

# Applications of Artificial Intelligence in Revolutionizing the Travel Industry

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## ABSTRACT

With the development of ICTs, vivid changes have been experienced in the travel industry. Artificial Intelligence (AI) is becoming an integral part of everyday lives and it is also impacting the travel industry to a great extent. The travel industry has always been among the leading industries to adopt the latest technologies. It has also acquired the AI-enabled tools for providing a seamless travelling experience to the travellers. The use of travel chatbots, customer service travel bots, voice assistants, service automation and robots have been able to fulfill the demands of modern day tourists. This eventually leads to personalization of tourism services, upgradation of operations and increment of productivity. Artificial Intelligence (AI) has proved to be of great help during the COVID-19 pandemic when there were restrictions on travelling and social distancing regulations were being followed by the travellers. It has a promising future in the travel industry as well. The present study tends to discuss the various usages of artificial intelligence in improving the travel industry. The paper also tends to highlight the impact of artificial intelligence in revolutionizing the travel industry and offering a better travel experience to the tourists.

**Keywords:** Artificial Intelligence, chatbots, digital transformation, robotics, technologies, tourism, travel industry, virtual assistants.

## INTRODUCTION

There has been constant evolution in the technology of the world. New innovations have come up which are now being widely used in all fields including the travel industry, more specifically termed as Artificial Intelligence (AI). The word AI has been defined as “*the ability of a machine to display human-like capabilities such as reasoning, learning, planning and creativity.*” (European Parliament, 2020)

The travel industry has always been among the leading fields in adopting latest technological developments. The industry has also realized the potential of Artificial Intelligence (AI) and is using it for optimizing the workforce and revolutionizing the tourists’ experience and the travel industry as a whole. The travel industry relies on data analysis for making strategies for the future and propels it towards new horizons. Chatbots are being used as a cost-effective technology by the travel-based companies that help to reshape the way tourists interact with their businesses and it also accesses crucial information of the tourists. Virtual assistants are also used by the travel-based companies which is an AI-enabled application. These are used to help the tourists in their planning and for ensuring a seamless and enjoyable experience to them. They answer the queries of the tourists and give them personalized services by using machine learning and natural language processing. During COVID-19 pandemic, AI

was used for thermal imaging at airports. Automated check-in systems and baggage handlers, virtual tour guides, use of robots in hotels and restaurants, sensor-powered automatic sanitizer dispensers greatly helped the tourists to travel following the social distancing guidelines after the COVID-19 pandemic hit the world. Contactless solutions and self-service kiosks were being embraced by the travel industry during the pandemic era.

## REVIEW OF LITERATURE

**Tsaih and Hsu (2018)** tried to provide a conceptual framework compiling artificial intelligence learning, organisation, business processes for assisting smart tourism stakeholders for creating business level IT strategy. The study proposed a conceptual model covering variables like smart destination, Artificial Intelligence and smart business ecosystem to develop smart tourism initiative for providing smart experience to the tourists. It was concluded that the sophisticated AI technology needs to be simplified into a cognitive function for developing smart tourism industry.

**Zlatanov and Popesku (2019)** discussed about the recent applications of artificial intelligence in the travel and hospitality industry. The paper tried to provide insights of travel chatbots including Facebook chatbots, customer service travel bots and AI-based travel bots. The paper also emphasized on the usage of robots in the tourism industry. It was concluded that Artificial Intelligence, service automation and robots have opened vast opportunities for the travel-oriented companies and organizations. Artificial intelligence tends to provide valuable information to the tourists. It also helps to provide personalized tourism services and ensure the improvement of operations and increment of productivity.

**Ivanov and Webster (2019)** analyzed the usage of Robotics, Artificial Intelligence and Services Automation (RAISA) in the tourism and hospitality industry comprising of restaurants, hotels, events, museums and tourism information centres. The usage of self-service technologies in the travel and hospitality industry was also being discussed. Apart from this, customers' attitude towards robots used in the travel and hospitality industry was also being focused upon. The exploration of chat bot adoption in travel services and service automation affects the service quality and tourists' experience was also done. It also focused on the practical problems arising from RAISA adoption in various tourism sectors.

**Ferras et al. (2020)** studied the use of open innovation and AI in creating new opportunities in tourism industry. It also discussed that how AI transforms customer experiences using search tools, cognitive interfaces and social media platforms for making rational decisions. It was found that the tourist satisfaction can be enhanced by providing them with customized activities and experiences depending on their personal traits and motivations which leads to increment of emotional component of tourist experience. It was also revealed that smartphones have also played an essential part in transforming tourist experiences in the recent years. Other digital technologies like artificial intelligence, big data and voice recognition can lead to better customer experience in a cost-effective and automated way even to the low-profile tourists.

**Samala et al. (2022)** attempted to highlight the role of robotics and artificial intelligence in the tourism sector. The paper explored the expected changes and challenges of tourism industry. It provided a systematic study on the recent technologies of robotics and artificial intelligence applied in the tourism industry. It was found that artificial intelligence although helps in providing a better experience of tourist services but it cannot include the human aspect in it which is regarded as an integral component of experiential tourism. Artificial intelligence helps to simplify the process of making travel arrangements. AI helps to offer a personalized experience to the tourists and also provides them automated travel

services which end the process of making travel arrangements with the help of travel agents. It was highlighted that the use of virtual reality, chatbots and language translators in the travel and hospitality industry can prove to be beneficial for the tourists.

### OBJECTIVES OF THE STUDY

The underneath objectives were focused in the study:

1. To highlight the usage of Artificial Intelligence (AI) in the travel industry.
2. To explore the impact of Artificial Intelligence (AI) in revolutionizing tourists' experience.

### SIGNIFICANCE OF THE STUDY

The study based on the usage of Artificial Intelligence (AI) in the travel industry is crucial as it is the need of the hour and it is the most promising technology based solution for every industry including the travel industry. Also, when the COVID-19 pandemic hit the world, Artificial Intelligence (AI) proved to be of immense potential for allowing travel enthusiasts to travel without chaos and by following social distancing norms. AI will prove to be beneficial in the coming days and will transform the way the travel companies offer and deliver the services to the travellers and the way they experience it. This will eventually lead to increment in travellers' satisfaction levels. The present study is expected to highlight the usage of AI in the travel industry and to explore its impact in transforming tourists' experience.

### RESEARCH METHODOLOGY

The present study incorporates the information acquired from the secondary sources like previously published research papers, books, websites, etc. to provide a discussion on the applications of Artificial Intelligence (AI) in transforming the travel industry.

### USAGE OF ARTIFICIAL INTELLIGENCE (AI) IN THE TRAVEL INDUSTRY

Before the introduction of Artificial Intelligence (AI) in the travel industry, travelling was treated as a chore activity. With the help of AI, different technologies are integrated for improving the services provided to the tourists. AI has helped the tourists in making travel arrangements. It also caters tourism services to the tourists in an automated and customized manner. AI when used in travel industry tends to offer a personalized experience to the tourists.

The following discussion summarises the usage of artificial intelligence in the travel industry:

1. **Use of AI Assistants in Travel Booking:** AI has helped the tourists a lot in giving them a sense of relief from visiting travel agencies or railway stations to get their tickets booked or for booking the place of accommodation for their travel. With the development of Artificial Intelligence (AI) assistants and chatbots deployed in social media platforms such as WhatsApp, Facebook etc., the tourists can now make personalized booking for their travel without taking the help of travel agents. Apart from this, travel reservation websites like Expedia, booking.com etc., are also using chatbots for the same purpose. The Skyscanner chat bot used in Facebook or WhatsApp helps not only to search the cheapest flights but even help in its booking.
2. **Use of AI Applications to predict Flight Demands:** Data science algorithms and advanced AI are also useful to forecast flight demands. AI-enabled weather solutions also help in predicting the changes in weather patterns that will lead to the variations in flight demands and preferences.

Weather predicting AI technology is crucial for ensuring flight safety to the passengers from phenomena like turbulence due to thunderstorms, low-visibility to pilots, etc. As it is inevitable to challenge the weather conditions and the passengers' overall travel experience also get impacted by the delayed flights or due to flight safety concerns, AI-based tools play a crucial role in not only enhancing passengers' satisfaction levels and their perceptions about the brand but also ensures operational efficiency which majorly gets affected by the hazardous weather conditions.

3. **Use of AI in Advanced Personalization in Travel Booking:** With the advancements in machine learning, data science and AI, tourists are now able to receive personalized recommendations tailored to their requirements. AI systems adopt data-driven approach to ensure the same by analyzing huge datasets like the history of tourists' data, tourists' feedback, their user profiles and social media platforms interaction. This is used to know about both the preferences and patterns of the travellers which further leads to predict accurately and recommend the most relevant travel options to the travellers aligning with their interests and requirements.
4. **Use of Robots for offering face-to-face Services to Tourists:** Chatbots are being used by the travel agencies, hotels, restaurants, airlines etc. to cater one-to-one services to the travellers and further improve the services. These chatbots started to be used more frequently after the occurrence of COVID-19 pandemic. These AI-enabled chatbots are designed in such a way that they can give answers using automated responses to all the frequently asked questions. Robots are being employed in some airports like that in London Heathrow Airport to assist passengers in terminals. This also limits the usage of human agents. Apart from this, hotels are also using robots like the Henn-na Hotel of Nagasaki is known to be the first hotel of the world that has employed multi-lingual robots which ensure check-in and check-out processing. These robots also increase guest interactions by providing them personalized assistance and immediate responses. This way, AI in travel industry helps in offering innovative services to the travellers. Voice assistants are also being used in hotel rooms, for airport security and in ships. Robot receptionists are also being used in hotels that directly interacts with the guests.
5. **Use of Data Analytics for revealing Valuable Insights:** The vast amount of data created in the travel industry can prove to be very beneficial to the travel companies if they can well interpret it to identify what worked better for the travellers. Travel companies can use AI to sort this huge amount of data rapidly and accurately which was a cumbersome task for humans. For instance the renowned Dorchester Collection Hotel uses AI for processing and analyzing the guests' data on the basis of their reviews, feedbacks and online polls with the help of its AI-based platform Metis for determining the overall performance of the hotel. This way, the travel-based businesses can provide better solutions that would satisfy the requirements of the visitors by determining the trends of the visitors. AI tools also ensure data security as most of them are cloud-based and use encryption protocols.
6. **Use of AI-enabled Tools in Revenue Management of Travel Businesses:** With the usage of AI-powered tools, revenue management becomes not only easier but also faster. These tools enable processing payments very well and reveals the amount of money the business has by taking into consideration both incoming and outgoing cash. Also, these tools ensure that the correct payment is being received for the correct service and the charges from the travellers are also correct each time they pay. This helps in saving time as well of the administration staff. Also, AI-based accounting software used for the travel businesses can help to convert the revenue data into graphs and charts.

These types of software can also help in creating invoices and making better forecasts for the businesses they are employed in.

- 7. Use of AI-powered Software in managing Finances and Accounting of Travel Businesses:** AI-based software not only help the travel businesses to manage their finances and accounting but also help them to stay in accordance with the latest rules and regulations, even the newly implemented ones. It also helps to check and ensure that the records are being kept in a better and organized manner which makes it easier to scan. For instance, if a travel-based company makes use of self-service tax software, it can get benefits in both its finances as well as accounting processes. This is possible as it makes the process of paying tax easier for the end users.
- 8. Use of AI to provide Self-service Technology to Travellers:** Self-service technology can be used by the travel businesses as not all of them are capable enough of employing experts for doing each task. The self-service technology streamlines the check-in process at the airports and hotels to provide a smoother experience to the travellers. Digital self-service kiosks also provide effortless pick-up and streamlined drop-off services to the travellers for improving their car rental experience. Self-service kiosks also help the guests to browse menus, place orders and pay without waiting for the waiter. It also enables customers to buy tickets, select seats and order concessions at the entertainment venues. This eventually helps to meet up the demands of the tech-savvy generation, i.e. the Millennials and Generation Z, who travel the most and are used to adopt the latest technologies for simplifying their lives. This also helps to boost efficiency, provide valuable insights of travellers' preferences and helps in cost-savings for the travel businesses.
- 9. Conducting Sentiment Analysis using Social Media Platforms:** Airlines and hotel companies use the social media platforms to determine the sentiments of visitors. Tools like Brand24, Pure Strategy and Mindtree's PaxPulse also use Automated Neural Intelligence Engine (ANIE) for tracking visitors' sentiments and providing a better experience to them. For instance, if the customers post about an issue on its social media profile expressing their problems, a listening tool will make it analysis and provide some suggestion to resolve the issue of passengers in real time.
- 10. Use of AI in conducting Room Mapping and Dynamic Price Tracking:** AI can also be used for room mapping through which dynamic prices can be tracked for same room via different suppliers. It can also be added to forecast dynamic prices for a room to know the time duration for which it will remain the cheapest. Hotelmize, the leading hotel booking solution, uses AI for room mapping.
- 11. Use of AI-based Solutions for Smart Baggage Handling:** AI has got the potential of providing a better baggage handling system at the airports. This will also help to track the lost luggage and handle millions of bags that airports get each year. AI-empowered baggage handling solutions can simplify the process of moving and tracking the baggage. For instance, the Eindhoven Airport has successfully used Bags ID technology for luggage handling without baggage labels.
- 12. Use of AI-based Recommendation Systems for enhancing Customer Engagement:** AI-enabled recommendation systems are used by the travel-based companies for connecting with their customers and maintaining long lasting relationships with them. The travel companies can drive customer engagement using push notifications, offering discounts, sharing relevant advices related to travel, personalized e-mails, local events, fairs, etc. Travel companies can enhance their brand reputation and repeat bookings through AI-based customer engagement solutions. Positive customer engagement also enhances word-of-mouth marketing as satisfied customers recommend the services they received to their near and dear ones.

## IMPACT OF ARTIFICIAL INTELLIGENCE (AI) IN REVOLUTIONIZING TOURISTS' EXPERIENCE

1. Chatbots and visual assistants used by the travel businesses are transforming sustainable tourism as they give personalized recommendations to the visitors on the basis of their demands and interests. Thus, it helps in revolutionizing the tourists' experience.
2. AI also provides information to the tourists regarding eco-friendly practices that they need to follow. It also helps the travel businesses to propagate sustainability with the help of better marketing strategies. This eventually helps to promote responsible eco-tourism.
3. The personalized travel recommendations provided to the travellers through AI-enabled chatbots help them to know about relevant tourist spots, accommodation and transport options on the basis of their past travel history and interests. This helps to ensure that the travellers get to know what they wanted to know and enhance their travel experience.
4. Modern day chatbots provide real-time customer support to the travellers and can provide them aid to book transport, hotels, etc. on the basis of their preferences. It also provides 24×7 customer support to the travellers. Frequently asked questions by the travellers are also answered by the chatbots.
5. Chatbots having language translation capabilities can help to facilitate communication with local people. For instance, AI-powered translator of Google can help to translate text into pictures that too in real time. It helps those travelling internationally who do not know the local language.
6. Innovative chatbots also assist the travellers by acting as virtual travel guides. They can also provide real-time information of weather conditions and that of local tourist sites, dining options, etc. for ensuring a seamless experience to the visitors.
7. Real-time updates related to the status of flight, delays, etc. are also being provided by virtual assistants which help to keep them informed throughout their journeys.
8. AI-based virtual assistants also offer travel advices and the required information like that of packing lists to make the trip of the travellers more enjoyable and smoother.
9. AI can also transform destination management. This it can do by reducing congestion and optimizing tourist flows. This will help not only to provide an enriching travel experience to the visitors but also help in conserving the natural and cultural heritage of the tourist destinations.
10. Travel companies can become trusted ones by providing valuable updates to the tourists. Positive customer engagement also helps them to enhance their brand reputation and word-of-mouth marketing as satisfied visitors recommends the services received to their near and dear ones.

## CONCLUSION

Artificial Intelligence (AI) has immense potential in enhancing travellers' experience. It can help in further promotion of the travel and tourism industry by ensuring a seamless experience to the visitors during the journeys. AI is assumed to be the most promising technology for the future as it has the capacity of delivering personalized experience to the travellers and streamline operations. It also has vast capability to promote each aspect of the visitors' experience. This technology has to address some challenges too including ethical considerations, data privacy and security and potential of bias in AI-based algorithms. By navigating these challenges, travel-based companies can adopt and improve this technology for ensuring better and seamless travel experience to the visitors and smooth operations while maintaining high levels of tourists' satisfaction for making the trip enjoyable and memorable one for the visitors. These challenges need to be addressed by the travel-based companies. Therefore, the

travel-based companies should focus on using AI-empowered tools effectively for certifying a sustainable and eco-conscious prospect for the travel industry.

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