



SCHOOL OF SOCIAL SCIENCES

Master in Business Administration (MBA)

Postgraduate Dissertation

How Artificial Intelligence can help companies to improve the Customer Experience offered to their end users/customers in tourism industry.

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Patras, Greece, May 2024

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**How Artificial Intelligence can help companies to improve the
Customer Experience offered to their end users/customers in
tourism industry.**

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Abstract

This dissertation examines the impact of Artificial Intelligence (AI) on improving customer experiences in the tourism sector, with a specific focus on chatbots. Using correlation and regression analyses, we have investigated the factors influencing Greek users' intention to use chatbots in tourism. Our results highlight significant associations between various factors and chatbot adoption, with Performance Expectancy and Hedonic Motivation emerging as the most important positive factors, while Inconvenience has a negative impact. Moreover, Perceived Innovativeness and Hedonic Motivation positively affect chatbot usage, emphasizing the importance of innovation perception and enjoyable user experience. Conversely, Habit appears to have a negative impact, indicating resistance to change among users with established habits, while Difficulty of Use underscores the need for improving chatbot accessibility and usability. These findings highlight the ongoing need for technological progress and user-friendly interface development in the tourism industry. Embracing Artificial Intelligence technologies offers companies unparalleled opportunities to customize interactions, streamline operations, and enhance overall customer satisfaction, thereby fostering sustainable growth and competitiveness in the ever-evolving tourism landscape.

Keywords

Artificial Intelligence (AI), Tourism and Hospitality Industry, Customer Experience, Chatbots

Πώς η τεχνητή νοημοσύνη μπορεί να βοηθήσει τις εταιρείες να βελτιώσουν την Εμπειρία Πελατών που προσφέρεται στους τελικούς χρήστες/πελάτες τους στην τουριστική βιομηχανία

Γιώργος Τσαραμιάδης

Περίληψη

Αυτή η μελέτη διερευνά τον αντίκτυπο της Τεχνητής Νοημοσύνης (TN) στη βελτίωση της εμπειριών των χρηστών/ πελατών στον τομέα του τουρισμού, με ιδιαίτερη έμφαση στα chatbot. Χρησιμοποιώντας αναλύσεις συσχέτισης και παλινδρόμησης, διερευνήσαμε τους παράγοντες που επηρεάζουν την πρόθεση των Ελλήνων χρηστών να χρησιμοποιήσουν chatbots στον τουρισμό. Στα αποτελέσματά φαίνονται να υπάρχουν σημαντικές συσχετίσεις μεταξύ των διαφόρων παραγόντων και της υιοθέτησης chatbot, με το Performance Expectancy και το Hedonic Motivation να αναδεικνύονται ως ισχυροί θετικοί παράγοντες, ενώ η Inconvenience έχει αρνητικό αντίκτυπο. Επιπλέον, το Perceived Innovativeness και το Hedonic Motivation επηρεάζουν θετικά τη χρήση του chatbot, τονίζοντας τη σημασία της αντίληψης της καινοτομίας και των θετικών εμπειριών των χρηστών. Αντίθετα, το Habit φαίνεται να έχει αρνητική συσχέτιση, υποδεικνύοντας αντίσταση στην αλλαγή μεταξύ χρηστών με καθιερωμένες συνήθειες, ενώ η Δυσκολία Χρήσης υπογραμμίζει την ανάγκη για βελτίωση της προσβασιμότητας και της χρηστικότητας του chatbot. Αυτά τα ευρήματα υπογραμμίζουν τη συνεχιζόμενη ανάγκη για τεχνολογική πρόοδο και ανάπτυξη φιλικών προς τον χρήστη διεπαφής στην τουριστική βιομηχανία. Η υιοθέτηση τεχνολογιών τεχνητής νοημοσύνης προσφέρει στις εταιρείες απaráμιλλες ευκαιρίες για εξατομίκευση των αλληλεπιδράσεων, τον εξορθολογισμό των λειτουργιών και την ενίσχυση της συνολικής ικανοποίησης των πελατών, ενισχύοντας έτσι τη βιώσιμη ανάπτυξη και την ανταγωνιστικότητα στο διαρκώς εξελισσόμενο τουριστικό τοπίο.

Λέξεις – Κλειδιά

Τεχνητή Νοημοσύνη (TN), Βιομηχανία Τουρισμού και Φιλοξενίας, Εμπειρία Πελατών

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List of Abbreviations & Acronyms

| | | |
|--------|---|--|
| AI | : | Artificial Intelligence |
| AR | : | Augmented Reality |
| CUI | : | Chatbot Usage Intention |
| NLP | : | Natural Language Processing |
| SD | : | Service Dominant |
| SST | : | Self Service Technologies |
| T&H | : | Tourism and Hospitality |
| UTAUT2 | : | Unified Theory of Acceptance and Use of Technology |
| VA | : | Virtual Assistant |
| VR | : | Virtual Reality |

1. Introduction

In the tourism sector, delivering outstanding customer experience is crucial for companies aiming to succeed. Companies can now leverage Artificial Intelligence (AI) to improve how they interact with their customers. The tourism industry encounters various challenges in providing exceptional customer experience. Companies face challenges in catering to the varied and changing needs of their customers, from personalized recommendations to smooth booking procedures and travel assistance on the go. Conventional methods frequently do not meet the customization and efficiency standards expected by contemporary travelers. In addition, with the industry moving towards digitalization, the sheer amount of data being produced poses a difficulty in deriving useful insights to improve customer engagements. As a result, there is a significant demand for creative solutions that can utilize AI to tackle these issues and enhance customer experience (Hoyer et al., 2020).

This dissertation aims to investigate how AI technologies can enhance customer experience provided by companies in the tourism sector. exploring the different applications of Artificial Intelligence, such as chatbots, virtual assistants, predictive analytics, and recommendation systems, to investigate the potential advantages and disadvantages of incorporating AI into current customer service structures. This dissertation attempts to enhance the existing knowledge on AI-enabled customer experience management in the tourism sector, providing valuable insights for companies dealing with digital transformation challenges in a highly competitive market.

2. Literature Review and International Experience

2.1 Artificial Intelligence definition and application

The concept of AI has transformed from possessing intelligence to independently processing vast data sets and leveraging past experiences for improved decision-making. Artificial intelligence depends on three fundamental key components which have been tremendously advanced during the last years: algorithms, large datasets, and computing power. The improvement in increasingly robust systems capable of storing and analyzing vast quantities of data has boosted the significance of AI (Bulchand-Gidumal, 2022).

Given that Artificial Intelligence relies on cutting-edge technologies, numerous research studies across various fields use terminology related to machine learning, deep learning, neural networks, natural language processing, Internet of Things (IoT), robotics, automation, and big data to describe AI. Artificial intelligence has been applied to various economic sectors, including warehousing, logistics, transportation, manufacturing, medicine, and education. The industry of tourism and hospitality (T&H) has experienced significant growth in the utilisation of AI. AI technologies can provide numerous benefits for T&H service providers, including increased productivity and operational efficiency, cost reduction, as well as delivering personalized service experience (Huang et al., 2022).

Various AI applications are developed in the Tourism and Hospitality sector as outlined by Huang et al. (2022) i.e. in search and booking, demand forecasting, virtual agents and chatbots, augmented reality (AR) and virtual reality (VR) devices as well as service automation applications. In recent years, there has been a notable focus on using AI models for predicting trends in the tourism industry. The AI forecasting methods mentioned encompass a variety of advanced techniques such as artificial neural networks, grey theory, fuzzy time series theory, support-vector machines, and genetic algorithms as cited by Bulchand-Gidumal in 2020. Chatbots or conversational agents play a crucial role in facilitating booking processes, such as walking tourists through the process with insightful questions. Due to the impact of COVID-19, there has been a significant attention in the utilization of robots and autonomous machines in the tourism and hospitality industry. These technologies are being used for various tasks such as assisting tourists, managing check-out and check-in, ordering food and entertaining customers during peak hours. AR (commonly included on mobile devices) and VR (often paired with a relevant head equipment) are employed for recognizing tourist destinations such as museums, parks, zoos and hotel locations, as well as showcasing facilities like hotel virtual tours through 3D videos (Huang et al., 2022).

2.2 Advanced Techniques in Artificial Intelligence

Artificial Intelligence is often associated with Machine Learning, robotization, Deep Learning and Big Data. While the terms "machine learning" and "artificial intelligence" are frequently used interchangeably, they actually have much different meanings. Artificial intelligence is a notion that includes machine learning and deep learning. More specifically, Machine Learning (ML) is a computer application or a computational method that is usually integrated into AI technology and utilized to enhance task performance through knowledge

or experience (Volkmar et al., 2022). Machine learning is a component of artificial intelligence focused on machines learning autonomously from data, i.e. machine learning involves machines gaining knowledge through algorithms and learning from data. Machine learning and traditional computer programming differ in that machine learning can learn from large data sets and make predictions without specific programming instructions. Machine learning can independently extract insights from the processed data set and make accurate forecasts. This technology has found extensive use in the tourism and hospitality industry through the implementation of voice recognition and processing, facial recognition, and even robotics. ML has been utilized for predicting visitor arrivals and performing sentiment analysis.

One of the more sophisticated Artificial Intelligence techniques involves Deep Learning (DL), which is capable of extracting features with limited prior knowledge by training layers individually. Deep learning falls under machine learning and involves the utilization of artificial neural networks with multiple internal layers of processing of the training data sets. The approach has shown significant enhancements in accuracy in various tasks like image natural language processing and recognition/segmentation (Essien & Chukwukelu, 2022). Deep learning is considered as a subset of machine learning, utilizing various methods to tackle practical problems by employing neural networks that mimic human decision-making. Deep learning allows computers to grasp intricate concepts, handling abstract information and computational models effectively. There is a significant distinction between ML and DL: DL allows for the development of computational models in a hierarchical and layered structure. The models are crafted to acquire data representations by gradually incorporating various levels of abstraction (Duan et al., 2019).

Artificial intelligence has the capability to automate and enhance the effectiveness of big data analytics and complex prediction processes. Complex datasets consist of large volumes of data with diverse characteristics. Volume represents the quantity of data collected from various sources, variety indicates diverse data types, and velocity pertains to the necessity for regular decision-making concerning structured or even unstructured large sets of data. AI has the potential to enhance key aspects of data sets. It can execute intricate pattern recognition tasks and execute learning procedures. Big data has greatly assisted the travel and hospitality industry by connecting tourists to a large amount of accessible information. It can offer tailored, adaptive assistance for individuals as they organize their travel arrangements (Kim & So, 2022).

2.3 AI technology-based service encounters for service value cocreation

A service encounter is a type of social exchange that typically refers to the interactions between service transactors and there are 4 modes of service encounters based on Artificial Technology that can be identified: AI-mediated, AI-generated, AI-supplemented, and AI-facilitated. (Minglong Li et al, 2021). This perspective on service encounters emphasized the importance of customers and employees while overlooking other factors like service facilities, atmosphere, and environment that also influence service interactions. Organizations as service providers indirectly reflected the important role of technology in those service encounters. AI technologies stand out from other nonhuman elements due to their advanced level of intelligence, as well as anthropomorphism, which positions them as automated social entities. Hence, there are connections between AI and

customers or employees, and it is valuable to explore the characteristics of these interactions as highlighted by Huang and Rust (2018).

Service encounters are transformed through the implementation of AI technology. During the era of big data, Artificial Intelligence rapidly integrated into service processes as service firms strived to stay competitive. As a result, there has been a growing trend towards automation and intellectualization in the workplace. Moreover, customers are playing a growing part in services as a result of AI and participating in service value cocreation. Services are seen as crucial components of exchange, involving the application of professional knowledge and skills for mutual benefits, as per the service-dominant (SD) logic. Artificial Intelligence plays a crucial role in enabling service encounters through providing of essential information and knowledge, as well as ensuring that knowledge applications are easily accessible (Yoon and Lee, 2019). Moreover, service firms are unable to deliver value directly, but rather offer resources for the application of competencies. These competencies need to align with customers to generate value. AI applications that excel at connecting with customers can be valuable resources for creating value (Makridakis, 2017). In addition, artificial intelligence is not the only tool for creating business value, but also they transform service encounters into active participants. The SD logic views actors not as dual entities (consumer or producer), but as comprehensive participants within a network system that generates value through the interactions and integration of the resources. Service encounters that are based on artificial intelligence technology are a current trend that aligns well with SD logic and the cocreation of service value.

Effectively managing AI-infused service encounters involves a clear definition of the roles of each participant in each service process and a solid understanding of the attributes of each interaction. In the past, various levels or functions of technology in services resulted in various service encounter modes, such as technology-assisted, technology-mediated, technology-facilitated and technology-generated service encounters. Artificial Intelligence is significantly more complex and interactive compared to traditional technologies, necessitating focused research. The dynamics of human-AI interactions have become an integral part of service encounters, with the overall quality being closely related and impacted by end users, employees, and intelligent technologies. Artificial intelligence can accomplish various functions in human-robot interactions, such as guiding, facilitating, substituting, and enhancing. Identifying the different employees and customers roles and artificial intelligence allows for categorizing AI technology-based service encounters and exploring their specific impact on customer experiences and behaviours (De Keyser et al., 2019).

2.4 Artificial Intelligence in Business and Customer Interaction

The present state of artificial intelligence (AI) in business and consumer interaction is a dynamic and rapidly changing field, characterized by inventive uses and significant effects in several industries. The landscape is defined by the use of artificial intelligence (AI) applications into corporate communication, customer service, and digital marketing, which is transforming the channels through which organizations engage with their customers. The incorporation of AI in business communication has greatly transformed the research and teaching environment of this discipline. Getchell et al (2022) examine the present capacities, difficulties, and ideas associated with the adoption and utilization of AI technology in business communication. They stress the importance of understanding the

capabilities and constraints of AI technology in order to employ them in an ethical and efficient manner. The authors suggest a research plan that center around implementation, grammar, lexicography, bias, trust, collaboration, design, management considerations, tool evaluation, and demography. This complete approach emphasizes the diverse and complex influence of Artificial Intelligence on business communication, requiring sophisticated comprehension and strategic implementation. Virtual agents, often known as chatbots, have become indispensable in the field of customer service, as they play a crucial role in delivering online support. Nevertheless, Kraus et al. (2023) highlighted that customers frequently encounter frustration while interacting with virtual assistants and instead prefer human support. Their recommendation is to have a comprehensive strategy that integrates virtual agents with human operators in order to deliver a decent level of service. This method necessitates the integration of many artificial intelligence technologies, such as machine learning, natural language processing and reinforcement learning, in addition to insights from psychology, business, sociology, and other fields of study. The authors contend that adopting a multidisciplinary strategy can result in a customer service center that is both cost-effective and successful. This method showcases the intricate nature and potential of artificial intelligence in improving customer service (Kraus et al., 2023).

Artificial Intelligence has had a significant impact on the digital marketing field. In Nguyen et al (2021) study, the authors examine the present trends and prospects of digital and relationship marketing from a business standpoint. The focus is on the impact of AI applications, such as virtual assistants and programmatic advertising, at the core of digital marketing. The writers also highlight emerging trends such as the utilization of blockchain technology to enhance transaction transparency and data security, as well as the adoption of immersive technologies such as augmented and virtual worlds. These emerging patterns, enabled by innovations like 5G technology, are transforming the way customers interact and the field of relationship marketing. The present state of AI in business and consumer engagement is a combination of technology advancement, strategic commercial implementation, and ethical deliberations. The incorporation of artificial intelligence (AI) into company communication, customer service, and digital marketing improves operational efficiencies and facilitates the creation of more customized and captivating customer experiences (Nguyen et al., 2021).

The emergence of Artificial Intelligence (AI) in several industries signifies a substantial transformation in the way firms interact with their clients and oversee their activities. The driving force behind this change is the capacity of AI to evaluate immense quantities of data, automate intricate procedures, and offer insights that were previously unachievable. The influence of artificial intelligence (AI) is clearly observable in various sectors, including retail, healthcare, banking, and hospitality, where it is transforming both customer experience and corporate strategies, i.e. there is widespread use of artificial intelligence (AI) in several areas within the business sector with the aim to increase efficiency, reduce costs and improve customer experience overall. According to Gartner's projection mentioned in the report, the use of AI is expected to result in a business value of \$3.9 trillion by 2022. This value will mostly be obtained from customer experience enhancement, cost savings, and the development of new revenue. This highlights the significant impact of AI in company, since it stimulates advancements and generates fresh prospects for expansion.

Rubab (2023) provides a comprehensive analysis of the literature on the impact of AI on several facets of company growth, further explaining its importance. The study highlights the significance of AI in automating monotonous jobs, optimizing procedures, and facilitating predictive analytics and customized consumer experiences. Moreover, it

tackles the difficulties linked to the implementation of AI, including concerns about data privacy and security, as well as the necessity for strategic planning and enhancing the skills of the workforce. This exhaustive examination showcases the diverse influence of AI on corporate expansion, emphasizing the potential advantages as well as the obstacles it entails.

Getchell et al. (2022) conducted a case study that focuses on the application of AI technology in Swiggy, a prominent participant in the online food ordering and delivery market in India. The study examines many uses of artificial intelligence, including algorithms for optimizing logistics, chatbots based on natural language processing, and recommendation systems based on picture recognition. It also investigates how these applications impact business aspects like as customer service and delivery efficiency. The results indicate that artificial intelligence (AI) has the potential to greatly enhance customer satisfaction and retention through the improvement of company processes and customer service. Nevertheless, the study emphasizes the significance of guaranteeing ethical use of AI and tackling potential concerns about privacy and bias (Getchell et al., 2022). The increasing prevalence of AI across diverse business sectors serves as evidence of its capacity to fundamentally transform the manner in which firms function and engage with their clientele. The influence of AI is significant and extensive, ranging from improving consumer experiences to driving company growth and fostering creativity. Nevertheless, these studies emphasize that the effective incorporation of AI necessitates meticulous examination of ethical concerns, strategic preparation, and a dedication to resolving the obstacles that accompany technological progress. As artificial intelligence (AI) progresses, it will increasingly influence the future of business and consumer engagement. This will provide firms in different industries with both new possibilities and associated challenges (Soni et al., 2019).

The revolutionizing of customer experience in the corporate realm using Artificial Intelligence (AI) is an extraordinary phenomenon. This transition is propelled by critical AI technologies that have fundamentally transformed the manner in which firms engage with and comprehend their clients. These technologies encompass a wide range of tools, including data analytics, machine learning, natural language processing, and robots. Each of these technologies has a distinct function in improving the customer experience. Tussifah et al. (2024) examines the impact of AI on business innovations, specifically focusing on how AI may automate intricate procedures and offer profound insights into customer behavior. The report emphasizes the utilization of AI technologies such as data analytics and machine learning to forecast client preferences and behavior, facilitating businesses in providing more tailored and streamlined services. This customization is not solely restricted to suggesting products, but encompasses all facets of consumer engagement, encompassing marketing, sales, and post-sales assistance.

Kaliuta (2023) examined the implementation of AI technology to personalize the user experience in Salesforce. The article examines the impact of AI-driven customization on customer loyalty and engagement, namely by fostering a sense of value and understanding among customers. AI technologies such as machine learning and predictive analytics are employed to produce predictions regarding client behavior and preferences, enhancing the quality of content and product suggestions. By using this level of personalization, businesses may effectively cater to the distinct requirements of individual customers, thereby enhancing overall happiness and fostering loyalty. In their study, Deepthi et al (2022) examined the use of AI-powered technologies in the banking and finance industry in India. This study investigates the deployment of artificial intelligence (AI) technologies such as chatbots and automated customer support systems in the banking sector. It specifically focuses on the effects of these technologies on customer happiness and

service efficiency. Research suggests that AI technology has a substantial impact on cost reduction and enhances the consumer experience of services. Nevertheless, it also highlights the obstacles associated with implementing AI, such as concerns around data security and the necessity for employee education in AI expertise. The implementation of these crucial AI technologies is impacting customer experience by assisting firms to engage with customers in more efficient ways. AI enables firms to surpass customer expectations by providing personalized product recommendations and automating customer support. Nevertheless, the effective integration of these technologies necessitates meticulous examination of ethical concerns, data protection, and the ongoing enhancement of the workforce's skills (Deepthi. B et al., 2022).

The use of Artificial Intelligence (AI) into customer service has resulted in a diverse array of inventive applications that are transforming customer experience across several industries. These technologies are not only improving the efficiency and efficacy of customer interactions, but also reshaping the benchmarks for customer engagement and satisfaction. Khan and Iqbal (2020) investigate the effects of AI-driven customer service on enhancing customer experience. Their research centers on the digital revolution in customer service, propelled by AI technologies such as chatbots, virtual assistants, and automated response systems. The statement emphasizes the role of AI in facilitating service providers to engage with clients across various platforms, providing a more convenient and customized experience. Nevertheless, the study highlights the difficulties in recreating human interaction in a digital format and the notion that organizations are facing difficulties in establishing successful digital channels for customer interaction (Khan & Iqbal, 2020).

Pillarisetty and Mishra (2022) present a thorough examination of artificial intelligence (AI) tools and their influence on the customer experience within the online fashion retail industry. Their research explores the application of AI technologies such as machine learning, predictive analytics, and image recognition to improve e-satisfaction, which refers to the level of satisfaction customers experience when purchasing online. The study examines the utilization of AI-powered technologies by online retailers to provide customized shopping experiences, enhance product suggestions, and optimize customer service. This, in turn, helps in establishing brand credibility and increasing consumer contentment (Pillarisetty & Mishra, 2022).

The study conducted by Kaur, Singh, and Singh (2022) provides additional evidence of how AI contributes to improving consumer experience in the fashion business, whether it be through online or offline retail environments. The chapter explores the integration of AI into the retail industry, where it plays a crucial role in comprehending client preferences and enhancing the overall shopping experience. The authors offer valuable perspectives on the utilization of AI to enhance forthcoming fashion acquisitions and its integration as a fundamental element in everyday consumer interactions. These instances of AI-powered advancements in customer experience showcase the notable influence that AI is exerting in several industries. AI is facilitating businesses in meeting the changing demands and expectations of their customers by optimizing customer care interactions and personalizing the buying experience (Kaur et al., 2022).

3. Artificial intelligence in the Tourism and Hospitality Industry

3.1 Relationship between Tourism and Hospitality and Artificial Intelligence

The relationship between the tourism industry and Artificial Intelligence (AI) is a transformative one, reshaping how travelers experience and engage with the sector while optimizing operational efficiency for businesses. This dynamic partnership has the potential to revolutionize the entire travel landscape (Zhang et al., 2022).

- **Enhanced Customer Experience**

The advent of Artificial Intelligence has completely transformed the process by which travelers strategize and undertake their expeditions. AI-driven algorithms utilize extensive information to offer personalized recommendations for travelers regarding destinations, lodgings, and activities. This high degree of customization guarantees that every traveler's experience is distinct and unforgettable. Furthermore, AI-driven chatbots and virtual assistants are accessible 24/7, handling queries and aiding in making reservations. Instantaneous and tailored customer help greatly enhances satisfaction and lowers response times. AI-driven language translation facilitates effective communication, hence enhancing accessibility and inclusivity in the realm of travel (Soori et al., 2023).

- **Operational Efficiency**

Artificial Intelligence is optimizing the operations of airlines, hotels, and transportation providers behind the scenes. AI-powered predictive maintenance monitors equipment and facilities to minimize downtime and improve reliability. AI-driven demand forecasting enhances the optimization of personnel, pricing, and resource allocation, resulting in improved resource utilization. AI-enabled kiosks streamline check-in procedures at hotels and airports, resulting in shorter wait times and improved convenience for travelers (Zhang et al., 2022).

- **Marketing and Advertising**

Artificial intelligence (AI) powered data analytics is transforming marketing and advertising strategies in the tourist sector. Through the analysis of comprehensive customer data, firms can identify patterns and behaviors, enabling the development of precise marketing campaigns and tailored offers. AI-driven recommendation engines utilize user preferences to offer travel packages, lodgings, and activities, leading to a boost in bookings and income (Soori et al., 2023).

- **Future Trends**

The correlation between the tourism business and artificial intelligence (AI) is constantly developing. Virtual Reality (VR) and Augmented Reality (AR) are advanced technologies that use Artificial Intelligence (AI) to provide engaging travel experiences. These technologies allow travelers to virtually visit different places and explore them before

making their travel arrangements. Artificial intelligence (AI) is contributing significantly to sustainability initiatives by optimizing travel routes and minimizing emissions. This aligns with the increasing need for environmentally sustainable and socially responsible travel choices (Zhang et al., 2022). Moreover, since artificial intelligence gathers and analyses extensive quantities of customer data, guaranteeing data security and privacy remains a crucial apprehension for the tourism industry. The symbiotic relationship between the tourist sector and Artificial Intelligence is fundamentally transforming travel experiences and operational processes. Personalization, operational efficiency, and data-driven marketing are key components of this ever-changing partnership. In order to remain competitive and provide outstanding services to travelers, businesses must stay current with the newest breakthroughs in Artificial Intelligence technologies. This collaboration ensures a future in which travel becomes not only more easily attainable but also more customized to individual interests and progressively environmentally friendly (Thakur, 2022).

3.2 Artificial Intelligence applications in Tourism and Hospitality

Artificial intelligence is defined as programs, algorithms, and machines that exhibit intelligence (Shankar, 2018). Artificial intelligence includes various intelligent technologies and tools such as machine learning, the Internet of Things, artificial neural networks, big data, smart robots, and virtual and augmented reality applications. Artificial intelligence is becoming more significant because of its growing computing capabilities, the abundance of large datasets, and the progress made in machine-learning algorithms and models. This process depends on big data, processing capacities, and algorithms to carry out various intricate tasks such as data collection, data processing, and data analysis, which would be challenging for humans to accomplish. These tasks are fundamental to various intelligent services and activities, influencing interactions between service providers and customers, and carrying significant implications for service, operations, management, and marketing (Buhalis et al., 2019).

The field of tourism and hospitality has been impacted by technological advancements as noted by Buhalis et al. (2019). In the last two decades, various information and communication technologies (ICT) have been utilized to add value, offer efficient services, and improve tourists' experiences before, during, and after their travels. ICT is present throughout every stage of a tourist's journey. Advancements in ICTs have been furthered by the emergence of AI, which aids in combining physical and online/virtual components. These technologies have contributed to personalizing tourist experiences and providing technology-enhanced tourist experiences, as noted by Grundner and Neuhofer (2021). For example, AI has broadened the usage of robotics applications to improve customer engagement in hotels and restaurants. In essence, artificial intelligence assists travelers in discovering more relevant information to enhance their decision-making and offer them superior tourism experiences. Despite the untapped potential of AI in the T&H sector, its impact on this field has been significant according to Ivanov et al. (2019).

Given the growing impact of Artificial Intelligence in the field, numerous studies have been conducted on its applications in T&H, especially in last few years. Artificial intelligence is becoming more and more integrated into our daily tasks. The distinguishing factor between intelligent systems and others lies in their capacity to comprehend situations, acquire and retain knowledge, draw conclusions from past experiences, and effectively respond to new situations. Typically, intelligent systems possess two primary characteristics as outlined by Ferreira, et. al., 2017: the capacity to perceive the environment and the

capability to acquire knowledge from actions to enhance success in accomplishing specific goals. Robots along with artificial intelligence, are extensively popular across various business sectors. Given the complex nature of making decisions related to travel, Artificial Intelligence and tourism align seamlessly. Through the collection and analysis of data on users' personal needs, decisions can be facilitated, and additionally tourists' information search can be significantly impacted. Artificial intelligence has been implemented to a certain level in different areas of the tourism and hospitality industry, as mentioned by Kuo et al. (2017).

Despite Alan Turing introducing the concept of artificial intelligence in 1936 and successful applications in the travel industry early in the century, there remains a lack of scientific literature on its use in the tourism industry. Both are used in various sectors of the T & H sector. Discussing digital artificial intelligence systems, one can find instances like check-in online systems and mobile boarding passes in the airline sector. Nevertheless, the most significant impacts on tourism and hospitality emerged from the evolution of various chatbots (Ivanov & Webster, 2017).

The tourism sector has been increasingly incorporating artificial intelligence in recent years. Main focus areas include robotics, automation of services, recommendation engines, chatbots, and intelligent agents. In the current era, hotels are incorporating robotic technology for service automation, along with various advanced technologies for enhancing smart tourism. Customer satisfaction is crucial in today's competitive landscape. Tourism companies are now creating travel lists based on customer behavior to attract more customers and gain competitive edge. Industry leaders such as GoIbibo, makemytrip.com, and oyo.com are utilizing these strategies.

3.3 Usage of Chatbots in Tourism and Hospitality

AI powered chatbots are an important part of tourism sector. "Chatbot" is the term derived from the combination of "chat" and "robot", clearly indicating their intended function. Chatbots are, in essence, computer applications designed to stimulate human-like conversations using NLP (Natural Language Processing). In 1966, the initial chatbot named ELIZA was created with the intention of deceiving users into thinking they were interacting with a genuine human being (Zsarnoczky, 2017). Chatbots have significantly advanced since the inception of the initial model. They are primarily used in the customer support field. Given the proven value and rapid growth of chatbots, their utilization in the tourism sector has expanded significantly. With the growing demand for trustworthy sources of information among tourists, travel chatbots have been developed to meet these needs and expectations. Travel chatbots play a crucial role in improving the travel experience by assisting tourists with all aspects of their trip, including booking and providing travel tips. There are three distinct types of travel chat-bots based on the platform they are integrated into, their sophistication level, and their recommendation capabilities: Facebook chatbots, customer service bots and Artificial intelligence empowered travel bots (Sheffield, 2016).

3.4. Customer service travel bots

Customer service bots are considered as the fundamental type of chatbots found on travel companies' websites. These automated bots rely on a predetermined list of answers

and can only assist users in navigating the website, not with booking. After reviewing scientific literature and various other resources found in the Internet, it was found that there were more customer service chatbots deployed a few years ago compared to the present. It appears that travel companies have recognized the limitations of underdeveloped bots and have chosen to remove them from their website. Examples of companies that followed this approach are Booking.com, Tap Portugal and On the Beach. Nevertheless, some individuals still use customer service travel bots provided by companies like Copa Airlines, Amtrak, and Air New Zealand (Zlatanov & Popesku, 2019).

3.5. Facebook chatbots

Chatbots integrated into Facebook Messenger provide numerous opportunities for travelers. In addition to assisting users in navigating a specific page, these chatbots offer a more engaging experience by facilitating booking through interactive two-way conversations. Despite users having to input the same data required for booking a trip independently, Facebook chatbots are demonstrating positive outcomes in terms of user satisfaction and are proving to be a worthwhile investment. In 2018, the number of active chatbots on Facebook Messenger was 300,000, triple the amount from the previous year. Expedia's chatbot is considered one of the most successful on Facebook, according to Zlatanov & Popesku (2019). To initiate a conversation with Expedia through their chatbot, users simply have to log in to their Facebook accounts, navigate to Expedia's page, and the chat window will appear automatically (Batish, 2018). One limitation of the Expedia chatbot is that it can assist with hotel bookings and trip management, but it does not provide assistance with flight searches, cruises, or car rentals. One illustration of a successfully executed Facebook chatbot is the Skyscanner chatbot. This chatbot stands out for providing the most affordable travel options from nearby airports and organizing flights into categories based on price, duration, and quality. Moreover, if a traveler is seeking inspiration, they can simply type "anywhere" and they will receive some interesting suggestions from the chatbot (Sanchez, 2019).

The Kayak Facebook chatbot provides a wide range of services including flights, hotels, rental cars, activities, and trip updates, making it one of the most comprehensive chatbots available. It includes a memory of past discussions and uses Kayak search history or personalization. Skyscanner and Kayak chatbots are accessible on various platforms including Facebook Messenger, Slack, Amazon Alexa, Skype, and Google Assistant. Many travel companies offering chat-bots are either airlines or search engines. Faroe Island tourist board is an excellent example of a tourist board utilizing a Facebook chatbot. In addition to being accessible on their official Facebook page, users can also initiate contact with the Faroe Island chatbot on their official website through the Facebook Messenger extension (Chiong et al., 2022).

3.6. Artificial Intelligence empowered travel bots

While the bots in this category continue to use instant messaging to interact with users, what sets them apart from the previous two categories is their capability to provide recommendations. They achieve this through the use of specific algorithms, access to information, and integration with other applications. KLM Royal Dutch Airlines

exemplifies a chatbot that surpassed the previously mentioned ones. In addition to providing assistance through a Facebook Messenger chatbot for tourists, this company has introduced another intriguing feature. Their chatbot, named BB, is capable of assisting tourists with packing for their journey (Rahmanti et al., 2022). Simply provide the date, destination, and trip length, and the tool will generate a packing list with all the necessary information. This feature can be found on Google Home Assistant. One more illustration is Hello Hipmunk, a virtual assistant that provides a wide range of services to assist users in planning their trip and booking all its components (Zlatanov & Popesku, 2019).

One notable feature provided by Hello Hipmunk is the integration of travellers' emails and calendar details to generate customized travel suggestions. It is capable of creating a travel plan for the user's journey and allowing them to distribute it to others, like family or coworkers. Additionally, there is the HelloGBye travel assistant designed for frequent fliers and small businesses. One distinguishing factor of HelloGBuy travel assistant is that it is a standalone application, currently exclusive to IOS users. Nevertheless, acquiring an application, particularly one that requires payment, can pose a challenge for many users. Nonetheless, this application is purposed to efficiently handle travel requests for multiple individuals, providing a comprehensive flight and hotel schedule in less than 30 seconds, which can justify this extra cost. One of the latest examples of AI-powered chatbots is known as Sam (Deng et al., 2023).

Similar to other travel VAs (Virtual Assistants), it can be utilized by an individual user, but its key features cater more to frequent fliers and business travelers. Initially, Sam assists users in booking flights and subsequently consolidates all trips into a convenient itinerary. In case of any developments, like a poor weather forecast, Sam will notify the user to assist with packing more effectively. Furthermore, it will arrange transportation to the airport by coordinating with local services authorized by the traveler's organization. Upon arrival, Sam is equipped with the necessary baggage claim details for the traveler and can also notify their family members of a safe flight. Moreover, it provides a travel guide for the destination location and stays in contact with the traveler during the entire trip, keeping them informed about issues like traffic and flight delays. These functionalities are made possible through integration with various applications like Uber, Avis and Google Maps.

3.7. Use of robots in Tourism and Hospitality

Robots are sophisticated physical entities equipped with autonomy, mobility, and sensory functions, enabling them to carry out tasks without human intervention (Chen & Hu, 2013). Industrial robots have been utilized in the T&H industry for over 5 decades in various production processes, including food preparation. Discussing the increasing autonomy and social interaction capabilities of robots, there are distinctions between professional service robots and personal service robots. These categories were established approximately two decades ago and continue to undergo ongoing advancements. Service robots in the T&H industry encompass self-check-in kiosks, room cleaning robots, automated border control gates at airports, and conveyor belt restaurants commonly found in major cities (Murphy, et. al., 2017).

There is a growing trend in the tourism and hospitality industry where the use of professional service robots is on the rise, along with their increasing complexity. For instance, there is currently a robotic suitcase on the market that greatly simplifies travel. This product can autonomously follow its owner and navigate around obstacles, eliminating the necessity to manually transport the suitcase. Robots are now being utilized in the roles

of travel agents and airport security (Tan et al., 2016). In 2014, a restaurant in China unveiled robot waiters according to Pan et al. (2015). In the subsequent year, there were trials of robots serving as information agents, and by 2016, robots were implemented as servers. A robot server was constructed and programmed to deliver additional towels, toothpaste, or other essentials to the guest rooms. The hotel staff must input the number of the room on the robot's input device (e.g. touch screen), following which the robot will use the lift to reach the assigned room. The robots could only communicate through messages displayed on the screen. According to Martin (2016), the next advancement in the hospitality industry involved the launch of a completely automated hotel welcoming guests.

The Henna hotel in Japan is the world's first hotel staffed exclusively by robots. Robots proficient in various languages welcome and assist customers at the front desk, including one designed as a dinosaur. Robotic arms handle the storage of guests' luggage, while rooms are accessed using facial recognition systems. It may appear excessive, but this hotel is not the sole establishment incorporating robots into various hotel roles; it is just the only one relying solely on robots. For instance, the Hilton Hotel in Virginia, has introduced a robotic concierge that assists guests in navigating the hotel, answering common questions about services, and potentially translating inquiries for guests and staff in the future (Fusté-Forné & Jamal, 2021). Connie effectively engages with visitors by utilizing speech recognition to address their inquiries. Furthermore, it gains knowledge from every interaction, so the more it is used, the more refined its responses will be. Moreover, two Marriott hotels in China have implemented facial recognition technology for check-in, and Japan Airlines is also exploring this concept (Gupta et al., 2022)..

3.8. AI and automation systems in the travel and tourism industry

While certain applications aim to provide services and support throughout the travel process, the use of automation in tourism can be categorized within the overall tourism experience, including the advantages and disadvantages for tourists (consumers) and destinations (authorities and service providers) (Boyd & Holton, 2017). Intelligent automation can be utilized in the pre-trip phase to motivate passengers and assist them in their information search, booking, and pre-arrival experiences. Service providers must integrate AI to achieve omni-channel marketing automation in order to expand their marketing campaigns, but also to personalize their offers to their customer base and simplify the purchasing process. Marketing automation relies on personalization and predictive analytics engines that collect and analyze relevant customer data. These engines create customer profiles by matching biographical data, social media profiles, device and location information, and other relevant details. They also identify significant customer attributes. By utilizing predictive analytics and adaptive modelling, service providers are able to forecast the probability of consumers' response and their likelihood to make a purchase. This allows them to predict the lifetime value of clients (Ivanov, 2019).

This often requires using behavioral insights obtained through pattern recognition, along with data on credit, risk, and loyalty. The deployment of artificial intelligence algorithms enables faster purchase rates (booking) (Law et al., 2023). Applications such as natural language generation, which includes text-to-speech combined with automated translation, are used to expand the reach of digital content to a global audience. Subsequently, these systems are linked to user interfaces that facilitate uninterrupted communication, streamline the process of making a purchase, and provide assistance in enhancing the pre-arrival experience (Pencarelli, 2019). Some examples of these interfaces

are chatbots, messenger apps with chat functionality, virtual hosts that are designed for a single provider (such as Edward from the Edwardian Hotel), and personal travel assistants (such as Mezi from American Express) (Bulchand-Gidumal et al., 2023).

At present, applications are primarily dominated by "analytical AI" technologies, also known as cognitive intelligence, which collect and evaluate large amounts of customer data. These platforms can assist passengers throughout their whole journey, including the post-trip stages of sharing, reflecting, and following up on their travel experiences. Travelers often face challenges with finding their way and navigating when they visit or leave a place. They also have to decide on a transportation method and deal with the experience of using public transportation, including airports (Antonio et al., 2018). This phase is of utmost importance for authorities and service providers with regards to security, as it requires finding a middle ground between making travel easier and verifying the identities of tourists when they pass across borders. Airlines currently provide self-service options for baggage drop-off and check-in. Government entities, airlines, and airport authorities worldwide have implemented pilot trials of automated border check systems. The US Customs and Border Protection employs data from immigration agencies, Interpol, and passenger manifests, together with machine learning, to detect suspicious individuals and contraband at border crossings. In 2018, the iBorderCtrl (Intelligent Portable Control System) was introduced. It is an AI border control agent that integrates risk assessment, document authentication, automated deception detection, and biometric verification. The implementation took place in Hungary, Latvia, and Greece. For individuals who do not constitute a risk to security, travelling and crossing borders is a straightforward process. They are able to navigate through customs and security checks efficiently, without the need to continually present identification documents. The topic is now dominated by "analytical AI" technologies, but there is a growing emphasis on intuitive AI, especially for automated risk and deception evaluation. Furthermore, the utilization of "embodied AI" (which includes robots) is employed in this phase specifically for customer service and mobility purposes. In the past decade, there has been significant progress in the development of autonomous mobility technology, such as people-moving pods and drones. Airports employ interactive robots of the conventional mobile variety to aid passengers, including autonomous carts like KLM's Care-E and support robots like Munich Airport's Josie Pepper (Wirtz, et. al., 2021).

Customer service robots are equipped with real-time question-answering and learning capabilities. Through repeated contacts, they acquire knowledge and use it to enhance their responses to consumer requests. In addition, airports provide a range of retail and hospitality areas that utilize interactive and mechanical robots to aid visitors. Currently, automated travel companions and smartphone chatbots play a vital role in offering information for navigating and locating directions (Ukpabi et al., 2019).

The on-site experience refers to the implementation of automated service procedures in hotels, tourist sites, and entertainment venues, utilizing a range of robots, including commercial and Android models. Intelligent service robots, also known as collaborative robots, enhanced with artificial intelligence, are typically employed as robot concierges. Two examples of such robots are Hilton's Connie and Marriott's Mario. These robots have the ability to provide recommendations for worthwhile attractions, provide rapid answers to questions, and continuously improve their performance through self-learning. Intelligent mobile robots, such as Aloft's Botlr, are utilized to transport items to hotel rooms due to their ability to autonomously navigate indoor spaces amidst people and goods. Robotic roommates, such as Henn-na Hotel's Tapia, and ubiquitous agents on autonomous devices, like Wynn's Amazon Alexa, primarily operate by responding to voice commands. They assist hotel guests in controlling the lighting and temperature in their rooms, scheduling

laundry services, making reservations, and performing other tasks (Hassan & Jung, 2018). Current robotic receptionists lack sophisticated interaction skills. One instance is the utilization of the dinosaur robot Mirai at the Henn-na Hotel as an enhancement to self-service check-in and check-out procedures. Stationary industrial robots, referred to as "Mechanical AI," are employed in automated storage and locker systems, such as the robot in the cloakroom of the Henn-na Hotel, as well as in restaurants, cafés and bars. Notable examples include the robot chef in the Henn-na Restaurant, the Café X coffee bar system and the Makr Shkr robotic barman (Roy & Pagaldiviti, 2023).

Museums and galleries have implemented robotic tour guides, predominantly utilizing humanoid robots, to enhance tourist experiences such as sightseeing and guided tours. In Kyoto, Japan, the increasing trend of hiring taxis for sightseeing has led to the use of multilingual miniature humanoid robots with AI capabilities, such as Sharp Co.'s RoBoHon, to accompany guests on their cab rides. Examples of "disembodied AI" systems used for on-site encounters include digital assistants that are connected to location-based services. These assistants provide push alerts and automatically translate text in real-time to improve interactions between tourists and locals, as well as enhance their understanding of the attractions. Digital assistants can assist visitors in sharing their experiences by providing guidance in completing post-trip chores such as writing assessments, organizing photographs, and preparing for future trips. The utilization of distributed artificial intelligence, coupled with distributed database technologies like as blockchain, enables the expedited evaluation of extensive volumes of textual data and facilitates the training of chatbots to enhance customer support. Hotels and other establishments are utilizing artificial intelligence (AI) and the Internet of Things (IoT) to develop intelligent and interconnected buildings. These technologies are mostly employed for facility management and energy optimization, which involve identifying problems and implementing preventive maintenance measures. The travel business incorporates automated thinking to accommodate the information-intensive nature of tourism, where passengers must process a significant amount of information to make decisions.

Analytical AI is commonly used to automate the process of retrieving data and evaluating it for marketing and decision-making purposes in these applications. Analytical AI is employed alongside chatbots and/or interactive service robots to deliver customer care. Currently, the use of "Mechanical AI" is limited to transit and hospitality environments, such as the usage of industrial robots. The infrastructure necessary to facilitate smart tourist ecosystems is established through the use of artificial intelligence technologies and the Internet of Things. This infrastructure also involves the collection, sharing, and conversion of data along the whole tourism value chain. The current tourism industry and hospitality company utilize automation and artificial intelligence technology for many purposes. These technologies not only facilitate the consumer's access to accurate and pertinent information for decision-making, but also enhance the visitors' tourism experience by keeping it up-to-date. From a commercial standpoint, artificial intelligence has the potential to be highly beneficial for management in terms of product promotion, marketing, and the development of sustainable travel experiences, as shown by researchers. AI will enhance the customer's ability to attain heightened levels of luxury and leisure experiences throughout their journey (Roy & Pagaldiviti, 2023).

The travel and tourism industry has recognized the necessity of verifying one's identification before allowing access to travel and accommodation services. Authentication of this nature enables organizations to provide exceptional and unforgettable service experiences through polite and engaging interactions. The authentication mechanism enhances the security of both workers and society. The travel and tourism industry has

experimented with various technologies, such as message-based platforms, self-service kiosks and remote check-in systems. However, there are still authentication bottlenecks that result in dissatisfied visitors and gaps in service. This study aims to address these issues. Facial recognition is notable among these applications for its capacity to process information rapidly and accurately, while posing no security risk (Bromberg et al., 2019).

AI-powered biometric facial recognition technology can enhance personalization for travelers. Hotels have the ability to upload a customer's photograph while they are booking, and this photograph can be combined with the airline booking and on-arrival services to improve the traveler's experience (Collins et al., 2021). Utilizing image or video recognition technology to compare a photo or video with a database can assist hotel personnel in identifying a returning customer. This enables them to customize services to enhance the customer's experience throughout their stay (Gaur et al., 2021). Hotel rooms can be programmed to maintain a desired temperature based on a recognized pattern, and meals can be pre-arranged according to individual tastes. AI-driven face recognition has the advantage of securely and safely processing information with various partners, such as an insurer for a specific visit (Bromberg et al., 2020).

Moreover, the device has the capability to deter criminal activities or identify individuals who raise suspicion when travelling (Culot et al., 2019). The hotel security team can provide coverage in regions that are not monitored by CCTV systems, and security officers may promptly identify suspects, which is not possible with CCTVs. The travel business is characterized by its high level of dynamism and operates based on the principles of the experience economy. Consequently, it is essential to carefully analyze every aspect of a guest's experience in order to effectively create procedures and services. AI-powered facial recognition technology can analyze the demographic and psychographic characteristics of passengers and share this information with other sites along their journey. This enables service providers to deliver exceptional services (Kim et al., 2018).

AI-powered facial recognition technology can also have a crucial role in quickly and smoothly authorizing payments. The payment solutions provided encompass several scenarios, including contactless check-out and self-service payment options at front desks, as well as automated payment systems at restaurants (González-Rodríguez et al., 2020). Hotels can utilize advanced AI-driven face recognition technology to discover visuals, sounds, and services that are likely to be attractive to specific traveler profiles. Hence, the travel and tourism sector has the ability to construct the psychological characteristics of a traveler and tailor their array of services to suit the specific needs of the traveler in question (Samala et al., 2020).

Moreover, the implementation of artificial intelligence (AI) based recognition technology provides organizations in the travel and tourism sector with advantages that are related to society, economy, and the environment (Xue et al., 2020). Enterprises can eliminate the traditional method of documentation. Airports are employing this technology to expedite the processing of travelers by 40%, while hotels in China have decreased the check-in time. Royal Caribbean, a company in the cruise industry, has implemented facial recognition technology to greatly decrease the time it takes to conduct customs clearance, as opposed to the traditional method (Lu et al., 2019). The technology can also be utilized for making advance reservations for automobiles or minicabs while on board. Hence, the utilization of AI-powered facial recognition technology can greatly assist customs, hotels, airports, and immigration (Murphy et al., 2016).

The conventional procedure of customs clearance and immigration registration is time-consuming, leading to frustration among tourists. In addition to its application in facial recognition for tourists, several industries, including travel and tourism, utilize this

technology for other stakeholder-related objectives, such as monitoring the count of staff and contractors to ensure optimal service standards. This AI-driven advancement simplifies the tasks of payroll officers by continuously monitoring attendance in real time and eliminating the need for employees to wait in queue at the time office, a common practice in traditional systems (Andrejevic & Selwyn, 2019).

In the foreseeable future, artificial intelligence-powered facial recognition technology has the potential to be used to automobiles and other types of vehicles, which are essential means of transportation in the travel sector. The implementation of an AI-powered facial recognition system will enhance the security measures associated with various forms of transportation, such as automobiles, aircraft, and ships. This technology will specifically improve the safety and reliability of driving, parking, as well as the locking and unlocking mechanisms of vehicles. By utilizing AI-powered facial recognition technology, the detection of blink rate can effectively contribute to accident prevention during travel by monitoring and tracking symptoms of driver tiredness (Yang et al., 2020).

4. Artificial Intelligence and Customer Experience

4.1 Customer Experience through Artificial Intelligence Technology

The customer experience in the Tourism and Hospitality industry has undergone significant changes over the years, influenced by historical backgrounds and technological advancements. Throughout the history of organized travel, hospitality has consistently played a significant role in human interactions, focusing on service quality and guest satisfaction. During the early days, customer experiences relied heavily on in-person interactions and recommendations from others, with personalized service being a symbol of luxury. With the progression of technology, the strategies for improving customer experience in the T&H industry also evolved. The emergence of the internet and online booking platforms transformed the way customers engaged with businesses in the sector. This change enhanced convenience and accessibility, empowering customers to have more control over their travel and accommodation decisions. However, it also posed challenges for businesses to maintain personalized service in a digital landscape (Hoyer et al., 2020).

Recently, AI technology has become a valuable tool for enhancing customer experience in the T&H industry. Artificial intelligence covers a range of sectors such as natural language processing (NLP), machine learning (ML), and robotics, which can all be applied in various aspects of the industry. Within the realm of tourism and hospitality, AI is being implemented in various areas as outlined by Moore et al. (2022):

- AI algorithms have the capability to analyze customer data, enabling businesses to provide personalized recommendations and experiences based on preferences and behavior. As an illustration, hotels have the option to utilize AI-powered chatbots to recommend personalized amenities or activities according to guest profiles.
- Customer Service is enhanced through AI-powered chatbots and virtual assistants that offer round-the-clock support, address inquiries, and provide help in various languages. Enhancing response times and maintaining consistent service quality across various touchpoints.
- Forecasting with Predictive Analytics: Through the use of AI, extensive datasets can be analysed to predict demand trends, pricing strategies, and customer preferences. Businesses can optimise resource allocation and marketing efforts to enhance overall customer satisfaction.
- Automation is becoming more prevalent in hotels and restaurants, with robotics and AI-powered systems being utilised for various tasks like check-in/check-out processes, room service delivery, and inventory management. Automation optimises processes, minimises mistakes, and allows employees to concentrate on providing tailored interactions.

AI technologies play a crucial role in enhancing the customer experience in the T&H industry by improving satisfaction, optimising processes, and fostering loyalty. It is crucial for businesses to find a middle ground between technological advancements and personal connection, since authentic hospitality is often dependent on human engagement and understanding. Hence, the effective integration of AI in the industry necessitates thoughtful

reflection on its synergy with the human aspect of service provision, rather than its substitution (Buhalis & Sinarta, 2019).

4.2. Innovativeness

Perceived innovativeness has been suggested as a potential predictor of technology adoption. As an illustration, consider chatbots. We have also made the hypothesis that a second construct known as attitude towards Self Service Technologies (SSTs) may influence the intentions to utilise chatbots, given that chatbots are SSTs. Five additional drivers may also account for chatbot usage (Melián-González et al., 2019).

- **Perceived innovativeness**

Despite being in the era of information technology, customers may adopt many various patterns in the level of using Information Technology applications. Some consumers are inclined to be early adopters of new technologies, while others resist or postpone its adoption. Innovativeness, as described by Rogers and Shoemaker (1971), refers to the degree to which individuals are inclined to embrace novel concepts in comparison to their peers within their social framework. Agarwal and Prasad (1998) defined perceived innovativeness in the context of IT usage as the inclination of an individual to experiment with any novel information technology. San Martín and Herrero (2012) discovered a favourable correlation between innovativeness and the propensity of tourists to utilise technology for online shopping. Dabholkar and Bagozzi (2002) suggested that the inclination to try out new technologies includes a favourable desire to employ any self-service technology (SST). The researchers discovered that those who exhibited a low level of this trait displayed hesitancy towards utilising a touch screen for the purpose of placing food orders.

- **Attitude towards SSTs.**

The relationship between individuals' attitudes towards an object and their behavioural intention has been well acknowledged. Hypothesis 7 suggests that a favourable attitude towards SSTs may act as a mediator in the connection between customers' inclination to try new IT and their intention to utilise SSTs like chatbots. There are two hypotheses involved in this.

- There is a direct correlation between how creative something is thought to be and the attitude towards self-service technologies (SSTs).
- There is a direct correlation between one's attitude towards SSTs (Smart Speaker Technologies) and their intents to use chatbots.

Specific technologies may necessitate the evaluation of additional criteria, beyond the general factors already mentioned and those encompassed in a comprehensive model like UTAUT2 (Unified Theory of Acceptance and Use of Technology). Lu et al. (2019) examined the inclination to utilise service robots, which are robots that are physically present during service interactions. They also took into account the anthropomorphism factor, in addition to the factors outlined in the UTAUT2. Chatbots include distinctive

characteristics that indicate additional factors that may influence consumers' inclination to use them.

- **Inconveniences**

While customers may perceive utilising chatbots as straightforward, specific attributes of chatbots might influence the manner in which individuals articulate their opinions. Consumers are required to articulate their views, either through typing or speaking clearly, in a manner that can be comprehended by the bot. This requires greater exertion compared to natural and verbal communication. Furthermore, when customers are conscious that they are engaging with an automated system, they may feel compelled to articulate their thoughts in a distinct manner. Hill et al. (2015) discovered that individuals employ a greater number of words, longer words, and terms linked to good emotions while engaging in conversation with other individuals, as opposed to when interacting with chatbots. It can be inferred that people alter their manner of communicating when engaging with a chatbot. The implementation of these modifications can potentially decrease the speed of the engagement with chatbots, leading to a negative impact on users satisfaction with Self Service Technologies (Collier & Kimes, 2013). Indeed, Hill et al. (2015) discovered that chatbot interactions exhibit a greater proportion of profanities, suggesting that individuals may not be receiving the anticipated responses. Furthermore, consumers may have a preference for engaging with real human agents.

- **Anthropomorphism.**

Chatbots want to exhibit anthropomorphic qualities during interactions with individuals (Hill et al., 2015). Contests centred around the Turing Test, such as the Loebner Prize and Chatbottle, involve chatbots competing to mimic human behaviour. According to Sheehan (2018), chatbots have the ability to engage in open-ended conversations, which can lead to the creation of anthropomorphism in human users. Anthropomorphism is the act of attributing human-like qualities to something that is not human. According to Van Doorn et al. (2017) and Araujo (2018), the level at which machines create a sense of human-like interaction might enhance consumer engagement and satisfaction. Regarding social robots, Ho and MacDorman (2017) discovered that people have a positive perception of robots' human-like qualities up to a certain extent. However, beyond that point, perceiving robots as more human-like is linked to emotions of unease or creepiness. However, chatbots are not humanoid robots and are incapable of experiencing emotions. Sheehan (2018) discovered that users' adoption and recommendation intentions of chatbots were influenced by their impressions of the chatbots' anthropomorphism. In a similar vein, Araujo (2018) discovered that individuals' belief that they are engaging with other social entities had a beneficial impact on their emotional bond with the organisation while utilising a chatbot.

- **Automation**

Technological unemployment is a highly debated topic in the realm of employment. According to Pol and Reveley (2017), machines are involved in many tasks such as manufacturing vehicles, generating written content, identifying diseases, and are gradually becoming part of several professions, including but not limited to, teaching, accounting, and law. While there is no definitive evidence about the precise impact of IT advancements on

employment, but it is commonly cautioned in media and non-academic sources that current technology are displacing jobs. According to a research conducted by the Pew Research Centre in 2018, the majority of individuals believe that robots and computers would assume a significant portion of the tasks currently carried out by humans. Furthermore, Patel, Devaraj, Hicks, & Wornell (2018) discovered that those employed in occupations with a high likelihood of automation had higher levels of job insecurity, which in turn correlated with decreased overall health. Therefore, customers may develop a pessimistic disposition towards chatbots due to their execution of tasks that have conventionally been undertaken by people.

4.3. Previous research on the role of AI in customer engagement

The research conducted by Tula et al. (2024) indicated that chatbots and virtual assistants have the potential to be valuable tools for engaging with customers. However, it is crucial for firms to ensure that these tools are adequately educated and used in conjunction with human agents to address more intricate inquiries. Multiple research have been conducted on the utilization of chatbots and virtual assistants in consumer engagement. The following are significant outcomes:

- **Improved Customer Satisfaction**

In the current technological era, individuals are increasingly inclined towards the convenience of purchasing anything online. Multiple studies have discovered that customers generally express contentment with chatbot and virtual interactions. An analysis of user preferences revealed that 63% of customers exhibit a preference for engaging with chatbots and virtual assistants. Additionally, a survey conducted by HubSpot indicated that 47% of customers are inclined to make purchases through chatbots and virtual assistants. The findings indicate that the use of chatbots and virtual assistants can enhance customer satisfaction by delivering quicker and more convenient customer support (Tula et al., 2024).

- **Cost Savings**

It is also resulting in cost savings for both customers and companies. Chatbots and virtual assistants can assist firms in decreasing costs by eliminating the need for human staff to address simple customer support concerns. Additionally, they save money by reducing consumer gasoline use and saving time, which is equivalent to saving money. A study conducted by Juniper Research revealed that the use of chatbots and virtual assistants has the potential to generate annual cost savings of up to \$8 billion for organisations by the year 2022.

- **Increased Efficiency**

Research has confirmed that the installation of chatbots and virtual assistants in organisations can effectively manage many conversations at the same time, leading to improved productivity and reduced wait times for clients. This, in turn, fosters customer loyalty towards the organisation. A study conducted by Capgemini revealed that the implementation of chatbots and virtual assistants can result in a significant reduction of up to 90% in customer support response times (Tula et al., 2024).

- **Challenges with Chatbot Accuracy**

An obstacle that arises with chatbots and virtual assistants is the need to guarantee their precision. A survey conducted by PwC revealed that 55% of customers expressed dissatisfaction with chatbots' ability to adequately address their concerns. Companies must ensure that their chatbots and virtual assistants are adequately trained and equipped with systems to handle intricate inquiries that necessitate human participation (Tula et al., 2024).

- **Potential for Personalization**

Several studies have demonstrated the efficacy of chatbots and virtual assistants in personalising client interactions. An Accenture study revealed that 80% of customers expressed their willingness to disclose personal information to chatbots and virtual assistants, provided that it led to an enhanced customer experience. This indicates that chatbots and virtual assistants have the potential to be successful in delivering customised advice and marketing messages (Tula et al., 2024).

The results suggest that personalized marketing and recommendations can effectively enhance consumer engagement and boost sales. However, organisations must ensure the use of precise data and address customer concerns over privacy and accuracy. In addition, it is important to implement personalisation strategies across various communication channels in order to ensure a cohesive and seamless client experience. In recent years, there has been significant research conducted on personalised marketing and advice. Several significant conclusions were drawn (Tussifah et al., 2024)

- **Enhanced Customer Engagement**

Customer involvement is a crucial aspect for every organisation. Personalised marketing is a remarkable development of artificial intelligence. By using personalised marketing and suggestions, organisations can enhance consumer engagement by delivering more pertinent and focused information. The content's relevance captivates customers, leading to prolonged engagement and increased website interactions. Dedicating additional time to the website that the customer spends indicates that the organisation comprehends their requirements. An analysis of Epsilon revealed that customised emails exhibited superior open rates and click-through rates compared to non-personalized emails (Tussifah et al., 2024).

- **Increased Sales**

Personalised marketing and suggestions can enhance sales by facilitating clients in discovering and acquiring products that are specifically tailored to their need. Companies can employ the dynamic content method to tailor their website according to customer interests and behavior. By implementing this strategy, the open rate and click-through rates also experience improvement. According to a study conducted by Accenture, 91% of customers are inclined to shop with firms that offer pertinent offers and recommendations (Merve Kacar, 2023).

- **Challenges with Personalization**

An obstacle in personalised marketing and suggestions lies in guaranteeing the accuracy and currency of the data utilised to personalise the user experience. Implementing

personalised marketing strategies necessitates substantial resources, such as data analytics tools, technological platforms, and proficient individuals. Companies must use caution to avoid exceeding their limits and ensuring that they deliver value to customers without being excessively disagreeable. Companies must achieve optimal equilibrium between automation and human contact to ensure a favourable client experience. An Accenture study revealed that 60% of customers express apprehension regarding the protection of their data, while 48% express anxiety about the veracity of the suggestions they receive (Merve Kacar, 2023).

- **Effectiveness of Personalization Techniques**

An obstacle in personalised marketing and suggestions lies in guaranteeing the accuracy and currency of the data utilised to personalise the user experience. Implementing personalised marketing strategies necessitates substantial resources, such as data analytics tools, technological platforms, and proficient individuals. Companies must use caution to avoid exceeding their limits and ensuring that they deliver value to customers without being excessively disagreeable. Companies must achieve optimal equilibrium between automation and human contact to ensure a favourable client experience. An Accenture study revealed that 60% of customers express apprehension regarding the protection of their data, while 48% express anxiety about the veracity of the suggestions they receive.

- **Personalization Across Channels**

Implementing personalisation strategies across many channels ensures a uniform and tailored experience for clients, regardless of the specific channel or touchpoint they are engaging with. By leveraging consumer data to customise the customer journey, firms may enhance the customer experience and boost engagement and sales. The channels encompassed can comprise email, website, mobile app, social media, and other mediums (Tussifah et al., 2024).

5. Research Results and Discussion

5.1 Purpose of the research

This research focuses on understanding the factors that influence the intention to use chatbots by Greek tourists for travel and tourism services. The focus of the study is to evaluate the relationship between the recognized research constructs such as Performance Expectancy, Effort Expectancy, Social Influence, and other aspects highlighted by the UTAUT2 (Unified Theory of Acceptance and Use of Technology) model such as novelty and usage habit.

This research attempts to examine how instrumental intentions and attitudes towards Artificial Intelligence technology, as expressed through the use of chatbots, can influence the tourism experience of Greek travelers. The survey incorporates questions that measure the acceptance of chatbots, the evaluation of their practicality, personal innovation, and the impact of the technology on user satisfaction.

Through this study, the potential relationship between the use of chatbots and improved customer experience in the tourism sector is explored, while also examining how recent travel experience is related to familiarity with IT technologies. The research attempts to reveal important factors that could be used to improve tourism technology applications tailored to the current needs of Greek tourists.

5.2 Research questions

The main objective of this study is to understand the factors that influence the intention to use chatbots by Greek tourists for travel and tourism. Based on the findings from the initial review of relevant literature and existing research tools, the following research questions are formulated:

- How is Performance Expectancy related to the intention to use chatbots in tourism by Greek tourists?
This question examines whether tourists who perceive chatbots as useful and efficient are more likely to use them.
- To what extent does social influence (Social Influence) affect the intentions to use chatbots by Greek tourists?
Investigates whether influence from important people in tourists' social environment enhances their intention to use the technology.
- How does Effort Expectancy affect the intention to use chatbots in tourism?
Explores whether tourists' perception of the ease of use of chatbots contributes to their intention to use them.
- Is there a relationship between a sense of satisfaction and intention to use chatbots (Hedonic Motivation)?
Evaluates whether the pleasure and fun that tourists derive from using chatbots contributes to their intention to use them again.

- How does the familiarity with Artificial Intelligence technology affect the intention to use technological tools such as chatbots?

This question examines whether individuals who have recently traveled and have greater familiarity with AI technologies are more likely to use chatbots for tourism purposes.

5.3 Research tools

Two main tools were used for data collection in this study: Google Forms for distributing the questionnaire and SPSS software for data analysis. Google Forms was chosen because of its ease of use, its ability to be widely distributed online, and its ability to collect responses in real time. This allowed for efficient data management and organization for further analysis.

Data processing and analysis was performed using SPSS, a widely used statistical analysis software that provides powerful functions for conducting various statistical tests such as correlation analysis, reliability analysis, exploratory and confirmatory factor analysis, and structural equation modeling. These tools allowed the accurate estimation of the effect of the UTAUT2 (Unified Theory of Acceptance and Use of Technology) model variables on the intention to use chatbots.

Through Google Forms, the questionnaire was distributed electronically to a broad sampling of Greek tourists, allowing easy access and direct entry of responses. The analysis of the results through SPSS helped to understand the underlying trends and draw conclusions about the acceptance and use of chatbots by Greek tourists, thus contributing to the improvement of tourism services through technology.

5.4 Sample of research

The sample of this research consists exclusively of Greek tourists. The aim is to understand their intentions and attitudes towards the use of technological applications, such as chatbots, during their travels. The research focuses on this demographic group to determine how cultural specificities and local habits may influence the acceptance and use of new technologies in tourism.

An online questionnaire was used to collect the data, which was made available via social media and email to ensure wide and rapid distribution. The questionnaire was designed to address a range of demographic and behavioural questions related to technology use during travel.

The sample size and specifications were designed to collect sufficient data to allow for reliable analysis and statistical processing. Participant selection is based on randomness through the various distribution platforms, seeking to represent different age groups, educational levels and travel habits.

For this study, the convenience sampling method was used. This method was chosen for its practicality and ability to easily access a sample, especially when time and resource constraints exist. Survey participants were drawn from friends, social networks and email distribution lists of fellow students, with the only criterion being Greek.

5.5 Statistical analysis

The survey sample consists of 109 people and responses were collected from April 26th, 2024 until May 4th, 2024, through various sources, ie. business colleagues, HOU students, friends etc and through various modes of distribution (ie. emails, social media, word of mouth).

There was an almost equal gender distribution, 54.1% men and 45.9% women. This ensures a balanced gender representation in the analysis of the responses.

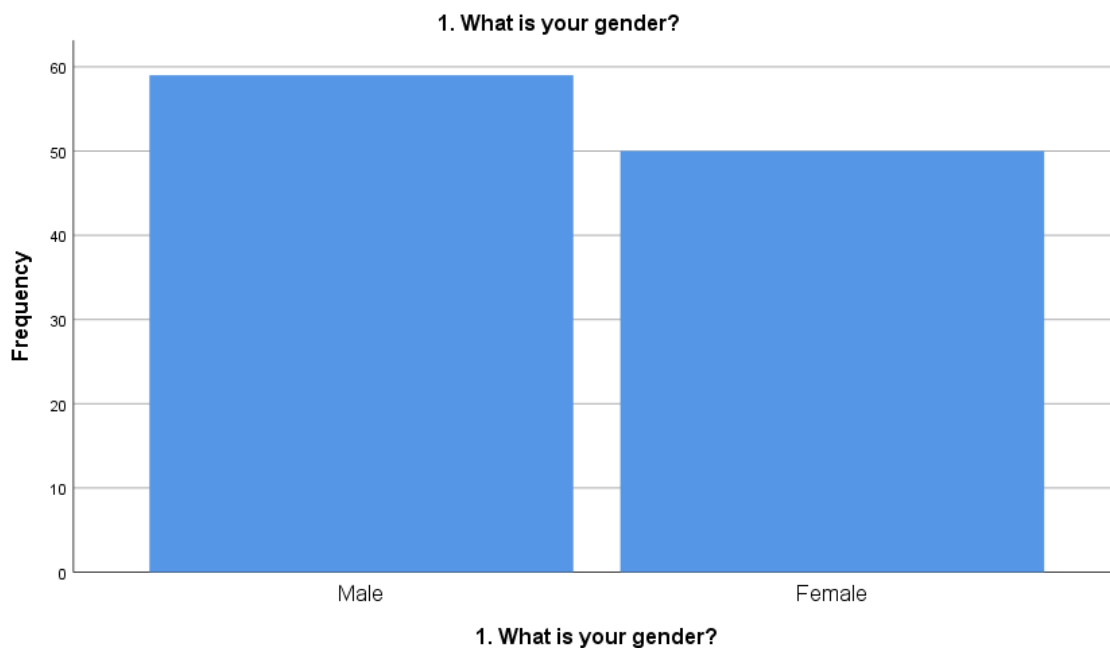


Figure 1 - Gender Distribution

The age distribution shows that the largest proportion of participants (43.1%) is in the 45-55 age group, followed by the 35-44 age group (35.8%). This suggests that the majority of participants are adults at a more mature age, probably with stable travel habits and more familiarity with technology use compared to younger groups.

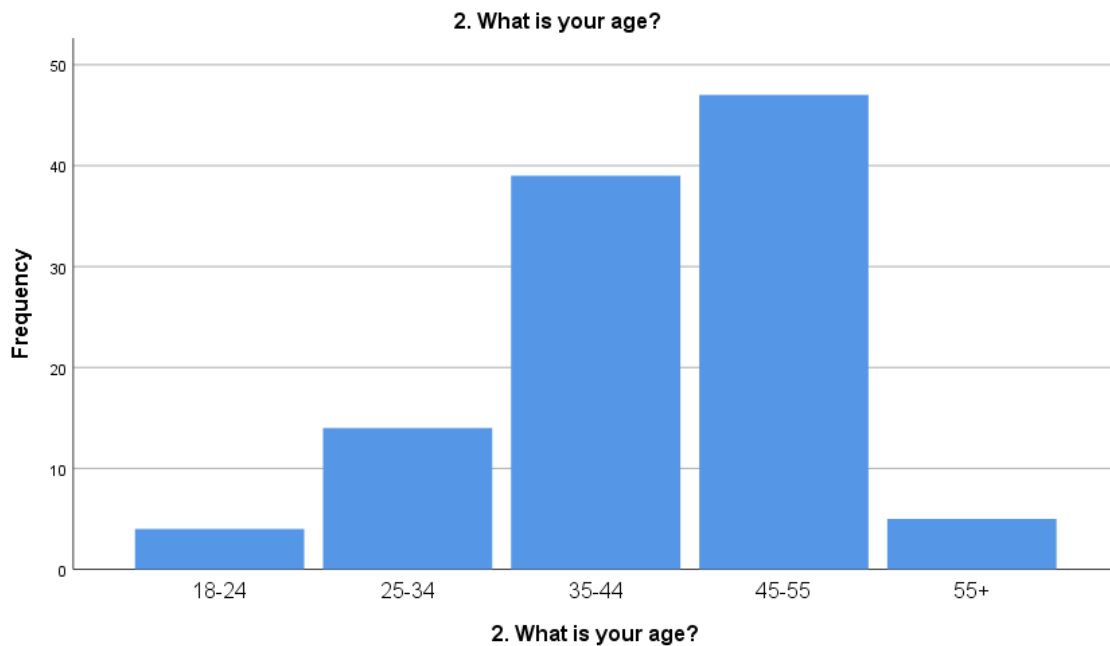


Figure 2 - Age Distribution

In terms of educational level, the majority (50.5%) of respondents hold a Master's degree, while a significant proportion (35.8%) have a university degree. This indicates that the sample has a relatively high educational level, which may influence the preferences and acceptance of technological tools such as chatbots.

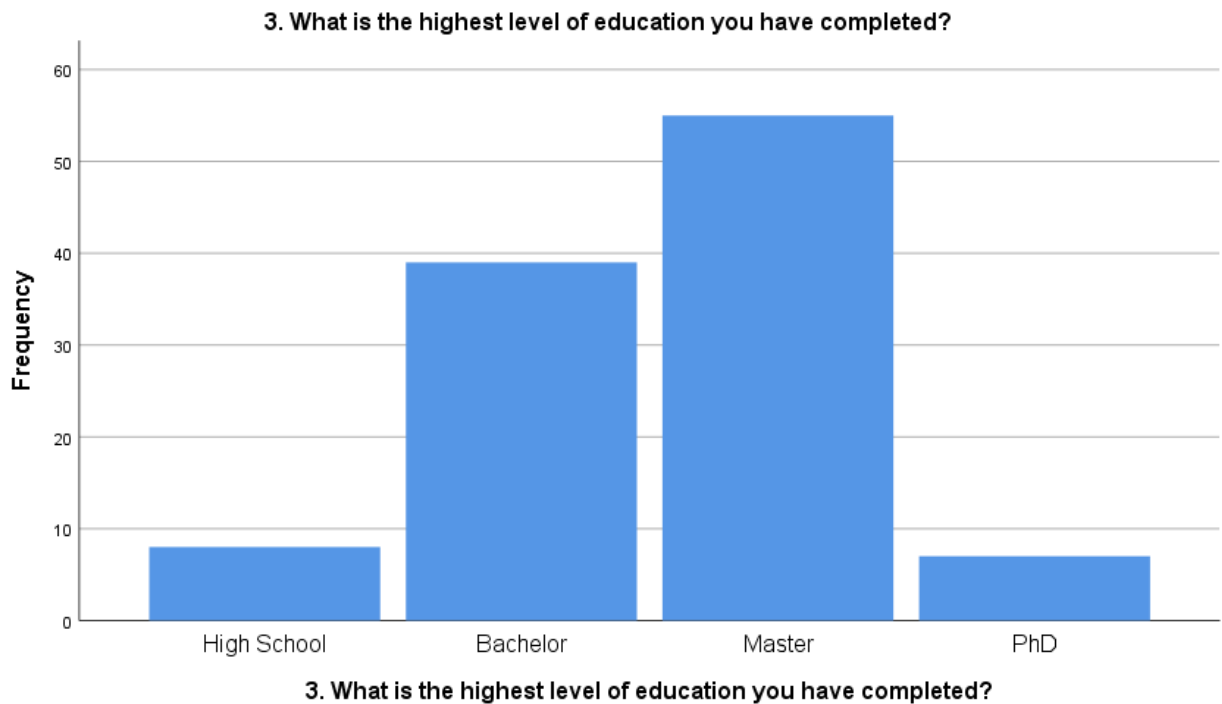


Figure 3 - Education

In terms of marital status, the majority of participants (52.3%) are married with children, while 30.3% are single. This probably suggests different needs and preferences in the area of tourism technology, with married people probably being more interested in family-oriented offers and solutions.

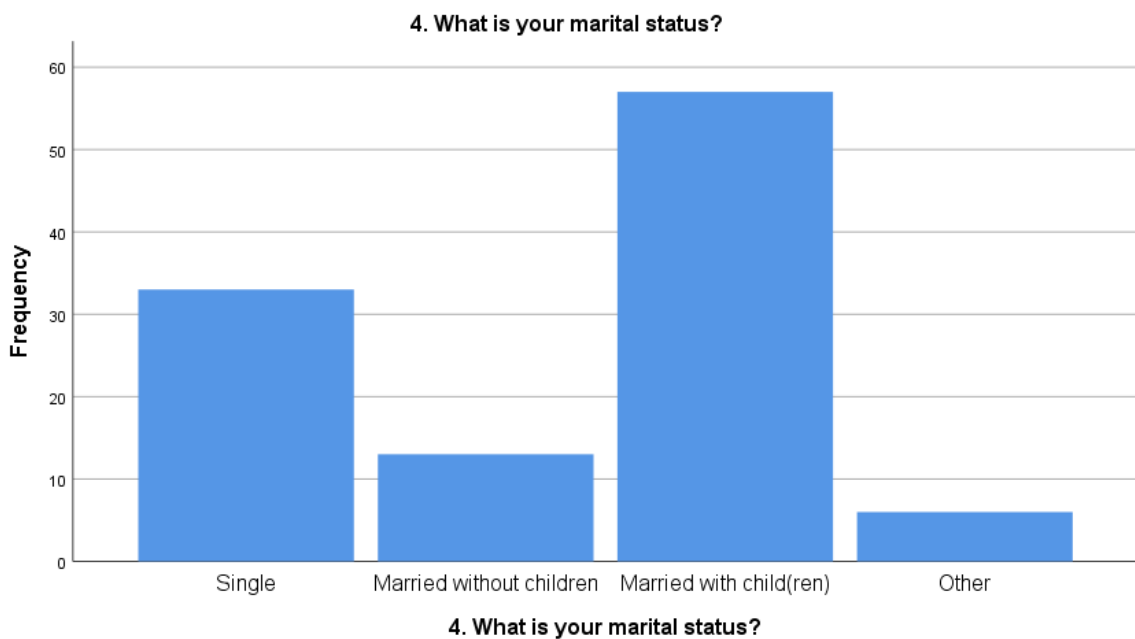


Figure 4 - Marital Status

The geographical distribution shows a clear concentration in the Attica region (78%), followed by Crete (8.3%) and Macedonia (7.3%). This provides an interesting framework for analysing regional differences in technology adoption.

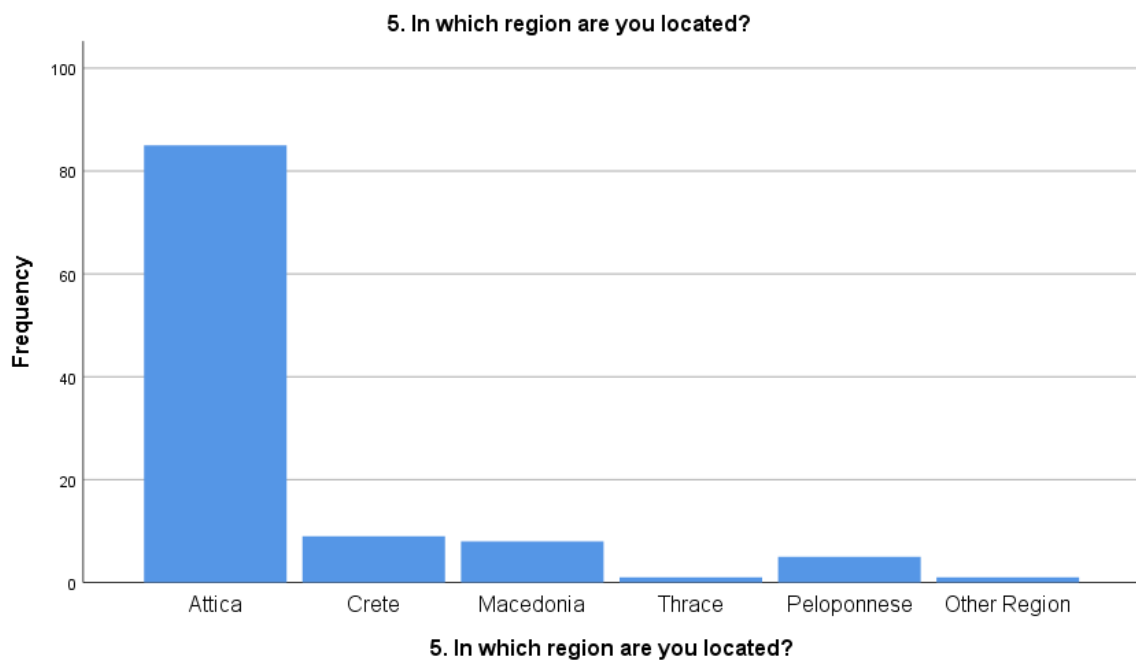


Figure 5 - Region Distribution

Finally, travel frequency shows that 92.7% of respondents have travelled on holiday in the last 12 months, suggesting a strong tourism activity that may reinforce the importance and influence of technology use in their travel experiences.

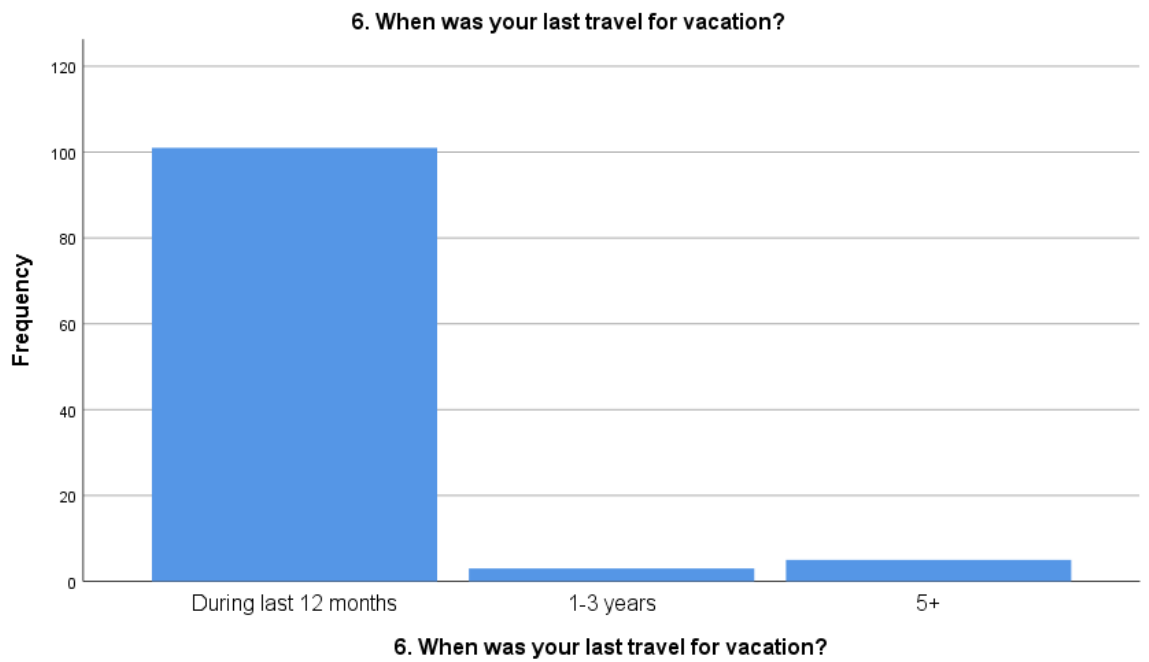


Figure 6 - Latest Travel

Table 1 - Measures

| Construct | | Measurement |
|----------------------------------|--------|--|
| 1. Performance Expectancy (PE) | PE 1 | 8. I find chatbots very practical and useful |
| | PE 2 | 9. With chatbots I implement my tasks quicker |
| | PE 3 | 10. Chatbots help me define what exactly to search for |
| | PE 4 | 11. I often receive content tailored to my needs when using chatbots. |
| 2. Effort Expectancy (EE) | EE1 | 12. Chatbots are user friendly |
| 3. Social Influence (SI) | SI 1 | 13. Chatbots are widely used by many people in my environment |
| 4. Hedonic Motivation (HED) | HED 1 | 14. I enjoy using chatbots |
| 5. Habit (HAB) | HAB 1 | 15. Using chatbots is my first choice when I need to search for something |
| 6. Perceived Innovativeness (PI) | PI 1 | 16. I like to be up to date with the latest technological trends |
| | PI 2 | 17. I always look for new applications/technology tools to make my life easier |
| | PI 3 | 20. I believe chatbots are innovative applications |
| 7. Attitude towards SSTs (SSTA) | SSTA 1 | 18. I enjoy receiving service through mobile/PC applications |
| | SSTA 2 | 19. Receiving service through mobile/PC applications has several advantages |
| 8. Inconvenience (INC) | INC 1 | 21. I find chatbot usage inefficient as most of the time they don't understand what I am expressing |
| | INC 2 | 22. I find more difficult to express an idea to a chatbot than to a human |
| | INC 3 | 23. I find chatbot usage less practical as I need to type my question and it takes me more time |
| | INC 4 | 24. I find chatbot usage uncomfortable as I need to adjust my wording in a way that a chatbot can understand |
| 9. Chatbot Usage Intention (CUI) | CUI 1 | 25. I am willing to use chatbots in the future |
| | CUI 2 | 26. Chatbots usage will be further increased in the future |

Table 2 - Cronbach's alpha

| Construct | References | Cronbach's alpha |
|----------------------------------|--|------------------|
| 1. Performance Expectancy (PE) | Venkatash et al. (2012) | 0.863 |
| 2. Effort Expectancy (EE) | Venkatash et al. (2012) | |
| 3. Social Influence (SI) | Venkatash et al. (2012) | |
| 4. Hedonic Motivation (HED) | Venkatash et al. (2012) | |
| 5. Habit (HAB) | Venkatash et al. (2012) | |
| 6. Perceived Innovativeness (PI) | Parra-López et al. (2011) | 0.723 |
| 7. Attitude towards SSTs (SSTA) | Dabholkar and Bagozzi (2002) | 0.769 |
| 8. Inconvenience (INC) | Based on Hill et al. (2015), Robertson, McDonald, Leckie, and McQuilken (2016) | 0.696 |
| 9. Chatbot Usage Intention (CUI) | Venkatash et al. (2012), Parra- López et al. (2011) | 0.662 |

The Cronbach's alpha results presented for the different constructs are an indication of the internal consistency of each scale of measurement. The Cronbach's alpha value ranges from 0 to 1, with values above 0.7 being considered acceptable, above 0.8 good and above 0.9 excellent for research. Let us evaluate the values given:

- **Performance Expectancy (PE)** - 0.863: This value indicates high internal consistency, which is supporting of the fact that the various questions that make up this scale converge to measure a single underlying characteristic. This is positive for the survey as it indicates that the instrument is reliable for measuring performance expectancy.
- **Perceived Innovativeness (PI)** - 0.723: This value also indicates acceptable internal consistency and shows that the scale questions provide consistent measures of perceived innovativeness.
- **Attitude towards SSTs (SSTA)** - 0.769: This value represents good internal consistency, indicating that the questions effectively capture user attitudes towards self-service technologies.
- **Inconvenience (INC)** - 0.696: This value is slightly below the generally accepted threshold of 0.7, which may indicate the need for further revision or refinement of the scale to improve its reliability.
- **Chatbot Usage Intention (CUI)** - 0.662: This value is also below the threshold of 0.7, suggesting that there may be a need to reformulate the scale to ensure that the questions therefore measure usage intention.

Table 3 - Correlations

| | | Chatbot_Usage_Intention_CUI |
|-----------------------------|---------------------|-----------------------------|
| Performance_Expectancy_PE | Pearson Correlation | .635** |
| | Sig. (2-tailed) | 0.000 |
| | N | 109 |
| Effort_Expectancy_EE | Pearson Correlation | .400** |
| | Sig. (2-tailed) | 0.000 |
| | N | 109 |
| Social_Influence_SI | Pearson Correlation | .361** |
| | Sig. (2-tailed) | 0.000 |
| | N | 109 |
| Hedonic_Motivation_HED | Pearson Correlation | .612** |
| | Sig. (2-tailed) | 0.000 |
| | N | 109 |
| Habit_HAB | Pearson Correlation | .386** |
| | Sig. (2-tailed) | 0.000 |
| | N | 109 |
| Perceived_Innovativeness_PI | Pearson Correlation | .495** |
| | Sig. (2-tailed) | 0.000 |
| | N | 109 |
| Attitude_towards_SSTs_SSTA | Pearson Correlation | .373** |
| | Sig. (2-tailed) | 0.000 |
| | N | 109 |
| Inconvenience_INC | Pearson Correlation | -.370** |
| | Sig. (2-tailed) | 0.000 |
| | N | 109 |
| Chatbot_Usage_Intention_CUI | Pearson Correlation | 1 |
| | Sig. (2-tailed) | |
| | N | 109 |

The data analysis was organized into subsections based on the research questions. Each subsection examines the influence of specific factors on the intention to use chatbots as described in the research questions. The below constructs are based on the relevant paper by Melián-González et al., 2019 which in turn is based on [UTAUT2](#).

1. Relationship between performance expectancy and intention to use chatbots (H1)

Performance Expectancy (PE) analysis showed a high positive correlation with intention to use chatbots, with a Pearson correlation coefficient of .635 ($p < .001$). This suggests that users who find chatbots practical and useful are more likely to use them in the future.

2. Relationship between personalization and intention to use chatbots (H2)

Personalization shows a significant positive correlation with intention to use chatbots, as shown by the correlation between the question "I often receive content tailored to my needs when using chatbots" and intention to use chatbots ($r = .482, p < .001$). This indicates that users who receive tailored content are more likely to use chatbots.

3. Relationship between ease of use and intention to use chatbots (H3)

Ease of use (Effort Expectancy - EE) also shows a positive correlation with intention to use chatbots, with a Pearson correlation coefficient of .400 ($p < .001$). This highlights the importance of developing user-friendly interfaces.

4. Relationship between social influence and intention to use chatbots (H4)

Social Influence (SI) has a positive but less strong correlation with intention to use chatbots, with a Pearson correlation coefficient of .361 ($p < .001$). This suggests that the opinions of others may influence the decision to use chatbots.

5. Relationship between hedonic motivation and intention to use chatbots (H5)

Hedonic Motivation (HED) has a significant positive correlation with intention to use chatbots, with a Pearson correlation coefficient of .612 ($p < .001$). This indicates that enjoyment of using chatbots contributes significantly to intention to use.

6. Relationship between habit and intention to use chatbots (H6)

Habit (HAB) has a positive correlation with intention to use chatbots, with a Pearson correlation coefficient of .386 ($p < .001$). This suggests that users who already have a habit of using chatbots are more likely to continue using them.

7. Relationship between perceived innovation and intention to use chatbots (H7)

Perceived Innovativeness (PI) shows a significant positive correlation with intention to use chatbots, with a Pearson correlation coefficient of .495 ($p < .001$). This indicates that users who perceive chatbots as innovative are more likely to use them.

8. Relationship between attitudes towards self-service technologies and intention to use chatbots (H8)

Attitude towards self-service technologies (Attitude towards SSTs - SSTA) has a positive correlation with intention to use chatbots, with a Pearson correlation coefficient of .373 ($p < .001$). This suggests that users with a positive attitude towards self-service technologies are more likely to use chatbots.

9. Relationship between perceived difficulties and intention to use chatbots (H9)

Perceived Inconvenience (INC) has a negative correlation with intention to use chatbots, with a Pearson correlation coefficient of -0.370 ($p < .001$). This indicates that difficulties in using chatbots can reduce the intention to use chatbots.

Table 4 - Regression

Model Summary

| Model | R | R Square | Adjusted R Square | Std. Error of the Estimate |
|-------|-------------------|----------|-------------------|----------------------------|
| 1 | .713 ^a | 0.508 | 0.469 | 0.49128 |

a. Predictors: (Constant), Inconvenience_INC, Attitude_towards_SSTs_SSTA, Social_Influence_SI, Habit_HAB, Effort_Expectancy_EE, Perceived_Innovativeness_PI, Hedonic_Motivation_HED, Performance_Expectancy_PE

ANOVA^a

| Model | | Sum of Squares | df | Mean Square | F | Sig. |
|-------|------------|----------------|-----|-------------|--------|-------------------|
| 1 | Regression | 24.947 | 8 | 3.118 | 12.920 | .000 ^b |
| | Residual | 24.136 | 100 | 0.241 | | |
| | Total | 49.083 | 108 | | | |

a. Dependent Variable: Chatbot_Usage_Intention_CUI

b. Predictors: (Constant), Inconvenience_INC, Attitude_towards_SSTs_SSTA, Social_Influence_SI, Habit_HAB, Effort_Expectancy_EE, Perceived_Innovativeness_PI, Hedonic_Motivation_HED, Performance_Expectancy_PE

Coefficients^a

| Model | | Unstandardized Coefficients | | Standardized Coefficients | t | Sig. |
|-------|-----------------------------|-----------------------------|------------|---------------------------|--------|-------|
| | | B | Std. Error | Beta | | |
| 1 | (Constant) | 0.538 | 0.363 | | 1.480 | 0.142 |
| | Performance_Expectancy_PE | 0.373 | 0.112 | 0.430 | 3.330 | 0.001 |
| | Effort_Expectancy_EE | -0.059 | 0.070 | -0.078 | -0.846 | 0.400 |
| | Social_Influence_SI | 0.093 | 0.061 | 0.126 | 1.528 | 0.130 |
| | Hedonic_Motivation_HED | 0.143 | 0.081 | 0.219 | 1.755 | 0.082 |
| | Habit_HAB | -0.128 | 0.062 | -0.207 | -2.069 | 0.041 |
| | Perceived_Innovativeness_PI | 0.187 | 0.086 | 0.219 | 2.169 | 0.032 |
| | Attitude_towards_SSTs_SSTA | 0.060 | 0.084 | 0.066 | 0.721 | 0.473 |
| | Inconvenience_INC | -0.084 | 0.076 | -0.092 | -1.113 | 0.268 |

a. Dependent Variable: Chatbot_Usage_Intention_CUI

From Table-3 it can be observed that Pearson coefficients show a moderate correlation. Nevertheless, Table-4 analyses the effect of various predictor variables on the intention to use chatbots, based on data from 109 responses. The model has an R Square of 0.508, suggesting that approximately 50.8% of the variability in intention to use chatbots is explained by the predictor variables. The Adjusted R Square is 0.469, indicating the adjusted prediction after adjusting for the number of predictor variables in the model.

ANOVA analysis shows a significant F-statistic of 12.920 with a p-value <0.0001, indicating that the model is statistically significant and the predictor variables are significantly different from random predictions.

Regarding the independent variables:

- **Performance Expectancy (PE)** is highly significant ($\beta = 0.430$, $p = 0.001$), confirming that users who see chatbots as beneficial are more likely to use them.
- **Perceived Innovativeness (PI) and Hedonic Motivation (HED)** also show a positive correlation with intention to use, suggesting that innovativeness and enjoyment of use enhance intention to use.
- **Habit (HAB)** shows a negative correlation ($\beta = -0.207$, $p = 0.041$), possibly suggesting that habitual use environment may play a deterrent role in the adoption of new technologies.
- **Inconvenience (INC)** has a negative effect on intention to use ($\beta = -0.092$, $p = 0.268$), although this effect is not statistically significant in this model, suggesting the need for improvement in the accessibility and usability of chatbots.

These results provide important insight into the factors that influence the intention to use chatbots and offer directions for improvements in their design and implementation.

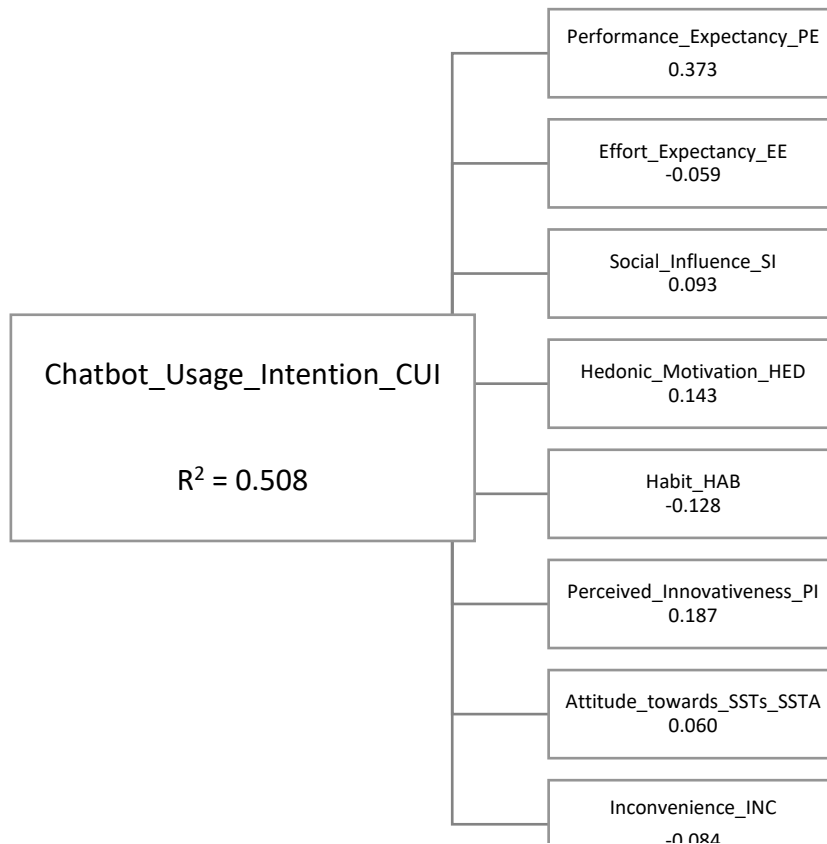


Figure 7 - CUI Analysis Results

Table 5 - Correlations

| | | 6. When was your last travel for vacation? | 7. I am familiar with IT applications and technology in general. |
|--|---------------------|--|--|
| 6. When was your last travel for vacation? | Pearson Correlation | 1 | 0.131 |
| | Sig. (2-tailed) | | 0.174 |
| | N | 109 | 109 |
| 7. I am familiar with IT applications and technology in general. | Pearson Correlation | 0.131 | 1 |
| | Sig. (2-tailed) | 0.174 | |
| | N | 109 | 109 |

The correlation analysis between the variable "When was your last travel for vacation?" and the variable "I am familiar with IT applications and technology in general" shows a Pearson correlation coefficient of 0.131 with a significance level (Sig.) of 0.174.

This correlation coefficient indicates a very weak positive correlation between the two variables. In other words, there is no strong relationship between the timing of the last holiday trip and familiarity with information technologies and applications in general.

Moreover, the significance level ($p = 0.174$) is greater than 0.05, which means that the correlation is not statistically significant. This suggests that there is insufficient evidence to support that these two variables are related.

In summary, the results show that there is no significant correlation between the timing of the last holiday trip and familiarity with information technology. This may suggest that familiarity with IT is not particularly affected by how recently one has travelled on holiday.

5.6 Discussion

The findings from the correlation and regression analyses reveal significant dynamics in the relationship between various factors and the intention to use chatbots by Greek users in tourism. The correlations indicate that Performance Expectancy and Hedonic Motivation are the strongest positive predictors of intention to use, while Inconvenience appears to have a negative effect.

In the regression analysis, the model explained about 50.8% of the variance in the intention to use chatbots, with Performance Acceptance emerging as a significant factor. In addition, Perceived Innovativeness and Hedonic Motivation positively influenced the intention to use, confirming the importance of perceived innovativeness and pleasant experience in the adoption of new technologies.

In contrast, the negative statistically significant results for Habit indicate possible resistance to change in users who have established habits, while Difficulty of Use, although not showing statistical significance, is an indication of the need to improve the accessibility and usability of chatbots.

These findings highlight the need for continuous improvement of technological solutions and the development of more user-friendly interfaces, as well as the need to understand the psychological and social factors that influence the adoption of innovative technologies in the tourism sector.

Our findings align with the research of Santiago Melián-González, Desiderio Gutiérrez-Taño and Jacques Bulchand-Gidumal in their study "Predicting the intentions to use chatbots for travel and tourism." Both studies highlight the significant positive effect of performance expectancy on the intention to use chatbots, indicating that users are more likely to use chatbots when they perceive them as useful and efficient. Furthermore, both studies found that social influence and hedonic motivation play an important role in shaping users' intentions to use chatbots. However, our study adds to the existing literature by focusing specifically on Greek tourists, providing a regional perspective that has not been previously explored.

6. Conclusion

Integrating Artificial Intelligence (AI) into the tourist business provides an exceptional chance for organisations to improve the customer experience provided to its users. The research findings highlight the crucial importance of AI technology, specifically chatbots, in influencing customer interactions in the tourist and hospitality industry. AI-driven chatbots have shown considerable promise in strengthening customer service capabilities, enabling smooth communication, and improving overall user pleasure. The findings of our study indicate that Performance Expectancy, Hedonic Motivation, and Perceived Innovativeness have a beneficial impact on the intention of Greek users in the tourism industry to utilise chatbots. These insights highlight the significance of delivering inventive and pleasurable experiences to clients via AI-powered technologies.

Furthermore, the study emphasises the necessity for firms to tackle obstacles such as user behaviours and perceived usability issues when integrating AI technologies. Organisations may minimise resistance to change and enhance the usability of AI-driven technologies by promoting a culture of continuous improvement and prioritising user-centric design. Artificial Intelligence acts as a driver for innovation and transformation in the tourist industry, allowing organisations to customise interactions, simplify processes, and enhance the overall quality of consumer experiences. In order to remain competitive and satisfy the changing needs of modern travelers, firms must prioritise the adoption of AI-driven solutions as technology advances. By using the capabilities of artificial intelligence, firms may establish stronger relationships with their clients, cultivate loyalty, and eventually, achieve sustainable success in the ever-changing tourism industry.

This study has several limitations that need to be mentioned. First, the sample consists only of Greek tourists, which may limit the generalizability of the findings to other cultural or geographic contexts. Future research could expand the sample to include tourists from different backgrounds to improve the generalizability of the results. Second, the cross-sectional nature of the study limits our ability to draw causal inferences. Future studies could base their sample on wider location areas and provide deeper insights into how users' intentions to use chatbots evolve over time. Moreover, while this study focuses on the intention to use chatbots, future research could explore actual usage behaviors and factors that influence the transition from intention to action, i.e. real usage of the chatbots. Finally, as the technological landscape continues to evolve, future studies should examine emerging technologies and their impact on user behavior in the tourism industry.

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