



Tourism in the digital frontier: a study on user continuance intention in the metaverse

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Abstract

In light of the burgeoning metaverse trend, this study seeks to explore the key factors influencing users' continuance intention towards this emerging platform in the context of tourism. Leveraging a dataset from individuals experienced with the metaverse, this study applied structural equation modeling to examine the hypothesized relationships empirically. Contrary to conventional wisdom, this paper found that perceived ease of use does not significantly affect utilitarian benefits. However, perceived usefulness emerged as a crucial driver of these benefits. Further, perceived enjoyment was observed to exert a positive influence on hedonic benefits. Empirical analysis reveals that continuance intention is significantly swayed by utilitarian, hedonic, and symbolic benefits. As one of the first empirical studies in this field, this research presents both theoretical and practical insights that shed light on the dynamics of user behavior within the metaverse.

Keywords Metaverse · Continuance intention · Utilitarian benefits · Hedonic benefits · Symbolic benefits

1 Introduction

Along with the evolution of information technology (IT), Internet users are engaging more actively in cyberspace. The fourth industrial revolution has expedited the development of technologies corresponding to spatial and penetrative elements, such as virtual reality (VR) and augmented reality (AR) (Shahroom and Hussin 2018). Within this context, the metaverse industry has also expanded. The metaverse is recognized as a persistent, ever-evolving multi-user environment that amalgamates physical

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reality with digital virtuality (Mystakidis 2022). Users are able to lead alternative lives by creating secondary selves within the metaverse (Park & Kim 2022). They can customize avatars (Kim and Na 2022), interact with others (Kye et al. 2021), and participate in commercial activities (Crowell 2022). A report ranked the metaverse among the top five emerging trends and technologies for 2022 (Nguyen 2021), and leaders in sectors such as gaming, retail, the arts, healthcare, and blockchain are strategizing their positions within this burgeoning ecosystem (Palaha 2022). Recently, large social networking companies have earnestly entered the metaverse and VR industries (Kim 2021; Kraus et al. 2022). Furthermore, the COVID-19 pandemic has amplified consumer and corporate interest in the metaverse (Ifdil et al. 2022). The metaverse market is projected to exceed \$47 billion in 2022, with expectations reaching an astounding \$678.8 billion by 2030 (Nikolovska 2022). Parallely, derivative industries such as VR and AR have also witnessed growth. Global spending on VR and AR is expected to rise from \$12 billion in 2020 to \$72.8 billion in 2024 (Mileva 2022). Relevant industry players include game developers like Roblox and Epic Games (Cappannari and Vitillo 2022; Kaur and Gupta 2021), software vendors such as Unity and Adobe (Gonsher et al. 2023), and VR/AR hardware manufacturers like Facebook (Fernandez 2022). Representative platforms comprise uHive, Hyper Nation, and SANDBOX (Palaha 2022). Users can utilize uHive akin to any other social media platform, but with the added benefits of free expression, as well as the purchasing and trading of digital assets like non-fungible tokens (NFTs) (Martínez-López et al. 2022). Hyper Nation supports a democratic and egalitarian economy within a decentralized ecology (Palaha 2022). In SANDBOX, users can buy, sell, and trade virtual plots of land in the blockchain-based game and metaverse (Nakavachara and Saengchote 2022).

The metaverse paves the way for a plethora of new and unique tourism experiences (Go and Kang 2023; Monaco and Sacchi 2023). From venturing into meticulously reconstructed virtual heritage sites to attending larger-than-life concerts or sports events from the comfort of one's home, the metaverse serves as a platform for immersive, interactive, and personalized experiences (Buhalis and Karatay 2022; Koo et al. 2022; Lu et al. 2023; Wu et al. 2022). Moreover, the metaverse allows users to explore different cultures, landscapes, and historical periods without physical limitations (Gursoy et al. 2022). This potential for virtually exploring the world's wonders and attending global events fosters an entirely new form of tourism, aptly termed 'virtual tourism' or 'cyber-tourism' (Ha and Kim 2022). Furthermore, the metaverse provides opportunities for enhancing the inclusivity and accessibility of tourism, as it allows people with physical disabilities or travel constraints to participate in travel experiences virtually (Kouroupi and Metaxas 2023).

The motivation for our research stems from the significant transformations that the tourism industry has been experiencing, driven by the adoption of new digital technologies, particularly the metaverse. Despite the increasing relevance of the metaverse in the tourism sector, academic understanding of the motivations and behaviors of metaverse users in the context of tourism is still limited. As users move from the physical world to the metaverse, they embark on what can be regarded as a cyber tour (Bale et al. 2022). This offers a unique platform for virtual tours, games, and travel experiences that are fundamentally different from traditional forms of tourism

(Um et al. 2022). These novel experiences provide an alternative universe of tourism opportunities, but there is little empirical evidence on what motivates users to continue using these platforms, which was the focus of this research. Furthermore, the metaverse offers the tourism industry an innovative platform to reach and engage with potential tourists, making it highly relevant for tourism managers and professionals. However, to fully leverage this potential, it's important to understand users' experiences and their intention to continue using the metaverse for touristic activities. Therefore, this research seeks to contribute to the existing literature by providing insights into the determinants of users' continuance intention in the metaverse from a tourism perspective, with the aim of benefiting both academia and the tourism industry.

Users can reap various utilitarian benefits from using the metaverse (Aburbeian et al. 2022). They can also profit economically through commerce (Chen and Cheng 2022), and some can access the information necessary for their work or studies (Dincelli and Yayla 2022). Users might choose to continue using the metaverse due to these valuable benefits. Consumers also engage with the metaverse because it's entertaining (Gursoy et al. 2022). They can experience fun in new virtual spaces by interacting with others through games like Minecraft (Bos et al. 2014). For these users, hedonistic benefits motivate their usage of the metaverse. Conversely, the metaverse allows users to express themselves (Sung et al. 2011), and it encourages interaction and communication between users by forming new cultures (Han et al. 2021). Notably, it fosters a visible culture (Han 2020), implying that symbolic benefits may impact user behavior. Therefore, this paper explores the continuation intentions of metaverse users based on utilitarian, hedonic, and symbolic benefits.

Existing literature on metaverse usage primarily explores behavioral intentions and user experience from a broad perspective (Aburbeian et al. 2022; Arpaci et al. 2022; Salloum et al. 2023; Yang et al. 2022), but specific focus on its implication for the tourism industry is relatively unexplored. This gap in understanding represents an opportunity for research to provide valuable insights into how metaverse technology impacts tourism, especially in the context of users' continuance intention. To address this gap, this study aims to investigate the determinants of continuance intention for metaverse users specifically within the scope of tourism experiences. It incorporates the uses and gratification theory (U>) to provide a comprehensive understanding of user motivations. This research contributes originality by applying a well-established theory to a novel and emerging field. The value of our research lies in its potential to aid tourism managers and industry professionals in effectively utilizing the metaverse as a medium to enhance user experience and drive sustainable tourism growth. Given the nascent state of metaverse adoption in the tourism industry, this study stands to offer actionable insights for marketing and business strategy in this emerging arena. The primary objective of this paper is to elucidate the factors influencing users' continuance intention in the metaverse from a tourism perspective, with a goal of propelling both academic discourse and practical application within the tourism industry.

The remainder of this paper is organized as follows. Section 2 presents previous research on the metaverse and U>. Section 3 outlines the research hypotheses. Section 4 details the measurement process and data collection procedure. Section 5

presents the analysis results. Section 6 discusses the results of hypothesis testing. Lastly, Section 7 offers implications, limitations, and future research directions.

2 Theoretical background

2.1 Metaverse

As the metaverse has been steadily gaining attention and related industries have developed, research has been conducted in academia. Some researchers analyzed the awareness and intent to use among metaverse users and potential users. Other scholars have explained the intentions of behavior such as acceptance, participation, and purchase. Numerous studies have illuminated the metaverse from the point of view of engineering.

A study was conducted on the level of users' perception of the metaverse. Lee (2022) studied the intention and experience of using metaverse by surveying university students. More than half of respondents (53.8%) said they have never used metaverse but are willing to use it. Respondents used Minecraft (42.0%), Animal Forest (40.4%), and ZEPETO (13.3%). They use the metaverse for games (46.5%), virtual space and avatar decoration (32.4%), and movies or music (17.8%).

Some researchers have examined the determinants of the behavioral intentions of metaverse users. Akour et al. (2022) proposed an analytical model for predicting metaverse adoption. They showed that adoption intention is affected by satisfaction, perceived ease of use, and perceived usefulness. It was also revealed that trialability, observability, compatibility, and complexity are the main antecedents of satisfaction. Misirlis and Munawar (2022) proposed a conceptual framework to explicate the behavioral intention to use metaverse by adding self-efficacy and subjective norms to the technology acceptance model (TAM). TAM is first developed by Davis (1989) to describe user behavior toward ITs. According to the model, perceived ease of use and perceived usefulness determine user behavior via attitude and behavioral intention sequentially. Misirlis and Munawar (2022) proved that self-efficacy is negatively associated with attitude and behavioral intention. Subjective norms were found to positively relate to perceived ease of use, attitude, and behavioral intention. Yang et al. (2022) explored the deciding factors of college students' intention to use metaverse technology based on unified technology acceptance and use of technology 2 (UTAUT2). UTAUT2 is a research model devised by Venkatesh et al. (2012) for explaining consumer behavior toward technology. According to the model, behavioral intention is produced by performance, effort, social effect, promoting conditions, hedonistic motive, price, and habit. Yang et al. (2022) discovered that attitude is affected by hedonic motivation, facilitating conditions, and performance expectancy. It was also unveiled that behavioral intention is influenced by habit and attitude. Alvarez-Risco et al. (2022) examined the intention to participate in the Facebook metaverse by employing social cognitive theory. They verified that institutional support and technological literacy play a salient role in forming self-efficacy of participating in the metaverse, leading to intention to participate in the metaverse. Plechatá et al. (2022) cast light on the virtual reality intention to draw implications for com-

munication in the metaverse. The authors found that spatial presence harms psychological distance change while it enhances emotions. It was unveiled that behavioral intentions change is shaped by risk perception change, self-efficacy change, and emotions. The authors asserted that the metaverse could be a platform to communicate the environment.

Several works have identified the purchase of metaverse users. Hwang and Lee (2022) investigated the effects of music content marketing on satisfaction and intention to use in the metaverse by applying the SPICE model. The SPICE model consists of five factors, which are seamlessness (continuity), presence (reality), interoperability, concurrence, and economy flow. The authors figured out that both satisfaction and purchase intention is influenced by continuity, reality, interoperability, and concurrency. Shen et al. (2021) investigated the contributors to purchase in the metaverse by reviewing the literature systematically. They suggested five themes for future research directions. Those are a diversity of boundary factors, diversity of immersive technology, organic research circles, consumer behavior, and metaverse evolution trends. Bourlakis et al. (2009) drew light on the ways metaverses affect the evolution of retailing. The authors examined Second Life concerning the metaverse phenomena. They stated that the spatial dimension is taken into consideration as retailers organizationally operate in intertwined spaces. They also stressed that retailers must develop promotional campaigns using a comprehensive and all-encompassing approach. Efendioğlu (2022) investigated the impacts of obtained information and perceived risk on purchase intention in the metaverse by reflecting on the information adoption framework. They demonstrated that credibility and quality of information positively affect purchase intention.

The metaverse is increasingly being recognized for its potential to reshape tourism, a sector inherently tied to the ebb and flow of technological innovation. A significant component of the metaverse is VR. With VR, tourists can experience a realistic imitation of a physical location or an entirely fantastical setting (Guttentag 2010). Guttentag (2010) further highlights the potential applications of VR in tourism, such as pre-trip visits, virtual heritage tourism, and virtual adventure tourism, which can make inaccessible destinations accessible to a wider audience. The potential impact of the metaverse on tourism extends beyond VR. For example, AR offers possibilities for enriching physical tourist experiences with additional information or virtual elements (Yovcheva et al. 2012). Mixed reality (MR) allows tourists to interact with physical and virtual objects in real time, creating immersive and memorable experiences (Han et al. 2019). Furthermore, the metaverse offers a novel platform for social interaction and connection, echoing Hsu et al. (2010)'s assertion that travel is a socially driven activity. Virtual platforms provide spaces for people to meet, share experiences, and form communities, thereby redefining the social aspects of tourism (Neuhofner et al. 2015). The metaverse also has implications for tourism marketing. According to Hudson and Thal (2013), the metaverse's interactive and engaging environment presents opportunities for personalized and experiential marketing. Additionally, the use of gamification in metaverse platforms can enhance tourist engagement and loyalty (Xu et al. 2016). Lastly, the metaverse may influence sustainable tourism practices. By offering virtual experiences that can supplement or replace physical travel, the metaverse can contribute to reducing the environmental footprint

of tourism (Go and Kang 2023). However, despite these promising prospects, there is still much to be explored about the metaverse's potential role in tourism. In particular, existing research does not sufficiently explain the behavior of metaverse users, especially the behavioral intention based on the benefits obtained by the users.

2.2 Uses and gratification theory

U> is a theoretical motivating paradigm that is grounded in communication science (Katz 1974). It integrates psychological and social aspects of needs (Van der Wurff 2011). U> was initially advocated by communications researchers to investigate how and why consumers adopt new forms of media, but it has become more common among academics (Eighmey and McCord 1998). With the virtue of its legitimacy, it has been applied to explain why people choose to use technology (Grellhesl and Punyanunt-Carter 2012; McLean and Osei-Frimpong 2019; Rauschnabel et al. 2018).

Researchers in U> literature have classified the individual needs or gratifications into utilitarian (e.g. information), hedonic (e.g. entertainment), and symbolic (e.g. social advantage) (Chen et al. 2015; Cheng 2021; Gan and Li 2018). Metaverse users obtain economic benefits and perceived pleasure. They also enjoy symbolic benefits while expressing themselves in communicating with others. U> may thus be used to understand why people want to continue the metaverse since they are probably driven by a desire to satisfy a variety of requirements. Therefore U> offers a fascinating theoretical lens through which to view the incentives for using the metaverse continuously.

3 Research framework

Figure 1 shows the research framework of the present study. This paper posits that perceived ease of use and perceived usefulness shape utilitarian benefits. It postulates that perceived enjoyment develops hedonic benefits. The current work suggests that continuance intention is formed by utilitarian benefits, hedonic benefits, and symbolic benefits.

3.1 Perceived ease of use

According to Davis (1989), perceived ease of use is the degree to which a user thinks an IS is simple to use and comprehend. Perceived ease of use has been validated as the vital determinant of the behaviors of IS users (Jo 2023a; Jo and Park 2022; Nayanaajith et al. 2019; Zaman 2020). It improves the level of users' intention to adopt metaverse (Akour et al. 2022). When users perceive IS as simpler, they would feel a greater utilitarian value. Thus, this paper suggests that perceived ease of use raises utilitarian benefits.

H1 Perceived ease of use positively impacts utilitarian benefits.

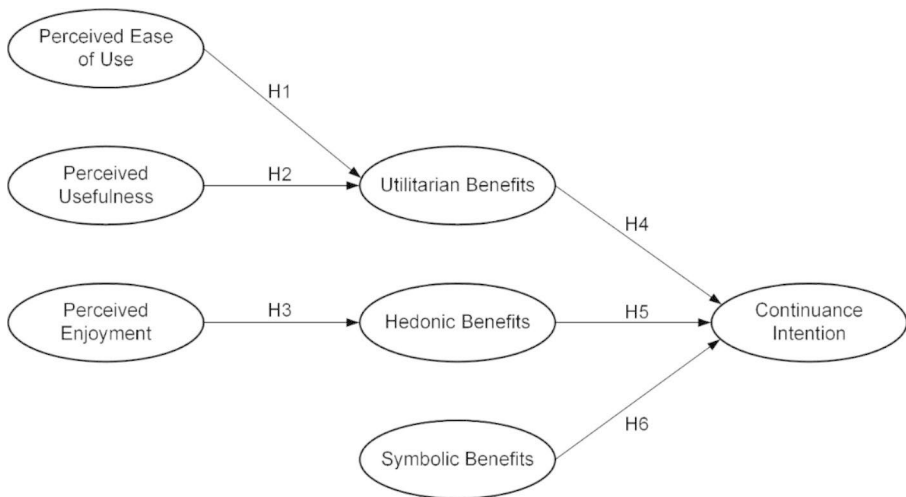


Fig. 1 Research Model

3.2 Perceived usefulness

Perceived usefulness is defined as the extent to which a user thinks a certain technology would improve their performance for a given task. It has been found to affect satisfaction, loyalty, and behavioral intention in several IT artifacts (Al Amin et al. 2021; Jo 2022b, 2023b; Peña-García et al. 2020). Perceived usefulness is significantly associated with behavioral intention in the domain of metaverse (Akour et al. 2022). A higher degree of perceived usefulness leads to an increase in utilitarian value. Therefore, this work proposes that perceived usefulness drives utilitarian benefits.

H2 Perceived usefulness positively impacts utilitarian benefits.

3.3 Perceived enjoyment

According to Venkatesh and Davis (2000), perceived enjoyment is the degree to which the act of utilizing a particular IT is thought to be pleasurable in and of itself. It has been pointed out that perceived enjoyment is the determinant of user behaviors in various contexts (Alalwan et al. 2018; Chang and Chen 2021; Matute-Vallejo and Melero-Polo 2019). The more users enjoy IT, the higher they think its hedonistic value is (Jo 2022a). Hence, this research predicts that perceived enjoyment amplifies the hedonic benefits.

H3 Perceived enjoyment positively impacts hedonic benefits.

3.4 Utilitarian benefits

Utilitarian benefits are concerned with convenience, helpfulness, efficiency, and fitness with a task (Taylor and Todd 1995). Utilitarian factors are validated as critical in determining the adoption of technology (Venkatesh et al. 2012). Utilitarian benefits enhance the usage of IT devices (McLean and Osei-Frimpong 2019). As users get more useful help from the metaverse, they may want to use it more consistently. Accordingly, utilitarian benefits are believed to promote continuance intention.

H4 Utilitarian benefits positively impact continuance intention.

3.5 Hedonic benefits

Hedonic benefits refer to the emotional experience of a person such as pleasure and happiness from engaging with others or using new technology (Schuitema et al. 2013). Hedonic value has been shown to affect the behavioral intention of IT users (Ozturk et al. 2016b; Yu et al. 2013). When people get more hedonic value from ISSs, they try to make more use of it (Jo 2022a). If users gain greater hedonic benefits from the metaverse, their intention to continue to use may increase. In this vein, this paper surmises that hedonic benefits facilitate continuance intention.

H5 Hedonic benefits positively impact continuance intention.

3.6 Symbolic benefits

Symbolic benefits refer to the degree to which a person believes to obtain a symbolic reward such as winning the favor of others (Goodin 1977). This also has something to do with a person's "feeling of self or social identity" as it relates to the adoption or usage of new technologies (Schuitema et al. 2013). Metaverse forms a new culture among users in cyberspace (Han et al. 2021). Using the metaverse may mean that users are following the trend well. Symbolic benefits lead to an enhancement of the usage of IT artifacts (McLean and Osei-Frimpong 2019). Given the above, symbolic benefits are proposed to predict continuance intention.

H6 Symbolic benefits positively impact continuance intention.

4 Empirical methodology

4.1 Measurement instrument

This study employed validated scales from existing literature, tailoring them to fit the metaverse context. A 7-point Likert scale was utilized for each construct to ensure

a nuanced capture of respondents' views. The initial questionnaire was prepared in English and subsequently translated into Korean by a bilingual researcher. Before the main survey, content validation was conducted with academic professionals in the information systems field, ensuring clarity of language and avoiding ambiguity in the questionnaire items. The survey was divided into three sections. The first section provided a detailed explanation of the study, the objective, and the assurance of personal information protection, and it required consent from respondents for academic publication of the survey data. The second section encompassed questions related to perceptions about the metaverse, with a clear emphasis on tourism-related metaverse usage. This particular emphasis was in accordance with our target of gathering data from users who had engaged with tourism content within the metaverse. The final section was devoted to gathering demographic information. To further ensure the reliability and validity of our instrument, we conducted a pilot test involving twelve respondents. Their feedback on overlapping questions, flow, and structure was incorporated to refine the questionnaire and enhance its effectiveness for the main study.

4.2 Data

The data for this study was gathered from an online survey targeted specifically at metaverse users who have experience with tourism-related content. This selection was purposeful and strategic, as it enabled us to gain insights from individuals who could provide firsthand information regarding the intersection of metaverse and tourism, thus closely aligning with our research aim. Metaverse, a rapidly growing platform for virtual shared experiences, has been integrating into various sectors, including tourism. VR now offers unique tourism experiences, such as exploring digital replicas of real-world heritage sites or attending virtual concerts (Bourlakis et al. 2009). As this new form of tourism experience emerges, understanding the user's perception, adoption, and sustained use of metaverse becomes crucial. Our target group, thus, provides an essential context for understanding the use of IT in tourism. Selecting metaverse users with tourism content experience also allows us to address our research questions accurately. They can provide in-depth feedback on their experiences, motivations, satisfaction levels, and intentions to continue using metaverse for tourism-related activities, enabling us to offer relevant suggestions to tourism practitioners and policy-makers. Therefore, the insights derived from this target group are both relevant and significant for IT and tourism literature.

The survey was conducted in South Korea in early May 2022, a country known for its advanced technology use and high internet penetration rate. A professional survey company ensured the distribution of the questionnaire to the appropriate target group. After data cleaning to eliminate insincere responses, a total of 246 valid surveys were obtained. The respondents were between 19 and 59 years old and included a mix of males (52.0%) and females (48.0%). The diverse demographic and occupational profiles of the respondents enrich our data, providing a wide range of perspectives crucial for our study. Table 1 shows the demographics of respondents.

Table 1 Profile of the Respondents

Demographics	Item	Subjects (N=246)	
		Frequency	Percentage
Gender	Male	128	52.0%
	Female	118	48.0%
Age	10s	1	0.4%
	20s	37	15.0%
	30s	45	18.3%
	40s	83	33.7%
	50s	80	32.5%
Job	Public official	20	8.1%
	Professionals	40	16.3%
	Researcher	29	11.8%
	Housewife	29	11.8%
	Student	15	6.1%
	Production job	26	10.6%
	Other	87	35.4%

5 Research results

Using SmartPLS (Ringle et al. 2015), the current work conducted partial least squares (PLS) to examine the hypotheses. The IS and marketing areas have all found usage for the PLS technique (Chin et al. 2003). Due to PLS's robustness and lack of restrictions on the distribution of data and sample size, it was used in this analysis (Falk and Miller 1992). The main analysis was performed in two steps: (1) an assessment of the measurement model and (2) an evaluation of the structural model.

5.1 Measurement model

Confirmatory factor analysis was used to evaluate the measures' reliability, convergent validity, and discriminant validity. Composite reliability (CR) and Cronbach's alpha were used to evaluate scale reliability. When the CR value is more than 0.7 (Fornell and Larcker 1981) and Cronbach's alpha are larger than 0.6 (Churchill Jr 1979), the model's reliability is deemed to be satisfactory. As shown in Table 2, all CR scores are over 0.7 (Fornell and Larcker 1981) and all Cronbach's alpha values are above 0.6, showing an adequate level of reliability. The survey questions' factor loads are all over the recommended threshold of 0.70 (Hair et al. 2006). Average variance extracted (AVE) values exceed the cut-off limit of 0.5 (Fornell and Larcker 1981). Thus, the model has a satisfactory level of convergent validity. Finally, the root square of AVE values of the individual factors was compared to the correlation coefficients between them to investigate discriminant validity. Discriminant validity is ensured since all diagonal matrix values except symbolic benefits are larger than other input values (Fornell and Larcker 1981). This study proceeded to the assessment of structural model because the root square of AVE of symbolic benefits is slightly lower than the correlation. Table 3 describes construct correlations and discriminant validity.

Table 2 Test Results of Reliability and Validity

Construct	Items	Mean	St. Dev.	Factor Loading	Cronbach's Alpha	CR	AVE
Perceived Ease of Use	PEU1	3.063	0.824	0.863	0.822	0.893	0.735
	PEU2	3.142	0.943	0.831			
	PEU3	3.102	0.923	0.878			
Perceived Usefulness	PUS1	3.320	0.857	0.840	0.763	0.863	0.678
	PUS2	3.513	0.873	0.831			
	PUS3	3.734	0.886	0.799			
Perceived Enjoyment	PEN1	3.662	0.867	0.884	0.871	0.921	0.795
	PEN2	3.673	0.844	0.909			
	PEN3	3.825	0.885	0.882			
Utilitarian Benefits	UTB1	3.421	0.898	0.872	0.800	0.883	0.715
	UTB2	3.048	0.969	0.836			
	UTB3	3.614	0.814	0.827			
Hedonic Benefits	HEB1	3.675	0.825	0.901	0.783	0.902	0.822
	HEB2	3.713	0.862	0.912			
Symbolic Benefits	SYB1	3.675	0.913	0.793	0.647	0.845	0.732
	SYB2	3.332	0.968	0.914			
Continuance Intention	COI1	3.289	0.888	0.791	0.750	0.855	0.664
	COI2	3.619	0.772	0.785			
	COI3	3.332	0.968	0.865			

Table 3 Construct Correlations and Discriminant Validity

Constructs	1	2	3	4	5	6	7
1. Perceive Ease of Use	0.857						
2. Perceived Usefulness	0.369	0.823					
3. Perceived Enjoyment	0.363	0.759	0.892				
4. Utilitarian Benefits	0.331	0.708	0.655	0.845			
5. Hedonic Benefits	0.357	0.737	0.817	0.639	0.906		
6. Symbolic Benefits	0.328	0.578	0.545	0.621	0.529	0.856	
7. Continuance Intention	0.362	0.670	0.629	0.727	0.602	0.865	0.815

Note: Diagonal entries are the square root of the AVE.

5.2 Structural model

The current study conducted evaluated the hypothesized paths using structural equation modeling (SEM). The bootstrap resampling method generated 5000 resamples. As shown in Fig. 2, five of the six paths in the research model are supported.

Contrary to the hypothesis, perceived ease of use is not a motivator of utilitarian benefits ($b=0.081$, $t=1.776$), failing to accept H1. In line with prediction, perceived usefulness is positively associated with utilitarian benefits ($b=0.678$, $t=19.966$), strongly supporting H2. Consistent with prediction, perceived enjoyment affects hedonic benefits ($b=0.817$, $t=43.374$), strongly supporting H3. As suggested, utilitarian benefits have a significant association with continuance intention ($b=0.264$, $t=7.729$), supporting H4. In line with the hypothesis, hedonic benefits are significantly associated with continuance intention ($b=0.085$, $t=2.716$), supporting H5. In line with expectations, symbolic benefits have a significant correlation with continu-

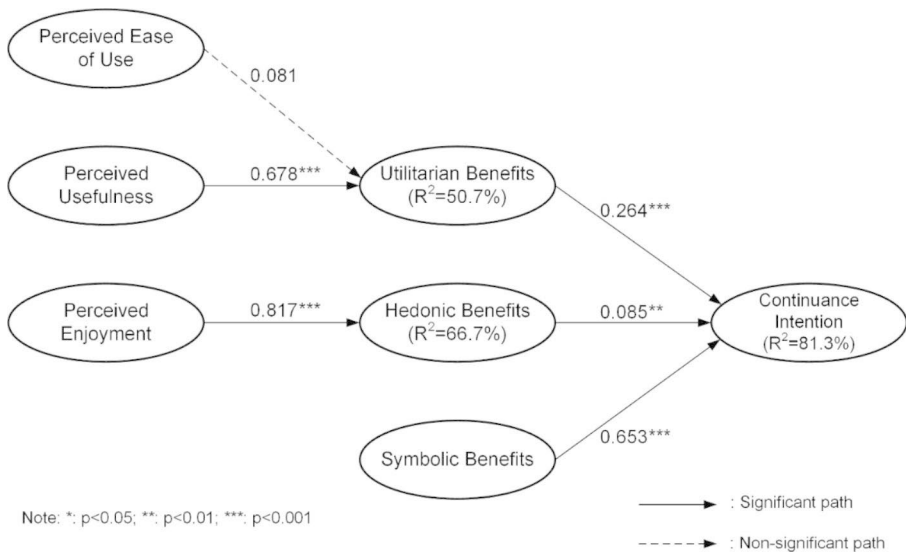


Fig. 2 Analysis results

Table 4 SEM results

H	Cause	Effect	Coefficient	T-value	Hypothesis
H1	Perceived Ease of Use	Utilitarian Benefits	0.081	1.776	Not Supported
H2	Perceived Usefulness	Utilitarian Benefits	0.678	19.966	Supported
H3	Perceived Enjoyment	Hedonic Benefits	0.817	43.374	Supported
H4	Utilitarian Benefits	Continuance Intention	0.264	7.729	Supported
H5	Hedonic Benefits	Continuance Intention	0.085	2.716	Supported
H6	Symbolic Benefits	Continuance Intention	0.653	23.281	Supported

ance intention ($b=0.653$, $t=23.281$), strongly supporting H6. Overall, the structural model accounted for approximately 81.3% of the variation in continuance intention. Table 4 summarizes the results of SEM.

6 Discussion

This study provides critical insights into the factors influencing metaverse users' continuance intention, particularly in the context of tourism.

Contrary to the general belief on the significance of perceived ease of use on utilitarian value (Jo 2022a; Ozturk et al. 2016), this study found that perceived ease of use did not significantly influence utilitarian benefits among metaverse users seeking tourism experiences. This intriguing finding suggests that metaverse users might prioritize the depth and quality of the experience over the simplicity of the interface or operations. In the context of virtual tourism, users may be willing to grapple with a degree of complexity if it means gaining a richer, more immersive travel experience (Bourlakis et al. 2009; Tussyadiah and Fesenmaier 2009). These findings challenge

the notion of ‘ease of use’ as a universal driver of technology adoption and underlines the importance of context-specific nuances. It suggests the need for future research to explore the relative importance of perceived ease of use in different virtual environments, especially as the metaverse continues to evolve (Schroeder 2010).

Indeed, our findings revealed that perceived usefulness significantly influences utilitarian benefits for metaverse users in the realm of tourism. This finding aligns with TAM (Davis 1989) and other related studies (Jo 2022a; Kumar Kakar 2017). It suggests that the user’s recognition of the platform’s benefits, such as being able to virtually explore heritage sites or attend virtual events (Bourlakis et al. 2009; Neuhofer et al. 2015), directly impacts their continued interaction and engagement. As such, it underscores that usefulness, as derived from functional aspects of the metaverse, forms a critical driver for its acceptance and adoption in the context of tourism. Therefore, developers aiming to leverage the metaverse for tourism purposes should focus on enhancing these functional aspects, ensuring they meet the diverse needs of virtual tourists and enrich their experiences (Xiang et al. 2015).

Our findings corroborate the notion that perceived enjoyment significantly and positively influences hedonic benefits in the metaverse when used for tourism purposes. This is aligned with previous research (Huang and Hsu 2010; Jo 2022a) which illustrates that enjoyment, derived from interactive and engaging experiences, considerably contributes to the users’ hedonic value perception. In the context of the metaverse, users experiencing pleasure from the virtual exploration of different sites, engaging in activities, or interacting with other avatars, derive a sense of gratification. This suggests that beyond functional utility, the fun and pleasure derived from the metaverse significantly enhances the user’s continuance intention, thereby, reinforcing the role of enjoyment in promoting user engagement in the virtual tourism context.

The study corroborates the significant impact of utilitarian benefits on the continuance intention of metaverse users in the tourism context. This finding aligns with extant research highlighting the role of practical value in driving user engagement (Jo 2022a, 2023b; Lee et al. 2005). In the context of the metaverse, users who perceive pragmatic benefits like gaining new knowledge, experiencing unique virtual tours, or efficient virtual navigation, exhibit higher tendencies to persist in their use of the platform. Therefore, enriching the functional features and enhancing the practical value of the metaverse can significantly influence users’ intention to continue using it for tourism purposes.

Our findings substantiate that hedonic benefits significantly influence the continuance intention among metaverse users. This echoes prior research, asserting the crucial role of enjoyment in sustaining user engagement with virtual platforms (Huang and Hsieh 2012; Mouatt et al. 2020; Okada and Sheehy 2020). Metaverse users who derive pleasure and fun from virtual tourism experiences are more likely to continue using the platform. This implies that the metaverse offering entertaining and stimulating virtual experiences can effectively retain users. It underscores the need to enrich the hedonic qualities of metaverse tourism, intertwining the aspects of enjoyment with usefulness to heighten user retention.

Symbolic benefits were found to have a significant effect on continuance intention within our study, echoing previous research findings in the realm of consumer

behavior and technology use (Belk 1988; Sundar and Limperos 2013). This suggests that metaverse users who perceive their virtual tourism activities as enhancing their self-image or social status are more inclined to persistently engage with the platform. This further highlights the multidimensional nature of user experience in the metaverse, where not just the utilitarian or hedonic value, but also the symbolic value of the experience, matters. For metaverse developers focusing on tourism applications, this finding underscores the importance of creating opportunities for users to attain symbolic benefits, such as unique virtual identities or exclusive experiences.

7 Conclusion

7.1 Implications for theory

This study presents substantial theoretical contributions by emphasizing the singular importance of the metaverse as a groundbreaking platform for tourism experiences. Importantly, our research expands the tourism literature into the domain of the digital metaverse, opening an unexplored realm of research. Until now, academic literature in the area of tourism has paid attention to the role of VR in enhancing tourist experiences (Godovykh et al. 2022; Neuhofer et al. 2015; Pestek and Sarvan 2021). However, the emphasis has been largely on singular, isolated VR experiences. Our research, on the other hand, argues for the metaverse as a holistic, immersive environment that enables a wide spectrum of tourism experiences, ranging from virtual sightseeing to cultural immersion and interactive experiences. These experiences can be as varied and complex as real-world tourism, thus making the metaverse a significantly promising platform for tourism. Our study, therefore, not only distinguishes itself from previous work in this area but also sets a new direction for further academic investigation in the rapidly evolving field of metaverse-enabled tourism experiences.

The second significant contribution of our research lies in its challenging stance towards the conventional emphasis on ‘ease of use’ as a key factor of utilitarian benefits within technology acceptance models. Classical studies like that of Davis et al. (1989) in his TAM have strongly advocated the importance of ‘ease of use’ in technology acceptance. However, our study introduces a counterpoint to this widely accepted perspective in the context of metaverse and tourism. Our results indicate that for users seeking virtual tourism experiences within the metaverse, the ‘usefulness’ of the platform transcends the ‘ease of use’. This indicates that users might accept and adapt to the complexities inherent in a metaverse environment, provided it offers meaningful interactions and substantial utility. Consequently, this study emphasizes the need for a more detailed comprehension of user behaviors and expectations within the realm of virtual tourism. It suggests that the traditional model of technology acceptance may need to be modified or extended to fully capture the complexities of user experience in immersive, multifaceted environments like the metaverse. Our work, thus, introduces an important shift in perspective and serves as a beacon for future research exploring the intersection of tourism, technology acceptance, and the metaverse.

The third contribution of our research is the emphasis on the importance of hedonic, utilitarian, and symbolic benefits as primary drivers for continuance intention within the metaverse. A series of past research has conducted extensive studies on these factors in the backdrop of traditional IT systems, such as the works of Bhattacharjee (2001) and Thong et al. (2006). These works demonstrated the influence of these factors on users' adoption and continuous use of conventional IT applications and platforms. Our study, however, extends this traditional paradigm to the new, unexplored territory of the metaverse, which is rapidly becoming a major player in the digital landscape. It brings to the fore the relevance of these established factors in the context of the metaverse, particularly relating to virtual tourism experiences. It highlights how the hedonic (pleasure-driven), utilitarian (useful-driven), and symbolic (status-driven) benefits can significantly influence users' decisions to continue their engagement with the metaverse. This novel perspective adds substantial value to the existing body of literature by blending the insights of traditional IT systems with the evolving dynamics of the metaverse. Our findings could serve as a foundation for future research to further investigate the specific aspects and mechanisms of these influential factors in the realm of the metaverse and virtual tourism experiences.

Finally, the fourth substantial contribution of our research is the delineation of the significant role perceived enjoyment plays in driving hedonic benefits within the metaverse context. While earlier studies have shed light on the influence of perceived enjoyment within online gaming or e-commerce settings (Chang and Chen 2021; Hsu and Lu 2004; Rouibah et al. 2021; van der Heijden 2004), our study moves beyond these traditional realms to explore its implications within the relatively uncharted territory of the metaverse. The study underscores the criticality of perceived enjoyment in enhancing hedonic benefits in the metaverse, and further indicates its cascading effect on users' continuance intention. This finding serves to broaden the conventional knowledge boundaries of IT-enabled tourism experiences, thus infusing fresh perspectives into the domain. This contribution provides impetus for scholars to further delve into the role of perceived enjoyment across various virtual tourism contexts within the metaverse. The dynamic, immersive, and interactive nature of the metaverse, coupled with its potential to deliver engaging tourism experiences, makes it an ideal platform for investigating how enjoyment perception can drive user engagement and continuance intention.

7.2 Implications for practice

The initial practical implication of our research is directed towards developers and service providers operating within the metaverse ecosystem. Drawing from our research results, it appears that for metaverse users seeking tourism experiences, the perceived usefulness is of greater importance than the perceived ease of use. This finding aligns with previous research emphasizing the role of perceived usefulness in technology acceptance (Cheng and Mitomo 2017; Kim et al. 2021; Kumar Kakar 2017; Venkatesh and Davis 2000), but extends it to the context of the metaverse and virtual tourism. Developers, therefore, need to prioritize enhancing meaningful and useful interactions within the metaverse, rather than focusing solely on ease of navigation or use. For example, the creation of

immersive virtual tours of heritage sites, infused with rich, detailed information and interactive elements, might appeal more to users than an oversimplified interface (Bourlakis et al. 2009; Neuhofer et al. 2015). Inclusion of components such as virtual tour guides or interactive exhibits that allow users to explore and learn at their own pace could significantly elevate the perceived usefulness of the platform. Furthermore, implementing live Q&A sessions can provide real-time assistance and engage users, further enhancing the platform's perceived usefulness. The integration of such features not only contributes to a comprehensive virtual tourism experience, but also substantiates the metaverse's role as a powerful tool in reshaping tourism.

The second practical implication derived from our research highlights the importance of perceived enjoyment in enhancing hedonic benefits, which significantly influences the continuance intention of users in a metaverse environment. This observation is in line with existing research emphasizing the importance of enjoyment in technology acceptance and usage, especially in hedonic systems like online games or e-commerce platforms (Busalim et al. 2021; Evelina et al. 2020; Hsu and Lu 2004; van der Heijden 2004). For practitioners such as service providers and marketers operating within the metaverse, the challenge lies in crafting enjoyable and engaging tourism experiences. Concrete examples of this could be the organization of virtual music festivals, sports events, or interactive cultural performances. These types of experiences not only provide entertainment, but also contribute to increased user engagement and a sense of community within the metaverse (Huang and Hsieh 2012). Furthermore, the integration of gamification elements, such as rewards systems, leaderboards, or interactive challenges, can add another layer of enjoyment, thereby amplifying user engagement (Hamari et al. 2014). These components serve to heighten the user's sense of achievement and competition, further enhancing the hedonic benefits derived from the metaverse.

The third practical implication drawn from our research deals with the influence of utilitarian, hedonic, and symbolic benefits on continuance intention. It points towards the importance of presenting a comprehensive value proposition for metaverse users. This is in line with previous research that emphasizes the value of a multi-dimensional benefits approach in customer retention in various contexts (Chitturi et al. 2008; Gurung 2022; Thong et al. 2006; Yuan et al. 2022). For service providers and developers within the metaverse, the challenge is to offer a balanced mix of these benefits to retain users. Practically, this could translate to combining utilitarian benefits such as providing virtual tours of famous landmarks, offering gamified challenges that enhance hedonic benefits, and rewarding users with exclusive badges or titles representing symbolic benefits. This well-rounded approach could enhance the overall user experience, thereby increasing their stickiness to the platform. Additionally, this insight is also significant for marketers, who can leverage this understanding to design promotional strategies that underscore these diverse benefits. The marketing narratives can highlight the multiple facets of the metaverse tourism experience – from useful and educational tours to enjoyable gaming aspects and the prestige of earning exclusive rewards.

The final practical implication derived from our research emphasizes the significance of symbolic benefits in shaping continuance intention. Users of the metaverse are not only seeking functional or entertaining aspects but also symbols that resonate with their identity or status. This echoes findings from prior research highlighting the role of symbolic benefits in various consumption contexts (Ekinici et al. 2013; Granulo et al. 2021; Tseng and Lee 2018). Developers and product manufacturers in the metaverse should thus consider ways to bolster the provision of symbolic benefits. One such way could be through the personalization of user avatars or environments. Allowing users to customize their avatars with a wide range of attributes or virtual items could provide an avenue for them to express their unique identities or social status. This could involve features like customizable clothing, accessories, or even attributes like strength or intelligence for the avatar. Furthermore, the design of exclusive or premium virtual spaces could also boost the symbolic benefits for users. The access to special areas or features, restricted to premium users or those who have achieved certain milestones, could offer a sense of prestige or differentiation. This could be similar to VIP sections in physical events or exclusive membership perks in digital platforms. By providing users with these symbolic benefits, developers can enhance users' intention to continue using the metaverse for tourism experiences.

7.3 Limitations and further research directions

Despite the significant contributions, our study does possess certain limitations that open up avenues for future research. Firstly, our study is geographically confined to one country – South Korea. Considering the metaverse is a globally accessible online space with users from various cultural and geographical backgrounds, this poses a limitation. The attitudes, perceptions, and behaviors of users may be influenced by their cultural context, which might have implications on their tourism experiences in the metaverse. Thus, future research should aim to replicate our study in other countries or conduct a cross-cultural analysis to enhance the generalizability of our findings. Secondly, the current study did not distinguish between individual metaverse platforms or specific types of tourism contents. The user experience and perceived benefits could vary based on the platform used or the type of tourism content accessed. For example, platforms specializing in virtual heritage tours might offer different user experiences compared to those focused on virtual concerts or sporting events. Additionally, the survey items in our study were not explicitly focused on tourism-related contexts or contents. Therefore, future research should aim to delineate and analyze user behaviors on different metaverse platforms and types of tourism contents. This would provide a more intricate understanding of user perceptions and behaviors. Furthermore, survey instruments in future research could be designed to reflect more explicitly the specific contexts and contents related to tourism in the metaverse. This would allow for a more in-depth understanding of user perceptions and offer richer insights for both academia and industry.

8 Appendix

Table A1 Constructs and Items

Construct	Items	Mean	References
Perceived Ease of Use	PEU1	Using metaverse is simple.	Ashfaq et al. (2020)
	PEU2	Learning to use the Metaverse doesn't require much effort.	
	PEU3	I find the metaverse to be easy to use.	
Perceived Usefulness	PUS1	I find the metaverse useful in my daily life.	Ashfaq et al. (2020)
	PUS2	Using the metaverse helps me to accomplish things more quickly.	
	PUS3	I can increase my imagination and creativity by using the metaverse.	
Perceived Enjoyment	PEN1	Using the metaverse gives me fun.	Ashfaq et al. (2020); Jo (2022a)
	PEN2	Metaverse doesn't make me bored.	
	PEN3	Metaverse gives me the curiosity to keep using it.	
Utilitarian Benefits	UTB1	The use of metaverse offers good value.	Kim and Oh (2011)
	UTB2	The use of metaverse is beneficial to me.	
	UTB3	The use of metaverse is worthwhile to me.	
Hedonic Benefits	HEB1	I find using metaverse to be enjoyable	Kim and Oh (2011)
	HEB2	The actual process of using Metaverse is entertaining	
Symbolic Benefits	SYB1	Using metaverse enhances my image amongst my peers.	McLean and Osei-Frimpong (2019)
	SYB2	Using metaverse makes me seem more prestigious than those who do not.	
Continuance Intention	COI1	I intend to continue my use of metaverse in the future.	Bhat-tacherjee (2001)
	COI2	I will keep using the metaverse as regularly as I do now.	
	COI3	I intend to increase metaverse in the future.	

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Declarations

Informed consent Informed consent was obtained from all individual participants included in the study.

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