

The concepts of Smart cities, Smart Tourism Destination and Smart Tourism Cities and their interrelationship

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Abstract. Because of the dramatic urbanization processes and increasing number of the population, cities are required to develop complex strategies and innovative plans for their future. Advancing technologies are causing the transformation of cities into smart cities and the recent trend of tourism research shows the potential relationship of smart cities with tourism. In this article, the content of the concepts of smartness, smart tourism destination (STD), smart city, smart tourism cities, their interdependence and importance are studied. Furthermore, the purpose of this study is to explore what STDs provide for tourists and the chances that smart cities offer for local people, analysing the potential benefits of STDs for tourists, stakeholders and destinations, and their importance in urban development based on current scholar research.

1 Introduction

One of the major global sectors, tourism, plays a significant role in the socioeconomic development of many nations. Since this sector contributes to new jobs, improvement of infrastructure conditions and development of society. UNWTO defines [1] tourism as a social, cultural, and economic trend that is linked to human movement to locations outside of certain environments. Although the sector has still not reached its pre-pandemic levels after the pandemic, according to UNWTO [2], more than 900 million tourists travelled internationally in 2022, more than twice as many as in 2021, but this is 37% less than in 2019. The growth of international tourism has been driven by growing demand and the lifting or easing of travel restrictions in many countries. In 2022, Europe and the Middle East (achieving almost 80 percent and 83 percent of pre-pandemic levels, respectively) lead the way in attracting tourists. 65% of the UNWTO expert group believes that international tourism will reach 2019 figures in 2024 or later.

Of course, the growth of the sector depends on the proper use of information and communication technology (ICT). Recent decades have witnessed the rapid development of ICT that has transformed the tourism industry [3]. The impact of information technology on

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the tourism industry is gaining attention with the emergence of smart tourism [4]. Taking into account the information-demanding quality of tourism, the term "smart" is applied to events covering tourism. That is, in the next few years, due to the formation of the idea of connecting the term "smart" to modern technologies, these concepts were also applied to tourism destinations, and the term "smart tourism destination" appeared. Technologically, economically and socially developed or developing tourism with the help of advanced smart technologies means smart tourism. Gretzel et al., [5] defined smart tourism as a technologically oriented tourist experience in a destination. Bringing a tourism destination to a smart level requires facilitating information sharing among stakeholders, which can improve their decision-making process [6]. This ultimately helps tourism service businesses to provide new and advanced services to tourists [7]. Therefore, smart tourism is attracting the attention of practitioners and scientists precisely because it leads to the integration of tourism resources and smart technologies and allows tourism stakeholders to share important and timely information [8, 5].

The advent of smart city technologies has provided new opportunities for tourism, leading to the development of STDs which provide tourists with a smooth and individualised experience through the use of cutting-edge technology like Internet of Things (IoT), big data analytics, and artificial intelligence (AI). This research paper explores the concept of STDs in the context of the smart city paradigm. With a focus on the potential and problems encountered by STDs, it intends to analyse how smart city technology might help develop a sustainable and innovative tourist business. Through a thorough literature review, this paper seeks to provide insights into the potential benefits of STDs for both tourists and destinations, as well as the implications for policymakers and stakeholders. Ultimately, this research highlights the importance of collaboration and innovation in the development of STDs as a means of enhancing the overall tourism experience and promoting sustainable urban development [24].

The rest of the paper is as follows. In section 2 materials and methods used in the article are explained. In section 3, smart cities and their characteristics, smart tourism and smart tourism destinations as well as definition of smart tourism cities are presented, while in section 4, the conclusion and limitations of the research are discussed [24].

2 Materials and methods

The research referred to in this paper was designed to clarify a general view of the smart city and smart tourism and the relationship between them [24]. In order to achieve that, qualitative analysis was performed and comprehensive literature review was carried out to shed light on the essence of smart cities and their peculiarities as well as nature of smart tourism and STDs. In the article, several definitions of smart cities were discussed, and the characteristics and importance of smart cities, smart tourism, STDs, smart tourism cities and their interrelationships were described graphically [45]. Given that research in smart tourism is not limited to journals in the hospitality and tourism fields, and relevant materials are dispersed across multiple publications, materials from a variety of disciplines were considered in the literature study. Because of their ease of use and accessibility to researchers, Web of Science and Google Scholar were chosen as online journal databases for this study. All of the selected articles were in English and published between 2000 and 2021.

3 Results

3.1 Smart cities and their characteristics

Smartness first came onto the scene in the 1990s, though it experienced a huge growth in popularity after 2008 [9]. At first, smartness was defined as a sophisticated technological framework built into cities to promote economic, social, and ecological well being [10]. In general, smartness is focused on a user-based viewpoint, making it more user-friendly than "intelligence". This term has been incorporated in smart cities to describe attempts to use technology in an ingenious way to optimise resources, maintain effective and equitable governance, sustainability, and an overall better quality of life. To do this, it proposed the integration of ICTs to optimise processes [11], so as to address the financial, social and environmental concerns that come with urbanisation [12]. Managing large cities has enabled the emergence of Smart City ideas. Talking about "smart cities", it can be seen that this concept covers various fields, including tourism [13]. Nowadays, the term "smart city" or "digital city" has numerous interpretations. For instance, some view a smart city as a location outfitted with ICT infrastructure to promote social development, such as increasing economic prosperity, facilitating citizen engagement and optimising government activities. Concepts related to this aspect include the digital city [14], virtual city [15], information city [16], wired city [17], omnipresent city [16], and intelligent city [18]. Smart cities leverage ICTs to open up new opportunities, as Lee [19] argues. In order to promote sustainable economic growth and a high standard of living, smart cities are investments in human and social capital that use both old and contemporary communication infrastructures [20]. These cities use communication technology integrated into municipal infrastructures to optimise transportation, electricity, and other daily functions, hence enhancing the quality of life for their citizens [21]. With the aid of all available technologies and resources, smart cities also work to make their urban areas as interconnected, livable, sustainable, and ecologically friendly as feasible [22]. Smart cities are often deemed as having increased efficiency, ICT connectivity, sustainable use of resources, environmental friendliness and an improved quality of life. STDs, then, strive to implement innovations that nurture sustainable development, enhance visitors' experiences with the help of existing conditions in the destination, bring more tourists in, achieve economic efficiency and ultimately raise the wellbeing of the population. Furthermore, it is viewed as a potential solution to the issues faced by smart cities [23].

Although the idea of a "smart city" is gaining popularity, its qualities are still not entirely clear [24]. For smart cities to be sustainable, livable, and developed, they need to possess a number of qualities: smart living conditions (e.g. availability of recreation areas and libraries, effective management of resources, educational and health facilities, green spaces, ICT), smart environment (CO₂ reduction strategies, efficient use of water and electricity, green space, urban development policy and waste recycling), intelligent citizens (literacy level of citizens, language skills, education curricula and technical skills), as well as smart governance (number of educational institutions, e-governance facilities for citizens to access the Internet easily and access existing services) [65]. A stable and livable smart city is built on these pillars [24]. Consequently, it can be said that a smart city is an established, livable, linked ecosystem.

Even if the goal of a smart city is to enhance the quality of life for its citizens, it is crucial to focus on tourism since it is a major source of income for many communities [24, 25]. According to Buhalis [26], the mix of tourism-related businesses and smart cities is the origin of STDs. According to Huang [27], the fundamental purpose of STDs is to pay attention to and attend to each visitor's specific needs by fusing ICT with informal culture. In the end, this boosts a destination's level of customer service and enhances tourism administration. It

should be noted that persons without a basic understanding of technology can live in popular tourist areas. Destinations need to concentrate on training residents and visitors on how to use new technologies effectively given that they can generally learn and adapt to quickly changing technology [28].

3.2 Smart Tourism and Smart Tourism Destinations

Tourism is "a social, cultural, and economic phenomenon that involves people traveling to places outside of their normal environment for personal, business, or professional purposes," according to the UNWTO [1]. It is not surprising to see the term "smart" being used to describe phenomena that include tourism given the information-intensity of tourism and the associated heavy dependence on ICTs [3, 29]. In many ways, smart tourism can be seen as a logical development from traditional tourism and more recently e-tourism in that the foundation for innovations and a technologically oriented industry and consumers was laid early with the extensive adoption of ICT in tourism, for example in the form of global distribution and central reservation systems, the integration of Web-based technologies that led to the emergence of e-Tourism [30, 58].

Cities and tourist sites have been viewed as complex ecosystems with a wide range of stakeholders that eventually work together to produce value for themselves and others [31] as environments for the smartness notion. Governments, as well as public and private agencies in cities and tourist destinations, started to incorporate smartness in new policies and strategies to enhance sustainable development and economic growth [32, 10] for all stakeholders in the tourism ecosystem as the public sector began to understand the potential of smartness and the need to adapt to this rapid change in technology [45].

Buhalis and Amaranggana [6] stated that interconnecting the stakeholders through a shared platform is crucial to bringing smartness to tourism destinations. Guo et al. [13] and Wang et al. [33] have described The STDs as a site that employs the available technology to jointly give value, pleasure, and experiences for tourists. The STD community must positively interact with regional stakeholders to ensure community involvement [24]. Because STDs allow for information sharing between tourism organisations and guests via a single platform, the tourism industry benefits. STDs could gain better insight into the actual needs and preferences of their clientele. A successful interaction between customers and service providers is necessary for the delivery of goods that are tailored to the demands of tourists. Ultimately, this will assist the service providers in understanding the needs of the tourists and providing innovative and improved solutions [7].

According to Buhalis and Amaranggana [34], Smart Tourism is defined as the application of ICT to enhance tourism experiences, optimise destination management, and promote sustainable tourism practices. Smart Tourism is based on the idea that technology can be used to offer more personalised, seamless, and efficient services to visitors, while also enabling destination managers to optimise resource allocation, reduce waste, and enhance sustainability.

In recent years, several studies have focused on the application of specific technologies to Smart Tourism, such as the Internet of Things (IoT), Big Data analytics, Artificial Intelligence (AI), Virtual Reality (VR) and Augmented Reality (AR). Gretzel et al. [5] used Big Data analytics to analyse social media data to understand visitor behaviour and preferences, providing insights that can inform destination management strategies.

STDs are specific destinations that have adopted smart tourism technologies to enhance their sustainability and competitiveness by considering them as main factors to develop the tourism industry [35, 36]. According to Xiang et al. [37], STDs are characterised by the integration of various technologies and systems, such as IoT, AI, and AR, to provide visitors

with more personalised and efficient services, while also enabling destination managers to optimise resource allocation, reduce waste, and enhance sustainability.

Several studies have focused on the development of STDs in different regions around the world, such as Europe, Asia, and Australia. For example, Li et al. [38] conducted a case study of the STD development in Hangzhou, China, and identified several key success factors, such as collaboration and partnerships, vision and leadership, and flexibility and adaptability. Similarly, Femenia-Serra et al. [39] examined the development of STDs in Spain and highlighted the importance of stakeholder engagement, innovation, and sustainability in achieving the objectives of Smart Tourism.

3.3 Definitions and qualities of smart cities

The concepts of smart city and smart tourism are closely interconnected, because of their shared core elements [61]. Yet, a key difference exists between them - smart cities aim to benefit their residents while smart tourism focuses largely on tourists. In essence, both concepts involve infrastructure as well as facilities that offer solutions to both citizens and tourists alike. In the literature, "Smart" has developed into two distinct branches, though both possess similar elements. Thus, it is necessary to explore past studies in order to comprehend the basis of this phenomenon and the advancements that have occurred both generally and particularly to current contexts.

Appendix 1 illustrates the definitions of smart cities and they will lead to accept that a "smart city" is a special type of spatially localised socio-economic system that provides a chance to implement a system of local competitive advantages of an intelligent type based on the widespread introduction of infrastructure and management technologies, methods, and tools from the perspective of a socio-economic approach to managing the territory.

A "smart city" may be further defined as the growth of the area and the origin of economic transformations by the following characteristics:

- *Smart cities ensure systemic socio-economic efficiency.* That is, it means saving all kinds of resources, increasing the rationality of using nature, and reducing the anthropogenic load on the natural environment. Also, they ensure the optimization of local management decisions in accordance with the criteria for preventing the deterioration of the positions of stakeholders (residents, entrepreneurs, migrants, economic entities). In addition, smart cities are important in the development of intellectual and creative activities that increase the competitiveness of the region and improve the living standards of local residents.

- *Smart cities increase the investment attractiveness of the region.* Simplicity, transparency and speed of business start-up procedures in the region, as well as automation of business processes are of great importance. It should be noted that smart cities increase the level of digitization of the area by bringing advanced technologies to the area, and as a result, the establishment of communication relations with foreign investors becomes easier, foreign investors can get important information about the area, and high results are achieved in attracting foreign investors.

- *Smart cities create an environment to support business entities producing import-substituting and export-oriented products.* For this purpose, attention is paid to increasing the absolute and relative competitiveness of local stakeholders, to the implementation of targeted initiatives to attract human and creative capital to the economic environment of the region.

- *Smart cities encourage the priority of the cluster form of economic activity organisation.* In this case, smart cities provide cluster participants with digital infrastructure, as well as support the centres of innovative clusters - higher educational institutions, subjects engaged in scientific and intellectual activities.

- *Smart cities are important in providing the territory with complex infrastructure.* An example of this feature of smart cities is the widespread introduction of digital infrastructure approaches, tools and technologies in the region, the introduction of transport systems with the potential for economic development of the region, and the stimulation of the development of the entire complex of innovative infrastructure aimed at increasing creative capital.

- *Smart cities increase regional competitiveness.* In this, effective use of digital technologies for optimal use of available resources in the area, cost savings, collection, sorting, processing, and monitoring of all types of garbage and waste take place. Targeted initiatives to attract and support promising and creative class from other regions are also of particular importance.

- *Smart cities bring the area management to a high level of efficiency.* For this purpose, an autonomous digital business environment and a city management system with a high digital level will be created in the region. Also, special attention is paid to mass "digital" involvement of residents in municipal management and development processes.

3.4 Smart Tourism Cities

The methods through which global cities are built, consumed, and shared have altered and become "smartized" due to the rapid development of technology. The term "smart city" has been defined by a number of earlier researchers, but the most frequently cited characteristic of a "smart city" is connectivity provided by ICTs, which improves sustainability, eco-friendliness, tourist experiences and the standard of living for locals [40]. In parallel, as ICT and tourism have converged, the travel industry has also advanced technologically, economically, and socially. The goal of smart tourism is to create a symbiotic relationship between visitors and locals while also adding economic and social value.

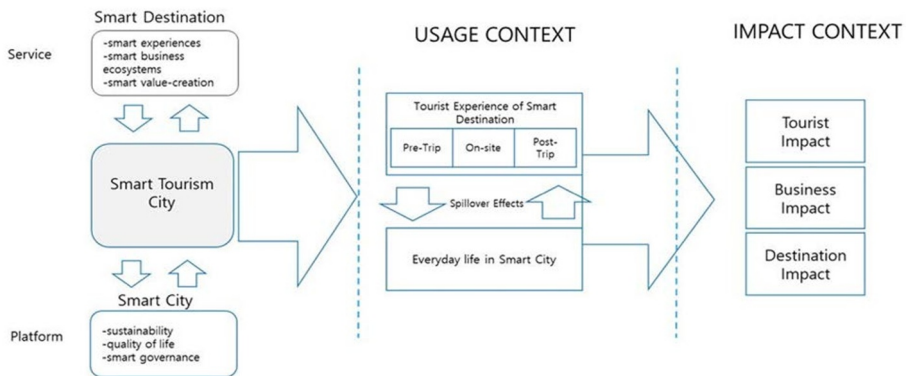


Fig. 1. Strategic supporting impacts of smart tourism cities. Source: [41]

As shown in Figure 1, building smart touristic services on vital smart city infrastructure results in synergies and strategic implications at the levels of the tourist, business, and destination.

The objectives of "smart cities" in particular produce substantial benefits for tourism in terms of efficient energy management solutions, enhanced mobility, and social policies that ensure safety and well-being in the city and permit sustainable development [42; 58-72]. Additionally, the quality-of-life objectives develop a community where qualified workers are accessible and disputes over resource use between locals and visitors are less likely to occur. Smart city governance makes it possible for smart tourism to gain from efficient infrastructure and an environment that values innovation. Additionally, the smart tourism city provides visitors with a setting for using technology that facilitates seamless interactions and

simple movement within and outside of the tourist industry. As a result, the smart tourism city promotes benefits for travellers, businesses, and destinations. As more visitors look for authentic, creative experiences that may be highly personalised, the fusion of smart cities and smart destinations, for instance, improves the experience at the tourist level. Additionally, it provides new business opportunities. In comparison to smart destinations, smart tourism cities typically have a significantly wider client base and support a far more vibrant smart business ecosystem.

4 Discussion

While Smart Cities focus on their citizens, STDs emphasise the importance of enhancing the tourist experience through ICT integration. The role of a smart city in smart tourism is not limited. In particular, the smart tourism city is paying more attention to increasing information exchange. When people cancel travel plans and stay at home during the pandemic, an alternative solution could be to offer real-time VR or AR content to enhance the tourist experience. The development of a STD and a smart city requires the informed participation of each stakeholder in the process of effective city formation and sustainable competitiveness in the tourism market. For this, tourism infrastructure should be developed in the city, which provides a strong technological connection between the relevant organisations. In addition, as an ideal approach in making cities "smart" and designing them for sustainable development, it is appropriate to focus not only on technology, but on people, especially human resources and their level of literacy.

This article attempted to shed light on the ideas of smart cities, STDs, and smart tourism cities. According to the authors, theoretical knowledge in the fields of smart cities, smart tourism, and related fields would considerably improve as a result of research. Additionally, it offers smart city planners and smart tourists useful information about how the coordination of efforts will result in more environmentally, socially, and economically sustainable growth in metropolitan areas.

5 Conclusion

The integration of technology in tourism destinations has the potential to enhance visitor experiences, improve destination management, and contribute to sustainable practices. However, several limitations and gaps in the current understanding of STDs exist, necessitating further investigation. These limitations include the following:

Limited empirical evidence: Many studies in the field rely on theoretical frameworks and conceptual models, lacking empirical validation. Future research should prioritise empirical studies to validate the proposed models and theories.

Lack of standardised frameworks: There is a lack of standardised frameworks for evaluating and measuring the effectiveness of emerging technologies in STDs. Developing comprehensive frameworks will facilitate better understanding and benchmarking.

Incomplete understanding of visitor behaviour: While emerging technologies offer personalised experiences, there is limited research on visitor behaviour in the context of STDs. Understanding how visitors interact with technology and the subsequent impact on their experiences requires further investigation.

In order to address these limitations further research is required in the following directions:

Artificial intelligence for personalised experiences: Investigate the potential of artificial intelligence (AI) in creating personalised experiences for visitors in STDs. Research could

explore the use of AI-powered chatbots, recommendation systems, and virtual assistants to enhance visitor satisfaction.

Data analytics for destination management: Examine the role of data analytics in destination management. Research could focus on leveraging big data analytics and machine learning techniques to improve decision-making processes, resource allocation, and tourism demand forecasting.

Sustainable practices in STDs: Explore the development of sustainable practices in STDs. Research should investigate how emerging technologies can contribute to reducing environmental impacts, optimising resource utilisation, and promoting responsible tourism practices.

Socio-cultural implications: Investigate the socio-cultural implications of technology integration in STDs. Research should explore the impact of technology on local communities, cultural heritage preservation, and the balance between technology-driven experiences and authentic local experiences.

Privacy and security concerns: Address the privacy and security concerns associated with the use of emerging technologies in STDs. Research should focus on establishing robust data protection measures and ensuring visitor trust in the use of technology.

By addressing these limitations and pursuing these future research directions, we can advance the understanding and application of emerging technologies in STDs. This will not only enhance visitor experiences but also contribute to the sustainable and responsible development of tourism destinations in the digital era.

Appendix 1. Definitions of smart cities (derived from [43-46])

Definition	Source
A city can more effectively utilise its resources, plan its preventive maintenance activities, and monitor security aspects while maximising services to its citizens if it continuously monitors and integrates the conditions of all of its critical infrastructures, including roads, bridges, tunnels, rail/subways, airports, seaports, communications, water, and power, as well as major buildings [60].	[47]
A city that makes the most of the chances offered by ICTs to increase its income and influence.	[48]
A city that actively adopts new technologies aims to be a more open society where technology makes it simpler for individuals to keep informed about their surroundings, access services, and have their say.	[49]
A city that thrives in the future-looking areas of economics, people, governance, mobility, environment, and quality of life is one that is cleverly crafted from the assets and deeds of self-aware, independent, and self-determining residents.	[50]
A city that raises the standard of living for all its inhabitants—including those who live in ecological, cultural, political, institutional, social, and economic aspects—without burdening future generations.	[51]
A city is smart when investments in human and social capital and traditional (transport) and modern (ICT) communication infrastructure fuel sustainable economic growth and a high quality of life, with a wise management of natural resources, through participatory governance [59].	[12]
The development of smart cities is the consequence of innovative, knowledge-intensive initiatives designed to improve the socioeconomic, ecological, logistical, and competitive performance of urban areas.	[52]

The idea of the "Smart City," which is the subject of several efforts, projects, and demonstrations, is often supported by one or more components of ambient systems that need to be integrated through a mediation process [58].	[53]
A network-managed city that uses high-performance ICT-based fixed and mobile Smart City infrastructure to provide its residents with services and content over the network [58].	[54]
A "smart city" is an urban setting backed by pervasive ICT systems that can provide cutting-edge and cutting-edge services to inhabitants in order to improve their overall quality of life [45].	[55]
A city's ability to mobilise human capital in collaborations between the various (organised and individual) actors through the use of information and communication technologies" is referred to as "being smart [45].	[10]
A community that consistently works to improve everyone's general wellness, and which is adaptable enough to proactively and sustainably improve as a place to live, work, and play.	[56]
In the event that a balanced and sustainable view of economic, sociological, environmental, and institutional growth is realised, this design would be appropriate for developing the sustainable cities of the twenty-first century.	[57]

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