

Opiniones y Ensayos

Artificial Intelligence and its Importance in the Near Future in the Spanish Tourism Industry

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Abstract: The tourism industry is constantly evolving, and in recent years there has been a growing interest in the use of Artificial Intelligence (AI) to improve and transform the services offered. This article explores the role of Artificial Intelligence (AI) in the Spanish tourism industry and discusses its importance and potential impact in the near future. The study examines various cases of AI use in the tourism sector, including personalised customer experiences, optimised destination management, and improved safety measures. It also addresses the ethical and social implications of implementing AI in the industry. The article highlights the opportunities and challenges associated with AI in the Spanish tourism sector and emphasises the need to address these challenges to fully leverage the potential of AI. The findings suggest that AI has significant potential to transform and enhance the tourism industry in Spain, but careful consideration and management of the associated challenges are crucial for its successful implementation.

Keywords: Artificial Intelligence; Tourism; opportunity; challenge; Spain.

Resumen: La industria turística está en constante evolución, y en los últimos años ha habido un creciente interés en el uso de la Inteligencia Artificial (IA) para mejorar y transformar los servicios ofrecidos. Este artículo explora el papel de la Inteligencia Artificial (IA) en la industria turística española y analiza su importancia y potencial impacto en un futuro próximo. El estudio examina varios casos de uso de la IA en el sector turístico, incluidas las experiencias personalizadas de los clientes, la optimización de la gestión de destinos y la mejora de las medidas de seguridad. También aborda las implicaciones éticas y sociales de la implementación de la IA en la industria. El artículo destaca las oportunidades y los desafíos asociados a la IA en el sector turístico español y enfatiza la necesidad de abordar estos desafíos para aprovechar al máximo el potencial de la IA. Los hallazgos sugieren que la IA tiene un potencial significativo para transformar y mejorar la industria turística en España, pero la consideración y gestión cuidadosas de los desafíos.

Palabras clave: Inteligencia Artificial; Turismo; oportunidad; reto; España.

1. Introduction

Artificial Intelligence (AI) has shown rapid advancement in recent years and has found applications in a wide range of sectors, from healthcare to automotive. The tourism sector is no exception, as it has begun to take advantage of AI capabilities to improve customer experience, optimize destination

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management, and address other important challenges (Más-Ferrando et al., 2020). That is why all countries with a strong tourism industry are increasingly aware of the potential associated with AI (Samala et al., 2020).

That is why AI presents two clear stages associated with the digitization of the sector's economy, which would be associated with the fact that AI is used to personalize and improve the customer experience. AI systems can analyse vast amounts of data about customer preferences, behaviours, and feedback to deliver personalized recommendations and suggestions. This may include recommendations for destinations, accommodations, activities and places to visit, based on individual traveller preferences and needs. And a second stage to the acceleration and automation of the sector promoted by AI. What would be that stage in which AI is used to optimize the management of tourist destinations. AI systems can analyse real-time data such as booking trends, weather, tourist congestion and behaviour patterns to make informed destination management decisions. This can help tourist destinations to anticipate demand, strategically plan the distribution of resources and efficiently manage tourist flows (Xiang, 2018).

It is denoted, therefore, how AI has revolutionized the way in which we interact with information and tourist services (Alonso Almeida, 2019). From destination search to accommodation booking to experience personalization, AI is transforming every stage of the travel cycle (Car et al., 2019). However, this technological advance is not without its challenges that require careful consideration and management.

First of all, one of the main challenges posed by AI in the Spanish tourism sector is the need to guarantee the privacy and security of tourist data (Moreno-Izquierdo et al., 2022). As a large amount of personal information such as travel preferences, booking history and location data is collected and processed, it is essential to establish robust protection mechanisms to prevent misuse of this data and protect the privacy of tourists (Buendicha et al., 2019).

Likewise, there is a clear challenge regarding the potential existence of a possible digital divide that could arise as a result of the adoption of AI in the tourism sector (Esteban-Navarro et al., 2020). Although AI offers exciting opportunities to enhance the tourist experience, it is essential to ensure that all players in the sector, both large companies and small and medium-sized tourism companies, have access to and the ability to take full advantage of these technologies. Otherwise, there is a risk of generating inequalities in the sector and excluding certain groups of tourists (Brossi et al., 2019).

In addition, the implementation of AI also poses ethical and social challenges (Gómez, 2022). That is why in a globalized context it is important to establish clear regulatory frameworks and supervision mechanisms to guarantee that AI is used ethically and responsibly (Álvaro, 2017).

Despite these challenges, AI also provides numerous opportunities for the Spanish tourism sector (Más-Ferrando et al., 2020). The ability to process large volumes of data and offer personalized recommendations can significantly improve the tourist experience, allowing for more efficient planning and a service offering more tailored to individual preferences (Ivanov and Webster, 2019). In addition, AI can also play an important role in the sustainable management of tourism, helping to reduce environmental impact and optimize resources (Samara et al., 2020).

However, the implementation and open debate on AI, and specifically in the tourism sector is still very incipient, this circumstance makes the analysis of this relationship still very initial. The main objective of this article is to analyse the opportunities and challenges associated with the implementation of AI in the tourism sector in Spain. It aims to examine the role of AI in improving and transforming the services offered in the tourism industry, with specific focus on areas such as personalizing the customer experience, optimizing destination management, and enhancing safety measures. The article also discusses the ethical and social implications of implementing AI in the tourism sector. Ultimately, the goal is to highlight the significant potential of AI to transform and improve the tourism industry in Spain, while emphasizing the importance of addressing the challenges that arise along the way.

For the correct development of responding to the main objective set in this article, the bibliography search in the digital library: ACM has been used and Google scholar. To specify the exploration, it has been stated using keywords such as tourism, AI and ethics.

The article presents several outcomes based on the analysis of the potential opportunities and challenges of implementing AI in the tourism industry in Spain. One of the main outcomes is that AI has the potential to transform and improve the tourism industry by personalizing the customer experience, optimizing destination management, and addressing specific challenges. AI can help tourism companies to better understand their customers' preferences and needs, and provide personalized

recommendations and services. It can also help destination managers to optimize the use of resources and improve the sustainability of tourism activities.

Likewise, throughout the article we will be able to see that a successful implementation of AI in tourism requires collaboration between interested parties, the development of regulatory frameworks and investments in research and development. Collaboration between tourism companies, research centres and universities are essential to identify new opportunities and overcome existing challenges. To ensure that the implementation of AI in tourism is ethically and socially responsible, a regulatory framework is needed. To advance the use of artificial intelligence in tourism, investment in research and development is needed.

In addition, the article highlights the importance of education and training for tourism professionals to adapt to changes and use AI tools effectively. The acquisition of knowledge in AI technologies, data analysis, and systems management is crucial to take full advantage of the opportunities that this technology offers. Specific education and training programs can help tourism professionals update their skills and adapt to changes brought about by the implementation of AI (Jarrahi, 2018) in the tourism industry.

The work has been structured as follows: Section 2 reviews the literature. Section 3 presents the methodology that we have followed for our research. Section 4 shows the potential opportunities that AI brings to the tourism sector. Section 5 presents the main challenges to which the tourism sector is exposed when applying AI. Section 6 presents the discussion in relation to the objective. Section 7 presents a series of recommendations. Finally, section 8 presents the main conclusions.

2. Theoretical framework

The tourism sector is constantly evolving, and in recent years it has witnessed significant advances in the field of AI (Kong et al., 2023). The combination of AI with technologies such as natural language processing, machine learning and computer vision has opened up new opportunities and challenges for the tourism industry (Kazak et al., 2020).

The implementation of AI in the tourism industry in Spain does not differ from what could be understood internationally, since this new tool offers significant opportunities to improve the customer experience, optimize destination management and address specific challenges (Zhang and Sun, 2019). As AI capabilities develop and improve, its importance in the near future of the tourism industry becomes even more apparent (Kazak et al., 2020).

We must take into account how AI can have various realities in terms of its applicability in the tourism sector (Alonso-Almeida, 2019). In the tourism sector, the personalization of tourist experiences has become a key factor in providing differentiated services and meeting customer expectations (Solakis et al., 2022). In this framework, AI has emerged as a powerful tool to collect, analyse and use large amounts of data about tourists, which allows tourism companies to offer personalized recommendations and suggestions that adapt to the individual interests of each tourist (Maedche et al., 2019). This involves the use of recommendation algorithms that take into account individual preferences, location, context, and other relevant factors. Personalized recommendations cover aspects such as destinations, activities, accommodation, restaurants, and special offers (Más-Ferrando et al., 2020).

Likewise, it is worth noting the importance of AI in personalized travel recommendations, since the use of machine learning algorithms and natural language processing techniques has led to a significant improvement in the accuracy of the recommendations, which results in more satisfying experiences for tourists (Pencarelli, 2020).

In addition to personalization, AI can contribute to the optimization of the management of tourist destinations (Pencarelli, 2020). The application of AI in the management of tourist destinations, through predictive analysis and machine learning, has the potential to significantly improve strategic decision-making and resource optimization in the tourism sector (Más-Ferrando et al., 2020). By predicting demand patterns and forecasting tourist influx, AI can enable more efficient planning, better resource allocation and higher tourist satisfaction, as well as can be used to forecast demand in different seasons and forecast the influx of tourists in specific destinations (Guerra, 2022).

This allows tourism companies to make informed and efficient decisions, which translates into more effective resource management, higher profitability and better customer satisfaction (Shoukry and Aldeek, 2020). Moreover, the automation of routine and repetitive tasks through AI can free up time and resources for tourism professionals to focus on strategic, higher value-added activities.

Although AI offers numerous opportunities in the tourism sector, it also poses challenges and ethical considerations that need to be addressed (Bulchand-Gidumal, 2022). The collection and use of personal data from tourists raises privacy and data security concerns. Furthermore, the use of AI algorithms in automated decision making may raise concerns about transparency, algorithmic bias, and fairness (Bostrom and Yudkowsky, 2014). Establishing strong regulatory and ethical frameworks is essential to ensure responsible and ethical use of AI in the tourism sector (Wong et al., 2023).

In addition, the implementation of AI in tourism also raises concerns about the impact on employment (García, 2019). As certain tasks and processes are automated, some jobs may be threatened (Saini and Bhalla, 2022). However, it is essential to address this challenge by training and retraining the affected workers (Tussyadiah, 2020).

But it is important to consider at what point is the development and implementation of AI in the Spanish tourism sector. In other words, is there a use of the potential benefits of AI by the Spanish tourism sector? The implementation of AI in the Spanish tourism sector is in constant development and growth (Filiari et al., 2021). Spain has been a leading tourist destination for decades, and the country's tourism industry has recognized the potential of AI to enhance the tourist experience, optimize operational management and foster competitiveness.

Currently, many Spanish tourism firms are adopting AI in different aspects of their operation. For example, AI-powered chatbots and virtual assistants are being used to provide personalized customer service and support at different stages of the journey, from planning to after-sales. These automated tools offer quick and accurate responses to tourist inquiries, improving efficiency and customer satisfaction.

The article aims to provide insights into how AI can improve the customer experience, optimize destination management, and address specific challenges in the tourism sector. Additionally, the article presents a series of recommendations for the successful implementation of AI in the tourism industry.

3. Methodology

To carry out the calculation of the work proposed in this article, we have started from a review of the literature, in which we have started from Samara et al. (2020) where they propose a "systematic literature review" approach as a structured methodology in a replicable way. That is why the ACM Digital Library and Google Scholar have been used as a source of information, which has allowed us to review those academic articles published to identify the effect of AI in the tourism industry and ethical impact.

Thus, in order to respond to our objective, our keywords have been the following:

- Tourism.
- Artificial Intelligence.
- Ethics.

As indicated in Samara et al. (2020; 346): "*To build this, we adopted a "systematic literature review" approach (Siddaway, 2014).*" For this we use the ACM digital library. Likewise, the Google Scholar search engine has been used as a parallel search tool.

Following Samara et al. (2020) we have taken into consideration those articles that were focused on AI (eliminating those studies focused on ICT in general). We have also taken into consideration those articles that took into contemplation the search terms.

4. Opportunities of Artificial Intelligence in the Tourism Industry

The tourism industry in Spain has experienced significant growth in recent years, becoming one of the most popular tourist destinations worldwide. The implementation of AI in this sector has provided a series of opportunities that have contributed to the development and strengthening of the Spanish tourism industry.

One of the main opportunities that AI offers the tourism sector is the ability to personalize the experiences of tourists (Salgado-Reyes, 2023). AI makes it possible to analyse large volumes of data on travel preferences, online behaviour and tourist demographics (Moreno-Izquierdo et al., 2022), which allows Spanish tourism companies to offer recommendations and suggestions tailored to the individual interests of tourists. every tourist. This not only improves customer satisfaction (Socarras-Peña et al. 2022), but also fosters loyalty to Spanish tourism brands (Alonso-Almeida, 2019).

Another outstanding opportunity is the optimization of operational efficiency in the Spanish tourism sector. According to a report from the *Instituto Nacional de Estadística* (INE), Spain received more than

35.3 million tourists in the first quarter of 2023. AI can take advantage of this data and analyse it to predict tourism demand, optimize prices for tourism services, and improve resource allocation such as staff, accommodation capacity, and transportation.

That is why AI can analyse large volumes of data in real time to predict patterns and trends. In the tourism sector, this can be useful to anticipate demand, optimize resource management (Bulchand-Gidumal, 2023) and prevent problems before they occur, which can lead to a significant improvement in profitability and in the supply of more efficient tourist services in Spain.

Assistance and customer service have also experienced significant improvements thanks to the implementation of AI in the Spanish tourism sector. AI-powered chatbots and virtual assistants enable tourism businesses to provide quick and accurate responses to tourist inquiries 24/7. This allows for fast and efficient customer service, regardless of the time of day or geographic location (Montaudon-Tomas et al., 2020).

Constant availability, personalization of recommendations, multilingual assistance, sentiment analysis and improvement of virtual experiences are just some of the benefits that AI has brought, improving customer satisfaction and loyalty in the tourism sector. This improves efficiency and customer satisfaction, and contributes to a smoother tourist experience in Spain.

In addition, AI offers opportunities for data analysis and strategic decision making in the Spanish tourism sector. Machine learning algorithms can analyse this data and extract valuable information about tourist patterns, trends and preferences.

Likewise, AI can help tourism companies to better segment and understand their audience. By analysing demographic data, preferences and behaviours, AI can identify specific customer segments and deliver personalized offers and experiences. Consequently, this allows Spanish tourism companies to adapt their offer based on market demands and improve their competitiveness.

5. Challenges of the implementation of AI in tourism

The paradigm of AI in tourism presents important challenges in its implementation. It is important to clearly identify what they are and how they can be dealt with. Considering the objective of this article, we are going to delve into them.

Digital divide and equitable access: The implementation of AI in the tourism sector can generate a digital divide, where certain groups of the population do not have access or sufficient knowledge to use these technologies. This may exclude segments of tourists and limit their ability to access personalized and AI-enhanced services. It is essential to address this digital divide and ensure equal access to AI-based solutions to avoid the exclusion of certain groups.

Privacy and data security: AI in tourism involves the collection and processing of large amounts of personal data from tourists. This raises privacy and data security concerns, especially with regards to the protection of sensitive information. Establishing strong data protection measures and ensuring compliance with privacy regulations is critical to protecting tourists' personal information.

Bias and transparency: AI algorithms used in tourism can introduce unintended biases into automated recommendations and decisions. These biases may be based on historical data that reflects previous inequalities or preferences, which could perpetuate discrimination or inequity in tourism offerings. There is a need to develop transparent algorithms and ensure that steps are taken to mitigate and eliminate any algorithmic bias, thus promoting fairness and transparency in the sector.

Loss of jobs and change in required skills: The implementation of AI in tourism can have an impact on the labour market, automating tasks that were previously performed by humans. This can result in job reductions in certain roles, posing challenges in terms of replacement and retraining of workers. Policies and training programs need to be considered to ensure that workers can acquire the necessary skills to take advantage of the opportunities that arise with AI.

Ethics and responsibility: AI raise ethical questions and responsibilities in tourism. For example, AI-based automated decision-making can raise ethical dilemmas in terms of responsibility and accountability. Also, misunderstanding or misinterpretation of AI recommendations or suggestions can lead to problems for tourists. It is essential to establish ethical frameworks and clear regulations that guide the responsible use of AI and protect the rights of tourists.

6. Discussion

The implementation of AI in the tourism industry presents both opportunities and challenges. This is why it has been found that it is necessary to optimize the benefit generated by AI in the tourism sector

(Tussyadiah, 2020). However, the use of AI has great potential to increase the efficiency and personalization of services (Huang and Rust, 2018). In the discussed article, the main objective is to analyse the role of AI in the tourism sector in Spain and highlight the potential benefits it brings, as well as the challenges that need to be addressed.

AI offers several opportunities for the tourism industry in Spain. One significant opportunity is the ability to personalize the experiences of tourists. By analysing large volumes of data on travel preferences, online behaviour, and tourist demographics, AI can enable tourism firms to offer tailored recommendations and suggestions to individual tourists (Samara et al., 2020). This personalization not only improves customer satisfaction but also fosters loyalty to Spanish tourism brands.

In addition to personalization, AI can optimize operational efficiency in the tourism sector (Huang and Rust, 2018). Through the analysis of data on tourism demand, AI can predict patterns and trends, allowing for more efficient planning, better resource allocation, and higher tourist satisfaction. This can lead to improved profitability and the delivery of more efficient tourist services in Spain.

Furthermore, AI can contribute to the management of tourist destinations. Real-time data analysis on booking trends, weather, tourist congestion, and behaviour patterns can help destinations anticipate demand, strategically plan the distribution of resources, and efficiently manage tourist flows. This can result in improved strategic decision-making, resource optimization, and enhanced overall management of tourist destinations.

However, the implementation of AI in the tourism sector also poses challenges that need careful consideration. One of the main challenges is ensuring the privacy and security of tourist data (Boyd & Holton, 2018). With the collection and processing of large amounts of personal information, it is crucial to establish robust protection mechanisms to prevent misuse of data and protect the privacy of tourists.

Another challenge is the potential existence of a digital divide that could arise from the adoption of AI in the tourism sector. It is important to ensure equal access to AI-based solutions and technologies, avoiding the exclusion of certain groups of tourists. Additionally, ethical and social challenges need to be addressed, such as algorithmic bias, transparency, and the impact on employment (Gurkaynak, et al., 2016).

To maximize the positive impact of AI in the tourism industry, certain recommendations can be considered. Public-private collaboration is essential, with government authorities playing a crucial role in establishing policies and regulations, and tourism firms investing in research and development. Trust and transparency should be promoted by ensuring tourists understand how their data is used and implementing strong ethical standards and clear communication (Samara et al., 2020).

Education and training programs can help tourism professionals acquire the necessary skills to effectively use AI tools and adapt to technological changes. Investment in research and technological development is also important in order to identify new opportunities and overcome existing challenges in the application of AI in the tourism industry.

Finally, regarding the objective set out in this article, we can see how it highlights the need to identify moments and aspects of the tourist experience that can be improved with the application of intelligent automation (Tussyadiah et al., 2020). It emphasizes the importance of designing AI systems that are robust, secure and transparent (Russell et al., 2015). The article also analyses the adoption of intelligent automation by tourism organizations, employees and tourists (Goel et al., 2022). Furthermore, it emphasizes the need to evaluate the impacts of intelligent automation on individuals, industry and society and anticipate the positive and negative impacts of automation on tourism (Pagallo, 2016). Overall, the research agenda proposed in the article aims to optimize the benefits of intelligent automation while mitigating potential risks and challenges in the tourism industry.

Nevertheless, there are also potential negative impacts, such as job displacement (Tussyadiah, 2020) and concerns about privacy and data protection (Pan et al., 2015). This is why it is important to carefully consider these potential impacts and prioritize research that can help ensure the beneficial applications of intelligent automation in tourism.

7. Recommendations and Future Perspectives

As Artificial Intelligence continues to evolve and its application in the tourism industry in Spain expands, it is important to consider some future recommendations to maximize its positive impact.

That is why it would be important to promote public-private collaboration. In this sense, the successful implementation of AI in tourism requires a close collaboration between the public and private sectors in that government authorities can play a crucial role in establishing adequate policies and regulations, while tourism companies must invest in research and development. Development to

adopt cutting-edge AI solutions. In addition, we must not forget the potential collaboration between companies and universities that can foster innovation and the exchange of knowledge.

Likewise, it would be interesting to promote trust and transparency. Under this umbrella, the confidence of the tourist for the success of the implementation of AI in the tourism industry should be included as the main entity.

Businesses must ensure that tourists understand how their data is used and ensure transparency in data collection and analysis processes. Adherence to strong ethical standards and clear communication can help build trust and mitigate privacy concerns.

Education and training should be promoted, since, with the implementation of AI, it is necessary to train and update the skills of tourism professionals. The acquisition of knowledge in AI technologies, data analysis and systems management will be crucial to take full advantage of the opportunities that this technology offers. Specific education and training programs can help tourism professionals adapt to changes and use AI tools effectively.

Finally, it is necessary to encourage investment in research. In this case, the importance of having continuous research is highlighted, as well as an investment in technological development, since these are essential to promote the application of AI in the tourism industry. Tourism firms, research centers and universities must collaborate on joint research projects to identify new opportunities and overcome existing challenges. This can help keep Spain at the forefront of innovation in the tourism sector.

8. Conclusions

AI has significant potential to transform the tourism industry in Spain in the near future. The personalization of the customer experience and the optimization of destination management are just a few examples of how AI can improve the quality and efficiency of tourism services. However, it is essential to address the challenges and ethical considerations associated with the implementation of AI, such as data privacy and the impact on employment. By properly overcoming these challenges, AI can play a crucial role in the growth and sustainable development of the tourism industry in Spain.

AI has significant potential to transform and improve the tourism industry in Spain. Personalizing the customer experience, optimizing destination management and improving security are just some of the areas where AI can make a difference. However, it is essential to address the challenges and ethical considerations associated with its implementation. Data privacy and the impact on employment must be adequately managed to guarantee the sustainable development of the tourism industry in Spain.

That is why it is considered that AI can help tourism companies make more informed and appropriate decisions by using mathematical algorithms and data patterns to learn complex relationships and make decisions. Instead of programming the machine to do a task, the machine can "train" itself to perform a specific task. This allows tourism companies to obtain valuable information about their customers and operations, allowing them to customize operations for each customer and improve customer satisfaction, loyalty and repurchase. In addition, artificial intelligence is also being used through virtual agents for customer service tasks, which can improve the quality of service.

Therefore, the main conclusions of the article are that AI plays an important role in the quality and efficiency of service automation in the tourism industry, and that the use of robots and machine learning are the thematic trends that mark the point. starting point for new research approaches on this topic.

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