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The Possibility of Applying Artificial Intelligence Technologies in the Tourism and Travel Industry in Iraq and its Relationship to Customer Satisfaction with Tourism Services

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ABSTRACT

Artificial intelligence has recently become a rapidly growing global trend, given its advanced technological capabilities and capabilities and its ability to perform tasks that were previously dependent on humans. This makes the use of AI particularly beneficial in the tourism and travel industry, saving tourism organizations time, effort, and costs. It also eliminates, or at least reduces, human error, allowing tasks to be performed quickly, at any time, and around the clock, thus achieving customer satisfaction.

The tourism industry, with all its components, from tourism companies to hotels, is committed to providing exceptional, high-quality customer service to achieve customer satisfaction. In this area, artificial intelligence technologies help achieve customer satisfaction in multiple ways. These include, for example, the use of AI in tourism and travel to provide a more personalized tourism experience, ensure rapid response to customer requests, and implement voice assistance, chat, and smart marketing, in addition to providing virtual tourism experiences, augmented and integrated reality, and assist in forecasting, data analysis, and problem-solving.

From this standpoint, the study aimed to identify the nature of artificial intelligence and its importance in the tourism and travel industry in Iraq and to address artificial intelligence techniques in the tourism and hospitality sector and the challenges facing it. The study also addresses the concept of customer satisfaction, the importance of achieving it, and methods of measuring customer satisfaction in the tourism sector through the service quality model. The study relied on the descriptive analytical approach and used the questionnaire to collect study data from two random samples: the first of customers in tourism companies in the city of Karbala, amounting to (70) individuals, and the second of customers of premium hotels in the city of Karbala, amounting to (90) individuals. The research results concluded that there is a relationship between artificial intelligence and customer satisfaction in the tourism and travel industry in Iraq.

Keywords
Tourism and Travel Industry, Artificial Intelligence, Customer Satisfaction, Iraq.

INTRODUCTION

Artificial intelligence has spearheaded the new industrial revolution, profoundly impacting the tourism and hospitality industries. This has been reflected in the growing interest in AI in the tourism and hospitality industry,

thanks to the widespread and increasing reliance of tourism organizations on AI systems to facilitate smart tourism planning and travel procedures that help understand tourists' behaviors, choices, and preferences. Therefore, the integration of AI and tourism represents a new, cross-border integration between science, technology, and the tourism industry, redefining the tourism and travel experience. With the help of AI technologies, tourism services, management, the travel experience, and tourism marketing are being improved, enhancing the transformation and advancement of tourism toward a comprehensive service model and personalized customization, providing tourists with a better tourism experience. AI is emerging as a transformative force in the tourism industry as a result of its tremendous innovative potential to address the pressing challenges facing the tourism sector. This calls for further exploration of the potential opportunities, challenges, and risks posed by the use of AI in tourism. Tourist customer satisfaction is an important factor in the tourism sector, representing a key indicator in evaluating the travel experience at tourist destinations. In this context, perceived environmental value and perceived quality influence customer satisfaction. From this perspective, the dimensions of the service quality model were used to demonstrate the impact of using artificial intelligence technologies on tourist customer satisfaction, indicating that tourism service quality is a strong indicator of satisfaction with information technology services.

First - Methodological Framework:

1 - The Study Problem:

The following main question represents the study problem: Is there a relationship between artificial intelligence and customer satisfaction in the Iraqi tourism and travel industry?

The following sub-questions branch from the main question:

1/1 What is the relationship between artificial intelligence and customer satisfaction with empathy quality in the Iraqi tourism and travel industry?

1/2 What is the relationship between artificial intelligence and customer satisfaction with tangibility quality in the Iraqi tourism and travel industry?

1/3 What is the relationship between artificial intelligence and customer satisfaction with response quality in the Iraqi tourism and travel industry?

1/4 What is the relationship between artificial intelligence and customer satisfaction with reliability in the Iraqi tourism and travel industry?

1/5 What is the relationship between artificial intelligence and customer satisfaction with security in the Iraqi tourism and travel industry?

2 - Study Hypotheses:

2/1 There is a statistically significant relationship between artificial intelligence and customer satisfaction with empathy in the Iraqi tourism and travel industry.

2/2 There is a statistically significant relationship between artificial intelligence and customer satisfaction with tangibility in the Iraqi tourism and travel industry.

2/3 There is a statistically significant relationship between artificial intelligence and customer satisfaction with response quality in the Iraqi tourism and travel industry.

2/4 There is a statistically significant relationship between artificial intelligence and customer satisfaction with reliability in the Iraqi tourism and travel industry.

2/5 There is a statistically significant relationship between artificial intelligence and customer satisfaction with security in the Iraqi tourism and travel industry.

3 - Study Objectives

3/1 To understand the concept of artificial intelligence and its importance in the tourism and travel industry.

3/2 Identifying artificial intelligence techniques that can be employed in the tourism and travel industry.

3/3 Explaining the relationship between artificial intelligence and customer satisfaction with the quality of tourism

services.

4 - Study Methodology:

The study used the descriptive-analytical approach and the quantitative approach in the statistical analysis of the questionnaire forms and analyzed them using SPSS, V.24.

5 - Study Limits:

5/1 Spatial Limits: The study was conducted in the holy city of Karbala in Iraq as a case study.

5/2 Time Limits: The field study was conducted by distributing electronic questionnaire forms during the period from February 1, 2025, to March 31, 2025.

5/3 Human Limits and Study Sample: The study was limited to a random sample of customers in tourism companies in Karbala, with a total of (70) responses, in addition to a random sample of customers in premium hotels in Karbala, with a total of (90) responses.

6 - Previous Studies:

Several studies have addressed artificial intelligence technologies in the tourism and travel industry, including Henriques et al.'s (2024) study on the application of artificial intelligence in the tourism industry. The study concluded that the use of artificial intelligence in the tourism industry improves efficiency and the effective use of resources. Its application in various aspects, operations, and services of tourism also benefits the customer experience. Sousa et al.'s (2024) study examined the use of artificial intelligence systems in tourism and hospitality from the perspective of tourists. The results showed that most participants had already used various artificial intelligence systems and emphasized that the advantages of using them outweighed their disadvantages, which shaped a positive trend toward the use of artificial intelligence systems in the tourism and hospitality industry. Shalan et al.'s (2024) study demonstrated the impact of artificial intelligence on improving the quality of tourism services in an Egyptian destination. The results revealed that artificial intelligence significantly contributed to improving customer satisfaction and the quality of tourism services in terms of tangibility, reliability, responsiveness, safety, and empathy. Other studies have also linked the use of modern technology/AI to customer satisfaction. Wang et al.'s (2017) study examined technology readiness and customer satisfaction with travel technologies in Australia, China, and the United States. This study indicated the importance of technology readiness as a personality trait in shaping traveler satisfaction with travel technologies. Pai et al. (2020) also conducted a study on the role of perceived smart tourism technology experiences in achieving tourist satisfaction, happiness, and revisit intentions in China. They concluded that accessibility is the most important factor influencing smart tourism technology experiences. They also found a close relationship between smart tourism technology experiences and tourist satisfaction with their experience. Ranasinghe et al. (2020) also studied the role of smart tourism destinations in shaping tourist satisfaction based on technological features in Sri Lanka. The results revealed a positive relationship between smart tourism features and tourist satisfaction with the travel experience, which encourages the development of smart tourism destinations that integrate technological technologies into the destination environment to enrich tourism experiences and enhance destination competitiveness. It is clear from the above that the impact of artificial intelligence technologies on customer satisfaction in the travel and tourism industry in Iraq has not been the subject of any previous studies, which represents a research gap for the current study. Second - Theoretical Framework:

1 - Artificial Intelligence:

1-1 The Concept of Artificial Intelligence:

John McMullah was the first to define artificial intelligence in 1955 as the use of science and engineering to create intelligent machines (Hsu, 2018). Artificial intelligence technologies refer to the development of computer systems capable of performing tasks and activities that require human intelligence (Russell and Norvig, 2016). These are systems with intelligent behavior capable of analyzing their environment and taking actions with a certain degree

of autonomy to achieve specific goals (Sheikh et al., 2023). In the tourism industry, artificial intelligence is defined as automated systems that operate similarly to the human brain, thinking, learning, and making decisions. Their primary purpose is to complete tasks automatically without the need for a human brain (Kirtil and Askun, 2021). In the hotel sector, it is a set of technologies capable of simulating human intelligence in the problem-solving process (Lai and Hung, 2018). 1-2 The Importance of Artificial Intelligence in the Tourism Sector:

The importance of artificial intelligence in the tourism sector lies in the following:

- The use of artificial intelligence in the tourism industry has witnessed significant development since the late 1990s, initially used to predict hotel occupancy and tourist demand (Kirtil and Askun, 2021).
- Assisting tourists in searching for travel information and making decisions related to trip planning (Gretzel, 2011), and integrating information gathering, communication, and entertainment (Wang et al., 2014).
- AI big data analytics technology enables smart tourism services, such as analyzing tourist flow fluctuations, planning tourism marketing, transportation, and the public service system of tourist areas. This creates an integrated tourism information exchange system for predicting early warning mechanisms, improving emergency management capabilities, and enhancing tourism security (Zhang et al., 2012).
- AI technology improves tourist experiences by simplifying procedures, increasing convenience, and enhancing the quality of tourism services (Thakur et al., 2023).
- The integration of AI into the tourism industry has helped personalize tourism experiences and provide technologically enhanced tourism experiences (Parvez, 2021).
- AI helps make accurate and rapid decisions by automating tourism decision-making processes. AI decisions are faster and more accurate than human decisions. For example, airlines use AI to analyze demand, competition, and other factors in real time, leading to more effective pricing decisions that improve ticket prices (Chimera, 2023). Artificial intelligence (AI) provides many useful technologies for the tourism sector, such as search engines, reservation systems, tourism demand forecasting, autonomous transportation vehicles, tourism service automation, self-service kiosks, and virtual reality devices (Knani et al., 2022).
- AI is used to create a virtual visual experience of tourist attractions, including numerous virtual images that explain their features or interact with tourists, enhancing their sense of engagement and creating a unique and distinctive interactive experience (Zhang and Sun, 2019).
- AI, through chatbots, contributes to the rapid response to customer inquiries. For example, the online travel company Expedia uses AI-powered chatbots to provide prompt customer service (Skift, 2023).
- AI is useful in customer relationship management by creating personalized tourism experiences and services, thanks to the use of intelligent marketing capable of providing personalized forecasts, support agents, and intelligent sales assistants in the tourism marketing sector (Shalan et al., 2024).

Artificial intelligence has contributed to the emergence of self-operated smart hotels, which provide a contactless customer experience without the need for human intervention. This leads to increased customer numbers and improved reputation and image (Cheng et al., 2023).

1-3 AI Application Technologies in the Tourism Industry

1/3/1 AI-Enhanced Website Search: AI-enhanced website search is used to improve the search experience, using advanced algorithms, natural language processing, and machine learning to understand tourist queries, interpret context, and generate more accurate and relevant smart search results (Merrill, 2023). This allows customers to access travel guides, learn about price updates and promotions, and provide more personalized and relevant offers (Sousa et al., 2024).

1/3/2 Reservation Systems: AI-based reservation systems enhance customer experiences through personalized interactions, offers, and rewards, as well as speeding up and facilitating bookings, reducing costs, automating tasks, reducing errors, and optimizing resources. For example, the hotel booking platform "SmartStay" relies on AI to

understand customer preferences regarding amenities, room types, and locations. It uses machine learning techniques to provide recommendations for the most suitable accommodations for each customer, improving the overall travel experience (Barten, 2023). 1/3/3 Simultaneous Language Translation Systems: Artificial intelligence supports machine learning techniques, natural language processing, and the development of machine translation applications and simultaneous translation systems that handle multiple languages, facilitating tourists' navigation around their destinations and participating in all types of tourism activities (Sousa et al., 2024). AI is also used in some applications, such as ChatGPT, which allows tourists to speak in their native language and record a voice message, which is then translated into the target local language (Ivanov et al., 2020).

1/3/4 Autonomous Robots: These are self-operating physical machines powered by artificial intelligence that sense the environment, allowing them to make decisions and perform actions. They can be embodied in various forms, such as human-like, animal-like, object-like, or functional. They are also somewhat autonomous, which distinguishes them from similar devices (Tung and Law, 2017). There are two types of service robots: professional service robots and personal service robots, and they are used to facilitate operations and improve tasks previously performed by workers. (Li et al., 2019), as these robots can perform various tasks in the tourism and hospitality sector, such as front-line services in hotels, food ordering, room service, cleaning services, taxi services, reading messages, scheduling tasks and appointments, and setting alarms (Gajdošík and Marciš, 2019).

1/3/5 Chatbots: Also known as conversational systems or virtual agents, they include intelligent technologies such as natural language processing and speech recognition. They function as personal assistants on smartphones, loudspeakers, and chatbots on websites and self-service kiosks (Buhalis et al., 2019). Chatbots are divided into two categories: text chatbots, which provide messaging services for customer inquiries in the form of text messages, and voice chatbots, which provide messaging services for customer inquiries in the form of voice messages (Kumar et al., 2018). 1/3/6 Virtual Reality and Augmented Reality: Virtual reality provides visual representations of tourist sites and hotel locations using 3D videos, which helps tourism organizations describe their services on websites, create virtual booking interfaces, create virtual tours, and create virtual travel experiences (Samala et al., 2022). Augmented reality, on the other hand, offers a digital technology that alters customers' perceptions of the physical environment through viewing via a specific device. Although this technology is similar to virtual reality, augmented reality does not replace the real-world environment, but rather enhances it through the overlay of digital elements (Barten, 2023). This enhanced interaction contributes to increasing the competitiveness of tourist destinations, making them more attractive and competitive (Marasco et al., 2018). 1/3/7 Drones: These are unmanned aerial vehicles used for various purposes. Their development began with manual and remote control, and they have now evolved to include drones powered by artificial intelligence (Mehmet and Koç, 2023). The use of drones is increasing in the tourism and hospitality sector, particularly in response to the growing need for an efficient and rapid delivery system (Snead and Seibler, 2017). 1/3/8 Big Data Processing: Big data in tourism comes from two sources: the environment and the tourist. The environment provides data that includes current events at the destination, real-time information updated from sensors, the Internet of Things, and transactions. Tourists, on the other hand, provide their data through five sources: online activities, offline activities, biometric and emotional data, personal devices, and digital content created by tourists before, during, and after the trip (Gunter and Önder, 2016). Artificial intelligence relies on big data, improving and developing artificial intelligence algorithms, enhancing processing capabilities, and developing information resources that allow for the storage and processing of massive amounts of data (Li et al., 2019). 1-4 Challenges of Applying Artificial Intelligence in the Tourism Industry:

Although AI technology provides valuable tools for enhancing tourism sector performance and achieving tourist satisfaction, it also poses numerous challenges, including:

- Rapid technological development poses numerous challenges related to data privacy and security, the digital divide, and the need for digital skills training (Henriques et al., 2024).

- Modern technology cannot replace direct human communication, the exchange of verbal information, and the full expression of feelings and perceptions (Sun et al., 2019).
- Projections indicate that by 2100, the employment of robots will differ significantly thanks to AI and automation technologies, and that the proportion of human labor will not exceed 10%. This raises questions about the future of human labor in the tourism industry from a cultural, political, economic, and ethical perspective (Webster and Ivanov, 2020).
- Customer skepticism about technology is a major concern. This imposes on designers and developers the need to ensure that technologies are easily accessible, possessed, easy to use, and interact with customers in their local languages, and to make AI more attractive in terms of form and texture by providing physical forms that make AI visible, audible, and tangible (Pillai and Sivathanu, 2020).

2 - Customer Satisfaction:

2-1 The Concept of Customer Satisfaction in the Tourism Sector:

The concept of satisfaction expresses customers' feelings of enjoyment or disappointment resulting from comparing the perceived performance of a product with their expectations. Customers feel dissatisfied when the perceived performance does not meet expectations, while customers feel satisfied when the perceived performance matches expectations (Kotler and Amstrong, 2016). In tourism consumer behavior research, the concept of customer satisfaction refers to the psychological state that arises in tourists when the emotional response to their expectations aligns with their prior feelings about the consumer experience (Hermawan et al., 2019). Therefore, the definition of tourist satisfaction refers to the difference between their pre-travel expectations and their post-travel experiences, which may lead to satisfaction or dissatisfaction, thus contributing significantly to assessing the success of tourism service quality (Rathnayake, 2015).

2-2 Dimensions of customer satisfaction in the tourism sector according to the service quality model:

Tourist customer satisfaction is a complex phenomenon, influenced by many different factors (Pestana et al., 2020), including the natural and cultural factors of the tourist destination, ease of access, reception, services, shopping opportunities, infrastructure, and cost (Dumitras et al., 2023). However, despite this positive atmosphere, tourism service quality attributes increase customer happiness and improve their psychological health, which significantly impacts their satisfaction (Cai et al., 2021). Keshavez and Hareeza (2015) confirmed that service quality directly affects tourist satisfaction. Therefore, the service quality model is an important model for measuring customer satisfaction in the tourism sector. Tourist satisfaction represents the overall measure of their opinions about the quality of service or the performance of a tourist destination (Campón-Cerro et al., 2017), (Zulvianti et al., 2022). Good tourist service quality encourages repeat business and loyalty, which reflects customer satisfaction and achieves long-term success for tourism organizations (Azhar et al., 2019).

The service quality model includes five elements: empathy, tangibility, responsiveness, reliability, and security (Siddiqi, 2011):

2/2/1 Empathy: This refers to the positive or negative thoughts and feelings that customers perceive regarding the service provided to them. Empathy is one of the most important factors directly related to tourist satisfaction (Sánchez-Rebull et al., 2018), as it is considered the main driver of tourist satisfaction (Moon et al., 2016). 2/2/2 Tangibility: This relates to the physical elements of tourism services, such as the appearance and cleanliness of tourism facilities, and the availability of modern equipment and devices. Tangibility is a crucial element in shaping customers' first impressions (Babic-Hodovic et al., 2019). Modern technology in the tourism sector contributes to generating value-added tourism experiences for customers, thanks to improved efficiency and support for the automation of tourism organizations' processes (Xiang and Gretzel, 2010). In this context, the tangibility of the exploratory use of modern technology generally affects tourists' satisfaction with the travel experience, while the tangibility of the exploitative use of modern technology specifically affects tourists' satisfaction with transactions

(Huang et al., 2017). 2/2/3 Responsiveness: This refers to achieving rapid response in tourism service delivery, providing widely distributed information (Wang et al., 2014), meeting tourists' needs and in a timely manner, and providing immediate answers to their questions, requests, and complaints, which significantly increases tourist satisfaction and loyalty (Rezaei et al., 2018).

2/2/4 Reliability: This refers to the ability of tourism service providers to accurately and credibly deliver the various services they promise (Parasuraman et al., 2015). Reliability is linked to tourist satisfaction with the travel experience, particularly with regard to the quality, accessibility, interactivity, source, and credibility of information. These factors positively impact tourist satisfaction and support travel decisions (Yoo et al., 2017). 2/2/5 Security: This refers to the safety of customers' personal information while using different types of social media (Huang et al., 2017). This is related to the ability of tourism service providers to instill trust in customers, especially regarding the safety of travel information, which is reflected in tourists' feelings of comfort and trust towards tourism service providers (Meerschman and Verkeyn, 2019). The feeling of safety and security is an important driver for achieving tourist satisfaction (Buckley et al., 2014).

3- The role of artificial intelligence in achieving customer satisfaction through improving service quality:

Xiang et al. (2015) indicated that tourism companies, hotels, and tourist destinations are improving the quality of traditional direct services through service interactions supported by artificial intelligence technology to meet tourists' needs and help them make decisions and plan their trips. Fahim (2019) also emphasized the potential for significantly improving service quality in the tourism sector by integrating artificial intelligence with the service quality model framework. He also reported on the use of artificial intelligence to improve tourism service quality by focusing on the aspects with the greatest gaps and identifying areas in need of development. This contributes to achieving the overall quality of tourism services by bridging gaps and meeting or exceeding customer expectations. This significantly impacts customer satisfaction with the tourism experience and increases the likelihood of them returning, recommending a visit to the destination, or engaging with the tourism service provider again (Babic-Hodovic et al., 2019). Artificial intelligence, through chatbots or sentiment analysis programs, contributes to collecting customer feedback and analyzing it to measure the dimensions of tourism service quality more effectively and efficiently. For example, the Marriott International hotel chain collects customer feedback and improves the quality of its services by employing chatbots using artificial intelligence (Newgen, 2023). Artificial intelligence algorithms are also used to provide personalized recommendations and suggest customized trips based on customer preferences and needs. For example, Airbnb uses artificial intelligence to recommend accommodations based on customer preferences and their area of activity (Julian, 2023). Furthermore, artificial intelligence, through virtual assistants, provides accurate and up-to-date information that enhances customer confidence and improves the quality of services in the tourism sector. For example, the Wynn Las Vegas Hotel uses the Alexa system developed by Amazon to improve customer experiences and achieve satisfaction (Alexa, 2023). Third - Applied Framework:

1 - Field Study Methodology:

1/1 Design of the Questionnaire:

The questionnaire was designed to study the impact of artificial intelligence technologies on customer satisfaction with service quality in the tourism and travel industry. Questionnaire items were answered by selecting one of the restricted answers. The questionnaire consisted of three axes. The first axis addressed the personal data of the study sample of customers of tourism companies and hotels. The second axis addressed artificial intelligence technologies. The third axis addressed customer satisfaction with the quality of tourism services and included five dimensions: empathy, tangibility, responsiveness, reliability, and safety.

The responses to the questionnaire were formulated according to a five-point Likert scale, and the scale scores were classified as shown in Table (1):

Table (1) Scale for answering the questionnaire items

Strongly Agree	Agreed	Somewhat Agree	I Disagree		Strongly Disagree	Classification
5	4	3	2		1	Grade
Greater than 4.2 to 5.0	Greater than 3.4 to 4.2	Greater than 2.6 to 3.4	Greater than 1.8 to 2.6		From 1.0 to 1.8	Range

1.2 Testing the validity and reliability of the questionnaire:

Table (2) Validity and reliability coefficients for the questionnaire axes

Reliability Coefficient (Square Root Of Reliability Coefficient)	Reliability Coefficient (Cronbach's Alpha)	Number Of Paragraphs	Axis
0.882	**0.765**	**5**	Artificial Intelligence Technologies
0.883	**0.780**	**15**	Customer Satisfaction With The Quality Of Tourism Services
0.843	**0.772**	**20**	Total Survey

Table (2) shows that for the first axis related to artificial intelligence technologies, which consisted of five items, the Cronbach's alpha coefficient was 0.765, and the reliability coefficient was 0.874. For the second axis related to customer satisfaction with the quality of tourism services, which consisted of 15 items, Cronbach's alpha coefficient was 0.698, and the reliability coefficient was 0.835. The Cronbach's alpha coefficient for all the questionnaire axes was 0.772, and the reliability coefficient was 0.878, indicating a high degree of reliability for the questionnaire items. The reliability coefficient also indicates a high degree of validity for the questionnaire items.

2 - Results of the Statistical Analysis:

2/1 Statistical Analysis of Personal Data:

Table (3) Statistical Analysis of Customer Personal Data

Hotel Clients			Travel Company Clients			Variables	
Arrangement	**Percentage**	**Repetition**	**Arrangement**	**Percentage**	**Repetition**		
1	**93.3**	**84**	**1**	**88.6**	**62**	Male	Type
2	**6.7**	**6**	**2**	**11.4**	**8**	Female	
3	**0**	**0**	**3**	**0**	**0**	Intermediate	Academic Qualification Type
1	**62.2**	**56**	**1**	**74.3**	**52**	Bachelor's	
2	**37.8**	**34**	**2**	**25.7**	**18**	Graduate	
3	**0**	**0**	**3**	**0**	**0**	Other	
2	**42.2**	**38**	**3**	**8.6**	**6**	Once	
1	**48.9**	**44**	**1**	**80.0**	**56**	Twice	
3	**8.9**	**8**	**2**	**11.4**	**8**	Three Times	
4	**0**	**0**	**4**	**0**	**0**	More Than Three Times	

Table (3) shows that the type of study sample of clients of tourism companies in Karbala was male, with (62) individuals and a percentage of (88.6%), and females came in second place with (8) individuals and a percentage of (11.4%). As for the type of study sample of hotel clients in Karbala, males came in first place with (84) individuals and a percentage of (93.3%), and females came in second place with (6) individuals and a percentage of (6.7%). In terms of educational qualifications of clients of tourism companies, bachelor's degrees came in first place with (52) individuals and a percentage of (74.3%), and postgraduate studies came in second place with (18) individuals and a percentage of (25.7%). As for educational qualifications of hotel clients, bachelor's degrees came in first place with (56) individuals and a percentage of (62.2%), and postgraduate studies came in second place with (34) individuals and a percentage of (37.8%). As for the number of visits by clients of tourism companies, it came in first place twice with (56) individuals at a rate of (80%) came in second place three times with (8) individuals at a rate of (11.4%), and came in third place once with (6) individuals at a rate of (8.6%). As for the number of visits by hotel clients, it came in first place twice with (44) individuals at a rate of (48.9%), came in second place once with (38) individuals at a rate of (42.2%), and came in third place three times with (8) individuals at a rate of (8.9%). 2/2 Statistical Analysis of Objective Data:

Table (4) shows an analysis of the study sample's opinions regarding artificial intelligence technologies:

1- Use of artificial intelligence technologies in tourism information searches:

The arithmetic mean of the study sample's opinions from tourism company customers was 3.48, compared to (3.60) for hotel customers, indicating that the answers fall within the agreed range of (3.40-4.20). The standard deviation of the responses from tourism company customers was (0.91), compared to (0.93) for hotel customers, indicating that the study sample's answers were dispersed around their arithmetic mean. 2- Relying on artificial intelligence systems for booking on websites:

The arithmetic mean of the study sample's opinions from tourism company customers was 3.97, compared to (3.90) for hotel customers, indicating that the responses fall within the agreed range of (3.40-4.20). The standard deviation of tourism company customers' responses was (0.61), compared to (1.11) for hotel customers, indicating that the study sample's responses were dispersed around their arithmetic mean. 3- Interested in using ChatGPT to obtain recommendations for planning a tourist trip:

The arithmetic mean of the study sample's opinions from tourism company customers was 4.28 compared to (3.47) for hotel customers, indicating that the responses fell within the range of (strongly agreed) for tourism company customers, which fell between (4.20-5.00) and (3.40-4.20) for hotel customers. The standard deviation of tourism company customers' responses was (0.62) compared to (1.00) for hotel customers, indicating that the study sample's responses were dispersed around their arithmetic mean.

Table No. (4) Statistical analysis of the study sample's opinions on artificial intelligence technologies

Hotel Clients							Travel Company Clients							Paragraph		
Standard Deviation	Arithmetic Mean	Strongly Agree	Agree	I Somewhat Agree	Disagree	Strongly Disagree	Standard Deviation	Arithmetic Mean	Strongly Agree	Agree	I Somewhat Agree	Disagree	Strongly Disagree			
0.93	3.60	16 17.8	34 378.	32 35.6	4 4.4	4 4.4	0.91	3.48	14 20.0	12 171.	38 54.3	6 8.6	0 0	K N	Use AI technologies in your tourism	1

															information searches	
1.11	3.90	14 15.6	36 400.	22 24.4	14 15.6	4 4.4	0.61	3.97	12 17.1	44 629.	14 20.0	0 0	0 0	K N	Rely on AI systems for online booking	2
1.00	3.47	22 24.4	26 289.	30 33.3	12 13.3	0 0	0.62	4.28	26 37.1	38 543.	6 8.6	0 0	0 0	K N	I am interested in using ChatGPT to get recommendations for planning a tourist trip	3
0.93	4.17	24 26.7	34 378.	24 26.7	8 8.9	0 0	0.85	4.28	32 45.7	32 457.	6 8.6	0 0	0 0	K N	I am willing to use self-service systems to perform various tasks in the tourism and hospitality sector	4
0.86	3.82	22	34	30	4	0	0.63	3.65	6	34	30	0	0	K	I prefer to take virtual tours to learn about the features of a tourist destination before traveling	5

															there	

- Readiness to use self-service systems to perform various tasks in the tourism and hospitality sector:
The arithmetic mean of the study sample's opinions from tourism company customers was 4.28, compared to (4.17) for hotel customers, indicating that the responses fell within the range of (strongly agreed) for tourism company customers, which fell between (4.20-5.00), and (3.40-4.20) for hotel customers. The standard deviation of the responses from tourism company customers was (0.85) compared to (0.93) for hotel customers, indicating that the responses of the study sample were dispersed around their arithmetic mean. 5- It is best to take virtual tours to learn about the destination's features before traveling there:
The arithmetic mean for the study sample's opinions of tourism company customers was 3.65, compared to 3.82 for hotel customers, indicating that the responses fall within the agreed range of 3.40-4.20. The standard deviation for tourism company customers' responses was 0.63, compared to 0.86 for hotel customers, indicating that the study sample's responses were dispersed around their arithmetic mean. Table (5) shows an analysis of the study sample's opinions regarding satisfaction with tourism services:
1- There is a positive attitude toward the use of artificial intelligence technology in tourism and hospitality:
The arithmetic mean of the study sample's opinions from tourism company customers was 2.85, compared to (2.80) for hotel customers, indicating that the answers fall within a somewhat consistent range of (2.60-3.40). The standard deviation of the answers from tourism company customers was (1.19), compared to (1.07) for hotel customers, indicating that the study sample's answers are dispersed around their arithmetic mean. 2- I feel satisfied and content with the technological services provided in the tourism and hospitality sector:
The arithmetic mean of the study sample's opinions of tourism company customers was (3.97) compared to (3.37) for hotel customers, indicating that the responses fall within the agreed range of (3.40-4.20). The standard deviation of the responses of tourism company customers was (0.61) compared to (0.93) for hotel customers, indicating that the study sample's responses are dispersed around their arithmetic mean.

Table No. (5) Statistical analysis of the study sample's opinions regarding satisfaction with tourism services

Hotel Clients							Travel Company Clients								Paragraph	The code
Disagree	Strongly Disagree	Disagree	Strongly Disagree	Disagree	Strongly Disagree	Disagree	Strongly Disagree	Disagree	Strongly Disagree	Disagree	Strongly Disagree	Disagree	Strongly Disagree			
First dimension: satisfaction with sympathy																
1.07	2.80	0	28	32	14	16	1.19	2.85	12	0	32	18	8	ك	I have a positive attitude toward the use of AI technology in tourism and hospitality.	1
		0	31.1	35.6	156.	17.8			17.1	0	45.7	25.7	114.	ن		
0.93	3.37	12	22	48	4	4	0.61	3.97	12	44	14	0	0	ك	I feel satisfied and content with the technological services provided in the tourism and hospitality sector.	2
		133.	24.4	53.3	4.4	4.4			17.1	62.9	20.0	0	0	ن		
1.06	3.00	8	18	38	18	8	1.29	3.45	18	18	20	6	8	ك	The technological services provided in the tourism and hospitality sector make me feel happy.	3
		8.9	20.0	42.2	200.	8.9			25.7	25.7	28.6	8.6	114.	ن		

																Dimension 2: Satisfaction with tangibility
1.04	3.31	12 133.	26 28.9	34 37.8	14 156.	4 4.4	0.67	3.88	12 17.1	38 54.3	20 28.6	0 0	0 0	ك ن	I find real value in the travel and accommodation experience powered by AI technology.	4
0.93	4.17	24 267.	34 37.8	24 26.7	8 8.9	0 0	0.85	4.28	32 45.7	32 45.7	6 8.6	0 0	0 0	ك ن	I am prepared to use AI technology in transactions with tourism companies/hotels.	5
0.80	3.24	4 4.4	26 28.9	52 57.8	4 4.4	4 4.4	0.65	3.51	6 8.6	24 34.3	40 57.1	0 0	0 0	ك ن	I have a positive initial impression of the use of AI technology in tourism companies/hotels.	6
															The third dimension: satisfaction with the response	
1.00	3.47	22 244.	26 28.9	30 33.3	12 133.	0 0	0.50	3.45	0 0	32 45.7	38 54.3	0 0	0 0	ك ن	I find it much faster to answer questions using AI technology.	7
0.85	3.65	32 356.	44 48.9	4 4.4	4 4.4	6 6.7	1.09	3.57	20 28.6	12 17.1	26 37.1	12 17.1	0 0	ك ن	I find it much faster to solve problems using AI technology.	8
0.91	3.42	16 178.	34 37.8	30 33.3	10 111.	0 0	1.07	3.31	12 17.1	18 25.7	20 28.6	20 28.6	0 0	ك ن	AI technology saves me time and money when taking a trip.	9
															The fourth dimension: satisfaction with reliability	
0.96	3.50	24 267.	40 44.4	8 8.9	14 156.	4 4.4	0.84	3.85	14 20.0	38 54.3	12 17.1	6 8.6	0 0	ك ن	Use AI technology to obtain essential information about a tourist destination.	10
0.93	3.60	16 178.	14 37.8	32 35.6	4 4.4	4 4.4	0.60	3.85	8 11.4	44 62.9	18 25.7	0 0	0 0	ك ن	I trust search results generated using AI in the tourism and hospitality sector.	11
0.89	3.17	4 4.4	38 42.2	30 33.3	18 200.	0 0	0.91	3.48	14 20.0	12 17.1	38 54.3	6 8.6	0 0	ك ن	AI technology provides me with more opportunities and useful conclusions in the tourism and hospitality sector.	12
															The fifth dimension: satisfaction with security	
1.14	4.30	38 422.	20 22.2	16 17.8	6 6.7	10 11.1	0.65	4.25	26 37.1	36 51.4	8 11.4	0 0	0 0	ك ن	I have no concerns about using AI technology in tourism and hospitality.	13
1.06	3.22	6 6.7	36 40.0	28 31.1	12 133.	8 8.9	0.49	4.37	26 37.1	44 62.9	0 0	0 0	0 0	ك ن	I have no problem providing my basic information when using AI technology in tourism and hospitality.	14
1.11	3.90	14 156.	36 40.0	22 24.4	14 156.	4 4.4	0.62	4.28	26 37.1	38 54.3	6 8.6	0 0	0 0	ك ن	I have never encountered any security issues when using AI technology in tourism and hospitality.	15

- The technological services provided in the tourism and hospitality sector bring me a sense of happiness:
The arithmetic mean of the study sample's opinions from tourism company customers was (3.45) compared to

(3.00) for hotel customers, indicating that the answers fall within the agreed range of (3.40-4.20). The standard deviation of the study sample's answers was (1.29) compared to (1.06) for hotel customers, indicating that the study sample's answers are dispersed around their arithmetic mean.

4- I find a real value in the travel and accommodation experience supported by artificial intelligence technology:

The arithmetic mean of the study sample's opinions from tourism company customers was (3.88) compared to (3.31) for hotel customers, indicating that the answers fall within the agreed range of (3.40-4.20). The standard deviation of the study sample's answers was (0.67) compared to (1.04) for hotel customers, indicating that the study sample's answers are dispersed around their arithmetic mean.

5- Readiness to use artificial intelligence technology in conducting transactions with tourism companies/hotels:

The arithmetic mean of the study sample's opinions of tourism company customers was (4.28) compared to (4.17) for hotel customers, indicating that the responses of tourism company customers fell within the strongly agreed range of (4.20-5.00), while the responses of hotel customers fell within the agreed range of (3.40-4.20). The standard deviation of tourism company customers' responses was (0.85) compared to (0.93) for hotel customers, indicating that the responses of the study sample were dispersed around their arithmetic mean. 6- A positive initial impression of the use of artificial intelligence technology in tourism companies/hotels was formed:

The arithmetic mean of the study sample's opinions of tourism company customers was (3.51) compared to (3.24) for hotel customers, indicating that the responses fell within the agreed range of (3.40-4.20) for tourism company customers and within the somewhat agreed range of (2.60-3.40) for hotel customers. The standard deviation of the responses of tourism company customers was (0.65) compared to (0.80) for hotel customers, indicating that the responses of the study sample were dispersed around their arithmetic mean. 7- I find it very fast to answer questions using artificial intelligence technology:

The arithmetic mean of the study sample's opinions from tourism company customers was (3.45) compared to (3.47) for hotel customers, indicating that the answers fall within the agreed range of (3.40-4.20). The standard deviation of the study sample's answers was (0.50) compared to (1.00) for hotel customers, indicating that the study sample's answers are dispersed around their arithmetic mean.

8- I find it fast to resolve problems using artificial intelligence technology:

The arithmetic mean of the study sample's opinions from tourism company customers was (3.57) compared to (3.65) for hotel customers, indicating that the answers fall within the agreed range of (3.40-4.20). The standard deviation of the study sample's answers was (1.09) compared to (0.85) for hotel customers, indicating that the study sample's answers are dispersed around their arithmetic mean.

Artificial intelligence technology saves me time and money when taking a tourist trip:

The arithmetic mean of the study sample's opinions from tourism company customers was (3.31) compared to (3.42) for hotel customers, indicating that the answers fall within a somewhat consistent range of (2.60-3.40) for tourism company customers and within a consistent range of (3.40-4.20) for hotel customers. The standard deviation of the responses from tourism company customers was (1.07) compared to (0.91) for hotel customers, indicating that the study sample's answers are dispersed around their arithmetic mean. 10- Use artificial intelligence technology to obtain basic information about the tourist destination:

The arithmetic mean of the study sample's opinions from tourism company customers was (3.85) compared to (3.50) for hotel customers, indicating that the answers fall within the agreed range of (3.40-4.20). The standard deviation of the responses from tourism company customers was (0.84) compared to (0.96) for hotel customers, indicating that the study sample's answers are dispersed around their arithmetic mean.

11- I trust the results of research conducted using artificial intelligence in the field of tourism and hospitality:

The arithmetic mean of the study sample's opinions from tourism company customers was (3.85) compared to (3.60) for hotel customers, indicating that the answers fall within the agreed range of (3.40-4.20). The standard

deviation of the responses from tourism company customers was (0.60) compared to (0.93) for hotel customers, indicating that the study sample's answers are dispersed around their arithmetic mean. 12- Artificial intelligence technology provides me with more opportunities and useful conclusions in the field of tourism and hospitality:
The arithmetic mean of the study sample's opinions of tourism company customers was (3.48) compared to (3.17) for hotel customers, indicating that the answers fall within the agreed range of (3.40-4.20) for tourism company customers and within the somewhat agreed range of (2.60-3.40) for hotel customers. The standard deviation of tourism company customers' answers was (0.91) compared to (0.89) for hotel customers, indicating the dispersion of the study sample's answers around their arithmetic mean. 13- I have no concerns about using artificial intelligence technology in tourism and hospitality:
The arithmetic mean of the study sample's opinions of tourism company customers was (4.25) compared to (4.30) for hotel customers, indicating that the answers fall within the strongly agreed range of (4.20-5.00). The standard deviation of tourism company customers' answers was (0.65) compared to (1.14) for hotel customers, indicating that the study sample's answers are dispersed around their arithmetic mean. 14- I have no problem providing my basic data when using artificial intelligence technology in tourism and hospitality:
The arithmetic mean of the study sample's opinions from tourism company customers was (4.37) compared to (3.22) for hotel customers, indicating that the responses fell within the "strongly agree" range of (4.20-5.00) for tourism company customers and within the "somewhat agree" range of (2.60-3.40) for hotel customers. The standard deviation of the responses from tourism company customers was (0.49) compared to (1.06) for hotel customers, indicating that the study sample's responses were dispersed around their arithmetic mean. 15- I have never encountered security problems when using artificial intelligence technology in tourism and hospitality:
The arithmetic mean of the study sample's opinions from tourism company customers was (4.28) compared to (3.90) for hotel customers, indicating that the responses fell within the "strongly agreed" range of (4.20-5.00) for tourism company customers and within the "agreed" range of (3.40-4.20) for hotel customers. The standard deviation of the responses from tourism company customers was (0.62) compared to (1.11) for hotel customers, indicating that the responses of the study sample were dispersed around their arithmetic mean.

3- Testing the validity of the study's hypotheses

The validity of the study's hypotheses was tested using Pearson's correlation using SPSS, V.24. Table (6) shows the test results:

Table (6) Pearson's correlation test for the study variables

9

Satisfaction With Security	Satisfaction With Reliability	Response Satisfaction	Satisfaction With Tangibility	Satisfaction With Sympathy	Artificial Intelligence	Variables
					1.00	Artificial Intelligence
				1.00	0.529**	Satisfaction With Empathy
			1.00	0.536**	0.565**	Satisfaction With Tangibility
		1.00	0.602**	0.677**	0.679**	Satisfaction With Responsiveness
	1.00	0.680**	0.686**	0.661**	0.648**	Satisfaction With Reliability
1.00	0.798**	0.681**	0.602**	0.641**	0.656**	Satisfaction With Safety

** The relationship is statistically significant at the 0.01 level.

The results of the correlations shown in Table (6) showed a significant positive relationship between the dimensions of satisfaction with the quality of tourism services and artificial intelligence in the tourism and travel industry in Iraq. The relationship between artificial intelligence and satisfaction with empathy reached (0.529), indicating the

validity of the first hypothesis: There is a statistically significant relationship between artificial intelligence and customer satisfaction with the quality of empathy in the tourism and travel industry in Iraq. The correlation between artificial intelligence and satisfaction with tangibility reached (0.595), indicating the validity of the second hypothesis: There is a statistically significant relationship between artificial intelligence and customer satisfaction with the quality of tangibility in the tourism and travel industry in Iraq. The relationship between artificial intelligence and satisfaction with responsiveness reached (0.679), indicating the validity of the third hypothesis: There is a statistically significant relationship between artificial intelligence and customer satisfaction with the quality of responsiveness in the tourism and travel industry in Iraq. The relationship between artificial intelligence and satisfaction with reliability reached (0.648), indicating the validity of the fourth hypothesis: There is a significant relationship. There is a statistically significant relationship between artificial intelligence and customer satisfaction with reliability in the Iraqi tourism and travel industry. The correlation between artificial intelligence and satisfaction with safety reached (0.656), indicating the validity of the fifth hypothesis: There is a statistically significant relationship between artificial intelligence and customer satisfaction with security in the Iraqi tourism and travel industry.

CONCLUSION

General Results:

- The importance of artificial intelligence in the tourism sector lies in searching for travel information, making decisions related to planning tourist trips, analyzing big data, improving and personalizing tourist experiences, responding quickly to customer inquiries, providing personalized predictions, supporting agents, and improving reputation and image.
- The most important technologies applying artificial intelligence in the tourism industry are artificial intelligence-based website searches, reservation systems, instant language translation systems, autonomous robots, chatbots, virtual and augmented reality, drones, and big data processing.
- The service quality model that measures customer satisfaction in the tourism and travel industry includes five elements: empathy, tangibility, responsiveness, reliability, and security.

There is a relationship between artificial intelligence and customer satisfaction in the tourism and travel industry in Iraq.

Recommendations:

- Incorporate artificial intelligence technologies into the operations of tourism and hotel companies in Iraq.
- Develop the capabilities and skills of tourism sector workers to keep pace with the development of artificial intelligence.
- Utilize international expertise in the field of artificial intelligence to develop the tourism sector in Iraq.
- Benefit from successful international experiences in applying artificial intelligence in tourism and hotel companies and attempt to implement them in Iraq.
- Provide the necessary financial resources to purchase hardware, equipment, and technological programs specific to artificial intelligence technologies.
- Set standards to measure customer satisfaction in the tourism and travel industry in Iraq regarding the quality of tourism services provided.
- Update educational curricula in specialized tourism and hotel colleges and institutes to keep pace with modern technological developments, particularly artificial intelligence.

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