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## Enhancing the Accessibility of Tourists with Disabilities in Religious Sites through Smart Tourism Technology

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### Abstract

*The study has been motivated by the gap between the increasing numbers of people with disabilities worldwide who travel and the adequacy of tourism facilities, especially religious place tourism facilities for people with disabilities. This study examines the relationship between the use of smart tourism technology at religious sites and accessibility for tourists with disabilities. This study evaluates current accessibility at religious sites, identifies challenges faced by disabled tourists, and proposes smart tourism technologies to create inclusive experiences that support full cultural and spiritual engagement.*

**Keywords:** Accessibility, Tourists with Disabilities, Religious tourism, Smart Tourism Technology, Inclusive Tourism, Assistive Technology, Internet of Things (IoT).

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### 1. Introduction

Religious tourism, sometimes referred to as faith tourism or spiritual tourism, is a kind of travel in which people or groups go to places that have religious significance. Shrines, temples, churches, mosques, monasteries, and other places of worship are examples of these locations. Spiritual enrichment, pilgrimage, taking part in religious ceremonies or festivals, and developing a deeper understanding of one's faith are frequently the main drivers of religious tourism. Millions of tourists visit holy locations, pilgrimage routes, and religious festivals throughout the year, making religious tourism a substantial part of the world travel industry. Despite the growing concern about increasing accessibility for visitors with different disabilities, religious sites still do not make significant efforts to improve access for this people and for everyone (Dash et. al, 2016). Around 5.5%

of the visitors are visitors with disabilities. The World health organization (WHO) estimates that 253 million people have some kind of impairment (Ackland et. al,2017). Thus, increasing inclusion and accessibility is important for religious sites, since visitors with disabilities still experience a large number of constraints and cannot visit the religious sites.

The U.K. Disability Discrimination Act defines a person living with a disability define as "A person who has a physical or mental impairment which substantially and permanently affects his or her ability to carry out normal day-to-day activities." (Ozturk et. al, 2008). All individuals, regardless of disability, including those with mobility, hearing, vision, cognitive, or mental impairments, the elderly, and those with temporary disabilities, can access the expanding and thriving global niche market known as accessible tourism. It is defined as a travel and

tourism activity that provides all services, facilities, and accessibility capabilities that allow people with disabilities to entertain and enjoy their vacations and vacations in places, sites, and tourist destinations without problems and to work independently with fairness and dignity.

According to **Ozturk et al. (2008)**, **Patterson (2012)**, and **Domínguez (2015)**, accessibility includes both public and private tourist destinations, amenities, transportation, service locations, and public spaces in both urban and rural areas. The rights of disabled people were first protected by the United Nations Convention on the Rights of Persons with Disabilities (UNCRPD). In 2016, India passed the Rights of Persons with Disabilities Act to ensure that the disabled are included in society. As stated by World Health Organization (WHO, 2023), 1.3 billion people - about 16% of the global population - experience significant disability. The Ministry of Tourism also conducted a study on “Problems and Prospects of Accessible Tourism in India” in the year 2010 (**Press Information Bureau Government of India Ministry of Tourism**). The report claims that disabled tourists must overcome numerous obstacles both when making reservations and while traveling. Here are a few of them:

- Their particular issues and need were not completely comprehended by the booking staff.
- There aren't enough accessible taxis or local transportation options.
- Inadequate signage and information at key intersections and points.
- Insufficient availability of accessible and budget-friendly accommodation.
- The destination lacks easily accessible public amenities.

Accessibility for all to tourism facilities, products, and services should be a central part of any responsible and sustainable tourism policy. Accessibility is not only about human rights. It is a business opportunity for destinations and companies to embrace all visitors and enhance their revenues. To successfully implement accessible tourism, it is crucial to include the group of people with disabilities in the travel experience, grant them the

freedom to engage in leisure and tourism activities, and establish all necessary conditions that are compatible with their physical and mental capabilities to make the accessible tourism process successful an essential means of achieving many social and national values (**Ibrahim, 2022**).

Since smart technologies are used in everything from civil infrastructure to education services, technology is no longer merely a supplementary tool but is turning into a need and a prerequisite (**Hall et al. 2000**). For example, sensors and the Internet of Things (IoTs) offer an enormous amount of data, enabling city officials to monitor not only important events but also traffic and air pollution levels in real time; citizens can solve issues and communicate directly with public administrators through personal smart devices and applications (**Totty 2017**). Given that technology has had a substantial impact on the travel and tourism sector in a number of ways, tourist destinations are not an exception to the rule when it comes to smart technology use (**Huang et al. 2017**). To provide tourists intriguing and relevant information about the city and its nearby attractions, Seoul, South Korea, for example, launched the ‘*Deoksugung in My Hands*’ mobile application (**Korea Tourism Theoretical Background**

Despite being a regular member of the Executive Council of the United Nations World Tourism Organization (UNWTO) since 2010, most of India's sacred sites unfortunately lack accessible amenities. People with disabilities are defined as those who, due to their environment, have limitations in their ability to relate to others and have special needs when traveling, when lodging (accommodation), and when receiving other services (**Manual on Accessible Tourism for All–Public–Private Partnerships and Good Practices 2015**). In addition to those with other medical conditions that call for special care, such as elderly people and others who need limited assistance, this also includes people with physical, sensory, and intellectual disabilities.

India's Rights of Persons with Disabilities (RPwD) Act went into effect on December 28, 2016. It states that the appropriate government and local authorities are required to provide information and accessible

infrastructure for individuals with disabilities. The local government's success is largely due to its excellent information management. For management to be effective, large amounts of spatial (territorial) data pertaining to various local tasks must be handled quickly.

In the last decade, websites as software products have evolved in abundance. The web developers only focus on providing the information and neglect the quality attributes for accessibility and usability. *Tourism* is a leisure activity that is carried out by all people, including people with disabilities. Tourism websites have been neglected on accessibility issues, even in most developed nations like the United States (Agrawal et al., 2023). According to Boes, Buhalis, and Inversini (2016), smart tourism technologies are designed to elevate a destination's competitiveness and enhance the standard of living for all parties involved, including visitors and locals. The definitions of disability, accessibility, and smart tourism technologies must be examined first, especially in relation to religious tourism.

## Religious tourism

Individual lives are greatly impacted by pilgrimages, as approximately 79.8% of the overall population is Hindu and 19.3% is Muslim, Sikh, Christian, or Jains (Census of India 2011). Ever since the Vedic era, Hinduism has made "Tirthayatra," or pilgrimage, a major practice. Ancient epics like the Ramayana (c. 1000 BCE) and the Mahabharata (c. 350 BC) mention sacred sites across the Indian subcontinent. The phrase "religious tourism" has gained popularity in non-Western nations like India, but it only partially describes how religious tourism operates in the west (Shinde 2018).

According to Rinschede (1992) and Shinde (2007), religious tourism describes contemporary trends of pilgrimage to places of religious significance where tourists seek to satisfy their religious and recreational needs. Religious tourism, according to Rinschede (1992), is a "specific type of tourism whose participants are motivated either either in part or exclusively for religious reasons." It is described as travel intended to experience "religious forms" or the products they inspire, such as "art," "culture," "traditions," or "architecture" (Griffin & Raj,

2017). Singh claims that approximately 95% of domestic travelers are religious tourists, and the UNWTO (2011) estimates that 170 million people visit India's more than 2,000 religious sites (Singh, 2001; Sharpley and Sundaram, 2005, p. 164). In order to estimate the number of domestic tourists by different travel purposes as well as the overall amount and trends of tourist expenditures, the National Council of Applied Economic Research (NCAER) surveyed about 800,000 households across the country in 2002 for the Indian Ministry of Tourism. Eight of the top ten domestic tourist destinations, including Tirupati, Puri, Vaishno Devi, Haridwar, Mathura-Vrindavan, and others, are listed as pilgrimage sites in the NCAER report from 2003.

According to the 2024 *India Tourism Market Insight* report, Tirupati recorded over 25 million visitors, followed by Puri with 19 million, Vaishno Devi with 18 million, Haridwar with 13 million, and Mathura-Vrindavan with 9 million in recent years. This growth underscores the appeal of spiritual and cultural heritage among domestic tourists. According to Kraft (2007), religious tourism is also heavily featured in the well-known travel guidebook Lonely Planet India, where 47 out of 126 images have a religious theme. This is presumably done for the "others" who are interested in visiting these locations.

## Disability, Rights to tourism and Accessibility

*Disability* is frequently discussed in terms of access needs, which have been classified into several categories, including mobility, hearing, vision, cognitive/learning, mental health, sensitivities, and long-term health issues (e.g., dexterity loss, fatigue) (Darcy et al., 2010). To identify environmental barriers affecting PWDs' access to tourism goods and services, it has proven crucial to differentiate between access requirements (Stumbo & Pegg, 2005; Darcy & Buhalis, 2011). Travel and tourism are considered basic human *rights* that can improve the quality of life and create better living conditions for all people (Skarstad 2018; UNWTO, 2021). The UNWTO dedicated 2016 to "Accessible Tourism for All: An Opportunity Within Our Reach". The concept of accessible tourism for all "is not about creating separated services for disabled

people, it aims at full integration, or rather inclusion of people with special needs, in particular disabled and aged people, in the tourism sector” (**Leidner, 2006**). An excellent example of this complexity is the situation in the UK, namely in Cornwall. Given that 94% of tourists to Cornwall are British nationals, the UK's degree of right to tourism has significant implications for the Cornish tourism sector (**Beautort Research, 2013**). Since the right to paid holidays is protected by employment laws, it is closely related to workers' rights. This can be viewed as a barrier to inclusive tourism because working-age PWDs are still less likely to be employed than ABPs, with a percentage point disparity reaching 30.1 in 2012 (i.e., more than 2 million individuals) (**Office for Disability Issues, 2014**).

The United Kingdom took a significant step toward inclusive tourism with the introduction of the Disability Discrimination Act (DDA) in 1995. Before this legislation, many people with disabilities (PWDs) reported feeling excluded from mainstream tourist venues, with evidence of such exclusion dating back to the 1980s (**Couch, Forrester, & Mayhew-Smith, 1989**). The DDA introduced regulations covering commercial spaces, advertising, and physical accessibility features such as entryways and facilities. However, while businesses were required to consider adjustments, many resisted making changes—often citing impracticality or financial burden as reasons to avoid physical modifications (**Shaw & Veitch, 2011**). It wasn't until 2004 that providing equal access to tourism amenities became a clear legal obligation (**Barnes & Mercer, 2010**). Prior to this shift, tourism efforts for PWDs were mostly limited to "special needs" events that unintentionally emphasized their differences from non-disabled individuals (**Murray, 2002**).

On the digital front, progress was also slow. **Williams et al. (2007)** found that hotel websites in Australia, the UK, and the US lacked proper accessibility due to designers' limited awareness of assistive technology and the specific needs of users with impairments. Technological limitations at the time only worsened the issue. Similarly, Gutierrez (2010) evaluated official U.S. tourism websites and found that none complied with Section 508

accessibility standards, highlighting a widespread disregard for digital inclusion in the tourism sector—even as the web became central to travel planning. The quality of the U.S. tourism website has not improved in over a decade, and it still does not meet the accessibility criteria. In research published in 2020 (**Singh et al., 2020**), the authors looked at the official tourist departments of the 57 U.S. states and territories. The authors used TAW and A Checker to guarantee that the tourism website followed WCAG and Section 508 criteria. The findings found that tourism websites had severe accessibility issues, making navigation difficult for impaired individuals. In (**Bastida and Huan, 2014**), the authors evaluated the performance of Beijing, Hong Kong, Shanghai, and Taipei tourism websites on 23 consumer-centric usability parameters. The manual evaluation's findings indicated that, out of the four, the Hong Kong website was the best. Additionally, tourism websites disregard the usability requirements of individuals with disabilities. The accessibility evaluation report of 41 European tourist national board websites was released by the European Network for Accessible Tourism (**Ambrose et al., 2013**). According to the results of the automated and manual testing, none of the websites satisfies the fundamental level A accessibility guidelines. **Domínguez et al. (2019)** assessed 14 tourism websites' accessibility in three northern European regions. The authors made use of the web accessibility test, a free version of the automated tool. The result shows that different European countries have adopted different accessibility policies. Most of the European websites suffer from several accessibility errors. In (**Rubáček et al., 2020**), the authors tested the accessibility of European National Tourism Board websites. The websites were evaluated to check their compliance with WCAG 2.1 guidelines using A Checker and the accessibility evaluation tool. The result shows that the accessibility of European websites had improved a lot and had a high accessibility score. Missing alternative text on the images and missing transcripts in video content are some of the errors that exist. **Domínguez Vila et al. (2018)** analyzed the accessibility status of 210 tourism websites worldwide.

Despite 90% of the countries under study having signed the Convention on the Rights of Persons with Disabilities (CRPD) and having adopted one or the other version of WCAG accessibility guidelines, none of the websites passed the WCAG 2.0 accessibility test. In another study in 2020 (**Domínguez Vila et al., 2020**), the authors evaluated the country's commitment to adopting and implementing accessibility standards in tourism websites. The results show that despite the countries having signed an international agreement on disabilities, the websites were not accessible to the people with disabilities and needed much improvement in navigation and compatibility. In (**Bastida and Huan, 2014**), web quality evaluation of four tourist destination websites was done using manual evaluation on 23 quality parameters. The result shows that the website of Hong Kong behaved best on the selected quality criteria.

## Smart Tourism Technologies

In general, general and specialized applications that can enhance the experiences of tourists and generate extra value are included in the category of Smart Tourism Technologies (STTs) (**Neuhofer, Buhalis, and Ladkin 2015**). Cloud computing, ubiquitous connectivity through Wi-Fi, near field communication (NFC), radio-frequency identification (RFID), sensors, smartphones, mobile connected devices, beacons, virtual reality (VR), augmented reality (AR), mobile apps, integrated payment methods, smart cards, social networking sites, and more are examples of STTs, according to **Gretzel et al. (2015)**, **Huang et al. (2017)**, **Wang, Li, and Li (2013)**.

They (e.g., **Huang et al. 2017**; **Lee et al. 2018**; **No and Kim 2015**) have classified STTs according to four distinct criteria, including accessibility, informativeness, interaction, and personalization, in order to assess their efficacy in destinations. The first aspect, *accessibility*, refers to how easy it is for someone to access and use the information offered at the destination using the different types of STT. Because tourists may utilize more information to improve their memorable travel experience and contentment with the destination, high levels of accessibility of STTs contribute to perceived ease of

use (**Huang et al. 2017**; **Tussyadiah and Fesenmaier 2007, 2009**). The quality and authenticity of the information provided by STTs at tourist destinations are combined to create informativeness, according to **Huang et al. (2017)** and **No and Kim (2015)**. Smart tourism technologies (STTs), including virtual and augmented reality, help tourists easily grasp the variety and complexity of information needed for planning their trips (**Jeong & Shin, 2020**). By offering immersive and detailed insights, these technologies not only inform but also inspire travellers to make the most of their visit to smart tourism destinations.

A key strength of STTs lies in their interactivity, which enables two-way communication between users and service providers. When travellers actively engage with these platforms, they receive more relevant, tailored information—making their planning process smoother and more effective. This interactivity also fosters more positive attitudes toward using technology in tourism (**Berthon, Pitt, & Watson, 1996**).

Another important feature is personalization. Customized services reduce the time tourists spend searching for information and enhance their overall satisfaction (**Schaupp & Bélanger, 2005**; **Ball, Coelho, & Vilares, 2006**). At smart destinations, such personalization plays a vital role in delivering meaningful and enjoyable experiences. This is because personalized services enable destinations to tailor the information they provide (**Jeong & Shin, 2020**).

STTs facilitate direct communication and efficient interaction between tourists and other tourism stakeholders, making them important enablers at smart tourism sites. According to **Ozgunes and Bozok (2017; p. 620)**, *Augmented Reality (AR)* enhances the quality of the tourist experience and raises contact with the physical world. A type of information technology called a *virtual reality (VR)* platform enables users to roam around in a computer simulation environment (**Hunter, 2014**). The user creates an illusion about their destination experience on this platform (**Hunter et al., 2015, p. 108**). Through a specific network, cloud computing is



intended to give users access to dependable web platforms and storage. Using a smartphone or other portable device, tourists may retrieve information from cloud computing services like TripAdvisor, WhatsApp, Tripcast, and HearPlanet regardless of time or location (Jovicic, 2019, p. 3). The Internet of Things (IoTs) provides a network connection to anything, anywhere, at any time, through real-time interactions (Buhalis and Amaranggana 2014). Additionally, tourists are able to access information about tourist destinations thanks to mobile communication technology (Wang et al. 2016). Thus, it enhances the tourist's experience by providing relevant information (such as the city's history as presented by city guide applications and real-time traffic information).

## 2. Data & Methodology

India, a geographically and culturally diverse nation, comprises 28 states and eight union territories, each offering a unique blend of culture, religion, language, and historical significance. This diversity makes India a prominent destination for tourists worldwide. The state tourism ministries oversee tourism activities in their respective regions, with each ministry maintaining an official tourism website to provide comprehensive information for tourists.

This research adopted a mixed method approach by using both quantitative and qualitative means of collecting data. Due to the fact that the population was not known, a non-probability sampling approach was adopted for this study. The study surveyed a total of 64 respondents from Prayagraj, India, focusing on individuals with disabilities, including mobility, hearing, vision, cognitive, or mental impairments; older adults; and those with temporary disabilities. This study further analyzed 36 official tourism websites of Indian states and union territories. The web addresses of these sites were sourced from the Ministry of Tourism's official website (<http://tourism.gov.in>), ensuring accuracy and reliability in the selection of the study sample.

## 3. Challenges faced by Disabled Tourist

Disabled tourists continue to face a wide range of barriers when visiting religious and heritage sites,

many of which significantly restrict their ability to participate fully in tourism experiences. According to Martin-Fuentes et al. (2021), these challenges are typically categorized into three main types: physical barriers such as stairs, narrow pathways, and the absence of ramps; sensory barriers including inadequate signage and a lack of auditory guides; and communication barriers stemming from the unavailability of information in accessible formats.

The difficulties often begin even before the trip starts. From the planning and booking stages onward, disabled tourists encounter several obstacles. One of the most persistent issues is the limited understanding among booking staff regarding their specific needs. This lack of awareness is frequently accompanied by an unwelcoming attitude, making the process uncomfortable and discouraging. This concern is echoed by both domestic and international travellers, as noted by Saha et al. (2020), and underscores the general lack of sensitivity among tourism service providers.

Web accessibility adds another layer of complexity. Despite global standards like the Web Content Accessibility Guidelines (WCAG), many tourism websites fail to meet even the basic criteria. This non-compliance creates significant information barriers. Many tourism websites still fail to provide essential information that travellers with disabilities rely on—such as the availability of accessible facilities, booking options, or whether ramps and lifts are present. For individuals with hearing or mobility impairments, limited captioning and non-interactive interfaces make navigation frustrating. Visually impaired users face even greater challenges, with poorly structured content, missing alt-text, and a lack of screen-reader compatibility. These digital gaps not only hinder effective trip planning but also contribute to a sense of exclusion long before the journey begins.

Transportation poses another significant barrier. In many destinations, accessible taxis, buses, and transit systems are either insufficient or entirely unavailable. Confusing or poorly placed signage at stations and intersections further limits mobility, especially for travellers using wheelchairs or

assistive equipment—items often missing at public transit hubs. Additionally, finding affordable accommodations that meet accessibility standards remains difficult. Many hotels still lack fundamental amenities like accessible bathrooms, elevators, or properly designed rooms. The situation is often compounded by hotel staff lacking awareness or training on how to support guests with disabilities (Saha et al., 2020).

Tourist sites themselves frequently fail to offer inclusive experiences. Poorly maintained or inaccessible toilets, missing ramps or lifts, and unclear signage create unwelcoming environments. Uneven, slippery, or narrow pathways can also be dangerous for those with limited mobility. These infrastructural flaws highlight the urgent need for thoughtful, inclusive design (**Problems and Prospects of Accessible Tourism in India, 2010**).

While physical barriers are visible, digital inaccessibility is often overlooked. As planning increasingly shifts online, inclusive digital platforms are vital. Accessible websites can empower travellers with disabilities by offering clear, usable, and complete information—closing the gap between exclusion and meaningful participation in tourism.

To overcome these barriers, tourism stakeholders must prioritize both physical infrastructure improvements and digital accessibility enhancements. Compliance with WCAG standards, the introduction of assistive technologies, and targeted staff training can play a transformative role in ensuring that disabled tourists can engage with tourism services seamlessly. By addressing these challenges, India can take meaningful steps toward creating an inclusive, accessible tourism environment that caters to the diverse needs of all visitors.

#### 4. Current State of Web Accessibility for tourist in India

The accessibility of tourist sites plays a critical role in shaping the experiences of disabled visitors, as demonstrated by Israeli (2002), whose analysis revealed that tourists with disabilities base their preferences on the accessibility features provided at a site. For instance, the absence of suitable bathroom facilities or other essential amenities directly

impacts their decision to revisit. In response to similar challenges and a growing need for inclusivity, the Government of India has initiated significant steps to address the gaps in universal access.

One notable initiative is the '*Accessible India Campaign*', launched in December 2015. This campaign is closely aligned with Article 9 of the United Nations Convention on the Rights of Persons with Disabilities (UNCRPD), which recognizes accessibility as a fundamental human right for individuals with disabilities. At its heart, the campaign aims to create a barrier-free environment across public spaces—including popular tourist destinations—by combining thoughtful infrastructure upgrades with accessible technology. India reaffirmed its commitment to inclusivity with the enactment of the Rights of Persons with Disabilities (RPwD) Act on December 28, 2016. This landmark law significantly bolstered the country's legal foundation for accessibility by mandating the removal of physical, digital, and systemic barriers across key sectors such as education, transportation, public infrastructure, and information access. As Rani (2018) notes, the RPwD Act clearly reflects the government's intent to promote inclusive development through legally enforceable measures.

Yet, despite this progress on paper, the reality for many Indian tourists with disabilities remains challenging—particularly in the digital space. Numerous tourism websites still do not align with internationally recognized standards like the Web Content Accessibility Guidelines (WCAG), which are designed to support users who rely on assistive technologies such as screen readers, magnifiers, or voice navigation tools.

The absence of accessible online content does more than inconvenience travellers—it effectively excludes them. Without reliable digital access to information on facilities, services, and accessibility features, planning a trip becomes an uphill battle. This gap in accessibility limits not only convenience but also the ability of individuals with disabilities to engage meaningfully in cultural and spiritual tourism.

The WCAG 2.0 guidelines were created to make digital platforms inclusive for users with diverse needs, including visual, auditory, cognitive, and neurological impairments, as well as elderly individuals. However, a review using the TAW online tool showed major gaps in how Indian state tourism websites comply with these standards. These digital shortcomings further marginalize travellers. While a few sites cater to users with disabilities, denying them the information they need to travel confidently and independently.

### Accessibility Evaluation: Key Insights

The Web Content Accessibility Guidelines (WCAG) 2.0 outline three levels of compliance—A, AA, and AAA—with Level A being the most basic. However, an analysis of 34 Indian state tourism websites revealed that most failed to meet even the minimum Level A requirements. Key issues included missing text alternatives for non-text content, a lack of programmatically defined relationships between elements, and the absence of user controls for dynamic content such as blinking or scrolling visuals. Operability violations were especially common, accounting for 31% of all errors. One of the most critical findings was that 41% of websites did not support keyboard navigation—a vital feature for individuals with mobility impairments. Additionally, 38% of the errors were related to content robustness, indicating widespread incompatibility with assistive technologies like screen readers. These findings highlight a significant digital divide that continues to prevent users with disabilities from fully accessing and benefiting from online tourism platforms.

### Performance and Technical Barriers

Performance assessments highlighted slow page load times, with only 20% of websites meeting the optimal loading benchmark of three seconds. The average page size far exceeded recommended thresholds, primarily due to excessive use of visual content and high HTTP request counts. A common problem, broken links further harmed accessibility and user experience. Widespread coding errors, including the use of outdated tags, unclosed elements, and invalid attributes, were discovered by HTML and CSS validation. Because assistive

technologies rely on clear, semantically correct code to provide an inclusive user experience, these technical errors make accessibility issues worse.

### Multilingual Support and Accessibility Features

The availability of multilingual content is essential to guaranteeing widespread accessibility in a linguistically diverse nation like India. Nevertheless, the majority of websites lacked sufficient language options, which limited their usability for non-native English speakers both domestically and abroad. Additionally, there were very few accessibility-improving features like color contrast settings, text size adjustments, and screen readers. Only 23% of websites offered screen reader compatibility, underscoring a significant gap in meeting the needs of visually impaired users.

### Implications for Disabled Tourists

The widespread failure to comply with accessibility standards severely impacts disabled tourists' ability to plan and experience visits to religious sites. The absence of navigation aids, coupled with slow-loading and poorly designed interfaces, creates substantial barriers for those reliant on assistive technologies. These shortcomings emphasize the urgent necessity for systematic reforms to enhance digital accessibility and make religious tourism more inclusive.

## 5. Findings and Results

The study conducted in Prayagraj surveyed 64 respondents to assess their experiences and challenges related to the accessibility of religious sites for disabled individuals, including mobility, hearing, vision, cognitive, or mental impairments; older adults; and those with temporary disabilities. The findings revealed a diverse representation of disabilities among the participants, the majority reported mobility impairments (N=29), followed by hearing impairments (N=16), vision impairments (N=10), and cognitive or mental disabilities (N=9). The gender distribution showed a slight majority of males (52%) compared to females (48%). The average age of respondents was 40 years, ranging from 20 to 80 years. Regarding education, 65% held a tertiary qualification, indicating a high level of educational attainment



among participants. Employment status revealed that 57% were employed, 20% were unemployed, and 23% were self-employed. Home language data highlighted that Hindi was the dominant language (38%), followed by English (30%), with other regional languages making up the remainder. When it came to marital status, about half of the participants reported being married, while the remaining individuals were either single, divorced, or widowed. Interestingly, 12% of the respondents were tourists from other states, while the majority were local or domestic travelers. This mix of backgrounds offered a valuable perspective on the accessibility barriers often faced by individuals with disabilities in both the planning and actual experience of tourism.

One notable insight was the frequency of visits to religious destinations: 55% of those surveyed were repeat visitors, while 45% were experiencing these sites for the first time. This indicates not only a strong engagement of people with disabilities in religious tourism but also highlights the challenges that first-time visitors may encounter—often due to a lack of familiarity with the site’s accessibility features.

Additionally, when assessing the usefulness of pre-visit resources, only 32% of respondents felt that websites, brochures, or helpline services provided adequate information. This points to significant shortcomings in how accessible, clear, and comprehensive current tourism information is for people with disabilities. Overall, the findings stress the urgent need for more inclusive infrastructure and better-informed policies to truly accommodate this often-overlooked group of travellers.

Despite some visible progress, physical accessibility continues to be a significant hurdle for many visitors with disabilities. While a few religious sites have installed ramps or modified entrances, only 38% of surveyed individuals felt these efforts were truly adequate. Similarly, just 35% believed that pathways and seating areas were both accessible and in good condition—clearly pointing to a pressing need for better infrastructure and upkeep.

Support for visitors with sensory impairments was even more limited. Tactile paths and braille signage

for the visually impaired were present at only 14% of the sites. For those with hearing impairments, the picture was even bleaker—just 12% of the sites offered hearing aids or access to sign language interpreters, highlighting a significant gap in inclusive communication services.

Digital access posed another set of challenges. Only a quarter of respondents felt that official websites met even basic accessibility standards, such as compatibility with screen readers. On-site facilities were also underwhelming: accessible restrooms were present and properly maintained at just 28% of the surveyed locations, and only 22% had designated seating or prayer spaces for people with disabilities.

When it came to assistive equipment, only 18% of sites provided wheelchairs or similar aids. Clear directional signage was observed by just 34% of participants. While some locations offered staff support, only 41% of visitors rated it as satisfactory—pointing to a need for better staff training in disability awareness and assistance.

Other barriers also played a role in limiting access. Cultural practices were cited by 23% of respondents as a challenge, and 47% reported physical obstructions that made navigating sites difficult. Perhaps most worrying, just 18% of locations had emergency protocols tailored for disabled visitors—revealing serious gaps in safety and inclusive preparedness.

## Result of the Factor Analysis

To assess the suitability of the data for factor analysis, both the Kaiser–Meyer–Olkin (KMO) measure and Bartlett’s Test of Sphericity were employed. The KMO value, which evaluates sampling adequacy, was found to be 0.94—well above the acceptable threshold of 0.60—indicating that the dataset was well-structured for factor extraction and that the variables were sufficiently correlated (Steyn, 2000). Complementing this, Bartlett’s Test of Sphericity produced a statistically significant result ( $\chi^2 (190) = 726.42, p < 0.001$ ), confirming that the correlation matrix was not an identity matrix and that factor analysis was indeed appropriate.

The analysis extracted three main factors that shape the accessibility experiences of individuals with disabilities visiting religious sites. Collectively, these factors explained 67.10% of the total variance. To ensure the reliability of each factor, Cronbach's alpha was calculated, consistently yielding high values across the board.

The first and most significant factor, titled **"Accessing the Religious Site,"** encompassed variables such as the availability of accessible parking, the ease of site entry, transport access by car, and the usability of reception or welcome areas. This factor alone accounted for 67.10% of the total variance, underscoring its substantial influence on the overall accessibility experience. It also demonstrated excellent internal consistency, with a Cronbach's alpha of 0.95. Respondents reported a mean score of 3.98 on this factor, reflecting a moderate level of satisfaction with these accessibility provisions. The average inter-item correlation within this factor was 0.58, further confirming a strong internal coherence among the associated variables.

**"Activities at the Religious Site,"** the second factor, represented the inclusiveness of activities at

the religious site and included things like accessible pathways, accommodations for people with hearing and vision impairments (e.g., audio assistance, Braille signage), and information in multiple accessible formats. This factor had a **Cronbach's alpha of 0.95**, indicating high reliability, and explained **72.00% of the variance**. With a mean score of **3.76**, there was a mix of areas that needed improvement and satisfaction. This factor's inter-item correlation was **0.63**, indicating that the variables were highly related to one another.

**"Amenities and On-Site Support,"** the third factor, included things like designated seating or prayer areas, accessible restrooms, staff assistance, emergency procedures, and assistive technology. This factor had the highest **Cronbach's alpha of 0.97**, indicating excellent reliability, and it explained **57.05%** of the variance. Participants' satisfaction with this factor was moderate, as indicated by the mean response value of **4.02**. The coherence of the variables included was confirmed by the inter-item correlation of **0.62**.

The table 1 below summarizes the results of the factor analysis:

**Table 1: Results of the three-factor analysis**

Factors	Items Covered	KMO	Variance (%)	Cronbach's Alpha	Mean	Inter-Item Correlation	Standard Deviation
Accessing the Site	Parking, entrance, transport, reception	0.94	67.10	0.95	3.98	0.58	0.91
Activities at the Site	Accessible pathways, sensory support, information formats	0.9	72.00	0.95	3.76	0.63	1.01
Amenities and On-Site Support	Restrooms, prayer areas, assistive devices, staff, emergency	0.877	57.05	0.97	4.02	0.62	0.87

Source: Prepared by author

## Interpretation of Factor Analysis Results

The chart (Factor Analysis : Variance Explained and Satisfaction) below provides a comparative

overview of the variance explained and mean satisfaction scores for each of the three identified

factors influencing accessibility experiences at religious sites for individuals with disabilities.

The factor “Activities at the Religious Site” emerged as the most influential, explaining 72.00% of the total variance, indicating that this dimension significantly contributes to how individuals perceive accessibility. However, it recorded the lowest mean satisfaction score of 3.76, suggesting that while this factor is critical to overall experience, current provisions in this area may not fully meet user expectations. This points to a potential gap in services such as accessible pathways, support for sensory impairments, and availability of inclusive information formats.

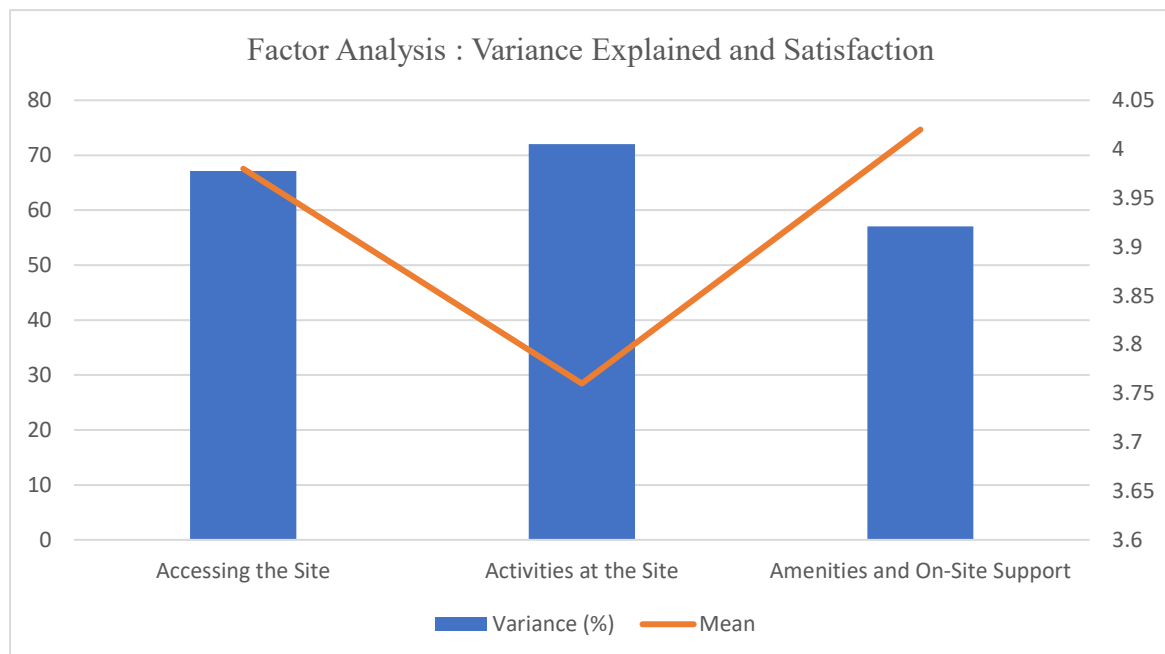
The factor “Accessing the Religious Site” explained 67.10% of the variance and received a mean score of 3.98, indicating moderate satisfaction. This suggests that while transportation, parking, and entrance access are relatively well addressed, there is still

room for improvement to enhance the overall accessibility experience at the initial point of contact.

Interestingly, “Amenities and On-Site Support”, while accounting for the lowest proportion of variance (57.05%), recorded the highest satisfaction score of 4.02. This reflects positively on the availability and quality of assistive infrastructure, such as accessible restrooms, staff support, and emergency measures, suggesting that these features are both present and appreciated by users.

Overall, this analysis highlights that the most impactful areas on user experience are not necessarily those with the highest satisfaction levels. Therefore, improving Activities at the Religious Site may yield the most significant improvements in overall accessibility perception, while continuing to maintain high standards in Amenities and On-Site Support.

**Figure 1: Factor Analysis- Variance Explained & Satisfaction**



*Source: Compiled by author*

## 6. Discussion, Conclusion and Implication

The study underscores the pressing issue of inaccessibility at Indian religious tourist sites, highlighting the interplay between physical barriers,

environmental constraints, and the life-course phase of individuals with disabilities, as noted by **Lid and Solvang (2016)**. Despite the large number of pilgrims with disabilities visiting these sites, the

built environment is still inadequately equipped to meet their needs. This demonstrates a lack of structural planning and policy implementation that prioritises inclusive design. Furthermore, the lack of reliable data on the tourist footfall of people with disabilities, both domestically and internationally, impedes the development of effective policies. The Census of India's inclusion of disability data only in 2011 is a step forward, but the inability to calculate the economic contributions of disabled tourists to religious tourism is a critical shortcoming. This lack of information impedes the allocation of resources and the development of policies to improve accessibility.

The findings emphasize the critical need for improvements in physical infrastructure, accessibility of information, and on-site amenities to enhance inclusivity for individuals with disabilities. IoT, as an enabler technology, can offer people with disabilities the assistance and support they need to achieve a good quality of life and allows them to participate in the social and economic life. Some disability rights organizations periodically (for instance, yearly) verify if declared accessibilities are compliant to the standard. As a good example of this, in UK, there are important providers of access information like DisabledGo (<https://www.disabledgo.com/>).

Furthermore, the Ministry of Tourism has launched a number of initiatives to promote tourist destinations and improve accessibility for people with disabilities. State governments and union territory administrations must incorporate barrier-free environments into project designs under schemes such as Swadesh Darshan and PRASAD (National Mission on Pilgrimage Rejuvenation and Spiritual Augmentation Drive). Furthermore, the Ministry has established awards to recognize monuments and tourist attractions that excel at accessibility. Furthermore, guidelines for star-rated hotels now include provisions for accessible rooms, parking, ramps, and public areas, resulting in a more inclusive tourism experience. These efforts are aimed at making the environment more welcoming and accessible to disabled tourists.

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