, sociocultural, and environmental problems [5, 6]. Technological advancements are broad-based and include a variety of production, information, and social technologies [7]. Though different technologies have implications for the sustainable tourism development, thanks to its unique characteristics, blockchain technology is capable to revolutionise sustainable tourism. Blockchain technology has gained a great interest from both practitioners and scholars quiet recently, yet various solutions to improve different sectors have been already provided. The attempts are being made to create more collaborative and integrated cities [8]; this will have a potential to provide more efficient and effective methods to live, work, and network through integrative platforms linking different stakeholders [9].

[10] assure that via blockchain implementation the tourism businesses will be able to manage sales, operations, finance, and administration related transaction, while capable to deal with external stakeholders, including the government. This will potentially contribute to sustainable tourism development, which cannot be achieved without the collaboration of all stakeholders.

This conceptual paper aims to contribute to existing literature on impacts of blockchain technology and focuses on the potential of blockchain technology to contribute to sustainable tourism development. In the further sections the authors provide an overview of sustainable tourism and blockchain technology, discuss how blockchain technology can be used to achieve sustainable tourism, elaborate on the ways the blockchain technology can be implemented in practice, and conclude and determine future research directions.

2   Literature Review

2.1   Sustainable Tourism

[11] defined sustainable tourism as tourism that takes full responsibility of its current and future economic, environmental, and social impacts, addressing the needs of the industry, the environment, tourists, and host communities. Generally speaking, sustainable tourism must satisfy the needs of the present tourists and tourism destinations in cope with providing opportunities for future development and maintaining heritage integrity, ecological integrity, biodiversity, and life-support system [12].

Sustainability and sustainable development gained high interest from the tourism scholars since the late 1980s [13]. Sustainable development approach is based on three pillars of sustainability: economic, social, and environmental. Economic sustainability refers to the efficiency of companies' activities in the long run; social responsibility is related to providing equal opportunities, respecting distinct cultures, reducing poverty and discrimination; and environmental sustainability refers to a proper management of scarce, especially not renewable, resources [11]. Similarly, many scholars regarded sustainable tourism as the interaction among economic, socio-cultural, and environmental aspects of tourism [14]. In order to be deemed as sustainable, a destination must be liveable, equitable, and viable [15].

However, in some research the intersection of three aspects of tourism is viewed as weak sustainability and great emphasis is put on strong sustainability [16]. Weak sustainability concept leads to endorsement of "sustainable" economic growth, whereas strong sustainability concept leads to conclusions that a steady-state economy is the most desirable outcome [17]. Furthermore, some academics have extended the three-pillar concept of sustainability to four pillars including organisational development [18] or tourism value chain [19]. The advocates of the latter concept put emphasis on that sustainable tourism must find the ways to lower the harm that is simultaneously created along with the value for the tourists [20].

An extensive research on sustainable tourism has been matured with years; earlier papers focused on definitional and conceptual matters and provided frameworks to explain the sustainability construct; recent studies started to conduct more empirical research [21]. A more recent research focuses on sustainable tourism implementation [22], investigates gamification techniques and applications that can be used for achieving sustainable tourism [23], and proposes a multilevel approaches to understand sustainable tourism development [24]. [25] highlight the most popular researched topics in the domain, namely, tourism impact; sustainability assessment; development; visitors' attitudes; and planning. According to [21], since 2008 sustainable tourists' behaviour, event tourism, nature-based tourism, and climate change were predominant themes in sustainable tourism research. Though information technologies have been acknowledged to have a direct and significant impact on tourism industry, disruptive technologies did not receive much attention in sustainable tourism research.

2.2   Blockchain Overview

A blockchain is a distributed database that is comprised of a list of transaction bundles, named blocks, that are linked to each other. These blocks cannot be easily altered once they are accepted as parts of the total chain in a sophisticated non-centralised procedure. In order to change one block, every following block would also need to be changed that makes changing almost impossible [26]. There is no central authority who administers the blockchain, but the technology constitutes a peer-to-peer network where decentralised nodes keep copies of the whole blockchain. The so-called miners participate in the process of adding and verifying the new records. To add and verify the data, they solve a computationally difficult problem and then get rewarded for contributing their resources [27]. Every new block added to the chain contains a unique identifying code, the hash, based on its preceding blocks; this ensures more accuracy in data tracking and higher security [28]. Different blockchain-based platforms deploy so-called smart contracts that enable the trusted conclusion of online agreements between unknown parties. Digital currencies and smart contracts have the potential to disrupt many industries [29], including tourism. The major characteristics of blockchain technology and their possible links to sustainable tourism are provided in the Table 1.

Table 1. Major characteristics of blockchain and the links to sustainable tourism

Feature	Description	Possible link to sustainable tourism
Disintermediation	The peer-to-peer nature of the blockchain means the absence of a central authority	Tourists and travel service providers as well as local hosts can directly contact each other
Trust	All participants can trust each other and deal directly with each other	Tourists can express opinions and evaluate their experiences with different travel companies with full transparency
Costs	Costs can be cut due to the elimination of third parties	Cost savings for both tourists and travel service providers
Traceability	All transactions can be traced to authenticate their origin and path	Ensure that such products as seafood, lumber and other products sold as environmentally friendly really are
Integration of coins/tokens	The coins/tokens are used for more effective currency exchange, loyalty program, and rewards for review	Both tourists and local community can gain coins/tokens for realising sustainable tourism practices
Access to high-quality data to everyone	All parties involved in a transaction will have accurate, timely, consistent and complete data	The availability of information about the prices, travel service or product to all parties ensures that all tourists will be treated equally

Tourism industry is actively investing in blockchain-based start-ups. Among the tourism enterprises that already implement blockchain technology are TUI, adopting the technology in its booking, reservation, and payment systems [30]; CheapAir, Expedia, One Shot Hotels, and Webjet accepting bitcoins as a payment method [31]. Various blockchain solutions in tourism, for instance, Winding Tree, DeskBell Chain, TravelChain, invented their own coins or tokens.

Few academic papers on blockchain tourism research demonstrate the novelty of the topic. Existing studies mainly focus on general possible impacts of blockchain on travel, hospitality, food, and airline sectors [32, 33]. The blockchain adoption from smart tourism perspective is also discussed in some articles [34, 35]. Some authors [36] propose a blockchain basics criteria set for comparing the distributed applications (DApps). Recent research by [37] conceptualised the role of blockchain technology and cryptocurrencies in achieving tourism related SDGs.

Yet, the research focusing on the contribution of this disruptive technology to sustainable tourism development is very scarce. The practitioners seem to be more fast in addressing the SDGs via encouraging the sustainable tourism practices. Table 2 comprises several blockchain based companies that adopt sustainable tourism practices.

Table 2. Blockchain based companies with sustainable tourism practices

Company name	Sustainable tourism practices
DeskBellChain	The tourists can collect rewards for helping to clear up plastic litter on the beach, for recycling, and for renting a bike instead of a hire-car
Provenance	Traces yellowfin and skipjack tuna from catch to consumers and digitally reinforce the value of certification with Soil Association Organic
IDGO	Aims at strengthening the indigenous people autonomy and ethnic identity. Tourists can obtain local merchandise discount. The revenue will be returned to the community to help the environmental protection, education, and cultural continuity
Tranexus	Will provide a travel assistant providing support for travel services with eco-options and low-carbon choices
NatureCoin App	The users get coins for recycling plastic. Later, they can change the coins for local products

3   Blockchain Technology and Sustainable Tourism

3.1   Potential of Blockchain Technology for Sustainable Tourism

Because of its unique characteristics blockchain technology can have a tremendous impact on the business processes and the whole industries [38]. Sustainable tourism development is facing numerous challenges and barriers, for instance, large energy use and green gas emissions, inappropriate waste management and treatment, loss of biodiversity and habitat destruction, threats to heritage management and cultural integrity, lack of communication channels and information platforms [12]. In this section the authors focus on the possible potential of blockchain technology to tackle some of these challenges and discuss how this disruptive technology can be used to contribute to other domains of sustainable tourism. The domains of sustainable tourism that could be positively impacted by application of blockchain technology are summarised in Fig. 1 and explained in detail below. Though the effect of blockchain implementation on the achievement of SDGs is out of scope of this paper, the authors express their opinion regarding which particular SDGs can be affected by blockchain technology use.
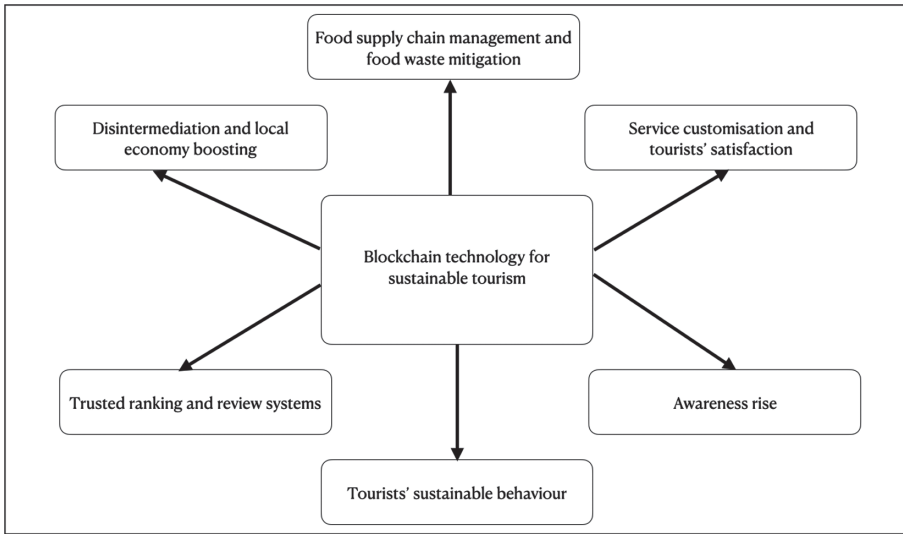
Fig. 1. Blockchain technology's potential for sustainable tourism.

Disintermediation of Tourism Operations and Boosting of Local Economy and Culture. Providing economic benefits to local and other stakeholders as well as reaching tourists' satisfaction are among the important goals pursuing by sustainable tourism development [39]. Blockchain technology can help achieve these goals through enabling disintermediation of tourism operations. Blockchain technology can effectively remove the intermediaries because of its potential to build trust, ensure more secure information exchange, reduce costs, and enable transparency. Also, blockchain based cryptocurrencies enable simple, direct, and safe peer-to-peer transactions without the need for trusted third parties [40]. Moreover, blockchain technology can make transactions more equal and distribute similar powers to both providers and consumers of tourism services [41]. By virtue of these characteristics of blockchain technology, new players, both small companies and local tourism service providers, would appear in the tourism and hospitality market. As a result, the locals could sell tourism products to the tourists and in their turn, the tourists would access the authentic travel experiences. Through blockchain systems, the local businesses that conserve cultural heritage and traditional values as well as small businesses that sell local goods could offer their services and goods directly to the tourists and visitors. Blockchain ensures the transparency, quality, and origin of the data, so the tourists could verify the authenticity of purchased product and could be sure in its originality. Besides, they could be assured that the prices for goods and services are same for all. Also, rather than staying at a hotel, the tourists could have an opportunity to stay at some local's house and receive advices on authentic restaurants or/and sacred places to visit. Moreover, since blockchain technology allows to design and create digital currencies [39], local community could create their own money. The tourists could use local money to pay for goods and services at the destination, and thus boost local economy.

Food Supply Chain Management and Food Waste Mitigation. From the perspective of contributing to environmental sustainability, blockchain technology can impact the food supply chain management and food logistics management [41]. Blockchain technology's properties, such as transparency, reliability, and invariability of data, can ensure a traceability system that will provide information about the origin, authenticity, processing, and retailing of food products. Such a traceability system will guarantee the food safety, confirm whether the food is really 'green', limit the chance of forgery or fraud, and increase tourist confidence and trust [34].

Another major sustainability challenge is waste mitigation [42]. As the hospitality sector grows, it produces more waste [43], and the major fraction of hospitality waste is represented by food waste [44]. Food waste mitigation could be achieved by effective stock management, excess food redistribution, recycling, and waste disposal [45]. Blockchain technology's decentralised, integrated architecture could improve stock management and facilitate excess food distribution.

Service Customisation and Tourists' Satisfaction. Tourists' satisfaction is one of the crucial goals aimed by sustainable tourism development. Tourism and hospitality companies put a great emphasis on customer management, tourist's experience, and service excellence to meet the tourists' needs and expectations with the aim to enhance the overall tourists' experience and achieve tourists' satisfaction [40]. Applying blockchain technology for guest services, such as tracking tourists, tracking luggage, facilitating travel insurance in case of flight delay or cancel, can significantly enhance tourists' satisfaction [32]. In addition, blockchain technology can provide services customisation without violating tourists' privacy. Using digital ID in blockchain technology, the tourists themselves choose which data and with whom they want to share their personal information [40]. Overall, blockchain technology can provide more accurate and trustworthy information enabling customised services resulted in better tourists' experiences and tourists' satisfaction.

Awareness Rise. According to [46] it can be stated that as all national tourism organisations, destination management organisations, local community, and tourists are essential levers in the transition to a sustainable future, it will be crucial to raise global awareness around sustainable tourism issues and increasing individuals' willingness to contribute to sustainable tourism development. In this case, blockchain may deliver transparent information regarding emissions, benchmarks, food supply chains, and tourists' choices. Genuine and audible informations on the blockchain could help to raise awareness and create incentives for sustainable behaviour of all interested parties.

Tourists' Sustainable Behaviour. Whereas some tourists tend to be pro-environmental and have a great interest in sustainable tourism practices, others do not care about the impacts their behaviour could have on local community and destination's environment. A blockchain-based rewarding system could be helpful in changing the tourists' behaviour. If the tourists could collect rewards for their sustainable behaviour, they would be more likely, for instance, to clear the beaches or collect plastic from the sea and bring it to established recycled centres. Or, the tourists would be more likely to prefer walking routes if they would receive cryptocurrency coins or tokens as a reward for their pro-environmental behaviour. Incentives are acknowledged to have a positive impact on

individual's sustainable behaviour [23]. Blockchain technology could provide an excellent opportunity to create cryptocurrency-based rewarding system to encourage tourists' sustainable behaviour. The tourist would get tokens which they could spend on other goods and services in the host destination.

Trusted Ranking and Review Systems. When tourists with pro-environmental behaviours select an accommodation or restaurant, they often search reviews and ratings. However, the major problem can be inability to know which reviews are genuine and trustworthy and which are not [47]. The hotels, restaurant owners, or customers can manipulate the ranking and review systems [48]. Blockchain technology is capable to tackle this issue via its possibility to create a unique private key for each identity with several independent verification processes embedded into ranking and review systems [40]. This can ensure the reduced rates of manipulation or duplication of reviews. Blockchain technology could be applied to create a voting system that could be used to establish an immutable ranking of the best accommodations and restaurants with sustainable tourism practices.

Overall, based on the examples of potential effects of blockchain implementation on sustainable tourism, the authors argue that the application of blockchain technology can contribute to many SDGs, namely, SDG No.1 (no poverty), SDG No. 2 (zero hunger), SDG No. 5 (gender equality), SDG No. 8 (decent work and economic growth), SDG No. 9 (industry, innovation, and infrastructure), SDG No. 10 (reduced inequalities), SDG No. 11 (sustainable cities and communities), SDG No. 12 (responsible consumption and production), SDG No. 13 (climate action), SDG No. 14 (life below sea), SDG No. 15 (life on land), and SDG No. 17 (partnerships for the goals).

3.2   Implementation of Blockchain Technology in Practice

Within tourism industry, different stakeholders can benefit from blockchain implementation. For instance, some travel companies aim to implement blockchain technology in order to enhance tourist service quality and provide customised services [49], while others view the technology as a solution to reduce intermediary costs and travel agents' fees. Among the possible implementations of blockchain in tourism are: cryptocurrencies, smart contracts, and DApps.

Cryptocurrencies. Cryptocurrency is a digital currency where transactions are validated by all network members, rather than by central authority, at low costs [10]. Up to date, among a myriad of cryptocurrencies the most popular ones are Bitcoin, Ethereum, LiteCoin, Monero, Dash, BitcoinCash. Tourism destinations may accept and use cryptocurrencies; this will allow both tourists and residents to use cryptocurrency for purchasing different products, including flights and accommodation.

Smart Contracts. Smart contracts entail a coded programme of an agreement between two or more parties [10]. Applying smart contracts, tourism stakeholders (hotels, local shops, tourists) can automatically place orders, perform tasks, and issue payments without the need for approvals and instructions [36]. Within a tourism destination, smart contracts can automate the transactions related to purchases, salary payments, rewards issuance, hotel room key programming [50].

Tourism Related DApps. To improve the communication and interaction with the customers, tourism businesses can develop blockchain integrated DApps. Table 3 shows some of the existing tourism-related DApps. The tourists as well as service providers will benefit from using DApps in terms of significant cost savings, effective loyalty programmes, data sharing, and better identity management.

Table 3. Tourism related DApps

DApp name	Description
Winding Tree	Using smart contracts and ERC827 protocols, connects travellers directly with service providers, thus providing best savings for the travel industry and reducing the fees associated to the booking process
Sandblock	Aims to improve customer loyalty programs; is creating a much more customisable token for all travel companies to make their loyalty scheme more effective
Accenture	Introduces the Traveler Digital Identity System thanks to which airports can accelerate the process of document verifications and, therefore, reduce the lines in the airports
Travelchain	Intents to create an open-source system to manage the data of the tourists. The systems will monitor and protect all travel data and users will get tokens for sharing their data
Trippki	Aims to develop better customer loyalty schemes
ShoCard and SITA	Aims to better identity management in the tourism industry
Lockchain	Enables a direct marketplace for hotels, airlines; uses the decentralised system for payment, property management, and booking processes

4   Conclusion

As popularity of blockchain technology and great interest in its implementation in various sectors are growing, the number of research papers dedicated to this technology grows as well. In spite of this, the tourism research on blockchain is still in its infancy. This conceptual paper intends to foster an academic discussion regarding blockchain and its possible impacts on tourism industry, specifically, on sustainable tourism development.

In the light of UN Agenda for sustainable development and its SDGs, this paper makes a contribution in terms of proposed achievement of sustainable tourism. This paper conceptualised the role of blockchain technology in its contribution to sustainable tourism. The authors have addressed the challenges and the goals of sustainable tourism by examining the potentials of blockchain technology. Blockchain technology can positively contribute to sustainable tourism development through boosting local economy, achieving tourists's satisfaction, and encouraging sustainable behaviour, and, therefore, can help address many SDGs. Nevertheless, blockchain technology itself may be quite unsustainable in terms of spending too much energy when creating the blocks. However, this issue has been addressing as there are different methods to create

and validate the blocks that require less energy consumption [51]. As technical characteristics of blockchain that can impact the sustainability are out of scope of the present study, the possible negative impacts of blockchain technology on environment are not discussed in the present paper.

The paper also elaborated on blockchain implementation in practice. Cryptocurrencies, smart contracts, and DApps were conceptualised as the possible ways to implement blockchain technology.

One of the limitations of this paper is its scope; the authors explored few domains of sustainable tourism as to be impacted by blockchain technology. Additionally, the paper did not identify and elaborate about neither the barriers that impede blockchain technology adoption in the tourism sector, nor negative impacts of blockchain technology implementation on sustainability. Another limitation of the paper is in its type. Therefore, empirical research confirming the propositions made by this paper is of high importance.

Given the broadness of the topic and the limited number of relevant papers examining blockchain technology's benefits for sustainable tourism, the authors propose the following directions for further investigation. Future studies may examine the perceptions of different stakeholders towards blockchain technology's potential for sustainable tourism by conducting interviews. Also, considering the limited number of implemented blockchain solutions, the academia and specialists in the subject are invited to develop a real blockchain-based system on the basis of the propositions made in this paper and evaluate the results. Additionally, given many domains of sustainable tourism, the scholars are encouraged to explore the blockchain's impacts for different domains of sustainable tourism, for example, better communication, water consumption, benchmarking of tourism enterprises, biodiversity conservation, etc.

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In-room Voice-Based AI Digital Assistants Transforming On-Site Hotel Services and Guests' Experiences

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Abstract. Voice-based artificial intelligence (AI) devices transform human-computer bidirectional interactions with new touchpoints. Despite the recent release of purpose-developed in-room voice assistants for hotels, they have not been widely deployed by hospitality companies. There is limited research on the phenomenon of voice-based digital assistants and a research gap in their adoption by hotels for automating workflows and enhancing guests' experiences. This study analysed the role of voice devices for mediating interactions between hotels and guests from both the hospitality technology providers' and guests' perspectives. This was done by the means of inductive qualitative research using 28 semi-structured interviews. The findings revealed that benefits associated with the application of voice-based digital assistants in hospitality outweigh the drawbacks for both hotels and guests. The paper proposes a model which illustrates the essence of speech-based interactions between hotels and guests via voice assistants. This concept contributes to human-computer interactions in the hotel industry.

Keywords: Voice-based digital assistants · Artificial intelligence · Internet of Things · Human-computer interactions

1 Introduction

Technology, smartness, robotics, Artificial Intelligence (AI) revolutionise tourism and hospitality industries, by reengineering the entire ecosystem [8–10]. Intelligent automation represented by both embodied and disembodied AI is likely to disrupt most of hotel operations, as safety remains the main value of all COVID-19 era travels [53]. What was regarded as a disadvantage of automation [43], the loss of human touch in interactions, is now considered as an advantage [19, 23, 44]. AI and voice recognition technology are integral parts of the so-called 'new normal' hospitality [10, 30]. In fact, 78% of hospitality companies are expecting voice-activated devices becoming mainstream for room lights and temperature controls [35]. The technology itself can bring new challenges, as once widely adopted, it may reveal its technical imperfection causing customers' dissatisfaction. This paper aims to examine the role of in-room AI-empowered voice-based digital assistants in enhancing hotel services and experiences, the benefits and limitations linked to the introduction of voice-activated devices for operating hotel businesses as well as mediating interactions with guests.

2   Literature Review

Voice recognition technology has been a popular research topic covered by many scholars in the last decade [5, 18, 21, 27, 41]. However, such studies are often focused on the implications of the technology in private households rather than hotel spaces. The existing literature [12, 25, 31, 36, 38, 40] on AI and automation in hospitality prioritise more established and widely accepted technologies and does not investigate voice assistants in detail. Studies dedicated to the adoption of voice-based assistants by hotels are very limited [15, 17]. Due to the overall low level of adoption of the technology by hotels they is insufficient for building a theoretical framework.

2.1   Voice-Based Digital Assistants: Main Definitions

Voice recognition technology has been around for a while. However, major developments have only emerged with the launch of *Apple Siri* in 2010, *Microsoft Cortana* in 2013, *Amazon Echo* in 2014 and *Google Assistant* in 2016. Interchangeable terms are used for voice-based virtual service robots [45], including but not limited to, 'AI voice assistants' [21, 41], 'intelligent virtual assistants' [39], 'voice-based digital assistants' [37], 'virtual voice assistants' [27], 'intelligent personal assistants' [22] and 'digital voice assistants' [26]. Though scholars do not always agree on the terminology, most describe a technology that uses voice input to process information and reply with relevant actions. A voice-based assistant can be a software integrated in a smartphone or computer, like *Apple Siri*, or exist in the form of a standalone device, e.g. *Amazon Echo*, *Alibaba Tmall Genie*, *Apple HomePod*, *Google Home* [37].

Modern voice-activated devices consist of conversational AI that allows people to communicate with machines in the same way they would with other people. Typically, conversational AI includes Automatic Speech Recognition (ASR), Natural Language Processing (NLP) and Text-to-Speech (TTS). ASR takes the audio stream, transcribes it into text and then passes to the NLP and its components for analysis [1]. As for the NLP, it looks for the meanings of voice inputs in a certain context, using the knowledge about human natural language [13]. Then, TTS automatically converts a text into a synthesised speech, based on broad vocabulary options [33].

2.2   Implications of Voice Assistants for Hospitality

Many hoteliers regard AI-empowered voice solutions as a top impacting technology [23]. This explains the growing number of experiments with voice-based digital assistants, launched to enhance hotel services and streamline guests' experiences [14]. In 2016, *Aloft* installed *Apple Siri*'s in-room tablets, whereas *Wynn Resorts Las Vegas* equipped 4000 rooms with *Amazon Echo* speakers [20]. Following the example of these pioneers, voice technology was later introduced in many other properties. In 2018, *InterContinental Hotels Group* partnered with *Baidu* to use customised devices in China [44]. In 2018, *Amazon* launched *Alexa for Hospitality*, developed as a room hub for a guest-centric experience [2]. *Marriott International* became the first partner of the product and *The Charlotte Marriott City Centre* in North Carolina was the first location where the novel device had been implemented [11]. This particular kind of AI

enabled voice-activated assistant offers a hotel-specific functionality and addresses the main concerns surrounding voice-activated devices, their security, as it is set to delete recordings automatically every 24 h. Some hoteliers, however, are still doubting *Amazon*'s interest in solely selling affordable devices [37]. Thus, to reassure guests, they reset devices manually daily or delegate the integration with *Amazon* to technology providers, that intermediate the integrations of speakers into hotels' systems. Some other hoteliers refer to new voice assistants with advanced security features, which have been recently developed around the world, such as *Aragon* [38], *Angie Hospitality* [3], *Houndify* [42].

2.3   Human-Computer Speech-Based Interactions

Consumers increasingly rely on search engines when looking for hospitality products before arrival and during their stays [37]. The idea of a technologically empowered voice mediation between consumers and brands made companies reconsider the new marketing role of voice. Any human-computer interaction has core features of human's input and computer's output. Voice-based assistants have modified such interactions with new voice touchpoints [32]. The absence of physical embodiment stimulates more personal interactions, replacing missing visual touchpoints with voice [41]. AI voice bots offer people a pleasant and convenient experience since they do not disagree and do not overload their outputs with more than one suggestion at a time [28]. A voice-based assistant is a purely consumer-centric technology, as it does not work without humans' input. This makes customers participate in the service delivery process, co-creating their own experiences [34]. Voice-based assistants help people not only to get unusual virtual experiences, but also to customise physical ones, while the conversational AI collects data from each interaction for further AI analysis.

Voice identity can enhance logos and slogans as a part of branding [28]. Thus, businesses can prioritise VEO (Voice Engine Optimisation) strategies, over those of SEO (Search Engine Optimisation), in their ongoing digital marketing activities [44]. The concept of voice being an interface of the digital ecosystem inspired voice assistants' producers to introduce 3rd party integration opportunities. Brands can create *Skills* for *Amazon Alexa* devices and *Actions* for those of *Google Home* to offer consumers a seamless way of accessing services or products via their personal devices. From the commercial point of view, *Skills* or *Actions* could be an efficient distribution channel. From the marketing perspective, they improve brands' context-awareness as many customers use voice to navigate the web and can customise the experience.

3   Methodology

As voice technology in hotels is relevantly new and there is insufficient literature on the field, exploratory research was adopted to develop theory and identify variables for conducting quantitative research in the future. A qualitative approach was selected [16] because it helps investigate all aspects and how people engage with this technology. This was essential for examining the role of voice-based devices in hospitality as it is largely an unexplored area. Following existing health and safety regulations during the

COVID-19 lockdown, online in-depth semi-structured interviews were selected. This proved to be efficient when it is impossible to personally observe a phenomenon or meet interviewees in person. Pre-defined open-ended questions were created based on the literature findings and used in this study as guidelines rather than a script:

1. How can you describe the current role of digital voice devices in hotel services?
2. Which service tasks in hotels, in your opinion, can be automated with voice devices?
3. What are the advantages of using digital voice assistants for a hotel?
4. What are the barriers for the adoption of voice-activated devices by a hotel?
5. How can hotel guests benefit from having a smart speaker in their rooms?
6. Which functions of digital voice devices are most useful for hotel guests?
7. What is your opinion as to why some guests resist using smart speakers in rooms?
8. Speaking about the current COVID-19 pandemic, in what way may it affect guests' attitude to face-to-face service delivery?
9. How do you see the future of in-room digital voice assistants in hotels?

The research benefited from 7 interviews with hospitality technology providers, that had introduced voice devices in hotels and had valuable insights as well as feedback to share. Consumers were represented by 21 millennial users [29], born between 1981 and 1994, who have been using voice-based assistants for personal purposes. The consumers' age range was applied to interview people that would feel more comfortable to use and take opportunities new technologies offer. The list of technology companies was identified using purposeful or purposive sampling [46] through secondary data sources; particularly online articles about the examples of voice speakers' use in hotels. Hence, 78 companies with relevant expertise were selected and contacted via email, 2 of which were additionally contacted during *VOICE Global Summit*. 2 more companies were contacted using references from existing participants, making a sample partially created by the means of snowballing method [46]. Out of all contacted companies, 11 (13.75%) replies were received, and 7 (8.75%) interviews were conducted. The consumer sample was created using a snowballing method. A Facebook post invited experienced users of voice assistants. Their expectations and perceptions of hotel service delivery through smart speakers was examined. All participants were selected without any geographical limitations, but with the focus on matching experiences. Out of 27 consumers contacted between, 23 (85.19%) responded, and 21 (77.78%) interviews were conducted in June and July 2020. Overall, 28 interviews were conducted for this research, and the point of saturation was reached after the 23rd interview.

All arrangements and communication with participants were done online. There is an obvious advantage to online interviews, as they provide an opportunity for a researcher to reach participants in diverse locations worldwide. The interviewees' locations breakdown was as follows: UK (12), US (3), Netherlands (3), Ukraine (3), UAE (2), France (1), Germany (1), Spain (1), Poland (1), Bermuda (1). Interviews were conducted via Zoom (50%) and Email (50%), using the tools most convenient for each participant. To give the initial understanding of the capabilities of voice assistants in hospitality, it was decided to show consumers a 1:38 min video about *Alexa for Hospitality* as a part of experiment [46]. Zoom provided the opportunity to talk directly with respondents and clarify issues. All interviews were digitally recorded for further

transcription by the researchers. Email offered more time flexibility for respondents and an opportunity to get information at their convenience. Email response simplified transcribing, saved time and helped to overcome time zone differences with some participants, although, it eliminated non-verbal language and emotional factors. Semantic thematic analysis was applied to this study focusing on meanings [4]. Coding was facilitated by the *QDA Miner 5* software, that enabled to identify patterns in content using themes, subthemes and categories [4].

4   Results

Responses provided a very rich overview of the hotel voice-assistants adoption. Guests expressed their expectations and the functionality required. They also shared their opinion on using this technology. Technology solution providers explained the technical capabilities and the core benefits. The map of themes and subthemes of all conducted interviews is presented in Fig. 1.
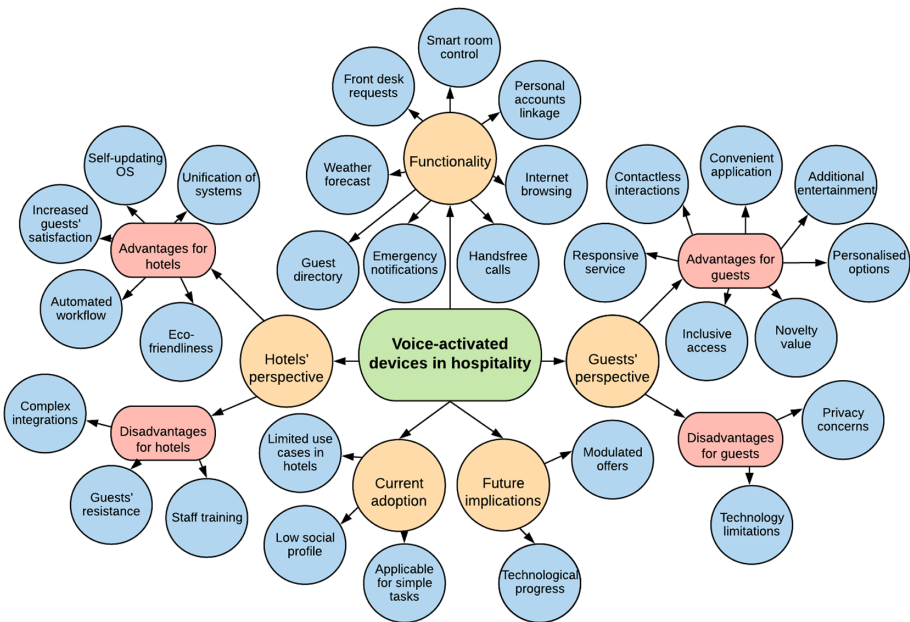
Fig. 1. Advantages and disadvantages of hotel voice-based AI digital assistants

4.1   Current Level of Adoption of In-room Voice Assistants by Hotels

Literature states that the adoption of in-room AI-empowered voice-based digital assistants for enhancing hotel services and experiences remains This study explores the reasons behind the current low level of adoption, such as: limited number of use cases to learn from in the industry and low awareness of the technology and its capabilities in

society. This study also shows that experienced consumers believe that voice-based assistants can only fulfil basic tasks.

> *"So, if I turn up to a hotel room… my first thought wouldn't be to walk in and just start barking orders at an electronic device."*

> *"I don't trust the computers enough to solve complicated problems. Because sometimes at the desk, you can have extraordinary situations where you would need extraordinary thinking rather than just the algorithmic thinking…"*

Providing guests with information on the functionality of voice assistants and issuing clear instructions on how to use them helps eliminate the barriers for those consumers who have never used smart speakers. Extra guidance from hotels provides more tech-savvy guests with deeper understanding of the usability and utility of voice devices.

> *"Wynn [Wynn Resorts] has done a nice job with putting little placards in the room to sort of tell them [guests] what they [voice assistants] are able to do."*

4.2   Functionality of Voice-Based Digital Assistants in Hospitality

The functionality of Voice Assistants in hospitality was examined and summarised in Table 1. The results of the interviews acknowledged the main tasks frequently mentioned in secondary data sources, e.g. front desk requests, smart room control, Internet browsing, the weather forecast, hands-free calls, and guest directory. Yet, interviewees suggested additional functions and offered potential areas for development. For example, efficient feedback and complaint handling; Check out processes; facilities booking Maintenance, transfer, and weak-up requests, as well as controlling the physical infrastructure of the room including, temperature, lights; curtains and media devices. The possibility of smart speakers to serve as a deliverer of emergency notifications. This feature can be very useful if set properly.

> *"If someone breaks into your room it's much faster to say with the voice command that you need help than to actually try to reach your phone."*

Nevertheless, this function must be adjusted and tested before employing, as one participant contradicted the usability of digital voice devices for emergency situations, reasoning that technological limitations can prevent this feature from working properly.

> *"You can say 'Alexa, there is an emergency', and the person that is breaking in can say 'Alexa stop' and Alexa will stop… I think in Alexa you have a setting to restrict it to your voice, but I wouldn't see it happening in a hotel."*

According to participants' insights, the linkage of personal accounts and profile portability, can bring an additional layer of personalisation. This would be an auxiliary stimulus for some consumers to use voice assistants more willingly in the context of their stay in hotels. However, there are security and privacy concerns, as this is often been associated with data breaches in broadcast media.

Table 1. Functionality of voice assistants in hospitality

Themes	Subthemes	Categories
Functionality	Front Desk Requests	Room Service
		Feedback and Complaints
		Housekeeping
		Check out
		Facilities Booking
		Maintenance
		Transfer
		Wakeup Call
	Smart Room Control	Temperature
		Lights
		Curtains
		Media Devices
	Emergency Notifications	
	Weather Forecast	
	Guest Directory	
	Handsfree Calls	
	Personal Accounts Linkage	Calendar
		Shopping Lists

4.3   Hotels' Perspectives on Digital Voice Assistants

The advantages and disadvantages which accompany voice-enabled interactions in hotels were analysed from hotels' perspectives and presented in Table 2.

Advantages for Hotels. In-room voice-activated devices often reduce labour cost and provide coverage around the clock. They can reduce service friction and allow staff to spend more time on enhancing guests' experiences. Given that in-room voice-based digital assistants are part of Internet of Things (IoT) systems they are integrated with hotel amenities and back office [8, 10, 30]. That empowers staff to stay constantly informed on guests' requests and experiences, respond rapidly, pass messages on to relevant department efficiently when service requests or complains are identified, using contextual and real-time information [6, 9]. Most technology providers mentioned automation of processes as the main advantage of voice assistants for hotels. The benefits that can be associated with the automation of workflows were determined by participants. These points fully match with those outlined in the literature.

> *"We saw a huge uptick in the satisfaction of the front desk team, their ability to provide a better service because they weren't answering phones…"*

Operational efficiency, that is usually mentioned in literature with regards to automated workflows, has also a strong influence on guests' satisfaction [24].

> *"With an automated system everyone in the hotel can ask for an extra pillow at the same time and that can then go into a workflow. So, they all know that their request is being heard and that's a great customer experience."*

Table 2. Hotels' perspectives on the usage of voice assistants in hospitality

Themes	Subthemes	Categories
Advantages for Hotels	Automated Workflow	Staff Offload
		Seamless Routing of Tasks
		Reduced Operational Cost
	Increased Guests' Satisfaction	
	Unification of Systems	
	Self-updating OS	
	Eco-friendliness	
Disadvantages for Hotels	Guests' Resistance	Age/Demographics Preferences
		Importance of Human Service
		Avoidance out of Habit
	Complex Integrations	
	Staff Training	

Respondents also revealed that voice assistants can offer more eco-friendly operations, cost-effective maintenance due to self-updating OS, and the unification of interfaces.

> *"Ability to add incremental features and capability without any 'forklift upgrades' as the smart speaker capabilities improve."*

> *"The technology behind the voice activation facilitates a parallel automation system that can reduce the consumption of energy."*

> *"Unifying a variety of systems which originally had different modes on interfaces, into a singular mode, voice."*

Disadvantages for Hotels. Though the cost of voice speakers is low, to function efficiently, they must be interoperable and interconnected with other hotel systems [10]. Therefore, before benefiting from cost-saving mechanisms, hoteliers must invest in their IoT network. The complexity, challenge and cost of integration was endorsed by all technology providers during their interviews.

> *"The challenge that you have with a hotel is that every single hotel is very unique… So, integrating with all the management, food and beverage, billing software, that's usually different on a per hotel basis."*

While reviewing disadvantages of voice-activated devices, it was crucial to analyse some consumers' resistance to technology. The predominant number of participants shared hoteliers' concerns regarding guests' resistance to using voice assistants in their rooms, connecting this barrier primarily with habits and demographics.

> *"People are creatures of habit. So, if you are used to setting alarm every day on your phone, maybe you wouldn't see the point of setting it on the Google/Alexa."*

"Older people might be somewhat reticent to use this kind of device finding it a bit odd to talk to a computer."

There is still a belief that no technology can potentially replace human service delivery. Such statements were made by the minority of participants, as all the interviewed consumers had used voice assistants, whilst technology providers clearly had a vested interest in voice technology expanding its market share in the hospitality domain.

"Some people, they prefer a human touch. You know, they are preparing for a service to be delivered. They believe that part of what they're paying for is as a human service."

4.4   Guests' Attitudes to In-room Voice Assistants in Hotels

Guests' ideas regarding the benefits and limitations of speech-based interactions in hotels were investigated in detail and illustrated in Table 3.

Advantages for Guests. Voice assistants are available 24/7 and transfer requests to relevant hotel services immediately. This level of responsiveness empowers hotels to meet guest demands for instant gratification [7], as mentioned by participants.

"When you arrive in your room, you probably want to set your environment out for yourself, order a late check out, get another pillow, order your dinner. And that can be a long kind of half-hour process if you are trying to phone and get all these bits of information from the hotel. If you can just know that there is an automated agent to get these tasks done for you, then you are going to have a better stay."

"Among advantages for guests: Intuitive Interactions, Commands, Responses as if speaking with a human"

In addition to bringing ease to digital interactions with hands-free features, time-saving opportunities, and the advantage of having a human-like communication, there is also a key aspect of meeting guests' technological habits.

"If you have the same system of assistant in your home, it's pretty convenient for you because you know what you can ask."

The sense of novelty and the additional level of entertainment, which new technology often provides, has also been defined within this study as a benefit for guests.

"At this moment, it's also kind of a novelty… You don't necessarily need it, like you can turn on the light by yourself, right? But it is much fancier and unusual to do it with a machine…"

Consumers who took part in this research admitted that using voice assistants in hotel rooms can potentially enhance their experiences by providing inclusive access, personalised options, and contactless interactions. The findings suggest that hoteliers should not fully rely on the COVID-19 pandemic-related trend for minimising face-to-face service delivery but to fully explore the opportunities of this technology for customer service.

Table 3. Guests' perspectives on the usage of voice assistants in hotels

Themes	Subthemes	Categories
Advantages for Guests	Responsive Service	
	Convenient Application	Time-saving
		Human-like Response
		Single Point of Access
		Similar to Personal Voice Devices
	Additional Attraction	
	Novelty Value	
	Contactless Interactions	Hygienic
		Unbiased
	Inclusive Access	
	Personalised Options	
Disadvantages for Guests	Technology Limitations	Language and Accent Recognition
		Semantic Analysis
		Multiple Device Conflict
		Dependence on Wi-Fi
	Privacy Concerns	Personal Data
		Industrial Espionage
		3rd Party Scams

Among the reasons for preferring contactless interactions named during the interviews were: hygienic interactions (regardless of the pandemic) and unbiased characteristics of voice assistants. As discovered during the interviews, people who prefer face-to-face service delivery are not likely to change their minds due to new COVID related health regulations. The same is true for those who prefer being served by computers.

"You don't have to touch things, like light switches that are usually very dirty…"

"Lowering the barrier to making requests, not having to feel that burden of asking for something."

Disadvantages for Guests. Despite all the developments of NLP, existing voice-based assistants still struggle when dealing with accents and foreign languages [14]. This has been broadly disclosed in papers as well as by the majority of interviewees who

underlined the importance of this drawback, since many hotel guests arrive from abroad.

> *"So, if you speak with a French accent or if you're referring to the French author, and you pronounce the French name in a French way, the machine doesn't get it because it speaks English to you."*

While reviewing technical limitations of voice assistants and the occurrences that lead to malfunctions, participants identified "multiple device conflict" and "dependence on Wi-Fi" as reasons that significantly influence interactions with voice speakers. Scholars [36, 40] agree that privacy is still a major concern associated with voice assistants. It has unsurprisingly been the most frequently named disadvantage of voice assistants, reflected in this study by almost all participants, primarily from a personal data point of view. Nonetheless, some participants were particularly wary of industrial espionage that had not been discussed in literature.

> *"It's one thing having it in your own home, and a lot of people don't necessarily want that, but you have some semblance of an idea that you control it because it's your account. So how does that switch over work when you are in a hotel? Is the data actually being harvested by the Hilton or whoever for use in there?"*

> *"If I am running a meeting from my hotel room and technically, we sign NDA [non-disclosure agreement] with our clients. And… Amazon may listen to everything we discuss. And technically, it may be a part of business that competes with Amazon or maybe a start-up that may be acquired by Amazon."*

However, this research proved that more tech-savvy consumers tend to be less concerned about privacy when using voice assistants.

> *"I personally don't have concerns about privacy, but lots of people have. I stand for open information flow… IT people know that Google, Apple have lots of information about us even without hotel assistants."*

4.5   Future Implications of Voice-Based Digital Assistants in Hospitality

The growing connectivity of devices and the Internet of Everything [6, 8] justifies the inevitable technological progress in hotels [10, 30]. The only question would be what role in this progress voice assistants will play. Figure 2 presents the conceptualisation of speech-based interactions between hotels and guests. Digital voice assistants' producers aim to embed their technology into as many devices as possible, allowing brands to easily create voice-compatible products, e.g. TVs, headphones, smart plugs, bulbs, locks, security cameras, soundbars, watches and tooth brushes. This enables major technology manufacturers to have a wider pool of sources for their AI software to collect data, label it and learn from it. Consumers are getting used to being hyper-connected via voice as an interface. They are not only using standalone or smartphone in-built assistants, but also through almost every device they use throughout the day. This is likely to impact hotels in future, when in-room smart speakers become irrelevant as guests will be able to access voice assistants from any digital device in their rooms. Yet, the ability of in-room voice-activated devices to understand and speak different languages and engage in different accents [39] was identified as the defining
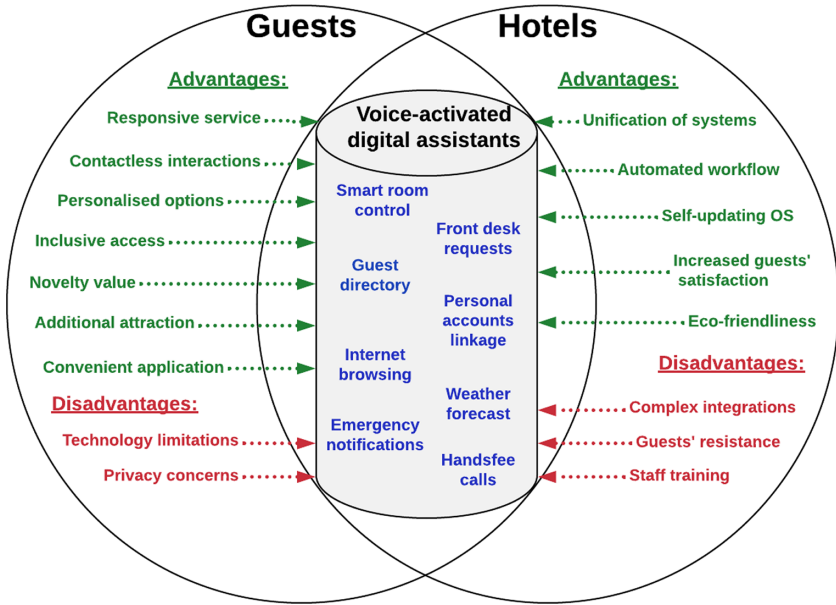
Fig. 2. Conceptualisation of speech-based interactions between hotels and guests

feature for their future applicability. Some participants shared the statements that a wider adoption of the technology will have a differentiated or modulated approach [25]. This effectively mean that it would be useful to have voice assistants as an option for guests, rather than a default setting, provided that the devices can be managed centrally.

5   Conclusions: The Future of Voice Assistants in Hotels

Despite their limited adoption by hotels, it is clear from this research that the advantages of using voice assistants in hotels outweigh the disadvantages for both hotels and guests. Guests' expectations of their functionality acknowledge the core tasks frequently mentioned in secondary data sources and demonstrate their use. In addition, technology solution providers illustrate the emerging technical capabilities of these devices. Yet, this research unveiled some points which had not been reflected in existing literature. For example, the possibility of smart speakers in hotels to serve as a deliverer of emergency notifications or bring an additional layer of personalisation through profile portability with the linkage of personal accounts.

The findings illustrate that voice-based human-computer interactions bring a range of benefits and voice assistants will be widely deployed in the future. To fully benefit from their capabilities, hotels will need to ensure the interoperability and unification of their systems within the IoT infostructure. Technology integrations are often complex and costly to set up but provide significant benefits. Guest appreciate the prospective benefits but are concerned with privacy and usability, although tech-savvy consumers are less concerned about privacy when using voice assistants. With all participants

believing in technological progress, the findings indicated the direction for the future development of voice technology in hospitality towards multilingualism and modulated offers which can ultimately ensure the overall wider reach of the technology in the hotel industry.

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Next-POI Recommendations Matching User's Visit Behaviour

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Abstract. We consider the *urban tourism* scenario, which is characterized by limited availability of information about individuals' past behaviour. Our system goal is to identify relevant next Points of Interest (POIs) recommendations. We propose a technique that addresses the domain requirements by using clusters of users' visits trajectories that show similar visit behaviour. Previous analysis clustered visit trajectories by aggregating trajectories that contain similar POIs. We compare our approach with a next-item recommendation state-of-the-art Neighbour-based model. The results show that customizing recommendations for clusters of users' with similar behaviour yields superior performance on different quality dimensions of the recommendation.

Keywords: Recommender Systems · Clustering · Behaviour learning

1 Introduction

User decision-making in *urban tourism* is affected by a multitude of factors: weather conditions; time at disposal; background knowledge of the places to visit; previously visited places; reputation of a place; and many others. Context-aware [1] and session-based Recommender Systems (RSs) have been proposed to tackle similar settings [10,15]. Our specific goal is to support visitors to identify next points of interest (POIs) to visit that match their interests and the specific context of the visit. We aim at developing techniques that identify new POIs that produce a rewarding overall experience that complete the initiated journey. Hence, the recommendations should be diverse, novel, compelling, and not only accurate [4,14], i.e., matching users' expected behaviour [7].

We conjecture that the above mentioned goals can be attained by better understanding and using previously observed users' visit behaviour. We adopt a theory-driven approach to model not only *what* tourists visits but also *how* they do that, on the base of their conduct in the destination. In particular, we represent a user's POI-visit trajectory, a sequence of POI visits, with four inter-dependent behavioural characteristics that qualify the tourist conduct in an urban destination: *selectivity*, *rapidity*, *repetition* and *capriciousness* [2].

Selectivity indicates that tourists consume only a very small portion of what a city has to offer, due to a limited knowledge of the destination, time to perform

the POIs selection/visit and a scarce willingness to move [16]. *Rapidity* relates to the temporal dimension in the visit of a destination; users can be interested to visit few POIs for a longer period while others may want to see as many POIs as possible [5]. *Repetition* indicates that repeated visits are typically superfluous, and users rather extend their visits to novel places that share some characteristics with the visited ones [6]. *Capriciousness* stresses that tourists' choices are influenced by the social context. Tourists often follow touristic trends, being influenced by POIs popularity and fashion [8], which is easily communicated by websites like TripAdvisor.

In this study we operationalize these four behavioral characteristics with five available features (Sect. 3.1) that grasp the essential dimensions of the users' conduct in a city, and we use them to build a low-dimensional representation of the users' POI-visit trajectories. We then identify clusters of users that share *what* and *how* they visit a destination. These clusters are used to learn cluster-specific behaviour models and to generate recommendations. We conjecture that these recommendations are more effective (along several dimensions) than: a) those generated by clustering POI-visits trajectories by solely using POI content features [13] and b) a state of the art session based RS (SKNN).

We propose here a novel Inverse Reinforcement Learning based recommendation algorithm called Q-BASEX that allows to generate next-POI visit actions recommendations for new POIs (not observed in the training) and even for user states whose contextual conditions have not been observed in the training set. Q-BASEX is evaluated on two POI-visit trajectories data sets (Rome and Florence) by measuring: the precision of the recommendations; how they match to the user's expected visit experience; the coverage of suggested relevant items; the diversity of the items suggested to the various users; the recommended items (un)popularity. Q-BASEX is compared with a next-item nearest neighbour-based recommendation model Session KNN (SKNN) [10] that in previous studies resulted to be more accurate than other Inverse Reinforcement Learning methods [12,13].

The obtained results show that clustering users with similar behaviour allows to better support the visitors of an urban area. In particular, the proposed method is more accurate than the recommendation baselines, and suggests items that are closer to the user's interest and more rewarding.

2 Related Work

The exploitation of data describing a sequence of human actions (e.g., choices or web pages visits), in order to support user decision making, has been often studied in the past. Content personalization by leveraging users' interaction sequences on the web (e.g., e-commerce) has been studied in [15]. Here, by mining data, recording the sequence of items a user interacted with, a set of candidate items is found in order to generate recommendations to similar users. Other RSs approaches that leverage users' behavioural data are based on nearest neighbour and neural network methods. Session KNN (SKNN) is a nearest neighbour-based RSs approach that exploit users' behavioural data logs that are similar (neighbours) to the logs of a target user. GRU4REC is another popular method used

in session-based RSs. It uses a Gated Recurrent Unit (GRU) Recurrent Neural Network and predicts the next action (i.e., next item to purchase) of a target user given information on her past action sequences.

Other approaches are based on Reinforcement Learning and generate next-action recommendations by estimating the user's reward obtained from a sequence of (optimal) choices [17,20]. Here, the reward function is known, i.e., users provide feedback for the consumed items, which is not always the case in reality. Hence, in order to learn an explainable user behavioural model, without relying on explicit user feedback, Inverse Reinforcement Learning (IRL) has been used [19]. IRL models estimate the reward function that makes the behaviour, induced by the optimal policy of the estimated reward function, close to the observed data. In [12,13] IRL was used to generate next-POIs recommendations.

RSs are designed and evaluated predominately by measuring the recommendation accuracy, which relates to the ability to correctly predict the observed user choices [7,11]. However, it has been pointed out that optimizing a RS for accuracy yields suggestions that are seen by the user as obvious and repetitive: they too closely match what the user is normally doing. In fact, in [4,14] it is argued that a proper assessment of a RS should be based on a wider spectrum of metrics.

In [9] tourists' collective information about their activities in a city is used to identify POIs of interest and the tourists' behaviour in an urban area. The authors employ a density based clustering algorithm (POI identification) and association-rule mining (behaviour analysis) on users' geo-localized photos uploaded on a photo sharing platform. They propose this approach in order to identify POIs to recommend to a user. In that work collective users' information is aggregated, hence losing the information about the sequence of decisions.

The generation of recommendations using user's sequences of behavioural data is also discussed in [21]. The authors revisit the trajectory clustering problem [22], which generally leverages spatio-temporal similarity measures, in order detect clusters of trajectories in different regions and time periods. This is achieved by learning a low-dimensional representations of the trajectories. As in our approach they reduce the dimensionality of a trajectory by discarding space and time features at the POI-visit level. But, they also discard the global temporal aspect of a trajectory that instead we consider among the characterizing factors of the users' behaviour.

3   Next-POI Recommendation with QBASEX

3.1   Data

We have analysed two data sets of geo-localized POI-visits trajectories, recorded via GPS sensors in the cities of Florence and Rome (Italy) [18]. Each trajectory describes the successive visits of a tourist in one day in one city. The total visit time of a trajectory spans from 30 min to the whole day.

We represent each POI-visit in terms of its content and context, namely: an hourly weather summary (e.g., cloudy), temperature (e.g., cold) and day-time (e.g., evening). We use a weather API and the recorded user's stay points to obtain that information. Moreover, from TripAdvisor data we match GPS locations to POIs that were likely visited by the tourists and determine POIs' categories (e.g., museum). In addition, we extract "expert" knowledge from TripAdvisor crowd-sourced data, indicating the POI reputation (e.g., ratings).

The total number of distinct POIs, POI-visit trajectories and features in the above mentioned categories are shown in Table 1.

Table 1. Rome and Florence POIs data sets global characteristics (Source: authors)

Dataset	# POIs	# Trajectories	# Features			
			Context	Content	"Expert"	Behaviour
Florence	316	2110	15	29	9	5
Rome	376	4340	14	28	9	5

In addition to the above mentioned features, we heuristically identified in the available data five hand-crafted features that operationalise the behavioural dimensions that characterizes user's visit conduct in an urban area (see Sect. 1). *(1) Duration:* is the total time of the POI-visits trajectory. It is the time interval, in minutes, between the first and the last POI-visit in a given trajectory. *(2) Nr. POIs:* is the total number of POI-visits in a trajectory and shows the user's willingness to move. *(3) Avg. dwell time:* is the time a user allocates to a specific POI-visit and it is computed by dividing the total duration of a POI-visits trajectory by the number of POI-visits it contains. *(4) Top-[n]:* is the proportion of "must-see" attractions in a user's POI-visits trajectory. In a POI-visits trajectory we count the number of POIs in the trajectory that fall in the top-n ($n = 10, 50, 100$) list of attractions in TripAdvisor "Things to do". Then, we divide that number by the length of the POI-visits trajectory. *(5) Excellence:* is the proportion of fashionable POIs in a user's POI-visits trajectory. Given a POI-visits trajectory, we divide the number of its POIs that have a TripAdvisor's Certificate of Excellence by the trajectory's length.

Clusters of POI-visits trajectories obtained by using the above listed features, are considered as different typologies of users, tight together by similar POI-visits behaviour. For instance, a cluster may consist of tourists that are not particularly knowledgeable about the destination and prefer to visit "must-see" POIs.

3.2   User Behaviour Learning

We model the next-POI selection problem as a Markov Decision Process (MDP). A MDP is a tuple (S, A, T, r, γ). S denotes the set states, where a state s represents the visit to a specific POI and its context (e.g., the weather condition

at the visit time). A is the actions set; an action a models the movement from the previous POI to the target visit POI. T is a set of transition probabilities, where $T(s'|s, a)$ is the probability to move from a state s to a next state s', by performing the action a. We also denote a user POI-visits trajectory with $\zeta \in Z$. For instance, $\zeta_{u_1} = (s_2, s_7, s_9)$ represent the user u_1 trajectory starting from state s_2, passing to s_7 and ending in s_9. The set of all the observed users' trajectories Z is used to estimate the probabilities $T(s'|s, a)$.

Given a MDP, the goal is to find a policy $\pi^* : S \rightarrow A$ that maximises the cumulative reward r that a decision maker obtains by acting according to π^* (optimal policy). The value of taking a specific action a in state s under the policy π, is computed as $Q_\pi(s, a) = \mathbf{E}^{s,a,\pi}[\sum_{k=0}^{\infty} \gamma^k r(s_k)]$ (γ is a discount factor). This is the expected discounted cumulative reward obtained from a in state s and then following the policy π.

Since (typically) users of a RS scarcely provide feedback on the consumed items (visited POIs) the reward they obtain by consuming an item is rarely known. Hence, we solve the MDP via Inverse Reinforcement Learning [19] which allows to estimate a reward function whose optimal policy (the learning objective) produces actions close to the demonstrated behavior (the user's trajectory). We assume that the reward function r for a state s as $r(s) = \phi(s) \cdot \theta$, is a linear combination of the state's feature vector $\phi(s)$ and the user utility vector θ, which models the unknown user preferences for the various state features. We use Maximum likelihood IRL for learning the target reward function and optimal policy [3].

3.3   Clustering Similarly Behaving Users

In order to cluster users with similar visit behaviour, and tailor the recommendations for each cluster, we use a representation of the POI-visit trajectories that contains only the 5 visit behavioural features mentioned in the previous section. For each city we build a matrix M with $|Z|$ rows and 5 columns. Each row represents a POI-visit trajectory ζ and each column represents a "behavioural" feature. We perform clustering on the standardized (z-score) matrix M by employing the k-Means algorithm.

The optimal number of clusters is found by optimising recommendation precision as discussed in the next section. For the Florence and Rome data sets we found that the optimal numbers of clusters is 6 and 11 respectively. This difference is surely due to the larger number of trajectories and the higher variability of the features values in the Rome data set.

The polar plots in Fig. 1 show how much each "behavioural" feature scores in some of the clusters in the Florence and Rome data sets. For instance, a high "Duration" means that a cluster contains mostly trajectories where the user spent almost the whole day for the visits. Low values for "Excellence" and "Top-n" indicate that the clustered trajectories contain few visits to popular or fashionable places. Overall the clusters in one city show different combinations of feature values. For instance, cluster "Florence 1" has a high number of POIs ("Nr. POIs") that have been visited for a short time (low "Avg. dwell time"),

whereas cluster "Florence 2" contains trajectories whose visits last almost as those in "Florence 1" ("Duration") but that contain lower numbers of POIs whose visit time (on average) is longer (higher "Avg. dwell time"). Interestingly, if we compare the clusters of the two cities we can spot some similarities. For instance, cluster "Florence 1" looks similar to cluster "Rome 3". To a less extent we can spot similarities in the other clusters like "Florence 2" and "Rome 2" and "Florence 3" and "Rome 1".
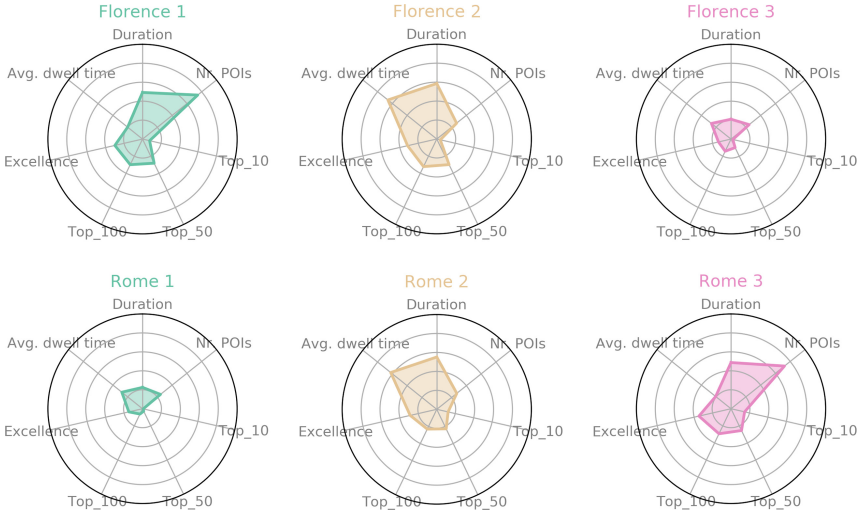
Fig. 1. Visit behaviour description in 3 clusters in Florence and Rome (Source: authors)

3.4 Recommendation Generation with QBASEX

he IRL-based model here proposed (`Q-BASEX`) is an extension of `Q-BASE` [13]. `Q-BASE` harnesses the behavioural model of the cluster the user belongs to in order to suggest next-POI visit actions the user should make from her current POI-visit (state s) [12]. The recommended POI-visit actions a are those with the highest $Q(s, \cdot)$ value in the user current state. However, when users' observations are limited not all the possible contextual situations in a POI and next POI-visit actions combinations may have been observed in the training set. Hence, `Q-BASE` often is not able to generate a full set of top-n recommendations.

Therefore, we propose here, for a state s for which `Q-BASE` is not able to generate the required n recommendations, to ignore the information given by the current context of the user in the state s, and identify the set of states $gen(s)$ that represent a visit to the same POI of state s, but possibly in different contexts. Then, the next POI-visit actions a for which we are able to compute $Q(s', a)$, for states $s' \in gen(s)$, are sorted by $AVG_{s' \in gen(s)}\{Q(s', a)\}$, and the top scoring actions are recommended. We call this new IRL-based RS `Q-BASEX`

(conteXt relaXed). In case a full set of recommendations can not be generated even by ignoring the current user context, Q-BASEX generates recommendations by considering the s predecessor state (if any), hence computing next visit recommendations suited for the previous location of the user; the "previous" state is typically related to the "current" state of the user.

An additional property of Q-BASEX is the capability to generate recommendations for new unseen POIs, i.e., new venues that have not been visited yet by any user, and therefore are not in the training set. Let $\phi(a)$ be the feature vector of a, i.e., it is a binary vector containing the same content features modeling a POI in the state model, but here they model the action to move to a POI. Let $a_n \in A_n$ be a new POI-visit action that has not been previously observed (not in the train set). Given the user's current state s, by considering the actions for which we are able to compute the value $Q(s, \cdot)$, we compute the (Jaccard index) similarity $sim(\phi(a), \phi(a_n))$ between the POI feature vectors associated to an observed (known) visit action $a \in A_k$ and to the unseen new POI associated to a_n. In order to generate next visit recommendations for new POIs using Q-BASEX we compute:

$$Q(s, a_n) = \frac{1}{|A_k|} \sum_{a \in A_k} sim(\phi(a), \phi(a_n))Q(s, a)$$

The actions that maximise this score are recommended.

4   Experimental Study

Our first hypothesis is that by clustering users on the base of behavioural features Q-BASEX can generate better recommendations than a nearest neighbour baseline (SKNN). The second hypothesis is that by assigning a test trajectory to a cluster on the base of the behavioural features Q-BASEX has a better performance than if test trajectories are assigned to a cluster according to content features.

4.1   Experimental Strategy

In order to validate the research hypotheses each cluster is partitioned in a train and test set, counting 80% and 20% of the cluster's trajectories respectively. The cluster specific behavioural model is learnt on the train set, whereas the next-POI recommendations (top-1 and top-3) are generated on the POI-visits trajectories in the test set. Actually, each trajectory in the test set is partitioned in two segments: the initial 70% is used for the recommendation generation (it represents the visits performed by the user up to a certain point, reaching the last visited POI) and the remaining 30% is used for the recommendation evaluation (the next POI visits considered to be good for the user). The result show in the next section are the average values of a 3-fold cross-validation evaluation procedure.

To assign a partial user's POI-visit trajectory (test trajectory) to a cluster and compute recommendations we compare two options: a) by using the 5 identified "behavioural" features and, b) by using the contained POIs descriptions (content). In the first assignment a test trajectory is assigned to the closest cluster by computing the euclidean distance between the low-level behaviour representation of the trajectory and the centroids of the clusters. To implement the second assignment, we first build a document-like representation of the POI-visit trajectory by performing the union of the descriptive features of the POIs it contains. In particular, we create a trajectory vector and each entry of the vector counts how many times the corresponding content feature is present in the POIs that fall in the POI-visit trajectory. Then, the vector is normalized to unary length (L^1-normalization). The centroids of the clusters' (determined by using the behavioural features) are then computed as average of the trajectory vectors of the contained trajectories. Finally, a test POI-visit trajectory is assigned to the cluster with the smallest cosine distance (from its centroid).

4.2   Baseline Recommendation Techniques

We compare the performance of Q-BASEX with SKNN [10], which is considered to be a strong state of the art next-item recommendation method [11]. It has shown a better accuracy than another IRL-based model presented in [13].

SKNN recommends the next-item (visit action) to a user by considering her current session (trajectory) and searching for similar sessions (neighbourhood) in the data-set. These are obtained by computing the binary cosine similarity $c(\zeta, \zeta_i)$ between the current trajectory ζ and those in the dataset ζ_i. Given a set of nearest neighbours N_ζ, then the score of a visit action a can be computed as:

$$score_{sknn}(a, \zeta) = \sum_{\zeta_n \in N_\zeta} c(\zeta, \zeta_n) \mathbb{1}_{\zeta_n}(a)$$

where $\mathbb{1}_{\zeta_n}$ is the indicator function of the trajectory ζ_n: it is 1 if the POI selected by action a appears in the neighbour trajectory ζ_n, and 0 otherwise. In our data set we cross validated the optimal number of neighbours and this number is close to the full cardinality of the data set: 1785 trajectories for Florence and 3689 for Rome. The actions recommended by SKNN are those with the highest scores.

4.3   Performance Metrics

Let be U the set of all the users that receive recommendations, $R_{u,s}$ is the recommendation set for the user u in state s (top-1 and top-3), and $Y_{u,s}$ is the the test set of user u, that is, the next POI-visit actions observed after state s.

Precision. is the classical accuracy metric of RSs. Let $\mathbb{1}_{Y_{u,s}}(a)$ be the indicator function of the set $Y_{u,s}$, which is 1 if $a \in Y_{u,s}$ and 0 otherwise. The precision of a recommendation set is: $precision(R_{u,s}) = \frac{1}{|R_{u,s}|} \sum_{a \in R_{u,s}} \mathbb{1}_{Y_{u,s}}(a)$.

Reward. measures the increase in reward that the recommended actions give, compared to the next action observed in the user's test set a_o. Reward measures

the user's gain if she acts according to what is recommended rather than what she is going to do autonomously: $reward(R_{u,s}, a_o) = \frac{1}{|R_{u,s}|} \sum_{a \in R_{u,s}} Q(s,a) - Q(s, a_o)$.

Similarity. measures how much the features of the recommended POIs match those of the POI-visit actions in the test set. Let $\phi(a)$ be the feature vector representation of the POI visited by action a, and $sim(\cdot, \cdot)$ the Jaccard index similarity. We have: $similarity(R_{u,s}, Y_{u,s}) = \frac{1}{|R_{u,s}||Y_{u,s}|} \sum_{a \in R_{u,s}} \sum_{o \in Y_{u,s}} sim(\phi(a), \phi(o))$.

I-Coverage. is the percentage of the relevant items that are actually recommended and ranges in $[0,1]$: $icoverage = \frac{\left|\bigcup_{u \in U} R_{u,s} \cap Y_{u,s}\right|}{\left|\bigcup_{u \in U} Y_{u,s}\right|}$

Unique. measures the capability of a RS to suggest diverse items, among the various users, it ranges in $[0,1]$ and it is: $unique = \frac{\left|\bigcup_{u \in U} R_{u,s}\right|}{|U|n}$.

Popularity. Let D_{top50} be the set of the top-50 visited POIs in the train set of a RS model and $\mathbb{1}_{D_{top50}}(a)$ its indicator function (it is 1 if $a \in D_{top50}$ and 0 otherwise). We have: $popularity(R_{u,s}) = \frac{1}{|R_{u,s}|} \sum_{a \in R_{u,s}} \mathbb{1}_{D_{top50}}(a)$. We assume that a high popularity POI is likely to be known by the users (e.g., a "must-see" POI) and therefore is not novel, hence novel POIs have low popularity.

5 Experimental Results

We first compare the proposed model, `Q-BASEX`, with the `SKNN` baseline. We perform a two-tailed paired t-test with significance level of 0.05 in order to assess if there is a significant difference between the best performing model and the other. If a model is significantly better than the other on a specific metric we underscore in the following tables its performance value. The performance of the two compared RSs when behavioural clustering is employed in the Florence data set is reported in Table 2. `Q-BASEX` outperforms `SKNN` in all the evaluated metrics for top-1 and top-3 recommendations. In particular, `Q-BASEX` recommends next-POI visits that are: more precise (high *Prec*), increase the user's utility (high *Rew*) and closer to the user's expected experience (high *Sim*). Moreover, `Q-BASEX` is less prone to recommend popular places (lower *Pop*) and diversifies the POI-visit suggestions among the users (higher *Unique* and *I-Cov*).

Table 2. Recommendation performance on the Florence dataset (Source: authors)

Model	Top-n	Prec	Rew	Sim	I-Cov	Unique	Pop
Q-BASEX	1	0,10	0,44	0,10	0,33	0,36	0,79
SKNN	1	0,02	−0,03	0,06	0,28	0,30	0,88
Q-BASEX	3	0,09	0,26	0,10	0,53	0,21	0,78
SKNN	3	0,06	0,00	0,08	0,38	0,14	0,92

The RSs performance in the Rome data set is shown in Table 3. Similar observations done for the Florence data set (Table 2) can be made here. The excellent performance of `Q-BASEX` is confirmed here for all the metrics (both for top-1 and top-3 recommendations). `SKNN` suggests lower accurate next-POI visits (`Prec`) that have also lower reward (`Rew`), compared to `Q-BASEX`. By looking at the metrics *Sim*, *I-Cov*, *Unique* and *Pop*, we can state that `Q-BASEX` suggests less popular (low *Pop*) next-POI visits that are also more diverse (high *Unique*) and relevant (low *I-cov* and *Sim*).

Table 3. Recommendation performance on the Rome dataset (Source: authors)

Model	Top-n	Prec	Rew	Sim	I-Cov	Unique	Pop
`Q-BASEX`	1	0,12	0,52	0,17	0,32	0,35	0,70
`SKNN`	1	0,00	−0,07	0,12	0,30	0,34	0,79
`Q-BASEX`	3	0,10	0,34	0,17	0,60	0,23	0,69
`SKNN`	3	0,06	0,00	0,16	0,43	0,17	0,86

In summary, `Q-BASEX` can better support a visitor in identifying POI visits that are relevant and aligned to the users' expected experience (high *Prec*, *Sim* and *Rew*) as well as interesting and diverse (high *I-Cov*, *Unique* and low *Pop*).

Now we focus on the second hypothesis and we show (Table 4) how the performance metrics of `Q-BASEX` (top-3 recommendations) change if, instead of assign a test user's trajectory to the cluster of similarly behaving users' trajectories, as we have done in the previous experiment, we assign it to a cluster that contains trajectories with similar content features.

Table 4. Comparison of the recommendation metrics (top-3) when users are assigned to a cluster on the base of *behavioural* vs. *content* features (Source: authors)

City	Features	Prec	Rew	Sim	I-Cov	Unique	Pop
Florence	Behaviour	0,09	0,26	0,10	0,53	0,21	0,78
	Content	0,08	0,04	0,10	0,54	0,23	0,79
Rome	Behaviour	0,10	0,34	0,17	0,60	0,23	0,69
	Content	0,09	0,04	0,17	0,60	0,26	0,71

In both data sets, clustering by using the behavioural features produces a higher precision, reward, novelty (low *Pop*) and a slightly (non significant) lower diversity (*Unique*). Hence, we can state that the proposed behavioural features (Sect. 3.1) are more suitable than content features to identify similar trajectories to exploit in IRL methods to generate POI visit recommendations.

In conclusion, we have shown that `Q-BASEX` can better accomplish the task of a RSs in the tourism domain, by suggesting items that are relevant for a user, i.e., with high precision, reward and expected POI-visit experience (similarity), as well as by being able to suggest to the whole user base different items that are also novel.

6   Conclusion and Future Works

We have proposed a novel next-POI RS called `Q-BASEX` that is based on two computational steps: (1) clustering users' trajectories so that each cluster contains users visits' trajectories showing similar behaviour; (2) harnessing a behaviour model, learned for each cluster, to recommend to a user for which a partial POI-visit trajectory is known, next-POI visit actions.

We operationalized a theory-driven schema [2] by identifying visit behaviour features that identifies clusters on the base of *what* and *how* tourists visit a destination. We tested the proposed approach with two datasets consisting of users' POI-visits trajectories in Rome and Florence (Italy), across several dimensions of the recommendation quality and compared its performance to the next-item recommendation model `SKNN`. Our conclusion is that `Q-BASEX` can generate recommendations that better match the user's context and interests, and also offers the best combination of precision and novelty, while making suggestions that are more rewarding for the user. Moreover, `Q-BASEX` effectiveness depends significantly on the used clusters of similarly behaving POI-visit trajectories: how the users visit POIs seems even more important than *what* the users visit.

We plan to conduct a live user-study to assess the users' perceived performance of `Q-BASEX` and to analyse its fairness in supporting the different users that falls within a cluster, i.e., users with different profiles but treated by `Q-BASEX` in the same way.

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Assessing Online Sustainability Communication of Italian Cultural Destinations – A Web Content Mining Approach

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Abstract. Online sustainability communication attracts a considerable attention in tourism research. This study focuses on sustainability communication in official destination websites for informing and motivating visitors to adopt sustainable practices and behaviors. To advance previous research in this area, it adopts a web content mining approach to assess the characteristics of online contents of a sample of 20 Italian cultural destinations. The main dimensions and typologies of sustainability-oriented practices in tourism are used as basis to develop a text classifier for the automated content analysis. A total of 2.975 web pages from official city websites and official tourism promotion websites of the destinations is analyzed through this approach to investigate the online contents relating to the environmental, economic, socio-cultural and general dimensions sustainability as well as their emotional appeal. The analysis reveals that about 15.8% of total online texts contains information to promote sustainability-oriented behaviors at the destination. It indicates that the communication is more specifically focused on environmental/economic/socio-cultural practices than generically referring to sustainable/responsible tourism. However, in line with previous research, it highlights that destinations do not sufficiently balance these pillars in their online communication. Further, the websites' texts scarcely leverage the persuasive potential of affective appealing messages. The implications of this automated approach for improving the design of online sustainability-related contents are also discussed.

Keywords: Online sustainability communication · Sustainable behaviors · Cultural destinations · Automated web content mining · Emotions

1 Introduction

One of the greatest challenges for sustainable tourism development is to encourage tourists to adopt sustainable behaviors in order to minimize the negative impacts of tourism on host communities, cultural heritage and the environment while providing its positive contribution to local economies [1–3]. In this direction, destination marketing and communications tools can be used to influence tourists' decision-making and

purchasing behaviors for more sustainable choices and practices [4, 5]. As the first touchpoint with the destination [6], tourism destination websites represent an important source for sustainability communication to travelers [7]. Official destination websites primarily serve the goal of providing useful information to potential visitors and promoting their products and services [8] and can influence tourists' behaviors by making them aware of destination's sustainable policies and products and stimulating pro-sustainable choices, actions and practices at the destination [9–11].

Although the topic of sustainability communication has been receiving an increasing attention in the last decade [7], there is still limited research on sustainability communication in official destination websites and further research is needed to advance the design of persuasive messages to engage visitors in sustainability behaviors [7, 11]. To contribute to fill this gap, this study aims to understand how to design effective sustainability messages for destinations online communication in order to promote visitors' sustainable behaviors. With respect to research based on manual approaches, it adopts an automated approach for analyzing the communication provided by official destination websites to inform about and motivate sustainable choices and practices by visitors. The final aim is to develop a reliable tool to perform automated analysis of online texts that could facilitate systematic, large-scale and comparable analyses of online communications. Previous research introduced automated approaches and techniques from data mining domain as effective methods for analyzing and evaluating destination websites [12, 13]. Gill et al. [14] performed an automated content analysis of sustainability communication in corporate websites, considering economic, environmental, and social indicators, in conjunction with semantic analysis in order to investigate level and type of sustainability reporting across firms. Whereas web automated analysis may not be appropriate to evaluate the audience impact of sustainability communication [15], it presents several benefits by allowing to analyze thousands of online texts in a speedy and accurate way and to reduce subjective interpretation in coding [14].

This study presents a web content mining analysis based on natural language processing (NLP) with a total set of 2.975 web pages by the official websites of the top 20 competitive Italian cultural destinations. The main dimensions and typologies of sustainability-oriented practices in tourism were used as basis to develop a text classifier for the automated analysis of sustainability-related contents in 39 official websites. Through emotional and sentiment analysis, the study also investigated the affective appeal of online sustainability-related contents as one of the main persuasive characteristics of communication identified by previous research. The paper presents the findings from the application of this automated approach and discusses its potential for measuring the effectiveness of official sustainability communication.

2 Related Work

Sustainability communication "sets out to make consumers aware of the availability of sustainable travel products, to inform consumers how these offerings meet their needs and comply with sustainability criteria, and ultimately to stimulate pro-sustainable purchases" [7, p. 10]. According to the recent literature review by Tölkes [7], tourism

organizations' websites are the most researched channels of sustainability communication. Smith and Font [15, 16] investigated the responsible tourism communication messages provided by volunteer tour operators. Through online content analysis, they analyze and score the organizations' webpages across 19 responsibility criteria (including donations, local conservation, respect heritage, respect wild-life, etc.). Overall, there is a lack of responsible marketing practices which represents a crucial feature of sustainability communication. Based on the analysis of Malaysian hotels, Joseph et al. [17] found that websites are not fully utilized to create awareness about sustainable development and mostly report economic information, followed by social and environment sustainability information. In the same line, Santos et al. [18] show that only a minority of hotels in Portugal explicitly practice sustainability communication, but they do it in a quite superficial way and using a rational appeal. With reference small and medium accommodation firms in the Azores, Tiago et al. [19] concluded that digital communication could be substantially improved and is linked to website sophistication.

Previous research also highlights that tourism organizations do not fully utilize their websites to motivate customers to behave more sustainably. In particular, Villarino and Font [20, p. 326] denoted a "sustainability marketing myopia", because communication tends to be mostly focused on products rather than on customers' needs. They identified four dimensions of persuasiveness in sustainability communication: type of action (including theme and beneficiary), structure (explicit versus implicit, active versus passive and denotative versus connotative), content (appeal versus logic, social norms and level of experience) and authority. Based on the analysis of sustainability contents in accommodations' websites, they highlighted the importance of communication specificity and the persuasive effects of emotional appealing and experiential messages to engage tourists in sustainable behaviors [20].

Literature in this area also investigated sustainability communication in official destinations' websites, with particular emphasis on its role and effectiveness in encouraging sustainable behaviors by prospective travelers. Pennington-Gray and Thapa [21] analyzed the role of websites for promoting culturally responsible behaviors based on a manual content analysis; they found that only a small number of destinations provided information related to cultural responsibility, rules or guideline. Based on the five pillars identified by the Sustainable Tourism for Development Guidebook by UNWTO, Garbelli et al. [22] performed a content analysis of online resources relating to Victoria Falls World Heritage Site; results showed there is room to improve the online communication to educate prospective travelers to behave in a sustainable and responsible manner during their visit to this UNESCO site. D'Angella and De Carlo [10] investigated the relationship between the orientation to sustainability in destinations' online communications and their strategic positioning. They proposed and applied Green D-web score and highlighted the importance of communication oriented to sustainability for destination competitiveness and for attracting new segments of environmentally sensitive tourists. A qualitative approach is adopted by Mura and Sharif [6] to perform a benchmarking of official websites of destinations in Southeast Asia. They stressed the important educative role of official websites for sustainability issues and recommended more content in this regard.

Finally, Ghanem and Elgammal [11] developed an online sustainability communication checklist for a web content analysis of the top 50 competitive destinations.

Their results indicated a lack of appropriate online approach to informing, motivating and engaging stakeholders in sustainability practices along with an unbalanced communication in relation to the three sustainability pillars. Based on their analysis, they call for more research to advance the design of effective online sustainability messages at destination level.

3 Research Methodology

This study adopted a web content mining approach to examine the characteristics of online contents provided by Italian destinations to inform and engage prospective visitors in sustainable practices. An automated approach is deemed to be useful to advance previous studies on sustainability that relied on manual web content analysis as well as to contribute to the development of reliable instruments for assessing the effectiveness of sustainability communication at destination level. In particular, the automated approach is used in this study to analyze contents communicated in official websites in relation to characteristics that the literature suggested may influence their persuasiveness. These include the communication of specific contents on topics relating to all the (environmental, economic, socio-cultural) sustainability dimensions [7, 11, 20] and the emotional appeal of contents [7, 18, 20].

3.1 Research Design

In the first stage of the research, literature was reviewed to identify a typology of sustainability dimensions and practices, which formed the basis for the development of a text classifier to be used for the analysis. The review also considered manuals and guidelines by international tourism organizations, including the *Sustainable visitor tips* by the World Monument Fund and the *Responsible traveler tips* by UNWTO. Further, the sample of destinations' websites was identified. In detail, the analysis focused on the official websites of the top 20 Italian cultural destinations, which collectively accounted for about 80% of international arrivals (almost 47 million) and 75% of nights spent in accommodation (more than 121 million) in 2018 [23]. The destinations in this sample include Italian cities classified by Italian Institute of Statistics [24] as cultural destinations that have been presenting positive growth rates of tourist arrivals in 2018. This sample was deemed appropriate to explore online sustainability communication, also in consideration of the relevance of online communication for sustainability in relation to cultural heritage sites and destinations [22]. In the second stage, based on the keywords identified in the first stage a text classifier was created for the automated analysis of online sustainability-related contents. Finally, data collection and analysis were performed as detailed below.

3.2 Data Collection and Analysis

The study used two sources of online sustainability content provided by the 20 Italian destinations in our sample: i) official city websites (20); ii) official tourism promotion websites (19). In the first step, the researchers selected 39 web sites through a manual

preliminary screening. Contents were then collected by using a web scraping procedure, which is a technique to extract data without the need of a user interaction [25]. It retrieved all texts and subpages directly accessible from web pages [26]. In order to focus the analysis on the main visible and accessible sustainable contents, the study excluded those not linked to the homepage. The web scraping procedure was performed using R software [27] on the 39 websites in Italian language during the period February–April 2020. In a first stage, 4.058 web pages were extracted. A pre-processing operation was carried out with the aim of deleting duplicated results and additional noise. The final database was composed of 2.975 web pages.

In the second step, the study adopted a content analysis technique to detect words related to sustainability practices and behavior in the online communications. For the purpose of the study, a dictionary to detect messages targeting visitors for promoting sustainable/responsible tourism was built. A semi-automatic dictionary was created following the proposed scheme of Deng et al. [28] in order to combine the researcher's knowledge with the assistance of text analysis software (Fig. 1). Computational text analysis was performed using R, a statistical opensource software, which allows replicability. The corpus creation, which consists in the set of documents on which the dictionary is developed [28], was based on different textual contents identified: i) guidelines by international tourism organizations and scientific articles analyzed through a manual analysis; ii) web sites of the 20 Italian cultural destination manually analyzed in the preliminary phase; iii) 2.975 web pages of the 20 Italian cultural destination extracted using web scraping procedure and processed through an automated text analysis. Afterwards, a pre-processing operation was carried out with the aim of removing stop word, unnecessary information and reducing all words to lowercase. Moreover, the cut-off criteria were applied, based on term frequency that shows how certain concepts occur in the text. Later, the study focused on the identification of categories and categorizing entries. In line with previous research on sustainability and sustainability communication [11, 20] the researchers included the four following categories recognized as the main dimensions for sustainable tourism: economic, socio-cultural, environmental and general.

Keywords identified consist in word lists, without term overlaps between the four sustainability dimensions, composed by unigram, bigram and trigram. Researchers manually reviewed the words and phrases emerging from each category. Synonym words were manually detected and included in the dictionary. This step generated new words. For example in the economic category were included also terms like 'Km0' to indicate farmers markets. The validation method of the dictionary considered the Keyword-in-context (KWIC) Indexing. KWIC is an automatic system that allows to search a particular keyword in the text and analyze its local meaning in relation to a number of words immediately preceding and following it [29]. It was performed using the R package called 'Quanteda' for managing and analyzing text [30]. The final sustainable dictionary was composed of 124 sustainable keywords.

In the third step, a preliminary sentiment analysis was carried out to understand the characteristics of contents published online to promote sustainable practices by the Italian destinations. The study adopted the OpenNER Sentiment Lexicon developed in six languages [31], including Italian, thus allowing an applicability of the analysis even on a sample in different languages. The research applied the Italian Sentiment Lexicon,
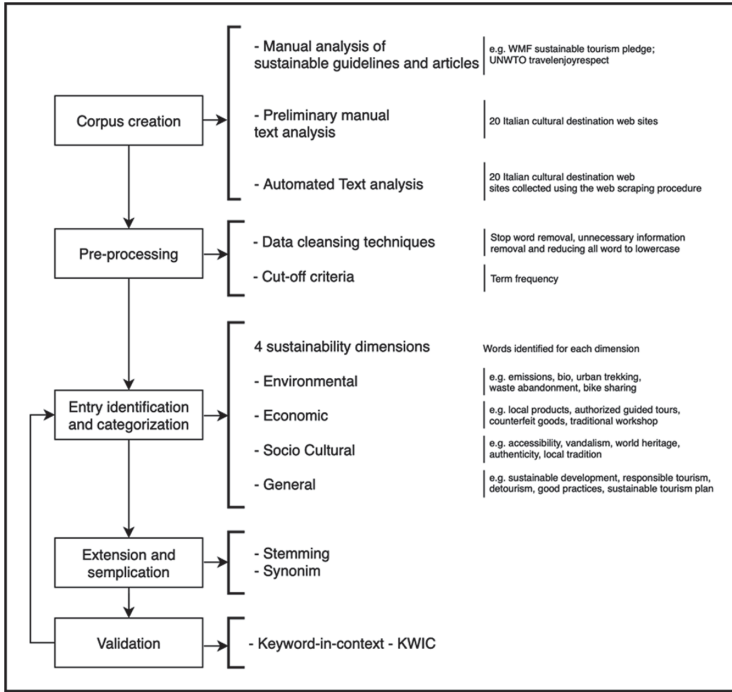
Fig. 1. The semi-automatic dictionary building process (S-DBP) implemented to build a dictionary on sustainable tourism following the design scheme proposed by Deng et al. [28].

which allows to analyze the sentiment polarity classification (positive, negative and neutral).

Further, the study developed an ad-hoc emotional dictionary with the aim to explore more in-depth the affective appeal of sustainability-related contents. This dictionary includes emotional and experiential keywords identified through a preliminary manual text analysis and an automated text analysis. The words in this dictionary are also included in the NRC Emotion Lexicon [32], which consists of a list of English words and their association with eight basic emotions (anger, fear, anticipation, trust, surprise, sadness, joy and disgust) and two sentiments (positive and negative). This lexicon, also known as EmoLex, has been previously used to detect the emotions conveyed by destinations' online texts [33].

4 Results

Table 1 presents the results relating to the frequency count of sustainability-related words, which is calculated as the total number of words for each of the four dimensions in the total texts. It also reports the number of web pages containing sustainability-related words and the percentage of web pages on the total pages containing words related to the four sustainability dimensions. Overall, the analysis revealed that 15.8%

of the total online texts contains information to promote sustainability-oriented behaviors at the destination. It further shows that environmental sustainability has the highest frequency of words, followed by the economic dimension. These results align with previous studies reporting that online information is mostly concerned with environmental sustainability, overlooking the other two dimensions [11, 14, 19, 20]. Further, they indicate that the communication is more specifically focused on environmental/economic/socio-cultural practices (14.59% of the total web pages) than generically referring to sustainable/responsible tourism (1.21% of the total web pages), which can be considered a relevant characteristic of credible and thus persuasive communication according to Villarino and Font [20].

Table 1. Frequency of sustainability-related words across dimensions

Dimensions	Word frequency	Text per topics	% Text per topics
Environmental	342	193	6.49
Economic	329	191	6.42
Socio-Cultural	159	124	4.17
General	116	68	2.29

Table 2. Frequency of sustainability-related words by city

Cities	Env.	Eco.	Soc.	Gen.	TOT	MEAN	SD
Assisi	0.020	0.016	0.007	0.010	0.053	0.013	0.0059
Bari	0	0.025	0	0.031	0.056	0.014	0.0164
Bologna	0.011	0.025	0.039	0.003	0.078	0.020	0.0159
Como	0.013	0.022	0.002	0.009	0.046	0.011	0.0083
Firenze	0.099	0.021	0.007	0.021	0.148	0.037	0.0419
Genova	0.030	0.092	0.020	0.008	0.150	0.038	0.0374
Milano	0.037	0.026	0.016	0.006	0.085	0.021	0.0133
Napoli	0.011	0.009	0.017	0.017	0.054	0.013	0.0041
Padova	0.104	0.044	0.009	0.044	0.201	0.050	0.0394
Palermo	0.005	0.005	0.024	0.005	0.039	0.010	0.0095
Parma	0.018	0.022	0.004	0.018	0.062	0.016	0.0079
Perugia	0.009	0.028	0.003	0.004	0.044	0.011	0.0116
Pisa	0.011	0.006	0.003	0.005	0.025	0.006	0.0034
Ravenna	0.021	0.038	0.013	0.002	0.074	0.018	0.0152
Roma	0.022	0.033	0.012	0.007	0.074	0.019	0.0115
Siena	0.121	0.023	0.052	0.006	0.202	0.050	0.0507
Torino	0.036	0.011	0.013	0.006	0.066	0.017	0.0133
Trieste	0.074	0.115	0	0	0.189	0.047	0.0571
Venezia	0.036	0.022	0.015	0.032	0.105	0.027	0.0095
Verona	0.034	0.026	0.010	0.007	0.077	0.019	0.0129

The number of frequencies in each text are divided by the total number of words of each text to avoid that longer texts are over-represented.

This is confirmed by the results relating to the frequency count by city (Table 2), which also highlights a small group of cities with a higher frequency of sustainability-related words (Firenze, Genova, Padova, Siena, Trieste and Venezia). Among these, it is interesting to note that Genova and Trieste present high percentages of economic sustainability-related words, as they often refer to the promotion of local products food, markets, as well as traditional workshops.

However, the analysis by destination shows that communication is mostly unbalanced across the dimensions, confirming evidence provided by Ghanem and Elgammal [11] about the lack of an effective approach balancing all sustainability pillars to better inform, motivate, and engage stakeholders in sustainable tourism.

Table 3 provides a detailed analysis of the contents that are most frequently communicated in relation to the four dimensions of sustainability. Sustainability-related words concerning the environment are mainly related to green practices and areas, while those relating to the economic pillar concern the specific products/providers for encouraging to shop locally. The promotion of excursions and authorized guided tours to discover destinations emerge in the communication related to the environmental and economic dimensions, respectively. In relation to the socio-cultural dimension, online texts most frequently refer to the authenticity of the resources at the destination and their preservation. This dimension also includes information about accessibility of hospitality services and attractions along with recommendations/codes of conduct that are aimed to prevent damaging behaviors by visitors (e.g., vandalism, graffiti). The last dimension includes words relating to general sustainability practices (e.g., Detourism, good practices, sustainable development) and awareness campaigns promoting sustainability.

Table 3. Top 5 sustainability-related words across dimensions

Environment	%	Economic	%	Socio-cultural	%	General	%
Excursions	28.07	Authorized guided tours	45.90	Authenticity	14.46	Sustainability	21.55
Green areas	14.32	Local products	14.89	Preservation	13.84	Good practices	14.65
Green practices	12.86	Local food	13.07	Cultural Heritage	11.94	Sust. Develop.	11.21
Cycle paths	9.94	Traditional workshops	11.85	Accessibility	8.17	Awareness campaigns	10.34
Bike sharing	7.31	Local markets	4.56	Damage	5.03	Detourism	8.62

Table 4 and 5 present the results of the sentiment analysis, indicating the occurrences of positive, negative and neutral words in sustainability-related online texts across sustainability dimensions and by city, respectively. Overall, the results show that destinations do not take much advantage of an emotionally appealing language, in line with previous research [20]. Looking more in detail at the results of the sentiment analysis by destination (Table 5), some cases emerge presenting a higher percentage of

positive sentiment along with a lower percentage of negative sentiment, notably Firenze, Perugia and Trieste.

Table 4. Sentiment analysis of sustainability-related contents across dimensions

Dimensions	Positive	%	Negative	%	Neutral	%
Environmental	14845	1.89	3163	0.40	29909	3.81
Economic	16971	1.85	3787	0.41	34284	3.74
Socio-Cultural	17938	1.85	3978	0.41	36015	3.71
General	18815	1.86	4200	0.42	37545	3.71

Table 5. Sentiment analysis of sustainability-related contents by destination

Cities	Positive (%)	Negative (%)	Neutral (%)
Trieste	2.23	0.22	3.23
Firenze	2.17	0.49	4.16
Perugia	2.16	0.34	3.23
Bari	1.76	0.50	3.99
Verona	1.51	0.35	4.52
Pisa	1.32	0.22	2.79

Table shows the three cities with the highest percentage of positive sentiment and the three cities with the lowest negative score

Finally, the research developed an emotional dictionary, which was tested on web pages coded as *no sustainable* and on those pages coded as *sustainable*, based on the sustainable dictionary previously created. On the pages regarding sustainability there is a greater use of emotional words. The result is statistically significant with a confidence level of 99% (p-value = 0.006943).

Table 6 reports the top emotional words, based on their frequency count in relation to the emotional dictionary. Based on EmoLex [32], they provide indications of the range of positive emotions associated the texts, including surprise ("unique"), joy ("beautiful", "happy"), trust ("responsible", "authentic"), anticipation ("passionate").

The analysis on the use of emotional words does not reveal substantial differences between the four dimensions of sustainability. Table 7 shows the top five emotional-related words that are mostly communicated, and highlighted that, although most of the emotional words are common between dimensions, yet their frequency is different. Measuring emotions through specific words has limits, as highlighted by Zhang and Fesenmaier [33, p. 87], because emotions are also expressed through some important experiential connotations that may not be immediately grasped with dictionary.

Table 6. Top 10 emotional words

Words	%
Unique	19,08
Beautiful	18,10
Discovery	15,38
Extraordinary	8,07
Respect	7,63
Passionate	3,05
Pleasant	2,94
Difficult	2,73
Responsible	2,62
Authentic	2,62

Table 7. Top 5 emotional-related words across dimensions

Dimensions	Top 5 emotional words
Environment	Unique (20.9%), Discovery (15.2%), Beautiful (12.9%), Responsible (8.1%), Respect (7.5%)
Economic	Discovery (19.2%), Beautiful (16.6%), Unique (14.1%), Respect (7.6%), Extraordinary (7.1%)
Socio-Cultural	Unique (18.3%), Responsible (15.9%), Discovery (15.6%), Beautiful (7.6%), Respect (6.7%)
General	Unique (20.3%), Discovery (18.2%), Responsible (12.3%), Participation (8.0%), Extraordinary (8.0%)

5   Conclusions and Future Research

This study aims to contribute to research on online sustainability communication through a first attempt in the direction of developing a reliable tool for the automated analysis of online texts that could advance research based on manual approaches. When validated, such an instrument could facilitate systematic, large-scale and comparable analyses of online communications to understand how effectively destinations communicate to create awareness on and encourage sustainable behaviors through their websites as well as provide insights for the design of messages to improve their persuasiveness. Future research is needed to overcome the limits of this study, especially related to the size and the composition of the sample that includes only few Italian urban destinations. In this study, 124 sustainability related words have been identified; however, further testing on online texts relating to other destinations is necessary to assess the validity of the dictionaries and consequently refine them. Related to this issue is the challenge of multilinguality. The present study analyzed only online contents written in Italian language. Although "focusing on the largest languages is not a sustainable strategy in an increasingly multilingual world" [34, p. 430], future research should address the need to analyze online contents in other languages. Moreover, it would be interesting to test the dictionaries on tourism sustainability promotion contents and campaigns posted by DMOs on social networks. Finally, text-based sentiment analysis

should take into account some important experiential connotations that are not immediately captured through the dictionary. Future research should be oriented to create an ad-hoc emotional dictionary for sustainability.

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Technostress Among Hotel Employees - a Longitudinal Study of Social Media as Digital Service Encounters

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Abstract. The increasing implementation of digital technologies in organizations such as social media platforms is fundamentally transforming the nature of services encounters [1, 2], not least in the hospitality industry. This causes new ways of working for hotel employees, causing disruption in service routines and work tasks. There are few qualitative studies that are focusing on the hospitality industry and technostress. The present study focus on technostress among employees in an international hotel chain. Data have been collected in eight European countries over a period of seven years. The Person-Technology fit model is used in order to identify and analyze stressors and strains deriving from social media use. The results indicate that techno stressors such as work overload, work-life conflict, and changing algorithms creates negative stressors. The study makes a theoretical contribution to technostress research in the Information Systems research as well as the hospitality research field by uncovering negative stressors and strains created over time.

Keywords: Technostress · Social media · Digital service encounters · Hotel organizations

1 Introduction

The increasing implementation of digital technologies in organizations such as social media platforms is fundamentally transforming the nature of service encounters [1, 2], not least in the hospitality industry. By using social media platforms as communication tools, they have also become important digital service encounters [3]. A digital service encounter happens whenever a customer interacts with an employee through technology, e.g. social media platforms or e-mail. The use of social media in hospitality has brought many new work practices [4], for example, new, immediate ways of stakeholder interaction [5] that are often viewed as a positive development with many benefits, both for organizations and stakeholders [4]. However, there are also challenges with the new communication paradigm. Recent research emphasizes that employees are confronted with large amounts of information, which may generate information overload [6], as well as work overload [7, 8]. Earlier research also points out that the use of social media in a work context can cause blurred boundaries between employees' private and professional lives. Recently, research has called for more

practical insights to extend the knowledge about social media–induced stress on employees in the context of work [9–13]. The phenomenon of stress caused by the use of Information Technologies is discussed in research under the term technostress [6, 8]. Technostress is related to several negative outcomes, such as physical, psychological, or behavioral strain. Stress represents the condition of discrepancy experienced by an individual between the demands of a given situation and the individual's capacity to meet them [14]. This can have consequences for employees, e.g. physical strains, but also for the organization as such, through lower employee job satisfaction and motivation [6, 16].

Recently, research has started to study technostress in the context of social media and the workplace [5, 17]. This is due to the fact that social media increasingly pervade professional and personal life and are becoming more and more ubiquitous in work settings [6–8]. Such research has empirically validated that social media–induced technostress does exist, that the presence of social media–induced technostress is critical in the context of work [5], and that the increasing use of digital technologies in service encounters is closely related to employee technostress [18]. A large stream of research on social media-induced technostress has focused on private social media use in the workplace [19]. Research on technostress relies mostly on two methods, questionnaire and/or experimental investigations stimulated by hypotheses to assess perceived stress and what causes it [16, 18, 20, 21]. Both techniques have limitations in the degree to which they capture the contextual contingencies of a stressful situation: the first because it relies on participant recall, while the simulated environment of the second may not reflect real life. That is, both techniques are appropriate for testing whether a particular phenomenon causes stress, but neither technique is appropriate for finding what stimulates stress in the workplace [22]. Additionally, little focus has been given to the context of the hospitality industry and employees concerning their experience of technostress and digital service encounters [23].

Considering the research gap and the importance of the topic, the aim of the present paper is to expose and explain stressors experienced by hotel employees at work when using digital service encounters, in this case social media platforms, over time. Hence, the present study extends the existing literature of social media–induced technostress. The following research question is asked: *How do hotel employees experience technostress related to digital service encounters in social media platforms?* A study of hotel employees in an international hotel chain is the context of the study. The theory of Person Technology fit [6] has been used as an interpretive lens for analyzing social media–induced stress in the context of the hotels. The theory of Person Technology fit was chosen due to its explanatory power, which can enable a richer interpretation of social media-induced technostress. As a theoretical contribution, stressors and strains deriving from digital service encounters and social media use over time are exposed and analyzed, which contributes to the Information Systems research field as well as hospitality and service research.

2 Related Research

2.1 Technostress

Organizational stress typically includes individuals' perceptions of the demands placed on them by challenging stimuli, known as "stressors," and their psychological responses to such demands, known as "strains" [6]. Stressors represent "demands, stimuli, or conditions encountered by individuals in the work/organizational environment as factors that create stress," and strain refers to "the behavioral, psychological, and physiological outcomes of stress that are observed in individuals" [16, p. 419]. Examples of stressors in the workplace may include role ambiguity, conflict, and work overload, while examples of strain may include job satisfaction, organizational commitment, and turnover intention [16]. The information systems (IS) research field has long emphasized the stressor-strain relationship [1, 5, 7], which highlights the stress induced by rapid technological changes, time pressure and work overload, to mention a few [7], which is an approach that has been termed technostress. The term technostress was coined by Brod who described it as a "modern disease of adaptation caused by an inability to cope with the new computer technologies in a healthy manner" [24, p. 16]. Weil and Rosen [25, p. 5] developed Brod's definition by viewing technostress as "any negative impact on attitudes, thoughts, behaviors, or body physiology that is caused either directly or indirectly by technology." Research on technostress emphasizes that technostress can be attributed to continuous multitasking, re-learning and insecurity related to one's work tasks, as a consequence of frequent IT paradigm changes [18]. To understand IT-induced stress, researchers emphasize it is important to identify manifestations of the technologies themselves and for example focus on the question of what it is about technologies that eventually leads to stress. Theoretically, the outcomes of stress depend on how a person experiences the technology and stress. When stress is appraised positively, the outcomes are desirable. However, when stress is experienced negatively, it gives undesirable outcomes [26].

2.2 Social Media in Organizations

Social media platforms refer to technology artefacts that enable various actors to produce user-generated content, develop and maintain connections and social relationships, or enable other computer-mediated interactions and collaborations [27]. In the context of social media in the workplace, there are several research streams such as public social media, [2], enterprise social media, enterprise social software, and corporate social software [12]. Public social media such as Facebook and Twitter are often used by organizations for marketing and sales purposes and to create relationships with customers [2]. This can be compared to enterprise social media that are used for internal communications or internal knowledge exchange within organizations [12]. In

the present paper, the definition stated by Van Osch and Coursaris [27, p. 54] of social media used by organizations is used:

> technology artefacts, both material and virtual, that support various intra- and extra-organizational actors— including management, employees and external stakeholders—in a multiplicity of organizational communication activities for producing user-generated content, developing and maintaining social relationships, or enabling other computer-mediated interactions and collaborations in the context of a specific organization and its environment.

In contrast to other definitions, it includes both internal and public social media use and hence involves a wider range of social media use by organizations. Hence, Van Osch and Coursaris's definition was chosen since it is common that organizations use a range of social media platforms for various purposes [2, 39]. Based on previous research [cf. 2, 6], social media–induced technostress is defined in the present study as any negative impact on attitudes, feelings and behaviors that is stimulated by using social media in a work-related context. Recently, social media–induced technostress has been studied, focusing on different aspects. For example, one stream of research focuses on the private use of social media during work hours [5, 28] while another stream of research shows the implications of constant connectivity [2]. Van Zoonen et al. [29] claimed that work-related social media created boundary conflicts for employees [30]. Maier et al. [17] investigated conflicts related to work-home conflict and the technostress related to this. Kahn and Mahapatra [28] investigated social media as an inhibitor for technostress compared to other information systems and its impact on employee productivity.

3 Theoretical Framework: Person Technology Fit Model

In order to understand the advent of technostress related to social media the present study follows Ayyagari [6] and uses the Person Technology fit model, which has the purpose of identifying what causes stress related to IT in the workplace. Pervasive access to social media can induce people to engage in excessive use at work, which can promote technostress. This study thereby uses the P-T fit model of stress to examine the social media–induced technostress phenomenon. The model proposes usability features that are related to the adoption and use of technologies. *Usefulness* refers to the individual's perceived ability to do more, and *complexity* to increased work demanded by IT. The authors argue that these characteristics have been the basis of voluntary adoption of ICT, in order to predict adoption and use. However, they also point out that in the present technological context at the workplace, there is usually not a choice for adoption and use of ICTs due to the requirements of the job, which also suggests that individuals might have low perceptions of usability features. Furthermore, the authors point out the *pace of change* which relates to the dynamic nature of ITs. Finally, the category of intrusive features refers to the invasiveness of ITs, i.e., presenteeism, the degree to which the technology enables users to be reachable and anonymous (see Fig. 1). The P-T model also identifies *stressors*, under the categorization of *work overload*, i.e., the perception that assigned work exceeds an individual's capability and relates to role ambiguity, invasion of privacy and work-home conflict. The category of

role ambiguity is the unpredictability of the consequences of the users' performance. This is also related to *role overload*, which "has considerable overlap with work overload" [6, p. 835]. Role overload arises when employees face too many work requests in relation to the time they have available. Arguably, digital technology forces employees to work more and adapt their work routines to fit into digital service encounters as well as physical ones [31]. Furthermore, they are forced to invest more work time in learning and adapting to how to control digital technologies and integrate them into their daily routines, which often results in work overload [32]. This requirement often results in an excess of tasks [32] and creates or intensifies role overload. Such an excess of tasks may also occur if unreliable technology forces employees to repeat digital inputs or to restart a system. *Work-home conflict* is the perceived conflict between the demands of work and family and *invasion of privacy* involves the perception that an individual's privacy has been compromised (see Fig. 1). The stressors can in turn bring about *strains*, such as reduced productivity, lack of innovation, burnout and less organizational loyalty and commitment [15].
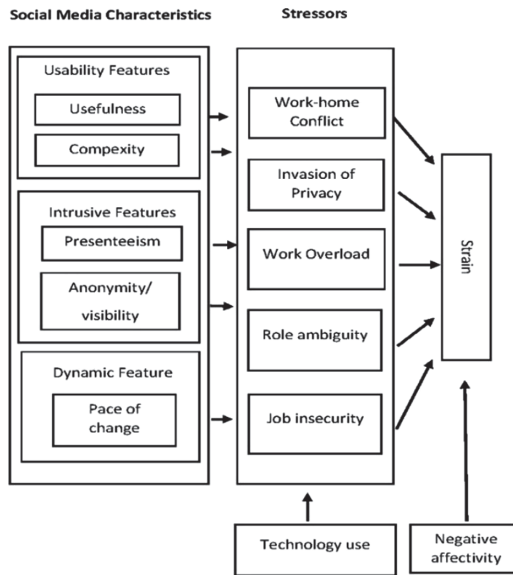
Fig. 1. Technostress framework, adapted from Ayyagari et al. [6]

4 Research Setting and Methodology

The empirical data presented in this paper is part of a larger research project [40] of organizational social media use in an international hotel chain. The case study focuses on the implementation and early use as well as continuous use of social media in 14 hotels in eight European countries within the hotel chain. For this study an interpretative approach had been adopted, building on case study design [33]. This is because

the aim is to understand the phenomenon, social media-induced stress, through the meanings that individuals ascribe them [33]. Hence an interpretative methodology is appropriate since the aim is to gain insight into the hotel employees' experiences of stress and strains induced by social media use over time in a work context. Due to the longitudinal design of the study, the hotel employees' early interpretations of the introduction and use as well as use over time have been studied. Collecting data over a period of seven years gave the possibility of exposing social media use over time with its stressors and strains, not just the implementation phase or a snapshot in time.

4.1 Data Collection

A number of different data collecting methods have been used, including interviews, workplace observations, online observations, and written materials such as social media policies and strategies. Interviews were the main source of empirical data. The interviews were conducted in a narrative form [34] to gain understanding into the employees' concrete experiences of technostress induced by social media. Narratives can be useful for revealing detailed explanations of individual IT use and behavior [35]. The primary data collection technique was based on 58 semi-structured interviews conducted with 32 hotel employees. Of these, 22 were follow-up interviews. Hence, empirical data was collected both in the immediate implementation phase of social media in the 14 hotels and later. Thereby, employees early interpretations of social media use at work and their experiences and adoption to daily work practices could be uncovered. By doing regular follow-up interviews and observations, data concerning the changes of use, interpretations and experiences over time could be collected. Also, studying the social media use over time gave insights into where and how digital service encounters took place and evolved.

The interviews were conducted in eight European countries between 2013 and 2020 and lasted between 60 and 90 min. Half of the employees were women, and half were men. Their age ranged from 23 to 43. The employees' private use of social media varied from using with low interest to being very active users. Altogether, the interviewed employees had varying professional statuses including marketing manager, sales manager, front office manager and CRM manager. However, all of them had social media use included in their work practices, hence social media use was mandatory for these employees. By studying the employees in their natural settings insights into the employees' daily social media work practices could be uncovered. Furthermore, the understanding of how the employees interacted with customers in digital service encounters in social media platforms increased by doing online observations. Furthermore, written materials and documentation, such as social media strategies and policies, functioned as contextual information. Hence, gathering narratives from the hotel employees gave insights into stressors and strains related to the use of social media. Hence the users were asked to thoroughly describe service encounters taking place in social media platforms, how they experience these encounters and situations and other stressors related to the social media introduction and ongoing use and how this had affected them in their work but also private life. More detailed follow-up questions were also asked in order to expose stressors and strains. To understand the work/life relationship to organizational social media, the employees were asked to

describe their private use of social media. Essentially, this narrative approach allowed the employees to describe their experiences of social media in their own words without being restricted to or guided by the researchers' terminology. Hence, speculation and hypothetical scenarios could be avoided [36].

4.2   Analysis

In the present study, the unit of analysis was the individual hotel employee's perception of technostress, i.e., stressors and strains deriving from the use of multiple organizational social media for digital service encounters. The analysis process used was inductive, grounded in the empirical findings. The coding process started with open coding which resulted in identifying several themes in the data related to stress induced by social media. Thereafter categories from the P-T fit framework [6] were used, i.e., technology features, use, stressors and strains. Strauss and Corbin's [37] recommendations to do axial coding after open coding was used. However, this method was treated as a method through which to discern relationships in the data, not as an overly restrictive set of methodological rules [38]. Examples of these labels include "working after hours," "always being available" and "lack of understanding and knowledge." In the following step, the recurrent patterns of social media use and stressors were emphasized as well as the strains from these stressors. Furthermore, the strains were related to their causes and what technological features/characteristics had caused the stress (see Table 1). The data was triangulated by ensuring that main insights were repeated in multiple interviews [33].

Table 1. Axial coding schemes and examples from data

Category	Description	Examples from data
SM characteristics		
Visibility	Published content in SM is visible to a big audience and difficult to erase	"I thing twice before I post because everyone can see if I make a mistake"
Push notifications	Automatic notifications from SM platforms when users interact	"There is a constant flow of notifications"
Real-time interactions	Real-time encounters with guests and colleagues	"Everything goes on in all these digital places at once"
SM stressors		
Work overload	SM causes more workload	"It [SM] gives us so much more to do, so many more things to keep up with, and it feels like you are never done."
Reachability	Smartphones and SM make it possible to always be reached	"I am constantly connected, always online."
Work-home conflict	The use of SM at work blurs boundaries between work and private life	"I feel very loyal to both my colleagues and to our guests so I never turn my phone off."
Digital encounters	SM are new encounters for service	"We are really encouraged to answer all questions fast"
Changing algorithms	SM are constantly changing features	"I try to keep up with all the new stuff but it's really hard because it keeps changing."
Strains	Does not prioritize social media	"I give service to the guests at the hotels, then I take on social media"

5   Findings

5.1   Multiple Organizational Social Media

Many of the employees express that they use many different types of social media platforms in their daily work practices. For example, Facebook and Instagram are used by all employees and many of them also use LinkedIn and Twitter. Furthermore, third-party platforms such as TripAdvisor are important platforms for the hotels, because many guests use them to review the hotel. This created a numerous amount of digital service encounters to manage and keep up with. The employees emphasize that it is "an impossible task" to keep up with the development and changes in current social media platforms as well as the encounters with hotel guests. The employees experience that their current knowledge of workplace technologies and social media soon loses its relevance as they are quickly replaced or changed. The constant change of trying to keep up with these developments is stressful and the employees do not always consider it worth the effort. Many employees says that social media platforms are not techno-logically difficult to grasp per se, that is, there is not high complexity related to social media, but it takes time and frequent use to figure them out. The employees report that push notifications and alerts from the platforms make them stressed and that it is very hard "not to give them any notice," and that they disrupt their other work tasks. One of the employee says:

> Whenever I see a red mark or hear the signal [push-notification], I just leave everything I do and look. It is annoying but I just can't seem to help it.

The employees also express that the push notifications reveal how fast they respond to customers and that it is a way for managers and other employees to keep track of how quickly the employees answer and interact with customers. Interestingly, most employees emphasize that they wish to prioritize the guests and the physical hotel, but experience that "most guests want us to be present all the time in social media and give them quick answers." Another important stressor underlined by the employees is the visibility that social media platforms provide. That is, what is written and published in social media is visible to others and very hard to delete. Bad behavior and conflicts can easily be shared and stored digitally. This makes the employees express that they think twice before they post answers to guests.

5.2   Parallel Worlds

The employees describe that social media has become a "parallel world" and that there is little integration between the social media platforms and e.g. their other IT systems. This causes a need to constantly shift between different technological devices such as smartphones and laptops. This is expressed as a source of stress for employees who point out that they feel "out of control and need to check everything all the time."

The characteristics of social media also had a stressful impact on the employees' work routines. The employees say that because hotel management encourages them to use social media platforms as service encounters and that the guests also view them as a good platform for encounters, they experience increased stress in relation to their work.

They describe rearranged work routines and procedures and "parallel worlds." One of the employees says:

> It is as if we live in two different worlds. The physical one at the hotel and then the digital. And everything goes so fast in the digital world. An hour is an eternity and if you don't answer fast enough you're out!

According to the employees' statements, the use of social media in a workplace setting does not make their work tasks more time effective, quite the opposite. Using social media takes a lot of time according to the employees and is often put "on top of everything else." The employees underline that in order to cope with the stress, they "ignore" and do not "prioritize" using social media, despite the demand from the hotel management.

5.3   Private Life vs. Professional Life

The empirical data suggest that the use of social media especially creates stress for employees because of increased availability. Due to ubiquitous internet access and use of smartphones, they experience that they need to always be available even when they are not working. Hence, the boundaries between their professional life and private life have been blurred and the employees find it difficult to find a balance. The importance of loyalty, both to colleagues and to guests are pointed out as a stressor. That is, the employees express that they choose to be available at all times in order to do a good job and provide good service, instead of prioritizing their private life. Most employees say that they do not turn off their work phone when they are not at work. One employee says:

> I believe that our kind of people [hoteliers] want to give good service and it is very hard for us to turn off that side of us, even when we are off duty. I want to be there for my colleagues as well, and I want them to be there for me as well.

The example above illustrates an issue that is commonly regarded as problematic among the employees. However, they all express an "unspoken agreement" that one should be available, so that good service can be provided.

6   Discussion

The present longitudinal qualitative study contributes to the existing literature on social media–induced technostress within the hospitality industry with respect to social media as digital service encounters. In contrast to earlier research (cf. [11]), which focused on stressors that occur during the implementation phase, the present study investigated long-term social media–induced stressors perceived by employees over a seven-year period. A first reading of the findings confirms many of the established insights from both information system research (cf. [16]) and organizational research (cf. [17]). For example, the case confirms earlier research discussion about workload, work/life balance and availability. Based on the data, the characteristics of social media cause stressors. The *visibility* [6, 39] made possible by social media characteristics stands out

as one stressor for the employees. Many of them argue that they are more insecure about how to answer a guest in social media channels than in a "face-to-face" situation. This also illustrates that the guests can be more anonymous in social media, as the face-to-face interaction is missing. Furthermore, it illustrates the new routines and work practice related to "service encounters 2.0," that is, service encounters taking place using digital technologies [3]. The visibility gives other members of the organizations such as managers and colleagues as well as stakeholders such as guests, the possibility to see how individual employees communicate and behave in social media including what they post [39]. Features like real-time interactions and reachability were emphasized as stressors, which also blurred boundaries between the employees' private and professional lives [16]. Obviously, being available is a part of the hotels organizations culture but also an important part of the employee's professional identity Furthermore, the study reveals a high degree of presence connected to stressors. The features of social media contain constant push notifications [6, 39]. The constant alerts from social media at all hours of the day called for employees that were eager to provide good service, but also to be present and alert on enterprise social media platforms, to the detriment of their private lives. In the present paper, third-party platforms such as TripAdvisor and Booking.com have been included, in order to identify stressors deriving from these platforms and the service encounters that take place there. The data reveals that social media redundancy, i.e., the use of a range of social media platforms for a variety of purposes, created a lack of synchronization, both between the social media platforms and with other IT used in the organizations. As stated by the employees, the use of multiple social media created a flexible way of working, but also blurred the boundaries concerning life and work, and hence can be linked to a high degree of privacy intrusion [6]. The pace of change [6], i.e., the changing algorithms in social media platforms, was described as a stressor. Many employees expressed the feeling of lagging behind the constant change of social media algorithms and features.

7   Conclusions, Limitations and Future Research

The increasing use of many different social media platforms in organizations has been associated with negative side effects such as technostress [16–18]. While prior studies concerning social media–induced stress have provided valuable knowledge regarding social media stressors, they have not examined the associated stressors related to using social media as service encounters over time. Therefore, the present study aimed to explore this area of research and hence contribute to both information systems research as well as hospitality research. The present study revealed that social media use could contribute to lack of synchronization between social media and other IT as well as intrusion in private life and work overload.

The study has several limitations. Although the case study design allows deep insights into the stressors and strains linked to social media, only one company was studied, and thus the generalizability of the findings is limited. Future research could complement the findings by, for example, analyzing other hotel organizations and

combining the qualitative method with quantitative methods in order to create a greater understanding of stressors.

The study also has practical implications. By identifying and linking stressors induced by social media, organizations and managers can recognize strains and create an understanding of why they emerge and avoid creating them. Also, the notion that hotel employees take pride in being accessible around the clock, since they associate this with providing good service, is relevant to acknowledge in service organizations such as hotel organizations.

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How Artificial Intelligence Will Change the Future of Tourism Industry: The Practice in China

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Abstract. In the future, artificial intelligence (AI) is likely to substantially change both the tourism industry and tourist behavior. At present, research on artificial intelligence and tourism is receiving widespread attention, but most of them focus on a certain subject or a specific aspect of the tourism industry. For example, artificial intelligence influences the behavior of tourists and tourism enterprises. The analysis of the impact of artificial intelligence on the tourism industry as a system is still insufficient. Therefore, this research proposes a multi-dimensional framework from an industry perspective based on the existing definition of artificial intelligence. The framework involves three aspects: the level of intelligence, task types, and whether artificial intelligence is embedded in robots. The authors use a large number of Chinese practice cases to investigate how AI affects the tourism industry, then put forward a research agenda to analyze how destination government, tourism enterprises and tourist experience will change in the future. Finally, they highlight important issues related to privacy, prejudice and ethics.

Keywords: Artificial intelligence · Tourism industry · Robots · Tourist experience · Privacy

1 Introduction

As an interdisciplinary, super-level original technique, artificial intelligence is profoundly changing the human society and global landscape [1, 2]. The subversive nature of artificial intelligence technology is reflected in the following aspects: (1) It replaces and performs better than manpower in highly repetitive and labor-intensive industries [3, 4] (2) It can provide interactive experience and deep involvement. (3) Scene design based on the artificial intelligence can provide personalized and customized products and services for any industry [5].

Artificial intelligence plays a key role in a series of innovations and applications in the tourism industry, and is deeply changing the experience of tourism and service [6]. The global spread of COVID-19 at the beginning of 2020 has caused worldwide economic stagnation. Thanks to the artificial intelligence, the wide application of

Telemedicine, UAV monitoring, robot nursing in hospitals, Google Duplex, Siri, customer service speech has not only replaced medical staff to complete many high-risk tasks, but also become a human "special companion" in extraordinary times.

In real life, artificial intelligence has been widely used in tourism and service industry. However, in the academic field, most of the existing research is concentrated on the field of information science, exploring the artificial intelligence technology itself [7] and the ethical issues brought by the technology [8], lack of research based on an interdisciplinary and macro perspective. Scholars mainly study the impact of artificial intelligence technology on employment [9], individuals' anxiety, panic and other negative emotions caused by the substitution effect of artificial intelligence technology on humans [10]. In addition, there have been studies on the effect of AI on the tourism and service industry, marketing [11], strategy [12], and retail [13]. Most of them are speculative studies lacking scientific evidence. Above questions can be summarized into three aspects: (1) Existing studies have not analyzed the connotation and characteristics of the impact of technology on the tourism industry based on the uniqueness of artificial intelligence technology. (2) Since artificial intelligence is an emerging field, research on the mechanism by which artificial intelligence affects the tourism industry is very scarce, which makes it impossible to answer the impact of artificial intelligence on the tourism industry from the internal mechanism. (3) There are few existing studies on the side effects of artificial intelligence on the tourism industry, which leads to relevant policies, corporate management, and public management that cannot recognize their particularity.

Existing studies rarely systematically explain how artificial intelligence will affect the tourism industry and how artificial intelligence will develop in the future. Out of practical and theoretical demands, this article attempted to put forward a research framework on how AI influences and changes the tourism industry. Based on insights from marketing (more broadly, business), social sciences (e.g. psychology, sociology) and computer science/robotics, we proposed a framework which can help tourists, tourism enterprises, governments and destinations foresee how artificial intelligence will develop and evolve.

2   Literature Review

2.1   Artificial Intelligence

Most definitions of artificial intelligence focus on it as a subfield of computer science or in terms of how machines can mimichuman intelligence [14]. Since the emergence of artificial intelligence technology is inseparable from the rapid development of computer technology, some scholars tend to define it from the perspective of computer science, believing that it is "the scientific study of the computational principles behind the ideology and intelligent behavior" [15]. Others are concerned about the relationship between artificial intelligence and human intelligence. They divide AI into the following three types: Weak AI that can replace humans in some aspects, Strong AI with a high degree of perception of the outside world and automatic learning capabilities, and

Artificial Super Intelligence, which has super artificial intelligence that far exceeds human intelligence [16].

Another way to describe artificial intelligence does not depend on its underlying technology, but on its marketing and commercial applications [17]. For consumers, AI gives customized buyer experience. For producers and retailers, AI allows them to gain sharper predicting tools that ensure the making of sharper business decisions [18]. This research is mainly based on the latter definition and discusses its impact on the tourism industry.

2.2 Tourism Industry

Some researchers try to use the knowledge of network science to understand it. They believe that tourism is a dynamic and complex system [19]. A central point is that complex systems are investigated as holistic entities, given the impossibility to comprehend all their manifestations as compositions of individual traits and behaviors [20].

Gunn [21] first proposed the concept of the functioning tourism system, emphasizing that it consists of two parts: demand and supply. Some researchers pay more attention to the entire tourism industry from the supply side, that is, to focus on the competitiveness of tourism destinations at a more micro level. They believe that the destination can be described as a complex networked system, where local actors (public and private) and organizations are the nodes, and the relationships between them are the links [21].

In this article, the research object is regarded as a tourism system composed of dynamic and interdependent tourism elements, including governments of tourism destinations, tourism enterprises, and tourists.

2.3 Artificial Intelligence, Tourism and Tourism Industry

From the perspective of tourism enterprises as the supply side, artificial intelligence is in the stage of growth from Weak AI to Strong AI, and its impact on employment is continuously increasing [4]. The service process is adjusted, and the cost and method of management are also affected. As a result, the most obvious financial benefit is labour costs savings [22].

From the perspective of tourists, artificial intelligence has a great impact on consumers and their experience. In the Web of science database, searching with Artificial Intelligence and Consume/Consumption/Consumer as the subject keywords, a total of 5216 related documents were retrieved, of which the number of studies from 2011 to 2014 was relatively small. Since 2015, there has been an upward trend in the number of studies focused on computer science, communications science, and engineering, but there has been less research in the fields of social science, economics, and management science. At present, smart customer service, accurate information push, robot sensing services and other methods have had a great impact on consumer needs, preferences, decision-making and experience [23]. For example, it has been found that consumers who find that they are talking to robots will think that robots have insufficient expertise and believe that their empathy is worse [24]. In the context of business change, artificial intelligence also has a certain impact on customer experience. Artificial intelligence can

provide customers with customized and personalized services; realize scene experience; meet emotional needs; better meet basic needs. The application of artificial intelligence technology in the retail field can effectively promote consumer interaction and pleasure in scene marketing, improve customer shopping satisfaction and customer loyalty, enhance consumer desire and expand consumption [25].

3   Research Design

Based on the insights of marketing, social science and computer science/robotics, Davenport T et al. [26] proposed a research framework system to comprehensively predict the impact of artificial intelligence on marketing. They divided the system into three dimensions: the level of intelligence, task types, and whether the AI is embedded in a robot. The level of intelligence includes task automation and context awareness. The former refers to the application of artificial intelligence which can perform standardized and consistent tasks. The latter encompasses different forms of intelligence that require computation and algorithms to "learn how to learn". Task types refer to whether an AI program analyzes numbers or non-numeric data. Analyzing numbers is easier than other forms, but in fact, the majority of data is non-digital, which needs more powerful intelligent analysis capabilities. As for the forms of artificial intelligence, one is virtual, such as some digital platforms used on mobile phones; the other is based on entities. This multi-dimensional thinking or data-driven method enables us to have a deeper and comprehensive understanding of the nature and internal development laws of things. Therefore, this paper uses Davenport T's research framework to conduct cross-over research in a comprehensive and systematic way.

This research is aimed to help destination management organization and tourism companies predict how artificial intelligence may develop. We considered three perspectives: governments, tourism enterprises, and tourists. In each perspective, there are three dimensions related to artificial intelligence: the level of intelligence, task types, and forms of AI. We extracted topics and questions from real cases, and integrated them to form the framework of the impact of AI on governments, tourism enterprises, tourists and future issues.

Table 1. Research design

The main body of tourism	Forms of artificial intelligence		
The government (Destination Management Organization)	Level of intelligence	Task automation
		Context awareness
	Task types	Numbers
		Non-numeric data
	Forms of AI	Digital form
		Robot form
Tourism enterprises	Level of intelligence	Task automation
		Context awareness
	Task types	Numbers
		Non-numeric data
	Forms of AI	Digital form
		Robot form
Tourist	Level of intelligence	Task automation
		Context awareness
	Task types	Numbers
		Non-numeric data
	Forms of AI	Digital form
		Robot form

4 Findings

4.1 The Impact of Artificial Intelligence on Tourism Destination Governments

Level of Intelligence. *Task automation.* In China, the instrumental value of artificial intelligence and "intelligence" as an important direction of social governance in destinations have been highly valued by governments at all levels [27]. A series of intelligent service management platforms represented by Hangzhou "City Brain" hope to give full play to government management functions with the support of AI. The "City Brain" can automatically sense and process real-time emergencies in various public services at tourist destinations. The traffic system of the "City Brain" scans the traffic conditions of the city's roads every 2 min and automatically warns in advance of

possible changes in road conditions, in order to provide decision-making information for traffic commanders. During holidays, Hangzhou "City Brain" collects mobile phone signaling data to conduct real-time flow statistics on key areas of West Lake and deliver the statistics to mobile phone users, which can improve the safety warning mechanism of the scenic spot.

Context Awareness. The application of "City Brain" has improved the quality and efficiency of tourism emergency rescue and tourism services. The "One-click escort" system of "City Brain" can automatically control signal lights to clear the queues in advance through video and real-time information of vehicle trajectory. In this way, it opens up a "green channel" for rescue traffic. The government also lays more emphasis on some "pain spots" of tourism governance. Based on data analysis results, the authorities can provide services such as "find vacancies within 10 s", "enter the scenic spots within 20 s", and "annual card for cultural tourism in the Yangtze River Delta" now. Taking the "enter the scenic spots within 20 s" as an example, tourists go to the attraction and open Alipay, scan the payment code and enter the park directly, reducing time spent in queue for ticket purchase.

Task Types. *Numbers.* The "City Brain" cultural and tourism system focuses on the construction of Hangzhou cultural and tourism big data decision-making system. Firstly, build a unified data standard, and a data sharing mechanism to promote the integration of the "city-county-street" three-level data platform. Secondly, rely on the government affairs data sharing and the exchange platform, promote the integration of travel-related data from public security, transportation, urban management and other departments to the "City Brain" cultural tourism system to provide first-hand data support for travel tasks. Finally, in order to accelerate the construction of a tourism data network for vertical and horizontal communication, actively guide tourism companies and other market entities to participate in cultural tourism data production and results sharing.

Non-numeric Data. Hangzhou "City Brain" also analyzed sentiment tendencies on text data such as tourist reviews. For example, the system conducted data mining on hotel reviews from six categories: health, location, service, price, facilities, price, and organized the overall ranking of Hangzhou hotel praise rate and the favorable rate ranking of each individual item.

Forms of Artificial Intelligence. *Digital form.* WeChat applet, APP and other methods have innovated the service process. The WeChat applet of "Hangzhou Digital Tourism Line" relies on various data such as tourist trajectories, railway reservations, and bus operations to plan dedicated lines scientifically and schedule shift times dynamically. At present, 35 special lines have been opened, serving more than 1.2 million tourists. In response to the difficulty of accommodation during holidays, the Hangzhou government has launched a WeChat applet called "Find vacancies". The front-end vacancy display platform displays the hotel vacancy status; the back-end inventory management system docks with platforms such as PMS and OTA. Tourists can find suitable nearby vacancies based on real-time positioning and price preferences through the applet.

Robot Form. In order to solve the problem of cumbersome check-in and check-out procedures for tourists, the Hangzhou government started from the front desk of the hotel and launched a "hotel check-in in 30 s" service. Tourists can check in and check out quickly by themselves with only three steps: scan and compare ID card, find order and confirm check-in, make room card. Both the check-in experience of tourists and the efficiency of service are improved. At present, "hotel check-in in 30 s" has been connected to 246 hotels, serving more than 284,000 tourists.

4.2 The Impact of Artificial Intelligence on Tourism Enterprises

Level of Intelligence. *Task automation.* Automation does not simply mean replacing manpower with machines, but integrating machines into an autonomous system that can complete a process without manpower assistance [28]. Many tourism suppliers have begun to use artificial intelligence technology in their operations: (1) Automation of customized travel: the company "Mioji Travel" has developed an interface. Users input their destinations, number of travelers and travel preferences. Then they can get a "tailor-made" travel plan in a few seconds. Its founder and CEO Zhang Fan said: *"The process of customized tours should be automated. 'Mioji Travel' hopes to automate customized tours through the route planning supported by artificial intelligence."* (2) Intelligent customer service system: Chinese OTA platforms represented by "Ctrip" and "Qunr" have set up customer service robot systems, which are responsible for answering basic customer service questions.

Context Awareness. Shenzhen timekettle.Co., Ltd. Has developed the world's first real-time translation headset WT2, which realizes the effect that two people in a conversation do not need to repeatedly pass the device, and do not require the person receiving the conversation to download the program. Its co-founder Qin Zi'ang said, *"When passengers need to ask for flight information or directions, they can talk with foreigners as long as they wear the headset."* In travel activities such as shopping or dining, this kind of communication will make travel more interesting.

Task Types. *Numbers.* The big data group "Vpon" accurately locates passport holders and high-spending groups by analyzing more than 600 million mobile devices in China. "Vpon" uses AI to research various algorithms to understand the data, and then classify different types of passengers. Since purchase transactions may occur at different stages of travel, people use AI to analyze consumers' preference during a trip based on the historical data, predict the behavior of passengers, and finally locate advertisements accurately.

Non-numeric Data. The text of customer reviews often contains words of emotional value, such as "thank you", "sorry", and "not satisfied". Some Chinese companies use robots which can detect how many words containing negative emotions the customer has used to collect information about preferences, satisfaction through customer posts on social media platforms.

Forms of Artificial Intelligence. *Digital form.* In July 2019, the "In-depth enjoyment of the Forbidden City tour" applet launched by the Forbidden City was upgraded.

The AI tour guide "Mr. Fu" became the biggest highlight. As a cabinet bachelor, "Mr. Fu" can not only chat with tourists, but also recommend personalized tour routes and explain the cultural relics of scenic spots. Especially in this epidemic, a series of "vertical tourism" products represented by the Forbidden City applet played an important role in promoting the recovery of the tourism industry. People can enjoy the beautiful scenery at home.

Robot Form. With technical support, the robot continuously adapts and evaluates application scenarios. In 2018, Alibaba's first unmanned hotel "Fly Zoo Hotel" landed in Hangzhou. Although full-robot hotels like this may still be rare today, hotels around the world have implemented intelligent automation in some customer-oriented operations, such as automatic check-in, virtual personal assistants, and meal delivery robots.

4.3　The Impact of Artificial Intelligence on Tourist Experience

Level of Intelligence. *Task automation.* In the expectation stage before a trip, there are two main difficulties for tourists in decision-making: First, tourism data is large in volume and diverse in types. The decision-making process consumes energy and requires great ability. Second, the travel process is continuous, so it is difficult to achieve the best time, distance and price at the same time. To solve these problems, the online travel website "Qyer" designed an itinerary planning tool called "Itinerary Assistant". Tourists input their own needs, and directly perform one-key intelligent optimization to obtain the most reasonable arrangement. In this way, tourists have an increased sense of expectation towards the destination.

Context Awareness. Image recognition, voice recognition, and face recognition technology is widely used in museum tourism in the stage of on-site experience. This article takes the Hunan Provincial Museum, and sorted out 100 key comments with a total of 3507 words. The keywords "technology", "experience", "interaction", and "explanation" appeared 51 times, 21 times, 17 times, and 13 times respectively. *"Admiring modern technology and ancient technology, I often wonder whether the humans who created modern electronic intelligent technology are smarter, or those who created ancient extinctions are smarter. Traveling in the history and imagining the future, this is the surprise and fun brought by cultural relics."* It can be seen that context awareness technology makes tourists deeply integrate into the scene, breaking their stereotype of the museum. They no longer stay in the sensory aesthetic stage of "skimming the surface", but develop to a stage of both appreciating the scenery and reflecting on themselves.

Task Types. *Numbers.* The entire process of tourism decision-making, experience, and recall constitutes a closed loop. Before the journey, tourists are usually not clear about their travel preferences, but after in-depth analysis of their previous travel data, they can more clearly recognize their habits and make better decisions.

Non-numeric Data. Still take "Qyer" as an example, it has formed a "Qyer Community" that attracts a large number of experienced tourists. User-produced content (UGC) is its greatest feature. People discover some niche attractions through vivid

language and photos. After a trip, they are also willing to share what they have seen and heard. A social community gives tourists a more personalized and memorable experience. Meanwhile, artificial intelligence analyzes the non-numeric data and gains insight into consumer behavior.

Forms of Artificial Intelligence. *Digital form.* In the on-site experience stage, tourists obtain personalized support services through digital products. In Hunan Provincial Museum, tourists can directly scan the QR code on WeChat to get the voice explanation for free, which provides tourists with opportunities to observe cultural relics more closely and experience culture more deeply.

Robot Form. A tourist who has been to the Hunan Provincial Museum commented, *"The kindergarten children are not very interested in the museum, but are attracted by the Xiaodu robot at the entrance."* For tourists, robots in travel scenes can not only provide more detailed and convenient services, but robots themselves are also an attraction.

5   Discussion and the Agenda for Future Research

5.1   Discussion

Artificial Intelligence Technology Promotes the Transformation of Tourism Destination Government Management Concepts and Service Models. In the field of tourism, research similar to artificial intelligence is found in "wisdom tourism" (originating from "smart cities"), and has become an independent research field with the development of "smart cities" [29]. Gretzel et al. [30] decomposed "wisdom tourism" into three main parts: smart experience, smart business ecosystem, and smart destination. It is not difficult to see that "wisdom tourism" is a new field formed by the emerging information communication and artificial intelligence, with a multi-level complex structure. However, the wisdom tourism at the tourism destination level is often led by the government, participated by enterprises and benefited from various aspects. While reforming the tourism industry chain, it also drives the service upgrading of related industries, with dual attributes of commercial service and public service.

The Challenge of Technological Progress and the Demand for Experience to Tourism Enterprises. We can see the impact of different abilities of artificial intelligence on tourism companies in different dimensions in the following aspects: (1) Economic benefits: the use of artificial intelligence robots may bring economic development and various other benefits. Artificial intelligence systems or robots can work 24 h a day. Its low error rate saves costs for enterprises. (2) Internal and external customer service: the impact of this aspect mainly includes two parts: one is forecasting customer needs, conduct customer portraits based on customer past data, and make recommendations based on customer preferences, the other is simplifying repetitive tasks for employees so they can focus on more meaningful things. (3) Tourist satisfaction: a lot of technical research is to improve tourist experience, thereby improving

customer satisfaction. (4) Artificial intelligence technology requires enterprises to innovate business models. Companies can understand the preferences of tourists through the analysis of historical data, and even "tailor-made" travel experiences for them.

5.2   The Agenda for Future Research

For Destination Management Organization. How does the tourism destination management structure under the influence of AI technology move from fragmentation to synergy? How will the highly circulated data sharing mode and disintermediated service organization boundaries that accompany the emergence of AI technology help improve the existing power structure? The inefficiency of the market-oriented supply of tourism public services is basically due to the fact that it is difficult to reconcile the contradictions and conflicts between the profit-seeking nature of marketization and the public nature of public services. Promoted by AI technology, how to make the marketized supply of tourism public services move from concealment to transparency, and finally realize the effective supply of tourism public services is worthy of further exploration. How to realize the socialized supply of tourism public services from amateur to professional? It is also a new topic for the development of tourism public services under the background of AI technology to promote the standardization and professionalism of tourism service socialization.

For Tourist Enterprises and Tourists. AI transforms the traditional seller's market to a buyer's market. The complex needs of tourists are met, but at the same time privacy issues are encountered. Intelligent systems capture information about tourists on platforms, such as their location. The entire analysis process is a "black box" operation, tourists do not know who uses their information and what channels it is used for.

The Interactive Relationship Between Tourists and Virtual Humans. A kind, patient, and knowledgeable virtual tour guide makes tourists more likely to have a desire to communicate. This kind of interactivity changes the mindset of users. In the future, it is necessary to focus on the social interaction between tourists and virtual people, and to deeply explore its social value and the value of shaping IP.

Tourists and the Morality of Robots. When talking about the erosion and threat of artificial intelligence to people, some researchers will use the term "human-centric" to describe the loss of intrinsic value. Intrinsic value does not serve any purpose, so its influence on moral judgments is crucial. Although the current level of technology is still at the stage of weak artificial intelligence, and only stays at simple technical support, it is still necessary to maintain a rational attitude and make preparations for research on robot ethics related systems.

All in all, this research focuses more on the analysis and summary of the overall research framework, and lacks a quantitative analysis of each case. In the future, we will conduct in-depth analysis on the key cases mentioned.

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Co-creating Personalised Experiences
in the Context of the Personalisation-Privacy
Paradox

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Abstract. The personalisation-privacy paradox demonstrates a two-fold effect of tourists' awareness about personalisation on their experience. Compulsory personal data agreements under the GDPR and similar legislation acts raise tourists' concerns regarding privacy and security. The role of tourist awareness about the value of data-driven personalisation in their co-creation behaviour remains underexplored. This paper applies an exploratory experiment methodology to identify the effects of information about personalisation on tourists' experience with travel information websites. It triangulates the data from eye-tracking and self-report techniques, to compare the co-creating behaviour of respondents who have or have not been informed about the value of personalisation. The study demonstrates the presence of a personalisation-privacy paradox. It further reveals that awareness about data-driven personalisation motivates tourists to reinforce value co-creation by ensuring the accuracy of information filtering. The study advances our understanding of tourist digital behaviour and provides insights for the design of personalised information services.

Keywords: Personalisation · Privacy · Security · Value reinforcement · Value · Awareness · Experiment · Eye-tracking

1 Introduction

The personalisation-privacy paradox is one of the most controversial phenomena in data-driven services. The proliferation of smart technologies [1] combined with the increasing availability of personalisation capabilities offers the prospects of enhanced tourist experiences and induces tourists to prefer personalised websites to non-personalised ones [2]. Yet, personalisation technology based on personal data raises a multitude of concerns regarding tourists' privacy and security. Tourists behaviour changes over time and information plays a key role in triggering such change [3]. Legal regulations, such as the General Data Protections Regulation (GDPR), and widely discussed data breaches and misuses by Cambridge Analytica, Cathey Pacific, Marriott and other tech-savvy companies, have in fact exposed the threats of privacy intrusion and frauds, which data-driven personalisation can pose [4]. Given that personalisation

is named among the key success factors for tourism businesses, practical solutions are required to ensure positive tourists experiences [5]. However, the effect of information about data-driven personalisation on tourist experiences remains underexplored.

This study aims to explore possible effects of tourist awareness of the value that data-driven personalisation offers on their experience with travel information websites. It conceptualises the value of personalisation in enhancing tourist interactions with extensive travel information. The study applies an experimental research design and triangulates the findings of eye-tracking and self-report data to identify changes in tourist value co-creation behaviour under the influence of personalisation information. The findings provide novel insights on tourist interactions with personalised websites, demonstrating earlier unobserved value reinforcement behaviour in the context of the personalisation-privacy paradox. The study contributes to the consumer behaviour and service management domains and creates the background to improve the tourist user experience (UX).

2   Research Background

2.1   Personalised UX

Personalisation is generally defined as an adaptation of a service in a way that is relevant to satisfy individual tourist needs. Initially, it was possible only by learning preferences, explicitly articulated by tourists themselves [6]. The proliferation of digital tracking technologies and, recently, smart devices, together with the increased storage and computational capacity of computers, enabled the implicit collection of tourist context data and its interpretation in order to recognise tourist needs and preferences [7]. While data-driven personalisation has not yet reached its full potential [8], it is believed to be among the determinants of advanced tourist experiences [9].

This paper explores tourists' experiences with implicit data-driven personalisation. A personalised travel information website tracks tourist personal data and applies it to recognise the tourist's needs and preferences in a specific context. Such preferences are used to filter information that is irrelevant for the tourist, and to deliver a short list of relevant travel services that can satisfy the tourist's expectations [10]. The scope of travel information is exponentially increasing, affecting tourist interactions with travel information websites [11]. Interestingly, the presence of highly diversified travel services increases the time required to select a relevant option. Simultaneously, the extensive exposure to information causes a high cognitive and emotional load, associated with decision-making [12]. A short list of relevant travel services is a proven tool to make tourist interactions with information websites more time-efficient, easier and less confusing, while supporting travel satisfaction. Therefore, personalisation capabilities embedded in travel websites are becoming increasingly important to deliver advanced experiences [13].

2.2   Value Co-creation in Experiences

Advanced tourist experiences are the result of collaborative resource integration [14]. From the customer side, such resources may include but may not be limited to time, money, cognitive or emotional efforts, reviews, opinions, and personal data. According to the Service-Dominant Logic (SDL) paradigm, resource integration may result either in a positive or a negative outcome, co-creating or co-destructing value in interactions. The outcome depends on the relevance of the resources applied to realise value [15]. Importantly, resource integration is a voluntary process. Not only the customer experience itself, but a tourist's initial decision to participate in it depends on the understanding of the resource integration capability in order to attain value.

Value co-creation is an individual and highly subjective activity, constructed by available information about the tourist's internal and external environment [3]. Exhaustive understanding of value co-creation enables actors to participate in resource integration by determining the resources and ways of their integration. Specifically, actors will likely be willing to contribute their resources and comply with the proposed practices of value co-creation in case they share a congruent understanding about the purpose of the resource integration and its relevance for value co-creation. A lack of understanding of value co-creation may prevent tourists from relevant resource integration, co-destructing value for themselves and for other actors [16]. Therefore, information is among the key resources that can change actors' co-creation behaviour and the value that can be obtained from it [15].

2.3   Awareness as a Factor of Change in Personalised Experiences

Tourists are becoming increasingly aware of the potential that data-driven technologies offer [17]. At the same time, the proliferation of personalised services raises tourists' expectations towards the value proposition [18]. Following the GDPR and similar legislation, all data-driven websites have to inform users about applied data [19], thereby, affecting their perceptions of the websites' dependability. Explicit information about the data being collected can raise tourist's levels of trust in personalised service providers, increasing their willingness to share personal data and use the service [2]. However, awareness about possible threats to the individual privacy and security may lead tourists to refuse engaging with travel information websites equipped with personalisation technology [20], and favour the use of not personalised information websites. However, tourists remain largely unaware about personalisation technology being applied by specific travel information websites [21]. This may prevent them from taking full advantage of shortened lists of relevant services, offered by personalisation. However, the effects of information about the value of data-driven personalisation on the tourist value co-creation behaviour and their experience with travel information websites, including their perceptions on efficiency, perspicuity and dependability, remains underexplored.

3 Methodology

The study aimed to explore the potential effects of tourist awareness of the value that data-driven personalisation offer on their interactions with travel information websites. It adopted an exploratory experiment research design, in which the treatment group (TG) was informed about the value of personalisation, while the control group (CG) remained unaware about it. The study searched for differences in behaviour patterns between these two groups of participants.

To perform the experiment, a fictional realistically looking website for attraction booking was created. It contained three main pages. To trigger privacy concerns, the personal data agreement page included the description of data, similar to those, tracked by Booking.com: information search history, online search behaviour, device location, language preferences, device and app details, settings and customer data from them, including payment methods and currency preferences. Second, the page with the list of attractions included a preview of travel destinations and filtering options. Third, a range of pages with the description of each attraction was added to make a website to look realistic. The treatment group was exposed to the additional page with the explicit explanation of the purpose of personal data tracking and the benefit obtainable through the application of the personalisation services before the start of interactions with other web pages. Both groups were exposed to the same content without the use of any personalisation strategy.

To enable a comparison between the two groups, the experiment aimed at a minimum of 30 valid cases. A convenience sampling approach approached 58 international, technology-savvy participants. Participants were offered a lunch voucher as an incentive. Participants were randomly assigned to one of the two conditions. To induce travel need-driven behaviour, participants were asked to imagine that they are selecting a place to visit. Participants were further instructed to use the website to book one attraction of their choice, while being informed that no charges would apply in the end. No time limitations were introduced. Two questions, delivered by push notifications, controlled the effect of the treatment for the TG. As the study aimed to explore tourists' experiences of using a presumably personalised website, only those respondents who accepted the data agreement were retained in the sample.

The study adopted three data collection methods. Similar to previous studies [22, 23], actual interactions with the website were recorded with the use of a Tobii Pro X2–60 eye-tracker. A post-experiment survey, based on a 5-point Likert UX scale [24] and a behavioural intention scale [25], was conducted. This allowed comparing the perceptions of the website's dependability, efficiency and perspicuity, as well as the overall experience of the website between the two groups. The data validity was ensured by an attention check question in the survey. Finally, semi-structured individual interviews were conducted to acquire insights into the participants' motivation and co-creation behaviour, including the participants' willingness to share personal data and the perceived value attributed to personalisation services. After the 3-stage validation procedure, the total n = 31 cases, represented by n = 11 male and n = 20 female of 18–44 years old with a graduate (n = 27) and postgraduate (n = 4) degree, were retained. As a result, the TG and CG contained n = 15 and n = 16 cases, respectively.

The analysis consisted of the combination of qualitative and quantitative data. First, the visualised heatmaps and gaze plots were explored to identify differences in the

respondents' interactions with the predefined areas of interests (AOI). Second, independent sample t-tests with 95% confidence interval were used to compare the differences between the gaze behaviour and UX, acquired from eye-tracking and survey. Third, thematic coding was applied to interpret the explanation of the experienced interactions. The findings were then triangulated.

4 Findings

This section reports the results of the data analysis collected from eye-tracking, survey and interviews. It first describes the understanding of personalisation technology for the TG and CG. Then it proceeds with exploring the differences in co-creation behaviour and acquired experiences, supplemented by the respondents' explanation.

4.1 General Understanding of Personalisation Technology

The participants from both, the TG and CG highlighted that they do not have an in-depth understanding about personalisation technology itself: *"I am looking for beautiful, huge presents and now my internet and computer is boomed with huge and cheesy things … I don't know how it works I just know this happens"*. Twelve participants additionally highlighted that they would be interested in learning about the technical specifics of the personalisation process. Explicit information about personalisation is perceived as a valuable source for improving the understanding of the interactions with travel websites.

The information about the value of personalisation affects tourists' perception of the interactions. When asked about their general awareness about the purpose of data tracking, participants in the CG named third-parties ads, opportunity of a quick login to an account, and a more general purpose of "*improved websites*" as outcomes of personalisation. Information filtering was mentioned only by three out of 16 participants from the CG. After the interviewer named personalisation as one of the purposes of application of data, CG participants were often surprised:

"I never really thought about that before… that they can use Facebook for personalization, I mean I'm not sure if my Facebook reflects what kind of holiday want to go to but maybe it does. I just didn't think about it before…".

Participants assigned to the TG spent on average M = 33.08 s, SD = 14.73 s for reading the treatment, which included the explanation of the purpose of data collection and value of data-driven personalisation. During the interviews, participants primarily indicated "*sorting*" and "*rearranging*" information as a key purpose of data collection. In other words, the information about the value of data-driven personalisation allows the participants to build awareness about the process of resource integration and the value it can deliver.

4.2 Personalised Travel Information Website Dependability

As expected, the website dependability is defined in relation to security of personal data application. Information about personalisation being applied, motivated participants to be more attentive to the data agreement page (Table 1). TG participants spent more

time exploring the details of personal data usage in comparison to those in the CG (n_{TG} = 137, n_{CG} = 133 fixations with M_{TG} = 44.2, M_{CG} = 39.5 s. of total duration of fixation).

Table 1. Tourist value co-creation behaviour and perceptions.

	M_{TG}	SD_{TG}	M_{CG}	SD_{CG}	M_{TG-CG}
Dependability (co-creation behaviour)					
Fixation count/Data agreement	138.53	56.47	124.86	53.87	13.67
Total fixation duration/Data agreement	44.55	21.10	39.51	14.89	5.04
Fixation count/Attraction filter	66.67	45.70	21.93	28.652	44.75***
Total fixation duration/Attraction filter	29.45	17.06	8.35	5.86	21.09**
Dependability (perceptions)					
Predictability	3.60	1.056	3.94	0,998	−0.338
Supportiveness	3.80	0.941	3.56	0.892	0.238
Security	3.27	0.704	3.06	1.063	0.204
Correspondence to expectations	3.53	0.743	3.50	1.095	0.033
Efficiency (co-creation behaviour)					
Total fix. duration/Attractions list page	72.26	36.36	37.51	16.85	34.75***
Fixation count/Attractions list page	213.27	118.34	133.27	97.95	80**
Efficiency (perceptions)					
Speed of attraction selection	3.40	1.298	4.31	1.014	−0.913**
Efficiency of attraction selection	3.80	1.082	3.69	1.138	0.113
Practicality of attraction selection	4.20	0.941	3.69	1.195	0.513
Organisation of attraction selection	4.53	0.640	4.44	0.512	0.096
Perspicuity (co-creation behaviour)					
Total fixation duration/Attraction list	38.01	18.91	31.39	15.82	6.613
Fixation count/Attraction list	133.40	89.70	102.47	63.703	30.933
Time to 1st click/Attraction list	22.59	15.19	31.90	26.41	−9.32
Perspicuity (perceptions)					
Understanding	4.47	0.640	4.44	0.814	0.029
Ease to learn	4.80	0.414	4.75	0.577	0.050
Ease of use	4.87	0.352	4.56	0.629	0.304
Clarity	4.60	0.828	3.69	1.302	0.913**
Overall experience (perceptions)					
Enjoyability	3.53	0.915	3.69	0.946	−0.154
Goodness	3.60	0.986	3.63	0.719	−0.025
Likability	3.87	0.915	3.63	1.025	0.242
Attractiveness	3.60	1.056	3.25	1.000	0.350
User-friendliness	3.87	0.834	3.88	0.885	−0.008
Intention to Use (perceptions)					
In future	3.13	1.356	3.13	0.957	0.008
When required	2.80	1.207	2.69	1.302	0.113
In the next trip	3.27	1.335	3.06	1.289	0.204
Recommend to others	3.37	1.187	3.19	1.276	0.279

The heatmaps and gaze plots demonstrate different ways of consuming the information of the Data Agreement AOI. While in the TG content was read line by line (Fig. 1a), in the CG chaotic gaze patterns were prevalent with gaze movements going back and forth from the top left corner through the content to the "Agree to Share" button, and returning to the text (Fig. 1b).

a.   Treatment Group   b.   Control Group
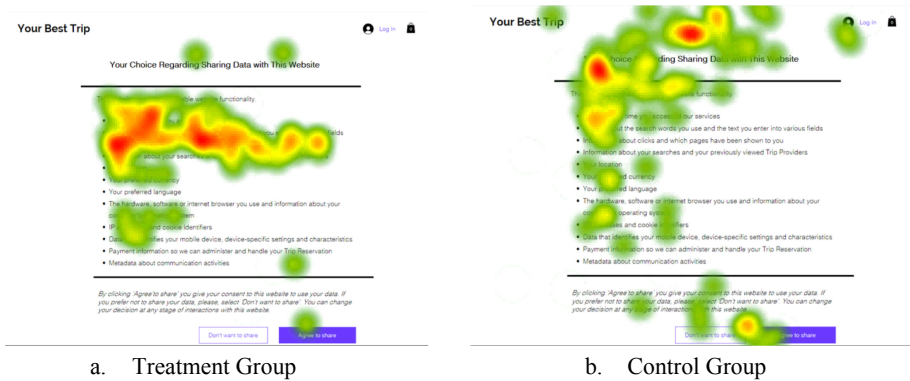
Fig. 1. Attention to the personal data agreement

No significant difference between the TG and CG perceptions of dependability was detected (Table 1). The majority of the respondents acknowledged to be concerned with issues related to personal data protection. Participants reported that they do not feel secure about submitting personal details and logging-in to websites through the use of their social media profiles. However, 25 out of 31 participants indicated to submit their personal data to websites despite not having full trust in the service providers: *"I am not sure if I trust it but I still risk it."* No significant difference between the TG and CG in the attempts to minimise the perceived risks was identified. However, three out of 16 CG participants and three out of 15 TG participants explored the opportunity to change the data settings after giving consent. Interestingly, some participants shared the opinion that "*it is their own responsibility now to manage the data*", demonstrating an active value co-creation behaviour. Other participants offered a different perspective and indicated to be rather passive in regards to managing private data. They tend to comply with the proposed resource integration: "*Everyone tracks data, everyone shares data – why care?*".

Participants also highlighted that an increased awareness about personalisation builds "*confidence*" in sharing personal data. Similarly, the trustworthiness of brands and peer reviews seems to have a positive effect on the perception of personalisation services: *"I guess the more I see it [information about personalisation being implemented] the more I will start to trust"*. An understanding of the process of personalisation motivates the participants to reassess the value of their own resources towards the value of personalisation. Several participants claimed that the risks of sharing

personal data are low as they "*have nothing to hide*". While information about the value of personalisation does not eliminate privacy and security concerns, it motivates tourists to make more conscious decisions regarding the management of private data.

4.3   Personalised Travel Information Website Efficiency

The efficiency of the website was mainly associated with the time invested in the selection of relevant attractions. Contrary to the initial assumption, awareness about personalisation makes the selection of attractions both, more time- and attention-consuming. In the TG, the counted number of fixations ($M_{TG-CG} = 80**$) and the total fixation duration ($M_{TG-CG} = 34.75***$) on the page with the list of attractions largely exceeded the recorded results in the CG. At the same time, the process of selecting attractions was slower for TG participants ($M_{TG-CG} = 0.913**$). Therefore, information about personalisation can make the process of selection less efficient. Moreover, the TG participants revealed that explicit information about personalisation did not increase their expectations about the capability of personalisation to deliver the promised value proposition. Participants from both the TG and CG reported that the proposed attractions do not fully match their preferences. For example, price was named as a criterion that they do not expect to be personalised. Participants commonly agree on the fact that automated personalisation technology still needs to improve in terms of needs recognition accuracy: *"I think it will serve me well because you know it will be based on my preference it will be based on my categories that I belong to, based on my preferences or taste or something like that so to it will be easier for me"*.

Filters were largely used as a tool to cope with possibly inaccurate context recognition: *"A little personalisation is great for the beginning. You get that first impression and say "oh yeah this one". If you read further and you don't like it then you start playing with the filter"*. Participants from both groups further highlighted to explore the proposed list of services first and to later switch to select filtering options during the interactions with any personalised service. However, the visualised timeline demonstrated that TG participants largely started the page overview with exploring the filtering options. On the contrary, CG participants demonstrated an irregular gaze behaviour (Fig. 2). In the TG, the number of fixations on the Filter AOI was three times larger than that recorded in the CG ($M_{TG} = 66.67$, $M_{CG} = 21.93$, $M_{TG-CG} = 44.75***$). There is even a larger difference between the TG and CG in terms of the total fixation duration ($M_{TG} = 29.45$ s, 66.67, $M_{CG} = 8.35$, $M_{TG-CG} = 21.09**$). This indicates that the TG dedicated a significantly higher attention to the filtering criteria.

| a. Treatment Group | b. Control Group |

Fig. 2. Attention to the selection of an attraction

Such differences in attention were explained by the preference to have an "*overview*" of attractions rather than having a narrow list of services. The expressions as "*to check is everything is correct*" or "*make sure that the filters are right*" were also used to justify the attempt to filter attractions: *"I wanted to see how the destinations change… then if I'm not still satisfied with what I find then I use the filter and then I look again".*

Surprisingly, the perceptions of the interactions with the Filter AOI between the TG and the CG did not vary. Nine out of 15 TG participants did not recognise the fact that they have accessed the filtering options. Moreover, four of them claimed to have not noticed the presence of filters at all, although the eye-tracking data demonstrated the contrary. Given that the validity of the eye-tracking data was ensured by the experimental settings, it seems that the TG participants may have interacted with the Filter AOI subconsciously.

4.4   Personalised Travel Information Website Perspicuity

The perceptions of perspicuity did not vary a lot between the two groups. Both the TG and CG perceived the proposed page with attractions as easy to use. Several TG participants named the presence of filters as the main reason of a clear and easy to use website. Additionally, the participants outlined that the opportunity to login with existing social media profiles made the website *"easy"* to use. However, automated personalisation was not mentioned as an important factor to make the website perspicuous.

The only difference between the two groups related to website clarity. The TG rated it higher than the CT ($M_{T-C} = 0.913**$). However, the TG explored the list of attractions for a longer period of time ($M_{TG} = 38.01$, $M_{CG} = 31.39$, $M_{TG-CG} = 6.613***$) and with more focus ($M_{TG} = 133.40$, $M_{CG} = 102.47$, $M_{TG-CG} = 30.93***$). Such behaviour might indicate confusion and complications in the decision-making as well as a high degree of interest. Self-reported data did however not provide any additional relevant insights to explain the observed behaviour.

4.5   Overall Experience and Use Intension

The website received positive overall evaluation and average use intention scores from both groups. When reflecting on their experience, participants focused on their need satisfaction rather than on the website functionality with no significant differences between the groups. The website was often described as "*interesting*", "*informative*", "*with beautiful attractions*". When discussing the potential of personalisation, 28 out of 31 participants agreed that they would like to receive a personalised information. The participants also highlighted that they would prefer having two options: a personalised one and a full list of attractions. This further provides new evidence for the fact that tourists pay attention to need satisfaction and customer experience rather than to a specific technology [26].

5   Discussion

The findings demonstrate that the awareness about personalisation has a dual effect on tourist value co-creation behaviour. The information about personalisation being implemented raises tourist awareness about both, the potential value of personalisation and the possible threats which this might pose. Personalised travel information can be useful and supportive in the decision-making process. However, the results demonstrate that awareness about personalisation technology being implemented increases tourists' concerns about the accuracy of personalisation as well as the security and misuse of their personal data. In other words, the awareness about personalisation intensifies the personalisation-privacy paradox of the tourist co-creation behaviour [5].

The findings indicate a novel trend in which ensuring the delivery of the value of personalisation assumes priority over the establishment of control over the whole process of personalisation. Multiple studies demonstrate that the application of sensitive personal data by information systems makes them perceived as not dependable [10]. This motivates tourists to control information systems by establishing an alternative value co-creation strategy. Thus, tourists do not tend to control the outcome of personalised services [27]. Instead, they ensure that the planned resource integration is done according to their own needs. Failing to provide such value is likely to result in an interruption of interactions with the travel information website [28].

In the case of personalisation, control refers to modifying the applied data settings, the filtering criteria, the outcome, and the way how it is presented [10]. The results of the experiment demonstrate that tourists pay great attention to the personal data agreement page. However, they are reluctant to control their personal data. Instead, they let data-driven personalisation deliver the promised value. Tourists who are aware about personalisation being applied, simultaneously increase their engagement with the filtering options. Specifically, they invest time to ensure that the filtering criteria meet their requirements. However, there is no significant difference neither in the overall experience with the website, nor in the intention to use, although both groups did not rate them as advanced. In other words, awareness about personalisation being implemented cannot be defined as a moderator of a tourist's experience with personalised websites.

The SDL explains such behaviour as value reinforcement [3,29]. Actors engage in resource integration for the purpose of value co-creation as they accept a value proposition. Value can be both co-created and co-destructed through resource integration. Value reinforcement therefore refers to additional resource incorporation in order to prevent any inappropriate resource integration with the accepted service. Value recovery behaviour serves a minimisation of consequences of an occurred resource misuse [30]. Tourist increasingly engage in citizenship behaviour of being tolerant to less satisfactory services and become more active in their attempts to support value co-creation [31]. They can be further motivated by voluntarily reconfiguring resource integration to ensure its appropriateness [32].

To be capable of contributing to value realisation, actors should have a congruent understanding of the resource integration process [33]. Value co-creation and co-destruction represent a dynamic process, which can be affected by each actor. Understanding of value co-creation refers to the relevant interpretation of established processes of resource integration, purpose of engagement and the role of the actor in it. Being one of the key resources, information can serve as an operant resource to build a better understanding about value realisation potentialities by enabling actors to control and reconfigure resources [34]. When communicated explicitly, information about the purpose of personal data application helps with the tourists' understanding of the value co-creation process, enabling them to properly contribute to it.

Being value co-creators, tourists have the power to initiate the changes in the planned value co-creation process, and to further coordinate resource integration [35]. An understanding of the value co-creation process enables actors to select relevant resources and to develop the required competencies to engage in resource integration procedures [36,37]. Actors can dynamically build competencies to reconfigure resources in a way they perceive appropriate for the realisation of value [30]. The observed process of interactions, which included tourists' voluntary engagement in attractions' filtering process, expressed interest in receiving personalised information. At the same time, the unchanged overall experience and intention to use, reflect the attempt to ensure that the proposed value of a personalised list of attractions is realised. It seems that instead of taking over the control and modifying the outcome, tourists invested additional time in reconfiguring the applied process of filtering in order to receive the promised value. In other words, tourists demonstrated value reinforcement behaviour.

6   Conclusion

The study conducted an exploratory experiment. It searched for effects of tourist awareness about the value that personalisation offers on their experience with travel websites. The findings provide new evidence on the existence of a personalisation-privacy paradox. Tourists are willing to participate in resource integration to realise the value of personalisation while having concerns about the application of personal data. The study contributes to tourist co-creation behaviour, which has not been previously observed in the context of personalisation. Being motivated by the value proposition and the concerns of data misuse, tourists attempt to reinforce value realisation.

This novel insight contributes to the domains of consumer behaviour, service management and UX design. It deepens the understanding of the tourist co-creation behaviour in the context of travel information and website personalisation. The study provides evidence on the idea of value reinforcement and actors' willingness to integrate additional resources, given a congruent understanding of the value co-creation process [3]. The paper further demonstrates the specifics of tourist behaviour with data-driven services, offering novel insights for service design in smart technological solutions.

The findings of the exploratory study have not provided enough evidence to explain all details of the observed behaviour. While the difference in the interactions with the website have been observed between the TG and CG, their perceptions of the experienced interactions seem to be similar. This might indicate that tourist behaviour of reconfiguring the filters is subconscious. Alternatively, this might be the limitation of self-reported data as people tend to forget details and report ideas that they believe to be expected. Alternatively, this might be a result of the small sample size. Future research is recommended to test the presence of subconscious behaviour and to develop an exhaustive explanation of the observed patterns. Furthermore, research exploring behavioural differences across target markets might contribute to improve personalisation strategies.

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A Platform for Difficulty Assessment and Recommendation of Hiking Trails

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Abstract. In recent years, the popularity of hiking has steadily increased across different segments of the population. Although there is considerable evidence of the benefits for hikers regarding physical and mental health, the inherent risks of these outdoor activities cannot be underestimated. Accident prevention and an increase of awareness about possible risks are necessary to minimize hiking and pedestrian tourism's negative consequences. In most hiking information maps and interactive applications, there is usually not enough information about difficulty points or the granularity level required to provide tailored recommendations to hikers with physical or psychological limitations. In this paper, we present Syris, a geo-information system for hiking itineraries that incorporates Points-Of-Difficulty to assess the level of effort, technique, and risk of hiking trails. The system allows users to filter itineraries and obtain recommendations based on the assessment of difficulty following a well-established methodology. The system has been implemented, deployed and tested with real data in the region of Val d'Anniviers in Switzerland, and is openly available to enable further developments and refinement.

Keywords: Hiking tourism · Difficulty assessment · eTourism systems · Semantic web

1 Introduction

Pedestrian tourism has recently experienced increased interest, paving the way for the emergence of (online) services and products for hiking and outdoor activities [3,9]. Nowadays, the availability of mountain paths and hiking trails reaches a wide range of population segments, from novice to expert users. The heterogeneity of the potential hiker profiles leads to several challenges, especially regarding safety and risk concerns, which have not been fully addressed by existing information platforms and applications. Indeed, in most mountain tourist destinations, there is only superficial information about trail difficulty and risks. Moreover, it is often not standardized nor reflecting specific elements that can drastically affect the overall hiking experience.

In this paper, we describe the design, implementation, and deployment of Syris, a comprehensive platform for management and recommendation of pedestrian tourism trails, including the assessment of difficulties and risks. The design of Syris follows a methodology and data model for describing and representing points of difficulty, according to well-defined criteria [4]. Moreover, it includes visualization and filtering functionalities, aiming at providing tailored recommendations for users according to their physical skills and preferences. Furthermore, the platform includes a mechanism for data acquisition of points-of-difficulty through a mobile application, leveraging knowledge, and experience from expert hikers on-the-ground. Finally, Syris has been deployed[1] and tested in the mountain region of Val d'Anniviers in Switzerland, including real data on more than 70 pedestrian tourism trails of different characteristics, in collaboration with local tourism offices.

The remainder of the paper is structured as follows. We present an overview of the system in Sect. 2. The data model is presented in Sect. 3. Specific details about data acquisition, visualization, filtering, and deployment, are presented in Sect. 4, 5, 6, and 7 respectively. Section 9 provides a discussion about potential future developments based on Syris and finally, Sect. 10 concludes the paper.

2   Syris Overview and Architecture

Beyond existing systems in the market, Syris has been conceived as a prototype that integrates both geographical aspects of hiking trails and risk and difficulty information needs. To do so, Syris relies on a well-defined model for both hiking trails and their difficulties, and user profile models, as described in a previous work [4]. This model considers the complexities due to the subjectivity of difficulty information, related to the perception of risk from heterogeneous users. We have gathered evidence in previous works, through questionnaires and workshops with key actors in the Swiss tourism sector [5], that difficulty and risk assessment information is repeatedly demanded by end-users and tourism providers.

The Syris platform demonstrates the use of difficulty and risk information, as explained in Sect. 3, reflected in a user-friendly search and visualization interface (Fig. 1). This interface is complemented with recommendations of hiking trails matching user profiles, i.e., according to the physical condition and risk perception of users.

The main functionalities of the Syris Web application can be summarized as follows:

– Geographic visualization: depiction of hiking trails projected over Web mapping overlays. For the purpose of the prototype, the pedestrian routes are limited to the region of Anniviers in Switzerland. The map includes the usual features, including zoom + drag, the possibility of switching the map overlay (OpenStreetMap, OpenTopoMap, and SwissTopo), and clustering of routes according to zoom position.

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[1] The prototype is publicly available at: http://syris.iigweb.hevs.ch/.
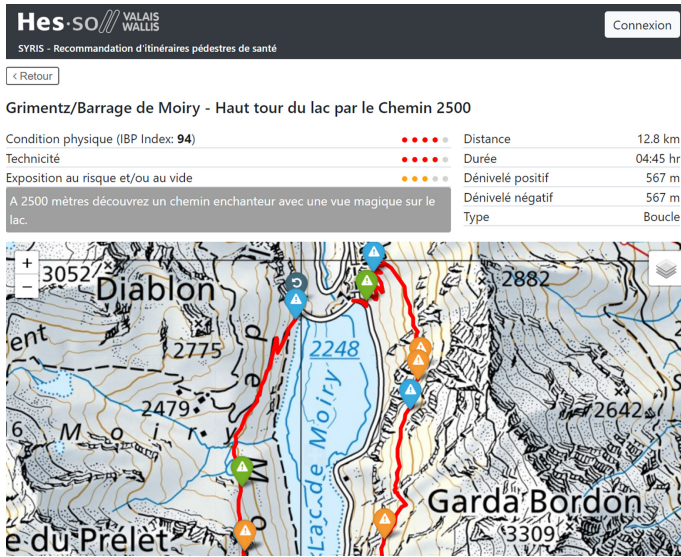
Fig. 1. Syris overview. Main interface displaying a particular pedestrian route along with its details and points of difficulty.

- Route filtering: pedestrian routes can be filtered according to by ability (effort, technique, and risk), for single users or groups. Route icons are color-marked according to the physical, technical, or psychological difficulty. Clickable icons display brief information about the routes and allow to display further details. A list of routes is presented along with the map, which changes according to the map's routes.
- Health profile: registered users can save their profiles, including their physical condition (effort skills), technique, and risk perception. These parameters are obtained by filling a version of the Baecke questionnaire [1].
- Customized list of routes: users may add selected routes to a list, display them, and add feedback to them. Tourist Offices may provide additional advice on specific itineraries. Custom filters can also be saved and associated with a list of routes.
- Visualization of points of difficulty: specific difficulty points are highlighted in the map visualization. The itinerary's start and endpoints are also highlighted, as well as additional information about the difficulty and other route attributes. Routes and points of difficulty can be exported as GPX and KML.
- Authentication and administration: includes registration, login, and basic access control. The administration interfaces also allow CRUD operations on routes, PODs, users, roles, outputs, feedback, health profile, links to other applications (e.g., OutdoorActive).

The architecture of the Syris platform is depicted in Fig. 2. We chose to use a geospatial database to store routes and difficulty points. A PostgreSQL database

with PostGIS extensions has been used in combination with the Python Django Framework for the dynamic processing of itineraries on maps. The following technologies have been included in the prototype implementation:

– PostgreSQL for the attributive data (users, profiles, route details, etc.)
– PostGIS for geospatial data (points of difficulty, routes, spatial operations).
– Django and Python for Web development and Web services.
– Leaflet for displaying maps.
– GeoDjango for geospatial data management in Django.
– GeoJSON for the transmission of geospatial data to the JS Leaflet library.
– Docker for the virtualization of development and production environments.

Both the database and Web servers have been deployed as docker instances. The points of difficulty are fed dynamically from an external Data Acquisition mobile application (see Sect. 4), and effort scores of the itineraries are taken from the IBP index API.
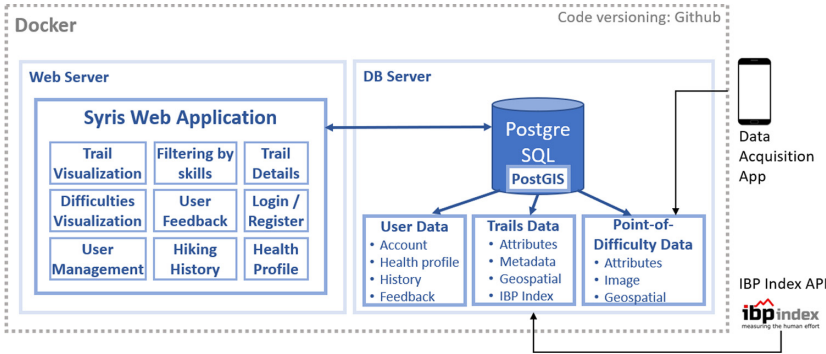
Fig. 2. Syris system architecture overview.

3   Data Model

To address the challenge of insufficient information about difficulties of pedestrian hiking trails, Syris incorporates a data model based on our previous research on semantic representations [4]. This data model considers the assessment of difficulties as a combination of three different dimensions, as developed by the classification methodology of the French Hiking Federation[2]:

– Effort: this dimension is related to the physical energy required for a certain itinerary. The calculation of an indicator for this factor takes into account different parameters. For instance, the total distance, slopes, altitude, descent, and slope changes will directly affect the energy expenditure of a pedestrian

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[2] Fédération Française de la Randonnée Pédestre (FFR) https://www.ffrandonnee.fr.

track. In Syris, we use the IBP index[3], a numerical scale for representing the human effort in hiking and biking tracks. The algorithm behind IBP takes as input the GPS coordinates of a trail and calculates an index based on the slope gradients, ascending and descending distances, altitude, etc.

– Technique: this dimension is associated with the motion/motricity required to overcome obstacles present in the track. Examples of technique-related difficulties include rocks that require specific skills to be overtaken, e.g., raising the leg to the knee or hip level, or even using the hands to overcome the obstacle. Given the lack of automatic calculations of an index for this dimension, experts usually perform the assessment on the in loco. Syris follows the scoring guidelines for the technique of the FFR, assessed by experts from the local Tourism Offices.

– Risk: this dimension entails a psychological difficulty related to situations to which the hiker is exposed and could lead to potential accidents or dangerous conditions. As with the technique, Syris requires the intervention of experts in the field to assess the risk level. This score is typically associated with the risk of falling (e.g., narrow passages, cliffs, abysses, unstable terrain) or losing control while climbing.

It is important to consider that a single hiking trail may be divided into different sections, with possibly very different difficulty characteristics. A pathway may start with a very easy sector in terms of risk and effort, while afterwards, there might be points of difficulty that require advanced skills to be crossed. In Syris, all major points of difficulty of a trail are reported and displayed. Moreover, the highest-ranking points are taken into account to have an overall characterization of the trail.
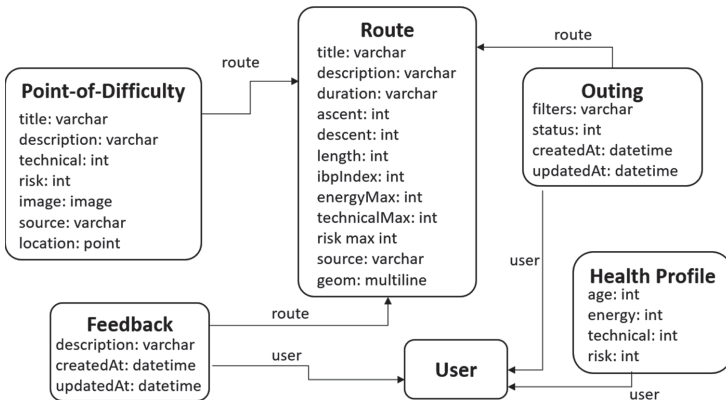
Fig. 3. Syris data model.

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3   https://www.ibpindex.com.

The data model of Syris, as depicted in Fig. 3, includes the following main elements:

- Routes: including the main information associated to an itinerary. Attributive data comprises the route title, short description, long description, duration, height difference, length, type (loop, round trip, traverse). It also includes route metadata regarding the risks, as described previously, i.e., IBP Index, energy, technical, risk. The route is also associated with a geometrical object, represented as a multi-line.
- Points of difficulty: includes attributes including title and description, as well as the risk and technical evaluation scores. It may also include an image of the point of difficulty, and the geometrical object, typically represented as a point in space.
- User information: which includes not only the user's basic information, but also the health profile (i.e., according to the Baecke questionnaire), and the risk/techniques scores. Any filtering and saved search are also stored, along with feedback provided about specific hiking routes.

4   Data Acquisition

Difficulty points are acquired in the field via a mobile application (Web or native) that allows the user to take a picture of the point of difficulty, obtain its geographic coordinates, and add a few attributes characterizing the type of difficulty. For the mobile application, we opted for using an existing mobile data acquisition platform: Appsheet[4], which allows us to easily create a small mobile Web application with a form including the possibility to take pictures or to geo-locate the difficulty (Fig. 4). The data is saved and then imported into the Syris database through a Python script. Each time a point of difficulty image is imported into the Syris, it will be compressed, resized, while the latitude and longitude will be extracted, providing the location. Once the import is completed, recalculating the technical and psychological difficulties of the routes according to the newly imported point of difficulty is imperative. We have chosen to exclude points beyond a threshold distance from the route in the calculation of the difficulties score.

The data acquisition process has been validated by a set of volunteer beta-testers who have hiked through the selected 70 routes of the region of Anniviers to collect difficulty points and populate our database. The points of difficulty collected have been validated by terrain experts, although it has been acknowledged that there is a need for a standardized procedure for such type of validation, potentially including the Swiss Council for Accident Prevention. Although the acquisition App is limited to the collection of points of difficulty, it has been evidenced that its usage could be extended in order to provide data quality and validation features. Following a citizen-science approach, a collaborative methodology can be put in place in order to allow users to contribute difficulty and risk data according to an established protocol.

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[4] https://www.appsheet.com/.
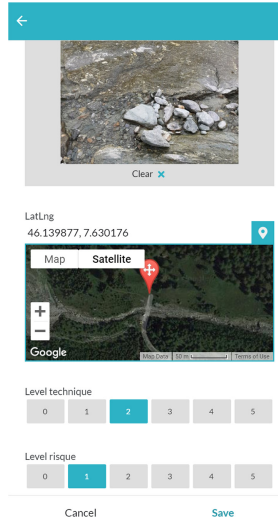
Fig. 4. Syris acsuition app based on appsheet.

5   Trails Visualization

Hiking itineraries are geo-located and displayed on a Leaflet map in order to allow the user to explore and visualize them. Depending on the required level of detail, different visualization options are available, i.e., display all routes on a map with an icon that points to the route starting point; or display the route and its difficulty points.

By default, the map is centered on Sierre with an undefined radius. These two filters (center and radius) are not modifiable. At this stage, we decided to display only the routes of Anniviers. Although initially we had imported all the itineraries from Valrando, it was evidenced that several attributes were missing. Thus, for the sake of clarity, we decided to take only the itineraries from Annivers Tourisme. The itineraries are clustered according to the zoom level, and coloured according to the difficulty levels.

A color scheme has been established to denote physical difficulty: Easy → Green; Easy enough → Blue; Not very difficult → Orange; Quite difficult → Red; Difficult → Black. It is possible to change the color assignment according to the technical or psychological difficulty by clicking on the wheel configuration icon at the bottom of the map. The icons are clickable and display a pop-up with route information and the link to display the route. By default, the map type is OpenStreetMap, but it is possible to change it, for instance, using SwissTopo maps (with their agreement, free for research projects below a certain quantity of maps displayed). The routes displayed on the map are also listed below the map. The list updates automatically after each Zoom or Drag (Fig. 5).

The physical difficulty of a route is calculated from its IBP Index. We performed the calculation (via API) for all routes and stored the information in the
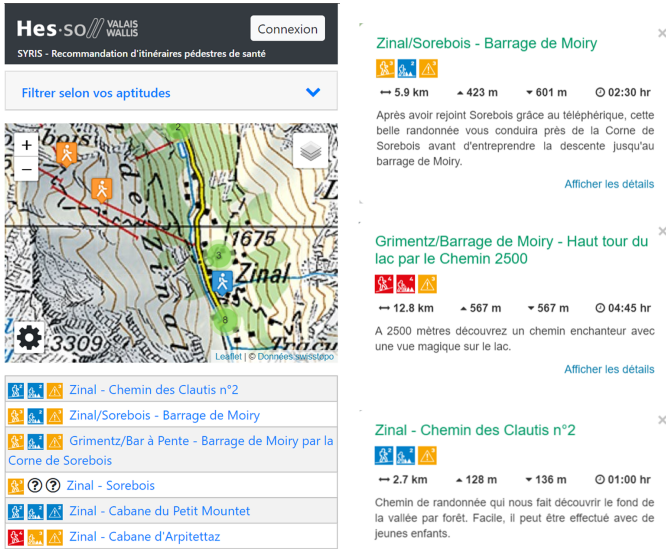
Fig. 5. Syris: details on hiking trails and list of trails.

database. On the other hand, the technical and psychological difficulties depend on the difficulty points of the itinerary. If no POD is recorded, the difficulty cannot be calculated, and an icon with a question mark is displayed.

6   Filtering and Recommendation

Fig. 6. Syris: Filtering criteria for effort, risk and technique.

The terminology, icons, and descriptions of the skill types are based on the rating system of the *Fédération Française de Randonnée*. The main filters based on the user ability are (as related to the data model in Sect. 3): Energy (E): Fitness;

Technique (T): Motor capacity; Risk (R): Ability to manage risk. Fear of heights has been added to this category. On the route index page, logged-in or logged-out users can directly define their skills and filter routes accordingly Fig. 6.

The filters linked to the group are currently only informative, and the idea is to integrate them on the route recommendation. Such filters are saved in the database when creating an output. The user can click on the question marks to display each ability's information in a modal window.

To filter trails according to the user fitness level, we have used the Baecke questionnaire [1]. It contains 23 questions and returns a score between 0 and 15, which allow the user to determine his level of fitness. The complete form adapted to the Syris web application is available online[5] as seen in Fig. 7. For logged users, a filtering button is activated, which allows the transfer of the defined filters and saves them in the *Health Profile* area of the user. The age is purely informative at the moment but could be useful to refine the health profile and, thus, the itinerary recommendation.

Fig. 7. Excerpt of the adapted Baecke questionnaire in Syris.

7   Deployment

The system is fully virtualized in Docker containers. The database is stored in a Docker volume, which allows the database server container to be stopped and restarted without losing the data stored in it. In production, the Web application's source code is copied directly into the custom Docker image that serves the Web server, unlike development where the source code is mounted on a volume to allow on-the-fly code modification and automatic restart of the Web server. The source code is stored in a GitHub directory. The system shares the Docker server with other solutions. They are managed by Traefik, which defines the port and URL alias and secures the data exchange (SSL).

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[5]   https://syris.iigweb.hevs.ch/fr/profile/baecke.
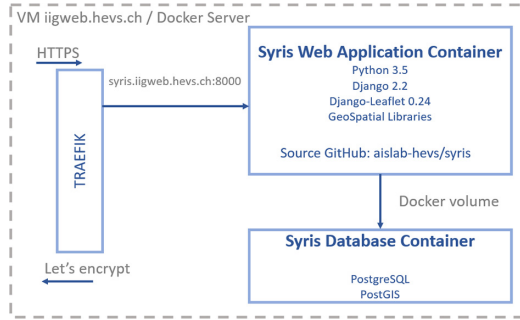
Fig. 8. Deployment architecture.

8   Related Work

The extensive affirmation of hiking among the most practiced outdoor activities has stimulated the creation of heterogeneous segments to satisfy the demand of a population spanning from beginners/people with limited mobility to professional athletes. Such a trend encouraged more investments in maintaining and promoting hiking sites, which in turn produced a remarkable return of interest [19,20]. In turn, the need for improving existing guidelines and their accessibility has attracted the attention of health institutions and associations [8,11,14], who promoted initiatives to raise awareness about hiking trail difficulties [12]. Studies assessing difficulty in terms of energy expenditure [10], hikers' preparedness [15], and collaborative annotation of tourism objects[6] can be considere pioneers. More recent contributions span from preference-based recommendations for groups of users [7] to more technological ones employing recommender chatbots [16].

However, providing suggestions for hiking trails has only been addressed partially. For example, some recommendation systems rely on hiking time estimation [2,18] or on questionnaires to estimate the users' physical condition [5]. On the one hand, although some studies introduced elements relevant for evaluating track difficulties, all of them overlooked several factors included in Syris. On the other hand, several standards for representation and modeling of tourism and travel concepts arose. For example, Open Travel Schema developed by the Open Travel Alliance (OTA)[7] is a standard model for travel objects. However, it mostly focuses on booking information and neglects to current ontology modeling standards. The WTO (World Tourism Organization) [17] developed the Thesaurus on Tourism and Leisure Activities, used mainly for indexing concepts in the tourism realm. Similarly, a set of standards, including different messaging and tourism agent specifications, has been provided by the Travel Technology Initiative[8].

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[6]   https://www.apidae-tourisme.com/.

[7]   https://opentravel.org.

[8]   https://www.tti.org/.

Solely focusing on booking operations and availability, and less on outdoor activities, such standards can guide the integration of tourism information. Nevertheless, the more significant limitation is the lack of data description models for pedestrian roads and the different aspects tackled in Syris (e.g., description and specification of difficulty types).

Although neglecting the modeling of hiking difficulty types, many interesting systems/projects focusing on outdoor activities are worth mentioning. In Austria, the local tourism office (Vorarlberg[9]) maintains an online database of hiking trails. The Swiss canton of Valais delegated the management of official hiking trails to Valrando[10]. Similarly, SuisseMobile[11] provides online apps mapping pedestrian trails and respective technical information. Moreover, regional tourism offices offer complementary services with more detailed and accurate information, sometimes exploiting third party companies such as Outdooractive[12] or Snukr[13]. To collect and maintain up to date information about hiking trails are expensive and robots/humans-intense activities [6,13]. Nevertheless, this detailed information is crucial to provides hikers with crucial indications about the trails they are willing to undertake.

If the potential hikers have physical limitation(s), the complexity and heterogeneity of the pathways characterization might escalate, thus requiring proper models to handle factors such as fear of heights, climbing constraints, reduced mobility, walking aids, or terrain preferences, etc.

9   Discussion

This paper presents a novel system for assessing difficulty points in hiking trails, considering different dimensions related to effort, technique and risk. The implementation of this data model opens the door for providing recommendations based on the matching of the health profile of a user with the characteristics of available routes. The Syris prototype includes several important steps in the data life-cycle of pedestrian and mountain routes, from data modelling, acquisition, storage, exploitation, and validation. In this regard, it has the potential for empowering different types of users, according to their needs. For example, regional tourist offices and local development authorities can use it as a basis for tailored recommendations for tourists, reaching segments of the population such as older adults and people with disabilities. Health professionals can also use Syris for helping patients to adhere to physical activities that increase their quality of life. For mountain guides, it can help as a tool for assessing and validating difficulty points, and choosing the best itinerary for a group of customers. Moreover, Syris can be used as an instrument of prevention, with the indirect

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[9]   https://www.vorarlberg.travel.

[10] https://www.valrando.ch/.

[11] https://www.schweizmobil.ch.

[12] https://www.outdooractive.com.

[13] https://www.snukr.com.

target of decreasing the number of accidents thanks to a better understanding of risks and difficulties.

Although Syris was conceived fundamentally for the assessment of difficulties in pedestrian routes, it is easy to see that the concept can be expanded towards a Citizen Science approach for acquiring, managing and validating outdoor activity data. This concept may extend also to other sports such as mountain biking or even skiing, although with additional constraints. The data acquisition approach, which is currently implemented simply for difficulty points, can also be expanded to gather other types of relevant information, e.g., pollution indicators, weather-dependent risks, or difficulties according to age. Moreover, we see the potential of using gamification techniques in order to provide incentives and motivation cues to potential contributors to the platform. This can also be applied in order to teach users to assess risks and difficulties, through game/example based training scenarios. Furthermore, it is clear to see that a full evaluation of this approach will require considering not only the hiking experience aspects, but also the usability/visualization aspects. In order to do so we expect to expand the database beyond the itineraries of Val d'Anniviers, in order to have a larger and more heterogeneous set of scenarios and user base.

10   Conclusions and Future Work

This paper introduced Syris, a system for managing difficulty and risk data of pedestrian routes. The system was conceived to manage the entire data life-cycle for hiking trails, from data acquisition, to storage and exploitation. The Syris data model considers different risk and difficulty dimensions, which can also be used to provide recommendations according to a user profile. The system has been implemented, deployed, and validated using real hiking trail data from the Val d'Annivers valley in Switzerland.

In the future, we will focus on specializing recommendations, by taking into account other factors, such as weather-related variables, or by using other alternative fitness assessment instruments other than Baecke's questionnaire. Once a large amount of user data is collected, alternative recommendation mechanisms can be explored, focusing on the usage of feedback, as well as profile learning. We will also study the assessment and perception of risks not only from individuals but also for groups of users, as well as identifying potential clusters of users with similar characteristics. Enabling group recommendations would entail changing the way of assessing physical and technical skills, as well as applying adequate matching strategies to existing itineraries. Finally, we will analyze the potential impact of the Syris platform in certain industry sectors such as insurances, outdoor activity providers, and prevention organizations, which may benefit from the results of this initiative.

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A Study on the Factors Affect the Technology Satisfaction on AI Based Self-service Technology Service Failure in Hotel

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Abstract. The advancement of technology following the Fourth Industrial Revolution and the surge in demand for untact services caused by COVID-19 will gradually expand the scope of service automation through artificial intelligence (AI) technologies. In practice, numerous hotels are adopting AI-based service technologies, but it is still in its early stage to provide guidelines for the overall service strategy for this technology. Therefore, this study conducted a study on the failure of AI based self-service technologies (SSTs), service recovery, and the psychological expectations of customers' SST. An online survey was conducted on respondents who had experience using AI based SSTs, and a total of 370 responses were used for analysis. As a result of structural model analysis through AMOS, it was found that adequate service recovery and low expectations for SSTs were satisfied with SSTs and hotels as a result, even if service failures were experienced. These findings provide specific practical guidelines for many hotels promoting AI-based service automation.

Keywords: Customer satisfaction · AI based self-service technology · Service failure · Service recovery

1 Introduction

The radical development of information and communication technologies (ICTs) and the Fourth Industrial Revolution have affected almost all industries, and the hotel industry is no exception. Hotels have already adopted self-service technologies (SSTs) such as Kiosk to realize service automation for simple services such as self check-in/check-out. However, the Fourth Industrial Revolution has taken this hotel service automation to the next level, and hotels are providing more sophisticated and diverse self-services based on AI. For example, The FlyZoo Hotel which located in Hangzhou,

depending on the Alibaba's online travel platform, Fliggy, as well as other Alibaba Group business units, such as Alibaba A.I. [1]. As a result, hotel customers are exposed to the hotel's SSTs and become familiar with the services provided by technology, and many customers are consuming services through technology.

Customers' demand for service automation is growing even more recently as they experience the global COVID-19 pandemic [10]. Because human-to-human contact can cause the spread of various infectious diseases, hotel customers have come to perceive that contact with hotel service technology is more hygienic [2]. Therefore, more hotels are planning to introduce more diverse technologies and build more diversified and evolved AI-based service automation systems to respond to the post COVID-19 era [10]. However, compared to the rapidly increasing customer demand, AI-based SSTs is in its infancy, both academically and practically. No matter how actively SSTs are used by recent customers, since AI technology has not been applied to the service stage for a long time and unless it is a service failure situation caused by the customers, there may be anxiety about receiving services using the technology [5]. However, when AI-based self-service fails and when service recovery occurs, there has been insufficient discussion on how hotel customers perceive the technology and how they perceive the hotel that introduced the technology. Therefore, a close academic review of AI based services is required. Accordingly, this study aims to provide guidelines for hotels to successfully automate AI based services in response to social phenomena. Specifically, we will look at AI-based self-service failure, and empirically review the factors that cause failure, service recovery, and customer response. In addition, by examining the role of low expectations for SST caused by service failure in service satisfaction, we will additionally examine variables that have not been addressed sufficiently. We expect the results of this analysis to provide effective guidelines for hotels to successfully realize efficient AI-based service automation.

2   Theoretical Background and Hypotheses Development

AI based SSTs service failure was theorized as a second-order construct, consist of technology failure, poorly designed interface and excessive customer waiting line which based on previous studies [4, 13]. Service failure leads to two situations. First, when a service failure occurs, the service provider proceeds with a procedure to recover it. At that time, the degree of service recovery varies depending on the degree of service failure, which is generally proportional to the degree of service failure. (H1). Furthermore, it is recognized that the customer cannot easily control the service failure caused by the interaction with AI based technology [6], and as a result, the customer may feel a lot of anxiety [8]. This anxiety eventually leads to low expectations for SST (H2).

H1–2. AI Based SST Service Failure Has a Significant Effect on Service Recovery and Low Expectation for SST

Meanwhile, from the viewpoint of customer satisfaction, as has already been demonstrated by numerous studies [e.g., 3], various types of service failures occur in the service delivery process, but service recovery by prompt and appropriate solutions enhances customer satisfaction with service providers [6]. Therefore, even if AI based

SSTs cause service failure, a hotel's adequate service recovery will make customers not only satisfied with AI based SSTs (H3) but also with hotels that introduced and provided this technology (H4).

H3–4. Recovery from AI Based SST Service Failure is Positively Related to the Satisfaction with AI Based SST and Satisfaction with Hotel.

Interestingly, low expectations for SST can enhanced satisfaction with SST. Psychologically, satisfaction or happiness depend on individual expectations, not what you feel when something goes well [12]. Therefore, when the customer's reinforced low expectations for AI-based SST in the negative situation of service failure are converted to a positive situation such as service recovery, it can have a positive effect on satisfaction with SST (H5). It can also have a positive effect on the satisfaction of the hotel that provided it (H6). Lastly, lots of previous studies [e.g., 11] have empirically proved that satisfaction with SSTs has a positive effect on satisfaction with service providers of SSTs (H7).

H5–6. Low Expectation for SST from AI Based SST Service Failures is Positively Related to the Satisfaction with AI Based SST and Satisfaction with Hotel.

H7. Satisfaction with AI Based SST is Positively Related to the Satisfaction with Hotel.

3   Methods

An online survey was conducted. This online survey was conducted from May 2nd, 2020 to May 12th, 2020. Data from a total of 370 respondents who have the experience to use hotel AI based kiosk were used for analysis. Technology failure was measured with 4 items adapted from [13], poorly designed interface was measured with 6 items adapted from [4], and excessive customer waiting line was measured with 5 items adapted from [8]. The scale of service recovery was adapted from [4] including 6 items and the scale of anxiety was adapted from [9] including 4 items. AI based SST satisfaction was measured with 5 items adapted from [14]. Finally, hotel satisfaction was measured with 4 items adapted from [7]. The analysis was been conducted following the steps below. Firstly, coding the data to SPSS format. Secondly, the validity and reliability of all the measurement scales were proved by confirmatory Factor Analysis (CFA) via AMOS was performed to test the measurement model. Finally, Structural Equation Modeling (SEM) analysis and path analysis through AMOS was performed to verify all the seven proposed hypotheses.

4   Analysis and Results

To validate our measurement model, this study assessed content, discriminant, and convergent validity using SPSS 23. The content validity was explored and developed from the previous literature. Discriminant validity was tested by comparing the average variance extracted (AVE) associated with each construct (all the AVE 0.6), with the correlations among constructs and the square root of the AVE. Convergent validity was

assessed by the composite reliability and Cronbach's α (all the CR value above 0.6 and all the Cronbach's α above 0.8). Furthermore, the structural model show a appropriate model fit to the data ($\chi2$ = 583.641; d.f = 289; $\chi2$/d.f = 2.020; CFI = 0.897; NFI = 0.897; GFI = 0.897; AGFI = 0.875; Standardized RMR = 0.071.). As a result of structural model analysis, all hypotheses were supported (see Fig. 1).

Specifically, service failure was found to enhance the service provider's service recovery behavior and induce low expectations for SST for customers. In addition, enhanced service recovery and low expectations were found to enhance satisfaction with AI-based SST and hotel satisfaction, and AI-based SST also reinforced hotel satisfaction.
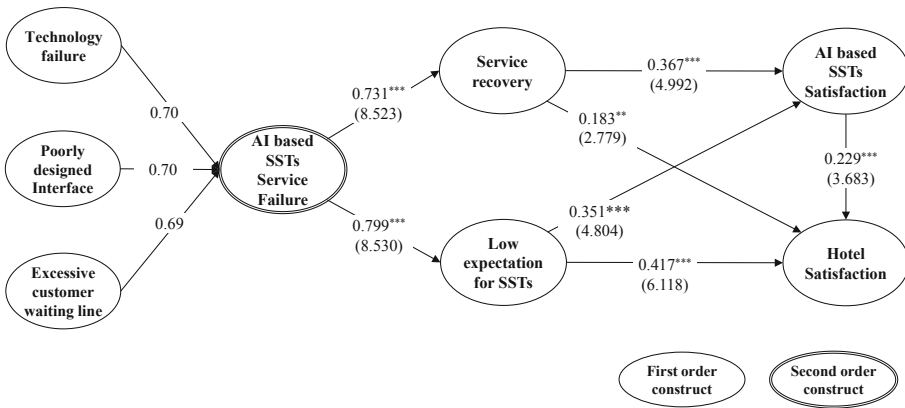
Fig. 1. Results of structural model.

5 Conclusion

Our findings have the following theoretical and practical implications. In the SST literature, studies on service failure are actively conducted, but studies on low expectation following failure are relatively rare. This study is of academic significance by empirically verifying the effect of low expectation on satisfaction. This interesting role of low expectation deserves attention from hotel practitioners as well. Rather, low expectations for SSTs were found to have a positive effect on customer satisfaction and hotels despite the negative situation of service failure.

Therefore, hotels need to be aware that, rather than emphasizing the ease of self-service and AI service technologies, service recovery such as appropriate assistance in the event of a service failure has more positive results. Despite these implications, this study has limitations in that the study was conducted only in the context of SST. Recently, hotels are introducing various AI-based service agents (e.g., AI-based chatbot, speaker and service robot). Therefore, we intend to expand the research results by conducting research on other types of service agents in the future.

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The Role of Perceived Technology and Consumers' Personality Traits for Trust Transfer in Airbnb

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Abstract. Airbnb is widely popular among tourists around the world and in the hospitality industry. With Airbnb being a sharing economy and a type of e-commerce platform, consumers' trust in it is an important issue. This study proposed three information technology factors affecting trust in Airbnb from positive and negative aspects. Personality traits affecting trust in Airbnb and its hosts are also put forward. Using data collected from Chinese Airbnb users, this study applied the structural equation modeling (SEM) to test the proposed hypotheses. Results suggest various implications for Airbnb and similar sharing economy platforms.

Keywords: Airbnb · Sharing economy · Trust · Trust transfer theory · Disposition to trust

1 Introduction

The sharing economy is emerging as an important part of the global economy. The basic elements of the sharing economy include suppliers, consumers, and platforms. Airbnb is a representative example of this sharing economy. Airbnb's main participants consist of hosts and guests, who respectively provide and use shared services through the Airbnb platform. In this situation, Airbnb's hosts and guests need to communicate and form a basic understanding of one another. Therefore, trust plays an important role in people's sharing behavior. When consumers use Airbnb services, they are faced with two types of trust: trust in the Airbnb platform and trust in the host [1]. Existing research has focused mainly on finding factors that affect trust in the Airbnb platform or

factors that affect trust in hosts [2]. However, the mechanisms by which guests build trust in the Airbnb platform and hosts have yet to be extensively studied. Despite the fact that guests may have varying dispositions and preferences, we still do not fully understand how a guest's trust disposition toward the other party affects the formation of a trust mechanism. Therefore, the main purpose of this study is to understand how the trust transfer mechanism works when people use Airbnb.

2 Research Model and Hypotheses

In this study, an Airbnb-focused model was developed on the basis of trust transfer theory (e.g., [3–5]) (Fig. 1).
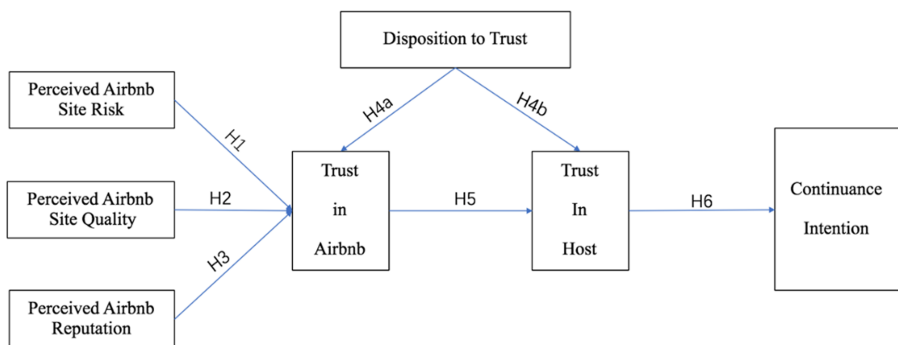
Fig. 1. Research model

Perceived risk refers to the uncertainty about possible negative effects on expected outcomes. In particular, perceived website risk negatively affects the process of making a purchase decision for a product or service on a website [5]. It stems from the fear/concerns about problems that will arise during the use of a website. Thus, the concern reflected in the risks in using a website negatively affects consumers' trust in that website. If a consumer is fearful and concerned about using a website, they are less likely to trust the website and buy a product or service through it. Therefore, perceived risk refers to a guest's belief in all potential negative consequences they may encounter while using Airbnb [6]. On the basis of these findings, the following hypothesis is proposed:

H1: Perceived Airbnb Site Risk Will Negatively Affect Consumers' Trust in Airbnb.

Website quality can also affect consumers' use of a website. Perceived website quality, such as the quality of the information provided by the website and its interface, enhances the formation of consumers' trust in that website [5]. If the Airbnb site provides high-quality information or is structured so that guests can find the information they want quickly and easily, guests will be able to build higher trust in the Airbnb site [2]. Therefore, the following hypothesis is formulated:

H2: Perceived Airbnb Site Quality Will Positively Affect Consumers' Trust in Airbnb.

Reputation refers to public opinion, which is the collective assessment of an entity or person [7]. In previous studies, reputation has been shown to play an important role in establishing trust [8]. As new users with no website experience can rely on the reputation or experience of others, reputation has an impact on building initial trust in a product or service provider [5]. Thus, the reputation perceived by customers can be an important trust-building factor for web vendors. On the basis of these findings, the following hypothesis is derived:

H3: Perceived Airbnb Reputation Will Positively Affect Consumers' Trust in Airbnb.

Disposition to trust is a personality-based trust [2] that reflects the degree to which a person shows "a consistent tendency to be willing to depend on others across a broad spectrum of situations and persons" [9, p. 477]. It refers to an individual's tendency to trust others in general on the basis of his or her personal trait rather than the direct experience of certain trusted parties [10]. In the context of a website, it can also affect trust in others or in web-based vendors [2, 10]. According to Kim et al. [4], personality-oriented antecedents, such as consumer disposition to trust, exert a significant influence on consumers' trust in the website. Thus, the next two hypotheses are proposed:

H4a: Consumers' Disposition to Trust Will Positively Affect Their Trust in Airbnb.

H4b: Consumers' Disposition to Trust Will Positively Affect Their Trust in Hosts.

Trust transfer theory explains that trust can be transferred from a well-known target to an unknown target [11]. The trust transfer process is a cognitive process that describes how one person's trust can be transferred to another through some associations [12]. In the case of a well-known object of trust, such as a platform, trust in this platform can be transferred to an unknown object associated with the platform, such as the platform's seller. In other words, trust in the platform can positively affect trust in the seller [3], and the formation of this trust can ultimately affect consumers' purchase intention or attitude [13]. Therefore, the following hypothesis is proposed:

H5: Trust in Airbnb Will Positively Affect Consumers' Trust in Hosts.

Perceived trust has been identified as an important antecedent for consumer intention (e.g., [5]). In particular, perceived trust in sellers is positively related to the willingness-to-purchase intention in e-commerce [3, 9]. On the basis of these findings, the following hypothesis is formulated:

H6: Trust in Hosts Will Positively Affect Consumers' Continuance Intention to Use Airbnb.

3   Research Methodology and Results

For the development of the measurements, items from relevant studies were applied, and some of them were modified for this study. Survey items were measured using a five-point Likert scale (i.e., 1 = strongly disagree, 5 = strongly agree). The questionnaire was generated in two steps. First, the questionnaire was written in English and

then translated into Chinese by experts who are proficient in Chinese and English. Second, two scholars with a good understanding of the research topic reviewed the validity of each item in the questionnaire. The Chinese version of the questionnaire was uploaded to https://www.wjx.cn, one of the largest online survey sites in China, and the data were collected in May 2019.

A total of 512 responses were collected. A final 228 valid questionnaires were used in this study through a review of the responses to the screening questions. Confirmatory factor analysis (CFA) was performed using AMOS 25.0 to examine convergent validity and discriminant validity. All analysis results were found to support the overall measurement quality. The convergent validity was checked by applying three criteria [14]. First, the standardized path loading value of each item should be statistically significant and must be greater than 0.7. Second, the composite reliability (CR) for each construct should be greater than 0.7. Third, the average variance extracted (AVE) for each construct should be greater than 0.5. The result of the analysis showed that the standardized path loading value of each item was 0.776–0.941. CR showed values ranging from 0.878 (for perceived Airbnb site quality) to 0.960 (for continuance intention). AVE values ranged from 0.706 (for perceived Airbnb site quality) to 0.844 (for trust in Airbnb). As all three conditions were satisfied, convergence validity was supported for each construct. For each construct to have discriminant validity, the square root of the AVE for each construct must be greater than the correlations between that construct and the other constructs. The analysis results were shown to satisfy the condition of discriminant validity for each construct. As shown in Fig. 2, the structural model analysis results indicate that all hypotheses were supported.
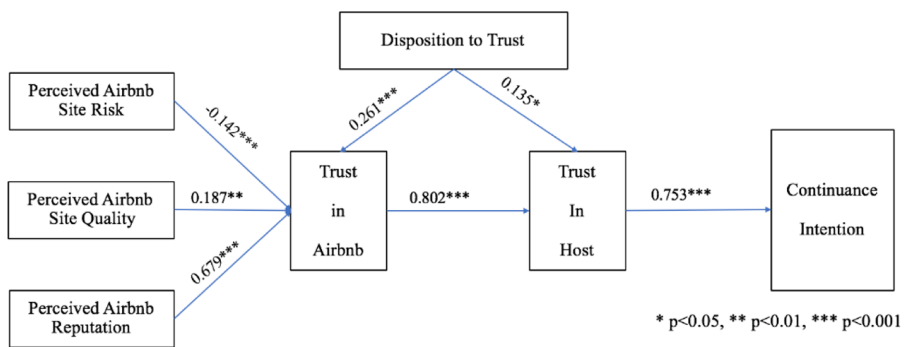
Fig. 2. Analysis result

4   Discussion and Conclusion

The analysis of 228 survey responses collected from Chinese Airbnb users showed that all the proposed hypotheses exert significant effects. However, among the factors influencing trust in Airbnb, the influence of perceived Airbnb reputation was found to

be the largest. This result suggests that despite the risk factors of the platform, the Airbnb brand itself is the biggest foundation for trust formation. Therefore, companies that provide shared accommodation platform services, such as Airbnb, should pay initial attention to their brand marketing. In addition, the results show that a guest's trait of trust (i.e., disposition to trust) positively affects trust in Airbnb and trust in the host. However, guests' trait of trust has a greater impact on trust in the Airbnb platform than on trust in the host. This result suggests that people have a higher level of trust in a particular service platform than in other people. Moreover, the result also indicates that trust in the platform is transferred to trust in hosts. Trust in hosts will ultimately have a positive impact on continuous intention to use Airbnb. Therefore, companies that provide shared accommodation platform services, such as Airbnb, should secure loyal customers by enhancing their image through brand marketing. Providing loyalty programs that can give loyal customers a variety of incentives could be a good strategic option.

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Part II: Innovation

Finding Meaning Through Travel Journaling: A Strength-Based Approach

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Abstract. This study explores how technology-mediated journaling can support memorable and meaningful tourism experiences (MMEs). The digital photo is the most common medium for travelers to keep a record of memorable and meaningful moments and share them via social media. We explore the potential of using these footprints for travelers to connect the implicit dimensions of their well-being. In particular, we draw reference from positive psychology, which emphasizes that human well-being is rooted in people's implicit personal factors and psychological needs such as character strengths, motives, and values. Making the implicit explicit may help people to make a wiser choice that matches their own aspirations. To support people in (re)creating meaningful narratives, we created a proof-of-concept prototype by incorporating character strengths into the design of a digital journaling platform. This study involved ten participants and each of them created at least five MME narratives from their past journeys. In this article, we discuss the design concerns for such a platform and examine the effectiveness of the platform in producing meaningful narrative by collecting participant feedback, and looking into the character strengths that the participants draw upon in their MMEs. The result suggests that not only the platform supports the reminiscing of MMEs, but the narration also deepened their self-awareness and allowed the participants to connect their behaviors with their personality traits and implicit values. Some participants were able to identify meanings that were hitherto obscured to them. Implications for quantified travelers and smart tourism are discussed.

Keywords: Memorable and meaningful tourism experiences (MMEs) · Reflective technology · Character strength · Well-being · Storytelling

1   Introduction

Tourism provides opportunities for travelers to gain memorable and meaningful experiences (MMEs); however, studies [1] have found that the happiness resulting from leisure travel is mostly short-lived. Yet, positive psychology [2] provides a rich body of knowledge on the factors that contribute to the sustained happiness of individuals. These factors which comprise explicit and implicit elements, are closely associated with what people do, feel, and value [3]. An apparent research gap exists regarding the happiness between the two disciplines. Nevertheless, digital photography and story-telling can be the medium and means that help people find meaning from their journeys. The digital photo is the most common medium for travelers to keep a record of these moments and then share them via social media. With the support of these memorabilia, journaling can be a way for travelers to (re)create narratives on these moments, instill self-reflection, and trigger self-development [4]. Technology-mediated reflection [5] urged that design artifacts should support users in reflection by "bringing unconscious aspects of experience to conscious awareness, thereby making them available for conscious choice" (P. 50). Through the process of journaling, technology may aggregate self-relevant data that are meaningful to the users such that they can be more self-aware of their own needs. In this study, we want to know if technology can support travelers to gain these insights with the pictures taken on their past journeys. In so doing, we developed a proof-of-concept journaling platform that incorporates character strengths and values to guide users in connecting explicit tourism activities and implicit psychology dimensions. We describe the design of the platform and interviewed participants on their experience of use, and thus evaluate the features that support users to gain meaning from their past journeys.

2   Literature Review

The tourism experience and its contribution to tourists' well-being are important considerations in tourism development [6]. In the era of the experience economy, tourism experience has been examined through different lenses, for example, as a consumer experience [7], from a tourist motivation perspective [8], sense-making [9] and as a peak experience [10]. Researchers strive to elucidate what constitutes an engaging and memorable tourism experience so that any insights can be integrated into tourism innovations [11]. Scholars [12] have argued for the delivery of memorable experiences that bring novel and refreshing dimensions to tourism services. However, a memorable experience, even though remarkable, may not be meaningful or valuable to individuals. Pine and Gilmore [13] describe the authentic experience as an event that engages the individual in a personal way. Dann [14] recognized that tourism engagement could be understood as a play between push-pull forces, with the pull factors being those that motivate tourists to experience novel and pleasant stimuli, and the push factors being the intrinsic motivations that predispose them to such engagement.

2.1   Character Strengths as Mediators of Well-Being

Positive psychology recognizes such push and pull forces as hedonic and eudaimonic motivated activities [15]. Rather than viewing tourism as a form of hedonic consumption, some tourists travel for purposes of self-exploration, pursuing a personal interest, or learning, so their experiences become particularly memorable and meaningful. MMEs are well connected with innate psychological factors, such as positive emotions, engagement, character strengths, relationships, meaning, and achievement [2]. Nevertheless, probing into MMEs is particularly challenging because of its idiosyncratic nature and the implicitness of the psychological mechanisms involved. Hence, starting from one's character strengths can help people to make the implicit explicit [16]. Here, character strengths are pre-existing capacity for a particular way of behaving, thinking, or feeling that is authentic and energizing to the user and enable optimal functioning, development, and performance [17]. The Values in Action Classification of character strengths identified six core virtues and 24 related character strengths (Table 1) which when used in a good way will generate positive experiences, find meaning and ultimately flourish [17].

Table 1. VIA Classification of Character Strengths and Virtues (Peterson and Seligman 2004)

Virtues	Character strengths
Wisdom	**Creativity** – originality, adaptive, ingenuity; **Curiosity** – interest, novelty-seeking, exploration; **Judgment** – critical thinking, open-minded; **Love of learning** – mastering new skills & topics; **Perspective** – taking the big picture view
Transcendence	**Appreciation of beauty & excellence** – awe, elevation; **Gratitude** – thankful for the good, expressing thanks; **Hope** – optimism, future-mindedness, future orientation; **Humor** – playfulness, bringing smiles to others, light-hearted; **Spirituality** – religiousness, faith, purpose, meaning;
Courage	**Bravery** – not shrinking from fear, stand up for what's right; **Perseverance** – persistence, finishing what one starts; **Honesty** – authenticity, integrity; **Zest** – vitality, enthusiasm, feeling alive and activated
Temperance	**Forgiveness** – mercy, accepting others' shortcomings; **Humility** – modesty; **Prudence** – careful, cautious, not taking undue risks; **Self-regulation** – self-control, disciplined;
Humanity	**Love** – valuing close relations with others; **Kindness** – generosity, nurturance, compassion, altruism; **Social intelligence** – being aware of the motives/feelings of oneself/others
Justice	**Teamwork** – citizenship, social responsibility, loyalty; **Fairness** – not letting feelings bias decisions about others; **Leadership** – encouraging a group to get things done

2.2 Digital Journaling on Memorable and Meaningful Tourism Experience

Digital photo and video are the popular mediums that travelers use to capture memorable and meaningful moments during their travel journeys and become memorabilia for later reminiscing, whereas journaling is the activity that supports reflection and introspection to take place [4]. To this end, the human-computer interaction community also looked into technology-mediated meaningful interaction. For instance, the sense of meaning can be created by collecting and showing personal relevant data [18], bringing unconscious aspects of experience to conscious attention [5], and reviewing one's past [19]. These reflective informatics systems assist users to break down lived experiences, triggering introspection, and fostering transformation [20]. Core to such a well-being supporting system is to make implicit dimensions of experience explicit [5]. In this study, we incorporate the strength-based approach into the journaling of MMEs for travelers to narrate MMEs with their photos taken of these moments.

3 Research Methodology and Research Design

Using a strengths-based approach to create a digital journal platform, this study bridges the research gap in tourist well-being between tourism study and positive psychology. The goal of this study was to explore how strength-based digital journaling can help travelers to narrate their MMEs by connecting the explicit experiential dimensions of tourism experience, using the pictures people had created of their journeys, with that of implicit psychological needs and values. We created an interactive journaling platform —strands of life (https://www.strands-of-life.com)—that guides participants to create strength-based narratives on their memorable and meaningful tourism experiences. We would like to know how the system features would support tourists to find meaning from the journaling process. Therefore, after the journaling, we interviewed the participants about their experience of use on: 1) the features that support the explicit experiential dimensions of MMEs, and 2) the features that support the implicit psychological dimensions of MMEs. Designing the strength-based journaling platform.

The design of the platform draws reference from three sources, namely experience design [21], the Labovian narrative model [22], and PERMA model of well-being [2]. Regarding activity theory, experience design [21] emphasizes that design should address the user experience holistically through three levels of goal-directed action: be-goals, do-goals, and motor-goals. The do-goals and motor-goals are explicit and observable activities and actions that people do; the be-goals are the implicit motivations and values underlying the do-goals and motor-goals. The PERMA model, on the other hand, provides a holistic view of human flourishing. A full-life consists in experiencing positive emotions about the past and future, savoring positive feelings from pleasures, deriving abundant gratification from your signature strengths, and using these strengths in the service of something larger to obtain meaning [2]. The PERMA model was built on the three pathways of happiness wherein human flourishing rests on five pillars, namely positive emotion, engagement, relationship, meaning, and accomplishment. Two models suggested a hierarchical structure of the

well-being narration: from the highest level, the values that people hold dear (e.g., relationships, meaning, and accomplishment), through the middle, the motive and character strengths, to the bottom, the emotions felt and the tourism activities involved. The models informed the narrative features that facilitate users to reveal the implicit psychological dimensions of their MMEs, for instance, the emotion felt, the character strengths drawn upon, and the values that were appreciated by the users.

However, pictures created by travelers are largely fragments of the MMEs. A study [23] adopted the Labovian narrative model to guide comprehensive oral and visual storytelling. The Labovian narrative model consists of six storytelling elements, namely abstract, orientation, complicating action, evaluation, resolution, and coda. Abstract refers to a summary of the story. Orientation provides the context in which the story takes place. Complicating action involves sequence actions regarding what happened. Evaluation explains why the narrative is worth telling, whereas resolution describes how the story ends. Lastly, coda (as an option) allows the storyteller to point out the relevance of the story by connecting it with everyday life. The Labovian narrative model provides a more fine-gained narrative structure, especially on guiding users to create visual and textual content pertaining to their MMEs. For instance, the narrative structure requires users to: 1) provide a date and title (as abstract); 2) upload images of the people, place, and activities with relevant descriptions (as orientation); 3) provide details (both images and text) on the peak moment (as complication); and 4) describe how the anecdote was ended and explain the significance of the story.

The below provides a succinct description of the features. The journaling platform, strands of life, is accessible from both desktop browsers and smartphones. It is composed of three main sections: user profile, story creation, and story browser.

User Profile: This mainly consists of the strength profile from the result of the VIA survey (https://www.viacharacter.org/) conducted prior to the account creation. A short description is provided on each strength which allows users to be familiar with the definition of each strength (Fig. 1(a)).

Story Creation: This is a section that guides users to create MME entries (Fig. 1(b) for an overview). It is composed of nine subsections in which users can upload images, create tags, input descriptions, assign emotions, associate character strengths, and provide titles and dates of the experience (Fig. 1(c) for example). The nine sections, which are created based on the narrative model mentioned, guide users to connect explicit tourism activities and implicit psychological dimensions. The nine sections include the people involved, place visited, activity undertaken, peak moment experienced, character strength used, the final result, the values gained (i.e., the significance of the experience), the title of the story, and the date of the experience.

Here, we highlight three subsections that help elicit the implicit psychological dimensions of MMEs from users. First, to facilitate users' expression, an emotion dial (Fig. 1(d)) was created to allow users to select a representative emoticon to describe the experience. This feature allows users to express the non-verbal dimension of their experience. Second, we invited users to select a maximum of two character strengths they had drawn upon in the experience. The strengths were arranged according to the user's strength profile (Fig. 1(a)) to increase usability (Fig. 1(e)). Users were allowed to choose multiple strengths of the experience because strengths are not expressed in isolation but in combination with one another [17]. On each of the strengths selected,

we invited users to provide a short description of its contribution to the experience. The last subsection invited users to select the benefits and values gained as a result of the MMEs. The value section (Fig. 1(f)) listed 17 items that cover both hedonic and eudaimonic well-being dimensions that may be associated with tourism activities. Since there is little consensus on what constitutes eudaimonia [24], this section aggregates well-being dimensions from prominent frameworks in positive psychology and tourism. These frameworks include the Ryff's model of well-being [25], self-determination theory [26], memorable tourism experience scale [27]. The list includes self-acceptance, personal growth, meaning and purpose in life, a sense of mastery, autonomy, kinship, friendship, health, better world and society, prosperity, wisdom, social recognition, harmony, excitement, knowledge, courage, and justice. Each value is accompanied by a representative illustration to enhance the comprehensiveness of the term used. Users can register a maximum of two values gained for each narrative.
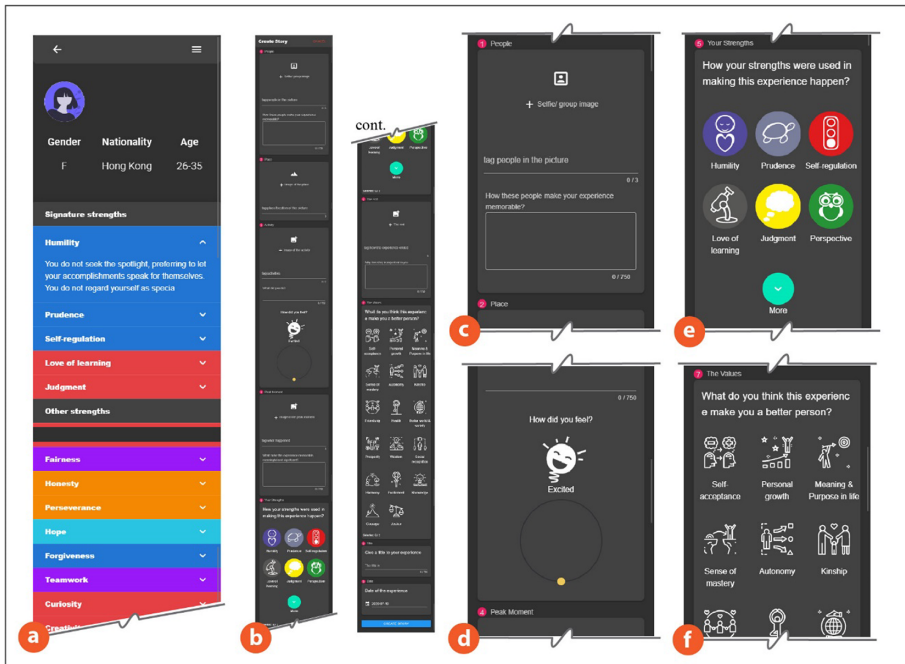
Fig. 1. The strength-based journaling platform: user profile and story creation

Story Browser: Once the stories are created, they can be viewed in the story browser. This section allows users to browse all stories created, and each story is displayed with a picture and title. Clicking on the picture brings users to the corresponding story. The filter feature allows users to review entries by selecting specific strengths, values, and people.

3.1   Participant Recruitment and Data Collection

Data collection was conducted in four steps: recruiting participants, collecting their strength profiles, creating stories with the strength-based journaling platform, and interviewing after finishing the tasks. This study used a purposive sampling approach, where each participant needed to provide at least five MMEs with a fair amount of photos captured of each of these experiences. The participants were recruited through social media platforms. The study recruited 16 participants but only ten (6 females and 4 males) finished all four steps. Among the ten participants, seven of them were aged 26–35, and three of them were 36–45 yr old. Six participants were Asian (China, India, Indonesia, and Hong Kong), three African (Nigeria, and Ghana), and one European (British). The participants' travel frequency ranged from once a year to eight times per year. Most MMEs reported were from leisure travel with a few from study trips and missionary trips. Two-thirds of the MMEs reported were less than five years old. The whole study was conducted online with the help of conference and instant messaging software for support and interview.
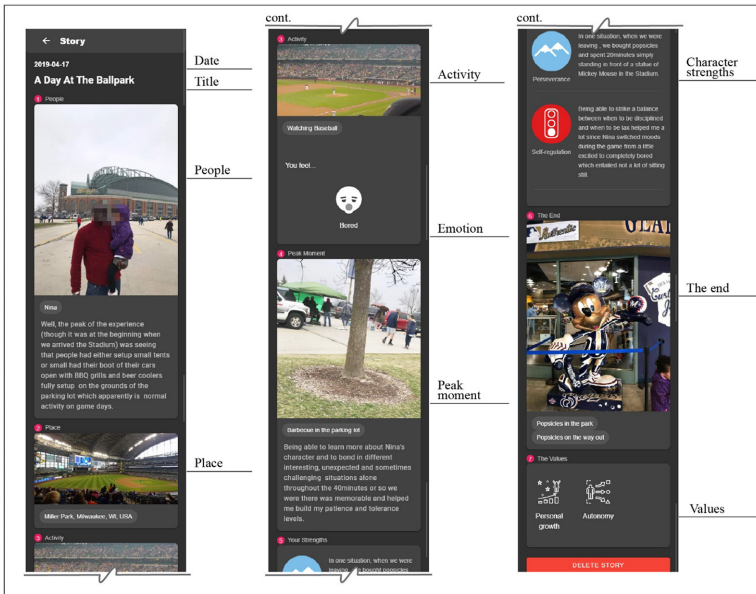
Fig. 2. A sample of MME entries provided by Ron (P10)

The participants were first invited to identify their character strengths using the free VIA-IS survey online (https://www.viacharacter.org/). The survey consists of 240 questions with ten items for each character strength, laid out in a 5-point Likert scale format. A report listing the 24 strengths in ranking order of significance was given to each participant. The top five strengths were considered to be the signature strengths. The research team created a user account with the character strengths profile of the

participant. The participants were invited to create at least five stories based on MMEs they encountered in their past journeys. Figure 2 shows an example of the MME entry by Ron (P10). The data collection ended with a 20-min online interview which focused on two aspects of journaling experience:

- How the features support the explicit experiential dimensions of MMEs
- How the features support the implicit psychological dimensions of MMEs

The study resulted in three sets of data for the analysis: character strength profile of each participant; 51 strength-based MME entries (with one participant creating six entries), and the participants' feedback on the usage of the platform. Interviews were conducted in English and transcribed verbatim for thematic analysis.

4   Data Analysis and Findings

In response to the research questions, we now summarize the result and answer the three research questions by using the emerging themes from the stories and the character strengths drawn upon in these experiences, with the support of participant strength profiles and interview quotes.

4.1   Features that Support the Explicit Experiential Dimension of MMEs: Images, Text, and Emotions

The participants clearly stated that both visual and textual elements are very important for their narratives (Fig. 1(c)). Especially the platform required the participants to upload five pictures that outline different aspects of the experience, namely people, place, activity, peak experience, and the end, although choosing relevant photos could be time-consuming. Both Susan (P1) and Pauline (P6) stated that the process of sorting and selecting suitable pictures allowed them to relive these experiences. "Finding the picture that represents the peak moment is a powerful way to trigger memories and the associated emotion," said Ron (P10). The journaling platform also offered some practical benefits. Allan (P4) found that aggregating these pictures allowed him to spare the photo storage space in his smartphone: "I have so many pictures in my phone, the platform helped to keep the most important ones."

There is little doubt that text can provide rich information to the narrative; however, text input also helps when images are missing or fail to convey information. The platform has five text fields associated with five aspects of MMEs, namely people, activity, peak moment, character strengths, and the end. A guiding question invites users to input different content into each of the text fields. For instance, for the peak moment: what makes the experience memorable, meaningful, and significant? Allan (P4) mentioned that he could not find a suitable picture for the peak moment, but the description box allowed him to add supplemental information to the MMEs.

The ability to attribute emotion to the experience is another capability that the participants highly appreciated (Fig. 1(d)). Four participants (P1, P5, P7, P8) found the feature appealing because the emoticon characters allowed them to associate with the

specific time, space, and activities in which the MMEs happened. Yolanda (P7) explained that highlighting one's emotions is important because they are just fleeting sensations that happened during her journeys. The emoticon provides a shortcut to these memories.

David (P8), on the other hand, mentioned that the emoticon allowed him to express himself when he was lost for words in the narratives. Nevertheless, some participants (e.g., P2, P8) also wanted more diverse emotional expression (currently limited to eight basic emotions) and suggested that the design can affiliate more than one emotion to each of their narratives.

4.2 Features that Support the Implicit Psychological Dimensions of MMEs: Character Strengths and Values

One of the unique features of this journaling platform is incorporating character strengths and values as integral parts of the narrative. For Jane (P3) and Allan (P4), highlighting strengths and values in the narrative was a revelation that helped them get to know "many things" that they had never thought of. Jane shared how such narrative helped her to connect with her innermost self: "I love recording my travel experiences but never in such depth… for example, I did a street run when I was traveling in Taipei for the first time. Before the journaling, it was just a novel experience among others. I have never associated my bravery and perseverance (character strengths) with it!" This is how she put her character strengths to good use: "I now realize that I broke out of my comfort zone by doing my first street run in Taipei without my companion." Moreover, by reviewing her moments with the strength of bravery (using the filter feature), she found that her breakthrough led to another "adventure" in which she was the person-in-charge for a one-month trip to Italy. She did not recognize the connection between the two trips until she reviewed her MME entries.

Ron (P10) drew upon his bravery and perseverance in another context when he was engaged in a hiking trip at Huashan Mountain, China. Ron and his wife decided to visit the love lock located at the top of the mountain next to the edge of a breath-taking cliff. After an exhausting five-hour uphill hike in snowy conditions, they were finally able to fasten the padlock on the handrails. The expression of everlasting love was strengthened by his strengths of bravery and perseverance. Ron was amazed at how strength-based journaling can make these attributes more explicit: "I feel it, but I never really thought about it in such a structured way… Let's say, I enjoyed the whole experience. But the platform made me go deeper into my mind."

Susan (P1) was surprised to find meaning in one of her relaxation trips to Malaysia. She recorded the moment of attending a sunset at a beach. She confessed that she used to be a tense person and often traveled with a detailed itinerary. Then there was the time when she listened to her friend's advice on "doing nothing" at the beach. Not only the journaling process brought her awareness of the strengths used, but also the values the experience entailed. "Wow, I now realize that attending the sunset brought me self-acceptance and harmony," said Susan.

Nevertheless, some participants were confused about the terms used for character strengths. For instance, both Cherry (P2) and Yolanda (P7) expressed that they were curious to know more about their strengths but uncertain about the terms used. For

instance, curiosity has a similar meaning to the love of learning for Yolanda. Building up character strength literacy and values may help people to understand themselves better.

In sum, the participants found not only that the platform supported them to create their MME narratives, but also revealed deeper insights into their behaviors by making connections between their character strengths and the values gained. The process can make the implicit dimension of the experience explicit. New meanings can also emerge when participants find patterns in their behaviors.

5   Discussions

The result of this study shows that the strength-based journaling platform can effectively guide travelers to structure a comprehensive narrative by connecting explicit tourism activities (people, place, activity, peak moment and the like) and implicit psychological dimensions (i.e., emotion, character strengths, and values) inherent to MMEs. The platform supports people to make the implicit explicit so that they can reflect on them. While smart tourism relies heavily on digital technologies, this study shows that human intervention (e.g., provide description and ascribe meaning to digital footprints) is also important in order to make the data representative and significant to the users because meaning is essentially subjective and idiosyncratic. Experience design can cope with technology mediation for the goal of enriching the tourist experience. Although strengths-based journaling seems only beneficial to individuals or small groups of people (e.g., friends and family), extending this concept to quantified travelers [28] and smart tourism [29] can be far-reaching.

Quantified travel [28], which extends from the movement of the quantified self, is about people's willingness to gain self-knowledge, and thereby use a wide range of technological devices to capture one's behaviors, habits, and thoughts, through self-tracking, and personal informatics. The assumption of the self-tracking practice is about gaining self-knowledge, as a result of data mashup from these devices, which can lead to positive behavioral changes. However, there still lacks a discussion on what all these personal data gathered could represent for users, what meaning they may have, and the value they may provide [30]. Especially, many people fail to gain self-knowledge from numbers and charts provided by these informatics systems [31]. This study provides a possible way for people to gain self-knowledge through storytelling of their MMEs. The narration supports people to generate insights that were hitherto obscured to them. When combined with other self-tracking devices, the result of the journaling can make these self-trackers capture more meaningful data, for example, make onsite recommendations on tourism activities that match the character strengths and values of the travelers; or find likeminded people (i.e., values) who share similar personal interests (i.e., tourism activities).

Although MMEs are essentially particular and idiosyncratic, building big data on these MMEs can help the tourism industry to conceptualize services that respond to the implicit and latent needs of travelers. This can be highly valuable to smart tourism because such information helps the industry to innovate smart experiences, which are rich in meaning, with personalization, context-awareness, and real-time monitoring

[29]. For instance, travelers should be supported to develop unique, self-relevant and reachable goals the travelers can accomplish in their journeys because experiences are more satisfying when tourist activities resonate with tourists' intrinsic goals (i.e., personal interest focused), growth-based goals (i.e., self-development focused), and goals related to flow activities (i.e., character strengths focused) [32].

6 Limitations and Future Research

This study has a few limitations and also provides the direction for future research. First, taking the VIA-IS survey may be a tedious task for some users, so future designs may consider other ways to identify the character strengths of users, for instance, using strengths-spotting [33] processes which involve self-nomination or a third person who is familiar with character strengths (e.g., counselors). Second, the MMEs provided by the participants were based on their past journeys. Future study can invite participants to create MME entries of their journeys so that more vivid emotions, memories, and opinions can be captured. Third, this study's design was cross-sectional; therefore, it was difficult to probe into the well-being benefits from strength-based journaling. Future research can opt for longitudinal studies so that the well-being changes can be observed over a longer period. Also, increasing the sample size can also help researchers to understand the complexity of MMEs due to their idiosyncratic nature. Lastly, future exploration of a strength-based personal informatics and recommender system may bring more meaningful journeys for travelers.

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Loyalty Programs and Direct Website Performance: An Empirical Analysis of Global Hotel Brands

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Abstract. With loyalty programs increasingly used as a competitive method by hotel brands, this study investigates the relationship between program size/satisfaction and brand direct website performance. Analyzing a unique database of loyalty program statistics, traffic levels/sources and engagement metrics from the top 50 global hotel brands, we find that size matters, with larger programs performing better in terms of both traffic and engagement, suggesting that efforts by hotel brands to grow membership are appropriate. Similarly, program satisfaction positively impacts both traffic levels and engagement, suggesting that brands should also focus on ensuring that existing members are happy with program benefits and operations. These findings are consistent irrespective of brand level, suggesting that all types of hotel brands can profit from leveraging loyalty programs.

Keywords: Loyalty programs · Website performance · Hotel sector

1 Introduction

Facing a highly competitive environment with a product that consumers increasingly regard as a commodity, hotels have intensified marketing efforts to attract and retain customers [44]. Chief amongst these is an increased emphasis on customer loyalty programs [12]. To drive more bookings through direct, and in particular online direct, channels, hotel brands are currently growing program membership as well as better leverage the resulting contact, demographic and transactional data to reach out and develop more personalised relationships with customers [29].

There is no doubt that developing loyalty is beneficial. Direct links have been found between with hotel service performance [13] and perceived value of the firm's offer [41]. Similarly, multiple studies have demonstrated the connection with financial performance [see, for example, 10, 18 and 28]. However, while these studies establish this link in the macro sense, they do not determine the mechanism through which these improvements occur. Certain commentators theorise that these financial benefits arise from driving higher proportions of direct bookings, thus avoiding online travel agent (OTA) commissions and reducing customer acquisition costs, thus increasing profitability [25]. However, at present there is little empirical evidence to support these assertions.

The objective, therefore, of this paper is to delve deeper and investigate the link between hotel loyalty programs and direct website performance. As loyalty is primarily a marketing issue, analysis is carried out at the brand level, utilising a unique database of performance metrics from the fifty largest global hotel companies. The impact of both program size and satisfaction is investigated, with stickiness (time spent on a website and number of pages viewed) used as a proxy for engagement, and both traffic levels and source used to explore effectiveness. This paper complements and extends existing studies by deepening our understand of how loyalty programs can positively impact hotel performance. In addition, from a practical perspective the study helps practitioners better understand the value of loyalty programs to help make better strategic decisions as to future developments. The remainder of this paper is organised as follows. Firstly, the literature on hotel loyalty programs is explored. The strategic/financial importance of driving bookings through direct channels is then established, with the role of loyalty programs in achieving this discussed. Using a unique database of loyalty program and performance website metrics, the effect of program usage by the top 50 global hotel brands is empirically analysed. Implications for both academia and industry are then presented, as well as suggestions for extensions and further research.

2 Literature Review

2.1 Loyalty Programs

According to [18], loyalty programs first became popular at the beginning of the twentieth century. It was only in the 1980s that they began to diffuse into travel, as airlines and hotel companies introduced formalised schemes to enhance their relationships with customers. These initiatives were driven by a belief that loyal customers exhibit long-term commitment to the brand, leading to increased buying intention [5]; higher revenue per customer; a willingness to pay more for comparable products/services; and reduced vulnerability to substitution by alternative brands [35]. Loyal customers are also thought to be more likely to use lower-cost, and in particular direct, channels as well as to generate additional ancillary revenues during their stay. In addition, leveraging data from loyalty programs allows firms to reduce their reliance on wasteful mass marketing and concentrate on targeting more efficient customised messages to an already receptive audience [16]. As a result, many feel that building and maintaining an effective loyalty program is important, particularly in the highly competitive and increasingly commoditised hotel sector [44].

However, comprehensive empirical studies investigating the effects of loyalty programs on performance in the hotel sector has been relatively rare [39]. [18] investigated how programs affect revenue, occupancy rate and operating margin, revealing that investment yielded a modest but positive impact. Similarly [46] found that loyalty programs positively impacted revenues and occupancy, but only in high-end luxury hotels. Other studies [see, for example, 11 or 28] address the issue only indirectly, using aggregate loyalty measures that do not reliably reflect loyalty spend. A more recent study [12] found that loyalty expenses positively impacted RevPAR,

ADR, occupancy and gross operating profit. In a follow up study [10], Hua demonstrates that this is moderated by e-commerce spend.

Loyalty programs, however, are not without their challenges, leading some to challenge their effectiveness [9, 23, 43]. For example, [40] point out that consumer benefits from hotel loyalty programs remain functional and are easily replicated by competitors, making any advantaged gained unsustainable. With programs largely undifferentiated, switching costs are low. In addition, travellers typically belong to multiple programs, further reducing the bond with the brand [47]. As they permeate throughout the sector, their overall benefit decreases, with the result that hotel loyalty programs have now become a commodity that is expected, but not necessarily valued, by customers, and which generates questionable returns for its sponsoring company.

Despite this, it's clear that hotel brands believe that loyalty programs are important for competing in today's marketplace [47]. Cumulatively over 1.1 billion Americans are members of hotel programs, with, in contrast to other sectors, membership levels growing quickly [3]. This may be because the barriers to membership has been dramatically reduced [47]. In an effort to compete, particularly with the powerful global online travel agencies, many hotel chains have launched what O'Connor [30] has dubbed 'the loyalty wars', placing increased emphasis on their loyalty program as a competitive method and automatically enrolling anyone making a reservation by offering substantial instant discounts for sign-up, in effect artificially inflating their membership numbers. Although in the short term this may bring some benefits, particularly in making the brand more attractive to real estate owners for franchise/ management contract deals, in the longer term it is problematic as these new members compromise the integrity of the database, polluting it with subjects with little intention of subsequently interacting with the brand. Also, this strategy has implications in terms of running cost [6]. Administrative and technological costs increase proportionately with size [18], and brands must also make allowance for reward points as liabilities on balance sheets [47]. Thus, growing the database with less than optimal subjects has negative implications from both a strategic and financial perspective.

Given the increased emphasis hotel companies place on loyalty programs, combined with the aforementioned database quality issues, it's clear that a deeper understanding of the mechanisms through which loyalty programs deliver their promised benefits is needed. In addition, since loyalty programs typically operate at the brand level, there is a need to shift the unit of analyses away from the hotel property level used in previous studies to the chain (brand) level. Prior research specifically identifies the need for further research on the mechanisms of how customer loyalty tools affect firm performance [14, 43]. We answer this call, attempting to bring clarity to how loyalty programs affect hotel performance by investigating their impact on driving business through direct distribution channels.

2.2 Online Distribution

Over the past decades, technology has become deeply ingrained in the hotel marketing, sales and distribution processes [2]. In particular Internet-based distribution has become a key feature of hotels, with customers increasingly searching for, and booking, their hotel stays through online (web and mobile) channels [31]. Due to the perishable nature

of the hotel product, having the right mix of distribution channels is important in terms of maximise revenue opportunities [19]. As a result, most hotels use a dynamic portfolio of direct and indirect, and online and offline channels, to reach out to the customer in an effective and efficient manner [26].

However in recent years overall distribution costs have been rising due to the rising prominence of online intermediaries in the hotel distribution process [33]. OTAs provide consumers with a wide range of value-added services, including supplemental information on destinations [17], room rate, facility and amenity comparison facilities [22] as well as, in many cases, more attractive pricing [7]. As a result, their value proposition is highly attractive from a customer perspective, with the result that online penetration figures have shifted substantially towards the indirect OTA route [21]. From a financial perspective this has two major implications for hotels. Firstly, selling through OTAs necessitates either the payment of a commission or the provision of net rates at a substantial discount, decreasing the resulting net revenue [42]. Alternatively, hotels have to invest more marketing funds to compete with the OTAs for the customer, again driving up costs and reducing profitability. In both cases the presence of OTAs in the marketplace has a significant effect on the competitiveness of hotels over reliant on these channels [2].

Direct channels, in contrast, have lower transaction costs and also allow hotels to communicate with customers more efficiently [15]. [34] suggest strategies for encouraging customers to book directly, in particular through the hotel's or brand's direct website. One way of driving such bookings is by nurturing a direct relationship with customers through loyalty programs operations. [37] hold that it requires less effort and is less costly to retain current customers rather than trying to attract new ones. And in addition, rather than booking through third parties, loyal customers tend to book through direct channels and in particular the hotel's direct web presence [12]. Thus, attempting to better leverage loyalty programs to decrease dependence on OTAs, thus driving higher proportions of higher-margin direct business and enhancing profitability, would appear to be an attractive strategy for hotels.

To facilitate this process, this study specifically examines two interrelated issues. Firstly, as discussed above, hotel brands use loyalty programs to enhance customers' perceived value, brand image and trust, leading to enhanced customer engagement [14]. As a result, the traditional "consider -> evaluate -> buy -> enjoy -> advocate -> bond" purchase continuum is short-circuited, prompting loyal customers to skip earlier stages and move directly to "buy" [4]. This is particularly important in the hotel sector, which compete not only with each other but also with the powerful OTAs whose added value includes expediting consumer access to product choice and facilitating comparative evaluations. Thus, locking customers into an abridged customer journey is advantageous, reducing or eliminating the threat of substitution, resulting in higher direct sales [8].

The brand's direct website plays a key role in this strategy [26]. Since loyal customers tend to book through the brand's direct web presence [43], we theorise that there is a relationship between loyalty program effectiveness and brand website performance. With a deeper connection to the brand, loyal customers tend to be more

engaged, browse more information and spend longer on the brand website [38]. We operationalise loyalty program effectiveness using a membership satisfaction score but given the afore mentioned efforts to grow loyalty program membership numbers, examining whether program size affects website performance is also relevant. This is assessed in two ways: traffic (number of unique visitors arriving on the website per month) and the resulting engagement of this traffic [20]. This is operationalised as "stickiness' - the site's ability to retain visitors as measured by number of pages viewed by each visitor and time spend on the site [36]. Bounce rate, the percentage of visitors who view only a single page (regarded as a negative sign in terms of user satisfaction) was also investigated. Thus, we put forth the following hypothesis:

H1a: Consumer satisfaction with hotel loyalty programs positively influences brand website traffic.
H1b: Hotel loyalty program size positively influences brand website traffic.
H2a: Consumer satisfaction with hotel loyalty programs positively affects brand website engagement.
H2b: Hotel loyalty program size positively affects brand website engagement.

While absolute traffic levels are important, the source of this traffic is also relevant. If loyalty programs are effective, they should have a positive effect on how the website attracts visitors. With an established connection to the brand, program members should already be aware of the brand's existence and more likely to navigate directly to its website. They also could arrive through brand marketing efforts that leverage the loyalty database to communicate with members, prompting them to reengage [43]. In contrast, transient customers, as they are less aware of the brand and do not receive promotional efforts, arrive through search, and in particular paid search, where the resulting transaction costs negate many of the benefits of capturing a direct booking [32]. Thus, we put forth the following hypothesis:

H3a: Consumer satisfaction with hotel loyalty programs positively influences traffic levels from direct sources.
H3b: Loyalty program size positively influences traffic levels from direct sources.

3   Research Methodology

Research on consumer behaviour is traditionally dominated by survey data, where intent, rather than actual behaviour, is measured [27]. However, with online channels, clickstream data, which measures actual interactions rather than declared intent or perceptions, can be used [20]. For this study, a unique dataset was assembled from secondary sources. A ranked list of the top 50 global hotel brands were obtained from Brand Finance [1]. Satisfaction scores with the loyalty programs of these brands was

obtained from J.D. Power. Unique visitor, metrics traffic sources and other online measures for the direct brand websites for December 2019 were scraped from SimilarWeb.com in July 2020. Data on size (number of hotels and rooms respectively) was retrieved for 2019 from the Hotels 325 Report 2020 [45], while data on loyalty club membership levels was compiled from the 2019 annual reports of the respective hotel companies. As, in line with past studies [46], we expected more upmarket brands to perform better, following [24] we used Consumer Reports classification of hotel brands to create four categories; luxury (e.g. Ritz Carlton), upscale (e.g. Marriott), midscale (e.g. Hampton Inn), and budget (e.g. Ibis) and performed post-hoc analysis to investigate differences between groups.

4   Results

As can be seen from Table 1, the loyalty programs studied have a substantial number of members (mean = 83 million), with high variability (std dev of over 38 million). Satisfaction scores were more homogeneous, with a mean of 838/1000, and std dev of only 38, suggesting a high degree of satisfaction amongst customers with hotel loyalty programs. As reflects their status as the world's largest chains, the brands studied were also substantial in size, with a mean number of rooms and properties of nearly 96,939 and 757 respectively. Websites attracted an average of almost 18 million monthly visitors, again with high variability with a standard deviation of over 15 million. The average visit time was over 6 min, with the typical visitor viewing just over four pages. Brand's websites were not very successful at retaining visitors, with a mean bounce rate of over 45%. Search was the primary traffic source (mean = 45.53%), followed by direct navigation (32.21%). Other sources were more minor (10% or less), confirming the well establish power of brand in hotel distribution [32].

To examine the relationship between program size and stickiness, Pearson's Correlations were calculated. As can be seen from Table 2, there is a strong and statistically significant relationship between number of members in a brand's program and traffic to its website, lending support to Hypothesis 1b. Similarly, programs with higher number of members profited from deeper engagement, with visitors viewing more pages and bouncing less often. However, this advantage does not translate into time spend on the site, with the relationship between program size and visit length not significant. Given the variability in brand scale, it was though important to control for chain size, as presumably larger brands, with more significant global presence, should be able to attract more members. For that reason, the same analyses were performed using two calculated metrics – members per room and members per hotel – to neutralise the effect of chain size. As can be seen from Table 2, in both cases the relationships remained both positive and significant, although their degree was substantially weaker, suggesting that brand scale does have a substantial effect.

Table 1. Descriptive statistics.

Statistic	n	Minimum	Maximum	Mean	Std Dev
Members (Millions)	49	8.50	148.00	83.29	38.43
Satisfaction	49	745	888	838	38
Rooms	49	2800	293882	96939	74567
Hotels	49	6	3734	757	887
Members per room	49	69	12428	1932	2704
Members per hotel	49	12051	3419355	455464	728081
Unique visitors	49	0.093	40.650	17.977	15.196
Bounce rate	49	35.420	56.700	45.252	6.994
Pages	49	2.400	5.420	4.180	0.993
Length	49	02:11	12:55	06:23	02:56
Search	49	13.300	71.190	45.530	9.814
Direct	49	18.670	83.760	32.215	8.981
Email	49	0.000	17.270	9.116	4.798
Referrals	49	1.360	20.160	10.366	3.409
Social	49	0.070	4.030	1.463	0.792
Display	49	0.020	11.490	1.304	1.609
Organic	49	29.330	100.000	85.038	12.381
Paid	49	0.000	70.670	14.962	12.381

In terms of the program satisfaction, there is a strong and significant association with both average number of pages viewed and bounce rate (in this case negative, suggesting that programs with higher satisfaction rates result in lower levels of site abandonment), in both cases supporting H2a. The relationship with visit length, although significant, was less strong, but still adds support to H2a. Lastly, the relationship with traffic level, although positive and significant, was weaker, suggesting that program size may be more important than program satisfaction.

Table 2. Membership's effect on stickiness

Variables	Members	Members per room	Members per hotel	Satisfaction
Unique visitors	**0.696**	**0.402**	**0.409**	**0.492**
Bounce rate	**−0.323**	−0.215	−0.247	**−0.660**
Pages	**0.582**	**0.370**	**0.355**	**0.699**
Length	0.283	0.169	0.202	**0.340**

Values in bold are significance at the 0.05 level.

Given differing service levels among hotel brands and their potential effect on loyalty development, an important question was to investigate whether brand level (economy, midscale, upscale, luxury) affects traffic and stickiness. A one-way MANOVA revealed no statistically significant difference in the variables under investigation based on brand level, $F(12, 111) = 1.84$, $p < .15\ 8$; Wilk's $\Lambda = 0.683$, suggesting that

service levels have no significant effect on the relationship between loyalty program size/satisfaction and the selected elements of brand website performance.

Table 3. Membership's effect on traffic sources

Variables	Members	Members per room	Members per hotel	Satisfaction
Direct	0.052	0.040	0.056	0.165
Search	−0.199	−0.157	−0.159	−0.159
Email	**0.320**	0.287	0.273	**0.442**
Referrals	−0.158	−0.113	−0.124	**−0.639**
Social	**0.570**	0.256	0.280	**0.474**
Display	−0.213	−0.202	−0.213	**−0.340**
Organic	0.200	0.223	0.206	0.272
Paid	−0.200	−0.223	−0.206	−0.272

Values in bold are significance at the 0.05 level.

Lastly, in terms of traffic sources, we found little evidence to support the theory that brands with larger and/or better loyalty programs drive larger proportions of their web traffic through direct navigation and/or direct marketing channels. As can be seen from Table 3, the relationship between program size and proportion of traffic driven directly is both non-significant and weak, causing us to reject hypothesis 3b. There is, however, some evidence that program size is associated with the proportion of traffic generated through both email and social media. These effects are, however, based on the absolute scale of the loyalty programs concerned, as statistical significance disappears when controlled by number of rooms/properties.

Program satisfaction has a similar effect, with the association with percentage of direct traffic both insignificant and weak (causing us to reject H3a), but the associations with both traffic from email and from social both tested significant, positive and moderately strong. In addition, the association between program satisfaction and traffic from both referrals and display advertising is significant and negative, providing evidence that better loyalty programs drive higher levels of direct traffic. As with stickiness, post-hoc analysis was carried out to establish whether brand level affected how the brand sites generated traffic. The resulting one-way MANOVA revealed no statistically significant difference, $F (12, 111) = 1.616$, $p < .490$; Wilk's $\Lambda = 0.57$, suggesting that brand level no effect on overall findings.

5   Conclusion and Discussion

With loyalty programs having become a competitive necessity for any company wanting to work in travel, this study explores the impact of loyalty program size/satisfaction on the direct website performance of the world's largest hotel brands using a unique dataset compiled from multiple secondary sources. Using a brand rather than a property perspective, the study extends and complements previous work [11, 12,

28], enhancing our understanding of how hotel loyalty programs positively affect hotel operations and performance.

The results demonstrate that, when it comes to hotel loyalty programs, size clearly matters. Analyses revealed a strong, statistically significant, relationship between number of members in a brand's loyalty program and traffic to its website. When chain size is controlled, the relationship remains significant although decreasing in strength. In addition, there is a positive association between program size and both pages viewed and bounce rate. Overall bigger is better, with larger programs seeing concrete results in terms of both traffic levels and site engagement, suggesting that brands' current efforts to grow membership by offering instant discounts may be appropriate. However, size is less important in terms of how visitors arrive on the site. Despite theoretical benefits, there is no significant relationship between program size and proportion of traffic arriving through direct navigation. Instead the most common traffic source is search, suggesting that hotel loyalty programs may not be generating true loyalty or recognition. That being said, the proportion of traffic from email and social media does associate with program size, suggesting that hotel brands may be leveraging economies of scale to reach out more successfully to members through direct marketing efforts.

In terms of loyalty program satisfaction, a significant and positive association was found with both traffic levels as well as all aspects of stickiness. Similarly, no relationship was found with proportion of direct traffic, although satisfaction did influence traffic driven through brand promotional channels (in particular social media and to a lesser degree email). Furthermore, there was a significant negative association with referrals and display advertising, adding evidence that brand-driven marketing activities, supported by data from the loyalty program, have a positive effect. These findings suggest that having a better program helps generate more, and more engage, traffic, implying that hotel brands should invest in ensuring members are happy with program operation and benefits. Finally, despite conjecture that loyalty programs work better at higher service levels, our study found no differences between the levels of brands included, suggesting, in contrast to prior studies, that loyalty program size and satisfaction have similar effects irrespective of brand level.

As with most research, the study suffers from several limitations. First, traffic, rather than bookings or booking value, was used as a key success metric due to the challenges of accessing such sensitive information. While not a full proxy, the relationship between traffic and resulting sales has been well documented and arguments can be made for its relevance. Nevertheless, future researchers could increase validity by gaining access to appropriate booking data. Second, the study was carried out at a single point in time and focused on the top 50 global hotel brands. Future researchers might consider adopting a more longitudinal approach and including a wider sample of hotel brands to increase the generalisability of the findings. Lastly, traffic sources are based on last touch attribution. In reality customers use multiple routes consecutive to arrive on a website. For example, they may see a social media post which caused them to search for the hotel brand before clicking on a paid link and visiting the site. As only the last point of contact is recorded, the relative importance of other traffic sources may be underreported. More sophisticated attribution models are now available and further studies could incorporate these into their analyses to develop a more comprehensive understanding of the issue.

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Effect of Personal Innovativeness on Technology Adoption in Hospitality and Tourism: Meta-analysis

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Abstract. This study synthesizes existing empirical results about the effect of personal innovativeness on the intention to use technology in hospitality and tourism studies published from January 2010 to March 2020 via meta-analysis. The meta-analysis with a random effects model was conducted on 29 effect sizes of this relationship documented in 28 studies collected from over 7,000 search results on Google Scholar and Scopus. The results of the analysis suggest a significant positive medium effect of personal innovativeness on the intention to use technology in hospitality and tourism research with the overall effect size (ESr) of .38 (95% CI = .32, .44, z = 10.62, p = .001). The study also found that the effect does not change significantly across industries (hotels, restaurants, and tourism and travel), types of technology by task (with transaction function and without transaction function), age groups (younger than 30 years old and 30 years old and older), and power distance cultural differences of the respondents (high-power distance and low-power distance cultures). Based on the results of this study, the authors suggest adding personal innovativeness as a construct in technology adoption models in future research in hospitality and tourism studies and continue investigating potential moderations that could explain variations in effect sizes of the impact of personal innovativeness on the technology adoption intention across different populations. From the industry perspective, hospitality and tourism organizations may rely on customers with high perceived innovativeness to serve as change agents and drive customer adoption of new technology.

Keywords: Personal innovativeness · Technology adoption · Meta-analysis

1 Introduction

Personal innovativeness is "the degree to which the individual is receptive to new ideas and makes innovation decisions independently of the communicated experience of others" ([17], p. 49 as cited in [18]). In the information technology context, customers with high personal innovativeness are more likely to have a positive perception of technological innovations [1, 25] and have the ability to overcome uncertainties related to using new technology [1]. Personal innovativeness is a personality trait that drives an individual's initial intention to try innovations, which precedes customer experience

with any specific technology, therefore, making innovative customers an attractive group for businesses to initiate technology adoption and stimulate innovation.

According to the diffusion of innovation theory (DOI) by Rogers [24], early adopters and innovators (i.e., people with high personal innovativeness) may serve as technology advocates when a company is implementing new technologies. These two groups of people need little advertising and guidance, and, after trying a technology, they may turn into promoters and simply examples helping other customers embrace it. Therefore, companies that aim to implement technology may rely on innovators and early adopters as 'change agents' [1]. Additionally, these individuals may be recruited for early access to technology or purposefully targeted in a marketing campaign when the funds are limited. Thus, numerous previous studies on technology adoption included personal innovativeness as a factor influencing the willingness of an individual to use new technologies [e.g., 6, 22].

Research on technology adoption, including studies in hospitality and tourism, often relies on two theoretical frameworks to explain customer or employee adoption of technology. Those two models are the technology acceptance model (TAM) [7] and the unified theory of acceptance and use of technology (UTAUT) [27]. One of the two main outcomes of these models is the intention to use technology. In some studies, researchers use synonyms to this construct, including adoption intention, behavioral intention to use, willingness to use, or adopt.

Serving as a theoretical core, these two models have been modified by different researchers to increase the explanatory power of each model by introducing additional variables. Based on the DOI, personal innovativeness is often added as an antecedent of the intention to use technology. The studies in hospitality and tourism examine direct [e.g., 12, 20, 22] or indirect [e.g., 19, 26] effects of personal innovativeness on the intention to use technology. Or, in some studies, personal innovativeness is used as a moderator of the effect of other factors on the intention to use [e.g., 22]. Most of the studies hypothesize that personal innovativeness has a positive effect on the intention to use technology. But some studies found that there is no effect of personal innovativeness on the adoption intention of some types of technologies [4, 14, 15].

The conflicting results around the role of personal innovativeness in technology adoption may be explained by a variety of factors, such as the type of technology, industry segment that uses it, demographics, or cultural differences. From the type of technology perspective, research distinguishes between technology with the direct transaction function (e.g., mobile payments) and other self-service features (e.g., self-check-in) [2], and suggests that users perceive more severe potential negative consequences of technologies with transaction function in comparison with other technologies [16]. From the industry segment perspective, different segments of the hospitality industry, e.g., hotels, restaurants, tourism and travel, differ operationally and, therefore, may interact with the effect of personal innovativeness on the intention to use technology. At the user level, age was added as a moderator in the original UTAUT [27], and researchers in the field of technology adoption are still debating if adoption intentions can be different for younger and older users [13, 21]. And, from the perspective of cultural differences, power distance based on classification by Hofstede [11] may explain user reliance on technology adoption guidance provided by authorities and more powerful members of the society in high-power distance cultures [11],

thus, leaving more room for the impacts of personal innovativeness on the intention to use technology in low-power distance cultures.

Given the results described above, the purpose of this study is to synthesize and clarify the effect and magnitude of the effect of personal innovativeness on technology adoption intention and factors that may change such effect. To the best of the authors' knowledge, there was no such study as of April 30, 2020. In order to achieve the purpose, the study sets the following objectives:

- To assess the overall size of the effect of personal innovativeness on the intention to use technology across different hospitality and tourism studies.
- To investigate the source and magnitude of moderator factors that may affect the overall effect size of the relation between personal innovativeness and the intention to use technology.

2 Methods

This study applies the meta-analysis method to achieve its objectives. Meta-analysis method allows to determine the magnitude of the studied effect by statistically synthesizing the results from independent studies [3]. The magnitude of an effect calculated via meta-analysis more precisely estimates the effect size across the population than any of the studies could do alone [3]. This method also allows to identify the range of effects and factors that change the magnitude of the effect size [3].

2.1 Search Strategy and Selection Criteria

The relevant studies for the meta-analysis were obtained from electronic databases Google Scholar and Scopus using the combinations of search words "personal innovativeness," "technology," and "adoption" with the following words: travel, tourism, hospitality, leisure, recreation, hotel, hostel, lodging, accommodation, restaurant, bar, travel agency, tour operator, travel agent, airport, airline, cruise, event, museum, casino, theme park, amusement park. The studies were collected for meta-analysis based on the following inclusion criteria:

1. The studies were published in peer-reviewed journals from January 2010 to March 2020. Information technology changes rapidly, so do the factors affecting technology adoption. This study focused on the last decade of research to capture the most current and relevant findings in this area.
2. The studies were written in the English language;
3. The studies were conducted in the hospitality and tourism context;
4. The studies included both personal innovativeness and intention to use technology, or either of the following constructs: adoption intention, willingness to use, behavioral intentions (if the items of the construct measure intention to use technology or social media) constructs;

5. The studies used a quantitative methodology and reported correlation coefficients or regression coefficients of the relationship between the constructs of personal innovativeness and intention to use technology.

The search results lists were screened using a two-step approach to identify studies that meet inclusion criteria. First, the titles and sources of papers in each search list were manually screened for studies that meet criteria (1)–(3). After the duplicates were eliminated, the second screening of the articles' text was done to find articles that satisfy the criterion (4). The full text of the remaining articles was reviewed to identify whether or not the inclusion criterion (5) was met. Next, the reference lists of collected studies were manually reviewed for additional articles. However, no additional articles were found.

2.2   Assessment of Methodological Quality of Individual Studies

To assess the methodological quality of the studies included in the analysis, Downs and Black's Checklist [9] was modified to fit the specifics of methods used in social science studies. Questions with numbers 1, 2, 3, 4, 6, 10, 11, 12, 16, 18, 20, 22, 25, and 27 from original checklist remained in modified checklist. The studies were graded as zero (0) or one (1) point for each question on the checklist. The maximum total score of the modified Downs and Black's Checklist was 14 that represents the highest methodological quality of a paper.

2.3   Data Extraction and Coding

After the studies for meta-analysis were collected, the following categories of variables were extracted and coded from each of the studies included in the sample.[1]

1. Study characteristics: authors, study year, country where the research was conducted (they were coded into high-power distance and low-power distance cultures following classification by Hofstede [11]), industry (hotels, restaurants, tourism and travel);
2. Sample characteristics: sample size, population (customers, employees, or management),
3. Participants' age groups: only data from studies with age range cut-off at 30 years old were coded. While most of the studies reported age in different categories, a common cut-off of 30 years old was identified and used for the age group analysis. The studies were coded in two levels: studies with more than 60% of respondents younger than 30 years old and studies with more than 60% of respondents 30 years old and older;
4. Type of technology: technology type and task that was accomplished with technology were recorded but not coded for analysis (e.g., mobile applications for hotel check-in); technology type by task was coded in two levels, such as technology with transaction function (including, purchasing, booking, NFC, and financing) and

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[1] The table with the individual studies' characteristics, topics, effect sizes and codes for the variables is available in the supplementary materials.

without transaction function (e.g., social media, mobile apps for information search) as classified by Meuter et al. [16].

The effect size used in this meta-analysis is the Pearson correlation coefficient. The correlation coefficients were gathered from correlation or validity tables reported in the articles. If correlation coefficients were not available, standardized β regression coefficients from the direct effect between personal innovativeness and intention were derived from articles. The standardized β regression coefficients were transformed to correlation coefficients using Peterson and Brown's formula [23]:

$$r = .98\,\beta + .05\,\lambda, \tag{1}$$

where $\lambda = 1$ when $\beta >= 0$, and $\lambda = 0$ when $\beta < 0$.

3   Analysis

The study used a random effect model to calculate the mean effect size (ES) and 95% confidence interval (95% CI). ESs between .1 and .3 were interpreted as small, between .3 and .5 as medium, and greater than .5 as large according to Cohen's guidelines [5]. The present study used Cochran's Q statistics to examine the heterogeneity of the mean ES [10]. The study also reports variance of true ES, T^2, with a standard deviation of true ES, T; I^2 statistic that represents the percent of the variance in observed effects reflects variation in true effects, rather than sampling error; and a prediction interval. The moderator analyses via analog ANOVA were conducted to examine potential moderator variables' influence on the relationship between personal innovativeness and intention to use technology. The publication bias of the sample of studies was assessed based on the result of Egger's test of the regression intercept and by visually analyzing a funnel plot. All data analyses were conducted using JASP 0.11.1 software program.

Before meta-analysis, the correlation coefficients were converted into z scores using Fisher's r-to-z transformation [7]

$$z_r = \frac{1}{2}\ln\left(\frac{1+r}{1-r}\right). \tag{2}$$

This transformation prevents sampling distribution error of correlation coefficients [8]. The Campbell Collaboration calculator [28] was used to transform correlation coefficients r to Fisher's z_r and compute 95% CI, and inverse variance weight for each study.

The data in Fisher's z_r units were used as input for meta-analysis. To allow meaningful interpretation, results of the meta-analysis were transformed manually from the Fisher's z into correlation coefficients using Fisher's z-to-r transformation formula [8]

$$r = \frac{e^{2z_r} - 1}{e^{2z_r} + 1} \tag{3}$$

The results of the meta-analysis are reported in the form of both the Pearson correlation coefficient (ESr) and Fisher's z (ESz$_r$) in the manuscript.

4   Results

4.1   Study Characteristics

The search on Google Scholar and Scopus resulted in 7,162 citations. After two screenings, duplicates elimination, and full-text review, 28 articles that met inclusion criteria remain for further analysis.[2] The final sample for meta-analysis contained 29 effect sizes from 28 studies with a total of 10,106 participants. (see footnote 1)

4.2   Methodological Quality of Individual Studies

Based on the Downs and Black's checklist [9], the methodological quality of the included studies was robust [mean ± standard deviation (SD) 11.39 ± 1.95] ranging from 7 to 14, considering the maximum score of 14 (see Table 1). No studies had quality scores outside three standard deviations of the mean; thus, data of all of the studies were used in the meta-analysis. Average scores for each measurement domain were: reporting (5 of 6), external validity (1.54 of 2), internal validity (4.68 of 5), and power (.18 of 1).

Table 1. Modified Downs and Black's Checklist scores of the total sample

	Reporting score (Out of 6)	External validity score (Out of 2)	Internal validity - bias score (Out of 3)	Internal validity - confounding score (Out of 2)	Power (Out of 1)	Total score (Out of 14)
Mean	5.00	1.54	2.93	1.75	.18	11.39
SD	.98	.58	.26	.44	.39	1.95

4.3   The Overall Strength of Effect Size

The overall mean effect size of the Pearson correlation coefficient (ESr) is .38. The 95% CI is .32 to .44, which tells us that the true mean ES in comparable studies could fall anywhere in this range (see Table 2 and Fig. 1). This range does not include zero, suggesting that the mean ES is different from zero. Similarly, the z-value for testing the null hypothesis (that mean ES is zero) is 10.62 with a p-value less than .001. Thus, based on Cohen's guidelines, there is a significant positive, medium effect of personal innovativeness on the intention to use technology in hospitality and tourism research.

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[2] PRISMA flow diagram that illustrates the number of papers that were accessed and removed from the sample on each stage of the data collection is available in the supplementary materials.

Table 2. Results of meta-analysis

n	N	ESz_r	ESr	z	p	95% CI (z_r)		95% CI (r)	
						Lower bound	Upper bound	Lower bound	Upper bound
29	10106	.40	.38	10.62	<.001	.33	.48	.32	.44

Note: n = number of effect sizes; N = total sample size; ES*zr* = weighted mean ES in Fisher's z units; ES*r* = weighted mean ES in Pearson's r units; 95% CI (z_r) = confidence interval in Fisher's z units; 95% CI (r) = confidence interval in Pearson's r units.

Chen & Wu (2014)	0.49 [0.40, 0.57]
Cheng & Huang (2013)	0.50 [0.37, 0.62]
Ciftci et al. (2020)_1	0.25 [0.16, 0.33]
Ciftci et al. (2020)_2	0.23 [0.14, 0.31]
Chiu et al. (2019)	0.11 [-0.02, 0.24]
Fatima et al. (2019)	0.42 [0.27, 0.57]
Jeon et al. (2019)	0.52 [0.42, 0.62]
Kamboj & Gupta (2020)	0.30 [0.17, 0.43]
Kourouthanassis et al. (2015)	0.50 [0.30, 0.69]
Lin & Filieri (2015)	0.40 [0.28, 0.52]
Makki et al. (2016)	0.62 [0.52, 0.71]
Meli.n-Gonz.lez et al. (2019)	0.30 [0.21, 0.39]
Morosan (2011)	0.09 [-0.07, 0.24]
Morosan (2012a)	0.05 [-0.11, 0.20]
Morosan (2012b)	0.15 [0.00, 0.31]
Morosan (2014)	0.20 [0.11, 0.28]
Morosan (2018)	0.64 [0.53, 0.75]
Morosan & DeFranco (2016)	0.63 [0.51, 0.74]
Nuryyev et al. (2020)	0.79 [0.60, 0.99]
Okumus el al. (2018)	0.39 [0.29, 0.49]
Okumus el al. (2016)	0.56 [0.45, 0.66]
Ozturk et al. (2016)	0.54 [0.44, 0.63]
San Mart.n & Herrero (2012)	0.23 [0.17, 0.29]
Sarmah et al. (2018)	0.40 [0.30, 0.51]
Sarmah et al. (2017a)	0.30 [0.17, 0.43]
Sarmah et al. (2017b)	0.38 [0.22, 0.54]
Tan & Ooi (2018)	0.10 [0.01, 0.19]
Tan et al. (2017)	0.67 [0.58, 0.76]
Wang (2018)	0.92 [0.78, 1.05]
RE Model	0.40 [0.33, 0.47]

Observed Outcome

Fig. 1. Forest plot (presented in Fisher's z_r units).

4.4   Variation in Effect Size

The test of homogeneity of ES Q-statistic provides a test of the null hypothesis that all studies in the analysis share a common ES. The *Q*-statistic is 388.57 with 28 df and a p-value of less than .001. Thus, the true ES is not identical in all the studies. The variance of true ES is T^2 = .04, with a standard deviation of true ES is T = .19. The I^2 statistic is 92.79%, which tells us that 92.79% of the variance in observed effects reflects variation in true effects, rather than sampling error.

The prediction interval is −.002 to .66. Thus, the true ES can be as low as −.002 in some populations and as high as .66 on others. Based on the context outlined above, there will be some populations where the impact of the personal innovativeness on the intention to use technology is negative very close to zero and in some populations where the impact is positive large.

4.5   Moderator Analysis

The moderator analysis via analog ANOVA revealed that the industry does not explain the variations of ESs. The Q statistics for model with industry was not statistically significant, $Q_{between}$ = .827, df = 2, p = .66. Although there was no evidence of a moderator effect for industry, we found that the mean ESr for hotels and tourism and travel were not equal to zero (i.e., 95% CI did not include zero) (see Table 3). Thus, there were significant positive, medium effects of personal innovativeness on the intention to use technology in studies about hotels (ESr = .43) and tourism and travel (ESr = .37) industries, respectively.

Table 3. Results of moderator analyses

Moderator variables	n	ESz$_r$	ESr	95% CI (z$_r$)		95% CI (r)		Q$_b$
				Lower bound	Upper bound	Lower bound	Upper bound	
Industry								.83
Hotels	8	.45	.43	.31	.60	.30	.54	
Restaurants	6	.36	.35	−.01	.72	−.01	.62	
Tourism and travel	15	.39	.37	.07	.71	.07	.61	
Type of technology by tasks								.004
Transaction	14	.41	.39	.30	.52	.29	.47	
No transaction	14	.42	.39	.16	.67	.16	.59	
Age								.124
At least 60% are younger than 30 years old	6	.48	.44	.33	.63	.31	.56	
At least 60% are 30 years old and older	9	.44	.41	.10	.79	.10	.66	
Cultural power distance								2.77
High-power distance	14	.45	.42	.34	.55	.33	.50	
Low-power distance	12	.32	.31	.06	.58	.06	.52	

Note: All p > .05; n = number of effect sizes; ESz$_r$ = weighted mean ES in Fisher's z units; ESz$_r$ = weighted mean ES in Pearson's r units; Qb = Cochran's Q between statistics.

The type of technology by task does not explain the variations of ESs. The Q statistics for the model with types of technology was not statistically significant, $Q_{between}$ = .004, df = 1, p = .949. The mean ESr of both types of technology with and without transaction function are greater than zero (i.e., the 95% CI (r) does not include zero) (see Table 3). Accordingly, personal innovativeness has a positive medium effect (ESr = .39) on the intention to use technology regardless of the type of technology.

Age does not explain the variations of ESs either. The Q statistics for model with age was not statistically significant, $Q_{between} = .124, df = 1, p = .724$. Also, the 95% CI (r) of both subgroups does not include zero (see Table 3). Thus, the personal innovativeness has a significant positive medium effect on the intention to use technology in the studies with more than 60% of respondents younger than 30 years old (ESr = .44) and the studies with more than 60% of 30-year-old and older respondents in the samples (ESr = .41).

Cultural power distance does not explain the variations of ESs. The Q statistics for model with cultural power distance was not statistically significant, $Q_{between} = 2.77$, $df = 2, p = .10$. The mean ES of both high-power and low-power distance cultures subgroups are not equal to zero (i.e., 95% CI (r) do not include zero) (see Table 3). Thus, the studies conducted in both high-power culture and lower-power countries will more likely find a significant positive medium effect of personal innovativeness on the intention to use technology (ESr = .42 and ESr = .31 accordingly).

4.6   Publication Bias

Egger's regression test was performed to examine the risk of bias across studies. Egger's test of regression intercept result shows no evidence of publication bias in this meta-analysis, z = .616, two-tailed p-value = .538. The funnel plot shows a symmetrical distribution[3]. Thus, there is no evidence of publication bias in the meta-analysis.

5   Conclusions and Discussion

This study is the first attempt to synthesize evidence of the effect of personal innovativeness on the intention to use technology across hospitality and tourism studies. The study results show that the overall ES of this effect is .38. Thus, the researchers have evidence of the medium, positive effect of personal innovativeness on the intention to use technology. However, according to the prediction interval, in some populations, the impact of the personal innovativeness on the intention to use technology may be null (true ES can be −.002) and, in other populations, the true ES of this effect can be as high as .66.

5.1   Theoretical Contribution

This study filled the void in the literature and reconciled the inconsistent findings regarding the effect of personal innovativeness on the technology adoption intention. Given the medium, positive effect of personal innovativeness on the intention to use technology, the authors of this study suggest including personal innovativeness in the technology adoption models. Interestingly, many of those articles that were excluded from the sample appeared in Google Scholar search results because they contained a recommendation to include personal innovativeness in future research. Thus, the

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[3] The funnel plot is available in the supplementary materials.

authors of those studies did not use the construct of personal innovativeness but acknowledged that it could be an influential factor for technology adoption. Therefore, the results of the current research substantiate the suggestion forwarded in prior studies.

Besides gaining the understanding of the overall effect of personal innovativeness on the intention to use technology, this study contributes to the scholarly debate about the moderation effect of age in technology adoption. This study found no moderation effect of age on the relationship between personal innovativeness and intention to use technology in hospitality and tourism settings. Also, the study results show a positive medium effect between the two constructs for the studies with more than 60% of people younger than 30 years old in the samples and the studies with more than 60% of people older than 30 years old. There were no moderating effects of industry, type of technology, or culture power distance characteristics found either.

5.2 Practical Implications

The results of this study indicate that personal innovativeness plays an important role in technology adoption in the hospitality and tourism setting despite the industry segment, type of technology, customer age, or power distance in the society. This means that people who perceive themselves innovative will use technology if they have access to it in all hospitality and tourism settings. Thus, hospitality businesses may benefit from building relationships with innovative consumers and rely on them to drive the technology adoption process. Hospitality businesses may want to identify customers with high perceived personal innovativeness and invite them to focus groups or think tank sessions for improving and developing technology-driven innovations within the organization. While opinions, wants, and needs of all customers should be heard, innovative customers may act as change agents to set examples for other less innovative customers. Also, some markets tend to have a higher density of innovative customers than others, and therefore, may be selected as technology testing grounds. And, finally, customers should be informed and educated about new technologies employed in the industry to encourage customers to use it with no regard to country, industry, or technology characteristics.

5.3 Future Research Directions

Overall, this study showed that personal innovativeness has a medium effect on the intention to use technology in the hospitality and tourism context. The findings also indicated heterogeneity of effect sizes of personal innovativeness on the technology adoption intention, however, failed to discover any moderators that would contribute to variations in effect sizes. The industry segment, technology type, user age, and social power distance did not reveal any statistically significant differences in effect sizes across the groups. Therefore, future research may continue to investigate the factors that may shed the light on the studied relationship. For example, this study was not able to make a comparison between customer and employee groups concerning personal innovativeness and technology adoption intentions due to the limitations of the sample size. The study population may be an interesting moderator to explore because employees may be more driven by an organizational mandate to adopt technology rather than by personal innovativeness. Also, moderator categories with wide

confidence intervals around the identified effects may be explored further. For example, additional studies may be needed to flesh out the impact of personal innovativeness on technology adoption across restaurants of different service levels (e.g., quick service, fast-casual, casual, and fine dining). Finally, future research may conduct a meta-analysis of structural technology adoption models that include personal innovativeness with other antecedents of intention to use technology in hospitality and tourism.

5.4   Limitations

The study search was limited only to articles in English. Also, those articles that did not report correlation coefficients and regression coefficients were not included in the sample. The limitations of the study are also related to incomplete reporting of study data. Three studies included in the sample did not report sample characteristics at all or just stated that participants were students at a university, and three papers did not report a country of respondents' residency.

The study used data for analysis of the moderation effect of age only from 15 out of 28 studies that reported the age of the respondents in ranges with a cut-off at 30 years old. The other ten studies of the sample had a cut-off at 35 years old in the age ranges, and three studies did not report the age of the participants at all. Thus, only studies with the age range at 30 years old were suitable for moderating analysis and generalization. All the articles in the sample did not specify the mean and standard deviation (SD) of age respondents. So, the data did not allow us to use meta-regression with age as a moderator that could give more insights into the effect of age on the relationship between personal innovativeness and intention to use technology. If researchers have the opportunity to find the mean of age for each study, the results of moderating analysis of age on technology adoption could be a valuable addition to academic and practical knowledge. However, generally, reporting only age ranges is common practice in hospitality and tourism research.

The supplementary materials are available at https://drive.google.com/file/d/1YdVRr7lGvKrvNQJ9-znPdt9jtIa17H2N/view?usp=sharing or upon request.

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References marked with an asterisk (*) indicate studies included in the meta-analysis. The full reference list of studies included in the meta-analysis sample available at https://drive.google.com/file/d/1YdVRr7lGvKrvNQJ9-znPdt9jtIa17H2N/view?usp=sharing   or upon request.

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A Netnographic Study of Consumer Value in Slow Travel

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Abstract. Travelling by land is a phenomenon that utilizes different surface transport modes, such as trains, buses, bicycles etc. The slow travel contributes also to the concerns about ecological footprint and climate change derived from air travel. Slow travel aims to encourage individuals to travel to their destinations more slowly, stay for a longer period in the chosen destination, and travel less. For slow travellers, travelling to the destination is a significant part of the travel experience. The qualitative research aimed to understand the phenomena of travelling by land and the tourist experience holistically using a netnographic approach. The data was collected from the Finnish Facebook -group, Maata pitkin matkustavat. (Those who travel by land) in January 2020. The data consisted of 185 posts and their comments. The goal of the data analysis was to understand the role of consumer value in the slow travel experience. The research findings show the importance of minimizing travel time and the costs of travelling by land. Also, leisure time, and "having fun" are valued in travelling by land experience. Thus, self-oriented, active value components, Efficiency, and Play, were most applicable in the collected data set. These findings help us to understand slow travel as a tourism experience better and provide important insights into the requirements to develop consumer-centric slow travel for sustainable development in the future.

Keywords: Customer value · Tourist experience · Netnography · Travelling by land · Slow tourism · Facebook groups · Sustainable tourism

1 Introduction

1.1 Background

The tourism industry has a sustainability problem. Before the COVID-19 pandemic, the transport-related emissions from tourism represented 5% of all man-made emissions [31]. Especially air transportation often required by tourism has been seen as one of the main sources of CO_2 emissions in the industry. Most studies examining the environmental impact of tourism often neglect the effects of travelling to a destination (and back), and mostly just focus on tourism's effects at the holiday destination. As Böhler et al. [3] state that although car travel still dominates the holiday mobility, increasing global tourism there has been a significant demand for growing holiday air travel [3]. Thus, to reduce CO_2 emissions alternative forms of transportation are needed and

understanding their appeal for consumers is a major factor in succeeding to increase alternative transport method use in tourism.

The concept of slow travel arises in this context as a response to the concerns about the ecological footprints and climate change derived from air travel. Slow travel aims to reshape the notion of sustainable destinations and conceptualize slow travel as an alternative to travel by car or flying. Slow travel encourages individuals to travel to their destinations by land favoring public transport modes, stay longer in the chosen destination, and travel less [20]. Slow travel could provide solutions for creating a thriving tourism industry with less greenhouse gas emissions, at least in some destinations.

This paper aims to study consumer value in slow travel through a netnographic study of a social media community focused on travelling by land. The research question we aim to answer is *How tourists experience the consumer value of travelling by land?* This research question allows us to explore what tourists value in their slow travel experience [25]. Finland has set an objective for being one of the top countries is sustainable tourism by 2025 [35], which requires attitude change from customers as well. Slow travel is a relatively new concept, there is little research about the topic, which is one of the motivations for this study. Thus, understanding consumer motives and value that they experience from slow travel can contribute to wider adoption and use of sustainable transportation in tourism.

2   Theoretical Framework

2.1   Travelling by Land as a Tourist Experience

To evaluate the tourist experiences and the value building in travelling by land, one must understand the concept of tourist experience and consumer value. To consume tourism is to consume experiences [29]. Experiences, however, are not similar to all tourist, even with the specific context and places. Tourist experiences are unique to individual tourist. There are as many tourist experiences as there are tourists. Tourist experiences are individualistic and they engage emotions, which is essential in creating a memory. [32] The extraordinary experiences are characterized by emotional intensity [1].

In this study, the tourism experience does not only include on-site experiences. Also, the pre-trip phase is part of the experience. Both plans (before) and memories (after) are essential parts of the tourist experience [26]. Travelling to and from the destination are viewed as integral parts of the experience, and not separate experiences or inseparable "costs" of the experience. Especially in the case of travelling by land as a tourist experience, being on the road and travelling as a means to dislocate are as important factors than the destination itself [26].

In this case, we adopt the consumer value framework to improve our understanding of travelling by land. Sánchez-Fernández & Iniesta-Bonillo [28] argue that "value" is a simple trade-off between benefit and sacrifice. However, Williams and Soutar [34] acknowledge that in services, due to their nature of being intangible, heterogeneous and complex, the trade-off model is too simplistic.

According to Holbrook [10,11], a consumption experience may create value for the customer. Holbrook has shown a long and consistent interest in the topic of value [6]. According to Holbrook, consumer value is defined as an interactive, relativistic, preference experience [10], emphasizing the interaction between the product and user from which value is derived. This definition assumes that consumers purchase products and services to achieve value-related goals or to obtain their benefits [12]. Typology of value is divided into eight separate categories of consumer value: efficiency, excellence (quality), play, aesthetics, status, esteem, ethics and spirituality. Distinct categories are based on the three-dimensional paradigm [6] consisting of extrinsic and intrinsic value (utilitarian vs. Hedonistic), self-oriented and other-oriented value, (when in a consuming act includes a social dimension) and active and reactive value (active or passive control of the customer on the object) [6,10]. Both consumers value appreciations and priorities have a strong influence on the way consumer ultimately perceives an experience [12].

Evaluating the customer value in this study is done by using Holbrook's [10] framework of consumer value to identify the different value components of the experience in travelling by land. However, Holbrook's theoretical proposal does not consider negative dimensions of value, which is criticized by his co-authors and admitted by himself [10,12].

2.2   Slow Travel as a Tourist Experience

Travelling by land is travelling without flying and thus connected to slow travel. Slow travel can be defined as a conceptual framework that focuses on people who travel slowly overland, stay longer and travel less [4,20]. Slow tourism emerges from concern for environmental sustainability and traveller's personal and social well-being. Interest in slow tourism lies in the transport to and from destinations that could reduce environmental pollution by using low carbon emission vehicles. Therefore, slow tourism is frequently tied to sustainable tourism [24]. However, the phenomenon needs to be understood also in a broader socio-cultural context of the slow movement, [25] situated in the context of contemporary consumption society [27].

As well as tourist experiences in general, slow travel experiences include the phases before, during and after the trip. Dickinson and Lumsdon [4] emphasize that definitions of slow travel should focus on both transportations for the sake of protecting the environment, as well as participation in the slower forms of travel, for example; exploring local history, culture and people [4]. Compared to mass tourism which extensively promotes the use of transportation with no attention to the environment, and where vacations are experienced in a standardized manner, slow travel enables people to travel at their own pace, being able to avoid fixed schedules if preferred. Slow travellers can be considered as independent, tough, resilient, and eager for new experiences [4,27].

The mode of transport is a meaningful part of the whole tourist experience and it is equally important as is the stay in the destination itself [20,24,27]. Lin [19] found in her research, that the tourism experience drives slow travellers to be more engaged with sustainable tourism. Slow travel experiences structure tourists' time and enable tourists to engage locations and locals deeply and develop quality leisure moments.

Accessibility, ease, pleasure, safety, and informative guides at the destinations, are factors increasing the willingness of industrial tourists to try slow tourism [19].

Slow travel is related to less travel intensive tourism [27] while slow tourism goes beyond mobility and the mode of transport. Slow tourists expect to see more than a gaze of their destination and instead, they are more likely to have more immersive experiences. Emphasis is on quality over quantity [20].

The empirical research regarding slow tourism is still lacking. Interviews have been used to develop frameworks that help us to understand the phenomenon better [21]. Oh and his colleagues [25] used interviews, focus groups, and a survey with 1068 respondents to study the motivations and goals of slow tourism. They found that tourists can set slow tourism as a goal and the maximize attainment of some super-ordinate goals through optimal choices related to travel. Tourists constantly compare choices in the slow-fast continuum to find maximal goal attainment. Lin [19] identified that the quality of the transportation mode and the tourism experience are the most powerful determinants of slow tourism intentions among industrial tourists in Taiwan. Sales Oliveira [27] analysed the discourse of slow travellers using their travel blogs. She found that subjective perceptions and representations of slowness are key elements in slow tourism experience. However, with slow travel discourse, the juxtaposition with instantaneous time is nonetheless present.

3   Research

3.1   Target Group and Data Collection

Understanding why people choose slow travel is needed to develop slow, sustainable tourism. Social media has become an important communication venue for people to express themselves. Thus, this study focuses on a Finnish Facebook group called "Maata pitkin matkustavat" (Those who travel by land) [22]. The description of the group is "We want to travel environmentally friendly, without planes!".

The group's slogan supports Visit Finland's goals of sustainable tourism in Finland [35] and this kind of group provides qualitative discussion data of the topic, without being affected by the research at hand. The discussion comes naturally from the participants in the group and describes the motivations and values of people interested in the topic of slow travel.

The qualitative data from discussions aim for a holistic understanding of the issues studied. The research is also conducted in an abductive manner that moves from everyday descriptions and meanings to categories and concepts, which will create the basis for understanding the phenomena described [5].

The research starts with the data, which is already existing and created by the members of the Facebook group. Maata pitkin matkustavat - Facebook group is founded in 29.6.2015. When this study started, the group had 16 189 members (26.9.2019). During the data analysis (4.9.2020) the group had grown to 22 315 members.

Data for the research was collected from the conversations and posts in the group, made in January 2020. The data collected consisted of 185 posts, including the

comments. The research started from the assumption the members in the group have already decided on the travel mode, to travel by land and avoiding flights as they were members of the group. The discourses and themes discussed in the Facebook group will answer the research question defined and help to understand travelling by land as a phenomenon. The data was saturated as adding new posts to the data set did not bring any new insights into the results.

3.2   Methodology

Netnography was chosen as the research approach as it allows a deep understanding of the culture of the social media community. As in ethnography, netnography adapts research techniques to study online consumer-based communities [33]. The cornerstone of the research process is participant observation [2,18,23]. Netnographic research does not evaluate the interactions between the participants [33]. It is interesting in what kind of topics and discourses received comments and likes in the group, and to which kinds of topics the discussion in the community is focused on.

Netnography is an established approach for qualitative research [15]. The name draws from two terms, "internet" and "etnography" [14]. The approach has several similarities to ethnography, from which it has been adapted. *"It is a qualitative, interpretive research methodology that adapts traditional ethnographic techniques to the study of social media"* [16]. Netnographers role is limited to analysing the existing data (online material) [30].

Netnography is a flexible method, allowing scholars to explore and explain rich and diverse cultural worlds [15]. Netnographic field sites are diverse, [15] yet the focus in this research is to only one site, a Facebook group which can be defined as a social networking site. Online data can provide insights into a naturally occurring community [14] and makes it easier to reach the population which might otherwise be difficult to reach for consumer research [24,36]. Originally netnography is developed as a response to customers increased internet use [13]. It helps to understand the consumption-related aspects of customer's lives online.

In this research netnography was the used approach and analysis of qualitative online data, i.e. Facebook posts, was done by using thematic analysis as well as content analysis. The thematic analysis involves coding and categorizing the data for emerging patterns and themes [7]. Once the data was collected, each of the posts and their comments were carefully read and examined. The posts were analysed in chronological order, from older to the latest. Authors wrote notes to each of the posts and categorized the posts, based on the value component the posts represented, and the main topics from the posts. In the analysis, Holbrook's [10] framework of consumer value was used to categorize the posts under different value components. In the data, some of the posts represented not only one value component [10], but several of them.

3.3   Findings

Members in the group were active and there was lots of discussion around the topic of travelling by land. It highlights the fact that the phenomena – travelling by land – is current, and there is lots of interest around it. Since people are eager to find out more

and search for practical tips, it can also be noted, that the way of travelling (by land, avoiding flights) is a relatively new phenomenon and alternative way to travel for many. Many users need peer-support in organizing the trips without flying. This also highlights that travelling by land is not (yet) made as easy as it is to travel by plane but requires relatively more planning and effort before the actual travel begins. Some of the members are also ready to travel long distances by land. In the data, some of the longest journeys and distant destinations members are planning to visit/or had visited were Japan, Vladivostok, Iceland, and the USA. The conclusion of the increasing interest around the topic can also be drawn from the increased member number in the group, during the research process.

The writers of most of the 185 posts adopted a detailed mixed text and image style presentation. There was a notable amount of posts (70) including links to different websites, most of them news articles, blog posts related to travelling (by land) or YouTube videos related to the groups' common interest. Members invariably used their photographs in the posts. Since members post pictures and stories from different destinations all this planning of travelling by land has led to action as well. Pictures of train timetables and maps were posted as well, to ask for more specific information from other members or other experiences of particular timetables or routes.

Generally, members of the group are eager to help one another and tell about their own experiences in a very detailed manner. The discussions are mostly positive and encouraging. Since there were a lot of posts asking for tips and recommendations for different routes or places to visit while travelling, members seem to trust the peer-support of other members in the group. The comments are supportive, and some members take their time to compare the routes for each other and comment with different alternatives. There is some discussion about the destinations too, and what to see on the way. In some posts, there were even recommendations for the music for the road, to get into the mood of the destination. Not only are the discussions encouraging, but members also seem to be keen to know real facts and are looking for scientific information about the issues discussed in the group. If it is about the emissions on different travel modes, some of the members often compare the different result from different sources. They also do not trust completely to different surveys results posted to the groups but try to aim to understand possible flaws and errors in results. Sometimes also the sources for some controversial statements are asked from other members. Some members can be seen as agents of change, driving the agenda of the group.

By far the dominant topic in the discussion is travelling by train. Most likely it is the most convenient way of travel and there is a vast rail network within Europe, where most of the members primarily travel. (Maata pitkin matkustavat 2020) There is also a lot of discussion regarding the Interrail travel. It needs to be noted, however, that travelling by land includes also other transport modes, such as buses, private car, ferries, ships, and bicycles. All the mentioned were presented in the data as well, but in the lesser extension than the discussion about the trains.

The discussions in the group form a massive "data bank." From the earlier posts, members can search for topics they are interested in or need more information. By reading the older posts, member do not necessarily need to make a post of their own, but they can use the already existing information, shared experiences, and practical tips,

for example in planning their holidays. Since there are many posts made in a single day, in some of the posts chosen for the analysis, the comments suggested the member who made the original post to "search" for the group and the previous discussions about the topic. There is one post telling;

> "*Our family has decided to travel to Malaga by land this time and hopefully in the future as well. The group has been a great help in planning the trip and choosing the places to visit. Group has been helpful in the problematic situations. Thank you for the inspiration*".

There was no specific information asked in the post related to the trip, but to thank about the group in general. From this example, it can be interpreted that since there is already a lot of discussion regarding planning the routes all over Europe in the group, members can use the existing information when planning their trips. In some posts, members also commented with website links to other pages where to find more information, their travel blogs, Instagram pages, or other Facebook-pages related to travelling by land.

Not only are the older posts beneficial, but in the data set, there were new posts made which could be interesting to the group to know. These include newspaper articles about the new train routes under consideration, maps showing all the night trains around the world, mentions about current a radio or TV programs and so forth. The post types varied from blog posts or YouTube Channels to news articles as well as comments and texts written by a member. All the posts, which only included a link to another website, or only a picture, with no explanation or writing from the member who did the original post, were excluded from the research. Research findings also could mirror several value dimensions of travelling by land experience. Some of the posts were categorised under one value component, and some included even four different value components.

Table 1 shows how often different value components were applicable in the posts as well as explains how they were presented in the data. Play and Efficiency were the most represented and spirituality the least. Some of the posts were categorized under several value components. This was noted by Holbrook [10] himself too, that any consumption experience can entail many or even all the different types of consumer value, which are identified in the typology (Holbrook 1999, 186).

There were also negative issues discussed in the dataset, which Holbrook's [10] typology do not take into account. These concerned usually the extra time that travelling by land takes in comparison to flying to the destination. Also, the different route options caused insecurity and indecisiveness. Other negative posts discussed e.g. strikes, maintenance works, visas and prices.

Table 1. Value components represented in the data set and their realization in travelling by land experience

Dimension	Number of representations	Realization
Play	100	Having fun while travelling, travelling for a holiday, exploring new places and cities on the way, visiting museums, amusement parks, beaches, natural parks, enjoying restaurants and culture
Efficiency	92	Time and cost variants; being able to travel as fast as possible from A to B, choosing the most inexpensive tickets for train/bus while travelling, saving money by travelling by land (instead of flying)
Status/Esteem	32/37	Successfully making a trip travelling by land, having a blog, Instagram page, or YouTube channel about travelling by land (the possibility to influence others while making one's own consumption patterns visible in social media) Reputation traveller receives from others by choosing the surface travel modes
Ethics	25	Choosing to travel by land because of environmental reasons. The possibility to reduce emissions by choosing the least polluting mode of transport. Being able to travel according to one's own (personal) values
Aesthetics	14	Enjoying the landscapes from the train/bus/car, choosing scenic routes to travel
Spirituality	4	Feeling of making a "right choice" by travelling by land instead of flying

4   Conclusions and Discussion

The purpose of the research was to understand the phenomena of travelling by land, and what is the desired consumer value of travelling by land experience by examing a social media group related to the topic. Using Holbrook's [10] framework of customer value as a base for the analysis, the results of the netnographic study show that travelling by land contributes most to adding self-oriented value for the members in the group. This is demonstrated by the importance of play, efficiency, and excellence value dimensions. Apart from ethics, three other-oriented values (status, esteem, and spirituality) were not often represented. Drawn from this, travelling by land contributes to adding self-oriented value, as the consumption is prized for one's own sake. Self-oriented means to consider the consumption experience (travelling) for how the person reacts to it, or what kind of effect it has on the person travelling [10]. It does not exclude the consumption experience for providing further types of value involving others as well, but the primary source of value received from, (in this research) travelling by land, comes from its capability to contribute members own consumption experience. However, togetherness [12] further added to complete Holbrook's framework in this research. Time spent on a train or bus can be used to relax and spend time

together with the family or other travel companions. This is also highlighted in the definition of slow travel, as part of travelling to the destination is an essential part of the experience.

The value component togetherness as suggested by Komppula and Gartner [12] was necessary to add for the research, as in many of the posts analysed included referring to travelling together with family and friends, and the time spent together was valued in many of the comments as well. Play value component was the most often identified in the collected data set. This is understandable as travelling is mainly something the members in the group do "for fun" and enjoy in their leisure time, as there was no discussion about the work-related travelling in the data set. Efficiency was also applied to more than half of the collected posts (92). The short travel time is appreciated according to the data collected from the members' discussions in the group. Also, the convenience of travel is important. For example, the changes between trains need to be long enough for there is no rush in running from train to another or risk of missing the next connection. The convenience is also highlighted in the discussion for booking seat tickets in advance, and not to have too long transfers at the time (e.g. sitting in a train/bus for 10 h or more.) The possibility to arrange a route and travel times to fit one's schedule is important. Concerns about the prices of tickets and the costs of the trips also speak for efficiency being an important value component. According to the posts and comments in the group, it is possible to save money by choosing to travel by land (compared to the flights) but one needs to be ready to compare prices between buses and trains, between different days and times, and between different transport companies as well. One needs to be also in time with the bookings, as the ticket prices increase the closer the travel day becomes. The concerns of time and especially the price are often compared to the flights in the group.

The research findings were surprising, as the pre-assumption when conducting the research was that members value the environmental reasons and chose to travel by land to minimise the emissions and their greenhouse gas footprint. However, the value component "Ethics" was not placed to even to a majority of the collected posts (25 posts out of 185). From this could be drawn that environmental reasons are not the primary reason for travelling by land for most of the members. However, as previously noted in this paper, it can be also since members have already made the conscious choice to avoid flying, which is more consuming for the environment than travelling by land. During this sustainability boom in the tourism industry, it is crucial to understand that the experience itself still stands on top. The consumers choose sustainable options when they create value for the tourists themselves. It is not enough that sustainability is promoted as a way to save the world for others.

As noted by Gallarza and Saura [6] it can be assumed that Holbrook's typology of consumer value can be utilized to explain a travel experience [6]. This research, however, continues the criticism of the lack of negative value components in Holbrook's customer value typology [6,12]. Self-oriented dimensions of Holbrook's typology (Efficiency, Excellence, Play and Aesthetics) of consumer value, are representative of consumer behaviour [6]. This applied in this research as well.

Other-oriented values were more difficult to operationalize. As noted earlier in this research as well, the operationalization of esteem and status, and especially separating only one of them to represent the value received from travelling by land was difficult with the current research approach. There were challenges to operationalizing the value dimension of spirituality as well. As noted by Gallarza & Saura [6] it should be studied further in future research.

Since the consumer value typology of Holbrook lacks the negative value components, operationalizing the framework in a service context is challenging. As prior research demonstrates, tourists do not often consider the environment when making transport mode decisions, but instead, they rather focus on minimising the cost and travel time [17]. Yet important aspects of travel mode choice are also comfort, convenience, and flexibility [8]. As noted also by Ram et al. [26] mobility aspects of travelling are often considered a necessary evil of making a vacation trip. This consideration highlights the fact that for some tourists the "real holiday" begins only at the destination, not yet on the way to it [26] Tourists' concern about time and cost of travel, family commitments and the simple desire to "see the world" can outweigh any consideration of the environmental impact of their travel [9].

This applies also to this research. Those who have decided to travel by land have chosen to avoid flights. However, the reasons behind the decision are not necessarily derived only from environmental concerns or it might be, that motives for joining the group were not discussed in this material. Yet, like the findings in this research show, tourists primarily make the transport mode decisions based on efficiency, considering the time and cost variants of their travel. Yet, for some travellers, the possibility to choose scenic routes and plan the trip according to their own pace was important, yet those were in minority according to the data.

As it was seen in the research finding as well, stories written and published by other travellers can inspire one's vacation plans and inform the decisions. Tourists may get first-hand knowledge as well as highly relevant information from others who they like and/or perceive as similar to themselves [37]. The members in the Facebook-group can consider the others being similar to themselves, as they have at least one thing in common; the desire to travel by land, avoiding flights. Therefore, they are willing to ask tips from each other in the group and trust each other's support. According to the data and the posts analyzed, the group Maata pitkin matkustavat is especially important to its members in the pre-trip phase. As Xiang and Gretzel [37] also note, tourists may need to make high-involvement decisions about the products or services, which lack standardization, are difficult to describe, cannot be inspected before purchase and are high in emotional content. For these reasons, experience-based content and information are critical in the context of tourism. Yet, telling about the travels (recollection phase) in the group also enables the members to reflect their experience, and travel narratives can also be an important part of social interactions [37].

There have not yet been many empirical studies in the slow tourism field that would have explored the importance of value for tourists. Earlier studies have constructed frameworks [21] and studied motivations [25] as well as explored travel patterns [19].

This study provides strong evidence on the factors that tourists value in slow travel. Developing possibilities to co-create play and efficiency value with the tourists is paramount for developing slow tourism further. Even though earlier studies have identified motivations important for slow tourism [25], the importance of experienced value has to be also accounted for. The tourists in our study are already motivated for slow travel, but to keep them motivated and enable repeat behavior, slow travel has to be valuable for them. Thus, this study has been able to identify the superordinate goals of slow tourists as called by Oh et al. [25].

It must be noted that since the research only studied traveling by land experience by collecting data from one Facebook- group, the research results can only give directional insights, of the consumer value in traveling by land experience. To complement the research, reasons, and motives behind the travel mode choice of those traveling by land could be studied. Interesting is also the participation in online communities. Also, a different research approach is recommended to find more about the underlying motivations.

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Gen Z and Esports: Digitizing the Live Event Brand

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Abstract. As digitization converges with globalization, industries across the world establish new standards, platforms and audience engagement methods to delight consumers adjusting to CV19's virtual space. Within the Tourism and Hospitality industry, gamification provides the events and meetings sector an opportunity to implement hybrid events at a level unseen before. Esports is the newest standard of gamification for hybrid, both live and virtual, events. However, within this new standard, there is a large knowledge gap among event organizers of how to execute an esport experience and why esports dominance is necessary to incorporate into hospitality and tourism models. Through understanding esports' majority consumer, Gen Z, and accurately reflecting esports culture, event organizers will assist the tourism economy through prosperous esport events.

Keywords: Esports · Event management · Gamification · Gen Z · Live events

1 Background

Defined as a multiplayer competition using video games through mobile PC and console platforms esports has transformed from a solitary niche subculture into a lucrative industry with an estimated market growth of $2.5 billion in revenue by the year 2025 [1]. Long gone are the days as a stereotypical refuge of nerdy hobbyists or introverted gamers playing PCs (web-based games) or consoles (i.e.: Nintendo Switch PlayStation and Xbox). In 2018 there were 737 major events. When combined these events generated "$54.7 million in ticket revenue" [2, 3]. Today esports can be a fully immersive three-dimensional video game experience in the event arena setting in front of fans or mobile game leisure individual play in the hands of the consumer (i.e.: games on tablets and smartphones).

When esports is presented before an audience it is a logistically complex event with digitally advanced and glamorous sponsors [4]. Needs such as hotel accommodations for esport tournaments personnel and the travel schedules of esport teams sponsors and fans create immense hospitality requirements. Tourism and Hospitality professionals provide venue familiarities deadline appreciation and logistical steps to guarantee a phenomenal esport experience. These same professionals provide airline bookings restaurant reservations and a destination marketing plan to support the circular economy growth of local esport events.

2   Introduction

Riot Games' League of Legends Championship Series (LCS) in the summer of 2019 is credited for contributing $5.44 million to the economy of the host city, Detroit, Michigan [5]. The 2019 LCS Summer Finals was held in Detroit's Little Caesars Arena for 48 h, from August 24th–August 25th. During open business hours, the LCS was generating $226,666 an hour to the local Detroit economy. A majority of these business were hospitality driven; restaurants, hotels, casinos or travel bookings. Tourist hotspots, as Hangzhou and Raleigh, have advanced this model into larger more permanent investments. Anticipating the swell of esport enthusiasts, Hangzhou created an esports town complex to the cost of $280 million with 3.94 million square feet in 2018 [6]. Similarly, the Greater Raleigh Convention reported $1.45 million in direct economic impact resulting from R6 Raleigh Major at the Raleigh Convention Center [7]. With CV19 pivoting interest away from these expensive infrastructures' capacity, it is important to understand esports' young consumers and their disposable incomes.

When these young consumers, with growing disposable incomes, are matched with the projected revenue growth of $2.5 billion, the future of esport is a compelling business proposition. [1]. Esport's perceived explosive monetary potential has led to a flood of non-esport corporations pursuing ways to successfully position themselves in the segment [8]. 59% of esports financials are generated from these corporate brands, private equity investors and venture capitalists. These entities do not have an esport governing body for support, to facilitate government relationships, or reliable broad data on their consumers preferences. An appropriate analogy would be similar to the NFL did not exist to supervise football in the United States or if Monaco was to plan the Grand Prix without Formula One Group's regulations.

As a result, companies risk expending financial resources unwisely and ending up, like so many unseasoned gamers, getting "ganked", or defeated in the game [9]. Additionally, there is little available research available on esports event's economic impact, outside of the post event press releases from CVBs concluding the an esport events's local effect.

Esports is not a swift way to generate revenue or to meet the needs of younger consumers. Esports is a digital lifestyle and a sustainable hospitality business opportunity. Esports will influence live events and tourism moving forward. The opportunity is for the event industry to understand the esport consumer, make well educated decisions and sustain the hospitality industry in the digital future leveraging esports as an economic platform for the segment.

2.1   Purpose

The amalgamation of esports' economic impact post CV19 and the digital model of Gen Z's consumerism is palpable; to connect with the future Gen Z traveler, an event organizer's digital message of esports must be clear, whether on behalf of the event itself or using a Destination Management Organization (DMO) platform. The combination of this emerging esport market and esports' young demographic has propelled interested corporations to initiate as many esport events as possible to create audience retention and revenue. This marathon of events, endured by the organizers and other

tourism professionals, is exacerbated because there is no consensual, governing esport body to mandate procedures or initiate structured esport event operations.

The challenge e facing the Tourism and Hospitality industry is how to capture and sustain the monetization opportunity of esports; in an environment lacking governance structure, where leading technology providers can greatly influence all aspects of the segment, and the young consumer responds to stimuli differently than historical patterns. Event organizers are uninformed when executing an esport event. The purpose of this research is to close the knowledge gap among event organizers regarding how to execute a Gen Z centered esport event among these challenges. Thus, why esports is necessary to incorporate into hospitality and tourism models. There is little accredited research available on esports' economic impact within the tourism and hospitality vertical. Rather, research available is often a published whitepaper of a sales seeking organization or a press release from a CVB post event on the esport event's impact. Consequently, the purpose of researching the esport consumer behavior patterns of the Gen Z demographic is to predict the esport event trends, and the potential economic impact on future hospitality and tourism business models.

2.2   Theory

The goal of this research is to be transparent and transferrable for other tourism and event organizers to replicate the process when researching or executing an esport event. The theoretical framework is centered in researching Gen Z esport consumer trends, and effective esport event implementations in a post CV19 space. The belief that esports provide positive growth drives the data collection process.

This conceptual framework, will guide the reader through executive interviews and data provided by survey participants by emphasizing the consistencies found in the data collection which support effective esport event execution for the Gen Z consumer and positive growth in the hospitality sector of local economies. The objective of this esport event research is to demonstrate value so as to be considered for distribution among numerous organizations, including Meeting Planner International (MPI), Events Industry Council (EIC) and Professional Convention Management Association (PCMA) for possible inclusion in their respective Certified Meeting Professional (CMP) and Digital Event Strategist (DES) courses certification course.

3   Methodology

This study is a mixed method approach. Data is synthesized from fifteen qualitative esport executive interviews to create a singular quantitative survey. The survey is circulated among a large esport professional network. Executive summaries from the fifteen interviews and applicable stats from the subject survey will inform esport event organizers and tourism professionals in executing an esport event for the Gen Z consumer. Our objective is to use our research to minimize the identified knowledge gap and to guide the tourism industry into the digital future post CV19.

Interview Process

Participants
≥4 years of esports experience
AND
≥Director Title or above

↓

Method
10 questions (APPENDIX I)
Questions 1 - 3 / Conversation Starters
Questions 4 - 8 / Esport Brand and Consumers **
Questions 9 - 10 / Relationship Continuity

Survey Process

Method
6 questions (APPENDIX II)
Questions 1 - 2 / Career Confirmation

↓   ↓

Participants   **Participants Dismissed**
≥2 years of esports experience   < 2 years of esports experience
AND   OR
Career is "Event Organizer"   Career is "Profession not Listed"
Career is "Esport Business Support/Investor"   Career is "Esport Consultant"

↓

Method (cont'd)
6 questions (APPENDIX II)
Questions 3 - 4 / Event Execution
Questions 5 / Gen Z Consumer
Questions 6 / Event KPI

**Answers to Executive Interview
Questions 4 - 8 were synthesized as data
sources to create Survey Questions 3 -6

3.1   Interview Participants

The data collection process was initiated by interviewing esport executives who possess a broad understanding, deep insight and forecasting knowledge of the industry. This is the primary source of data with a qualitative intent. Participants for GenZ and Esports: Digitizing the Live Event Brand executive interviews were individuals with a Director title or above and at least four years of experience in the esport space. The primary sources are the premiers in a range of organizations within the esport ecosystem; video game publishers, esport media outlets, digital event organizers, gaming investors, branding agencies and esport leagues/teams. There was no geographical limitation as to where these individuals lived or worked. Rather, the only constraint was the individual must have a Director title, or above, and have at least four years' experience within the esport space.

The executives interviewed were each asked ten identical questions; the first three questions were conversation generators whose purpose was to create a welcoming and trusting dialogue between the student and the interviewer. This was followed by five questions regarding the esport event brand and consumer and then closing with survey continuity, an attempt to continue the relationship for research purposes. The exact interview questions posed are located in Appendix I.

The first interview was hosted on January 26th, 2020 and the fifteenth interview was completed in two months' time on March 26th, 2020. As the executive interviews were completed, the student transcribed the interviews into a Microsoft excel software. The executives' varying answers are transliterated as anonymous "data sources." From this software, common themes were discovered from the data sources and developed into a six-question survey.

3.2   Survey Participants

The second, quantitative component of this research is a survey amongst a select group sampling of esport professionals with at least two years of experience within the esport industry. This survey is a primary source of data with the objective to quantify numerically the solutions event organizers should utilize when hosting an esport event to position the event for success; achieving financial margins, effective branding and audience retention within the Gen Z demographic.

In addition, this survey pool of esport professionals' places of employment mirror the organizations from the esport executives who participated in the preliminary interviews were selected. 9,000 survey participants were contacted through LinkedIn or Email with a survey link bringing the participants to the survey host site, Survey Monkey. This universe of 9,000 esport surveys and the sampling pool of data was developed from professional esports networking groups and recommendations of both individuals and groups from the executives who were interviewed.

The speed of monetization in the esport industry is overwhelming with many corporations racing to partake in the exciting industry. However, the speed of which certain corporations are entering the market leave little time to understand the true value proposition that esports provides the event and tourism space. There are several actors in the space who claim to have significant experience and expertise in esports when it is simply not true. Two questions at the beginning of the survey were to serve as vetting filters to select the most experienced participants with rich esport event knowledge. The first question was asking survey participants how many years they had been involved in esports. Survey participants with less than two years experiences were eliminated. The second question asked survey participants to provide their profession. Survey participants who answered either "profession not listed" or "esport consultant" were also eliminated. Candidates who listed their profession as event organizer or business support investor had their survey counted. In order to create a knowledgeable survey pool, it was necessary to eliminate those participants who could not clearly define their professional role in the esport ecosystem.

The result of this vetting was to focus on event organizers, esport investors and esport professionals who have had at least two years' experience in the fairly young esport industry. The survey included four questions, intended to fit on one email page for the convenience of the survey participant. The questions relate to:

1. Esport Event Execution
2. The Gen Z Esport Consumer
3. Esport Brands' Metric

Each question was created by synthesizing the primary source data from the executive interviews for common themes; event execution, consumer and esport brand, as mentioned. The exact survey questions are distributed survey findings are located in Fig. 4, 5, 6 and 7.

The survey was launched on March 30th, 2020 and was circulated over time among 9,000 esport professionals through April 20th. March 30th is a Monday and Mondays are proven to carry the highest engagement and response rate [10]. The survey period included 4 Monday's. The survey software used to distribute the survey was Survey Monkey.

3.3   Secondary Sources of Literature

Secondary sources are literature and bibliography's references from which were selected from tourism and hospitality industry news articles, academic journals, market reports, published interviews and corporate white papers. The specific data obtained from these secondary, literary sources was used to either support or contradict the primary source data. Due to absence of esport governance and the overwhelming number of actors in the esport ecosystem, there are limited cohesive studies on live event esport organizing. This lack of quality reference literature material is a contributing factor to the knowledge gap existing among event organizers relative to esports.

Ironically, the esport industry itself is data dense; with Big Data, digital archives and player statistics yet, there have been limited studies on esport event organizing. These limited research opportunities are not unusual in a developing industry, but the lack of data makes drawing conclusions difficult. The industry's explosive growth, its newness, lack of attributes similar to other sporting activities, and targeted demographic's still developing disposable income stream make drawing conclusions fluid, until data becomes more reliable. As the problem statement states, in the intervening period, there are several esport knowledge gaps developing pertaining to audience retention, consumer reports and return on investments within the tourism and hospitality industry.

4   Results

4.1   Qualitative Executive Interview Summary

The qualitative approach summarizes the esport community's voice from an executive level, framing what may occur in the next 3 to 5 years in the future. The ten questions, mentioned earlier and located in Appendix I, led to an open conversation with executives. As the executive interviews were completed, the recording of each interview, with the interviewee's permission, is transcribed into an excel software. The executives' varying answers are transliterated as anonymous "data sources". Common themes (esport consumer, esport event execution and esport metrics) are discovered from the data sources and implemented into a four-question survey.

When executives were asked for recommendations regarding how to present uniform branding across both live events and streaming event audiences (Fig. 1, following page), 67% (ten) of executives referred to live event experiential branding within the actual esport event. Thus, the final question in the survey was a direct result of this executive response. With the plethora of virtual platforms emerging post CV19, it is critical for event organizers and tourism professionals to choose the correct platform that prioritizes the live event esport experiential branding. Virtual event platforms have varied abilities such as live workshops, engaging chat features and webcasting yet, the foundation of the capabilities must be the live event esports experiential branding. For example, when executing an esport event the event organizers and tourism professionals should consider creating avatars that would be represented in the physical, live event model while streaming in the digital broadcast simultaneously. This avatar could be a sponsor's mascot or a local concert hall that is providing music for the event.
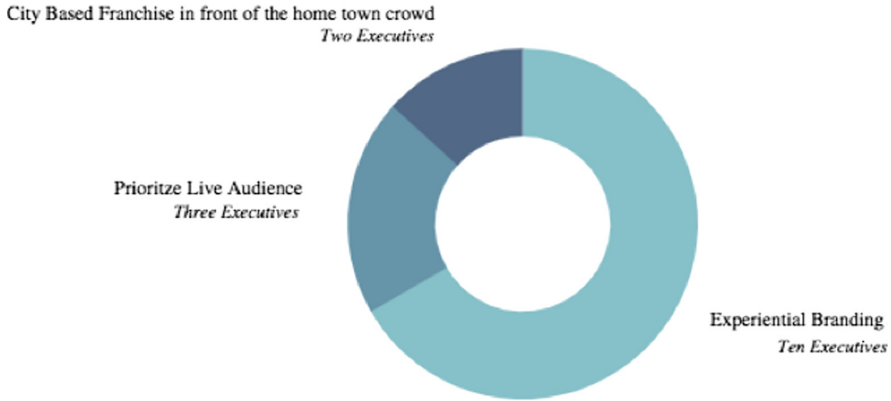
City Based Franchise in front of the home town crowd
Two Executives

Prioritze Live Audience
Three Executives

Experiential Branding
Ten Executives

Fig. 1. How do you recommend synthesizing a live event brand experience with a streaming audience simultaneously? Fifteen Executive Interviews to confirm.

The second question (Fig. 2, below) executives answered in the interviews was; what are the challenges you foresee for event organizers who are exploring or becoming familiar with esports as a business opportunity? A majority of executives, (9) referred to the lack of consistent data and lack of knowledge of the esport culture stipulating event organizer's challenges. This became the basis of the third survey question; asking survey participants to clarify exactly what challenges they are facing. The survey participants' answers to the third question were aggregated and presented so as to alleviate the lack of data plaguing the event organizers interested in esports.

The objective of this research is to demonstrate value so it may be included in the respective CMP and DES certification courses of, MPI, EIC, and PCMA. The data's value is to shrink the knowledge gap of esport culture within the tourism industry and to frame an industry wide standard of event execution, in the absence of esport body governance.

Venue Management
Three Executives

Lack of Esport Culture Knowledge
Nine Executives

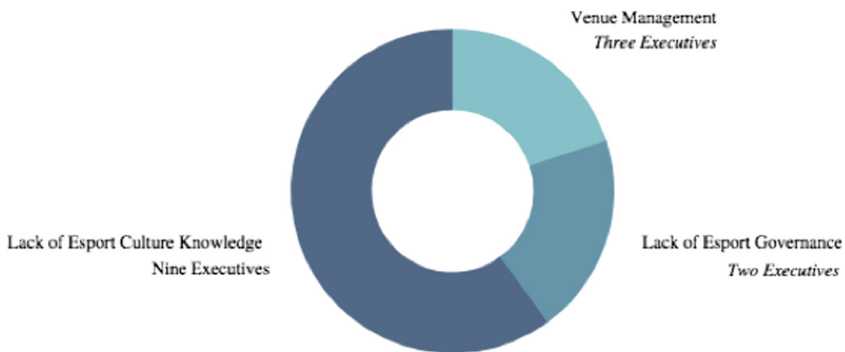Lack of Esport Governance
Two Executives

Fig. 2. What are the challenges you foresee for event organizers who are becoming familiar with esports? Fifteen Executive Interviews to confirm.

Lastly, (Fig. 3, following page), what are the metrics you prefer when approaching an esport project? There was little variation between the five common answers. Without a reliable distinction of responses available, the five common answers were segmented into four of the survey questions. Whether the five commonalities were used as answer options or within the survey question body itself, this question proved to provide the widest array and most revealing trends of event organizers when approaching esport opportunities.

The encompassing opportunities of monetization and viewership can be reorganized through the direct (Corporate Sponsorship, below) and indirect revenue (Social Media and Influence Engagement, below) amalgamation of Audience Data Analytics. An example of direct revenue through corporate sponsorship at an esport event would be a creating an "Experience Bundle" for a Gen Z consumer that would include an Instagram Live (IG Live) chat with their favorite gamer, tickets to the esport event and passes to local restaurant sponsor to enjoy after the esport event has passed. Additionally, to expand viewership, indirect revenue and audience data analytics event organizers must promote live event esports on social media channels. Utilizing famous esport influencers or local thought leaders can encourage esport event attendance and ticket purchase.
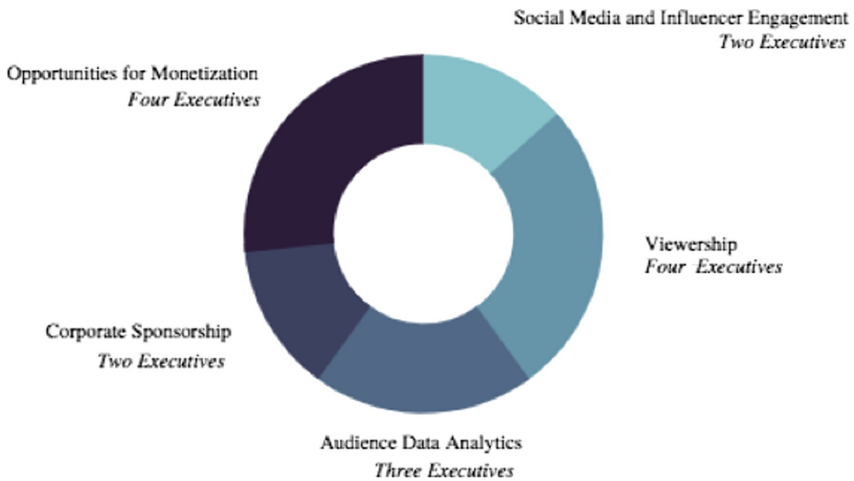
Fig. 3. What are the metrics you prefer when approaching an esports project? Fifteen Executive Interviews to confirm.

4.2   Quantitative Survey Results

The quantitative research survey provides numbers to highlight which solutions are needed to close the esport knowledge gap among event organizers and tourism professionals. As completed, the survey's response is presented in a graph format that represents the survey's pool response numerically. The survey's results present the following data points.

The first question (Fig. 4, following page) directly asked the survey participants to vote for the singular most important component of an esport event. Personalized experiences for the live event audience ranked first with over 32% of survey participants voting this as the most important esport event task to executed successfully. However, trailing 1.2% behind was the duty of presenting uniformed branding between both the live esport event audience and streaming audiences.

As the survey participants were fairly young, 70% under the age of 45, it is paramount that experiential branding is spotlighted. As mentioned earlier, the Gen Z consumer favors experience over material items and with event organizers at the helm sharing in the experiential thought process, client and host are aligned. Keep in mind, GenZ consumers prioritize experience over material goods, socio-economic progressive policies and loyalty to an esport athlete rather an esport team. This solidified the solution to the problem of esports' knowledge gap amongst event organizers: experiential branding and personalized experiences.

As the largest demographic, consumers between the ages of 18–34, are credited as 62% of the esport market [11]. The Gen Z demographic is the first demographic to grow up with a world online. It is deemed digitally fluent and can navigate the internet and social media with ease. Through this ease of navigation and familiarity of the internet, it is cited that 85% of Gen Z individuals engage with branded content on social media [11].
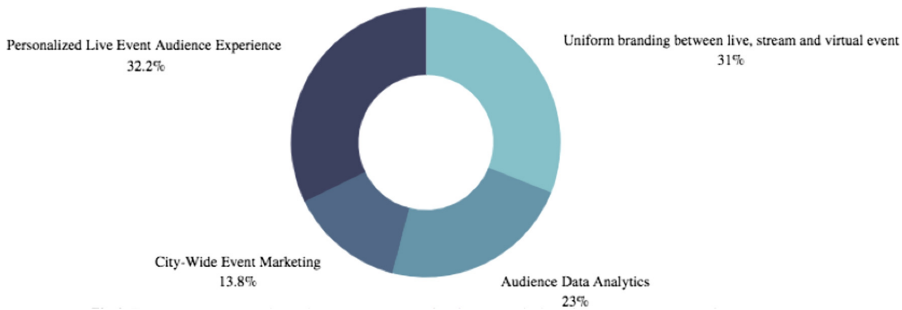

Personalized Live Event Audience Experience
32.2%

Uniform branding between live, stream and virtual event
31%

City-Wide Event Marketing
13.8%

Audience Data Analytics
23%

Fig. 4. For an event sponsor, what is the most important task to be executed when planning an esports event? One hundred survey participants selected from nine thousand survey pool.

The third question (Fig. 5, following page) was also a ranking analysis; what is the greatest challenge event organizers will face in 2021? The survey participants ranked the absence of an esport governing body to be the greatest challenge in esport event organization, with 37% of survey participants voting in favor of this.

This response presented an anomaly for there was a tie for the second challenge event organizers will face. 24% of survey participants voted that mobile gaming is greatest challenge facing esports, while an additional 24% believed presenting a uniform brand experience between both the live event and streaming event. This question confirmed the problem statement and the industry's need for the esport knowledge gap to be closed as there is no esport governance to guide and provide structure to such growth.

This question provided surprising results as mobile gaming emerged as a great concern amongst the survey participants. In North America, mobile gaming is often dismissed as a leisurely past time and not included in the professional realm of competitive esports that are played on PC or consoles.

For event organizers and DMOs to be concerned that mobile gaming will overtake traditional esports is prudent. e. Mobile gaming is easily accessible via cell phones or iPads. This accessibility may eliminate the need for event space gatherings to observe video game play. However, our view is while emboldened by the current COVID 19 pandemic, this challenge will occur overtime. In APAC, mobile is escalating and the mobile platform has improved to run high quality games for PCs or consoles. Also, in this region, from 2016 to 2018, a game called Honor of Kings went viral and became the most popular game in China. In 2018, the King Pro League (Honor of Kings) Spring tournament sold out Shanghai's Mercedes-Benz Arena, with a 18,000 capacity, within minutes of ticket sales opening [2]. Research encourages readers to see mobile gaming is not a challenge to traditional esports so much as it is a new, exciting platform for event organizers to implement.
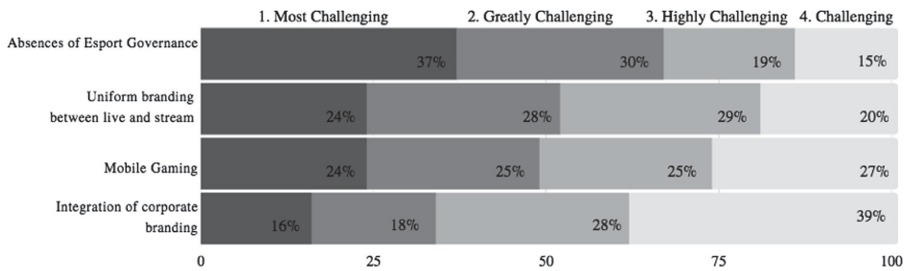

Fig. 5. Rank the following, starting with 1, what is the greatest challenge esport event organizers will face in 2021? One hundred survey participants selected from nine thousand survey pool.

The third question, (Fig. 6, below), survey participants were asked to rank the most important attribute of the Gen Z Esport consumer, the Gen Z's preference to be loyal to an esport athlete rather than an esport team was superior. 68% of survey participants voted Gen Z's esport athlete loyalty to be either the most important second most important attribute. This was followed in a close second by Gen Z's value of experience over material items, with 59% of survey participants voting the experiential presence to be either the most important or second most important of the Gen Z Esport audience

This is key for event organizers who handle sponsorship or experiential branding accounts. These fervent fans are likely to be weekly streamers who follow and make donations to their favorite esport athlete or fellow streamer. There were instances when game publishers released streaming content that feature esport celebrities playing each or top-level amateur players (Eg: Fortnite Summer Skirmish). Transitioning the esport fan's enthusiasm from online to live events will be executed through fan vs. influencer experiences.

For example, event organizers and DMOs should consider the possibility of providing a "fervent fan" tour of the esport facilities and arenas such as the Philadelphia Fusion arena. Furthermore, inviting the fans to play side by side with the esport athletes themselves within the complex. The experience of connecting with an esport influencer or celebrity will solidify a Gen Z's interest in attending a live event.
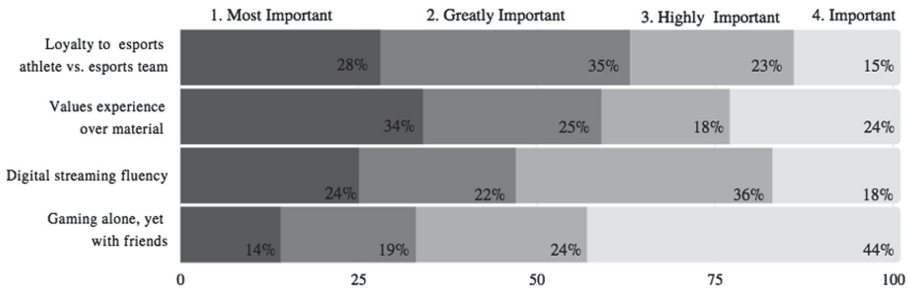

Fig. 6. Rank the following, starting with 1, what is the most important attribute of the youngest esport consumer, Gen Z (8–24)? One hundred survey participants selected from nine thousand survey pool.

The second survey (Fig. 7, below) question presented a wider variance of survey responses. The question inquired as to what the most useful Key Performance Indicator (KPI) is and how it should be ranked between the "most useful" to "useful". 47% of survey respondents revealed that esport retention rates and audience satisfaction is the singular most useful form of KPI. The second most useful KPI was deemed to be esport streaming and advertising impressions by 30% of the survey participants.

The retention rate factor listed in Fig. 7 is essential. Many esport leagues operate utilizing local teams and are planning the construction of local esport venues. Local fans and consumers are the retention demographic demanded because of their geographical proximity to the esport brand and, if a great live event experience, guaranteed return trips. Localization of esports will be able to include local vendors, DMOs, community sponsors and create a familiar environment esport fans can repeatedly return too.
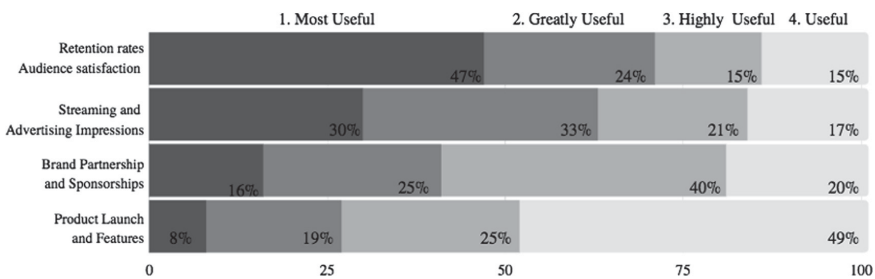

Fig. 7. Rank the following, starting with 1, what is the most useful source of KPI (Key Performance Indicator) for esports events? One hundred survey participants selected from nine thousand survey pool.

5   Conclusion

Finding a way, to integrate esport content and the consumer is challenging. Yet, corporations heeding to the consumer base' preferences [12, 13]. and manifesting authenticity is clearly demanded by esport consumers. For example, questions were raised when The Overwatch League, the brainchild of Activation BlizzCon was cited as floating $300 million valuations for a $25 million revenue. It was mysterious because the valuations were twelve times larger than the revenue and there was no mention of forecasted profit. Although, capitalists want to find those opportunities to get advantageous ROI's, it was the esport fanbase who protested and felt deceived [8].

As authenticity drives the esport world, the student chose to approach data from both a qualitative approach and a quantitative approach. With both gygies implemented there would be an executive voice heard, qualitatively, and an event management opinion heard, quantitatively. Thus, emerging a more well-rounded report of data from different roles within the esport live event community.

By gathering data, both quantitative and qualitative, and then analyzing the data along with primary and secondary sources, a broad perspective and deep-dive insight of esport emerges. The data collection will ensure applicable stats (survey) and executive summaries (executive interviews) for those readers who are making decisions for an esport event. The student emphasizes that by connecting with the streaming consumer, event organizers can meet and influence consumer decisions at their esport passion points; [14] Through diversifying digital brand options (fashion, lifestyle, luxury, food and beverage, entertainment, etc.) that offer esport fans something in addition to the game, consumer retention is guaranteed [15].

As experiential branding and the live event esport experiences strive to wow and delight consumers, it is paramount to recognize the consumer's willingness to be enchanted. A post event survey distributed by the Consumer Electronic Show (CES) revealed how event organizers on the CES team utilized the consumer's openness to be transported to another world by providing virtual reality [15]. This virtual reality was an incredibly realistic and undisturbed journey into an immersion room that could not be achieved at home. Consumers who entered the immersion were enthralled and provided rave reviews of their CES event experience.

The arc is identical as event organizers find a way to integrate the esport content with the experience infatuated esport consumer. Two op-ed pieces from the events industry confirmed that by listening to the first consumer base' preferences [13, 16] event organizers will legitimize esport and provide the authentic connection desired at esport events. On-site solutions for event organizers to achieve this bridge into the digital include designating digital meeting spaces or launching event apps to enhance the event's immersive experience [17]. The streamline of digital approaches leaves more time for creativity and event organizers can utilize this creativity to create Q&A chat functions; thus, see what questions the audience might have or give the platform for audience members to share their own expertise or event feedback.

Associations and organizations have been considering when or if to invest in esports. That question is no longer relevant as esports is a booming and mature industry

saturated with corporations. The associations and organizations need to ask now how to expand their event programs into the esport business.

Appendix I

1. What is your favorite video game?
2. What has been the premier esport experience you've encountered?
3. How many years have you been working along esports professionally?
4. How do you recommend synthesizing a live audience esport brand experience while streaming online simultaneously?
5. What are the challenges you foresee for event organizers who becoming familiar with esports?
6. What strategies do you implement to create a personalized esport experience for attendees?
7. In your opinion, what are the top metrics that sponsorships are looking for?
8. How do you use data to personalize and enhance the consumer experience at an esport event?
9. Will you be willing to participate in a survey post interview?
10. Are you in a position to circulate the identical survey to other five other esport professionals?

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Coworking and Coliving: The Attraction for Digital Nomad Tourists

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Abstract. The study facilitates digital nomadism for tourism research and recognizes a unique product offer on the market: the combined coworking and coliving space in compelling or exotic destinations. The aim of the study is to explore the experience of coworking and coliving by digital nomads and identify valuable elements. Qualitative interview data are used to analyse combined coworking and coliving space environments from the perspective of digital nomad tourists. A better understanding of digital nomad preferences may help destinations and business owners to attract digital nomads during and after the pandemic. The study's findings, perceived advantages and disadvantages of coworking and coliving spaces, may serve as a guideline for targeting digital nomads.

Keywords: Digital nomad travel · Coworking and coliving space · Travel experience · Coworkation

1 Introduction

Numerous coworking hotspots worldwide attract digital nomads; some examples include Bali, Lisbon, Mexico City, Barcelona. A more recent trend is in work-travel coliving spaces as a part of the coworking in exotic environments or places promising exploration of a new place or benefits of warm weather, beaches, or a calm environment for recreation [1]. This trend may also be known as "coworkation," an inspirational coworking retreat set in stunning locations around the world [2], within a coworking and coliving space. Some countries see the potential in digital nomad tourism to restart the economy after the pandemic crisis of 2020 by introducing an attractive visa policy for remote workers [3].

The destinations and hospitality industry may benefit from gaining a better understanding of the role of coworking and coliving for digital nomad tourism. It is worth opening a conversation about the new type of attractions to facilitate digital nomad travel's institutionalization for tourism research. This study aims to explore the experience of a combined coworking and coliving space during travel and acknowledge elements that digital nomads most value. The study questions which factors affect digital nomad's choice to stay in the coworking and coliving space.

2   Overview of Coworking and Coliving

Coworking and coliving space belong to the sharing economy, where the value is co-created [4, 5]. The majority of the previous studies recognized the value of bonding with like-minded individuals as the main advantage of coworking and coliving space [6–10]. Digital nomads tend to group within like-minded communities of location-independent individuals [11]. Therefore, collective work-leisure hubs that combine working and living facilities are likely to foster guests' interpersonal relationships [8]. Nevertheless, only a few studies distinguished travelers from local users of coworking spaces or focused on coworking as a part of the hospitality industry.

Establishing of coliving spaces was a market response to the labor conditions crisis that later influenced the conventional meaning of home, making it a co-productive and co-emergent practice: instead of being an escape from work, it is productive; instead of being private, it is social; and instead of being inhabited long term, it is mobile [5]. The proposition of coliving space is in providing a ready-made community to its residents, providing a sense of belonging in the disconnected location [12]. Creating this sense of community is essential for digital nomads' wellbeing [9]. Besides community and flexibility, one of the main features that make coliving attractive is that the culture of sharing leads to a reduction in the cost of living and travelling [13].

Nevertheless, for digital nomads in travel destinations, coliving space as part of a coworking space commonly has a one-week minimum stay requirement, making it a less flexible option than room renting or a hotel. The majority of the coliving spaces in inspiring destinations target digital nomads in their marketing activities, and it reflects the new meaning of a home through multiple short-term tenancies across the globe, home-as-work, and home as a social network [5]. One of Bali's coworking spaces with coliving accommodation indicated that 90% of its customers refer to themselves as digital nomads [14].

3   Methodology

This study investigates the experience of staying in coworking and coliving space during travels following a qualitative research design by using inductive content analysis. Semistructured interviews were completed online in May 2020 to collect data for the study. Participants were asked to reflect on their experience in coworking and coliving space, share what they would have improved and future travel preferences. The participants' search was performed via social media accounts of different coworking and coliving companies and targeted travelers who experienced them abroad. The principle of saturation was applied to distinguish the sample size. In total, 12 participants were involved in the study, representing five nationalities, covering coworking and coliving experience in Asia, Europe, Africa, South, Central and North America. Data collection and data analysis were conducted simultaneously. The data was analyzed by one researcher, which is common for inductive content analysis [15].

4   Findings and Discussion

This section summarizes ten main themes drawn in regards to coworking and coliving experience. The most recognized advantage is a community sense that includes easy access to meeting people and events; this finding is aligned with previous research [6–10]. In contrast to the community spirit, three participants indicated that they felt the lack of privacy at the same time:

> *"There is sort of that social pressure, people want to talk to you. There is this sort of expectation that people are friendly and want to network. [. . .] I guess I would make it a little bit more private."*

The main perceived advantages and disadvantages of coworking and coliving spaces were noted and summarized in Table 1. The next thread is convenience that combines such elements as the location of coworking and coliving spaces close to each other, location near restaurants or the beach, food availability, extra services (pick up from the airport, pre-arranged sim card, assistance with renting transportation), and workspace availability 24/7. This theme is aligned with previous studies, as several researchers recognized the level of accessibility valued by digital nomads [6, 16]. Moreover, Bendkowski [17] separately distinguished food and beverage service, 24/7 building access, and other dedicated services. However, it is essential to point out that not all coworking spaces are the same, and some participants shared experience about coworking places that were closed on weekends (mostly in Europe). Some coworking places only had a furniture and internet connection with no other services. Also, five participants shared that it is challenging to find a coliving space in most locations.

Table 1. Advantages and disadvantages of coworking and coliving spaces during travel.

Advantages	Frequency	Disadvantages	Frequency
Community sense	11	Limited availability of coliving (limited destinations)	5
Pleasant work environment	7	Party scene	5
Business advice & place to learn from others	7	Expensive compared to a similar quality of accommodation	4
Convenience	5	Segregation from the local community	4
Helpful with local tips	4	Lack of privacy	3

Interestingly, the advantage of convenience comes with a price; segregation from local people and culture. Four participants mentioned distancing from a local community, with one person comparing coworking and coliving space with a Disneyland experience. Digital nomads being separated from locals was also found in previous studies [6, 18].

Another recognized area is the pleasant work environment of the coworking space. Participants pointed out such features as comfortable furniture, good lighting, plants, air-conditioning, light, noise level, internet speed, and coffee quality. The importance of the atmosphere and interior aesthetics and the layout of the space was previously mentioned by researchers [19]. Besides a pleasant work environment being acknowledged as an advantage, five participants mentioned a negative experience in coworking and coliving places with loud parties being a major distraction from work. These findings suggest that calling a location "coworking and coliving space" potentially has different meanings to different people. The definition of "coworking and coliving space" may vary: between a simple place with Wi-Fi and a full-service hotel; between a quiet place to collaborate on work and a place of entertainment. This suggests a necessity for business owners to include elements that help to identify their purpose and gain trust – online promotions and recommendations, word of mouth, reviews, recognized brands and others.

The following theme emerged is that coworking space gives business advice and is a place to learn from others; this advantage was mentioned by Capdevila [20] when he highlighted that coworking spaces have a knowledge sharing dynamics that are often absent in shared offices. On top of sharing practical knowledge, participants learned about remote culture and slow living style.

An additional key issue recognized is related to cost; the price of the coliving option being higher than other accommodation types of the same quality. As previous literature revealed, for a coliving concept, community, flexibility and price are among attractions [13]. However, for travelers, flexibility is already limited by a minimum stay requirement, and by having a higher price than alternatives, the second common advantage of a coliving space is absent. It affects the competitiveness of coliving accommodation as part of coworking space on the market and contradicts the accepted perception of the shared economy being more affordable than private accommodation.

However, some participants saw a positive influence of a higher price:

"Coliving I stayed in had a slightly higher price point, which I think helped filter out (people) [. . .] I think the higher price point sort of filtered out some of the people who were more on like "I don't really know what I'm doing, sort of backpacker type of vibe."

Others perceived the facilities being overpriced. One shared:

"I've only been in coliving space once but only to try it I didn't like it because it was so expensive."

A different participant explained his/her reasons to moving to a hotel:

"I was there for about a month and a half when they started doing coliving and I went to view the houses (coliving). It was more expensive to stay in a coliving space then to stay in a hotel. And that was ultimately the factor."

The next thread recognized is that coworking and coliving spaces provide helpful local advice, especially when first time in the destination. This was an exciting finding, as, besides a vast online community within remote workers who travel, many participants shared that they do not plan much in advance and refer to coworking and coliving spaces to find places to eat and things to do. From the tourism perspective, this may be a new opportunity for local businesses to recognize coworking and coliving spaces as information intermediates for travelers and establish partnerships within locals.

One more advantage is in the pulling ability of coworking spaces to attract digital nomads. Out of all participants, three mentioned that they are looking specifically for a combined coworking and coliving space in the destination, even choosing a destination based on it. It is an exciting new finding for destination managers and a new opportunity for emerging destinations. Surprisingly, these three participants were the most experienced travelers.

Another matter that emerged is in different perceptions of the digital nomad community by travelers from Asia. As most digital nomad travelers are Western, Asian nomads, when traveling, had a different community and travel experiences. Asian travelers in sport-induced tourism previously observed similar differences compared to their Western counterparts [21]. Participants' comments included:

"I did not belong in a predominantly white community. So that's why I chose a community or a coworking space based on the community as I test it out. I tried out several coworking spaces, but I tested it out based on "how do I do as an Asian?""

Another participant said:

"Most of the places I was perhaps the only Indian who was traveling while working a lot of people told me that I was the only Indian, so having some friends from home along to accompany with me was not an option because I was the only one I knew who could do this."

The last theme is related to the importance of the first impression, so-called vibe, or energy of the place that comes mostly from people. Five participants recognized that they draw conclusions about the space from the first few moments in a place, and participants even compared it with the first day in school or mentioned that it is like love at first sight. This first impression was often studied in hospitality and was found to be valuable [22, 23]. However, in contrast with hotel experience, where the webpage is a contributor to the first impression image, all participants shared the importance of an actual appearance in the coworking and coliving to evaluate the people and atmosphere. This contribution highlights the influence of offline impression to understanding digital nomad experience and is aligned with the importance of co-creation and co-production in coworking spaces [5, 7].

5   Conclusion

This paper contributed to the body of knowledge by identifying elements that are valued in coworking and coliving space during travel. The content analysis of semistructured interviews with digital nomads who stayed in coworking and coliving space assisted in disclosing their travel experience. As a result, a summary of the advantages and disadvantages of coworking and coliving space seen by digital nomads was developed (Table 1). This study discovered that digital nomads highly value community sense, pleasant work environment, convenience, ability to consult and learn from others; these factors are aligned with findings in the previous research [6, 16, 17, 19, 20]. Also, participants appreciated that coworking and coliving space helps them with local tips, like restaurants and things to do, especially during the first visit to the area. Disadvantages of coworking space indicated by participants include limited availability of coliving accommodation, loud parties, high prices compared to similar accommodation, and lack of privacy. Moreover, a new finding of the study is the acknowledgment of Asian nomads and their different perspectives of community experience with a mostly western accumulation of digital nomads.

Among the practical implications of this study, perhaps the most important one is that coworking and coliving space can be an attraction of destinations and serve as a peculiar tourism information center. It suggests to the tourism boards who focus on digital nomads to invest in relationships with coworking businesses, just as it is commonly practiced with theme parks and hotels. The findings may serve as a guideline for destinations and business owners to develop new products, adjust marketing strategy, and improve the service quality.

The limitation is related to the range of coliving spaces covered in the study. As community-based coliving may have different forms, there are unique retreat farms, converted Buddhist temples, community-based eco-villages, and many others. However, the study has initially reached out to travelers who stayed in establishments that call themselves a coliving space (as part of the coworking space) and focused the study around them. Future research is worth developing a categorization of coworking and coliving spaces for travelers and factors influencing a particular establishment's choice during travels, such as length of stay and trip composition.

Out of the current study's scope, all participants indicated that they were looking forward to their next adventure once travel restrictions are down; some of them even were still travelling during data collection (in May 2020) and stayed in the coworking and coliving space at the moment of the interview. Digital nomad tourism can continue to be the world's significant phenomenon after the mobility change of COVID-19. More future research on understanding digital nomads as a segment for tourism is called for.

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Mobile Payments, Chinese Tourists, and Host Residents: Are Destination Stakeholders Prepared to Facilitate Mobile Payments?

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Abstract. Mobile payment has become ubiquitous worldwide. It is a form of digital payment activity performed on-site from a mobile device (i.e. smartphone) for the purchase of goods and services using QR or NFC (contactless and proximity card) technology. This study examines destination stakeholders' level of engagement and involvement in facilitating mobile payments (e.g., AliPay and WeChat Pay) for Chinese tourists. Sabah (Malaysian-Borneo), a popular island destination in Southeast Asia, was selected as the study site. Using a qualitative approach, 25 tourism and hospitality industry practitioners participated in a semi-structured, in-depth interview between February to July 2020. Preliminary results revealed that industry practitioners had been actively seeking to implement mobile payment facilities since late-2017, specifically in the retail sector, as they felt the pressure in accommodating the needs of Chinese tourists. This study offers insights into how industry practitioners address local consumers' shift in payment usage-behaviours; from traditional forms of payments (e.g., cash and credit card) to mobile payments in light of the COVID-19 pandemic.

Keywords: Mobile payment · Mobile payment usage behaviour · Chinese outbound tourism · Destination stakeholders · Sabah (Malaysian-Borneo)

1   Mobile Payments and Chinese Tourism

The global phenomenon of mobile payment (MP) technologies is spearheaded by the Chinese (Mainland China) as they exemplify a cashless society. They consider it a norm to rely on mobile devices to make day-to-day payments even during travels [3, 4]. Prior to the COVID-19 pandemic, many destinations worldwide were overwhelmed with the influx of Chinese tourists. Considering the growth of 20% outbound tourists yearly, they contribute to the growth of tourism and the economy in many parts of the world. Destinations capitalized on Chinese spenders by implementing mobile technologies to facilitate AliPay and WeChat Pay payments. With this in mind, the Chinese tourism segment being the largest body of travellers abroad has changed the global travel landscape, specifically how destinations cater to them [5].

As MP becomes ubiquitous in many Asian countries and globally, there are drawbacks to this universal phenomenon, such as MP failures during travel attributed to merchants, network operators, service providers, and users [4]. Moreover, the barriers to implementing MP in many countries at a local or state level are their facilities, aside from installation cost, lack of trust and knowledge, as well as safety and security issues. There has been no consensus on the standard setting of MP in which its success and failures of implementation have primarily attributed to country-specific consumer's payment culture [1]. As prerequisites of MP, the current facilities lack universality and interoperability [1, 2]. Simply put, the over-dependence on MP usage among (Chinese) travellers may pose a problem when destinations do not offer such facilities [3, 4].

Currently, MP research within the tourism and hospitality industry (e.g. hotel and restaurant setting) has made very little progress over the past several years with much focus on the Western context for MP adoption and technology acceptance. Knowing that MP is part of the Chinese social norm, it is unknown the extent of the MP culture can be observed when they travel abroad as MP facilities are not readily available at all destinations. Therefore, this study's main objective is to understand stakeholders' level of involvement and engagement in facilitating MP for Chinese tourists at destinations. Depending on the availability of MP facilities at destinations (country), stakeholders have generally focused on the Chinese MP model, AliPay and WeChat Pay, with less attention on local MP for host residents. Subsequently, this study examines the tourism and hospitality industry practitioners' responses to residents' MP needs.

2   Methodology

This study is part of a large project which examines the role of MP and value co-creation efforts among destination stakeholders. This study adopted an interpretive, qualitative research approach informed by social constructionist ideologies. The data presented were collected from tourism and hospitality industry practitioners for six months (February to July 2020) in the capital city of Sabah (Malaysian-Borneo), Kota Kinabalu (KK). Sabah was selected as Chinese outbound tourists highly rated it as one of the top island destinations in 2017. Participants were selected based on convenience and snowball sampling methods from two sources (offline/online). The interview followed a semi-structured format, where participants were briefed on the research objectives, followed by their written/verbal consent to audio-recording of the interviews. The interviews were transcribed verbatim and translated to English. Interpretations were validated through member-checking and verified with a seasoned tourism expert. Thematic analysis was used to interpret data using both manual and computer-assisted analysis (NVIVO12) to identify, categorize and code patterns.

3   Preliminary Findings and Discussion

In total, 25 participants agreed to participate in this study, with an average of 32-min per interview. A majority of the participants are male (68%) and married (75%), with most under the age of 31–40 years (32%) and 41–50 years (28%). Tourism and

Table 1. Study participants' profile and mobile payment facilitation readiness

Tourism and hospitality industry practitioners' demographic profile (N = 25)	Mobile payment facility				*
	Yes			No	
	Local	Chinese	Both		
Food & Beverage (F&B)					
1. Restaurant Manager, KK (M, 50)			/		1
2. Durian Seller, Fruit Stall, KK (M, 35)		/			1
3. Owner, Coffee shop, KK (M, 55)				/	1
4. Owner, Coffee shop, KK (F, 52)				/	3
5. Owner, Coffee shop, KK (M, 26)	/				3
Wellness (Spa)					
6. Owner, Health & Wellness Centre, KK (M, 34)			/		2
Hotel					
7. General Manager, 4-star Hotel, KK (M, 59)		/			3
Retail					
8. Manager, Jewellery Store, KK (F, 46)		/			1
9. Manager, Souvenir Shop, KK (F, 50)		/			1
10. Owner, Souvenir Shop, KK (M, 58)			/		1
11. Manager, Sports Apparel Retail Store, KK (M, 27)			/		1
12. Manager, Souvenir Shop, KK (M, 35)			/		3
13. Owner, Souvenir Kiosk, KK (F, 29)	/				3
Payments					
14. Top Management, Payment Gateway (M, 54)	Not applicable				2
15. Manager (Merchant Acquirer), Payment Gateway (F, 33)					2
16. Manager (Merchant Acquirer), Malaysian eWallet (M, 46)					3
Travel					
17. Manager (Accommodation), Online Travel Agency, KK (M, 29)	Not applicable				1
18. Freelance Tour Guide – Chinese Market (M, 39)				/	1
19. Freelance Tour Guide – Chinese Market (M, 38)		/			1
20. Freelance Tour Guide – Chinese Market (F, 46)				/	2
21. Freelance Tour Guide – Chinese & South Korean Market (F, 37)				/	2
22. Freelance Tour Guide – Chinese Market (M, 48)		/			2
23. Freelance Tour Guide – English & Chinese Market (M, 36)				/	2
24. Tour Coordinator, Inbound/Outbound Operator, KK (F, 29)		/			2
25. Tour Operator (Product Owner), KK (M, 50)	/				2

*Interaction via Offline/Face-to-face (1 and 3) and Online/Phone (2): 1 = mid-Feb to mid-Mar 2020; 2 = mid-Mar to mid-May 2020 (MCO: Movement Control Order in Malaysia); 3 = mid-May to mid-July 2020

hospitality industry practitioners are identified based on industry categories: Food and Beverage (F&B), Travel, Hotel, Retail, Payments, and Wellness (Spa). Based on preliminary findings in this study, almost half of the industry practitioners fall under the category of 'innovators' and 'early adopters' (See: Diffusion of Innovation by Rogers, 1962). These stakeholders highly sought for MP technologies from late-2017 ('Hotels' and 'Retail' categories) to 2018 ('F&B' and 'Wellness' categories) and signed up with little hesitation in 2019 ('Retail' and 'F&B' categories) to cater to the Chinese tourism segment. Table 1 provides a summary of the participants in this study.

In the service industry, it is common for hotels within the 4- to 5-star range in Sabah to have MP facilities for Chinese guests, but rarely for local guests. However, a spa owner (#6) revealed that having both local and Chinese MP systems ease sales consolidation for all forms of payments (cash, credit cards, and MP) across all branch outlets. Most establishments in the retail industry (n = 6) accepts Chinese MP with three retailers (#10, #11 and #12) accepting local MP as well. For example, participant #12 relayed that their main customers are domestic tourists; hence, the need to provide local MP facility on top of accepting Chinese MP.

In the 'Travel' category (n = 9), one inbound/outbound operator (#24) accepts Chinese MP apart from accepting major credit cards, bank transfers, and cash transactions. However, one tour operator (#25) does not accept Chinese MP as the current business deals with local tour agents (intermediaries) who pay in cash or bank transfer. Chinese guests usually pay for tour packages via OTAs (e.g., CTrip), which accept Chinese MP (#17). There are fewer Chinese FIT guests who book directly with the tour operator, and when they do, the transactions are either in cash or credit card (#25). There are two Chinese-speaking, freelance tour guides (#19 and #22) who accept Chinese MP via P2P transfers as they own a Chinese eWallet (e.g., WeChat Pay) linked to their Chinese banking account (i.e., both have worked in Mainland China prior). All tour guides agreed that their Chinese guests are more inclined to spend at retail stores with Chinese MP. However, tour guides are usually prepared with cash (Malaysian Ringgit) when their Chinese guests request to exchange local currencies.

This study also found that F&B merchants such as participants #3 and #4 have yet to adopt MP facilities. Their reservations are due implementation cost and merchants' lack of know-how in consolidating payments via MP systems. For example, a local durian seller (#2) shares one WeChat account with a few other sellers (within the same vicinity). Moreover, participants #3 and #4 differentiated food businesses (medium-large businesses with branch outlets) that rely heavily on workers would most probably use MP facilities as compared to small-medium, family-run businesses. Participants in the 'Payments' industry (#14, #15 and #16) further corroborated that most merchants are reluctant to enrol for MP (local, Chinese or both) because they do not want additional payment methods. Their reluctance is due to keeping their businesses as uncomplicated and straightforward as possible by accepting 'cash only'. Nonetheless, the impact of the COVID-19 pandemic led participant #5 to apply for local MP facility in order to cope with the growing need for food deliveries during the MCO period.

Although (lack of) 'trust' was cited in past literature, this study shows that industry practitioners were eager and ready to facilitate payments for Chinese tourists and, of late, adopt local MP due to the COVID-19 pandemic. It is worth noting that utilizing MP facilities have been equated as being hygienic (i.e., safe and free from germs) for

destination hosts. For example, two participants (#5 and #13, 25–30 year-old) imple-
mented local MP facilities (i.e., QR code display) during Malaysia's MCO period to
facilitate payments for its customers (e.g., food take-away and in-app food delivery
services). Additionally, they aspire to capture the future domestic tourist segment.

One of the key findings of this study is that local natives are less likely to adopt MP
facilities as they perceive that such technologies are not safe and secure (e.g. data
privacy). They feel additional costs will be incurred for setting the facility, in addition
to not fully understanding how payments are received at their end. For local merchants
who adopted Chinese MP, they believe it limits the need for local staff to communicate
with Chinese tourists due to cultural differences and language barrier. Furthermore, MP
adoption among stakeholders varies, considering the industry characteristics and their
dependence on the Chinese tourism segment. For example, the retail industry provides
MP solutions to enhance consumers' shopping experience by preserving the sense of
convenience and familiarity, making tourism accessible to the Chinese tourist segment.
This preliminary finding is similar to Yang [5], where merchants at host destinations
are compelled to accommodate Chinese tourists. Further analysis is required to link
residents' MP usage behaviour with the growing Chinese outbound tourism.

4 Conclusion and Limitations of the Study

Globally, the COVID-19 pandemic has contributed to the accelerated shift in payment
preference; from physical payments (i.e., cash bills) to digital (mobile) payments. As a
result, MP technologies will play an integral role to see a wider adoption of both
suppliers/merchants and buyers/consumers worldwide. In the foreseeable future, des-
tination stakeholders alongside with governmental efforts would require to not only
bridge the digital (mobile) gap through ICT infrastructures for its residents and visitors
but to also concentrate on MP security and verification features (e.g. blockchain
technologies). As payment methods have an impact on consumer behaviour, future
studies may delve into consumers' (tourists) personal and socio-cultural values related
to MP usage behaviours, particularly on product/service consumptions, as they have
social, marketing, and legal implications. On limitations, this study was conducted at
the beginning of 2020, where the social/physical distancing practices may have con-
tributed to participants' reluctance in this study. Moreover, it cannot be denied that
insider-bias may be a limitation in selecting tourism industry practitioners as the pri-
mary researcher of this study is a Sabah native.

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Airbnb Host's Perceptions on Airbnb Customer Social Responsibility and Organizational Justice in Airbnb 2.0

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Abstract. In a peer-to-peer transaction of the sharing economy, an Airbnb host is a worker as well as a service provider. From this perspective, this study explores how Airbnb hosts' perception of Corporate Social Responsibility (CSR) and organizational justice impact their customer orientation directly and indirectly via job satisfaction and Organizational Citizenship Behavior (OCB). The results highlight the importance of a host's perception of Airbnb's CSR and organizational justice. The results provide various implications for online accommodation businesses and guidance for future research.

Keywords: Airbnb hosts · CSR · Organizational justice · Customer orientation

1 Introduction

In the tourism industry, the most famous example of the sharing economy is Airbnb, which allows owners to offer visitors their unoccupied properties (houses or rooms). Airbnb has over 150 million users worldwide (including both hosts and guests), and its annual revenue in 2018 was USD3.6 billion [1]. In this situation, Airbnb hosts are becoming increasingly commercial. According to [1], it is expected that Airbnb hosts listing multiple houses for rent will become the fastest-growing section of Airbnb and will generate most of Airbnb's income. In fact, the number of hosts who lease two or more properties in the U.S totals nine million, and 44% of those homes are professionally managed. Some scholars refer to this professional Airbnb as Airbnb 2.0 [2]. As an individual service provider, a host attracts prospective customers by advertising the

characteristics of himself/herself and his/her properties, and tries to achieve competitive advantages [3, 4]. At the same time, as a worker, he/she can be influenced by whether the Airbnb company has a sense of business ethics and concerns regarding environmental or social issues [5]. In this vein, we adopt some business-related issues (corporate social responsibility, organizational justice, job satisfaction, organizational citizenship behavior, and customer orientation) and investigate their causal relationships.

Meanwhile, China is one of the biggest Airbnb markets. According to an Airbnb report [6], up to 94% of hosts in China practice environmental protection, and 63% of the hosts provide guests with public transport cards and travel information to encourage them to use public transport. Forty-five percent of the hosts use green cleaning products and methods. This study decided to investigate Chinese Airbnb hosts' perception.

2   Theoretical Background and Research Model

CSR is essential for a corporate's sustainability, and this attribute applies also to service providers of the sharing economy [7]. Mi & Coffman noted that the sharing economy has the potential to achieve Sustainable Development Goals (SDGs) when a sharing service provider cooperates with the government by engaging in CSR [8]. Drawn from Social Identity Theory (SIT), previous studies have found that employees who perceive that their company's CSR activities are likely to engender a positive attitude toward the company and its work contribute to the goal of obtaining customer orientation [9]. According to SIT, people tend to divide themselves into different categories, and the perceived identity within each category in turn affects each member's self-concept [10]. For example, if an employee thinks he/she is a member of a superior company, his/her self-esteem and attitude toward the organization will be enhanced. In the context of CSR, companies' participation in CSR activities can lead employees to have a positive view of the company and a positive attitude towards work, which consequently results in good performance [9]. CSR boosts pleasant feelings amongst employees and prevents negative ones from flourishing. CSR also has the power to create an OCB [11]. In the context of the sharing economy, "a peer-to-peer based sharing of access to goods and services" ([8], p. 1), an owner (e.g., an Airbnb host) is a kind of a worker as well as a service provider [5, 8]. From this perspective, it can be assumed that Airbnb hosts' perception of CSR helps to increase a positive attitude toward jobs and organizations, which consequently enhances performance.

H1-4:   Airbnb hosts' perception of CSR has positive impacts on job satisfaction, OCB, organizational justice, and customer orientation.

Organizational justice is considered a crucial factor influencing the attitude of members of an organization. The concept of organizational justice is related to "fairness," and has three key components: procedural justice (fairness in process), distributive justice (fairness in reward distribution), and interactional justice (fairness in relationships) [12]. According to previous studies, employees' organizational justice

has a positive impact on attitude toward jobs and organizations, and customer orientation [13]. In the context of this study, organizational justice refers to hosts' perception of fairness in Airbnbs' behavior. Although the sharing economy is believed to be a decentralized and equitable system, some researchers have shared concerns about the sharing economy under the shadow of moral hazards, unfair distribution of income and welfare, and a power struggle between the host and guest [14]. Therefore, the importance of considering and increasing the host's organizational justice will increase. Considering the role of organizational justice, it can be assumed that hosts' organizational justice enhances a positive attitude toward jobs and Airbnb, and customer orientation.

H5-7:   Organizational justice has positive impacts on job satisfaction, OCB, and customer orientation.

Customer orientation is defined as an employee's tendency or predisposition to meet a customer's needs or a customer's desire on the job, and it is essential for achieving customer satisfaction. Both job satisfaction and OCB are important factors affecting customer orientation, and they also have causal relationships with each other [15]. OCB is an employee's behavior while supporting organizational operations such as helping colleagues, and includes positively affecting all actions of the work-related parties for long-term business success [3].

H8-9:   Job satisfaction has positive impacts on customer orientation and OCB
H10:   OCB has a positive impact on customer orientation.

Based on the theoretical background, we proposed the following research model (see Fig. 1). Both CSR and organizational justice were measured as a second-order construct by the three constructs, respectively.
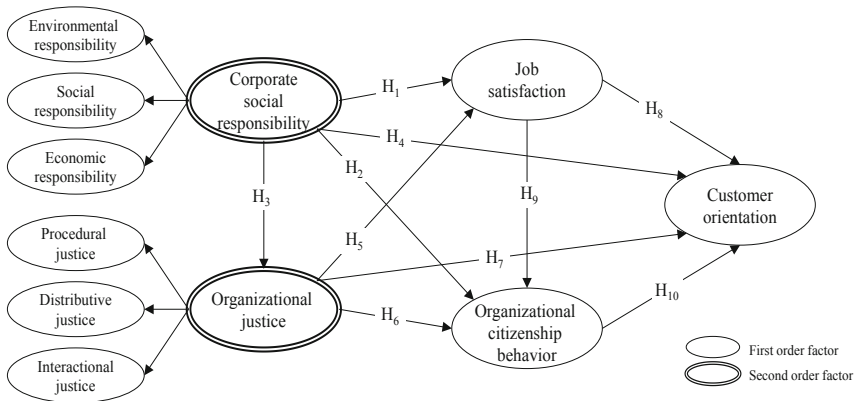

Fig. 1. Research model

3   Method and Results

All items were based on prior research and measured by a 5-point Likert scale. The survey instruments were initially produced in English and then translated into Chinese. A web-based online survey was conducted from 14 to 28 April, 2019. Data were collected from members of the largest Airbnb host communities in China: BAIDU TIEBA and the DOUBAN GROUP. As a result, a total number of 202 respondents completed the questionnaire.

First, we assessed the measurement model. The values of composite reliability, Cronbach's alpha, and average variance extracted are greater than their thresholds. In addition, this study separately conducted CFA for the two second-order variables (CSR and organizational justice) in order to reduce the likelihood of interpretational confounding resulting from conducting a complex model. The results showed an acceptable model fit. Therefore, all items are satisfactory in terms of reliability and validity.

Then, SEM was conducted (see Table 1). The results showed that host's perception of Airbnb CSR have an impact on customer orientation, indirectly via job satisfaction and organizational justice. That is, customer orientation can be enhanced only when the host's perception of Airbnb's CSR induces other positive perceptions or attitudes. A host's organizational justice directly influences OCB and customer orientation but does not contribute to job satisfaction. These results highlight the need for Airbnb to balance both CSR activities and fairness in process, distribution, and relationships. In the Airbnb 2.0 era, owners (hosts) are workers as well as service providers. Their perception of Airbnb's CSR activities and fairness is important to increase customer satisfaction, since the value of the customer should be created from the perspective of the hosts. Meanwhile, OCB does not influence customer orientation, and is not influenced by job satisfaction. One possible explanation is that since Airbnb is a peer-to-peer service, it is relatively rare to collaborate with colleagues for common goals.

Table 1. Standardized parameter estimates

Hypothesized path				Estimate	t-value	Results
H1	CSR	→	Job satisfaction	0.828	4.060	Support
H2	CSR	→	OCB	0.599	2.715	Support
H3	CSR	→	Organizational justice	0.925	13.643	Support
H4	CSR	→	Customer orientation	0.334	1.320	Reject
H5	Organizational justice	→	Job satisfaction	0.101	0.516	Reject
H6	Organizational justice	→	OCB	0.238	1.720	Support
H7	Organizational justice	→	Customer orientation	0.402	3.068	Support
H8	Job satisfaction	→	Customer orientation	0.427	2.930	Support
H9	Job satisfaction	→	OCB	0.140	0.971	Reject
H10	OCB	→	Customer orientation	−0.186	−1.033	Reject

χ^2 = 217.334; d.f = 136; χ^2/d.f = 1.598; CFI = 0.979; NFI = 0.947; GFI = 0.900; AGFI = 0.860; Standardized RMR = 0.03.

4   Conclusions

This study extends the literature on the sharing economy, which has focused intensively on Airbnb guests' perceptions by observing what hosts' perceptions of CSR and organizational justice are. The results suggest that, in order to improve the reputation of the company, especially from the perspective of employees and all stakeholders, the company should accelerate the implementation of CSR. Thus, Airbnb can be used as a valuable tool to provide competitive advantage. With the help of CSR implementation, Airbnb can improve hosts' OCB and job satisfaction, and hence improve customer orientation. In addition, the procedures and rules are used to compensate and distribute bonuses that are provided as a result of hosts' performance. And the more fair the supervisor's treatment is in the process of setting up the procedure, the more customer orientation is increased. It is important to operate a reward system as a way of maintaining organizational justice. Moreover, because the working state of the landlord is not collective, the Airbnb company needs to make every host feel fairness is being applied so as to promote the extra-role behavior and customer orientation of the hosts, at the same time improving the working environment and customer service.

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Robo-Tipping: Are Customers Game?

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Abstract. This study sought to investigate customer attitudes towards tipping robotic employees in bars. A convenience sample of participants who were 21 years of age or older and who had patronized a bar was recruited using Amazon's Mechanical Turk platform. Of the 102 usable responses, only 15 participants had experienced robotic bartender service. Only 11 individuals (10.8%) in total said they would tip a robot; 10 of those were respondents who had acutally experienced robotic bartenders, representing 67% of that subsample. Participants listed efficiency and required maintenance as reasons for giving a tip to a robotic bartender. Out of 91 respondents who initially declined to tip a robotic bartender, 38 study participants (41.8%) agreed to tip if they knew that the collected funds would go to human employees. However, in the same group of respondents, only 14 (15.4%) agreed to tip in the scenario when tipping would serve as a learning experience for a robot to understand customer preferences. The rationale for not tipping included such reasoning as robots are machines that do not need extra income and cannot appreciate the gesture. This study suggests that explaining how the collected funds will be used may positively impact consumer intentions to tip a robotic bartender. This extra revenue may help offset the cost of the robot, and subsequently lower the prices of the drinks served at a robotic bar, thus making the product more affordable for a wider audience.

Keywords: Robotic employees · Robotic bartender · Tipping behavior

1 Introduction

Robotics and automation have entered the hospitality industry, which has been traditionally regarded as a people industry [6, 8, 9]. Currently, robots are employed as hosts, wait staff, food runners, cooks, and bartenders [5]. However, customer acceptance of and reaction to this new type of employee in bar settings has not been studied. Because the beverage service industry in the United States relies on a tipping culture, understanding how employing robots impacts customers' service evaluations and tipping practices is of importance. Therefore, the purpose of this study was to investigate customer attitudes towards tipping robotic employees in bars.

2   Literature Review

Tipping is a complex phenomenon that involves the organization, employees, and customers. From the perspective of the agency theory, tipping may serve as a mechanism that, which assists in aligning the interests of the service company (the principal) and the employee (the agent) [2]. While the principal is usually interested in business success that may be defined via financial performance, customer satisfaction, customer return, or business reputation, agents are usually more concerned about their personal benefits that may be expressed via working hours, work conditions, and high pay. In such a goal conflict, tips appear to be an instrument that rewards employees with higher income for providing high quality service to customers, which, in turn, may satisfy the business owner expectations of increased earning, customer satisfaction, and return.

The logic presented above seems to work well when all parties in the organization – employee – customer relationship are human. However, the introduction of robotic employees ensures a perfect goal alignment between the principal and the agent, and removes any personal interests of the agent. In such a scenario, the robotic employee is not interested in receiving tips because it is a machine and does not have personal interests. However, the organization may remain interested in receiving tips as an additional source of revenue that recognizes the quality of product and service that customers received. The funds received as tips may be used by the organization in a variety of ways, such as offsetting the cost of robotic employees or supporting human employees who remain in the organization. Additionally, if tips are going directly to the organization, the company may choose to lower its prices accordingly to attract more customers and increase value perception. Therefore, the question is whether or not customers would be willing to tip robotic employees.

Previous literature has established that tipping is a complex multi-faceted behavior [4]. Even though numerous studies have examined the tipping behavior of patrons (e.g., see 2, 14 for meta-analysis), no comprehensive theoretical framework has been developed in this area of human behavior [4]. The studies conducted in this area usually approach the topic from either psychological or economic perspectives.

Extant literature on the psychological motivations behind tipping includes the desire to reward good service, assist servers financially, and increase social status or gain approval [11, 12, 15]. While scholars have examined moderators of the service-tipping relationship including, but not limited to, gender and ethnicity of the server, time of service, age of the patron, and bill size [13]. Tipping scholars have also sought to identify how best to increase tips for service staff [10]. Ultimately, research has demonstrated that behavioral changes, such as self-introductions, eye contact, offering chocolates, and drawing suns on the receipts may lead to positive changes in customer tipping behavior (increased tip percentage) [4, 7, 17].

The economic perspective usually attempts to test the assumption that tipping is a rational behavior that rewards high quality service [4]. However, meta-analytic studies reveal a significant but weak relationship between service quality and the tip percentage [2, 14], therefore, suggesting otherwise. Furthermore, Azar [2] was not able to find support for the relationship between repeat visits to an establishment and tipping behavior as a mechanism of ensuring better service in the future. Becker et al. [4]

conducted regression modeling to identify factors that predict customer tipping behavior, and identified that the heuristics model was the factor with the highest regression coefficients making statistically significant contributions to models built for exceptional, satisfactory, and poor service.

In summary, customer tipping behavior appears to be a complex, possibly irrational behavior that is often driven by heuristics and may be influenced by psychological manipulations. Based on the findings documented in the previous literature, one may suggest that customers may choose to tip robotic employees for some pre-existing innate reasons (e.g., personal beliefs, cultural environment, etc.). Therefore, this study seeks to explore customer baseline attitudes toward giving tips to robotic employees, and customer susceptibility to being influenced by psychological factors.

3   Methods

To achieve the purpose of this study, an online survey was built on Qualtrics. The survey included a combination of multiple-choice and open-ended questions. In the survey, participants were asked to watch a video about a robotic bartender and answer questions about their perceptions of the robotic bartender and whether or not they would tip, and why. Additionally, the study participants were asked if they would tip a robotic bartender if they knew that the collected funds would go to human employees or serve as a learning experience for the robot to understand customer likes and dislikes.

A convenience sample of participants who were located in the United States, 21 years of age or older and who had patronized a bar was recruited using Amazon's Mechanical Turk (MTurk) platform. To increase the quality of responses, participants were also required to have an approval rate of previous requests of 95% or above [16]. In addition to that, the survey contained a combination of multiple-choice and open-ended questions. The study design made it easy to eliminate low quality responses through the review of qualitative answers.

4   Results

A total of 122 responses were collected for this study in October, 2019. Eighteen responses were incomplete, and therefore were excluded from the study. Two more respondents provided ineligible qualitative answers (a string of characters) and were subsequently eliminated from the analysis as well. Of the 102 usable responses, 15 respondents (14.7%) had experienced a robotic bartender at one of the casino or cruise line bars at which they are featured. Of those, 10 (67%) said that they would tip a robot. Reasons mentioned included, "Yes: It hardly spills and it's quick and easy; its humanity; Yes, that tip is not for the robot, it's for bar and robot maintenance." Only 11 individuals (10.8%) in total said they would tip. The one individual who had not experienced a robotic bartender in person before, but said they would tip offered the rationale: "to see if there would be a positive reaction to my tip."

The remaining 91 individuals who said they would not tip a robot overwhelmingly provided responses like "Robots don't need income to survive", "I would only want to tip a human", and "When I tip, it's because a person who's serving me isn't making minimum wage and tips are there to compensate of that." However, some respondents cited a lack of gratitude as a reason for not tipping: "the robot is not human so it would not appreciate a tip or do anything with it." Another participant cited, "it doesn't have a soul."

Out of 91 respondents who initially declined to tip a robotic bartender, 38 study participants (41.8%) agreed to tip if they knew that the collected funds would go to human employees. However, in the same group of respondents, only 14 (15.4%) agreed to tip in the scenario when tipping would serve as a learning experience for a robot to understand customer likes and dislikes.

5 Discussion, Implications, and Conclusion

5.1 Theoretical Contribution

This exploratory study was designed to measure customers' intentions to tip robotic emplyees and explore possibilities of influencing such intentions. The results of the study revealed that 10.8% of respondents were willing to tip robotic bartenders. Interestingly, the willingness to tip seems to be higher among those customers who have experienced a service offered by a robotic bartender (67%). Therefore, it appears that experience with a robotic employee makes a difference in a customer's intention to offer tips.

Also, an intention to tip a robotic bartender increased after offering explanations that tips would serve as a learning experience for the robot to understand customer preferences (15.4%) or support human employees (41.8%). The findings of the study seem to be in line with the results of previous research on tipping human emplyees that could not establish a link between tipping behavior and future visits to the establishment [2]. The first scenario suggests that a robot may learn from the tips given to it which service situations were evaluated positively by customer and which ones were not up to the par, thus, resulting in future improvements of service. This scenario generated a small increase in customer willingness to tip a robotic bartender, therefore, suggesting that improvements of future service encounters is not a strong motivator for offering tips to robots.

The second scenario that suggested that collected tips would be used to support human employees generated a higher increase in the intention to tip a robotic bartender. First, such a scenario may be more familiar to the participants. Different businesses may use different tip distribution strategies, however, tips going to human employees has been a status quo in the industry. Second, this scenario may speak to the customers' gratitude, empathy, and desire to help service employees that has been documented in the literature as motives for tipping [1, 11, 12, 15]. Overall, these two scenarios suggest that customer intentions to tip robotic employees may be altered by different psychological influences, which has also been documented for tipping human employees [4, 7, 17].

5.2   Practical Implications

From the practical perspective, because respondents cited efficiency and maintenance as reasons for tipping, practitioners need to ensure the machinery runs seamlessly and is constantly updated to drive customer satisfaction. It is also important to ensure that gratitude or some other reaction is expressed on the part of the machine as "a reaction" was cited as a reason for offering a tip. The rationale provided for not tipping robots supports discussions put forth by Lynn and McCall [14] who maintain that gratitude expressed by the server is a necessary component.

The findings of this study also suggest that bar operators may expect to receive extra revenue in tips from around 11% of customers. This percentage may increase in the category of repeat customers or those who have experienced a service by a robotic employee in the past. This extra revenue may help to offset the cost of the robot, and, therefore, lower the prices of the drinks served at a robotic bar, thus making the product more affordable for a wider audience. Additionally, this study suggests that explaining the way how the collected funds will be used, may positively impact consumer intentions to leave a tip for a robotic bartender.

5.3   Limitations and Future Research

This study was limited by a small sample size and convenience sampling method, which both limit generalizability. Future research should attempt to gather information from more individuals who have and have not encountered robotic service to assess how this impacts customers overall service evaluation and tipping of employees who work alongside robots. Identifying how these robotic interactions are perceived and valued by customers is important for both internal and external customer service.

The tipping literature has been criticized for the lack of sound theoretical frameworks that could explain tipping behavior [3, 4]. Such a void is even larger for the area of tipping robotic employees and understanding customer behavior in new, emerging service environments. Therefore, future research should concentrate on developing theoretical frameworks that could offer insight into customers' intentions of tipping robotic employees. Such studies may rely on the extant tipping literature and approach the question from either psychological or economics perspectives. Additionally, future research may leverage the literature on human-robot interactions and consider such aspects as anthropomorphic features of robots or speech abilities.

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Part III: Social Media and User Generated Content

Tourist Experiences at Overcrowded Attractions: A Text Analytics Approach

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Abstract. As a result of travel activities, overtourism has become a global issue. Even after the COVID-19 pandemic, the topic of overtourism would benefit localized overcrowding as a new occurrence in the tourism industry. Since there is no specific measurement to evaluate tourist experiences at crowded attractions, this study aims to explore the perception and feelings of tourists when they visit popular and crowded attractions through topic modeling and sentiment analysis based on TripAdvisor online reviews as of the end of 2019. By investigating the top 10 attractions in Paris, the results present 24 topics frequently discussed by tourists. Examples of some topics related to overtourism are safety, service, queuing, and social interaction. Specifically, tourists felt the most negative towards safety and security among all the identified topics. By bridging overtourism, text analytics, and user-generated-content, this study contributes to the field of tourist experiences and crowd management.

Keywords: Overtourism · Carrying capacity · User-generated content · Topic model · Sentiment analysis

1   Introduction

While revenue generated through tourism activities directly contributes to a country's GDP, negative consequences emerge from the high number of visitors over a period of time. In contemporary tourism, exceeding a destination's carrying capacity or crowding of tourist sites through day visitors are considered as the precursor of overtourism [1, 2]. Overtourism is harmful to the environment [3], society, and the economy of a destination [4]. One of the indicators of this phenomenon is the perception of crowding [5]. When the capacity in one place is exceeded, the quality of life of residents and tourist experiences inevitably decline [5]. From the perspectives of inhabitants, perceived overcrowdedness can be implied from the comparison between the number of visitors of non-touristy spots and popular ones. Moreover, the extent of perceived crowding negatively influences destination attractiveness [6]. Because of the negative effects resulting from overtourism (e.g. a decrease in tourists' loyalty [7], revisit intention [8], and satisfaction [9]), effective managing strategies are necessary for destination marketing organizations (DMOs). Recently, there has been a growing interest among scholars and practitioners in discussing the impact of overtourism [1, 10]. However, since existing studies have only

examined overtourism in general pertaining to a city or a country, Koens et al. [2] underpinned the importance in relating the issue to specific attractions, to avoid over-generalization of the results. Furthermore, earlier literature mainly analyzed overtourism via surveys/interviews with limited sample size [5]. Thus, a holistic understanding of tourist experiences when visiting overcrowded attractions merits attention. While it appears that overtourism may not exist during the global crisis, we have already witnessed domestic travel booms in few countries as a result of successful preventions of COVID-19 outbreak [11, 12]. Even during the COVID-19 pandemic, people still have desires for travelling, yet at different spots that are considered safer [13] and might be less well-known before.

To understand tourist experiences from an inductive approach, uncovering their perceptions based on user-generated content (UGC) can be beneficial. Built on the notion of experience economy, staging memorable and extraordinary experiences are crucial to the tourism industry [14]. Technology has enabled tourists to share their travel experiences in real-time [15]. The valence of online reviews can further influence consumer perceptions towards tourism products [16]. Due to the unstructured nature of online data, there is an increasing popularity in adopting topic modeling and sentiment analysis [17]. The former identifies the main topics of the reviews and is particularly suitable for exploratory studies [18]. The latter quantifies subjective information by natural language processing and computational linguistics [19].

Although text analytics of online reviews is an ideal tool to examine tourist experiences at certain attractions, insights from social media is rather scarce [20]. A comprehensive understanding towards overtourism has also been overlooked by scholars [10]. Thus, this study aims to uncover the most common issues related to overtourism when visiting overcrowded attractions and to reveal the feelings of tourists through text analytic techniques. Theoretically, this study extends the current knowledge towards overtourism by examining tourism experiences on social media. Methodologically, the technique applied in this study is beneficial to marketers who want to examine tourists' feelings based on UGC elsewhere. Practically, destination marketers will be able to improve their management strategies accordingly, especially for emerging touristic spots during/after the COVID-19 pandemic.

2   Literature Review

2.1   Overtourism and Tourist Experiences

Overtourism occurs when hosts, tourists, or locals feel that there are too many tourists in a particular area, which leads to a decline in the quality of life of residents and worsens tourist experiences [21]. Understanding tourist experiences has long been a critical issue as tourists continue seeking for personalized, unique, and extraordinary experiences [14]. Essentially, tourists experiences refer to the interplay between tourists, destinations, and the surrounding atmosphere [22]. Although overtourism has been foregrounded in the media [10], there is an ongoing debate on the definition, antecedents, and consequences. Koens et al. [2] argue that overtourism has not been clearly defined despite its popularity. Wall [1] claims that overtourism is simply a notion based

on carrying capacity, rather than a new phenomenon. Because every destination has a maximum carrying capacity, capacity standards reflect the local image and land availability [1]. Neuts and Nijkamp [23] developed a crowding perception model by examining the destination environment in Bruges. Liu and Ma [24] discovered that the perception of crowdedness is not directly related to tourist satisfaction, while Kılıçarslan and Caber [25] reported contradicting results. Notably, since the nature of service offerings and atmosphere vary among different sites, Koens et al. [2] made recommendations to analyze the effects of overtourism based on specific attractions rather than the whole destination.

Significant ramifications associated with overtourism include the deregulation of the airline industry [26], home-sharing platforms [2], and social networks that can influence tourists' travel behavior [20]. Problems such as the increasing number of tourists in certain attractions, tourism gentrification, commodification on tourist sites, and rent escalation, are gaining more visibility [27]. These factors have all worsened tourist experiences in overcrowded areas [28]. An example can be seen from the deputy mayor's unpleasant attitude towards tour buses in Paris [29]. The evaluation of tourist experiences in areas with a high level of perceived crowdedness could be based on the range of provided services, expenses, and the extent of security, among others [4]. Specifically, the issue of safety and security is much more difficult to manage because of the crowds [4]. Excessive waiting time as a result of too many tourists creates frustration and anxiety [30]. The perceived service quality decreases due to insufficient staff and facilities available for tourists [30]. Also, there is a relationship between perceived value, congestion, and tourist satisfaction [31]. Yet, other studies have pointed out some of the positive viewpoints. Due to the needs of interacting with other tourists when traveling [23], the presence of others positively influences tourists' feelings [32]. Given the increase in tourist numbers, the residents in the heritage town of Besalu in Spain still recognize the economic benefits [5]. Afterall, although tourist experiences at the destination further contribute to the economy, society and the overall environment [4], recent studies have stated that crowding perception and overtourism are still neglected areas in contemporary tourism research [24, 33].

2.2 Text Analytics on User Generated Content

To investigate tourists' feelings when visiting overcrowded attractions, the analysis of online reviews has been recognized as a reliable source given the rich data it provides. In the digital area, consumers are more likely to share their travel experiences online [15]. Reviews posted by other tourists become more critical in influencing one's decision-making process [34]. One typical example is TripAdvisor which enables tourists to consult reviews on any hotel, restaurant or attractions shared by other users [35]. Due to the unstructured nature of online content, text analytics try to facilitate the meaning-making process by extracting insights from social media. Particularly, Latent Dirichlet Allocation (LDA) is one of the most common topic modelling techniques that helps to deal with collections of text data [18]. LDA views a document of text as a mixture of topics that disclose words with certain probabilities. Its main purpose is to identify the underlying topics in unstructured corpus such as customer reviews [18]. Another technique, which is often incorporated with LDA is sentiment analysis [17].

Sentiments refer to feelings based on attitudes, emotions, and opinions; it determines whether an expression is positive, negative, or neutral [19]. Social media data, especially from online review platforms, are frequently used for sentiment analysis, as their content expresses the experiences and feelings of products and services [15].

Specific to this research, topic modeling uncovers visitor experiences from a bottom-up approach. As the current understanding on overtourism is limited by existing constructs and framework [2, 5], more efforts are needed to provide a holistic view of the consequences of crowdedness. The benefits of text analytics (e.g. topic modeling and sentiment analysis) have been corroborated by several studies investigating tourism experiences. For instance, Guo et al. [18] adopted LDA technique to identify the most commonly perceived factors of hotel visitors when sharing their experience online. Liu et al. [19] reported that Chinese tourists had positive sentiments regarding themes such as natural environment, landmarks, and architecture when visiting Australia. Overall, topic modeling techniques reveal the hidden insights that are often overlooked by the destination marketers [36].

3   Methodology

3.1   Study Context

France has always been a well-known destination and has been ranked number one in terms of visitor numbers over the past years [37]. Being the symbol of France, several studies proved that Paris encounters problems of overtourism [38, 39]. This study thus scrutinized the top ten cultural and heritage attractions in Paris [40]: Notre-Dame de Paris, Basilica of the Sacred Heart of Paris, Louvre Museum, Tour Eiffel, Centre Pompidou, Musée d'Orsay, City of Science and Industry, Museum of Natural History, Arc de Triomphe, and Sainte-Chapelle, and analyzed visitor experiences when travelling to attractions with an intensely high concentration of tourists.

3.2   Data Collection and Data Treatment

To reveal issues related to overtourism when visitors travel to the above attractions, this study analyzes tourist experiences based on TripAdvisor online reviews. First, all available posts in English, of the top 10 cultural-related attractions in Paris, in TripAdvisor were extracted, resulting in a total of 140,712 posts published by any user as of the end of 2019. The following procedures were conducted in Orange 3, an open source visual programming software. Prior to the implementation of LDA topic modeling, online posts were pre-processed. A list of stopwords was prepared to eliminate non-informative text. The remaining corpus was transferred to lowercase, where diacritics were transformed to basic format. Next, text data was tokenized. All words were converted into their basic form, using lemmatization (e.g. travelling to travel).

Due to the restriction of Orange 3, only a maximum of 5,000 data instances were allowed for conducting topic modeling. Hence, 5,000 posts were randomly selected for each attraction using a random selection in excel. The sample size is similar to recent

studies applying topic modeling technique [41, 42]. To ensure an equal distribution of the data, two attractions (i.e., Museum of Natural History and City of Science and Industry) having less than 300 reviews were excluded. LDA topic modelling was conducted to generate term clusters from the extracted reviews, which yielded 10 topics for each attraction based on the default setting of Orange 3. The degree of how a token contributes to a given review was revealed based on TF-IDF representation (term frequency-inverse document frequency). In the next step, based on the identified topics, a lexicon-based sentiment analysis using the Vader algorithm was adopted to extract online users' feelings based on the posts. The results are presented by a numerical spectrum where −1 is the most negative, +1 is the most positive, and 0 suggests the neutral point.

4 Results

Table 1 provides detailed descriptions of the 24 identified topics generated from LDA of the remaining eight sites. The naming of the topic was based on the top keywords with the highest TF-IDF scores detected by LDA (Table 1). This research took references from the destination image measurement [43] and overtourism risk assessment [4] to for the topic names. Though, additional topics/themes were added when the researchers encountered other important aspects during the analysis.

Unsurprisingly, visitors tend to post their experiences related to artwork, architecture, or cultural and historical background of the attraction. Nevertheless, other topics highly relevant to the effects of overtourism include, "safety and security", "queues of customers", "time to visit", "social interaction", "staff and service", "service and facility", "time value of money", "visitor expectation", "fee and ticket", "visitor recommendations", "emotional experience", "reputation", and "overall atmosphere". Based on the keywords in Table 1, tourists often relate incidents of theft at the crowded attractions. Because of the crowds, other emerging problems include a long waiting time, unsatisfactory experiences of the provided service, occupied spaces in shops and restaurants, and insufficient toilet facilities. Consequently, when the standards did not meet visitor expectation, the disappointment from the tourists played a role in shaping their overall experiences and influencing their perceived reputation of the attractions. Furthermore, overcrowding also leads to a discussion about ticket pricing and the best time to visit. The discussion would revolve around early-bird tickets, advance booking, city pass, and free admissions during specific times or dates. Eventually, the overall tourist experiences at the sites causes visitors to reflect on the costperformance ratio in terms of time and money spent.

Among the topics relevant to overtourism, Table 2 shows that visitors felt most negatively about "safety and security", "service and staff", and "queues of customers". Yet, the sentiment scores were higher regarding "social interaction", "reputation", and "overall atmosphere". The results explain that although overcrowding issues might lead to frustrating touchpoints in a tourist's journey, the experience derived from the attraction itself (e.g. appreciation towards masterpieces) can counterbalance the overall tourist experiences (e.g. high sentiment scores of "reputation" and "overall atmosphere"). Moreover, the findings demonstrate that crowds positively affect tourists'

Table 1. Summary of topics

Identified topic	Definition	Keywords
*Safety and security	Visitors' concern about safety and security when visiting the attraction (e.g. pickpockets, security check)	dangerous, suspicious, harass, scam, pickpocket, strangers, steal, group, busy, searched
*Queues of customers	Visitors' impression about queuing to access the attraction (e.g. length, time)	wait, inform, queue, entrance, rough, long, fast, crowd, skip, stand
*Time to visit	Visitors' impression of what is the best time or period to visit the attraction	hours, week, time, queue, days, night time, schedule, early, summer, weather
*Social interaction	Visitors' impression of the interaction with other tourists who are also visiting the attraction	many, groups, tourists, talk, gathering play, security, many, children, families
*Staff and service	Visitors' impression of friendliness and helpfulness of the staff working at the attraction	staff, friendly, rude, helpful, English, nice, employees, confused, misunderstanding, refund
*Location and surroundings	Visitor's impression about the attraction's location and its surroundings (e.g. cleanliness, beauty)	places, landmark, Paris, city, location, distance, roads, community, cafes, area
*Service and facility	Visitors' impression about the extra services and facilities available at the attraction	shop, restaurant, souvenir, expensive, staff, buy, pay, access, restroom, echo
*Time value of money	Visitors' impression of the value they get in return for the money spent at the attraction	worthwhile, waiting, queue, crowds, wonderful, rewarding, special, affordable, reserve, value
*Visitor expectation	Visitors' impression of expectation fulfilment or disappointment when visiting the attraction	disappointing, crowded, small, few, overrated, wait, queue, bucket-list, lifetime, best
*Fee and ticket	Visitors' impression of the entry fees and tickets (e.g. prices, discounts)	price, free, ticket, enter, age, advance, early, group, cheap, pass
*Visitor recommendations	Visitors' recommendations to other potential visitors of the attraction	incredible, recommend, visit, return, must, advise, tip, overrated, impression, worth
*Emotional experience	Visitors' emotions experienced throughout their visit to the attraction	disappointing, amazing, remarkable, unique, worth, awesome, breathtaking, boring, surprising, fun,
*Reputation	Visitors' impression of the fame and reputation of the attraction and its impact on the visitor experience	famous, overrated, rewarding, unique, worth, overcrowded, icon, expect, nice, better

Table 1. (*continued*)

Identified topic	Definition	Keywords
*Overall atmosphere	Visitors' impression of the atmosphere in and at the attraction (e.g. cozy, relaxing)	neighborhood, atmosphere, cozy, worth, views, outside, crowd, romantic, sparkles, light
Navigation design	Visitors' ability to navigate and walk through the attraction	signs, lost, English, navigate, understand, helpful, way, display, walking, confusing
Scenery and view	Visitors' impression about the scenery and views as seen from and around the attraction	view, good, amazing, scenery, top, city, surrounding, spiritual, steep, climb
Accessibility	Visitors' impression about the general accessibility of the attraction (e.g. wheelchair, elderly people)	climb, metro, steps, stairs, lift, tired, walk, base, easier, passageway
Exhibition impression	Visitors' impression of the exhibitions they visited at the attraction (e.g. design, appeal)	collection, impressionism. Monet, sculptures, exhibition, interesting, artists, amount, huge, section
Architecture impression	Visitors' impression of the architecture of the attractions (e.g. building, glasswork)	chapels, scope, building, inside, style, ceiling, treasure, design, pyramid, shape
Artwork impression	Visitors' impression of the artwork present at the attraction (e.g. interesting, inspiring)	interesting, collection, art, Monet, painting, gallery, design, glasswork, sculptures, Picasso
Information and education	Visitors' impression of the information and educational value provided at the attraction	information, signs, children, read, understand, school, story, boards, languages, cards
Culture and history	Visitors' impression and awareness of the cultural and historical background of the attraction	story, shape, magnificent, cultural, memorial, artefacts, Napoleon, old, history, past
Impact of religion	Visitors' impression of the impact of their own religion on the visitor experience at the attraction	church, religious, significance, priest, service, pray, Christian, believer, worship, inspiring
Public transport	Visitors' impression of the public transport available to arrive at the attraction	public, metro, booth, transit, bus, arrive, easy, transport, access, distance

Note: *topic is related to overtourism

emotional experiences and encourage interactions with others. Overall, visitors' feelings were generally positive with a sentiment score of 0.61. However, only Notre-Dame de Paris, Basilica of the Sacred Heart of Paris, and Musée d'Orsay had an overall sentiment score higher than the average value.

Table 2. Summary of sentiment scores.

	NDP	BSH	LM	TE	CP	MO	AT	SC	Count	Average
*Safety and security	–	0.00	–	0.61	–	–	–	–	2	0.31
*Queues of customers	0.61	–	0.51	0.48	–	–	–	0.45	4	0.51
*Time to visit	–	0.65	0.53	0.59	–	0.77	–	–	4	0.64
*Social interaction	0.69	0.82	–	–	0.67	–	–	–	3	0.73
*Staff and service	–	–	–	–	0.81	–	−0.14	–	2	0.34
*Location and surroundings	0.67	0.57	–	0	0.75	–	0.66	–	5	0.53
*Service and facility	–	–	–	–	0.68	0.73	0.51	0.29	4	0.55
*Time value of money	–	–	–	0.48	0.72	0.73	–	0.35	4	0.57
*Visitor expectation	–	–	0.71	0.46	–	–	–	–	2	0.59
*Fee and ticket	–	–	0.70	0.51	–	0.67	0.67	0.55	5	0.62
*Visitor recommendations	0.76	–	–	0.69	–	0.64	–	0.45	4	0.64
*Emotional experience	–	–	0.64	0.84	0.74	0.63	–	–	4	0.71
*Reputation	0.80	–	–	–	–	–	–	–	1	0.80
*Overall atmosphere	–	0.79	–	0.84	–	–	–	–	2	0.82
Navigation design	–	–	0.39	–	0.23	0.70	–	–	3	0.44
Scenery and view	–	0.68	–	–	0	–	0.74	0.56	4	0.50
Accessibility	0.70	0.61	–	–	–	–	0.37	–	3	0.56
Exhibition impression	–	–	0.51	–	–	0.7	–	–	2	0.61
Architecture impression	0.68	0.66	0.37	–	0.69	–	0.83	0.56	6	0.63
Artwork impression	0.67	–	0.74	–	0.78	0.69	0.40	0.55	6	0.64
Information and education	–	–	–	–	–	–	0.56	0.76	2	0.66
Culture and history	0.78	–	0.72	–	–	0.79	0.44	0.72	5	0.69
Impact of religion	0.77	0.85	–	–	–	–	–	–	2	0.81
Public transport	–	0.87	–	–	–	–	–	–	1	0.87
Average	0.71	0.65	0.58	0.55	0.61	0.71	0.50	0.52		0.61

Note: NDP = Notre-Dame de Paris, BSH = Basilica of the Sacred Heart of Paris, LM = Louvre Museum, TE = Tour Eiffel, CP = Centre Pompidou, MO = Musée d'Orsay, AT = Arc de Triomphe, SC = Sainte-Chapelle; topics sorted based on average sentiment scores (from small to large); count: the number of attractions accorded a score; *topic is related to overtourism

5   Conclusion

5.1   General Discussion

As the demand for leisure and the plethora of tourist destinations has increased, especially emerging at the domestic level, overtourism has become a global issue. Although literature has highlighted the multifaceted problems resulted from overtourism such as safety and security [33], poor management strategies [2], and negative tourist experiences [30], crowding perception and the concept of overtourism have not

been adequately addressed to date [10, 24]. Additionally, a strong focus was put on investigating the perception of residents [4, 44] rather than providing a holistic understanding towards tourist experiences related to overtourism. Since overcrowdedness occurs in site-specific terms [2], this study is a much more detailed one as it scrutinizes the most popular attractions perceived as overcrowded.

First, the lowest sentiment score of safety issue might imply tourist' uncertainty and anxiety [30] owing to the high number of tourists. This result can be explained via several negative words (e.g. "dangerous", "scared", and "nervous") when tourists described their experiences at the sites. Indeed, it is unsurprising that tourists are concerned about their safety when traveling. This point has also been brought up in recent literature [33]. Buhalis [45] suggests that visitor safety should be included in the comprehensive strategies developed by the DMOs to have a prosperous and sustainable destination. Other salient issues resulting from overtourism include the poor performance of service, staff, and insufficient facilities. Consistent with earlier studies investigating the effect of crowdedness on service performance and consumer perceptions [46], this research discovered that visitors potentially perceived service quality as compromised due to the presence of crowds, leading to an unsatisfactory outcome. Moreover, this study highlights the excessive waiting time at the attractions that can cause negative tourist experiences. Apart from implementing possible solutions to reduce the perceived waiting time such as embedding gamifying and technological elements to entertain visitors [47], based on the keywords derived from this study, it appears that tourist experiences can be improved by informing one in advance of a rough waiting time or providing sufficient seating capacity. Notably, it is interesting to see that a high level of perceived crowdedness is not always negative [46]. Specifically, a feeling of co-presence with other tourists [48] fosters the chances of interacting with one another during the trip. This is conveyed by the higher sentiment score of "social interaction" and "overall atmosphere". Suggested by Neuts and Nijkamp [23], the perceived crowding level is related to the interactions with other tourists, which subsequently influence tourists' feelings [32]. While it appears that tourists' feelings are generally positive when visiting the overcrowding attractions, the high sentiment scores were mainly contributed by topics that may not have a direct relationship with the crowds (e.g. "artwork impression", "culture and history"). This assumption is especially obvious at the Arc de Triomphe where visitors were most positive towards the architecture while being negative towards the service and staff. Similarly, queuing received the lowest sentiment score whereas the reputation and the history of the attraction received the highest sentiment score at Notre-Dame de Paris. Echoing the study of Capocchi et al. [33], although the dimensions related to overtourism are interrelated and overlapping, it is evident that overtourism is a problem that must be addressed to improve the quality of tourist experiences and to ensure the sustainability of attraction development. Despite that the number of international tourists in popular attractions declined during the global crisis, domestic tourism is booming [12]. Indeed, while it might take years until the tourism industry recovers from the COVID-19 pandemic, people are still traveling in the meantime yet in different forms (e.g. road trips, short-distance travel). Well-known destinations might be less attracted to tourists, but the phenomenon of overtourism is likely to occur in other spots that were less promoted and unpopular previously.

5.2   Theoretical Contributions and Practical Implications

Given that a high number of visitor arrivals appears to be profitable, tourist experiences end up being compromised and negative feelings at specific attractions emerge concurrently. This research provides a threefold contribution to theory, methodology, and practice. First, this study is novel in that it links the emerging fields of overtourism and social media [20] into tourist experiences. Unlike earlier research built upon existing measurements/figures [4, 44], this study takes one step further by exploratorily discovering the critical dimensions in managing tourist experiences at overcrowded attractions. Seeing that earlier literature often examined perceptions of crowding based on tourists' demography (e.g. age and gender) [32], this study sheds light on the potential directions for future research to test the identified topics based on visitors' socio-demographic backgrounds. Additionally, this study also contributes from a methodological angle by incorporating topic modelling technique and sentiment analysis to reveal tourists' subjective perceptions. Practically, the findings provide insights to attraction management, DMOs, governments, and relevant stakeholders to strategically plan and enhance both the tourist experiences and socio-ecosystem. Because of the international travel restrictions, overtourism might not be highly relevant in the post-COVID-19. However, it is critical to be aware of the localized overcrowding as a new occurrence in the tourism industry. This study speaks to the thriving global tourism industry in that it offers a detailed account regarding tourist experiences and their feelings when traveling to overcrowded attractions.

5.3   Limitations and Recommendations for Future Research

As with any research, this study is not without limitations. First, this research only investigates visitors' experiences in the top attractions in Paris, leading to a high degree of uncertainty in the generalization of results. Future studies should be done that examine other crowded attractions. Meanwhile, comparing the results with locations that are less crowded could further reveal more insights. Moreover, the findings in this research are based on online reviews from TripAdvisor. Future studies should consider other platforms such as Facebook and Instagram. Additionally, this research did not consider reviews posted by non-English speakers, while they could be emerging markets (e.g. Chinese) for the tourism industry. Methodologically, some attractions may have numerically fewer or more topics rather than ten. It therefore leads to an unequal distribution regarding the number of posts in each identified topic. Finally, researchers are suggested to employ various topic modeling techniques (e.g. correlation explanation and k-means) to find the optimized results. Apart from understanding the valence of online reviews, future studies can also incorporate emotional analysis to better quantify tourists' emotional engagement in the context of overtourism.

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The Implicit and Explicit Motivations of Tourist Behaviour in Sharing Travel Photographs on Instagram: A Path and Cluster Analysis

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Abstract. Instagram has been an emerging platform for tourists to share their experiences and connect with other users in the multiphasic travel stages. Despite the huge number of photographs shared on Instagram on a daily basis, it remains ambiguous regarding the underlying motives of tourists' posting behaviour. Thus, this study aims to conceptualise a framework based on the internal and external triggers of sharing travel photographs through a mix methods design involving diary studies and questionnaires. By conducting a path analysis, this study presents and validates a theoretical model including various motivational factors; namely enjoyment, self-esteem, recognition, interests, social norms, goals, social ties, social status and prestige, self-efficiency, outcome expectations and memorabilia. Meanwhile, this research clusters young techsavvy tourists into four distinct segments based on their behaviour of using Instagram while traveling. By bridging motivational theories, social psychology, and social media in the context of tourism, this research extends literature related to user-generated content and Instagram. Practically, this research allows marketers to optimise the effectiveness of marketing strategies based on the characteristics of tourists and their behaviour on social media platforms.

Keywords: Motivation · Instagram · Posting behaviour · Tourism · Social media

1 Introduction

In the era of digitalisation, social media has not only transformed tourism marketing and management [1], but also drastically influenced tourist behaviour regarding how they share experiences and connect with one another [2]. In the multiphasic travel

stages, the use of social media mediates the process of information search, decision making, experience co-creation, networking, and the creation of long-lasting memories [3, 4]. Platforms commonly used by tourists are Facebook, YouTube, and Instagram. In particular, in quest of vivid content (e.g. pictures and videos) [5], Instagram has rapidly emerged as a trendy channel for tourists, especially the young tech-savvy generation, to share their travel experiences [3, 6]. Comparing to other social media sites that are text intensive, pictures shared on Instagram create inspiration [7] and trigger potential tourists' imagination towards a destination [8]. This can be evidenced by several studies related to Instagram tourism published recently [7–9]. In a nutshell, existing literature has focused on the role of Instagram in the perceived and projected destination image [10, 11], destination branding [9], tourists' perceptions and online reactions (e.g. likes and comment) [6], the effectiveness of visual content [8], and the influence on travel planning [10]. Instagram has been proved as an essential tool for tourists to express their experiences, in which, about 45% of users reported travel as their top interests on Instagram [12]. However, since the existing research often addressed Instagram from the perspectives of destination marketers, the antecedents of sharing photographs on Instagram remain ambiguous. Scholars also claim that the role of Instagram is in its infancy in the content of travel and tourism [6, 8, 9].

Due to the strong social presence and the growth of social media, sharing travel experiences online merits attention among scholars and practitioners [2, 13, 14]. Understanding the motivations behind one's posting behaviour is valuable in that it provides deeper insight on the social, cultural and environmental characteristics of travellers, and thereby offering marketers suggestions to improve their management and marketing strategies accordingly [15]. An earlier study categorises factors influencing users' online behaviour according to the type of content and the type of social media into individual action and personal cognition motivation, self-centred motivation and community-related motivation [16]. Other scholars suggest that consumers use social media to share experiences because of the need for higher social status [17, 18], entertainment [17], social interaction [16], belongingness [16], and documentation [19], among many others. Given that tourists are influenced by various implicit and explicit motives to use social media during trips, Instagram as the most popular site for travel posts [20] remains underexplored.

Seeing the potentials of Instagram in optimising strategic planning and tourism promotion, this cross-domain study brings together social psychology, motivational theories, and social media in tourism. The objectives of this research is (1) to develop a conceptual framework for the motivations of tech-savvy tourists to post on Instagram while travelling and (2) to categorise tourists into different segments according to their characteristics. Theoretically, this study contributes to the body of literature on Instagram and tourism, and extends the existing knowledge on consumer behaviour in the digital sphere. Practically, the current study provides insights for tourism marketers to evaluate and improve the effectiveness of marketing strategies based on tourists' internal and external motives of using Instagram.

2   Literature Review

Motivations refer to one's enthusiasm for doing something [19], which can be classified into intrinsic and extrinsic triggers. The former suggests that the engagement of behaviours arises from within an individual, whereas the latter is driven by the motives to gain external rewards/avoid punishment [21]. Examples of intrinsic factors are enjoyment, emotional connection, self-identification, and self-expression. Extrinsic motivations include economic incentives, personal goals, and social networking.

Specific to Instagram-related literature, knowledge about others, selfdocumentation, coolness, and creativity are proved to be the most influential reasons for consumers to use Instagram [22]. Different from Facebook or Twitter, users often engage in the Instagram community to keep up with what their friends, family, or strangers are doing [22]. Another study takes the psychosocial factors into account, suggesting that enjoyment serves as a crucial factor for users to devote time to Instagram [23]. Other scholars claim that social media functions as a platform for consumers to present the best of themselves [24]. Accelerated by emerging visual-centered digital platforms, individuals can express and project different aspects of the self through photographs [24]. For instance, Eckhaus and Sheaffer [25] underpin that sharing content on social media improves the extent of self-esteem. Similarly, another research identifies self-expression as one of the main factors of using Instagram [23].

Apart from individuals' self motives, tourists also share travel-related photographs in an attempt to gain social status and prestige [17,18]. Tourists could fulfil prestige by visiting destinations that impress their friends and family [26] or experiencing something others have not travelled to [27]. As social media features instantaneity by nature, tourists can already gain gratification and recognition even during the trip [18] by uploading photographs in real-time. This foreseeable reward thus fosters tourists' intentions to use Instagram while traveling. The uniqueness of each tourism experience implies that tourists can receive different kinds of social return from other online users [18] through liking, commenting, and sharing behaviour [6].

While investigating the fundamental motives to share experiences on social media has received tremendous interests, it appears that there is no general consensus among researchers. Some studies support the notion of external motivations [16, 28], while others argue that internal motives are the most influential drivers affecting user behaviour [17, 21, 23, 24, 29]. Therefore, driven by the sophistication of psychological, social, and environmental factors, the diversity of tourists' posting behaviour on Instagram during trips calls an urgent need to develop a holistic framework to better understand the underlying characteristics of tech-savvy tourists. The development of the conceptual model is explained in the following methodological sections.

3   Methodology

This research adopted a triangulation of a diary study and a survey method to identify tourists' motivations to post on Instagram during trips. Methodology consisted four steps: (1) conducting diary studies, (2) refining the conceptual model, (3) developing the survey and collecting data, (4) implementing path analysis and cluster analysis.

3.1 Step 1: Diary Study

First, diary studies serve as the basis for developing the survey instruments. This technique is particularly suitable for research topics that have not been widely investigated [30] (e.g. users' motives to post on Instagram in the tourism domain). A convenience sampling technique was applied. With a particular interest on Instagram, the selection criteria was based on potential participants' activities on Instagram such as the frequency of sharing travel pictures and regular updating. Moreover, to guarantee effective memory retrieval, participants were required to have at least a one-week travel experience between July to September 2019. A pilot diary study was conducted first with three participants to minimise confusion and misunderstanding of the instructions. Eventually, ten individuals age between 18 to 28 were selected to participate the diary studies. Participants were asked to make a diary entry online whenever they posted a picture on Instagram while traveling.

3.2 Step 2: Refinement

Researchers manually read through each of the diary entries. The content was coded into various motivational factors based on literature, including enjoyment, selfesteem, social ties, recognition, interests, social norms, goals, self-efficacy and outcome expectations. Meanwhile, memorabilia was identified by the researchers as an additional trigger that is rarely mentioned by other scholars. In this case, memorabilia refers to the behaviour to share travel pictures for personal collection and storage of memories. These items hence served as the basis for the development of the survey.

3.3 Step 3: Data Collection and Survey Development

The questionnaire consisted three parts. The first section contained screening questions to ensure that the participants belong to the young tech-savvy generation. Specifically, this research took the notion of 'digital natives' [31], defined as the contemporary users of technologies born between 1977 and 1997. Additionally, participants inactive on Instagram during trips were excluded. The second section focused on the relationship between tourist behaviour in the context of sharing pictures on Instagram while traveling and the intrinsic and extrinsic factors. According to the identified motivations in step 2, this study summarised a list of 47 statements to measure 11 motives based on previous research [16, 17, 32, 33] (i.e., enjoyment, self-esteem, recognition, interests, social norms, goals, social ties, social status and prestige, selfefficiency, outcome expectations, and memorabilia). A 6-point Likert scale was adopted (1 = strongly disagree; 6 = strongly agree). The last section concerned with demographic information and participants' general usage of Instagram.

Note that this study did not rely on existing scales. Instead, measurements were based on previous literature and the results derived from the diary studies. To ensure the validity of the questionnaire, the scales were first assessed using Cronbach's alpha. Data collection was conducted in November 2019 through email invitations and social media sharing on Facebook and Instagram. No incentives were given. A total of 376

young tech-savvy tourists completed the survey. Table 1 presents that the framework is reliable and has internal consistency.

Table 1. Cronbach's alpha results for questionnaire items.

Motives	Cronbach's alpha	Number of items
Goals	0.606	4
Interests	0.676	4
Social status and prestige	0.686	4
Social norms	0.748	4
Outcome expectations	0.730	4
Self-efficacy	0.729	5
Memorabilia	0.829	4
Enjoyment	0.857	4
Recognition	0.636	4
Self-esteem	0.678	6
Social ties	0.552	4

3.4   Step 4: Data Analysis

This research first presents the participants' demographic background and their behaviour of using Instagram and posting pictures during trips. Next, to investigate the causal connections between variables to refine the proposed conceptual framework, path analysis was implemented to assess the relationship between the motivations to post on Instagram while travelling and the observed motivational factors.

A hierarchical cluster analysis was implemented to identify distinct traveller segments based on the 11 types of motivations to publish content on Instagram while travelling. The technique is particularly suitable for this study because it does not require one to pre-set the groups. Cophenetic correlation was calculated to identify optimal linkage. Next, Python was adopted to analyse the silhouette scores and Calinski–Harabasz index to determine a cluster solution in terms of interpretability, explanatory power and parsimony. A dendrogram was first generated from the whole sample. ANOVA was applied to examine whether the means of established clusters are significantly different from each other. The mean values of motivational factors were compared for all clusters. Finally, four types of tourists were identified based on their motives to post on Instagram during trips.

4   Results

4.1   Demographic Profile

A total of 376 digital natives (male = 32.7%; female = 66.5%; other = 0.8%) participated in the study. Regarding their age, 76.6% are under the group of 18–24, 22.1% belong to 25–34, and 1.3% are over 34. The participants are composed mainly by

Austrian (62%) and German (15%), followed by Norwegian (3%), and Romanian (2%), among others. Most of the respondents have been using Instagram for more than 3 years (67.3%), followed by 2 to 3 years (16.5%), 1 to 2 years (11.4%), and less than one year (4.8%). They mainly post monthly (44.7%), few times per month (27.4%), weekly (16.2%), few times per week (5.9%), or daily (4.5%). With regards to the indicated importance of posting on Instagram, 77.2% of travellers indicate that posting on Instagram is either somewhat important or important. Moreover, most people post photos either frequently (28.7%) or occasionally (46.8%). 10.1% indicate that they always post, while 14.3% of participants rarely post on Instagram. It is noticeable that the majority of travellers post on Instagram at the end of the day (61.4%), followed by those who post at the end of their trip (26.1%). Just 12.5% of respondents post their experience immediately after taking the photo.

4.2   Motivation to Post on Instagram While Travelling

A descriptive analysis of the observable variables was performed, before going into details with the path analysis. It turned out that interest, followed by memorabilia and self-efficacy are the most important factors to post on Instagram. The lowest valued items were social norms, recognition, outcome expectations and prestige. Thus, it becomes clear that travellers have very complex reasons to post on Instagram and the traditional large bundles of motivation (e.g. egocentric motivations, narcissism, community-related motivations, individual action and personal cognition) are decisive. Hence, each of these factors consists of a diverse set of variables that have various influences on the overall motivation to post on Instagram while travelling.

4.3   Path Analysis

Path analysis was used to determine the correlations between motivational factors and the actual motivation to post on Instagram while travelling. The model was tested using a covariance matrix and maximum likelihood estimation (Fig. 1).

The latent variable "Motivation to post on Instagram while traveling" should be explained with the following observed variables: enjoyment, self-esteem, social ties, recognition, social status and prestige, interests, social norms, goals, self-efficacy, outcome expectations and memorabilia. The developed model indicates that all variables have a significant influence on the motivation to post on Instagram while travelling. Ultimately, it was found that the variable interests precedes the variables enjoyment, social ties and memorabilia, and thus a better model fit could be achieved for the final model. The factor of memorabilia influences the outcome expectations which further influences self-efficacy.

According to Fig. 1, all relationships are significant at a significance level of p 0.001. Only between memorabilia and overall satisfaction there is no significant correlation. Several indices were used for the model fit. The Goodness of fit index (GFI) showed a good model fit with a value of .871. The values for normed fit index (NFI) and comparative fit index (CFI) were .88 and .89 respectively, indicating an acceptable fit to the data. The Root Mean Square Error of Approximation (RMSEA)

value was too high with .129, which however could be explained by both, the relatively sample size and the model size [34].
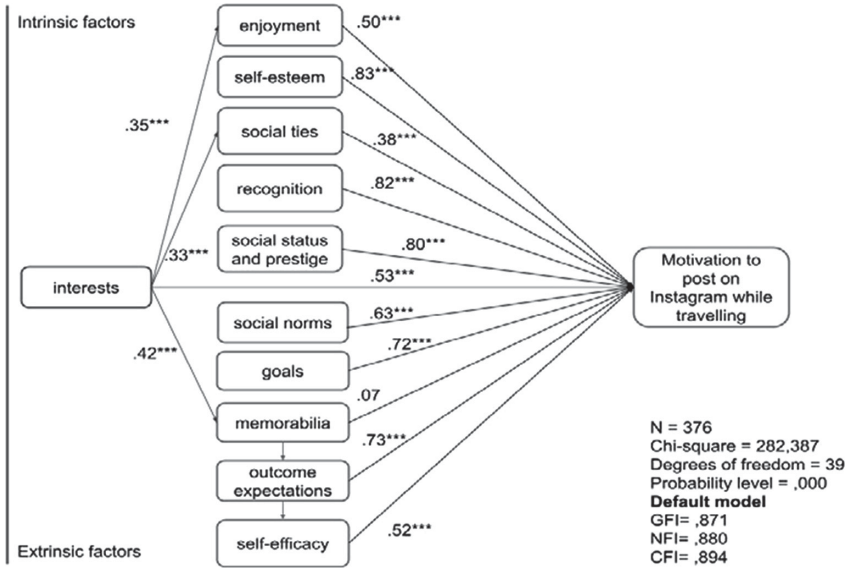

Fig. 1. Correlations between observed variables and the motivation to post on Instagram.

4.4   Cluster Analysis

Finally, a hierarchical cluster analysis was carried out to segment the travellers into ideal-typical, homogeneous groups according to their Instagram usage behaviour. The validation was conducted using the cophenetic correlation, in which, the average linkage method (0.58) outperformed the values of single linkage (0.37), complete linkage (0.48), and Ward (0.47). Next, based on average linkage method, silhouette scores were analysed in Python and presented a four-cluster solution (Table 2). The four-cluster solution was then evidenced by Calinski–Harabasz index (Fig. 2).

Table 2. Initial selection of cluster number based on silhouette scores.

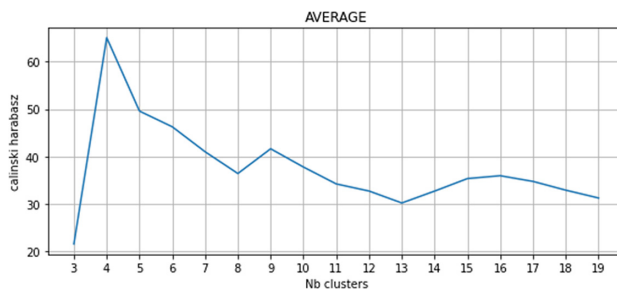| No. of cluster	3	**4**	5	6	7	8	9	10
Scores	21.57	**65.05**	49.57	46.26	41.00	36.41	41.63	37.76

Fig. 2. Calinski–Harabasz index.

These four clusters are named as "The Charming Adventurer", "The Silent Spectator", "The Photo Collector" and "The Immersed Creator". ANOVA analysis found significant differences between all clusters regarding the constructs. It is important to note that in general the scores of interest, memorabilia and self-efficacy are among the highest for all clusters, which means that those are the most common influential factors for motivation to post on Instagram while travelling.

The Charming Adventure: The largest cluster, with 156 participants is characterised by a relatively high interest value (mean of 4.6) but rather low scores on prestige, recognition and social norms (means between 1.9 and 3.1). They post photos for enjoyment (mean of 4.08) and memorabilia (mean of 4.77). Their motivations are more intrinsically than extrinsically oriented. Instagram is of high importance for members of this group. People in this cluster have used Instagram on average since 2 to 3 years and open the app multiple times per day. They tend to post a lot while travelling and Instagram is a way for them to establish social ties.

The Silent Spectator: With 99 participants, this cluster represents the secondlargest group. People in this cluster score moderately high on community-related aspects such as prestige and social norms, and rather high on individual action and personal cognition scores (means between 2.5 and 3.6). Self-efficacy and outcomes are important for this group. Although they do not post regularly, Instagram is a must for members of this cluster. They are more active especially when traveling.

The Photo Collector: This cluster (73 respondents) contains the most passive Instagram users. These travellers consider that posting on Instagram while travelling is not that important (mean of 2.67 compared to 3.16 and higher for the other clusters). Members of this cluster tend to post for themselves, for memorabilia reasons (mean of 3.36 – highest value compared to the other clusters), outcome expectations or self-efficacy. They use Instagram regularly and many times per day but post much less while travelling than other groups.

The Immersed Creator: The smallest cluster, with 48 participants, shows the highest scores on all categories. These travellers use Instagram the most out of all the clusters (mean of 2.48 compared to 2.28 in Cluster 1, 2.09 in Cluster 2 and only 1.89 in Cluster 4). They are very active Instagram users and have been using the app for 2 to 3 years.

They consider memorabilia, interests, and enjoyment as the main drivers to share pictures on Instagram during trips. They are posting the most while travelling and they think that posting on Instagram is moderately important to them.

5   Conclusion

As motivations are the primary drivers of purchase decisions, it is critical for tourism providers to understand tourists' physiological and psychological needs and wants in order to refine their marketing strategies. Seeing the power of user-generated content, investigating users' motivations to post on social media has been an emerging topic within the academia [22–24]. With a particular focus on Instagram, although recent research has attempted to bridge Instagram to tourism [7–9], the internal and external motives for young tourists to post on Instagram during trips are underexplored.

The current research thus presents a motivational framework and classifies tourists into four distinct segments. In line with previous literature [17, 21, 23, 29, 32], this study affirms that enjoyment, self-esteem, social ties, recognition, interests, social norms, goals, self-efficacy, outcome expectations and prestige, are related with users' motivations to post on Instagram while travelling. Notably, in addition to the fact that users would like to elevate their status and gain prestige by sharing on social media sites [25, 35], this study uncovers other factors that are more internal and self-centred such as recognition, enjoyment and self-esteem. This result can be interpreted from the nature of Instagram which focuses on visual content. Unlike other platforms such as Twitter and Facebook, Instagram functions as a social media site for individuals to present the best of themselves through photographs [24]. Furthermore, different from Facebook featuring a closed-knit community of people know each other, Instagram allows users to build and join communities according to their own interests. Thus, Instagram potentially decreases one's intention to be recognised within his or her social network. In the case of travelling, self-efficacy and outcome expectations are found to be more influential on affecting users' motivations to share on Instagram. In addition to the factors commonly mentioned by previous studies, the current research is novel in that it reveals 'memorabilia' as another crucial motive for tourists to post pictures on Instagram, which has never been mentioned in previous motivational research. Nevertheless, this finding is somehow in line with some recent studies, suggesting that taking photographs function as a way to create personal collections of memories [36, 37].

Moreover, this research proposes charming adventurers, silent spectators, photo collectors and immersed creators as the dominant tourist segments when sharing travel experiences on Instagram. First, charming adventurers mainly post for their own benefit and enjoyment but not for the sake of community relations. This contradicts to the study of van Dijk [38], where social ties are not directly linked to external motives. Instead, the current research discovers that social ties affect trust and recognition, and thereby leading to individual motivations and behaviours. As for silent spectators, members of this cluster also tend to be more influenced by the community's norms and are expecting a certain outcome from the posts they share while travelling. Next, photo collectors are considered as the most passive tourists on Instagram because their main motivations are to post for themselves for the purpose of saving memories. Though,

'memorabilia' is in fact similar to souvenirs. It is well-known that tourists have impulse to commemorate their experiences by purchasing souvenirs [39]. With improvements in technologies, souvenirs can be presented in the form of visual narratives. A recent study suggests that by analysing memorabilia, marketers can understand more on tourists' preferences and psychological needs in order to facilitate the creation of meaningful travel experiences [40]. Lastly, immersed creators share pictures not only for their own benefits but also for the community. Storing memories and reflecting on their interests are the most important motives for them, followed by enjoyment.

On the whole, this study extends the existing knowledge on Instagram and tourism by conceptualising an Instagram motivational framework concerning with users' posting behaviour. Specifically, first, this research goes beyond travel experiences that have been often investigated by recent studies. Meanwhile, unlike most of the literature that considers young travellers as the same group of Instagram users, this study clusters digital natives based on their characteristics of Instagram usage. By looking at the intersections of social psychology, motivational theories, and social media in the context of tourism, this research highlights the significance in incorporating tourists' behaviour as well as their internal and external motives of using Instagram in the era of digitalisation. Practically, by understanding tourists' motivations, marketers and tourism-related businesses can improve their media communication and marketing techniques accordingly to boost tourists' intentions to share photographs on Instagram in the multiphasic travel stages. Finally, marketers are recommended to develop various strategies based on digital natives' characteristics to maximise the effectiveness of communication strategies through Instagram.

Nonetheless, the current research is not without limitations. First, this research implemented a convenient sampling method, in which, the participants are dominated by Austrian and German. Readers should bear in mind the potential cultural differences between users on Instagram on different continents. Furthermore, given that this is the first study to propose a motivational framework for Instagram travellers concerning with their posting behaviour, future research is recommended to further validate the results due to the infancy of the study context. On a broader marketing discipline focusing on social media, future studies are suggested to investigate whether the proposed model can be adopted in other similar social media sites such as Pinterest. Lastly, this research reinforces memorabilia as an emerging but underexplored field in studies related to user-generated content. Scholars are thus encouraged to continue this line of research in various digital context such as YouTube, Facebook, and online travel review platforms.

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Dreaming About Travel:
A Pinterest Netnography

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Abstract. Ongoing travel information search remains under-examined in general, and specifically in terms of social media use. Understanding how visual social media platforms inspire travel dreams is increasingly pertinent as visual contents gain in importance. This is especially relevant when travel is restricted, such as during the COVID-19 pandemic. Pinterest seems to be ideally suited for supporting ongoing search but has been rarely used as a data source in e-tourism research. This paper uses a netnographic approach to explore travel-related Pinterest data. From a methodological perspective, it finds that the platform is suitable for informing ongoing travel information search research but points to potential methodological challenges. As a theoretical contribution, it highlights the popularity of capturing travel dreams through Pinterest boards and illustrates the affective labor users put into their collections of travel dreams. The paper concludes with implications for tourism marketing and recommender system design.

Keywords: Ongoing information search · Dreaming phase · Netnography

1 Introduction

"Dreaming about travel" as a stage in the travel process that involves looking for inspiration is generally recognized as an important phase because of the hedonic value to consumers and the persuasive potential for tourism marketers. In practice, it is often very narrowly defined as information search without firm travel plans and as starting when travelers think of their next vacation [1]. As such, it initiates a trip cycle or travel customer journey [2]. From a theoretical perspective, dreaming about travel is a more loosely defined concept that involves ongoing information search without any relation to a specific trip. It entails building up a general knowledge base for unspecified future travel and can last for a lifetime [3]. Visual contents are particularly important in the dreaming phase [2] and the visual turn in social media contents and use [4] seems to indicate that social media have become even more suitable for supporting travelers in imagining their dream vacations. Despite the theoretical need to understand how consumers construct their travel dreams and the practical necessity to identify what types of information sources and channels inform the process, little is currently known about this "dreaming" phase.

The Washington Post [5] reports that even, or maybe especially, during the travel restrictions imposed by the COVID-19 pandemic, Internet users have been busy

looking for inspirational content, including travel-related information. It mentions Pinterest as one of the platforms where consumers look for travel ideas. Indeed, Pinterest seems to be ideally suited for catering to ongoing information needs as it allows users to create extensive curations of contents they find relevant or motivating. Since its inception, the platform has included a default board called "Places I'd Like to Go" to which users can pin travel contents. Surprisingly, little is known about Pinterest as a source of travel inspiration. The research in this paper therefore seeks to explore Pinterest data and its suitability as a data source for research on ongoing information search. It also aims at deriving preliminary insights on the kinds of ongoing searches Pinterest users engage in and the patterns that emerge from their pinning activities.

2 Literature Review

2.1 Ongoing Information Search

While information search has been a central topic in tourism research [6], theoretical progress on the role of technology, and especially social media, in supporting travel information search has been slow [7]. This is particularly true for ongoing information search, which has received very little attention in the literature. Although mentioned in traditional travel information search models [3], its conceptualization in online contexts and its measurement have received little attention [8, 9]. It is typically buried in the "prior knowledge" category when discussing information search [10], without considering how it comes about and what role social media play in its construction. Alternatively, it is explained away with enduring involvement in travel and mixed up with activities that express it, such as subscribing to travel magazines. Social media represent a unique opportunity to explore ongoing travel information search as they make related processes explicit and provide records of the "travel dreams" users construct when engaging with contents. As explained above, Pinterest seems to be particularly important for travelers as an external memory device that supports ongoing searches.

2.2 Pinterest

Pinterest was founded in 2010 and has since grown to over 400 million monthly active users [11]. It is an image sharing platform which also features an AI-powered visual search engine that allows users to discover contents. Users, so-called Pinners, curate online contents in the form of pins that are either directly uploaded to the platform or link to contents available on the Internet. As such, it differs significantly from other platforms like Instagram or Facebook that allow for the sharing of contents but not their thematic organization. These pins are organized into boards that represent different topic areas. The pins consist of an image with a short label and an indication of whether the pin was created by the user or repinned from other Pinterest accounts. Such repinning is actively encouraged by the platform through daily emails that make suggestions and by featuring "related ideas" within the boards themselves. The platform currently houses over 200 billion pins organized into 4 billion boards [12].

While the platform is global, users from the United States still dominate [13]. Almost 70% of the users are between 18 and 49 years old [14] and the majority of users (71%) are female [12]. In the United States, Pinterest reaches 83% of women aged 25–54; this group makes 80% of the buying decisions in US households [15]. Importantly, 89% of US Pinners use Pinterest for inspiration in their path to purchase [15].

Compared to other social media platforms, tourism-related research on Pinterest or using Pinterest data is almost non-existent. Existing studies explored the adoption of Pinterest for destination marketing [16] and analyzed the destination image of Japanese cities using Pinterest data [17]. Research on pins that show celebrities at airports is also tangentially related to tourism [18]. More recent studies conducted an automated analysis of Thailand's destination image using Pinterest [19] and analyzed the heritage destination images shared on the platform [20]. Overall, the potential of Pinterest to inform tourism research remains grossly underexplored.

3   Methodology

Netnography is a qualitative research method that allows for in-depth, contextual understanding of data derived from websites, social media or mobile phone applications [21]. Such deep understanding of Pinterest as a platform and of its users and uses in the context of ongoing travel information search was deemed necessary to inform this research. Netnography has been used extensively in tourism research to study a wide range of phenomena [22, 23] but seems underused in the e-tourism field, despite the "natural fit" pointed out in [24]. In contrast to other qualitative methods for digital data collection and analysis, netnography provides an explicit set of operational procedures [21]. These are organized into six procedural movements related to finding research questions (initiation), collecting data (investigation, interaction, immersion), analyzing and interpreting data (integration) and communicating the results (incarnation). The initiation phase includes ethical considerations. This research only collected small-scale, publicly available data and used pseudonyms when referring to specific Pinterest users.

3.1   Data Collection

Two netnographic data collection operations (investigation and immersion) were combined in this research. Investigation involves the systematic collection of existing digital data while immersion describes the researcher's "inhabitation" [21, p. 140] of relevant digital spaces. The data site for this research was pre-determined because of the theoretical and methodological interest in Pinterest as a platform that specifically caters to ongoing travel information search.

Immersion. Immersion is a signature move for netnography as it fosters engagement with the data in context. Rather than being focused on quantity, length or intensity of participation, immersion in netnographic research is data-centric and involves the search for deep, insightful data. According to [21], immersion encompasses reconnoitering, recording, researching and reflecting and has sense-making as its ultimate

goal. Data is recorded in the form of an immersion journal to support the curation of insights.

The author signed up for Pinterest shortly after it became publicly available in the United States and has been using the default "Places I'd Like to Go" board ever since (Fig. 1). Thus, the netnographic immersion could build on a decade's worth of experience with the platform, its notification emails and the activities of other users. The exposure to Pinterest was intensified for a four-week period in 2020. It focused on exploring travel-related boards of other Pinterest users and noting interesting patterns that emerged in terms of structure as well as contents.
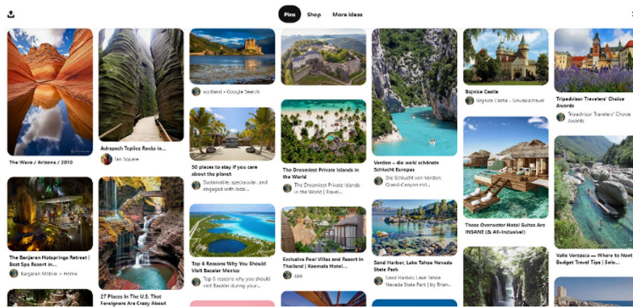

Fig. 1. The author's "Places I'd Like to Go" Pinterest board.

Investigation. The standardized "Places I'd Like to Go" boards served as the sole data site for the investigative part of the netnography. These boards were accessed through a simple board-based search on Pinterest using the exact title. Pinterest displays thousands of boards for this search but does not provide an exact number of search results, neither is the ranking of the results clear. The order of the boards also changes somewhat when the search is repeated. While this is not particularly problematic but still annoying for qualitative data collection, it constitutes a challenge for systematic data sampling. To allow for exploration of the potential for automated analysis, the first 100 boards that appeared in the search results and represented individual users rather than corporate accounts were selected. The search was conducted in September 2020.

For these boards, the URL of the board, the number of followers, the number of pins, and the username of the board creator were manually captured in a spreadsheet as these were the types of information readily available for every board. The display of the pins changes dynamically, and is interspersed with advertisements. Also, pins have a standardized width but can differ substantially in length and can span several rows. Only the top row does not change and was therefore used for sampling purposes. This row contains a maximum of 7 pins but often only displays 6 images as some boards have pin suggestions in the first pin position. Even though the boards are clearly travel-related, not all pins are. Only pins that featured travel-related contents were considered. Pinning mistakes happen quite frequently as Pinterest automatically selects the most likely board/section to which the pin belongs. This means that inconsistent data

structure and data quality are an issue [25]. A total of 609 pins were considered for analysis.

The coding of pin contents was conducted by the author and involved simple determination of the presence or absence of image features. No distinction was made between videos, composite images and simple still images as the image modality does not necessarily affect manual coding; however, the different types of image contents could be problematic for automated analysis.

Location of the displayed image was coded at the continent level. The coding also involved the identification of popular image categories. The emphasis was on features that could be easily identified by visual search engines/image classification algorithms but also hint at the types of vacations Pinners are dreaming about. A group of 10 boards identified during the immersion phase was used to derive these categories and resulted in eight features that were coded: 1) water (ocean, lakes, rivers, pools, waterfalls, etc.); 2) mountains; 3) beaches; 4) cityscapes; 5) snow & ice; 6) churches or temples; 7) food, and 8) animals. This coding scheme was then applied to the main sample of pins.

3.2   Data Analysis

Netnographic analysis of data is flexible in that it allows for deductive, inductive and abductive reasoning as well as telescopic and microscopic levels of analysis [21]. The data analysis for this research was inductive and occurred at both levels. Structural patterns provide important contextual information that allow for interpretation of detailed findings. Structural analysis was also necessary to inform methodological considerations regarding the suitability of Pinterest data for automated forms of data analysis. The structure and content of the 100 Pinterest boards were explored through descriptive statistics to reveal such larger patterns in the data. The analysis was interwoven with insights from the immersion data. At the microscopic level, the analysis involved in-depth exploration of individual boards and identification of interesting patterns within and across these boards. During the analysis, a total of four cases were identified as particularly illustrative of the diversity of board structures and contents.

4   Findings

The findings illustrate the richness of data about ongoing travel search readily available through Pinterest, demonstrate the flexibility of netnography in terms of zooming in and out of data to explore insights at different levels, discuss how the platform shapes travel dreams, and present commonalities and differences across Pinners and boards.

4.1   Descriptive Analysis of Pinterest Boards

As mentioned above, 100 "Places I'd Like to Go" boards on Pinterest were analyzed in terms of their characteristics and top row contents. The results of the descriptive analysis indicate that there is diversity in the boards but also suggest some interesting trends. They further hint at methodological challenges for automated types of analysis.

Creators. The creators of these boards were overwhelmingly female (94%); only 5% were male and one creator's gender could not be identified. In general, the names were easily assignable to one gender or the other but for several cases the profile picture was needed to identify the gender. In a handful of instances, it was necessary to click on the creator profile and read their description to assign a gender. While most names appeared to be first names of European or North American origin, the location of the creators was indeed not identifiable through just the Pinterest account.

Followers. In terms of followers, the boards ranged between 68 and over 2.1 million, with a mean of 29,009 and a median of 512 followers. It is quite astonishing that all boards had followers and that many had a substantial number. The follower statistics suggest that these travel boards are not only public but represent travel dreams that are actively followed by others who will be notified when new pins are added. That this platform-facilitated inspiration of others is happening was evident in pins that appeared across several boards, even in this small sample of boards.

Pins. As far as the actual pins are concerned, the 100 boards contained a minimum of 85 and a maximum of 11,201 pins. On average, they contained 1,098 pins, with a median of 655. Only one board had over 5,000 pins. It is evident that Pinterest users put in quite a bit of effort over time into constructing these boards and have a substantial collection of travel information available at their and other's disposal. Interestingly, the correlation between the number of pins and the number of followers was insignificant ($r = -.048$; $p = .637$). This is somewhat surprising as one would assume that boards with a small number of pins have a smaller number of followers and vice versa. One possible interpretation is that Pinterest users predominantly create these boards for their own benefit rather than for others.

Contents. The coding of the location of the pins was quite difficult in that there is no automatic location tag and the location is rarely indicated in the picture and often not even in the pin label or associated link. Often the links did not work. Further, the pins rarely contain iconic destinations. Only one picture of the Eiffel Tower was visible in the over 600 pictures analyzed. Some pins are so generic (e.g. trees in the fog) that even after clicking through the associated link, no location could be assigned. Other pins related to multiple locations (e.g. best beaches around the world) and, thus, could not be assigned to a specific continent. Human judgment was needed in almost all instances to correctly classify the location, and even though only the top row of the boards was analyzed, this required substantial time investments. For 564 pins (93%), the location could be identified in this way.

Despite these difficulties, some interesting results emerged, even for high-level coding at the continent level. First, no pins displayed in the first row of the board related to destinations in Antarctica and five pins each were located in Africa and in the Middle East. Most surprisingly, only 9 boards displayed destinations in the Pacific, although Australia, New Zealand and the South Pacific island nations often fill the pages of travel magazines and are generally considered as highly aspirational destinations. Central & South America were only present in 11% of the boards (16 pins in total) and 19% of the boards displayed an Asian destination in their first row. Europe and North America clearly dominated the boards, with 63% of boards featuring at least

one European destination and 71% showing at least one pin from North America in their top row.

While the analyzed pins represent the most recent pins for each board, the actual date the pin was added is not displayed. The platform has a new option to add date ranges to boards, but users (including the author) do not seem to limit their "Places I'd Like to Go" boards to specific time periods, confirming the ongoing nature of their efforts. Thus, while there is some indication that recent pins do not include many exotic destinations, a direct link to the COVID-19 pandemic cannot be made. Only two pins directly spoke to travel restrictions: one featured the best virtual tours around the world and was labeled "Can't travel?", while the other presented "family staycation" ideas for spring break. Most rows (56%) displayed pins from more than one continent, suggesting that the travel dreams of Pinners generally involve at least some long-haul travel.

As described in the methodology section, the coding of the contents further involved the identification of easily detectable features that speak to the types of destinations or vacations Pinners dream about. Only one board did not have any of the coded features in its top row. What stands out is that 90% of the analyzed boards display at least one image with a water-related feature. In contrast, only five of all analyzed pins contain animals. Equally rare to find were churches and temples. Surprisingly, while the "sea" portion of the "sea, sand and sun" vacation stereotype appeared prominently across the boards, only 42% of the boards displayed an image of a beach and 28% even showed snow or ice. Mountains and cityscapes were equally popular, with 39% of boards including at least one respective image. A small number of pins (27 in total) spread over 19% of the boards related to food.

Other categories that emerged but were not specifically coded include general "bucket lists" or more specific "best places in X" lists, hinting at the role of these boards in providing inspiration at various levels. Further, quite a few images related to specific hotels, restaurants or attractions, suggesting that Pinners do not just dream of destinations in the sense of geographic locations. Moreover, maps that displayed itineraries or clusters of attractions were included in several of the boards, indicating that Pinterest boards are used to archive information that directly helps with later travel planning.

4.2   In-Depth Analysis

The four boards selected to represent the in-depth analysis display a broad range in terms of their structure, size, popularity and contents. They provide diverse content types and describe travel dreams at different levels of specificity. They illustrate what contextual information can be easily derived through qualitative analysis of boards and what insights are possible in terms of the ways different Pinners go about structuring their ongoing travel searches.

Katy. This 45-year-old Pinner (the year of birth forms part of her username) lives in Texas (her 68 boards pertain to things like cowboy boots, quilts, pies, Tex Mex food, Hill Country Living and Texas Courthouses). Her profile has over 23,000 followers overall and almost 250,000 pins. Her "Places I'd Like to Go" board and a board called

"Favorite Places & Spaces" are her only travel-related boards, with the latter pertaining to places she has already visited. The "Places I'd Like to Go" board has 2,727 pins and 1,300 followers. Katy clearly dreams of road trips to national parks in the United States and Canada. Her board is dominated by views of mountains, glaciers, rivers, canyons, waterfalls and empty roads winding through picturesque landscapes. Despite this focus on nature, her pins are almost completely void of animals. Katy also dreams of seeing fall colors and snow. A few stray pins pertain to beach vacations (mostly Florida and Hawaii). There are quite a few pins about destinations in Europe. Regarding more "exotic", long-haul travel, Katy appears to dream about going to the Maldives, the U.S. Virgin Islands, Madagascar, Japan and several places in China. One of her China pins (Rainbow Mountains) is a pin that appears on many Pinners' travel boards. Katy also pins antiquing-related destinations and likes inspirational lists like "Premade Vacation Itineraries", "12 Awesome Oregon Coast Vacation Rentals for Less Than $100" and "5 Spots in Alberta that Will Blow Your Mind".

Chloe. A vocalist from Florida, Chloe uses Pinterest mostly to collect baking and holiday decoration ideas. Her 73 boards have over 25,000 pins and her profile is followed by more than 2000 Pinners. Chloe has four travel-related boards, although only two of them have more than 25 pins, namely her "Places I'd Like to Go" board (424 pins, 686 followers) and her "Caribbean Travel" board (72,857 pins and 33,790 followers). Chloe's "Places I'd Like to Go" board seems to have changed about mid-way. Her earlier pins were a mix of European destinations with a few more exotic places like Jordan, Egypt and Belize. She also went through a Great Britain phase, with a cluster of pins showing British towns and Scottish castles and landscapes. Notable is also her love for European churches. Her more recent pins are almost exclusively about beaches. Featuring destinations from Fiji to Greece and the Philippines, the pins display picturesque, sandy beachscapes with palm trees, shells and sailboats in the background. Her board looks like a vision board, with motivational pins that say thinks like "Dear Beach, I think of you ALL THE TIME". There are no maps, no itineraries, no hotel-related pins or anything else that would hint at actually planning a trip. Chloe dreams of traveling to serene, empty beaches, no matter where in the world they are.

Rheanna. This African American woman in her late 30s who lives in Maryland has 6,000 followers and 40,146 pins distributed over 93 boards. She pins about a lot of things, from weight loss and fitness to gift ideas and home decorating. She has a total of 11 travel-related boards that feature destinations like Egypt, Paris, New Orleans, Thailand, Jamaica, Greece and Bali. Two of her boards pertain to the planning concrete trips. Her "Places I'd Like to Go" board has 788 pins and 361 followers and stands in stark contrast to Chloe's board as it is filled with practical travel pins and bucket lists. From tips for solo female travelers, to in-flight beauty recommendations, long-haul flight survival guides, packing lists and "how to travel on a budget" and "how to take travel selfies" advice, her board is full of information that pertains to trip logistics and acquiring travel skills. While New York City and Los Angeles seem to dominate her board, the bucket lists relate to destinations all over the world, from Dubai and Paris to Thailand. While Rheanna clearly dreams of traveling the world, she also seems to have a lot of anxieties and financial constraints regarding travel.

Laura. Laura is in her 40s and lives in Colorado. Her Pinterest profile is followed by 399 users and features 7,077 pins that encompass topics such as wine, beauty tips, tattoos, hairstyles and crafts. Of her 37 boards, four are travel-related, with specific ones relating to Beirut, Idaho and Sicily & Malta. Her "Places I'd Like to Go" board has 342 followers, 834 pins and 27 sections for particular destinations (Table 1). Two sections stand out because of their direct relevance to dreaming about travel: "I dream of Morocco" and "Travel Dreams". The Morocco section has pins with itineraries, lists of "hidden gems", restaurants, accommodation, and tips for women. It also has several pins that are clearly not related to Morocco, confirming the data quality concerns raised earlier. The "Travel Dreams" section features pins that speak of "breathtaking", "stunning", "ultimate", "fairytale", "awesome", "most creative" and "Instagram-best" destinations all over the world.

Table 1. Laura's "Places I'd Like to Go" Board Sections.

Section title	#Pins	Section Title	#Pins
Nicaragua	1	Kona Hawaii	12
Guatemala	3	Stateside	17
Girls Trip	3	Spain + Portugal + Chefchaouen	31
Chile	2	Italy	41
Madagascar & Seychelles	4	Netherlands and Belgium	76
Amalfi	2	Turkey	172
Balkans	11	Sicily	44
Sri Lanka travel	6	Paris trip	8
Lebanon	2	Malta	43
Tahoe trip	4	Travel Dreams	52
France	15	Cuba Bound	53
Greece	34	I dream of Morocco	67
Peru	8	Vacation Excitement	35
Travel Wardrobe	34		

Her "Places I'd Like to Go" board only has 54 pins that are not assigned to any section. They encompass a random collection of pins that discuss when to visit different destinations, what to buy on a trip to Turkey, most iconic hotels in the world, best tapas bars in Seville, things-to-do in Kathmandu, etc.

5   Discussion and Conclusion

The results demonstrate that Pinterest is used extensively to support ongoing travel-information search and that its role ranges from visual inspiration and motivation to archiving of materials to inform future trip planning efforts. The findings also hint at important patterns in pinning behavior that could be used to predict shifts in travel

preferences. They further elaborate on data constraints while at the same time pointing to vast opportunities for using the platform to explore travel-related research questions.

5.1   Theoretical and Methodological Implications

Given the almost exclusive focus in the literature on trip planning, this research provides important insights on how potential travelers conceptualize their dream vacations and engage in ongoing search to inspire their future trips. Importantly, the visual aesthetics apparent in the boards - with tranquil waters, towering mountains, icy landscapes and picturesque European cities capturing the imagination of Pinterest users - highlight the importance of more than functional needs in travel information search [26]. In addition, the research demonstrates that a platform like Pinterest that is dominated by female users can also provide a gendered perspective on travel information search that is still largely missing from the literature [27]. Especially the extensive and ongoing labor that these female travelers invest in curating these boards needs to be recognized and further investigated. The research also adds to the literature on the importance of visuals for women when planning activities [28]. Last, the findings challenge the prevailing perspectives of information search as the activity of individuals or small travel groups and highlights the collective nature and shared inspiration that Pinterest facilitates.

From a methodological perspective, the value of this research lies in identifying the richness of publicly available data on Pinterest, especially in relation to travel. The findings suggest that this information could and should be mined in different ways but also explain why it might not be easy to capture and analyze this data in automated ways. The display algorithm is opaque, the structure of boards is inconsistent, pins can include different modalities of content, the pre-classification of pins through the boards is far from perfect and the data capture would have to scrape the actual images rather than relying on capturing links. The results also call for progress in the automated analysis of images given their centrality in travel and tourism. At the same time, the research demonstrated the strength of a netnographic approach in terms of its flexibility as well as the ability to obtain rich contextual understanding. This was particularly important for understanding who the creators of these boards are, as little information beyond their gender can be extracted from the platform. Kozinets [21] writes that Pinterest netnographies are surprisingly rare and this research therefore contributes to the literature on netnographic studies relating to the platform in significant ways.

5.2   Practical Implications

While the research was only exploratory, it offers some important practical implications for tourism marketing. The fact that identifying the location of the pins was problematic constitutes a huge problem for destination marketers and emphasizes the need to feed the Internet, and especially social media, with visuals that have captions and to

optimize website and social media contents for pinning. In addition, the vacation dreams represented by these boards allow for understanding of the competitive positioning of destinations in the minds of potential travelers. However, not being able to easily identify the location of the pins or of the Pinners is a big issue from a practical point of view. Similarly, the continued dominance of North American and European users limits the insights that can be derived from Pinterest on a global scale.

The findings also suggest that visuals are critical in the dreaming phase. Some pins are added because of their aesthetic qualities, without any indication of the location. This has important implications for recommender system design in that it stresses the relevance of visual recommendations and the need for systems that support the search for inspiration [29]. At the same time, the results also demonstrate the huge potential of Pinterest boards to be mined for recommender system development as they represent elaborate user profiles and categories of dream destinations.

5.3   Limitations and Future Research

Netnography offers three distinct data collection operations, two of which were applied to this research. While it is common to leave out the interaction movement in netnographic tourism research [22], future research should consider eliciting research from Pinterest users who use the platform for ongoing travel information search to obtain further contextual data about the how's and why's of pinning travel-related contents. Pinterest has a messaging function that makes contacting specific pinners possible. Of course, such data collection will require different ethical considerations.

The current research only analyzed snapshots of boards. Longitudinal analysis of specific boards would allow for additional insights regarding pinning frequency and patterns. Also, this research did not code the source of the pin (e.g. repins from other Pinterest users, pins from social media or pins from websites). Such data could provide important understandings of Pinterest use behaviors as well as offer information about the sources of inspiration for ongoing travel information searchers. Finally, the content analysis of the types of destinations/attractions included in the boards was rudimentary and mainly for illustrative purposes. Many other aspects of these images could be coded manually or using machine learning approaches to identify what kinds of images/contents Pinners find worthy of inclusion in their travel-related boards. Co-occurrences of destinations could be explored using network analytic approaches.

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Cultural Traits in the Consumption of Luxury Hotel Services

An Exploratory Analysis Through Online Reviews Data

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Abstract. This study investigates luxury hotel guests' online reviews to explore how ratings, language and sentiment differ according to guests' culture of origin. The study considers three large cultural groups (Asian, North American, and European) examining hotel guests in their reviews to identify the most recurring themes in association with luxury tourism.

The study uses automated text analysis to explore 16,415 hotel reviews from 22 luxury hotel brands belonging to nine global hotel chains located across six European cities over a period of 10 years. In particular, this exploratory study combines LIWC, Leximancer and SPSS analytic tools to shed light on: i) the extent luxury hotel guests' reviews vary in terms of rating, language metrics and sentiment according to reviewers' culture of origin; ii) the main themes of luxury hotel service discussed by guests, of different cultures of origin, in their reviews.

The main findings reveal that Asians guests are particularly analytical when reviewing online and are the less satisfied about their stays in luxury hotels in Europe. North Americans are the most satisfied luxury hotel guests; however, their reviews show low level of sentiment descriptions. Instead, Europeans embed more sentiment when posting a review. The three cultures examined also tend to associate luxury to different attributes.

Keywords: Luxury hotel service · Online reviews · Cultural traits

1 Introduction

The luxury segment in hospitality has been growing in the last decade, registering one of the highest occupancy rates [1, 2]. Although just 3% of travelers seek for luxury in hospitality services, the segment represents itself 20% of the total tourism expenditure [3]. Luxury tourism is therefore a crucial market segment for service providers worth investigating. The concept of luxury with specific reference to the hospitality service consumption received relatively less attention compared to overall luxury goods consumption [1], and still little is known about the differences between luxury experiential purchases and tangible goods purchases.

Luxury value in hospitality generally involves the three different subdimensions of i) experiential, ii) symbolic, and iii) functional value. While functional value refers to product's core benefits and quality [4], the experiential one evokes fantasies, fun and feelings essential to the luxury consumption, symbolic value reflects owner's wealth and status [5]. Extant research on luxury consumption has mainly focused on goods rather than on services [6]. This is unfortunate since luxury experiences strongly affect positive emotions in customers compared to material possession of luxury goods [7], and experiences are more closely connected to the self than material possessions [8]. Symbolic and experiential values have a significant impact on luxury hotel consumers, directly influencing guests' staying behavior [3], while functional value does not elicit the same effect.

Luxury services have been investigated with respect to four different value dimensions, namely i) functional, ii) financial, iii) hedonic and iv) symbolic [9] and the first three value categories were found to positively and directly affect consumers' purchase intentions. Thus, symbolic value is more likely sought by consumers in luxury goods rather than in luxury services, due to services intangible and invisible nature and their reliance on service quality and atmosphere [9].

The role of online reviews data is widely acknowledged in hospitality literature with most authors pointing out the relevance of adequately collecting, analyzing and processing online user-generated content to investigate various aspects of consumer behavior and explore guest behaviors and hospitality performances [10–12]. Online reviews have received extensive attention for their ability to serve as source of input data for companies to understand their customers and for destinations to explore the image portrayed by tourists [13, 14]. The usefulness of big data has led scholars to explore among the others: customers´ motivation to contribute to online reviews [15]; the persuasive effect of online reviews [16]; online reviews value and connection to hotel performance [17]; the influence of trust and its antecedents on online reviews [18]; and hotel customer characteristics and their perception of satisfaction [19].

2   Objectives

Extant research already attempted to examine the antecedents and outcomes of luxury hotel guests' satisfaction [20] and dissatisfaction [21], and to examine the nature of e-complaints in luxury [22] by the mean of online reviews, by focusing on specific small hotel samples. Hotel guests' luxury perceptions have also been explored by focusing on the visual content of online reviews [23]. However, to the best of the authors´ knowledge, no study has adopted online reviews data to investigate the influence of cultural traits on guest associations of luxury when staying at hotels.

Recent literature is examining cultural influences on hotel guests' behavior by means of online reviews data [24, 25]. Mariani and Predvoditeleva [24] examined to what extent reviewers' cultural traits may affect online ratings, showing that the cultural dimensions considered exert negative influences on hotels' online ratings. Likewise, [25] tested Hofstede's cultural dimensions relationships with visitor satisfaction at destinations, finding the presence of a positive relation with individualism and

indulgence while a negative one occurs with regards to power distance and long-term orientation.

This research aims at exploring to what extent luxury hotel guests' feedbacks differ in terms of ratings, language, and sentiment, and at investigating the pivotal attributes associated to the concept of luxury by guests with different culture of origin. The literature on cross-cultural studies shows an overreliance of scholars on well-known demographics (countries, nationalities) to study different cultures and a lack of studies that use language or ethnicity [26]. Nevertheless, validated supra-national, national, and regional affiliations are widely used in tourism research given their ability to capture cultural differences [26, 27]. Thus, this paper focuses on Asian, European, and North American luxury hotel guests who travelled to different destinations in Europe and stayed at the most recognized international luxury hotel chains. In this vein, the study offers a cross-culture comparative overview and explores to what extent the presence of culture-of-origin effect may affect guests' elaboration of luxury across different settings. Online travel reviews are used for the purpose of this paper. Exploiting the advantages of text mining techniques applied to big datasets, this study contributes to unveil how different guests discuss about luxury in their reviews and the hotel service areas they most frequently associate to the concept of luxury. Thus, the following exploratory research questions are herein considered:

RQ1: To what extent luxury hotel guests' reviews vary in terms of i) rating, ii) language and iii) sentiment according to the reviewers' culture of origin?
RQ2: What are the main themes of luxury hotel service discussed by guests in their reviews and to what extent do they vary according to the reviewers' culture of origin?

3   Methodology

Text mining techniques in association with cluster analysis have been used to explore luxury guests' review content. Automated language analysis is experiencing a rapid adoption in tourism and hospitality (e.g. [28, 29]). For the purposes of this study specific software tools have been adopted to analyse the data with the aim of identifying and describing the concept of luxury in hotel guests self-reported feedbacks (i.e. online reviews). Specifically, automated text analysis allowed to examine the structure of review content including language and sentiment used by guests when describing luxury, thus leading to identify specific patterns. Cluster analysis was then adopted in order to identify the recurring themes and concepts discussed by guests in association with luxury.

3.1   Measurements

The study employs three different software to run the analysis. Specifically, Linguistic Inquiry Word Count (LIWC) [30] was used to run the automated content analysis of reviews' text to detect the extent of guests' sentiment and the extent of analytical and authentic content. LIWC summary variables [30] have been used to run the analysis

and specifically the output variables of analytical thinking [31] and authenticity [32]. Summary variables are derived from previously published findings from LIWC authors' lab and converted to percentiles based on standardized scores from large comparison samples [30]. LIWC software reads a given text and counts the percentage of words that match predefined dictionaries which reflect different psychological constructs. Extant research by LIWC has already focused on cross-cultural word usage, for instance to compare linguistic categories expressed in online forums across groups belonging to different cultures [33] and to detect the most frequently used content words across and within cultures in the definition of self-schemas [34]. In this study LIWC is used to explore the differences in word usage across luxury hotel guests' cultural groups.

Leximancer software was used to cluster the recurrent themes and concepts relating to luxury with respect to guests' comments. Leximancer has already found wide use in hospitality research to investigate on hotel attributes as satisfaction drivers [35, 36] as well as to perform text mining in online reviews data [37–40]. The peculiarity of this software is to extract lexical co-occurrence information and to convert it from natural language into semantic patterns in an unsupervised manner, this way providing a map of the concepts and themes identified. Finally, SPSS statistic software was used to provide descriptive statistics and to run the data elaborations on LIWC outputs, such as means comparisons and ANOVA tests.

3.2 Data

A big dataset of luxury hotel reviews have been retrieved from TripAdvisor.com, the most prominent and suitable travel review platform to study guests [14, 28]. Data from this platform have already been used to investigate the luxury domain with regards to customer evaluations and preferences [20, 23]. This study focuses on the European market, therefore six main European cities [41] were chosen and investigated. GDCI index [41] considers both, volume, and revenues, generated by international overnight incoming visitors offering a reliable benchmark in the tourism industry already used in the hospitality [42] and consumer research [43]. Data was collected considering the most important global hotel chains operating in Europe in the luxury market segment. The final dataset consists of 16.415 reviews covering nine top international hotel chains and 22 luxury hotel brands. Reviewer details (e.g. nickname, age class, gender, origin, trip purpose) and reviews' text and ratings were retrieved from TripAdvisor pages. Reviews posted by Asian, European, and North American travelers were collected but only reviews originally written in English were considered, as this allowed for a straightforward use of the LIWC dictionary and to run the analysis with Leximancer. The time span considers the period 2006-16.

4 Results

4.1 Descriptive Statistics

Tables 1 and 2 respectively provide the characteristics of the dataset per hotels chains/brands and per reviewers' features.

Table 1. Luxury hotel chains/brands sample

Hotel Chain and Brand	n° of reviews	%	Hotel Chain and Brand	n° of reviews	%
Marriott	4898	29.8	**IHG Intercontinental**	1909	11.6
Bulgari	47	0.3	Intercontinental	1909	11.6
Edition	175	1.1	**Hyatt**	1757	10.7
JW Marriott	596	3.6	Andaz	819	5.0
Luxury collection	369	2.2	Grand Hyatt	382	2.3
St. Regis	480	2.9	Park Hyatt	556	3.4
The Ritz-Carlton	1085	6.6	**Four Seasons**	1217	7.4
W hotels	2146	13.1	Four Seasons	1217	7.4
Hilton	2904	17.7	**Shangri-la**	790	4.8
Conrad	880	5.4	Shangri-la hotels	790	4.8
Waldorf Astoria	2024	12.3	**Melia**	471	2.9
Accor	2018	12.3	Gran Melia	168	1.0
Fairmont	54	0.3	Me by Melia	303	1.8
Raffles	75	0.5	**Jumeirah**	451	2.7
Rixos	140	0.9	Jumeirah	451	2.7
Sofitel	1749	10.7	**Total**	16415	100.0

Table 2. Dataset characteristics

Variable	Measurement	n° of reviews	%	Variable	Measurement	n° of reviews	%
Reviewer age	−24	400	2.4	Trip purpose	As a couple	7870	47.9
	25–34	3387	20.6		On business	3405	20.7
	35–49	7165	43.6		Solo	769	4.7
	50–64	4585	27.9		With family	2785	17.0
	65+	878	5.3		With friends	1586	9.7
	Total	16415	100.0		Total	16415	100.0
Reviewer gender	Man	10004	60.9	City of stay	Amsterdam	1193	7.3
	Woman	6411	39.1		Barcelona	1154	7.0
	Total	16415	100.0		Istanbul	3094	18.8
Reviewer origin	Asia	1910	11.6		Paris	2380	14.5
	Europe	8366	51.0		Rome	1881	11.5
	North Ame.	6139	37.4		London	6713	40.9
	Total	16415	100.0		Total	16415	100.0

4.2   Luxury Hotel Guests' Reviews: Language and Sentiment

Syntactic features were used to compare different groups of guests' reviews. Specifically, word count (i.e. review text length), sentiment polarity (i.e. positive and negative emotions embedded in the text), analytical thinking (i.e. the extent of formal, logical, and hierarchical thinking in writing a text) and authentic content (i.e. the extent of honest, personal, and disclosing attitude in writing a text). Comparing the average rating of reviews posted by Asian, European and North American luxury hotel guests, Asians are on average the less satisfied (4.41) while North Americans tend to better review their experience (4.52) and Europeans range in the middle (4.45). However, interesting contrasts appear when analyzing reviews' length and the sentiment embedded in the text by the mean of LIWC software summary variables.

The average review length, measured by word count, is lower for Asian (141.96) and higher for North Americans (174.49) and Europeans (156.84) (F = 17.130; p < 0.001). Western guests therefore result more expressive overall than their Asians counterparts, similarly to past findings [44, 45]. Moreover, a positive relation between ratings and review length also emerges, luxury hotel guests put stronger effort in describing their experiences of stay when these are good. This finding may be peculiar to the luxury hotel segment, since extant research indicates that negative reviews as generally longer than positive [46].

Despite North Americans guests being on average the most satisfied group, they tend to express fewer positive emotions (6.03). Europeans instead express their sentiment the most when posting a review, and this occurs with regards to both, positive (6.65) and negative (0.72) emotions. These findings are partially in line with [45] who also found a higher tendency of Western (i.e. Europeans and North Americans) customers in the use of more elaborate sentiment expression compared to Asians.

Furthermore, as shown in Table 3, North Americans guests´ language results the most authentic (52.39) comparing it with Asians and Europeans, a sign of a more honest, personal, and disclosing attitude [30]. Asians reviewers are associated instead with the highest level of analytical language, thus reflecting a more formal, logical, and hierarchical thinking [30] in their reviewing process. This confirms that short reviews are written using more analytic thinking [47].

Table 3. Luxury hotel guests' reviews: LIWC analysis

Reviewers' origin	Rating (mean)	Word count	Positive emotions (%)	Negative emotions (%)	Analytic (%)	Authentic (%)
Asia	4.41	141.96	6.61	0.62	76.21	51.15
Europe	4.45	156.84	6.65	0.72	74.88	49.62
North America	4.52	174.49	6.03	0.61	76.12	52.39
Total	4.47	161.71	6.41	0.67	75.50	50.83
F	17.130	42.170	59.996	30.646	9.624	20.152
p	.000	.000	.000	.000	.000	.000

Preliminary findings also show that luxury hotel guests' preferences for European cities differ according to their culture of origin. Amsterdam is associated with the highest ratings across each group of travelers (i.e. 4.72, 4.60 and 4.69 respectively for Asians, Europeans, and North Americans) unveiling the general preference of luxury hotel guests for this city. Europeans (4.40) and North Americans (4.38) express their lowest levels of satisfaction when staying in Barcelona, while Asians when staying at luxury hotels in Rome (4.27) (F = 17.130; p < .000). Figure 1 shows the results.
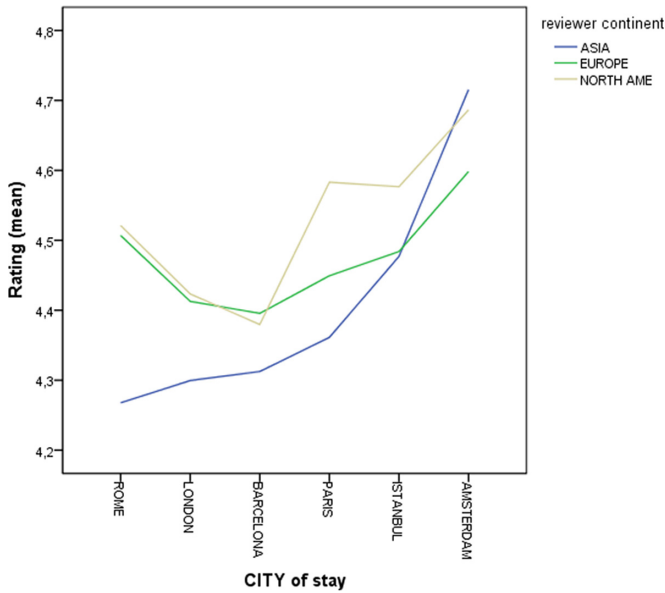
Fig. 1. Luxury hotel guests' preferences per city of stay

4.3 Recurrent Themes with Reference to Luxury

The Leximancer concept map reveals the most common themes and concepts connected to the luxury node found in the three groups of guests' hotel reviews. Figure 2 shows the Leximancer concept maps per reviewers' groups. This map includes concepts, shown as small grey nodes, grouped into main themes, indicated by the larger colored circles. The colors and position of each circle in the concept map also have strong importance, since in the Leximancer concept map themes are "heat-mapped".

The analysis of each group of guests shows that the top two recurrent themes associated with luxury are "hotel" and "room" across each group of reviewers, with a relevance of respectively 49% and 16% for North Americans, 49% and 19% for Asians, and 54% and 25% for Europeans. A main difference occurs however across the groups of guests with respect to the third attribute: luxury results respectively associated with "service" (14%) for North Americans, "location" (13%) for Asians, and "stay" (15%) for Europeans.

These preliminary findings show two cohesive themes in guests' reviews (i.e. hotel and room) as the most recurrent in connection with luxury hotel stay, regardless of guests' country of origin. However, significant cross-cultural differences emerge with respect to other attributes. Specifically, the third most recurrent themes of North Americans, Asians and European are respectively i) service, ii) location and iii) stay. The role of such secondary attributes thus confirms how different culture may relate to luxury in different ways. These findings offer some preliminary information on guests' associations to luxury, providing initial insights to hoteliers on designing luxury offers to suits different cultural preferences and to better approach different customers.

Fig. 2. Leximancer concept maps: i) North Americans, ii) Asians, iii) Europeans

5   Conclusion

This study was motivated by the general paucity of studies on luxury in tourism and hospitality services compared to the luxury goods domain [6]. The study explores luxury hotel reviews by considering guests' culture of origin and determines how linguistic and cognitive elements embedded in the text move across the considered cultures. Furthermore, the study identifies the most recurring hotel service areas discussed by guests in association with their concept of luxury, showing a general predominance of physical attributes regardless of guest origin. However, differences regarding the intangible attributes of hotel service in association with luxury occur when moving across guests' cultures.

The study exhibits the critical role of online reviews data in understanding hotel guests' seeking for luxury hotel experiences. The findings also exhibit how different guests may associate different themes to their luxury expectations and contribute to the ongoing discussion of luxury perceptions as a driver affecting guests' attitudes and behaviors [3].

This study is not without limitations. First, given the purely exploratory nature of the study no causal relationships were investigated. Second, non-English mother tongue guests might have a limited style, wording, and syntax, and this can affect reviews. Third, culture of origin was assessed in a broad sense considering macro areas and further research could use other criteria that would capture the cultural variance among the three large groups. Future research should consider these limitations, and also explore different hotel market segments (e.g. midscale, upscale) and consider qualitative

methods to further study the different dimensions of luxury service, while experimental design may help to investigate their interconnection with guest satisfaction levels.

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Exploring the Impact of Heuristic Attributes of Electronic Word of Mouth on Accommodation Sharing Platforms

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Abstract. With the rapid development of the sharing economy, accommodation sharing is a growing trend across the global. Consumers' feelings, opinions, praises, and even criticisms regarding accommodations can be easily posted and shared via review sharing platforms. Word of mouth (WOM) breaks through the oral communication between people, and further turns out to be a more communicative and influential form, electronic word of mouth (eWOM). An empirical approach is applied to explore the relationship between eWOM attributes of accommodation sharing and accommodation popularity on Tujia.com. More specifically, the three heuristic factors of eWOM (i.e., house, review, and host attributes) are identified to influence accommodation popularity, and rental and host types are additionally considered moderating variables to better understand these relationships. This study would provide valuable suggestions for accommodation platform managers and hosts to design more popular accommodations.

Keywords: Electronic word of mouth · Accommodation sharing · Heuristic attribute · Accommodation popularity · Tujia.com · Sharing economy

1 Introduction

Accommodation Sharing (AS) is one of the fastest growing branches in the sharing economy [1]. The information about houses (rooms) and hosts displayed on AS platforms is easy to get and be used by accommodation seekers. At the same time, users are able to post their reviews freely through these platforms. Thus, the form of word of mouth (WOM) has broken through the oral communication and has become an electronic word of mouth (eWOM) [2]. For experiential products such as hotels and restaurants, eWOM plays an important role in helping make better decision by reducing uncertainty [3]. Previous studies have proven that eWOM has a significant impact on consumers' affirmative intentions [4]. However, research about eWOM in the context of AS has been limited, and the popularity of accommodation has not been paid attention compared to its practical importance. To fill in this gap, the purpose of this study is to explore the influence of different heuristic dimensions of eWOM (i.e., house, review, and host attributes) on accommodation popularity. Moreover, rental (i.e., entire vs. Shared houses) and host (i.e., individual vs. Merchant hosts) types are further

considered moderating variables to see if those relationships are different according to these types. This research is one of the first attempts to explore the relationship between multi-dimensional heuristic factors of eWOM and accommodation popularity in an AS setting. It would provide hosts and AS platform managers with a depth of knowledge on how accommodation seekers' preferences can be realized through eWOM.

2 Theoretical Background

2.1 Multi-dimensional Heuristic Attributes of eWOM in AS

eWOM is defined as all informal communications related to specific goods/services by consumers through the Internet [2]. According to [3], when individual's motivation and ability level of information processing are relatively weak or the volume of information to be processed is too large, heuristic processing cues, rather than systematic ones, become dominant. By exploiting multi-dimensional heuristic cues of eWOM (i.e., house, host, and review attributes), users of AS platforms can reduce the cognitive burden when making decisions [5].

2.2 Accommodation Popularity

The popularity of accommodation refers to the state of being liked, satisfied, or re-purchased by a large number of consumers. There is a significant positive correlation between accommodation popularity and consumers' reservation intention [4]. As prior research used online guest reviews as a performance measure of AS [6], the number of likes is used for measuring accommodation popularity in this study.

3 Research Model and Hypotheses Development

Based on literatures on eWOM and the sharing economy including AS, the research model is developed, which is shown in Fig. 1.
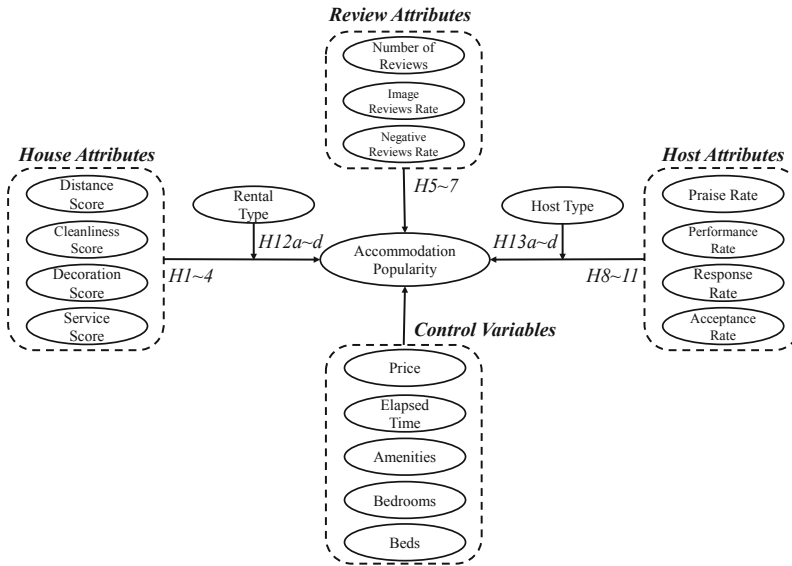
Fig. 1. Research model.

3.1   House Attributes

The content analysis of users' perception of AS shows that the main factors are location, landlord, decoration, interactivity, and convenience, with the exception for price [7, 8]. Similarly, Tujia.com (the target AS platform of the study) offers a review scoring system (1–5 Points) with different key attributes of AS such as location, decoration, service, and cleanliness. As houses (rooms) with high scores are more attractive to (potential) guests, the following hypotheses are proposed:

H1: Distance score has a positive effect on accommodation popularity.
H2: Cleanliness score has a positive effect on accommodation popularity.
H3: Decoration score has a positive effect on accommodation popularity.
H4: Service score has a positive effect on accommodation popularity

3.2   Review Attributes

According to extant studies, the number of online user reviews has a positive impact on hotel room sales, vivid and intuitive pictures have a more positive effect on consumers' purchasing decisions than abstract words, and negative reviews are easier to gain consumer trust than positive reviews [9]. Thus, the following hypotheses are posited:

H5: Number of reviews has a positive effect on accommodation popularity.
H6: Image reviews rate has a positive effect on accommodation popularity.
H7: Negative reviews rate has a negative effect on accommodation popularity.

3.3 Host Attributes

Sztompka (1999) [10] proposed three criteria for hosts to gain consumer trust: reputation (past behavior record), performance (actual behavior), and appearance (personal appearance). A high acceptance rate indicates that a host has good service capabilities or abilities to provide enough extra rooms, which helps increase the level of trust to the host and enhances the favorability of the accommodation [4]. The popular accommodation hosts have the characteristics of high rates in terms of praise, performance, response, and acceptance. Thus, the following hypotheses are suggested:

> H8: Host's praise rate has a positive effect on accommodation popularity.
> H9: Host's performanceH8: Host's praise rate has a positive effect on accommodation popularity.
> H10: Host's response rate has a positive effect on accommodation popularity.
> H11: Host's acceptance rate has a positive effect on accommodation popularity

3.4 Moderating Role of Rental Type and Host Type

The AS occupancy rate can be different according to the rental type as consumers who want to try an entire house put more importance on privacy, while guests who choose to live with a host emphasize the experience of living within the local atmosphere [11]. In the same vein, individual hosts are more popular with consumers who want to live like a local, although merchant hosts can provide more professional services to them. Therefore, the following moderating hypotheses regarding the rental (i.e., entire vs. Shared houses) and host (i.e., individual vs. Merchant hosts) types are proposed:

H12a $\sim$ d: The effects of house attributes (distance, cleanliness, decoration, and service scores) on accommodation popularity are different according to the rental type (entire vs. Shared houses).

H13a $\sim$ d: The effects of host attributes (praise, performance, response, and acceptance rates) on accommodation popularity are different according to the host type (individual vs. Merchant hosts).

4 Research Methodology

This study will employ the data crawling technique to measure variables used in the research model. Accommodations listed on Tujia.com (China's largest AS platform) located in the four tier-one cities in China will be chosen as the target area of data collection. The illustrative sample accommodation on Tujia.com with all variables used in the analysis is presented in Fig. 2.
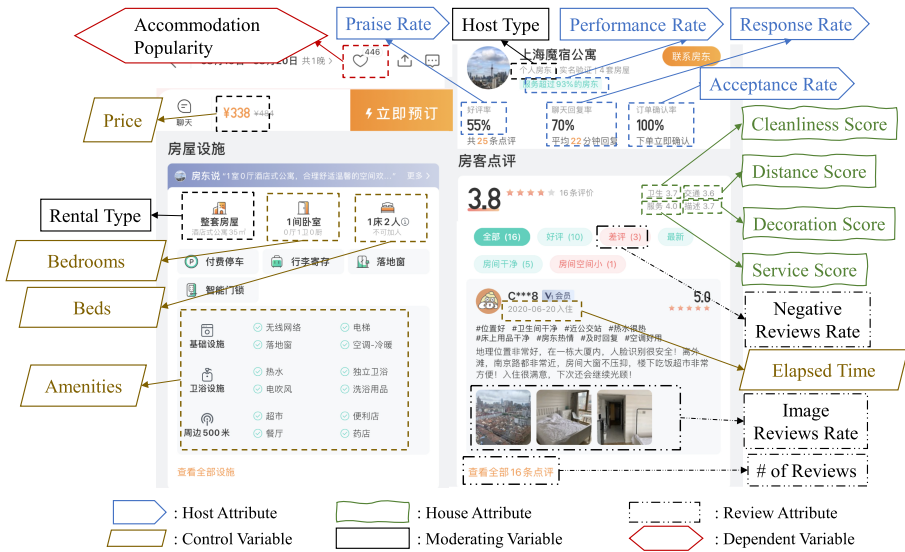
Fig. 2. The illustrative sample accommodation on Tujia.com with all variables measured.

5 Expected Contributions

This study is one of the first attempts to explore the relationship between heuristic factors of eWOM and accommodation popularity in the AS context. Moreover, it identifies multi-dimensional heuristic features of eWOM, and examines their impacts on accommodation popularity, expanding the concept of eWOM with a single heuristic dimension into the eWOM with three different heuristic dimensions including house-, review-, and host-related attributes. It would provide valuable insights for AS platform managers and hosts in understanding how accommodation seekers' preferences can be realized through eWOM.

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How Reliable Is Social Media Data? Validation of TripAdvisor Tourism Visitations Using Independent Data Sources

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Abstract. Social media data has been rapidly applied as alternative data source for tourism statistics and measurement in recent years due to its availability, easy collection, good spatial coverage at multiple scales, and rich content. However, frequent criticism towards the social media is the bias towards the population of social media users leading to unknown representativeness of the entire population. The purpose of this study is to cross-validate the reliability and validity of visitation pattern of tourist destinations retrieved from the social media using alternative independent data sources. The primary social media data is TripAdvisor reviews of Florida attraction points, restaurants, and hotels. The inferred visitation pattern was validated against two independent datasets: cellphone tracking data and official visitor surveys. The validity was explored in tourist origins, destinations, and travel flows. Repetitively, travel patterns inferred from the social media were found strongly correlated to those from cellphone tracking and surveys. The visitation data obtained from social media was concluded to be reliable and representative.

Keywords: Social media · Validation · Tourism visitation · Cellphone data · User-generated content (UGC)

1 Introduction

The statistical measurement of tourism has been a vital task for all stakeholders in tourism fields since its emergence in modern economy [1,2]. Historically, major supranational organizations such as the United Nations Statistical Commission (UNSC) and World Tourism Organization (WTO), along with national and regional tourism entities have provided the official tourism data for public. However, this data largely rely on conventional surveys resulting in inconsistencies across countries, costly data collection, problems with respondents' mobility, and variability in sampled population [3–8]. The big data provided an alternative source of low-cost data tracing tourists' movements, preferences, points of interests, behaviors and even expenditures [9], together with novel data collection methodologies [10]. In the big data domain, social media is particularly promising due to its availability, seamless collection, good spatial coverage at multiple scales, and rich content [11], which has been convincingly demonstrated in multiple studies [12–15].

Meanwhile, frequent criticism towards the social media is the suggested bias towards the population of social media users leading to unknown representativeness of the entire population [16,17]. Complicating the issue, population representativeness may vary time and across social media platforms [11]. The inherent bias of the social media data has long been debated [18], yet the attempts to measure its extent are extremely limited [19,20]. The purpose of this study is to cross-validate the reliability and validity of visitation pattern of tourist destinations retrieved from the social media with alternative independent data sources. The primary social media data is TripAdvisor reviews of Florida attraction points, restaurants, and hotels. The inferred visitation pattern was validated against two independent datasets: cellphone tracking data and official visitor surveys.

2 Data and Methods

2.1 Social Media Data

We collected all TripAdvisor reviews of Florida attractions, hotels, and restaurants (further – properties) published from January 2003 to October 2019. The collected variables included reviewers' self-reported place of living address, the total review numbers, property location, and review date. The data was cleaned in the following way: we (1) filtered out the abnormally active reviewers ranking in top 5%; (2) used Google location API to geotag the reviewers' place of living (at a city, county, state, of country level); and (3) classified the visitors into three groups based on their origins, that is, Floridians, USA domestic, and international. The home locations were kept with at least a city granularity for Floridians, state granularity for domestic visitors, and nation granularity for the international visitors.

Data cleaning resulted in a total of 2,162,249 reviews generated by 250,844 reviewers (visitors) to 51,525 Florida properties. Between the reviewers, 24.4% were Floridians, 57.4% domestic, and 18.2% were international tourists. These groups contributed 42.6%, 39.6%, 13.6% of reviews, respectively. Based on the visitors' origin (place of living) and destination (location of the visited property), the database was rearranged as a monthly visitation frequency for each visitor group in the origin-destination (OD) format (see Table 1).

2.2 Cellphone Data

The primary independent dataset used for cross-validation was the trilaterated mobile phone signal tower data provided by AirSage (www.airsage.com). The anonymized data (over 8 billion records) covered Florida and adjacent areas from October 2018 to September 2019 and was organized in a form of OD trip counts for visitors from different home zones with a census tract granularity. The raw was preprocessed to filter out non-tourism travels and aggregated at a monthly time scale. Then, data was separated into two market segments: Floridians and domestic visitors. The origins of the domestic were aggregated at the state level. International visitors' information was largely unavailable in cellphone database and was excluded from research (Table 1).

2.3   VISIT FLORIDA Survey Data

The secondary cross-validation dataset was the Florida Visitor Study survey from Visit Florida (visitflorida.org). The annual survey is the premier reference guide on visitors to Florida. These data largely rely on conventional survey tools such as questionnaires and interviews. The data used in this study cover 2015–2018 and include quarterly statistics on domestic and international visitors: the origins at a state and nation scales and the total number of Florida visitors. The data on destinations visited in Florida is not provided; the local Florida tourists is also not included. Data summary is provided in Table 1.

Table 1. The data used in this research.

	Origin	Destination	Geo resolution	Timeframe	Time frequency
Social media data					
Floridian	Yes	Yes	County - County	2003–2019	Monthly
Domestic	Yes	Yes	State - County	2003–2019	Monthly
Int'l	Yes	Yes	Nation - County	2003–2019	Monthly
Cellphone data					
Floridian	Yes	Yes	Tract - Tract	2018.10–2019.9	Monthly
Domestic	Yes	Partial	State - Tract	2018.10–2019.9	Monthly
Int'l	No	No	Not applicable	2018.10–2019.9	Monthly
Survey data					
Floridian	No	No	Not applicable	Not applicable	Not applicable
Domestic	Yes	Partial	State - Region	2015–2018	Seasonal
Int'l	Yes	Partial	Nation - Region	2015–2018	Seasonal

2.4   Methods

Based on data availability and spatial resolution, the validation methodology was as follows:

– to validate the origins of Floridians inferred from the social media, their spatial distributions were compared with the cellphone data. Pearson's r correlation between the log-transformed paired data on the number of visits from each origin was used to estimate the match between different data sources.
– in a similar way, to validate the origins of domestic visitors, the destination of Floridians, and the travel flows of Floridians, their respective representations in different databases were used.

3   Results

3.1   Validation of Trip Origins

The validation of the origins of Floridian travel was based on the social media and cellphone data at a county resolution. The data on the top travel origins from both datasets are shown in Table 2. The inferred numbers of trips (log-transformed) from

same origins estimated from social media and cellphone data are highly correlated (r = 0.93, p < 0.001). The preliminary estimation implies that one TripAdvisor trip approximately corresponds to 100 trip counts from the cellphone data (Fig. 1).

Table 2. Top origin counties of Floridians

Origin	N Trips Cellphone	N Trips Social media
Palm Beach	1,531,156	15,309
Hillsborough	1,435,614	13,325
Miami-Dade	1,205,709	12,986
Duval	1,147,412	8,711
Orange	1,128,544	14,447
Broward	866,250	15,048
Lee	830,158	9,218
Pinellas	816,220	10,156
Polk	757,789	4,618
Brevard	674,611	6,898
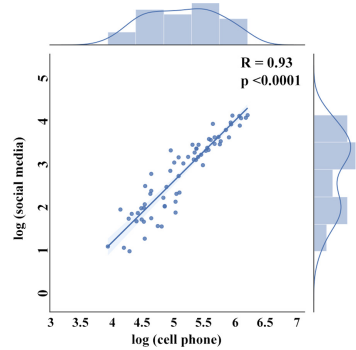
Fig. 1. Correlation of log (social media) * log(cellphone) trip origin counts

Validation of the origins of domestic US visitors was based on the comparison between social media, cellphone, and survey data, at a state level resolution. The data on the top 15 origin states provided in the Survey was compared with data from the other two datasets (Table 3) and demonstrated high cross-correlation (Fig. 2). The data

Table 3. Top origin states for the US domestic visitors

Origin State	N Trips Cellphone	N Trips Social media	N Trips Survey 2018
Georgia	834,620	30,639	11,935,176
New York	661,042	34,242	10,021,044
California	368,015	11,633	4,503,840
Texas	364,626	16,726	4,841,628
North Carolina	326,272	15,850	5,292,012
New Jersey	277,725	16,661	4,729,032
Ohio	271,976	18,393	4,841,628
Pennsylvania	270,474	19,783	5,742,396
Alabama	266,281	7,955	5,404,608
Virginia	266,275	12,605	3,265,284
Illinois	261,418	18,124	5,517,204
Massachusetts	203,044	14,162	3,152,688
Michigan	200,719	13,589	4,278,648
Tennessee	175,951	12,853	4,616,436
Indiana	150,297	9,280	3,603,072
Maryland	141,362	8,943	2,927,496
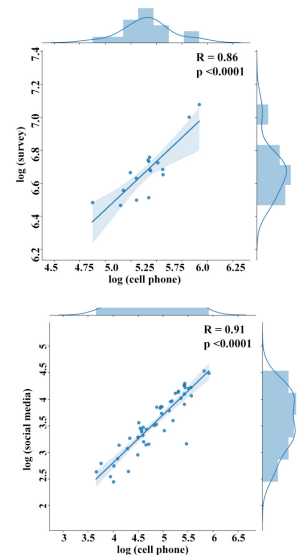
Fig. 2. Correlations of origin trip counts estimated from three datasets.

implies that one TripAdvisor trip count is equivalent to 100 trips inferred from the cellphone data and 2000 trips inferred from Visit Florida survey, hence providing the base to ranslate the social media and cellphone record data to real visitation data.

4   Validation of Destinations

Validation of the destination choices of Floridian travelers was based on data from social media and cellphone, on a county level resolution. The comparative data for the top destinations from both datasets are found in Table 4. The comparative numbers of trips are highly correlated ($r = 0.89$, $p < 0.0001$) (Fig. 3). The preliminary estimation implies that each trip count from the social media approximates 100 trip count from cellphone data.

Table 4. Top destination counties for Floridian tourists.

County	N Trips Cellphone	N Trips Social media
Orange	4,222,721	32,014
Miami-Dade	2,573,859	9,787
Hillsborough	1,878,658	8,779
Broward	911,854	8,149
Palm Beach	690,836	7,145
Polk	677,824	2,978
Duval	622,774	5,804
Pinellas	549,217	11,055
Osceola	534,319	5,746
Seminole	534,261	1,893
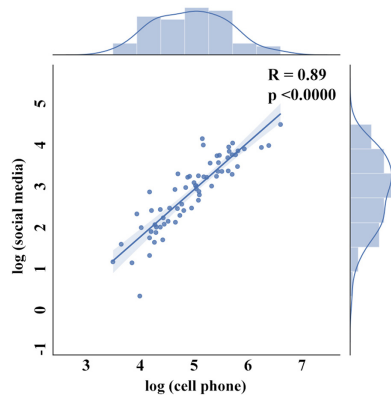
Fig. 3. Correlation of log (social media) * log (cellphone). Floridian travelers only.

5   Validation of Travel Flows

The validation on the origin-destination travel flows of Floridians was based on data from the social media and cellphones at a county level resolution. The number of trips for the top network links are shown in Table 5. The number of OD trips are strongly correlated ($r = 0.72$, $p < 0.01$) (Fig. 4). One travel estimated from the social media approximates 180 travels estimated from the cellphone data.

Table 5. Top OD flows for Floridian tourists

Origin - destination	N Trips Cellphones	N Trips Social media
Palm Beach - Miami-Dade	806,358	1,619
Hillsborough - Orange	699,457	3,606
Duval - Orange	339,657	2,187
Pinellas - Orange	326,103	2,286
Lee - Miami-Dade	325,180	622
Duval - Hillsborough	295,452	496
Orange - Hillsborough	284,670	1,314
Miami-Dade - Palm Beach	234,129	1,109
Miami-Dade - Orange	224,680	3,748
Marion - Orange	222,944	668
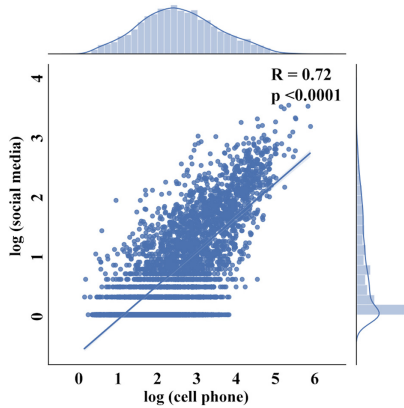
Fig. 4. Cross-plot of log (Social media) * log (cellphone)

6 Conclusions

We found that the social media is a reliable source of data on tourism visitations representative not only of the social media users, but also of the general population. The travel patterns extracted from social media are strongly correlated to those retrieved from the cellphone tracking data and official tourist surveys. The reliability of social media data is evidenced not only in the counts of tourists arriving from various origins or going to various destinations, but also in the travel origin-to-destination travel flows. A longitudinal comparison based on visitation temporal patterns in a future study is suggested to improve the robustness of our results.

This strong correlation in addition implies the potential of social media to represent the real visitation data by fusing the high-resolution social media with the overall tourism measurements from the state or national tourism organizations. In our data, one trip count from the social media approximately represents 2000 visitations from the survey data.

The two high-resolution data sources used in this study, social media and cell phone tracking, can both be used in visitation measurements. Notably, social media data has lower granularity, especially in determining visitor origins. We however found that the seemingly high resolution of the cell phone data can result in significant errors in urban areas. In addition, very high costs of the cellphone data determine its primary area of use in social media validation in key areas.

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Do Tourists from Different Countries Interpret Travel Experience with the Same Feeling? Sentiment Analysis of TripAdvisor Reviews

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Abstract. National parks attract millions of tourists to enjoy the beauty of nature. The opinions and feelings expressed by tourists in their reviews through social media significantly impact other visitors' tourism-related decisions. Notably, tourists from different countries visiting the same park may express different sentiments and post different experiences. It is not clear if those differences could be attributed to the differences in sentiment analysis software for different languages, or they reflect existing variability in culturally defined tourists' sentiments. To address this question, this study analyzed 27,177 TripAdvisor Grand Canyon, US reviews from visitors arriving from ten different countries with the goal of identification of sentiment differences. We found that while all reviews tend to be positive, there are significant regional differences with European and Japanese tourists routinely expressing lesser satisfaction from their visit. We also found differences in the sentiment expressed in different regions of the same country, such as the north and south of Italy. Overall, we suggest that social media reflects the real differences in the sentiment of visitors coming from different origins.

Keywords: Tourist experience · User-generated content (UGC) · TripAdvisor · Social media

1 Introduction

Tourism is growing dramatically in the early 21st century. National parks and protected areas are identified as major attractions for both domestic and international visitors. Visitor feedbacks on travel experiences in social media are essential sources in trip planning; hence understanding the unstructured user-generated content is crucial for park managers to improve visitors' experience. With the easily accessible social media data, researchers have adopted the information technology approaches, such as text mining, to analyze unstructured user-generated content [1]. Sentiment analysis, a popular natural language processing method, helps the industry to understand the polarity of tourist's reviews and identify management failures. Thus, park management can better accommodate tourists' needs and expectations, such as language assistance, food selection, in-park lodging, and many others.

Many tourists travel to foreign destinations to experience different ways of living, traditions, and customs [2]. These tourists from different countries differ in travel

behaviors and service expectations [3]. The scholars confirm that cultural differences have a great influence on tourist's travel experience [4]. Tourists from different countries differ in their preferences on means of transportation, travel arrangements, activities, and travel styles [5,6]. For example, in a study on preferences and sentiment characteristics among Chinese and other international tourists based on user reviews from Chinese social media [7], the Chinese tourists were found to be more likely to express critical and diverse sentiments in their reviews about Australian destinations than tourists from other countries. Similarly, a study of the TripAdvisor cruise tour reviews found the differences in the sentiments expressed by the North American and European tourists [8] with Americans interpreting their cruise experience more positively and with a more subjective and intimate tone. Meanwhile, it is not entirely clear if the observed differences in sentiment can be attributed to the real differences in tourists' expectations or just reflect the differences in emotion expression in national languages.

In the majority of these studies, researchers focus on comparisons between two countries or regions. However, the tourism industry is becoming more and more internationalized with many destinations receiving tourists from all over the world. Today's tourism businesses emphasize developing a better understanding of the cultural diversity of international tourists from many countries. The purpose of this study is to understand and compare the attitudes of tourists from multiple countries to the same destination. The data are unstructured TripAdvisor reviews written by the Grand Canyon National Park travelers from the top 10 countries in terms of the visitor numbers.

2 Area of Study

The study focuses on the top six attractions of the Grand Canyon National Park, Arizona, United States (Fig. 1): South Rim, Bright Angel Trail, North Rim, South Kaibab Trail, and Rim Trail. The 4,926 km^2 Grand Canyon park, established in 1919, is a UNESCO World Heritage Site and one of the world's top 10 desired destinations. The park is also an important economic driver of the region, support-

Fig. 1. Study area: Grand Canyon, USA [10]

ing 11,800 jobs. In 2019, nearly 6 million park visitors spent $891 million in communities located within 60 miles of the park [9].

3   Data and Methodology

TripAdvisor reviews of the top six attractions of the Grand Canyon National Park in Arizona, United States, were collected through web site scraping. In total, 30,237 reviews written between February 2008 and March 2020 were collected. These top six attraction reviews represent 75% of the Grand Canyon National Park's total reviews. The reviewers' place of living (at a city level) was determined from their self-report place of residence and transformed into the latitude and longitude using the Geopy Python software. The geographical coordinates were reverse-geolocated into countries using Google Geocode API. Overall, the location of 27,177 reviewers (89.9%) was determined, resulting in a list of 164 countries of origin. Table 1 shows the number of reviews from the top 10 countries representing 76.8% of the overall collected reviews.

Table 1.   Country distribution of reviews with reported locations.

Ranking	Country	Count	%	Ranking	Country	Count	%
1	United States	14,473	53.3	6	France	826	3.0
2	United Kingdom	2,175	8.0	7	Australia	799	2.9
3	Italy	1,246	4.6	8	Germany	581	2.1
4	Canada	1,241	4.6	9	Japan	495	1.8
5	Brazil	997	3.7	10	Spain	399	1.5
Total	**All countries**	**27,177**	**100**				

The number of international tourists in the collected data is overwhelming, given its remote location with only half of the tourists being domestic. Between the foreign tourists, the UK visitors represent nearly one-fourth. While there are tourists from other English-speaking countries such as Canada and Australia, there are also speakers of other European languages and of Japanese, creating a multitude of cultural and linguistic data for analysis.

The overall methodology is as follows. First, the reviews written in non-English languages were translated from multiple languages to English using Google Cloud Translate API base on Google's pre- trained machine learning models. Second, reviews from the top ten countries were pre-processed using the standard data cleaning methodology [11]. Then, the cleaned data was used to extract the sentiments from tourists' stated experience. Sentiment analysis was performed by Vader (Valence Aware Dictionary for Sentiment Reasoning) software from the NLTK library using Python. Vader is a lexicon-based sentiment classifier that considers the context of the sentences. For each review, Vader generates four values: a neutrality score, a positivity score, a negativity score, and the overall compound sentiment score. Each of the scores ranges from −1 to 1. From those metrics, we adapted the compound scores to express tourists' overall evaluation of their experience in the park. Finally, the compound

sentiment scores were used to find the locations of the sentiment hot and cold spots using the ESRI ArcGIS hotspot analysis tool. Each sentiment point was analyzed within the context of neighboring sentiment scores based on a certain neighborhood search threshold. Hence, the hot and cold spots identified locations with consistently high or low review scores.

4   Results

The compound scores were adopted to express tourists' overall sentiment of their experience in the park (Table 2). The most positive feedback comes from Brazil tourists (M = 0.73), followed by the US and Canada. European tourists have less positive attitude with the lowest sentiment score coming from France (M = 0.59). Japanese tourists have the least positive feedback (M = 0.52). The sentiment scores are consistent with the star ratings but less positive with over 88.3% of tourists rated their experience as excellent.

Table 2. Compound sentiment scores of 10 countries.

Ranking	Country	Mean	SD	Ranking	Country	Mean	SD
1	Brazil	0.73	0.36	6	UK	0.66	0.39
2	US	0.72	0.32	7	Italy	0.61	0.41
3	Australia	0.71	0.34	8	Spain	0.61	0.36
4	Canada	0.69	0.38	9	France	0.59	0.39
5	Germany	0.67	0.34	10	Japan	0.52	0.41
Average	**All countries**	**0.69**					

The hotspot analysis (Fig. 2) reveals that the US, Brazil, and Australia are the statistically significant hotspots indicating that tourists from these countries consistently have high sentiment scores (M = 0.69). Contrasting, the tourists from European countries and Japan have fewer positive opinions making statistically significant clusters of low sentiment scores.
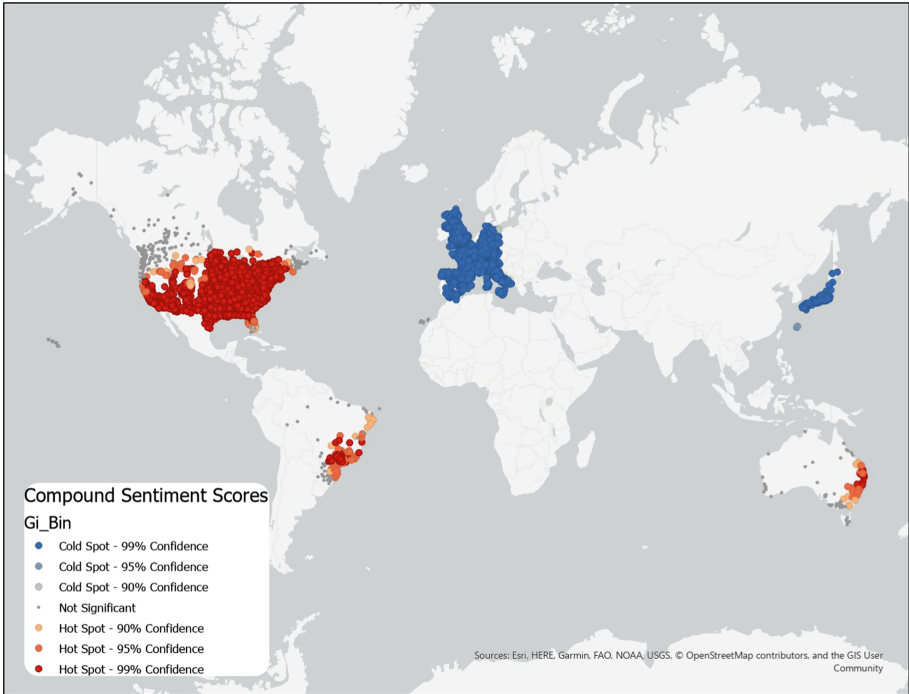
Fig. 2. Hotspot analysis of compound scores among the countries and regions. Notice the differences between the same country regions in the UK and Italy.

The analysis at a higher resolution reveals more intricate regional differences (Fig. 3). In Europe, Germany is a statistically significant hotspot contrasting the cold spot in France. In the UK, England is a hot spot while Scotland is a cold spot. Similarly, Northern Italy is a cold spot while Southern Italy is a hot spot.
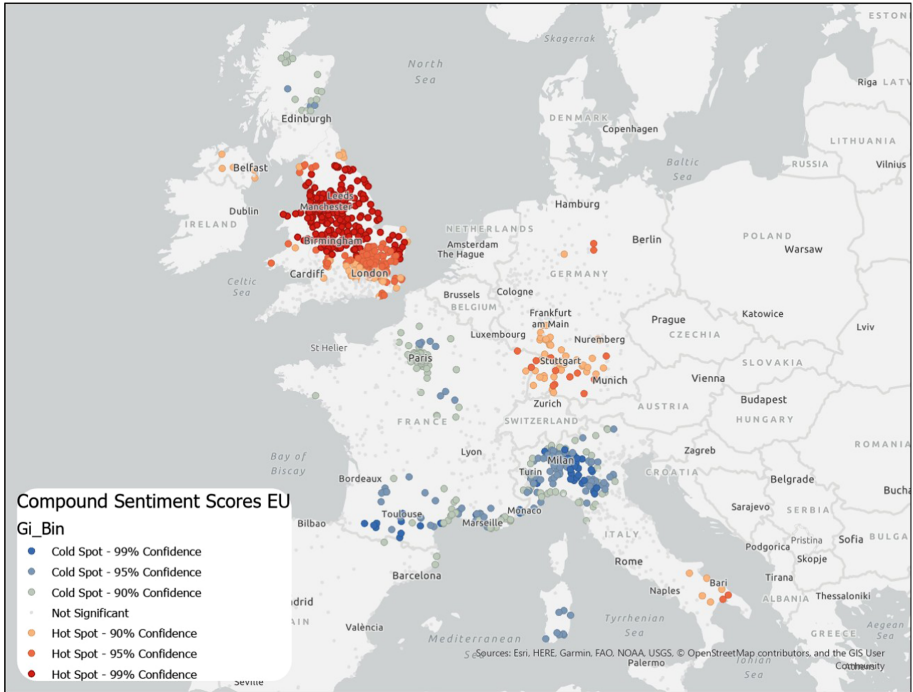
Fig. 3. Hotspot analysis of compound scores among the European countries. Notice the differences between the same country regions in the UK and Italy.

5   Conclusion

We found significant differences in the attitudes of visitors from different countries visiting our area of study. The most positive sentiments were expressed by Brazilian tourists, consistent with other observations [12]. Similarly, the US reviews tend to be positive as the American tourists frequently use adjectives such as spectacular, awesome, and amazing. This is consistent with North Americans being more emotionally charged and expressive than Europeans [8,13]. The lowest sentiments were provided by tourists coming from the European countries and Japan.

Note that the reviews' star ratings do not necessarily correspond with the text sentiment [14]: even when the star rating is high, the sentiment score may reflect multiple topics of dissatisfaction in the overall positive tourist experience. The expression of those dissatisfaction topics is influenced by the distinct cultural background of the tourist reviewing the travel experience. The expression style differences may cause less positive sentiment detected by European tourists. In a similar vein, European tourists show fewer amount of sentiment-bearing words with a more objective tone [8]. The Japanese are the most unique tourist group [15] expressing the least positive sentiment. Japanese people focus on detail, aesthetics, quality, and

service [16]. Because of that, Japanese tourists are more demanding and have higher service expectations, which may align with the level of service provided in the US.

The differences in expressed sentiments are lower between the tourists coming from the same regions as compared to the between-region differences resulting in a pattern of hot and cold spots which mark the regions with consistently more positive and less positive tourist reviews. Notably, those patterns are frequently crossing the borders suggesting that they reflect cultural differences rather than an artifact in sentiment analysis software processing texts originating from different languages. On the other hand, some linguistically similar but culturally diverse countries such as England and Scotland or South and Northern Italy exhibit both the hot and cold spots. Overall, we suggest that social media reflects the real differences in the sentiment of visitors coming from different countries and regions. The sentimental difference across different countries may be due to cultural differences such as expression styles and service expectations.

One limitation is that the text analysis relied on machine translation. We did not check the translation quality explicitly. The literature however suggests that the interrater percentage agreement in human vs. Google Cloud translation vary between 85% and 97% for 9 major languages [17]. This hints that the quality of machine translation already exceeds the ability of humans or computers to recognize the emotions in the written text [18] and hence was deemed adequate for the purpose of this study. Another limitation is using only one park in this pilot study. In the full study under progress, we are applying this methodology to study multiple natural parks around the globe.

Notice that this study did not provide confidence intervals nor p-values for the findings. One reason for that is that data represents the entire population of published reviews and not a sample. Meanwhile, even for the "bid data" samples the traditional tests of statistical significance become meaningless since for large N the p-values tend to either zero or one. An excellent discussion of the alternative measures was provided in [19].

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The Impact of Crisis Characteristics and Media Coverage on the Public's Attitude Toward Tourism Organization Expressed on Sina Weibo

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Abstract. Tourism and hospitality crises that are extensively discussed online are damaging to organizational image and reputation; therefore, choosing effective response strategies is of paramount importance for service providers. The online discussions data from six hospitality and tourism related crises were used to test which crisis and media coverage characteristics significantly affected the public's emotional and behavioral reactions to crises. With reference to the attribution theory and the situational crisis communication theory, this study identified the potentially influential crisis characteristics, hypothesized their relationship with variables describing consumer reactions to crises, and then tested those relationships in a series of ANOVA and hierarchical regression analyses. Results indicated that the locus of control, crisis stability, attribution of organizational responsibility, and organizational response strategy affected the public's cognitive and emotional responses to crises most strongly. The attractiveness and goodwill of media sources also had an effect, as well as the quality and fairness of messages. This study makes a methodological contribution to tourism research by training machine-learning classifiers prior to conducting hypothesis testing. Identifying the most influential factors affecting the public's response to crises can serve as guidelines for tourism and hospitality organizations in monitoring the spread of online crisis discussions and developing the most appropriate response in order to minimize consumers' negative emotions that affect online and off-line behavior toward the organization and its brand.

Keywords: Crisis communication · Machine-learning · Response strategies · Sina Weibo · Social media · Tourism and hospitality

1 Introduction

As any industry, tourism and hospitality have experienced their share of large-scale disasters, and small-scale crises that have been widely disseminated on social media. The disaster emergency management research has mostly dealt with the impact of a crisis at the national and regional levels and looked at the effects of those disasters on the whole business sectors, primarily from the regional governing and planning

perspective (e.g., Reuter and Kaufhold 2018; Ritchie and Jiang 2019). In the hospitality industry, however, a large share of crises is originated in the service failure incidents which the public take online where they are quickly and broadly disseminated. Limited research has examined the impact of such crises on the involved organizations and how tourism and hospitality companies could process online crisis information and effectively communicate their response (e.g., Ritchie and Jiang 2019; Lin et al. 2019).

In the digital era, social media provide a multitude of real-time interactive platforms that are actively used by organizations for their brand-building and marketing efforts as well as for crisis communications. Crisis communications, however, mainly include warnings about coming disasters (e.g., floods, hurricanes, or fires), providing evacuation guidelines, and dispensing advice for optimal behavior in emergencies (e.g., Reuter et al. 2016). It has been noted that most commercial organizations are reluctant to use social media for direct communications with the public about service failure crises of high visibility (Barbe and Pennington-Gray 2018; Su et al. 2019). Organizations, including tourism and hospitality enterprises, are not certain whether those communications would improve the public image of the company or create more tensions between the company and their current and potential customer base.

In the absence of solid research on the subject, the guidelines are vague and the selected strategies are largely "trial and error" (Eriksson and Olsson 2016). Three different response strategies are mainly adopted: no response, the accommodative, and defensive strategies. The accommodative strategies refer to responses that "accepts responsibility, admits to the existence of problems"; the defensive strategies refer to responses that "insists that the problems do not exist, tries to alleviate doubts about the firm's ability to generate future revenue" (Marcus and Goodman 1991).

This study examined the social media coverage of six tourism crises that were widely disseminated on China's largest social media platform Sina Weibo. The purpose of the study was to identify which crisis characteristics, especially the organizational response strategies types, affected the public's levels of information processing and attitudes, that is, acceptance and rejection of organizational response, boycotts, online reposting, and emotions, the most. The choice of crisis characteristics was guided by the attribution theory (Weiner 1986) and the situational crisis communication theory (Coombs 2007), which indicated that the crisis attribution, organizational responsibility, crisis response strategies had impacts on customers' emotions and online behaviors. The study also considered the impact of crisis media coverage.

2 Research Context

Brief descriptions of the selected crises are provided below. The crises were classified with respect to crisis attribution type, responsibility attribution, organizational response strategies, and the credibility of the media source and message.

2018 Five-Star Hotels' Hygiene Horror (HHH). A Chinese whistle-blower posted a 12-min video on Weibo, recording how housekeepers violated hygiene protocols in 14 luxury hotels in November 2018. The posting triggered nearly 1.6 million comments. The hotels adopted various response strategies (e.g., scapegoating, denial).

2017 Five-Star Hotel Unchanged Bedsheet. On September 4, 2017, Lanmei Test released a video that provided evidence that five inspected five-star hotels in Beijing did not change bedsheets for the next guest. The involved hotels used the no response or denial strategy after the video was widely disseminated online (China Daily, 2017).

2017 Haidilao Hotpot Chain Rat Infest Scandal. On August 25, 2017, a journalist posted a video showing rats infesting the kitchen in two branches of a popular Sichuan-based hot pot chain Haidilao in Beijing. Haidilao admitted their fault and apologized online within three hours of the video posting, and followed by closing the branches.

2019 Taste of Grandma Restaurant Hygienic Scandal. On March 15, 2019, the hygiene problems in two branches of a famous Chinese restaurant chain, Taste of Grandma, were exposed. The company apologized and further invited a third-party company to conduct inspections for all its branches.

2019 Boycott to Cathay Pacific on Sina Weibo. In August of 2019, Cathay Pacific received an official warning from the Civil Aviation Administration of China regarding violating aviation rules. #Boycott to Cathay Pacific got 51 million views on Weibo.

2020 OTAs and Airlines Refund Policies to Covid-19. Facing the outbreak of Covid-19, Chinese online travel agencies faced a high volume of canceled trips. The number of customer complaints on Tujia, Ctrip, and Zhixing increased by 1353%, 427%, and 142% in January, respectively, compared to December of 2019 (Blackcat 2020).

3   Method

A total of 254,206 comments under 638 most popular posts about six selected crises were collected, and 216,288 comment messages were cleaned for analysis. Using the HHH crisis dataset, the optimal feature parameters and classifiers were selected among five supervised algorithms. The bagging tree (Predictor subset = 83, Interaction depth = 12) had the lowest cross-validated error rate, as well as the highest accuracy, recall, and F-score to categorize emotions (Table 1). The bagging algorithm was used on the full dataset.

Table 1. Model performance of five supervised algorithms.

Method	Train.err	Test.err	CV.err	Accuracy	Precision	Recall	F
KNN	.4852	.6982	.6761	.5648	.1999	.2540	.2237
Bagging	.0138	.4751	.5237	.5953	.3007	.3819	.3365
Boosting	.2867	.4908	.5405	.5919	.3800	.2840	.3251
SVM	.0414	.4803	.5847	.5831	.2870	.2842	.2856
Naïve Bayes	.9213	.9053	.9174	.5165	.2201	.1257	.1600

Next, 11,600 (5.36%) messages were randomly selected from the full dataset to manually label the public's levels of (1) information processing, (2) boycotting and buying intentions, (3) attitudes to response strategies, (4) reposting intentions, and (5) emotion types. For example, the levels of information processing involved attention, comprehension, elaboration, and not mentioned. Two coders were recruited to manual label the dataset independently and agreement was achieved for the inconsistent results.

Five automated classifiers were trained with the bagging algorithm to categorize the above variables based on the TF-IDF matrix of the tokens extracted from the texts. The K-fold cross-validation (K = 5) procedure was employed to measure the model performance. The out-of-bag errors were 22.33%, 16.66%, 11.59%, 0.88%, and 58.87%, respectively. The high OOB of emotions was related to the number of emotional types, including seven categories (e.g., anger, contempt, sadness).

4 Findings

4.1 Differences in Three Types of Crisis Response Strategies

A series of ANOVA analyses were conducted to examine how the general public reacted to crises depending on the organizational response strategy. The no response strategy outperformed another two strategies, with significantly lower levels of information processing, rejection of organizational response, and anger. The defensive strategy had significantly larger scores in the anger ratio and rejection ratio; while the last one had higher scores of the information processing, boycotts, and rejections.

4.2 Impact on Levels of Information Processing

The study utilized hierarchical regression models to predict the public's average level of information processing (Table 2). Dummy variables were created for categorical variables.Three crisis attributions, organizational responsibility, and crisis response strategies were input in step one and explained 22.17% of the total variances (R^2 = .2492, Adj R^2 = .2217, F = 9.06). The internal locus of crisis and the defensive strategies had significant impacts, while stability was marginally significant. Posts with defense strategies resulted in a higher average level of information processing. After the entry of credibility variables, no significant improvement was detected (ΔF = .7168).

Table 2. Regression results in the average scores of information processing.

Step1	B	SE B	t	p	Step2	B	SE B	t	p
Locus: Internal*	-.3082	.0702	-4.3890	.0000	Locus: Internal*	-.3037	.0717	-4.2340	.0000
Stability: Stable.	-.0982	.0511	-1.9230	.0559	Stability: Stable.	-.0982	.0535	-1.8380	.0677
Control: Intention	-.3464	.2219	-1.5610	.1201	Control: Intention	-.3499	.2243	-1.5600	.1205
Responsibility	.0484	.0339	1.4270	.1552	Responsibility	.0410	.0347	1.1810	.2391
Accommodative	.0491	.0388	1.2650	.2073	Accommodative	.0455	.0398	1.1430	.2544
Defensive*	.1185	.0498	2.3830	.0182	Defensive.	.1058	.0538	1.9660	.0508
No Response	.0649	.0582	1.1140	.2666	No Response	.0481	.0598	.8030	.4227
					Goodwill	.0335	.0684	.4900	.6247
					Attractiveness	-.0475	.0334	-1.4200	.1574
					Quality	.0358	.0963	.3720	.7103
					Fairness	-.0134	.0835	-.1600	.8730

4.3 Impacts on Rejection and Acceptance to Crisis Response Strategies

The frequency of messages mentioning the rejection of organizational crisis strategies was predicted by both crisis attribution and credibility variables, as well as the goodwill and attractiveness of media sources. The accommodative strategies had significantly positive impact on these variances (t = 3.459, p = .0007). In the model to predict the rejection ratio, only the crisis attribution and response strategies had impacts.

As for the acceptance to crisis response strategies, accommodative strategies (t = 3.027, p = .0028) and organizational responsibility (t = 1.661, p = .0980) had significantly and marginally positive effects. The accommodative strategies also had a significant positive impact to predict the acceptance ratio (t = 5.255, p < .001).

4.4 Impacts on Anger

SCCT model indicated that both the organizational responsibility and crisis response strategies had an impact on emotions, especially the emotion of anger. For the frequency of anger, the internal locus had a significantly negative impact, while organizational responsibility, accommodative strategies, and defensive strategies had a significantly positive impact. However, the entry of credibility variables failed to improve the prediction model significantly (F = 1.4443, p = .2211).

For the ratio of anger, the basic model explained 37% of the total variances. The internal locus (t = −3.870, p < .001) and the stable attribution (t = −2.750, p = .0065) had a significantly negative impact; organizational responsibility (t = 3.517, p < .001), accommodative strategies (t = 3.871, p < .001), and defensive strategies (t = 6.809, p < . 001) had significantly positive effects. The entry of credibility variables could improve the model significantly (F = 2.7536, p = .0294).

5 Discussion and Conclusion

Crisis characteristics depicted in the popular posts could successfully predict the public's levels of information processing, attitudes to the crisis response strategies, and the emotion of anger retrieved from the comments and replies, but could not predict the

publics' calls for boycotts and reposting behaviors. This study indicates that crises with the internal and stable attribution result in more negative responses towards the involved organization. The involved organization would be suggested to take no responses. For another two strategies, PR could make a decision purposefully: the defensive strategies lead to a higher ratio of rejections to responses, boycotts, and anger; while the accommodative strategies lead to a higher volume of online discussions.

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HOTFRED: A Flexible Hotel Fake Review Detection System

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Abstract. The importance to cope with online fake reviews in Tourism becomes more and more evident. In the hotel sector hoteliers as well as guests often struggle with the challenges to separate true and fake reviews from each other. Therefore, our research introduces HOTFRED - a flexible hotel fake review detection system - as part of an on-going research project. By combining different analytical approaches, the HOTFRED system indicates via an aggregated probability whether a review is true or fake. As the evaluation of the prototypical implementation showed, this approach can support to detect fake reviews. Many different stakeholders in the Tourism sector can profit from this automatic tool. Thus, hoteliers can take measures to safe their reputation, guests can benefit in their decision-making process and research might use the tool as an initial starting point for future research in the area of fake information.

Keywords: Online reviews · Fake reviews · Detection · Machine learning

1 Introduction

Online reviews are an important information source for decision making, for instance prior booking a hotel room [1]. However, not all of the information provided via online platforms is reliable. Online reviews at sites like Tripadvisor, Yelp or Google Places are not always written by real customers with a real experience of the hotel. Thus, some of the reviews are fictious and subsequentially fake. Fake reviews with false information may lead to wrong decisions by tourists [1, 3]. In general, it is not easy for tourists to detect fake reviews [4]. They are not able the evaluate how trustworthy the provided information is. Additionally, both fake reviews with a negative as well as positive valence can be posted by a fake review writer [1].

In general, there are two ways tourists can detect hotel fake reviews before booking. They are typically either reviewing it manually based on different heuristics (e.g., [5]) or using software tools (e.g., [1, 6]). Due to sparse research on a combination and flexible implementation of different approaches for automatic fake review classification, the presented research aims to create a new system following the design science

research method [7]. Thus, this short paper is part of an ongoing research project addressing the research question *"How can a flexible hotel fake review detection system be designed?"*. In the following a short and comprehensive theoretical background section is given before the proposed solution approach is presented.

2   Background

Besides manual checks by tourists [5] different automatic approaches can be used to detect fake reviews in online environments. Past research showed different approaches on specific samples.

First, meta data of the behavior of the reviewer can be used to check the fake probability of reviews [2, 6, 8, 9]. For instance, if the reviewer writes a lot of hotel reviews in a short time period, this might help to identify fake reviews. Besides meta data, a fake detection can be carried out for example by investigating the writing style, grammar, spelling etc. [10]. Special data sources for training of fake classification models are provided by Yelp.de and through research using crowdsourcing approaches to write fake reviews [4, 10]. Furthermore, research focuses on the comparison of different textual styles between fake and non-fake classified texts [2, 4, 11]. The specific use of some phrases or special spelling issues can lead to the detection of fake reviews, too. Further, there are some online platforms (e.g., reviewmeta.com) providing assistance to identify fake reviews from Amazon. However, flexible hotel review-specific approaches applying different approaches with a scientifical base are still missing. Thus, the research wants to address this gap by providing a flexible fake detection system based on different adjusted approaches.

3   Design of the System

A design science research approach was chosen [7, 12] to create a hotel fake review detection system with the aim to answer the proposed research question. Regarding the recommendations, the problem of fake review detection and need of a software solution were identified in Sect. 1 and 2 of the paper. Previous published research work (e.g., [2, 6, 8, 9, 11]) as well as setup several design workshops with several participants were reviewed to collect the relevant objectives of the solution. The primary objective of the system is to determine the probability of fake reviews for a given hotel using several analytical approaches. The system should gather data of the individual reviews collected from online review sites as well as information about the reviewers and the hotel itself. It should have the capability to integrate more analytical approaches stepwise over the time to improve accuracy and integrate current research results. Furthermore, components should be selectable and de-selectable case by case. Based on these objectives, a hotel fake review detection system based on different components has been created. At first, online hotel reviews and related meta data (such as hotel name, reviewers, etc. [2]) have to be collected through a web crawling tool [21] from online review sides like TripAdvisor. These data should be stored in a central database. Thus, central and fast accessible place for data access for the analytical components is shared.

In the following, the analytical components (*here:* (1) text mining-based classification and (2) spell checker) can fall back on the needed data to calculate the probability of fake reviews for a given hotel in a related time frame. The text mining-based classification (1) will use already classified hotel fake review data to calculate the probability of a fake by evaluating textual similarities. The spell checker (2) will calculate a probability based on the amount spelling and grammar issues. Furthermore, the reviewer behavior checker uses data (e.g. timings, hotels, etc. [2]) about the last written reviews of the reviewer to infer on fakes. The hotel environment checker uses data about the hotel to identify fake or incorrect information (e.g., location, stars, facilities). After all components (1 and 2) are analyzed, a scoring system [17] uses the individual probabilities to determine the final probability of fake reviews for a given hotel. The scoring system can run a weighted or unweighted average of the different probabilities. The weights can be adjusted based on trained models and validation after system use. The system architecture is summarized in the following Fig. 1 and allows analytical extensions in the future. Dotted components (reviewer behavior checker, hotel environment checker) are not implemented currently, but will follow up as a part of future research. For a first demonstration a prototype was implemented as explained in the following section.
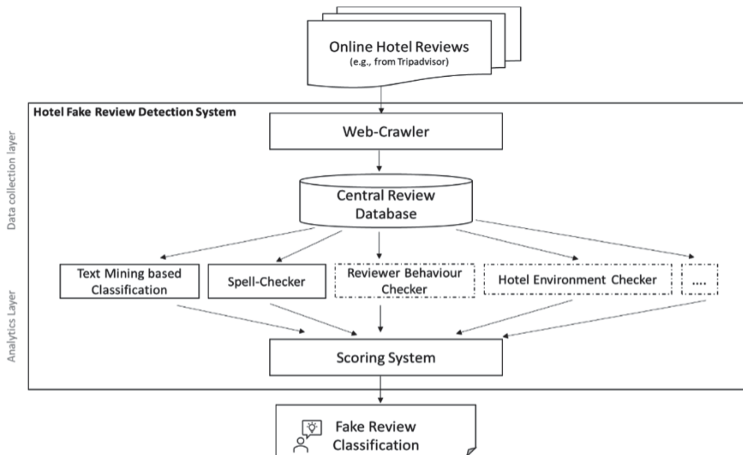
Fig. 1. Architecture of hotel fake detection system

4   First Prototype Development and First Evaluation

Prototypical Implementation: A flexible hotel fake detection system - called HOTFRED - was implemented within a first prototype according to general recommendations coming from previous research [13]. The prototype focuses on the main components to collect data on two major analytical components (1) text mining-based classification and (2) spell checker as well as the scoring system to provide the user (*here:* Tourist) an aggregated, comprehensive information. A web crawler tool [21] was

developed in Python to collect the review data from tripadvisor.com. The web crawler has to collect different data of the hotel (e.g., name, URL, class) and the review (e.g., date, review text, points) to run a proper fake review detection and related analysis. After data receiving via HTTPS, it is stored for further analysis within a MySQL database. As a first analytical component (1) a text mining-based fake detection approach was implemented according to the general text pre-processing recommendations [14]. Following, classified fake review data from Yelp was used as a data source for training the classification model [2]. This data set consists of pre-labeled examples regarding the filtered fake characters of hotel reviews written in English. Approximately, 14% of the data can be seen as filtered fake reviews. Existing research already used and validated this data source for e.g. validations [2]. After the evaluation of different classification algorithms (e.g., Support Vector Machines, Naïve Bayes Classifier, KNN), the Support Vector Machine has been chosen as a good fake review classifier based on the accuracy of the classification (e.g., combined metrics like precision, recall, F-score, etc.). For the second analytical component, (2) a spelling checker software tool was developed. This detection component of the system recognizes spelling mistakes based on the ideas of the Levenshtein Distance [15]. The software was programmed in Python. Therefore, the Python library pyspellchecker was used. The scoring system component can use the individual results of the finished analytical components to show a summarized view about the fake probabilities of the reviews for the given hotel.

Testing and Evaluation of the Prototype: For the demonstration of the detection system a touristic region in Italy was chosen. Thus, a full sample for all 3 stars and 4 stars hotels in Sorrento/Italy was selected. The sample contained $N = 35370$ reviews for 79 hotels from 3570 different users. For $N = 12$ hotels we found a high probability for having fake reviews within the given timeframe (examples are provided by the authors on request). This stands also in line with previous research, that states about 10%–20% of fake reviews on Yelp [16]. Furthermore, already recognized approaches were used and combined via a flexible scoring model. The accuracy of the trained models was ensured by quality metrics recommended in the literature. Furthermore, some workshops with researchers and potential users were performed based on the results to discuss the progress and application of the HOTFRED prototype of the proposed flexible system. For technical software testing and evaluations of system components (1) and (2), a Swagger interface through a FastAPI [18] deployment is currently under development. The system as well as its components (with deployment possibilities as microservices [20]) can be reachable via a user interface as well as a REST-API call. This function is also currently under development. Furthermore, HOTFRED is to be designed as a scalable system with a fast data processing.

5   Conclusion and Discussion

The detection of hotel fake reviews is an important topic for research and practice as well. On the one hand, tourists are afraid of taking unfavorable or wrong decisions based on fake reviews. On the other hand, hoteliers are afraid that fake reviews harm

their reputation. Therefore, the flexible HOTFRED fake detection system was implemented to cope with the challenges of fake reviews. This approach extends past research (e.g. [2, 4, 9]) in different ways. HOTFRED is designed as a flexible and open tool which enables review detection through different components and allows a case by case selection of these. Therefore, in practice different detection components can be used depending on a use-case specific evaluation. The components can be reached through a defined REST-API, which will be extended and in a currently on-going development project. At the moment, a combined detection approach using a new classified fake detection text model (1) as well as a spell checker (2) is used. In that components, in comparison to other approaches (e.g. [2]), we are using a spell checker focusing on grammar and a classified Yelp dataset not only for validation reasons but also to build a good textual classification model upon it. Additionally, further analytical components as depicted in Fig. 1 are under development. Research as well a practice can benefit from presented research.

Tourists can use the tool to evaluate easily and fast the probability of fake reviews for a given hotel. Business users (like hotel owners) can use HOTFRED to acquire fake review detection capabilities or to develop existing ones; this stands in-line with the current research discussion focusing on fake reviews (e.g., [19]).

Research can benefit from the new architecture which enables a fast as well as broad fake review detection system. At the moment, two interesting fake review detection components (textual and spell checker) are implemented some first preliminary evaluations for the prototype have been run. Additionally, considerations for further needed components have been done to enlarge the system in the future and enhance its predictive power. Research can build upon the results and use it for studies in different fields such as Tourism, information systems and machine learning.

No research is without limitations. First, not all possible detection algorithms could have been implemented and evaluated so far. This aspect is going-to be addressed in future research. Furthermore, it is technically not feasible to have a system with 100% correctness. Aiming to reduce the failure rate, the flexible fake detection system uses different analytical components at the same time. The system is implemented by a prototype. In the future it has to be tested more and confronted with new and original classified fake data to ensure a good evaluation and accuracy. In general, it is hard to get actual fake data to evaluate several systems. Due to the on-going research project, it is planned to further evaluate and extend our detection system by the following steps. At first, more analytical components will be integrated (e.g., hotel environment checker, reviewer behavior checker as recommend also in the literature (e.g. [2])) as well as several software tests will be run. Also, more complex models and combinations of it (e.g. through neural networks) are well-suited opportunities for future improvements and adaptions. Additionally, a qualitative evaluation of the system with experts from the hospitality sector as well as different tourist groups are intended. Furthermore, it is considered to extend the tool to collect review data from different review platforms like Yelp and Google Places and show a combined analysis and results view. After extensions, it is planned to make the tool public for research and

practice as well and collect further feedback to expand promising future research directions.

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Contextual Effects of Online Review Recency: Three Research Propositions

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Abstract. Online reviews are influential information sources for tourists in trip planning and related decision-making. How tourists process online reviews is context-specific, so the effects of online reviews on their perceptions or decision-making are affected by different contextual factors. Building on the literature on information recency, this research note discusses recency as an important information component of online reviews and explores a range of contextual factors that affect online review recency in terms of its role in information search and processing. Three propositions are suggested as the basis for future research. Implications for both theory development and managerial practice are also discussed.

Keywords: Online review recency · Review helpfulness · Information processing · Contextual factors · Research propositions

1 Introduction

Online reviews are influential information sources for supporting tourist's decision-making [22]. To understand how tourists process online reviews, the literature has studied different information components of online reviews that make them helpful in the eyes of tourists, such as review valence, source credibility, content quality and so on [12, 36]. Review recency, which refers to the degree to which online reviews are current to deliver the latest information about reviewed products or services [34], has been confirmed as a major component [6]. Since a tourism business's performance may not remain stable over time [15], tourists tend to prefer recent online reviews that indicate its current status of service quality [5, 28].

Review recency manifests in several ways. In general, the posting date of each online review reflects how recently the review was uploaded to the review platform [16]. Along with posting date, some review websites show when the experience occurred to provide further assurance of review recency [15]. For example, in TripAdvisor, each hotel review presents the date of stay along with posting date. Lastly, as online reviews are usually listed in reverse chronological order, their position on the webpage can be an indication of review recency (although only as an approximation) [34].

How tourists process online reviews is context-specific [33]. Essentially, the effects of online reviews on tourist's perceptions (e.g., review helpfulness) or decision-making

(e.g., online hotel booking) become more (or less) pronounced under certain circumstances [11, 13], and so does review recency. For example, while consumers place a high value on recent reviews when they purchase a fast-depreciating product (e.g., fashionable cloth), they do not do so when buying a slow-depreciating product (e.g., classical textbook) [11].

In the hospitality and tourism literature, tourist information processing has been conceptualized as a dynamic process wherein tourists utilize different amounts and types of information sources in accordance with internal and external contingencies [9]. To further understand how tourists process information, it is important to consider the contextual factors which might influence the effects of travel information [7]. However, existing tourism literature has treated the effects of online reviews as static, as if tourist's online review processing is independent from a range of contextual factors [6, 7].

This research note builds on the literature on information recency to discuss contextual factors that must be considered in order to understand the effects of review recency. Consequently, this study formulates three propositions that guide future research on review recency as well as the dynamic nature of online reviews in the hospitality and tourism field. In this research, contextual factors are defined as the tourist's (e.g., socio-demographics or travel knowledge), tourism product's (e.g., product type or popularity), and situational characteristics (e.g., type of device used to process information, time and place of processing information) that may affect the tourist's information processing.

2   Three Propositions on Review Recency

In the hospitality and tourism field, researchers have argued that several different contextual factors affect the way tourists process information [33]. As for the personal characteristics, various socio-demographics have been found as influencing its information search behavior, such as gender [17], age [3], and family life cycle [8]. In addition, other characteristics have been identified as the antecedents of tourist information search, including personality [21] and involvement level [4]. When tourists are highly involved in trip planning, detailed information concerning activities or destinations is carefully considered, but low-involvement tourists tend to disregard the details [4]. Different trip characteristics have been also identified as important contextual factors, such as travel purpose [10], length of travel [24], or travel party composition [15]. According to McKercher [20], while tourists with children tend to focus on the accessibility of restaurants or hotels when they check the information about the properties, couples without children are less concerned about the issue. Lastly, the effects of situational characteristics have been examined. Fodness & Murray [10] have shown that tourists use different information search strategies in response to spatial and temporal dimensions of search activity. In the study of [24], it has been found that tourist's information search effort is significantly constrained by the available time for the search.

The effects of contextual factors on tourist's information processing have also been confirmed in the online review setting. Hlee et al. [13] found that the peripheral review components (e.g., the number of reviewers' followers) become more important criteria

for judging review helpfulness, when the review is about unfamiliar restaurants. Findings of the study showed that there are different contextual factors involved in the effects of online reviews on tourist's perceptions or decision-making. Essentially, it has been argued that the situational nature of the effects of review components should be acknowledged [16].

As such, it is necessary to explore contextual factors that might affect the effect of review recency. Certainly, the contextual effects of information recency on recipient's perceptions have been examined in other settings. Recency of website content becomes more important for determining its quality when it claims to deliver the latest information (e.g., online news sites) [31]. On online news sites, people select the news story to read based on its recency, but they become more sensitive to news recency when the source of the news is not popular or credible [25, 35]. Based on the literature regarding information recency, we identified three factors associated with online reviews which are expected to influence the effects of review recency in the hospitality and tourism field: context of use, content of online reviews, and nature of the product.

2.1   Context of Use

Although tourists prefer recent reviews to outdated ones in general, their preference for recent reviews could be stronger when they conduct local search (e.g., "restaurants near me"). Tourists search for nearby places of interest the very moment they are needed, so more immediate actions tend to be followed when tourists conduct local search: 76% of consumers who performed local search visited a related business within a day and 88% did so within a week [26]. In other words, tourists deal with spatially close places and make near-future visit decisions in the local search context.

According to the construal level theory (CLT hereafter), when processing information regarding spatially-close objects or near-future events, individuals tend to prefer up-to-date information because it fits their mindset, what is called lower-level construal, and vice versa [29]. Jin et al. [16] found that recent reviews are more influential in affecting consumer's product choice for near-future purchase decisions. Given this finding and the argument of CLT, it is expected that the effects of review recency on tourist's decision-making, that is, how influential tourists think recent reviews are as they select the place to visit, become more pronounced when tourists conduct local search.

A recent survey regarding local search revealed that consumers tend to focus on review recency (i.e., how the local business has been evaluated lately) rather than volume (i.e., how popular the local business has been so far) when choosing the place to visit through local search [2]. In the present case, the following research proposition can be formulated.

Proposition 1.   The effects of review recency on tourist's perceptions or decision-making would be pronounced when tourists use online reviews for local search.

2.2   Content of Online Reviews

The effects of review recency might be affected by the topics included in its content. As the posting date of each review is readily available, tourists can assess its recency by checking the timestamp [30]. However, the timestamp cannot guarantee that the review includes actual up-to-date content. Even if it has been recently uploaded, the review might not necessarily contain the latest issues related to the subjects [15].

Nowadays, when reading online reviews, tourists want to know how tourism businesses take action on COVID-19 (e.g., measures such as social distance, face covering, hand sanitizer). If the reviews include such information as expected, their recency might be appreciated. However, if there is no information about the safety protocols, even recent reviews would not be perceived as helpful [15].

In present times, social distancing and other actions are considered as important information in restaurant reviews [32]. A new restaurant review website encourages tourists to write about restaurants' safety protocols rather than other general aspects [23]. In the present case, the following research proposition can be formulated.

Proposition 2.   The effects of review recency on tourist's perceptions or decision-making would be pronounced when the review content indicates it is up-to-date in addition to its posting date.

2.3   Nature of the Product

The ability of recent reviews to deliver the latest information is appreciated when their subjects are products whose quality easily changes, such as tourism products [1]. Due to their vulnerability to external factors (e.g., seasonality), the service quality of tourism businesses varies greatly from one time period to another [14]. Thus, tourists want to learn about the current performance of tourism businesses to make better decisions, and they tend to prefer recent reviews to outdated ones [19].

However, even within tourism products, some product's service quality varies more compared to others. For example, the service quality of restaurants is comparatively less stable than that of hotels [18]. In this case, when processing online reviews about restaurants, tourist's preference for recent reviews might be pronounced. Conversely, tourists might think that hotel reviews do not need to be up-to-date because the primary aspects of hotel products (e.g., room, staff service, facility) are less time-sensitive [11]. Indeed, it was found that the extent to which tourists assess how recent online reviews are depends on the type of tourism product [27, 37]. In the present case, the following research proposition can be formulated.

Proposition 3.   The effects of review recency on tourist's perceptions or decision-making would be pronounced when the online reviews concern tourism products whose quality is more time-sensitive.

3   Conclusion

This research note proposes three contextual factors that need to be considered to understand the effects of review recency in the hospitality and tourism context. The propositions can serve as the foundation for future research on online reviews and information recency. Moreover, the current research contributes to the literature on the tourist's information processing [7, 13] and contextual decision-making, that is, which contextual factors should be considered to provide a more nuanced explanation of how travel information affects the tourist's decision-making [11, 16]. As for the practical implications, the propositions offer insights into tourism businesses' online marketing strategies and interface design for information channels. For example, if the effects of recency depend on the product type, then managers can make decisions regarding how frequently they need to check their online reviews or how much effort they should invest in dealing with recent reviews. This could also help local search platforms better understand ways to improve their interface design to enhance the perceptibility of information recency on the result pages in order to meet local search users' information requirements.

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Information Characteristics on Instagram and Viewer Behavior

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Abstract. Image-based social media such as Instagram is actively used as a tourism marketing channel that provides information regarding tourist destinations. Recognizing the importance of viewers' responses, this study investigated the relationship between viewers' responsive behavior and the characteristics of texts and images posted on Instagram. The results of multiple regression analysis showed that certain emotional expressions in hashtags and images that include people are positively associated with the number of likes and comments. This study provides insights into social media utilization strategies and post-marketing strategies that are helpful for DMO (Destination Marketing Organization).

Keywords: Customer behavior · Information characteristics · Social media · Instagram · DMO

1 Introduction

The growth and importance of smart tourism has been facilitated by the development of social media [1]. Social media is often used as a marketing tool that provides information and formulates a positive attitude about destinations [2]. As the visual image is a powerful tool that leads tourists' behavior [3], Instagram, which allows users to upload and share images with short texts and captions, has emerged as an actively used platform [4] in tourism. The texts and images in the post in turn affect viewers' responsive behavior. Despite the increasing importance of social media and Instagram, to the best of our knowledge few studies have explored the characteristics of texts and images, which elicit viewers' responsive behavior [5].

Prior studies mainly explored the marketing effect of the text reviews or the images. Investigating both texts and images simultaneously, this study aims to explore how the characteristics of visual and verbal information are related to viewers' responsive behaviors, using the Korea Tourism Organization (KTO)'s English Instagram account. Academically, this study expands the scope of understanding social media posts by adopting dual-coding theory [6]. This study also provides additional insights into social media marketing strategy and post-appeal-evaluation guidelines that are helpful in marketing.

2 Literature Review

Consumers' decision-making on experience goods and services such as tourism is greatly influenced by online contents on social media [7]. Social media users exchange and share useful information through texts and images [8]. Specifically, Instagram, which is an image-oriented platform [9], allows users to search for images more easily through hashtags. Hashtags also facilitate users to recommend specific posts to others with common interests [9]. Dual-coding theory postulates that visual and verbal information are processed differently [6]. Thus, this study identifies characteristics of Instagram information by texts (emotional expressions in the posts and the number of hashtags) and images (whether the image contains people or not).

Viewer behavior in social media has been categorized into consuming, contributing, and creating [10]. Through content-consumer interactions on Instagram, viewers receive sensory stimulation and in response they may engage in contributing reactions to the post; commenting or clicking on likes, for example. Prior studies examined the antecedents of reactive behavior on social media. Casalo et al. [11] found that consumers' interaction intentions positively affect the number of likes and comments. This study examines how consumers' reactive behavior, measured by the number of likes and comments on Instagram posts, varies according to the characteristics of texts, tags, and images of the posts that provide tourism information.

3 Research Model and Hypothetical Development
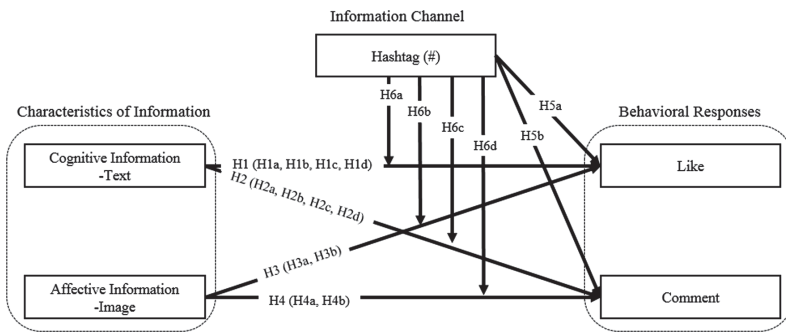
Fig. 1. Research framework

Figure 1 presents the research framework. Using dual-coding theory [6], information on Instagram was examined by two types–cognitive (texts) and affective (images). It has been reported that emotional expressions on social media posts affect viewers' behavioral reactions [12]. Thus, we examined the intensity of four emotions, namely, anticipation, joy, surprise, and trust from the text information. Since the account is operated by the national tourism organization, only positive emotions were considered. The characteristics of the text are expected to be associated with viewers' behavioral

responses measured by the number of likes and comments. Thus, we propose the following hypotheses:

H1-H2: *Characteristics of cognitive information (Text) is positively associated with the number of Likes/Comments.*

H1a~H1d/H2a~H2d: *The number of anticipation-, joy-, surprise-, and trust-related words are positively associated with the number of Likes/Comments.*

As for the images in the tourism context, the feeling of presence is likely to affect the behavioral intention. Photos with people were found to make viewers feel more present in the featured location [13]. Thus, in this current research, images were categorized by whether the photos contain people or not (images only contain scenery or objects without people). Thus, we hypothesize as follows:

H3-H4: *Characteristics of affective information (Image) is positively associated with the number of Likes/Comments.*

H3a-H3b/ H4a-H4b: *Images with/without people are positively associated with the number of Likes/Comments.*

With hashtags, people can search and collect posts more easily. So, the more hashtags, the higher potential to bring users, which result in a higher likelihood of active reactions. These premises can be hypothesized as:

H5a-H5b: *The number of hashtags is positively associated with the number of Likes/Comments.*

Further, when hashtags used with text and image can call more active responses. Appropriate hashtags will reinforce contents to reach additional users and thereby invite more likes and comments [14]. Therefore, we hypothesize as below:

H6a~H6d: *Hashtags moderate the relationship between the characteristics of cognitive/affective information and the number of Likes/Comments.*

4   Research Methodology

4.1   Data

Data were obtained from KTO's English Instagram account, which contains more than 800 posts with 310,000 followers as of August 2020. We collected likes, comments, and hashtags from 753 posts posted from 1st November 2017 through 31st July 2020. Table 1 shows the description of data. Images were categorized into 2 groups: photos with people and without people based on elements included in Chrome Developer tool.

Table 1. Description of data

Variables	Description	Obs.	Avg.	Std.	min	max
Text	Number of emotional words in the caption	3,016	4.01	3.49	0	23
Image	Photos without people = 0	489 (64.9%)	0.35	0.48	0	1
	Photos with people = 1	264 (35.1%)				
	Total	753 (100%)				
Hashtag	Number of hashtags	4,927	6.54	1.11	1	12
Like	Number of likes	9,312,964	12,367.46	18,226.40	682	221,169
Comment	Number of comments	46,894	62.28	70.29	3	965

4.2   Methodology

Multiple regression analysis was used to verify the hypothesized relationships. The number of likes and comments were converted to the log scale. For the text characteristics, the number of words related to positive emotions (*Anticipation*, *Joy*, *Surprise*, and *Trust*) was identified by sentiment analysis using the NRC (National Research Council Canada) emotion lexicon. We estimate the following equation:

Viewer   response = β_0 + β_1Text_Char + β_2Image_Char + β_3*Hashtag* + β_4Text_Char $\times$ *Hashtag* + β_5Image_Char $\times$ *Hashtag* + ε, where Viewer Response is *Like* and *Comment*; Text_Char is a vector of *Anticipation, Joy, Surprise, and Trust*; Image_Char is a dummy variable of *Image*; and ε is an error term. All the explanatory variables were mean-centered. VIF (variance inflation factor) confirmed no issue of multicollinearity.

4.3   Results

Table 2 shows the results of analysis. Interestingly, emotional expressions in texts were not associated with *Like* (H1a-H1d), while *Anticipation* and *Joy* (H2a and H2b) were significant for *Comment*. *Image* and *Hashtag* indicated a significant relationship with *Like* and *Comment* (H3, H4, H6a, and H6b). As to H3 and H4, photo without people gathered more *Like* and *Comment*. While there was no moderating effect of *Hashtag* on the relationship between text characteristics and behavioral reactions (H5a and H5b), negative moderating effects were found on the relationship between *Image* and behavioral reactions (*Like* and *Comment*) (H5c and H5d).

Table 2. Results of analysis

Dependent variable: *Like*	Coefficient	Std. error	t-value	Dependent variable: *Comment*	Coefficient	Std. error	t-value
Text_Char				Text_Char			
Anticipation (H1a)	−0.024	0.017	−1.432	Anticipation (H2a)	−0.030	0.014	−2.122[**]
Joy (H1b)	0.025	0.016	1.504	Joy (H2b)	0.027	0.014	1.980[**]
Trust (H1c)	0.015	0.022	0.664	Trust (H2c)	0.022	0.019	1.195
Surprise (H1d)	−0.028	0.019	−1.449	Surprise (H2d)	−0.013	0.016	−0.793
Image (H3)	0.118	0.031	3.791[***]	Image (H4)	0.068	0.026	2.598[***]
Hashtag × Image (H5c)	−0.112	0.030	−3.721[***]	Hashtag × Image (H5d)	−0.130	0.025	−5.205[***]
Hashtag (H6a)	0.111	0.014	8.174[***]	Hashtag (H6b)	0.092	0.011	8.028[**]

***, **, and * denote statistical significance at the 1%, 5%, and 10% level, respectively.

5 Conclusion

This study examined the relationship between the information characteristics and viewers' behavioral responses considering visual (cognitive) and text (affective) information. The emotional expressions in *Text* were not associated with *Like*. While neither *Trust* nor *Surprise* are associated with *Like* and *Comment*, *Anticipation* and *Joy* were positively associated with *Comment*. As to *Image*, photos without people indicated stronger association with viewer responses. Concerning *Hashtag*, negative moderating effect was found on the relationship between *Image* and responsive behavior. Too many hashtags may drive the users to be confused. Future research may validate this point utilizing Geotags as well. This study expands the scope of understanding of the viewers' behavior on social media using Instagram. We provide useful and strategic social media management guidelines for both destination marketers and uploaders.

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Meme Tourism: A Conceptual Framework

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Abstract. With advances in technology affordances, contents generated by individual tourists in the tourism context has become an influential source of tourism information besides contents channeled by traditional mass media such as newspapers and broadcasts. Specifically, *Meme Tourism* (i.e., meme phenomenon in tourism) becomes one of the biggest trends in imitating and transforming/evolving tourism contents online, which is a byproduct of participatory culture that use text and visual images as means of user-generated communications in online communities through the exchange, distribution, and transactions. Understanding the emerging phenomena of meme in tourism would provide insights on tourists' desires and behaviors in modern traveling. This study conceptualizes three major perspectives in tourism; 1) media-induced tourism, 2) user-generated content, and 3) social media activities, reflecting meme phenomena in tourism. Given the foundation provided, this study calls for a new stream of study in tourism that examines desire, motivation, and behavior of tourists in technology-enabled modern travel culture.

Keywords: Meme · Internet meme · Meme tourism · Meme phenomenon · Media-induced tourism · User-generated content · Conceptual framework

1 Introduction

The rise of digital media - most notably social media sites – has provided commonly called "user democracy culture" [1]. Digital media has developed from a broadcast medium to participatory platforms including social media such as YouTube, Instagram and TikTok, encouraging "media" to collaborate and share information on its own [2]. On Web 2.0 platforms, the social system consists of individuals and objects related through mutual viewing, sharing, and commenting [3]. In an era marked by 'networked individualism' [4], internet meme has become a new digital culture, which connects tourism to a new territory. This new digital culture in tourism pave a way for opening new fields of research. The term '*MEME*' is a short for mimeme, which means 'imitated thing.', in the book of *The Selfish Gene* by Richard Dawkins [5]. An Internet

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meme spreads via through social media platforms (YouTube, Instagram) from person to person. For example, a staircase, the concrete flight of steps in the Bronx, New York, is emerged as the latest tourist hotspot in the film Joker [6]. The memorable scene is spread out to tourists the #jokerstairs by way of hashtag tagged on Instagram and recreate new image. Finally, such the popularity of the location was briefly marked as a religious site on Google Maps. This popularity of unexpected attraction causes a new paradigm in tourism, which is described as *'meme tourism'*. In other word, digital media technologies allow people to create and distribute own travel contents online— and those meme contents have a traction to potential tourists for a hot place to visit. The most popular Pisa and Eiffel Tower are good examples of the meme picture. Despite the fact that these meme phenomena (i.e. to imitate photos posted on SNS and create them in one's own way) are already prevalent in the tourism industry, thus far, the meme (including internet meme) has not been included in studies in context of tourism. Understanding of meme diffusion in the context of tourism can be important in view travelers such that triggered by tourist-generated contents (i.e. photos, videos and so on) on social media, and have a meaningful insight that non famous place become travel hotspot. This research aims to explore *'meme tourism'* theoretically and proposes a conceptual framework in explaining the phenomenon for tourism discipline.

2　Meme Tourism

A concept of meme is introduced as an example of 'gene' in the human body that is inherited to generation to generation, which can replicate itself through imitation based on the Darwinian [7]. The rise of internet and digital media generate memes and digital cultures. Specifically, Shifman [8] has conducted extensive research on digital memes from the perspective of journalism and communication. She defined the internet meme as artifacts are circulated, imitated, and transformed via the Internet by multiple users" [9]. That is, internet memes are a byproduct of participatory culture that use text and visual images as means of user-generated communication in online communities through the exchange, distribution, and reception [10]. The use of memetic contents in a desirable manner can impact the impressions of the recipients [11] and, thus, influence the perception of the subject (yourself, other individuals, groups, places, phenomena) by individuals or groups of recipients.

The role of this process in the self-presentation of tourist activity in the social media is emphasized by Lo and McKercher [12]. They view that shared photos are expressions of a tourist's satisfaction with a trip and the people sharing them would like to be perceived as such by the recipients [13]. Internet meme generated by tourists is a potential manifestation of the tourist experience embedded in their context, activities and experiences. That is, in an era of 'networked individualism', a tourist can exploit memetic contents to simultaneously express both their uniqueness of themselves and their connectivity to the community [9]. The characteristics of the images as the content of a memetic nature can significantly influence the perception of individual subjects. At the same time, these contents may significantly shape and stimulate other users' willingness to undertake different online activities of an affective, cognitive, and behavioral nature [13]. The intensity of such activities or behaviors of tourists including

consuming, distributing, and recreating contents will, then, become a determinant of the intention to visit a specific destination or attitude toward a certain place of other potential tourists. Eventually, 'meme tourism' is defined as a series of processes in which tourists visit tourist sites to share their experiences of copying other tourists or expressing tourist attractions in their own way, can explain the current tourism phenomenon in terms of memes. Hence, this paper explores a conceptual framework, which draw an attention meme tourism on user-generated content, media-induced tourism, and social media use motivation.

3 Meme Tourism: Three Major Perspectives

Internet meme generated by tourists is a potential manifestation of the tourist experience embedded in their context, activities and experiences. Although meme tourism is a new concept, meme tourism has been involved in multiple components and real cases related to the context of tourism [6]. Drawing on the characteristics of internet meme from the prior tourism research, we categorize them into three major perspectives that are essential for understanding meme tourism [14, 15]. They include media-induced tourism [16], user-generated contents [17], and social media activities [18] (Fig. 1).
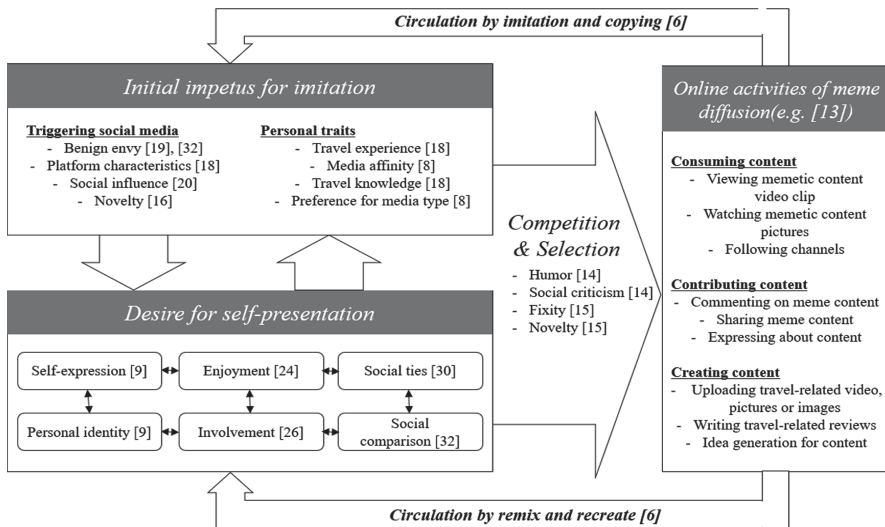
Fig. 1. Conceptual model of meme tourism

3.1 Media-Induced Tourism

Media related tourism has been extensively studied in the past 20 years, defined as travel to places associated with books, celebrities, television and film [16, 19]. Numerous studies have tried to explain how media shapes images about destinations and influences tourism [17]. As social media in Web 2.0 allowed people to create and

share their travel experiences online in real time [20], various types of content on social media are mostly motivated by altruistic and hedonic desire, thereby a significant relationship between potential tourists' desires and motivational factors [17] were examined. For example, a friend's travel-related contents seen in social media tends to elevate envious thoughts that lead to more travel intention [21]. Therefore, it seems becoming spontaneous as less attractive places could become travelers' hotspots. Considering that memetic contents spread rapidly through social media, theses contents created and shared through various types of media can also boost tourists' desires. However, there seems a clear difference between general content and memetic content. Even if the social media content becomes viral, the memetic content is transmitted through imitation as a form of the recreated version [22].

3.2   User-Generated Content (UGC)

Customers express their satisfaction or dissatisfaction with a product or service through UGC because social media offers people opportunities to socialize and form communities of interest [23]. Customers use UGC for various reasons, such as evaluating service quality and price [24] and identifying the best attractions, food, and destinations [25]. Others search for social acceptance [26], enjoyment [27], a communal feeling [28], and involvement [29]. In the tourism and hospitality industries, special attention has also been given to user-generated content (UGC) online due to its influence on destination and business image formation [30], tourist behavior [31]. Tourists have a significant influence on other potential tourists by sharing travel experiences through UGC (i.e. text, pictures and videos). Those contents inspire social networks individually to copy or imitate the contents. Although internet memes are also a form of UGC, there is a lack of research on theoretical points of view on them.

3.3   Social Media Activities

The rise of Web 2.0 technologies has led to a wealth of social media websites, popular examples of which are YouTube, Instagram, and TikTok. These platforms provide many opportunities for users to share and create content about anything, including their travel and journey [23]. To study travel-related activities as behavioral construct provides a unifying framework to think about tourist activities pertaining to travel-related content on social media platforms. This concept is not new and also encompasses early typologies of consumer behavior in online brand-related activities. Muntinga et al. [18] categorized into three dimensions that correspond to path of gradual involvement with brand-related content on social media, namely consuming, contributing, and creating as level of activeness. In the context of media use, it is also important to examine travel-related activities' meme. Particularly, tourists' meme for engaging with content on travel-related content on social media (cf. [32]) would be important to overview the full spectrum of travel-related social media activities. In this process, we can explore how a memetic content spread and why tourists consume, distribute, and recreate a memetic content.

4 Directions for Future Research

Apparently, meme phenomenon in tourism is already underway and tourism-related meme has grown to become a significant part of the tourist market. However, it appears that a lack of attention to meme tourism is paid by the academia. With this paper, we introduced a new concept of meme tourism and identified three perspectives of meme tourism for the foundation of future research in understanding the current phenomenon in the context of tourism. While not meant to be concrete or comprehensive, this research aims to serve as a starting point for further development of the theoretical aspect of meme phenomenon. In the future, it is recommended to identify the attributes of meme tourism through a mixed method approach including qualitative and quantitative study.

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Part IV: Destinations

Approach to Evaluating the Effect of an Inter-organizational Information System on Performance: The Case of a Destination Management Organization

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Abstract. This research proposes an approach to evaluate the contribution of an interorganizational information system (IOIS) to processes and organizational performance. Using a process-based framework, the approach was developed from a review of the IS evaluation literature and then refined through an in-depth embedded case study of an IOIS used by a destination management organization (DMO). The need for this research, comes from the significant investments in terms of capital and human resources and the numerous challenges that IOISs represent for DMOs. DMO' IOISs are characterized by their interdependence between multiple stakeholders with sometimes contradictory interests. The approach developed here is of interest to researchers and practitioners in that it allows for a contextualization of IOIS system evaluation, and that it considers the depth and breadth of performance measures.

Keywords: Information system evaluation · Tourism destination information systems · Interorganizational information systems performance · Process-based information system value assessment

1 Introduction

As a catalyst for the economic development of the destination, the DMO assumes a strategic leadership role [1] with its stakeholders, tourism service providers and business authorities in order to develop content and programs related to a strong tourism image [2]. To carry out this mission, the DMO must acquire various technologies. As early as 1997, Chen and Sheldon [3] indicated that it is often in a complex relational context and subject to contradictory forces that DMOs are led to acquire an interorganizational information system (IOIS). IOISs support information exchange and business transactions between different organizations and are based on networks that transcend organizational limits [4, 5]. They focus on the optimization of the internal processes and on relations within the destination's stakeholders. There is a lack of

consensus on the conceptualization of IOIS used by DMOs, and they are often studied as DMO websites [6]. Previous research focused on antecedents of DMO systems adoption, on implementation drivers and on expected benefits. DMOs continue to invest in the development of their IS [7–9] while the benefits are neither guaranteed nor easily understood [10–12]. Despite the numerous studies on the IOISs used by DMOs, questions remain about the disappointing performance of these systems [13]. The majority of research does not address the challenges posed by transactional and inter-organizational components [5, 14]. However, in the era of smart destinations, DMOs need to have a global vision supported by interoperable and interconnected systems [11, 15, 16]. Hence, studying how to evaluate the performance of IOISs used by DMOs, while considering the research needs found in the literature, seems relevant. Sigala [13] proposes an evaluation that takes into account the inter-organizational context and the vision of multiple stakeholders. Buhalis, Leung [17] highlight the strategic usefulness of the IOISs used by DMOs to support the differentiation efforts of tourism SMEs and to strengthen the competitiveness of the destination.

This research aims to propose a qualitative method for evaluating the performance of an IOIS. Using a process-based approach, this method, issued from an IS evaluation literature review, is applied to a DMO's IOIS as an embedded case study.

2   Literature Review and Theoretical Framework

Given the diversity of its theoretical foundations, the research on the ex-post evaluation of information systems presents several models and still reports difficulties in assessing the impact of IOISs [18]. The evaluation of ISs poses challenges, both conceptual and methodological. Conceptual challenges can be classified into four categories: (1) biases related to the chosen theoretical framework [19, 20]; (2) heterogeneous conceptualization of the evaluation variables [21, 22]; (3) the intangible and hidden nature of costs and benefits [23] and, finally, (4) the anchoring biases related to the benchmark chosen to evaluate the IS. Also, the complex nature of organizational performance is often conceptualized in only productivity or profitability dimensions whereas it is multi-dimensional and dynamic [24].

Research on the effects of ISs relies primarily on two types of models: causal models and process models. Causal models attempt to demonstrate a linear and uni-directional and static relationship between IS investments and organizational benefits [18, 19]. The parsimony of these models explains their frequent use in IS evaluation. However, they produce conflicting results regarding the IS value paradox [20]. Process-based models, on the other hand, measure the effects of IS at the level of intermediate processes before evaluating their impact on organizational performance [25, 26]. They explore the chain of events by which the IS investment is converted into added value to the organization. Despite a greater level of complexity and more difficult opera-tionalization, process-based models are known for their ability to render empirical reality [18]. This is the reason for their choice as the basis of the conceptual framework of this research in combination with the performance prism developed by Neely, Adams [24], to evaluate the effects of a DMO's IOIS on the DMO performance.

The theoretical framework, as shown in Fig. 1, states that the performance of DMOs' IOISs is based on several concomitant and competing factors: the strategic objectives pursued by the DMO, the capabilities implemented by all stakeholders, their use of the IOIS, the effects of the IOIS on processes, and the nature of their contribution to IOIS performance. The theoretical framework, based on the resource-based view theory of the firm, combines process-based models for evaluating IS performance [25, 26] with the integrated organizational performance evaluation method of Neely, Adams [24]. As such, it responds to the recommendations of Marthandan and Tang [27] regarding the need to use multidimensional methods combined with multi-perspective approaches for the efficient evaluation of IOISs. The prism of the performance of Neely, Adams [24] was designed to take into account a significant number of stakeholders.
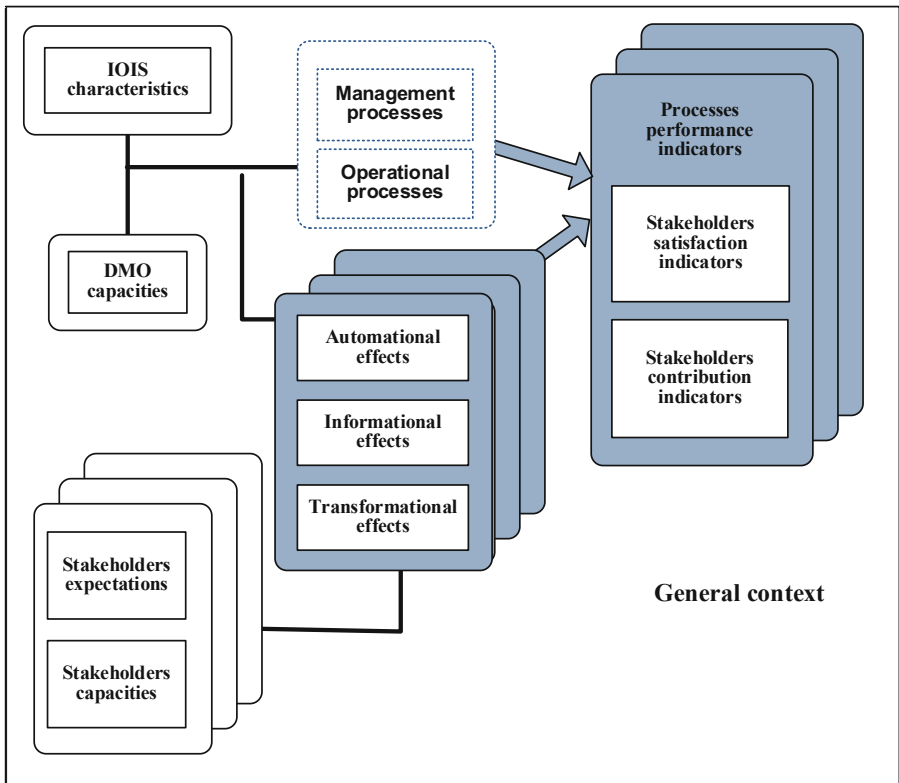
Fig. 1. Theoretical framework for evaluating the performance of an IOIS

The theoretical framework consists of six blocks addressing: (1) the characteristics of the IOIS and the technological capabilities of the DMO and its complementary capabilities as defined by Melville, Kraemer [25]; (2) the capabilities and expectations of the stakeholders external to the DMO following the logic of Melville, Kraemer [25] and Neely, Adams [24]; (3) the operational and management processes supported by the IOIS; (4) the automation, information and transformational effects of the IOIS on

the processes [26]; (5) performance measures of operational and management processes [24]; and (6) satisfaction and contribution of stakeholders using IOIS [24]. Stakeholder contribution defines the behavior that the DMO expects its stakeholders to have in relation to the IOIS. Satisfaction is an individual measure of process performance. According to Sabherwal, Jeyaraj [28], organizational variables (voluntary use of IOIS by tourism organizations) and individual variables (mandatory use of IOIS by DMO employees) may coexist within the same framework.

The theoretical framework for evaluating the performance of an IOIS served as a guide in the empirical part of the research, whose main question was: How can the performance of a destination's IOIS be evaluated? This main question considered the performance of the IOIS according to each stakeholder and suggested the specific question #1 "How do the dimensions of the DMO's IOIS performance differ according to the stakeholder concerned?" Finally, the main question also focused on the integration of these dimensions into a whole, which led to the specific question #2 "How can these dimensions be integrated into a tool for evaluating the performance of a DMO's IOIS?".

3   Methodology

In order to address the methodological difficulties of IOIS evaluations, it is important to situate oneself among the various existing types of evaluation. This research is a participating ex post evaluation of IS organizational impact. As an inductive evaluation, it avoids evaluations' anchoring bias of preset objectives or criteria. With the performance prism of Neely, Adams [24], an integrated evaluation method was chosen rather than quantitative financial or economic ones.

Users of the IOIS participated in the evaluation and the researcher adopted a consultant's position conducting a summative evaluation [24]. The evaluation was conducted from the perspective of the DMO, taking into account internal stakeholders (DMO employees) and external stakeholders (tourism organizations that are members of the destination) [13]. Finally, the level of analysis used is that of the impact of the IOIS on the following processes.

For the interpretivist, the process of knowledge creation involves understanding the meaning that actors give to reality. The validity of this knowledge depends on the idiographic nature of the data and the empathic perspective of the researcher. The research design was therefore developed in such a way as to produce rich, contextualized data for discovery purposes. This research uses an exploratory qualitative approach based on inductive reasoning applicable to the discovery of new phenomena. The case study method was chosen to answer a descriptive research question. A single case with multiple groups (the embedded cases) was chosen to conduct this research. This method facilitates a new understanding [29] of the performance of an IOIS from a perspective that has not yet been addressed in the literature. The single case study has sub-divisions where attention is focused in particular ways, understood as the different perspectives of stakeholder groups. Tourisme Montréal's IOIS was used as the case for a contextualized exploration of the theoretical framework (Fig. 1). This type of sample provides instrumental interest and meets the criteria of theoretical representativeness of

the case and richness of the available data [29]. Tourisme Montréal is a regional DMO, which, in North America, is the level with the largest number of DMOs that own and manage their own ISs. Tourisme Montréal is a private non-profit organization that brings together members from various tourism sectors: accommodation, attractions, tourism facilities, events and various services. Tourisme Montréal's mission consists of "maximizing the economic benefits of tourism, uniting the local tourism industry, deploying innovative tourist welcome strategies, as well as developing the tourism offer." As such, it uses its IOISs to disseminate information on the destination's offer and to enable the online reservation of products and services. It also uses IOISs to build a customer database and deploys it in its sales and marketing department. The system also makes it possible to offer monitoring and training services to participating organizations.

Stakeholder Groups: At this level, theoretical representativeness implies a homogeneity of respondents in terms of the issue to be studied. In this case, the stakeholder groups concerned all had to be users of Tourisme Montréal's IOIS. These were, internally, employees and managers, and externally, tourism organizations that are members of Tourisme Montréal and active in the accommodation, museum or travel agency sectors. The purpose of this research was not to gather the consumer's point of view directly, there already being a great deal of literature on this subject. Consumer satisfaction is intrinsic to the definition of performance [24] and, as such, it is the main objective pursued by each group of stakeholders.

The Respondents: The number and type of companies to be surveyed within each group of external stakeholders, respect the criteria of variety and heterogeneity. The sample of internal respondents is non-probabilistic, voluntary and purposive. The concept of informational power, linked to the specific objectives of this research, also guided the composition of the respondent sample [30]. The eighteen internal respondents and the eight external ones were targeted based on their ability to comment on the performance dimensions of this IOIS. External respondents were Tourisme Montréal members from hotels, travel agencies and attractions sectors. Internal respondents were Tourisme Montréal employees from sales, convention servicing, communications, marketing, members service, research and product development departments. The multiplicity of stakeholder groups as well as the variety of hierarchical positions within the DMO between coordinators, managers, directors and vice-presidents helped to triangulate information sources and enrich data collection.

Data Analysis: The twenty-six pieces of verbatim data were coded using Atlas.ti software. A first coding allowed the researcher to become familiar with the data from the first interviews. It focused on the meaning that emerged from the words used by the respondents [31]. In a first step, the codes were used to determine the code tree structure. Subsequently, thematic coding [32] was performed with predefined codes based on the literature and corresponding to the categories included in the evaluation model. It organized the data according to seven categories which were divided in the following sub-categories: capacities, expectations (system quality, information quality, service quality, communication needs, training needs, networking needs), processes (sub-processes and task), IOIS effects (automational, informational, transformational),

processes performance indicators, satisfaction and contributions. Finally, a second coding was applied to the content of each major category, using in vivo codes. Partially ordered matrices were used to reveal indicators' similarities and differences per stakeholder groups according to the processes evaluated. For each process, matrices included the expectations, the satisfaction, the IOIS effects and the processes performance indicators. A logbook and the memos made it possible to track the iterations of the analysis. Theoretical saturation, in terms of meaning, was achieved for each stakeholder group [33].

4   Results and Discussion

This research has made it possible to demonstrate the usefulness of the theoretical framework developed for evaluating the performance of an IOIS and, to propose an approach for evaluating the performance of an IOIS. Figure 2 below illustrates how the dimensions of the performance of the DMO's IOIS differ according to the internal and external stakeholders involved (answer to specific research question #1).

4.1   Dimensions of IOIS Performance for Internal Stakeholders

The top of Fig. 2 shows the dimensions and performance indicators of the DMO's IOIS that relate to its internal stakeholders: (1) the capabilities of the DMO and its employees, (2) the expectations of DMO employees with respect to the processes supported, or not, by its IOIS, (3) the automation, information and transformation effects of the IOIS on DMO processes, (4) the satisfaction of DMO employees with the IOIS, and (5) the contribution of employees to the DMO's IOIS.

Capacities of the DMO and Its Employees. This first dimension reflects the necessary alignment of the DMO's strategies with the processes supported by the IOIS, its capabilities as a DMO and the individual capacities of its employees. This alignment provides an understanding of how the DMO can articulate its strategies and the processes supported by its IOIS toward the satisfaction of its employees and in accordance with their expectations and those of the DMO. DMO's capacities include (1) the capacities of the DMO's technology department, (2) the individual technological capacities of the employees, (3) the complementary organizational resources (human resources, material and financial resources, training provided) of DMO, (4) the strategic directions of the DMO, and (5) the characteristics of the IOIS and its functionalities. Although the use of the IOIS is mandatory, this does not mean that it is optimal in all departments and for all automated processes.

For example, a difference in the training provided on IOIS functionalities was at the origin of significant variations between departments.

Internal Stakeholder Expectations. The tool provides measures of internal stakeholder expectations that relate to the time required to complete a process and the costs involved. Internal stakeholders are concerned about improving the quality of the system: "Now all departments are ready for a new IS." This includes ease of use and access, speed of response and execution, intuitive navigation "like Google," flexibility

of queries, visual appearance and formatting to suit needs. At the same time, they seek to improve the quality of information, based on the criteria real time, up-to-dateness, reliability and completeness: "to become a nerve center of information." Some internal stakeholders are in favor of integrating functionalities that allow the IOIS to be adapted to relational marketing, to promote the integration of technologies with one another: "a single platform for the entire destination." Participants also mentioned the need to make better use of all the functionalities of the IOIS and the need to improve the quality of the IS service to support users.

Processes Supported by the IOIS. In the process of evaluating an IOIS, it is necessary to understand its impact on process performance. To this end, this dimension lists all the processes supported by the IOIS. Throughout the interviews, details are provided regarding the level of automation of all the tasks that make up these management and operational processes.

Effects of the IOIS, Satisfaction, Contribution and Performance Indicators. Automational, informational and transformational effects are considered when evaluating the IOIS by the internal stakeholders. First, the automational effects of the IOIS are related to the quality of the system, its navigation, stability, processing speed, response time, "just a click away" and remote accessibility. The DMO's employees mentioned automational effects such as loss of autonomy, work overload, "more steps than before" and the complexity of tasks to be performed in the system. The fact that
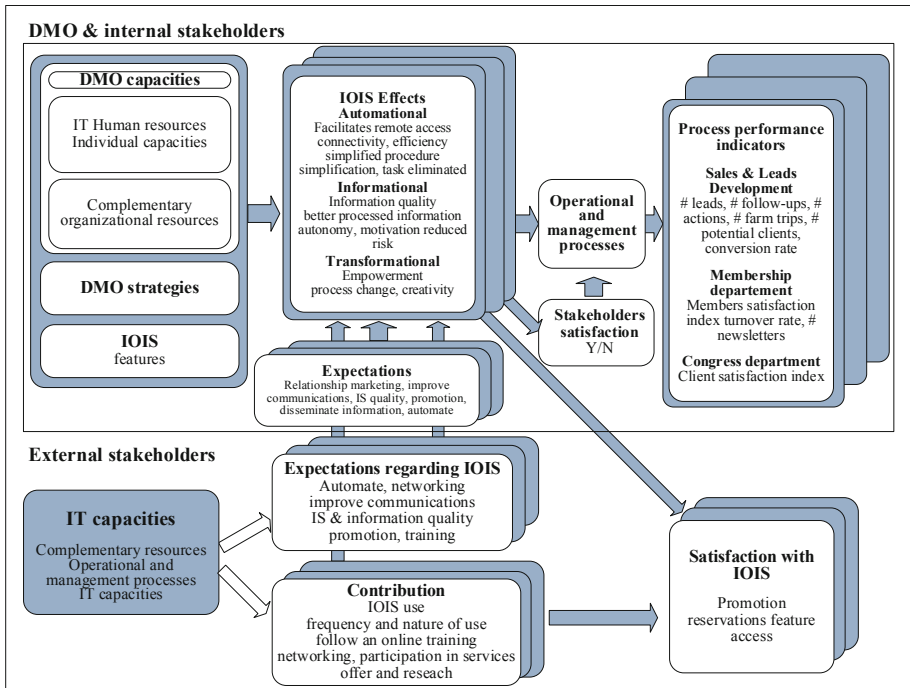
Fig. 2. Evaluation of Tourisme Montréal's IOIS performance

the expectations of a certain group of users had not been considered during implementation explains these adverse effects. It should be also noted that some sub-processes may be supported differently by the IOIS and cause opposite impacts.

Second, the informational effects of the IOIS relate to the quality of the information and the system's accuracy, updating, presentation, level of centralization and share-ability, and relevance. With regard to the respondents' responses, the measurement of the time spent carrying out a process and the costs this entails must be included in the performance indicators as they influence user satisfaction. Risk management related to information ownership is reduced when vendors are able to update information remotely in the IOIS. For the DMO, such quasi-simultaneous access to this information means that it can attain ownership of the information and, submit an estimate to potential customers at great speed. Thirdly, transformational effects occur immediately after a new IOIS implementation or new functionality is implemented, since a re-engineering process is underway. This is the case when certain processes are out-sourced to DMO members, such as the updating of tourism establishment information and the submission process of group quotes. Some DMO departments can become more autonomous in carrying out certain processes, as was the case with the sending out of the newsletter to Tourisme Montréal members. They no longer had to wait for the communications department to extract information from the database, as a result of which members' newsletters were issued more frequently, and with up to date infor-mation: "awesome, more interesting, motivating to develop these tools; real time marketing." Transformational effects therefore also have an impact on the perceived value to external stakeholders. Finally, process re-engineering can change the level of autonomy of managers versus coordinators, due to their different abilities to work on a new system: "It's reassuring to know that it's available to everyone and that it isn't just me who knows how to fly the airplane." However, these transformational effects are expected to be temporary as "data volume grows."

Contributions Expected from Employees. This dimension of the tool measures the extent to which DMO employees are involved in using the full potential of the IOIS, such as the constant suggesting of improvements, their regular training on the database, and their possible actions as ambassadors of the online destination: "super users."

Performance Measures of the Processes Supported by IOIS. The analysis shows that the indicators used by DMOs measure performance at a global level and are not always related to the effects of the IOIS on processes. For example, at Tourisme Montréal, the client satisfaction rate was measured for the entire destination and does not reflect on the performance of services offered through the DMO's IOIS. Nevertheless, the sales department had some relevant performance indicators at the process level, such as: the number of leads generated, the number of follow-ups and development actions carried out, the number of coordinated tracking visits, and the number of newsletters sent. It has proven useful to be able to calibrate the costs related to the execution of certain processes according to the time spent on an action. This would be a good indicator of the need to automate or transform certain processes supported, or not, by the IOIS. However, the process/time/cost indicators are missing in this case study.

Furthermore, in this case study, the impact of the IOIS on the overall performance of the DMO could not be assessed due to the absence of performance measurement indicators that link process efficiency (process-level performance indicators) to the overall performance indicators of the DMO. This finding confirms that the effects of technologies on processes do not necessarily correspond to the performance indicators used by process managers [18].

4.2   Dimensions of IOIS Performance for External Stakeholders

At the bottom of Fig. 2 are dimensions of IOIS performance that relate to external stakeholders, in other words, DMO member organizations.

Capacities of DMO Member Organizations and Their Use of IOIS Functionalities. As with the capacities of the DMO and its employees, this first dimension reflects the necessary alignment of the DMO's strategies with the processes supported by its IOIS and the capacities of DMO member organizations. This alignment provides an understanding of how the DMO can gear its strategies and processes supported by its IOIS toward the satisfaction of external stakeholders, in accordance with its own expectations. The capacities of member organizations include their own resources as well as those of their brand's head offices. It is the availability of these resources that conditions to what extent these organizations really need the DMO's IOIS.

Effects of IOIS on the Processes, Satisfaction and Expectations of External Stakeholders. There are, to begin**,** the IOIS automational effects, which can be measured for external stakeholders in terms of the quality of the system, ease of navigation, ergonomics, speed and interactivity of the system, and flexible formatting of the reports to suit needs. External user satisfaction is positive if the value of the previous measurement indicators exceeds their expectations. It will be negative if not.

The expectations of the external stakeholders can guide the DMO IOIS deployment strategies. Some external stakeholders use IOIS functionalities out of solidarity with the DMO rather than to respond to a real need. When evaluating the IOIS at the process performance level, and hence not only at the level of solidarity use, it became obvious that the individual hotel reservation process was cumbersome, complex and caused errors and loss of time for its users:: "I'm all behind Tourisme Montréal; but it's not in any way a booking engine, it's for promotion." External stakeholders do not all attach the same importance to process automation seeing that they do not all use them in the same way. Expectations for automation are high among hoteliers.

Secondly, the indicators for measuring the informational effects of the IOIS for external stakeholders focus on the quality of the information, in other words, its timeliness, completeness and relevance of its content, timing and conciseness. The sometimes-contradictory interests of these external stakeholders appeared in terms of informational effects because of their different information needs: "long stays markets," "deluxe leisure markets," "increased paid visibility" or an "excess of information; we don't have time to stroll around in members' extranets."

Finally, transformational effects are rarely encountered by external stakeholders, as the study revealed, except for the individual reservations process that demanded considerable adjustments on behalf of the hotels.

External Stakeholder Contribution. For each expectation of the external stakeholders toward the IOIS, a counterpart is expected by the DMO, in the form of a contribution toward the IOIS and/or a voluntary participation. This is a key dimension of the performance prism. All uses of the IOIS by the external stakeholders are voluntary. One member qualifies his relationship with the DMO as "intuitive" and has the impression that he isn't making "enough use of it due to a lack of time." Indicators to measure the contribution of external stakeholders to the DMO can therefore be, the frequency of use of the IOIS, the overall value of these uses (member fees, commissions on individual and group bookings, promotional placements, entrance to networking activities, etc.); the average value per transaction; the frequency of suggestions for improvement of the IOIS; and the perceived value of the services offered by the DMO's IOIS.

4.3   An Approach to Evaluate the Performance of a DMO's IOIS

The process-based evaluation approach used in this case study brings together all the needs and expectations of external and internal stakeholders by linking them to processes supported by the IOIS (answer to specific research question #2). The process-based approach was found to be the most likely to reflect the mechanisms by which the IOIS could affect the performance of the DMO: the exploitation of the IOIS in the operational processes of the DMO produces automational, informational and transformational effects which, in turn, affect the performance indicators at the level of the operational processes used by the stakeholders. These processes performance indicators have an influence on the overall DMO performance.

If the evaluation process reveals that the IOIS has little or no impact on the overall performance indicators used by the DMO managers in managing their processes, the following questions should be asked:

– Is the IOIS used appropriate for the DMO? Do its functionalities meet the expectations of the stakeholders? Are the key processes supported by the system?
– Do the DMO's IS strategies meet the needs of the stakeholders?
– Is the implemented IOIS being exploited to its full potential?
– Have investments been made in the "complementary assets" (DMO's capabilities) that enable the development of the IOIS? Does the capacity of user tourism organizations allow the IOIS to support the processes?
– Do the performance indicators used by the DMO truly reflect its organizational performance in all its aspects and capture the efficiency of the processes supported by the IOIS?

In the face of conflicts that may exist between competing tourism enterprises within the same destination, the DMO has a critical role to play through its IOIS: that of consolidator, leader and coordinator in order to reconcile divergences and present a global image of the destination [1]. Previous studies [13, 34] found that stakeholders held different perceptions about the role of IOISs and the metrics that need to be used. This case study integrates those different perspectives into a single framework taking into account the vision of its multiple stakeholders. This was made possible using a process-based rather than a variance-based evaluation approach, since a process-based

evaluation allows to measure the effects of the IOIS at the level of intermediate processes and functionalities. Furthermore, this evaluation approach offers a framework for DMOs to nurture a collaborative culture [13]: each stakeholder may express his expectations regarding the processes he is using, following which the DMO will request a contribution from those stakeholders. While the IOIS effects and performance indicators are highly contextualized, this process-based evaluation approach is replicable to any IOIS. This approach confirms previous literature in focusing attention on the need to evaluate all the IOIS functionalities with a holistic approach [5, 13, 14]. This approach is in line with Sigala recommendations for future research [13]: (1) to include the view of stakeholders in the private sector; (2) to consider attitudes through the dimensions *satisfaction* and *contribution* as well as the expected benefits with the dimension *expectations* regarding the IOIS. As previous research suggests, a high-level integration between stakeholders and interoperable systems is a requisite to a better performance [1, 5, 17]. This case study confirms previous findings showing that the primary goal of the DMO IOIS is still to provide information and to market the destination to potential visitors, and that less attention is given to their internal leadership role of coordination [35]. For example, Tourisme Montréal utilizes its IOIS neither to support the product development role of the destination nor to provide any B2B information to potential investors. It was found that Tourisme Montréal follows the trend identified in the literature in disengaging from the transactional functionalities as a way to give access to suppliers' own booking engines [5, 13]. As a consequence, this DMO will need to access third parties' big data to become an adopter of business intelligence and data science [1, 36]. In order to position this IOIS evaluation approach within the business intelligence literature, the following BI definition will be used. "Business intelligence (BI) is a combination of processes, policies, culture, and technologies for gathering, manipulating, storing, and analyzing data collected from internal and external sources, in order to communicate information, create knowledge, and inform decision making. BI helps report business performance, uncover new business opportunities, and make better business decision regarding competitors, suppliers, customers, financial issues, strategic issues, products and services" [37]. As the resource based-view theory of the firm was mobilized in the theoretical framework, and as this evaluation approach already involves internal and external stakeholders and is process-based, this evaluation approach offers an evaluation framework usable in the context of BI implementation. However, the adoption of BI initiatives requires more than an integrative IOIS performance evaluation approach; indeed, it requires a complete business model shift to place a greater emphasis on building a collaborative knowledge creation environment [1, 36] and, above all, a significant investment in the technologies that will allow DMOs to access and analyze relevant data on a timely basis.

5   Conclusion

The theoretical contribution of this article is based on four points. The first point is to establish a link between the effects of IOISs on processes and the performance indicators of these processes in an inter-organizational context. By evaluating the effects of the IS on processes and not the impact of ISs directly on the overall performance of organizations, the approach avoids the influence of exogenous variables that influence the DMO's performance. In a context where the literature attests to the difficulties in explaining the effect of IOISs on participating organizations, this research makes it possible to identify and define relevant dimensions: the effects of IOISs and user expectations, satisfaction and contribution.

The second point shows how the methodology used makes it possible to avoid the anchoring bias of an ex post evaluation. The proposed inductive approach avoids the subjectivity of an ex post evaluation that aims to define the level of performance of the IOIS in relation to the objectives pursued by the organization [18] or in relation to objectives determined during an ex ante evaluation. Since there is no potential value, the assessment of the value achieved is based on user satisfaction and the effects of the IS on processes, thereby avoiding anchoring bias.

The third point highlights the multidimensional and contextual aspects of the performance indicators used. By using the performance prism [24], the evaluation approach used takes into account the complexity and the multidimensional and contextual aspect of the concept of performance and does not reduce it to quantitative and financial aspects. This approach considers the expectations of the various stakeholders and their influence on the concept of process performance through their satisfaction; it focuses on the contribution of business partners, who can also benefit from the value of the IOIS when they are not directly part of the DMO [25]. The approach combines within the same evaluation tool individual and organizational indicators of the impact of IOIS on the performance of DMO processes.

The fourth point indicates that the contribution and satisfaction components make it possible to integrate, in one and the same tool, the concepts of voluntary use by external stakeholders as well as that of mandatory use by stakeholders internal to the DMO, in an inter-organizational context. The contribution component contains quantitative indicators (frequency and duration of use) and qualitative indicators (nature and reason for use). The contribution component also includes dimensions specific to IOIS. For example, the quality of inter-organizational relationships may motivate the use of IOISs by SMEs, which means that some stakeholders use IOIS functionalities for no other benefit than to participate in and maintain a close relationship with DMO initiatives.

While this research contributes to improving the understanding and evaluation of the impact of IOISs on the performance of DMO processes, and despite the rigor of the cross-sectional research design, this research has limitations. These limitations stem from choices relating to the interpretive epistemological position, convenience sampling (the study of a single case with nested cases), and the collection and analysis method. Data collected over a single period of time in semi-structured interviews reflect the respondents' point of view, which exposes them to cognitive bias. Data collection,

for external stakeholders, was conducted with only one person per organization. The results of the qualitative analysis of the data are essentially based on the researcher's interpretation despite the precautions taken to ensure transferability: the creation of a structured database; the use of reflective tools such as the logbook and memos; the validation of certain results with key respondents; and an audit of the coding.

The current state of knowledge justifies the continuation of work on the evaluation of IOIS performance. An interesting approach would be to conduct similar research, but this time with one or more rural DMOs IOIS. Another avenue to explore would be to conduct a longitudinal study of the evaluation of the performance of the IOIS of a DMO in order to have a perspective of its medium- and long-term impact on stakeholders.

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The Digitized Ecosystem of Tourism in Europe: Current Trends and Implications

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Abstract. Emerging digital technologies enable the creation of new services and business models, leading to ecosystems' continuous change. In the tourism industry, new digital-savvy players like Airbnb have entered and created entirely new market segments, while many existing players are challenged to redefine their business logic. However, the literature does not provide a generic overview of the value network in tourism, including new market players, and their ways of interacting. Therefore, this paper develops a current overview of the value network of the European tourism ecosystem. By analyzing the business models and value streams of 704 European enterprises based on Crunchbase data, we identified 27 distinct roles and their respective interrelations in the domain. To validate the proposed value network, we conducted five expert interviews. Our results highlight the continuously growing importance of intermediaries in tourism. Furthermore, new technology players offer new opportunities for innovative services, creating high dynamism in the industry. Nonetheless, local entities, such as residents and communities, play a central role in European tourism and need to be included in experiences provided to tourists. Scholars and practitioners might use the results to identify disruptive actors and opportunities for innovation and niche creation. Additionally, the results can be used as a basis for further analysis of the ecosystem's ongoing changes induced through technological advancements or external events such as the COVID-19 pandemic.

Keywords: Tourism ecosystem · Digital transformation · Value network

1 Introduction

Digital technologies transform the daily lives of consumers, companies, and the structure of entire ecosystems [32]. Through digital innovation and resulting digital transformation, new kinds of interactions and value creation emerge [40]. These changes challenge organizations in all industries, from product-centric to service-centric [39].

No exception, the tourism industry has undergone fundamental changes in the last two decades. Touristic behaviors and experiences have changed, and powerful actors have ramped up their operations globally. Players like Airbnb encourage private entities to lease their accommodations to fellow travelers, while Expedia and other aggregators offer one-stop-shops for services ranging from transportation to accommodation, rental cars, and on-site experiences. Tripadvisor is one of the largest online communities for exchanging and rating all kinds of touristic players, destinations, and activities. Due to current megatrends such as the restructuring of economies, the role of data, and shifts of global power, the tourism industry is likely to continue to face disruptive changes [38].

Consumers, businesses, and various other public and public-private players interact with information and communication technologies in new ways, leading to dynamic interactions among different touristic stakeholders [11]. These interactions among multiple actors within the ecosystem lead to the co-creation of value [16, 17]. However, tourism ecosystems are particularly dynamic, with new local and global players emerging during the past few decades [11].

To thrive in the ecosystem and drive innovation, however, understanding the ecosystem's active position and purpose (subsumed as role), and interrelations between them, is key. Furthermore, the knowledge of actors and value streams enables the development of more sustainable business approaches as the value is co-created among multiple stakeholders [33]. Practitioners need to understand the ecosystem's active roles to identify disruptive actors or potential business opportunities. Current research often focuses on specific technologies, such as augmented reality (AR) or specific players like hotels, but does not consider the ecosystem as a whole [11]. Furthermore, the high dynamic of the ecosystem, its actors, and their interactions make understanding the status quo difficult. Indeed, detailed identification of ecosystem actors and their interactions is required [11], and [13] even call for transformative work on the impact of digital technologies on tourism beyond COVID-19.

However, the research is still missing a holistic analysis of the current and ongoing transformation of the tourism ecosystem.

Therefore, this paper aims to answer the following research question: *What are the generic roles and their interactions in the European tourism ecosystem?*

To answer this question, we followed the research approach of [30, 31] and [32] to identify 27 generic roles derived from analyzing 704 companies from the database Crunchbase. To visualize the ecosystem and understand the interrelations between involved actors, we created an e3-value model. The e3-value method is a business modeling method to elicit, analyze, and evaluate business ideas from an ecosystem perspective [1, 10]. Based on this ecosystem, we discuss the strategic implications of today's tourism ecosystem, such as aggregation of intermediaries and the growing importance of data-based services.

2 Related Work

Digital transformation led to the emergence of highly complex relationships among actors and industry players who can no longer be grouped into suppliers, customers, and competitors [7, 24]. Having evolved from this classical value chain perspective, the concept of ecosystems goes beyond linear relationships and describes a group of loosely interacting and interdependent actors [14]. Firms such as Google, Amazon.com, and Alibaba leverage a large network of actors that provide complementary products and services. [35] defines "business ecosystems" as "[…] the community of organizations, institutions, and individuals that impact the enterprise and the enterprise's customers and supplies." Digitally-enabled transformation of many different industries, from linear value chains to highly interrelated and interdependent ecosystems, also affects the tourism ecosystem. Transferring this notion of "ecosystems" to tourism is justified due to the involved actors' complexity and interrelatedness, as [2] showed regarding tourism destinations. In this study's context, extending this view when "zooming-out," the generic term *tourism ecosystem* describes not only destinations and their actors but also the respective tourism ecosystem and its actors in any one country and region. Therefore, the tourism ecosystem in Europe as this study's unit of analysis entails all stakeholders and their interactions and also the resulting interrelations in this particular region. Prior work has introduced different concepts to describe ongoing changes and consequences induced by digital technologies in tourism, and the next sections present these concepts in more detail.

Accounting for services' increasing importance and the resulting servitization, researchers have introduced the term *tourism service ecosystem.* It follows the notion of Service-Dominant Logic (SD-Logic) (cf. [36] and [37]) to describe actors participating in resource integration and service exchange. These activities are enabled and constrained by endogenously generated institutions and institutional arrangements, and interlocking service ecosystems where value is co-created in the context of tourism [5]. This perspective allows researchers to account for increasing levels of value co-creation among actors within tourism ecosystems. In particular, it acknowledges digital technologies' role of enabling increased levels of servitization and value co-creation.

Furthermore, prior work on the use and impact of information and communication technologies in tourism led to the concept of *e-tourism*, used to describe digital technologies' wider impacts on tourism in general, thereby taking the perspective of tourists and businesses alike [8]. In the context of e-tourism, concepts such as business models were introduced to understand individual firms' business logic [28, 29]. Furthermore, research on e-tourism highlights the role of ecosystems and their dynamics [3, 26].

Based on the early term *e-tourism*, the literature accounting for digital technologies' ubiquity and the resulting connectedness in tourism referred to this advanced phenomenon as *smart tourism* [12, 15]. Smart tourism offers an integrated perspective on data, technological infrastructure, and the creation of business value. Moreover, *smart tourism ecosystems* (STEs) describe tourism systems that take advantage of smart technology in several ways. STEs are characterized by intensive information sharing and value co-creation among actors and include a variety of "species" such as touristic and residential consumers, tourism suppliers, tourism intermediaries, and others [11]

who co-create value within tourism ecosystems. An example of a local smart tourism ecosystem is the region of Salerno, Italy. Political administrative structures, such as the municipality and provincial tourism authority, periodically contact hosts, update them on events in the city, and invite them to regular meetings [27].

While the terms above describe different phenomena resulting from the impact of digital technologies on tourism in general, prior work was reluctant to analyze and discuss implications for a tourism ecosystem as the unit of analysis. Thus, this work aims to uncover advanced digital technologies' effects on different touristic and increasingly technology-focused actors and their respective interrelations subsumed into the tourism ecosystem in Europe.

3   Research Approach

We followed the research design proposed by [30, 31], and [32]. We first identified active actors' roles in the tourism industry and the value streams between them. Second, we converted the roles and interrelations into an e3-value-network to visualize the derived ecosystem. Third, we validated the model with semi-structured interviews of experts from the tourism domain and adapted the ecosystem according to their feedback.

First, we used the database Crunchbase,[1] which provides extensive information for existing companies and startups [19]. We extracted a dataset on September 13, 2018, applying the category "tourism" and the location "headquarter in Europe." This provided 851 European companies categorized as tourism companies according to Crunchbase. We excluded 124 companies no longer in existence. Then, we excluded further 23 companies classified into several categories close to tourism, but their value proposition was neither directly nor indirectly relevant to the industry. Thus, their relation to the tourism domain was nonexistent according to our understanding of the respective companies. Our final sample consisted of 704 companies. Using this sample, we performed a structured content analysis to develop categories inductively, i.e., generic roles, based on [20] and [21]. In addition to the information available in Crunchbase, we used publicly available information from the Internet, such as homepages of respective companies as well as reports, press articles, and annual reports. To ensure coding consistency, three experts individually coded the 704 organizations. To become familiar with the coding scheme, in the beginning, each expert coded 50 companies individually. Afterward, we compared and discussed these 50 organizations' coding for calibration purposes. Once this step was completed, all experts coded half the organizations independently, followed by another calibration step. Based on this, the remaining organizations were again coded independently by the three experts. All authors discussed the coding and discrepancies, eventually eliminating individual disparities and reaching consensus [9]. Then, we derived interrelations and value streams between generated roles through structured content analysis [20]. The concept of value systems was introduced by Porter and further extended to

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[1] Crunchbase is accessible via www.crunchbase.com. We used a premium account for data collection.

value networks to analyze industries, its' roles, inherent functions, activities, and their interrelations: value streams [6, 24]. To derive the value streams, we again used all available information. Primarily, we checked explicit interrelations these companies have with other companies, using the information provided about partners, customers, and suppliers of individual organizations on their public homepages and in other sources, such as newspapers.

In the second step, we visualized the ecosystem by developing an e3-value network based on coded generic roles and their interrelations. The method is suitable for abstracting roles from similar organizations and for modeling large ecosystems with a variety of stakeholders [32]. Our result was a generic e3-value network, i.e., the tourism ecosystem of Europe.

Third, from June to July 2020, we evaluated the developed ecosystem by conducting five interviews with representatives of the tourism industry. Among the experts were a managing director of a large online portal for holiday apartments, a former executive of the German National Tourism Board, a former executive of a large tour operator, a hospitality expert, and the head of R&D of a large tour and activity portal. Due to the experts' extensive experience and their different roles and approaches to the industry, a variety of interrelations were revised, and nine roles were added or changed in the final ecosystem. In an additional step to validate our findings, we randomly extracted 50 American-based tourism organizations from Crunchbase in October 2020. We chose American based companies due to the much easier accessibility and comprehensibility of additional information online via websites and blogs. The research team extended this sample, to deliberately include the well-known players Airbnb, Booking.com, and Tripadvisor. Two researchers then successfully coded all 53 companies into existing roles. As such, the identified roles seem suitable for non-European players, increasing the validity and generalizability of our findings outside the European tourism ecosystem.

4 Results

This section presents our research results. First, we introduce derived roles active in the ecosystem. Second, we present an overview of the tourism value network. After that, we discuss current trends and innovation patterns in the ecosystem.

4.1 The Generic Tourism Ecosystem

Picturing the tourism ecosystem requires understanding which individuals belong to it. Based on our structured content analysis of 704 organizations' Crunchbase data, Table 1 displays 27 roles identified in the ecosystem. Besides existing roles, we identified new roles that have emerged in recent years because of technological developments. Of course, one organization can act in different roles by offering different services to other players.

Table 1. Generic roles of actors in the tourism ecosystem

Role	Description	Example
Analytics Technology Providers	Companies providing analytics services or data insights. Their main value is collecting and processing touristic information that can be commercialized to other stakeholders inside the industry, or they sell insights from the data or analytics services that the customer can use	Milanamos Kido Dynamics Yourmyguide
Data Technology Providers	Providers of data and data sources, e.g., weather data, traffic data, capacities of regions, POIs, etc. Mostly, APIs are provided, which can be integrated into existing services	Amadeus Travel APIs GIATA
Digital Infrastructure Technology Providers	Providers of digital infrastructure, mostly platforms, to support service provision, e.g., booking-systems (mostly back-end solutions without direct contact with the tourist)	Amadeus IT Group
Disruptive Technology Providers: AR, VR, MR	Providers of disruptive technologies, offering AR, Virtual Reality (VR), or Mixed Reality (MR) services	Urban Time Travel
Disruptive Technology Providers: Artificial Intelligence	Providers of disruptive technologies, selling either services or software solutions based on Artificial Intelligence (mostly Machine Learning)	Surebot
Disruptive Technology Providers: Blockchain	Providers of disruptive technologies, selling either services or software solutions based on blockchain	Windingtree
Disruptive Technology Providers: Internet of Things	Providers of disruptive technologies, selling IoT-Solutions (cooperative work of physical and virtual objects)	Valpas Enterprises OY Yuubo
DMO (public & private)	Destination Marketing Organizations promote specific touristic regions to potential customers. Often, these are public or public-private partnerships	Allgäu GmbH visitBerlin
Intermediaries: Experiences	Leisure agents sell experiences, e.g., tours or museum visits to tourists by acquiring quotas from actual service providers. The physical service is performed by tourism experience providers	Tours&Tickets; Ceetiz
Intermediaries: Hospitality	Leisure agents sell Leisure services, e.g., hotel, camping, etc., to tourists by acquiring quotas from actual service providers. The physical service is performed by tourism experience providers	Hostelworld
Intermediaries: Tour Operators & Travel agents	Commercial providers of aggregated experiences, e.g., packaged tours. The physical service is performed by a tourism experience provider, and travel agents aggregate experiences into bundles	Trip Mule Classic Travel
Intermediaries: Transportation	Transportation agents sell transportation services, e.g., flights, to tourists by acquiring quotas from actual service providers. The physical service is performed by tourism experience providers	Urbo Solutions
Marketing and PR agencies	Specialized agencies for marketing and PR services in tourism promote concrete POIs, attractions, accommodations, or whole regions	Mylike

(*continued*)

Table 1. (*continued*)

Role	Description	Example
Online Communities: Content providers	Online communities providing touristic content	Vivere.travel Excursiopedia Live2Leave
Online Communities: Ratings	Online communities providing ratings of touristic destinations, activities, POIs, etc.	Mangrove TripAdvisor
Search Engine Optimization (SEO)	Companies offering services to navigate the Web, gathering travel options according to user requisites. SEOs redirect the user to vendor websites (no transactional process)	Flykt
Shared Accommodation	Accommodation provided by private entities, mostly locals, e.g., rental of a private apartment. In general, commercial platforms connect private and commercial entities	Farmbnb HomeExchange
Shared Experiences	Leisure Services provided by private entities, mostly locals, e.g., city tours by a resident. In general, commercial platforms connect private and commercial entities	Coolcousins Fromigo
Shared Gastronomy	Local food provided by private entities, mostly locals, but not in a restaurant, e.g., food provided by a private entity in his/her apartment. In general, commercial platforms connect private and commercial entities	Eatwith Foody
Shared Transportation	Transportation services provided or rented by private entities, e.g., a private person using his/her private car or a person renting his/her private boat. In general, commercial platforms connect private and commercial entities	Hiyacar Forestcar
Social Networks	Social networks (generic and tourism-specific solutions) providing content and influencing touristic purchase decisions	Ventoura Mojo Mobility
Software Technology Providers	Companies providing tourism-specific software solutions, e.g., hotel management software	Hotel Runner
Tourism Experience Provider: Accommodation	Commercial providers of hospitality services, e.g., a hotel, pension, campground, etc.	James Villas
Tourism Experience Provider: Activities & Attractions	Providers of touristic activities and attractions in the form of experiences, in general, all POIs	Pure Boats London Duck Tours
Tourism Experience Provider: Gastronomy	Gastronomy provides culinary experiences at visitor attractions and touristic destinations	The Chef's Cut
Tourism Experience Provider: Transportation (public & private)	Commercial providers of transportation services, e.g., airlines, bus tours, trains. These can be public or private entities	Mister Fly Enjoy Car Hire
Tourist	Tourists consuming a variety of experiences provided. Tourists are travelers on vacation and individuals on business trips	
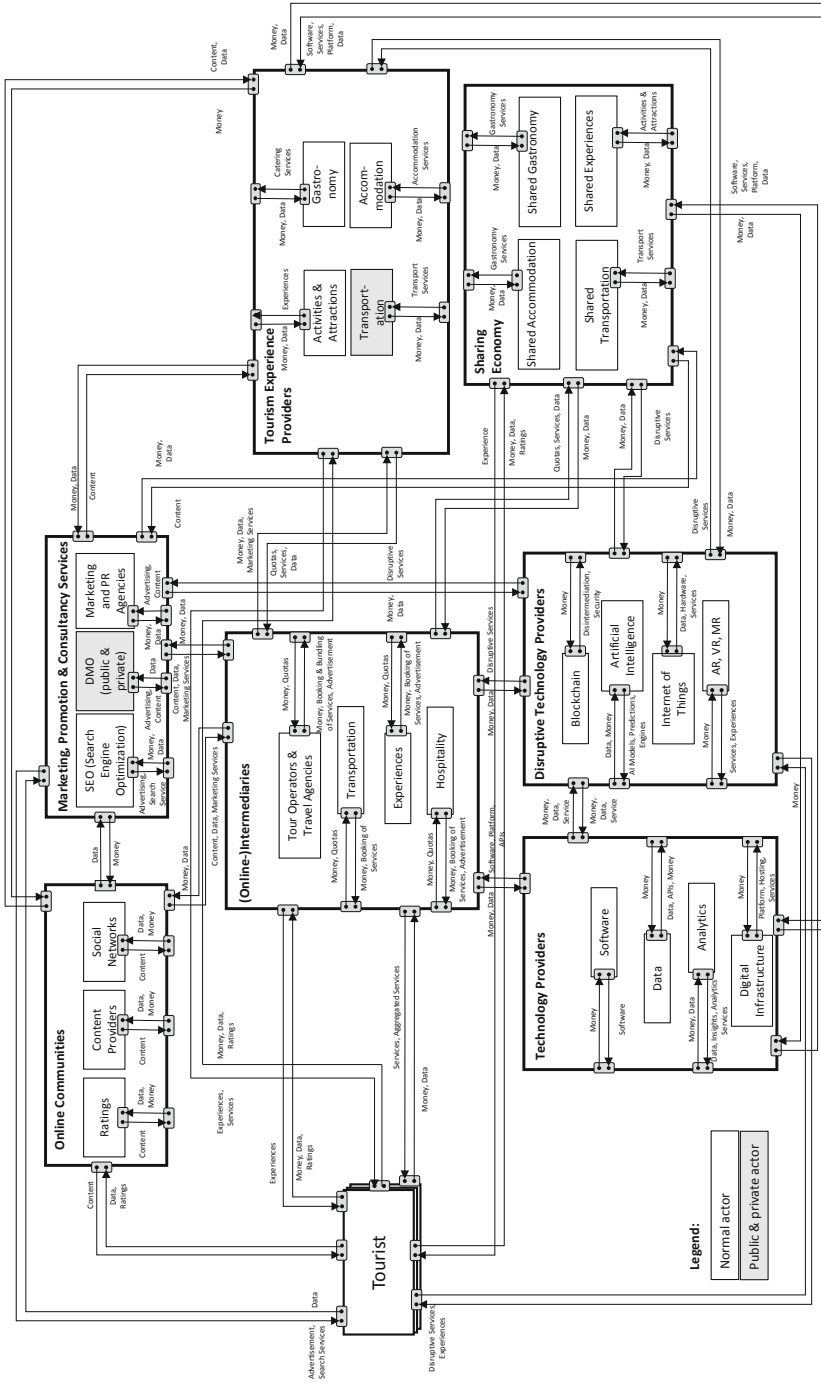
Fig. 1. Generic value network of tourism as e3-value model (author's illustration)

The central roles in the current tourism ecosystem are still tourists, intermediaries, and tourism experience providers. The tourism domain's generic network shows that the industry transformed into a heterogeneous, multi-sided network: Next to this "core" of the ecosystem, sharing economy services substitute a share of experiences provided previously only by tourism experience providers. This role's importance has grown within the last decade, challenging existing actors. Specialized marketing, promotion, and consultancy services reflect a purely B2B relationship toward intermediaries and tourism experience providers. Online communities play a special role, capturing tourists' content and emotions and influencing touristic purchase decisions. Technology providers ensure the ecosystem's functioning by operating digital infrastructure and offering relevant software solutions and relevant data for the ecosystem. Next to these, disruptive technology providers evolve, using such technologies as AR to provide new experiences for tourists, as well as B2B services such as the Internet of Things (IoT) and blockchain-based solutions. Disruptive technology providers challenge existing actors, mostly the roles of tourism experience providers, as well as technology providers. Figure 1 presents the resulting overview of the ecosystem.

4.2 Innovation Patterns and Strategic Implications of the Tourism Ecosystem

Today's tourism ecosystem still consists of a core of tourists, intermediaries, and tourism experience providers. Yet, the industry demonstrates high dynamism as well as an increasing number of collaborative business models. Tourists are modern consumers whose expectations are high and influenced by a variety of factors, including further roles, such as online communities. Nowadays, tourists consume "experiences" rather than services, reflecting their increasing expectations. Aggregated bundles of services must complement each other to provide a sound and complete tourist experience [23, 25]. As such, tourists' purchase decisions are highly influenced by ratings (sometimes even referred to as the "rating economy") provided by specialized touristic entities (e.g., TripAdvisor), integrated ratings of intermediaries (such as booking.com), but also by content provided in social networks.

Today's tourists rate almost all their consumed experiences on some platform. At the same time, especially among more tech-savvy tourists, non-tourism related platforms, for example, Instagram, influence decisions such as booking accommodations.

Special in the tourism domain, compared to other domains, is the public sector's important role. For one thing, public entities are responsible for the governance of heterogeneous actors. Especially for sharing economy services, new rules and mechanisms had to be introduced to balance a thriving local economy and to prevent harm to residents. For example, in Spain, rental of an apartment with Airbnb nowadays requires a special license to improve the management of tourist flow.

At the same time, public entities play a central role not only in governing their local region but also in marketing their destination for touristic providers. Destination Marketing Organizations (DMO) often take this multi-sided role, ensuring governance and, at the same time, promoting their regions and in some cases even offering a booking-platform for small accommodations.

Lastly, if tourists have an unmet need, the market tends to solve this issue by itself, often leading to the creation of new business models and actors. For example, mostly non-tech-savvy individuals operate a large share of European camping sites. Thus, tourists can encounter difficulties finding current information, such as open capacities and data about properties, for instance, "Is the campsite suitable for wheelchairs?" Because in such cases no actor is offering the information, specialized online communities have evolved so that tourists themselves provide and share it.

5   Conclusion and Outlook

Dynamic developments in the age of COVID-19 have demonstrated the necessity of having an in-depth understanding of the ecosystem and led to the call for further research [13]. Thus, this paper presents a generic value network of the European tourism ecosystem. Based on a structured content analysis of Crunchbase data of 704 organizations associated with tourism and subsequent validation by expert interviews, we derived 27 distinct roles. Our findings show that the "core" of the ecosystem—tourists, intermediaries, and tourism experience providers—remains the same. Yet nowadays, experiences instead of services are offered, delivering a full package personalized for users' needs. Next to that core, the role of sharing economy services has increased within the domain. We show the emergence of new, disruptive actors, offering experiences for end-users, as well as pure B2B services. The ecosystem acknowledges the relevance of digital technologies in enabling increased levels of servitization, i.e. in building value for touristic experiences [4], and value co-creation among actors. As such, the availability of data-based services has and still is growing within the tourism ecosystem. In particular analytics services emerge due to more open data in tourism and larger data volumes available [18, 34], offering great benefits for touristic experiences, but increasing the complexity for the players in the industry.

With this research, we contribute to the literature on value networks [24] in the tourism domain. Furthermore, we enhance research on tourism ecosystems with a more computer-science focused, big-picture approach, as proposed by [22]. Prior work has often diminished the use of digital technologies in tourism to e-tourism or smart tourism, positioning this hugely disruptive phenomenon as a sub-discipline of tourism [13]. Yet, a holistic overview of this highly dynamic ecosystem, with different actors and their mutual value interactions was missing as a basis for a more comprehensive understanding of digital technologies' impacts on tourism as a whole. By identifying ecosystem actors and their interactions, we directly follow the call by [11] to identify roles and value streams in tourism and [13] to enrich tourism research using multi-disciplinary approaches. Scholars and practitioners can apply our results to identify opportunities for innovative experiences for tourists, as well as new B2B services. Furthermore, disruptive actors can be uncovered, and existing white spots in the ecosystem can be transparently mapped. Active organizations can apply the model to identify potential threats to their current market positions and evaluate potential opportunities to adapt their business models. Besides that, results may be used as a basis for further analysis of the ecosystem's ongoing changes induced through technological advancements or external events such as the COVID-19 pandemic.

Naturally, our results have certain limitations and reflect roles and relationships that emerged from our available data, resulting in limited generalizability. Additionally, coding is always partly subjective. To understand interrelations among different actors, we relied on publicly available information, such as reports, press articles, or companies' websites. However, by validating our results with five experts, the mentioned limitations were mitigated, but not fully eliminated. To generalize our findings further, empirical research is necessary. Besides that, tourism connects various industries. As such, further actors from other ecosystems could be included, especially from the payment and insurance sectors, which also play a vital role in touristic experiences. However, because our goal was to focus deliberately on tourism-actors, these entities are not included in the dataset used and thus not reflected in the resulting ecosystem.

Future research can build on our results and enhance the network with concrete market shares. If actual revenue shares among different actors were understood in more detail, it would be possible to make objective statements about power shares within the industry. Based on this, the dynamics within this ecosystem can be studied, i.e., understanding how these shares will shift in the future and how the business models employed by providers will evolve [29]. Besides existing actors' importance, studying actual models of services and experience-provision can give valuable insights. One interesting trend observed in tourism, compared to other industries, is the importance of the public sector as well as the integration of local communities' into service provision. Future research can provide valuable insights into whether and how these entities can be better integrated.

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Measuring the Value of Social Media Marketing from a Destination Marketing Organization Perspective

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Abstract. Even though social media is one of the most significant marketing tools in tourism, the measurement of its value is still developing. Assessing return-on-investment on social media marketing is challenging. Thus, destination marketing organizations (DMOs) are nonetheless pouring money and time in social media marketing without being aware of the results. In this study, we seek to understand what DMOs are measuring in social media marketing that they do and why. The qualitative data was gathered via semi-structured interviews among eight representatives of Finnish DMOs. The interview responses were analyzed with a theory-guided content analysis method. The results demonstrate that even though the goals for social media presence are clear, the actions taken are more of an experimental nature and undocumented. Only the basic metrics that the platforms automatically provide are used and the evaluation of financial value is difficult. However, social media marketing creates value beyond financial value. Non-measurable data like customer emotions and opinions in various channels are considered as important especially to understand customer engagement. Even though the evaluation of financial value is challenging the total value of social media marketing is considered extremely valuable. Social media marketing is utilized in decision-making by top management especially with the help of measurable data. In addition to this, non-measurable insights are utilized in product development and marketing planning.

Keywords: Destination marketing · Social media · Marketing metrics · Measurements

1 Introduction

Social media has become one of the main marketing tools in tourism, both for businesses as well as for destination marketing organizations (DMOs). However, success is difficult to measure in social media. Mariani and his team found in their interviews of Italian DMOs that DMOs take for granted that spending on e-promotion is a worthy investment [17]. DMOs are nonetheless responsible for the public money they spend. Thus, we need a deeper understanding of how DMOs perceive the value of social media marketing to understand the reasoning behind investments in social media marketing.

Performance metrics in social media marketing are fragmented [1] and there is a lot that social media marketers can measure. DMOs tend to evaluate "what can be measured instead of what should be measured", meaning that marketing tactics are not chosen according to social media marketing strategy, but rather according to a tool that is easy to acquire and use [20, pp. 75].

There are various ways DMOs can utilize social media. It is a powerful tool that enables DMOs to accomplish their tasks such as increasing the competitiveness of the destination, enhancing marketing effectiveness and improving destination attractiveness, and following strategic management and marketing. The actions that DMOs undertake in social media marketing defines how well it can utilize social media to accomplish these tasks. This study focuses especially on actions that DMOs take themselves to reach their goals and to understand why social media marketing is conducted as it is. Examining measurements of social media value will provide insights into the topic.

Social media marketing can provide a lot of information for a destination. Tourism destinations are full of customer-based data in several sources, but they are typically unused [10]. Tourism destinations need to manage this knowledge and make it available and meaningful to others [2]. Pike [26] states that not enough research is done to control the results of destination marketing around the world. Smart tourism destinations are built on data and how that data is used to increase knowledge in the destination. For this purpose, it is paramount that we understand those who have access to various data sources in tourism destinations and how they utilize the data.

To this date, it is still relatively unknown how DMOs utilize the data they can get from social media marketing, and especially how personnel working for the DMOs perceive and use social media marketing data. This study aims to increase our understanding of the perceptions destination social media marketers have of utilizing social media data. Thus, the main research question in this study is to examine how destination marketers use data they get from social media marketing they do to make decisions based on data.

2   Social Media Data in Destination Marketing

Social media is a source of strategic information which can be utilized for developing several business strategies in the tourism sector, such as visitor satisfaction as a result of product development, solving visitor problems, learning about the visitor experience, analyzing competitive strategies as well as monitoring the image and reputation of the destination [21]. Thus, strategic management of social media is vital to a destination marketing organization [15]. According to Peters et al. [24], social media must have a distinct approach to measurement, which cannot follow the measurement systems of traditional or offline media. Also, utilizing marketing performance data in marketing decision-making impacts positively the performance. Social media channels provide various metrics such as the number of followers, engagement, reach, reactions and likes that create datasets, which allow marketers to assess the success of their actions.

From a marketing perspective, social media channels must be evaluated for their effectiveness [18]. According to Germann, Lilien, and Rangaswamy [6], many marketing managers are sceptical towards the use of performance measurement data. Thus, they tend to count on intuition and experience when making decisions. On the contrary, Agostino and Sidorova [1] state that with the adoption of different social media technologies widely, both practitioners and academics have understood the organizations' important role in measuring the contribution of social media activities in business. This applies in terms of financial input as well as the value generated by social media data from users' interactions [1].

In general, there is little research done to give guidelines for the ways of planning engagement tactics and the impacts on social media communities [11]. Nevertheless, within the emergence of digital marketing platforms and the possibility to utilize data obtained from them, the use of real-time quantitative data and statistics is increasing in the form of data-driven marketing [7, 23], [34]. Also, many times the information on marketing evaluation that destination marketers have is mainly tacit, lacking shared knowledge on marketing management [20]. According to marketing literature, this phenomenon is quite common among marketing practitioners [25].

In addition to this, several studies relating especially to traditional, offline marketing state that marketing performance measurement is usually affected by the focus on subjective measures, including brand loyalty and customer satisfaction. There are difficulties in linking them with financial metrics, which often are in the interests of top management [27, 28, 30]. According to research so far, industry practitioners in the tourism sector have inadequate knowledge about the financial returns on their investment in terms of social media marketing, leading to significant differences in the knowledge of social media assessment among DMOs [15, 17]. For example, Mariani and his colleagues found out that Italian DMOs are not measuring commercial outcomes at all [17].

Another challenge in measuring social media marketing is the impact of spillover effects, meaning that exposure to other marketing channels may influence the exposure of social media channels [16]. Also, Järvinen [12] mentions difficulties relating to the impact of marketing activity from other effects. For example, if the sales of a product or service increase as a result of a marketing campaign, it is challenging to determine which part of the total sales increase as an outcome of a particular campaign, such as campaigns relating to new products, news published about the company, price promotions or improvements in the economic situation, to name but a few [12]. Therefore, metrics, which not only listen to the core brand but also the noise across the system are needed in social media dashboards [24].

There is no point in gathering information from digital analytics unless the data obtained from it is analyzed properly [3, 25]. The research shows that with the help of analytics, which is used in assessing the performance, it is possible to generate more sales, profit and return on investment [5, 6], which are also essential goals for DMOs. Assessing the financial value is another essential part for the tourism companies to demonstrate their success in social media marketing. However, previous research suggests that industry practitioners do not have enough knowledge about the financial returns on their investment in terms of social media marketing, leading to significant differences in the knowledge of social media assessment among DMOs [15, 17].

Table 1 presents the studies focusing on social media marketing metrics. There are different methods for assessing social media performance in academic literature. According to the research so far, quantifiable measures are highly appreciated, while

Table 1. Previous studies relating to social media marketing measurement.. Paraphrasing: Lamberti and Noci [14]; Chaffey and Patron [3]; Morgan et al. [20]; Sigala [13]; Germann et al. [5]; Peters et al. [24]; Mariani et al. [17]; Järvinen and Karjaluoto [11]; Agostino and Sidorova [1]; Järvinen [12].

Author(s) and year	Major findings relating to the previous study of social media marketing measurement
Lamberti & Noci 2010	The outcomes show that companies pursuing different marketing strategies adopt different kinds of MPMS (marketing performance measurement system).
Chaffey & Patron 2012	Technology already exists in making the most of digital analytics, but according to the study, the major constraints for companies in digital analytics in fact are people and resources.
Morgan et al. 2012	It is argued in the article that the KPIs (key performance indicators) used traditionally are partly unsuitable for assessing the impact of DMO digital platforms. The article suggests that traditional marketing KPIs evaluate what can be measured instead of what should be measured.
Sigala 2013	The public and private stakeholders had differing views about the roles of DMS (destination marketing system) as well as about the metrics that need to be used for evaluating DMS performance. The findings also showed that the perceptions that stakeholders had about the roles of the DMS influence their perceptions about the performance evaluation of DMS.
Germann et al. 2013	The use of marketing analytics depends on the competition in the field of business the company operates in, as well as the needs and wants of the company's customers. A suitable culture for the use of analytics in the organisation contributes to better marketing performance. Most companies will benefit from the use of marketing analytics.
Peters et al. 2013	In the study, three components of appropriate metrics for social media were developed, namely a holistic framework for social media elements and nine guidelines for social media management. Also, the theoretically driven metrics for dashboards were established, including the requirement of the new kind of input for social media and organizational changes that need to be followed when implementing social media.
Mariani et al. 2015	In the paper, factors contributing to superior level of social media activity are investigated. There are differences in the ways in which Facebook is tactically and strategically practiced among Italian regional DMOs. Different tools and ways to measure the ROI of social media are used among DMOs. Some DMOs rather rely on sentiment gained from social media instead of numbers, when assessing the impact on sales of tourism products and services.
Järvinen & Karjaluoto 2015	An organization should consider the the chosen metrics, the processing of metrics data, and the organizational context surrounding the use of the system. KPIs, which can be managed and corresponds to the firm's objectives are recommended. In addition to this, the collected data should be continuously modified in order to make right decisions. In marketing metrics management, time and resources should be invested.
Agostino & Sidorova 2016	A PMS (performance measurement system) framework was developed, making a difference between metrics and methods. The measurement of financial and relational impact of social media are supported in PMS metrics, as well as the impact of social media conversations and opinions of the users. However, as social media evolves continuously, the system should be updated on a regular basis.
Järvinen 2016	In the measurement of digital marketing performance digital analytics can be used, however, its actual value is processed by the company's ability to process the data into meaningful information and thus, better performance. With digital analytics, moving to data driven marketing instead of relying on experience and intuition in decision-making is possible.

analyzing the reactions from the user sentiment is gaining more popularity among practitioners. However, the method for analyzing customer sentiment is especially challenging to find. Also, as it is the consumer who is responsible for shaping the brand and the media, DMO managers must be able to show the impact of their marketing actions against a 'clear and communicable set' of KPIs [20].

This study aims to further elaborate on how social media data is utilized in tourism destinations. To further improve this important aspect we need to understand how social media metrics are perceived and utilized by DMOs. To this day, we are lacking knowledge on what success means for DMOs in social media marketing, how data they obtain from social media contributes to this success, and how that data can help in decision-making in the DMOs.

3   Methodology

To reach the study goals qualitative research approach was chosen. Semi-guided theme interviews were with the personnel of Finnish DMOs during April, May, June, and September of 2019. In the study, altogether eight interviews (I1-I8) were conducted as data saturation was reached at that point, and new interviews did not provide any major new insights [32]. Finnish DMOs were chosen as Finland is undergoing development towards a smarter destination [33] and it was easy and efficient to find the interviewees.

The interviewees ranged from marketing managers to CEOs. Before the interview, a letter concerning the interview was sent to the interviewees to get more information about the background and practicalities of the interview, including anonymity and confidentiality, which is important in interviews where businesses and their tactics are handled [4].

Based on the literature four main themes were identified for the interviews: goals of social media marketing, how social media marketing is measured, the financial value of social media marketing, and use of social media in decision making. A pre-defined definition of success, social media marketing, or any other concept was not given to the interviewees but the goal was to understand their perceptions of these topics. All the interviews were conducted in Finnish and they typically lasted for about an hour, including the forewords and an informal discussion at the end. To focus the topic the interviews explored mainly two most used social media channels, namely Facebook and Instagram. At the time of the interviews, the number of followers and likes ranged from 6427 to 160 000 in Facebook and 4080 to 55 300 in Instagram in the social media channels of the DMOs participating in the study. Also, many of the DMOs have other channels in use, such as Twitter, LinkedIn or TikTok. In addition to this, social media channels, especially for Russian or Chinese markets, were in use in some DMOs. Some DMOs had several channels on Facebook for example in different languages. YouTube was in general regarded as a channel to store video content rather than a marketing channel.

The interviews were recorded and later transcribed. Transcribed data was analysed using content analysis. The main purpose of content analysis is to organize the data so that the essential information is not lost. It is a methodological framework, which can

be used in various ways, enabling analyzing the data in versatile manners. The analysis process is based on interpretation and reasoning, where it is possible to proceed from the empirical data to conceptual perception about the phenomenon. The analysis must be based on truthful and credible interpretation as well as justifying the decisions made in the process [27].

According to Tuomi and Sarajärvi [32], the analysis process can be either data-driven, theory-guided, or theory-driven, depending on how strongly the research and its analysis is based on theory or data. In this study, the analysis is theory-guided, also called abductive reasoning, for the research itself is based on theory and previous theory was studied before the interviews were conducted. However, it does not strictly follow a certain theory nor does not try to test a theory. In abductive research, the focus is on the meanings and interpretations, the motives, and intentions that people use in their daily lives [4, 22].

Phrases can be simplified into single expressions. This is also called coding [27]. Coding was done for the data in question by collecting single expressions into an Excel sheet. Subsequently, findings will be categorized and thus, thematized into the most important topics aroused from the data [27]. In the data of this study, the similar expressions were later unified under one. As Eriksson and Kovalainen [4] state, the analysis process took place in several simultaneous phases. As a result of the content analysis categories or typologies regarding the relevant study, questions are created. These typologies identify the perceptions of the DMO personnel regarding the study questions.

4 Findings

4.1 Goals of Social Media Marketing

Table 2 presents the ten categories of goals identified in the content analysis of the interviews that the DMOs have regarding social media marketing. Similar analyses were conducted for all the questions in the study. We can see that branding and profiling the destination and promoting the services and products are the main goals for DMOs. We can also see that different DMOs have different goals set for social media marketing. The goals are important to understand as they define what metrics and what kind of data are utilized in social media marketing. For example, I3 was the only interviewee stating that they use social media as a tool for communication with followers and fans. I3 was also the only interviewee that used social media marketing to participate in the conversations in social media channels.

Table 2. The goals of social media marketing in DMOs

	I1	I2	I3	I4	I5	I6	I7	I8
Branding/profiling the destination	x	x	x		x	x	x	
Promoting the services and products in the destination	x	x		x		x		x
Being involved in the customer journey	x			x				
Increasing the awareness/demand		x	x	x			x	
A tool for reaching/knowing the target groups and customers		x	x			x		x
A tool for communication with followers and fans			x					
A customer-service channel			x			x		
Inspiring/building long-term relationships with the audience				x		x		x
Directing customers to the website and selling					x	x		
Spreading current information/source of info						x	x	

4.2 Meeting the Goals of Social Media Marketing

How DMOs define whether or not their social media marketing is successful depends on the goals they have set for social media marketing. When asked about comparing the goals set and documented with the results gained from social media marketing, several types of ideas were received. For example, two interviewees (I1 and I3) mentioned that they tend to follow the set goals at a general level. However, they do not actively follow whether the goals have been reached. As many of the goals are on a general level without any kind of concrete measurement, it is difficult to develop models that explain factors contributing to reaching the goals. Interviewee I3 says that they tend to measure quantitative goals "three or four times a year" in a sense that "where we have succeeded and where not" (I3). Following the qualitative measures, on the contrary, has been more like "based on vibes" (I3). Interviewee (I1) has similar thoughts concerning the issue:

"Yes we compare and measure our own success on a general level and of course it is monitored, but if in the strategy we don't have such quantitative goals, so of course, it has been impossible then to say quantitatively or so precisely that how, whether the objectives were exceeded or not.." (I1).

An interviewee mentions that they tend to compare their results with the ones of the previous year. *"Well, we compare and compare a lot to the previous year, especially if something similar has been done…"* (I6) Last, one interviewee says that the main purpose for providing the information about the results is for the partner companies operating within the destination: *"Partners, in other words, the companies that are involved, if they are satisfied with what information is available to them, then at the moment it has been just enough for us."* (I7).

Some interviewees (I1 and I2) state that the metrics used are considered basic metrics. However, according to the interviewee, this type of measurement relates more to the measurement on content production, stating that the measurement is *"Not so much the final product, which is to bring passengers or bring tourists to the destination, it does not measure the final goal but the success of the content work"* (I1).

Another interviewee has a similar opinion concerning the issue: "*If marketing is difficult to measure, then the relationship between marketing and sales is even harder to measure,*" (I2) continuing with *"…how much marketing is generating sales, as in our area with 200 travel companies, it is quite difficult to prove how much our branding campaign, for example, how much money it brings to a single company."*

Only one of the interviewees (I5) stated that they use ROI for calculating the success of their social media marketing. One interviewee (I2) stated that they make calculations before each campaign to set goals to be achieved. Also, two of the interviewees (I3 and I6) stated that creating financial models for calculating marketing success remains a challenge since the DMO does not practice sales.

Some of the interviewees (I3 and I6) brought out the challenge of calculating sales or marketing success since their main purpose is to brand the destination in social media instead of selling. An interviewee thinks that *"Yeah looks like its kind of hard to measure what value you put to the benefits related to the image".* (I6).

Most DMOs in this study do not currently have any financial models to measure the success of social media marketing. Yet, according to the findings, the DMOs, in general, are interested in acquiring them in the future. On the contrary, one of the interviewees (I1) stated their critical attitude towards financial models, and whether they are needed:

> *"I'm not really sure of anything is like that if it is that the value of an action is defined as something but not based on the actual trade it has, but on a certain value and like that, even if it was 20,000 €, there have been 300 people out there doing that function, so whether that's a sensible measure, that's just what I was thinking about." (I1).*

Another interviewee (I6) has similar thoughts concerning the issue, pointing out that the financial measures have not been calculated, but it is rather something that has been reflected in the organization:

> *"Well it is not really that computational, it has been more of what has been reflected, that we have invested this much into this and now these are the results, and then we kind of think about it either during campaigns or after and then, in a way, many times the things is that we do not sell anything. So, Visit xx does not sell anything alone". (I6).*

4.3   Effects of Social Media on Decision-Making

According to the findings, several notions arose concerning decision-making based on social media marketing in DMOs. The mentioned issues included the notions that the management understands the role of social media marketing (I1, I2, I3, I4, I5, I6 and I8), the DMOs utilize social-media marketing in decision-making (I1, I3, I6 and I8), social media is utilized in marketing planning (I1, I5 and I6), partner companies in the destination are kept informed in terms of plans regarding social media marketing (I2, I4 and I8), as well as measuring the financial value is in the interests of the board (I2, I3, and I5). Other issues mentioned were that social media measurement will increasingly be a tool for management (I1).

According to interview findings, it was mentioned in nearly all the interviews (I1, I2, I3, I4, I5, I6 and I8) that the management understands the role of social media marketing in marketing of the destination. Especially three interviewees said social media is (I1) or will be (I4) utilized in decision-making and budgeting (I1, I4, I6) as well as in investments (I8). One interviewee states that *"probably in budgeting and like marketing planning and well really in everything, it's such a central part of everything we do, I don't really come up with anything where it's left out like that. Or where you could exclude it."* (I1).

Another type of finding in the interviews is that the decisions in social media are made regarding the use of resources. Interviewee I4 states, that especially time resources can be justified when those working with marketing in DMOs can demonstrate how much time has been spent on certain operations.

> *"And yes, those are the choices, let us say about just moving something in-house. As you can see, it does not come from a two-hour weekly work, but requires eight hours at a minimum. In a way, with these results, I hope that we can also support such resources and other decision making."* (I4).

One interviewee stated opposing thoughts concerning the top management's (or board's) role in social media marketing. According to the interviewee (I7), also the management must understand the role of analytics and strategic management. There is no point in collecting social media data if the management is not interested:

> *"So, if the whole organization's decision-making is spoken of, yes, there never has been a question of what those numbers have been, that is to say, it would be quite different to put pressure on them if they were interested, but if I don't know if analytics and figures are going to be utilized, it is also useless to pay for collecting them."* (I7).

5   Discussion and Conclusions

This study paints an interesting in-depth picture of the everyday challenges DMOs face to build a smarter knowledge destination based on data they receive from various sources. In this specific case, the focus was on social media data and measuring the success of social media marketing. Even though tourism and marketing literature is abundant of models to measure digital marketing and social media marketing, virtually none of these are utilized by the DMOs in this study. This suggests a relatively wide

academic-practitioner gap in social media marketing metrics. It would also seem that relatively little development has happened during the past four years as the results in many regards are similar to what Mariani and his colleagues found [17]. However, in one aspect significant change can be identified. The connection between marketing and sales is becoming easier to measure and four DMOs in this study are developing their capabilities in this regard.

Interestingly we allowed the DMOs to define themselves what they mean by social media marketing and what are their emphasizing in it. The results show that they focus the most on owned and paid media, while earned media gains much less attention. This is an interesting observation as earned media can be regarded as one of the most influential sources of information when tourists are making destination decisions. Only three DMOs actively follow what is written about the destination in social media. This implies that there is a disconnect between social media marketing strategy and customer experience strategy at the destination. Social media is seen as a promotion channel instead of using it as a source of intelligence and two-way interaction with the tourists. We can also see from the data that the locals are in no way a stakeholder for social media marketing in DMOs. Not a single DMO mentioned any measurements regarding people living in the destination region.

According to the findings, the so-called basic metrics that the social media platforms automatically provide are used for measuring the results of social media marketing, as they can be easily acquired and implemented inside social media channels. This supports the finding made in the study by Morgan et al. [20], which suggests that tools for social media measurement tend to be chosen according to the easiness of adoption and use. This finding is also consistent with the finding of the study by Peters et al. [24], stating that especially small companies are likely to be in favour of the basic metrics. However, in the worst-case scenario, simple metrics (e.g. likes, followers) in measurement can mislead marketing efforts in a way that it may even be harmful to the organization's goals [24]. Nevertheless, based on the findings of this study, it is challenging to evaluate whether the metrics selected are the most appropriate for the DMOs' social media marketing and their goals.

In their studies, Hays et al. [8] and Järvinen and Karjaluoto [11] highlight that metrics selection varies between the organizations, referring mainly to web analytics in digital marketing in general. The findings of this study report similar findings. Even though there were similarities in the measurement techniques, it still seems that different types of measurement techniques are highlighted depending on the DMO. The study by Agostino and Sidorova [1] provided similar types of results in the metrics selection, stating that choosing the metrics for marketing measurement is fragmented among DMOs. This is natural, as the goals may differ among DMOs. Not just one metrics system exists in social media measurement, but rather, organizations need to define their measurement systems, which are in line with the strategy [11, 24].

As to the financial value, several DMOs of the study agreed that it is an important factor also in social media marketing. However, it is difficult to measure, especially if the DMO's main task is to brand the destination instead of selling products or services. When a DMO moves from marketing into sales it seems to affect the way all marketing is structured and measured. Measuring the financial value becomes easier when the DMO practices sales in their digital marketing channels, since the results of marketing

become more measurable. However, social media improves also website traffic [13, 19]. In this way, visitors and ultimately customers can be directed to the website, where they may end up buying tourism services. This demonstrates the complexity of branding versus direct sales in destination marketing, something that has not received enough attention in destination marketing literature.

The findings revealed that in social media marketing other measures, mainly the so-called qualitative measures are also important, and not just financial. This finding is in line with the study by Agostino and Sidorova [1] stating that both practitioners and academics have understood the organizations' importance for measuring the contribution of social media practices in business purposes, referring to both financial contributions as well as the value generated by social media data from users' interactions. Also, Huang et al. [9] state that by communicating with customers in social media channels, companies and destinations can get valuable information on competitive advantage and the desires that customers have. This will help marketers in getting new ideas and utilizing them in planning their products and services for customers' needs. From the study in question, similar types of conclusions can be made.

The findings show that social media marketing is generally taken into consideration in decision-making and its role is usually understood also by the board or top management of the DMO. This finding is in line with Mariani et al. [17] and Agostino and Sidorova [1] suggesting that the DMOs understand the importance of social media marketing today. Also, the findings show that social media often plays its role when deciding about budgets as well as investments both in social media and otherwise. The findings also implicate that especially with the help of social media analytics and other data, the board can be convinced about new decisions, as well as in justifying timely resources or future actions. The findings suggest that measuring the financial value is clearly in the interests of the board of the DMOs, as with the help of analytics, it is possible to generate more sales, profit and return on investment. This finding is in line with the studies by and Germann et al. [5] and Germann, Lilien, Fiedler, and Kraus [6] stating that web analytics in general offer objective and quantitative metrics, which can be easily communicated to top management.

In addition to metrics and analytics, the findings suggest that social media discussions are utilized in DMOs, thus benefiting from it in the decision-making. Social media acts as a tool for learning about the preferences and feelings of customers, which can consequently be utilized in decision-making.

For future research, the results of this study open up new possibilities and directions. For example, identifying the importance of goals is crucial if social media marketing and the use of data want to be improved. Goals need to be developed together with social media marketing knowledge. Also when researching social media marketing at the destinations the complexity of the phenomenon needs to be understood. Stakeholders and their expectations, goals, capabilities of the personnel, resources available and many other factors all influence social media marketing practices in DMOs. There is also still a demand for a more critical assessment of social media success. For example, the responsible use of public funds [17] was not mentioned by the respondents. DMOs acknowledge that they need to be able to demonstrate the quality of their marketing but are having difficulties in understanding it themselves. However, the opinions of the funding companies became important among

DMOs that are funded by tourism businesses. The question of whether or not the funding companies have any better understanding of the success of the DMO social media marketing still remains. The financial value of social media marketing is the top priority for DMOs, but in the future, the possibilities of social media marketing in reaching non-financial goals, such as engagement of the locals with the tourism industry, should be explored further.

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Destination Imagery Diagnosis Model: The Case of Switzerland

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Abstract. This research investigates destination imagery of Switzerland as a travel destination. This research first conducted survey and content analysis to identify 23 unique statements reflecting travel in Switzerland. Through an online survey, this research collected 399 responses from French and Italian respondents. Based on the comparisons of association strength and association valence of every statement to the aggregated association strength and association valence, this research developed the Destination Imagery Diagnosis model. The results show that, overall, French and Italian respondents have strong and positive associations to statements related to Switzerland's nature and opportunities for outdoor activities. Furthermore, respondents rated "Healthy lifestyle" and "Welcoming and friendly" positively but the associations to Switzerland were weaker. This research also identified marketing opportunities specifically for French and Italian respondents. The Destination Imagery Diagnosis Model serves as a new tool to compare destination imageries between markets or keep track of changes of destination imagery.

Keywords: Destination Imagery Diagnosis model · Association strength · Association valence

1 Introduction

Previous researchers have documented that both cognitive and affective perceptions contribute to overall destination image, and destination image impacts on the intention to visit. On the other hand, although destination image is one of the most researched topics in tourism, many researchers challenged the ambiguity of the destination image construct [6, 9]. Researchers have advocated the delimitation of concepts between destination imagery and destination image [6], and defined destination imagery as "an individual's or a group of individuals' diverse cognitive and affective associations relating to a destination"; while destination image is "an overall evaluative representation of a destination". Researchers have further proposed the Destination Content Model, which differs from the existing destination image model in replacing cognitive image and affective image with destination imagery, proposing destination affect as a

new construct, as well as in measuring destination imagery, destination affect and destination image [8].

The objectives of this research are to understand the destination imagery of Switzerland, and to identify marketing opportunities. This research makes contributions to the academia by testing the destination imagery concept proposed in [6, 8], developing marketing insights based on the results, and further proposing a Destination Imagery Diagnosis model. This research also contributes to the practitioners by understanding destination imagery associated with Switzerland in target markets, and the findings could be used to evaluate and improve marketing and branding efforts to develop demands for Switzerland tourism.

2   Literature Review

2.1   Destination Image

Destination image is considered as an attitudinal construct consisting of an individual's mental representation of knowledge, beliefs, feelings, and global impression about an object or destination [3, 5, 13]. Researchers have advocated that the measurement of destination image should consist of three dimensions, including functional and psychological characteristics, attributes and holistic (imagery), and common and unique attributes. Nevertheless, most destination image research focused on functional and psychological, and attributes and holistic dimensions [5].

Destination image construct contains two evaluations: perceptual/cognitive evaluation (the beliefs or knowledge about a destination's attributes), and affective evaluation (feelings toward, or attachment to the destination) [3]. Generally, researchers believe the cognitive components impact on the affective components, hence these two constructs are different but hierarchically related [3]. Furthermore, cognitive image influences the overall image either directly or indirectly through affective image [3].

Commonly the measurement of cognitive image is to firstly identify attributes related to the studied destination through literature review, focus group interviews, and content analysis, then ask respondents to evaluate these attributes on semantic or Likert scales [3, 5, 13]. On the other hand, the measurement of affective components is through four bipolar items, including arousing-sleepy, pleasant-unpleasant, exciting-gloomy, and relaxing-distressing. Although these four bipolar items were used in numerous research, and researchers almost treated all other attributes as cognitive image, some researchers also raised questions. For example, researchers advocated destination image should include both functional and psychological characteristics, and gave the example of "friendliness" as the only psychological attribute measured by the majority of researchers [5]. Researchers have stated "…personal safety, friendliness, … can be considered as cognitive image attributes of a more psychological nature", but still measured affective components with the popular four bipolar attributes [7, 8]. On the other hand, researchers have used text mining and sentiment analysis to analyse reviews in order to understand tourists' impressions and feelings [1]. Yet, researchers also argued that destination affect should be an overall affective response or an overall affective state of like or dislike to a destination [6, 8].

2.2   Destination Imagery

Although destination image is one of the most popular research topics, it has been criticized by different scholars for its ambiguity in the construct itself [4–6, 8, 9, 13]. An extensive review of the methodological issues related to destination image, including dimensionality (single vs. Multidimensional), and the nature of construct (formative or reflective, descriptive or evaluative) can be found in [6]. Consequently, researchers have proposed to differentiate destination image and destination imagery [6, 8]. Destination imagery is defined as "an individual's or a group of individuals' diverse cognitive and affective associations relating to a destination" [6, 8]. Destination imagery is descriptive in nature, and will benefit from using a formative modelling approach [6, 8].

On the other hand, destination image is defined as "a shortcut or outcome of the array of associations which people mentally link it to a destination"; or a mental shortcut that individuals use to make judgements and decision efficiently; and is evaluative in nature [6, 8].

2.3   Research Questions

The differentiation between destination imagery and destination image clarifies some methodological issues such as the ambiguity of the definition and the nature of variables (formative vs. Reflective, descriptive vs. Evaluative). Furthermore, destination imagery aligns with the general psychology concepts including the Theory of Spreading Activation and memes [2], as well as work done by some tourism researchers in destination branding [4, 8]. Common memes could be used to activate potential customers associations, while unique memes could serve as competitive advantages [2]. Hence, memes associated with a destination, or destination imagery is critical to tourism marketing.

This research aims to understand the destination imagery of Switzerland in the target markets. As an exploratory research, this research will first identify the attributes associated with Switzerland, and then investigate the strength and valence of these associations perceived in the target markets.

3   Method

3.1   First Phase

Both content analysis and surveys have been conducted to identify the destination imagery associated with Switzerland tourism. The survey has three questions asking respondents to provide keywords associated with stereotypes, feelings, and uniqueness of Switzerland tourism [4, 5, 10], as well as demographic information. The survey was distributed on social media (LinkedIn), and on campus of a Swiss university between Spring and Fall 2019. In addition, articles related to Switzerland tourism from popular guidebook websites (e.g. Lonely Planet) and newspaper websites (BBC, New York Times) were downloaded.

Data from the online survey, mass media, and travel guidebook website were merged into a master file. Four researchers (one Swiss and three long-term Swiss residents) conducted content analysis independently to identify unique attributes. Similar to [8], the content analysis did not aim to generate frequency counts of popular words, but identify unique statements about Switzerland as a travel destination. The content analysis from four researchers were compared and finally a total of 23 statements were identified to be used in the second survey.

3.2 Second Phase

For each statement, both association strength and association valence were measured. Association strength is measured with the question "how strongly do you associate this attribute to Switzerland?" while association valence is measured with the question "for you as a tourist in Switzerland, is this attribute positive or negative?" [8]. The association strength was measured in 5 points (1 not at all; 5 totally) while the association valence was measured with 7-point (−3 extremely negative; 3 extremely positive) Likert scales. The final survey consists of demographic questions, travel experience questions, and 23 attribute related questions. A total of 15 Swiss residents were invited to conduct the pilot test, and minor adjustments were made after the pilot test. Finally, the survey was translated and back-translated into French and Italy by native speakers.

This research used Prolific online panel to collect data. The main tourist original countries for Switzerland are Germany, the UK, France, Italy, and the US. Accordingly, this research aims to collect data from panellists with their nationality or country of residences in France or Italy. To improve the quality control, the approval rate of the panellist needs to be at least 90%. In addition, attention check questions were included in the survey.

4 Results and Discussions

4.1 Respondent Profile

The data collection took place in January 2020. After deleting respondents failed the attention tests, the numbers of respondents for France and Italy are 200 and 199, respectively. Table 1 presents the respondent profiles.

Table 1. Respondents profiles.

Description	France		Italy	
Age	Number	Percentage	Number	Percentage
18–29	133	67	140	69
30–39	38	19	42	21
40–49	17	9	11	6
50–59	9	5	5	3
60 and above	3	2	1	1
Total	200	100	199	100
Gender				
Male	101	51	124	62
Female	99	49	75	38
Total	200	100	199	100
Travel experience				
Never visited	108	54	125	63
Visited	92	46	71	27
Total	200	100	199	100

4.2   Association Strength and Association Valence

The means of the association strength and association valence were presented in Table 2. The overall association strengths are 3.55 for French, and 3.4 for Italian respondents. Given the scale for association strengths is a five point Likert scale, the results confirmed the relevance of these identified associations. It is interesting to note that "A country between mountains and lakes", and "Beautiful landscape, scenic views" are among the top five association strengths for both markets. On the other hand, "Boring", and "Festivals and Carnival" were perceived as less associated with Switzerland tourism.

The overall association valences are 1.45 for French residents, and 1.55 for Italian respondents. The association valences were measured with a seven point (-3 to 3) Likert scale. The positive association valence indicates the overall positive impressions with Switzerland as a travel destination. The attributes of "Beautiful landscape, scenic views" and "Fresh air, clear water, and clean environment" are among the top five attribute valence for these markets. Alternatively, "Boring" and "Expensive" received the lowest valence from both markets reflecting the negative attitudes associated with these statements.

Table 2. Means of association strengths and association valences and destination imagery diagnosis quadrant

Statements	France			Italy		
	AS	AV	Q	AS	AV	Q
1. A country between mountains and lakes	4.47	2.49	1	4.09	2.20	1
2. Safe	3.76	2.30	1	3.87	2.46	1
3. Multiculturalism, multi-lingual	3.65	1.95	1	3.13	1.76	2
4. Offers many outdoor activities with amazing views	3.84	2.08	1	3.59	2.05	1
5. Enjoy nature, connect with nature	3.79	2.34	1	3.44	1.94	1
6. Fondue, raclette, cheese, and chocolate	4.13	2.00	1	3.75	1.88	1
7. Beautiful landscape, scenic views	4.34	2.77	1	3.91	2.57	1
8. Precision and organized	3.44	1.22	3	4.13	2.09	1
9. Easy and efficient transportations throughout the journey	3.28	2.08	2	3.64	2.42	1
10. Transportation is a travel experience itself	2.88	1.45	3	3.02	1.75	2
11. Festivals and Carnival	2.83	1.30	3	2.15	1.00	3
12. St. Moritz, Zermatt, and Matterhorn	2.72	0.81	3	3.05	0.93	3
13. Calm, peaceful, tranquil	4.01	2.14	1	3.82	2.02	1
14. Authentic untouched nature	3.83	2.53	1	3.60	2.38	1
15. Fresh air, clear water, and clean environment	4.15	2.61	1	3.75	2.55	1
16. Expensive	4.06	−1.84	4	3.56	−1.35	4
17. Money or bank	3.66	−0.40	4	3.86	−0.03	4
18. Boring	1.72	−1.90	3	1.64	−1.97	3
19. Rule based country, strict	3.28	−0.01	3	3.40	0.77	3
20. Switzerland is picturesque	3.71	2.01	1	3.06	1.67	2
21. Healthy life style	3.20	1.65	2	3.21	1.80	2
22. Welcoming or friendly	3.14	2.16	2	2.83	2.06	2
23. Quiet and discreet	3.70	1.71	1	3.68	1.92	1
Average	3.55	1.45		3.4	1.55	

4.3 Destination Imagery Diagnosis Model

To understand the marketing opportunities, the overall averages of the association valence and the association strength were used as the intersection point of the x axis and y axis, respectively, and four quadrants were created, which is the Destination Imagery Diagnosis Model. The Destination Imagery Diagnosis consists of four quadrants (clockwise):

- First Quadrant: Strong association strength, and positive valence. Hence, it is named Treasures.
- Second Quadrant: Weak association strength, but positive valence. Its name is Hidden Gems.

- Third Quadrant: Weak association strength, and negative valence. Consequently, the name is Traps.
- Fourth Quadrant: Strong association strength, but negative valence. It is named as Roadblocks.

Three Destination Diagnosis Models were created and presented in Fig. 1 for French respondents, and Fig. 2 for Italian respondents.
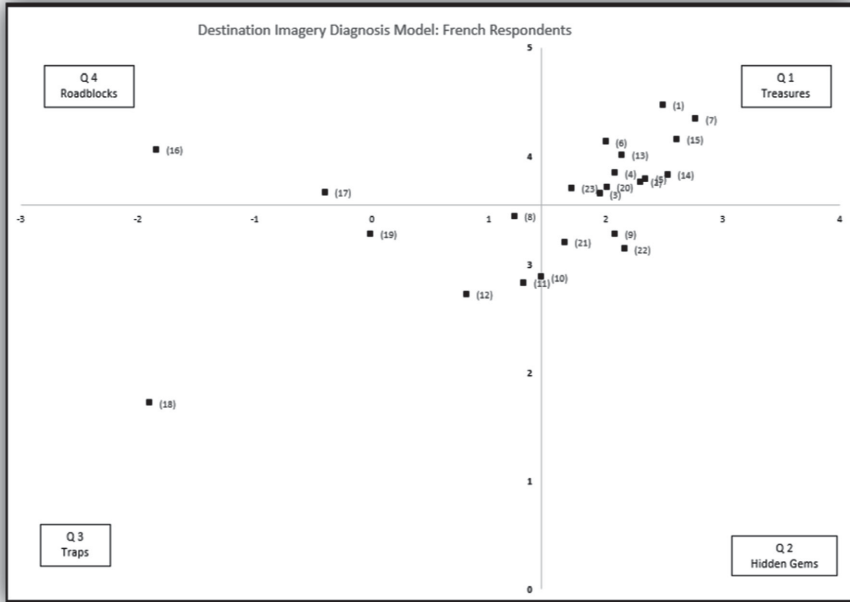
Fig. 1. Destination Imagery Diagnosis model for the French market. X-axis: association valence, Y-axis: association strength. Please refer to Table 2 for specific items.

First Quadrant, Treasures: Associations located in the first quadrant are strong and positive. A total of ten associations are located in the first quadrant for these markets. These ten statements are "A country between mountain and lakes", "Safe", "Offers many outdoor activities", "Enjoy nature, connect with nature", "Fondue, raclette, cheese, and chocolate", "Beautiful landscape, scenic views", "Clam, peaceful, tranquil", "Authentic untouched nature", "Fresh air, clear water, and clean environment", and "Quiet and discreet". It is interesting to note that the findings here echo with the official Switzerland Tourism slogan "Switzerland, get nature". Many of these strong and positive associations are related to Switzerland's nature, including mountains, lakes, and implied opportunities for outdoor activities. Marketers should leverage these treasures in their marketing communication.
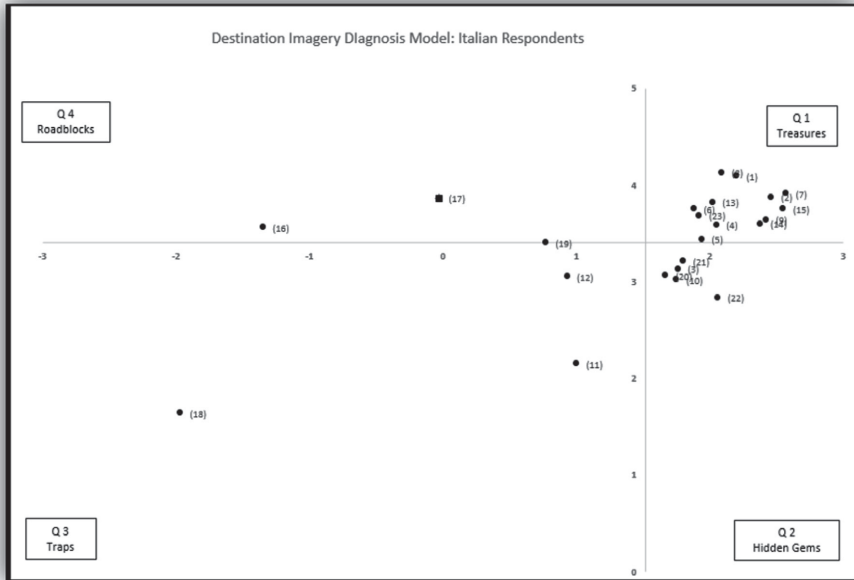
Fig. 2. Destination Imagery Diagnosis model for the Italy market. X-axis: association valence. Y-axis: association strength. Please refer to Table 2 for specific items.

Second Quadrant, Hidden Gems: Two associations, "Healthy life style" and "Welcoming and friendly" are located here for these markets. Associations located in this quadrant are positive but weak. Hence, marketers should strive to build a stronger association in these markets.

Third Quadrant, Traps: Associations located in this quadrant are weak and less positive or negative. Four associations including "Festivals and carnival", "St. Moritz, Zermatt, and Matterhorn", "Boring", and "Rules based country, strict" are in this quadrant. It is important to point out that the association valances for these association could be positive, but less than associations located in the first and second quadrants. For example, "Festivals and carnival" and "St. Moritz, Zermatt, and Matterhorn" were perceived as positive, while "Boring" was negative, but "Rules based country, strict" was ranked negative by French respondents yet positive by Italian respondents. Association located in this quadrant are less valuable to marketers.

Fourth Quadrant, Roadblocks: Associations located in this quadrant are strong but less positive or negative. In this study, "Expensive" and "Money or Bank" are located in this quadrant for both markets. Switzerland is known for its high living costs. To respond to this strong and negative association, marketers could actively propose more affordable travel alternatives, such as public transportation passes, or alternative accommodations. Overall, marketers should address associations located in this quadrant cautiously as their association valences are not all positive.

The above findings applied to both markets. Furthermore, marketers can use the findings to develop individual marketing strategies for each market. The French market considers "Multiculturalism, multi-lingual", and "Switzerland is picturesque" as strong and positive, while "Easy and efficient transportation" as positive but weak. Whereas the Italian market "Precision and organized", and "Easy and efficient transportations" are located in the first quadrant; and "Multiculturalism, multi-lingual", "Transportation is a travel experience itself", and "Switzerland is picturesque" are located in the second quadrant. Although similar statements were located in either the first or second quadrants, these markets have different association strengths and valences, and demand different marketing promotion strategies.

5   Conclusions/Implications

This research investigated destination imagery of Switzerland as a travel destination, and proposed the Destination Imagery Diagnosis model to analyse the association strengths and association valences and develop corresponding marketing strategies. Associations located in the third and fourth quadrants are similar in the sense that they are less positive or negative, but require different marketing strategies. Associations located in the fourth quadrant are strongly associated with the destination, hence marketers could either actively correct these less positive associations, or passively leave these associations along. On the other hand, associations located in the third quadrants are weakly associated with the destination, and probably should not be the top priority for marketers.

For academia, this research applied the Destination Imagery definition proposed by [6, 8], conducted empirical research to investigate the destination imagery in two target markets, and analysed the association strengths and valences. This research contributes to the academia by proposing the Destination Imagery Diagnosis Model, which could be used to analyse destination imagery, compare perceptions between markets as shown in this research, and develop marketing strategies. For practitioners, this research contributes by illustrating the Destination Imagery Diagnosis model with data collected from France and Italy, and provides examples of marketing insights for destination marketing organizations.

This research is not without limitation. This research respondents were recruited from Prolific, an online platform for online subject recruitment focusing on academic research. The reliability of Prolific has been examined and documented [12]. Nevertheless, the age groups of this research respondents are mainly between 18 and 39 years old, and may not correspond to the French and Italian tourist profiles for Swiss Tourism. Hence, this could be considered as a research limitation. This research collected demographic data including age, gender, and previous travel experience, but is in the process of analysing the data. Hence, the potential impact of age, gender, or travel experience could not be reported here. The data collection of this research took place in January 2020 before the COVID-19 Pandemic. Future research could refer to this research and compare the Destination Imagery Diagnosis Model for Switzerland after the Pandemic. Future research is also encouraged to apply the Destination Imagery Diagnosis model to other destinations, especially competing destinations sharing

similar stereotypes or tourism attractions. Additionally, this research did not focus on the projected destination image, nor incorporated the induced information sources. Future researchers are encouraged to compare the Destination Imagery Diagnosis models developed based on different information sources [11], and between projected and perceived destination images.

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Tourism Management in Japan and Switzerland: Is Japan Leapfrogging Traditional DMO's Models? A Research Agenda

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Abstract. Similarities may be seen in the development of tourism in Japan and Switzerland during the nineteenth and twentieth centuries, especially in terms of the origins and purpose of their respective national tourism offices. In the twenty-first century, however, fundamental differences became evident. During the first decades of the twenty-first century, Switzerland, that had been quick to see the opportunities of e-tourism, was less dynamic in response to the fourth and fifth industrial revolutions, whereas the opposite happened in Japan. Switzerland as with Austria and Germany, adopted a traditional concept of DMO's that was location-base and limited regionally by administrative boundaries. The Information and Communication Technologies (ICT) development after Web1.0 and the emergence of mobile applications have challenged this concept. A more contemporary view is based more on network travel and visitor flows rather than physical territory. The Japan Central government decided to adopt the western DMO concept as regional tourism policy, but relatively late in 2016.

The aim of this innovative research project is to analyze the adoption/implementation of the new concept of DMO's focusing on Switzerland and Japan. For Switzerland, the main barrier is the scarcity of data given the slower uptake of the technology emanating from the fourth and fifth industrial revolutions. In Japan, the situation may be seen to be inverted, given the country's proclivity to adopt the advantages from the latest industrial revolution. This may mean that Japan could leapfrog the traditional DMO concept. This research presents the Bass' analysis of DMO's websites as a proxy of DMO concepts – traditional or new generation.

Keywords: Destination Management Organization (DMO) · Japan · Switzerland · Travel network · National tourism policy · Diffusion models

1 Introduction

The popularization of leisure tourism occurred earlier in Japan than in many European countries. In the seventeenth century, equivalent to the early Edo or also known as the Tokugawa period (1603–1868) [1] Japan was under a feudal system and freedom of movement was strictly controlled. Permission to travel was granted for reasons either religious – visiting shrines and temples-or medical–visiting hot springs for healing illnesses, even though, these reasons were, to some extent, a kind of excuse to hide leisure motivations [2, 3]. In this era, improvement and expansion of the road networks contributed to the development and popularization of leisure tourism. In Western countries, such as Great Britain, visiting hot springs had been a well-established leisure activity from Roman times, and in the seventeenth century was reserved only for members of the upper classes. The popularization of leisure tourism in Britain came later, by the middle of the nineteenth century when a railway network was established [3]. The means of transportation explains the British and western European later popularization of leisure tourism in comparison with Japan. In the seventeenth century roads were in poor condition so carriage transportation was the most important means of transportation; moreover, travel on foot was dangerous and distance between inns along main roads was suitable for a day carriage trip but too far for foot travellers. In Japan, the carriage trip was mostly not allowed for security reasons-preventing attacks on Edo-Tokyo - so most of the travellers walked on roads, contributing to the earlier popularization of tourism activities in comparison to Europe. Another important difference during the seventeenth and eighteenth centuries was that Japan, due to the policy of closure of the country, domestic tourism only was developed, whereas Britain and continental Europe developed overseas tourism, often in the form of the Grand Peregrination or *le Grand Tour* [3–5]. British tourists greatly contributed to the development of Switzerland's international tourism, not only to urban tourism, but also to the Alpine resorts and in the development of Alpinism [6, 7].

The evolution of the tourism sectors in Switzerland and Japan may be seen to be quite synchronic in terms of national organization during the nineteenth and twentieth centuries, nevertheless in the twenty-first century major differences became apparent. On the one hand, Japan seems to have neglected the importance of digital tourism marketing in the beginning of the internet revolution in the latter decades of the twentieth century, and in the first decades of the century, perhaps because the tourism sector was not considered as a central national subject from 1980 to 1990 neither by politicians nor academics or even the media. As an example, after the national universities reorganization as corporations in 2004 no university had graduate schools or research departments in tourism [8]. On the other hand, Switzerland currently appears to be less dynamic in of its response to the fourth and fifth industrial revolutions in the so-called "Smart Society" or "Society 5.0" respectively. The Global competitiveness Report by the World Economic Forum (WEF) ranked Switzerland and Japan 5th and 6th respectively in 2019 [9]. In the WEF Travel & Tourism (T&T) Competitiveness overall index both countries are again ranked in the top 10, Japan is ranked 4th and Switzerland 10th [10].

Switzerland was a pioneer in modern tourism during the second part of the nineteenth century, with, for example the development of luxury or palace hotels through the innovations of Cesar Ritz and the creation of the first hotel school in the world [11, 12].

Tourism for Japan was considered as both a macroeconomic tool to obtain foreign currencies but also as a diplomatic tool facilitating the ending of isolation of the early stage and to cope with the consequences of the Pacific War [2]. Another major difference was the openness to foreign visitors in the nineteenth century: Switzerland was open to foreign visitors without restrictions whereas Japan restricted visitors' itineraries on the behalf of a "foreigner's travel ordinance" regulation from 1859 [6, 13]. Later we see more alignment in both countries' tourism development.

1893 was a milestone in tourism organization for both countries: The Association of Swiss Tourist Offices and *Ecole hôtelière de Lausanne* were founded in Switzerland [14] and in Japan the program "Welcome Society" was founded by the financial sector with the intention of providing services to foreign tourists [13]. This was supplemented by the founding of the Japan Tourist Bureau in 1912. Another similarity may be seen in the role of the railways in the promotion of the countries: in 1904 the Swiss Federal Railways (SBB) created an advertising department to promote tourism [15] and in 1930 Japan formed the International Tourism Office under the Ministry of Railways that mainly served foreign tourists (later an International Tourism Office was created outside of the railways to increase inbound tourism) [13]. In 1906, Kuoni, the first Swiss travel agency was created. In 1917 the Swiss National Tourist Office (SNTO) was formed (five years after Japan's Tourism Bureau's founding) and in 1940 a federal resolution gave to the SNTO the official status as the Swiss Central Office for Tourism Promotion [16]. In 1948, the All Japan Tourism Association was formed, along with the creation of a National Tourist Association and the Japanese Tourist Association. In 1956 the "Five-Year Tourist Industry Promotion Plan" was activated [13]. During the 1950's, Switzerland was developing new ski resorts that resulted in it becoming one of the top five tourist destinations in the world [17].

In 1979 Switzerland was the first country in the world to focus on sustainable development by approving the "Swiss Tourism Concept". This pioneering concept resulted in the government of the Swiss Confederation assuming the role of a planner, regulator and developer of tourism channels [18]. In 1995 the SNTO became Switzerland Tourism (ST) and was reorganized as a marketing company, with 12 tourism regions [19] with ST launching its online presence "MySwitzerland.com" and its own e-mail system. In 1997, the *Innotour* program began as an instrument for promoting innovation and co-operation in the tourism sector and in 1999 the Swiss Parliament agreed to increase the support for ST to 190 million Swiss francs for the period from 2000 to 2004. A part of these funds allowed the development and promotion of e-tourism tools linking practitioners with academia in the fields of computer sciences and tourism in order to help marketing efforts and increase productivity [20].

Some of the most important milestones in Japan's tourism development are the founding of the Japan National Tourism Organization (JNTO) in 1964. Following the Expo of 1970, Japan entered a phase of rapid economic growth, and there was less emphasis on gaining foreign currency through tourism as Japan caught up with developed economies. As a result, outbound tourism began to outpace inbound tourism

[1, 13]. In 1987, and in order to reduce international frictions due to its trade surplus, Japan adopted the policy of double outbound tourism, launching the "ten-million plan" after the international Plaza Accord agreement in 1985 with the aim to depreciate the U. S. dollar in relation to the Japanese yen and German Deutsche mark by intervening in currency markets [21]. "No other country has ever developed a national policy to promote outbound tourism for such a reason" (page 1103) [13], showing once more Japan's concept of tourism as a macroeconomic tool. There followed the "Law to Promote Inbound International Tourism by Diversifying Destinations in Japan", the "Inbound Tourism Promotion Law" was created in 1996 and in 2003 the plan "Inbound Tourism Initiatives for Japan" was activated followed by a "Visit Japan campaign" program in 2004 [22]. The Tourism Nation promotion Basic Plan was made public in 2007 and subsequently the Japan Tourism Agency (JTA) was inaugurated in 2008, which aimed at the integrated development and promotion of outbound, inbound and domestic tourism [23].

2 Literature Review

2.1 Evolution of Western Conception of DMOs

The United Nations World Tourism Organization (UNWTO) has displayed a kind of semantic shift in the concept of western tourism destinations. In 2007, the UNWTO proposed the following definition of tourism destinations: "A local tourism destination is a physical space in which a visitor spends at least one overnight. It includes tourism products such as support services and attractions, and tourism resources within one day´s return travel time. **It has physical and administrative boundaries** defining its management, images and perceptions defining its market competitiveness. Local tourism destinations incorporate various stakeholders often including a host community, and can nest and network to form larger destinations" p. 1 (emphasis added) [24]. This is a traditional concept of tourism destinations embraced by western countries [25–27]. The DMO, which is the leading organizational entity of local tourism destinations "may encompass the various authorities, stakeholders and professionals and facilitates tourism sector partnerships towards a collective destination vision" p. 16 [28]. This enforces the idea that tourism destinations are location-based, comprising transport, attractions, accommodations, ancillary services and experiences. Markets purchase and consume products and experiences, injecting extra-regional fiscal resources into a region where the multiplier effects contribute further regional growth and economic development [29]. This is evidently a static concept based on an industrial metaphor with means of production being the region, or the territory defined by physical and administrative boundaries.

In 2019, UNWTO updated the definition of tourism destinations as: "a physical space **with or without administrative and/or analytical boundaries** in which a visitor can spend an overnight. It is the cluster (co-location) of products and services, and of activities and experiences along the tourism value chain and a basic unit of analysis of tourism. **A destination incorporates various stakeholders and can network to form larger destinations**. It is also intangible with its image and identity

which may influence its market competitiveness" [28] p. 14 (emphasis added). This latter definition is more in line with recent technological developments [27] than the original one. In addition, it is a more dynamic concept oriented towards *travel networks* that may be a better and more accurate depiction. In the twenty-first century, the research agenda of network studies in tourism has sought to overcome the spatial dimension (i.e. geo-localisation aspects) and takes into account virtual dimensions, referred to as *travel networks* [30]. Evidence illustrating this virtual dimension consists of the following: firstly, travellers are creators and co-creators of the information contained by networks, which support travel planning; secondly, travellers share their experiences in community-based space and, finally; technologically supported networks are ubiquitous, meaning that the information can be found before, during and after the trip [31]. A shift of information and decision centrality into placeless and timeless networks has been observed, as with other sectors. Power patterns change from territorial organizations to visitor flows; therefore, flows become the units of work, decision and output. "Thus, the dialectic between centralization and decentralization, the increasing tension between places and flows, could reflect, in the final analysis, the gradual transformation of the flows of power to the power of flows" [32] (p. 171). This transformation of DMO's from a traditional static concept to a new one that takes into account travel networks - physical and virtual- is challenging western tourism policies. Besides the human barriers such as the resistance to change present in any innovation, some technological issues are also present. One of the more challenging problems is the scarcity or lack of empirical data allowing the interpretation of the geographical and virtual travel network structures or flows that are vital to the formation of new generation DMO's [26]. There are, however, a number of studies using different kinds of data [31] showing the relevance of statistical and mathematical algorithms for the geographical level description of the flows.

2.2   DMO Information and Communication Technology (ICT) Adoption

ICT's have changed the way in which business is conducted in the tourism sector [e.g. 33, 34]. Werthner & Klein [35] pointed out from the beginning that ICT and the travel and tourism industry are closely "interrelated and intertwined" (p. 256). From an historical perspective ICT, Kracht & Wang [36] propose three generations of ICT adoption based on the evolution of distribution channels: each generation increases the complexity of ICT layers and is driven to a large extent by technological advances. The first generation consisted of traditional channels that emerged in the pre-World-Wide-Web (WWW) era, before 1993. The second generation of channels are the online direct channels, developed after the communication protocols of the WWW had been made, namely Web 1.0. It is characterized by the growing importance of new direct communication and distribution channels such as e-mail, online booking forms and internet booking engines (IBE). The third generation, beginning in 2004 is based on Web2.0 technology [37] and is characterized by mass collaboration and User Generated Content (UGC), such as videos, blogs, wikis, podcasts and tags, allowing consumers to share their experiences online and to create positive or negative reviews of services they have experienced [38].

In response to these developments, the UNWTO published in 1999 [39] a document alerting policy makers not only about the fast impact growth of Internet in the marketing of travel but also of the consequences of slower adoption of ITC's by DMO's in comparison to other tourism commercial sectors such as air transportation. DMOs' adoption of ITC's during the first generation (1970's to 1990's) was mostly dedicated to information operation and less to support reservation services. "Despite their increasing use of ITC's, most DMO's did not start considering electronic distribution until the increased public awareness of the Internet in the mid-1990s. From 1996 onwards, many DMO's started taking the impact of the Web more seriously, often recognising the opportunity to use the special features of the new medium – interactivity and multimedia. DMO Web sites multiplied rapidly, with increasing quality of graphics and maps, and the facility to book through a computer reservation system (CRS), usually by fax or e-mail. However, at this time "the facility to book online remains the exception rather than the rule" pages 65–6 [39] Therefore, ICT development by DMO was a major issue from 1996.

Several studies [40–43] focus on the diffusion of ITC adoption associated with the Web 1.0 based on the domain name registration (DNR) date namely the moment when a company first registered or purchased a domain name such as "myswitzerland.com" as a measure of the website age. A better measure, however, is provided by Wayback Machine (WM) (). The DNR measure could present bias as organizations may buy a domain name but wait months or years before hosting a website with that name. WM instead yields the first date that this crawler detected the website was activated [44]. The timing analysis of the adoption by Austria and Germany are similar to Switzerland and earlier than Japan. This shows that DMO's in these European countries belong to the traditional or first generation of DMO's.

Diffusion of an innovation by organizations often occurs in two stages: adoption and implementation and DMO's are not an exception. Implementation studies focus on the post-adoption effectiveness through the adopter organization, which in the case of website implementation progresses from basic to comprehensive sophistication [45]. As implementation follows adoption and advances in technology accrue, some of the newcomers' adopters implement new technologies on the spot, without any intermediary process. This kind of phenomenon is called "leapfrogging", meaning the bypassing of the early adopter in the use and/or implementation of a technology. Generally speaking, late adopters' leapfrogging behaviour consists of adopting or replacing a product by skipping previous generations [46]. As a consequence, latecomers who leapfrog previous generations could outperform the performance of early adopters [47]. Scaglione, Ismail [48] show evidence of a leapfrogging situation in tourism sectors regarding the implementation of third generation features - Web 2.0 – by latecomer adopters of first generation – Web 1.0- in international tourism sectors.

3   Research Questions

The territorially-defined policy of regional tourism organizations was different across the two countries. At the moment of inception in Switzerland and other European countries a bottom-up concept prevailed. Japan, however, defined regional tourism

organizations in a top-down way, emanating from the central government with constant new regions or re-definitions of the existing ones. In Switzerland, at least at the regional level, destinations remained more or less stable.

Since 2016, Japan has undertaken a new strategic bottom-up policy in the definition of regional tourism organization. [49]. The Japanese government has encouraged the formation of Destination Management Organizations (DMO's) entitled "World-Class DMO's" with the aim of promoting the revival of tourism under the management of diverse stakeholders in the community through a bottom-up approach. The Government provided assistance in three ways: information, personnel and financial support. In 2016 there were 134 DMO's registered. The aim of this "Japanese version of Destination Marketing/Management Organization" [49] (p. 161) is the creation of various regional content and establishing an environment to receive tourists to realize a "world-class tourism destination" under the keywords of 'region' and 'consumption' (p. 161) The central government considers DMO's as a tool for economic regeneration and creating employment through the development of regional human resources.

Empirical studies that have focused on the understanding of the Western imported term of DMO by Japan's tourism actors conclude that they are not able to clearly grasp the concept [50]. On the one hand, they point out that for the Japanese government, the organizations created before 2016 have not invested in productive marketing activities and have not sufficiently engaged in multi-stakeholder collaborative management. The sectorial 2019 WEF Travel & Tourism (T&T) Competitiveness index seems to support this impression: Switzerland ranks 31 whereas Japan ranks only 108 for the sub-item of Country brand strategy rating. On the other hand, those tourism associations (Kanko Kyokai) may already be considered as DMO's. "However, a commonly held perception by practitioners was that existing organizations and the new DMO candidates are distinct in structure. In other words, they did not consider their organizations to be a DMO unless they were registered with the national program. Many organizations had difficulties understanding and describing the basic DMO concept and related objectives" [50] (p. 378).

This reorganization of DMO's is compelling as it has been mandated by the Japanese government. The first research question for the agenda is: How long will it take for the realization of this Japanese version of DMO's built on the bottom-up concept proposed in 2016 to come to fruition?

Western academia and some policy makers show an increasing consensus supporting the idea that traditional DMO's have not fulfilled their original expectations [26, 27]. Therefore, this research question becomes even more relevant. In these instances, Japan appears to be a leader in the process of gathering tourism data in comparison to Switzerland. Sectorial 2019 WEF Travel & Tourism (T&T) Competitiveness index ranks Japan at number 10 and Switzerland at 30 for the sub-item of Comprehensiveness of annual T&T data. In addition, Japan is developing the Regional Economy and Society Analysing System (RESAS) [51] based on the aggregation of public and private data sectors with an aim to evaluate how money circulates though regions, the nature of the transactions between regions, tourism trends and demand. This system includes not only tourism sectors but also linkages to industry, agriculture, forestry and fishing. From this, the second research question arises. What is the level of integration and availability of RESAS data-beyond the tourism data-used by the

Japanese version of DMO's? The answer to this question is central because the greater the integration, the greater is the evidence that Japan DMO's are leapfrogging traditional static models and using network and dynamic data generation.

4   Methodological Agenda

The methodology for the first research question will be undertaken in three stages: firstly, information will be collected on Japan's Tourism Associations (Kanko Kyokai) and will focus on their own conception of DMO's. The following issues will be addressed: actual mission and activities (i.e. marketing/branding, coordination of stakeholders, digital activities); internal organization (creation date, number of employees, socio-professional profile of the DMO head, budget, number and kind of stakeholders, organizational structure degree of innovation, etc.). The second stage consists of desk research that will show the digital characteristics of DMO's from a qualitative perspective based on eFitness® benchmark [52], Web2.0 [53], social media [54] and timing of adoption based on the adoption date of the website. The third stage consists of using the information obtained from the desk research to complete the survey database to test significant links between relevant variables.

To fulfil the second research question, exploratory research will be carried out. This will comprise comparative analysis of key government documents (for example the Japan Government's white papers on tourism and the Swiss Government's "Digitalisierung im Schweizer Tourismus: Chancen, Herausforderungen, Implikatione" (Digitilization in Swiss tourism: opportunities, challenges, implications) [55]. It is believed that the analysis will provide insights on the leapfrogging phenomena. In addition, the analysis will identify the comparative advantages across both countries. Qualitative methods including interviews will be carried out with policy makers and important actors in both countries; legal regulations about data privacy will also be analysed following the methodology proposed by Beritelli [56]. It will consist of in-depth interviews supported by a semi-structured questionnaire organized in two steps: firstly, a number of prominent actors were interviewed from a group of private companies and public authorities, which a year earlier had participated in a process of destination strategy development. Secondly, each interviewee will be asked to propose at least three other prominent actors in the sector, in this way a snowball sample will be implemented.

Results of Preliminary Research: Adoption of DMO Websites. A preliminary study on the adoption of the technologies associated with the Web 1.0 was carried out on three European countries (Austria (AUT), Germany (DEU) and Switzerland (CHE)) along with Japan (JPN). Table 1 shows 4 datasets concerning the time of first adoption by DMO's of Websites [57]. This was built using the internet Archives' Wayback Machine (archive.org) to gather the website age [44]. Table 1 shows the data under study. The Bass analysis and parameters were drawn from the SAS V9 Proc Model procedure [58].

Figure 1 shows the raw data of absolute frequency adoption per year and Table 1 shows estimate parameters of Bass model [59, 60] Eq. 1.

$$\frac{dN(t)}{dt} = p(m - N(t)) + \frac{q}{m}(m - N(t)) \tag{1}$$

Equation 1 shows the Bass function for adopting an innovation. *N(t)* is the cumulative number of adopters at time *t*, *m* is the total market adoption. Parameters *p* and *q*, the coefficients of innovation and imitation respectively, fuel the adoption.

The coefficients p and q, respectively, suggest the propensity to adopt driven by external information and interpersonal communication channels [61]. With pure innovation, $q = 0$ and $p > 0$ and $p = 0$ and $q > 0$ with pure imitation. Table 1 shows the peak of adoption for each country with the three western countries demonstrating the peak of adoption occurring at the latest by the year 2000. The process of adoption, at least of the first hyper-circle was finished for them at the beginning of the twenty-first century. In contrast, Japan's peak is at the beginning of 2011. The S-shapes of the cumulative values (actual and forecasted) in Fig. 2, also show evidence of the slower process for Japan's DMO's to obtain the necessary critical mass to complete the whole process which will only, ceteris paribus, occur in 2031, that is in more than a decade from now.

The whole cycle has lasted 5 years and 4 months (~ 64 months) for Switzerland, 7 years and 4 months for AUT (~ 88 months); 8 years and 2 months (~ 98 months) for GER but for JAPAN the process is still ongoing and will last a total of 13 years and 2 months (~ 158 months).

Table 1. Timing of the adoption of DMO's Websites for 4 countries understudy and Bass' estimated parameters and its standard deviations in (parentheses)

Acronym source	Age/#URL*	Samples dates M/Y	Peak date	m	p	q	q/p
DMO CHE myswitzerland.ch	149/155	12/96–2/05	7/99	149.2 (2.7)	0 (n.a.)	.873 (.075)	n.a.
DMO AUT [62]	96/96	12/96–7/10	9/99	95.54 (6.93)	.095 (.034)	.283 (.147)	2.9
DMO DEU [62]	182/188	11/96 – 10/10	12/00	182.34 (5.55)	.057 (.034)	.512 (.136)	8.9
DMO JPN JPN Tour. Agency	117 /127	2/97 – 11/19	3/11	123.27(11.14)	0	.2 (2.491)	n.a.

*Number of URL whose age is known over total number of URL for each country. The data and estimations for the European countries has been published in [57]
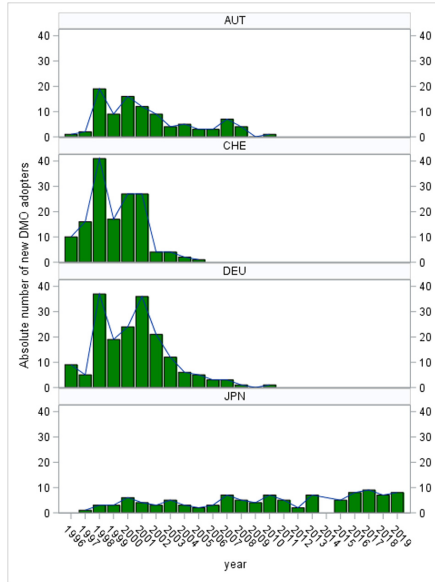
Fig. 1. Raw data of absolute website adoption yearly
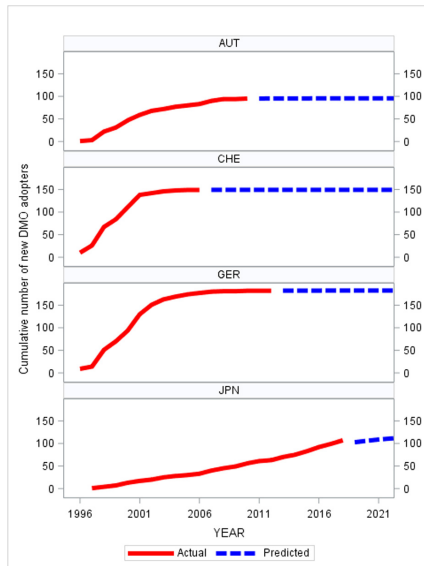
Fig. 2. Actual and predicted cumulative adoption year in %

5 Conclusion and Future Research

There has been global interest in the role of DMO's and their influence in tourism development in both academic and practitioner circles recent years,

To date, however, there has been little empirical research comparing DMO's across countries. This study is innovative in that it is an international comparative empirical study on the evolution of DOM's between three European countries and Japan. A Bass model was used that showed the significant differences between European and Japanese DOM's. Japan demonstrates a lower proclivity towards the adoption of Web 1.0 by the DMO tourism sectors than the European countries in the study. It is not clear whether the delay in Japanese acceptance of the web was due to managerial aspects or simply a general disinterest or lack of awareness of the importance of the potential of the Internet as a new distribution channel for tourism. Given Japan's technological advancement in several sectors (robotics, electronics, information systems) it begs the question if it was due to the relatively low value placed upon tourism initially, but this remains an open question that may be an important topic for future research. The study gave a forecast for the length of time of the adoption of DMO's websites, with the stark contrast between the three European countries and Japan, with the conclusion that Japan is still in the process that will continue for eleven more years.

There is a possibility, therefore, for a possible leapfrogging of this traditional DMO concept. This is a relevant and intriguing question that will be addressed in the next phase of this research agenda.

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Touristic Consumption as "Sitesharing": Unpacking the Smart Tourism Paradigm from an Internet Studies Perspective

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Abstract. This paper presents a conceptual framework "sitesharing" for understanding touristic consumption within the smart tourism paradigm. Smart tourism considers the use of ICTs as beneficial and essential to the future of tourism. However, the integration of technological intermediaries with the sphere of tourism bears investigation in terms of the wider effects on tourism processes. Taking an interdisciplinary stance, the paper utilizes an internet studies perspective in order to examine the political, social, and cultural implications of the integration of ICTs within tourism. Through the exploration of three key metaphors drawn from across the fields of study: performance, place, and sharing; the paper considers how ICTs influence tourists' consumption, telling, and experiencing of tourism. The framework of sitesharing argues that sharing, rather than seeing, becomes the requisite practice of tourists with concomitant changes in the form of tourist practice and the shape of tourist places. From the discussion, four emergent dimensions of sitesharing are presented with the intention of informing future tourism research.

Keywords: Smart tourism · Internet studies · ICTs · Sharing · Performance · Place · Sightseeing

1 Introduction

While the social and academic fields of e-tourism continue to develop at a rapid rate as spurred by the ongoing development of new technologies, tourism products and research; scholars have also began to argue that the academic field is a mature discipline [1]. It is perhaps fitting then in recent years we have also seen the beginnings of an overarching research paradigm tying together many of the various strands and agendas within the ambit of e-tourism: smart tourism. Smart tourism posits that technological actors are able to increase fluency between visitors and tourism providers by utilizing real-time connectivity and tourist data flows [2]. It is such that smart tourism relies upon high-speed connectivity, big data and the internet of things (IoT), with its premise being that digital technology is able to support tourist experience and increase overall satisfaction. Given the very visible integration of information communication technologies (ICTs) on the part of tourists and hosts at locations around the

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world; and the rising popularity of online platforms and entities like Airbnb, TripAdvisor or Google Maps as part of the tourism process, it is unsurprising that the smart tourism paradigm has gained such currency within industry and research. Taken with the acknowledgement of the need for ongoing critical perspectives, the development of smart tourism may be considered a boon for research and industry as it provides a cogent frame through which to understand how technology and data can be used to improve the tourism product.

It can be argued that the integration of ICTs dramatically reconfigures the process of tourism by permitting ongoing social connectivity within the journey and enabling the formation of large-scale peer-to-peer tourist networks. Thus, this paper will consider the effects of these and other technologically enabled developments upon the process of touristic consumption. Traditionally, the representative practice of tourism has been that of sightseeing. This is typified as a primarily visual method of consumption within canonical tourist texts such as those from MacCannell [3] and Urry [4] in which touristic destinations, i.e., 'sights', were consumed through ocular practices. The primacy of the visual in touristic consumption is illustrated in Rojek's [5, p. 58] quotation: "most tourists feel they have not fully absorbed a sight until they stand before it, see it and take a photograph to record the moment." However, the dominance of the visual as the premier way of understanding tourism began to wane in the early 21st century amongst greater attention to theory from the humanities arguing the importance of the role of the body and senses in tourist encounters, culturally specific ways of knowing, and tourist agency, within what is known as the 'performance turn' in tourism research.

At the current point in time, the rise of ICTs does also provide a radical disruption within the tourism process. And while both of these developments potentially destabilize the centrality of ocular practices within tourism, the term sightseeing is still widely used and continues to apotheosize the practice of tourism in a popular sense. From here the question arises, is sightseeing still an appropriate metaphor for conceptualizing touristic encounters, or are there better ways to understand the practice of tourists?

The purpose of this paper is to consider how tourism consumption occurs within the paradigm of smart tourism. While much attention has been given to the potential applied benefits of new technologies within smart tourism, much less has considered the social, cultural, and techno-political implications of the integration of new technological institutions within the tourism process. It is such that by unpacking smart tourist experience and consumption, the paper hopes to shed light on the complex system of entities and interactions within the wider terrain of the smart tourism ecosystem. The paper takes a conceptual approach by utilizing literature from the academic field of internet studies in order to provide an interdisciplinary overview of the smart tourism paradigm. Such a perspective helps support a dearth of conceptual research within tourism [6] and can add detail and gravity to discussions of the integration of ICTs into tourism.

Internet studies is an area of the humanities that is concerned with the influence of the internet and ICTs on society. As the internet has evolved into a ubiquitous social technology, the field has covered areas such as identity, sociality and techno-politics, while exploring internet-mediated social life [7]. Since the early 2000s, the shift to a widely participatory internet with Web 2.0 and the rise of social media has highlighted

the role of the internet as a platform for self-expression and civic participation within social activities including tourism. At present, social media platforms are not only integrated within but generative of tourist experiences as ICTs help us to connect to information, peers, locations, and services. Destinations and hosts integrate ICTs to support visitors. Experiences are streamed and shared as a means of verification and enhancement. And the large technological platforms that channel and collect data gain powers as actors and arbiters within touristic ecosystems. To consider such developments, the paper's conceptual investigation is anchored in an interpretivist approach that is concerned with how the internet is appropriated within daily life and used by people as a tool for agency and meaning-making [8]. Using this approach, the paper seeks to examine some of the as-of-yet-unquestioned implications of smart tourism, as well as considering new ways to study and conceptualize this phenomenon.

The paper undertakes its investigation in the form of three interlocking areas of discussion which are taken from three prominent theoretical metaphors from across the fields of study: performance, place, and sharing. Each section presents thematic discussion and suggests areas for future research. At the culmination of the theoretical discussion, the paper will present a conceptual framework referred to as sitesharing [9]. This is intended as a both a departure from and continuation of the framework of sightseeing that has accompanied studies of tourism throughout the 20th century. Sitesharing presents a way to conceptualize the implicit political influence of ICTs within the field of tourism as well as a recognition of tourists' agency to use these technologies to shape the social and cultural dimensions of tourism. This framework is intended to shed light on some of the implicit power structures within the smart tourism ecosystem as well as to explain trends and support inchoate theorizing on the experience of tourists within e-tourism.

2 Performance

The performance turn in tourism research that occurred during the late 20th century challenged the stereotype of the 'passive' sightseeing tourist [10]. Here, rather than the audience for staged performances of local culture, tourists were also seen as performers who contributed to the meaning of tourist locations through their individualized interpretations of, and behaviors at, the destination. From such an understanding it has been argued that, in addition to visual consumption, performance is an important theoretical frame through which to understand tourist encounters [11]. Drawing on Goffmanian thought, research within the performance turn suggested that tourists consumed locations not only in socially instructed ways but also in line with individualized motivations and interpretations; a contention that was supported by ethnographic studies of tourists on-site.

Just as tourist destinations have been conceptualized as locations for tourists' to express different ideas or facets of their identity, so too has the online realm been considered as a location for self-expression. As social media has grown in popularity and the number of social platforms and spaces available online has increased, one important idea is Papacharissi's concept of the "networked self" [12]. Here, Papacharissi contends that individuals commonly use a number of separate yet interlinked online profiles in order to perform the self across a variety of social contexts. To do

this, individuals make strategic decisions about how the self is presented on particular platforms and use technological functionalities to maintain distinctions between different audience groups. Taken from the perspective of tourists, the idea of the network self is salient not only as a way of managing social context but as a way for tourists to conduct mobile social relationships across space and time. Online avatars such as social profiles or email accounts provide tourists with different social affordances such as following, collaborating and dis/connecting [13]. However, while this compartmentalizing of identity and social relationships gives tourists the ability to manage their social experience, it also speaks to the pervasive context of the online audience within smart tourism and the potential weight of this virtual entity within the experience.

While tourism was previously conceptualized as a liminal experience that occurred in binary opposition to everyday life, the tourist's networked self now remains partly or wholly in contact with social relationships and responsibilities [13, 14]. The implication here is that the context for tourism performance changes too. Rather than something that occurred in an isolated, liminal timespace, touristic performances are now frequently integrated into the more mundane context of social media in which encounters may be shared, and feedback received, live in the moment. This pervasive connectivity means that the tourist may feel obliged to engage in routines of social communication within the journey. The negotiation of this social connectivity, framed through the presence of the online audience, is a nascent tension within smart tourism.

In terms of considering how tourists present themselves, or perform, to the audience, the conceptual frame of "microcelebrity" posits that individuals choreograph performances of self that are structured in relation to one's personal brand, desired attention, and the feedback from the audience [15, 16]. In a way that is similar to conventional celebrity, individuals shape their online performances to manage attention via strategies like audience management, self-editing, reciprocity, and play. Such techniques may require significant investment of time and energy on the part of the user, however, there are also benefits in terms of the receipt of capital. While it is possible to question the pervasiveness of the microcelebrity model as a mode of online performance for average users, its influence as a top-down discourse that shapes the context and norms of wider social media need also be considered.

Given the relationship between the online audience and performance strategies, smart tourism consumption should be seen as a social activity. Furthermore, tourists' online narratives should be seen as structured, externally-oriented performances at the same time as potential reflections of actual experience. As an example, travel influencers commonly share their experiences within the guise of personal narrative while at the same time fulfilling directives from professional partners that shape the form and tone of their output.

Regarding tourists' performance, some final concerns raised by the discussion in the paper but beyond its scope are, what affect does the disciplinary gaze of the online audience have on the performances of tourists (particularly given the liminal and transformative context of tourism)? To what extent is the desire for performance-derived attention and capital a motivator for experience? And, how and when do tourists switch consciousness between online/offline or more/less social planes within the networked self?

3   Place

The doing of tourism is closely intertwined with the notion of place. In his foundational work, MacCannell [3] describes tourist places as a sequence of differently arranged stages which structure a variety of discursive relationships between tourists and locals. Such a viewpoint suggested a relatively structured relationship between tourists and place, an idea also supported by the hermeneutic cycle of touristic representation, which contends that tourists' experiences of place are primed by the materials consumed prior to travel [17]. However, in recent scholarship attention has shifted to tourists individualized ways of not only seeing and consuming but also telling and shaping the landscape.

As we enter the era of smart tourism, the conceptualization of tourist place may broaden from a purely physical, atom-based environment to consider tourist environments shaped of bytes in online space. Important in an understanding of online space is the idea of Web 2.0 and participatory culture. The second-generation Web 2.0 promoted an environment which lowered entry barriers to content creation and supported involvement from amateur users in forms such as blogs, wikis, forums and social media [18]. Implicit here is the idea that individuals have the ability to collaborate with likeminded users and participate in the shaping of the cultural narratives within their fields of interest. Such group participation may provide a sense of agency to those involved and destabilize the position of established players. A famous example compares the user-created Wikipedia with Encyclopedia Britannica. From a tourism perspective, the website TripAdvisor, a repository of user-created content, has come to challenge incumbents in the field such as guidebooks publishers as a source of knowledge.

It may be argued that the self-publishing capabilities of Web 2.0 lend agency to tourists as shapers of tourist place and practice. Tourist narratives are shared in great numbers on social media and these tell the stories of tourists' individualized experiences with touristic locations. Aside from written and/or visual narratives, tourists shared stories also contain metadata such as hashtags, keywords, and geo-location information, which add layers of meaning and allow these stories to be organized into particular categories such as place, socio-cultural demographics, or by emotion. The agglomeration and sorting of tourist-created content allows for the surfacing of dominant themes and ideas, which add "social, emotional, psychological, and aesthetic dimensions to a sense of place" [19, p. 42]. Drawing on the rhetoric and technological functionality of Web 2.0 and the participatory internet, such a point suggests individual tourists' agency to shape the meanings of touristic places and culture.

Apart from the democratization of tourist placemaking, another aspect here is the hybridization of the tourist landscape. The creation of digital content creates layers of textual, visual, and other meanings that are overlain upon physical place. As tourists use ICTs as part of anticipating, consuming, and telling travel, we are led toward an increasingly hybridized digital-physical travel experience that may be considered as augmented or virtual reality travel. Within smart tourism, tourists' consciousness and attention will be split between the physical landscape and the screen (or cognitive interface) and they will need to manage both physical and digital inputs as part of

conducting tourism. As tourists themselves form the main source for the production of data and meanings within smart tourism, their influence on tourist landscapes should be seen as implicit. In this environment, rather than rarefied 'sights' which remained in some way separate from the visitor, tourism is conducted at permeable 'sites' for which meaning is spread across digital and physical layers.

Some further ideas to consider here are how will different layers of narrative, such as narratives from locals versus tourists, or narratives in different languages, merge in the creation of place? How will tourists balance between physical and online experiences in hybridized places? And how does the channeling and potential manipulation of data by technological elements affect its meaning?

4   Sharing

Tourists have always recorded their journeys and shared these with others as a variety of media forms. Travel narratives were shared not only as a way of recounting the events, landscapes and interactions encountered during travel but also as a way of describing personal growth. In the current era of e-tourism tourists upload personal stories to the internet in great numbers. While the telling of online travel narratives is frequently explained as a social imperative such as the act of staying in contact with friends and loved ones or establishing new relationships, the telling of online travel tales is not only a social activity but also is also influenced by the conventions of tourism and the operation of technology and tourism companies. The act of disclosing personal information online may be seen as being influenced by the discourse of "sharing", which has been developed in part to assist the commercial operations of online platforms [20]. While this term has varied, generally positive connotations in its original sense, these meanings may be coopted by corporations in order to facilitate the collection of consumer data. Lampinen [21, p. 2] explains that platforms encourage a culture of personal disclosure and social reciprocity: "in part because the more we share, the more data they can amass about everyday activities that used to be difficult to track." This culture of sharing is also apparent within the sphere of smart tourism as a way of supporting the collection of data regarding tourists' experiences and opinions.

Smart tourism valorizes ICT as a technological agent facilitating connections between stakeholders in order to increase the value of tourist experience. Within this context, tourists are encouraged to share their personal narratives and data in order to ostensibly improve their experience. This sharing occurs in different ways, both purposefully, as in the case of personal narratives such as reviews, comments, messages or queries; or automatically via sensors within applications, personal devices or the physical landscape (i.e., IoT). However, once this data is shared it will likely not go to directly to the host but rather through the hands of technological intermediaries such as online platforms, device makers, and internet connectivity providers. For online platforms in particular, their business models involve collecting, analyzing, and sometimes selling, the data collected from users. Furthermore, as platforms offer the facilities for social practices, they are also able to develop leverage in influencing how the social practices take place.

The political influence that platforms exert on their users may be viewed by examining the different technological structures which underpin their operation such as algorithms, protocols and defaults [22]. These structures can shape social practices or flows in particular ways, such as the character limit imposed on communications on Twitter, or the way users are incentivized to leave reviews on Airbnb by automatic reminders or status tiers. While these examples may appear insignificant, the demonstrate the ability of platforms to influence how traveler data is created and how travel takes place and may culminate in the influencing of traveler sociality and culture.

Within the smart tourism paradigm, touristic consumption necessitates the sharing of data whether as personal narratives, ambient data, metadata or otherwise. Such a scenario permits the political influence of technology companies as actors within the sphere of tourism. While the influence of large non-tourism specific technology companies such as the GAFAM platforms (Google, Apple, Facebook, Amazon, Microsoft) has arguably been minimal up until this point in time, there exists significant potential for these entities to become players in the tourism ecosystem. The influence which platforms exert within a tourism sphere has so far received little scholarly attention [23], and need be considered in more depth as technology companies such as online platforms and device makers continue to channel the ever-increasing flows of tourist data.

Considering the influence of technological intermediaries on tourism, some final questions to consider are, as tourism is a global endeavor but connectivity services differ markedly around the world, to what extent does the digital divide affect the implementation, growth and consistency of smart tourism? Will privacy concerns, or social discourses like 'oversharing', reduce tourists' willingness to share data? And, in the era of informationalization, to what extent are personalized narratives like selfies essential markers of touristic consumption?

5 Discussion

Building on the theoretical discussion provided, this section will put forward a conceptual framework referred to as sitesharing in order to theorize touristic consumption within the smart tourism paradigm. Sitesharing is defined as a mode of tourism in which the sharing of online narratives is the requisite act of touristic consumption. In order to further explain this concept, the paper will discuss the two constituent components of the term: site and sharing.

Within the sitesharing framework, the visual sight is swapped for the more multidimensional site – a location of mundane events, happenings, or transitions – to indicate a theoretical move away from a privileging of ocular practices toward one of agency, possibility and mutability. Many have commented on the democratic possibilities of social media as a forum for individuals to spread ideas and form likeminded communities in which the balance of power shifts from the institution to the individual [18]. Such possibilities have to an extent been realized within the sphere of tourism through online platforms such as TripAdvisor, Couchsurfing and Airbnb; or through online movements with a smaller or more ephemeral footprint such as #vanlife, #holidayspam, or even #travel. While this paper acknowledges the pervasive structuring influence of platforms and their political economies, it also recognizes the

redistribution of power towards tourists which these platforms may permit. Rather than the sight, which is staged for tourists' visual consumption and may be physically or discursively separated from tourists, as MacCannell [3] outlined in his description of touristic front-stages, it is the site, a more open, fluid location of indeterminate meaning and potentiality which is used as the spatial metaphor for tourist places. Such a shift involves a recognition of tourists' ability to identify, consume and promote locations as touristic based on their own choices and also the ability for the meanings contained within place to be shaped and changed over time. From here, the next part will go on to consider the integral role of sharing within smart tourism.

In this era of information saturation, is it still enough for the tourist merely to be present before and gaze upon an attraction? The intensification of tourists' photographic practices, as highlighted by recent exposés from popular touristic locations such as Angkor Wat [24], speaks to the importance of personalized narratives as an integral component of touristic consumption. Narrative techniques such as the selfie fulfill an authenticating function by providing personalized narratives prominently featuring the tourist protagonist. Here, the pervasive dissemination of not only the global but also the personal enabled by the internet raises the bar on tourist consumption. Rather than witnessing in a personal sense, the seeing with one's own eyes on which sightseeing was predicated, it is rather the dissemination of the experience to others, the act of sharing, which becomes the defining practice of tourist consumption. Further, as smart tourism hinges upon ongoing communication and connectivity, within this paradigm the consumption of experience in fact necessitates the sharing of experiential data in order to sustain service relationships. Indeed, to what extent tourists will have the ability to opt out of, or minimize, data sharing within smart tourism remains to be seen.

Taken on the back of techno-optimistic narratives such as the participatory culture, sitesharing permits greater openness in the interpretation of tourist behaviors and the consideration of what and where is touristic. This is not, however, necessarily at the expense of touristic grand narratives and related trends in tourist preferences. As an example, in a recent paper MacCannell [25] notes that: "There are several hundred thousand "selfie" type pictures posted on the Web of tourists at the Golden Gate Bridge. There are only several dozen similar pictures at the equally large and busy Oakland Bay Bridge two kilometers away." It is not surprising that the Golden Gate Bridge retains its cultural power as a tourist icon after nearly a century as the premier landmark of San Francisco. However, what this observation also reveals about the nature of sitesharing as touristic consumption is the changing focus of the tourists' gaze (or, perhaps, instinct) not in terms of target but rather configuration. The image of the Golden Gate Bridge is no longer presented as a landscape but rather a portrait. In the case of the selfie image, the person or people within the frame become the main subject while the background is used to elevate the self which is presented in the foreground [26]. This example of the shifting nature of touristic instinct highlights that sitesharing is as an evolution of, but not necessarily a radical departure from, sightseeing. In sitesharing, ICTs become an essential component of experience; the digital image may be as or more important than the on-site events. Finally, just as with sightseeing, sitesharing is not an all-encompassing frame. Even as smart tourism progresses, it will contain different levels of technological adoption, literacy and interest, that need be taken into account in producing a broad and textured understanding of tourism.

6   Conclusion

This paper has demonstrated how internet studies theory may be productively applied within the context of smart tourism. Following its interpretivist perspective, the paper summarizes four emergent dimensions of sitesharing that may be utilized as the base for future research:

1) Tourists perform their experiences to, and with, the online audience. [Performance]
2) Tourism place and experience are spread across physical and digital space. [Place]
3) IT companies act as powerful intermediaries within the tourism value chain. [Sharing]
4) Individual tourists gain agency within an increasingly complex touristic ecosystem. [Sitesharing]

As this paper has argued, the paradigm of smart tourism is a useful structure through which to understand the involvement of ICTs within tourism. However, co-opting marketing jargon assuming that a technology is inherently beneficial can be problematic, an issue which the literature has been cognizant of. The frame of site-sharing provides a useful lens for critically analyzing smart tourism by making visible some of the technopolitical structures which underlie its enactment. More work is needed which explores the practices through which tourists engage in sitesharing and how ICTs are integrated as part of the journey. Data will be an ever-present concern of future tourism study and so understanding the conditions which produce, manage and implement data flows will be an increasingly important part of understanding tourism. Internet studies can be a helpful domain in providing a nuanced view of such activities.

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The Pathway from Smartness to Sustainability: Exploring the Transmission Mechanisms

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Abstract. Smartness and sustainability have many points in common. Recent literature suggests that smartness would be a possibility to achieve the desired sustainability of tourist destinations. This article reviews the theoretical mechanisms that link both concepts and analyses their importance for a set of smart cities an destinations in Spain.

Keywords: Smartness · Sustainability · Theoretical mechanisms

1 Introduction

Among the many definitions that exist of smart cities, Caragliu et al. [5]. Consider that "a city is smart when investments in human and social capital and traditional and modern (ICT) communication infrastructure fuel sustainable economic growth and a high quality of life, with a wise management of natural resources, through participatory governance". Their adaptation to tourist destinations as "a knowledge-based destination, where information and communication technologies are used to provide a technological platform on which information and knowledge relating to tourism activities could be instantly exchanged" [6] would integrate the components to make the concept of sustainable tourism more operational.

The intensive use of technology involved in the implementation of a smart tourist destination allows the continuous measurement of aspects related to sustainability that, in the absence of this technology, are difficult or impossible to measure and manage [1–3]. Following this idea, Perles and Ivars [4] examine the existing links between both concepts and propose the theoretical transmission mechanisms operating in this context. The aim of this article is to empirically explore the importance of the proposed mechanisms to facilitate the optimization of the investments leading to sustainability.

2 The Theoretical Pathway from Smartness to Sustainability

The theoretical model (see Fig. 1) establishes the transmission mechanisms from smartness to sustainability for both smart cities and destinations. According to this framework, technology applied in smart destinations allows improvements in key aspects of planning and management. These improvements translate into a more efficient use of resources, costs saving and access to funds to invest in alternative and more

sustainable uses. Technology also facilitates better governance processes and increases transparency, which facilitates a real commitment to the sustainable management of destinations. Finally, technology applied to marketing and open data policy facilitates the customization of tourism services and the strengthening of innovative dynamics that enhance the competitiveness of the tourism destination.
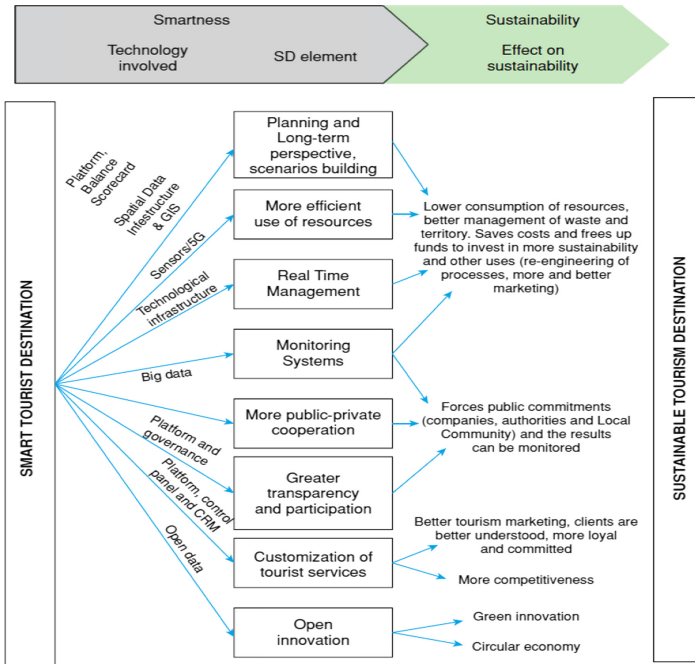
Fig. 1. Theoretical channels from smartness to sustainability (Source: Perles and Ivars [4])

3   Methodology and Data

In order to assess the relevance of the channels proposed in the model, primary data has been collected through an online survey addressed to managers leading smart cities and destinations initiatives in Spain. The questionnaire was developed within the framework of the research project "Analysis of planning processes applied to intelligent cities and tourist destinations. Balances and methodological proposal for tourist areas" (CSO2017-82592-R) financed by the Ministry of Science and Technology within the National Plan for R+D+i.

After a review of the literature, the items for each mechanism were formulated and a pretest was carried out to initially observe the understanding of a small sample of managers from the Valencian region.

Then, the questionnaire was sent to managers of Spanish smart cities and destinations initiatives, considering that these initiatives are developed in different departments of the local administration. After sending an invitation and several reminders,

46 valid questionnaires were collected. In some cases, two questionnaires from the same city were received, while in others only one responsible manager answered. Smart cities initiatives include important regional or provincial capitals such as Madrid, Barcelona, Palma de Mallorca or Santa Cruz de Tenerife. The tourist destinations projects include Benidorm, Marbella, Córdoba or Toledo, among others. The sample is representative of those destinations that are at a more advanced stage of development in their conversion process towards a smart city or destination.

The variables analysed are related to the theoretical transmission mechanisms of Fig. 1. A set of items related with the question "*the smart actions in your city/destination have had a positive impact on…*" valued in 7 point Likert scale with values ranging from 0 (strongly disagree) to 7 (strongly agree), 4 (neutral value) and 5 the score that implies agreement. These variables are studied for both, the smart cities and destinations case. The methodology of analysis is the exploratory data analysis.

4   Results

Table 1 shows the comparative results for smart cities and destinations (median and interquartile range results). Values are ordered from highest to lowest for smart destinations. In general, both managers of destinations and smart cities initiatives (median 6) consider that smart projects have improved the sustainability of the city or destination. Both medians are above the cut-off value of 5 (agree). Conversely, there is only one item that does not reach the cut-off value of 5 in the case of smart cities managers: reduction of tourist congestion.

Regarding the transmission mechanisms themselves, results show that the improvement of the management transparency is clearly perceived as the most relevant element. This item presents the highest median value and the lowest dispersion among smart destinations managers. Smaller improvements are perceived on the reduction of noise pollution, air quality, climate change mitigation, security levels, social inclusion, rationalization of public expenditure and reduction of tourist congestion. This could be attributed to the greater remoteness of these services from tourist destination managers and their difficulties to control them, as they are outsourced services in most destinations.

Regarding real time management and monitoring systems of cities/destinations, results reflect the practical difficulties of its implementation, both for tourist destinations and smart cities. Thus, the monitoring and control of public policies are ranked at the bottom of the list with the management of traffic in the destinations.

Table 1. Empirical values for the theoretical transmission mechanisms.

Item (values 1 strongly disagree -7 strongly agree)	n = 14		n = 23	
	Smart destinations		Smart cities	
	Median	IQR	Median	IQR
Management transparency	7	1.75	6	2
Image of the city	6.5	1.75	6	2
Collaboration with universities and research centres	6	1	6	3
Energy efficiency	6	1	6	2
Encouraging entrepreneurship	6	1.5	6	3
Promoting sustainable mobility	6	1.75	6	2
Citizen-oriented public services	6	1.75	6	2
Generating a more competitive city	6	1.75	5	3
A more sustainable city	6	2	6	2
Universal accessibility for disabled people	6	2	6	2.5
Waste management	6	2	6	2.5
Generating a more innovative city	6	2	6	3
Public-private partnership	6	2	5	2
Sustainable public transport	6	2.75	6	2
Interdepartmental collaboration	6	2.75	6	3
Protection of biodiversity and urban ecosystems	6	2.75	5	2.5
Water cycle management	6	3	6	2
Quality of urban public spaces	5.5	2	6	3
Citizen participation	5.5	2	6	1.5
Business attractiveness	5.5	2	5	3
Traffic management	5.5	2.75	6	2
Monitoring and control of public policies	5.5	2.75	5	2.5
Reduction of noise pollution	5	1	5	2
Air quality	5	2	6	2.5
Climate change mitigation	5	2	5	1.5
Security levels	5	2	5	2
Greater social inclusion	5	2	5	2
Rationalization of public expenditure	5	2	5	3
Reduction of tourist congestion	5	2	4	3

Authors own elaboration.

In relation to transparency, participation and public-private collaboration, managers perceive positively the impact that smart projects have on the general management of destinations. They also consider as favourable the relationship of these managers with the academic field from which some of these smart initiatives emerged. This improvement in transparency is accompanied with improvements in other aspects such as interdepartmental collaboration, citizen participation and public-private partnership. The absence of the later has always been highlighted as a burden on improving the sustainability of destinations.

Regarding customization of tourism services and innovation, managers recognise the potential of smart projects to generate innovative cities, improve their image, promote entrepreneurship and generate citizens and tourists-oriented services. All these improvements lead to a more competitive city. Therefore, there is a favourable agreement towards this statement among both destination (median 6) and smart cities managers (median 5).

Finally, regarding the accessibility side of smart destinations, managers also perceive the potential role of smart projects to improve these relevant aspects. However, the possibility of improving universal accessibility for disabled people is better perceived than the improvements towards a greater social inclusion.

5 Conclusions

Tourism literature points out the existence of a relationship between smartness and sustainability. Literature has also shed light on the theoretical mechanisms of transmission that operate in this context. On this theoretical basis, this article has tried to assess the importance of the mechanisms proposed by Perles and Ivars [4] in a relevant set of Spanish smart destinations and cities. Two preliminary conclusions have been obtained. First, the results point out that the implementation of smart projects promotes incremental improvements in the sustainability of cities and destinations. Second, the channels and mechanisms proposed by the pre-existing literature seem to be appropriate, being most of them favourably perceived by destinations managers.

Future research based on the evaluation of real data on the evolution of destinations and cities may confirm or refute the results obtained in this paper through surveys addressed to cities and destination managers.

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Discovering Cultural Differences Through Information Flow of National DMOs Websites

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Abstract. The purpose of the study is to investigate whether cultural differences are reflected in how destinations present themselves online by performing hyperlink network analysis of their official DMOs websites. The study examines whether variance in online presentation can be explained using well established theories on culture. To this end, hyperlink data were collected from three official tourism websites: Korea Tourism Organization (KTO) of South Korea, Brand USA of United States, and German National Tourist Board (GNTB) of Germany. The results show that the three hyperlink networks exhibit differences in size and structural properties. The information network of KTO tends to reflect collectivism, while those of Brand USA and GNTB reflect individualism. Blockmodeling analysis provides the grounds for further statistical approach.

Keywords: DMOs websites · Network analysis · Culture theory

1 Introduction

As all activities closely related to production in economy, art, technology, or education have fundamental realms of culture [1], cultural differences across societies or communities have always existed. Cultural impacts on tourist perception and behavior have been extensively investigated in many different contexts [2–5].

In the tourism field, websites are the important channels because they serve as the information hubs between the providers and consumers of destination tourism services [6, 7]. Therefore, lots of tourism authorities employ the internet-based infrastructure to facilitate the exchange of information between stakeholders. Although the websites are full of information reflective of cultural peculiarities, the ways to leverage that cultural element have been limited. This study, which can be classified into the tourist information search domain, looks at the issue from a somewhat unusual angle: it focuses on how national tourist destination websites reflect cultural value system of their respective societies. One major growth engines of the websites is that users are able to search information by traversing throughout a set of hyperlinks [8–10]. This study examines the ways in which national destination websites build up the hyperlink structural network of destination stakeholders and communicate information through this network.

Specifically, the study posited the research question whether the cultural attributes underlie the information flow patterns of the web-linkages. The overall purpose of the

study is to examine the structural idiosyncrasies of national DMOs websites using three national tourism websites – Korea Tourism Organization (KTO) of South Korea, Brand USA of United States, and German National Tourist Board (GNTB) of Germany.

2   Literature Review

Hofstede's studies [11–14] shed light on the embodiment of culture by suggesting cultural dimensions (e.g., Individualism-Collectivism, Uncertainty avoidance, Long-term (or Short term) orientation, Masculinity-Femininity, Power distance, and Indulgence-Restraint). Hall [15] claims that cultures can be classified as low or high context, depending on how important the context is to fully grasp the meaning of its communication. In high-context culture (e.g., China, Greece, Japan, South Korea, UAE), people are involved with each other and share strong intimacy. On the other hand, in low-context culture (e.g., Canada, Germany, Sweden, Switzerland, USA), the degree of involvement is low meaning that direct verbal information is required to communicate in daily life. Since their frameworks are well-known and due to limited space, detailed descriptions are omitted here. Briefly, South Korea is the society in which people appreciate the value of collectivism. They tend to be familiar with the commands from top-to-bottom approach. Power is centralized to authorities in a hierarchical order. When communicating with others, they express their opinions indirectly by utilizing nonverbal cues. On the other hand, in the United States, people value individual's freedom the most. They also place great emphasis on equality and transparency, so that they expect to get all information through open access in a direct communication way [16]. Even though German culture share some characteristics with American culture [17], not every cultural characteristic match that of the American. Germany presents a distinct departure from the American culture in terms of conflict resolution. According to Hall [15], Germans' management style to deal with conflict is quite blunt and rigorous, which seems averse to Americans. In sum, the United States and South Korea are located at opposite poles of cultural aspects, while Germany would be placed on between of these two countries.

Cultural variations have impacts on various online behaviors in tourism. Park and Reisinger [18] argued that national culture exerts an influence on web-communication behaviors such as information search, communication, and transaction behavior. Mele, Kerkhof [19] examined the effect of cultural localization on users' perceptions in webpages by adopting Individualism-Collectivism, and Power Distance dimensions in heritage tourism context. Cultural values could be reflected in the network structure on the web which (un)intentionally resonate with the values that permeate owners' culture [6, 10]. Barnett and Sung [20] focused on the role of national culture as a web-mechanism. They operationalized national culture as Hofstede's dimensions by the centrality and the overall structure of the hyperlink network. By analyzing data of 47 nations, they concluded that the national culture could explain the structure of the Internet. In tourism literature, one of the earliest studies conducted by Baggio, Scott [6] compared the structure of hyperlink network of tourism destinations assuming that the web system represents the economic and social group. Based on the literature, we

assume that the cultural attributes embedded in DMOs websites might be associated with the layout of hyperlink network.

3   Data Collection

Three national DMOs websites were selected as the tourism information repositories to be influenced by cultural characteristics (see Table 1). For collecting hyperlink data, we follow the steps described by Yi and Scholz [21]. The hyperlinks of the websites were collected by using web-based crawler during late May and early June 2020. The overall network structures of each website were firstly quantified with the network indicators. In addition, blockmodeling analysis, a method of grouping similar nodes and condensing data into blocks based on the extent to which they are equivalent, was conducted to detect structural dissimilarity of information flow between networks.

Table 1. National DMOs websites as seed source

	South Korea	Germany	United States
National DMO	Korea Tourism Organization (KTO)	German National Tourist Board (GNTB)	Brand USA
Websites URL	engligh.visitkorea.or.kr	www.germany.travel/en	www. visitusa.com

4   Results

4.1   Overall Network Structure

Table 2 presents overall properties of each hyperlink network. KTO has the largest network with the diameter value of 11 among three networks. The values of density of the networks were very low ranging from 1% to 2% indicating the direct interconnections between nodes in the whole network are very rare. A k-core analysis was applied to differentiate important actors for further analysis [22]. 3-kore in which we examine reciprocity and transitivity value was applied as cut-off point [23]. Among the 3-core networks, KTO network still has the largest network size with one giant component group. Overall, all three networks reveal quite low-density values same as in the whole networks. The KTO network is a much more collectivist network, with evidence of network size and the number of connected components. The KTO network could be characterized by collectivist network whose members share same cultural value in pursuit of a common goal. The Brand USA and GNTB, on the other hand, have much less hierarchized networks where a flatter structure is favored with more than 10 components. The networks of Brand USA and GNTB have more predominance of reciprocated hyperlinks over asymmetric connections than that of KTO meaning a more equal relation between members. The 3-core network properties of three DMOs networks are also provided in Table 2.

Table 2. Whole & 3-core network properties of three DMOs web-networks.

Properties	KTO	GNTB	Brand USA
# of nodes	592 (1934)	219 (966)	180 (1456)
# of edges	3465 (6142)	644 (1612)	664 (2138)
Avg. degree	5.84 (3.17)	3.58 (1.67)	3.01 (1.47)
Diameter	13 (11)	5 (5)	5 (5)
Density	0.01 (0.002)	0.02 (0.002)	0.01 (0.001)
Reciprocity	0.05	0.06	0.06
Transitivity	0.20	0.54	0.65
Clustering coefficient	0.35	0.65	0.59
Components	1 (1)	7 (15)	3 (20)

Note: The numbers in parentheses are the whole network properties of three DMOs networks

4.2   Blockmodeling Analysis

A blockmodeling analysis was also conducted to uncover structural dissimilarity between networks. It is useful into sorting hyperlinks into discrete clusters based on each unique block determined by a researcher [24]. In this study, 6 blocks which are *Federal Level Government, State Level Government, Local Level Government, Social Media, Private Sector,* and *Association* were identified. Next, block image matrix was dichotomized from block density matrix. Because of the lack of space, only data for the two networks with the most differences – KTO and Brand USA – are provided in Table 3. To evaluate how well the blockmodeling fits the identified categories, the goodness-of-fit for the hypothesized blockmodeling was also examined. All three blockmodels secure the adequacy of representation of each data set. Based on the two matrices, we generated reduced graphs (Fig. 1).

The result indicates that there are structural dissimilarities between three DMOs networks. With a predominance of asymmetric connections compared to the other networks, KTO network implies more of a hierarchy culture. Brand USA reflects their cultural characteristic that all information is distributed quite evenly, moreover, the blocks are all interconnected each other without no isolation. To some extent, the study found that there are more similarities than dissimilarities between KTO and GNTB. The findings of this study support many of earlier studies whose results argue that human activities have fundamentally realms of culture.

Table 3. Density matrix of blockmodeling of three DMOs web-networks.

KTO	Fed Gov.	State Gov.	Local Gov.	SNS	Private	Assoc.
Fed Gov.	0.017 (1)	0.006 (0)	0.006 (0)	0.003 (0)	0.004 (0)	0.004 (0)
State Gov.	0.019 (1)	0.027 (1)	0.009 (0)	0.035 (1)	0.007 (0)	0.011 (1)
Local Gov.	0.024 (1)	0.005 (0)	0.013 (1)	0.003 (0)	0.002 (0)	0.006 (0)
SNS	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
Private	0.007 (0)	0.004 (0)	0.002 (0)	0 (0)	0.01 (0)	0.004 (0)
Assoc.	0.007 (0)	0.005 (0)	0.002 (0)	0.01 (1)	0.003 (0)	0.004 (0)
Brand USA	Fed Gov.	State Gov.	Local Gov.	SNS	Private	Assoc.
Fed Gov.	0.117 (1)	0.009 (0)	0.004 (0)	0 (0)	0.006 (0)	0.017 (1)
State Gov.	0.016 (1)	0.036 (1)	0.009 (0)	0.144 (1)	0.016 (1)	0.008 (0)
Local Gov.	0.024 (1)	0.006 (0)	0.013 (0)	0 (1)	0 (1)	0 (1)
SNS	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
Private	0.004 (0)	0.003 (0)	0.004 (0)	0.034 (1)	0.011 (0)	0.013 (0)
Assoc.	0.003 (0)	0.005 (0)	0.012 (0)	0.018 (1)	0.011 (0)	0.013 (0)

Note: The numbers in parentheses are dichotomized value for image matrix
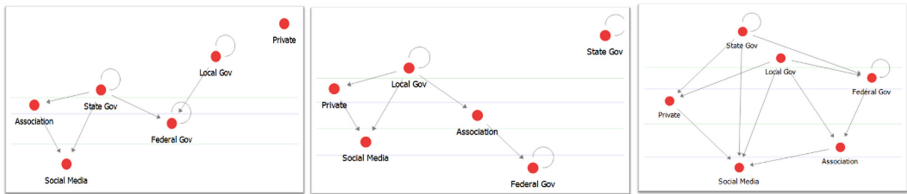
Fig. 1. Reduced graphs (KTO, GNTB and brand USA from left to right)

5   Discussion

The purpose of the study was to explore the structural idiosyncrasies of these websites which could impact on users' tourism information searching behavior. To this end, hyperlink network analysis was conducted on the data sets collected from three official tourism websites. Results indicated that the significance of structural hierarchy which was one common thread in the culture theories were associated with how the information is distributed. In the KTO network, rather than being evenly distributed among various players in the network, the number of links is concentrated in a limited number of subjects, governmental organizations, showing a structure in which power is concentrated. In the case of Brand USA and GNTB, actors other than the government share tourism information on the DMO platform, therefore, active information exchange was taking place among network participants.

Given the nature of tourism and destination branding, the target audiences are globally distributed. Accordingly, it is likely to cultural propensities would have a great influence the interaction between users and DMOs websites. For instance, a person in

collectivistic culture would be more familiar with information created by top-down approach. We, therefore, assumed that the underlying cultural features of national DMOs websites could influence tourism information searching behavior or tourist satisfaction on websites. However, the study only unveils the evidence of different structural pattern of information flow based on cultural propensities. Therefore, future research should empirically examine how well users perceive the information patterns and how much it influences their decision-making process in tourism context. Also, it will be useful for researchers to explore more DMOs in same cultural sphere to draw validate conclusion.

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A Conceptual Framework of Destination Sustainability in Sharing Economy

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Abstract. The introduction of the sharing economy has revolutionized resident-tourist relationships and provides further implications of destination sustainability. Built on several well-established theories, this conceptual study intends to develop a new and holistic framework to examine destination sustainability, focusing on the change of resident-tourist relationships. The framework is first guided by the stakeholder theory to identify the four key stakeholders in the new sharing economy context: residents, tourists, governments, and the sharing economy platform. With the collaboration theory and resource theory as a foundation, the framework then describes each stakeholder's specific needs and resources. The service-dominant logic further supports service exchanges and value co-creation among stakeholders. The framework then adopts the capital theory approach to conceptualize destination sustainability in terms of human, social, natural and manufactured capital. Finally, three propositions are developed to justify the new peer-to-peer collaboration paradigm that leads to destination sustainability. The proposed framework is aligned with the six-pillar transformation in e-Tourism research and serves as an intelligent solution to destination sustainable development in the sharing economy context.

Keywords: Resident-tourist relationship · Sharing economy · Destination sustainability · Stakeholder theory · Collaboration theory · Resource theory · Service-dominant logic · Capital Theory Approach (CTA) · Transformative e-Tourism

1 Introduction

The interaction between tourists and residents is fundamental to tourism destinations (Sharpley 2014). However, tourists' activities negatively impact residents' quality of life and local sustainability (Routledge 2001), and waves of anti-tourism movements exacerbate conflicts between tourists and residents (Hughes 2018). What's worse, the COVID-19 pandemic escalates the existing conflicts as residents condemn tourists as carriers of the virus and believe tourists contaminate communities (Los Angeles Times 2020), which hinders the move toward destination sustainability (Wulfhorst 2017). The introduction of the sharing economy sheds light on the current clash by facilitating satisfying resident-tourist relationships and enhancing destination sustainability. The

extant literature review indicates a lack of theoretically innovative studies on the resident-tourist relationship and its role in destination sustainability (Font and McCabe 2017). Therefore, this study intended to: (1) review relevant theories that provide the theoretical foundation for the resident-tourist relationship in the sharing economy context; (2) develop a conceptual framework of destination sustainability, and (3) justify destination sustainability from the capital theory approach. It will contribute to the sustainable literature in the sharing economy era and offer guidance in addressing the resident-tourist relationship.

2   Literature Review and Theoretical Foundation

Proposed by Gretzel et al. (2020), the impact of COVID-19 pushed research to a crossroads to transform through challenging existing paradigms with a six-pillar approach (historicity, reflexivity, transparency, equity, plurality, and creativity). In this section, the existing literature and selected theories were first reviewed from the "historicity" perspective, extracting linkage among established theories and serving as the theoretical foundation. The study first identifies stakeholders in the sharing economy (Stakeholder Theory), their needs (Collaboration Theory), and resources as bases for exchange (Resource Theory). Then, value co-creation (Service-Dominant Logic) explains stakeholders' needs and resources to supplement each other. Finally, the rationale of destination sustainability is justified by analyzing four capitals from the Capital Theory Approach.

2.1   Stakeholder Theory

Sharing economy literature on destinations (Boes et al. 2016; Leung et al. 2019) identifies tourists, residents, government, and sharing economy platforms as the four key stakeholders.

2.2   Collaboration Theory

Collaboration theory serves as a useful tool to resolve conflicts and advance shared visions among different stakeholders (Jamal and Getz 1995) by identifying each stakeholder's needs. Tourists pursue authentic experiences, better value for money, and sustainable tourism products in the sharing economy environment (Cheng 2016). Residents' needs are summarized as reaping direct economic benefits from tourist activities (Lee 2013). The driving forces behind government involvement include the ardent interest in tourism's economic returns, the mitigation of the undesirable effects of tourist activities, and the implementation of destination sustainability (Kubickova 2016). Last, sharing economy platforms enable tourism enterprises to expand their scopes, generate platform users, and make profits (Teixeira and Ferreira 2019).

2.3   Resource Theory

Resource theory offers stakeholders guidance to exchange resources they possess to meet their needs and form peer-to-peer collaboration. Time, money, and involvement are tourists' resources enclosed in their travel experience (Prebensen et al. 2013). The principal resource owned by residents is local authenticity, which consists of genuine quality, originality, uniqueness, sense of place, and pride (Gannon 1994). The government has legislative empowerment and resources to implement tourism (Ruhanen 2013); sharing economy platforms play the primary role in applying information technology in connecting tourists with residents in destinations.

2.4   Service-Dominant Logic

Service-dominant (S-D) logic provides a system-wide perspective of value co-creation through service exchanges among different stakeholders (Vargo and Lusch 2014). Value-creation in tourism is inextricable from tourists' participation and involvement (Prebensen et al. 2013), such as feedback. Residents contribute to the value co-creation process as both suppliers of authenticity and co-creators to tourists' experience (Stylidis et al. 2014). The government joins the value co-creation process as a facilitator and regulator (Ruhanen 2013) by regulating unethical and illegal behaviors on tourists' rights, securing locals' safety and benefits, and cohering efforts to destination sustainability. During the value co-creation process, sharing economy platforms enable efficient synergies of residents and tourists, and the platform itself profits for a fraction of the sharing fee (Belk 2014).

2.5   Capital Theory Approach to Sustainability

The capital theory approach (CTA) uses all capital assets' economic value to measure sustainability (Ruta and Hamilton 2007). These capital assets can be categorized into natural, manufactured, human, and social capital (Ekins 1992). Applying CTA to destination sustainability, this study posits that a destination's total capital should not decline over time for sustainable growth.

3   A Conceptual Framework of Destination Sustainability

The relevant literature review provides a solid foundation to connect the related theories and guide tourist destinations' sustainable development. The proposed framework was aligned with the six-pillar shift advocated in the transformative e-Tourism research (Gretzel et al. 2020). The careful examination (historicity) and reflection (reflexivity) on the current literature generated a different approach (creativity) to the sharing economy's function in all related stakeholders (equity). Additionally, this framework revealed the sharing economy's implicit value in destination sustainability (transparency) through building bridges that lead to an alternative to the current challenge in practice (plurality). Figure 1 (below) presents the proposed conceptual framework.

3.1 Resident-Tourist Relationship Facilitated by Sharing Economy

The proposed framework identifies four stakeholders, whose unique needs and possessed recourses are marked in the blue and black dash circles (Fig. 1). The value co-creation process occurs within the red-dash circle of the framework. In short, the new peer-to-peer collaboration paradigm ensures value co-creation in destinations through exchanging resources and meeting all stakeholders' needs.
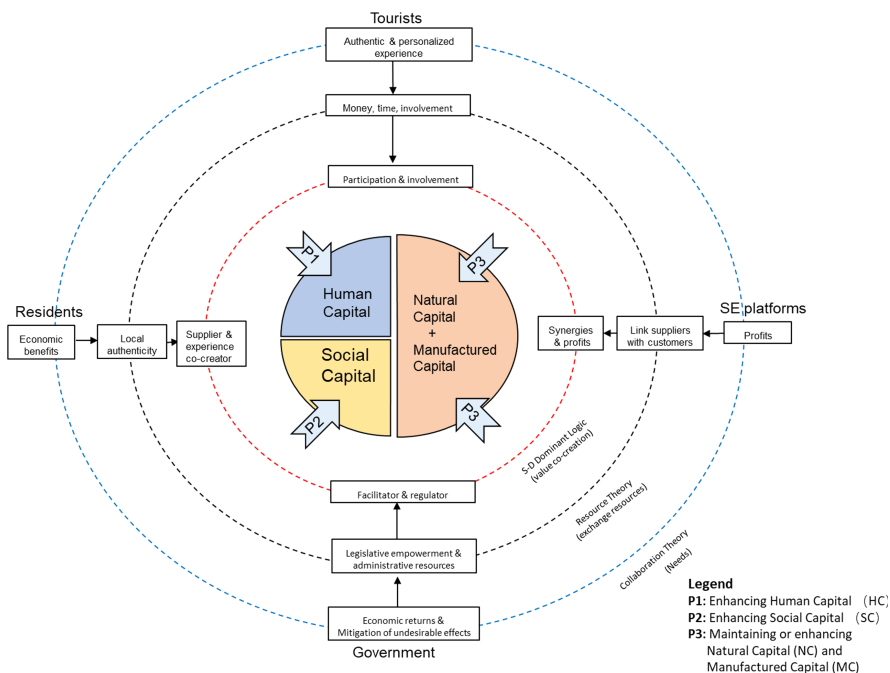
Fig. 1. A conceptual framework of destination sustainability built on sharing economy

3.2 Destination Sustainability Built on Sharing Economy

In the center of the framework (Fig. 1), CTA explains how the multi-stakeholder approach of value co-creation in the sharing economy contributes to destination sustainability. Human capital consists of the health, knowledge, skills, and motivation of residents, tourists, and employees at both sharing economy platforms and government level. Such initiatives enhance the total human capital of the destination. Hence, the following proposition:

Proposition 1: Peer-to-peer collaboration in the sharing economy and a multi-stakeholder approach to value co-creation will enhance destinations' human capital.

Further, the government builds trusted, accessible systems of governance, regulations, and justice, while the sharing economy platform provides safe, supportive working environments and intelligent networks. Such peer-to-peer collaboration forms

a new paradigm of social relationships that contributes to the increase of social capital. Thus, the following proposition is put forward:

Proposition 2: Peer-to-peer collaboration and a multi-stakeholder approach to value co-creation will enhance the destination's social capital.

As the core assets of destinations, natural and cultural resources are well-maintained to attract tourists due to value co-creation in the destination. Therefore, we formulate the following proposition:

Proposition 3: Peer-to-peer collaboration and a multi-stakeholder approach to value co-creation will maintain or enhance the destination's combined natural capital and manufactured capital.

The framework indicates that a favorable resident-tourist relationship can only be sustained when all stakeholders have a common interest in keeping this mechanism running. In the proposed context, all the stakeholders contribute their resources to and benefit from the destination development, resulting in an operationally sustainable system.

4 Implications

4.1 Theoretical Implications

In response to the recent criticism on lacking macro-level guidance in the literature (Gretzel et al. 2020), the current study makes the first attempt to conceptually explore multi-stakeholder collaboration in the sharing economy. The IT-facilitated sharing economy platform also serves as an active stakeholder and contributor instead of an "instrumental solution" criticized by Gretzel et al. (2020). Moreover, this study contributes to the destination literature by first adopting CTA from the economic discipline to measure destination sustainability in terms of four significant capitals: human, social, natural, and manufactured. This study also expands the original CTA in tourist practices by emphasizing human capital and social capital in destination development.

4.2 Practical Implications

The study provides a roadmap with a multi-stakeholder approach to destination sustainability. Stakeholders involved should create a favorable environment and conditions to generate such collaboration. The study confirms the theoretical possibility of solving the conflicts and urges all stakeholders to rethink tourist activities' value and reexamine their resources to exchange.

5 Limitations and Future Research

This study is not without limitations. It did not consider the different levels of destination development. Further, this study developed a conceptual framework but did not provide empirical evidence. However, real-world practices have shown the development tendency identified in the proposed framework. A collaborative app, *i-Tourguide*, was developed in China recently to offer tourists audio guide services. The government

encourages and invites residents to contribute their expertise in exchange for economic gains, facilitating local tourism recovery. All identified stakeholders in the framework are geared to co-create value and benefit from the prorated profit-sharing mechanism in a sustainable pattern. Future studies should also consider assessing destination development at various levels when a destination implements the framework and collects either qualitative or quantitative data to validate the model.

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Smart Tourism Cities' Competitiveness Index: A Conceptual Model

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Abstract. As smart tourism cities are becoming a blur boundary between residents and tourists at a spatial place (e.g., urban city or destination), innovation and technologies should be integrated with tourism applications and urban infrastructure. The idea of smart tourism cities is generated as incorporating tourism business or tourism context into everyday life, opening up opportunities in daily life and travel. We need to explore a possible concept of smart tourism cities and how urban cities can play a role of the duality emphasizing on the blurring boundaries and allowing both residents and travelers to co-create the value of the urban cities' competitiveness name as 'smart tourism cities.' This study aims to develop a competitiveness evaluation index for sustaining urban cities through tourism.

Keywords: Smart tourism cities · Competitiveness index · Urban cities · Smart cities · Smart tourism · Evaluation

1 Introduction

In recent years, the global prevalence of smart technologies and devices has fundamentally changed the way of global urban cities are constructed, consumed and shared between visitors and residents, as well as mediated by technologies and tourism businesses. Tourists in urban cities are usually playing a variety of memorable tourism experiences during their local traveling. Travel activities such as accommodating, dining at a restaurant, shopping and entertaining are all taking place at urban cities that are called as tourism destinations [1]. In this way, tourists or visitors consume resources and infrastructure of the city that are all providing for citizens and residents.

How can the urban cities make a blended place of life and travel in spatial alike? Google Maps, mobility (e.g., Uber), and accommodations (e.g., Airbnb) play an

essential role in making a city smarter and more accessible to people, which enable the blending of tourists and residents and foster the conversion of regular homes or cars into tourism and hospitality offerings. In order to enhance the smart tourism experience [2], urban functions, facilities, amenities, infrastructure of the cities can intertwine seamlessly urban life and needs of tourism in smart cities [3]. Therefore, it is necessary to have a guideline of how tourism context and urban life are overlapped in smart cities, and maximize smart tourism through effective and efficient use of the urban infrastructure and functions [4]. Therefore, last but not least, we try to conceptualize smart tourism perspective into smart city as one place that are blurred for both of residents and tourists [1, 4] and provide an index from which broader views of smart tourism and cities competitiveness [5] that can evaluate relatively smart tourism cities and measure its resources, capabilities, management, and policies.

2 Literature Review

2.1 Smart Tourism and Urban Competitiveness

Smart tourism can refer to tourism that is technologically, economically and socially developed or growing by advanced smart technologies [2]. Gretzel et al. [2] conceptualized smart tourism as technological oriented on-site tourism experience at a destination. Meanwhile, the concepts of smart city are generating various definitions, including intelligent city, digital city, and ubiquitous city (U-city) [6]. Smart city is defined as a city equipped with ICT infrastructure to lead social and urban growth through reinforcement of economic level, citizens' participation and government efficiency [7]. Celino and Kotoulas regarded smart city as an urban ecosystem that utilize connected technologies to improve urban operations and make intelligent near real-time decision [8]. Isi lab addressed how smart city helps to resolve numerous urban problems as well as how advanced technologies implement into urban infrastructure [6]. To sum up, the attributes of smart city which commonly mentioned in these definitions are (1) connectivity through ICTs (2) efficiency improvement (3) sustainability (4) eco-friendliness (5) improved quality of life. We regarded smart tourism city as a combination of smart tourism and smart city. In smart tourism destination, automated tourism services and creative contents that induce tourists' desire are development. For tourism context, smart city can be defined as "a city using technologies innovatively to achieve resource optimization, effective and fair governance, sustainability and quality of life" [2, p. 179]. In this perspective, smart tourism cities are "an innovative tourist destination that guarantees sustainable development that facilitates and enhances visitors' interaction with experiences at the destination and eventually improves the residents' quality of life" [9, p. 6], and it has been regarded as a solution to various problems facing various smart cities (e.g., over-tourism).

2.2   Competitiveness Index for Smart Tourism Cities

In the tourism field, the World Economic Forum (WEF) mainly evaluates tourism competitiveness (e.g., [10]), but it is insufficient to evaluate the smart tourism cities as it focuses on general tourism rather than, specifically, smart tourism. WEF's indicators only take into account ICT readiness, which focuses on building and using ICT infrastructure such as mobile and internet. However, considering the concept of smart tourism, developing various indicators that can enable smart tourism that maximizes the tourist's experience on-site from the viewpoint of smartization as a whole are required. Regarding smart tourism cities, the European Union (EU) has been conducting a project to support promotion and marketing activities of the city by evaluating the excellent smart tourism capitals in the EU every year. The evaluation area is largely divided into four areas: *Accessibility, Sustainability, Digitalization* and *Cultural Heritage and Creativity* [11]. However, considering the concept of smart tourism cities, first, the evaluation indices of the EU focus more on the point of view of tourists, and therefore, it lacks consideration of the various social issues experienced by residents due to tourism. In particular, smart tourism cities should consider sustainable development through symbiosis between citizens and tourists. Second, collaborative partnerships and building its ecosystems with various stakeholders related to smart tourism cities are also an important area that should be considered for building competitiveness of smart tourism cities, but the EU's indices lack consideration for these areas. Therefore, we believe that there should be a need for embracing evaluation indices and measurement items for smart tourism cities considering both smart tourism and smart cities' perspectives.

3   Conceptual Framework

Figure 1 illustrates the conceptual framework of this study. Based on the three components of smart tourism cities suggested by [2], the research frame work was comprised of three phases: smart destination, smart business ecosystem, and smart experience. First, smart experience in smart tourism cities is based on a concrete smart destination and business ecosystem [9]. Thus, smart destination can be categorized and assessed by four dimensions: attractiveness, sustainability, accessibility and digitalization readiness [11]. Again, these dimensions can be characterized into two aspects of smart tourism destination: tourism versus city. Secondly, smart business ecosystem is composed of numerous stakeholders who forms collaborative partnership with each other [5]. Finally, smart experience can be tourists' and residents' memorable experience enhanced by advanced ICT [6].
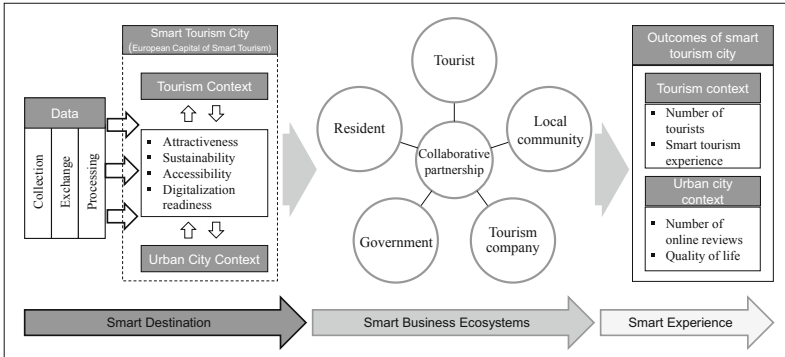
Fig. 1. Conceptual framework

4   Smart Tourism Cities' Competitiveness Index

After developing the first indicator based on the conceptual framework, we collected experts' opinion about that via Delphi survey for increasing objectivity and expertise. Delphi experts were composed of 12 experts in various field such as smart tourism, smart city and index development. Based on their opinions, we could develop the following smart tourism index comprised of 5 subcategories, 18 pillars and 48 individual indicators (see Fig. 2).

Based on the evaluation areas developed by EU [11] and results of Delphi survey, we defined the five subcategories as follows. Attractiveness is a degree to which tangible and intangible tourist attractions are provided through the Internet or ICTs. It is comprised of smart attraction, smart amenities, smart contents and online popularity. Accessibility is a degree to which touristic information and transportation system can be accessed by both of virtual and physical ways. It consists of smart convenience, smart mobility and barrier-free design. Digitalization readiness is a degree of data openness and infrastructure that can provide high-quality smart tourism information based on the cutting-edge ICTs. It is comprised of digital infrastructure, information openness, smart platform and smart service technology. Sustainability is a degree to which a smart tourism city has a foundation for sustainable social, economic and environmental growth. It is comprised of life and tourism environments, tourism creativity and innovativeness, tourism safety and city resilience. Finally, collaborative partnership is a degree of establishment of a smart tourism ecosystem for the symbiosis of numerous stakeholders in smart tourism cities. It consists of resident-tourist symbiosis, living lab activation and smart tourism governance.

Fig. 2. Smart tourism cities' competitiveness index

5   Discussion and Implications

This study suggests smart tourism cities' competitiveness index. Through literature reviews, we proposed our conceptual model based on [2, 11]. In our conceptual model, we believe that we can be able to understand mutual aspects of smart tourism and urban cities as one 'smart tourism cities' and give a guideline for strengthening competitiveness index inclusive tourism context and urban cities. So, we provide a framework, dimensions, measurement indicators on the systematic flow and integration among smart tourism technologies and other components of destination competitiveness. With this index, we can expect to be able to diagnose the level of smart tourism in urban cities and measure their competitiveness in the future.

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Part V: COVID-19

Hear No Virus, See No Virus, Speak No Virus: Swiss Hotels' Online Communication Regarding Coronavirus

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Abstract. Tourism is a lucrative business, and Swiss hotels rely heavily on international clientele to book their rooms. The Coronavirus pandemic has halted travel and hotel stays from March to June 2020. Based on Situational Crisis Communication Theory (SCCT), this paper investigates the messages Swiss hotels have posted on their official websites and Facebook pages to reassure guests that it is safe to book rooms in Switzerland again. The findings from 73 independent 4 and 5-star hotels show that most hotels did not publish messages regarding the Coronavirus or the measures they have taken; instead, the hotels posted positive messages about reopening their rooms and services. Official hotel websites emphasized deals and offers while the Facebook pages concentrated on enthusiastic 'welcome back' messages. The findings presented here contribute to the literature by offering the first results of a larger project on communication during the de-confinement stage of a pandemic.

Keywords: Swiss hotels · Coronavirus · De-confinement · Facebook · Situational Crisis Communication Theory (SCCT)

1 Introduction

Tourism in Switzerland is a lucrative business, providing many jobs to the local communities and contributing significantly to the local economy. According to the official statistics published in 2019, there are 28 985 hotel and restaurant establishments with 175 489 full-time employees and 7845 trainees who generate CHF 44.7 billion in total revenue, CHF 16.6 billion from foreign tourists in Switzerland through hotels, restaurants, and transportation. The tourism industry is one of the largest export industries in Switzerland, with 4.4% of export revenue [1]. Thus, the tourism industry in Switzerland relies heavily on foreign travelers. In 2019, the Swiss hotel industry registered 39.6 million overnight stays across the country [2]. It was a profitable year for Swiss tourism, and the expectations for 2020 were positive until the first reports of the Coronavirus in China.

As word of the Coronavirus spread, the Swiss tourism industry began to make predictions regarding the 2020 tourism season. In a message published in January 2020, one tourism expert stated: "In the coming weeks, Switzerland Tourism expects a

30–50% reduction in the number of Chinese visitors to Switzerland" [3]. Based on 2018 figures, this could represent 70,000–100,000 overnight stays per month. As Chinese visitors are among the biggest spenders when holidaying in Switzerland, paying out on average CHF380 per person per day, this pandemic could be a dire situation for Swiss tourism affecting popular Swiss destinations such as Geneva, Zermatt, Interlaken, Lucerne, and Zurich. As hotels are heavily affected by international travel, they are likely to feel greater repercussions from the Coronavirus restrictions than restaurants [4].

By March 2020, a survey conducted by Valais University of Applied Sciences and Arts predicted that the tourism industry revenue could suffer an 18% loss due to the restrictions and, in some cases, closure of hotels and restaurants. While the study predicted up to 6 billion CHF losses for the tourism industry in 2020, the hotel sector alone would lose as much as 2 billion CHF between March and May (the time this study was conducted) [4]. In the same survey, bookings had dropped by 69% for March, 90% for April, and 73% for May. The President of the Swiss Hotel Association, Andreas Zullig, estimated that 5% of Swiss hotels (from 200–250) would not survive the pandemic [4].

This paper examines the messages during and after the confinement of 73 Swiss 4 and 5-star independent hotels to analyze how they communicated with their customers regarding the Coronavirus and whether they applied appropriate crisis communication strategies. The purpose is to gauge whether the hotel messages were effective in reassuring the customers that Swiss hotels are prepared and 'safe' to book during their holidays. Their messages posted on their official websites and their Facebook pages are measured against Situational Crisis Communication Theory (SCCT). A content analysis of their messages was conducted to create word combinations and visuals through Wordji. This paper concludes with the implications of using social media and company websites to communicate with customers in the time of a crisis.

2   Literature Review

2.1   Crisis and Situational Crisis Communication Theory (SCCT)

Crises have been defined as "unpredictable events that can disrupt an organization's operations and threaten to damage organizational reputations" [5]. The priority in any crisis is to protect stakeholders from harm; therefore, public safety concerns should precede any reputational concerns [6]. Stakeholders will attribute responsibility of the crisis to the company, which can be grouped into three categories: Victim (weak attributions of organizational responsibility such as natural disasters or rumors), accidental (low level of responsibility such as challenges or technical-errors), and preventable (high level of organizational responsibility such as human-error or organizational misdeed) [7]. As industries are the victims of the Coronavirus pandemic and could do nothing to avoid it, the response strategies for managing this crisis will be based on the victim category.

According to Coombs Situational Crisis Communication Theory (SCCT), for each of the attribution clusters mentioned, there are communication strategies to employ to

protect company reputation in three ways: 1) shape attributions of the crisis, 2) change perceptions of the organization, and 3) reduce the negative effect generated by the crisis [8]. When the organization has been attributed with weak responsibility as seen with the Coronavirus, the organization should implement an ethical base response consisting of instructing information (i.e., explaining the crisis to the stakeholders) and adjusting information (i.e., helping stakeholders cope with the crisis). However, it could also include bolstering messages such as ingratiation (i.e., praising stakeholders for efforts they have made) and victimage (i.e., reminding stakeholders that the organization is a victim of this crisis) [9]. Unlike bolstering, which focuses on communicating past good works a company has done, enhancing includes telling stakeholders about the company's current good works [10]. In the Coronavirus case, this could entail communicating the new safety measures put in place for both the employees and the customers. This paper examines how SCCT crisis responses were communicated online, particularly the enhancing strategy, by Swiss 4 and 5-star, independent hotels.

2.2 Crisis Communication in the Hospitality Industry

Previous studies have examined crises in the hospitality industry that have significantly impacted specific properties or areas. From war and political instability to crime, terrorism, and health epidemics, safety concerns are a significant predictor of travel intentions [11]. Swiss hotels have circumvented major crises thus far. Their recent crises have included little or no snow during regular ski seasons, a hailstorm that destroyed some vineyards, and the financial burden of a strong Swiss franc. While researchers have recommended that hotels post messages regarding the crisis, irrespective of the crisis level, on their websites so that potential customers will read these messages when connecting to make their reservations [12], some hotels are reticent for fear of lowering the interest in their properties if their customers read messages about a crisis [9], particularly a health crisis like the Coronavirus. This study analyzes how many hotels effectively communicated these messages in the de-confinement stage of Swiss hospitality.

Previous studies have examined how and what companies communicate with their stakeholders in times of crisis. Specifically, in the hospitality industry, researchers have examined social media use through social media such as Twitter or Facebook and traditional media during crises. One study focused on the tourists' risk perceptions associated with health amongst others to gauge how frequently tourists resort to social media to gather their information to find that international tourists with high-risk perceptions had a high likelihood of seeking information through social media channels during a crisis [13]. The perception, particularly of risk associated with crises, can be mediated by using social media to give information and address the human needs of conversation and compassion [14]. Nonetheless, international travelers are more vulnerable due to linguistic communication, culture, and varying levels of social media savvy, which may affect their choice to use social media to seek information in the event of a crisis [15]. As Switzerland is dependent on international travel for their tourism, particularly for hotel occupancy, this study will analyze the messages on both the official hotel websites and their Facebook pages and address the following two research questions:

RQ1: What are Swiss 4 and 5-star independent hoteliers communicating on their official websites regarding the Coronavirus?

RQ2: Are Swiss 4 and 5-star independent hoteliers using social media to communicate about the Coronavirus crisis?

3   Methodology

A list of 4 and 5-star independent hotels in Switzerland was gathered to examine the messages posted on their official websites and Facebook pages. One criterion for inclusion in this study was total independence; thus, hotels that were part of chains or groups were not included. Of the 222 hotels on the original list, only 96 had Facebook pages. Of the 96, hotels that were part of a group (though not a chain) and hotels with no Facebook page were eliminated. Also, hotels that were not yet open were eliminated as the purpose was to analyze their reopening messages regarding the Coronavirus. The official company websites were accessed on June 12, 2020, when many hotels had officially opened. The Facebook comments were tracked from mid-crisis when many hotels were closed (March 13, 2020) to June 13, 2020, again, when many of the hotels reopened. Figure 1 shows the research methodology employed.
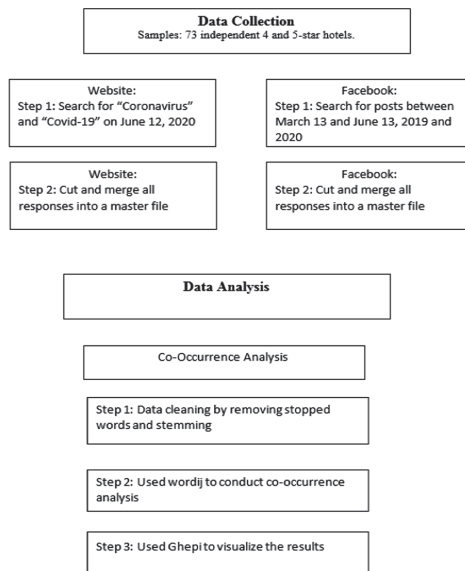

Fig. 1. Research methodology.

While Swiss hotels are located in various regions and are often set to the local language of the canton in which the hotel is situated (French, German, or Italian), most of these websites had a combination of the national languages, and all of them had an English language setting. This could be explained by the number of international

tourists who peruse the official websites to book their accommodations. For this reason, the English setting was used on all of the official hotel websites, and the search for Coronavirus information was conducted. The homepage of each hotel website was scrutinized for direct messages that could be found. Some hotel websites offered a pop-up message with Covid-19 information directly on access.

Further, each website was searched using the keywords Coronavirus, and Covid-19 were entered into the search boxes when available. These two keywords were chosen to establish timely messages regarding the pandemic. While health and safety measures could have been used, hotels already have best practices in place. The purpose of this study was to identify the 'new' messages written precisely in response to the Coronavirus. For the Facebook pages, again, the messages posted in English were chosen for this research project to remain consistent with the international clientele who seeks information via the hotels' websites.

4   Results

4.1   Hotel Official Websites

The official hotel websites offered a varied amount of information regarding the Coronavirus. Figure 2 shows the relationships between the words in the messages found on the hotel websites. Twenty-nine of the hotels had a direct message, sometimes a pop-up, which appeared on their homepage regarding Coronavirus or Covid-19. Word pairs such as 'federal office,' 'federal public,' 'federal health,' 'office health,' and 'office public' appeared 12 times in the official hotel website messages. 'Disinfect hands' and 'wear protective' appeared 13 times before 'wear masks' and 'wear mask' (at 12 and 10 times, respectively). The highest number of word pairs was attributed to 'guests employees' (23 times), followed by 'hygiene measures' (18 times), 'hotel guests' (17 times), 'safety measures' (16 times), 'health safety' (15 times), and Public health' and 'public areas' (14 times). The number of unique pairs was 363, with an average pair frequency of 4.440771 and pair entropy (or level of uncertainty or randomness) of 5.765317.

For the frequency of individual words, the most common word in the messages were 'guests' (126 times). The word 'hotel' (81 times) was followed by 'employees' (58 times), 'safety' (53 times), 'measures' (52 times), 'hygiene' (40 times), and 'distance' (34 times). The majority of the individual words were tabulated less than ten times. Out of 440 unique words, 342 (77%) were used less than ten times in all of the messages combined. The average word frequency was 8.1, and the entropy was 5.690377.
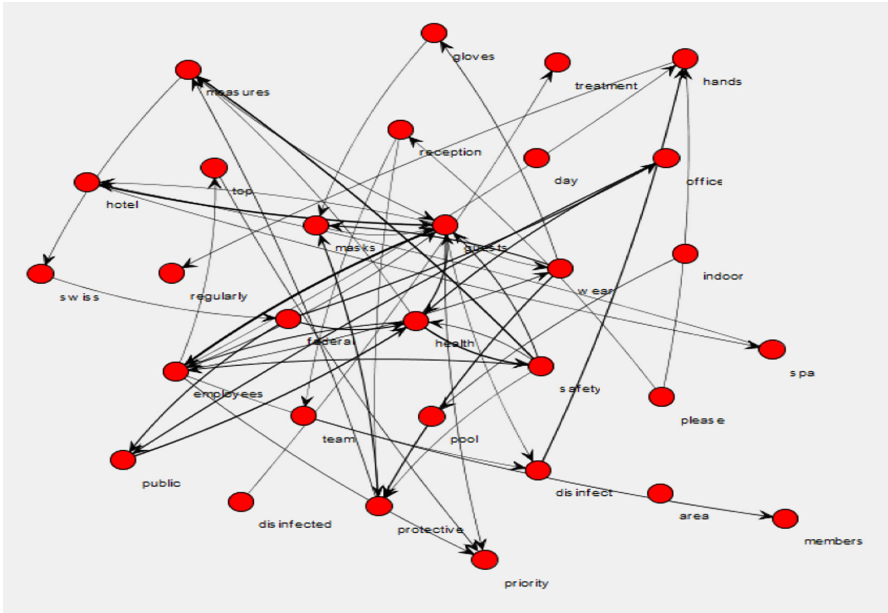
Fig. 2. Wordji image of the messages on the official hotel websites.

4.2   Hotel Facebook Comments and Hashtags

The messages on Facebook were also analyzed both for the individual words used and the word pairings. Figure 3 shows the relationship between unique words (71) found in the Facebook posts. Only three word pairs appeared ten or more times in the analysis: 'forward welcoming' (15 times), 'forward back' (10 times), and 'dear guests' (10 times). As seen in Fig. 3, trio relationships can be seen through words such as 'safe,' 'health,' and 'employees,' 'welcome,' 'back,' and 'soon,' and 'love,' 'Switzerland,' and 'Zurich.' The only words that specifically refer to the Coronavirus pandemic were 'health' and 'safety.' The average pair frequency was 4.450704, and the pair entropy was 4.174661.

Figure 4 shows the results from the hashtags associated with the Facebook comments.

As seen in Fig. 4, the relationships between the words used in the hashtags were also examined. Relationships were established between 'Switzerland' and 'love' and 'stay' and 'home.' Only 'stay' and 'home' could be linked to the current Coronavirus pandemic. Further, just ten unique word pairs appeared less than five times in the hashtags (average pair frequency of 3.2). The pair entropy was calculated as 2.295203. The individual words found in the hashtags resulted in 20 unique words for an average word frequency of 4.15 and entropy of 2.91938.

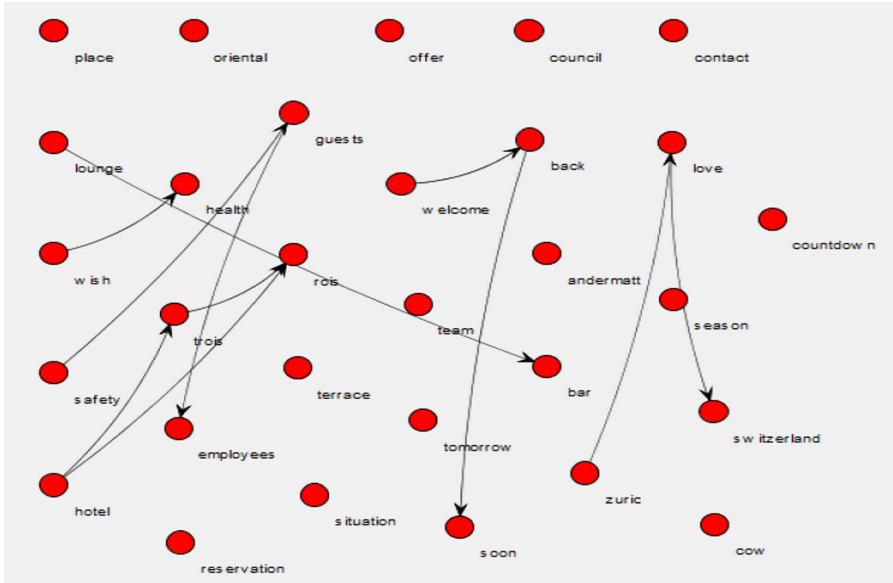**Fig. 3.** Wordji image of the words used in the messages posted on Facebook.
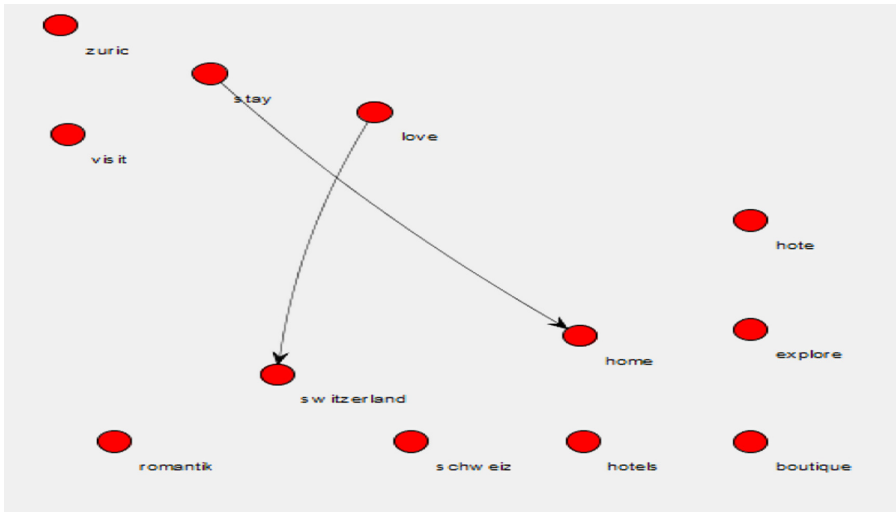

Fig. 4. Wordji image of the words used in the hashtags.

5   Discussion

For the official hotel websites, only 29 out of the 73(39%) 4 and 5-star independent hotels examined in this study published a message regarding Coronavirus measures or corrective actions on their sites. As mentioned in the literature review, this could be explained by the fact that this was not a unique crisis affecting an individual property or region; instead, this crisis affected all hotels and regions equally. There was minimal responsibility attribution allocated to the hotels; thus, their response could be justifiably minimal. However, in this study, the vast majority of the hoteliers seemed to employ the *ignore* strategy of crisis communication, i.e., if we do not talk about it, it will go away on its own. Hoteliers may not have felt the need to remind guests of the pandemic at a time when they were trying to reserve a holiday to escape the last few months of worry. Out of sight, out of mind could have been the strategy employed by these hotels. Further, there was little, if any, use of the *victimage* strategy, i.e., reminding customers that the hotels are victims of this crisis. This could be explained by the fact that the customers are victims in this pandemic; thus, one victim telling another victim that they are a victim could be counter-productive.

RQ1: What are Swiss 4 and 5-star independent hoteliers communicating on their official websites regarding the Coronavirus?

Compared to social media communication, some hoteliers did communicate information regarding the Covid-19 pandemic. As seen in Fig. 2, the hoteliers who did publish messages that focused on hygiene, safety, health, and protective measures implemented part of Coombs' base response of SCCT, i.e., providing instructing information or giving information about the situation to the stakeholders. The hotels also employed the enhancing strategy or telling guests the 'good' actions they are taking, such as disinfecting areas and wearing masks. While the instructing information aligns with the base response of SCCT, the adjusting information, i.e., that of the caring response, appeared to be missing from these messages. This is not to say that it never appeared in any message; instead, it did not appear often enough to be significantly recognized. At times, the hoteliers referred to external third parties, such as the Swiss government, to justify the measures they were taking. Nonetheless, no hotel over-emphasized the measures taken by the hotel. This could be explained in two ways: 1) hoteliers did not want to increase the risk perception of travel for potential tourists, or 2) hoteliers are reticent to discuss negative situations when promoting the positive side of staying in their hotels.

The messages communicated on social media (Facebook) pages contained much less information regarding the Coronavirus. The focus on the Facebook messages was on welcoming back the clientele after a long period of closure and included words of the services they offer, such as 'bar', 'lounge', and 'terrace'. The hoteliers posted messages that were upbeat and positive as if trying to convince the clientele that the opportunity to return to their properties had finally arrived. These messages did not inform the guests that the experience could potentially be different from previous stays; instead, the messages focused on getting the clients back. This could be interpreted as an application of the reminder strategy, i.e., reminding the clientele of the great experience they had the last time they stayed in the hotel. The hashtags echoed this

same spirit. Even the hashtag 'stay home' could be interpreted as staying in the home country, this case, Switzerland, i.e., targeting local customers who will choose domestic destinations this year instead of traveling abroad.

RQ2: Are Swiss 4 and 5-star independent hoteliers using social media to communicate about the Coronavirus crisis?

The response to this question confirms previous results on how hotels effectively or ineffectively use social media at any time, crisis, or not. To summarize, there is a lack of interactive dialogue between Swiss hoteliers and their guests via social media. The results from this study demonstrate that hoteliers were not using social media, at least not Facebook, to communicate their actions in regards to the Coronavirus pandemic. Although the literature suggested that international travelers are the most likely to use social media to gather information in times of crisis and most hotel guests in Switzerland are international, this study showed that hoteliers in Switzerland did not provide this information through the social media channels. Hoteliers may have missed an opportunity to show compassion or empathy that is so important during any crisis, regardless of attribution level.

6   Conclusion/Implications

Coombs' SCCT outlines the importance of preparing strategic messages that align with the crisis a company faces by establishing the level of attribution, the past crises a company has faced (i.e., a history of crises), and the reputation a particular company has in dealing with crises. Based on the SCCT theory, crisis communication teams can brainstorm potential crises for their industry and proactively prepare crisis communication templates for each type of potential crisis. Before Covid-19, the hospitality industry has endured other global health crises such as severe acute respiratory syndrome (SARS) and the Middle East Respiratory Syndrome (MERS), as well as terrorist attacks, hurricanes, and tsunamis. However, these crises affected one property, one region, one industry, or one country. A pandemic such as the Coronavirus that affected the entire hospitality industry worldwide has yet to be seen in this century.

Unlike previous crises, this pandemic has made it impossible to claim the 'victim' status. As seen in this study, hotels cannot play the victim card because their competitors are equally victims. While taking precautions and communicating them to the clients, some hotels may be protecting themselves against the worst-case scenario, i.e., an outbreak in their hotel that affects their clients and employees. In the case of an outbreak, the 'silent' hotels may be attributed responsibility as the 'victim' crisis would be perceived as a 'preventable' one. Hoteliers need to make strategic decisions on how many corrective actions are put in place and how they will communicate these actions to the stakeholders. Without such, hotels are putting themselves and their reputations at risk for the future.

From March to June, the number of new cases of Covid-19 dropped to approximately a dozen; the number of hospital cases and deaths have declined as well. Unfortunately, by mid-June, the number of new cases began to rise again. On August 12, the announcement that events with more than 1000 people would again be permitted on October 1, a new spike in cases has reversed this decision. On October 18,

the Swiss government announced a new set of measures beyond social distancing and hygiene rules, such as mandatory mask-wearing in all public places, including train stations, airports, shops, and restaurants [16].

Since the completion of the initial phase of this study on domestic tourism, Swiss tourism has survived the summer season. In an article published by swissinfo.ch on October 21, 2020, the authors summarized what has happened since June. According to the Federal Statistical Office, domestic guests helped fill the void of international guests for Swiss hotels, which fell by 60.3%. Compared to August 2019, Swiss hotels in 2020 welcomed more domestic guests (approximately 1/6 more than the previous year). Nonetheless, by mid-August, the Swiss hotel industry slowed down, with hotel occupancy declining by 28.1% compared to 2019. Overall, the Swiss hotel industry witnessed a 40.9% decline in overnight stays in the first eight months of 2020, mainly by international travelers (down by 61.7%) [16]. At the moment, with the new spikes in and the second wave of Covid-19 cases, the future looks bleak for Swiss tourism and, particularly, Swiss hotels. Unless Swiss hoteliers can convince their customers to return to their hotels, Mr. Zullig's predictions, i.e., the closing of 5% of Swiss hotels, may become a reality.

7　Limitations/Future Studies

This study had several limitations. Firstly, the hotels were limited to 4 and 5-star properties that are independent and had Facebook pages. Future studies could evaluate all categories of hotels in Switzerland to gauge how other categories communicated their pandemic measures to their customers. Secondly, the language used for analysis was English. Although justified by the international clientele that most frequents these establishments, further studies could analyze the other languages and their messages. Thirdly, the study was limited to Swiss hotels. Comparative studies against other countries could be preferable to identify best practices in communicating about a crisis on an industry level. Fourthly, the analysis of this study's message was one-sided, deriving only from the hotels' official websites and Facebook pages. A further study should investigate the dialogue between the hotels and the stakeholders. Other social media channels such as Twitter or Instagram could be analyzed as well. Finally, this study did not investigate messages they may have been communicated within the hotels upon arrival. Hoteliers may have had posters or brochures at the reception, in the rooms, or in the public spaces outlining the hygiene and safety measures guests were expected to follow.

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Virtual Reality as a Travel Substitution Tool During COVID-19

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Abstract. The pandemic outbreak of COVID-19 in 2020 has profoundly affected the global leisure and tourism industry, with international travel bans affecting over 90% of the world's population. Widespread restrictions on community mobility have resulted in a projected decline of international tourism arrivals up to 30%. The rapid development of Virtual Reality (VR) and its effectiveness in the simulation of real-life experiences provides an opportunity for virtual holiday making especially when actual travel is not possible. Based on a quantitative study with 193 participants, the role of VR as a substitute for physical travel during the pandemic outbreak of COVID-19 was examined, more specifically by looking at the relationship between perceived risk to travel and technological acceptance of VR. The findings suggest that tourists use VR as a travel substitute during and even after a pandemic. However, perceived risk does not play a significant role when it comes to using VR.

Keywords: Risk perception · Virtual travel · Health crisis · Virtual reality · COVID-19 · Technology acceptance model

1 Introduction

The tourism industry has experienced many crises and disasters over the past decade, ranging from terrorist attacks to infectious diseases [1]. An unknown virus, most likely originating from the Chinese city Wuhan and subsequently named COVID-19, was discovered in December 2019 [2]. At the beginning of July 2020, there were 19,381,455 confirmed cases worldwide and 721,409 deaths according to the John Hopkins COVID-19 Resource Center with over 274.000 new COVID cases confirmed every day [3, 4]. Similar to SARS that developed in 2003, COVID-19 is an airborne transmitted illness that is highly contagious [5]. This resulted in major disruptions on the stock market, with many companies going through upheavals and over 35 million jobs at risk, expected to increase to 100 million by the end of 2020. Due to the nature of traveling that facilitates the spread of the pandemic, the World Health Organization

(WHO) and national governments imposed the closure of borders resulting in a disruption of tourism activities worldwide [6, 7].

However, the wish to travel and escape from everyday life still prevails, with novel possibilities offered by information and communication technologies (ICTs). Immersive technologies such as Virtual Reality (VR) enable users to travel virtually using computer generated images or videos, simulating real-life experiences and offering a travel alternative [8, 9]. However, there is a paucity of research dealing with the question of whether VR is capable of replacing physical travel [8, 10, 11].

Therefore, the goal of this paper is to investigate the ability of VR to replace physical travel in times when travel possibilities are limited due to travel restrictions caused by the COVID-19 pandemic using structured equation modeling (SEM), building upon the theory of the technology acceptance model by including additional variables such as presence, perceived risk and perceived severity.

2   Literature Review

2.1   Perceived Risk

The perceived risk to travel in times of crises is one of the most important factors in the decision-making process to travel in general as well as to choose a specific destination [12, 13]. A decision is considered a risk, when the consequences connected to the decision are negative, undesirable or uncertain compared to other options [14].

The risk of the tourism industry is that services or products cannot meet the expectations of tourists or that negative experiences happen on-site. Previous studies have revealed, that risk perception is multidimensional and heavily depend on peoples' characteristics [14]. Thus, tourists are willing to change their destination choice if they perceive travel as dangerous or unpleasant due to actual or perceived risks [15]. Often, travel plans are made according to constraints such as time, physical distance or budget whereas this study focuses on the health related aspect of risk perception particularly due to COVID-19 [12, 16]. Health problems are frequently reported with infectious diseases being the most common [1].

As consumer anxiety and uncertainty is becoming a big challenge for tour operators, alternative forms of travel must be adopted. Virtual Reality is gaining momentum in this context, as it enables travelers to visit the remotest areas in the world from their living room, leaving huge potential to use it as a travel substitute [17, 18].

2.2   Virtual Reality (VR)

VR is defined as an immersive technology that uses realistic computer-generated 3D virtual environments (VE) in which users can navigate and interact with objects, resulting in a strong sense of a three-dimensional perception [8]. The technology allows the incorporation of the participant as a part of the environment where users receive multi-sensory information – such as auditory, visual or kinaesthetic – that enable realistic responses from the environment that the user is embedded in [19, 20]. This induced mental state, in which the user feels completely physically present in the VE is

called 'presence' [21]. While presence is a term related to the subjective feeling of the individual, immersion is the objective degree to which the user is isolated from the real world. Immersion depends on the degree of which a VR system is capable of providing natural sensorimotor for perception such as the resolution, frame rate, latency or the device itself [22].

2.3   Applications of VR in Tourism

The proliferation of VR has transformed different industries such as healthcare, recruitment, training, and education [23]. Through its capacity of creating and manipulating three-dimensional spaces, the travel and tourism industry has found VR useful as a collaborative and commercial tool for travelers as well as tourism providers to communicate [24].

The most common use of VR in the tourism sector is to enhance tourism experiences for tourism sites and attractions. Already in 1962, theme parks started to establish multisensory experiences such as simulated rides in 3D [8]. In addition, VR has enjoyed a surge in popularity especially when it comes to educational purposes during a trip. Using VR leverages the user's spatial perception abilities and the feeling of presence assists the learning process [8]. HMD are frequently used in museums or exhibitions to convey additional information or make objects interactive such as the example of Virtual Stonehenge [8].

Another benefit of VR is the increased accessibility of tourist destinations. Accessibility describes access to specific touristic sites that are hard to enter due to remoteness, costs, undeveloped conditions or physical limitations of the tourists themselves. The opportunity to investigate virtual re-creations of destroyed sites equates to increased accessibility [8].

VR has been proposed to be used as a substitute for travel and certain products of the tourism industry which brings several benefits [25]. In this study, the terminology substitute is used in the context of replacing the visit to a destination which brings several advantages [10]. Destinations can be chosen freely, VR is effective in reducing emissions while traveling and locations can be visited that are not accessible [8, 26].

When it comes to VR as a tool for travel substitution, few studies have examined whether VR is capable of replacing the travel to a destination itself. Sussmann [10] tested the feasibility of VR according to whether tourists perceive VR as a complement to actual travel. However, the results suggested that the sample did not perceive VR as a real holiday replacement [10]. Another study conducted by Prideuax in [27] affirmed similar conclusions. The lack of spontaneity, the inability to purchase things as well the lack of relaxation were factors mentioned as to why the prospect of using VR as a substitute for actual travel is limited [8]. However, most of these studies focused on VR in its early stage of development and adoption, which is not comparable to the performance that current HMDs offer [27].

2.4   Technology Acceptance Model (TAM)

This study is predicated upon three concepts: the technology acceptance model (TAM), perceived risk to travel and presence. TAM has been used in immersive technology

research to analyze the acceptance of new ICTs such as mobile gaming, virtual worlds or Augmented Reality in tourism as well as Virtual Reality in tourism marketing [24, 28]. There are several extensions of the model such as the TAM2, UTAUT, IDT or the TPB, adding and removing different components to the initial concept. After reviewing the different models in the context of VR, it became apparent that the original TAM was the most reliable model to predict and explain user acceptance in the special context of being used as a travel substitute during the COVID-19 crisis [28–30]. The theory initially proposed by Davis [31], postulates two axioms of user acceptance which are perceived usefulness (PU) and perceived ease of use (PEU) to explain behavioral intention (BI) [28]. PU refers to the extent "[…] that people believe information technology will help them perform their jobs better." [24]. PEU on the other hand refers to the technology's ease of use, where the benefits are outweighed by the efforts of using the device [24]. PU is affected by PEU in a way that the easier a system is to use, the more useful it is [32]. Based on TAM, the proposed model of this study adds another component and extends the classical approach by including the perceived risk (RISK) and presence (PR) of VR.

3 Hypothesis Development

Studies have been conducted to analyze the relationship between PEU and PU, showing that both constructs are related to the BI and the consumer acceptance of ICTs [28, 33]. This means that BI is jointly determined by both the PEU as well as the PU. The relationship implies, that everything being equal, people create intentions to perform a specific behavior that they have a positive affinity to [31]. Therefore, these two variables determine the framework for this study and from this, the following two hypotheses can be formulated:

H1. *Perceived ease of use (PEU) has an effect on behavioral intention (BI)*

H2. *Perceived use (PU) has an effect on the behavioral intention (BI)*

High usability does not only influence the behavioral intention to use VR but also the perception of its usefulness [34]. Several studies have already successfully confirmed the relationship between PU and PEU and in the present context, it is therefore assumed that a person perceives a VR device as more useful if the operating difficulty is low [30, 35].

H3. *Perceived ease of use has an effect on perceived usefulness*

Perceived risk affects the situation where the probabilities of the outcome are uncertain. As most of the studies used perceived risk as an antecedent of PU, it is expected that RISK directly affects PU and that they are therefore related whereas they are independent of one another [36, 37]. This means, if the potential reward outweighs the potential risk, it can be expected that the system tends to be adopted [38]. As mentioned aforehand, the perceived risk to travel is considered from the perspective of the traveler, in the context of traveling during COVID-19 and its travel behavior. Perceived severity on the other hand measures the extent of individual concern about negative consequences when catching the disease [15, 39]. To include two dimensions of risk, the effect of perceived severity on perceived usefulness was tested separately [40].

H4. Perceived risk has an effect on perceived usefulness

H5. Perceived severity has an effect on perceived usefulness

Although there exists a large body of literature discussing virtual reality and virtual environments, the classical approach of the technology acceptance model is not readily applicable to interactive technology. It can have a significant influence on the flow effect during the exposure and therefore change the outcome and the way how the technology is perceived [41, 42]. This study therefore includes the presence as an extension to the TAM model [43, 44].

H6. Presence has an effect on perceived usefulness

4   Methodology

The study was based on a quantitative research design with a self-administered questionnaire, consisting of nine sections. Measurement items were previously validated and structured into four different parts. The first part focuses on demographic attributes, the second part on the perceived risk and perceived severity, the third part focuses on presence while the last section focuses on the TAM. The study employed 44 items for the four different constructs. The items used in the study were then contextualized based on prior research with necessary wording and validation changes. The questionnaire was validated and pre-tested to ensure its validity and reliability.

4.1   Data Analysis

An online survey was used and distributed in several social media groups related to VR in a bid to address people who own a HMD themselves. It was an essential part of this study to recruit people who already experienced VR-content on their own devices, meeting the requirement to receive tourism VR content to exclude any novelty effects. After administering the survey from March 14 to May 12 in 2020, 193 valid respondents participated in this study. Participants were instructed to watch a static, non-interactive 360-degree video of several iconic places in the world such as Amsterdam, Dubrovnik, a beach in Mexico or Cadiz in Spain. After the exposure, the participants were directly led to the questionnaire. The recruitment of the sample was performed in several social media groups such as Facebook, Discord, Reddit or Instagram. The participants profile consisted of 69% male respondents, aged 29 years on average with over 50% being between 25 and 55. The largest country of origin was Austria (9.8%), followed by Germany (8.8) and America (7.8%).

The data analysis of this paper was executed using SPSS 20. The reliability of the constructs was measured by analyzing indicator reliability as well as composite reliability [45]. The validity of the model was assessed by using convergent validity and discriminant validity. The SEM requires the data to be multivariate normal distributed, therefore the bias as well as the kurtosis was validated. In order to test the validity of the model, several fit indices were identified and analyzed [45]. Finally, to negate bad fit indices, several post hoc modifications were made by deleting insignificant paths and adding several covariances [46].

In the second stage, the model fit indices for the proposed SEM were evaluated, followed by the testing of the hypothesis using Analysis of Moment Structure (AMOS 25). For the primary criteria to evaluate the model, R^2 was chosen to report variance.

5   Results

An indicator reliability analysis was conducted to evaluate the consistency and stability for each of the proposed latent constructs. Based on their corrected item-to-total correlation and their improved alpha values, several items were deleted to justify the model [47]. All items below the value .30 were deleted.

The five items of the latent variable perceived risk showed a Cronbach Alpha coefficient of $\alpha = 0.43$ with an increase to $\alpha = 0.74$ by excluding the variable "I would feel very comfortable traveling right now" (M = 3.85, SD = 0.99). Perceived severity had a measured Cronbach Alpha coefficient of 0.71. Even though all the four items had a high coefficient, the removal of one variable resulted in an increased Cronbach Alpha of 0.81 (M = 2.20, SD = 1.05). The nine items of the construct Presence had the highest Cronbach Alpha coefficient of 0.9 with no increase if any of the items were deleted (M = 3,42, SD = 0,99). Looking at the TAM-constructs, the perceived usefulness was reported to have a coefficient of 0.67. With the removal of the variable "The satisfaction provided by VR makes me want to travel again" the value increased to 0.72 and therefore being suitable (M = 3, SD = 1,20). Perceived ease of use had a Cronbach Alpha value of 0.83 by removing one variable (M = 4,12, SD = 0,84). Finally, behavioral intention had a coefficient of 0.85 with no improvements by removing an item. With the proper adjustments, all coefficients exceed the recommendation of 0.7 [48]. The coefficient for all variables reached a value of 0.85 (M = 3,70, SD = 1,14).

After testing the indicator reliability, confirmatory factor analysis was performed in order to confirm the factor loadings of the six constructs (perceived risk, perceived severity, presence, perceived ease of use, perceived usefulness and behavioral intention) as well as the model fit [49]. Extraction method used in the study was the Maximum Likelihood method and the Promax method was chosen for rotation. The Kaiser-Meyer-Olkin measure of sampling adequacy was .85 and therefore above the recommended value of 60. The Bartlett's test of sphericity was highly significant (χ^2 (378) = 2836.48, $p < 0.00$).

In addition, the construct reliability estimates ranged from 0.72 to 0.90, which exceeds the recommended value of 0.7, indicating a satisfactory estimation, seen in Table 1. The AVE of all constructs ranged between 0.47 and 0.61 with two of the constructs between 0.47 and 0.49. According to Fornell and Larcker [50], the AVE may fall short as "On the basis of p_n (composite reliability) alone, the researcher may conclude that the convergent validity of the construct is adequate, even though more than 50% of the variance is due to error" [50].

Table 1. Convergent validity

Constructs	Construct reliability α	AVE
Perceived risk	0.79	0.49
Perceived severity	0.82	0.61
Presence	0.90	0.50
Perceived usefulness	0.72	0.47
Perceived ease of use	0.76	0.53
Behavioral intention	0.81	0.52

The SEM was estimated by using a maximum likelihood estimation method as well as a correlation matrix as input data. All fit indices are shown in Table 2.

The model shows an overall significant fit (χ^2 = 332.474, df = 274, p < 0.00). As χ^2 is sensitive to a large sample size, it frequently rejects well-fitted models with an increase in the sample size as it is the case in this study [49, 51]. Therefore, the normed χ^2 (i.e. χ^2/df) is used to examine the model fit, showing an acceptable fit with χ^2 = 1.26 [51]. To increase the indices, two items were removed due to their factor loadings being below 0.4. The other goodness of fit indices are GFI = 0.89, AGFI = 0.85, CFI = 0.97, RMSEA = 0.03, and TLI = 0.97. Comparing the values to their critical corresponding values, the hypothesized model can be assessed as fitting.

Table 2. Goodness of fit

Index	Criteria	Indicators
χ^2	p > 0.05	332.474 (p < 0.00)
χ^2/df	<5	1.21
Fit indices		
GFI	>0.90	0.89
AGFI	>0.90	0.85
CFI	>0.95	0.97
RMSEA	<0.08	0.03
TLI	<0.90	0.97

Table 3 provides details about the results of the hypotheses tests. Out of six proposed hypotheses, four were supported. PEU has a positive and highly significant effect on PU (β = 0.57, t = 4.25, p < 0.001) but not on BI (β = 0.23, t = 1.62, p < 0.10), therefore supporting H3 and rejecting H1. Perceived usefulness had a positive and highly significant effect on behavioral intention (β = 0.83, t = 5.90, p < 0.001) and thus supporting the second hypothesis H2. Presence has a medium strong but highly significant positive effect on perceived usefulness (β = 0.33, t = 4.30, p < 0.001), supporting H6. Perceived risk has no significant effect on PU (β = -0.00, t = -0.61, p < 0.90) whereas perceived severity loads highly significant on perceived usefulness (β = 0.26, t = 3.41, p < 0.001) therefore rejecting H4 but accepting H5.

Table 3. Hypotheses testing

Path	Coefficient of determination	S.E.	Result
H1: PEU → BI	0.23	0.14	Reject
H2: PU → BI	1.28	0.21	Support
H3: PEU → PU	0.57	0.13	Support
H4: RISK → PU	−0.00	0.04	Reject
H5: SEV → PU	0.26	0.07	Support
H6: PR → PU	0.33	0.07	Support

6 Discussion

The aim of this study was to investigate the potential of VR to replace real travel when physical travel is restricted due to external circumstances, as in the specific case of this study the pandemic outbreak of COVID-19. Another contribution of the study was to validate the use of TAM in the tourism context as a framework to understand the use of VR [24]. The unique addition to the theory was the consideration of the perceived risk to travel and its potential to affect the PU of participants, as neither TAM nor TPB have provided explanations about behavioral predictions [52]. Thus, this research provides new perspective for researchers by identifying several factors that influence the intention to use VR as a substitute for physical travel during COVID-19.

The results suggested that the measured constructs have an adequate reliability and validity. Out of the six proposed hypotheses, four were confirmed as summarized in Table 3. Results revealed that perceived usefulness has a strong direct effect on behavioral intention, indicating the intention of tourists to use VR to travel virtually during and even after a crisis such as the pandemic outbreak of COVID-19. This result contrasts prior findings reported by Sussmann and Vanhegan [10] indicating that tourists will not replace real traveling by using VR. However, the aforementioned study was not conducted based on a situational crisis such as a global pandemic outbreak.

The finding that perceived risk has no significant effect on participants' perceived usefulness of VR during a crisis can potentially be explained by other factors that were not considered in this study such as hedonic travel motives, positive emotions or the state of flow [24, 53]. VR can convey a sense of escapism to the user, allowing one to travel virtually, dissolving the link between an infectious disease and travelling [54].

Looking at the relation between perceived severity and perceived usefulness, the hypothesis was confirmed showing a significant effect, implying that personal risks are more meaningful than natural ones or risks associated with destinations when making a decision to use VR as a substitute to travel [40, 55]. Furthermore, presence significantly influenced perceived usefulness suggesting that the higher the degree of spatial presence, the higher the perceived use of VR to substitute physical travel. This indicates that it is imperative to use a sophisticated headset and to negate any distractions [25].

The relatively high value of PEU can explain user acceptance of VR systems and its significant effect on PU. Thus, the easier a system is to use, the more likely it is that people use it to travel virtually. The testing of the first hypothesis is also according to

their findings, as evidence for a significant effect of PEU on BI was not provided [28]. A reason could be the rather experienced sample size, as all participants owned a personal VR headset, resulting in the general high mean. Besides hypothesis testing, it became apparent that the general urge to travel increased after the exposure as the variable 'The satisfaction provided by VR makes me want to travel again' showed a generally high mean.

7   Limitations and Suggestions for Further Research

The study has several limitations that can be addressed in further and future research. Firstly, the study was conducted with a relatively homogenous sample size as all participants have had previous experience with VR headsets before, which limits the generalizability. Future studies can further validate the findings of this study in a different field with participants who have never used VR before. As perceived risk was found to have no significant effect on perceived usefulness, future research should try to discover other factors such as hedonic travel motivation that might explain the allure of using VR to travel virtually. Furthermore, other sensory modalities apart from auditive/auditory and visual feedback can stimulate the imagination. Subsequent studies can therefore include other sensory information and utilize an environment with a higher degree of interactivity, thereby integrating the effect of immersion on perceived usefulness. Finally, another direction that future researchers can undertake is to further investigate the dynamics of social interaction in a VR experience that is being used in a tourism context.

8   Conclusion

This study examines the ability of VR to substitute real travel during the COVID19 pandemic. By using TAM with additional variables, namely perceived risk, perceived severity and presence, this study identified the role that VR plays as a substitute to real travel in times when travel is restricted due to external and environmental circumstances. Results suggested that perceived usefulness positively influences the behavioral intention. Perceived usefulness on the other hand is positively affected by presence, perceived severity and perceived ease of use. The most important finding of this study is the significant relationship between perceived usefulness and behavioral intention, suggesting that there is an intention to use VR to travel during and even after the COVID-19 pandemic. Additionally, findings suggested that there is no significant correlation between perceived risk and perceived usefulness, indicating that other unobserved influential factors need to be examined. In this study, it appears that the perceived risk to travel is not impactful compared to the individually perceived severity, such as the fear of contracting the disease. Nevertheless, in order to experience real tourism with the help of VR, it is necessary to provide targeted stimuli to other sensory modalities besides auditive/auditory and visual exposure. The aspect of interaction is also crucial for a positive travel experience, a theme that future researchers might wish to pursue.

The findings of this study demonstrate the potential of VR to be used as a virtual imagery tool to induce travel experiences and potentially substitute travel. Political or environmental instabilities may force customers to make new decisions and adapt their traveling style to the circumstances by using VR for instance [10]. In order to enhance its power, it is imperative to add economic value to it. It is up to marketeers to recognize and use the possibility to create virtual reality content and provide a realistic preview of the destination which eventually translates into a purchase intention. A challenge is to plan activities that take advantage of the technology, even though its used to substitute travel while maintaining the attractiveness of actual traveling and encouraging wanderlust [56].

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Covid-19 and Instagram: Digital Service Innovation in Top Restaurants

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Abstract. Governments across the world have imposed strict rules on social distancing to curb the spread of Covid-19. In particular, restaurants have been impacted by government-mandated lockdowns. This study adopts a mixed methods approach to explore how Finnish high-profile restaurants used Instagram as a means for service innovation and diffusion during nine weeks of government-mandated lockdown. Comparatively analysing 1,119 Instagram posts across two time-stamps (2019 and 2020) and across 45 restaurants, as well as conducting five semi-structured interviews with restaurant managers, it is found that while the overall number of Instagram posts and likes on posts stayed relatively similar to the year prior, the number of comments increased significantly, suggesting a move towards a more didactic and dyadic form of Instagram communication. In addition, four digital service innovation strategies are identified: launching new service offerings and introducing new elements to existing service offerings, fostering social relationship with customers, exploring novel streams of revenue, and reinvigorating the brand's image. Implications to service innovation theory and practice are discussed, along with suggestions for future research.

Keywords: Covid-19 · Instagram · Digital service innovation · Restaurants

1 Introduction

2020 has been a very difficult year for the hospitality industry. The advent of severe acute respiratory syndrome coronavirus 2, more commonly referred to by the illness the virus causes, Covid-19, has forced governments around the world to impose strict restrictions on individual rights, particularly around the freedom of movement [1]. As the virus spreads primarily through human-to-human transmission, experts have concluded that the best way to curb infection rates is to introduce measures for social distancing. Hospitality, an industry which relies heavily on people moving around and interacting with each other, has been hit particularly hard by the pandemic [2]. In many countries, restaurants have been told to close or at the very least reduce the amount of covers served to meet social distancing requirements. In addition to scaling down operations and mass-furloughing staff, some food service operators have taken the

crisis as an opportunity to innovate with new business models and service offerings. Information communications technology, in particular, has been seen as a potential tool for producing and providing socially distant services [3]. While the role of technology in innovation has been widely researched [4,5], previous studies mostly focus on disruptive changes brought by technology-driven (business model) innovation (such as Airbnb), and how incumbent firms are affected by and have responded to these changes [6]. Further, literature contrasts technology-driven vs. Market-driven (technology-push vs. Demand-pull) innovations in terms of their competitive and disruptive effects across the industry [5,7]. Service innovations we are witnessing today from hospitality firms are driven by the drastic change in the business environment (i.e., restrictions on physical operations), hence might not fit the mould of technology-push or demand-pull innovation. Furthermore, these innovations represent emergent strategies rather than planned, often involving a pivot to new business models at speed. This presents conceptual and practical challenges to better understand how technology and digital media play a role in the development of innovation for firms' survival and competitiveness in the hospitality sector.

This study adopts a mixed methods approach to explore digital service innovation in Finland's top 50 restaurants amidst Covid-19. In particular, the study addresses the following research question: How did Finland's top 50 restaurants leverage technology to innovate their service offering and business model amidst government-mandated lockdown measures? Drawing from the literature on service innovation and organisational change, this study provides insight on the agility of largely low-tech, small- and medium sized companies' innovation efforts, and offers important lessons learned as the sector prepares for the 'new normal' post-Covid-19.

2   Service Innovation and Organisational Change

As discussed by Trott (2012) [8] innovation is, at the most basic level, about change. Change can be big or small, and it can take on different forms. For example, Voss and Zomerdijk (2007) [9] argue that service innovation may consider different elements of service: the service environment, the service employee, the service delivery process, fellow customers, or the back-office functions. Snyder et al. (2016) [10] see that service innovation may also involve the transformation of entire service products or service processes, leading to either incremental or radical innovations. Helkkula, Kowalkowski and Tronvoll (2018) [11] characterise service innovations into four archetypes: output-based service innovations, process-based service innovations, experiential service innovations, and systemic service innovations. Witell et al. (2017) [12] conclude that service innovation is fundamentally about the combining and recombining of an organisation's available resources to improve its practices in novel, unforeseen ways.

Organisations go through change because the environments within which they operate are in constant flux. Dobbs et al. (2015) [13] see that modern companies are forced to change because of four key drivers in particular: urbanisation, technology, an ageing population, and globalisation. Besides these general megatrends of the 21st century, Taleb (2008) [14] argues that sometimes change is due to what he calls a 'black swan' event. These are events that are rare, random, unexpected, and as such,

extremely difficult to predict or plan for [14]. The emergence of Covid-19 could be characterised as a 'black swan' event because of its devastating impact on the global food service sector. Given the rapid pace and gravity with which hospitality operators have had to adapt to the new operating environment, an upsurge in emergent service innovation might be expected.

To conceptualise the roles of technology in innovation, extant research has largely agreed on the definition of technology-driven and market-driven innovations [5]. Technology-driven (technology-push) innovations happen when R&D experimentation precedes market opportunities, thus the potential market and applications are usually unknown [15]. Market-driven (demand-pull) innovations, even when involving technology, often result from radical changes in the value propositions made to existing customers [5]. Regardless of which came first, it is vital to align technology with user needs (demand) for innovations to be successful. Studying technology-driven innovations amongst retailers in the food sector, Esbjerg et al. (2012) [16] found that when implementing new (food) technologies, managers were driven by benefits to customers, confirming the importance of technology–demand alignment. Consequently, when this alignment is a challenge, firms, especially startups, are forced to redefine their competitive advantage and pivot their business model [17]. Garćia-Gutiérrez and Martinez-Borreguero (2016) [18] suggested the innovation pivot framework to guide firms navigating great uncertainty associated with internal and external factors. The framework assists in fostering the creative process of generating promising applications for an innovation by interrogating the links among the innovative technology, the sources of sustainable competitive advantage, and the innovative business model. Covid-19 presents an external challenge to existing firms due to the extreme narrowing of market and reduction in scale that has not been conceptualised fully in the literature on innovation and business model pivot. To address this gap in extant research it is important to examine the interplay between technological innovation and new demand exploration underlying service innovation and business model pivots in the hospitality industry as spurred by the pandemic.

3   Methods

This exploratory study adopted a sequential mixed methods approach, choosing as its sample 50 high-profile restaurants across Finland. "Finland's 50 best restaurants" is an annual compilation of the country's top food service operators [19]. The prestigious ranking is produced in consensus with hundreds of Finnish hospitality professionals, from chefs to sommeliers, and from food critics to researchers. The 50 best restaurants list was deemed an appropriate sample for this study as it includes a wide variety of food service organisations that differ in size, service concept, business model, and geographical location. All restaurants on the list are also independent, i.e. not part of a large chain or a clear central brand. This was assumed to make the organisations particularly agile in implementing change and innovation and thus well-suited for this study.

Data were collected between June-July 2020, using two methods: (1) web scraping and (2) semi-structured interviews. After a comprehensive desk research phase to analyse all available online channels (e.g. website, social media platforms), it was

concluded that the chosen sample of restaurants was most active on one digital channel in particular: Instagram. Put together, the restaurants have over 150,000 followers on the platform, with each individual organisation having thousands of followers and posting content several times per week. Others (c.f. [20]) have also found Instagram a rich source of information for hospitality research.

To understand how the restaurants' business model and service offering changed during government-mandated lockdown measures, the restaurants' Instagram posts were manually scraped across nine weeks pre-lockdown and during the lockdown: 30 March - 31 May 2020 (lockdown, calendar weeks 14–22) and 1 April - 2 June 2019 (normal operation, calendar weeks 14–22). In total, 1,119 posts (including the number of posts, likes, and comments as well as post captions) were scraped for analysis (2020: $n = 554$, 2019: $n = 565$). Number of posts, likes, and comments were compared week-by-week between 2019 and 2020, and the qualitative data found in captions were analysed thematically, identifying recurring patterns of behaviour/themes [21,22]. The analysis moved between deduction and induction [23], and drew from a priori themes established in recent innovation literature [11]. Out of the 50 restaurants, four were not found on Instagram or any other social media platform and thus were excluded from the study. One restaurant was found to have posted nine times the overall average in 2019 and not at all in 2020 and was thus marked as a clear outlier and excluded from the study. The final list of included restaurants ($n = 45$) along with their follower counts is shown in Table 1.

Table 1. Restaurants included in the study.

No	Handle	Followers
1	@palacehelsinki	4700
2	@basbasofficial	7500
3	@inarihki	5000
4	@restaurantolo	6300
5	@restaurantgron	13300
6	@ravintolavinkkeli	1700
7	@savoyhelsinki	3300
8	@ravintolakaskis	5200
9	@orarestaurantfin	3100
10	@restaurant_demo	2700
11	@ravintolac	1500
12	@restaurantkuurna	2200
13	@alexanderplatshelsinki	1900
14	@restaurant_tapio	5100
15	@ravintolamuru	5200
16	@ravintolamami	1400
17	@restaurantultima	4400
18	@finnjavel_finnishhautecuisine	7100
19	@restaurantnolla	9300
20	@kalliowino	3100

(*continued*)

Table 1. (*continued*)

No	Handle	Followers
21	@bistro_omat	1200
22	@ostroferia	1900
23	@ravintelihuber	1500
24	@ravintelibertha	1900
25	@ravintolanokka	5800
26	@ravintolakakolanruusu	2900
27	@sicapelle_restaurant	1400
28	@gastrocafekallio	1400
29	@kajoravintola	2000
30	@kultakitchen	700
31	@pastisravintola	2600
32	@hellostrangerhki	1700
33	@yesyesyeshelsinki	4900
34	@farang_helsinki	3400
35	@ravintolaragu	2600
36	@ravintolapenelope	2900
37	@localbistro_jns	1400
38	@restaurantnude	2000
39	@maannos	1700
40	@restaurantspis	1400
41	@restaurant_gaijin	2400
42	@restaurantplein	2100
43	@ravintolasmor	1500
44	@ravintolaludu	1400
45	@oldboybbq	1700

To shed further light on the studied restaurants' innovation strategies during the lockdown, theoretical sampling was conducted, whereby 20 of the most innovative restaurants were contacted to arrange a formal interview. In the end, representatives from five restaurants (three restaurant managers and two executive chefs/owners) took part in a semi-structured interview. The interviews lasted for 35 min on average and were conducted via phone and a video conferencing application. Questions focused on themes identified when analysing scraped posts, and dug deeper into the impacts of Covid-19 at a particular venue throughout the lockdown period. In particular, the researchers were interested in better understanding the challenges and successes of implementing innovation. The interviews were recorded, automatically transcribed, and as before analysed drawing on a priori themes established in recent service innovation literature [11]. Figure 1 provides a summary of the data collection and analysis procedures adopted herewith.
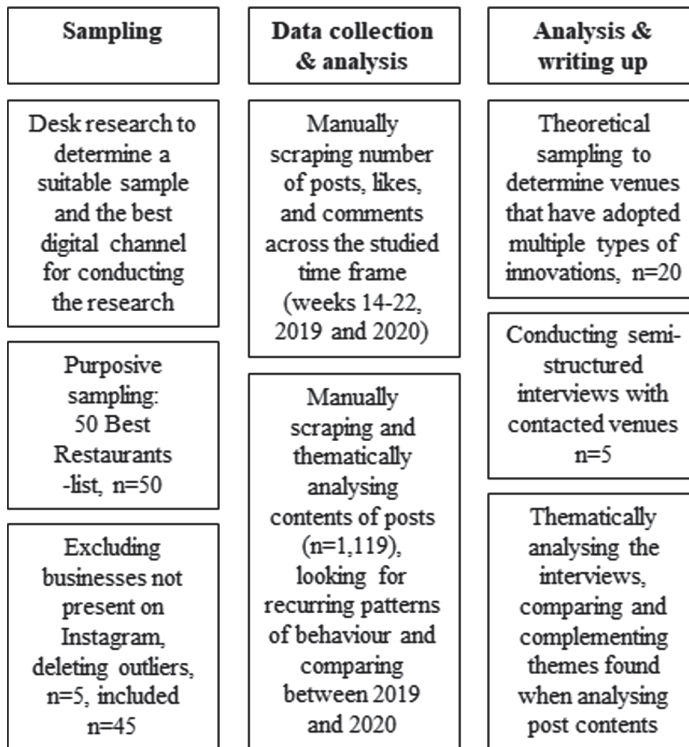
Sampling	Data collection & analysis	Analysis & writing up
Desk research to determine a suitable sample and the best digital channel for conducting the research	Manually scraping number of posts, likes, and comments across the studied time frame (weeks 14-22, 2019 and 2020)	Theoretical sampling to determine venues that have adopted multiple types of innovations, n=20
Purposive sampling: 50 Best Restaurants -list, n=50	Manually scraping and thematically analysing contents of posts (n=1,119), looking for recurring patterns of behaviour and comparing between 2019 and 2020	Conducting semi-structured interviews with contacted venues n=5
Excluding businesses not present on Instagram, deleting outliers, n=5, included n=45		Thematically analysing the interviews, comparing and complementing themes found when analysing post contents

Fig. 1. Data collection and analysis procedure.

4 Findings and Discussion

As illustrated in Figs. 2 and 3, restaurants' general post frequency and the overall number of likes per post did not significantly change between the lockdown and the year prior, although some variance was observed (i.e., some individual restaurants posted more during lockdown, while others posted less). However, the thematic content analysis highlighted a clear shift in the way in which Instagram was used as a customer-facing communication channel. While in 2019 posts were mainly promotional in nature, in 2020 posts were more dyadic, didactive, and often centred around the launch of a new service process or offering. As illustrated by one interview participant: *"Instagram quickly became our primary means of staying in touch with our guests. We would post about anything and everything, stuff we wouldn't normally […] wouldn't normally post"*.

The shift in Instagram usage is well illustrated by the peaks of post frequency, whereby in 2019 posts peaked during Finnish public holidays that fall within the studied time period (Easter on week 15/16, Labour Day on week 18, and Mother's Day on week 19), while in 2020 post frequency was more constant with only slight peaks at the beginning and the end of the lockdown. The week-by-week number of comments per post provided further support for this, whereby a stark increase (32%) in comments

was observed between 2019 and 2020 (Fig. 4). Posts towards the end of the lockdown (weeks 21–22) were commented particularly often, indicating a focus on re-establishing customer relationships and building trust.
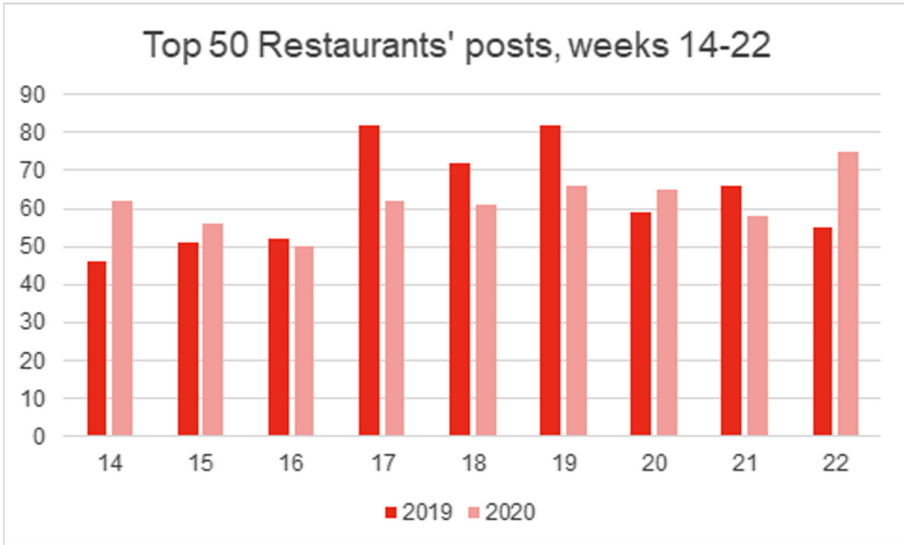

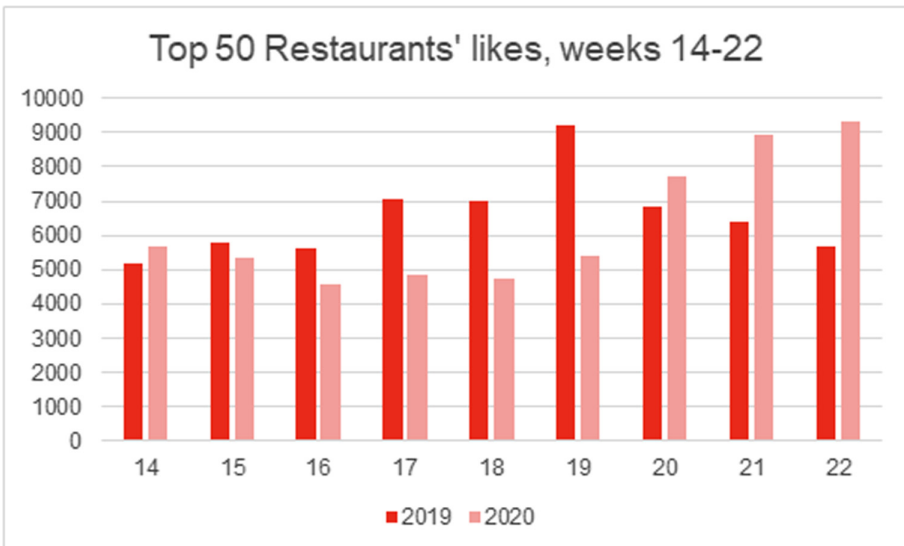**Fig. 2.** Total posts across the studied period (2019: $n = 565$, 2020: $n = 554$).

Fig. 3. Total likes across the studied time period (2019: $n = 58,829$, 2020: $n = 56,537$).
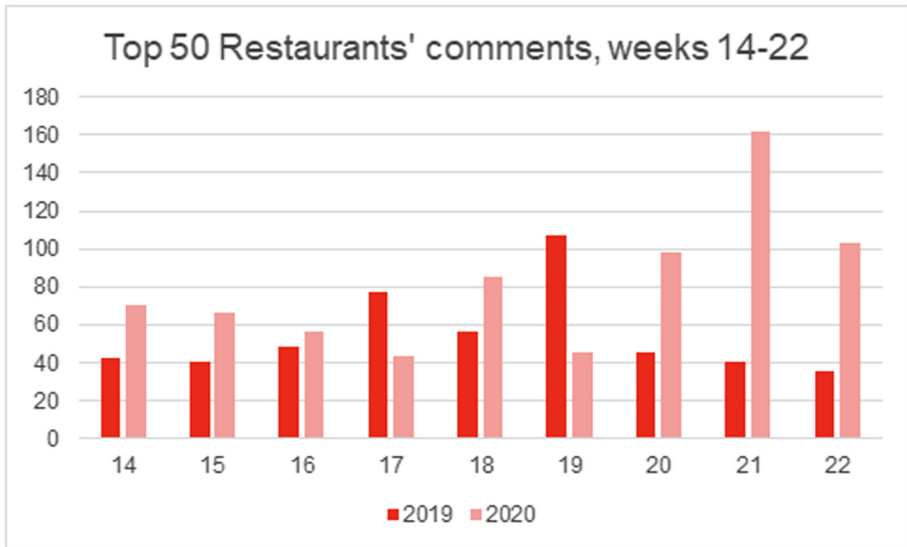
Fig. 4. Total comments across the studied time period (2019: $n = 497$, 2020: $n = 731$).

Further noting the significance of Instagram as a two-way communication channel, one restaurant manager commented: *"Our Insta really blew up during the lockdown, we gained so many new followers, most organically. When the lockdown hit we basically lost all our reservations and catering orders overnight. We had no choice but to change our business and be damn quick about it. Insta effectively allowed us to stay in touch with our guests throughout the process."*

In terms of the innovative service processes and offerings launched during lockdown, as observed from the thematic analysis of restaurants' Instagram posts and the five semi-structured interviews with decision-makers, four distinct forms of digital service innovation were found: (1) launching completely new service offerings or introducing new value-adding elements to existing service offerings, (2) experimenting with new ways of fostering social relationships with customers, (3) exploring novel streams of revenue, and (4) focusing on revamping and reinvigorating the brand's visual image or broader servicescape. These forms of service innovation resonate well with Helkkula, Kowalkowski and Tronvoll's (2018) [11] four service innovation archetypes. As will be illustrated, in the first two types of digital service innovation identified herewith, Instagram forms a key part of the innovation itself and is thus used directly as an enabler of innovation, while in the latter two types of innovation Instagram is used primarily as a means of promoting the innovation to customers.

4.1 Innovation Archetype 1 and 2: Output- and Process-Based Service Innovations

In terms of new service offerings, several high-end restaurants transformed their traditional tasting menus into a delivery-friendly format, either a ready-to-eat takeaway

offering or a vacuum-packed meal kit. For example, Helsinki-based *Ora* transformed its Michelin-starred kitchen into a 'sushi factory', while *Demo* introduced a luxurious finish-at-home tasting menu complete with video instructions, wine pairings, and a specially curated Spotify-playlist to create the'right' ambiance. Besides new offerings, restaurants also explored ways of bringing added value to the stay-at-home experience. Helsinki-based *Savoy* used the lockdown to educate their Instagram followers about the history of the restaurant, while Turku-based *C* took the opportunity to highlight the importance of working with local suppliers at a time when global supply chains are being disrupted. One of the most creative approaches came from *Finnjävel*, which decided to offer its customers a complimentary two-week access to an online course promoting and providing tools for taking care of mental health amidst the pandemic. In these cases, digital platforms (chiefly Instagram) play a role as enabler of innovation, allowing these restaurants to pivot their business model and generate new service offerings (e.g. reservation app for takeaway and delivery). Further, the availability of technology (e.g. a combination of Instagram videos and Spotify playlist) also allows businesses to afford implementation of emergent strategies to react quickly to the drastic change in the business environment. In other words, technology allows firms to quickly redefine their competitive advantage by exploring alternative use of their resources (i.e., capabilities, assets, knowledge) or pivoting the ways they reach customers and, consequently, operate.

4.2   Innovation Archetype 3: Experiential Service Innovations

As highlighted by the shift to a more dyadic use of Instagram, restaurants fostered social connection through, for example, holding regular raffles or competitions. For example, Porvoo-based *Sicapelle* invited its followers to share pictures of their take-away picnic setups, whereas in Turku Restaurant *Mami* held frequent raffles in collaboration with a local leafy green producer. In terms of more direct outreach, *Sikke*'s organised virtual champagne tasting events, while *Penélope* introduced virtual, home cooking-centred Instagram Live sessions and IGTV videos hosted by executive chef Hans Välimäki. Similar to the previous type of innovations, Instagram (and similar consumer-facing platforms) is used as a channel to enable the implementation of innovations as firms' emergent strategies. Again, it signifies the role of technology as enabler of firms' dynamic capability to stay highly flexible in the business world.

4.3   Innovation Archetype 4: Systemic Service Innovations

Hospitality is a business with notoriously thin margins, and making ends meet even with new service offerings and innovative ways of staying in touch with customers is difficult. For this reason, the majority of the top 50 restaurants also experimented with additional revenue streams. From gift certificates to wholesale of branded products such as spice mix, beer, or hoodies, restaurateurs explored creative approaches to stay afloat. Several restaurants started a collaboration with a local supermarket to offer a branded ready-to-eat offering, while some turned to crowdfunding. Operators with multiple venues tended to focus their assets on one. Even though across the board many organisations were forced to furlough and lay off staff to cut costs, some came up with

creative ways of utilising new-found time and manpower. Joensuu-based *Local Bistro* turned to volunteering and provided free meals for frontline healthcare staff, while in Helsinki Ultima took the opportunity to renovate premises and redesign customer journeys to facilitate a more low-touch post-lockdown service experience. As noted by one restaurant manager: *"The changes we implemented are here to stay. We simply cannot sustain our business at just half capacity once we're allowed to take customers in again. We have no choice but to go with a more resilient hybrid model".* The role of Instagram is less pronounced in these systemic service innovations. In fact, these emergent strategies are born from the lack of economic incentives in the business world, forcing businesses to realign their revenue model and mobilise their value network differently (e.g. supporting social causes) to remain sustainable. Whereas in other types of service innovation Instagram played a key part in enabling the innovation, in the case of systemic service innovations Instagram was used primarily for promotion.

5   Conclusion, Limitations and Further Research

The coronavirus has managed to both devastate and develop the hospitality sector. On one hand, several restaurateurs have been forced to scale down operations, furlough and lay off staff, or even close. On another, the virus has hastened digitalisation efforts across entire industries, with food service operators that remain open having to come up with innovative new offerings and business models. This mixed methods study explored how Finland's top restaurants reacted and adapted to a period of radical, exogenous 'black swan' event, specifically focusing on the roles of technology in these innovations. The innovations found in this study fit the categories specified in the literature [11]: output-based, process-based, experiential, and systemic process innovations. These innovations are the manifestation of emergent or discovery-driven strategies [5] largely enabled by the availability of technology and digital social media platforms. This suggests the vital role of technology in fostering dynamic capability of firms facing a drastic change in the business environment. As the lockdown period drastically reduces the scale of operations and the size of market (due to physical distancing), technology allows firms to explore alternative uses of their resources and identify different ways to secure their market foothold.

Despite offering important theoretical and practical insight on digital service innovation in the face of the unexpected, the study has limitations that need to be considered. First, only high-profile independent restaurants were analysed here. Extending the study to include operators with multiple centrally branded sites would have provided interesting insight into digital service innovation across large, less agile organisations. The study also focused solely on restaurants located in Finland. Replicating the study in other cultural contexts with different norms and conventions on service culture would produce a fuller picture of innovation efforts. Third, the study only focused on Instagram. Even though a set of interviews was conducted to gain a deeper account of the phenomenon studied, conducting content analysis on Instagram is inherently problematic. This is because of the ever-evolving nature of the platform, whereby there is no straightforward way of knowing whether old posts have been

edited or deleted, when a particular post (old or new) has been liked or commented on, or how changes in the follower base (increase or decrease) might impact the overall number of likes or comments on a particular post. A more comprehensive look into different digital platforms used to generate and communicate service innovations in the hospitality sector will shed more light into the role of technology in service innovations.

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The Sustainability of Using Domestic Tourism as a Post-COVID-19 Recovery Strategy in a Distressed Destination

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Abstract. Tourism is a critical contributor to the gross domestic product, especially among developing countries like Zimbabwe. Zimbabwe is a tourist destination that relies more on international travellers, a market which has been affected by the novel coronavirus. The purpose of this study is to establish the perceptions of domestic travellers and tourism managers on the sustainability of using domestic tourism as strategic responses to the impacts of the coronavirus. This study employs a qualitative methodology to examine the perceptions of the demand and supply side regarding the recovery options for Zimbabwean tourism post-pandemic. Online interviews with demand and supply participants were conducted. Data were analysed using thematic analysis, and the results were discussed. Results show that domestic tourism as a recovery option is unstainable due to the challenges that Zimbabwe is facing, beyond the coronavirus.

Keyword: Distressed destination · Coronavirus · Tourism recovery · Domestic tourism · Resilience

1 Introduction

Coronavirus (COVID -19) is a global health pandemic that has triggered an unprecedented crisis in the tourism industry globally [1], making it the most powerful phenomenon of the 21st century [2]. The pandemic saw the growth of the tourism industry revised downwards, and it is estimated that 75 million jobs have been lost following the suspension of international travel by March 2020 [3]. It is further estimated that the industry is likely to lose more than US$2.1 trillion in revenue [3] due to the closure of national borders and lockdowns. Therefore, the impacts of COVID-19 on destinations that overly rely on tourism are devastating.

Though COVID-19 is not yet contained, countries including Southern African countries are easing the lockdown through the opening of national borders to restart international travel. The easing of restrictions has been necessitated by business and political voices that are pushing for the opening of economies as soon as possible [4]. In anticipation of the resumption of travel, destinations developed tourism recovery strategies for an industry that contributes much to the gross domestic product (GDP) of most developing economies. Zimbabwe launched its tourism recovery strategy in

August 2020 intending to promote domestic tourism as a strategic option and means of building destination resilience.

Domestic tourism promotion as a recovery strategy is not new in literature. It has been a default response in several destinations during crises in countries like Kenya, following post-election violence in 2008, and Malaysia during the Asian financial crisis1997/98 [5]. Though extant research has evaluated the vulnerability of destinations following natural disasters [6], research focusing on the promotion of domestic tourism as a destination recovery and resilience building strategy during pandemics in destinations with prolonged political and economic crises like Zimbabwe is limited. Understanding the sustainability of promoting domestic tourism as an alternative following the decline of international tourism demand due to the impacts of COVID-19 is required. Globally, due to COVID-19, the tourism industry is confronted with severe demand and supply challenges. These challenges vary from one country to another. Generally, the aspects of perceived health, social and psychological risks top demand challenges, while the supply side is confronted with challenges including deficits, low occupancies, job losses, company liquidation, and human capital depletion [1, 2, 7]. Based on this, the objective of this study is to examine the sustainability of using domestic tourism as a recovery and resilience building strategy using both demand and supply-side views in a destination with ongoing political and economic challenges.

2   Literature Review

Tourism is a sensitive industry [8], especially to disasters and crises [9]. Due to the growing amount of disasters, literature discussing disasters is also growing [2]. It has been established that natural disasters do not result in permanent effects on tourism compared to the effects of incidents like violence and terrorism [10]. Disasters and crises are terms that are often used interchangeably in the literature, though fundamental differences exist [11–13]. On the one hand, a crisis is a disruptive event or outcome occurring within a system and has the potential to threaten the system's [14]. Following the contested land reform programme, political and economic crises, have been a common occurrence in Zimbabwe [8]. These crises threatened the operations of tourism, resulting in dwindling arrivals and income [8]. On the other hand, a disaster is an event that confronts a system with unpredictable catastrophic changes over which a system has no control [13]. Thus, crises have an internal outlook that makes them more manageable, while disasters are external and less predictable [15].

It is not clear in literature if COVID-19 is a disaster or crisis. Zenker and Kock [2] argue that it is either a disaster or crisis, depending on the lenses one uses to analyse its impacts. While the classification of COVID-19 is contestable, it is beyond the scope of this study. However, its categorisation is critical to better our understanding of the past [2] and improve the formulation of tourism recovery and resilience strategies post-pandemic. Though COVID-19 is new, several of its aspects have been experienced and affected travel and tourism [16, 17]. COVID-19 in this study is treated as a unique disaster based on its scale and impacts on the global economy. COVID-19 is a natural disaster that degenerated into a socio-political, tourism and economic crisis [2].

The impacts of COVID-19 on the tourism industry globally are yet to be fully developed and measured [18]. However, what is clear is that following the closure of borders, the demand for international tourism plummeted [1]. The recovery of global tourism, regardless of the type of the crisis, depends mostly on the scale, type, and size of the crisis [15]. With no vaccine in sight, it appears that the pandemic will be around for a long-time, with some countries already been hit by a second wave. Therefore, the tourism recovery efforts must be formulated based on dealing with an ongoing pandemic. This is being reflected in how countries are opening their economies and national borders. Despite an increased stream of literature investigating disasters and crises in tourism, these studies are limited in terms of scope and depth [6, 19], and the promotion of domestic tourism as a means of recovery and resilience building, is hardly discussed. Furthermore, though the focus of most studies has been post-crisis/disasters, they have not dealt with a pandemic with socio-economic impacts that are so devastating like COVID-19. Thus, the understanding of the role that domestic tourism promotion plays in helping destinations with ongoing crises and negative reputations reduce vulnerability and building resilience is critical.

Debate on what constitutes resilience is ongoing [20], suggesting that it is another elusive term in tourism research. Resilience is an essential construct in disaster and crises management research because it provides destination managers with the means of enhancing capacity to adapt and deal with changes [21, 22]. Though there is a lack of universal measurement, resilience has been approached using three significant perspectives: engineering, ecological and adaptive perspectives [23–25]. Resilience from an engineering perspective measures how rapid a system can return to its normal state. In contrast, the ecological view measures resilience using the system's ability to absorb the impacts of disruption without altering its identity, functions, and structure [25]. Adaptive resilience refers to the systems' ability to experience the impacts of changes without losing the ability to manage its resources. Thus, in a destination context, resilience is concerned with how quick the destination can return to its previous normal conditions following a shock [25], such as COVID-19. Adaptive destinations can adjust to, learn from, and manage changes [26]. Applying adaptive resilience thinking during disasters and crises provides "great utility, namely, the ability to react to external stimuli and modify behaviour accordingly" [27 pp. 4]. COVID-19 presents an opportunity for the promotion of domestic tourism to destinations such as Zimbabwe that relies heavily on international tourism. Whether this strategy could prove to be useful to a destination with ongoing crises [8] remains relatively unknown. Thus, the recognition by destinations of vulnerabilities and being able to plan for eventualities is critical tourism recovery and building a resilient destination. Destinations that can adapt are thus considered more resilient and can recover from disasters and crises quicker [28].

The capacity of a tourist destination to respond to pandemics is framed in stages [4]. Despite knowing that tourism is a victim of crises and disasters [27], the conceptualisation of recovery and resilience building strategies is generally informed from a reactive point. COVID-19 has long-term impacts on both international and domestic tourism. Thus, how destinations with ongoing political and economic crises respond to

the pandemic in shaping long-term tourism recovery and resilience building strategies depends on how well-thought and planned the strategies are. Following the decline in international tourism demand, spearheading tourism recovery and enhancing the resilience of the sector through the growth and promotion of domestic tourism is timely and critical, especially for destinations that overly relies on international visitors.

3 Methodology

The study examines the perceptions of demand and supply participants regarding the promotion of domestic tourism as a post-pandemic recovery and resilience building strategy in Zimbabwe. Zimbabwe is a Southern African tourist destination with several world-class attractions including the Victoria Falls, Hwange National Park, Gonarezhou National, Eastern Highlands and Great Zimbabwe Monuments [29]. International tourism, which is the biggest market to Zimbabwe, has shown some resilience after it was disrupted in 2000 due to the contested elections, violence, and the land reform programme [8, 29]. These pre-COVID crises in Zimbabwe are not new in literature. However, COVID-19 presents a situation which is novel and not much is known regarding this ongoing virus. Based on this, Strauss and Corbin [30] argue that a qualitative methodology is appropriate in cases where newer problems for which nuanced understanding needs to be developed. Thus, a qualitative research approach was employed.

Data were collected using online interviews (in English) between May and July 2020. Due to COVID-19 restrictions, online interviews are becoming a standard method of data collection. Online interviews were conducted using Zoom Video Conferencing Platform with both the demand side (domestic tourists) and supply-side (managers from tourism establishments) participants. These interviews were conducted separately. Questions used in the interviews were based on the review of the literature. Demand interviews focused on the perceptions and challenges faced by domestic travellers in Zimbabwe. Supply side interviews focused on the feasibility of using domestic tourism as a means of restarting tourism, challenges of using domestic tourism and adoption of technologies.

Thirty demand respondents were approached using WhatsApp messages, where the aims of the study were explained. Twenty participants accepted to participate (66.7% response rate). Demand participants were supposed to have visited major attractions such as the Victoria Falls, Great Zimbabwe and big national parks including Hwange and Gonarezhou in the last three years to participate in the study. 28 managers were initially approached using emails, and 12 accepted to participate in the study (42.8% response rate). Both demand and supply participants were sampled using convenience sampling. Occasional email and WhatsApp reminders were sent to participants. Participants were informed of the content, aims, their rights to anonymity, and withdrawal of participation. Interviews were recorded using the Zoom cloud facility, averaging 20–30 min. Tables 1 and 2 summarises the participants' profiles.

Table 1. Supply side profile

Participant	Position	Establishment	Age	Gender	Experience	Location
S1	General manager	5-star hotel	40	Male	15 years	Harare
S2	General manager	4-star hotel	39	Male	12 years	Victoria Falls
S3	General manager	Tour operator	36	Male	8 years	Victoria Falls
S4	General manager	Restaurant	41	Male	6 years	Victoria Falls
S5	General manager	Tour Operator	50	Male	14 years	Victoria Falls
S6	General Manager	Museum	34	Female	5 years	Master
S7	General manager	Tour Operator	33	Female	5 years	Harare
S8	General manager	3-star hotel	38	Female	5 years	Masvingo
S9	General manager	3-star hotel	36	Female	5 years	Nyanga
S10	General manager	Car rental	30	Female	5 years	Kariba
S11	General manager	Tour Operator	37	Female	13 years	Kariba
S12	General manager	Restaurant	42	Female	10 years	Harare

Table 2. Demand-side profile

Participant	Age (years)	Gender	Income (ZWL)*	Qualification	Residing
D1	27	Male	$3 200	Bachelor's	Urban
D2	50	Female	$1 000	Diploma	Urban
D3	44	Male	$5 000	Bachelor's	Urban
D4	35	Female	$20 000	Higher diploma	Urban
D5	59	Male	$15 000	Certificate	Peri-urban
D6	34	Female	$5 500	Bachelor's	Urban
D7	39	Female	$7 000	Secondary	Urban
D8	31	Male	$15 000	Bachelor's	Peri-urban
D9	35	Male	$12 000	Bachelor's	Urban
D10	38	Male	$18 000	Bachelor's	Urban
D11	48	Female	$15 000	Postgraduate	Farm
D12	42	Male	$30 000	Master's	Rural area
D13	27	Female	$20 000	Master's	Urban
D14	28	Female	$8 000	Master's	Urban
D15	36	Male	$10 000	Doctorate	Urban
D16	49	Male	$1 000	Bachelor's	Urban
D17	32	Female	$9 000	Bachelor's	Urban
D18	29	Female	$8 500	Diploma	Urban
D19	27	Male	$25 000	Bachelor's	Urban
D20	52	Male	$20 000	Master's	Urban

*At the time of writing, USD$1 = ZWL$50

Interviews were conducted, transcribed and analysed using thematic analysis. Data analysis started full data transcription, followed by data familiarisation, codes identification, searching, reviewing, and defining themes, and generation of results. Coding was performed manually, through repeated reading of and making notes on interview transcripts.

4 Findings

This section discusses the sustainability of using domestic tourism as a recovery and resilience building strategy. The key issues that emerged from the analysis of data are discussed in the following sections.

4.1 Affordability of Tourism Products and Services

The theme of affordability of tourism products revealed deep-seated challenges that Zimbabwean destination managers need to deal with if the promotion of domestic tourism is to pay off. Using demand analysis, tourism in Zimbabwe is perceived as expensive. Results show that many domestic tourists cannot afford to travel for leisure in Zimbabwe. Thus, demand participants unanimously agree that affordability of tourism products is a critical concern that should be addressed if Zimbabwe wants to pin its tourism recovery using the domestic market as noted below:

> D7: "The elite may do that, but I am not sure if they are also ready to support the local industry, as they can visit other destinations. Yes, domestic tourism could work, it might take off, but at an incredibly low pace because we cannot afford their prices now."
> D16: "How could I travel, when I am earning less than USD$30, after working for the whole month.

Cost of travel was identified as an inhibitor of domestic travel, thus affecting the success of using domestic tourism as a recovery and resilience building strategy in Zimbabwe. While there was a particular cost-related question in the interview guide, the aspect of the cost of travel as an inhibitor of domestic travel emerged in the answers long before the question was asked and it is illustrated as follows:

> D8: "Tourism has a positive relationship with the availability of disposable income. To then say domestic tourism could be a recovery strategy is problematic because if that positive relationship is looked at, it means Zimbabwe must recover first for disposable income to be available.
> D4: "Imagine a civil servant who earns less than US$30 and is expected to pay US $150 per night in a decent hotel, what is that prices should be lowered like what South Africa charges".
> D15: "Look at bungee jumping, it attracts a charge of US$120 per jump, rafting US $115, and a helicopter flight US$150 for 12 min. There should be prices tailored for locals so that we also enjoy these attractions".

The aspect of inclusion remained a recurring sub-theme in most demand responses:

> D2: *"Let us begin with financial inclusion; then affordability for local tourists. We love travelling every holiday we go to kumusha/ekhaya [to the countryside]. We could visit Vic falls or Nyanga if the trips do not burn holes in our pockets.*
> D9: *"Tourism in Zimbabwe was not designed for us domestic clients; it was designed for varungu [international visitors].*

4.2 The Willingness of the Domestic Market to Pay for Tourism

Willingness to pay in this analysis developed as a factor explaining how the supply participants perceive the viability of recovering tourism and building a resilient destination using domestic tourism in Zimbabwe in the absence of international tourism due to COVID-19. Many supply-side participants note that domestic tourism might not be sustainable, given their unwillingness to pay premium prices:

> S8: *"The domestic market has many challenges, and key among them is lack of disposable income to support travelling and paying the premium prices we often charge."*
> S9: *"We are pricing ourselves out of business. I think to entice domestic tourists we should work on the law of numbers. There is more to benefit by charging $20 per night and get lots of people regularly coming than charging $100 and get four customers per night occasionally. I do not know the economics we are using. The food is also expensive."*

Moreover, some supply participants' reflections of kickstarting using domestic shows that post-pandemic, it will not deliver desired results, given that its promotion following post-2000 crises has been futile:

> S6: *"Zimbabwe has always been struggling to stimulate domestic tourism, will it do that after the pandemic, I doubt".*
> S9: *"Numbers are too little. Of the many millions in Zimbabwe, very few are mobile and resourced (the elite)"*
> S10: *"This is not the first time we hear the use of domestic tourism, the last two-three years, ZTA has been making noise about this, but with little changes. Even when Zimbabwe said they were looking East, changes in numbers have not been that large, more effort is required".*
> S11: *"Most Zimbabweans are low-income earners that cannot economically support tourism in Zimbabwe. Furthermore, the economic climate, compounded with COVID-19, makes it significantly worse, and I do not see domestic tourism supporting the revival of the sector, maybe I am too sceptical".*

Although the majority supply participants were sceptical, some participants argue that post-pandemic tourism recovery and post-pandemic resilience needs to go beyond the promotion of domestic tourism:

> S6: *"It is short-term opium. It is too dependent on disposable income."*
> S7: *"It will help with hotel occupancies here and there, but the value is too low for what this property can go for".*

S10: *"As a tourism-dependent country, it may work, but in the long-run, we will not be able to compensate for at least some of the lost income with domestic tourists. S12: "Domestic tourists take short-term trips, generally, about 1 to 3 days, and this will not be meaningful in short to long term in terms of occupancies".*

4.3 Economic Performance

Zimbabwe is faced with an ongoing economic crisis that stemmed from high inflation, unemployment, drought, and a worsening political climate. Despite that, pre-COVID-19 has been a significant contributor to the country's GDP [8, 29]. The performance of the economy was described by supply as the primary deterrent of using domestic tourism, given the lack of economic fundamentals:

S5: *"Even with international tourism pre-COVID, we still have supply challenges that are attributed to a poor performing economy, including limited access, and lack of airline connectivity. The international market has been resilient, but not sure how it will work out for the domestic market."*
S8: *"Too much unemployment and high inflation, makes the tourism recovery using domestic tourism largely too ambitious".*

Demand views concerning how the performance of the economy affects the use of domestic tourism as a recovery and resilience option were mainly from the fact that many are unemployed, and earnings are meaningless:

D7: *"Hatina mabasa (we have no jobs), how then can we travel in such an economy".*
D20: *"Hatitambiri baba (we are not earning), so there will not be any leisure to make".*

4.4 Adoption Technologies

Because of social distancing, the study also asked supply participants if Zimbabwean tourism could adopt information and communication technologies (ICT) including virtual reality (VR). Adoption of technology in this study is established as a theme that explains supply views in circumstances where tourists are unable to fly. Mixed opinions are noted regarding the adoption of ICT in tourism in a distressed destination:

S1: *"The use of ICT in the tourism industry is limited but could work if the government creates an enabling environment and stop using the internet as a means of power. Shutting down the internet is bad for business, should we start selling virtual tourism".*
S3: *"Virtual maybe somewhere. In Zimbabwe, we are even failing to have virtual meetings. It is embarrassing. Forget about virtual tourism as a strategic response to the impacts of COVID-19".*
S5: *"Zimbabwe's ICT infrastructure needs a facelift, and then we can talk about virtual tourism. With internet shutdowns that are always instigated by the authoritarian regime we have now; this might not work".*

S9: "Imagine, selling a virtual reality experience, where people across the world can have an experience of Victoria Falls or Great Zimbabwe through a simulated environment? This can potentially revolutionise the tourism industry, especially now that most people across the world are confined to their homes, in the spirit of maintaining social distance. But then, look, we have much more deep-seated challenges, that might not support the use of ICTs in tourism in Zimbabwe".

5   Discussion and Conclusion

This study examines the perceptions of demand and supply participants concerning the use of domestic tourism as a post-pandemic recovery and resilience strategy. The impacts of COVID-19 on tourism are likely to remain for an extended period in the absence of a vaccine, and the sector must be more prepared than it was when the pandemic struck. Post-COVID tourism recovery is likely to be slow and will depend on the recovery of the global economy as well as the risk perceptions of travellers in the absence of pharmaceutical solutions. The recovery of Zimbabwean tourism using domestic tourism is likely to be slowed by four key factors. These factors include the affordability of the tourism product by the domestic market, willingness of domestic tourists to pay, the performance of the economy and adoption of technologies. Each of these themes had several different sub-themes, as presented in Fig. 1.
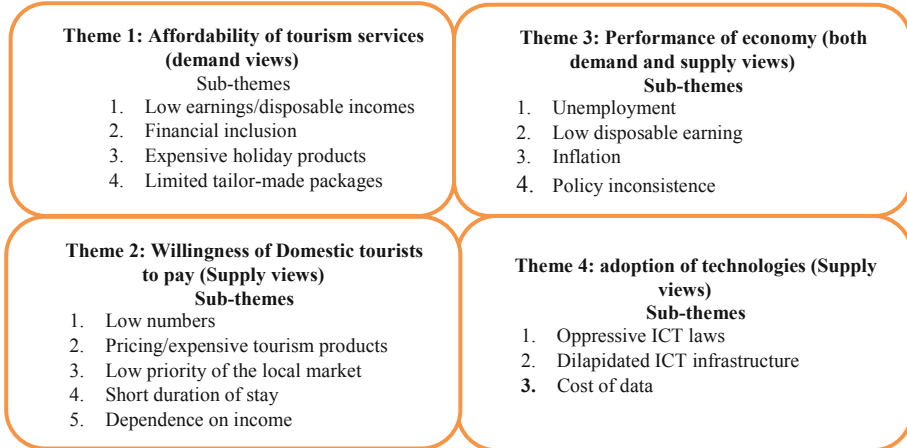
Theme 1: Affordability of tourism services (demand views)
Sub-themes
1. Low earnings/disposable incomes
2. Financial inclusion
3. Expensive holiday products
4. Limited tailor-made packages

Theme 3: Performance of economy (both demand and supply views)
Sub-themes
1. Unemployment
2. Low disposable earning
3. Inflation
4. Policy inconsistence

Theme 2: Willingness of Domestic tourists to pay (Supply views)
Sub-themes
1. Low numbers
2. Pricing/expensive tourism products
3. Low priority of the local market
4. Short duration of stay
5. Dependence on income

Theme 4: adoption of technologies (Supply views)
Sub-themes
1. Oppressive ICT laws
2. Dilapidated ICT infrastructure
3. Cost of data

Fig. 1. Factors affecting domestic tourism as a recovery and resilience strategy in Zimbabwe

The following main findings were evident from the analysis of data. Firstly, Zimbabwean tourism is expensive for the market that should be leading the post-pandemic tourism recovery and the creation of a resilient destination. It is imperative to highlight that the viability of using domestic tourism as an option for recovery and resilience building of the tourism industry depends on how attractive and affordable the

tourism product is. Several demand participants argued that pricing of the tourism product makes it difficult for them to participate in and consume tourism activities. Therefore, destination managers must consider price reductions and other incentives in stimulating the domestic market. Given the negative relationship between the price of tourism products and demand for tourism, recovery and resilience building effort must ensure the aspects of affordability is addressed.

Both supply and demand participants agreed that domestic tourism is viewed as something which is beyond the affordability of the domestic market. This challenge has also been identified in studies that involved international tourists, where it was concluded that Zimbabwe is an expensive destination compared to regional competition [8, 29]. Results from demand and supply views show the need for a pricing regulatory framework in Zimbabwe aimed at boosting domestic arrivals in the interim and international arrivals in the long-term. This could help build destination loyalty, which was noted as weak in past studies [8, 29]. The price regulatory framework will also encourage both domestic and international tourists to stay longer than the reported average of 1–2 days at a destination [29]. Failure to address this will result in the destination losing more revenue and market share. This will add to the existing distress in terms of unemployment to the destination.

Secondly, the findings show the immediate need for inclusively promoting tourism. Domestic tourists feel that they are excluded in the tourism value chain due to exorbitant prices and the packages that are offered by the supply side. Some supply side participants also indicated that much priority, even in terms of marketing, has always been given to the international market. While efforts are being made to market domestic tourism aggressively, there is a need to develop packages that are tailor-made for the domestic market. Competitive prices must be deliberately pursued as a means of building financial inclusion, and government can play a crucial role in making subsidies available for the sector to charge less for domestic travellers. The pricing policy of Zimbabwe, which favours low volume and high spending visitors should be revised given the changing market dynamics, even for international tourism [8, 29]. Thus, addressing price competitiveness issues for a destination in distress. It is relatively challenging to promote domestic tourism as a recovery and resilience building strategy post-pandemic in a country where citizens have low disposable income, and the services are expensive (see Table 2).

Thirdly, the supply side is sceptical regarding the contribution of domestic tourism in enabling tourism recovery and resilience in Zimbabwe. Zimbabwe's pre-COVID-19 economic challenges which have been exacerbated by the pandemic does not promote tourism, especially from the domestic front. Tourism is highly dependent on income, and in the context of Zimbabwe, the domestic tourism market is highly income constrained. While it is recommended in the literature that at home is safer than visiting abroad during crises and disasters [10, 31], the findings of this study seem to suggest otherwise. Though supply participants lauded the use of domestic tourism as a viable strategy, they were quick to hint that it is a short-term strategy that might not help Zimbabwe to recovery and be a resilient destination given its over-reliance on international travellers [29]. As earlier indicated, there is a need also to market the domestic tourism aggressively given the low priority the destination management organisation has accorded it. Additionally, this aggressive marketing must be supported by ensuring

government and insurance schemes provide access to health care away from home. In the context of Zimbabwe, the assurance of insurance schemes and provision of health care away from might be difficult given its underdeveloped health system and a collapsing economy. There is a need for destination managers to increase the recovery rate by promoting destinations to international travellers through a range of tactics including enhancing the image of air travel safety in the long-term.

Fourthly, the performance of the Zimbabwean economy remained a recurring response in this study. Macro-economic factors will determine tourism recovery post-pandemic, and these fundamentals are not right in Zimbabwe, given the issues of hyperinflation, unemployment, corruption, and rising debt. Supply results showed that Zimbabwe has no capacity for funding the promotion of domestic tourism. Aggressive promotion of domestic tourism as a recovery and resilience strategy requires funding from the government. As part of their tourism recovery efforts, the Swiss and New Zealand governments, for instance, committed USD$42.2 million and USD$256.8 million to fund the promotion of domestic tourism. Currently, there is no known amount committed by the Zimbabwean government towards the promotion of domestic tourism as a recovery and resilience strategy post-pandemic. The success of using domestic tourism as a recovery strategy requires substantial funding in terms of subsidies and incentives. However, the strategy might not bring in results given the pre-COVID-19 current economic challenges that Zimbabwe has been experiencing. Thus, the use of domestic tourism strategy is merely an academic and theoretical one in the empirical context of Zimbabwe. Incentives like price reductions, tax incentives and subsidies are imperative given that domestic tourism is a market that is price sensitive. Subsidies and other forms of cash injections are imperative in keeping the industry functioning; otherwise, unemployment is likely to increase, and further affecting recovery efforts and puts Zimbabwe in deepening economic distress. This will also make it difficult for establishments to charge lower prices in the absence of incentives and subsidies, give higher operational costs in the sector.

Domestic tourism is perceived to recover quicker to pre-COVID-19 levels compared to international travel in other contexts. However, for this to happen, there is a need to increase accessibility to domestic attractions. Previous research argued that Zimbabwe is relatively inaccessible due to lack of internal airline connections, heavy police presence on the highways, and bad roads [8, 29]. Therefore, the practical promotion of domestic tourism requires government and other role players to address these supply-side challenges. Lastly, the adoption of technology, in particular robots and artificial intelligence, has been argued for in literature [33, 34]. In the view of the scepticism expressed by supply participants regarding the use of domestic tourism as a means of restoring tourism and building resilience, the possibility of implementing technologies was also explored. Though technology adoption could benefit Zimbabwean tourism, the economy and political players remains critical deterrents. The implementation of robots and other types of technology in travel and tourism needs an enabling infrastructure, which Zimbabwe does not seem to provide. Zimbabwe is one of the countries with oppressive ICT laws and in the past, the internet was permanently shut down [35], despite the new president promising a different narrative than what was experienced during the Mugabe administration [8]. Stakeholders must come together

and create applications that stimulate the experience of visiting Zimbabwe and package them for sale to potential clients around the world.

This study contributes to literature in the form of different themes than can be regarded as useful factors in further research. The dominant themes of affordability, the willingness of the domestic market to pay, the performance of the economy and adoption of technologies should be taken as an imperative contribution to theory regarding tourism recovery and resilience during the COVID-19 pandemic. However, this study is not without limitations. The study was based on a qualitative approach using a conveniently selected sample which may not justify generalisability of the results. Rigorous empirical investigations regarding the promotion of domestic tourism as a recovery and resilience strategy must be conducted. Future studies must also review pre-COVID and post-COVID challenges in promoting domestic tourism as this will provide the destination with an analytical framework that could help develop sustainable recovery and resilience building strategies of the industry. Though several aspects of COVID-19 have been reported in past studies, there is a need for research to provide a more nuanced understanding of the industry responses to a pandemic with wide-ranging impacts, including scale development. The findings of this study are context-specific; thus, themes and challenges argued in this study may not apply in other destinations, even if they have ongoing crises like Zimbabwe.

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"Nothing Can Stop Me!" Perceived Risk and Travel Intention Amid the COVID-19 Pandemic: A Comparative Study of Wuhan and Sapporo

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Abstract. The global tourism industry has been devastated by the COVID-19 pandemic due to strict travel restrictions imposed by most countries. In order to achieve a swift post-pandemic recovery, it is important to understand what psychological obstacles people would face when making travel decisions. Building upon the dual-route theory of information processing, this study examined and compared how the perceived risk of COVID-19 would affect people's travel intentions in the Japanese city of Sapporo and the Chinese city of Wuhan through two rounds of data collection. While both cities were hit hard by the COVID-19 pandemic at an early stage, the cumulative numbers of confirmed human cases and the levels of intervention adopted were largely different. Results from the present study showed that risk perception of COVID-19 had a negative effect on people's travel intentions in Sapporo. However, no significant effect of COVID-19 perception could be observed in post-lockdown Wuhan. Meanwhile, although the dual-route structure of information processing was obtained in Sapporo and post-lockdown Wuhan, neither routes seemed to predict the perceived risk of COVID-19 in Wuhan when lockdown restrictions were still in place. Several theoretical and practical implications concerning the results are discussed in this study.

Keywords: COVID-19 · ELM · Perceived risk · Travel intention

1 Introduction

The year 2020 could have been another promising year for the global tourism industry because of the Tokyo Summer Olympics and other major cultural events [1]. However, the unprecedented outbreak of COVID-19 reminded people how susceptible tourism is to various risks and threats [2]. Prior to the COVID-19 pandemic, both China and Japan saw increasing inbound tourism demands. In 2018, Chinese visitors ranked first on tourism expenditure in Japan with 1.545 trillion yen [3]. Meanwhile, Japan was also said to be one of the leading source countries of China's inbound tourists [4]. Nevertheless,

inbound tourism has been put on halt under the current pandemic. Even if the disease can be contained through global joint efforts, the perception of health hazard and lack of safety may persist and deter people from travelling in the near future [5].

People's travel decisions and behaviours are largely influenced by their risk perceptions, which are formed from information that does not necessarily reflect the reality [2]. While people's travel intention can be enhanced by positive online reviews [6], it can also be adversely affected by negative opinions and misperceptions especially when a destination is linked to a contagious disease [7]. If people perceive high health risk towards a destination, it is less likely for them to visit there out of safety concerns [5]. Since the virus was first identified in the Chinese city of Wuhan, COVID-19 was sometimes referred to as "Wuhan virus" or 'Chinese virus' on social media in the early stage of the outbreak [8]. In order to regain people's confidence in COVID-19 stricken destinations, local authorities and tourism practitioners should understand how and to what extent people are affected by information related to the current pandemic. Thus, the first goal of the present study is to ascertain how people process COVID-19 information to form their perceived risk of the disease and whether such perception would influence their intentions to visit Wuhan or China.

Meanwhile, people from different countries may perceive risks differently due to geographical and cultural variations [9]. This study compares the perceived risks of COVID-19 in China and Japan by conducting quantitative surveys in Wuhan and Sapporo in the early stage of the outbreak. Wuhan, known as the former epicenter of COVID-19, was placed under lockdown for 76 days since January 23, 2020 [10]. On the other hand, Sapporo was among the first Japanese cities to be affected by the disease as early as mid-February [11]. Unlike Wuhan however, Sapporo never went into a compulsory lockdown besides being placed under a state of emergency [12]. Given that the total numbers of infections and the levels of interventions in controlling the disease were different in these two cities, evident regional difference in COVID-19 perception would be expected. In addition, the present study recognizes that different stages of COVID-19 control could have varying influence on perceived risk and travel intention. In order to figure out whether the effect of COVID-19 risk perception would persist after the pandemic, additional data are necessary from regions that have successfully combated the disease. Therefore, the second objective of this study is to investigate any possible changes in people's travel intentions during and after the pandemic by obtaining data from post-lockdown Wuhan.

2 Theoretical Background

2.1 Perceived Risk and Travel Intention

Intentions are indications of how much people are willing to engage in a behaviour [13]. In the filed of tourism, an individual's subjective norm, perceived behavioural control, and past travel behaviour are considered to be important predictors of travel intention [14]. Yet, within the current pandemic situation, these predictors became largely uncontrollable due to border closures and strict travel restrictions. In the absence of personal experience, people's perceptions of risk and safety come into play

when making travel decisions [15]. Prior literature has identified five major risk factors related to tourism: (1) war and political instability, (2) health concerns, (3) crime, (4) terrorism, and (5) natural disasters [16]. Within those, health risk perception was found to come second after crime-induced risk when planning a trip to developing countries [17]. As COVID-19 has developed into a global pandemic, people are placed under the risk of infection not only in the developing world but also in high-income countries. This study defines perceived risk as the subjective belief that an individual will experience uncertain negative outcomes because of COVID-19.

H1. Risk perception of COVID-19 has a negative effect on travel intention.

2.2   Argument Quality and Source Credibility

While the impact of risk perception on travel has been an active research topic [9, 18], there is still scant knowledge regarding how people process information to construct their risk perceptions. Among all research approaches to investigate people's information processing behaviours, the dual-route theory of information processing is deemed appropriate for predicting risk judgment [19, 20].

The elaboration likelihood model (ELM) is a dual-route theory developed by Petty and Cacioppo [21], which suggests two different modes of information processing. Based on their theory, the first mode of processing, known as the central route, results from an individual's thoughtful evaluation of a message. In contrast, information processing can also occur through the peripheral route, which is induced by simple cues in the message without thorough scrutiny of the content itself. The central processing route would be adopted by people with higher elaboration likelihood and result in enduring attitude change, whereas the peripheral processing route would be favoured by people with lower elaboration likelihood [21]. Prior literature has identified argument quality and source credibility as two distinct variables that represent the central and peripheral routes of processing, respectively [22].

Endeavour has been made to associate the dual-route processing theory with risk perception. For instance, Trumbo [19] evaluated the heuristic-systematic model (HSM), a dual-process model similar to the ELM, for its ability to predict people's risk judgments on a suspected cancer cluster. He found that heuristic processing (peripheral route) was linked to lower risk judgment while systematic processing (central route) was associated with greater risk judgment. In a study that measures people's perceptions of the Fukushima nuclear accidents, systematic processing was found to result higher perceived risk whereas heuristic thinking had no significant influence [20]. Since heuristic processing involves less cognitive evaluation of risk information [23], people who do not scrutinize COVID-19 information carefully may underestimate the risk of the disease due to optimistic bias [24].

H2. Argument quality of COVID-19 information intensifies risk perception.

H3. Source credibility of COVID-19 information mitigates risk perception.

2.3 Self-efficacy

As noted previously, different modes of information processing are selected based on an individual's elaboration likelihood, which is determined by his or her's motivation and ability to evaluate the information [21]. However, ability is not a fixed attribute of a person. Rather, it resides in people's self-beliefs of their capabilities to perform an activity [25]. Moreover, most motivation is cognitively generated to guide one's actions. During academic learning, motivation is enhanced when students believe that they are performing well at school [26]. Hence, an individual's ability and motivation to perform a certain action might be explained by his or her sense of self-efficacy. The present study defines self-efficacy as people's perceived ability to collect and comprehend COVID-19 information, which predicts the effects of the central and peripheral routes (Fig. 1).

H4. Self-efficacy positively affects argument quality of COVID-19 information.

H5. Self-efficacy positively affects source credibility of COVID-19 information.
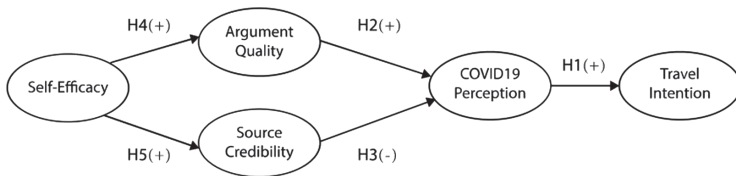
Fig. 1. Research model (compiled by authors)

3 Methodology

3.1 Measurement

Residents of Wuhan and Sapporo were surveyed about any COVID-19 information they received from the authorities, mass media, websites, social media, or face-to-face interactions. All constructs in the survey were adapted from the literature and measured with a 7-point Likert scale, ranging from 1 (strongly disagree) to 7 (strongly agree). In this study, argument quality (AQ) reflects accuracy, timeliness, and completeness of COVID-19 information that respondents received through different channels [22]. Items for argument quality were modified from existing studies on online reviews, which use the dual-route model to predict consumers' information adoptions and behavioural intentions [22, 27]. Items for source credibility (SC) were adapted from the work of Yoo et al. [28], in which source credibility is used as a peripheral cue to capture respondents' perceived credibility of a tourism website in terms of professionalism, trustworthiness, and reliability. Based on Li, Guo, and Ito [29], self-efficacy (SE) can be used as a predictor of people's information seeking behaviours in a risk communication setting. Thus, self-efficacy was operationalized in this study as a construct to measure respondents' beliefs in their capacities to collect and understand COVID-19 information. Items for perceived risk of COVID-19 (PC) and travel

intention (TI) were both adapted from the study of Lee et al. [18], where the influence of H1N1 influenza on travel intention is discussed.

Travel intention assessed for the Sapporo sample referred specifically to Wuhan and China because of their strong associations with COVID-19 in the opinions of some social media users [8]. It is worth finding out if risk perception induced by COVID-19 information would elicit negative views towards visiting Wuhan and China in the future. Respondents in Wuhan were not asked about travel intentions since the city was still in lockdown during the first round of data collection.

Additional data were obtained from post-lockdown Wuhan four months later to ascertain whether the risk perception of COVID-19 would still deter people from travelling in the post-pandemic era. People were surveyed about their intentions to visit any destination given that travel restrictions had been lifted in China at that time. Another data collection was not conducted in Sapporo due to the fact that the disease was far from being successfully contained in the city. In August 2020, Sapporo recorded 235 newly confirmed human cases [11], while Wuhan reported only 4 newly imported cases in the same month [30].

3.2   Data Collection

Sapporo Sample. An online survey was conducted in Sapporo through a Japanese research panel supplier in early April 2020. Survey items were first translated into Japanese and then translated back into English by two different researchers with vast experience of English-Japanese translation. There were no significant discrepancies between the original and the back-translated version. Overall, 542 valid responses were collected. Basic demographic information is listed in Table 1.

Wuhan Sample (First Collection). Survey questions were distributed through one of the biggest online survey platforms in China in late March 2020. All survey questions were first translated into Chinese and then translated back into English by a group of researchers with sufficient knowledge of both languages. After excluding incomplete responses, a total of 516 valid responses were obtained from the city of Wuhan.

Wuhan Sample (Second Collection). Another survey was conducted in post-lockdown Wuhan in mid-August 2020. Most parts of the survey remained identical from the previous version except for items measuring travel intention. A back-translation procedure was performed once again to ensure consistency in terminology. Overall, 400 valid responses were obtained from the city.

Table 1. Demographics of respondents (compiled by authors)

Characteristics		Sapporo (N = 542) April 2020		Wuhan (N = 516) March 2020		Wuhan (N = 400) August 2020	
		Frequency	%	Frequency	%	Frequency	%
Gender	Male	270	49.8	260	50.4	141	35.3
	Female	272	50.2	256	49.6	259	64.8
Age	Below 20	–	–	12	2.3	50	12.5
	20–29	105	19.4	141	27.3	225	56.3
	30–39	113	20.8	147	28.5	124	31.0
	40–49	104	19.2	153	29.7	1	.3
	50 and above	220	40.6	63	12.2	–	–
Education	High school or below	176	32.5	74	14.3	20	5.0
	College	150	27.7	108	20.9	44	11.0
	Bachelor's degree	195	36.0	278	53.9	270	67.5
	Master's degree/PhD	21	3.9	56	10.9	66	16.5

4 Data Analysis

4.1 Exploratory Factor Analysis

Sapporo Sample. An exploratory factor analysis (EFA) was performed with maximum likelihood extraction method in SPSS 25.0. The result of the Bartlett's test of sphericity confirmed that all variables were related and suitable for structure detection ($p < .001$). The minimum requirement of the Kaiser-Meyer-Olkin Measure (KMO) was met with a value of 0.863, which indicated that the sample was sufficient for further analysis [31]. Five significant factors were identified, which explained 79.601% of the total data variance. Following a promax rotation, one item from argument quality (AQ5) and one item from risk perception (PC4) were eliminated due to cross-loading problem. Cronbach's alpha coefficients were calculated to ensure internal consistencies. All values were above 0.7, suggesting an overall high reliability [32].

Wuhan Sample (First Collection). According to the EFA, both the Bartlett's test of sphericity ($p < .001$) and the Kaiser-Meyer-Olkin Measure (KMO = .847) had satisfied the minimum requirements [31]. Overall, four significant factors were extracted, explaining 69.614% of the total data variance. After a promax rotation, one item from argument quality (AQ2), one item from source credibility (SC5), and one item from risk perception (PC4) were removed due to cross-loading issues. All Cronbach's alpha coefficients were above 0.7, with the lowest found in COVID-19 perception (Cronbach's α = .750).

Wuhan Sample (Second Collection). Exploratory factor analysis was conducted to evaluate sampling sufficiency. Results from both the Bartlett's test of sphericity ($p < .001$) and the Kaiser-Meyer-Olkin Measure (KMO = .869) confirmed that the

sample was suitable for structure detection [31]. Five significant factors were extracted by using the maximum likelihood method. Cronbach's alpha coefficients of all constructs were above 0.6. Since some of the Cronbach's alpha values barely reached the acceptable level, results should be interpreted with caution (Table 2).

Table 2. Exploratory factor analysis results (compiled by authors)

Items	Sapporo (Apr 2020)		Wuhan (Mar 2020)		Wuhan (Aug 2020)	
	Loading	Cronbach's α	Loading	Cronbach's α	Loading	Cronbach's α
Argument quality		.802		.815		.721
AQ1. Information I received about COVID-19 is accurate	.592		.524		.542	
AQ2. Information I received about COVID-19 is relevant to my need	.340		–		.296	
AQ3. Information I received about COVID-19 is comprehensive	.569		.843		.761	
AQ4. Information I received about COVID-19 is up-to-date	.692		.608		.533	
AQ5. Arguments of the information I received about COVID-19 are convincing	–		.734		.645	
Source credibility		.944		.881		.840
SC1. People providing information about COVID-19 are knowledgeable on the topic	.715		.627		.502	
SC2. People providing information about COVID-19 have experience dealing with infectious diseases	.783		.693		.503	
SC3. People providing information about COVID-19 are trustworthy	1.025		.914		.876	
SC4. People providing information about COVID-19 are reliable	.964		.940		.797	
SC5. People providing information about COVID-19 are professional	.832		–		.752	
Self-efficacy		.902		.785		.719
SE1. I have confidence in my ability to search on COVID-19 related information	.755		.788		.471	
SE2. I have confidence in my ability to understand COVID-19 related information	.900		.764		.758	

Table 2. (*continued*)

Items	Sapporo (Apr 2020)		Wuhan (Mar 2020)		Wuhan (Aug 2020)	
	Loading	Cronbach's α	Loading	Cronbach's α	Loading	Cronbach's α
SE3. I have confidence in my ability to evaluate the credibility of COVID-19 related information	.962		.582		.346	
Risk perception		.846		.750		.623
PC1. COVID-19 is a frightening disease	.891		.848		.742	
PC2. I am afraid of contracting COVID19	.837		.709		.558	
PC3. Compared to SARS and Avian Influenza, COVID-19 is more dangerous	.735		.597		.499	
PC4. It is dangerous to travel because of COVID-19	–		–		.407	
Travel intention (Sapporo)		.909				
TIS1. I intend to visit Wuhan in the next 12 months	.841		–		–	
TIS2. I intend to visit China in the next 12 months	1.001		–		–	
Travel intention (Wuhan)						.892
TIW1. I intend to travel in the near future	–		–		.845	
TIW2. I am planning to travel in the near future	–		–		.852	
TIW3. I will make an effort to travel in the near future	–		–		.806	
TIW4. I will certainly invest time and money to travel in the near future	–		–		.795	

Note. Extraction Method: Maximum Likelihood. Rotation Method: Promax with Kaiser Normalization.

4.2   Hypothesis Testing

All hypotheses were tested with regression analyses using SPSS 25.0. Regression analysis was chosen instead of the widely used structural equation modeling (SEM) approach because of the exploratory nature of the present study. While all measurement items were adapted from the extant literature, this study might be one of the first attempts to examine the dual-route theory in an ongoing pandemic. Also, since some studies have questioned the validity of the dual-route information model [33], SEM might not be the best choice in this study as it requires a sound theoretical base [34]. Meanwhile, the present study was not intended to substitute path analysis or SEM with linear regression analysis. Instead of dealing with the causal relationship structure between each variable, all regression analyses conducted in this study merely served

the propose of capturing the direct effects from the included independent variables to the dependent variable [35].

Sapporo Sample. A series of regression analyses was conducted to examine the previously stated hypotheses. Supporting H1, people's perceptions of COVID-19 had a significant negative effect on their intention to visit Wuhan and China ($F = 23.810$, $p < .001$). Argument quality and source credibility significantly predicted COVID-19 perception ($F = 47.081$, $p < .001$). In addition, a positive influence was observed from AQ ($\beta = .458$, $p < .001$), whereas source credibility exerted a negative impact on COVID-19 perception ($\beta = -.115$, $p < .05$). Thus, H2 and H3 were validated. Supporting H4, self-efficacy positively influenced people's perceived argument quality of COVID-19 information ($F = 54.824$, $p < .001$). H5 was also proven to be true as self-efficacy showed a positive influence on perceived source credibility of COVID-19 information ($F = 47.812$, $p < .001$) (Table 3).

Wuhan Sample (First Collection). Since travel intention was not measured in the Wuhan survey, H1 was excluded from the analysis. Hypothesis 2 and 3 were tested by conducting a multiple regression analysis. Contrary to the widely held assumption, neither of the processing routes had any significant effect on the risk perception of COVID-19 ($F = 2.162$, $p = .116$). Hence, H2 and H3 were both rejected. Linear regression analyses were performed to investigate whether self-efficacy could predict the two information processing routes. Supporting H4, self-efficacy positively predicted argument quality ($F = 319.857$, $p < .001$). Source credibility was also predicted by self-efficacy ($F = 109.571$, $p < .001$), which lent support to H5.

Wuhan Sample (Second Collection). Regression analyses were performed in SPSS 25.0 to examine the previously stated hypotheses. Contrary to H1, COVID-19 perception in post-lockdown Wuhan did not affect their intentions to travel ($F = .014$, $p = .907$). Both argument quality and source credibility significantly predicted COVID-19 perception ($F = 18.466$, $p < .001$). However, the effect of source credibility on COVID-19 perception was also positive ($\beta = .136$, $p < .05$). Therefore, H2 was supported while H3 was partly supported. Self-efficacy positively influenced

Table 3. Results of regression analyses (compiled by authors)

Hypotheses	Sapporo (Apr 2020)		Wuhan (Mar 2020)		Wuhan (Aug 2020)	
	Standardized β	Result	Standardized β	Result	Standardized β	Result
H1. Perceived Risk → Travel Intention	−.205***	Supported	–	–	.006	Rejected
H2. Argument Quality → Perceived Risk	.458***	Supported	.100	Rejected	.193**	Supported
H3. Source Credibility → Perceived Risk	−.115*	Supported	−.081	Rejected	.136*	Partly Supported
H4. Self-Efficacy → Argument Quality	.304***	Supported	.619***	Supported	.538***	Supported
H5. Self-Efficacy → Source Credibility	.285***	Supported	.419***	Supported	.454***	Supported

Note. *$p < .05$. **$p < .01$. ***$p < .001$.

people's perceived argument quality of COVID-19 information ($F = 205.223$, $p < .001$), supporting H4. H5 was also validated as self-efficacy showed a positive influence on the perceived source credibility of COVID-19 information ($F = 103.564$, $p < .001$).

5 Discussion

5.1 Temporary Effect of COVID-19 Perception

According to the Sapporo data, people's perceived risk of COVID-19 indeed negatively influenced their intentions to travel during the early stage of the pandemic. Similar result can be found from a study on the Fukushima nuclear accident, where revisit intention was also directly reduced by higher physical risk [2]. However, data collected from post-lockdown Wuhan suggested that the negative effect of perceived risk might be temporary. It seemed that people's perceived risk of COVID-19 did not affect their intentions to travel after lockdown restrictions were lifted in Wuhan. Under a pandemic, the decline in tourism demand is mostly driven by people's perceived risk of being infected. When people feel control over the disease, the impact brought by COVID-19 may become more limited. In fact, a consumer survey on tourism in China shows that both the airline-seat capacity and the hotel-occupancy rate have gradually recovered in the country since late February. In particular, Chinese people's confidence in domestic travel increased as much as by 60% in May 2020 [36]. While it is unsure if the global tourism industry will recover at the same speed in the post-pandemic era, it is still encouraging to learn that the effect of COVID-19 perception might be limited once the disease is contained.

5.2 Cultural Influence

Another factor that may possibly explain the difference in travel intention between the two cities is socio-cultural influence. As a paradigm for cross-culture research, Hofstede's cultural dimensions theory has been frequently employed by scholars [37]. In his work, Hofstede proposed six dimensions of national culture, namely, power distance, uncertainty avoidance, individualism-collectivism, masculinity-femininity, long-short term orientation, and indulgence-restraint [37]. Among these six dimensions, uncertainty avoidance is considered as an appropriate benchmark to compare cultural effects in the field of tourism studies [5]. Previous research reveals that cultures with high uncertainty avoidance, such as Japan, would tend to take on shorter trips with fewer destinations, whereas cultures with a medium level of uncertainty avoidance would demonstrate more risk-accepting behaviours [38]. Based on Hofstede's ranking of 76 countries on uncertainty avoidance, Japan ranks 11th with an index value of 92 while China is among the least uncertainty avoiding countries with a score of 30 [37]. In light of this, it is possible that Chinese people in general would incline to take more risks and travel even under the COVID-19 pandemic.

5.3   Effect of COVID-19 on Information Processing

This study was conducted in part to verify whether the dual-route information processing theory can be applied to understand how people reach their risk judgments. Analysis results showed that while both routes successfully contributed to COVID-19 perception in Sapporo and post-lockdown Wuhan, neither seemed to function when Wuhan was still in lockdown. This finding raised an interesting question as whether traditional information processing approaches would fail under an extreme public health crisis. Research on the nature of perceived risk demonstrates that people's risk judgments are often fallible partly due to media biases [39]. In the case of Sapporo, where the total number of confirmed cases was much lower compared to Wuhan in April [11], the majority might not feel affected and rely mostly on media to learn about the disease. On the other hand, people who had personal experience with the disease, such as people in Wuhan during lockdown, might have not estimated their personal risks based on what they heard but what they witnessed. The predictive role of personal experience on risk perception was also confirmed in past research [40]. When daily life was set back to normal in post-lockdown Wuhan, however, people might start to feel distant from the disease again. Consequently the influence of external information might come back into play after the disease was under control.

6   Conclusion and Implications

Drawing upon the elaboration likelihood model (ELM), the present study examined how the risk perception of COVID-19, predicted by argument quality and source credibility, could affect people's travel intentions. The study results confirmed that while perceived risk related to disease would affect people's travel intentions, its effect might be short-lived or limited. This can be supported by an earlier study on the influence of 2009 H1N1 influenza, in which people's perceptions of the disease did not directly affect their travel intentions [18]. In addition, this study also examined the validity of the dual-route processing theory under a global pandemic. As hypothesized, self-efficacy successfully predicted people's information processing. However, the study results suggested that the dual-route information processing model could only go so far in predicting risk perception when the respondents were not directly affected by the event. Since previous dual-route theory research concerning risk perception rarely focused on people who were actually affected by the events [19, 20], further investigation would be needed to verify this finding.

Several practical implications can be found in the present study. Tourism recovery ties in closely with disease containment. In order to stop the disease from spreading, local authorities should devote more efforts in raising people's awareness of COVID-19. Since self-efficacy can improve people's processing of COVID-19 information, providing basic knowledge of the disease may help people build a correct understanding of the current pandemic situation. On the other hand, since the negative effect of COVID-19 perception seems to be temporary on people's travel intentions, hospitality and tourism practitioners may rest assured after the disease is contained as long as they can maintain expected hygiene standards.

Nevertheless, some limitations should be addressed regarding the present study. First, the internal consistency of items measuring COVID-19 perception was relatively low in Wuhan both during and after the lockdown. Given that all items were adapted from the literature [18] and the Cronbach's alpha value of the same construct in Sapporo was well above 0.8, the measurement should be adequate for the research purpose. Considering that people in Wuhan were the first affected by COVID-19, their perceived risk of the disease might be outside the scope of the survey questions. Thus, a new set of measurements may be needed in future research to assess risk perception in regions that are most affected by the event. Second, while the present study inferred that the dual-route processing model might fail to function in a public health crisis, other possible dependent variables, such as perceived information usefulness, were not measured in the first round of data collection. Future studies should include as many variables as possible to broaden the understanding of the dial-route processing theory under extreme conditions. Lastly, it should be noted that the majority of the respondents in the second Wuhan study were relatively young compared to the other two groups. Since adolescents and young adults had a higher probability of being asymptomatic when infected with COVID-19 [41], they might be less concerned about the disease and thus have higher intentions to travel when restrictions are lifted. A sample with age diversity may be helpful to investigate the relationship between perceived risk and travel intention in the post-pandemic era.

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Factors Influencing Tourists' Intention to Use COVID-19 Contact Tracing App

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Abstract. The purpose of this study was to develop and test a model that explores the antecedents of tourists' acceptance of COVID-19 contact tracing app (CTA). Data was obtained from a crowdsourcing platform (Pollfish), in which 400 respondents answered the questionnaire. We used SmartPLS to analyse the data. Results reveal that trust and structural assurance have the strongest relationship. Furthermore, the relationship between trust and destination safety was positive. Finally, self-efficacy moderated the relationship between trust and intention, implying that trust was stronger for tourists who have higher levels of self-efficacy. Recommendations are offered.

Keywords: COVID-19 · COVID-19 contact tracing app · Destination safety · Trust · Structural assurance · Self-efficacy · Intention

1 Introduction

According to the United Nations World Tourism Organisation [1], travel restrictions as a result of COVID-19 has had a devastating effect on the tourism industry, so much so that international tourist arrivals have fallen to 97%. Accordingly, the net effect of this is that about 1.2 trillion US Dollars have been lost, resulting in 120 million tourism-related job cuts [2]. While the devastating effect of COVID-19 remains and some countries witnessing a new surge in the number of infections, many countries have started to lift travel restrictions. To this end, the UNWTO has called on operators in tourism-related businesses to ensure safety, responsibility and security, as the world adjusts to the new normal.

In the wake of the outbreak of COVID-19, majority of countries adopted containment measures. This meant that cities and even countries were totally locked down. Since containment measures have not completely eradicated the virus, in addition to the World Health Organisation warning that the virus will live with us for a long time [3], health experts are advocating for community-wide monitoring [4], as management measures. To this end, many countries and cities are adopting digital contact tracing applications [5], as they emerged from the lock down.

While there are many variants in the implementation of the CTAs across different countries, some countries have witnessed stiff resistance to their use due to many unresolved questions bothering on trust, users' privacy and their actual benefits [6].

Interestingly, some destinations have made their use compulsory for both locals and tourists [7]. From a destination safety point of view, managers would ensure that critical measures are put in place for the safety of the destination, including the use of CTA to track possible surge [8]. However, it is unclear if and how destination image, particularly tourists' perception of a destination safety influences their trust and adoption of COVID-19 CTA in that destination. Additionally, in the midst of the stiff resistance to CTA adoption, users' concerns that have resonated across countries and destinations is the assurance of the protection of their privacy [32]. To the best of our knowledge, there is no study that has yet examined the role of structural assurance on users' trust and their intention to use the CTA, even as previous studies [5, 31] have highlighted the critical place of an empirical evidence to guide relevant authorities.

In the domain of location-based system, literature establishes that the need for safety is positively related to trust, however, the mechanisms underlying the moderating role of self-efficacy on the relationship between trust and intention is still lacking [9]. This is particularly important because the debate generated by the implementation of CTA will be reduced if users take responsibility for their own safety in the midst of the COVID-19 [10]. Thus, using tourist mobility as a theoretical standpoint, this study examines the role of trust on destination safety and the moderating role of self-efficacy on the relationship between trust and tourists' intention to use CTA. Specifically, this study develops a model and empirically tests tourist trust, destination safety, structural assurance and intentions to use CTA. In the model, we used self-efficacy as a moderating variable to test the relationship between tourist trust and intentions. We argue that in the midst of the confusion that has enveloped the global economy, a study of this nature that examines how CTAs impact tourists' choice of destinations and their travel patterns will be of interest to destination managers, health authorities and the scholarly community.

2   Tourist Mobility

Tourist mobility is an established theoretical stream in the tourism literature. Tourist mobility represents the spatio-temporal "movements of people, objects, and information and their complex relational dynamics" [11, p. 1075]. [11] advocates that tourist mobility encompass three components: movement, representation and practice. Movement entails the physical movement from one place to another. Representation depicts the shared "meanings assigned to the act of movement" while practice "refers to the experience and embodied practice of movement." [12] argue that there is a connection between tourist mobility and destination attractiveness and competitiveness. According to them, since tourism involves movements, attractive destinations usually experience high mobility. Different techniques have been used to understand tourists' travel styles and patterns within a destination, including different technologies to track tourist movements [13]. Currently, COVID-19 has introduced an interesting perspective to tracking tourists' movements. As destination safety and security are cardinal evaluation criteria for tourists, majority of destinations will use CTAs in post-COVID-19 era as part of destination safety and security strategies [14].

Literature has examined how different variables influence tourists' travel patterns. Thus, [13] identify six variables namely; visitor personal characteristics, user group type, knowledge of the destination, resources and constraints and infrastructure as predictors of travel patterns. Similarly, [15] examined the role of perceived quality factors on usage intention of location-based application. The current study will combine the destination, user and application factors as predictors of intention.

2.1 Trust and Destination Safety

Safety is critical to the choice of a destination. Literature classifies destination safety incidents as natural disasters such as tornadoes, hurricanes, earthquakes, floods and tsunamis; man-made tragedies, for example, terrorism, crime, and war; or health hazards such as the current COVID-19 [16]. Interestingly, the effect of safety incidents are not specific to a destination as one occurrence in one destination can have a spiraling effect of fear on the entire country or region. However, safe destinations imbue a sense of peace, confidence and trust in the tourist. Destination safety will therefore be a critical determinant of destination choice in the post-COVID-19 era. Destination safety therefore becomes relevant in this study because destinations that are considered safe (in relation to COVID-19) will appeal more to tourists than others. [9] examined the relationship between need for safety and trust and found that trust positively and significantly impact need for safety. Similarly, [17] found that safety guarantees significantly impact travelers' trust. The introduction of CTAs for COVID-19 will have many implications for tourism. Trusts for CTAs in destinations with a track record of safety will be higher than those who have experienced safety issues. In fact, based on scholarly evidence, tourists' destination loyalty depends on perceived safety [18], implying that the trust for a destination with a positive record of safety will translate to a positive perception of COVID-19 CTA and their intention to use it. In the light of the foregoing, we argue that:

H1. Trust for COVID-19 CTA is positively related to destination safety.
H2. Destination safety is positively related to intention to use COVID-19 CTA.

2.2 Trust and Intention to Use

In this study, we follow [19] definition of trust, as exchange partners' belief in others' trustworthiness, which is underlined by their benevolence, competence, and integrity. As a new technology, trust is important for tourists to be able to use the CTA. This is particularly important because the application may have access to critical information relating to the user. Trust has featured prominently on studies relating to information sensitivity and users' safety. For instance, in the context of location systems, [9] and [15] found a positive and significant impact of trust on intention to use. As digital contact tracing application works in similar context, that is, users location and mobility, we argue that the tourists' trust on the application will have positive and significant impact on their intention to use it. Thus, we hypothesize that:

H3. Trust for COVID-19 CTA is positively related to intention to use it

2.3   Trust and Structural Assurance

Structural assurance refers to safeguards such as regulations, legal resources and guarantees provided to increase consumers' confidence in a new innovation [20]. Empirical evidence suggests that consumers' trust and attitude towards a new technology is positively influenced by structural assurance [20, 21]. As novel as the COVID-19 CTA appears to be, much of the controversy surrounding its acceptance is because users lack the safeguards and guarantees from relevant authorities on the protection of their privacy information [7]. As such, this study argues that provision of necessary safeguards and legal resources will increase users' trust and their intention to use the application. Thus:

H4. Trust for COVID-19 CTA is positively related to structural assurance.

H5. Structural assurance is positively related to intention to use COVID-19 CTA.

The role of self-efficacy on users' adoption of technology has also been examined in previous studies [22]. Self-efficacy implies people's belief in their capabilities to execute certain actions to attain some performances [23]. In the context of COVID-19 CTA, if tourists' belief in their ability to use the application, they will more likely have higher willingness in using it. Majority of studies relating to technology adoption used self-efficacy as a direct effect [23]. However, in an organisational context, [24] drew more insight when they tested the relationship between self-efficacy and job performance using trust as a moderator variable. They found that self-efficacy had stronger relationship with job satisfaction with employees who have higher level of trust. In this study, we use self-efficacy as a moderator variable between trust and intention. We thus argue that the strength of the relationship between trust and intention will be determined by the tourist's self-efficacy.

H6: The relationship between trust and intention to use COVID-19 contact tracing app is moderated by self-efficacy (Fig. 1)
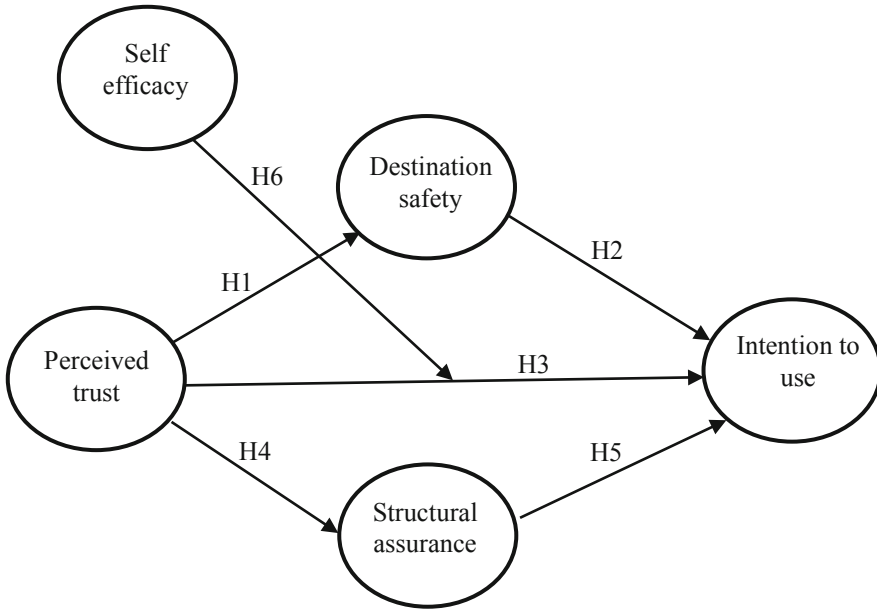
Fig. 1. Conceptual framework of our study

3 Research Methodology

This study adopts quantitative methodology and used Structural Equation Modelling to test the proposed model. Data were collected in August, 2020, via Pollfish. Pollfish algorithm provides for the opportunity for a researcher to select target audience (e.g. tourists, students and so on). A researcher can also select a target group within a specific region or country. Earlier study [25] has validated the Pollfish algorithm's robustness with potential to disqualify ineligible respondents in real-time. In total, the datasets comprised of 400 responses. Respondents were predominantly male with 50.5% and age bracket 25–34 records 31.5%. Also, under marital status, the single dominated the study with 40.8% while university students constitutes 39.5% respectively.

This study draws from existing validated questions with modifications to suit COVID-19 tracing mobile app context. Destination safety items were drawn from [25], perceived trust [15], structural assurance [21], self-efficacy [22], and intention to use [26]. Seven-point Likert scales strongly disagree (1) as the lowest scale and strongly agree (7) as the highest were employed. Table 1 indicates the measurement items for this study.

Table 1. COVID-19 tracing mobile app measurement Items (arranged by authors)

Variables	Items
Trust (PT)	PT1. COVID-19 contact tracing app is trustworthy PT2. COVID-19 contact tracing app keeps its promise PT3. COVID-19 contact tracing app keeps users' interests in mind
Structural assurance (SA)	SA1. COVID-19 contact tracing app has appropriate legal safeguards SA2. am assured that COVID-19 contact tracing app has features that adequately protect me from hacking SA3. believe COVID-19 contact tracing app is safe because it provides adequate protection
Destination safety (DS)	DS1. Additional security measures at airport make traveling safer DS2. Safety is the most important attribute a destination can offer DS3. Safety is a serious consideration when I am choosing a destination
Self-efficacy (SE)	SE1. I am skilled at avoiding dangers while using COVID-19 contact tracing app SE2. I am active in securing my environment when using COVID-19 contact tracing app SE3. I am confident that I can remove any hazards while using COVID-19 contact tracing app SE4. I have the ability to protect myself from dangers while using COVID-19 contact tracing app
Intention (IU)	IU1. I think more and more will use COVID-19 contact tracing app in the future IU1. I think I will use COVID-19 contact tracing app when organising and taking trips IU1. In the future, I will encourage my friends to use COVID-19 contact tracing app

4   Measurement and Structural Model Analysis

This study utilised SmartPLS version 3.3.2 software to analyse dataset with Partial Least Squares Structural Equation Modelling (PLS-SEM). This data analysis technique has been proved useful in the social sciences as a means of not imposing distributional assumptions on the data while working with indicator variables and structural paths aside from the benefits of complex models estimation [27]. PLS-SEM is growing along with CB-SEM. The study conducts an algorithms data analysis with SmartPLS to ascertain the quality criteria of the proposed measurement model (Table 2) and the result shows that the Cronbach Alpha, composite reliability (CR) and rho_A of the model reached and above the set criterion of 0.7. The average variance extracted (AVE) results were above the recommended boundary of 0.50 which indicates the 50% of the items variance. The AVE results also indicate convergent validity of the model [28]. Besides, the study also established discriminant validity as the shared variance for all the model constructs are larger than their corresponding AVE [28].

Table 2. Quality criterion results of COVID-19 tracing mobile app study

Variables and items	DS	IU	PT	SA	CA	rho_A	CR	AVE	R square
Destination safety					0.854	0.855	0.911	0.774	0.093
DS1	0.866								
DS2	0.903								
DS3	0.869								
Intention to use					0.794	0.795	0.907	0.829	0.594
IU1		0.909							
IU3		0.913							
Perceived trust					0.884	0.885	0.928	0.812	
PT1			0.913						
PT2			0.920						
PT3			0.869						
Structural assurance					0.871	0.873	0.921	0.795	0.626
				0.879					
				0.895					
				0.901					
Destination safety	**0.880**								
Intention to use	0.317	**0.911**							
Perceived trust	0.309	0.699	**0.901**						
Structural assurance	0.302	0.749	0.792	**0.892**					

In the second stage of the data analysis, the study utilised SmartPLS bootstrapping technique to assess the structural model [27–29]. The goal of using bootstrapping is to test the proposed hypotheses. The study found all the five formulated hypotheses significant. The perceived trust as a direct predictor of destination safety (H1) reveals strong path coefficients ($\beta = 0.31$, $p = 0.000$), destination safety predicts intention to use ($\beta = 0.08$, $p = 0.031$), perceived trust predicts intention to use ($\beta = 0.27$, $p = 0.000$), perceived trust predicts structural assurance ($\beta = 0.79$, $p = 0.000$) while structural assurance predicts intention to use ($\beta = 0.51$, $p = 0.000$). Structural assurance records the highest R^2 with 62.6%, seconded by intention to use COVID-19 tracing app with 59.4% and destination safety insignificant R^2 with 9.3%.

Table 3. Tested hypotheses results

Hypotheses	Path coefficient	Beta	Std. Dev.	t-values	Confirmation
H1	Perceived Trust -> Destination Safety	0.309	0.055	5.585***	Sig.
H2	Destination Safety -> Intention to use	0.079	0.037	2.166*	Sig.
H3	Perceived Trust -> Intention to use	0.269	0.059	4.541***	Sig.
H4	Perceived Trust -> Structural Assurance	0.792	0.025	31.060***	Sig.
H5	Structural Assurance -> Intention to use	0.512	0.055	9.275***	Sig.
H6	Self-Efficacy*Trust-> Intention to use	-0.085	0.020	4.183***	Sig

Notes. Significant levels *p < 0.05; ***p < 0.001

To get insight that the PL-SEM could not reveal, the study embarked on moderation analysis and used a contingent variable [29, 30]. In Table 3 and Fig. 3, perceived trust as a key variable in the proposed model was used as an independent variable, self-efficacy as a moderator and intention to use COVID-19 tracing app as the dependent variable (β = −0.085, p = 0.000) (Fig. 2).
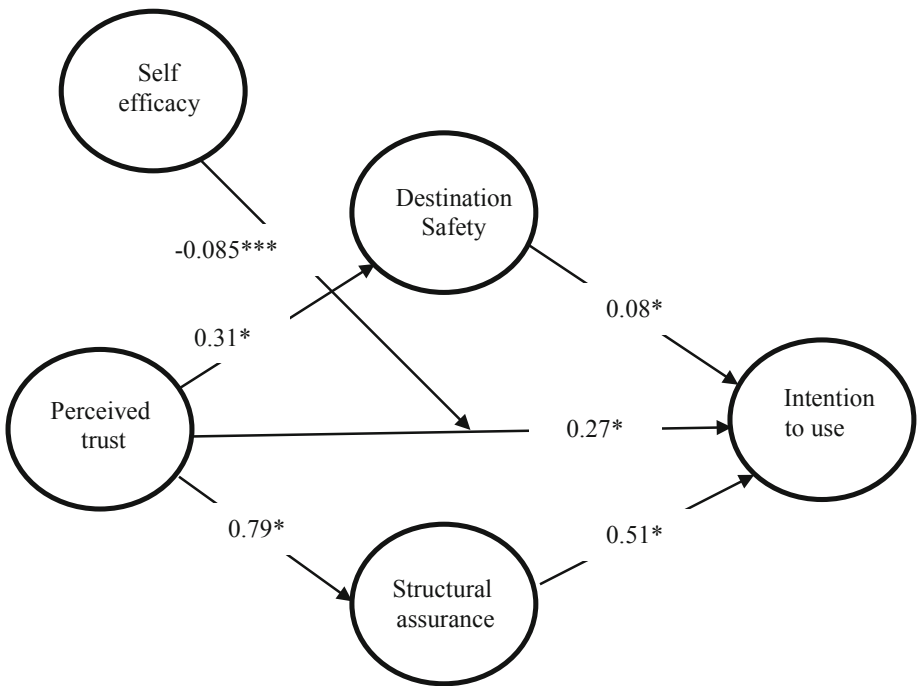
Fig. 2. COVID-19 model result (Notes. Significant levels *p < 0.05; ***p < 0.001)

The result established interaction with small size effects (0.028) and shows how self-efficacy changes the relationship between trust and intention to use tracing app and

how self-efficacy affects both trust and intention to use tracing app positively. The positive relationship between perceived trust and intention to use tracing mobile app was lightly stronger or weak when self-efficacy is high or low. Furthermore, the analysis shows a buffering moderation effect whereby the negative interaction effect indicates that the negative self-efficacy exacerbates the negative effect of trust on using the COVID-19 tracing app. When self-efficacy is increasing, the effect of trust on the intention will decrease.
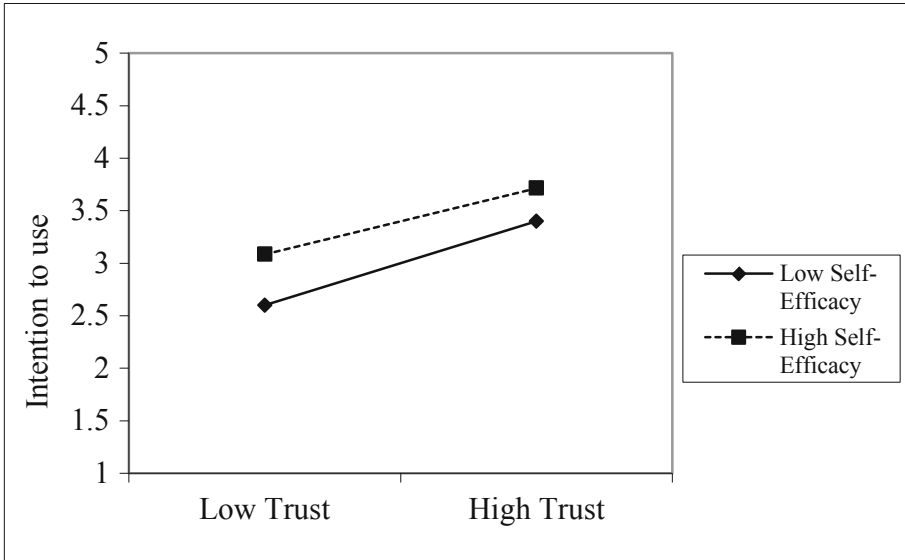
Fig. 3. Interaction effect of self-efficacy, trust and intention

5   Discussion

The purpose of this study was to examine the antecedents of tourists' adoption of COVID-19 CTA in a destination. Accordingly, six hypotheses were tested and all were confirmed. Specifically, trust and structural assurance had the strongest relationship, followed by intention. This result confirms an earlier study [20]. This result re-echoes users concerns and underlines the critical place of safeguards, regulations and legal resources as fundamental to the adoption of COVID-19 CTA. Again, strong and positive relationship between trust and destination safety resonates previous findings [17], indicating that a destination's previous record of safety will play a key role on the trust towards its COVID-19 CTA. Destinations with positive safety image will be more trusted than those that have experienced safety challenges. While the relationship between trust and intention returned a positive result, a more interesting finding is that self-efficacy moderated the relationship between trust and intention. This result establishes our assumption that trust will be more positively related to intention for tourists who have higher levels of self-efficacy.

5.1   Theoretical Implications

This study contributes to literature in the following ways: first, our study builds and tests a model that examines the antecedents of tourists' adoption of COVID-19 CTA. The introduction of COVID-19 CTA has generated hot debates mostly fueled by media hypes, to the extent that many people have decided against its use even before its launch. As a matter of fact, our study is among the first scientifically based literature that addresses the antecedents of adoption of COVID-19 CTA. Thus, this study fills the void identified by previous studies [5, 31] who called for scientific approach and empirical evidence to guide relevant authorities in the implementation of CTA. Second, as destinations begin to ease the lockdown, different authorities ponder key strategies to reset destination attractiveness and engender safety of tourists [2]. This study contributes to destination post COVID-19 reset strategies. Destinations previously perceived as safe can leverage the implementation of CTA to strengthen tourists' confidence in that destination. Finally, our study contributes to literature on tourist mobility. Recent literature on tourist mobility have looked at tracking tourists' travel patterns and their locations using mobile technologies [13, 15]. Thus, our study does not only extend the tourist mobility literature, but also argues that the deployment of COVID-19 CTA will be embedded as a safety criteria in the post COVID-19 era.

5.2   Managerial Implications

From a management perspective, the core contribution of this study is that trust has the strongest effect on structural assurance. This implies that relevant authorities should enact regulations and legal resources to safeguard the user's privacy because much of the concerns of users fundamentally arise due to the perceived absence of legal protection [7]. It is not enough to draft these regulations, intensive educational awareness and campaign should be vigorously pursued to educate the users on measures taken to protect them in their use of the COVID-19 CTA.

Per the moderation effect, it shows the weak sense of self-efficacy of the tourists, and it indicates that they focus on their personal failings of using the COVID-19 tracing app, and they expect its adverse outcomes. These results offer managerial insights into motivating tourists from low-level self-efficacy with consequences of highly negative interactions with the COVID-19 tracing app. This research suggests that managers should continually reinforce the tourists' perception of self-efficacy through the interventions of vicarious experiences, social persuasion, and emotional stability as proposed by [33]. The tourists need a trusted voice of encouragement.

From a destination image perspective, safety constitutes a critical element of a destination image. As part of the tourism reset strategies, destinations must introduce CTAs to guarantee the safety of tourists. Again, tourists will be more confident in a destination when they know that they can be flagged in the events of reports of COVID-19 cases; thus, they will be free to explore the attractions and optimally enjoy their time without necessarily being suspiciousness of everybody as a COVID-19 carrier.

5.3   Limitation and Future Research Direction

One limitation of our study was that we concentrated on CTAs. Indeed, there are variants of the digital contact tracing for COVID-19 and putting them together under apps could have impacted the results. We thus recommend future studies to examine these variants and compare users' evaluation based on their performance. While the CTA was accepted in some destinations, it was rejected in others. Future studies could consider multi-national comparisons of users' responses to their performance.

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Destination Management in Times of Crisis - Potentials of Open Innovation Approach in the Context of COVID-19?

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Abstract. The COVID-19 pandemic has led the tourist industry to a standstill. It also creates the potential to change both the global tourism industry and the context in which innovation management takes place in the medium to long term. The web-based open innovation approach provides one of the possibilities to uncover technical opportunities in the context of rapidly changing environment. This article takes a qualitative approach to explore the benefits of open innovation approach for destination management organizations (DMOs). The analysis of 15 semi-structured interviews reveals nine specific benefits that arise from the three types of open innovation. The findings deepen an understanding of the potential that the open innovation approach offers for DMOs. The study further creates a background to collaborative tourist recovery COVID-19 pandemic through smart destination ecosystems.

Keywords: Open innovation · Destination management · Coronavirus · COVID-19 · Innovation management · Smart destination ecosystem

1   Introduction

The coronavirus pandemic (COVID-19) has triggered an unprecedented crisis in the global tourism industry, given its immediate and immense impact. The tourism industry is one of the sectors most directly affected by the current crisis, particularly due to the fact that international air traffic has virtually ground to a halt [1]. De facto, travel, and everyday tourism is still far from the pre-Corona phase. The changes affect almost every aspect of the ecosystem of destination management organizations (DMOs). DMOs are need new and innovative formats in the course of this paradigm shift in order to gain competitive advantages. In the context of global competition it has become a condition sine qua non for destinations to distinguish themselves decidedly from competitors in order to successively and sustainably compete on the travel market [2].

A range of technological innovations and digital solutions of smart destination ecosystems are becoming available for DMOs [3]. Digitization and smart environments create a borderless, international competitive environment for the tourism industry [4, 5]. Innovative formats create new opportunities for tourism service development and

process optimization in general and DMOs in particular [6]. However, their application often requires paradigmatic changes in destination development strategies [7, 8]. Thus, it becomes necessary to involve a large number of stakeholders, and opening up to an innovative solution for DMOs' strategy in order to benefit from such technologies [4, 9].

The concept of open innovation explains the logic of engaging multiple stakeholders in an innovation process. Technology-oriented organizations can benefit from engaging multiple stakeholders at different stages of the innovation process. An appropriate combination of actors, their resources, including knowledge and technology, and institutional arrangements, can facilitate value co-creation in smart tourism ecosystems [10].

Among others, application of open innovation allows organizations to acquire missing resources and optimize internal processes of the organization [11]. There is an evidence that technology-driven open innovation has potential for strengthening competitive position of organizations. Sustainable development of businesses can be achieved through new collaboration, funding opportunities, intensified engagement, increased diversity and supported infrastructure [12]. However, the potential for changing smart tourism destinations to create value by engaging multiple stakeholders remains underexplored.

The following study aims to explore the benefits of applying open innovation strategy by destinations. It first defines an open innovation strategy and conceptualizes its three major types in relation to the objective of resource exchange processes between organizational and external stakeholders. The study then explains the applied qualitative research design and reports the findings of the 15 semi-structured interviews with the DMOs' experts. The study identifies 9 key benefits of open innovation strategy and increased involvement of tourists, locals, and other stakeholders, for tourism destinations. The study contributes to the domains of destination management and service innovation. It provides insights of successful implementation of open innovation in the context of global competition, developing smart ecosystems, and the pandemic. A discussion, which is primarily intended as a plea for the use of open innovation in the destination context, rounds off the article.

2 Theoretical Background: Open Innovation

Innovations play an important role in the development of increasingly fragmented and pluralistic societies. They are seen as drivers of economic development, which offer an opportunity for individual companies to remain competitive [13]. With regard to tourism, innovations are acknowledged to be a driving force for the entire tourism industry, especially in times of a crisis [14, 15]. Though, the degree of change an innovation can bring largely depends on the type of engaged transformational processes [16].

It is common to distinguish between close and open innovations. Closed innovation refers to the innovation process with all stages being performed within the boundaries of an organization [15]. Organizations traditionally carry out each step from the generation of ideas to the actual development of an innovative solution, its market launch, and distribution, on their own and with their own resources. The closed innovation concept is contrasted with open innovation. Chesbrough [17] defines an open

innovation as "…the use of purposive inflows and outflows of knowledge to accelerate internal innovation, and expand the markets for external use of innovation, respectively." Organizations could take an advantage of both internal and external resources, including new ideas about the innovative solution, resources for its implementation, and consequent positioning on the market [18]. The tasks of an organization's R&D department are, therefore, no longer limited to generating ideas themselves and developing them further. Instead, it is a matter of integrating new, external knowledge and expertise into the organization. It also becomes possible to share those ideas, generated within the organization, externally, or to combine internal and external resources [16]. The nature of innovation processes and the origin of resources, play a role in enabling the benefits of innovation strategy.

Depending on the nature of innovation processes and the origin of resources, it is common to distinguish between 3 different types of innovation models [9, 19]. An outside-in process allows to innovate by integrating the resources of external stakeholders. This may include external networking, integration of suppliers or customers in the design process, benefiting from external funds. An outside-in process can lead to an increase in the innovation capacity of the organization [11]. An inside-out process makes an organizational resource, including intellectual property and self-developed technologies, available to external stakeholders. This might refer to selling the result of research or technology development, sharing ideas with markets, or granting licenses. Lastly, the coupled process represents a combination of outside-in and inside-out processes. It can be achieved through strategic alliances with complementary partners, through joint ventures or co-patenting [19]. Hjalager & Nordin [20] give an overview of 16 practices of integrating external stakeholders into the innovation process. However, it is often difficult clearly to differentiate between the three types of open innovation [21]. The choice of the innovation process type, therefore, depends on the objective of engagement with external stakeholders.

Open innovation strategy facilitates new ways of meeting the abovenamed challenges with confidence. It allows to track down unknown sources of knowledge, and constructively integrate them into the innovation process [22]. First, it creates the opportunity to use external technologies and ideas than to generate them themselves and make them available to the ecosystem [23]. For DMOs, the open innovation strategy offers potential for aggregating ideas and using them as a starting point for the internal development of tourism services [24]. Accordingly, the added value of open innovation for destinations lies in acquisition of external knowledge [15]. Second, the open innovation strategy allows to intensify active participation of all interested stakeholders and enables them to participate in the design, development, and ultimately implementation of their "own" tourism service or product. This reduces costs and significantly increases fit-to-market. Third, open innovation and collaboration active collaboration between internal and external stakeholders inform them about each other, supporting marketing, the formation of a positive brand image, and the commitment to the DMOs [25–27]. Meeting the objectives of intensifying mutually beneficial collaboration, acquisition of new ideas and marketing, can be helpful for destinations in gaining a competitive advantage [18].

The benefits that the open innovation approach may provide, have triggered a paradigmatic change in destination management. More DMOs turn from the

conventional closed innovation process, which has been popular in the 20th century, towards an open innovation process. Thus, a range of DMOs, including the Vienna Tourism Board, Tirol Werbung, Salzburg State Board of Tourism, and Swiss Tourism Board, called for open collaboration to generate ideas to increase the destinations' competitiveness, revitalize tourism after the crisis while ensuring sustainable development of the regions [28–31]. However, the strategy of open innovation still lacks a comprehensive explanation in relation to benefits it can bring to a DMO [32]. Potentially, this prevents effective decision-making towards a specifics type of open innovation strategy and its efficient implementation.

3 Methodology

This study aims to identify the benefits of applying open innovation strategy by destinations. It applied the discussed types of open innovation as a framework to inform the research design and searched for common benefits of open innovation strategy. Since open innovation is still a relatively young research phenomenon in destination context, the study accepted a qualitative respectively exploratory research design [33].

Qualitative research must comply with the methodological principles of openness, flexibility, communication, reflexivity and explication. Furthermore, the process of research and subject under investigation should be considered [34–36]. In doing so, qualitative studies revolve around the question of what interviewees consider relevant, how they observe their world, and what characterises their respective lives. In this context, it is particularly important to understand what makes people act in a certain way in a social context, what dynamics this action triggers in the social environment and how this affects the way they (re-)act. Against this background, this qualitative study focused on societal anchoring of practice of human actions, social events and their developmental dynamics with the view attempt to feed this into a theorising understanding. Qualitative research was done to procure the materials that meet the above named requirements.

The data acquisition process was regarded as a communicative achievement in which the corresponding colloquial utterances and actions were interpreted based on understanding of the overall context of the research situation [37]. The study applied a convenience sampling approach to access the total number of 15 destination management experts with the relevant expertise [38] in the period 2018 to 2020. 13 of them were DMO executives from Germany, Austria, and Switzerland. 2 interviewees were the leading experts in the field of open innovation and worked as consultants in the tourism field. All of them have proven international experience and have completed open innovation projects. The contact to the interview partners was established via a snowball technique. The interviews lasted between 45 and 90 min and were conducted both in the offices of the interview partners and, with the beginning of the COVID-19 pandemic, via Skype. The interviews were conducted and transcribed in German. To ensure data validity, a back-translation to English, made by the interpreters with the relevant expertise, was conducted.

The research used semi-structured individual interviews to asked the experts to explain their motives of carrying out an open innovation project. Additionally, their

perceptions of the benefits that the DMOs have acquired have been collected. The questions used in the present study were adopted from the study by Storch and Pill-mayer [2]. The study then applied thematic coding principle to analyze the English version of the interviews. The themes were deductively derived from the conducted interviews. The coding was done with MAXQDA software, which is proven to be a reliable tool to ensure systematic content analysis of the tourism science context [2]. The identified themes were used to explore the common trends in the practices.

4   Findings: The Benefits of Open Innovation for Destinations

This section reports the results of the qualitative content analysis. Overall, most of the experts agree that the objective of applying the open innovation strategy lies in obtaining new knowledge and creative inspiration in the sense of thinking outside the box, especially in times of crisis. A crisis offers a paradigmatic opportunity to critically question everyday rituals and practices and to develop them further using suitable instruments. This aspect becomes especially important in the context of unexpected restrictions and new regulations that must be observed in the context of COVID-19. The impact of open innovation on external stakeholders including marketing and brand image plays a central role in the DMOs strategy. Active engagement of a large number of internal and external stakeholders is also confirmed to the advantageous for achieving the aim of the DMOs and the external stakeholders.

The study has identified a total of 9 benefits of applying open innovation approach by DMOs. Figure 1 summarizes all of them with the reference to the number of responses among the experts. It further demonstrates that each of the identified benefits

1 - Recruiting
2 - Destination brand image development
3 - Structure of the innovation process
4 - Identification with the result
5 - Participation
6 - Use of the idea for the tourist ecosystem
7 - Simple tool for generating ideas
8 - Wider range of idea generators
9 - Acquisition of external knowledge
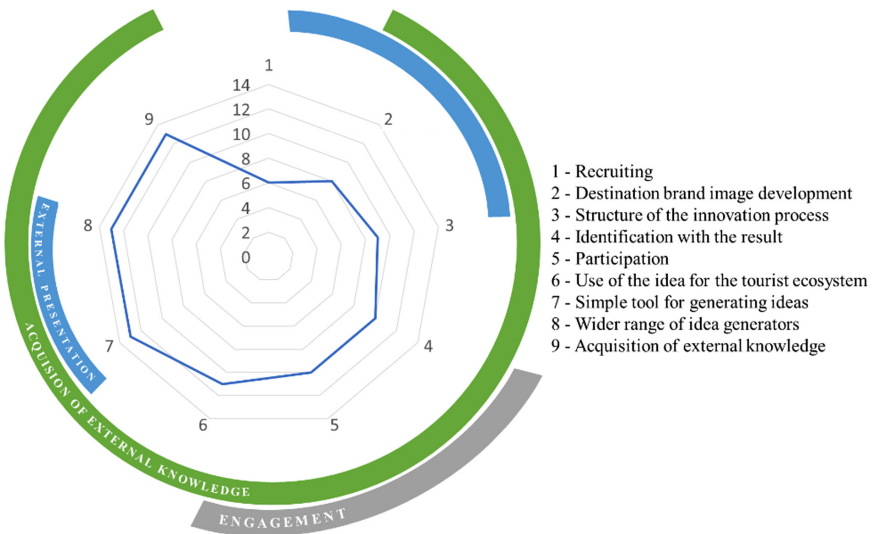
Fig. 1. Benefits of Open Innovation for DMOs

can contribute to more than one major objective of applying the open innovation strategy. The paper now proceeds with explaining those benefits within each of the three major objectives.

4.1 Acquisition of New Knowledge for Destination Development

The respondents see open innovation as an opportunity to gather external impulses and actively involve third parties in the development process. It is explained as a simple tool for generating new know-how and ideas (Fig. 1, Aspects 7, 8, 9). Accordingly, the aim of a DMOS is to obtain input from others and, above all, new input. This can be achieved by involving a larger circle of idea providers, who may not necessarily have tourism expertise, but who can provide new and possibly unconventional ideas. Several interviewees see great potential in involving people who are not rooted in the destination's ecosystem (Fig. 1, Aspect 6), but come from other sectors. The project manager of an open innovation project, which was one of the most successful tourism projects in Europe in 2018, sums up the added value in a nutshell:

"With open innovation, you broaden your horizon and come up with completely different ideas and possible solutions. That can also work well. With the limitations of meeting other people, this approach works quite well. I think that the strength of open innovation is diversity, on the one hand. That people with different backgrounds, different experiences, different knowledge contribute to their different skills. On the other hand, of course, the fact that I can contribute from my own living room at home via such a platform."

On the other hand, one hopes to receive more detailed ideas that more precisely meet the needs of the stakeholders (Fig. 1, Aspect 4). The consultant of one of the leading tourism consulting agencies in the German-speaking world, states:

"The decisive advantage is to get more ideas, more approaches, and more precise and detailed information about what exactly the clients and stakeholders actually want. To gain a deeper insight into their needs. To me, open innovation is basically about managing cross-border knowledge flows purposefully. Due to COVID-19, we cannot reach the customer in a conventional way. Clearly, that is a disadvantage. It's a different story with a digital solution where the customers feel that they are being taken along."

According to the experts, the involvement of tourists is a key added value for the development of innovations (Fig. 1, Aspects 2, 5). It enables destination management to gain the insights of those individual tourist needs, which they might not have articulated in a conventional way of customer feedback. One expert describes that open innovation offers their organization a good opportunity to involve customers on a large scale (Fig. 1, Aspect 2). They summarize the resulting added value as follows:

"What was positive in any case was that you can see what is important to the customer, especially with regard to hygiene and health standards. There was a lot there, we didn't even think about it because we are of course also in our bubble. When things are mentioned ten or twenty times, you notice that you have to look at them or it is important to address them. There were some good considerations."

Although some of the interviewees point out that many of the generated ideas may have been "not surprising", they emphasize that tourists' ideas and perceptions about their wishes are a great benefit for their organizations. Innovations that produce

personalized services, tailored to specific needs of the target groups, increase the fit-to-market and strengthens the organization's competitiveness (Fig. 1, Aspects 2, 3).

In summary, the experts see the added value of open innovation in the acquisition of external ideas. They conceptualize open innovation as a proven opportunity to involve a broader group of idea providers. In particular, they emphasize the involvement of guests and industry outsiders. The definition of the basic types of open innovation [9] show that open innovation is a process in which knowledge can diffuse in two directions. In particular, when open innovation has been used in the context of strategy development, the interlocutors can focus on further development of the ideas gained outside their own organization. The experts describe how open innovation strategy development gives stakeholders impulses for new projects, especially in the area of processes, services, and products, and how they can pursue these independently.

4.2 External Presentation of Destinations

The study reconfirms that open innovation projects are implemented with the objective of marketing destinations [39]. The tourism experts see open innovation as an opportunity for a positive public image of the destinations, especially in order to clearly differentiate themselves from competitors (Fig. 1, Aspects 2, 7, 8). The employee of a state tourism marketing organization emphasizes the benefits of an open innovation project for the external image of a destination:

> "I think that a relatively large marketing effect is involved. Firstly, the product we have created through open innovation introduces our destination and its various offers. In this way, we draw attention to what the region has to offer and sensitize to confidence-building measures. The Swiss colleagues have done this quite well with the Clean & Safe campaign, for example!".

According to the experts, a meaningful combination of an open innovation process with a marketing campaign can increase attention to one's own organization and its products. This, in turn, can raise the overall awareness of a destination (Fig. 1, Aspects 2, 3). A destination receives an opportunity to present itself as an authentic unit, which is open to concerns of existing guests and potential new customers. However, a destination and its individual service providers do not present themselves solely to their guests and new customers. Simultaneously, they are targeting future potential employees, especially in times of a shortage of skilled workers (Fig. 1, Aspect 1). Those service providers, who proactively involve their current or new employees, gain a strategic advantage [40, 41]. The innovation manager of one of the organizations also sees it this way:

> "At first glance, a mountain railway is not necessarily interesting for future employees, especially against the background of various doubts about climate change. We, therefore, launched an open innovation platform as part of a recruiting process and called on young people to think about how they would like to make our mountain railway operation sustainable. What were their ideas to keep it running in the next 10, 20, 30 years? Of course, this resulted in some crazy things, but we were able to see who had the analytical know-how and who was the best match for us in terms of mindset."

Apart from the attention, that such an unusual initiative attracts (Fig. 1, Aspect 2), open innovation can help DMOs to connect with young professionals. By using the

means of an open innovation platform, your people can address service providers in the tourism value chain and present themselves in a possibly creative way. The potential employer can check apart from conventional procedures such as interviews or assessment centers to see who is best suited to the company in the medium to long term.

4.3   Increased Degree of Engagement of Influential External Stakeholders

Another positive aspect, which is particularly emphasized by the participants in strategy development processes, is the degree of engagement that can be achieved through the open innovation process (Fig. 1, Aspect 5). In this context, the increasing appreciation of a product goes hand in hand with the participation of external stakeholders [18]. With the help of open innovation, a large number of stakeholders could be involved in tourism projects (Fig. 1, Aspect 6). This, in turn, is helpful for optimizing stakeholder management, as the strategy manager of a state tourism organization points out:

> "I see it as an opportunity to make tourism more inclusive again. How to enter into a discourse with all those who really participate in tourism and make a contribution to tourism. And how to present comprehensibility of the significance of what we are doing here, especially to many a critic. Because to me, that is the biggest challenge, even within the destination. That way everyone can get involved, everyone feels taken along."

Even though this aspect may not be directly aimed at creation of innovations, it does generate added value for the destinations. According to the interviewees, this happens due to the selected open innovation strategy. As a result of the high level of participation in the strategy development process, the experts describe that the outcome of an innovation is strongly identified with the participation of the stakeholders within destinations (Fig. 1, Aspects 4, 5, 6). External stakeholders are behind the strategy and show more commitment to the implementation of the individual points. One of the interviewees summarizes the advantages that the open innovation strategy development offers to a region:

> "So far, we have not done this in tourism, involving people on such a broad scale. At the beginning, people were quite critical of our project and distanced themselves from it. But it has now become a consequence, especially in terms of implementation: because we notice that the people we once involved want to continue to be involved. They really liked it, they thought that now we are being asked and that we must continue to work on it, that is our baby!".

It turns out that the involves external stakeholders affect the destination innovation strategies along the whole process rather than only at the development stage. Thus, a higher level of commitment can lead to increased loyalty to a product. The head of a development department for open innovation projects describes:

> "[The DMO] had the opportunity to actively involve guests and locals in the ski design process. The participants could choose and decide which one was the winning design. Specifically, cards with the designs of the three finalists were printed. The participants could mark their favorite design and send the card. So, the DMO had the opportunity to actively involve the participants and thus close this cycle. They could vote and decide which is the winning design and next season they had the opportunity to rent this ski in the ski rental and then ski with it on the slope themselves. This creates a completely different bond with my customers than would otherwise be possible. That's what I see as the decisive added value."

This statement in particular makes it almost paradigmatically clear, how co-design and the associated customer loyalty to the tourist product are realized. Locals and guests subsume the process as "their own product", which again gives it a completely new perspective on the tourist experience.

It becomes clear that the identified 9 benefits are interdependent. Each of them can influence the successful realization of several objectives that serve the reason for selecting the open innovation strategy over the closed one. Therefore, comprehensive planning to optimize the effect of the open innovation strategy for DMOs is required.

5   Discussion: The Potential of Innovation Management in Destinations?

Even though various industries have been making use of open innovation for some time now, the tourism industry still faces certain challenges in its application. The general tendency of a constantly changing complex competitive environment and increasingly divergent guest demands affect destinations. DMOs will face the need to open up to new options in order to co-create innovations. For the time being, DMOs often focus on short-term goals, including operational business and stake-holder management. In the context of constant time pressure and high-risk aversion, this leaves little time to address long-term strategic issues such as innovation management and related approaches. The pandemic revealed the unreadiness of DMOs to ensure competitiveness and sustainable collaboration between their stake-holders.

This study reconfirmed that open innovation strategy offers new opportunities for DMOs. This becomes especially important in times when the traditional dialogue with guests, locals, and stakeholders, loses its value. First, the open innovation approach creates an opportunity to generate ideas with the help of external knowledge. Chances lie in looking beyond the horizon and involving a larger circle of idea providers. External stakeholder, who are not rooted in the familiar ecosystem of the destination or DMOs, who have no expert knowledge, who come from other industries, and who, through their involvement, can raise completely new and sometimes, unusual aspects. Second, open innovations can lead to collaborative development of tourist services that are better tailored to the actual tourist needs of the respective target group. This ultimately increases the fit-to-market, especially against the background of sensitive issues in the context of hygiene and health. Furthermore, the targeted involvement of customers can increase customer loyalty to the destination and create positive marketing effects. Third, open innovation can be an effective means of involving more stake-holders. Increased involvement also means that stakeholders identify much more strongly with the outcome of the process and thus show more commitment in implementing the individual considerations. This is beneficial for both the guests, the stakeholders within a destination, and ultimately for DMOs. Importantly, the findings demonstrate that many of the benefits, derived from the open innovation approach, can contribute to several different objectives of applying open innovation approach.

The proliferation of smart tourism destinations may create a basis to boost open innovation approach. Smart destinations represent ecosystems of multiple players, including businesses, individuals and technology [3, 4]. In addition to interconnectivity

and interoperability of devices, smart destinations rely on mutually-beneficial collaboration between multiple stakeholders [4]. In this case, incorporating the open innovation approach in smart destinations may inform the logic of collaboration processes: outside-in, inside-out or coupled [42]. Open innovation approach may also inform smart destination planning by naming the possible benefits that may arise. Simultaneously, smart destinations may boost open innovation by enabling technical part. Thus, interconnectivity and interoperability enable multiple actors to contribute to DMOs with data, knowledge, ideas and other resources in order to co-create value [4]. Service personalization, which aims to tailor services according to individual real-time tourist needs and deliver it in the way and time, that are relevant for the target customer, is named among the revolutionary outcomes of smart destinations [43]. Smart infrastructure and established networks of smart destinations may serve as a background to intensify collaboration and mutual engagement of local community and tourists in a DMO and vice versa [44]. Importantly, the focus of technology-driven open innovation for DMOs partially aligns with the one, applied by travel businesses, which, among others, also aim to intensify collaboration and engagement between stakeholders and support the development of infrastructure [12]. However, the concept and technical solutions of DMOs has its specifics in comparison to other actors of smart tourism ecosystems. Moreover, they are constantly evolving, sometimes providing unexpected outcomes. Since open innovation projects nevertheless involve considerable effort, they must be strategically planned and professionally implemented.

Each DMO must individually weigh up the advantages and disadvantages of the approach in order to decide for itself whether it wants to take this path. One of the interviews consultants for open innovation highlights:

> *"There is no such thing as 'one size fits all'. It depends on the innovation challenge or the area in which I want to innovate. There is no 'all-purpose solution' for this. It has to be clear to everyone involved."*

Furthermore, the necessary mindset, associated with open innovation, often reaches its limits, as some stakeholders in destinations with resentment towards unusual approaches remain at a critical distance. The central challenge will be to break down and overcome these boundaries in order to raise awareness of the necessary innovations among destination stakeholders and to successfully exploit the opportunities offered by open innovation for destinations.

6   Conclusion

This paper explored the benefits of applying open innovation approach by destinations. It has identified a total of 9 benefits that arise for DMOs from this approach. The findings provide the evidence that these benefits enable destinations to meet at least one of the three key objectives of applying the open innovation approach, namely, to access external knowledge, to support the presentation of the brand externally, and to intensify engagement among key internal and external stakeholders of a destination.

The study contributes to the domain of destination management. The findings align with the more generalized concept of open innovation [9]. They also demonstrate that

the technology-driven open innovation strategies for DMOs may partially align with those, implemented by tourism businesses [12]. The developed context-specific insights deepen understanding of the potential of open innovation approach for DMOs and create a background to collaborative tourist recovery COVID-19 pandemic through smart destinations ecosystems. The study raises the question to what extent an open innovation and involvement of multiple stakeholders can represent an approach that develops tailor-made products for an international competitive environment, sustainably strengthens the competitive position in the international competition of destinations, and supports engagement with local communities through smart destination ecosystems. As a result, the findings provide conceptual background to the basic understanding of open innovation for destination management, including planned development of smart destinations and crisis management in the times.

The main limitation of the exploratory nature that this study took is the focus purely on the positive aspect of the open innovation strategy. Innovation in general and the incorporation of multiple stakeholders, who can influence the outcome of organizational activities, strips the organizations of control and increases the risks of failure [11]. Future research will focus on a deeper exploration of the open innovation strategy in one system with the threats, posed by it. Moreover, a roadmap of successful theory-driven practices on the incorporation of the open innovation strategy is also required.

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"Old" and "New" Media Discourses
on Chinese Outbound Tourism to Switzerland
Before and During the Covid-19 Outbreak.
An Exploratory Study

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Abstract. The paper presents an exploratory research focused on the themes concerning Chinese Outbound Tourism to Switzerland in the period from January 2019 to June 2020 including the Covid-19 outbreak. It analyses news media articles from Swiss-German print media covering tourism coming from China, including a visit by 12'000 Chinese travelers – an event extensively covered within Switzerland due to its exceptional number – up to recent times in which non-European tourists are almost absent from the country. The research aims at identifying the main themes being voiced in newspaper articles. It also tackles the themes mentioned in user-generated comments on Facebook on the same articles.

Keywords: Thematic analysis · Media analysis · Chinese outbound tourism · Visitor-host-relationship · Sustainable tourism · Tourism discourses

1 Introduction

Chinese Outbound Tourism (COT) is an important tourism source market for many destinations globally [1]. For Switzerland, COT has great potential because of its high growth rates, the absolute number of guests arriving and their daily spending [2, 3]. In fact, between the years 2005 and 2016, the flow of tourists from China to Switzerland grew by about 560% with regards to the number of overnight stays and about 700% with regards to the number of arrivals [2]. Moreover, studies have identified a notable willingness amongst Chinese citizens to visit Switzerland and a generally positive perception of the country, because of its natural beauty and offer in prestigious luxury goods [4, 5]. By now, Switzerland has hosted guests coming from mainland China for many years, with some noteworthy events taking place, such as the incentive trip of a group of 12'000 Chinese employees, offered by the American direct selling company, Jeunesse Global [6], in May 2019. This resulted in three groups of 4'000 members travelling around Switzerland visiting different destinations one after the other. Notably, one destination they visited was Lucerne, which was extensively covered in Swiss media. According to Switzerland Tourism [7] the trip generated approximately "170 media reports, with over 64 million media contacts". However, if in the past a major

upcoming trend within tourism had been the emergence and growth of the COT market, Covid-19 and the lack of international tourists at destinations [8], has potentially impacted narratives and discussions around the topic.

The study of trends, motivations, attitudes and behaviors of tourists travelling to different destinations is a popular research topic within the field of tourism, and naturally this also accounts for COT [9–12]. However, the following exploratory study aims at adding to the research on COT by considering a different perspective. Moreover, it is part of a bigger project exploring the public discourse around COT to Europe in Western mass media and on social media before and after the COVID-19 outbreak. The findings of this project could serve the sustainable and responsible reestablishment of international tourism coming to Europe. It is important to understand that the research is not about Chinese thought, culture or politics, but rather the view on COT in Western media and on social media. Moreover, the "consolidation of news coverage with user-generated content in social media" [13, p. 14] will add to tourism research concerning the topic of "host-tourist-relationships".

For a first step, the focus of this exploratory study is mainly on Swiss-German media outlets and the articles published about COT in weekly and daily print newspapers. Next, the user's opinions that are being expressed about mainland Chinese tourists on the social media platform Facebook in reaction to the images portrayed by the selected media articles are examined. The research question that this study wants to answer is the following: *what kind of themes emerge within the Swiss-German mass media coverage on COT and on social media?* For the context of this study, COT involves all the activities that citizens of the People's Republic of China undertake while traveling to and staying at destinations outside their country of residency for more than one night. Regarding the Swiss mass media landscape, it is notable that, even though the country is small in size with small cantons, it has a high newspaper density if compared to other countries and is furthermore characterized by a strong regional orientation and multilingualism [14, 15].

2 Literature Review

2.1 News Media Analysis and Tourism

Media analysis deals with media products like news media and analyzes their constructions of meaning, structures and aesthetic form [16]. It verifies or falsifies the general statements of media theory and media historiography by examining them in relation with a concrete subject [16]. The importance of news media analysis in tourism research has been widely acknowledged in terms of the agenda setting effect of mass media on public opinion formation [17] about tourism, as well as understanding tourism impacts, which influence tourism development and governance [18, 19]. Studies can range from the discussion and analysis of the media's role in influencing the formation of destination images [20, 21], producing important insights around topics such as "overtourism" by applying methods such as content or thematic narrative analysis [22, 23], to employing frame analysis for the identification of main frames regarding the online news media discourse on the "Golden Week" policy in China [24].

A noteworthy example for the media analysis of COT is the study by Hao et al. [13], who applied news media sentiment analysis, computing the general sentiment regarding mainland Chinese tourists covered in over 70,000 newspaper articles published in Hong Kong from 2003 to 2015, validating the results with typical socioeconomic factors and key socioeconomic events that occurred.

2.2 Analysis of UGC and Tourism

User generated content (UGC) is the "content that is produced by users of… [a] medium rather than by media professionals" [25]. This also includes comments posted publicly on social media. In the last decade, a major stream of research in tourism has focused on the analysis of UGC from a visitor perspective, quite often concentrating on online travel reviews, including works of hospitality research [26–28]. According to Marchiori and Cantoni [29], these UGC represent instances of published opinion (not public opinion overall) about a specific topic. This can then influence how a destination or tourism service provider is perceived or UGC shape travel decisions of others [30]. In their review of 122 scientific articles, with the earliest published in 2001, Lu and Stepchenkova [31] concluded that the research revolves mainly around the topics of (1) "service quality", (2)"destination image and reputation", (3) "experiences and behavior", (4) "the persuasive power of UGC" (e.g. for eWOM), and (5) "tourist mobility patterns". In terms of methodology, content analysis of textual UGC was employed the most. An example regarding COT and UGC analysis is for instance the work published by Hu et al. [4] investigating the reputation of Switzerland as a tourism destination on the Chinese microblogging platform Sina Weibo, again focusing on a demand perspective in tourism. What seems to be missing from the literature are studies on UGC and tourism from the "local" perspective, however future studies on this seem to have been suggested [13], but not notably published [31].

3   Methodology

In order to tackle the above stated research question, for this kind of preliminary study, it was decided to apply the method of thematic analysis [32], defining major themes that occur in the articles about COT. This kind of analysis does not give results on opinions expressed in the text, the structure of arguments, nor does it give any kind of indication on the effect of or intention behind the texts that have been analyzed. These can only be hypothesized on, by for instance, contextualizing the results with the troves on news value theory [33–35].

3.1   Sample Building

To kick off the research, it was decided that the newspaper articles that should be analyzed should come from the weekly and daily newspapers with the largest circulation numbers in Switzerland. The preliminary study presented here is on Swiss German media, which address the biggest linguistic region within the country. The statistics on the circulation numbers were taken from the 2019 WEMF "Swiss press

circulation bulletin" which summarizes the data from 01.04.2018 until 31.03.2019 [36]. Of those newspapers only those that are present on at least one of three commonly used social media platforms in Switzerland: Facebook, Instagram and/or Twitter were selected. The presence on these social media platforms is essential for the next research steps of the overall project. Finally, one last requirement of selection was the newspaper's presence on the research and business information tool, Factiva (www.factiva.com). In the end, eight Swiss-German daily (*20 Minuten*, *Die Südostschweiz*, *Tages-Anzeiger*, *bz – Berner Zeitung*, *Luzerner Zeitung*, *St. Galler Tagblatt*, *Blick* and *Neue Zürcher Zeitung*) and three Swiss weekly newspapers (*SonntagsZeitung*, *Sonntags-Blick*, *NZZ am Sonntag*) were selected (n = 11).

3.2   Corpus Selection & Data Cleaning

The period chosen to select the corpus was from 01.01.2019 to 30.06.2020 (in total 18 months). This ensured that the event of May 2019 of 12.000 visitors from China visiting Switzerland and the outbreak of Covid-19 were covered. In order to find content covering COT, the keywords "China" and "Tourism" (in German language) were used in Factiva. In total, 457 articles were found published by the eleven sources, once duplicates had been removed. Next, the first round of data cleaning followed. Only if COT constituted at least 50% of the concerned article, it would be considered as a dominant topic and the article would be kept within the sample. Articles in which tourism was, for example, only mentioned as an industry suffering because of Covid-19 and China was not mentioned in relation with tourism were excluded. In the end, the database amounted to 60 articles. Interestingly, one newspaper (*Sonntags-Blick*) did not seem to have published any article where COT was considered a dominant topic.

For comparative reasons it was decided to also search the number of articles only mentioning the keyword "China" (in German language). One can see that the combination of "China" and "Tourism" takes up a rather small amount of mentions in comparison to articles just mentioning "China". "China" and "Tourism" are mentioned in 3,4% (n = 457) of the sample only mentioning "China" (n = 13.320). Moreover, after the data cleaning only 13,1% (n = 60) out of the articles mentioning "China" and "Tourism" (n = 457) made it into the final sample.

Furthermore, the frequency of the mentions of the words "China" and "Tourism" over the selected time frame of 18 months (in this case with duplicates, n = 487) was considered. Interestingly, one can observe three peaks where the words "China" and "Tourism" were mostly mentioned: the first in May 2019 (in total 42 mentions), the second in July 2019 (in total 32 mentions) and the last in February 2020 (in total 69 mentions). It is striking that May 2019 was the month when the 12.000 visitors from China visited Switzerland, whereas February 2020 was two months after Covid-19 had been officially announced by the World Health Organization, and when daily cases in the Western Pacific reached their first peak [37].

In a second step, the articles were traced back to the Facebook pages of the concerned media outlets. This could be done by manually researching the articles on the different Facebook pages of the media outlets. Facebook was selected as the first platform to collect UGC because it is a frequently used social media platform in Switzerland. In December 2019, 3,5 million users logged into Facebook in Switzerland

[38]. Considering that the number of people living in Switzerland in 2019 was 8,606 million [39], 3,5 million Facebook users would amount to roughly 41% of the population. When checking the Facebook page of the media organizations in the sample (on 05.09.2020), the number of followers ranged from 555,633 (*20 Minuten*) to 8,477 (*NZZ am Sonntag*). Notably, not all of the word-for-word versions of the printed articles could traced back online, yet, the main topics of the online articles and the print articles were the same. As an example, a post about the article on the case of 12.000 tourists by *20 Minuten* (print) published on May 14, 2019 could not be found online on the Facebook page of the organization. However, around the same time, two posts directing to online articles about the same topic were published.

Facebook posts by news media organizations are published online and publicly accessible for any entity with a Facebook account. Nonetheless, for privacy and legal reasons, usernames or profile descriptions of the "commentators" were not included in the data collection and are hence not part of the analysis. Furthermore, in this study, user comments were never replicated word for word, but their content was paraphrased. For the purpose of this study, only two posts about articles, which were posted in their "original" print form, from the two "highest" peaks of *frequency of mentions* were selected to be presented further. This was done to put emphasis on the qualitative methodological approach of the study and underline its exploratory nature. Furthermore, both articles deal with subjects related to the city of Lucerne, which was also frequently mentioned in the media discourse surrounding the visit of 12'000 Chinese tourists visiting Switzerland in May 2019. Issues such as the discrepancies between the publication of print and online versions of articles (as described above) are still to be solved and currently represent significant issues in terms of the generalization of results.

The first post was about an article that was published on May 24, 2019 by the *Neue Zürcher Zeitung* concerning "the case of 12'000 visitors to Lucerne" published after the event occurred (14.05.2020). It was concurrently published on the newspaper's Facebook page (254.585 followers by 05.09.2020) on May 24, 2019, and received 71 reactions (likes, dislikes etc.), 73 comments and 12 shares (until 05.09.2020). For the analysis, only the first level of user generated comments was considered, while the comments to the comments were excluded. In total, 32 comments were analyzed.

The second post was about an article that was published on February 8, 2020 by the *Luzerner Zeitung* with a headline indicating that Chinese tourists were not present on one of the city's main attractions (a square). Concurrently, a post about the article was published on their Facebook page (31.783 followers by 05.09.2020); it received 524 reactions, 223 comments and 51 shares. In total, all 52 first-level comments were analyzed.

3.3   Thematic Analysis

Thematic analysis can be considered a basic method of qualitative text analysis and is used in this context as an exploratory and descriptive approach [32]. As a category-based method the text was analyzed according to different themes, which are presented to the reader [32]. Moreover, according to Kuckartz [32, p.70] thematic analysis is a "method that reduces content". For this study, after the data was cleaned, the text was

thoroughly read. Afterwards an inductive theme building approach followed. The first number of categories derived from this stage is rather rough and manageable. In a next step, the main categories are divided into sub-themes. In this study, this process is shown by the in-depth description of the analysis of the two articles chosen to exemplify the research. Moreover, a theme was coded as major if it was described in at least one third of the article. In order to collect, highlight, code and analyze the different articles, the qualitative data analysis software nVivo was used. Figure 1 (see below) shows the sequential process applied, which was based on Kuckartz [32, p.70].
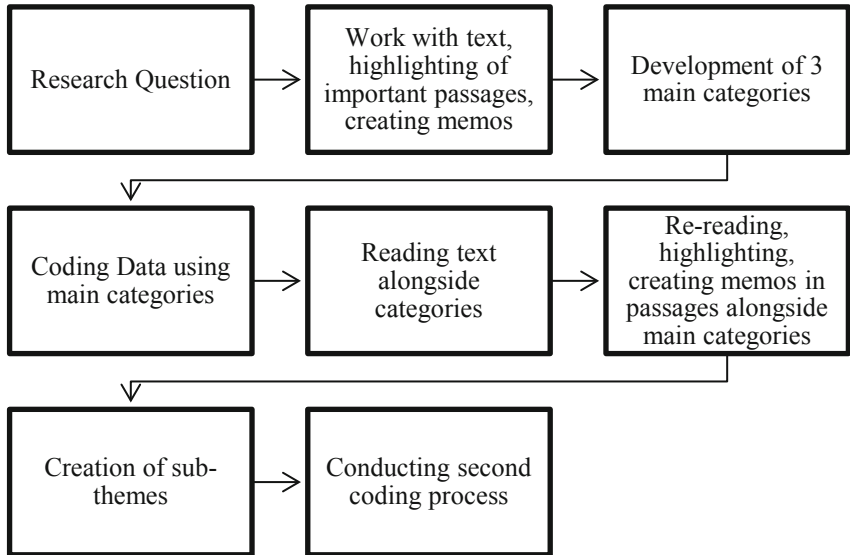
Fig. 1. Coding Process based on Kuckartz [32, p.70]

This process was first applied to the 60 selected news media articles. In a second step, the user-generated comments of two articles on Facebook were coded using the same process. The description of the results is presented hereafter.

4 Results

For the 60 articles three umbrella categories emerged: *economy*, *environment* and *behavior*. The text passages analyzed can range from very descriptive to more opinionated sections, depending on the kind of article, newspaper or author. Examples for them can be found below in Table 1 and 2. The passages have been translated from German into English by the author. Moreover, a passage can also be assigned to two or more themes.

Economy references are about the impact or effect of COT on local, regional, national or international economy. This can include the enumeration of economic figures, discussions around spending capacity, description of shopping behavior etc.

Environment references concern the impact and effect of COT on regional, national and international environment. They can include the discussion on specific ecological issues but also the wearing out or over usage of urban and rural infrastructure (e.g. topic of overtourism).

Behavior references describe one or many specific tourism behaviors supposedly assigned to Chinese tourists. This can include stating facts on group tour behavior or simply the itinerary, the enumeration of facts on group sizes but also the reproduction of specific stereotypes. Here it is important to remember that these descriptions are made by individual journalists and represent their views, not the ones of the authors of this paper.

For this preliminary study it was possible to identify references for all three categories, however the category "environment" seems to be less discussed. It was only possible to identify a small amount of references to this theme and only in two articles it was coded as a major theme.

4.1   Themes Mentioned Before the Covid-19 Outbreak

For the article published before the Covid-19 outbreak, the reporting is dominantly about *behavior* and *environment*. No references to *economy* could be identified. Table 1 (see below) depicts the sub-themes that arose through further analysis. The article is also concerned with the "overtourism aspects" when it comes to COT to Switzerland.

Regarding the analysis of UGC on Facebook, more sub-themes emerged. Nonetheless, with the material derived from Facebook there were also specific types of comments emerging from the corpus, which need specific mentioning since they were excluded from the analysis. These were (1) "tags" linking other users to the post. Presumably, this is done by one user to make another user pay attention to the content of the post; (2) "Incomprehensible comments", meaning that the linguistic content of the comment could not be identified by the authors (e.g. unclear spelling, unknown language); (3) "Links" are comments that are not about COT per se and therefore not part of the research question. An example is a comment remarking that tourism in Switzerland is better than "asylum abuse"; (4) "Author Comments", which are comments by the organization that published the post about the article (e.g. giving a correction, providing further details, tagging another article related to similar topics mentioned in the article). (5) "Other", which refers to comments that require a specific cultural repertoire to understand its meaning, being of exceedingly high interpretative nature, which might harm the reliability of coding. An example of this is a user quoting Goethe's 1797 "The Sorcere's Apprentice", not giving any more context (Source: Facebook, @nzz 2019).

In general, regarding the most dominant theme within the UGC, the comments relate to the environmental impact of COT, mostly concerned around the subject of *pollution* and *overtourism*. *Pollution* is a sub-theme that includes all references of COT and its impact on environmental pollution (e.g. air, land etc.). References can be made

to CO_2 emissions caused by flying to Europe or using buses as transportation means. The environmental comments are followed by comments regarding tourism *behavior* where one new sub-theme called *characteristics* emerged. The sub-theme concerns specific mental, moral and cultural qualities users assign to Chinese tourists. An example of this would be the comment of a user stating that the residents prefer intelligent Chinese guests over guests coming from Arab countries. In this case, the user seems to assign Chinese visitors the attribute that they are intelligent, in comparison to other visitor segments. The implicit meaning of these kinds of statements will be further analyzed when discourse analysis will be applied. Comments regarding the economic effect of COT are not absent from the corpus of UGC but appear less frequently than comments on the other to sub-themes.

Table 1. Themes & Sub-themes Article *Neue Zürcher Zeitung*

Theme	Sub-theme	Description	Example (Source: *Neue Zürcher Zeitung*, May 2019)
Behavior	*Group tours*	References to group tours, their size, travel itinerary, typical routes, typical behavior or the demographics assigned to group tourists coming from China etc. In contrast to this would be any kind of reference to individual travel behavior by Chinese tourists	"A total of 12,000 employees of the cosmetics company Jeunesse Global were piloted through Switzerland in three waves. Apart from Lucerne, the group visited other hotspots such as the Rhine Falls in Schaffhausen and the Aare Gorge"
Environment	*Overtourism*	References to overcrowding, congestions or simply mentioning the word (e.g. in title) etc.	"Many locals feared that this rush would lead to congested streets and traffic jams"

4.2 Themes Mentioned Since the Covid-19 Outbreak

For the article published after the Covid-19 outbreak there is a dominant reporting on the economic impact of COT on the tourism industry (or better how the lack of COT will impact the Swiss tourism industry). Moreover, there are references to the tourism *behavior* of Chinese visitors, mostly referring to "typical group tour behavior" that existed before the Covid-19 outbreak. References on *environment* are less poignant. Table 2 (see below) shows the sub-themes that have emerged for the specific article.

All three main categories that emerge when speaking about COT could again be identified in the user generated comments on Facebook. Users are again discussing the environmental impact of COT to a destination like Lucerne, mostly commenting regarding *pollution* and *overtourism*. References to *overtourism* often speak of the lack

there of. An example for a comment regarding *pollution* states that a terrible virus like Covid-19 can have positive effects and that the climate benefits from it, thanks to the limited mobility of millions. The environmental comments are discussed most dominantly, which are then followed by topics relating to economic impacts of COT, specifically, when it comes to the impact of COT on the national tourism industry in comparison to the local industry. The comments posted underneath this article relating to tourism behavior of COT are less discussed in absolute terms. This presents a difference to comments published before the COVID-19 outbreak. Moreover, there seem to be more comments linking to other topics that are not related to COT to Switzerland, for example, commenting on the nature of the Swiss tourism industry in general.

Table 2. Themes & Sub-themes Article *Luzerner Zeitung*

Theme	Subtheme	Description	Example (Source: *Luzerner Zeitung*, February 2020)
Economy	*Shopping*	References to specific shopping habits/behavior/preferences or facts assigned to Chinese visitors etc.	"We expect a massive cut in the mechanical watches popular in China in particular, says co-owner Robert Casagrande"
	Economic impact	References to impacts of COT on local/regional/national economy etc.	"The host shrugs its shoulders. 'What shall we do? We are currently experiencing a 70 to 80 percent drop in sales,' the man says"
Behavior	*Group tours*	See description above.	"(…) where otherwise tourist busses drive up every minute and women and men from Asia busily get in and out"
	Covid-19	References to the effects of the Covid-19 outbreak on COT and local destinations etc.	"Lucerne currently presents itself quite deserted. This since the Chinese government stopped group travel to Europe because of the corona virus"
Environment	*Destination image*	Reference to the effect of COT on the destination image etc.	"The picture seems almost idyllic. Lucerne currently presents itself quite deserted"
	Overtourism	See description above	". . . untenable conditions by bus traffic. . ."

5 Conclusions

The results of this preliminary study show that there are three major themes that can be identified within the public discourse around COT in "old" and "new" media. Moreover, sub-themes of these three major topics can be found in articles and UGC on social media. Interestingly, so far there seem to be differences of the dominance of themes and sub-themes addressed in the mass media and addressed in the comments reacting to the articles on social media. All in all, Fig. 2 (see below) shows all the themes and sub-themes that have emerged from the analysis of the two articles and their UGC, no matter the time frame (before or during Covid-19).
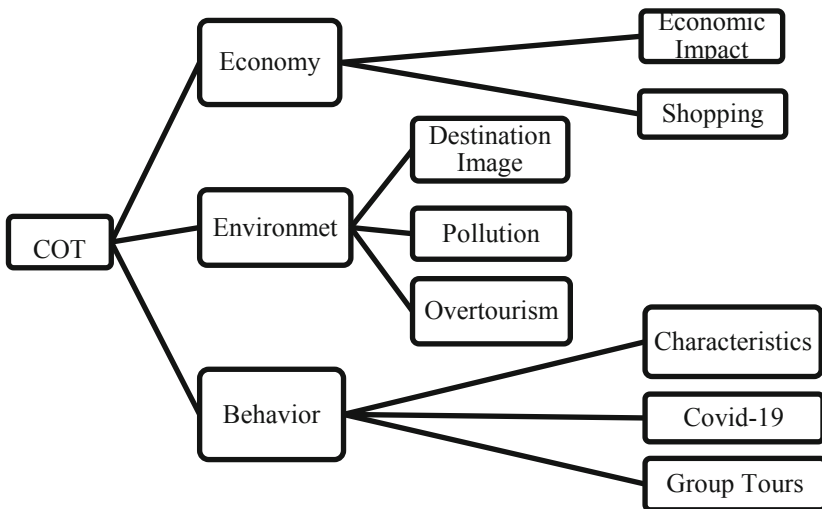
Fig. 2. Themes & Sub-themes

In the past years a major emerging topic within tourism has been so-called "overtourism". The results of this preliminary study show that the issue is not only a topic for researchers and policy makers but has become a hot issue within the public debate and that Covid-19 has dramatically impacted such discussions. The question that also arises from this research is: how are we planning on dealing with so-called "undertourism"?

Due to the preliminary nature of the empirical research, it has clear limitations regarding selected time frame, sample size, scaling and possibility of generalizing its results. Moreover, given that daily and weekly press has different editorial proposals, the authors are considering in future studies to separate these media outlets due to the nature of their publication frequency. The reason why they were considered as part of a single material in this study was due to the selection of newspapers based on their distribution numbers and not publication frequency. Additionally, quantitative methods will potentially also be integrated within this research (e.g. text mining using R) to enable an analysis of much larger corpora.

Nonetheless, the exploratory identification of major themes is crucial for the broader context of the research project related to the analysis of the public discourse around COT to Switzerland, because, in the end, these collected blocks of thematic references will serve as the basis for the critical analysis of different sentiments, narratives and arguments presented in the public discourse about COT to Europe. Of course, due to the current pandemic, it is unclear when and to what extend COT will return. Nonetheless, the authors believe that this kind of research will contribute to the "responsible and safe restart of tourism" [40], pushing for new findings in the field of "tourism-host-relationship" research, which will not only benefit academia but should present important results for any kind of political or private stakeholders that are concerned with the sustainable development of the tourism industry in Europe.

All kinds of stakeholders in the tourism sector (including DMO's) could greatly benefit from the results of this kind of research because even though they will not show the opinions of their locals, they will show which kind of narratives (including racist stereotypes), might currently polarize parts of the public agenda and, that could influence public opinion on tourism and COT. The knowledge gained from this research project should not only help to put in place the right kind of communication strategy to tourists but maybe even more importantly to the locals, minimizing stereotyped views, especially after Covid-19.

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A Model to Predict Users' Intentions to Adopt Contact-Tracing Apps for Prevention from COVID-19

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Abstract. Technological advances are increasingly progressing and have brought unprecedented solutions for real-world problems for various domains, particularly, when it comes to a health-related domain. This study aims to examine the predictors of users' intentions to adopt contact-tracing apps for prevention from COVID-19. Based on the extended unified theory of acceptance and use of technology (UTAUT2), our research model incorporates the following eight constructs: performance expectancy, effort expectancy, social influence, facilitating conditions, perceived privacy, perceived value, safety and accuracy. The empirical results were obtained from a sample of 93 questionnaires (currently still in course). We used the partial least squares approach to test our hypotheses. The results reveal that performance expectancy has the strongest impact on the intentions to use contact-tracing apps. The accuracy, effort expectancy and social influence are also important, followed by perceived value, safety and perceived privacy. Facilitating condition is listed as much less important. The theoretical and managerial implications of these results are discussed.

Keywords: COVID-19 · Contact-tracing apps · Intentions to use

1 Introduction

The novel Corona Virus Disease (COVID-19) outbreak was declared by the World Health Organization as a global emergency on January 30, 2020. It is one of the major public health threats the humanity has faced over the last century.

Countries all over the world have tried to manage this challenging situation. Solutions implemented have been lockdowns, closing of borders and social/physical distancing, among others. However, these solutions have led, in most cases, to major socio-economic problems. Many jobs have been lost, the workforce of almost all economic sectors has reduced, the daily life has been dramatically disrupted, and frustration has increased among people [1]. However, this will not guarantee that the spread of the disease will stop once these measures are removed.

Therefore, new insights have been thought to track the pandemic and keep in quarantine only the infected people and those that came in contact with. This is the case of contact-tracing apps (CTA) that are considered as an important tool for measuring, preventing and reducing the spread of infectious diseases such as COVID-19 [2].

CTA have begun to gain attention from academic researchers. However, most of the available researches are focused on features, content, and technical characteristics [3]. Therefore, available studies have not analyzed users' behavioral intentions to use these types of applications.

Given their importance in preventing and stopping the spread of COVID-19, this paper seeks to develop a comprehensive model to examine the predictors of users' intentions to use CTA. In this study, we have adopted the extended unified theory of acceptance and use of technology (UTAUT2).

2   Literature Review and Development of Hypotheses

2.1   Contact-Tracing Apps

CTA are mobile applications that can be installed on smartphones. CTA use the Bluetooth technology that helps to detect the nearest devices which had contacts with the infected individual's device. The Bluetooth technique operates by exchanging random tokens between the apps installed on smartphones of nearby people (i.e., less than two meters) and for a certain amount of time (i.e., 15 min or more). These tokens do not show the individual's identity and are time-varying strings (i.e., every 10–20 min) for more privacy protection. The tokens are also sent to a central database of health officials, without private information of the users (e.g. GPS location). If later someone tests positive for COVID-19, the health officials will ask the infected person to release its data on the app (i.e., all the tokens the app has received from all nearby phones). Then, the app sends alert to the apps of those that the infected person has been in contact with and invites them to follow the required safety instructions [2].

As the adoption of CTA has given satisfactory outcomes in China and South Korea, more and more countries tend to use these types of apps once the lockdowns are lifted. For example, "TraceTogether" in Singapore, "Immuni" in Italy, "WIQAYTNA" in Morocco, and "Radar COVID" in Spain, among others.

2.2   The UTAUT2 Model

The UTAUT was developed as a summary of eight technology acceptance models. UTAUT first proposed four constructs and four moderators. Venkatesh [4] further added three constructs and extended UTAUT to UTAUT2 to study the intentions and usage of technology in a consumer context.

UTAUT2 has been widely used on researches studying user adoption of technology in various contexts such as health and fitness apps [5]. We will now explain each of the constructs that form part of UTAUT2, and how we tailored them to suit the purpose of our study.

Performance Expectancy (PE). Performance expectancy is defined as the degree to which using a novel technology can bring benefits to users in performing particular activities [4]. This construct has proved to be a strong antecedent in consumer apps adoption studies [5].

Effort Expectancy (EE). Generally, users prefer a technology that responds to their needs with less effort [5].

Social Influence (SI). Social influence refers to the degree to which users perceive that important people (i.e. friends, family and colleagues) to them believe that they should use a technology [4]. Studies on apps have confirmed a positive relationship between social influence and usage intentions [6].

Facilitating Condition (FC). Prior studies on the acceptance of apps [6] revealed that user's perception of facilitating conditions (i.e., to be in possession of the resources and support to use a technology) directly influences the behavioral intentions to use a technology.

Furthermore, we will not include in our model the following three UTAUT2 constructs: hedonic motivation, price value, and habit for many reasons. First, CTA are conceived to help in preventing from the spread of COVID-19. Thus, there is no hedonic aspect as in games. Second, CTA are developed by authorities and they are free of charge. Therefore, price value does not suit our purpose. Third, habit refers to the degree to which consumers tend to use a particular technology. As this is an emerging pandemic, people are not used to use these types of apps.

However, we believe that there are four specific drivers of usage intentions tailored to the context of CTA for preventing from COVID-19. We will explain them in the following sub-sections.

Perceived Privacy (PPRI). Despite the wide use of apps for different contexts, the data privacy poses a threat to use and the continuous intentions of usage [7].

Perceived Value (PVAL). When consumers perceive that the benefits received outweigh the sacrifices, they may consider that the app is worthwhile and thus will adopt it [8].

Safety (SAF). Safety is considered as a key factor toward the use or continuous usage of apps specifically those dedicated for health care [9].

Accuracy (ACR). When users were not confident about the accuracy of the data, they tend to not adopt the app or abandon the use after their initial interaction [10].

3 Methodology

Due to the required safety instructions that have been applied by several countries worldwide, we conducted an online survey in English and French version. All items were measured by a 5-point Likert scale regarding the level of agreement, a total of 34 questions to test the constructs. The questionnaire also comprises general information

of respondents (i.e., gender, age, approximate average daily use of apps, education level, and country of residence).

The target population is smartphones' users in general. Data are in progress of being collected, having started in July 2020. A total of 93 responses have been collected up to now.

We used the structural equation model (SEM) with partial least squares (PLS) method and PLS-Graph Software Version 3.3.2., to test the hypotheses and analyze the measurement and structural model. In our case, we used reflective measurement scales, since all indicators of a construct are interchangeable.

The sample size of 93 responses is considered appropriate for a proper PLS-SEM analysis (i.e., we used the "10-times rule", 10 times the largest number of indicators used to measure a construct within the model).

4   Findings

4.1   Measurement Model

The results show that the convergent validity is confirmed, since all of the indicators have indicator reliability values that are close to the preferred level of 0.7 for an exploratory research. All values of composite reliability are larger than 0.6. Thus, demonstrating high levels of internal consistency reliability among all reflective latent variables (LVs). All of the average variance extracted (AVE) values are greater than the acceptable threshold of 0.5.

Additionally, all constructs have Cronbach's alpha values above 0.6, showing that all dimensions exhibited internal consistency. Furthermore, the discriminant validity is well established, since the square root of AVE of each LV is larger than the correlation values included in the row and column of such variable.

4.2   Structural Model

Based on Fig. 1, hypotheses H1–H8, which predicted a positive relationship of the intentions to use CTA for prevention from COVID-19 were verified with significant evidences at the level of $p < .001$.

The Stone-Geisser's (Q2) is equal to 0.744, thus confirming that the measurement model is adequate and that the structural model has a large predictive relevance for the usage intentions of CTA.

The coefficient of determination, R2, is 0.874 for the usage intentions endogenous LV (see Fig. 1), which means that 87.4% of the variance of usage intentions is explained by the eight LVs (PE, EE, SI, FC, PPRI, PVAL, SAF, and ACR).
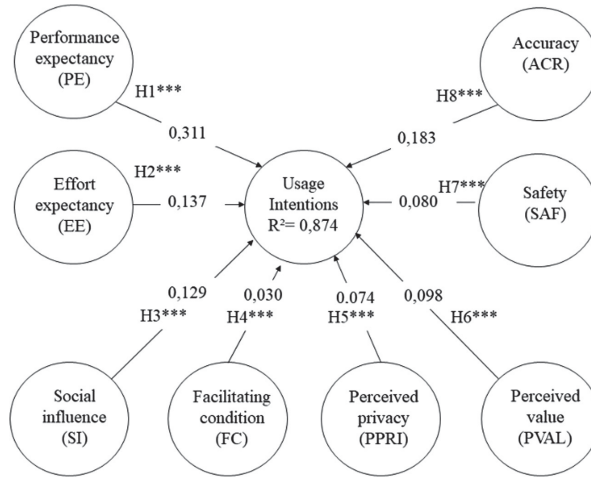
Fig. 1. Estimated causal relationships in the structural model

5 Conclusions

The purpose of this study is to examine the predictors of users' intentions to use CTA for prevention from COVID-19. We tested the impact of eight factors: performance expectancy, effort expectancy, social influence, facilitating condition, perceived privacy, perceived value, safety and accuracy, currently using a sample of 93 users' responses.

The major conclusion of this study is that the main factor that impacts the intentions to use CTA is the performance expectancy, which means that the expected benefits from using CTA could increase users' intentions to adopt these types of applications. The accuracy, effort expectancy and social influence are also important, followed by perceived value, safety and perceived privacy. Facilitating condition is listed as much less important.

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A Comparison of Hotel Guest Experience Before and During Pandemic: Evidence from Online Reviews

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Abstract. This paper compares the determinants of guest experience at luxury hotels in Mainland China before and during the pandemic—COVID-19. In particular, 740 Chinese reviews posted before the pandemic outbreak, and 1283 reviews posted during the pandemic were collected. Text analytics were applied to segment and count the frequency of words in these online reviews. The results show that the core dimensions of guest experiences at luxury hotels include services, room quality and settings, hotel facilities, dining, location, and environment. These core dimensions do not change regardless of the period before or during the pandemic. However, guests have higher expectations on hotel services such as late check-out and delivery service of takeaway during the pandemic. Online reviews amid-pandemic also contain words related to pandemic prevention and control measures, such as guest traffic and body temperature. Suggestions on operations and management are provided for hotel practitioners to improve their services during the critical period.

Keywords: COVID-19 · Pandemic · Guest experiences · Hotel · Online reviews

1 Introduction

Most, if not all, industries have been facing unprecedented challenges since the outbreak of the Novel Coronavirus (COVID-19), and tourism has been the hardest hit among all [11]. The United Nations World Tourism Organization [20] estimated a 98% drop in international tourist arrivals in May 2020. According to STR [19], China has experienced a slump in tourism demand and a 20.6% decline in domestic tourism revenue in year 2020. Besides, the overall hotel occupancy in China has decreased by 89% from early to mid-January and the overall revenue per available room witnessed a year-on-year drop of over 85%.

Crisis affects the macro-environment and brings about changes in customer behaviors and hotel performances [3, 18]. The outbreak of COVID-19 may have

brought about changes in guest experiences at hotels [8, 25]. Customers normally describe their experiences and emotions after their hotel stay in the form of user-generated content, such as online reviews [1]. Therefore, online reviews are frequently used by practitioners to understand the nature and structure of guest experiences, thereby devise useful reactive strategies [20].

Hotels are customer-centric that should keep up with customer preferences and requirements. Thus, it is essential to track the potential changes of guest experiences caused by the impact of COVID-19. In view of that, this study seeks to reveal the differences in guest experiences at luxury hotels before and during the pandemic as reflected in the online reviews posted in those two periods. A text analytic approach is used to transform unstructured data and identify factors in online reviews to compare the determinants of hotel guest experiences before and during the pandemic. The results of this study will offer practical suggestions to hotel managers to develop effective operational and marketing strategies to improve guest experiences at luxury hotels during the challenging situation. Future research opportunities are also provided.

2   Literature Review

2.1   Hotel Guest Experience and Online Reviews

Guest experience refers to the cognitive and affective responses derived from the interactions between the guest and a product or service [10, 21]. It is co-produced by service providers and consumers [5]. Xiang, Schwartz, Gerdes Jr, and Uysal [22] identified 80 guest experience-related words, including room, quality, and service. Knutson, Beck, Kim, and Cha further identified the guest experience dimensions by developing a four-factor model of Hotel Experience Index (HEI) [14]. The 18-item index consists of four dimensions, namely environment, accessibility, driving benefit, and incentive [14]. According to Xiang et al. [22], guest experience is used to measure hotel guest satisfaction. Satisfaction with and repurchase of a hotel product may be driven by a set of attributes, such as staff service quality, room quality, amenities, value, and security [6].

With the popularity of sharing experiences through online platforms, online reviews represent a legitimate source for hotel managers to understand customers' evaluations of hotel service and products [15, 22]. Research on textual reviews in hospitality mainly focus on identifying the hotel attributes and sentiments expressed in the reviews [e.g., 7, 12] and examining the relationships between specific attributes in the textual reviews and the overall review ratings [15, 16]. Comparisons of hotel attributes and guest experiences are mainly done among different hotel guest segments [12] and hotel types [1]. Hong et al. [13] found out that guests placed more emphasis on natural and safe experience associated with the bed & breakfast (B&B) after COVID-19, and provided practical suggestions for the industry to survive the disaster, such as avoid using central air-conditioning and adopting semi-self-service technologies. The current study contributes to existing literature by identifying the changes in hotel guest experience and its determinants before and during a pandemic situation.

3   Methodology

3.1   Data Collection

Online reviews were collected from the luxury hotels in Shanghai for two reasons. First, Shanghai is one of the top destinations in Mainland China, with 8.94 million tourist arrivals in 2018 [4]. The large number of visitors fueled the development of the hotel industry in the city [24]. Second, Shanghai has swiftly overcome its semi-lockdown amid the pandemic, unlike the other worst-hit cities, which was under full-lockdown for over one month, such as Wuhan. As a resilient tourism destination, Shanghai shows signs of recovery in March 2020 and has even become the most popular destination in Mainland China after going through the peak of the pandemic in May 2020 [17]. Thus, data before and during the pandemic are more readily available for luxury hotels in Shanghai, considering that travel activities are still present during the pandemic.

Online reviews for 20 luxury hotels in Shanghai that were posted from August 2019 to July 2020 were collected using Google Sheets in August 2020. These 20 hotels were randomly selected based on the list of luxury hotels in Shanghai that is available on Ctrip. Mainland China announced the lockdown measures to control the spread of COVID-19 around the country in late January 2020 [2]. Thus, online reviews posted from August 2019 to January 2020 are categorized into the pre-COVID-19 group (740 reviews), while those posted from February 2020 to July 2019 are in the amid-COVID-19 group (1238 reviews). There is a significant difference in the number of reviews between these two periods. A closer look into the distribution shows that a very small amount of reviews has been posted in September and October 2019 before the outbreak of the pandemic. However, a lot of reviews have been posted in June and July 2020 during the pandemic. This suggests that consumers have a higher motivation to share their experiences with and help the others amid-crisis.

3.2   Data Analysis

The online reviews were analyzed using the Chinese Text Analyzer software, which helps to perform segmentation and frequency count of the words. The authors then reviewed and verified that all retained words are related to guest experiences with hotel, i.e., both the tangible and non-tangible aspects of hotel products [22]. In the first step, frequency analysis using the Chinese Text Analyzer generated a list of words describing hotel guest experiences. In the next step, the primary coder reviewed each word and combine synonyms together (e.g., "writing desk" and "table", "hygiene", and "cleanliness"), so as to reduce the number of words. At the same time, words that are irrelevant to hotel guest experiences were eliminated. This iterative coding process seeks to establish a dictionary of terms relevant to hotel guest experiences. The manual coding was done with reference to other similar research [1, 23].

4   Findings

4.1   Comparison Between Pre- and Amid-Pandemic

A total of 3,558 and 5,034 words have been segmented from the pre-pandemic and amid-pandemic online reviews respectively. Table 1 shows the proportion of each identified determinants in hotel guest reviews both before and during the pandemic. The results show that the core determinants of hotel guest experience are the same in both periods, and they include services, room quality and settings, hotel facilities, dining, location, and environment. All these six factors have been mentioned more than 10% in the online reviews of the sampled luxury hotels in Shanghai.

The proportions for these factors are similar in the pre- and amid-pandemic periods, except for services. Hotel guests mentioned much more about services during the pandemic (21.8%) compared to the time before (17.3%). A closer look at the review content shows that the significant rise in the proportion of reviews describing the service dimension is mainly due to two items, including check-out time and takeaway services. A few reviews mentioned that the hotel actively offered late check-out during the pandemic. For example, "*The hotel management is very nice, they extended the check-out time for us without extra charges. Superb*!" On the other hand, some guests stated that the hotel does not help with delivering the takeaway that they have ordered. For example, one guest mentioned *"Overall the hotel is nice, the facilities are smart, but they refused to help send the take-away up to the room. They should improve on this service."*

As anticipated, the proportion of reviews mentioning about health measures increases from 0.8% before the outbreak of the pandemic to 3.2% during the pandemic. Words that most frequently appeared in the online reviews related to this dimension include *guest traffic* (59 times), *pandemic prevention and control* (46 times), and the *impact of pandemic* (24 times).

Table 1. Frequencies of hotel guest experience determinants before and during pandemic

Determinants	Words	% (pre)	% (amid)
Services	Service, check-in, check-out, reception, manager, employee, takeaway, courier, deposit, attitude, waiting, integrity, turn-down	17.3%	21.8%
Room quality and settings	Air-con, power, charging, refrigerator, dressing room, hair dryer, floor, carpet, trash, walls, desk, bed, room, size, design, pillows, fan, smart, heating, windows, clean, appliances, balcony, TV, speaker, mirror, wardrobe	17.7%	16.1%
Hotel facilities	Spa, parking, fitness, children's playground, facilities, entrance, public toilets, lobby, event, signs, show, meeting rooms, billiard, sauna, steam, robots, waterpark, activities, swimming pool, lawn, greening, garden, internet speed, shuttle, elevator, singers	14.8%	13.9%

Table 1. (*continued*)

Determinants	Words	% (pre)	% (amid)
Dining	Café, executive lounge, bar, drinks, restaurant, meals, food	10.9%	11.6%
Location	Transportation, location surroundings, nearby attractions, peripheral facilities, surrounding scenery, convenient, beaches, lake, road, farm	12.5%	10.9%
Environment	Humidity, noise, quiet, atmosphere, environment, smell, mosquitoes, soundproofing, scent, view	10.4%	10.3%
Value/price	Price, discount, upgrade, value for money	6.7%	5.8%
Health measures	Guest traffic, COVID-19, body temperature, pandemic safety, impact of the pandemic, pandemic prevention and control, isolated hotel, carry-on code, central isolation	0.8%	3.2%
Bathroom	Drainage, clothes hanger, water, bathing, washing, bathrooms, towel, shower, toilet	3.3%	2.5%
Amenities	Disposable supplies, ice, coffee machines, gifts, slippers, fruit, bath products, toothbrush and toothpaste, birthday, anti-mosquito, drinking water, tableware, mask	2.8%	2.4%
Hotel design	Hotel size, feel, style, color, hotel decoration	2.7%	0.4%
Management	Membership, member discount, management, policy	0.1%	0.3%
Safety & privacy	Privacy, safety, security, risk	0.1%	0.2%
Maintenance	Works, repairs, maintenance	0%	0.1%

5   Conclusions

5.1   Implications

The findings of this study reveal that most dimensions of guest experiences at luxury hotels, including room quality and settings, hotel facilities, location, environment, value/price, bathroom, amenities, and hotel design, show a minuscule decrease in frequencies, whereas the remaining determinants, conversely, show an increase. What is worth noticing is that "services" show an increase in proportions, indicating that hotel guests expect to receive additional services, such as delivery service of takeaway and late check-out services amid-pandemic. Besides, guests become more concerned about whether the hotel is taking preventive measures and control during the pandemic, such as controlling the number of guests at the hotel, measuring body temperature. This can be explained by the fact that people are more concerned about public health and personal safety during the pandemic. Social distancing prevents the virus from further spreading [9]. While it is important for hotels to maintain their standard quality of products and services as usual, hotel managers may provide more proactive or even extra services to guests during this critical period. As reflected in this study, offering

late check-out and assisting with the delivery of takeaways may maintain customers' perceived service quality of the hotel. In order to reduce interactions between service employees and guests, robots may be used to take and delivery takeaways and room services to guestrooms. Furthermore, self-service kiosk and express check out services may be offered to reduce the waiting time of guests, thereby avoid gathering large crowds at the hotel lobby. Any measures taken by the hotel in preventing the pandemic should be carefully communicated with hotel guests on the hotel websites or during the booking stage, so as not to create any inconveniences during the service experience.

5.2   Limitations and Future Research

The findings of this study are based on descriptive analysis of online reviews from 20 luxury hotels in Shanghai. The focus on luxury hotels and small samples size may limit the generalizability of the findings. Besides, ratings and sentiments in the online reviews have not been considered. Nevertheless, this study sheds lights on the potential differences in hotel guest experiences caused by the outbreak of the pandemic. Future studies may build on the idea of this study and expand the scope of the study to include all luxury hotels, or even all hotels across different categories in Shanghai and other cities of China. The dictionary developed in this study may be used for machine learning so that a larger amount of reviews may be analyzed. Analysis on the ratings and sentiments in the review text may be performed to reveal further insights into the differences in guests' sentiments before and during the pandemic.

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How COVID-19 Impacts Chinese Travelers' Mobility Decision-Making Processes: A Bayesian Network Model

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Abstract. The outbreak of the COVID-19 pandemic has a multi-faceted impact on the mobility of travelers. Current research has not yet explained the internal mechanisms of travelers' mobility changes during the pandemic. The Bayesian network is considered to be an effective method to describe the causality between the factors and output of a system. Thus, this paper established a Bayesian network model to analyze the impact of COVID-19 on Chinese travelers' mobility decision–making processes. The model for the traveler mobility decision-making process is built on both a qualitative and quantitative analysis of travelers' self-narration articles. Results show that official information, traffic information, family structure, and social interaction networks are the key factors affecting Chinese travelers' mobility.

Keywords: COVID-19 · Traveler mobility · Decision-Making process · Bayesian network model

1 Introduction

The large scale of travelers' flow has been a major risk during the COVID-19 pandemic. Travelers' emotions and mobile behaviors have become more changeable and anomalous, even resulting in disorder flow or chaos due to fear and uncertainty. Some factors that impact travelers' mobility decision making during the COVID-19 pandemic include government policies (e.g. border closures), accessibility (e.g. flight cancellations), and social media information. In addition to such general factors, *family and culture* are influencers that are particularly found in Chinese travelers' mobility patterns. Since the COVID-19 outbreak in China happened during the Chinese Spring Festival—the most important traditional festival in China, when people are expected to return to their hometowns—Chinese travelers' mobility decisions are not only affected by their own needs but also their families, customs, and morals. Therefore, it is interesting and significant to explore the decision-making process concerning Chinese travelers' mobility during COVID-19.

Travelers' mobility and decision making have always been hot topics in tourism research [1, 2]. Current research has demonstrated that the traveler mobility decision-making process is complex, determined by a wide range of factors stemming from the

economy, sociology, geography, and psychology [3]. Thus, it is still a challenge to predict how travelers' mobility behaviors and their underlying mechanisms will change. Undoubtfully, COVID-19 will impact travelers' mobility decisions, but how?

Certain studies have constructed spatiotemporal diffusion models to reveal the relationship between public flow and the spread of disease [4]. Some have discussed the impact of the epidemic on traveler mobility behavior, thus revealing particular abnormal mobility behaviors [5, 6]. However, most of the existing research has been based on epidemiological statistics, which may visualize the general flow while failing to explain the underlying mechanisms. Moreover, current research has not explained the behavior changes of heterogeneous travelers during the pandemic.

To fill the gaps, this study used the Bayesian network method to establish a causal model of Chinese travelers' mobility decision-making processes during the COVID-19 pandemic and identify key influential factors.

2 Method

2.1 Data Collection

We collected 60 non-fictional self-narration articles released on WeChat—one of the most popular social media platforms in China—from Jan. 28, 2020, to Jun. 4, 2020. In these sampled articles, the authors recalled and stated their mobility routines from Jan. 18, 2020, to Mar. 31, 2020. This exact time period covers the outbreak and spread of COVID-19 in China [7], including two important Chinese traditional festivals: the Spring Festival on Jan. 25, 2020 and the Lantern Festival on Feb. 8, 2020. This period is typically a peak of mobility for Chinese travelers because it is a traditional custom for Chinese people to return to their hometowns during the Spring Festival until the Lantern Festival. Thus, it is interesting to reveal how Chinese travelers negotiated information about the pandemic, travel risks, and cultural customs in their traveling decisions. These articles involved 63 individuals' mobile behaviors in total, including 24 men and 39 women. In accordance with their publication time, the self-narration articles were divided into two sample sets, with 30 articles each.

2.2 Bayesian Network Model

The Bayesian network is a directed acyclic graphical model that represents the probability dependence between variables [8]. Bayesian network modeling consists of the following steps: (1) Structure determination. We used NVivo 12 software to code the self-narration articles in Sample 1 to identify the elements and topics that affect travelers' mobile decisions. Then, cross-comparison was conducted by the three authors to discuss and recode the inconsistent codes. Finally, we identified the specific relationship between the elements and themes and constructed a directed acyclic network structure. (2) Parameter determination. We used GeNIe software to draw a Bayesian network model. Then, we employed experts to assign the initial conditional probability. (3) Parameter learning. We coded the elements in Sample 2 in accordance with the coding rules as Sample 1 to establish a quantitative data set. Then, based on the

Bayesian network built in Step 2 and the quantitative data set, we used the EM algorithm method to adjust the model. (4) Sensitivity analysis. We used sensitivity analysis to evaluate the Bayesian network model and identify key influential factors.

3   Bayesian Network Modeling

3.1   Structure Determination

Six main factors and 16 specific nodes were identified to construct a Bayesian network model of travelers' mobility changes (Table 1).

Table 1. Variables of traveler mobility changes

Factors	Variables	Variables States
Information Sources	Official Information	Departure place, Destination, Channel, Other places
	Word of Mouth	Cyberspace, Physical space
	Traffic Information	Yes, No
	Epidemic Information	Yes, No
Social Environment	Destination Environment	Relatives and Friends, Traveler, Residents
	Departure Place Environment	Relatives and Friends, Traveler, Residents
Personal Factors	Family Structure	Core, Stem, Joint
	Habits	Personal, Family, Social
	Prior Knowledge	Experience, Knowledge
	Social Interaction Network	Close, Distant
Emotional Experience	Emotion State	Positive, Negative
	Emotional Arousal	High, Medium, Low
Decision Process	Decision Orientation	For Self, Others, Group
	Risk Perception	Severity, Susceptibility
Behavior Outcome	Mobility Behavior	Increase, No Change, Decrease
	Self-Protection Behavior	Increase, No Change, Decrease

Information Sources. After the outbreak of COVID-19, complex and uncertain information directly and immediately affected travelers' mobile decisions, resulting in sudden route changes. For example, *"...a friend sent me a road closure notice in Tianmen, Hubei. Out of intuition, I decided to pack my things immediately, set off after New Year's Eve dinner, and returned early."*

Social Environment. Social environment is a relatively stable external influence in mobile decision making [9]. However, during the COVID-19 pandemic, the social environment deviated from the normal state, making it difficult to predict. The mobile

behavior of travelers is influenced by—and sometimes contended with—the social environment and Chinese culture. For example, *"According to the custom of my hometown, we must visit our relatives and friends on the first day of the first lunar month. My uncle did not think it necessary to be so careful (regarding COVID-19), while my mother stood firm on her principles and refused to let anyone visit her."*

Personal Factors. Previous experience, family structure, social interaction networks and customs are the main personal factors that affect traveler mobility. Travelers' previous experiences not only affect their risk perception but also arouse their previous emotional experience, consequently strengthening self-protection and impacting mobility decisions. For example, *"...those experiences (during SARS) are vivid. So, I... cancelled my wife's and children's train tickets and returned to Wuhan alone."* Travelers also consider their family structure, customs, and relationships when making decisions. For example, *"When the elderly pass away, it is an especially important and serious custom for relatives to worship on the first day of the new year. A sudden cancellation is too abrupt. I dare not make that decision."*

Emotional Experience. Most sampled travelers experienced negative emotions during the COVID-19 pandemic with a high or medium level of emotional arousal. Panic and worry are the driving forces leading to sudden changes of travelers' mobility behavior. For example, *"There are two old people and one young child in my hometown. What are their conditions? These worries have made me restless for several days. On January 22, I returned home from Shenzhen alone."*

Decision Process. The decision-making process includes two factors that are key in ultimately determining if and how the mobility decision changes: decision orientation and risk perception. Travelers show different attitudes and preferences when they make decisions taking various aspects into consideration [10]. For example, *"COVID-19 became serious at the time, and I felt that traveling to the UK might cause discomfort to the locals to some extent, so I asked for a refund for my ticket."*

3.2 Parameter Learning

Combining both expert assignments and quantitative data, we assigned the confidence of the original parameters to 30, equal to the sample size. Then we used the EM algorithm method to conduct parameter learning to accommodate the missing data. Genie2.0 was used for Bayesian network parameter learning. Finally, a Bayesian model was built to simulate travelers' mobility decision-making processes (Fig. 1).
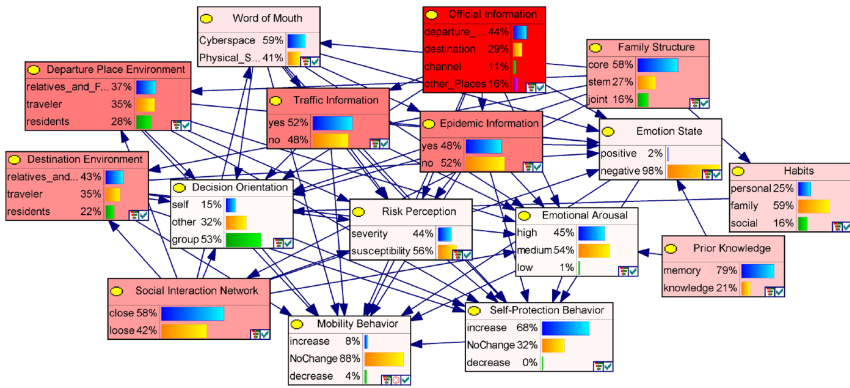
Fig. 1. The Bayesian network model and sensitive analysis of travelers' decision making

3.3   Sensitivity Analysis

Since the travelers' decision-making behaviors are affected by multiple factors, sensitivity analysis was used to explore the influence of each factor (set) and then figure out the most important ones. Figure 1 showed that information sources are the most important factor impacting changes in travelers' mobility behavior. Among them, official information has the highest sensitivity value, which means that travelers' mobility behavior is highly sensitive to the official information released. Social environment and personal factors also greatly impacted traveler mobility.

Further, we drew a sensitivity tornado of the increased and decreased states of mobility behavior and compared the sensitivity of each factor (Fig. 2). The top five factors (set) that may enhance the possibility of travelers to change their mobility include official information, departure place environment, family structure, traffic information, and social interaction network. While the official information from the destination may decrease the possibility of travelers increasing their mobility, official information from the departure place might enhance the possibility of travelers reducing their mobility.
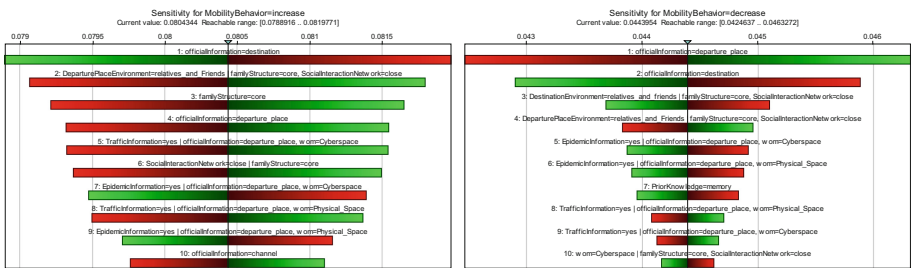
Fig. 2. Sensitivity tornado of mobility behavior

4   Conclusions

This research constructed a Bayesian network model to simulate Chinese travelers' mobility decision-making processes during the COVID-19 pandemic. The Bayesian network is widely applied to explain highly complex phenomena and decision-making processes. Results show that official information, traffic information, family structure and social interaction networks are the key factors (set) affecting the mobility of travelers. In addition, information sources and social environment not only directly affect the changes of travelers' mobility, but they also have indirect effects through travelers' decision processes and emotions. As a result, Chinese travelers' mobility decision-making processes are not only influenced by information about the pandemic but also culture, customs, and morals.

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Examining Post COVID-19 Tourist Concerns Using Sentiment Analysis and Topic Modeling

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Abstract. The COVID-19 pandemic has had a destructive effect on the tourism sector, especially on tourists' fears and risk perceptions, and is likely to have a lasting impact on their intention to travel. Governments and businesses worldwide looking to revive and revamp their tourism sector, therefore, must first develop a critical understanding of tourist concerns starting from the dreaming/planning phase to booking, travel, stay, and experiencing. This formed the motivation of this study, which empirically examines the tourist sentiments and concerns across the tourism supply chain. Natural Language Processing (NLP) using sentiment analysis and Latent Dirichlet Allocation (LDA) approach was applied to analyze the semi-structured survey data collected from 72 respondents. Practitioners and policymakers could use the study findings to enable various support mechanisms for restoring tourist confidence and help them adjust to the 'new normal.'

Keywords: Tourism supply chain · Emotions · Lexicon-based approach

1 Introduction

Travel and tourism are among the most affected sectors due to the worldwide outbreak of the COVID-19 pandemic. According to United Nations World Tourism Organization (UNWTO), the sector which witnessed an unprecedented decline of around 98% in international tourists in May 2020, compared to the same time last year, is likely to face a drop of up to 1.1 billion international tourists and US$ 1.2 trillion in revenues in 2020, putting 100 to 120 million jobs at risk [1]. Many countries, especially those most reliant on travel and tourism revenue, are implementing a wide range of measures for the reopening of the tourism economy and stimulate the recovery of the sector [2]. However, considerable challenges remain ahead, starting with the unknown duration of the pandemic itself and the global economic recession.

While immediate measures such as lifting travel restrictions, adjusting or simplifying visas requirements, and cutting tourist taxes could support the sector in the short term, for the long-term recovery, it is critical to restore consumer confidence and rebuild demand. This is because, although the COVID-19 started as a physical health crisis, there is growing evidence that COVID-19 is having a profound detrimental effect on the mental health of the general population, including tourists, which needs to be

addressed urgently [3, 4]. The impact of the pandemic on people's mental health, especially fear of falling ill and dying, fear of infecting others, anger, and anxiety are extremely concerning and may have a far more significant and lasting impact on the tourists' intention to travel. Hence, we must develop a critical understanding of tourist sentiments and concerns across the supply chain so that various support mechanisms can be put in place for restoring tourist confidence and rebuilding demand.

This formed the motivation of this study, which aims to examine tourists' sentiments and concerns across the tourism supply chain starting from the dreaming/planning phase to booking, travel, stay, experiencing, and departure. The specific objectives are as follows:

1) To understand the emotions related to tourist concerns through sentiment analysis.
2) To identify common topics of concern for the different stages in the tourism supply chain using Latent Dirichlet Allocation (LDA) approach.

In the next section, the research methodology adopted in this study is detailed. The findings are discussed in section three, with the final/concluding section covering the implications and suggestions for future research.

2 Research Methodology

The primary data was collected from participants belonging to different nationalities using qualitative, semi-structured surveys (an ideal tool for exploratory research) using Qualtrics. The survey link was sent to participants via email. The questions focused on capturing tourists' COVID-19 concerns during the phases of the tourist supply chain. The final data set for analysis included 72 responses from participants from nine countries, of which 64% was male, and 36% was female. In line with our research objectives, Natural Language Processing (NLP) using sentiment analysis and the LDA approach was applied for analyzing tourist concerns across the different phases of the tourism supply chain. Previous studies have shown that applying both sentimental analysis and LDA on the dataset provides rich and meaningful insights on public opinion [5]. Figure 1 explains the research methodology and its procedure.
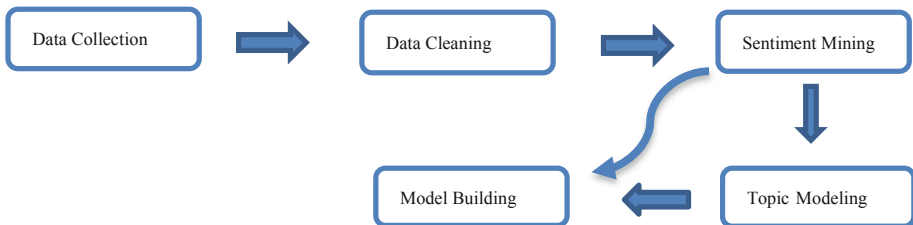
Fig. 1. Research methodology

The survey data was first cleaned to remove stop words, meaningless characters such as HTML tags, punctuation, numbers, and emoticons. It is important to understand the tourist concerns and their associated emotions. Sentiment analysis can help us understand the polarity (negative or positive) or the extent of emotions (joy, anger, and others) in a language, and it was used to uncover the various hidden emotions (related to concerns) of tourists [6, 7]. A lexicon-based approach, which involves calculating the sentiment from the semantic orientation of words or phrases that occur in a text, was used for sentiment analysis [8]. Each response for the questions in the survey was considered as a document in the dataset, and then analysis was performed for each of those responses. The lexicon-based emotion analysis package "syuzhet"- which is available in R (Version 3.6.2), was used for identifying the emotions contained in each response. Although both positive (e.g., trust, joy) and negative emotions (e.g., anger, fear) could be computed, given the focus of this study was to explore the concerns expressed by the tourists, only negative emotions were considered. The count of specific emotions in a comment was used for the analysis.

The next objective was to uncover the distinct themes/reasons in the tourist concerns. Topic modeling encompasses different algorithms that process text data to identify dominant themes based on the similarity of co-occurrences of the words [7, 9]. This research uses the Latent Dirichlet allocation (LDA) algorithm for topic modeling because of its ability to control the number of words and topics so that an empirical model can be developed. One of the prime objectives of this exercise was to understand if there are a few dominant topics in the dataset corresponding to each of the travel phases. Microsoft Azure Machine Learning Studio software was used for the LDA analysis.

3   Results and Discussions

This section discusses the results of sentiment analysis and topic modeling.

3.1   Tourist Emotions (Sentiment Analysis)

The five negative emotions, namely anticipation of uncertain/undesirable events, fear, sadness, anger, and disgust hidden in the tourist concerns related to different phases of the tourist supply chain was computed and ranked. The rank of emotions across each supply chain stage is given in Fig. 2.
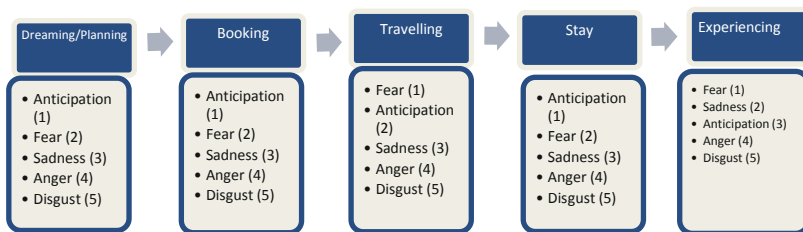
Fig. 2.   Results of sentiment analysis

As seen in the figure, the emotions related to anticipation of uncertain/undesirable events (ranked 1st in dreaming, booking, and stay phase) and fear (ranked 1st in traveling and experiencing stage) dominate the tourist concerns across the different stages of travel. The anticipation of uncertain/undesirable events was mostly attributed to the dynamic changes in the travel rules and regulations in different countries, such as changes in quarantine rules. In the words of one of the respondents, *"Changes in quarantine restrictions to and from the destination is a concern."* Similarly, in the words of another participant, *"I would never book without being fully sure that I could travel. Will the country remain open? Will I be able to return home?"* Emotion of fear was mostly related to the fear of getting infected/re-infected and infecting others. People are mainly worried about their safety and that of their loved ones. In the words of a participant, *"Fear of catching infections at the airport as it is the main hub where you tend to be around people from different parts of the world."* This is mostly in line with the findings of World Economic Forum [10].

3.2   Key Tourist Concerns (Topic Modeling)

Table 1 presents the topic modeling results based on the bi-gram analysis under LDA.

Table 1. Topic modeling results.

Travel Stage	Topic 1	Topic 2	Topic 3
Dreaming/Planning	Planning with restrictions	Technological Assistance during COVID Travel (Quarantine, Tracking, etc.)	–
Booking	Cancellation and refund concerns	Availability of convenient flights and hotels	–
Traveling	Security and Safety	COVID protocols	Fear of Getting Infected
Staying	COVID Hygiene	Access to Facilities nearby	–
Experiencing	COVID Situation at the Destination	Weather and Health Facility	–

Planning to travel while restrictions are still in place and relevance of technology (or lack thereof) such as smart COVID-19 applications such as contact tracing to detect nearby cases emerged as the two distinct concerns during the dreaming/planning phase. The latter further reiterates the significance of technological advances in improving tourist experiences. Cancellation and refund issues and availability of flights to destinations and hotels are the main concerns that worry people in the booking phase. For the travel and stay phase, the majority of the concerns are related to COVID protocols, hygiene, health & safety, availability of good accommodation, restaurants, COVID

testing facility, PPE kit in flight, etc. For instance, one of the participants mentioned the following concern *"How good is the hotel sanitation and cleanliness. How trained is the staff at the hotel to deal with COVID19 related issues?"* The concerns in the experiencing phase are mainly related to the destination itself, such as the social distancing measures in place, the number of active cases in the destination, and the availability of decent healthcare facilities in case of any infection. In the words of one of the respondents, "*Reaching the location, I would concern about the measures the country employs to prevent the spread of the virus and how strict the people in that country are aware of and comply with those measures*." Some of these tourist concerns topics identified are similar to the ones specified in the recent COVID-19 tourism literature [11, 12].

4   Conclusion

The preliminary findings of this study provides insights into the tourists' post-COVID-19 travel concerns. Given the heightened uncertainty in the tourism sector due to the pandemic, the study provides valuable insights for practitioners and policymakers to gauge better and manage tourist confidence levels, perception of travel as a risk, and any changes in their preference and behavior. Moreover, the study is timely as countries are faced with challenges of containing the second or third wave of spread and, at the same time, manage the reopening of the tourism economy [2]. Primary research on tourist sentiment analysis and modeling the tourist concerns during COVID-19 could prove to be an important tool in both assessing and monitoring the recovery of the industry. However, given the early stages of the paper, there are limitations. The small sample size of the study limits the generalizability of the findings. Also, the concerns were understood only from tourist perspectives, and concerns of other stakeholders were not considered. Future studies could adopt a multi-stakeholder approach. Further, future research could attempt triangulating the primary findings using secondary data such as from travel websites and social media.

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Enhancing the Visitor Experience in the Time of COVID 19: The Use of AI Robotics in Pembrokeshire Coastal Pathway

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Abstract. AI and Robots represent a major innovation opportunity for the tourism sector, and their potential impact and application offer several new opportunities to enhance and develop the visitor experience. Nevertheless, there has been limited academic research on the use of robots, together with a limited number of destinations embracing this technology. Focusing on the Pembrokeshire Coastal Path, this research paper outlines how a multi methodological approach could be utilised to examine the use of AI and robotics in helping to enhance the visitor experience during the ongoing COVID-19 pandemic. The researchers anticipate that outcomes from such a study could not only provide theoretical contributions in the area of addressing concerns about accessibility in tourism and leisure settings, but also serve to inform both academia and the wider tourism industry to the benefits such technology can have towards enhancing the visitor experience within social distancing parameters.

Keywords: COVID-19 · Visitor experience · AI and robotics · Accessibility · Wales

1 Introduction

The tourism industry has found itself operating in most unprecedented times, where the challenges of yesterday are compounded by the outbreak of global pandemic. This means a lot of destinations, particularly the ones which rely on tourism as a substantial percent of the economic outputs, fight not only the relatively short to mid-term effects related to COVID-19 travel restrictions but also long-term problems of underfunding, seasonal trade variations, attractiveness and inclusivity.

Pre COVID-19, both the Welsh and UK Economies considered tourism as a foundation sector for growth, with the overall tourism value in Wales rising from £4.5bn to £6.3bn in 2017 [4]. Tourism's impact was never more evident in Pembrokeshire, an area of Wales (see Fig. 1) known for its historical legends, walking trails and international sporting events. Tourism in Pembrokeshire is highly seasonal and generates over 75% of its trade during the months from March to October [4]. Unfortunately, funding for tourism has 'flatlined' [4], with the tourism economy being brought to stop due to the COVID-19 pandemic in March 2020. This regrettably

coincided with the beginning of the busy tourism season. Thus, the indirect impacts from Brexit funding cuts and over-night closure of all tourism during the pandemic has decimated the local industry which ultimately could take several years to recover, due to both travel restrictions and social distancing regulations [6, 21, 32].

Rebuilding the tourism trade in post pandemic world may be problematic for Pembrokeshire and Wales in general, as 16% of domestic visitors to Wales have identified themselves as having a long-term illness or disability, and further 28% of domestic visitors are also in the age bracket of 55 plus [31]. Wales as a destination is highly reliant on domestic tourism, this puts over a quarter of domestic tourists' arrivals in the 'at-risk category', therefore, less likely to go on holiday. This puts additional pressure on destinations to reopen and operate with an increased safety and social distancing as an underlying principle in order to enable all possible tourist groups a safe return and enjoyment of Welsh countryside.

One of the ways to enable the safe tourism interactions is introduction of AI and robotics to the day-to-day operations. Indeed many countries, such as the Netherlands and Singapore amongst others, have successfully utilised robots in hospitality and healthcare settings with the aim to reduce human to human contact, thus, helping to both mitigate the spread of the virus and as a means to getting back to 'normal' [33]. This conceptual research paper is aimed to bring together Universal Design principles, robotics and novel tourism visitor attractions together in one research study. Central to it is the use of purposely coded, humanoid robot tourist guides, which will be placed along Pembrokeshire Coastal path (see Fig. 1). It is anticipated that this study will contribute to the body of knowledge in the areas of the utilisation of Accessibility to All in robot design, empirical evidence of tourist – robot interactions and enhancement of visitor experience, as well as the effectiveness of robots to support social distancing requirements.

Fig. 1. Pembrokeshire Coastal Pathway (Source: National Trails, 2020)

2   Research Background

This anticipated study comes at a time when the tourism and leisure industry in Pembrokeshire is primarily made up from micro and small enterprises, with visitor economy contributing £585m annually [4]. Whilst the region's main strategy is to focus value in opposition to volume of tourists, there are growing calls from the Welsh Government "to be putting our energies into thinking innovatively for the future" [17]. Pembrokeshire as a destination, therefore, aims to maximise behaviour, wellbeing, health and the use of technology as strategic goals for 2020–2025. Thus, the use of latest technologies, such as AI and robots could tie in with the overall goal of enhancement of experience [4]. AI and Robots represent a major innovation opportunity for the tourism sector, and their potential impact and use may offer many new avenues to enhance and develop the visitor experience [2, 16, 26].

Pembrokeshire as a destination identified its main weakness as fragmented marketing, characterised by lack of joint 'Pembrokeshire narrative' and uncoordinated information provision. Pembrokeshire's fragmented tourism industry makes it difficult to coordinate those marketing efforts, especially considering lack of external funding. Particularly, under current economic climate the businesses are likely to concentrate on strategies of survival and safe operations, rather than long-term strategic destination management efforts. Yet, according to [22] AI has now entered the tourism and hospitality setting and is being consumed by both organisations and destinations in order to gain a competitive advantage, in what is a highly dynamic market. Indeed, [29, 30] theorise that the future of the sector is likely to be dominated by automated and robotic smart solutions, particularly robot use for information-giving functions has been reported as welcome [8, 29]. Therefore, utilisation of Robot tourist guides would enable the creation of sense of place by providing a robust, customised and coordinated tourist information fitting with the 'Pembrokeshire narrative' of a place of natural beauty and rich cultural heritage.

Both [7] and later [20] argue that tourist experiences are reflective and inherently personal, there is a need to provide opportunities to travellers to interact with the technology. This spans from the belief that travel often is considered a sense-making process whereby traveller's construct the touristic experience by learning, understanding, and feeling the places visited [11, 28]. In other words, lack of real time experience of robots in natural tourist setting is likely to affect the attitudes and perceptions of this technology. Indeed, [12] point out not a lot of travellers have had actual interactions with robots and the existing research to date does not typically use actual interactions between humans and robots for the basis of the studies; majority of research is either conceptual (e.g. [14]), engineering (e.g. [5]), experimental (e.g. [18]) or survey based (e.g. [9]). Yet, despite its increasing importance, there has been limited academic research on the use of robots in tourism, and even fewer empirical research focusing on travel interactions with robots. In fact, [10] note, in their literature review of 131 tourism-related papers, just over half of those focused on the adaptions of robots by companies, with less attention paid to human-robot interactions. Furthermore, restaurants, hotels, airports and bars dominated the sector focus of the reviewed studies, indicating relative lack of broader tourism application of robotics. This may be caused

by only a few destinations embracing this technology, mostly concentrated in Asia and commercialisation of the technologies in places such as Hen na Hotel in Nagasaki or FlyZoo Hotel in Hangzhou. This in part may be explained by a greater acceptance of automation rooted in Eastern cultures when compared with Western cultures [3].

Last consideration should be given to the tourist base of the area. The focus here is two-fold- on actual and potential tourist base for the region. First, as identified over a quarter of tourists are identified as 'at risk' due to COVID- 19; as people must avoid physical interaction, [23] argue that service robots can be a useful tool to ensure a high level of physical social distancing. Therefore, the use of robotics could potentially mean human to human contact frequency could be reduced, while also ensuring the recommended social distancing is maintained. However, more research is required to help determine how AI and robotics can help contribute to enhancing the visitor experience in tourism setting, particularly now in the time of COVID-19.

Second, existing research conducted by Visit England in 2018 suggests that 430,000 British adults with disabilities did not take a domestic holiday as a result of accessibility issues [27]. Despite legal requirements set out in the UK through the Equality Act (2010), the industry is still working towards equal participation for disabled people. Thus, whilst the industry talks of the value of the 'purple pound' (disabled people); disabled citizens still encounter barriers to their participation in tourism experiences as amongst other areas of life. It is anticipated that this study will help in addressing many of the concerns about accessibility in tourism and leisure settings and bias issues related to technologies and AI. This is in line with [24] observations that technology and visitor information alike must be accessible to people with a wide range of disabilities, as well as Welsh Government policies aimed at accessibility to all. As [27] research argues that the industry is missing out on a potential £116.7 million as a result of inaccessible infrastructure, the accessible nature of the project creates an opportunity for the Pembrokeshire destination to tap into new tourist markets, thus providing a much-needed economic advantage.

3   Proposed Methodology

In order to examine the use of AI and robotics to help enhance the visitor experience during a time of COVID-19, this research paper suggests a multi method approach, thus having the benefit of combining different approaches and research methods [13, 19]. The researchers therefore assume a three -stage study: 1) development, 2) implementations, 3) evaluation, and envisages a use of 10–15 small humanoid robots, positioned along the Pembrokeshire coastal path.

Accessibility for all is embedded into the project as a whole- from conception to the execution, by ensuring the technology as well as the information are accessible to people with a wide range of disabilities. This will be achieved by consulting different stakeholder groups, to include disability groups, with regards to functionalities of the robots, formats of information and type of information which the robots should have to maximise the benefit and access to all.

In stage one of the studies the researchers suggest a series of focus groups with four distinct groups (visitors, tourism organisations, visitors identifying as having a

disability and a mixed group consisting of all three) to determine how their visitor experiences could be enhanced. Since focus groups are 'particularly useful for exploratory research where rather little is known about the phenomenon of interest' [26:15] the aim here would be to stimulate some discussions with a use of a pilot robot. The findings will inform the development and design of the specific functionalities of the robots.

It is suggested that research on enhancing the visitor experience through the use of AI should use humanoid robots, in line with [34] and [15] study recommending human-like behaviours to be programmed onto the robots for greater acceptance. Whilst [25] note that the physical form of the robot does not affect the trust towards them; [34] found that the 'gender' of the robot is likely to affect acceptance of it. Furthermore, since [35] highlight that, in line with Media Equation theory, people tend to interact with technology in a social way. Therefore, researchers would need to have a variety of robot-personas developed to account for all possible outcomes and maximise the potential of positive interactions.

Implementation stage would naturally involve the installation of robots in tourist hot spots, such as check-in desks, cafes, tourist information centres, and other places of tourist interest where access to secure WIFI can be obtained. It is envisioned that this is where the robots will supply, when promoted, specific information to visitors and walkers. A variety of suitable methods could be employed during this stage, from direct observations by the research team, pre- and post- encounter interviews (to gauge emotions [35]), and data observed through the robots (e.g. facial expressions/ movement, types of interactions, commands used, information requested, length of interactions, distance, ease of use [35]). Therefore, the researchers argue that such characteristics could contribute to creating a unique and safe visitor experience.

A significant aspect of such a project would be ongoing consultation and collaboration with relevant stakeholders. Such an approach would be invaluable to help grow the interaction with the local stakeholder base. Furthermore, the businesses where robots were to be located would need to be consulted with the regards to the perceived usefulness and drawbacks of having this technology on the premises.

The researchers acknowledge that such research carries substantial ethical implications which need to be addressed. For example, as visual data would need to be generated to analyse the interactions, the researchers note the need for a carefully considered consent process to be implemented. Furthermore, all interactions recorded without the necessary consent of the participants will have to be removed and all other recordings would need be stored securely in line with current GDPR guidelines. Since such technology would be operated remotely using existing WIFI infrastructure, there is a potential risk of hacking and security. Other potential limitations and ethical considerations acknowledged by the researcher would relate to robot capabilities and design. For example, the robots cannot detect and interpret human emotions, therefore, will not be able to deal with and react to anger or frustration, thus there will be a need for people to deal with enquires in these situations. Furthermore, such robots would not have the ability to prioritise if faced with multiple requests/interactions at the same time, as such this could lead to frustration and anger [1].

4   Concluding Remarks

Artificial Intelligence and technology have helped to revolutionise various industries around the world [22]. And such innovative inventions are needed now more than ever when it comes to enhancing the Visitor Experience in the time of COVID 19. Therefore, this research paper outlines a methodological proposal to analyse how the use of AI robotics along the Pembrokeshire Coastal Pathway could help contribute to greater levels of visitor satisfaction by providing a unique and novel experience. The main theoretical contributions of this proposed study include addressing the concerns about accessibility in tourism and leisure settings, where the researchers have prioritised addressing these issues in developing the robot technology, thus, making the methodology unique and original.

Furthermore, it is envisaged that findings of such a proposed study could also be used to inform both academia and industry with regards to the potential of the use of purposely designed, accessible, AI powered technologies to maximise visitor experience within social distancing setting. As such a project would be the first to examine the feasibility of incorporating AI technology to help contribute to greater levels of visitor satisfaction as a result of COVID 19, it should be noted that there is limited research to draw comparisons. Therefore, data generated could enable the improved future design of technology and maximise the benefits it can offer. Such baseline information will benefit and inform future long-term studies around what type of interactions are desirable by all visitors, what type of information is mostly requested. Particularly it will inform to what extent the use of technology minimises the staff's exposure when faced with frequently asked questions, thus, highlighting the potential of creating safe working environment for tourism-related businesses.

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