THE ROLE OF TECHNOLOGY AND AI IN INCLUSIVE TOURISM

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Abstract. *Inclusive tourism emphasizes equal opportunities for all individuals—regardless of age, disability, gender, or socio-economic background—to access and enjoy travel experiences. The rapid development of digital technologies and artificial intelligence (AI) has created new opportunities for reducing barriers in tourism by offering tools such as mobile apps, virtual reality (VR), accessibility mapping, and AI-powered personalization. This paper explores how technology and AI enable inclusive tourism by reviewing academic literature, analyzing global case studies, and identifying challenges and future directions. While technology has improved accessibility, affordability and ethical concerns remain critical obstacles. The paper concludes that technology and AI, if responsibly applied, are essential for building a tourism sector that is inclusive, equitable, and aligned with the United Nations Sustainable Development Goals (SDGs).*

Keywords: *inclusive tourism, accessibility, artificial intelligence (ai), digital technologies, virtual reality (vr), smart tourism, sustainable development goals (sdgs), personalization, stakeholders, sustainable tourism*

1. Introduction

Tourism represents one of the world's most significant industries, contributing nearly 10% of global GDP and providing employment for more than 320 million individuals worldwide (WTTC, 2023). Yet, the benefits of this vast sector are not equitably distributed. Numerous groups—including persons with disabilities, older adults, low-income families, and ethnic minorities—continue to encounter structural and social barriers that constrain their participation in tourism. The World Health Organization (2022) reports that over 1.3 billion people, or approximately 16% of the global population, live with some form of disability, highlighting the scale of potential exclusion. Although recent decades have witnessed progress in accessibility, substantial gaps remain across infrastructure, services, and policy implementation. Projections from Tourism Economics (2023) indicate that global travel and tourism spending will expand at an average annual rate of 7% between 2024 and 2034, following full recovery from the COVID-19 pandemic shock. This anticipated growth accentuates the imperative of embedding inclusivity within tourism development strategies to ensure that the sector's expansion translates into equitable opportunities for all travelers.

The World Economic Forum and Kearney (2025) argue that the future of tourism must embrace both sustainability and inclusivity, highlighting that long-term sectoral growth cannot be achieved without addressing barriers faced by diverse travelers (Figure 1).

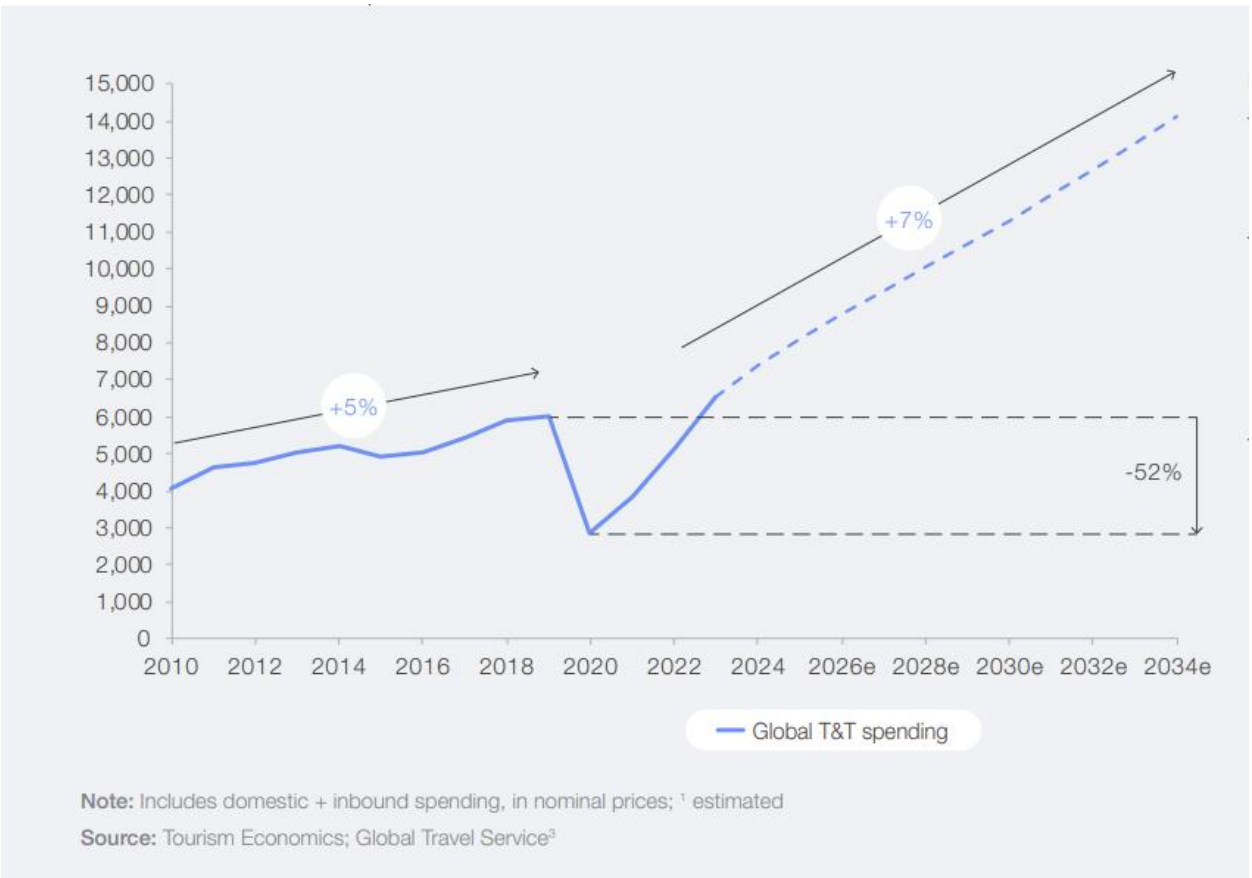


Figure 1. Global travel and tourism spending (in billion dollars, 2010-2034e[1])

Inclusive tourism is firmly embedded within the United Nations 2030 Agenda for Sustainable Development, which identifies inclusivity as a cross-cutting priority. Several Sustainable Development Goals (SDGs) directly address this dimension, most notably SDG 4 (quality education and lifelong learning), SDG 8 (decent work and inclusive economic growth), SDG 10 (reduction of inequalities), and SDG 11 (sustainable and inclusive cities). Recent bibliometric research shows that inclusive tourism scholarship is fragmented across themes such as accessibility, technology, and social equity, with limited integration between them (Korbiel, Gmyrek, & Kruczek, 2025). This confirms the need for studies that explicitly link AI-driven technological innovations with the broader inclusivity agenda.Table 1 outlines these goals alongside the specific tasks most pertinent to inclusive tourism. In parallel, the accelerating digital transformation of the tourism sector has introduced new mechanisms for advancing inclusivity. Emerging applications of artificial intelligence (AI)—ranging from Google Maps' wheelchair-accessible navigation features to Airbnb's AI-driven accessibility filters—demonstrate the growing role of technology in mitigating physical, social, and cultural barriers that have historically limited participation.

Table 1. Goals of the 2030 Agenda and tasks addressed to inclusive tourism

Goal—Number and Name	Task
Goal 4: Ensure quality education for all and promote life-long learning	4.7: All learners should acquire the knowledge and skills needed to promote sustainable development, including sustainable lifestyles, human rights, gender equality,

	promoting a culture of peace and non-violence, appreciation of cultural diversity, among others.
Goal 8: Promote stable, sustainable and inclusive economic growth, full and productive employment and decent work for all	8.5: Everyone should have a decent job—people of all genders, including young people and people with disabilities, with equal pay for equal work.
Goal 10: Reduce inequality within and between countries	10.2: Promote and strengthen the social, economic and political inclusion of all people, regardless of age, gender, disability, race, ethnicity, nationality, religion or economic or other status.
Goal 11: Make cities and human settlements safe, stable, sustainable and inclusive	11.2: Everyone should have access to safe, affordable and sustainable transport. Road safety should be improved, in particular by developing public transport. Particular attention should be paid to the needs of vulnerable groups, women, children, people with disabilities and senior citizens. 11.7: There should be easy and universal access to safe and inclusive green spaces and public spaces, especially for women, children, seniors and people with disabilities.

In this paper we explore the part that technology and AI can play in accessible tourism. It synthesizes the literature, showcases cases studies from around the world and explores opportunities and challenges. The intention is to show how technology can make tourism a fairer industry, recognising the constraints that we must work with.

2. Literature Review

The idea of inclusive tourism has been studied extensively, especially on accessibility and social equity. It has been characterized by Buhalis and Darcy (2011) as a form of tourism that guarantees limitless physical access and service for all populations, most particularly for those with disabilities. More contemporary discourses of inclusivity embrace accessibility, affordability and cultural relevance (UNWTO, 2022). Accessible tourism depends on the active involvement of diverse stakeholders, each with distinct needs and motivations. Teixeira, Teixeira, Silva, and Eusébio (2025) emphasize that technology-based approaches—particularly those employing personas—are effective in understanding these stakeholders and tailoring solutions for inclusivity. As illustrated in Figure 2, accessible tourism is shaped by interactions between demand agents, supply agents, and educational institutions, all of whom require tailored technological interventions to enhance participation.

Inclusive tourism is technology-driven. Tourists, as a consequence of both mobile apps and online booking systems and navigation tools, have changed their behaviors with over 70% of tourists worldwide using smartphones to plan their travel (Statista, 2023). Supportive facilities – such as speech-to-text apps, VR and real-time translation – enhance accessibility for elderly and sensory impaired travellers (Darcy & Buhalis, 2017). Additionally, the inclusion is also powered by AI features which includes personalization and predictive analytics, as well as accessibility mapping.

There are AI chatbots for support in its various languages, and machine learning used to identify accessible routes for wheelchairs (Gretzel et al., 2020). and Google's "Accessible Places" feature and platforms such as Wheelmap. org are some of the ways AI-based applications aim to overcome mobility limitations.

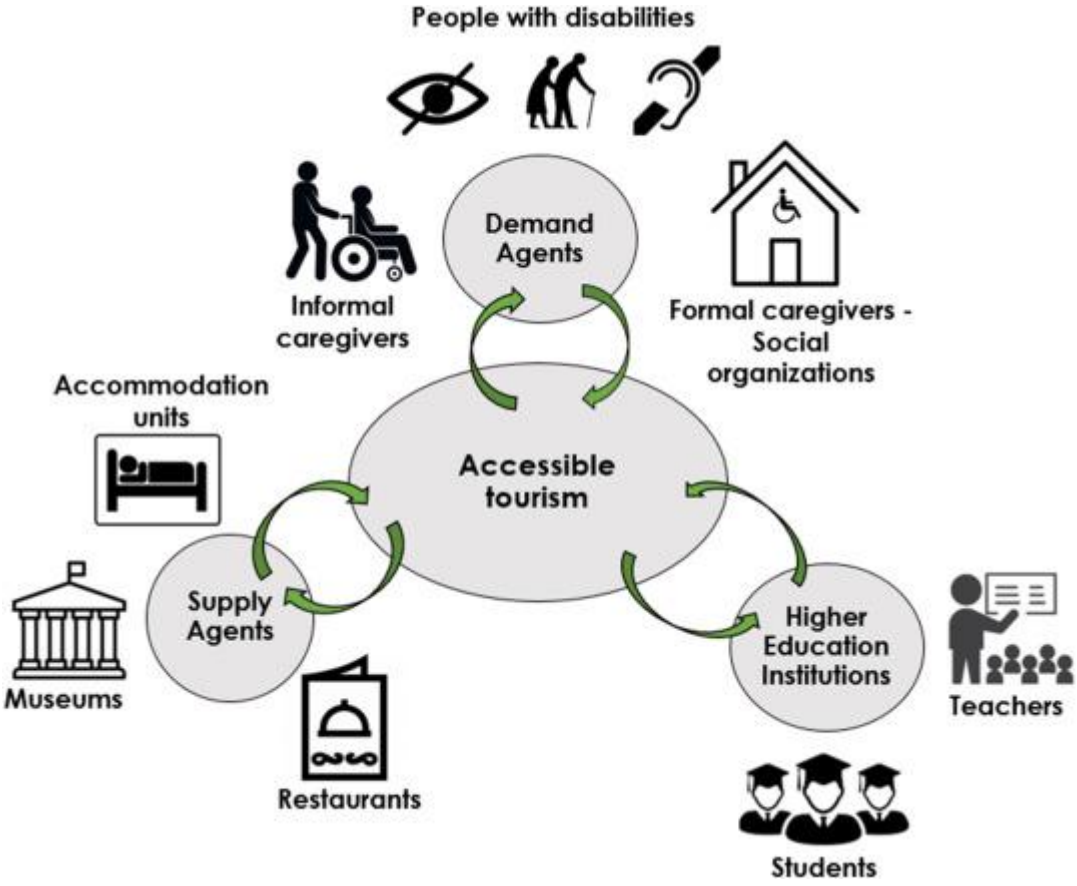


Figure 2. Stakeholders and agents involved in accessible tourism

While these studies have contributed to knowledge in this field, scholars suggest a missing link: the majority of previous work has either focused solely on physical access or smart tourism technologies. AI and inclusive tourism frameworks are not well combined (Scheyvens & Biddulph, 2018). This paper fills that gap.

3. Methodology

The paper is a conceptual and analytical piece based on secondary data. Theoretical backing is based on academic literature, reports from UNWTO and OECD as well as industry statistics. A case comparison of platforms like Be My Eyes, Airbnb, and Google Maps provides an example of concrete applicability. Results were thematically systematised: (i) technology facilitating inclusion, (ii) uses of AI, (iii) examples of cases and (iv) obstacles and future perspectives. This method enables the synthesis of international evidence without re-data collection.

4. AI and Technology in Inclusive Tourism

4.1 Mobile Applications and Digital Media

Digital channels are essential for inclusive tourism. Airbnb says there are more than 300,000 accessibility features available across its listings, and that users can filter accommodations for wheelchair access or step-free entry. Wheelchair-accessible routes, introduced in 2018 by Google

Maps, are now available for cities worldwide. These improvements assist in giving individuals with mobility impairments the confidence to plan a trip.

4.2 Virtual and Augmented Reality

VR and AR also provide the possibility to access cultural heritage and places when it is not possible to physically visit. UNESCO introduced VR tours of Machu Picchu and the Pyramids of Giza, while the Louvre in Paris and the British Museum in London utilize AR guides with haptic and audio assistance. These artefacts democratize participation by offering alternate means of inclusion.

4.3 Wearable and Assistive Technologies

Wearables promote freedom for travelers who are blind or deaf. Microsoft's Seeing AI app on smart glasses describes surroundings to people with sight disabilities. Wearables for guidance, like "Wayband," communicate with travelers through haptic signals; museums, including the Smithsonian, offer hearing-aid-compatible devices. These technologies lower the barriers of entry directly.

4.4 AI in Personalization and Support

AI customizes experience based on traveller needs. Expedia and Booking. com recommend hotels and restaurants using algorithms. Chatbots, as on Skyscanner, offer around-the-clock service in multiple languages and both Siri and Alexa help visually impaired travellers book without the use of fingers or hands. AI also propels translation tools — more than 100 billion words a day are processed by Google Translate — eroding language barriers.

4.5 Accessibility Mapping and Intelligent Cities

AI is improving mapping and city inclusion. Wheelmap. org aggregates and curates wheelchair availability data for more than 3 million places across the world. In Singapore, 95 percent of the transport network has barrier-free access as a result of smart city efforts. Multilingual e-tourism platforms are being developed in Uzbekistan under the resolution of Digital Uzbekistan 2030 yet there has been limited integration with accessibility.

5. Case Studies

– Be My Eyes: A mobile app that links sighted volunteers and AI image recognition with blind users. A global example for travel support, with over 7 million volunteers in 150+ countries.

– Airbnb Accessiblity Filters: Airbnb now offered more than 300,000 listings that have been checked for accessibility and were working with disability-oriented organizations like RNIB.

– Google Maps Accessible Places: Launched in 2020, this feature shows wheelchair-friendly entrances and restrooms across 130+ countries to make getting around easier for millions of users. These examples demonstrate how AI and digital technology can overcome the real-world obstacles to tourism created by global platform networks.

6. Challenges and Future Prospects

Despite notable progress, several structural and operational barriers continue to constrain the realization of fully inclusive tourism.

– Digital inequality: Some 2.6 billion people are cut off from internet access (ITU, 2023), with most particularly excluded needing inclusive tools.

– Cost: Devices, such as Wayband, are expensive and small businesses can't afford emerging AI.

– Data Privacy and Ethics: A 2022 poll with the OECD found that 72% of travellers' were wary of sharing personal data with AI powered tourism platforms. Algorithmic bias also risks exclusion.

– Dependence on Technology: It's not possible to entirely replace the need for human help, which some elderly tourists or people with cognitive problems may need if humans are no longer on site, as is the case with digital-only models.

– Heterogeneity: Accessibility standards are not standardized across devices and there is limited regulation in countries outside the EU on non-privatized digital accessibility standards.

In the future, AI applications have potential for deployment in smart cities integration (for example - predictive analytics to enhance transport accessibility), metaverse tourism (e.g., VR participation for 'staying behind' due to transportation barriers) and AI-based policy frameworks – e.g. upcoming European Accessibility Act (2025). Actions such as public–private partnerships, including Microsoft's AI for Accessibility, illustrate how nothing can scale innovations better than collaboration. But cost, digital literacy and ethics among them must be imperatives.

7. Conclusion and Recommendations

As technology and AI continue to evolve, they are also evolving tourism, making it more inclusive, accessible and equitable. With mobile apps, VR experiences and AI-driven personalization — barriers have fallen for travelers with disabilities, the elderly and non-native speakers. Examples demonstrate that inclusivity is possible when technology is developed with access in mind. Yet inclusivity is not guaranteed. Challenges such as the digital divide, affordability, ethical concerns and absence of uniformity need to be confronted. Without action, technology could increase — not reduce — disparities in tourism. Recommendations include:

1. Governments must mandate the requirement for accessibility of digital platforms under the United Nations Convention on the Rights of Persons with Disabilities.
2. The SMEs in tourism should be motived to implement low-cost AI solutions.
3. There is a need for international organizations to advance global models of AI inclusion and digital literacy.
4. Finally, technology and AI are not a luxury but rather the required enablers in achieving the dream of "tourism for all" aligned with the UN SDGs.

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