



Smart Hospitality: Opportunities and Challenges from Stakeholder Perspective in Santa Elena Province

Datzania Villao¹ , Andres Padilla^{1,2} , Soraya Linzan² , and Luis Mazón^{1,2} 

¹ Universidad Estatal Península de Santa Elena, La Libertad, Ecuador
datzaniavillao@gmail.com

² BITrum Research Group, Leon, Spain

Abstract. Currently, staying in a hotel is very different from how it was in the past, this happens thanks to technology that advances faster and brings many updates and tools that can be used to make the guest's stay more comfortable and pleasant. However, the decision and the way to apply technology to a hotel comes from owner, investors and managers who are important operational stakeholders. That is why, the purpose of the paper is to explore the opportunities and challenges for smart hospitality in Santa Elena Province from the perspective of stakeholders. In depth interviews were conducted with five hotel stakeholders in Santa Elena Province such as managers and owners of hotels. The opportunities identified are current technology available, new guest preferences and potential of Santa Elena Tourist places. The challenges identified are finance barriers, nonclear public policy and lack of human resources specialized.

The findings also shows that smart hospitality is just starting in Santa Elena province and few four- and five-stars hotels have some tools to consider smart. In addition, there is a big gap in the opportunities and challenges identified in the literature compared with a specific context like Ecuador in Santa Elena province.

Keywords: Smart hospitality · Challenges · Stakeholder

1 Introduction

Currently, staying in a hotel is very different from how it was in the past, this happens thanks to technology that advances faster and brings many updates and tools that can be used to make the guest's stay more comfortable and pleasant, with faster processes and fewer errors when extracting data, which has become a key component in the hotel industry. Proof of this is that almost 65% of tourists from all over the world book their hotel through the Internet and around 75% use the Internet to get inspired, choose a destination and look for leisure and professional activities during their stay [1].

Although there is no exact definition of what a smart hotel is, it can be said that a smart hotel makes use of devices connected to the Internet and these devices can communicate or interact with each other [2]. This sometimes becomes the Internet of Things (IoT), which means that even ordinary devices and appliances can send and

receive data, making them smart. The ability of these devices to communicate with each other allows users to control multiple devices from a single point of control (remote control, smartphone, tablet or smart speaker). This means that the devices can send or receive data that mostly facilitates administrative management, giving great added value to the final service received by the client [3].

Hotel stakeholders invest in technology due to three essential reasons such as: process automation, to avoid human errors and increase employee productivity, operational efficiency and cost reduction [4]. In this sense, according to the management model of relationships with stakeholders in the hospitality industry, there are four types of relationships that identify the relationships of stakeholders with an organization. These are: 1) supportive or enabling; 2) functional; 3) normative, and 4) diffuse [5]. Within which those stakeholders of support and functional are those that are directly related to the operational part of the hotel such as shareholders, investors, financial institutions, government, managers, employees, suppliers, travel agencies, services of tourism and tourists. Given the importance that investors or owners have in the decision making of invest in technology to strengthen their operational and human resources and meet the new demand, is critical to study this type of stakeholders in the hotel industry.

In Ecuador, tourism sector represents 2.2% of GDP of the country [6]. Despite the hard blow that the tourism sector has experienced due to the Covid-19 pandemic, investors consider that there are still business opportunities in the hotel industry. For instance in the big cities such Guayaquil and Quito there are some hotels that are using current technology to be considered smart. In Quito for example there are hotels that work with state-of-the-art technology, they are smart buildings in many areas such as energy and water savings. For example, the hot water comes from the Heat Pump heat transfer system, which consists of modern equipment that consumes less than half the electricity required by traditional water heating systems. The electrical system of these smart hotels is also innovative and consistent with the intention of avoiding, as much as possible, environmental pollution. They have LED lighting to save energy in percentages from 60% to 80%. They also have an energy saving system in each room through a control card so that, in the event that the guest forgets to turn off the lights, they will turn off automatically [7].

Ministry of Tourism has pointed out that this year \$95 million of private investment will enter Ecuador's tourism sector, it would be 11 contracts for lodging, food and beverages and tourism operations, which will mean new 580 jobs specially in Guayaquil and Quito [8]. In addition, there are 10 investment projects in the country related to the hotel industry. One of the projects is precisely in the Province of Santa Elena, which is one of the most touristic provinces in the country, which has unique beaches and natural tourist places that make the Province an attractive place for national and foreign tourists [9].

That is why, to stay open and build the seeds of resurgence by the time the coronavirus has receded, owners and investors are realizing that their hotels must become more tightly managed businesses intelligent. They need to become managed hotels in the most efficient and effective way possible; it means that they need to become smart hotels. Therefore, it is necessary to think about which strategies will help the business to grow in a scalable way, focusing on a differentiating component from the competition and

fitting it into the demands of the new generation of travelers. However, current literature on smart hotels has presented the benefits for the tourist about smart hotels [10] and there are very few studies focused on the point of view of the stakeholders of the operational part such as investors, owners, managers and employees, who are the decision makers about the adoption and application of technology in the hotel industry [11]. For this reason, it is essential to know their point of view about the current knowledge they have about smart hotels. For this reason, the objective of the research is to explore what are the opportunities and challenges of smart hospitality in this specific context such as the Province of Santa Elena in Ecuador from the point of view of stakeholders such as investors, owner and managers. To achieve this, two research questions have been stated: What are the opportunities for smart hospitality? and What are the challenges for smart hospitality?

The paper is organized as followed: in the next section, literature about the opportunities and challenges is presented. The section of methodology presents the details about the methods used to collect the information needed to answer the research questions, and the findings of the research. Last section presents the conclusion of the study.

2 Literature Review

2.1 Opportunities in Smart Hospitality

Operational Opportunities

More Sustainable Hotel Rooms.

One of the biggest advantages of a smart hotel room, from a hotel owner's perspective, is the enhanced sustainability available. This is mainly related to the possibilities of saving energy inside the rooms, which can be favored by the automation offered by the Internet of things. For example, light bulbs can be set to automatically increase or decrease wattage, based on the light levels in the room at the time. Similarly, the heating can be set to automatically maintain a certain temperature, with the radiators turning off once that temperature is reached. All this leads to a reduction in energy bills [12].

Sustainability, is a current trend and characteristic of the hotel sector, it has become essential in 2022. This translates into broader ethical and environmental considerations, especially in the decisions made at the hotel management level, including the reduction of the use of disposable plastics, the elimination of superfluous paper thanks to opt-in receipts and the reduction of food waste. Decisions about things as simple as which towel rails to install in renovations have far-reaching implications when implemented on a large scale. Simple green gestures include replacing miniature toiletries with larger dispensers and using local produce, choosing ethical bedding made from organic materials, and reducing energy use with smart light bulbs [13].

In this sense, smart sensors can detect and respond to fluctuations in occupancy. In addition, smart energy management systems use complex machines to analyze historical movements to optimize energy consumption. This also reduces costs in a significant way in a 20% approximately. They can also significantly increase the resale value of a hotel [12]. For instance, thank to sensors, hotels chains like Hilton have reduce lighting and heating bills and in 2017 in partnership with World wildlife fund this hotel chain launched

a water stewardship strategy in order to address water usage in their hotels [14]. On the other hand, Body area sensors also detect occupancy and reset thermostats, automatically turning lights off to reduce energy use. In addition, sensors can activate bathroom path lights when a guest gets out of bed.

Preventive Maintenance and Repairs

Hotel owners can benefit from the ability of a smart hotel for preventative maintenance and repairs. In simple terms, this can be achieved because IoT enables hotel staff to view performance information and operational data for specific devices, in real time. This allows hotel staff to detect problems quickly, or even before they happen, allowing repairs to be made sooner. As a result, fewer guests will encounter interruptions, earlier repairs can save hotel owners money on replacement devices, and far less money will be lost due to rooms being out of service [15].

On the other hands there are also robots that make some things that employees can do. For example, the American company Savioke, created the Relay robot who delivers food, toothpaste, towels and other items to hotel guests' rooms. Relay's work begins when a customer calls the front desk for room service. At that moment, the receptionist opens the compartment located in the front part of the robot, introduces the objects that the client has requested and types the room number. Relay, who activates the elevator button remotely, calls the room phone when he arrives at his destination. The back cover opens immediately when the customer opens the door for them to remove the objects. Once the job is done, Relay asks the customer if they are happy with their service via a message on the rear screen and opens and closes its eyes and performs a little dance with electronic sounds when the guest presses the five stars button to express their satisfaction [16].

Personalization

Today, customers have developed new expectations in terms of personalization. Establishments are already making a special effort to offer a personalized welcome to their customers, thanks to mail tools that allow customization on a large scale, ensuring very specific communications adapted to the chosen audience [17]. Far beyond simply adding a guest's name to a welcome message, data provides insights into past buying habits, allowing hotels to personalize their offers and promotions, and automatically offer services inspired by previous stays. Technological tools use big data to create individual interactions between the client and their host. Chatbots have proven to be a boon to customer service, both during the booking process and to answer recurring questions [18]. Hotel operations are increasingly driven by the use of management systems to analyze and optimize revenue, guest relations, real estate, networks and reputation. Not to mention the growing importance of integrated messaging, predictive analytics, customer profiling, and middleware, all of which aim to connect any disparate system. For example, in 2021 The hotel chain Accor in England announced the opening in London of the first completely digital hotel, the ibis Styles London Gloucester Road was classified as the first totally digital hotel of the Accor chain, whose contactless solutions presented guests and collaborators with an experience according to the needs and expectations of the guests. The initiative is part of a pilot plan for technological integration, aimed at

implementing a series of applications for customers to quickly, easily and safely access the services and common spaces of the building [19].

Guest's Experience

Enhanced Levels of Customization

A smart hotel offers good opportunities for fulfilling customization. For instance, TVs can be remotely configured to refer to guests by name, while guests can use a central control point to set conditions within the room. Through IoT technology, some devices can automatically create those conditions. In addition, smart TVs and smart speakers can give guests the ability to access their own accounts on services like Netflix and Spotify.

A Brilliant Booking Engine

Booking software solution offers exactly what hotel owners require. Offering exceptional tools and features, it can be customized to fit the needs of a hotel brand. A fully functional booking engine like this should also be quick and easy to use; designed to provide a consistent experience across hotel websites that puts guests at ease and makes them much more likely to book directly rather than through an OTA. It is about retaining guests and, therefore, maximizing conversions [20].

Work Spaces Within Hotels

Today, remote work has become commonplace for many employees and this trend is not going away any time soon. An unprecedented number of large companies, led by web giants like Twitter, Facebook and Amazon, have announced that they will take a hybrid or flexible approach to work for the long term. In 2021, the global percentage of employees working remotely full-time was doubled. This means that hotel establishments are and will be used as a workplace by travelers, as well as by local inhabitants seeking a temporary change of workplace. This trend represents, for hotel and restaurant establishments, an excellent capitalization opportunity that allows them to adapt their offer to the needs and desires of this new type of clientele, such as numerous power outlets, free high-speed WIFI and excellent coffee [21].

Digitized Customer Experience

Mobile applications are becoming an increasingly important part of how investors manage the services they provide to their guests, as well as the analysis of the experience they provide. Traditional services, in direct contact with customers, have been transformed thanks to the more frequent use of options supported by technologies, such as mobile check-in, contactless payments, voice control and biometrics. Consumers who have grown accustomed to unlocking their smartphones and laptops through facial recognition and fingerprints will soon expect the same service to access their hotel rooms [22]. For example, in W Paris hotel, staff use WhatsApp to answer guest questions, and at Virgin Hotel Chicago in U.S.A, guests already use their mobile phones to check room temperature or room service [23].

Virtual and Augmented Reality

To offer visually appealing content, companies in the hospitality industry are looking

to take advantage of certain features, such as virtual tours. The latter offer consumers, in a fun and immersive way, the opportunity to virtually immerse themselves in what could be a vacation spot. Once there, visitors should be able to whip out their trusted companion, their smartphone, and point it at real-world artifacts for additional information. Augmented reality uses graphic or informational overlays to enhance on-site environments. After downloading the corresponding app, customers can also use this tool to access restaurant opening hours, reviews or interactive tourist information maps and potentially create content as a user [24].

Management in Hotel Industry

Data-Driven Decision Making

It is essential that stakeholders in the hospitality industry take care with smart hotel systems, especially when it comes to protecting customer privacy. As long as hotels are transparent and comply with data protection legislation, some of the customer information obtained from smart hotel solutions can be useful. While it will be necessary to securely delete client voice commands and other data from devices like the Amazon Echo, some information, including basic usage data, may be collected. This can allow hotels to find out what the most popular TV channels or radio stations are, allowing them to make data-driven decisions about what to set as default options [25].

A Great Guest Management Platform

Smartly managed hotel would be making use of a management system that is really GMS (guest management system); being able to leverage its functionality to not only collect guest data, but also analyze details of guest social attributes, stay behavior, and historical spend. In turn, this would provide the investors with invaluable insight into their core clients, ensuring that the platform can help smart ads reach these customers with relevant and personalized content and offers, thus converting them into bookers precisely when and when needed. In addition, from its single central panel, such an intelligent GMS would take control of messaging. It would manage marketing emails and social media messages to all hotel supporters, as well as analyze these supporters [26].

Smart Advertisement

In fact, investors need to look to high-end smart ads software to complement and enhance their PPC activity. Such a solution would be designed to exploit valuable hotel information to drive and improve Google Ads performance by targeting the most likely bookers and thus, in turn, maximizing room reservations and increasing additional spending on hotel rooms services and amenities. Smart ad software solutions like this are at the sharp end of in-room advertising, ensuring investors and owners can reap the rewards of the latest integrated marketing techniques and digital technology. They seek to increase revenue at a time when the industry is facing great instability [27].

2.2 Challenges

Reluctance to Digitalization Investment

One of the main challenges in smart hospitality is the lack of predisposition or lack of

interest in investing in digital technology in hotels. This lack of interest occurs due to little knowledge of the usefulness of technologies both in the operative part, administration and in the experience of the guests. In addition, there are many investors who prefer to continue providing comfort to their hotel guests and therefore prefer to do business in the normal and traditional way. However, not considering the current technology that can be applied in hotels would be to waste the great benefits of smart hospitality, especially in terms of savings [28].

The Right Tech Partner

Owners and investors are overwhelmed by several technology suppliers which sometimes can be an impediment to the different process. This can affect directly in a positive or negative way. That is why is very important that investors can be sure about the responsibility and commitment of technological suppliers in order they can improve their investments. If owners invest in technology, they must make sure that it is new enough to attract attention and that they do not make an expense that in the end will not benefit them [29].

Fast- Paced Technology

Currently technology is changing so fast, which means hotel businesses need to pay attention to last technology in this area to become competitive in this market. As the technology change constantly, hotel investors and owner need to invest in technology to keep up with client's needs and expectations. The hotel industry faces a great modernization challenge, growing and innovating, but not all hotels in all destinations have the same needs. Little by little modernization is reaching this sector, for example, today in many hotels it is possible to check-in through an App or special modules in the lobby, which is beneficial because it speeds up the process and saves time. Another example is the television screens in the rooms. Years ago, few hotels had screens, and those that did represented a certain luxury. Today, with the analog blackout, it became a necessity and obligation for all hotels to migrate to this technology [30].

In many cases, starting to innovate may seem like a crazy process for hotel companies, since they may have an idea of the steps to follow, but not how to order and apply them correctly. It is highlighted that the application of an innovation roadmap is essential, which allows hotels to follow and maintain a specific plan, which not only includes immediate measures, but also long-term, to ensure that improvement is maintained in the future [31]. In addition, the route must propose to manage change, adapt and collaborate openly. In this sense, companies must be aware that adaptation is constant, and that of course it is impossible to advance without cooperation and teamwork.

On the other hand, customers are increasingly demanding immediate response, even within an hour when using digital channels. Providing a quick response through traditional channels is very costly, time-consuming, and inefficient, especially for travelers who occasionally book a last-minute reservation and need immediate answers about their potential room.

To avoid high costs, to improve response time and customer satisfaction, every hotel or hospitality business must implement a technology solution that can provide automated customer service from the get-go. For instance, according to McKinsey, the majority of travel bookings are made through digital channels: around 60% of bookings in Europe

and the US are digital [32]. Customers feel comfortable making a reservation across multiple platforms and apps, uploading photos, and inserting credit card details, all because they trust brands to keep their information safe and secure. However, a small breach in a large hotel group's system can leave information open to hackers who can steal it, use it to cause tremendous damage and ruin years of brand reputation. In general, according to a study, which has been carried out in collaboration with the Cotec Foundation for Innovation analyzed the relationship between innovation and the sector with the statistical information available between 2003 and 2018 in Spain and identified a set of barriers to innovation, among which are included: Access to finance, the shortage of own funds and public subsidies, difficulties in finding partners to cooperate in their activities, market dominance by established companies, difficulties in recruiting qualified personnel [33].

3 Methodology

Qualitative research through in-depth interviews were conducted with five hotel stakeholders in Santa Elena Province such as managers and owners. These five hotels are considered in the category 4 and 5 stars for the Ministry of Tourism in Ecuador. Each interviewee was asked about the two research questions, followed by questions for clarification. First, it was scheduled a day to interview stakeholders according to their availability. The interview for owner representative was through zoom application and for managers the interview was face to face. The interviews were recorded and the transcript was validated by a professor specialized in hotel management from Universidad Estatal Península de Santa Elena.

The two research questions were:

What are the opportunities for smart hospitality?

What are the challenges for smart hospitality?

The background of the interviewees are presented in Table 1.

4 Findings

4.1 Opportunities for Smart Hospitality

New Guest Preferences

Interviewees agreed in general that hospitality business models need to understand the new preferences and behaviors of consumers. Each time, different preferences are seen especially in young adults who are looking for new experiences but also need comfort. In this sense Owner representative, A pointed out *“We are in a time of great challenges for tourism, and especially for the hotel industry, which must learn to adapt to the forms of communication and interaction demanded by millennials, where technology plays a fundamental role”*. In the same way, Owner representative B said *“The growing use of digital devices by consumers has created new standards for customer service and communication. Customers expect hotels to provide a digital service”*.

The Technology Available for Smart Hospitality

Interviewees mentioned that today science has developed system management software

Table 1. Interviewees' background in Santa Elena Province

Stakeholder	Company background
Owner representative A	His company owns a local hotel chain with four hotels around Ecuador. One hotel is in Santa Elena. The number of hotel rooms is between 40 to 60
Owner representative B	His company owns an international hotel chain with three hotels around Ecuador. One hotel is in Santa Elena. The number of hotel rooms is between 80 to 100
Manager A	He is the general manager of a four stars hotel in Santa Elena Province. He has experience of 15 years as a manager
Manager B	He is the general manager of a five stars hotel in Santa Elena Province. He has experience of 6 years as a manager in hotel industry
Manager C	He is the general manager of a four stars hotel in Santa Elena Province. He has experience of 8 years as a hotel manager

packages that offer hoteliers unprecedented in-room management and control throughout the property. But they highlighted that the most important technology is the one that is focused in save energy and basic resources like water as well. In this sense, Manager A said *"I have realized that sensors are a great tool to detect occupancy and reset thermostats, automatically turning lights off to reduce energy use"*.

Furthermore, Manager B established *"The Internet is big and a driver of digital strategies in the hospitality industry, with the potential to provide an almost infinite limit to the reach of the audience. This allows your hotel to reach the eyes and ears of people who, a few years ago, did not know it existed"*.

Manager C also pointed out *"Travelers have an endless variety of accommodation possibilities and can easily choose another hotel if it offers a better price, location, or special benefits. That is why, in a world full of hotel websites, a brand must be unique to attract more customers, especially with the digital alternatives it offers therefore this is an opportunity to grow"*.

Owner A and B agreed that technology brings a good opportunity to compete in in an increasingly globalized world.

The Tourist Places in Santa Elena for New Markets in Tourism Industry

Interviewees also pointed out that one of the opportunities in hospitality industry in that Santa Elena is one of the most privileges provinces in Ecuador, because it has beautiful beaches and natural places that are highly demanded by tourists, especially foreigners. Owner A pointed out *"There is a specially reasons to invest in the country in the field of tourism, especially because the country can become a 'High End' or exclusive destination, a segment that represents millions of tourists a year in the world, given its natural beautiful landscapes specially in Santa Elena Province"*.

On the other hand, Owner B said *“There is still space and there are new markets to looking for but we believe that the public and private sector need to work together to grow in this sector”*.

Given the years of experience of three managers interviewed, they agreed that Santa Elena is a province with a big potential to invest in the hospitality industry, especially for its natural attractive, gastronomy and local people.

4.2 Challenges for Smart Hospitality

All interviewees agreed that although there are several opportunities in hotel operations, management and experience client as was explained above, there are also four challenges to pay attention to continue moving forward in smart hospitality.

Financial Challenges

Interviewees, said that although the implementation of smart technologies is a good opportunity to grow, it also is expensive specially with the high tariff values that represent their acquisition and It implies specialized technical equipment for its assembly and installation, as well as access to an after-sales service that in most cases increases the value of the investment and reduces profitability. Owner representative A pointed out *“The situation is very complicated. There is no enough backing from the government that offered hotel investors a 15-year loan, with three grace periods. There is no such line of credit and that even some tourism investors are not subject to credit, because the banks consider it a risky sector”*.

In the same way, Owner representative B said *“In 2020, the hotels had operating losses due to the pandemic. That is, revenues were not sufficient to cover operating costs and expenses. This generated the consumption of liquidity, and the servicing of the public and private debt was compromised. Given the cost of new technologies, at this time it becomes difficult to invest”*.

Public Policy Support Challenges

Interviewees pointed out that there are not enough public policies that encourage the incorporation of smart hotel technology aimed specially at reducing energy consumption and therefore aimed at reducing the carbon footprint on the atmosphere by the hotel industry, which discourages the investors to invest in technological structure for saving energy. However, few owners have invested in Ecuador in hotels with technology to save energy and water. In this sense, Owner representative A established *“Constantly changes in government regulations represent new restructuring and fiscal considerations for hotel companies”*.

On the other hand, Owner B said *“although, there is needed specific public policy to invest in technology, I think Ecuador is a developing country where there are still opportunities, but it is important to create public policy where public and private sector can work together in order to strengthen tourism sector”*.

While Manager A, B and C agreed that although government make effort to motivate private investment in tourism sector, there is still a lack specific and clear public policy to improve investment specially in smart technologies.

Technological Challenges

In order to decide and implement smart technologies, investors need to invest in specific infrastructure and make some changes in operation processes. Owner representative A pointed out that although they have already investment in changes in operation processes, it is still necessary to invest in infrastructure specially for energy management which is more expensive compared with operation procedures such us payment procedures, automatic check in, social networks among others. He pointed out *“In the province of Santa Elena we see that the greatest investment in elements that lead to a Smart Hotel lies in the acquisition of technological elements that reduce energy consumption and in the provision of free internet points for hotel guests. There is a lack of investment in elements such as the use of hotel management software, channel manager, security, maintenance, augmented reality, artificial intelligent and robots”*.

In the same way Representative B said *“Hotels have had to adapt their physical infrastructure, but also their digital strategy, to avoid physical contact. This implies that, when the guest is already in the facilities, they move in a more digital way”*.

However, all managers agreed that technical procedures need also human resources that have a specific knowledge about new technologies. For instance, Manager A said *“Definitely at this point, hotel industry has had to reinterpret technology to ensure a safe return for their traditional guests, new guests and a new generation of guests. The objective is that the lodging and the experience of the guest be safe, However, the assembly, maintenance and use of these technologies requires specific knowledge in information technologies, networks, and systems, which increases the demand for multitasking personnel who are capable of functioning in totally technological environments, which in the country are very scarce”*.

On the other hand, manager B pointed out *“navigating in the rooms and common spaces through virtual reality allow the guest can have certain security, even before the reservation, that they will be going to a safe place but for this is necessary to hire more specialized human resources”*. In the same way manager C said that hotels have benefited from new technological tools and have changed the rules of the game, manager pointed out *“In the tourism sector, operating or travel agencies no longer work through an office, all reservations must be made digitally, trying to position yourself in social networks and in search engines and metasearch engines today is essential for business development, however in Santa Elena Province only few hotels can considered smart, the majority still uses operational processes and infrastructure in a traditional way”*.

The Right Tech Partner Challenge

All interviewees agreed that suppliers of technological infrastructure for smart hotel in the country are intermediaries of the international companies that are the developers of these technologies because no technological component for Smart Hotels is manufactured in the country. All this means that the incorporation of technological elements capable of turning hotels into smart is minimal due to all the barriers that exist for its implementation and especially the costs and taxes that are involved in the acquisition of

these technologies. Owner representative A pointed out *“If hotels invest in technology, we must make sure that it is new enough to attract attention and that they do not make an expense that in the end will not benefit us, but in the country is very difficult to find suppliers of technology, we need to look for foreigner companies which implies time and money”*.

Owner B established that *“we know the importance of technology in our hotels, but this es very expensive, because in the country there is not enough human resources with the knowledge to implement some technology. However, we have implemented in one of our hotels magnetic cards for the rooms which was expensive, because We had to pay all travel expenses for the human resources that were foreigners”*.

Once that it was collected the answers about the opportunities and challenges that investors and managers think exists for smart hospitality, they also were asked about the technology that currently they have implemented in their hotels and Table 2 was the results of the available technology that they have in their hotels.

Table 2. Technology implemented in hotels of Santa Elena Province

Area	Technology	Hotel A	Hotel B	Hotel C	Hotel D	Hotel E
Infrastructure	Automatic doors	✓				
	Light sensors	✓		✓		✓
	Technological equipment for events	✓	✓			✓
	Speakers with Bluetooth connection	✓	✓	✓		✓
	Touch free	✓				
	Smart thermostat	✓				
	Stream from mobile device to TV	✓	✓			
	Air purifier	✓	✓			
	Magnetic Card	✓	✓			
	LCD displaying with signaling	✓	✓	✓	✓	✓
Systems	Hotel management system	✓	✓	✓		✓
	Web page	✓	✓	✓	✓	✓
	Wi-Fi	✓	✓	✓	✓	✓
	Social networks	✓	✓	✓	✓	✓
	Electronic ways of payment	✓	✓	✓	✓	✓
	Web check in	✓	✓	✓		
	Electronic menu	✓	✓			✓

5 Conclusion

Currently, technology is in the heart of the hotel experience, before or after the trip, in the room or in the common areas of a hotel. This trend will lead to the development of new concepts and more innovation in the sector, while contributing to the emergence of an increasingly individualized offer. Nowadays, everyone involved in hotel industry should prioritize turning their hotel into a smart hotel, as it can significantly improve the customer experience, make life easier for staff, and save owners money. Although some customers are still reliant on human interactions, the investors need to remember that digitalization is the only way to survive in the market for a long time. Indeed, the challenges are numerous and very hard to overcome, needing extensive research, training and investments, but once they have been reduced, the investors will enjoy great success and profit. The new technologies linked to digitization in the tourism sector in Ecuador are still in their first steps, but they are expected to completely revolutionize the industry soon. Even though there is a great variety of technologies developed for different fields and with important applications in the sector tourism, especially in the biggest cities such as Guayaquil and Quito, but its use in Ecuador has not been documented in empirical studies. This studied was focused specially in the opinion of stakeholders such as owners and managers of hotel industry, who have a big responsibility to make a decision to invest and apply technology in their hotel to become them in smart. As a result of the research the main opportunities identified are; current technology available, new guests preferences and the natural and beautiful tourist places that the Province have to open new markets. On the contrary, the challenges identified are; financial problems, human resources specialized in technology, lack of public policy and difficulties to find a tech partner in the country. It is important to point out that comparing with the big opportunities that the literature offer in terms of technological innovation for smart hotels, in Santa Elena Province few hotels have some basic tools to consider smart. These tools are focused specially in saving energy and the use of social networks. In addition, literature said that one challenge for smart hospitality is Reluctance to digitalization investment, however in Ecuador investors want to invest in technology, but there are some barriers to avoid invest on technology. The research have a big limitation, it was used only 5 stakeholders of hotels in the Province which means that the findings cannot be generalized for the whole hotel industry in Ecuador.

References

1. Accor (2022). <https://all.accor.com/hotel/B1C5/index.es.shtml>
2. Amatulli, C., De Angelis, M.: Analyzing online reviews in hospitality: data-driven opportunities for predicting the sharing of negative emotional content. *Curr. Issue Tour.* **22**(15), 1904–1917 (2019)
3. Atlata, J.: Hotel Management (2019). <https://www.hotelmanagement.net/tech/10-ways-smart-technology-reshaping-hotel-industry>
4. Avila, Y.: Odd (2021). <https://www.oddarchitects.com/post/odd-la-firma-de-arquitectos-en-quito-dise%C3%B1a-hoteles-con-certificaci%C3%B3n-de-ecoeficiencia>
5. Buhalis, D., Leung, R.: Smart hospitality—Interconnectivity and interoperability towards an ecosystem. *Int. J. Hosp. Manag.* **71**, 41–50 (2018)

6. Car, T., Stifanich, L.: Internet of things in tourism and hospitality: opportunities and challenges. *Tourism in South East Europe* **5**(163), 163–175 (2019). <https://d1wqtxts1xzle7.cloudfront.net/66894304/293-internet-of-things-iot-in-tourism-and-hospitality-opportunities-and-challenges-with-cover-page-v2.pdf?Expires=1657577761&Signature=CDZIUaDfRrf5PAIxULGje0jY-yzI-i2aGxg9mCmmTvIegLxY60i9jp5RwLBQWw69HpU9trg0X>
7. Castillejo, E.: In: *Proceedings of The Sixth International Conference on Mobile Ubiquitous Computing, Systems, Services and Technol* (2012). https://d1wqtxts1xzle7.cloudfront.net/30795457/ubicomm_2012_3_10_10055-with-cover-page-v2.pdf?Expires=1657584321&Signature=NztbeudpAQIrjhPIKNu-v0XlYcBiYLCzGdZYn3KirAHRB5aElg~04UAijxucfmb-MxRSKauvXukZTyFwLxUpwsw9xz0gdx6oND2u38fPg8vha~yn-JUDRh3toqQq7HfTsK7J
8. Commbbox. Commbbox (2020). <https://www.commbbox.io/es/overcoming-customer-communication-challenges-in-hospitality-and-tourism/>
9. control, G.E. Global Expertise in Pest Control (2020). <https://www.rentokil-pestcontrolindia.com/hospitality/challenges/>
10. COTEC Foundation. (s.f.). COTEC Foundation. <https://cotec.es/proyectos>
11. Dash, M., Bakshi, S.: An exploratory study of customer perceptions of usage of chatbots in the hospitality industry. *Int. J. Customer Relations* **7**(2), 27–33 (2019)
12. Digital Society. Digital Society (2022). <https://medium.com/digital-society/opportunity-and-challenges-of-the-hospitality-sector-6f98fe16e4e1>
13. El Universo. (2022). <https://www.eluniverso.com/noticias/ecuador/ministro-niels-olsen-anuncia-inversion-de-475-millones-para-la-promocion-turistica-de-ecuador-nota/>
14. Eysenck, G.: Sensor-based big data applications and computationally networked urbanism in smart energy management systems. *Geopolitics, History, Int. Relations* **12**(1), 52–58 (2020)
15. Flore, D.: Ecuador Chequea Fundamedios (2021). <http://www.ecuadorchequea.com/el-turismo-lucha-por-superar-el-desastre-economico-de-la-pandemia/>
16. Hsu, M., Ting, H., Lui, T., Chen, S.: Guest editorial: challenges and prospects of AIoT application in hospitality and tourism marketing. *J. Hosp. Tour. Technol.* **13**(3), 349–355 (2022)
17. Instituto Valenciano de Tecnologías Turísticas. Instituto Valenciano de Tecnologías Turísticas (2014). <https://www.thinktur.org/media/Big-Data.-Retos-y-oportunidades-para-el-turismo.pdf>
18. Kansakar, P., Munir, A.: Technology in the hospitality industry: Prospects and challenges. *Consumer Electronics Magazine* **8**(3), 60–65 (2019)
19. Leung, R.: Smart hospitality: Taiwan hotel stakeholder perspectives. *Tourism Review* **74**(1), 50–62 (2019). <https://doi.org/10.1108/TR-09-2017-0149>
20. Líderes, R.: (2016). <https://www.revistalideres.ec/lideres/intel-inversion-empresas-robots-tecnologia.html>
21. Lim, C., Maglio, P.: Data-driven understanding of smart service systems through text mining. *Serv. Sci.* **10**(2), 154–180 (2018)
22. Luo, X., Pan, Y.: A Study on the customer experience design through analyzing smart hotels in China. *J. Korea Convergence Society* **12**(3), 115–124 (2021)
23. Mercan, S., Cain, L., Akkaya, K., Cebe, M., Uluagac, S., Alonso, M.: Improving the service industry with hyper-connectivity: IoT in hospitality. *International Journal of Contemporary Hospitality Management*, XII(V), pp. 23–40 (2020). <http://www.ijaema.com/gallery/4-ijaema-may-3869.pdf>
24. Neuhofer, B., Buhalis, D.: Smart technologies for personalized experiences: a case study in the hospitality domain. *Electron. Mark.* **25**(3), 243–254 (2015)
25. Ojino, R.: *Proceedings of ENTER2018 PhD Workshop* (2018). https://enter-conference.org/wp-content/uploads/2020/10/ENTER2018_PhD.pdf#page=54

26. Ortiz, Y., Varga, E., Nava, R.: Los stakeholders de la industria hotelera: una clasificación a partir de sus intereses ambientales. *Universidad & Empresa* **18**(30), 97–120 (2016). <https://doi.org/10.12804/rev.univ.empresa.30.2016.05>
27. Salazar, A.: Hospitality trends: opportunities and challenges. *Worldwide Hospitality Tourism Themes* **5**(6), 592–602 (2018)
28. Shabani, N., Munir, A.: E-Marketing via augmented reality: a case study in the tourism and hospitality industry. *Potentials* **38**(1), 43–47 (2018)
29. SKIFT. SKIFT (2016). <https://skift.com/2016/08/26/how-smart-hotels-use-messaging-to-connect-with-guests/>
30. Adamo Software: Adamo Software (2021). <https://adamosoft.com/blog/challenges-for-the-hospitality-industry/>
31. Tourism, I.E.: Invest Ecuador Tourism (2022). https://investecuadortourism.com/wp-content/uploads/2021/11/Santa-Elena_RADISSON-BLUE-PUNTA-CENTINELA-OCT-2021.pdf
32. Verma, M.: Implementation of blockchain-based technique to a hostel room booking system: practical aspects. *Int. J. Res. Applied Science Eng. Technol.* **9**(5), 1–4 (2021)
33. Wise, N.: Developing smart tourism destinations with the Internet of Things. *Big data and innovation in tourism, travel, and hospitality*, pp. 21–29 (2019)