

The Future of Virtual Reality in The Tourism Industry in India: Trends and Challenges

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Abstract

The study explores the emerging trends, potential impact, and challenges of integrating virtual reality (VR) technology in the tourism industry in India. It examines how VR is being leveraged for destination-based virtual tours, travel service provider experiences, virtual museums and galleries, and VR applications in the hospitality industry. The key driving factors behind the growth of VR in Indian tourism, such as technological developments, consumer trends, and industry shifts, are also analyzed. The paper further discusses the challenges related to cost, accessibility, technical limitations, and content creation that need to be addressed for the widespread adoption of VR in the tourism sector. Finally, it highlights the opportunities VR presents for destination marketing, personalized experiences, and cultural immersion, underscoring its transformative potential in the tourism industry.

Keywords: Virtual Reality, Tourism, Immersive Experiences, Destination Marketing, Cultural Immersion

JEL Codes: L83 (Sports, Gambling, Recreation, Tourism), O33 (Technological Change: Choices and Consequences; Diffusion Processes), Z32 (Tourism and Development)

1. Introduction:

In tourism Virtual reality (VR) technology has made significant progress in recent years and had a impact on tourism industry in India, where VR has become a game-changer, offering unique immersive experiences that allow people to visit new places without leaving home. With benefits such as accessibility, sustainability, and cost-effectiveness, VR has the potential to transform the way we travel and experience things. VR hardware like headsets and controllers allowing tourism travelers to immerse themselves in a variety of simulated tourism environments and activities. This immersive technology improves the way places and travel companies market themselves and interact with potential guests.

As of 2021, India had 1.2 billion mobile subscribers, 750 million of whom were smartphone users. The majority of the young population in Tier 2 and Tier 3 cities is highly computer literate, allowing companies and app providers to offer AR(Augmented Reality)-based experiences. AR/VR in India is projected to grow at a CAGR of 38.29% to US\$ 14.07 billion by 2027, due to rising

smartphone penetration and expansive internet access, and this trend is predicted to continue (IBEF, 2022). According to Blue weave Consulting Report 2022 VR market is projected to \$9.28 billion by the year 2028. Head Mounted Display (HMD) grabbed the major market share followed by handheld applications, smart glasses, Head-up Display (HuD) and AR software (Blueweave Consulting, 2022).

2. Review of Literature:

The rapid advancements in virtual reality (VR) technology have significantly impacted the tourism industry, offering new and immersive ways for travelers to experience destinations and attractions. Virtual reality in tourism refers to the use of computer-generated simulations and interactive environments to provide users with a sense of presence and engagement with a destination, without the need for physical travel (Guttentag, 2010). One of the primary benefits of VR in tourism is its potential to enhance the pre-travel experience. Researchers have found that VR-based destination previews and virtual tours can effectively capture the essence of a location, generate interest, and influence travel decision-

making (Huang et al., 2016; Tussyadiah et al., 2018). These virtual experiences allow potential travelers to "try before they buy," potentially increasing the likelihood of actual visitation (Beck et al., 2019).

In addition to pre-travel experiences, VR has also been explored as a tool for enhancing the on-site tourist experience. Studies have shown that the integration of VR and augmented reality (AR) technologies can provide visitors with engaging and informative experiences, offering them unique perspectives and insights into cultural heritage sites, historical events, and natural wonders (Chung et al., 2018; tom Dieck & Jung, 2017). These immersive experiences can foster a deeper connection between the visitor and the destination, leading to increased satisfaction and memorable encounters (Jung et al., 2018). Another significant application of VR in tourism is its potential for accessibility and inclusivity. Virtual experiences can provide opportunities for individuals with disabilities, the elderly, or those with limited mobility to explore destinations that may be physically challenging or inaccessible (Chung et al., 2018). This can lead to a more equitable and inclusive tourism landscape, empowering a wider range of individuals to engage with and experience the world (Guttentag, 2010).

However, the integration of VR in tourism is not without its challenges. Researchers have highlighted concerns about the potential for VR to serve as a substitute for physical travel, leading to a reduction in actual tourism activities (Marchiori et al., 2013; Tussyadiah et al., 2018). Additionally, issues related to technological limitations, user acceptance, and ethical considerations, such as privacy and data security, must be carefully addressed (Mohanty et al., 2020). As the field of VR in tourism continues to evolve, it is crucial to explore the long-term implications of these technologies on tourist behavior, destination marketing, and the broader tourism ecosystem. Ongoing research should focus on understanding the optimal integration of VR with other emerging technologies, such as augmented reality and artificial intelligence, to create a seamless and personalized tourism experience (Mohanty et al., 2020; tom Dieck et al., 2018).

Virtual reality has the potential to revolutionize the tourism industry, offering new and innovative ways for travelers to engage with destinations, enhance accessibility, and foster deeper connections with the world around them. However, a balanced and responsible approach is necessary to ensure that the integration of VR in tourism aligns with the needs and preferences of both tourists and destination stakeholders. In this regard a modest attempt has been made to study the following objectives.

3. Research Objectives:

3.1 To examine the current use cases and applications of virtual reality (VR) technology in the Indian tourism industry, including destination-based virtual tours, VR adoption by travel service providers, virtual museums and galleries, and VR integration in the hospitality sector.

3.2 To identify the key driving factors behind the growth of VR in the Indian tourism industry, such as technological developments, consumer trends, and industry-level shifts.

3.3 To analyze the challenges and limitations associated with the integration of VR technology in the tourism sector, including issues related to cost, accessibility, technical limitations, and content creation.

3.4 To explore the opportunities and potential impact of VR on destination marketing, personalized experiences, and cultural immersion in the context of the Indian tourism industry.

4. Research Methodology:

The study follows a qualitative research approach, drawing insights from a comprehensive review of the existing literature on the application of VR technology in the tourism industry. The review encompasses academic research articles, industry reports, and case studies to provide a holistic understanding of the current trends, challenges, and opportunities in this emerging field. The review of literature covers various aspects of VR in tourism, such as the benefits of VR in enhancing pre-travel experiences, on-site tourist experiences, accessibility, and inclusivity. It also examines the concerns and limitations identified by researchers regarding the integration of VR, including its potential to substitute physical travel and the need

to address technological, user acceptance, and ethical considerations. Furthermore, the study delves into the specific use cases of VR technology in the Indian tourism industry, highlighting examples and case studies from different sectors, such as destination-based virtual tours, VR adoption by travel service providers, virtual museums and galleries, and VR applications in the hospitality industry. The analysis of these use cases aims to provide insights into the current state of VR implementation and its impact on the tourism landscape in India. The research methodology also involves the identification of the key driving factors behind the growth of VR in the Indian tourism industry, focusing on technological developments, consumer trends, and industry-level shifts that have contributed to the increasing adoption and integration of this transformative technology.

5. Usage of VR in Indian Tourism Industry: Use Cases

5.1 Destination based Virtual Tours: A virtual tour is a collection of panoramic images ordered in sequentially to provide a 'virtual' experience of any site. Once constructed, the viewer can experience what it's like to be somewhere else. This virtual experience could be seen on their desktop PCs, laptops, tablets, and mobile devices. Some virtual tours feature sound effects, such as music or narration, to describe products or areas of interest. Many provide buttons that viewers can utilize to capture still images of specific portions of the tour.

Use Case: The Ministry of Tourism, Government of India, in collaboration with Google India, released a 360° Virtual Reality (VR) experience video on Incredible India (PIB, 2018) available at <https://artsandculture.google.com/story/cQWBjVQD3BaCLg>. In this project Archaeological Survey of India (ASI) has explored the rich heritage destinations using 360° images and videos. The user can experience the destination or place using the directions. The importance of the location is also given on the image stating the history, importance and facts for better understanding the destination. The project comprises of festivals, temples, sites and monuments. Through this project increased the global tourist's footwall to India.

5.2 Virtual Reality adoption in Travel Service

Providers: Organizations in the travel business have been particularly quick to embrace virtual reality technology, and with good reason. Typically, their customers want to buy experiences rather than products, and virtual reality is an excellent approach for marketers to give them an understanding of what to expect. Travelers typically demand a large amount of information when booking a hotel stay. This could involve reviewing descriptions, examining photographs, streaming videos, reading consumer reviews, or gathering feedback on social media. However, by making effective use of virtual reality, this process can be considerably shortened.

Use Case: To improve the customer's experience Thomas Cook India using advanced technology Digiphoto Entertainment Imaging(DEI) recently created a solution that enables visitors to effortlessly access their pictures and offered for sale in a variety of media, including prints, digital downloads, and personalized products via Atlantis and Emaar Entertainment's e-commerce stores. In addition, it produces videos that are easily shared on social networking networks. It has also introduced Social Spin, a 360-degree video experience popular at the Burj Al Arab and Legoland Malaysia (Thomas Cook (India) Limited, 2023).

5.3 Virtual Museums and Galleries: A virtual museum is an online platform that recreates the immersive experience of visiting a traditional museum using digital technology. It provides a variety of interactive elements, including virtual tours, multimedia displays, and educational materials, enabling users to discover art, artifacts, and cultural treasures from around the globe. Virtual museums play a crucial role in increasing access to cultural content, fostering learning and engagement, and safeguarding heritage for future generations. According to Britannica Virtual museum defined as a collection of digitally recorded images, sound files, text documents, and other data which are accessed through the electronic media.

Use Case: Indian Museum established in 1814 at the inception of the Asiatic Society of Bengal, the Indian Museum stands as the oldest and largest

multipurpose museum in both the Indian subcontinent and the Asia-Pacific region. It is located in the present building of the Asiatic Society at 1 Park Street, Kolkata. The museum with six floors preserved rich heritage and culture. In the virtual tour each and every item can be viewed clearly and as a visitor we feel as if it is in front of us. The directions will guide the virtual visitor room wise, area wise and floor wise a walk through.

5.4 Virtual Reality in Hotels: VR hotel tours use Virtual Reality technology to create immersive, interactive tours of hotel locations. This service is valuable for marketing since it allows potential guests to tour facilities and rooms remotely, increasing engagement and assisting in decision-making. It exemplifies a modern, inventive approach to presenting hotel options.

Use Case: In the early 1900s, when the country was under British authority, the Grand Imperial was erected as a colonial hotel for the British Empire. After 45 years of business, the hotel underwent substantial renovations and reopened as "The Grand Imperial" in 2006. The hotel has adopted 360 degree virtual tour which allowed website users to see hotel premises from a digital first-person perspective. The technology is handy when showing the rooms, corridors, ambience, segments and interiors which are difficult to sale through traditional marketing. By using the technology, customers can get a "feel" for what is in hotel. Another intriguing element is that such a perspective can show the dimensions of a space as well as how to navigate the property.

5.5 Virtual Technology in Hospitality Industry: Amusement parks are integrating augmented reality (AR) and virtual reality (VR) to create remarkable experiences. AR adds digital aspects to the real world, whereas VR creates totally immersive virtual settings. These technologies will take visitors to worlds full of fascinating creatures, ancient civilizations, and adrenaline-fueled adventures (Goenka, 2023).

Use Case: Wonderla Holidays Limited operates three big amusement parks in Kochi, Bengaluru, and Hyderabad. Wonderla Kochi is an amusement park in Kochi, Kerala, India. In the park many virtual reality (VR) rides and activities, including

VR coasters. The VR coaster is a thrilling ride in which visitor wear a VR headset that transports visitor to a virtual roller coaster while visitor body feels the genuine coaster's motions. Visitors can have a truly immersive and urging experience by riding the "Virtual Reality Coaster" while wearing VR goggles. This ride, built using international technology, has a height of 6 metres and a track length of 190 metres. It's an incredible experience that mixes the intense feeling of a real roller coaster with the immersive realm of virtual reality (Wonderla).

6. The Driving Factors of VR in the Tourism Industry:

6.1 Technological Developments: India is no exception in the growth of the AR and VR industry globally. The country is already a hub for technology related products and services (Singh, 2023). The AR and VR market in India is expected to generate US\$759.9 million by 2024. The market volume is estimated to reach US\$1,170.0m by 2028, with an annual growth rate of 11.39% (CAGR 2024-2028). In terms of user base, the AR & VR market in India is estimated to reach 742.3 million users by 2028. The user penetration rate is expected to be 42.1% in 2024 and grow to 49.8% by 2028 (Statista, 2023). AR/VR is in high demand in the ed-tech, manufacturing, medical care, and retail industries, and it is likely to spread to travel, hospitality, media, and entertainment in the near future.

6.2 Consumer Trends: Increased tech adoption among the visitors has increased due to the availability of internet and smart phones. Convenience is a major factor for the rise of usage of technology in tourism industry for example online ticket booking. Travelers now they can book the hotels, destination, events, travels and other services through their smart phones. The rise of interest among the virtual tours of destinations, hotels, museums and hospitality before booking the service. In India State Tourism Boards adopting VR technology to attract the tourists.

6.3 Industry Trends: Digitalization in the tourism sector can help firms expand their market reach, grow, improve operational efficiencies, and gain a competitive advantage. The community economy has grown rapidly as a result of technological

advances such as high-speed internet connectivity, search and geolocation technologies, mobile payments, and social media platforms. Private sector internet portals offer transportation, hotel, travel package booking, food ordering and delivery, among other services (Ministry of Tourism, 2022). Indian Government has taken various sustainable initiatives like National Strategy for Sustainable Tourism and National Strategy for Eco Tourism for promoting sustainable tourism in India. Through the policy framework wide opportunities are created for both supply side and demand side of tourism landscape.

7. Challenges of VR Technology in Tourism Industry

7.1 Cost and Accessibility: Based on the ecommerce platform like amazon and flipkart VR headsets like the Oculus Rift, HTC Vive, and PlayStation VR were more expensive and therefore less accessible. The cost of these headsets can range from INR30,000 to INR70,000 or more, based on the model and extras. But in India startup company like Iruusu is providing the VR headsets at affordable cost ranging from INR 1900 to INR3000. Currently in India VR technology is widely used in the sectors like gaming, entertainment and education. The adoption and usage is also very high in urban cities in India compared to rural India.

7.2 Technical Limitations: As the device uses wireless, user is exposed to harmful electromagnetic radiation. Other health risks like eye strain, mental exhaustion, headache, visual impairment and mental illness (Matúš GREGA et.al, 2021).

7.3 Content Creation and Standardization: Specialized knowledge and abilities, including as 3D modeling, animation, and programming, are required to create VR content. For content makers who are unfamiliar with these tools, this intricacy may be a hurdle. Creating VR content of a high caliber may be costly, involving investments in personnel, software, and gear. For many content providers, particularly individuals and small enterprises, this fee may be unaffordable. It is challenging to produce VR content that works on various platforms and devices because to lack of standard formats and protocols. Different user

experiences and compatibility problems may also result from this lack of standards.

8. Opportunities of VR Technology in Tourism Industry

8.1 Destination Marketing: VR offers lifelike, 360-degree tours of various locations, enabling users to experience the sights and sounds as if they were physically present. This increases the possibility that passengers will make travel plans by giving them a taste of the place before they visit. Make interactive experiences that captivate visitors and provide them a better knowledge of the customs, sights, and activities of a place. Users can electronically enjoy things like festivals, historical landmarks, and natural wonders. Accessible to physically disabled people with mobility difficulties can experience virtually destination's attractions.

8.2 Personalized Experiences: VR can help passengers plan their vacations by providing tailored suggestions for locations, lodging, and activities based on their interests and previous travel experiences. This aids tourists in finding new places to visit and activities that suit their interests. Travelers can utilize VR to preview their destinations and experiences before leaving on a trip, which will help them plan and visualize their itinerary. The joy and anticipation for the next journey are increased by this personalized preview.

8.3 Cultural Immersion: Through virtual reality, tourists may engage with locals and discover more about their customs, culture, and way of life. Travelers can partake in real cultural activities such as cooking classes, storytelling sessions, or virtual workshops conducted by locals. Through immersive language instruction and cultural exchange programs, visitors can learn about regional languages and communication patterns. This makes it easier for visitors to interact with locals and fully experience the culture of their location. Used to protect and conserve locations and objects of cultural heritage that could be endangered by climate change, natural catastrophes, or human activity. This guarantees that these cultural treasures will be known about and appreciated by future generations.

9. Conclusion:

The analysis of various use cases, including destination-based virtual tours, VR adoption by travel service providers, virtual museums and galleries, and VR applications in the hospitality industry, has highlighted the diverse ways in which this immersive technology is being leveraged. These VR-enabled experiences have the ability to enhance the pre-travel decision-making process, provide engaging and informative on-site experiences, and improve accessibility and inclusivity for a wider range of travelers. The driving factors behind the growth of VR in Indian tourism, such as technological advancements, evolving consumer trends, and industry-level shifts, further underscore the increasing acceptance and demand for these innovative solutions. The country's growing smartphone penetration, expanding internet access, and the rising interest in AR/VR technologies across diverse sectors have created a favorable environment for the integration of VR in the tourism industry.

However, the study also identified several challenges that need to be addressed for the widespread adoption of VR in tourism. The issues of cost and accessibility, technical limitations, and the complexities involved in content creation and standardization pose significant barriers to the seamless integration of VR. Addressing these challenges through collaborative efforts between technology providers, tourism stakeholders, and policymakers will be crucial for unlocking the full potential of VR in the Indian tourism industry. Despite these challenges, the opportunities presented by VR in the realm of destination marketing, personalized experiences, and cultural immersion are immense. VR can significantly enhance the way destinations are promoted, increase traveler engagement and satisfaction, and foster deeper connections between visitors and the local culture. By leveraging the capabilities of VR, the tourism industry in India can provide transformative experiences that cater to the evolving preferences and expectations of both domestic and international travelers.

In conclusion, the integration of virtual reality in the Indian tourism industry holds great promise, offering innovative ways to engage with

destinations, enhance accessibility, and foster deeper connections with the world. As the technology continues to evolve and the industry adapts to the changing landscape, the strategic and responsible integration of VR can lead to a more dynamic, inclusive, and enriching tourism experience for all. Ongoing research, collaborative efforts, and a balanced approach to addressing the challenges will be crucial in realizing the full potential of VR in shaping the future of tourism in India.

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