AI's Mysterious Journey

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ARTICLE INFO	ABSTRACT
	The hospitality industry is undergoing significant changes owing to the emergence of Artificial Intelligence (AI), VR (Virtual Reality) technology, and mobile applications in the hospitality space. The purpose of this research is to contribute to the existing understanding to help bridge the knowledge gap focusing on technology adoption by critically evaluating both specific case studies- empirical cases and theories such as Grounded Theory and United Theory of Acceptance and Use of Technology (UTAUT). Considering the evidence presented in the individual cases, it also highlights issues like the use of data and the place of people in the process. This study emphasises the need to integrate technological aspects with humans to make the future of the hospitality industry flexible and focused on the customers.

1. Introduction

Advancements in technology such as big data, machine learning, AI (Artificial Intelligence) and VR (Virtual Reality) have immensely transformed industries across the globe. In the context of the hospitality sector, especially in the period of recovery after the pandemic, the digital transformation assists in overcoming labor deficiency and increased costs of operations while meeting evolving level of consumers. On the contrary, the speed of technology uptake in the global hospitality sector seems to be slow in areas with poor infrastructure. This research elaborates on the contribution of AI, VR and mobile apps to enhance the operational and customer engaging activities in the hospitality sector. It also integrates the existing ones that have been undertaken in efforts to explain barriers such as privacy issues, cost factors, and how people's services can be incorporated with the technologies.

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2. Literature Review

The hotel industry has seen a radical transformation due to the quick development of cutting-edge technology like mobile applications, virtual reality (VR), and artificial intelligence (AI). The significant effects of those changes on the business plans and client relations in hotels and restaurants are evaluated critically in this study of the literature. Studying the academic debate on the disruptive implications of AI, VR, and mobile apps is essential as technology reshapes the business world. This study aims to offer a comprehensive knowledge of how these technologies are affecting and influencing contemporary hospitality practices.

2.1 Grounded Theory

The grounded theory method provides useful tools to enhance the theoretical analyses of researchers. Researchers can create new ideas in their field and throughout the research literature by using the process. These concepts may directly affect psychology and other areas' professional practise and policy. Nowadays, using grounded theory involves more than simply comprehending the lives of individuals. To clearly communicate the findings of the study, it is also important to demonstrate how accurately and systematically the investigation was carried out [1].

2.1.1 Grounded theory in tourism industry

The utilisation of grounded theory in the theoretical technique by researchers researching tourism is increasing. Its broad success can be attributed to its specific methodological stages, which are particularly appealing to beginner researchers. Grounded theory might be of interest to researchers since it enables researchers to build new categories rather than simply refine current one. Another reason for its popularity in the tourism industry might be the perception that grounded theory provides an additional "objective" strategy for qualitative analysis [2]. Gidumal *et al.*, [3] used the Grounded Theory technique to explore the way Artificial Intelligence (AI) influences hospitality and tourist marketing. The study uses three-phases, interrelated empirical approach to extensively evaluate the effects of artificial intelligence on organisational processes. The study underlines how important it is to understand how artificial intelligence (AI) influences all aspects of corporate management. By providing analytical information, stakeholders may better predict and capitalise on technology improvements in the ever-changing hotel and tourism industries [3].

2.2 Unified Theory of Acceptance and Use of Technology (UTAUT)

According to the UTAUT theoretical paradigm, behavioural intention dictates how technology is used. The direct impact of four major constructs, performance expectation, effort expectancy, social influence, and enabling conditions determines the perceived likelihood of technology adoption. The impact of predictors is tempered by factors such as age, gender, experience level, and voluntary usage [4]. It was several references to the original publications that proposed the Unified Theory of Acceptance and Use of Technology (UTAUT), indicating that it has been in use for more than ten years in a variety of information systems (IS). Therefore, the ideas that have previously been mentioned are the most widely accepted and applied theories about the acceptance and adoption of technology. These include a single, limited, and essentially useless methodological approach, a disregard for learning concepts or theories, and a disregard for social and organisational aspects [5].

Considering the context, Escobar-Rodríguez and Carvajal-Trujillo [6] examined the online ticket sales for low-cost carriers (LCCs) using the UTAUT. Their research, which was published in Tourism Management, looks at the factors that people consider when choosing to buy flights through low-cost carriers. This research uses the UTAUT framework to reveal the factors that are crucial to the implementation and utilisation of technology in the context of online ticket sales for low-cost airlines in the aviation sector. Bakar *et al.,* [7] contribute to the database of work by applying the UTAUT to evaluate how travel- related mobile applications are utilised. To better understand the factors that influence users' adoption of these applications, this study investigates the behaviours goals of tourists who use mapping programmes while travelling. The current research focuses light on the complexity of technology adoption in the travel sector and provides valuable perspectives on passengers' motivations for using mapping applications [8].

Extending the Unified Theory of Acceptance and Use of Technology, Hao [9] looks at the reception of contactless technology in the hospitality sector. The research examines the complicated nature of user acceptability with a focus on contactless services in the travel industry. The findings, which use the UTAUT, offer insightful information on the uptake of contactless services and add to a thorough knowledge of technology acceptance in the dynamic hotel and tourism industry [9].

2.3 Mobile Technology Marketing Tool Concept

Visitors may utilise mobile technology to locate, modify and purchase travel things, facilitating the sector's globalisation by providing tools for beneficiary distribution, management, and development across boundaries. The ongoing advancement mobile technology has made it possible for everyone to quickly access as much data concerning the world, as they want. The use of smartphones, tablets and other mobile devices has provided visitors from all over the world with more flexibility, options and freedom to experience new places than ever before [10]. To enhance hotel income and profitability, Tomislav and Stifanich [11] investigate the possibilities of mobile technology as a marketing tool. The report underlines the importance of mobile technology marketing tools in the hotel industry. The study emphasises the relevance of mobile technology in the current hospitality sector by providing insights into how hotels may use it to optimise revenue streams [11].

The exciting and disruptive role that new technologies are playing in transforming the hotel and tourist sector is highlighted by this thorough literature analysis.

3. Discussion
3.1 Impacts of Artificial Intelligence in Organisations

Research in robots and artificial intelligence (AI) is changing the way individuals conduct their lives across the world. Robots are increasingly being seen outside of production facilities, such as in hospitals, colleges, hotels, airports, resorts, retail centres, and even our own houses [12]. Robotics and artificial intelligence (AI) have also entered the travel and tourism industry, and consumers are showing a lot of interest and curious about them [13]. Artificial intelligence (AI) is transforming the hospitality sector by automating processes and improving the visitor experience. Hotels are now able to provide their visitors with individualised experiences and services because of the use of AI in the hospitality industry. The manner that visitors engage with hotels has changed because of the use of AI in this sector [14].

3.1.1 AI in hospitality and tourism marketing

Daniel Berman (Forbes Councils Member) stated that hotels might use AI to help customers around-the-clock by answering their questions, managing reservations, and even making personalised suggestions [15]. Furthermore, by automating routine tasks, artificial intelligence (AI) frees up hotel personnel time for strategic efforts like developing connections with important clients and offering visitors individualised care. Hotel managers may make better-informed decisions and create more successful marketing campaigns by using predictive analytics to evaluate data, estimate consumer behaviour, and identify industry trends [16].

3.1.2 Theory applied

Based on the grounded theory approach, Gidumal *et al.,* [3] investigate how Artificial Intelligence (AI) affects marketing for hospitality and tourism. The author stated that marketing, which usually relies on the analysis of vast volumes of data to identify trends, behaviours, and opportunities, is one area where AI is very useful. It is anticipated that AI would greatly improve marketing effectiveness. When clients get communications that are properly customised to their unique requirements and aspirations in a real-time environment, where the traditional customer journey may potentially become ineffective [3].

3.2 Low-Cost Flights with Online Purchasing

Due to their more reasonable costs, low-cost airlines have grown in number, giving customers more alternatives for where to visit. Even though these airlines are frequently thought of as being low-cost, there is more to their value proposition for travellers [17]. In 2001, the worldwide market share of low-cost carriers (LCCs) was under 8%; however, by 2022, that figure had risen to 26.1%. LCCs have a 36.6% market share in Europe and a 30.1% share in North America, respectively. At 24.1%, the share was likewise noteworthy in the Asia-Pacific market. Considering the Asia-Pacific region, the market share of LCCs increased from 1.1% in 2001 to roughly 23 times in 2022 [18].

It is anticipated that the percentage of low-cost travel in Malaysia and Asia, which now make up 25% and 50% of overall travel, respectively, would rise. Cumulative annual growth return (CAGR) for the largest low-cost travel operator in the nation, AirAsia Group, was 11.6% for the past ten years [19].

3.2.1 Inclusion of Small and Medium Enterprises (SMEs)

The current analyses focus on very large entities. Hilton again is the model company. Adverts, applications of AI, Virtual Reality and Mobile phones by SMEs on the other hand, present a centred view of practical implementation of technology in resource deficient scenarios. For instance:

Boutique Hotels: A small boutique hotel in Bali used Virtual Reality tours and mobile apps in efforts to market the hotel to the international market after the COVID-19 pandemic. This enables them to keep a touch of personalisation while adopting the technological approach [20].

Family-owned Restaurants: Family-owned Restaurants in Italy have AI enabled reservation systems as tourists increase and need to facilitate the table management throughout the peak season that they are open for the visitors, proving that the technological input is valuable for the small-scale businesses [21].

3.2.2 Theory applied

Escobar-Rodríguez and Carvajal-Trujillo [6] examined the online ticket sales for low-cost carriers (LCCs) using the Unified Theory of Acceptance and Use of Technology (UTAUT). These models have been used in the tourist industry to explain consumers' adoption, their desire to use the technology going forward as well as their prior usage of e-commerce websites and other platforms, such as those for hotels. This investigation is based on an original model of online purchase intentions and actual online purchases in the tourist environment, called UTAUT2. During separate training sessions, interviewers from various regions were instructed on how to conduct individual questionnaire administrations to respondents in their locality who had either purchased air tickets or searched for specific information on a LCC e-commerce website within the previous six months. Eight hundred people from different regions of Spain were given the final questionnaire between December 26, 2012 and February 8, 2013.

As a final outcome, due to a number of factors, including the fact that they sell tickets directly to customers through their websites and therefore avoid paying large commissions to travel brokers, LCCs are able to offer rates 40–60% cheaper than full-service carrier (FSC) [8].

3.3 Contactless Service in Hospitality and Restaurant

The ways in which people use technology to connect, communicate, and learn are changing as it advances quickly. Contactless service has been implemented by businesses to boost efficiency and productivity. Customers may purchase goods and services in an automated environment or with little to no human contact through contactless service, which eliminates the need for them to deal directly with sales representatives [22].

During the COVID-19 epidemic, contactless service became more and more popular in the hospitality sector as a means of ensuring the security of both guests and staff. Because of this, contactless service a technology-enabled, flexible, and customisable automation solution has shown itself to be a beneficial advancement in service throughout the epidemic. Utilising contactless technology, hospitality companies may increase operations and services, reduce in-person interactions, offer value to their businesses, and protect clients [23].

3.3.1 Hilton's contactless check-in and check-out service

Hilton might enhance the quality of contactless check-in and check-out and provide digital room key services with the use of the digital APP. As an illustration, Hilton introduced a digital key platform for guests at an effort to improve the quality of the stay at Hilton hotels; the hotel chain has formally launched Digital Key, a smartphone software that gives users more flexibility and control over the journey. In the hotel sector, which is a dynamic field that demands new technology to function efficiently and save time, technological progress is crucial [24,25].

3.3.2 Contactless service in restaurants

Furthermore, it is fundamental that restaurant operations remain as contactless as possible in the wake of COVID-19. It not only makes workers safer, but it also shows that businesses care about their health and well-being, which encourages customers to come back [26]. McD's self-service ordering kiosks are an example of contactless service. Which the ordering will be as easy as possible through to the new kiosks, which essentially let you bypass the desk and wait together [27].

3.3.3 Theory applied

With the use of Unified Theory of Acceptance and Use of Technology, Hao [9] explains about the acceptance of contactless technology in hospitality. According to a comprehensive survey of the hotel sector in mainland China, this study used the Unified Theory of Acceptance and Use of Technology 2 (UTAUT2) to investigate the factors that influence consumers' acceptance and usage of contactless services. In November 2020, a sample population from China revealed the widespread adoption of contactless technology by Chinese hospitality businesses. A survey firm with headquarters in Hong Kong arranged an online self-reported poll that has been used to gather data. As to the study's findings, customers' adoption and utilisation of new technology are primarily determined by price value, motivational factors, enabling circumstances, effort expectation, performance expectation, and social impact. Guests are often more likely to adopt contactless hospitality services if they have higher expectations for new technologies [9].

3.4 Mobile Technology in Hotel Industry

The consumer universe of mobile devices is causing major shifts in the hotel sector. A growing number of hotels see the growing number of mobile devices as a chance to implement new procedures, innovate, and streamline operations across their many divisions, all of which will boost revenue, guest satisfaction, and staff efficiency [28]. Today's visitors demand improved service, comfort, and a customised experience. Hoteliers may leverage technology to meet all these demands while streamlining staff operations by adopting a mobile-first strategy. A hotel may save money, time, and labour by implementing a mobile-first strategy [29].

3.4.1 InterContinental Hotels Group (IHG) mobile technology

The InterContinental Hotels Group (IHG), is currently leading the way in hotel technology advancements, mostly due to the success of its IHG One Rewards smartphone app. The app has intended to improve the visitor experience from the booking procedure to the in-room stay, and it has purportedly emerged as IHG's fastest-growing booking channel. In 2023, it accounted for more than half of all digital reservations and is the main channel for loyalty interaction [30]. With the help of the app, visitors can now locate the best deals, book a hotel in a matter of minutes, filter results according to their interests, take advantage of special offers for IHG One Rewards members, and manage stays. The app continues to be successful. In September 2022, revenue, use, and downloads all showed growth of over 20% when compared to pre-pandemic indicators. The software performs almost flawlessly without crashing and is quicker. According to user evaluations, the app has a "stunning new design" and is "easy to navigate." In fact, one visitor said they "couldn't travel without it." [31].

3.4.2 Mobile technology marketing tool concept

Tomislav and Stifanich [11] discussed the important role of mobile technology in the hotel industry, with mobile technology marketing tool concept. In their discussion, they stated that mobile technology is essential to the success of organisations, where it is a cutting-edge and dynamic marketing tool that allows for online transaction abilities and the provision of services. Hotel businesses now need to embrace digital transformation in order to succeed in a cutthroat market.

Travellers nowadays are increasingly demanding and tech-savvy, seeking for distinctive experiences and wanting to engage with mobile devices. They also provide a data to support, which is [11]:

i) Approximately 74% of passengers say they would prefer the hotel app for booking and other details,
ii) 85% of foreign visitors use a mobile device when travelling,
iii) Nearly 70 percent of last-minute bookings are done via a mobile device,
iv) About 70% of travellers use mobile hotel applications to assist them make reservations,
v) 88% of hotel visitors desire a mobile app that provides them with a customised experience.

3.5 Comparison Between Shangri- La Vs Hilton Using SWOT Analysis

Table 1 provides a comparative analysis of Shangri-La and Hilton Hotels using SWOT analysis, highlighting their respective strengths, weaknesses, opportunities, and threats.

Table 1

Comparison Between Shangri- La Vs Hilton Using SWOT Analysis

SWOT Analysis	Findings	
	Shangri- La Hotel	Hilton Hotel
Strengths	i) According to the article by Vendom Talents, they stated that The Hong Kong-based Shangri-La will make use of Tencent's cutting-edge social network, payment, and cloud and artificial intelligence technology to cleverly enhance the conventional hotel services and operations, providing guests with greater convenience and individualised care [32]. ii) Shangri-La aims to enhance the guest experience with Launch of e-services utilising the WeChat platform [33].	i) World Recognised Hotel - In 2009, Hilton introduced LightStay, their renowned platform for measuring corporate responsibility that allows us to monitor their social and environmental effects throughout our global network of licenced and operated hotels [34]. ii) Facial Recognition to Streamline - Hilton hotel makes use of AI-powered check-in tools, such as face recognition, to expedite the visitor check-in process. Guests may check in using just their faces and the Hilton app, eliminating the need to stand in queue [35]. - Apart from these check-in methods, Hilton has introduced Connie, an AI-driven robot. In addition to offering recommendations for eateries and area attractions, Connie may answer, inquiries visitors may have regarding the hotel. It can also help book reservations at restaurants [36].
Weaknesses	Security Breaches - A data breach that affected eight Shangri-La hotels in Asia, including Singapore and Hong Kong, may have exposed personal data belonging to guests, including names, email addresses, and phone numbers [37].	Security Breaches - Data from the Hilton Hotels loyalty programme leaked, selling customer information. Hilton Hotels user data is being sold on a dark web forum. A forum member using by the handle Intel Broker has made available a database that

	- Shangri-La said in a statement on September 30 that "a competent threat actor" had unlawfully accessed their guest records by bypassing their IT security monitoring measures. The hotel chain said that while they first saw unusual activity in July, they really had access to the visitor information as early as May [38].	contains 3.7 million entries from the Hilton Hotels Honours programme [39].
Opportunities	**Shifting Market Patterns** - The hotel industry is seeing a shift in patterns. Although increasingly selective, the consumer is prepared to pay more for services with extra value. This implies that hotels may charge more for their amenities by emphasising more individualised service [40].	**Development of Loyalty Programme** - A hotel loyalty programme seeks to create a group of frequent customers, such as business travellers, who would then favour that specific brand or group of hotels when making hotel reservations [41]. The implementation of loyalty programmes is a widely used marketing tactic to preserve client ties and encourage repeat business [42].
Threats	**Competition** - The Wyndham Hotel Group, Hilton Worldwide, InterContinental Hotels Group, and Marriot International are a few of the major companies in the hotel sector. These businesses all include a range of hotel brands in their portfolios, from full-service to limited-service properties. In 2022, Hilton emerged as the most valuable worldwide hotel brand, with a brand value of 12.04 billion U.S. dollars, after these firms and their subsidiaries were compared. - In all, 1,842 hotels had launched worldwide in 2022. It was predicted that in the upcoming years, there would be more hotels opened globally, with a potential peak of 2,707 by 2024. On the other hand, it was anticipated that some areas would increase more than others [43].	**Economic Crisis** - The recent global outbreak of COVID-19 has had a significant impact on the hospitality business worldwide. Large-scale travel restrictions and the COVID-19 outbreak are still having a disastrous effect on the tourist and hospitality sectors worldwide. The COVID-19 pandemic has had a significant influence on the hotel business, resulting in financial losses, a decline in client base, and disruptions to industrial chains. Hilton, one of the largest hotel chains globally, had extreme strain on its cash flow in 2020 and 2021 [44].

There are several disadvantages to consider, even if the combination of artificial intelligence, virtual reality, and robots has undoubtedly transformed the global hospitality and tourist sector. The possible loss of the personal touch and personalised circumstances, which are essential to the hospitality industry, is one of the main causes for concern. Furthermore, there is a chance that an excessive dependence on technology will cause human workers to lose their jobs. The gathering and usage of vast volumes of data also raises security and privacy concerns. Maintaining the industry's sustainable growth in the future will require establishing a balance between these difficulties and the advantages of technical improvements.

4. Conclusion

An examination of how artificial intelligence (AI), virtual reality (VR) and smartphone apps are transforming the hotel and restaurant industries indicates an evolving climate with creativity and possibilities. This research, which includes a SWOT analysis, examples and data, demonstrates that new technologies are radically changing how organisations function and interact with their

consumers. AI integration enhances decision- making, efficiency and customisation, hence improving customer satisfaction and service delivery. Mobile applications are increasingly indispensable for ordering, reward schemes, and reservations. They also assist to optimise corporate procedures and establish a loyal customer base. These developments highlight how crucial it is for companies operating in the hotel and restaurant industries to deliberately adopt new technologies, building on their advantages and eliminating any possible drawbacks.

5. Recommendations

There are some recommendations discussed to overcome the issues faced by Shangri-La Hotel and Hilton Hotel, which is stated in the SWOT analysis above.

5.1 Invest in Cybersecurity Measures

To guard from malware and unauthorised access, install strong firewalls, detection and prevention systems, and antivirus programmes. This will help the industry to prevent their customers data from being hacked. Although most of the antivirus software is still referred to as "antivirus," the most effective options have changed and are now more appropriately known as anti-malware software. The greatest antivirus programmes can identify and stop a variety of dangerous programmes, including Trojan horses, worms, spyware, adware, and rootkits. With this programme, hotel industry and other industries may set up planned and real-time security, as well as 24/7 protection by scheduling thorough system checks at particular periods [45]. Furthermore, Robust device management techniques are also necessary for the hotel industries to ensure that all devices using business resources adhere to security policies and are updated with the most recent security updates regularly. Access management and authentication are yet another significant barrier. In remote work scenarios, strong protocols are required to control access to sensitive data and verify the identity of workers. Multi-factor authentication (MFA) and strict access control guidelines can improve the authentication process and reduce the likelihood of unauthorised access and data breaches [46]. Karbauskas stated the best antivirus software in 2024 in Cyber News Article [47]:

i)   TotalAV Pro Antivirus
ii) Norton 360 Antivirus
iii) Bitdefender Antivirus Plus
iv) Surfshark Antivirus
v)   Malwarebytes

5.2 Compliance with Regulations

To prevent fines and harm to the reputation, hotel industries need to be aware of pertinent rules, such as the Payment Card Industry Data Security Standard (PCI DSS) and the General Data Protection Regulation (GDPR) and make sure the business are in accordance. In order to support global payment security, Payment Card Industry Security Standards Council (PCI SSC) safeguard the individuals, procedures and technological advancement throughout the payment ecosystem. In addition to providing training, testing and qualification services for security professionals and organisations, the council also manages global payment security standards, validates and lists products and solutions that meet PCI SSC standards and programme requirements and offer free best practices and payment

protections tools [48]. Hotels may improve their security posture and lower the chance of security breaches by putting the ideas above into practice.

Acknowledgement

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