

An investigation of the Impact of Digital Transformation on Customer satisfaction and Loyalty in Hospitality Industry

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Abstract

The hotel industry is undergoing a profound transformation due to the integration of technologies, including artificial intelligence (AI), into service operations. The pattern of service delivery, which was previously predicated on human interaction, has been replaced by digital interaction due to this transformation. The Kingdom of Saudi Arabia (KSA) is considered one of the preferred places for the tourist to visit. KSA hotels are continuously working on enhancing their tourist experience since they contribute greatly to the KSA economy. The main purpose of this research is to examine how AI tools integration can improve KSA tourists' satisfaction and loyalty level. The research was conducted on Riyadh, Madinah, and Mecca hotels that have implemented AI chatbots, AI personalised services, and AI fraud detection systems. Satisfaction level was determined through quantitative analysis and data was collected from 300 respondents. The quantitative results show that AI tools integration enhance tourist satisfaction levels. It was determined by seeing the significance values of AI chatbots, AI personalised services, and AI fraud detection systems which are less than 0.05. Similarly, the qualitative analysis was performed through the interviews conducted with 9 tourists. The interview answers show that AI tools integration enhances the tourist loyalty level. Overall, research suggested that knowing the impact of AI on the satisfaction and loyalty of tourists could potentially result in the implementation of AI-driven services in hotels, thereby potentially enhancing the preferences of tourists.

Key Words:

Customer satisfaction, Loyalty, Artificial Intelligence, Chat Bot, Personalisation Services, Tourists, Fraud Detection

Introduction

Hospitality is an activity that has been around for hundreds of years and has changed a lot since the start of the 21st century. Several quantitative and qualitative changes are currently taking place due to the cumulative impact of various socioeconomic factors. The dominant position of the trend wherein the hotel superstructure substantially surpasses the volume of tourism demand growth is evident (Lukanova & Ilieva, 2019). In the hospitality industry, satisfaction and loyalty are greater rivalry and raised standards of fundamental services and products due to a great number of competitors. Due to this, the hotel industry should pay more attention to how they provide their services and products since these are often the same for all types and groups of hotels (Korstanje & Seraphin, 2018).

The hospitality industry sector now employs cutting-edge technology, including artificial intelligence (AI). The impact of such technologies on the operational expenses and customer service quality of hotels has been a topic of some debate in recent times. There are numerous benefits of AI over human labor. Nam et al. (2021) found that one minute of labour performed by an automaton is equivalent to fifteen minutes of labour performed by one human (Nam et al., 2021). Reports from experts say that by 2030, robots will be doing about 25% of everyday jobs. Different degrees of AI are implemented based on the intricacy of the technology at hand. These degrees range from basic routine functions to more sophisticated complex operations (Willcocks, 2020). Similarly, Nam et al. (2021) mentioned research conducted by MIT and BCG that reveals that organisations implement AI for the following reasons: to maintain a competitive edge (84%), enter new markets or industries (75%), or reduce expenses (63%). It suggests that AI plays a more strategic role in organisational operations (Nam et al., 2021).

Besides the fact that AI has a strategic value, various studies have shown that the implementation of AI can bring many benefits such as cost-cuttings, operational efficiency increase, or increased revenue (Liang et al., 2024). On the contrary, as per Reim et al. (2020), only 5% of enterprises adopted AI substantially, another 23% adopted it as a prototype, and the remaining 54% implemented it at the most basic level. Some basic challenges such as data consolidation, technical complexities, cyber-security risk, modeling challenges and human-AI process-based interactions may point out to the low adoption rate (Reim et al., 2020).

The hospitality industry is not excluded from the digital age, as technology has become an essential part of our lives. It is important to note that technology serves as a vital element in helping luxury hotels to create more and greater tourist satisfaction and loyalty, which ensures increased customer satisfaction (Shahid & Paul, 2022). Jabeen et al. (2022) note that the hotel and tourism sector remains to be transitioning slowly into the adoption of robotics and AI in the field. On the other hand, there has already been a huge number of hotel cases in which these technologies have been successfully applied (Jabeen et al., 2022).

In contrast, the study regarding employee service quality and AI's impact on tourists' overall experience within the hospitality sector presented by Prentice et al. (2020) depicts important results in this matter. Based on their research, although AI technologies hold the promise of operational efficiencies and improving visitor satisfaction and loyalty, their impact on tourist satisfaction and loyalty hinges on the quality of service provided by employees (Prentice et al., 2020). Also, as Alotaibi et al. (2020) point out, despite the barriers to the introduction of AI in the KSA hospitality sector, there are also such large potential benefits that make this initiative highly relevant. The authors also state that the hotels that can implement these technologies in their operations will have a competitive advantage in the market (Alotaibi et al., 2020).

Based on the literature gap above, the current empirical study attempts to measure the effect of AI on satisfaction and loyalty of tourists in the management of luxury hotels in KSA. The research aim is to determine how fraud detection systems, AI-enhanced personalisation, and chatbot implementation improve the tourist's overall experience. KSA, being a developing country, relies heavily on the socio-economic advantages provided by the tourist sector (AlArjani et al., 2021). Since the inception of Vision 2030, Saudi Arabia has become more open to international visitors than ever before. Saudi Arabia wants

to become an international tourism hub and one of the world's most visited countries, and it wants to speed up a \$800 billion plan to do so by targeting between 100 and 150 million tourist visits by 2030 (Moshashai et al., 2020; News, 2024). According to Price Waterhouse Coopers (PwC) International Limited Saudi Arabian economy is projected to gain \$135 billion from artificial intelligence by 2030, making it the largest beneficiary of the technology in the Middle East. Therefore, the significance behind this research is to determine how the incorporation of AI in the hospitality industry enhances its growth and catches the attention of tourists (PwC, 2023; Rostan & Rostan, 2021).

Research Objectives

The following are the research objectives for performing this research

To determine the impact of Fraud Detection Systems integration on tourist satisfaction and loyalty

To determine the impact of AI-enhanced personalisation integration on tourist satisfaction and loyalty

To determine the impact of Chatbot Implementation on tourist satisfaction and loyalty

Conceptual Framework

This research has supposed the integration of AI elements that include fraud detection systems, AI-enhanced personalisation, and Chatbot implementation as some independent variables. While tourist satisfaction and loyalty as dependent variables. The AI elements integration into hotel management can be explained through the utilisation of different kinds of theories. For the chatbot integration into hotel management, the Technology Acceptance Model (TAM) can be linked. The technology acceptance model (TAM) proposed by Fred Davis in 1986 is a concept of information systems that describes how to convince consumers to adopt and employ new technologies (Abuhassna et al., 2023). According to TAM theory, If tourist perceives chatbots as useful tools that can easily be used, they will adopt them and utilise them to enhance their satisfaction and loyalty.

CRM has the capability to discern the correlation between AI-enhanced personalisation and tourist satisfaction and loyalty. This is particularly advantageous in the present scenario. CRM is the framework that describes the methodologies, general approaches, and instruments used by business organisations to monitor data and contacts with customers throughout their relationship with the organisation (Guerola-Navarro et al., 2021). The concept of CRM has been created by Robert and Kate Kestnbaum. This theory relates to the current research in a way that AI has the potential to enhance individualised satisfaction and loyalty. Therefore, hotel companies can leverage cutting-edge technologies to provide personalised services to tourists and enhance their overall feelings and connections, thereby optimising their hotel performance. Furthermore, an application of Travis Hirschi's (1969) social control theory would clarify the correlation between the AI fraud detection system and tourist's experience. Social control theory contends that by capitalising on the socialisation and learning processes, individuals can develop self-control and diminish their tendency to engage in antisocial behaviour (Agnew, 1985; Kempf, 2023). Social Control theory supports the execution of fraud detection systems in the sense that social control of technology usually hinders dishonest behavior. The implementation of technological monitoring systems enhances accountability and deters potential fraudulent activities, thereby fostering a secure and dependable tourist environment.

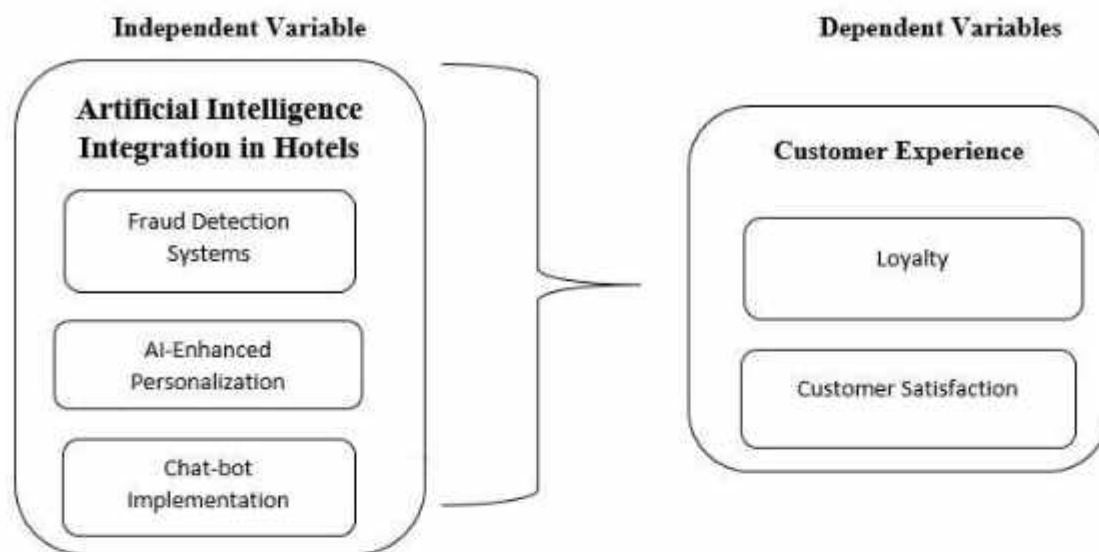


Figure # 1: Conceptual Framework

Literature Review

AI Integration in Hotels

AI has emerged as a crucial technology for hotel management in recent years. The impact of AI on the hotel industry has been reported in several studies (Alotaibi 2020; Alotaibi & Khan, 2022). AI technology assists hotels in optimising operating efficiency, elevating the visitor experience, and boosting income (Madhura et al., 2023). Leading hotels around the world are using AI and robots to improve how they run their businesses. AI gives people new and unique satisfaction and loyalty by giving them new tools like robots or voice-activated helpers. It saves money and cuts down on calls to the service desk (Huang et al., 2021; Sthapit et al., 2024; Venkatraman & Miah, 2022). AI also assists hotels in meeting the expectations of their customers, especially millennials, by delivering prompt and precise responses. AI offers customised services by forecasting the desires and requirements of customers and facilitating interactive dialogue throughout their satisfaction and loyalty (Li et al., 2021). Additionally, AI can eliminate repetitive duties therefore increasing employee satisfaction, decreasing operating expenses by 15%, and boosting revenues by 10% (Zhou, 2019).

Various scholars have looked into the effect that AI systems integration into the hotel industry has brought about including. In a study conducted by Roy et al. (2020), a survey of 300 Indian customers of hospitality was conducted to assess their views and readiness to accept AI in the business. It was found from the survey that AI usually shows good attitudes in the case of booking and reservation management, personalised service. According to the research, younger individuals, individuals with higher education, and more affluent individuals are likely to use AI-based services (Roy et al., 2020). A similar investigation was carried out in the UAE by Hussein et al. (2022) concerning the ability of AI to assist hotels in attaining a competitive edge. It has been noted that the use of AI technology by hotels in the UAE is increasingly becoming prevalent as a tool to improve operational efficiency and enhance satisfaction of tourists as well as assist in gaining a competitive advantage. However, the mentioned issues were about data privacy, need for training, and high-cost of implementation (Hussein Al-shami et al., 2022).

Based on the results of Mariani and Borghi's (2021) research, it is clear that mechanical artificial intelligence (MAI) in hospitality services was received positively by consumers who viewed and rated it. The study used data from online reviews, including MAI technology, in five Italian hotels which included chatbots and virtual assistants. The researchers found that the effectiveness of MAI depended on the category and situation. Concerning the levels of satisfaction, customers are more satisfied with MAI in booking and reservation administration, but less satisfied in detailed scenarios such as custom recommendations. The relationship between the perception of quality and total happiness and loyalty about MAI was positive, hence, its capacity to enhance visitors' experience (Mariani & Borghi, 2021). Furthermore, various studies have been conducted in the past that highlighted several methods through which a firm could employ the use of artificial intelligence to ensure that it captures the attention of tourists (Mnyakin, 2023; Nam et al., 2021; Pizam et al., 2022). However, this research takes into account the following approaches:

AI Chat-Bot

A chatbot which is also known as a virtual agent is a computational program that provides guidance instead of human being by answering textual or verbal questions and commands. The chatbot program is capable of comprehending one or more human languages and can engage in dialogue through text or voice (Kim et al., 2023). A chatbot can be conceptualised as an individual that remains operational around the clock, every day of the week. In addition to its primary functions, it is capable of executing productive duties such as generating calculations and establishing alarms or reminders (van der Schyff et al., 2023).

Al-Hyari et al., (2023) mentioned that Hotel websites and mobile applications are progressively incorporating chatbots as a means to optimise operations and augment customer service. These devices implement automated systems for check-in and check-out, enabling patrons to independently complete the check-in procedure, obtain room keys, and depart without requiring any staff involvement (Al-Hyari et al., 2023). Tourists can also place food orders, request amenities, and obtain suggestions for local activities through their room service and concierge departments. They take care of plans and appointments, letting people book a room, change their ticket, and get proof (Peng et al., 2024).

AI- Personalised Services

Management in hotels is using AI to make tourists content by tailoring experiences to each visitor's likes, dislikes, past visits, and behavior by analysing large amounts of data. This includes voice assistants, loyalty programs, personalised recommendations, and predictive analytics, in addition to customised room settings (Bulchand-Gidumal et al., 2023). AI-driven systems can accurately predict the amenities or services that tourists will need during their stay after studying prior visits and preferences (Wong et al., 2023).

As suggested by Gupta et al. (2023), implementation of face recognition technology using AI can enable travelers to receive personalised services despite the high level of randomness and unpredictability present in the environment. This technology can benefit several stakeholders such as insurance agents, travel agencies, and taxi drivers in handling large volumes of complex and multidimensional data. It serves as an intermediary between the desires of travellers concerning exceptional business visits and the ability of an organisation to deliver such visits. Integration of visual information in the forms of videos and images with data-driven service superiority might confer greater security to the industry (Gupta et al., 2023).

AI Fraud Detection System

Fraud is a major issue in the hospitality industry as it causes poor financial and image valuation to the businesses (Lin et al., 2023). AI provides hospitality softwares with access to a multitude of information about financial transactions and booking trends that can be used to detect outliers and prevent fraud. AI may improve the safety of hotels if it is used to analyse the behavior of tourists as well as detect security threats (Iliadi, 2023).

Various facilities are provided in hotel management, such as enhanced security through video surveillance, face recognition, access control, detection of threats, and fraud detection. AI can be utilised in the hotel industry to protect consumers, and employers from any threat and predicting and mitigating all probable risks that may be likely to happen to both tourists as well as staff members. Hotels can make tourists and employees safer by implementing AI-enabled technology that monitors what is happening in real time; identifies potential threats, while limiting access to restricted areas and catching fraud (Iliadi, 2023).

Tourist Experience

2.1.1. Tourist Satisfaction

Tourist satisfaction refers to the level of how satisfied or how much a visitor is delighted while lodging at a hotel or any other place within the hospitality sector (Delas Alas Jr & Limos-Galay, 2023). For any hotel to succeed, tourist satisfaction is an essential driver as it could either encourage one to revisit once more or spread positive word of mouth (Zhang et al., 2023). Jahmani et al (2023) indicated several factors from which client satisfaction is determined, such as quality of hotel facilities and services, cleanliness and comfort of rooms, professionalism and friendliness of staff, and overall perceptible value for money (Jahmani et al., 2023).

Moreover, tourist expects some level of personal service and swiftness in meeting their needs and preferences. Luxury hotels place significant importance on tourist satisfaction due to various factors, one of which is the potential for satisfied guests to engage in repeat business. This is even more important for luxury hotels since they become a major source of revenue (Preziosi et al., 2022). The luxury hotel industry is highly competitive and consumer satisfaction can be an area of superiority which will make a hotel different from other hotels and attract new customers. A luxury hotels' expectations of contentment must be met by the satisfaction of tourists as it is crucial for retaining current business and enabling the creation of positive word-of-mouth, advancement of reputation, development of brand loyalty, and possible competitive advantage in the market. This research has taken into account that the integration of AI tools can enhance the tourist satisfaction level (Shafiee et al., 2020). Thus, this research examines the following hypotheses:

H₁: AI Chat-Bot considerably advance the satisfaction level of the tourists

H₀₁: AI Chat-Bot does not considerably advance the satisfaction level of the tourists

H₂: AI- Personalised Services considerably advance the satisfaction level of the tourists

H₀₂: AI- Personalised Services do not considerably advance the satisfaction level of the tourists

H₃: AI Fraud Detection System considerably advance the satisfaction level of tourists

H₀₃: AI Fraud Detection System does not considerably advance the satisfaction level of tourists

2.1.2. Tourist Loyalty

Loyalty is described as the inclination or actual action of a customer to consistently buy certain items or services (Prum et al., 2024). Managers in the hotel business have prioritised the retention or growth of visitor loyalty in response to fierce competition and varied client expectations. Diverse approaches have been used and assessed to enhance the quality of service and boost the rate at which guests revisit (Latif et al., 2024). Ali (2024) demonstrated that hotel services and loyalty programs have a substantial impact on a guest's loyalty toward hotels. Previous research indicates that consumer loyalty is established through a combination of psychological commitment and recurrent purchases (Ali, 2024). Similarly, Hussain et al. (2023) mentioned that Tourist loyalty toward hotels can be comprehended with the help of attitude measurements such as repurchase intent, purchase frequency, and word-of-mouth recommendation (Hussain et al., 2023). This research aim was to determine the following objectives:

ROI: The integration of AI tools, which are AI Chat-Bot, AI- AI-Personalised Services, and AI Fraud Detection System, increases tourist loyalty.

Methodology

Current research has utilized a mixed-method approach. Mixed methods research combines qualitative and quantitative research to solve a research problem (Leonhardt & Overå, 2021). For the data collection, three hotels that provide services to tourists have been targeted. These hotels were situated in Riyadh, Mecca, and Madinah. The rationale behind the selection of Madinah and Mecca was that they are the holiest locations in Islam, attended by a substantial crowd of Muslims for the Umarah and Hajj pilgrimages, respectively. Furthermore, Riyadh was selected due to its reputation as a prominent economic and business center, renowned for its sophisticated infrastructure, which attracts international investors.

For the quantitative data, a questionnaire was performed with the aim of determining the impact of fraud detection systems, AI-enhanced personalisation, and chatbot implementation on tourist satisfaction. The rationale behind choosing quantitative analysis to assess tourist satisfaction with AI-integrated tools is that customer satisfaction is connected with tangible measurement. A questionnaire based on the 5-point Likert scale was formed. There were two primary sections to the questionnaire. The initial segment provided an overview of the demographics of the research sample. The subsequent segment comprised statements pertaining to the dependent variable (tourist satisfaction) and the independent variables that are AI Chat-Bot, AI-Personalised Services, and AI Fraud Detection Systems.

As a means of facilitating arbitration, the questionnaire was presented to a panel of experts in the respective disciplines. Following the arbitration process, the questionnaire underwent revisions and adjustments in line with their feedback. These modifications enhanced the questionnaire items' reliability and consistency with the primary objective of the research.

Three five-star hotels, each one from Riyadh, Madinah, and Macca, were targeted for the data collection. Hundred randomly selected participants from each hotel were requested to fill out the questionnaire at the time of the checkout. Overall, 300 questionnaires were gathered. Out of which 283 were filled, the rest of the 17 questionnaires were then excluded.

Furthermore, to assess the impact of the AI integration tool on tourist loyalty, qualitative analysis has been used. The rationale behind assessing tourist loyalty through qualitative analysis is due to the reason that loyalty is mostly connected to emotions, and that can be better interpreted into words instead of numeric values. For the qualitative data collection, nine tourists, three from each hotel, who spent the highest number of days in the hotel were requested to answer the questions as attached in Appendix No. 1.

Results

Qualitative Analysis

The impact of the AI tool integration on the tourist's loyalty was determined through qualitative analysis, for the interviews were taken from the selected tourists. The selection of the tourists was based on their days of stay and how frequently they visited the hotels.

AI Chat Bot

The tourists who visited the Mecca, Madinah, and Riyadh hotels have approved that the hotel's AI chatbot increased their loyalty level. One of the Mecca tourists shared his experience by citing the following words:

"The hotel's AI Chatbot has significantly transformed convenience and efficiency. The Chatbot would always respond to my queries or issues within record time. It was useful to me when looking through a myriad of hotels. Above all, the Chatbot's fast and smart replies to my questions and ability to help me with most requests, such as ordering room service or recommending the best local restaurants, was a massive improvement on my stay in general."

The Madinah tourist has also mentioned the same point of view. He added:

"I was greatly satisfied with the efficiency and promptness of the hotel AI Chatbot in assisting. It was as if one had an assistant-whenever and wherever. The chatbot responded to my questions quickly, whether I was looking for suggestions for a place to eat, information on what amenities were on site, or just inquired about something else generally."

On the other hand, the Riyadh tourist coted:

"The hotel's AI Chatbot always provided me with the latest information and support. It also helped in understanding background inquiries and easing conversation. It helped me in providing details about nearby attractions and retrieving hotel regulations."

AI personalised Services

The responses from the interviewer regarding the AI personalised services clearly depicted that they were highly impressed with it. One of the Riyadh hotel tourists has cited the following for the AI personalised services:

"I would like to mention that the hotel AI personalisation services were very impressive. AI personalisation services always provided me with the services that I wanted until the time I stayed in this hotel. I felt very overwhelmed while staying here due to the personalisation services I have been served according to my preferences and choices."

On the same hand, the Mecca hotel tourist has also shown a positive response regarding the AI personalisation service. The tourist coted that:

"Whenever I ordered through the hotel portal, I always got the recommendation of food, juices, and snacks that I like most. I must say, their personalised services are very well developed."

Similarly, the Madinah hotel tourist responded that:

"The personalisation services this hotel is offering just want me to stay more in this hotel. The hotel mobile application sent me the notification as per my interest level. Well, this is their best strategy to catch the customer's attention. The technology not only retained my choices but also adjusted in real time according to my interactions. As an example, it accurately predicted my schedule and made automatic changes to the lighting and room temperature appropriately. This adaptive response resulted in a more pleasant and satisfying atmosphere."

AI Fraud Detection System

AI fraud detection system implementation not only assists the hotel consumer but also the hotel management. It ensures the security of data of both the consumers and the hotel management. The Madinah hotel tourist coted her experience by mentioning that:

"I must say, the hotel's AI Fraud Detection System gave me a sense of security and confidence in my transactions. Knowing that there is a sophisticated system in place to safeguard my information and financial transactions provided peace of mind. It seamlessly operated in the background, and I never encountered any issues. The proactive nature of the system in identifying and preventing potential fraud added an extra layer of trust to my overall experience at the hotel."

While the Riyadh hotel tourist coted that:

"I observed that the system actively monitored transactions and flagged any dubious activity throughout my stay. I am grateful for the proactive measures taken to safeguard my financial information; undoubtedly, they contributed to the establishment of a secure environment. In my opinion, this is a valuable feature that enhances the hotel's credibility."

Furthermore, the Mecca hotlists share his overview:

“Throughout my stay, I had no concerns regarding the security of my personal information. The hotel's investment in cutting-edge technology to protect guests from potential fraudulent activities demonstrates a dual dedication to delivering exceptional service and fostering guest confidence. This is undoubtedly an important measure for me when deciding where to remain, and this hotel surely delivered in that regard.”

Similarly, the Riyadh tourist shared that:

“My stay in this hotel was very overjoyed. This hotel treated me like a prince. It is not wrong to say that this hotel is the Riyadh smart hotel. I found that this hotel has integrated AI into all its elements, ultimately enhancing the guest experience. I have already recommended this hotel to my friend, who is going to visit Riyadh with his family next year. As I believe, this hotel over joy the trip of the tourists.”

Hotel Recommendation

To determine the tourist loyalty toward the hotel, it was also asked from them if they recommend this hotel to their family, and friends and their overall experience in the hotel. The Mecca tourist replied that:

“I will definitely recommend this hotel to my family and friends. The experience and the services I got here were up to the mark. Whenever I come here, this hotel will be my first choice for the stay.”

The Madinah tourist replied that:

“ I considered this hotel as one of the best hotels in Madinah. This hotel's services have just overwhelmed my overall trip experience. All the services I received from here were as per my likes. When I visit Madinah next year for Umrah with my family, I will come here to stay. I suppose this is the most suitable hotel to stay when you are with your family.

Quantitative Analysis

As mentioned above, a mixed approach was utilised to assess the impact of the AI tool integration in the hotels on tourist satisfaction and loyalty level. For the satisfaction level, reliability tests, correlation, and regression tests have been performed. The results of these tests, along with the demographic analysis, are given below:

Reliability Statistics

Cronbach's Alpha	N of Items
.823	4

Table No # 1: Reliability Analysis

Table No. 1 shows the overall reliability of the model. Reliability is basically the consistency of a measure (Gong et al., 2024). According to the Cronbach alpha value, which is 0.823, it has been proven that the model that has been considered in this research is highly reliable. Since the value of the Cronbach alpha is above the given benchmark that is 0.07.

Demographic Analysis

		Frequency	Per cent	Valid Percent	Cumulative Percent
Age	20-35	18	6.4	6.4	6.4
	26-50	109	38.5	38.5	44.9
	51-65	110	38.9	38.9	83.7
	Above 65	46	16.3	16.3	100.0
	Total	283	100.0	100.0	
		Frequency	Per cent	Valid Percent	Cumulative Percent
City	Mecca	82	29.0	29.0	29.0
	Madinah	111	39.2	39.2	68.2
	Riyadh	90	31.8	31.8	100.0
	Total	283	100.0	100.0	
		Frequency	Per cent	Valid Percent	Cumulative Percent
Reason of Stay	Business	77	27.2	27.2	27.2
	Religious Tourist	41	14.5	14.5	41.7
	Cultural Tourists	77	27.2	27.2	68.9
	Adventure Tourists	58	20.5	20.5	89.4
	Other	30	10.6	10.6	100.0
	Total	283	100.0	100.0	

Table No # 2: Demographic Analysis

Table # 2 shows the demographic stats. As per the above table, 6.4% of tourists aged from 20-35, 38.5% of tourists aged 26-50, 38.9% aged ranging from 51-65, and 16.3% of tourists are above 65. As far as the hotels are concerned, 29% tourists were from Mecca hotels, 39.2% tourists were from Madinah hotels, and 31.8% were from Riyadh hotels. Among these tourists, 27.2% stayed at hotels for business, 14.5% were religious tourists, 27.2% were cultural tourists, 20.5 were adventurous tourists, and 10.6 visited hotels for other kinds of tourism.

Correlation

		Correlations			
		AI Chat Bot	AI Personalised Services	AI Fraud Detection System	Tourist Satisfaction
AI Chat Bot	Pearson Correlation	1	.762**	.449**	.613**
	Sig. (2-tailed)		.000	.000	.000
	N	283	283	283	283
AI Personalised Services	Pearson Correlation	.762**	1	.755**	.558**
	Sig. (2-tailed)	.000		.000	.000
	N	283	283	283	283

AI Fraud Detection System	Pearson Correlation	.449**	.755**	1	.707**
	Sig. (2-tailed)	.000	.000		.000
	N	283	283	283	283
Tourist Satisfaction	Pearson Correlation	.613**	.558**	.707**	1
	Sig. (2-tailed)	.000	.000	.000	
	N	283	283	283	283

** . Correlation is significant at the 0.01 level (2-tailed).

Table No # 3: Correlation Analysis

Table # 3 shows the correlation analysis among the variables. Correlation analysis is a statistical technique used to determine whether or not two variables/datasets are related and, if so, the strength of that relationship (Nie et al., 2023). As per the above table, AI Chat Bot and AI Personalised Services are highly correlated, having a value of 0.762. At the same time, AI Chat Bot and AI Fraud Detection System are less correlated than other variables. Since its correlation value is 0.449, furthermore, other variables are high to moderately correlated to each other, having a correlation value of more than 0.6.

Descriptive Analysis

	N	Minimum	Maximum	Mean	Std. Deviation
AI Chat Bot	283	1.50	4.5	3.6652	.8654
AI Personalised Services	283	1.50	4.75	3.5989	.99128
AI Fraud Detection System	283	1.25	5.00	3.3940	.72370
Tourist Satisfaction	283	1.25	4.75	3.6551	.83921
Valid N (listwise)	283				

Table No # 4: Descriptive Analysis

Table # 4 shows the descriptive statistics chart. Descriptive analysis is a type of data research that facilitates the clarification, demonstration, or concise summarisation of data points to identify patterns that meet all of the data's criteria. As per the above descriptive stats, AI Chat Bots have the highest mean (3.6652), while AI Fraud Detection System has the lowest mean (3.3940). Similarly, AI Personalised Services has the highest standard deviation (.99128), and AI Fraud Detection System has the lowest standard deviation (0.72370).

Regression Analysis

ANOVA

ANOVA ^a						
Model	Sum of Squares	df	Mean Square	F	Sig.	
1	Regression	137.509	3	45.836	211.000	.000 ^b
	Residual	60.391	278	.217		
	Total	197.900	281			

a. Dependent Variable: Tourist Satisfaction

b. Predictors: (Constant), AI Fraud Detection System, AI Chat Bot, AI Personalised Services

Table No # 5: Anova Analysis

Table # 5 is regarding the model summary. ANOVA is a statistical technique utilised to partition observed variance data into distinct components, which are subsequently utilised in further analyses. According to the Anova table, the model considered in this research is a good fit. It is also supported by the model significance value that is 0.00, less than 0.05, and the F value (211.000), which is critically high, supporting the model relevancy.

Coefficient Table

Model	Coefficients				t	Sig.
	Unstandardised Coefficients		Standardised Coefficients			
	B	Std. Error	Beta			
(Constant)	1.120	.135		8.325	.000	
1 AI Chat Bot	.059	.004	.711	13.259	.003	
AI Personalised Services	-.544	.062	-.643	-8.803	.001	
AI Fraud Detection System	1.012	.061	.873	16.509	.000	

a. Dependent Variable: Tourist Satisfaction

Table No # 5: Coefficient Analysis

As per table # 5, all the variables of the research have been accepted since their significance values are less than 0.05. It shows that the AI integration tools, including AI Chat Bots, AI personalised services, and AI fraud Detection systems, have significantly increased the satisfaction level of tourists. Therefore, the research has accepted the following hypotheses:

H₁: AI Chat-Bot increases the satisfaction level of the tourists

H₂: AI- Personalised Services increases the satisfaction level of the tourists

H₃: AI Fraud Detection System increases the satisfaction level of the tourists

Discussion

The quantitative and qualitative results of this research depict that the integration of AI tools into the hotels of Saudi Arabia tends to improve tourist satisfaction and loyalty levels. As per the satisfaction level is concerned, the integration of an AI chatbot, AI personalised services, and fraud detection system has significantly increased the satisfaction level of the tourists, as all the hypotheses of this research have been accepted. Similarly, the qualitative analysis also proved that the AI tools in hotels make tourists more loyal to the hotels. Past studies already support these results. According to several researchers, if the hotel provides personalised services to their tourists and regular customers, then it enhances their satisfaction, and loyalty level and catches their attention (Bulchand-Gidumal et al., 2023; Roy et al., 2020).

This can also be further explained through the TAM model that was utilised in this research to support the implementation of AI-personalisation services. TAM serves as a foundational framework for research on consumer experiences pertaining to the adoption of new technologies. Its explanatory capacity can be enhanced by integrating supplementary variables that account for the specific circumstances of evolving consumption patterns and new technology implementations. According to TAM model, inclusion of the extra factors into the current technological system help in enhancing the overall tourists experience in hotel management (Han et al., 2021).

Similarly, the results also depicted that the integration of Chatbots has helped in gaining tourist satisfaction and loyalty. According to Nguyen et al. (2023), Chat Bot plays an influential role in enhancing the guest experience. According to this research, chatbot implementation provides the

customisation, anonymity, and empathy response that ensures substantial interaction with the guest and thus increases satisfaction and loyalty levels (Nguyen et al., 2023). Satheesh et al. (2020) offer further support for the CRM framework that was implemented to facilitate chatbot integration.

The research shed light on the importance of chatbots utilisation in hotel management. The employer can utilise chatbots to effectively interact with their customers and get information regarding their needs, and preferences, and serve them according to it. This ultimately enhances their relationship with the customers (Satheesh et al., 2020).

In the same context, Putri et al., (2020) research have shown that Chatbots enable visitors to reach hotels for customised services at any time and from any location. It is a personal front desk that provides customers with real-time, context-appropriate hotel service information and the ability to verify room availability, reserve, and price rooms (Putri et al., 2019). This customised interaction guarantees positive tourist experiences that lead to a higher satisfaction level which in turn impacts their loyalty level too as the tourists feel that their preferences and needs are acknowledged and valued.

Furthermore, the research also shows that the integration of AI fraud detection provides more overwhelming experiences to the tourist and thus enhances their satisfaction and loyalty level. In this research, the AI fraud system integration is supported by Social Control theory. This theoretical integration is well explained in Tan et al (2023) research. According to the research, the inclusion of the AI fraud detection system guarantees social security to the consumers (Tan et al., 2023). In this context, the Social Control theory posits that the implementation of an AI fraud detection system would significantly reduce the likelihood of fraudulent activities. This is because individuals would be less inclined to engage in deceptive practices, given that they would be completely cognizant of the fact that their activities are being monitored. According to Al-Hyari et al. (2023), through the integration of the AI fraud detection system, the hotel management cannot only protect its data but also ensure the full security of the tourist's data and the transaction (Al-Hyari et al., 2023).

Limitations and Future Research

This research is limited to Saudi Arabia and did not take into account the other geographical states. More geographical states and hotels could be considered to increase the research's generalizability. The research is only limited to assessing the satisfaction and the loyalty level of tourists. The future researcher can consider hotel management to get a deeper insight into AI implementation. Furthermore, the research data was collected in a short time frame of three months. Data could be collected considering the longer time frame for data collection to catch the potential variation.

Recommendation

The research supports that the integration of AI into the hotel has the ability to enhance the overall tourist experiences. However, some recommendations should be taken into consideration to improve AI performance in hotels. The hotel management can utilise AI to collect data on customers' preferences and activities, including their lodging choices, eating preferences, and favourite activities. The hotel administration could also use AI technologies to handle typical requests like room service, maintenance, and bookings to help tourists promptly and free up staff time for more complicated duties. Furthermore, there should be the inclusion of a feedback system from the tourists to gather timely information regarding the tourists' experience within the hotel.

Conclusion

Artificial intelligence can improve visitor satisfaction in luxury hotels by delivering tailored and streamlined services. Technological tools like chatbots, face recognition, personalised services, and AI fraud detection systems have the potential to improve the tourist experience, leading to higher levels of satisfaction and loyalty. The current research investigated the impact of AI on tourist satisfaction. The study provided theoretical viewpoints on the impact of technology in the hospitality sector and proposed recommendations to improve tourist satisfaction through the use of AI. The practical implications of the research indicated that understanding the impact of AI on tourist satisfaction and loyalty levels might lead to the implementation of AI-powered solutions in luxury hotels, thereby improving tourist preferences.

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