JETIR.ORG ISSN: 2349-5162 | ESTD Year : 2014 | Monthly Issue
JOURNAL OF EMERGING TECHNOLOGIES AND INNOVATIVE RESEARCH (JETIR)
An International Scholarly Open Access, Peer-reviewed, Refereed Journal

# Conventional to Intelligent Tourism: Role of Artificial Intelligence

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**Abstract:**

The article aims to study the relationship between artificial intelligence technology and the paradigm shift from traditional tourism to intelligent tourism, aiming to foster advancement in this area. The paper critically analyses the role of AI in Customer Service, personalization, operational efficiency, marketing, and sustainability. The study reviews the literature available to substantiate the claim that AI has transformed travel experiences through automation, augmentation, understanding, and interaction.

The research evidence collected through secondary data supports the claim that AI has accelerated the enhancement of experiences both for sellers as well as consumers through Automated Booking Systems, Data Management, Customized Itineraries, Targeted Marketing: Dynamic Pricing, Resource Management, Predictive Maintenance, Chatbots and Virtual Assistants, Customized Recommendations, Customer Segmentation, Sentiment Analysis, Content Creation, Energy Management, Sustainable Travel Recommendations and Environmental Monitoring. The paper also precisely discusses the challenges the tourism industry faces with the use of AI.

**Keywords – Artificial Intelligence, Technology, Computerisation, Tourism, Travel, Ethics, Automation, Environment**

## Introduction:

The global travel and tourism industry has experienced substantial transformations. Technology has exerted a profound influence on it, specifically concerning the behavior of tourists and the strategic decisions made by managers. The use of technology in the sector is not a recent phenomenon. However, the pandemic has compelled businesses in the industry to reassess the role and integration of technology and acknowledge its growing role as crucial in shaping the industry (Ivanov D., 2019).

The travel and tourism industry, also known as T&T, has a rich history of evolution. It has seen substantial alterations, from traditional tour offerings to contemporary, individualized, and environmentally conscious travel experiences. Now, at a rapid pace, artificial intelligence (AI), in its most recent incarnation, is continuing this transition. In 2023, the Travel and Tourism industry contributed 9.1% to the global gross domestic product, and its growth is expected to continue.

Artificial intelligence, or AI, is the term used to describe the ability of computers or machines to perform tasks that would typically necessitate human intelligence. In the travel and tourism industry, AI has the potential to revolutionize the customer experience, making it more personalized and efficient. The concept is closely associated with automation, which involves executing processes with minimal human intervention.

Businesses are accumulating and archiving substantial data. This data is not just information but the fuel that powers the implementation of AI in the travel and tourism industry. It enables machines to perform a variety of tasks, including data analysis, problem-solving, speech translation, direct messaging, and the enhancement of personalization throughout the consumer journey. Understanding the role of data in AI implementation is crucial for staying informed and aware of the technological advancements in our industry.

Artificial intelligence (AI) can revolutionize the worldwide economy's efficiency and gross domestic product (GDP) capacity. To do that, strategically investing in various forms of AI technology is necessary. 1Studies indicate that nearly half, precisely 45%, of the overall economic benefits projected for 2030 will be derived from product improvements, stimulating consumer demand. This is because AI will result in a broader range of products, offering more personalized options that are more appealing and affordable as time goes on.

**Objectives of AI:**

- **Automation**: The process of completing repetitive or complex duties with minimal human intervention.
- **Augmentation**: The provision of intelligent assistance to enhance human capabilities.
- **Comprehending**: Enhancing decision-making processes and acquiring insights from data.
- **Interaction**: Enabling intuitive and natural interactions between humans and machines.

**Scope of AI in the context of Tourism:**

The tourism industry is transforming due to the introduction of artificial intelligence (AI), which delivers creative solutions that improve customers' experiences, streamline operations, and propel growth. To comprehend AI's function in the tourism industry, it is vital to have a comprehensive understanding of its breadth.

[1] PwC's Global Artificial Intelligence Study: Exploiting the AI Revolution

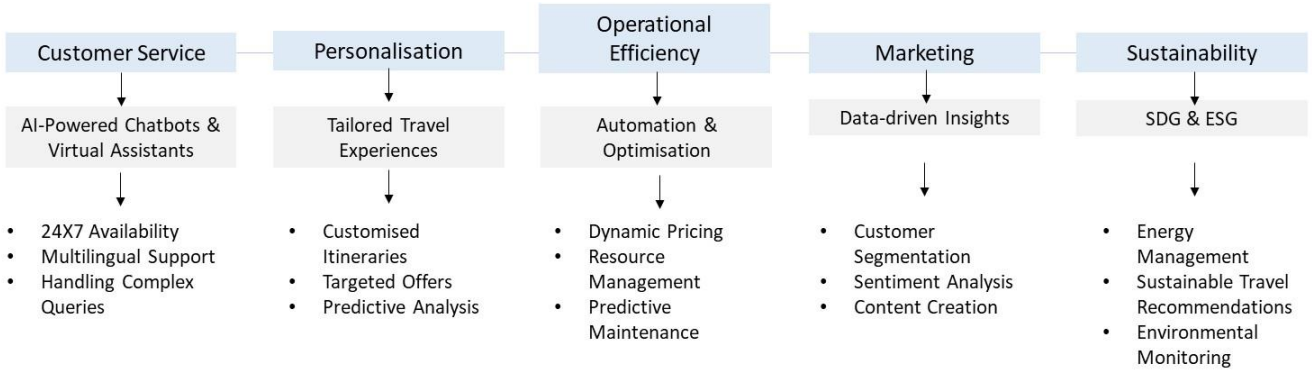


**Figure 1: Role of AI in Tourism**

**Review of Literature**

Technology plays a significant and crucial part in developing the tourism experience. Additionally, it is likely the most widely acknowledged position. An increasingly prominent application of technology in creating tourism experiences involves using motion simulators within amusement parks. Destinations like Disney World and Universal Studios and individual entrepreneurs are utilizing these simulators to develop attractions that achieve astonishing degrees of simulated reality (Stipanuk, 1993).

A systematic business process re-engineering is required to ensure that several essential factors, such as a clear vision, efficient organization, strong commitment, and comprehensive training, are established. This would allow the tourism industry to fully use information technologies' remarkable potential (Buhalis, 1998).

"e-tourism" denotes the digitization of all processes and value chains associated with the travel and tourism industry. This enables businesses to optimize their productivity and efficacy (Buhalis, 1998).

Information and communication technology (ICT) has progressed towards mobile and web 2.0 apps, transitioning from being innovative in the market to becoming widely used applications. Consumer websites significantly influence PR and marketing efforts by effectively reaching a vast global consumer base. The growing importance of social media in pre-trip travel planning, decision-making, and the sharing of tacit information is becoming more prominent. (Khatri, 2018). The development of the Internet channel and the introduction of ICTs significantly altered the competitive landscape of the tourism sector within a very short period (Buhalis, 1998).

ICT is crucial in meeting information requirements for planning and strategy and generating value through business process management and redesign (Kahtri, 2019).

Advanced information technology (IT) is crucial for enhancing the tourism industry's competitiveness, facilitating growth, and creating new enterprises. Knowledge modeling and artificial intelligence help with marketing choices, and AI models are used to predict short-term tourism demand increases. It is also essential to consider how ready artificial intelligence is in urban and rural areas. (Afsahhosseini, 2020).

Artificial intelligence (AI) is the discipline that investigates and advances technology aimed at emulating and augmenting human intelligence in computers. The primary objective is to create conscious entities capable of comprehending their environment with precision and making decisions that facilitate the achievement of their objectives. Robotics, language recognition, picture recognition, natural language processing, and expert

systems are all research domains within artificial intelligence. The primary components of AI include input devices, arithmetic units, memory, controllers, and output devices. Input devices utilize sensors to replicate human organs, whereas output devices generate visual representations, auditory signals, written content, and audiovisual recordings (Zhang & Sun, 2019). In 2008, IBM introduced the concept of "smart tourism." Subsequently, the conventional tourism sector swiftly incorporated the Internet, Internet of Things, cloud computing, and AI technology.

Cloud computers, the Internet of Things, mobile terminal communication, and AI are all parts of intelligent tourism. These technologies work together to make the system work. For example, artificial intelligence is vital for managing tourism information tools and bringing the industry together (Zhang & Sun, 2019).

Thanks to technological advances, productivity has gone up in many fields. AI is one of the most critical new technologies. Ideas like the "sharing economy," "the Internet of Things," and "the Internet of People" are new ideas that we use every day with the help of AI. Travel firms and air transport corporations employ intelligent technologies and chatbots. Forecasts for the near future anticipate the emergence of customized solutions, resulting in additional restructuring within the long-standing technological revolution in the tourism sector (Zsarnoczky, 2017).

The development of Web 2.0 applications, which promote user participation and collaboration, has transformed Internet websites into platforms facilitating information sharing and engagement among users. This has had a significant impact on the tourism industry, leading to the integration of technology throughout the entire value chain and the emergence of the idea of Travel 2.0. (Werthner & Francesco, 2004) (Oklobdžija & Popesku, 2017).

Intelligent systems typically have two primary attributes: the capacity to perceive and comprehend their surroundings and acquire knowledge from their activities to optimize their chances of reaching specific goals. Intelligent systems and tourism are a compatible combination due to the multitude of decisions involved in traveling. By gathering and scrutinizing data regarding user preferences, individuals can expedite decision-making processes and significantly influence how individuals access information (Gretzel, 2011). To create memorable travel experiences, one must meticulously coordinate many elements, drawing from a profound understanding of travellers' requirements (Tussyadiah, 2014).

Contemporary tourists have higher expectations than ever before, anticipating nearly instant replies on digital platforms. Artificial intelligence enables enterprises to achieve response times that would be unattainable for people. Furthermore, chatbots and AI-enabled travel bots facilitate customization of the tourism experience, enhance operational efficiency, and boost productivity, all while ensuring consistent product quality. Nevertheless, a significant drawback of employing robots in the tourism and hospitality industry is the absence of customized service, a crucial business attribute (Martin, 2016).

When planning tourist experiences, it's crucial to think about the whole journey, from planning to participating to thinking about the trip afterward. It is crucial to encourage interest and active participation. It is crucial to be clear about how AI can improve, upgrade, or replace tourist experiences, especially regarding how users connect with the technology (Lindvall et.al., 2018)

The use of AI systems can optimize the selection of the most suitable tourist spots and enhance the social and physical infrastructure in the future tourism sector. Predictive analytics and virtual tourism information can effectively influence tourists to visit popular destinations. Investing in environmental, social, and governance (ESG) practices and integrating Internet of Things (IoT) technology can contribute to creating a more environmentally friendly and socially responsible future for the tourism industry. Consequently, artificial intelligence can create intelligent automation systems for the tourism industry.

Government policy is essential if we want to lessen the adverse impact that intelligent automation might have on the industry and society. One governmental action that could be used to deal with the problem of employment opportunities in fields related to artificial intelligence (AI) and to mitigate the effects of being too dependent on automation is implementing education and training programs. As another approach to help solve the problem of widespread unemployment caused by automation, promoting jobs that require much work, like hospitality, and giving everyone a basic income are both possible answers (Navío-Marco J. et al., 2018).

**Evolution of AI in Tourism:**

When AI was first used in tourism, it was mostly for simple tasks like automating tasks and processing data. Initially, AI was mainly used for back-end tasks like data analysis and inventory control. For example, one researcher looked into how technology is used in tourism and talked about how early AI systems helped make booking easier and better handle customer data (Buhalis et al., 2008).

**Notable Advancements:**

- **Automated Booking Systems:** Early AI apps automated booking processes, which reduced hand-made mistakes and made things run more smoothly.
- **Data Management:** AI was used to analyze large data sets, which provided information about customers' behavior and preferences.

As AI has grown, it has given the tourism business more advanced ways to customize customers' experiences. AI systems use machine learning algorithms to look at customer data and guess what customers would like, making travel experiences very personalized (Xiang et al., 2015)

**Notable Advancements:**

. **Customized Itineraries:** AI-made personalized travel plans for each person based on their likes and dislikes and past behaviours.

- **Targeted Marketing:** I found groups of customers and created targeted marketing campaigns, which made the campaigns more relevant and successful.

As technology improved, AI's role in making operations more efficient became clearer. AI systems automated tedious tasks and improved complicated processes, saving much money and using resources better. (Ivanov & Webster, 2017)

**Notable Advancements:**

- **Dynamic Pricing:** AI systems updated prices in real-time based on supply and demand, which increased sales.
- **Resource Management:** AI optimized the allocation of resources, such as staff schedules and inventory management, which made operations run more smoothly.
- **Predictive Maintenance:** I predicted when the equipment would break down and set up repairs at the right time, which cut down on downtime and improved service efficiency.

As AI technology improved, the utilization of AI technology in tourist-related tasks that involve direct interaction with consumers increased. AI-propelled chatbots and virtual assistants have made significant strides forward. They enhance customer service by quickly responding to inquiries and simplifying the booking process. The chatbots are available to provide assistance and personalized suggestions on a 24/7 basis. (Tussyadiah & Park, 2018)

**Notable Advancements:**

- **Chatbots and Virtual Assistants:** These tools provided immediate assistance, reducing response times and improving customer satisfaction.
- **Customized Recommendations:** Artificial intelligence to evaluate consumer data to provide personalized trip suggestions, improving the user experience.

The ability of artificial intelligence to effectively process and analyze large amounts of data has led to a substantial revolution in marketing strategies in the tourism industry. Artificial intelligence (AI) enables a thorough examination of client behaviour and market trends, leading to improved marketing plans that are more effective and targeted (Buhalis & Leung, 2018).

**Notable Advancements:**

- **Customer Segmentation:** AI identified distinct customer segments, allowing for more personalized and effective marketing campaigns.
- **Sentiment Analysis:** AI analyzed social media and review platforms to gauge customer sentiment and adjust marketing strategies accordingly.
- **Content Creation:** AI-assisted creation of engaging and relevant content, improving customer engagement and brand loyalty.

Artificial intelligence is vital in promoting environmentally friendly practices when sustainability has emerged as a critical concern in the tourism industry. Artificial intelligence technologies are being utilized to optimize energy consumption, offer environmentally responsible travel options, and monitor environmental conditions (Gretzel et al.,2016)

**Notable Advancements:**

- **Energy Management:** AI systems optimized energy usage in hotels and other facilities, reducing waste and lowering carbon footprints.

- **Sustainable Travel Recommendations:** AI recommended eco-friendly travel options, such as green hotels and sustainable transportation.
- **Environmental Monitoring:** AI monitored environmental conditions and assessed the impact of tourism activities, providing data to support sustainable practices.

**Evaluating the Success of AI Implementations in Tourism:**

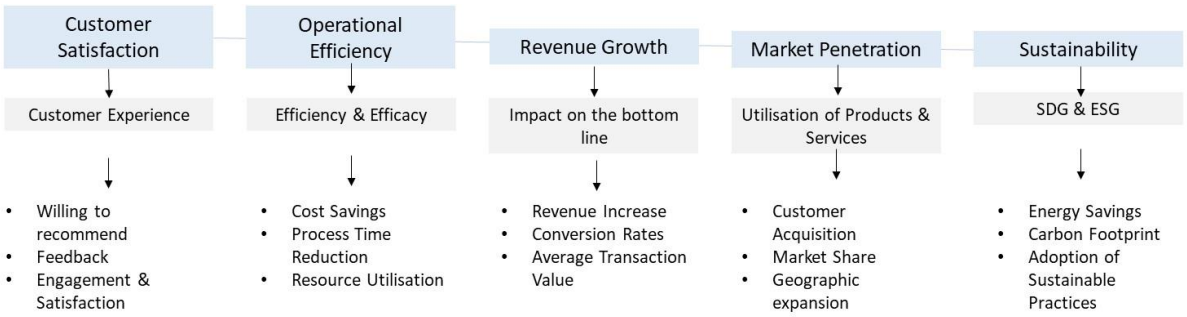


**Figure 2: Success of AI in Tourism**

**Future Direction:**

There is evidence that artificial intelligence has the potential to be utilized in the tourism industry in ways that are both more advanced and more beneficial. Artificial intelligence will be used to power virtual reality (VR) and augmented reality (AR), which will be used to create memorable travel experiences. Furthermore, strong machine learning models will enhance predictive analytics and personalizing quality, so producing more exact results.

**Emerging Trends:**

- **Immersive Experiences:** Virtual reality (VR) and augmented reality (AR) technology powered by artificial intelligence (AI) will help travelers virtually visit locations before they make travel decisions.
- **Advanced Personalization:** For more advanced personalization, AI will use more complex data sources, like biometric data and real-time behavioral analysis, to create travel experiences that are unique for each person.
- **Predictive Analytics:** Artificial intelligence's predictive capabilities will be enhanced, enabling it to more accurately foresee travellers' desires and preferences.
- **Sustainable Innovations:** AI will pivot the creation of innovative solutions that address social and environmental complications to promote sustainability in the tourism industry.
- **Ethical Development:** Transparency, accountability, impartiality, and consumer trust will become the guiding principles of developing ethical AI solutions.

**Ethics & AI:**

**Privacy -** Information Gathering and Application

Ethical Concerns:

- Consent: Visitors must be aware of the intended use of the data-collecting operation and must obtain explicit permission before data collection begins.
- Data Protection: Strong actions must be taken to guard data from illegal access and invasions. This would mean regularly conducting security audits, safe storage, and encryption.
- Anonymization: AI systems should protect personal data sensitively while protecting personal identities.

**Transparency** – Automated Decision-Making

Ethical Concerns:

- Explainability: AI systems must be able to justify the outcomes. This openness helps travelers to understand the reasoning behind particular advice or choices.
- Bias and Fairness: AI systems have to be free of prejudices that might lead to unfair treatment of people depending on their ethnicity, gender, nationality, or any other attribute. Developers have to be sure this is the case. One can help to lower this danger by employing regular audits and a range of training data.

**Inclusivity** - AI in travel can make travel more widely accessible for a larger, more varied population, including those with impairments. Still, if AI systems are not built inclusively, they can aggravate existing inequality.

Ethical Concerns:

- Universal Design: AI apps should be created with accessibility in mind, ensuring that they are usable by people with different degrees of ability. This covers abilities such as text-to-speech, voice commands, and multilingual support.
- Equitable Access: Every socioeconomic group should be able to benefit from AI-powered services, including affordability.

**Sustainability** – Environmental Impact

Ethical Concerns:

- Resource Efficiency: AI systems should designed to minimize power consumption. Green solutions must be explored and implemented.
- Promotion of Sustainable Tourism: AI can support sustainable tourism by giving people reasons to choose better travel options for the environment, like offering less crowded places to visit and encouraging people to take public transportation instead of driving their cars. The most important thing about ethical AI in tourism should be using good methods for the environment.

**Conclusion:**

Artificial intelligence is revolutionizing the tourism industry by fundamentally altering how it is run and controlled on a large scale. Thanks to developments in cloud computing, mobile internet, and the Internet of Things, artificial intelligence could improve administrative chores and vacation experiences.

Intelligent automation holds significant potential to revolutionize the tourism business shortly. This revolution will be achieved by decreasing the requirement for face-to-face interaction between tourists and tourism personnel.

Insufficient socialization correlates with the erosion of shared values essential for coordinated social interactions. These principles encompass a genuine regard for the well-being of others and safeguarding the environment by utilizing ESG standards. This inquiry aims to assess the extent to which artificial intelligence and robotics can help solve emerging difficulties.

Given our increasing dependence on virtual advisors and robots to manage daily activities and travel needs, we must shift our perception of intelligent agents from mere tools to complex and influential social entities. Through counselling, knowledge, and direction, computational systems can help individuals understand how physical and biological constraints affect behaviour and encourage responsible and successful behaviour.

Even with great development, the tourism industry continues to encounter challenges, including artificial intelligence. Addressing critical challenges, including algorithmic bias, data privacy, and the necessity of transparency in AI-driven decision-making, is of the utmost necessity. Additionally, to remain informed about the rapid advancements in artificial intelligence technology, the sector must consistently adapt to new developments and implement innovative practices. The power consumption of AI systems should be minimized. It is imperative to investigate and implement environmentally friendly solutions.

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