Consumer readiness to adopt AI applications utilized in the Travel, Tourism, and Hospitality (TTH) industry: An empirical study of Egyptian TTH consumers

Iten ElRouby
Associate Professor- Tourism Studies Department
Faculty of Tourism & Hotels-Alexandria University,
itenelrouby@alexu.edu.eg

Abstract:
The Travel, Tourism, and Hospitality industry (TTH) has been revolutionized by the emergence of Artificial Intelligence (AI). Key drivers of AI in TTH include enhancing operational efficiency, improving yield, boosting customer experiences, and ensuring sustainable growth in the TTH sector. AI is being used in the travel and tourism sector to provide consumers with personalized recommendations based on past experiences, offer more efficient online booking processes, and employ chatbots for customer service inquiries about tourist attractions and travel tips. Conversational AI systems like Apple's Siri use Natural Language Processing (NLP) to communicate with customers via speech and text.
AI is also being widely used in the hospitality industry to help customers through service robots, virtual assistance, smart room technologies, and concierge services. In addition, AI can also be recognized in airports through applications such as face recognition, biometrics, service robots, baggage handling, and geofencing for marketing purposes.
Back-office AI applications that support TTH businesses in decision-making include machine and deep learning, neural networks, decision trees, and rule-based systems. These applications can help businesses make informed business decisions based on real-time data analysis.

This research relied on the extended TAM (Technology Acceptance Model) model based on the Theory of Reasoned Action to examine the acceptance level and future intentions of Egyptian TTH customers to adopt AI applications. A quantitative approach was adopted wherein an online questionnaire was distributed to examine TTH customers' intentions to adopt AI, where 438 valid responses were received. Furthermore, multiple linear regression analysis was used to find relationships between variables of the TAM model such as perceived ease of use, perceived usefulness, and perceived risk.

The results showed, that Egyptian TTH customers perceive AI applications as useful, easy to use, and entertaining. However, some customers were skeptical about some AI technologies regarding the security of data and the lack of human touch in some services that robots took over. Based on the analysis, a significant positive relationship was found between the variables Perceived usefulness and Ease of use and variables of Behavioral Intentions. Nevertheless, no significant relationship was found between the variables of Behavioral Intentions and Perceived Risk.

Keywords: AI, perceived usefulness, perceived ease of use, TAM, Regression Analysis

1. INTRODUCTION

Travel, Tourism and Hospitality industry (TTH) has been always an early adopter of Information Communication technologies (ICT) in the areas of service delivery, information search, and trip planning (Buhalis et al., 2019).
Schwab (2017) stated that the world is currently experiencing the fourth industrial revolution, a period marked by groundbreaking developments in technologies like AI, robots, the Internet of

Things (IoT), and more. These advancements will have far-reaching effects on how consumers perceive value, and will fundamentally alter how people live, labor, and engage with one another.

TTH as a labor-intensive industry is often referred to as a "people business". It mainly relies on the service provided by humans to communicate with customers, execute tasks, solve problems, or handle customer service complaints that aren't often part of standard procedures. With the new technological advancements of the Internet of Things (IoT), Artificial Intelligence, Smartphones, and Machine Learning applications (ML), a shift from traditional "human-human" interactions into "human–machine," "human–computer," and, more recently, into "human–robot" interactions can be noticed (Ivanov & Berezina, 2017).

Artificial intelligence (AI) comprises a set of technologies that can simulate human intelligence to tackle problems. Analogously to human intelligence, AI can abide by rules, progress over time, acquire knowledge through experience, and accommodate changes (Russell & Norvig, 2020). As a field, AI has undergone a significant evolution, with earlier systems possessing only fundamentally intelligent qualifications (Buhalis et al., 2019). Nevertheless, modern standards require specific autonomous behaviors for a system to be considered intelligent (Sterne, 2017). To be seen as intelligent, AI must be capable of acting independently, self-regulating, fostering creativity, and engaging in social interaction (Kaplan & Haenlein, 2020).

AI is considered by many experts a game changer in enhancing customer experiences and service quality. Guests leave digital footprints (i.e. Big data) at several touchpoints throughout the different trip stages, which constitutes a valuable source for marketers, analysts, and decision-makers to rely on. Before the trip, the tourist generates data through online activities (IoT), and biometric data that can be captured by sensors, GPSs, and Point of Sale (POS). During the trip, data such as on-site movements, thermal images, and biometrics can be captured through smart watches, sensors, and GPSs. After the trip, data in the form of User-Generated Content (UGC) such as reviews, videos, posts, and photos can be traced. These UGCs are a useful source of data for decision-makers in the TTH industry, especially if analyzed by text mining techniques to measure sentiments related to videos, posts, or pictures shared by tourists (Li et al. 2018).

Additionally, AI is increasingly being used to carry out marketing activities which have led to strengthening customer engagement by personalizing travel experiences and making recommendations (Samala et.al, 2022).

AI-powered language translators can provide real-time, accurate translations, making it easier for travelers to communicate with local people in foreign countries (Carvalho et al., 2023).

With the emergence of AI technologies, trip planning and execution have become much easier. AI applications can make information search, bookings, and decision-making more user-friendly. The potential of AI in the TTH is evident as it helps to reduce costs, streamline operations, transform business models, boost service quality, and enhance decision-making processes (Davenport, 2018; Daugherty & Wilson, 2018; Webster & Ivanov, 2020).

2. DEFINITION OF ARTIFICIAL INTELLIGENCE

The term AI is defined as a "system's ability to correctly interpret external data, to learn from such data, and to use those learnings to achieve specific goals and tasks through flexible adaptation" (Kaplan & Haenlein, 2019).

Artificial Intelligence (AI) can be also referred to as the development of computer systems that can perform tasks and activities that require human intelligence. The field of artificial

intelligence (AI) involves developing systems that can exhibit human-like behavior by thinking and acting like humans, or by thinking and acting rationally. To achieve this goal, researchers have identified six key competencies that machines must possess, which correspond to different domains within AI: natural language processing for communication, knowledge representation for information storage, automated reasoning for drawing conclusions based on stored information, machine learning for identifying patterns, computer vision for object perception, and robotics for object manipulation and movement. AI is preferably defined as a system that mimics human performance rather than acting like humans (Russell & Norvig, 2020).

Kaplan & Haenlein, 2019 identify three types of AI. The first type is known as "Artificial Narrow Intelligence" or "Weak AI." It is used in a specific field where it can outperform humans, but it is not suitable for other areas because it lacks the necessary techniques to perform well. The second type is called "Artificial General Intelligence" or "Strong AI." It is almost at the same level as human intelligence and may even surpass humans in various fields. The third type is "Artificial Superintelligence," which is a conscious and self-aware AI that outperforms humans in all fields.

Whitson (2018) accurately notes that when defining artificial intelligence, it is crucial to keep in mind that the models created by computer scientists and engineers only display intelligent behavioral patterns; but they do not genuinely possess human intelligence.

This research study endeavors to examine the extent of readiness among consumers of the Travel, Tourism, and Hospitality (TTH) sector in Egypt to adopt Artificial Intelligence (AI). The primary objective is to evaluate consumer readiness and provide valuable insights into the current market trends and customer preferences. The study will employ a descriptive-analytical approach to evaluate the level of awareness and understanding of AI among consumers in the TTH industry and their willingness to adopt it. The findings of this research will be beneficial for the TTH industry stakeholders and policymakers in Egypt to make informed decisions regarding the implementation of AI technology in their TTH businesses and to cater to the evolving needs of their customers.

The study hypothized the following:

- ***H1***: There is a significant relationship between variables “Perceived usefulness” and “Behavioral Intentions” to use AI applications in TTH industry.
- ***H2***: There is a significant relationship between variables of “Ease of use” and “Behavioral Intentions” to use AI applications in TTH industry.
- ***H3***: There is a significant relationship between variables “Behavioral Intentions” and “Perceived Risk”.
- ***H4:*** There is a significant relationship between variables “Barriers of use” and “Behavioral Intentions”.

3. RELATED WORK

The literature review will focus on studies that used Technology Acceptance models to examine customer adoption of AI in TTH. It will also shed light on studies that focused on the positive outcomes of AI applications in TTH for customers as well as those studies that examined the reluctance of some consumers to embrace AI due to the absence of human interaction, which is fundamental in service delivery.

In 2019, Gursoy et al. conducted a study on 439 potential customers of AI in the USA to test the efficacy of the three-stage AIDUA (Artificially Intelligent Device Use Acceptance) model. The study identified a three-stage acceptance process that determines whether customers prefer AI devices in their service provision. The findings indicated that social influence and hedonic

motivation affect how well customers expect the AI to perform. Both performance and ease of use affect how customers feel, which ultimately determines whether they accept or reject AI device use in service delivery.

The purpose of the study of Go et al. (2020) is to examine consumers' acceptance of advanced artificial intelligence (AI) robots and to recommend a framework, interactive technology acceptance model (iTAM), which identifies key factors that formulate consumer attitudes towards advanced robot technology.

The study by Wang et al. (2023) used the Technology Acceptance model to examine how AI can be an effective tool in e-commerce. The results showed that Subjective Norms positively impact Perceived Usefulness (PU) and Pursued Ease of Use (PEU). The findings also showed that trust influences PEU which in turn affects PU and attitudes towards usage. However, the study did not find any evidence to support the idea that trust affects the attitude towards the intention to use. Finally, having the intention to use a technology leads to its actual usage.

The study by Isreal et al. (2019) tended to examine user acceptance of a smartphone virtual reality application, which allows virtual simulation of real experiences. The purpose of this application is to reduce the discrepancy between the product information provided and the real goods offered. The Technology Acceptance Model (TAM) was used to explain user acceptance of this new technology. The results showed that perceived usefulness affects the attitude towards usage and intention to use. Nevertheless, perceived ease of use has no effect on perceived usefulness or attitude towards usage.

In 2018, TomDieck et al. conducted a study that found that participants who had access to VR technology at an art gallery had better outcomes compared to those who didn't. The VR participants had increased levels of knowledge transmitted, satisfaction, value changes, and creativity compared to the non-VR participants.

The results of the study conducted by Kelly et al. (2023) showed that perceived usefulness positively influences the revisit intentions for robot service restaurants in hotels. Moreover, the study suggested that the easier the robot is to use, the higher the revisit intentions are. The findings also focused on the significance of trust in shaping technology acceptance.

The research by Huang et al. (2019) indicated that consumers use AI customer service in the first place to save time and solve problems successfully. The findings suggest that the most effective approach to serving customers is to integrate machine-related technologies in customer service conversation systems. This includes natural language processing, machine learning functionalities, and emotion recognition technologies to analyze customer semantics. In addition, human response systems can be integrated to achieve the best outcomes in addressing the problem of machines struggling to decipher human language accurately.

The study conducted by Choi et al. (2020) examined the quality of service delivered by humans compared to the ones delivered by robots in hotels from the perspective of guests and hoteliers. The findings showed that the services delivered by humans were highly rated compared to those delivered by robots in terms of interaction and atmosphere.

The study by Chi et al. (2022) examined the level of acceptance of AI devices in different TTH services. The findings showed that tourists are less inclined to use AI devices for hospitality services compared to airline services. This suggests that while people may find it acceptable for AI devices to be used for basic services, they may not be as comfortable with these devices being used for more personalized or enjoyable experiences.

In the study by Zhang et al. (2019), 35,356 Flickr tourists' photos of 103 different scenes in Beijing were detected and analyzed by computer deep learning technologies. The use of

ArcGIS allowed for an in-depth analysis of the data, providing a comprehensive understanding of the tourists' experiences and perceptions.

The purpose of Cakar & Aykol's (2020) study was to explore travelers' perceptions of robots used for service delivery in hotels, based on user-generated content on TripAdvisor. The results showed positive attitudes towards robotic hotels and intentions to revisit the properties based on the idea of improved service quality and user engagement.

The study by Jiang et al. (2023) investigated AR as an efficient tool to influence the memorability of tourism experiences at heritage sites. The study utilized a smartphone app with built-in AR heritage tourism experiences. The results showed an increase in memorability of tourism experiences with variances in the intensity of the effect.

The study (Nica et al., 2018) examined the technology behind a chatbot that allows people to book hotels, plan a trip, and ask for sights to visit. The study sheds light on how model-based reasoning can be used to enhance responses and improve customer experiences with chatbots.

The research by Tejas and Bargavi (2023) conducted a review of AI applications used for trip planning and examined the utilization of NLP and GPT-3 language technology to generate customized trips. The results showed the importance of the merger between human touch and Intelligent Agents (IA) to guarantee a successful customer experience. The study also highlighted some human characteristics that enhance customer experiences and aren't present in AI applications like communication skills and responsiveness.

The research conducted by Zhang &Sun (2019) examined AI capabilities in analyzing data generated by travelers to suggest tailored itineraries. Leveraging Intelligent Agents, it is possible to extract relevant data that can be used to recommend suitable activities and tourist attractions. The results have important implications for the travel industry as they show the potential of AI in providing tailored customer experiences.

The importance of the human aspect and unique qualities in the tourist sector was emphasized by the study of (Samala et al., 2022). The study focused on the need for critical human qualities, such as the skills to deliver unique and valuable customer experiences, even though AI technologies can automate several conventional operations. The study also discovered that a smooth and harmonious consumer experience requires collaboration between people and AI.

According to statistics, customers nowadays prefer using AI applications for improved service quality and are inclined towards self-service apps as opposed to traditional service delivery methods (Ivanov and Webster, 2017; Ivanov et al., 2017). According to a study by Statista, 2022, 75% of the respondents would trust AI to book their accommodation, while 73% rely on AI for passport renewal. Additionally, 70% of respondents utilize AI in experiential activities and 74% use AI for international transport arrangements.

A study by Juniper Research (2019) found that interactions executed by chatbots could enhance sales from $7.3 billion in 2019 to $112 billion by 2023.

According to Euromonitor International (2023), the number of passengers utilizing AI technologies like ChatGPT to plan their itineraries is projected to grow significantly. It is estimated that AI in the tourism sector will grow, with a compound annual growth rate (CAGR) of 35.2%, enhancing its value from $81.3 billion in 2022 to $908.7 billion by 2030.

It is estimated that by 2025, 85 percent of customers will be able to connect with 372 companies without any human intervention (Doborjeh et al., 2021).

Pitrelli (2023) explained that several virtual travel companies launched AI solutions like *Expedia and Kayak*, which were among the initiators of ChatGPT. *Expedia* announced a beta

launch of an AI chatbot from ChatGPT. *eDreams Odigeo* joined Google Cloud's AI "Trusted Testers Program," and *Airbnb* announced plans to initiate into its system GPT-4, OpenAI's newest large language model. *TripAdvisor* launched a web-based, AI-powered travel itinerary maker called Trips. *Trip.com* released an updated chatbot called *TripGenie*, which replies to text and voice inquiries, displays photos and maps, and gives booking links.

The review of the literature shows on the one hand, that the TTH sector has witnessed an increase in the integration of AI solutions in businesses to add value to service quality. On the other hand, through the incorporation of AI to deliver services, customer acceptance has increased. The following section discusses various AI applications in the TTH industry.

4. USES OF AI IN THE TRAVEL, TOURISM AND THE HOSPITALITY INDUSTRY

4.1 AI in Hospitality Service

AI has numerous applications in the TTH sector, including back-office and front-office applications that help streamline operations and enhance tourist experiences.

One of the ways in which AI is used in the hospitality industry is by employing chatbots or data-driven bots on social media platforms and booking engines. These bots provide customers with the option to ask questions and receive prompt responses 24/7. This is an effective solution to the problem of maintaining a human employee to answer queries round-the-clock. Chatbots can assist with making hotel reservations, recommending destinations, and answering inquiries. In addition, they can learn from human interactions and develop their abilities to solve problems and answer questions. (Citak, et al., 2021)

Natural language processing techniques (NLP) is the area of AI focusing on enabling computers to comprehend text and spoken words in the same way humans can. NLP has an extensive range of applications, including but not limited to analyzing unstructured data like emails, online reviews, social media posts, speech recognition, sentiment analysis, text summarization, and machine translation. Hospitality marketers can exploit the potential of NLP techniques to analyze customer preferences and needs and derive important insights from large volumes of unstructured data (Citak, et al., 2021)

Virtual experiences using 360-degree video technology can be effectively used by hotels to showcase rooms and other facilities in the hotel (Citak, et al., 2021)

Robots are being used in both the front and back-office tasks of hotels. They are utilized to execute activities related to room service, room cleaning, and entertainment. AI Concierge robots assist guests with check-in and offer information about hotel amenities, attractions, eating outlets, and weather forecasts. With each interaction, they can broaden their knowledge about guests' needs and purchasing patterns. This can help hoteliers design tailored services. (Citak, et al., 2021)

Near Field Communication (NFC), Personal Identification Numbers (PIN), and biometrics can be incorporated into hotels allowing guests to go straight to their rooms without stopping at the lobby. In addition, digital kiosks in lobbies serve as self-service outlets for check-ins which significantly reduces waiting time.

NSCI technologies have made it possible for hotels to offer keyless entry to guest rooms. Guests can either register with an application and use it to activate a signal to unlock their room upon arrival or receive an SMS with a PIN code, or a barcode that can be scanned by a

smartphone. Alternatively, guests can enter their rooms using fingerprint or retina-scanning devices (Keymolen, 2018).

Major hospitality brands have also introduced new technologies to assist customers in the pre-arrival stage. AccorHotels, for example, has launched an AI platform called MoodMatch. By analyzing 100 million reviews, the platform can identify specific attributes associated with hotels around the world. Customers choose between four categories, and the AI platform suggests hotels that correspond to the categories selected by the customer (Accor Hotels, 2017).

4.2 AI in Travel and Tourism

AI applications are widely used in the Travel and Tourism industry. Expedia for instance took advantage of Facebook's technology to launch a basic bot to help travelers book travel services. Recommender systems give recommendations on the best alternatives by matching the inventory with user profiles and preferences. (Gao et al. 2010). Therefore, personalization techniques involve large repositories of information about behavioral patterns, so that an accurate profile can be drawn.

In order to achieve a smart tourist experience, destinations must facilitate access to tourism and hospitality services through ICT- based tools (European Commission, 2022). Advanced technologies of AI like IoT, machine learning, biometrics, and data analytics can help achieve this goal.

AI can play an essential role in transforming data (i.e. Big data) into valuable experiences and business opportunities. AI technologies can make use of this valuable source of data to forecast tourist arrivals/demand/expenditure, perform sentiment analysis of customer-generated content, assess employee satisfaction, and perform market segmentation.

Face recognition is not only useful for recognizing a specific person but it can also be used to count the number of people in a certain area and even to detect the emotions of the people passing through a certain point (Bulchand, 2022).

Dynamic packaging is one of the many uses of AI which involves tailoring packages or allowing static packages to be upgraded with additional services.

Virtual, Augmented, and Hybrid Reality offer the potential to create interactive experiences for customers. Virtual reality for instance creates a simulated reality through ICTs. These new technologies help travelers experience a property, room, or destination before making a booking.

Mobile applications assist tourists navigate around the destination, play interactive games, execute self-check-ins, and utilize virtual guides. AI-powered mobile applications can also provide real-time and accurate language translations (Pestek, & Sarvan , 2021).

All these AI uses can add value to the tourist experience and help travel and tourism planners in providing high-quality and customized services.

4.3 AI in Restaurants

Chatbots are being used by restaurants to make table reservations for customers, answer frequently asked questions about the restaurant, provide menu item information (e.g. calorie count), place an order, and process payments.

Major restaurants and fast-food outlets have launched their own branded chatbots. Shortly, placing delivery orders over the phone will become outdated; as customers will use social networking sites such as Facebook, and WhatsApp to do so.

Voice-activated Technologies like Siri by Apple are being used for initiating a phone call, composing, and sending messages, displaying reminders, playing news updates, and conducting a search for nearby restaurants.

Robots perform a variety of different functions both at the front and back of the house. For instance, drones and flying robots are employed to deliver food inside the restaurant. These drones are equipped with AI software, enabling them to fly without human intervention and assist waiters in transporting food from the kitchen to the dining area (Ukpabi et al., 2019)

Many restaurants have inserted self-ordering kiosks like those used by McDonald's. These kiosks store data and grant reward points based on built-in algorithms. They can also make food suggestions to customers using machine-learning algorithms that analyze previous choices and preferences (Johnson, 2018).

4.4 AI in the Aviation industry

Li et al. (2021) identified various AI applications in the aviation industry: airside and landside operations, billing and invoicing systems, and information management.

According to Nechaeva (2023) an AI-powered assistant could be a useful tool to help customers find appropriate flight availabilities based on their preferred time, date, destination, and other requirements. This assistant could simplify the flight booking process in addition to providing real-time updates on flight statuses, delays, or cancellations. It can also supply customers with digital boarding passes, in addition to gathering feedback from customers.

Biometric technology utilizes personal physical and behavioral traits to identify and authenticate individuals. These traits may include facial features, iris, fingerprints, hand geometry, palm print, voice, vascular pattern, or DNA. Additionally, biometric behavioral markers such as typing or walking patterns and signatures may also be used for identification and authentication purposes.

Biometric technologies improve identification and safety for users, allowing or restricting entry to systems, authorizing, or declining transactions, and reducing instances of fraudulent activity. By scrutinizing and validating user requests, monitoring, and flagging suspicious activities, and implementing robust security protocols, organizations can minimize the risk of cyber threats and promote a secure and trustworthy environment (Khan & Efthymiou, 2021).

AI technologies are now used in passenger flow management at airports. This helps minimize waiting times at check-in counters, baggage claims, or immigration, which enhances KPIs for terminal operators related to average waiting time per queue. Immigration officials will soon be replaced by robots to execute tasks (Raafat et al., 2023).

Additionally, airports rely on AI technologies to forecast trends based on data generated by customers. The discovered patterns can assist in supporting security measures and detecting potential risks of terrorist attacks (Raafat et al., 2023).

4.5 AI in Museums

Museums have become institutions for education and entertainment which is referred to as "edutainment". AI applications can help museum operators enrich user experiences and engagement.

With the help of AR and VR technologies, museums have revolutionized the traditional concept of "do not touch" and allowed visitors to not only touch exhibits but also interact with them. Attractions and World Heritage Sites have become accessible through 360-degree digital and panoramic tours by using street view technology.

AI technologies play a significant role in authenticating paintings. Machine learning and deep neural networks are employed to classify periods of art history.

Museums are increasingly adopting modern tracking technologies such as QR codes, RFID systems, and beacons to monitor and analyze visitor behavior. These technologies help museums gain insights into visitors' interests and preferences to offer personalized discounts and incentives. Telepresence machines are used in museums to permit disabled people to explore these places. The Betaface API can match faces of individuals with those of ancient sculptures or restore the faces of ancient people. In addition, robots are designed for preservation purposes, both for indoor and outdoor use. Pattern recognition and machine learning are utilized to monitor air quality, control climate conditions, and detect dust particles (Recuero Virto & Lopez, 2019).

AI applications can also be utilized to map and digitize heritage. Various technologies can be used for restoring, reconstructing, rehabilitating, curating, and interpreting cultural artifacts.

Chatbots via social media platforms are introduced to engage with visitors and promote museum visits. These chatbots may take the form of games or provide users with information.

Additionally, robots have been developed to act as virtual guides or humanoids that interact with visitors and assemble large amounts of data. One interesting application of robotic technology in museums is the use of "emotion detectors" to better understand visitors' experiences and tailor exhibits accordingly (Recuero Virto & Lopez, 2019).

AI plays an instrumental role in discovering concealed archaeological sites. Researchers use the Light Detection and Ranging technique (LiDAR) to explore areas where archaeological remains are hidden by forests, creating high-resolution elevation maps. This technique generates a large amount of advanced data using AI technologies (Pasikowska-Schnass & Lim, 2023).

4.6 AI in Events

Event managers must ensure the safety, security, and convenience of attendees. This can be achieved through the implementation of AI technologies.

State-of-the-art facial recognition technology can speed up security checks and reduce long queues. Video surveillance technology can also detect suspicious conduct and emotions in attendees. (Thomas, 2018).

Chatbots are becoming more popular for mobile device queries and the classification of attendees. Data can be extracted from different platforms to be analyzed for a more customized experience. (Tung&Law,2017)

Instantaneous emotional analysis of attendees can be a powerful tool for event managers. By assessing the audience's emotional engagement, managers can gain valuable insights into how well their activities are being received. As attendees' motivations can shift during an event, this type of behavioral feedback is particularly important for identifying opportunities to enhance the experience and optimize user satisfaction (Blaisdell, 2018; Lamb & Ogle, 2017)

The implementation of a tie-in event application enables attendees to perform many tasks like booking or upgrading tickets, facilitating payment for parking, or ordering food and beverages (Reichert, 2019).

Virtual or hybrid events delivered through real-time platforms are a powerful tool for businesses and organizations seeking to engage with their audiences in a dynamic and immersive way. By capitalizing on this cutting-edge technology, these events offer a highly

convenient and interactive experience for attendees who face travel barriers to attend events, such as distance, cost, or scheduling conflicts (Sox & Campbell, 2018).

Table 1 illustrates the various AI applications utilized by TTH customers during different stages of their trip.

Table 1: AI applications used in the different stages of the trip

AI Applications in TTH / Trip Phase	**Travel &Tourism**	**Accommodation**	**Airports**	**Museums**	**Restaurants**	**Events**
Pre-trip activities	**Front-office operations**: chatbots, VR&AR, recommender system, booking engines, e-payments, mobile applications, NLP **Back-office operations:** analyzing data generated in tourist touchpoints (Big data, IoT), tracking software, data management software, document issuing software, inventory management, forecasting programs		Google Maps, information search, VR&AR	booking engines, chatbots, AR&VR of venues and exhibitions		
During the trip	GPSs, e-payment, chatbots for information search in destinations, smart tourist destinations, geo-fencing, translation apps, VR&AR	Front desk robots, cleaning robots…etc., check-in kiosks, mobile check-in, in-room smart technologies, biometrics (e.g. fingerprint, retina scan), VR/AR geo-fencing, translation apps	Airside and landside operational technologies, self-service kiosks, inventory management software, biometrics, bookings, mobile applications, geofencing, passenger flow management software, security systems, real-time attendee emotion analyses, weather forecast, software for emission reduction, service robots, baggage handling	Virtual guides, AR&VR, authentication of paintings, QR codes, RFID systems, beacons, robots, air climate control technologies, chatbots, preservation and restoration technologies, discovery of hidden archaeological sites	e-payments, QR codes for menus with ingredient details, suggestions for food, assigning reward points, drones for food delivery, robots, self-service kiosks, translation apps, VR&AR	biometrics, tie-in event-mobile applications, security systems, crowd control management technologies, real-time attendee emotion analyses, VR-engendered platforms for broadcasting hybrid or online events

			systems, management software for airspace and terminal, queuing, and occupancy control			
Post Trip	personalized offers based on aggregated data, review sentiment analysis, machine and deep learning algorithms to discover behavioral patterns					

The advent of AI has brought about a paradigm shift in the TTH industry. The industry has witnessed a significant increase in the deployment of AI technology to enhance customer experience and satisfaction. However, an important question arises as to whether the use of AI in the TTH industry an effective tool is to better serve the needs of the customers. It is imperative for businesses to conduct a thorough analysis of the market and customer preferences before implementing AI technologies to ensure their effectiveness in enhancing customer experience and satisfaction. The following part illustrates an examination of the Egyptian market in terms of consumer readiness for AI adoption in the TTH business.

5. METHODOLOGY OF RESEARCH

The TAM (Technology Acceptance Model), which is based on the Theory of Reasoned Action, suggests that people's attitudes and intentions govern their actions, and are influenced by subjective norms and psychological factors that shape their behavior as consumers. This model also highlights the importance of perceived usefulness and ease of use in shaping consumer attitudes towards a new technology.

TAM 2 is the updated version of TAM and comprises perceived technological features that have a direct effect on users' intents and attitudes towards utilizing technology. TAM3, is an expansion of TAM 2 and includes variables such as trust and perceived risk (Kelly et al., 2023).

The Unified Theory of Acceptance and Use of Technology (UTAUT) is a widely used model in the field of information systems that explains how users adopt new technologies. UTAUT 2 is an updated version of the model that includes more leading determinants for consumers' use of technology.

Additionally, the "Negative Attitudes towards Robots Scale (NARS)" and "Robot Anxiety Scale (RAS)" are used by researchers to assess negative attitudes and anxiety towards the use of robots (Taherdoost, 2018).

This research adopted TAM3 to assess customer acceptance of AI in the TTH field. Table 2 shows the variables used to identify Egyptian consumer attitudes towards AI applications used in the different TTH industries.

Table 2: Variables of TAM3

Codes	**Variables of TAM**

	Perceived Usefulness
PU1	Using AI applications saves me time.
PU2	Using AI increases the efficiency of TTH activities.
PU3	With deep learning, AI devices could give reliable information for decision-making.
PU4	TTH services provided by AI devices are more accurate than humans.
PU5	TTH services provided by AI devices are more accurate with less human error
	Perceived Ease of Use
EU1	AI services in TTH are easy to use.
EU2	AI services in TTH are clear and understandable.
EU3	Learning how to use AI in TTH services is easy and effortless.
EU4	It is easy for me to become skilled at using AI
	Possible Barriers to Use
BU1	I have the financial resources necessary to use AI.
BU2	I have the knowledge necessary to use AI.
BU3	I can get help from others when having difficulties using AI.
BU4	Artificial Intelligence is a good value for the money.
	Perceived User Engagement
UE1	Using Artificial Intelligence is fun.
UE2	Using AI will enhance my experience.
UE3	Using AI will increase customer satisfaction.
UE4	Interacting with AI applications is often interesting.
	Behavioral Intentions
BI1	I plan to use Artificial Intelligence frequently in TTH services.
BI2	I will encourage my friends to use AI in TTH services.
	Resistance to Use
RU1	Human contact is much preferred in service transactions.
RU2	Using AI devices lacks social interaction.
	Perceived Risk
PR1	There is a possibility of malfunction and performance failure.
PR2	The problem of Trust arises when personal information is being accessed and misused.

5.1 Sample Selection:

In an attempt to understand the potential use of AI in the Travel, Tourism, and Hospitality (TTH) industry by Egyptian consumers, a survey was designed using Google Forms and shared via various channels, including Facebook groups of Egyptian travel enthusiasts as well as via email lists obtained from customer databases of affiliated travel agencies in Egypt. A pilot test of the questionnaire was conducted under survey conditions and tested on a sample size that is representative of the target population of the research. Four questions were removed from the final version. The final survey was divided into three parts, examining demographic data, AI usage patterns by Egyptian TTH consumers, and the opinion of Egyptian consumers on the variables of the Technology Acceptance Model (TAM3).

There were 438 valid responses. The data was further analyzed using Simple Regression Analysis to determine the relationships between variables and test the hypotheses.

5.2 Construct reliability test

To assess that the variables of the TAM3 model are consistent, the Cronbach's alpha of each variable (construct reliability test) was estimated. Reliability is defined as the extent to which a measure consistently and accurately reflects the underlying construct that it is intended to measure. In other words, a reliable measure produces consistent results over time and across different situations, thereby ensuring that the data obtained is dependable and trustworthy for subsequent analysis and interpretation (Field, 2017).

As explained by Hair et al. (1998), the lowest acceptable value of Cronbach's alpha is 0.6. Table 3 shows that each construct has a Cronbach's alpha value greater than 0.6, which indicates construct reliability (Wessa, 2023)

Table 3: Cronbach's alpha values (Wessa, 2023)

Variable	Value of Cronbach's alpha	No. of items
Perceived usefulness (PU)	0.7465	5
Perceived ease of use (PE)	0.8041	4
Barriers of use (BU)	0.6962	4
User engagement (UE)	0.6481	4

Descriptive analysis of questionnaire results:

The first part of the questionnaire covered demographic data and questions investigating areas in which respondents used their smartphones and areas of TTH they encountered AI applications. The results showed that 68% of the respondents who participated in the survey were females, while 32% were males. The majority of the respondents were college graduates and belonged to the age group ranging between 25-40 years. The survey asked respondents to select the areas where they used their smartphones, with the option to choose more than one answer. The results showed (Figure 1) that the highest usage of smartphones was for social media (81%). This was followed by music (78%), entertainment (65%), travel and tourism (64%), news (56%) and shopping (51%) successively.

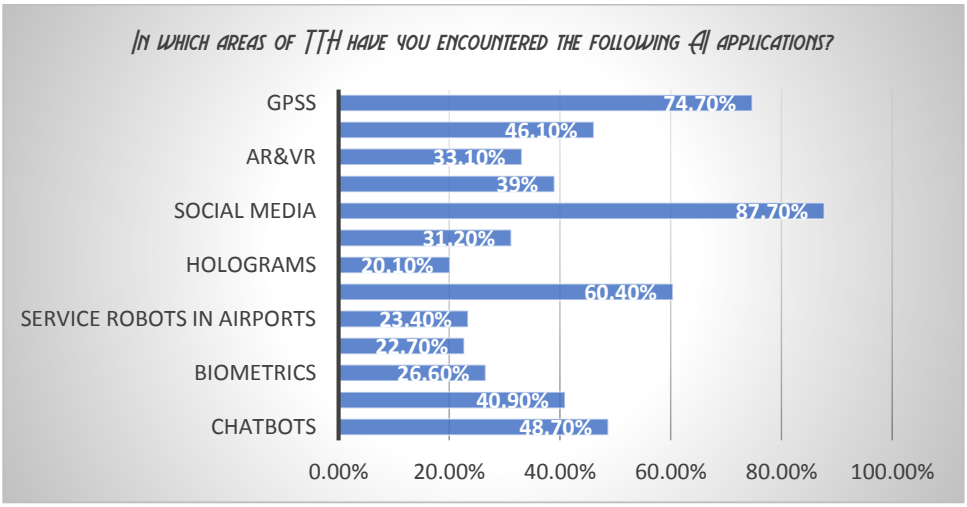

Figure 1: Areas of AI encountered in TTH

Regarding the areas where respondents encountered AI applications within TTH, the results showed that social media were the most commonly encountered AI applications (88%), followed by GPSs (75%), Natural Processing Language (i.e. Apple Siri) (60%), Chatbots (49%), booking engines (46%), face and voice recognition (41%) and multi-factor authentication (39%) (Figure 1).

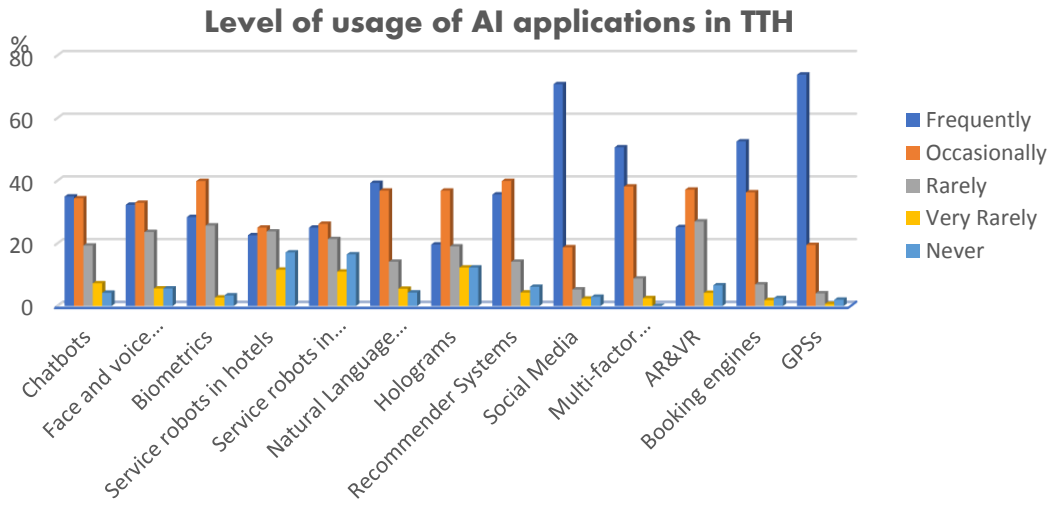

Figure 2: Level of usage of AI applications in TTH

The survey participants were asked to rate the extent to which they used AI applications in distinctive TTH areas. A 5-level Likert scale-item was utilized to exclude neutrality, where 1 meant ***frequently*** and 5 meant ***never***.

The average scores for all AI applications fell between 1.29 and 2.77, indicating that the respondents used the identified applications ***frequently*** to ***occasionally***. The scores for GPSs, booking engines, and social media were the closest to 1, representing ***frequently***, with respective scores of 1.29, 1.63, and 1.68.

The second part of the questionnaire examined the variables of the TAM3 and their effect on consumer adoption of AI. The mean scores for the "perceived usefulness" variables are presented in Table 4. The participants rated their agreement level on a 5-point Likert scale, where 1 meant ***totally agree*** and 5 meant ***totally disagree***.

The respondents agreed that AI applications in TTH are perceived as useful, with the mean scores ranging between 1.84 and 2.19. Specifically, they ***agreed*** that these applications "save time", "increase efficiency", "are more accurate than humans", and "are clear and understandable". The results for variables "perceived ease of use" showed that the respondents ***agree*** that AI applications in TTH are "easy to use", "clear and understandable", and "easy to become skilled at".

Table 4: Mean values of variables "Perceived Usefulness"

Variable	PU [Using AI applications saves me time]	PU [Using AI increases the efficiency of TTH activities]	PU [With deep learning, AI devices could give reliable information for decision-making]	PU [TTH services provided by AI devices are more accurate than humans]	PU [TTH services provided by AI devices are more accurate with less human errors]	PE [AI services in TTH are easy to use]	PE [AI services in TTH are clear and understandable]	PE [Learning how to use AI in TTH services is easy and effortless]	PE [It is easy for me to become skilled at using AI]
Mean	1.84	1.90	1.91	2.19	2.19	2.05	2.14	2.11	1.98

Regarding the "Possible barriers to Use", the mean of the variables fell between 1.98 to 2.34. This indicates that the majority ***agreed*** that they didn't have problems with "the financial

resources necessary to use AI", the knowledge necessary to use AI" and "no problems to get help from others when having difficulties using AI".

The survey also assessed the degree of user engagement with AI applications in TTH. The results showed that most respondents ***agreed*** that AI "is fun", "enhances one's experience"," increases customer satisfaction" and "is interesting".

Moreover, respondents explained that they "plan to use AI frequently in TTH services" and will "encourage their friends to use AI in TTH services". This was reflected in the mean of the variables "Behavioral Intentions" ranging between 2.01 and 2.03.

However, some respondents were skeptical about using AI applications in TTH which was reflected in the mean values of the variables "Resistance to Use". They explained that "Human contact is much preferred in service transactions" and highlighted that "using AI devices lacks social interaction." Furthermore, they showed concerns regarding "possibilities of malfunction and performance failure" and "problem of trust in AI applications arise when personal data is being misused". This was demonstrated in the mean values of variables "Perceived Risk" with values falling between 1.77 and 1.84.

5.1 Hypotheses Testing

The data was subjected to further analysis to test the formulated hypotheses. A regression analysis was conducted to examine relationships between dependent and independent variables. The p-value for each term examines the null hypothesis that the coefficient is equal to zero (no effect). A low p-value (< 0.05) indicates that the null hypothesis can be rejected, i.e. the predictor that has a low p-value means that changes in the predictor's value are related to changes in the response variable. Each hypothesis was analyzed to determine whether it was supported or rejected.

H_1: There is a significant relationship between variables "Perceived usefulness" and "Behavioral Intentions" to use AI applications in the TTH industry.

Table 5: Regression statistics for variables "Perceived Usefulness" and "Behavioral Intentions

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%
Intercept	0.598171	0.161264	3.709263	0.000293	0.279511	0.916831	0.279511	0.916831
Perceived Usefulness	0.700714	0.076599	9.147837	4.07E-16	0.549354	0.852074	0.549354	0.852074

The results of r2 indicate that the independent variable (PU) explains 36% of the variation in the dependent variable Behavioral Intention (BI). Correlation coefficient r = (0.59) shows a strong positive relationship between the variables with (β =0.70, $p<0.05$), hereby supporting H1 (Table 5).

H_2: There is a significant relationship between variables of "Ease of use" and "Behavioral Intentions" to use AI applications in the TTH industry.

Table 6: Regression statistics for variables "Ease of Use" and "Behavioral Intentions

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%
Intercept	0.656027	0.155014	4.232058	4.03E-05	0.349718	0.962336	0.349718	0.962336
Perceived Ease	0.652051	0.071162	9.162866	3.73E-16	0.511433	0.792669	0.511433	0.792669

of Use								

The results of r2 indicate that the independent variable (EU) explains 36% of the variation in the dependent variable Behavioral Intention (BI). Correlation coefficient r = (0.60) shows a strong positive relationship between the variables with (β =0.65, $p<0.05$), hereby supporting H2 (Table 6).

H_3: There is a significant relationship between variables "Behavioral Intentions" and "Perceived Risk".

Table 7: Regression statistics for variables "Behavioral Intentions" and "Perceived Risk"

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%
Intercept	1.55539	0.165597	9.39264	9.51E-17	1.228169	1.882611	1.228169	1.882611
Perceived Risk	0.246847	0.08512	2.89999	0.004297	0.078649	0.415046	0.078649	0.415046

The results of r2 indicate that the independent variable (PR) explains 0.5% of the variation in the dependent variable (Behavioral Intentions). Correlation coefficient r = (0.20) shows a weak positive relationship between the variables with (β =0.24, $p<0.05$), hereby H3 is not supported (Table 7).

H_4: There is a significant relationship between variables "Barriers of use" and "Behavioral Intentions"

Table 8: Regression statistics for variables "Barriers of use" and "Behavioral Intentions"

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%
Intercept	0.490959	0.1555	3.157284	0.001928	0.183688	0.79823	0.183688	0.79823
Barriers to Use	0.714199	0.069987	10.20481	7.17E-19	0.575905	0.852493	0.575905	0.852493

For hypothesis 4 the results of r2 indicate that the independent variable (BU) explains 41% of the variation in the dependent variable Behavioral Intention (BI). Correlation coefficient r = (0.64) shows a strong positive relationship between the variables with (β =0.71, $p<0.05$), hereby supporting H4 (Table 8).

6. DISCUSSION:

The advancement of AI has brought numerous benefits to the TTH industry. These benefits include improved service quality, enriched user experience, streamlined business activities, faster response rates, tailored customer recommendations, and reduced human errors.

Using communication channels powered by AI can provide customers with personalized experiences. AI agents answer queries and provide the necessary information about prices, attractions, means of transportation, and entertainment facilities. In addition, VR&AR applications can offer customers a preview of the destination, and language translations can assist in overcoming language barriers. The use of AI algorithms can also help effectively in cross-selling and up-selling, providing customers with relevant and customized

recommendations. Several AI applications in TTH can assist the tourist in pre-trip planning, at the destination, and after they return.

The results showed enthusiastic opinions conveyed by Egyptian respondents towards using AI technologies in the TTH industry. AI applications were perceived as useful, and more accurate than humans with fewer errors. They were also perceived as easy to use and easy to learn. This goes in line with the study conducted by Kelly et al. (2023) that indicated that perceived usefulness positively influences the revisit intentions for robot service restaurants in hotels.

Concerning user engagement opportunities conveyed by using AI applications, Egyptian consumers explained that AI applications in TTH are fun, increase customer satisfaction, and are often interesting. This is supported by the study of Gursoy et al. (2029) which showed that social influence and hedonic motivation affect how well customers expect the AI to perform. Also, the study by TomDieck et al. (2018) confirms with the results of the research as it showed that participants with access to virtual reality technologies at an art gallery had better outcomes concerning levels of knowledge conveyed, satisfaction, value changes, and creativity compared to the non-VR participants.

The respondents also expressed their intention to use AI applications and encourage their friends to do the same. In addition, the findings showed that the respondents didn't consider financial resources, lack of knowledge, or difficulties in learning a new technology as a barrier to AI adoption.

The respondents showed concerns related to data protection and security issues when sharing personal data is in question. This is substantiated by Tussyadiah et al. (2019) who have highlighted the potential risk to privacy that AI systems can present due to their capacity to collect vast amounts of data and extract patterns and information from it, which can contribute to the fear of surveillance. This is also consistent with the study by Kelly et al. (2023) which highlights the significance of trust in determining technology acceptance.

The results also revealed that one of the drawbacks of AI applications for Egyptian TTH consumers is the lack of personalized experiences or "human touch", which is a fundamental aspect of the TTH industry. The growth of robotics, chatbots, and other AI technologies in the TTH industry could potentially limit human interaction. This goes in line with the findings of the study by Chi et al. (2022) which suggests that individuals may exhibit an increased level of acceptance towards the use of AI devices for basic services while displaying a certain level of reluctance towards their implementation for more experiential or experiences that need a human touch. This is a crucial point to consider when implementing AI in the hospitality industry, as it's essential to ensure that guests feel comfortable and at ease with the technology being used. Also, the research by Tejas and Bargavi (2023) highlighted the significance of the merger between human touch and Intelligent Agents (IA) to guarantee an effective customer experience.

In addition, Choi et al. (2020) argued that in regard to service quality, interaction, and atmosphere, services delivered by humans are rated higher than services delivered by robots. The study by Samala et al. (2022) also highlighted the importance of human characteristics and unique qualities in the tourist sector to deliver special and valuable customer experiences. The study also discovered that a smooth and pleasant consumer experience requires integration between people and AI.

The analysis revealed a significant positive relationship between variables *Perceived usefulness* and *Ease of use* as independent variables with *Behavioral Intentions* as the dependent variable. Additionally, the examination showed a significant positive relationship between *Barriers to*

use and *Behavioral Intentions*. Nevertheless, no relationship was found between the variables of *Behavioral Intentions* and *Perceived Risk.*

The study by Isreal et al. (2019) which examined user acceptance of a smartphone virtual reality application, showed that perceived usefulness affects the attitude towards usage and intention to use. Nevertheless, perceived ease of use has no effect on perceived usefulness or attitude towards usage.

From the point of view of marketing and psychology, attitudes of customers in the TTH industry towards a new technology are influenced by a variety of demographic, behavioral traits, cognitive beliefs, social influence, and perceptions of usefulness and ease of use as well as their previous experiences with automated technology. Research has also indicated that factors such as gender, age, and nationality have an impact on how individuals perceive robots in the context of tourism. Studies suggest that males and younger individuals are more likely to be accepting of robotization in tourism. Notably, research has shown that individuals who have interacted with robots tend to hold more favorable attitudes toward them rather than customers who had no interaction with them (Ivanov et al., 2018a; Ivanov et al., 2018b; Ivanov et al. 2019a; Ivanov et al. 2019b)

7. RECOMMENDATIONS:

The results showed that Egyptian consumers had positive attitudes towards AI applications in TTH. Nevertheless, they had some concerns regarding legal frameworks, security, and lack of human touch.

Consequently, organizations should prioritize strong security measures and clear data handling procedures. These measures shall reduce perceived risk concerning the security of personal information.

In order to ensure responsible and effective implementation of artificial intelligence (AI), cultural understanding is essential in designing AI systems that are sensitive to cultural differences and do not perpetuate biases or stereotypes. Considering these aspects will enable the development of AI systems that align with ethical principles and respect cultural values. Furthermore, stakeholders must work collaboratively to develop appropriate legal frameworks, to guide the development and deployment of AI systems.

The study by Huang et al. (2019) demonstrated that the introduction of new technologies can potentially cause individuals to experience negative emotions such as anxiety and distress, particularly when their adoption is forced by peers or societal norms. Although Egyptian consumers didn't show concerns regarding these aspects, decision-makers should educate consumers about the benefits of AI and explain how to use it. This will help overcome feelings of resistance towards AI usage overwhelming some customers.

Egyptian consumers were concerned about AI applications lacking human touch. Hodges & Higgins (2016) explained that although AI applications like chatbots have the potential to automate tasks and provide round-the-clock assistance, their limitations in processing complex information and interpreting human subtle clues such as sarcasm or comprehending cultural differences can cause user dissatisfaction and reluctance to adopt this technology. The lack of creativity, engagement, and personal touch in chatbot interactions also weakens the level of satisfaction of consumer experience, which has led to concerns and reluctance around the adoption of chatbot technology in various industries. Robophobia may occur if TTH industries fail to satisfy customer needs for communication and interaction possibilities that are to an

extent close to humans. Therefore, an integration between humans and AI technologies in service delivery is essential to ensure the best outcomes.

Bulchand-Gidumal (2022) states that in the future tourists will have to choose between technology-driven automated self-services and human-based services. Many consumers still prefer human interaction in tourism and hospitality services since they are used to this kind of environment. Human labor has its advantages, such as a better understanding of cultures and effective communication. While robots may not possess these skills initially, they may not meet the current customers' expectations of service (Hodges & Higgins, 2016).

Although some authors have some doubts about AI applications in Travel, Tourism, and Hospitality (TTH), others have a positive outlook on the implementation of AI in different areas. However, certain challenges such as data protection, security, biases in algorithms, malfunctions, and lack of human touch must be addressed. AI can revolutionize the TTH industry if these challenges are properly addressed. Creating a synergy between human competencies and AI capabilities will result in the best service quality. With the help of AI, businesses can on the one hand better understand their customers and offer tailored services. AI can also help employees streamline their operations and provide robust customer support. Customers, on the other hand, can enjoy reduced costs, effortless trip planning, tailored offers, and a virtual experience of their destinations which will help them overcome the fear of the unknown. Businesses should seize the great potential that AI applications offer to improve their services and ultimately enhance customer satisfaction.

8. FUTURE RESEARCH AND LIMITATIONS

This research aimed to explore the readiness of Egyptian customers to adopt AI technologies in the TTH industry. The findings can help TTH academics and practitioners better understand needs and preferences of the Egyptian market, allowing them to develop strategies to improve their service. This research was limited to the Egyptian market with its special characteristics and was limited to the point of view of consumers.

Future studies might concern 1) The potential benefits and risks of AI implementations from the point of view of TTH employees 2) Ethical Considerations and Bias in AI 3) Collaborative and Social AI.

9. LIST OF REFERENCES:

1. Accor Hotels. (2017). MoodMatch: AccorHotels.com and Travelsify offer internet users a new way of finding the hotel that suits them best. Retrieved from https://press.accor.com/%E2%80%8Bmoodmatch-accorhotels-com-and-travelsify-offer-internet-users-a-new-way-of-finding-the-hotel-that-suits-them-best/?lang=en . Accessed October 22, 2017
2. Baki, R. (2020). Analysis of Factors Affecting Customer Trust in Online Hotel Booking Website Usage. Eur. J. Tour. Hosp. Recreation, Vol.10, pp.106–117.
3. Blaisdell, R. (2018). Is artificial intelligence good for the event industry? Retrieved from https://rickscloud.com/is-artificial-intelligence-good-for-the-event-industry/ Accessed November 2023.
4. Buhalis, D., Harwood, T., Bogicevic, V., Viglia, G., Beldona, S. & Hofacker, C. (2019). Technological disruptions in Services: lessons from Tourism and Hospitality, Journal of Service Management, Vol. 30 (4), pp. 484-506.

5. Bulchand-Gidumal, J. (2022). Impact of Artificial Intelligence in Travel, Tourism, and Hospitality. In: Xiang, Z., Fuchs, M., Gretzel, U., Höpken, W. (eds) Handbook of e-Tourism. Springer, Cham.
6. Çakar, K.& Aykol, Ş. (2020). Understanding travelers reactions to robotic services: a multiple case study approach of robotic hotels. Journal of Hospitality and Tourism Technology, No. 1, p. 155-174.
7. Carvalho, I., Ramires, A. & Iglesias, M (2023). Attitudes towards machine translation and languages among travelers. Inf Technol Tourism, Vol.25, pp.175–204.
8. Chi, O. H., Gursoy, D., & Chi, C. G. (2022). Tourists' Attitudes toward the Use of Artificially Intelligent (AI) Devices in Tourism Service Delivery: Moderating Role of Service Value Seeking. Journal of Travel Research, Vol.61(1), pp.170-185.
9. Choi, Y., Choi, M., Oh, M. and Kim, S. (2020), "Service robots in hotels: understanding the service quality perceptions of human-robot interaction", Journal of Hospitality Marketing and Management, Routledge, Vol. 29 No. 6, pp. 613–635.
10. Citak, J., Owoc, M.L. & Weichbroth, P. (2021). A note on the applications of artificial intelligence in the hospitality industry: preliminary results of a survey, Procedia Computer Science, Vol. 192, pp.4552–4559. 25th International Conference on Knowledge-Based and Intelligent Information & Engineering Systems.
11. Daugherty, P. R., & Wilson, H. J. (2018). Human + machine: Reimagining work in the age of AI. Boston, MA: Harvard Business Review Press.
12. Davenport, T. H. (2018). The AI advantage. How to put artificial intelligence revolution to work. Cambridge, MA: The MIT Press.
13. Doborjeh, Z., Hemmington, N., Doborjeh, M., & Kasabov, N. (2021). Artificial intelligence: a systematic review of methods and applications in hospitality and tourism. International Journal of Contemporary Hospitality Management, Vol. 34 (3), pp.1154-1176.
14. Euromonitor International (2023, July 12). Use of AI tools such as CHATGPT to plan travel set to boom. Euromonitor. Retrieved from: https://www.euromonitor.com/press/press-releases/july-20232/use-of-ai-tools-such-as-chatgpt-to-plan-travel-set-to-boom Accessed: November 2023.
15. European Commission (2022). Smart tourism destinations. In: EU guide on data for tourism destinations. Retrieved from: https://smarttourismdestinations.eu/wp-content/uploads/2022/07/Smart-Tourism-Destinations_EU-guide_v1_EN.pdf
16. Field, A. (2017), Discovering Statistics Using IBM SPSS (5th Edition), Sage.
17. Go, H., Kang, M. and Suh, S.C. (2020). Machine learning of robots in tourism and hospitality: interactive technology acceptance model (iTAM) – cutting edge. Tourism Review, Vol. 75 No. 4, pp. 625-636.
18. Gursoy, D., Chi, O. H., Lu, L., & Nunkoo, R. (2019). Consumers acceptance of artificially intelligent (AI) device use in service delivery. International Journal of Information Management, Vol.49, pp.157–169.
19. Hair, J.F., Babin, B. J., Anderson, R. E. & Black, W. C. & (2018). Multivariate Data Analysis (8th ed.). Prentice Hall: London.
20. Hansen, J.M.; Saridakis, G.; Benson, V. (2018). Risk, trust, and the interaction of perceived ease of use and behavioral control in predicting consumers' use of social media for transactions. Comput. Hum. Behav., Vol.80, pp.197–206.

21. Hodges, L., & Higgins, L. (2016). Travelers expect robots on their holidays by 2020: First Global Study on the Acceptance of Robots Working in Travel. Retrieved from: https://www.prnewswire.com/news-releases/travellers-expect-robots-on-their-holidays-by-2020-571461481.html Accessed December 2023.
22. Huang, Y.K., Hsieh, C.H., Chang, C., Li, W.& Fan, W. S. (2019). Preliminary Study of Factors Affecting the Spread and Resistance of Consumers' Use of AI Customer Service. AICCC '19: Proceedings of the 2019 2nd Artificial Intelligence and Cloud Computing Conference, December 2019, pp. 132–138.
23. Israel, K., Tscheulin, D., & Zerres, C. (2019). Virtual reality in the hotel industry: assessing the acceptance of immersive hotel presentation. European Journal of Tourism Research, Vol. 21, pp.5–22.
24. Ivanov, S., & Webster, C. (2019a). What should robots do? A comparative analysis of industry professionals, educators, and tourists. In J. Pesonen & J. Neidhardt (Eds.), Proceedings of the international conference on information and communication technologies in tourism 2019, 30 January–01 February, Nicosia, Cyprus (pp. 249–262).
25. Ivanov, S., & Webster, C. (2019b). Perceived appropriateness and intention to use service robots in tourism. In J. Pesonen & J. Neidhardt (Eds.), Proceedings of the international conference on information and communication technologies in tourism 2019, 30 January–01 February Nicosia, Cyprus (pp. 237–248).
26. Ivanov, S., Webster, C., & Berezina, K. (2017). Adoption of robots and service automation by tourism and hospitality companies. Journal of Tourism & Development, 27/28, pp.1501–1517.
27. Ivanov, S., Webster, C., & Seyyedi, P. (2018a). Consumers' attitudes towards the introduction of robots in accommodation establishments. Tourism, Vol. 63(3), pp.302–317.
28. Ivanov, S., Webster, G., & Garenko, A. (2018b). Young Russian adults' attitudes towards the potential use of robots in hotels. Technology in Society, Vol.55, pp.24–32.
29. Jiang, S., Scott, N. & Tao, L. (2019). Antecedents of augmented reality experiences: potential tourists to Shangri-La Potatso National Park, China. Asia Pacific Journal of Tourism Research, Vol. 24(10), pp.1034-1045.
30. Jiang, S., Moyle, B., Yung, R., Tao, L. & Scott, N. (2023). Augmented reality and the enhancement of memorable tourism experiences at heritage sites. Current Issues in Tourism, Vol.26(2), pp.242-257.
31. Johnson, H. (2018, July 26). We tried the kiosks that analysts say could help McDonald's win back $2.7 billion in sales. Here is the verdict. Business Insider. Retrieved from https://www.businessinsider.com/mcdonalds-kiosk-vs-cashiers-photos-2018-3 Accessed: December 2023.
32. Juniper Research (2019, May). Chatbot Interactions in Retail to Reach 22 Billion by 2023, as AI Offers Compelling New Engagement Solutions. Retrieved from: https://www.juniperresearch.com/press/chatbot-interactions-retail-reach-22-billion-2023 Accessed: November 2023.
33. Kaplan, A., & Haenlein, M. (2019). Siri, Siri, in my hand: Who's the fairest in the land? On the interpretations, illustrations, and implications of artificial intelligence. Business Horizons, Vol. 62(1), pp.15–25.
34. Kaplan, A., & Haenlein, M. (2020). Rulers of the world, unite! The challenges and opportunities of artificial intelligence. Business Horizons, Vol. 63(1), pp.37–50.

35. Kelly, S., Kaye S A & Oviedo-Trespalacios, O. (2023). What factors contribute to the acceptance of artificial intelligence ؟A systematic review. Telematics and Informatics, Vol. 77.
36. Keymolen, E. (2018). Trust in the networked era: When phones become hotel keys. Techné: Research in Philosophy and Technology, Vol. 22(1), pp.51–75.
37. Khan, N. & Efthymiou, M. (2021). The use of biometric technology at airports: The case of customs and border protection (CBP). International Journal of Information Management Data Insights, Vol.1(2), pp.
38. Lamb, D., & Ogle, A. (2017). Uncovering the motives and experiences of locally sourced volunteers at two events in Metropolitan Perth, Western Australia. Event Management, Vol.22(1), pp.65–78.
39. Li, J., Xu, L., Tang, L., Wang, S.& Li, L. (2018). Big data in tourism research: a literature review. Tourism Management. Vol.68, pp.301–323.
40. Li, X., Lai, P. L., Yang, C. C., & Yuen, K. F. (2021). Determinants of blockchain adoption in the aviation industry: Empirical evidence from Korea. Journal of Air Transport Management, Vol. 97, 102139.
41. Nechaeva, A. (2023). The Impact of AI on the Travel Industry. Retrieved from: https://www.solimarinternational.com/the-impact-of-ai-on-the-travel-industry/#:~:text=Modern%20chatbots%20in%20the%20travel,options%20based%20on%20individual%20preferences Accessed: December 2023.
42. Nica, I. Tazl, O.A & Wotawa, F. (2018). Chatbot-based Tourist Recommendations Using Model-based Reasoning. Proceedings of the 20th Configuration Workshop, Graz, Austria, September 27th to 28th, 2018.
43. Pasikowska-Schnass, M. & Lim, Y.S. (2023). Artificial intelligence in the context of cultural heritage and museums: Complex challenges and new opportunities, EPRS | European Parliamentary ResearchService.
44. Pestek, A. & Sarvan, M. (2021). Virtual reality and modern tourism. Journal of Tourism Futures, Vol. 7(2), pp. 245-250.
45. Pitrelli, M. (2023, August 15). Chances are you haven't used A.I. to plan a vacation. that's about to change. CNBC. Retrieved from: https://www.cnbc.com/2023/08/14/how-to-use-ai-to-plan-a-vacation-companies-are-bringing-it-to-you.html Accessed: December 2023.
46. Raafat, M., Hammoud G. and Fathallah, M (2023). Impact of Applying the Artificial Intelligence in Airports' Operations (Applied in Capital International Airport), International Journal of Tourism, Archeology and Heritage, Vol.3(2), pp.136-148.
47. Recuero Virto, N. & López, M.F.B. (2019). Robots, Artificial Intelligence, and Service Automation to the Core: Remastering Experiences at Museums, Ivanov, S. and Webster, C. (Ed.) Robots, Artificial Intelligence, and Service Automation in Travel, Tourism and Hospitality, Emerald Publishing Limited, Leeds, pp. 239-253.
48. Reichert, C. (2019). Sacramento Kings: Using 5G, VR, and blockchain for the NBA arena of the future. Retrieved from: https://www.zdnet.com/article/sacramento-kings-using-5g-vr-and-blockchain-for-the-nba-arena-of-the-future Accessed: December 2023.
49. Russell, S. & Norvig, P. (2020). Artificial Intelligence: A Modern Approach. 4th ed. Pearson, New York, NY.

50. Samala, N., Katkam, B.S., Bellamkonda, R.S. and Rodriguez, R.V. (2022). Impact of AI and robotics in the tourism sector: a critical insight, Journal of Tourism Futures, Vol. 8 No. 1, pp. 73-87.
51. Schwab, Klaus (2017). The Fourth Industrial Revolution. World Economic Forum. London, England: Portfolio Penguin.
52. Sox, C. B., & Campbell, J. M. (2018). Virtually impossible? Assessing factors for technology acceptance within the meeting environment. Event Management, Vol. 22(4), pp.655–670.
53. Statista Research. (2023). Expected use of AI to plan travel worldwide 2022. Accessed at: https://www.statista.com/statistics/1381319/expected-use-artificial-intelligence-for-travel-planning-worldwide/#:~:text=Among%20the%20different%20travel%20aspects,use%20it%20for%20that%20purpose Accessed on November,2023.
54. Sterne, J. (2017). Artificial intelligence for marketing: Practical applications. John Wiley and Sons.
55. Taherdoost, H. (2018). A review of technology acceptance and adoption models and theories. 11th International Conference Interdisciplinarity in Engineering, INTER-ENG 2017, 5-6 October 2017, Tirgu-Mures, Romania. Procedia Manufacturing, Vol.22, pp. 960–967.
56. Tejas, C.J. & S. K. Manju Bargavi (2023). AI-Powered Recommendation Systems for Trip Planning. International Journal of Advanced Research, Vol.11 (Mar), pp. 671-678.
Thomas, D. (2018). The cameras that know if you're happy – Or a threat. Retrieved from: https://www.bbc.com/news/business-44799239 Accessed: December 2023.
57. Tom Dieck, M. C., Jung, T. H. & Tom Dieck, D., (2018) Enhancing art gallery visitors' learning experience using wearable augmented reality: generic learning outcomes perspective. Current Issues in Tourism, Vol.21(17), pp.2014-2034.
58. Tung, V. W. S., & Law, R. (2017). The potential for tourism and hospitality experience research in human–robot interactions. International Journal of Contemporary Hospitality Management, Vol. 29(10), 2498–2513.
59. Tussyadiah, I., (2020). A review of research into automation in tourism: Launching the Annals of Tourism Research Curated Collection on Artificial Intelligence and Robotics in Tourism. Annals of Tourism Research, Elsevier, Vol. 81(C), pp. 2-44.
60. Tussyadiah, IP., Li, S., Miller, G. (2019). Privacy protection in tourism: where we are and where we should be heading for. In: Information and communication technologies in tourism. Springer, Cham, Chapter 22, pp. 278–290.
61. Ukpabi, D.C., Aslam, B. & Karjaluoto, H. (2019), "Chatbot Adoption in Tourism Services: A Conceptual Exploration", Ivanov, S. and Webster, C. (Ed.) Robots, Artificial Intelligence, and Service Automation in Travel, Tourism and Hospitality, Emerald Publishing Limited, Leeds, pp. 105-121.
62. Wang C., Ahmad S.F., Bani Ahmad Ayassrah AYA, Awwad E.M., Irshad M., Ali Y.A., Al-Razgan M., Khan Y., Han H. (2023). An empirical evaluation of technology acceptance model for Artificial Intelligence in E-commerce. Heliyon. Vol.9 No.8.
63. Webster, C., & Ivanov, S. (2020). Robotics, artificial intelligence, and the evolving nature of work. In B. George, J. & Paul (Eds.), Business transformation in data driven

societies [Digital Transformation in Business and Society Theory and Cases]. Palgrave-MacMillan.

64. Wessa P. (2023), Cronbach alpha (v1.0.7) in Free Statistics Software (v1.2.1), Office for Research Development and Education. Accessed at: https://www.wessa.net/rwasp_cronbach.wasp
65. Whitson, G. M. (2018). Artificial intelligence. In D. R. Franceschetti (Ed.), Principles of robotics and artificial intelligence (pp. 12–17). Ipswich, MA: Salem Press.
66. Zhang, K., Chen, Y. & Li, C. (2019). Discovering the tourists' behaviors and perceptions in a tourism destination by analyzing photos' visual content with a computer deep learning model: The case of Beijing. Tourism Management, Vol.75, pp. 595-608.

مدي استعداد المستخدمين لتبني تطبيقات الذكاء الاصطناعي المستخدمة في صناعة السفر والسياحة والضيافة: دراسة تحليلية للمستخدمين المصريين

ايتن الروبي

استاذ مساعد بقسم الدراسات السياحية- كلية السياحة و الفنادق- جامعة الاسكندرية

الملخص:

احدث ظهور تقنيات الذكاء الاصطناعي ثورة في صناعة السفر والسياحة والضيافة. ويتمثل المحرك الرئيسي لاستخدامات للذكاء الاصطناعي في صناعة السفر والسياحة والضيافة في تعزيز الكفاءة التشغيلية، وتحسين الإنتاجية، وتعزيز تجارب العملاء، وضمان النمو المستدام للمنشآت. و يتم استخدام الذكاء الاصطناعي في قطاع السفر والسياحة لتزويد المستهلكين بتوصيات شخصية بناءً علي تحليل التجارب السابقة، وتقديم عمليات حجز أكثر كفاءة عبر الإنترنت، وإدخال برامج الدردشة الآلية للرد علي استفسارات العملاء حول مناطق الجذب السياحي ونصائح السفر. كما تستخدم أنظمة الذكاء الاصطناعي للمحادثة، مثل Siri من Apple للتواصل مع العملاء عبر المحادثة والنص.

يتم أيضًا استخدام الذكاء الاصطناعي على نطاق واسع في صناعة الضيافة لمساعدة العملاء من خلال روبوتات الخدمة وتقنيات الغرف الذكية وخدمات البواب الالي. بالإضافة إلى ذلك، يمكن أيضًا التعرف على استخدامات الذكاء الاصطناعي في المطارات من خلال تطبيقات التعرف على الوجوه، والقياسات الحيوية، وروبوتات الخدمة، وتقنيات مناولة الأمتعة، وتحديد النطاق الجغرافي لأغراض التسويق.

و تشتمل تطبيقات الذكاء الاصطناعي في اعمال المكاتب الخلفية علي تحليل بيانات التصفح للعملاء، وأتمتة العمليات الروبوتية ، والتنبؤ بالطلب، واستخدامات إنترنت الأشياء، والبيانات الضخمة، وتحليل البيانات.

اعتمد هذا البحث على نموذج TAM (نموذج قبول التكنولوجيا) القائم على نظرية الإجراء المنطقي لفحص مستوى القبول والنوايا المستقبلية للعملاء في مصر لتبني تطبيقات الذكاء الاصطناعي في مجالات السفر والسياحة والضيافة. تم الاعتماد نهج كمي حيث تم توزيع استبيان لفحص نوايا الالمصريين عملاء ا تجاه استخدامات الذكاء الاصطناعي في مجالات لسفر والسياحة والضيافة. علاوة على ذلك، تم استخدام تحليل الانحدار الخطي لإيجاد العلاقات بين متغيرات نموذج TAM مثل سهولة الاستخدام والفائدة من الاستخدام والمخاطر المحتملة للاستخدام.

وأظهرت النتائج من جانب أن عملاء صناعة السفر والسياحة والضيافة المصريين يعتبرون أن الفائدة الملموسة وسهولة الاستخدام ستزداد مع التوسع في ادخال الذكاء الاصطناعي بشكل أكبر في شتي المجالات. وعلي الجانب الاخر اظهر البحث تشكك بعض العملاء في بعض تقنيات الذكاء الاصطناعي فيما يتعلق بأمان المعلومات وفقدان اللمسة البشرية في بعض الخدمات التي استحوذت عليها الروبوتات. كما

اظهر الانحدار الخطي وجود علاقات موجبة قوية بين بعض المتغيرات مثل الفائدة الملموسة وسهولة الاستخدام كمتغير مستقل مع النية للاستخدام كمتغير تابع. ولكن لم يتم العثور علي علاقة بين النية للاستخدام و المخاطر المحتملة للاستخدام.

الكلمات الدالة: الذكاء الاصطناعي، الفائدة من الاستخدام، سهولة الاستخدام، نموذج قبول التكنولوجيا.