

Artificial intelligence technologies and their role in developing the tourism sector

Djeddah Abdelkrim ¹, Gherrab Sara ², Madani Djamel Eddine ³, Benchriet Basma ⁴ and Trifa Mohamed ⁵

¹ University of Mohammed Ben Ahmed - Oran -2, Algeria. Email: Djeddah.abdelkrim@univ-oran2.dz

² University of Belhadj Bouchaib Ain Témouchent, Algeria. Email: Gherrabsara0@gmail.com

³ University of Mohammed Ben Ahmed - Oran -2, Algeria. Email: Dgamaldz@gmail.com

⁴ University of Ammar Thelidji-Laghouat, Algeria. Email: bbass.g4@gmail.com

⁵ University of Mohammed Seddik Benyahia -Jijel, Algeria. Email: Mohamed.trifa@univ-jjel.dz

Abstract---The main objective of this study is to explore the effects of AI technologies on the digital tourism sector, focusing on the positive and negative aspects of these technologies. The study showed that the use of artificial intelligence technologies in tourism contributed to the development of the sector by improving the customer experience and enhancing the efficiency of operations. However, the results also revealed a potential negative impact on employees' organizational commitment, necessitating the need to carefully balance the use of these technologies to ensure that corporate performance and the overall work environment are maintained.

Keywords---Artificial Intelligence, digital, tourism.

JEL classification: o31; o32 ; z32

Introduction

In a world characterized by rapid technological development and continuous digital transformation, artificial intelligence is emerging as one of the most influential and controversial fields of modern times. Artificial intelligence is the driving force that is reshaping various industrial and service sectors, and the digital tourism sector is no exception. The inclusion of artificial intelligence in this field opens up wide horizons of possibilities and opportunities that were not available before, as it effectively contributes to improving the travel experience for tourists and providing more specialized and effective services.

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Previously, the tourist experience relied heavily on direct human interaction, whether when booking a trip, choosing a hotel, or even exploring new landmarks. But with the continuous advances in artificial intelligence technologies, many of these processes have shifted to digital platforms that rely on machine learning and big data analysis to deliver personalized and unique experiences. AI improves the efficiency of the operational processes of tourism companies and hotels, by automating many routine tasks such as booking and resource management. Technologies such as bots and smart chat can provide instant support and quick responses to tourist queries, boosting satisfaction and reducing operational costs.

However, despite the significant benefits that artificial intelligence technologies offer in the tourism sector, they are not without some negative effects that must be faced to ensure their success and sustainability. In light of these challenges, it is imperative to develop integrated solutions that combine technology and innovation to ensure that the benefits and challenges of digital tourism are balanced.

Research problem: In light of the above, the main problem of our research is what are the most important artificial intelligence techniques applied in the field of tourism and what are their effects?

Research hypotheses: In order to answer the question posed, two hypotheses were proposed, which we will try to test their validity as follows:

- The first hypothesis: AI technologies applied in the tourism sector have helped the sector flourish;
- The second hypothesis: Artificial intelligence and robotic technologies negatively affect the organizational commitment of employees;

Research objectives: The research aims to shed light on the most important artificial intelligence techniques applied in the tourism sector and evaluate their effects in improving tourism services

Importance of the research: The importance of the study appears through the novelty of the topic and keeping pace with the current situation where traditional tourism organizations cannot face modern organizations in addition to diagnosing the most important technologies applied in digital tourism and analyzing their positive and negative effects on the ground

Previous studies:

_Ghada Mahmoud and Magdy Abdel Razzaq's study entitled Benefits and Challenges of Artificial Intelligence Uses in the Tourism Industry in 2024, which is a study that examines evaluating the application of artificial intelligence techniques and highlighting their advantages and disadvantages from the point of view of workers in tourism companies, and it concluded that the application of artificial intelligence techniques in the sector is of great importance in improving the quality of services provided to customers

_Saber Yahya Marzouki's study entitled the impact of the use of artificial intelligence techniques in improving the quality of tourism services in 2021, a study that sought to research the extent to which Egyptian tourism benefits from the use of artificial intelligence techniques and the most important problems facing this, and the study concluded that there is a relationship between the application of artificial intelligence techniques and improving the quality of banking services.

_Shaki Hicham and Boukhari Somaia's study entitled Artificial intelligence techniques and their role in activating digital tourism, an analytical vision of the case of Algeria in 2021 It sought to highlight the importance of applying artificial intelligence in developing and supporting the tourism digital industry at the Algerian and global levels, and the study found that artificial intelligence techniques are one of the most important means adopted by decision-makers in the tourism field.

_Samir Jbeil and Nassima Lakhdari study entitled Tourist destinations and the adoption of artificial intelligence Case study of Dubai in 2023, a study aimed at analyzing the development of the Emirate of Dubai as a tourist destination and the extent to which artificial intelligence applications contribute to

supporting it, and the study found that the tourism sector in Dubai is witnessing development after the adoption of artificial intelligence techniques

The first section:

the theoretical framework of artificial intelligence and digital tourism and the relationship between them

Artificial intelligence is a key strategic partner for the digital tourism industry, as it contributes to promoting innovation and improving the overall performance of companies in this vital sector.

Part One: Generalities About Artificial Intelligence and digital tourism

In our time, the world is witnessing a strong trend towards artificial intelligence and its adoption in various fields. This trend is due to the tremendous capabilities that AI provides in data analysis, machine learning, and intelligent decision-making.

The first branch: Definition of Artificial Intelligence and digital tourism

Artificial intelligence is a term consisting of two words whose meaning reflects the nature and importance of the field. Intelligence expresses the ability to understand and learn new and changing things, including the ability to recognize patterns and make decisions. The word "artificial" refers to the process that results in things that are not naturally formed, and includes innovations and technologies created by humans (Abu Baker & al, 2019). The American scientist McCarthy Johan It coined the term artificial intelligence in 1956, and it defined it as the science and engineering of the intelligent making of intelligent machines, or the branch of computer science that aims to create the intelligent machine (Malika, 2021). While W. Patterson defined Artificial intelligence as a type of computer science that is concerned with the study and formation of computer systems that show some forms of intelligence, and these systems have the ability to make very useful conclusions about the problem set as these systems can understand natural languages or understand living perception and other possibilities that need intelligence when implemented by humans (Ahmed, Muhamed, & Omar, 2018). Artificial intelligence is defined as the ability of a machine to perform cognitive functions that bind it to brains. humanity, such as perception and reasoning, learning, interaction with the environment, problem solving, and even creativity" (Muhamed & Nabila, 2021).

It is the theory and development of computer systems capable of performing tasks that require human intelligence, examples of which are visual perception, speech recognition, decision-making and learning under uncertainty" (Hichame & Hannane, 2022) . The key feature of AI is the ability to reduce and eliminate repetitive tasks. This helps shrink the functionality of the bottom layer, making AI applications more prevalent today, while increasing the number of independent software organizations available to handle advanced technologies. The benefits of AI systems are clearly visible to digital consumers in many industries and businesses, such as customer service practices implemented by chatbots. (Yahya Y. , 2021)

While The concept of the digital tourism industry is one of the modern concepts in the science of tourism, which overlaps and is closely related to the concept of e-commerce (Mowafak, Abdul-jabar, & Rami, 2016), it is defined as: a tourist pattern that carries out some of its transactions that take place between a tourist institution and another or between a tourism institution and a consumer (tourist) through the use of information and communication technology, in which the offers of tourism services through the Internet converge with the desires of tourists wishing to accept these tourism services. (breed, 2001).We support the broad definition as the set of tourism services associated with e-commerce and the Internet, where digital tourism constitutes the largest part of the volume of e-commerce, and it is the use of information technologies by all parties related to the tourism business system in the completion of their activities and conduct their business, and it extends to the creation of

tourism entities that rely on information technologies in their construction, processing, performance and operation, as well as the use of these technologies by customers (Mustafa, 2011).

The second branch: Artificial Intelligence Applications

Artificial intelligence and automation science provide many opportunities for tourism and hospitality companies to improve their daily operations and ensure the provision of high-quality service to their customers (Pongsakorn, 2023), these technologies include facial recognition technologies, virtual reality applications, chatbots, robotics, artificial intelligence in Google Maps, translation applications, voice tours, ease of shopping, etc. Among the most important applications of artificial intelligence used in the fields of tourism and hospitality are the following: (Samala, Katkam, & Shekhar, 2020)

- **Virtual reality:** Virtual reality applications are widely used in the tourism and hotel industry. Virtual hotel tours, virtual vacation experiences, and virtual booking interfaces are some examples. Virtual hotel tours offer three-dimensional video renderings of the hotel's surroundings and facilities (Mouhamed, Mohamed, & Samir, 2023), VR technology is ideal for pre-travel and exploring previously unseen locations. Marketers provide customers with a virtual journey to hotels and tourist destinations through Cooperation with hotel owners and tourism institutions (Samala, Katkam, & Shekhar, 2020). and also, through the use of virtual reality airlines will be able to market their services and products in an interactive and interesting way where the customer will be able to see his seat on board or see the first class and business class seats on board and meals, or entertainment and entertainment on board (Abdul kafi, Tocoa, & Ahmed, 2022).

Facial recognition: It is another way to apply artificial intelligence in the field of tourism, this technology helps tourists travel through airports and planes without travel documents and visitors can visit duty free, restaurants, or access entertainment easily through facial scanning as block chain technology ensures that the traveler's data and information are reliable, and helps in automatically identifying and verifying the customer's arrival at airports, facilitates self-check-in machines, and automatic passport verification Facial Recognition Travel Passenger Flow (Mohammed, 2020).

_ **Chatbots:** A chatbot is a piece of software that facilitates dialogue through audio or written means. Chatbots are categorized into two types: text-based chatbots and chatbots, and voice-based chatbots (Mohammed, 2020) These bots are used around the clock, seven days a week by responding to common guest queries, making recommendations and offers, and even handling simple booking requests. Can This improve customer service and reduces response times, thereby enhancing guest engagement, loyalty and satisfaction (Yahya M. , 2021).

Chatbots are also used at airports to inform travelers about gate changes, departure information, cheapest destinations, cheapest and shortest flights, as well as driving directions (Abdul kafi, Tocoa, & Ahmed, 2022).

Robotics: Robotics are another type of artificial intelligence technology that is enhancing its presence in the tourism industry. Robots are used to perform simple tasks such as turning on bedroom lights, turning off the TV, handling systems to ensure automatic baggage check-in, greeting hotel guests, changing the degree of lighting, and music. curtains etc., which will change the customer experience and improve energy consumption (Mouhamed, Mohamed, & Samir, 2023).

Recently, many restaurants have started using robots to perform various tasks, such as cooking. Packing and serving food, collecting dinnerware from tables, cleaning floors, tables and toilets, taking customer orders; washing dishes and serving food.

The introduction of artificial intelligence in the tourism industry is a reality in the current era. For example, renowned Japanese tourism and hospitality company Henna Hotel has introduced various types of robots into its workforce, including dinosaur robots. These robots are responsible for sponsoring the activities of the front desk and customer reception (Samala, Katkam, & Shekhar, 2020)

Similarly, it started Robots in the appearance at airports, where they are deployed as guides to assist customers and simplify business procedures (Mohammed, 2020), robots can also be used at airports to perform a variety of tasks, such as directing passengers to check in and guide them to the gates within the airport, moving and checking bags, checking passenger boarding passes, printing baggage tags, delivering luggage to the baggage area at the airport, and also carrying out cleaning work. In addition, the robots can respond to passengers' queries, interact with them and entertain them by presenting music and taking pictures with them. Munich Airport is the first airport in Germany to use a robot called Josie Pepper to greet passengers and answer their questions about shops, restaurants and gates (Abdul kafi, Tocoa, & Ahmed, 2022).

Augmented reality and targeted marketing: Augmented reality has become one of the new advertising and marketing tools. Augmented reality has been used in many brands to attract customers and to improve customers' commitment to helping augmented reality, smartphone and tablet users point their built-in cameras on these devices to anything they want, which then creates a three-dimensional video (Mouhamed, Mohamed, & Samir, 2023).

Google Maps: Google Maps using GPS technology has helped travelers by informing them of directions, the use of artificial intelligence technology in Google Maps has led to the development of information by keeping travelers informed of accidents and traffic Jussawalla et al to know Google 2020, travelers can also launch the Google Maps app to know their exact location and live view experience of Google Maps This technology provides details about shops, businesses, hotels, shopping malls, movie theaters, restaurants, entertainment areas, etc. (Samala, Katkam, & Shekhar, 2020)

Translation apps: There are few apps like Google Translate that allow travelers to talk to locals in their language, as Google Translate provides voice speaking services, when the traveler clicks on the "Chat Mode" option. This option allows travelers to speak their language, pick up their voice message, translate that voice message into the desired local language, and thus convey the travelers' message to the population Not only that, but this application can translate images that contain texts that benefit tourists who travel to countries where they do not know the local language, as this application works to translate the names of street shops and signs (Yahya M. , 2021).

Section Two:

Artificial Intelligence and their Effects on the Tourism Sector

When AI technologies are used in the tourism industry, diverse and differentiated impacts can occur. While these technologies may improve the customer experience and enhance the efficiency of operations, some potential downsides must also be considered.

The first part: Positive effects

the international hospitality and tourism industry is one of the most important, largest and fastest growing industries in the world globally, generating revenues of \$ 7.6 trillion and employing 292 million people, representing nearly 10% of global GDP and one in 10 jobs with more jobs expected to be created in the coming years due to its expected steady growth.

The use of robotics, artificial intelligence and service automation in tourism and hospitality is still in its early stages, but technological advances would force tourism and hospitality companies to look at automation as a path to innovation, competitive advantage, productivity and profitability. (ersoy & Ruya, 2023) The application of AI technologies has a positive impact on tourism and hospitality personnel, as it will provide an opportunity for managers to identify opportunities and threats that may arise from technology and guide them in developing the appropriate competencies for technologically emerging people. Murugesan (Subramanian, Srivastava, & Ashish, 2023) argues that AI can play a crucial role in employee engagement and retention. By analyzing employee data and identifying patterns

and trends that may indicate low engagement or high employee turnover rates. This information can help HR professionals take proactive measures to address these issues, such as implementing training programs or improving workplace culture.

Pongsakorn (2023) explained that the use of AI technologies can lead to improved customer experiences while reducing the need for human labor. As a result, many hospitality companies have invested more in technology in recent years to increase revenue and growth. Asians largely have a positive view of AI, with 48% seeing job automation as a positive innovation, while 42% disagreed. The digital workspace emerged as a new paradigm and employees were able to work in both physical and cyberspace, facilitating increased productivity.

Pongsakorn (2023) argues that the use of artificial intelligence technologies in the hospitality industry improves operations and reduces cost and has a great impact on many processes such as point-of-sale systems where it can reduce employee theft of food and beverages as in cafes and restaurants, moreover, AI and automation services have the potential to not only reduce human errors but also provide predictive insights for the future. Thus, AI and Automation Services Able to analyze vast amounts of data and turn it into useful business information.

The second part: Negative effects

Although its prevalence and impact on improving business efficiency are recognized, artificial intelligence (Breed, 2001) also raises growing concern about its replacement of human jobs. He explained that by 2030, some occupations are expected to see a significant decline and rapidly evolving AI technologies will displace some people, and that about 15% of all workers, or about 400 million people, may lose their workplaces due to artificial intelligence. The technical potential of job automation is the main reason behind this decline, is that 9% of jobs could become automated in 21 countries. A 2017 McKinsey Oxford University report predicted 5 percent job losses due to artificial intelligence. (ersoy & Ruya, 2023) asserted that with the advent of artificial intelligence, the hospitality sector faced the fear of losing the human element, because employees and the human touch are part of the hospitality product.

While (Abd Elkafy, Takwa, & Ahmad, 2022) argue that AI creates more jobs than destroys them and the level of replacement depends on the nature of the jobs, reports from the Pew Research Center (2017) have shown that only low-level human jobs can be replaced by robots or artificial intelligence.

Ghafar, 2020 confirmed that according to a 2020 survey conducted in the Asia-Pacific, United States, Europe, Canada, Russia and Brazil region, more than half of the people confirmed that the deployment of artificial intelligence and computer systems had a positive impact on society, while 33% confirmed that it had a negative impact. Despite the positive role of AI technologies in boosting productivity and efficiency, a workplace without limited time or space can cause huge losses and backfire. The excessive invasion of ICTs in our time and personal space inevitably leads to tension and social isolation.

Moreover, (Pongsakorn, 2023) argues that the use of AI-powered robots in the workplace poses a risk of deteriorating workers' mental health, workers may be stressed as a result of the possibility of losing their jobs or monitoring the quality of their work by robots, and the increase in leisure and rest time as a result of facilitating automated travel further boosts the demand for travel and tourism, which may contribute to issues such as overtourism and general pressure on destination ecosystems.

(ersoy & Ruya, 2023) emphasized that artificial intelligence and robotic technologies negatively affect the organizational commitment of employees. The human touch is important in services, especially in the tourism and hospitality industry and therefore, AI integration can disrupt the relationship between employees and organizations, cause psychological damage to employees, and negatively affect their

sense of belonging and commitment to the workplace. Implementing intelligent automation also carries some risks, such as loss of control due to robot autonomy.

In addition to safety, security and privacy concerns Moreover, some tourism and hospitality companies are concerned about the risks and security of implementing AI and robotic systems due to their ease of access and consistency. For example, because AI-powered robots have a certain level of autonomy, insufficient human-robot communication may lead to robot behavior that is not controlled by humans, putting the safety of workers at risk.

Inova (2020) predicts that technological development and automation in the tourism industry will significantly eliminate or reduce many jobs, along with changing tasks and the nature of work. New job positions will also be created to meet the changing needs of the industry. By 2030, the tourism sector is expected to grow significantly, but with insufficient staff available in the market due to low birth rates, tourism and hospitality companies in developed countries will find themselves forced to adopt Technology and automation regardless of whether they like it or not.

Conclusion:

Based on the study conducted, it can be concluded that the use of artificial intelligence technologies in the tourism sector is essential to keep pace with recent developments and improve the performance of the industry in general.

Based on the above, we concluded the following results:

- Ability to increase the efficiency of resource management through the application of artificial intelligence techniques in the tourism sector.
- Operational costs have been reduced and productivity increased through the implementation of robotics and artificial intelligence technologies.
- Marketing processes are improved and revenue is increased thanks to more accurate customer data analysis.
- There are challenges in terms of privacy and security that must be faced and resolved carefully to ensure the safety of the use of smart technologies in the tourism sector

Based on the above results, we can confirm or disconfirm the hypotheses as follows:

- Initially, the results show that AI technologies applied in the tourism sector have contributed significantly to the prosperity of the sector, by improving the customer experience, improving the efficiency of operations, and providing personalized services.
- On the other hand, the results show that artificial intelligence and robotic technologies may negatively affect the organizational commitment of employees in the tourism sector. Research shows that excessive adoption of these technologies may lead to a low level of commitment and engagement by employees, which can negatively affect the performance of companies and the work environment in general. Thus, we confirm the validity of the second hypothesis

Accordingly, we conclude the following set of recommendations:

- Directing investment towards research on advanced artificial intelligence technologies in the tourism sector.
- Develop clear strategies for adopting AI technologies, with a focus on security and privacy.
- Provide continuous training for employees to enhance their understanding and skills in the use of artificial intelligence techniques.
- Conduct periodic evaluations of the performance of artificial intelligence techniques and focus on continuous improvement.
- Enhance communication and interaction between smart systems and visitors to improve customer experience.

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