Will Machines Replace Humans in the Hospitality Business?

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ABSTRACT

This research investigates the impact of Artificial Intelligence (AI) and robotics on the hospitality industry, highlighting concerns about the potential for machines to replace human workers amid significant technological advancements. The study will use a qualitative-method approach, starting with a literature review to understand the hospitality industry's technological advancements and AI and robotics' potential role. The analysis will assess the economic implications of AI and robotics adoption, considering cost savings, efficiency gains, and customer satisfaction, using financial reports from major chains and industry-specific indicators. The research indicates that while technology and machines have improved operational efficiency and reduced costs in the hospitality industry, the human touch remains crucial for delivering exceptional guest experiences. AI and robotics have mixed results in the hospitality sector, as they lack empathy, creativity, and personalization. While they can perform tasks with precision, they cannot completely replace human roles in providing genuine and personalized guest services, as noted in previous research. This research will offer crucial insights into the hospitality industry's transformation and the delicate balance between automation and the human touch, aiding stakeholders, policymakers, and business owners in technology adoption decisions.

Keywords: Hospitality industry; Artificial Intelligence (AI); Robotics; Guest experience; Automation; Technology adoption

INTRODUCTION

Like many other service sectors, the hospitality and tourism sector is human-dependent to provide the best customer experience in any establishment around the globe. Since the inception of the hospitality and hotel business, the requirement for a trained workforce at a specific budget has been in demand across the industry. Starting from security check-in at the hotel entrance through the parking, at the entrance of the hotel reception, or the reception desk during performing any reservation process and registration activities, and even accommodation/dining-in/in any other in-house facilities is the service quality is dependent on the daily involvement of trained professionals in their respective areas to facilitate the guests. However, the scenario of the present hospitality industry is very different as compared to that of the previous century. At present people or customers have become selective as well as aggressive in demanding standard guest service from any hotel and restaurant. Today having personalized guest service has become more necessary than ordinary hotel services. As many of the leading international and national brands have occupied the market and are providing facilities at a competitive price; people have the option to locate any hotel at any given time according to their choice. Therefore, it is always a challenging task for any hotel or hospitality business owner to keep their prospective clients/guests satisfied to survive in this competitive market. Customers are firm and demand receive quick service from these establishments in less time and that is why the demand for technology and automation appeared in the hospitality business. As internet facilities, automation, and digitalization happened, it became easier for individuals to locate any hotel or restaurant in any specific location according to their choice. The

improvisation of the Central Reservation System (CRS) to the Global Distribution System (GDS) connected all hotel accommodations at a single point, which is helping individuals in booking a hotel room by using the internet. Innovation of Smart phones on the other hand made things easier for all at a fingertip. By using any individual website or mobile application, people can go to the hotel website, can check the availability of rooms, check-in and checkout timings, amenities, and other facilities that a hotel is providing to a particular destination at a standard price. Earlier people had to wait to complete billing formalities during arrival and departure but to reduce that wastage of timing many hotel and hospitality sectors have introduced self-service vending machines to support visitors with a digitalized platform. They provide uniform guest service with accuracy and deliver it according to the Standard Operating Procedure (SOP) of a hotel or any hospitality establishment, which is a critical task, if provided manually. Here, Information Technology (IT), Artificial Intelligence (AI), robotics, and IoT has played important role in providing guest service timely and effectively. The application of artificial intelligence, robotics, and other innovation systemized the hospitality business in the past ten years. There are multiple academic institutions like universities, colleges, business schools, and training centres, which are running professional courses for undergraduate, postgraduate, doctorate, and post-doc to support the industry and academia. Every year thousands of hospitality professionals are joining to support this industry. People are placed globally in different areas of hospitality segments like airlines, cruise, and shipping, flight catering services, hotel and resorts, and other customer service segments. However, post-pandemic during the new normal a different picture has been observed in the past two and half years where hospitality and tourism sectors majorly affected due to the widespread corona virus. The hospitality industry faced the challenges of staff layoff; retrenchment from employment and other severe situations reported. As the government had declared that operations must be performed with a limited number of staff to avoid the further spread of infection among the community and potential guidelines were imposed to improve contactless guest service in the over industry. The use of semi-automated and fully automated systems in the hospitality industry is not so very new but in the past two years the frequency of use of these devices, which have optimized the level of increases almost 80% in most of the hotels globally. However, this immediate change caused anxiety and fear of survival among hospitality professionals due to less recruitment, job loss, or employee cut-off issues. Hospitality services and facilities are need-dependent, which is why there is always a need for human interaction to provide personalized services to an individual guest, as the understanding of human emotions is also a necessary parameter in the hospitality business [1]. Multiple types of research have already been performed in the field of artificial intelligence or robotics and automation used in the tourism, hospitality, and hotel management sectors. However, only limited investigation has been performed on how these involvements of mechanisms or machines will go to impact society as well as whether adaptation of technology and mechanism will replace the human workforce from the hospitality industry is a valid topic for discussion in the arena of research? At present there are multiple smart hotels

have started their business in different cities. They are offering a wide number of in-room dining experiences, along with the theme of virtual reality and voice recognition and voice command systems to the guest so that individuals can experience the luxury of their brands in their figure tip. The present market shows the value of goods, which is already available in multiple properties at a competitive margin. Therefore, it became obvious for the operators to obtain various technologies and their applications to facilitate their guests and to survive their business in a competitive market.

Research objectives

The objectives of this research are:

- To explore how different technologies and machines shall impact the hospitality and hotel business.
- To identify whether Artificial Intelligence (AI) and Robotics have possibilities to replace humans in the hospitality and hotel industry

LITERATURE REVIEW

As explained, we are already undergoing the fourth industrial revolution and particularly in this era the improvisation of emerging technologies has changed our way of life and lifestyle through robotics, Artificial Intelligence (AI), nanotechnology, Quantum Computing (QC), the internet-of-things, Fifth-Generation Wireless Technologies (FGWT), and fully autonomous vehicles. It was challenging during the 3rd industrial revolution as the adaptation of technological advancement was "fuelled by data and machine learning". However, during the fourth industrial revolution due to the advancement of technology and the ever-increasing demand for productivity; machines are getting connected through various interfaces to support the service industry without human involvement. There are already many standard systems and mechanisms installed at most hospitality and service establishments that are capable of responding and replying to any individual through specific commands, signals, or gestures. Therefore, at present most hotels and hospitality establishments have started decreasing manpower over machines or digitalization.

Researchers have expressed their point of view in their research work that at present in the hospitality and tourism industry the demand of the customer has increased at its peak so the expectation from the hospitality establishments also increased compared to the past 30 years. Researchers have quoted that "in high customer contact settings, service robots tend to outperform humans when performing standardized tasks, because of their mechanical and analytical nature." However, to reduce workload and to improve productivity followed by authentic guest service; most hotels are taking the help of various technologies like artificial intelligence, ChatGPT, robotics, and other machines. According to the observation of the researchers and hoteliers these Service Robots (SR) did not achieve the desired productivity and intellectuality compared to human service and emotional attachments in every hospitality business segment. As hospitality services are very much

perishable and need dependent (the demand for experienced and trained manpower is always on the higher side. Therefore, to match the demand of the customer and increase productivity and reduce the wages of staff salaries hotels, restaurants, and most of the hospitality sectors are depending upon technological support. Researchers have supported that machines may achieve the accuracy than human labour but they cannot achieve human sentiments as it's only having program and application software to run the mechanism. Many times researchers have mentioned that in the service industry and like in many other sectors customers' need of human touch with whom they can talk can understand or able to share their emotions to make the opposite people understand what he or she is looking for [2]. At present the development of technology and advancement of artificial Intelligence and robotics are one of the trends to facilitate the customer. As we all know the hospitality and hotel sector are labour-intensive so technological innovation has started to embrace in the delivery of prompt service to the customer. Therefore, the use of all these software artificial intelligence robot waiters and many other technological developments become so famous that hotel operators and hospital service providers are using these facilities more and more to reduce labour costs and to improve service standards. Nowadays people are in the more favour of having the service from a digitalized terminal rather than standing in a queue for assistance. In the 21st century, the expectation from the people has increased in such a way that the hospitality and tourism business is almost run by software and by the usage of different online platforms. For making itineraries to book a restaurant table are taking the help of Google by using their smart phones to locate the restaurant according to their menu choice and financial capabilities. In today's world people have every option to reach any destination virtually by using different websites which is providing different features of the destination with the help of virtual reality and modern technologies to the customer? Even in a restaurant people are watching the digital menu instead of traditional manuals which were generally mounted on the world and are presented by any waiting staff to any guest. People have every option to book their order or to cancel it according to their choice or they can keep their booking for the future. At present many hospitality and hotel establishments are relying on security robots and technology which are more efficient than humans in providing prompt service where humans have the possibility of minor errors. In this regard researchers have also expressed that these mechanisms or robots can only perform their task depending on the program or the common has been installed. They have also argued that there are possibilities of mishandling this equipment if someone is using it for negative benefits. A major portion of the customer in the hospitality business is always in favour of technology development and the usage of fully automatic systems whereas a billion guests are in favour of human service from whom they can achieve human emotion, effective communication, and the level of service in exchange of money. In the last few years, it has been observed that there is a growing interest among all in using service robots in different parts of the hospitality and tourism sectors. The main reason behind this is it can offer better comfort and help with accurate information and services compared to a human.

There are so many robots and artificial intelligence are there in the market involved with the service industry offering different levels of comfort and help to the customer. The hospitality industry is already merging with different artificial intelligence through customer-friendly interfaces which are offering standard services daily. This growing interest among the human in the development and use of new interfaces for interaction; caused the human to use technology naturally. The use of interface must be transparent between human and machine like the machine or the technology must allow the human to interact with different surfaces without any cognitive effort. But compared to the expectation the situation is much different. Even experienced employees are relying on artificial intelligence or different user surfaces only to solve a regular issue that could be resolved by simple communication. For example: to communicate with the individual guest inside a guest room individual receptionist is communicating through a voice recognition system to inform any individual guest in a particular room. To book a cab or a prepaid taxi or even prepare a cappuccino or a specific coffee an individual can use specific comments for using Alexa to fulfil his demand. As recorded in the previous research that at present people are in more favour of ordering food online from any suitable restaurant according to their choices; even people are expecting the fastest delivery for their order through drone services (Hwang, Cho, and Kim, consequences of psychological benefits of using eco-friendly services in the context of drone food delivery services, 2019) which almost became a practice for many of the developing countries in the world [3]. During checkout or at the time of guest registration usually, people had to wait in a large queue. However, this situation became more primitive and people can use an express checkout system or fully automatic vending machine to complete their transaction process and they do not have to wait anymore. Most manufacturers are trying to introduce new technology which can produce and prepare specific food items on the range without a single involvement of any chef or cook to reduce human labour and to cut off the salary wages. Many researchers have shown their concern upon interacting with a robot or getting your product through a machine instead of a human being. Most individuals who are not having any experience or do not have any assistance in using those self-service terminals or interfaces; main face the challenge while visiting any hospitality establishment. It is very true that to attract the majority of the population of society is the way to adopt technology artificial intelligence robotics and other different surfaces to increase your revenue but on the other side of society who are directly or indirectly involved with this industry in terms of employment production and other related services; these adaptations of technology may cause serious trouble for the 30% of this total world population in terms of loss of employment if the use of technology cannot be used wisely.

The involvement of machine and technology not only help the service sector on a large scale but also caused a reason of anxiety in society [4]. There are many arguments and discussions already in the process of whether artificial Intelligence and technology can exterminate human beings from the hospitality and tourism industry.

DISCUSSION

Areas where artificial intelligence has replaced manpower

In the past 20 years, we have observed the effective development of hospitality and Tourism businesses all over the world. Therefore, the requirement for sufficient flight and other transport services has also increased. Various hospitality sectors like customer service, reception, travel desk, ground staff management at the airport terminal, at reservation and booking counter have already replaced humans in most places due to the use of the self-service terminal. Most International airports in different countries are using express check-in self-service terminals through which passengers can register themselves for web check-in without the help of any individual or ground staff (Nagaraj and Singh, Investigating the role of customer brand engagement and relationship quality on brand loyalty: an empirical analysis, 2018). At the hotel reception, people already have multiple visual displays that show the location and the layout of different places within a hotel which already reduces the number of staff who used to work in that establishment as guest service attendant (Nagaraj and Singh, Millennial's engagement with fashion brands: a moderated-mediation model of brand engagement with self-concept, involvement and knowledge, 2019). Many of the kiosks and fast-food restaurants or quick-service restaurants are using audio-visual systems and the display screen to sell their commodities to the customer which has reduced the number of staff who used to work in restaurants as host or hostesses. People even get their product at the food counter just by the announcement of the token number along with the name of the customer using an audio-visual system [5]. In the 90's most of the renowned hotels and Hospitality chain has a turnover of 1000 guest room attendants and public area attendants to clean different surfaces however after 2000 when multiple machines like vacuum cleaner upright vacuum cleaners and other products occupy the market for the sake of productivity and accuracy (Patel, Airport passenger processing technology: A biometric airport journey, 2018) those establishments reduced their staff turnover as one single machine can perform the task of 10 number of people at a same time. Commercial laundry and on-premises laundry which are mostly available in many business hotels are already equipped with fully automatic laundry machines which include a washer extractor laundry dryer tunnel washer calendaring machine steam press and steam iron have reduced the wastage of time alone with the manpower. These machines are self-sufficient require only an individual to operate and can perform rigorous cleaning work in very little time. Many coffee shops and cafes are equipped with coffee makers and Potter filters which can make multiple art for the preparation of different coffees. It has not only reduced the multiple manpower at a single shot but also given the same product to the customer in less time. When talking about kitchen or cooking the environment of different

appliances and machines is unavoidable. It is very rare we able to see anybody is grinding different spices manually rather than doing the same with the help of any mixer grinder or processor. For most of the multiple complex hotel hospitals and other establishments for the cleaning of the corridor or lobby instead of using regular bucket mob and water have scrubbing machine or fully automatic floor cleaner which can clean the enter surface with lint-free cleaning in less time. Therefore, at present, we can see only a nominal number of public area attendees who mainly work in the different places of any business or city hotel to perform any cleaning task. Especially after the infection of pandemic when every government enforced lockdowns and social distancing to avoid the further spread of infection among the community. Most the hospitality establishment have reduced staff along with the implementation of new technologies like fully automatic sterilizing and sanitizing systems for this surface as well as human, digital face recognition system along with photo capture, signature, and the finger impression detector, robot waiter for cleaning the floor surface as well as table top, and fully automatic floor cleaning robots to continue their business during this challenging time [6]. It is very unfortunate for those hospitality workers who lost their job during the pandemic did not able to join their previous organizations as they are continuing to drive with the help of those technologies and advancements. Even in the hospitality corporate and in other sectors the emerging trends of virtual meetings or discussion came into the picture in the mode of Zoom, Google Meet, Microsoft Teams, blackboard, and others. People became more advanced in the past 2 and a half years in terms of using digital devices along with upgraded software to identify and relocate even to conduct seminars and classes at different institutions which have created a problem for most user because they are not efficient in using those platforms or not having sufficient training or possibilities of using different gadgets. Even in the hospitality academics and hotel management institutions, it has been observed that in the past 2 years due to the COVID-19 pandemic infection, most of the classes were conducted through online even the examinations practical exams have been conducted online and the institutions are forcing their mentor to conduct classes by using digital perform. At very short notice it was quite impossible for most of the trainers and professionals who were involved with this industry. Therefore, most people have to leave their jobs or be laid off without any faster instruction from their organization. At present, most of the hotel business is run by online travel agent systems or OTAs. They are main responsibilities are to put a variety of hotel room tariffs at a single window from where visitors can book their desert hotel depending on the criteria like location price facilities and others. This innovation of the online travel agent system has not only decreased the business and the work of travel agents but also has extra minutes for the tour business in physical mode. In terms of transaction or payment, most individuals preferred to pay their amount through online transactions or by UPI payments to avoid any discrepancy in transaction.

There are multiple areas in the hospitality industry where we can see the emerging trends of artificial intelligence and its innovation for guest service. Artificial intelligence is one of the important tools that can multitask which can Undertaker hospitality staff. There are multiple possibilities for information technology and artificial intelligence to operate multiple backs of his task and reduce human by increasing efficiency and productivity standard. It is very expensive at present to implement new mechanisms or systems all over the places of hospitality establishments to operate the business but shortly it will cover most of the sector [7]. For example, artificial intelligence can enhance the customer experience through personalized interfaces. The modern AI facilities are having detailed up gradation which can keep the recording of the guest experience for future use and it is also capable of keeping the track record of every customer on their liking and disliking. For the future use of the arrival of the guest, these interfaces can recognize the guest by their name or their past recognition and able to justify to the hotel establishment what experience the guest has faced during his last visit. So, it will become outstanding improvisation of technology that already adopted the ability to interact with the guest in terms of communicating or solving any issues on guest complaints. For data management and operational effectiveness, artificial intelligence has a leading role. Most of the hotels are using PMS (Property Management System) which is collecting the data of all the guests throughout the operation hour and keeping a track record of every piece of information like introduction between the guest and the employee, feedback, and guest complaints, even the order of foods, etc. There are possible chances for the hospitality business shortly that both artificial intelligence and service roads will operate the hotel reception and the guest interaction. This artificial intelligence will anticipate the guest requirement in such a way that the visitors do not have to carry much of the document for validation during their stay. These interfaces will be more efficient to recognize any individual based on the record in their PMS. The advancement of technology happened through the guest introduction by using effective direct messaging and online chatting services. These facilities have a recording system along with the capability to answer simple questions and requests. The facility of ChatBots and auto messaging systems already become famous on many social media platforms and on different websites which are allowing their customer to get satisfactory answers to their questions 24 X 7. For example: "SAM" is an intelligent chat bots used in the hotel industry for booking hotels.

Data analysis is one of the latest inventions and capabilities of this software and mechanism for the hospitality business. It can easily analyse the data of the potential customer which will help the hotel managers to understand the percentage of revenue generation for individual days. There are software and interfaces that can analyse the review of multiple properties based on web ratings for individual properties. Instead of deploying employees most of the hotels are using the technology of digital concierge which can communicate with the guest in multiple languages to resolve guest queries. Multiple programming has been performed to make it more efficient to provide information like making itineraries, booking private vehicles, booking flights,

and even locating a spot in a restaurant within a locality. This process has not only improved the guest experience but also helps the hotel operators to hire a smaller number of employees.

Many foreign visitors usually visit different establishments and face the challenge of the interpretation of different languages. However, this situation has been controlled by the chat bot translator to help the customer in a much easier way [8]. It has not only reduced the issues of the hotel receptionist in communicating with a foreigner who is not familiar with the local language. This specific chat bot translator is having the ability to write or record the words of the customer through voice recognition systems. We can hope that in the coming future will see hotels with fewer receptionists and conceived or reservation attendants which will be only operated by machines with equipped artificial intelligence interfaces to solve guest queries.

Areas where artificial intelligence and machines cannot replace human

Service-dependent hospitality and tourism businesses are always human-dependent. Virtual reality, automation, robotics, and artificial intelligence has played the dominant role to provide futuristic services to the mass but it has the limitation of imagination which cannot be achieved without human emotions. Most of the self-service.
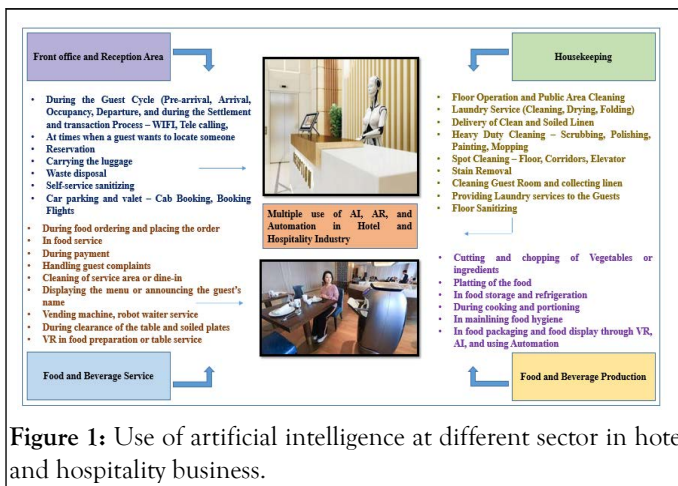

Figure 1: Use of artificial intelligence at different sector in hotel and hospitality business.

Interfaces at different hotels and restaurants provide customer friendly experience based on programming and input. But beyond those application and program data, these third-generation interfaces can't fulfill the need of the customer. Creating a recipe by service robot or automation is possible but to do the experiments based on available ingredients is only possible by a chef [9]. In labour intensive markets of the Third world countries including India, the cost of automation may not be viable as alternative to cheap labour that can be exploited to the fullest.

Robots may assist the visitor with specific greetings but cannot achieve the affection of human touch. According to the data of many of the research, machines could perform multitasking initiates based on programmable data; it has no ability beyond that.

The method of doing a systematic analysis and analysing findings from several research that mostly relies on language and text to describe and summarize the synthesis's conclusions is known as narrative synthesis. A narrative synthesis was used in this review paper. In addition, a thorough assessment of the literature was conducted to investigate AI in the hospitality sector. The literature and data came from a variety of sources, including EBSCO, Google Scholar, Scopus, Web of Science, and Science Direct books and research articles. Studies that defined Artificial Intelligence (AI) in the hospitality sector in detail, were published, composed in English, and underwent peer review were the requirements for inclusion. The review period for the data was January 1990-September 2023. The researcher chose a collection of terms associated with artificial intelligence in the hotel sector in order to scan the database [10]. The hotel industry, Artificial Intelligence (AI), robotics, guest experience, automation, and technology adoption were the keywords that were found. The secondary data used in this research. The author has researched numerous publications and pertinent articles on the topic. Appropriate findings for this research have been drawn after a qualitative analysis that took into account as many relevance possibilities as possible and was based on the analysis of research that has been reported by many authors in relevant fields.

Key findings

Based on the data we have obtained from different sources understand that at present artificial intelligence and ICT are giving a boost to the present hospitality and tourism business. Latest technologies are helping the hospitality and hotel business to perform their work more accurately and conveniently [11]. Many hoteliers are trying to adopt new tools and techniques to get accustomed to it. This adaptation of integrated hospitality management solutions is much more productive compared to human force but on the other side very expensive to install. According to the findings as productivity is on the higher side there is always a chance of manpower being laid off the hospitality organizations. As customers are becoming more technology-oriented; all employees must have the capacity to work together within this changing environment. Research has found that many hospitality business owners are in favor of using data-driven tools and interfaces. It is proved that the present generation is in favour of using modern technology rather using manual service but there is a proportionate demand from the customer who has a demand for human interaction and they are only fascinated by receiving the service from a professional rather than from machines or robots [12]. Multiple records of employee cut-off laid off, or retrenchment from jobs has been reported in the past two years during COVID-19 due to the sudden change of technological growth. But simultaneously, it will generate potential risk factors like lack of job opportunities for people, insecurity of customer data, frustration among the existing employees due to lack of attention or lack of training or adaptability, and multiple environmental impacts.

CONCLUSION

The function of the hospitality industry is operated through human touch. Whenever we talk about any personalized guest service we always think of professionals who will be providing us authentic guest service. However, machines and artificial intelligence have introduced a new dimension in hospitality Services to improve the experience and the service quality. The main reason behind this is to reduce the guest complaint as well as minimize the error. Considering the present situation after the pandemic, where contact and touchless services became one of the necessities to support hospitality. No doubt technological development and the introduction of artificial intelligence machines and automation already took place in many of the hospitality sectors to support humans. Most hotels are using AI to analyse different trends and guest behaviour so that employees can able to provide them with effective service. In many developed countries still, it is a challenge to depend on AI and robotics automation to operate hotel operations. Still, few of the hotels are using artificial intelligence like Alexa which is generally installed in a guest room to avoid less physical interaction. In the post-COVID scenario, we have already noticed that many of the hotels and Hospitality brands are using artificial intelligence for guest service which became easier for a few technologically sound customers, who know how to use this system. But for the majority of the people it became a challenge to interact with.

RECOMMENDATIONS

Therefore, while using this artificial intelligence robotics or humanoid robots or different machines will be some recommendations for a better future:

- AI is to be used in collaboration with human presence to avoid disturbance in service.
- Automation or humanoid robots can be used as support services during peak hours. As both human introduction and machine interface are necessary for offering prompt service to the guests.
- Human labour cannot be replaced by machines as support for any individual machines or robots or other IOT will not be enough as it doesn't have any emotion.
- If any establishment is trying to upgrade its facilities with automation must keep trained professionals to train other employees and customers.
- Scientific innovation should not be a barrier to human life even if for the hospitality and tourism industry. The reason for innovation should be limited to support mankind in the long run.

REFERENCES

1. Achacoso TB, Yamamoto WS. Artificial ethology and computational neuroethology: A scientific discipline and its subset by sharpening and extending the definition of artificial intelligence. Perspect Biol Med. 1990;33(3):379-390.

2. Ahmad R, Scott N. Technology innovations towards reducing hospitality human resource costs in Langkawi, Malaysia. Tour Rev. 2019;74(3):547-562.

3. Akdu U. Smart tourism: Issues, challenges and opportunities. The Emerald handbook of ICT in tourism and hospitality. 2020:291-308.

4. Aldabbagh A, Neyazi D, Alsahafi M, Sarhan A, Palaniswamy T. Improving the Quality of The Housekeeping Management Process for Stay at Bridge Suites Hotel. J Adv Hum Res. 2022;1(1):26-41.

5. Amer M, Alqhtani A. IoT applications in smart hotels. Int J Int Things Web Serv. 2019;6.

6. Azis NA, Hikmah RM, Tjahja TV, Nugroho AS. Evaluation of text-to-speech synthesizer for Indonesian language using semantically unpredictable sentences test: indoTTS, eSpeak, and google translate TTS. In 2011 International Conference on Advanced Computer Science and Information Systems 2011 Dec 17 (pp. 237-242). IEEE.

7. Baker MA, Magnini VP. The evolution of services marketing, hospitality marketing and building the constituency model for hospitality marketing. Int J Contemp Hosp Man. 2016;28(8): 1510-1534.

8. Beerli A, Martin JD. Factors influencing destination image. Ann Tour Res. 2004;31(3):657-681.

9. Berezina K, Ciftci O, Cobanoglu C. Robots, artificial intelligence, and service automation in restaurants. In Robots, artificial intelligence, and service automation in travel, tourism and hospitality. Eme Pub Ltd. 2019;185-219.

10. Bowyer KW. Face recognition technology: Security versus privacy. IEEE Technol Soc Mag. 2004;23(1):9-19.

11. Choi JJ, Robb CA, Mifli M, Zainuddin Z. University students' perception to online class delivery methods during the COVID-19 pandemic: A focus on hospitality education in Korea and Malaysia. J Hosp Leis Sport Tour Educ. 2021;29:100336.

12. Dirican C. The impacts of robotics, artificial intelligence on business and economics. Procedia Soc Behav Sci. 2015;195:564-573.