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EDITORIAL

Accessibility of tourism 4.0—designing more meaningful and inclusive tourist experiences

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The tourism industry caters to a diverse range of consumers, with a significant portion being individuals with disabilities [5]. Unfortunately, consumers encounter various barriers—be they physical, sensory, cognitive, or cultural—throughout the different phases of the tourist experience, from seeking inspiration to sharing their adventures. These challenges are not confined to a specific type of travel or tourism setting. However, despite this ubiquitous need for considering accessibility in tourism, the topic has received relatively little attention in academic research and in industry practice.

The tourism industry has become increasingly reliant on information technology, a trend accentuated by the adoption of technologies like the Internet of Things, big data analytics, artificial intelligence and robotics, location-based services, or virtual and augmented reality systems [9, 16]. Paradoxically, this dependence on technology could exacerbate accessibility issues, despite the intent of technological advancement to facilitate or enhance usage [33, 43]. The Fourth Industrial Revolution, also known as Industry 4.0, emphasized the integration of advanced technologies into manufacturing operations to improve business flexibility, productivity, and efficiency. While Industry 4.0 originated in the context of manufacturing and industrial processes, its principles and technologies have found applications in various other domains, since technological advancements have the potential to bring about positive changes, solve problems, and improve various scenarios of use [30]. Unfortunately, the negative consequences of Industry 4.0 are rarely discussed. This inherent presumption especially exists in tourism, where it is generally believed that technological advancements bring benefits to both tourists and society at large [37, 39]. However, advances in tourism technologies regularly lack human-centered design [38], and often even basic accessibility features [8, 12, 29].

In recent years, a paradigm shift has been occurring, pleading that a more comprehensive approach to Industry 4.0 is needed [15, 26]. Building on Industry 4.0 principles, tourism-specific use of advanced technology has been referred to as Tourism 4.0 [38, 42]. Tourism 4.0 involves a novel tourism value ecosystem built upon a technology-intensive service production paradigm [38]. However, amidst this transformative journey, a notable consequence has emerged—certain segments of tourists have been inadvertently left behind [7, 17]. Tourism researchers have recognized that, in order to provide meaningful and inclusive tourist experiences and uphold the promise of delivering the very essence of the tourist experience, a Tourism 4.0 approach must be more human-oriented and holistic [2, 10, 35].

In the nascent stages of the digital era, the focus of accessibility within the realm of tourism was primarily confined to the imperative of rendering tourism information more readily available on digital platforms, including websites and applications [11, 21–25]. However, with the pervasive integration of advanced technologies and their seamless convergence with the essence of tourism experiences, the significance of accessibility has undergone a profound transformation. No longer confined solely to the realm of information dissemination, accessibility has evolved into a paramount concern, intricately woven into the fabric of the entire tourism ecosystem [13, 14, 31, 32]. This shift from merely providing information access to fostering inclusive and immersive tourism encounters [3] underscores the broader realization that true accessibility extends beyond the digital realm, encompassing the entirety of the tourist

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journey. It now encompasses diverse dimensions, including but not limited to physical access to destinations, cultural inclusivity, and ensuring that technology serves as an enabler rather than a barrier for individuals with varying needs [28, 40, 41]. This evolution in the conceptualization of accessibility aligns with the dynamic nature of contemporary tourism experiences, where the focus is moving to facilitating more meaningful and inclusive interactions [6, 27],Stankov, Gretzel, & Filimonau, 2022).

As technology becomes increasingly integrated into every aspect of the travel industry, there is a growing acknowledgment that accessibility is not just a checkbox but a fundamental principle that should permeate the design and implementation of technological solutions in tourism. The need for a more inclusive approach stems from the dual factors of the relentless speed at which technology develops and the growing chasm between technological capabilities and needs of individuals [9, 36]. In other words, as technology becomes increasingly integral to every aspect of travel, ensuring universal accessibility has transitioned from being a mere consideration for tourism information provision [11, 34] to an imperative need. With the progression of technology, it is anticipated that the need for accessibility incorporation into the design of tourism services will increase exponentially [19].

This special issue aims to help broaden the often-narrow academic understanding of accessibility and the single-task oriented accessibility practices of the tourism industry, but also seeks to identify new possibilities brought about by Tourism 4.0 technologies. In this special issue, we showcase six noteworthy contributions from authors who cover a range of topics pertaining to various facets of Tourism 4.0 accessibility. Together, these papers help explore and promote more meaningful and inclusive tourist experiences by delving deeper into the accessibility aspects of virtual tourism, the expectations of potential cyborg tourists, the promise of use case modelling in software development to ensure accessibility, the significance of large events as accessibility laboratories and showcases, technology applications in restaurants and also the clear risk of exclusion from participation in the production and consumption of culture.

Virtual technologies and virtual tourism have the potential to democratize the travel experience, enabling individuals with diverse impairments to virtually visit iconic landmarks, historical sites, and natural wonders that might otherwise be challenging to access. Virtual tourism fosters inclusivity by accommodating various needs, ensuring that many, regardless of their abilities, can partake in the joy of discovery. It can also be instrumental in creating strong travel intentions, which can help individuals in finding the motivation to overcome barriers to travel. In recognition of the motivating power of virtual experiences and in line with the need to more broadly define accessibility issues, the first paper by Ye and colleagues [47] investigates the impact of virtual tourism on travel intentions during the post-COVID-19 era, providing evidence from China. The research shows that high quality virtual tourism experiences significantly promote travel intentions. The insights provided by the paper can aid governments in the development of pertinent policies and services, while also assisting tourism companies in recognizing virtual tourism as a positive force rather than a deterrent for visitation.

In recent years, advanced technologies have helped people with disabilities significantly. There are computer-controlled leg replacements, special suits for those who can't move their bodies well, implants that help deaf people hear better, electric wheelchairs, and advanced artificial hands, to mention a few. These technologies extend the abilities of tourist bodies and create cyborg tourists who can experience destinations that might otherwise be inaccessible to them. In the second contribution to the special issue, Ali and colleagues [1] dive into this transformation from tourists with mobility disabilities to impaired cyborg tourists. They present the many benefits but also challenges of current assistive devices like wheelchairs. They then explore the acceptance of cyborg products in the form of technological implants and find that expected gains in independence, control, freedom, convenience, and social inclusion are among several factors that would drive the desire to obtain implants.

In the era of rapid advances of information systems and technology use across diverse scenarios and by various users, use case modelling is becoming of paramount importance for a comprehensive understanding of user needs and system functionalities, ensuring that the design aligns closely with real-world scenarios. For designing tourism experiences, use case modelling ensures that the system is user-centric, inclusive, and capable of providing a seamless and supportive experience for all tourists, including those with disabilities. The third paper by Vranić and colleagues [45] describes and generalizes the application of use case modelling to establish a solid foundation for software development, laying the groundwork for further exploration within the Tourism 4.0 paradigm.

Self-service technology, such as touchscreen ordering kiosks and mobile apps, enhances accessibility in restaurants by providing consumers with alternative methods to independently place orders and personalize their meals. These advancements enable individuals with various requirements, including those with disabilities, to easily and efficiently navigate menus and complete transactions. The fifth study conducted by Li and colleagues [24] contributes to the understanding of restaurant brand image by examining it through the lens of technology applications. They investigate the pivotal importance of third-party partnerships and expand the Extended Unified Theory of Acceptance and Use

of Technology (UTAUT2) framework to better comprehend the integration of self-service technologies by restaurants.

Large events, namely those that draw wide audiences and are supported by significant budgets, are frequently employed by destinations to showcase the latest technologies and innovations. Consequently, they often serve as excellent examples of accessibility promotion, paving the way for future applications at smaller and less funded scales. The study conducted by Jiménez-Andres [18] adopts a case study approach, focusing on Expo 2020 Dubai and providing in-depth data on the accessibility of this large event. The research delves into the experiences of people with disabilities, the accessibility provisions in place, and the challenges faced by accessibility experts. It concludes with implications and recommendations for effectively managing accessibility in large events.

In a cultural tourism context, the term accessibility signifies the removal of physical, economic, cognitive, and digital barriers, fostering an environment where individuals can equally relish cultural artifacts and services [46]. This pursuit of the utmost accessibility underscores the commitment to enabling everyone, including the elderly, families with young children, or those with permanent or temporary disabilities, to partake in cultural experiences and cultural tourism seamlessly, without hindrance. When taking advantage of advanced technologies, culturally significant institutions should adopt universal accessibility and a design-for-all approach as standard practices. Therefore, Kovačić and colleagues [23], in the last paper, conducted a study to determine how visitors from various social groups perceive and experience the accessibility of cultural content offered by cultural institutions in northern Serbia.

As can be seen from the diversity of contributions to this special issue, from trip planning to post-travel activities, each phase of the tourist experience may pose challenges for individuals with diverse needs and abilities. The intersection of technology and tourism, while bringing forth unprecedented opportunities, must also address and mitigate accessibility issues to ensure not only an enjoyable but also an equitable experience for all tourists. The exploration of Industry 4.0 technologies within the tourism industry presents an exciting prospect to leverage technology not only for its groundbreaking capabilities but also to ensure that its benefits are universally attainable, fostering a more inclusive and enriching travel experience for all. This is a paradigm shift that seeks to reconcile the benefits of technological achievements with a renewed emphasis on inclusivity [4, 20, 44]. Thus, this special issue calls for a human-centred and holistic approach to advanced technology design and use in tourism where the well-being and diverse needs of all individuals, including those who may face barriers, are prioritized.

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