

The Use Of Artificial Intelligence In Tourism Industry Of India: A Critical Insight

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Abstract:

The augmentation of Artificial Intelligence (AI) in tourism businesses has gained considerable attention. AI promulgates significant transformation for the growth and development of the tourism industries of the world. However, for the tourism industry of India, although AI promises accelerated progress, it is a risky business. The socio-economic scenery of India is yet to harmonize with AI-based business. In this paper, the opportunities and challenges of the use of AI in the tourism industry of India are analyzed in detail. The cross-cutting opportunities that upgrade the tourism industry of India are detailed and the challenges that arise from the existing economic and social conditions of India are also listed in the present study.

Key Words: Artificial Intelligence, Tourism Industry, Opportunities, Challenges, India.

1. Introduction

The trending topic of recent decades, artificial intelligence (AI) can be acknowledged to revolutionize the industries of the world for the fifth time. AI pertains to understanding the fiber of human intelligence and creating intelligent artifacts that have the capacity to execute tasks on equal terms with the tasks executed by human intelligence. AI has installed and organized itself in our daily lives and revolutionized every industry. It has reordered the style of living and working in the world (Srivastava S. K., 2018). Like any other industry, the tourism industry is also impacted by the development and application of AI.

The tourism industry is recognized as the fastest-growing industry, economically and socially. The development and growth of the tourism industry have multiplying effects on the related industries. The development and growth of the tourism industry have the capacity to advance benefits to other sectors of the economy. It is an important tool and an economic powerhouse to transform the nation. Other than, supplementing the growth of an economy, it also improves quality of life, protects the environment, conserves cultural heritage, and promotes world peace. The Ministry of Tourism (MoT) of India has aimed to strengthen the tourism industry of India to reap its benefits. To foster development and facilitate tourism in India, the Indian MoT focuses on several policy areas including technology-driven development (MoT, India Annual Report 2022-23). The government of India has initiated the Digital India program to transform the economy into a digitally empowered economy. This vision of Digital India has embarked on the development of digital infrastructure, online governance, and services, to enhance digital literacy (Goswami H., 2016). The advancement of technology is transforming the functioning of the economy. The tourism industry of India is also undergoing transformation swiftly by adopting new

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and advanced technologies. This enables them to improve the client experience and streamline the company processes. There are a number of areas where automation is changing the tour and travel industry. In the tourism industry, AI and machine learning algorithms are being used in booking systems, detection of fraud, personalizing traveling plans, language translations, 24/7 customer service through chatbots and virtual assistance, hospitality, car rentals, and many more. The latest AI invention, ChatGPT is a powerful tool to bring radical changes in the present age of AI and automation. It has the ability to perform extended activities and can be used in the tourism industry.

Internationally, tourism industries of sophisticated countries operate AI-driven applications to enhance customer service. Japan is the first country in the world to have a hotel called Henn-na Hotel entirely staffed by robots that are multi-lingual. The state of Virginia of the US has also deployed a robot named Connie in the hotel Hilton McLean that uses Natural Language Processing to interact with humans and make recommendations. There are many areas where advanced countries of the world are utilizing AI in the tour and travel industry including travel agencies, luggage porters, security, bookings, etc (Barten, M., 2023).

In the tourism industry of India, although automation is capable of bringing transformation, it is important to be mindful of the fact that automation is not a catch-all solution. Despite the exceptional performance offered by AI in tourism, the full potential of automation in the tourism industry of India is far beyond reach. Considering this issue, the study aims to critically analyze AI and its uses in the tourism industry of India.

2. Objectives:

The study has the following objectives:

- i. To study the opportunities of the use of AI in the tourism industry of India.
- ii. To study the various challenges of the use of AI in the tourism industry of India.
- iii. To make a critical analysis of the use of AI in the tourism industry of India

3. Methodology:

The present study depended on secondary sources including published research articles, government reports, and the internet to achieve the above-mentioned objectives. Relevant industry examples were collected from newspapers published in various news portals on the internet and government reports. The study analyzed the secondary data to understand the opportunities and challenges of the use of AI in the tourism industry of India. The viewpoints to provide a critical analysis of the use of AI in the tourism industry of India were also developed based on these sources.

4. The Opportunities of the Use of AI in the Tourism Industry of India:

The application of AI and technologies can set up a tourism ecosystem that is intelligent and is able to design applications for the company, tourists, and the government. There is an increased use of AI in tourism industries that allows for fast transactions, effective comparison of prices, demand-oriented and personalization of services (Hsu M. J. et al., 2022). The most significant uses and opportunities of the use of AI in the tourism industries of India are discussed below:

i. Bookings:

Automation and Machine Learning algorithms have wide application in the booking system of the tour and travel industry. AI is capable of enhancing the tourist experience by suggesting to them the optimum and cost-effective bargains on accommodation, travel, and personalized travel plans. It is also used to develop traveling schedule systems that are efficient and precise. It also analyses the past data and makes predictions about the future prices related to tourism. This supports the decision-making process of the tourists.

According to a report by Brand India Equity (2022), 74 percent of Indians preferred online booking systems for domestic travel.

A report by BCG (2017), reported that markets of developed countries like the US, France, Germany, and the UK have digitized hotel bookings with more than 45-50 percent of hotel bookings done through online systems, and in India, 17 percent of hotel bookings are made through online systems. The penetration of the internet will develop growth potential for this space.

ii. Language Translation:

AI-powered language translators that use automated technologies have made cross-border travel much easier and trouble-free. For a country like India which is attributed with multiple spoken languages across its regions, language translators are a blessing and are essential for the tour and travel companies to serve tourists who do not speak the native language of the tourist destination. Language translators like the Google Translate applications support multiple languages and are also featured with typing translation, handwriting translation, conversation translation, and live camera translation.

The National Institute of Information and Communications Technology (2023) of Japan has announced that they have developed a new AI-based device called the VoiceBiz in Tokyo's Seibu Shinjuku Station. This device is capable of interpreting speech in 12 different languages and is fitted with a transparent screen where conversations are displayed to the customers. This initiative is being installed at ticket counters and will embrace travelers from different parts of the world. Similarly, Kotozna Inc. has also announced the launch of an AI multilingual translator called ConcierGPT on June 14, 2023. ConcierGPT is based on ChatGPT which is capable of providing specific information that is multilingual, plain, and accurate. Such initiatives in the tourism industry of India will boost its demand not only internationally but also domestically because India itself is multilingual.

iii. Virtual Reality and Chatbots:

Virtual assistance and Chatbots are powerful tools to assist customers with virtual experiences and frequently asked questions in the booking systems. They also assist customers in modifying and canceling bookings. They are essential to provide 24/7 customer service and to deal with complicated inquiries. Virtual realities provide customers with virtual experiences by creating a 3D digital realistic world. Chatbots are software that are pre-loaded with answers to the frequently asked questions. It converses with the customers to answer their questions via text messages or audio mode.

A growth of 67 percent in business and 70 percent more customer interaction can be witnessed that uses chatbots (LocaliQ, 2023). According to Outgrow (2023), chatbots are able to solve about 90 percent of customer queries in 10 or fewer messages so, giants like Starbucks, LinkedIn, eBay, and British Airways continue using chatbots. This reflects that the use of virtual reality and chatbots in the tourism sectors of India will be beneficial.

iv. Facial Recognition Technology and Fraud Detection:

Facial Recognition technology is widely used in the tourism industry to enhance the experiences of the customers and ensure accuracy and safety. To enhance the customer experience, it is used to greet guests and provide directions and reminders. It also effectively speeds up the customer check-in and check-out processes. It can also promote safety protocols, make payment processes safer, and avoid fraud. It can be a useful tool in the quick and contactless identification process in international travel.

The Gitnux Marketdata Report 2024, reports that facial recognition technology operated at AirAsia decreased fraudulent entries by 61 percent. The Apple music application, iTunes

has 94 percent of users opting for facial recognition technology for payment purposes. Giants like Amazon also utilize facial recognition technology, Rekognition to analyze and detect facial attributes and components. Extensive use of such technology in the tourism industries of India will ensure safety in the present digital world.

v. Google Maps:

Google Maps uses the Global Positioning System (GPS) to guide travelers by providing them with the fastest and easiest directions to get around new and unknown destinations not only through the usual road maps but also through satellite and aerial views of the locations. It also shows and suggests travelers places to see, eat, and stay, acting as a trip planner for the travelers. It also has the features of providing review statistics, opening hours, ratings, photos, and street view options.

Google Play Store displays that Google Maps has over 10 billion downloads and users with an average rating of 4.2. Google's official publication, *The Keyword* (2019), states that in more than 220 territories and countries, Google Maps is used. With billions of users from all over the globe, Google Maps is crucial for the tourism sector of India.

vi. Robots:

The robotic automation introduced in hospitality services has improved productivity levels and has made the administration process more feasible. Robots are used in house cleaning, housekeeping, and delivery in hotel businesses. It can also perform room services and administration. It is beneficial for the tourism industry because it is a one-time investment that reduces labor costs.

Amazon's Alexa robot is used widely in Marriott hotels like Westin, St. Regis, and Aloft. Airports also have started using robots to assist and guide travelers. The Henn-a-Hotel of Japan is the most famous hotel in the world for utilizing various kinds of robotic workforce (Villamarin, R. R., & Nagaraj, S., 2020). A silent revolution as such could transform the scenario of the Indian tourism industry.

5. Challenges of the use of AI in the Tourism Industry of India:

The use of AI in the tourism industry is undoubtedly propitious but the challenges that it draws along with it cannot be denied. It would be impractical to ignore the challenges and not regard the probable risks the application of AI in the tourism industry brings with it. In this section, the main concerns that appear in the use of AI in the tourism industry from the socio-economic condition of India are discussed.

i. Displacement of Workers:

One of the major issues of India is providing employment to its large set of population. The World Economic Forum (2020) released a report titled "The Future of Jobs Report 2020", which stated that about 85 million jobs of human labor will be replaced because of the adoption of machines and AI. The tourism industry of India is no exception, the adoption of non-human robots and AI will replace the services of the people engaged as travel agents, data analysis, customer service, security, and many more ground-level jobs. AI taking up human employment can have a huge impact on a middle-income country like India which is seeking to bring a large population out of poverty.

The daily newspaper *The Economic Times* on January 1, 2024, reported that India witnessed early signs of job disruptions because of AI. Paytm, the digital payment company dismissed 1000 employees to reduce employee cost by 10-15 percent through AI-powered automation. The global tech giant, Google is also considering restructuring of 30,000 odd sales team because the human oversight requirement is knocked out by the AI campaign management. Nike, the sportswear brand is also reportedly planning to undertake extensive automation with the aim of saving \$ 2 billion for the coming three years through restricting

and layoffs. Such events of AI disrupting the job scenario in various sectors and industries are a testament to the fact that AI makes no exception that employment in the tourism industry of India will remain unaffected by automation and technology.

ii. Privacy and Responsibility Concerns:

The security of data is one of the prime concerns in the use of AI. It is likely that tourism companies may breach privacy concerns and cross uncharted territory because AI requires data to function. This may lead to theft of data. Another important issue is, in the case of malfunctions in software and hardware it will be critical to find out who is accountable for the error. Before the use of AI, it was easy to determine whether the error occurred because of the user, manufacturer, or developer.

The Times of India on Sep 18, 2023, reported that the AI voice cloning system is aiding cybercrimes. The cybercriminals are becoming advanced and are using AI to siphon money. Similarly, Deep Fake can also be used to commit crimes. In the present age of AI, it is crucial that the tourism industry of India become aware of such crimes. In a country like India, where most of its population is not technologically efficient, individuals may not even be conscious that decisions are made by utilizing their personal data.

iii. Poor A.I. Infrastructure

To implement AI to its best, India does not have sufficient basic infrastructure facilities. Many tourist destinations of India are located in areas that are remote and far away from towns and cities, where technological development is yet to reach. Basic AI infrastructural facilities like networking infrastructure, performance computing, and security are inaccessible in many parts of India. The implementation of AI in the tourism sector will pose a major challenge in such areas of India.

According to the report “Lean ICT- Towards Digital Sobriety” by the Think Tank Shift Project (2019), there has been a 71 percent digital divide in the country since 2017. This means that the use of the internet did not reach 950 million people. Further, the report also stated that 50 percent of the population will still be without internet until 2025. This reflects the poor AI infrastructure of India and how the application of AI in the tourism industry will lead to inaccessibility to those sections of the population without the Internet.

iv. Capital Investment:

Investment is a key measure in the development of tourism destinations in India. The investment in AI technologies requires huge capital investments which is a major repulse in the flow of investments. Also, in the tourism sector of India, many are skeptical about investing in futuristic technologies, and by preference, they would like to invest in traditional investments in tourism.

Boukherouaa, E. B. et al., (2021) have raised the issue of embedded bias as a risky factor. AI systems may be biased and unjustly favor certain individuals over others. This may be perceivable even in AI investment because AI uses predictive algorithms and will be biased towards groups that have better data representation. AI using data to make decisions may also result in incorrect decisions because its decisions will favor the groups with better data representation. Thus, investment in AI is risky and critical.

v. Unsatisfaction among Employees and Customers and Ethical Issues:

The application of modern technologies and AI has reduced the physical interaction between employees and customers. This may create dissatisfaction among the customers. Since AI works on predictive analysis and machine learning, it is possible that it may fail to satisfy customers with complex issues. There may be customers preferring human interaction with service employees. The engagement of employees may also be affected

because of reduced human interaction. Reduced human interaction may result in psychological issues among the employees. Social interaction is very important in the working environment (Mukherjee D.V., et al., 2022).

Cebulla, A., et al., (2021) prepared a report titled “Ethical Use of Artificial Intelligence in the Workplace Final Report” for the NSW government of Australia, where the findings of the report suggested that the use of AI in the workplace impacted the workers psychologically more than physically. The intensification of workflow because of AI might result in new hazards. The use of AI in the workplace will also affect the relationship between the Work Health and Safety (WHS) manager and the workers because effective communication is required between managers and workers but AI is likely to take up the jobs of traditional managers. Application of AI in the workplace will also not recognize human conditions, it will function purely based on data set over human, social, and environmental wellbeing. Thus, the use of AI in the tourism industry of India might create ethical issues and develop barriers between workers in the workplace leading to dissatisfaction among workers.

6. The Use of AI and its Future in the Tourism Industry of India:

AI is transforming every facet of industries but the tourism industry has a lot of modifications from the way it used to be. The travelers of this day and age have different expectations from their travel based on comfort, price, and convenience. People who travel for leisure expect a unique experience from their travel and people traveling for business purposes do not want any kind of inconvenience in their travel. These new anticipations of the travelers are fulfilled with the help of AI. However, in the context of India, there are several positive and negative consequences to consider in the use of AI in the tourism industry.

6.1. Viewing the Problems of the Use of AI in the Tourism Industry of India:

It is true that AI is capable of transforming the travel industry if utilized to the best but it is also clear that AI does not provide any insight in its experimental nature. As a matter of fact, it is difficult to determine the improvement it can bring to the tourism company. A skilled team with the ability to select the right algorithm and provided with the required AI infrastructure is a necessity to optimize the results. This is a deal breaker for the tourism industries of India because technologically skilled workers attributed with programming and machine learning concepts and AI infrastructures at hand are not in easy reach for many Indian tourism destinations located in remote areas.

Amidst the advances brought by AI in the tourism industry, it is also highly debated that for a country like India, where the issues of poverty and unemployment are timely relevant, AI will result in increased unemployment levels and as a consequence, poverty levels will increase. The Future of Jobs Report 2020 (WEF, 2020) estimated that by 2025, 97 million new job roles may arise. These new job roles will benefit the new and advanced section of the people who are technologically efficient. A report by Capgemini (2017) stated that AI has created 67 percent of new job roles of manager level and above in India. However, AI may negatively impact the jobs of the people working at clerical levels, customer service, and sales departments of the tourism industries of India for the reason that AI can perform such job roles efficiently and replace human labor. A number of people also are employed as daily wage earners in the tourism sector. Replacing these employees with advanced AI will lead to job loss that will negatively impact the economy of India.

The issue of gender inequality is also essential to be addressed in the case of India’s utilization of AI. The combination of AI in the tourism sectors of India may amplify gender inequality in employment opportunities. A research study by Lannon, J. (2013) reported that in the software industries of India, there exists gender inequality at all levels. This means that the software industries of India are a male-dominated industry. Thus, the

incorporation of AI in the tourism industries of India could produce a strong male bias which is an undesirable imbalance. The high rates of investments in developing AI applications may also induce the exclusion of the disadvantaged and the poor. The initial boost of high rates of investments is conceivable from the private corporations. Private corporations are driven by profit motives with no intention to regard issues of social relevance like equitable access.

6.2. The Future of the Application of AI in the Tourism Industry of India:

Considering the future of the tourism industry with AI and technology, it is essential to look forward to the steps and safeguards of AI for the development of the tourism sector of India. Neither the air conditioning system nor motor cars could be set up and created without the simple thermometer. In less than no time, the world will move towards a more futuristic and technologically efficient position based on AI and machine learning. It is only imperative for the tourism sector of India also to look towards the future in the hands of technology, with the intention of improvement thereafter. It would neither be sustainable nor worthwhile if there was no room for improvement to address the issues and challenges of the use of AI in the tourism industry. The tourism industry is experiencing a major transformation with the use of advanced technology because of environmental dynamism made up of complex consumer behavior, global crisis, and digital-based economy approaches. AI technology having the goods, has the scope to transform the tourism industry of India into an appealing tourist destination. The advantages of the use of AI in the tourism industry discussed in section 4 of the paper will augment the tourism industry by enhancing customer experience and hassle-free processes. A study of the use of robotics in modern-day restaurants (Dabral, A., 2022) revealed that the customers were fascinated and ascertained to be satisfied with the robotic participation in delivering services.

With the fast development of AI around the world, it is reasonable that the tourism industry of India also become technologically enhanced and efficient. The implementation of AI and technology will help achieve the sustainability goals of the industry and will definitely aid the economic growth of India increasingly. The key to a successful implementation of AI is to recognize new AI-based opportunities and train the workforce to adapt to the changing nature of jobs.

7. Policy Implications:

In this section, we intend to provide guiding principles for the adoption of AI in the tourism industry of India:

- i. There are no parallel internet protocols based on hardware and software implementation for the states of India. This may result in glitches in connectivity. So, it is high time that software protocols be standardized for the states of India. Proper regulations and policies should be formulated to provide safety and protect the privacy of the people.
- ii. The marginalized section of the population including women, rural communities, and linguistic minorities should be provided with training efficiently to operate and function in an AI-based work environment.
- iii. India is attributed with multiple universities and a huge workforce but such a developing country which is large and diverse is supplied with the knowledge and skill sets that are inefficient. The young population of the country should be encouraged to aim for AI-based careers in the tourism sector.
- iv. AI-based industries should join and collaborate with the tourism industry of India to help them realize the benefits and overcome the challenges of AI.
- v. Researchers should be encouraged to provide excellence in AI technological use in the tourism industry as well as interdisciplinary

branches of knowledge. This will help identify and develop related areas of AI technology that will supplement the smooth functioning of AI systems in the tourism industry. Tourism industries also should be invited to team up with centers of excellence to work on AI technology and applications that serve their interest and needs.

- vi. The government should support the development of AI technology by creating AI infrastructure like the cloud. Cloud is one of the prerequisites for the development of AI infrastructure because AI works on large data sets that require large storage space.
- vii. Connectivity issues in remote and rural tourism destinations should be solved to achieve an all-inclusive AI-based development in the tourism industry of India. High-speed network is a necessity for AI and its application.
- viii. Training infrastructure and education facilities should be provided to retain the workers dismissed because of the advancement in the automation process. Such workers should be retrained to take up new job roles based on AI technology.

8. Conclusion:

The present study disposes the outline of the application of AI technology in the tourism industry of India. The study perceives that the application of AI and machine learning in the tourism industry bears a set of opportunities and challenges. We believe that with proper planning and management, the net effects of AI on the tourism industry of India will be positive. The tourism industry of India has the opportunity to utilize AI technology to solve some of its biggest issues concerning efficient and smooth functioning systems, customer service, and satisfaction. AI and technological advancements in tourism industries will improve efficiency and productivity levels. For a country like India which is aiming to stand shoulder to shoulder with its developed counterparts, technological progress is a necessity because it will help India grow sustainably and economically. Thus, the application of AI and machine learning in the tourism industry of India can play its part in helping India achieve its goals and objectives of a progressive nation.

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