Role of a Digital Transformation in Development of a Rural Tourism Destinations

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The study discusses the development and importance of information and communication technologies and processes of digitalisation or digital transformation in tourism and hospitality. The purpose of this chapter is to explain the difference between the concepts of e-tourism and smart tourism and in the following to show the importance of digitalisation for the further development of destinations and their transition to a smart destination.

Keywords: industrial revolution, e-Tourism, digital transformation, rural tourism, smart ecosystem.

1. Introduction

Globalisation has triggered the emergence and socio-political importance of smaller geographical units. In Europe, it has thus triggered a wave of regionalism and the emergence of a Europe of regions. Over the last 30 years, the European Union (EU) has strongly supported regional development policies in its member states and countries in accession negotiations. Support for regional development projects aims at eliminating or at least mitigating the effects of the uneven development of regions in the past, which differences in geographical characteristics between regions have also caused, affecting the socio-economic development of the region (remoteness of large cities, mountainous areas with difficult access, underdeveloped road or rail infrastructure and in last few years investment on internet (optical) highways (Iammarino et al., 2017). In this paper, we wish to show the importance of tourism in the context of rural development. First, it should be emphasised that rural development includes all rural activities (infrastructure, education, educational and scientific system, social protection, economy, tourism, etc.). Intensive cooperation with actors from other areas and localities, group work and networking, can lead to a useful exchange of ideas and discoveries, which eventually take quality solutions and way out of the current situation (Pollermann et al., 2020). In the 21st century, tourism has become one of the key challenges in sustainable development, which has become a particularly important issue in the field of tourism development in the post-19th century period, the main feature of which is the revival and development of non-mass tourism. which will focus on the supply of rural natural assets. Sustainable tourism is important in rural areas because it contributes not only economically but also environmentally, socially and culturally to the development of the rural ecosystem, thus providing employment for local people and sustaining the rural population. As part of the EU rural development policy, creative thinking and innovative approach include introducing and applying new (smart) technologies, i.e., applying proven concepts and experiences in an innovative, effective way. It is important to mention that the EU offers many people the opportunity to fund their projects, especially if they already have an international dimension. EU funds are intended to reduce regional disparities between member states and candidate countries such as Georgia. An important rural feature is the need to apply for high quality and sustainable projects. The

development of rural tourism projects is considered one of the most recognisable special forms of tourism, whose importance lies above all in the interaction between agricultural production and that of traditional products, in the presentation of tradition, traditional gastronomy and tourist services, i.e., in the use of already existing resources. Rural tourism must be based on sustainable development, which manifests itself, among other things, in the revitalisation of existing traditional buildings or heritage, which are put to new tourist use. It is important to note that the consequences of raising awareness of the need to preserve and protect the natural environment, increasing cultural sensitivity, and many strategic environmental documents are that tourism development is increasingly focused on introducing sustainable principles. Sustainable tourism as a new paradigm of tourism policy is environmentally oriented, considers the local population and respects their cultural values. According to the principles of a sustainable approach to the environment, this type of tourism should affect the environment as little as possible, thus reducing the human impact (positive or negative) while optimising the economic impact. Ecotourism, which we understand as a leisure activity in nature, attaches great importance to the host's contact with the tourist and the environment. It is not only about the intensity of the "experience" because the new form of leisure should also include educational content and explanations (Pung et al., 2020). All this poses a problem from the outset: can tourism as an economic activity not be profit-oriented? Mass tourism combined with uncontrolled use of space by private operators is extremely negative in terms of space and negatively affects the environment without respecting the principles of sustainable development. Ecotourism is a tourism activity that comes closest to the principles of sustainability. The orientation of the tourist offers in remote areas towards ecotourism, which is never aimed at the number of visits, is also seen as an opportunity to restore the built heritage, preserve customs and culture and protect the natural environment, which requires constant support from the State at regional level (Saarinen, 2021). The article presents the importance of technological solutions in the post-Covid-19 era that will encourage further tourist visits and add value to the visitors in rural destinations.

The paper consists of an introduction, a theoretical background, a research section with a discussion and a conclusion as the last part of the paper.

2. Theoretical background

2.1 Third industrial revolution and introduction of e-Tourism

During the three industrial revolutions (1960 to 2010), computerisation and digitisation were introduced into the tourism and hospitality industry processes. The advent of information and communication technology (hereafter ICT) enabled the first reservation system in the travel industry in the middle of the last century. The Gulliver reservation system emerged in the 1980s (Werthner and Klein 1999, 67). Further development of ICT technologies in the 1990s led to the emergence of global distribution systems such as SABER and Amadeus. With the advent of the internet, the 1990s introduced an e-tourism that should not be equated with smart tourism. E-tourism is based on ICT, online portals and social media solutions to enable marketing channels for tourism services and products. Web portals such as Booking com, reservation and information portals of railways (e.g., Trenitalia, DB railway, etc.) and air ticket providers (e.g., Expedia.com). The customer was allowed to search and compare online the offers of different tour operators, such as destinations, hotels, airlines and other providers of tourist services (Spencer, Buhalis and Moital 2011, 1195). Thus, at the beginning of the 21st century, internet technology had changed the value chain within which all tourism and hospitality stakeholders have to submit to digital technologies and solutions (Roblek et al., 2013, 559).

2.2 Fourth industrial revolution and digital transformation

Around 2011, the fourth industrial revolution or Industry 4.0 emerged, and the tourism and hospitality industry is challenged with digital transformation and informatisation. The most important development step (informatisation) within Industry 4.0 is the establishment of cyber-physical systems (CPS) that connect the physical environment and cyberspace (Chen et al., 2020). Within the systems, mechanisms are created that enable interaction at the human-to-human, human-to-machine, and machine-to-machine levels along the entire value chain (Storbacka et al., 2016). Digital transformation (of services) enables tourist destinations to become smart destinations. In this process, decision-makers in tourism destinations must take into account the knowledge they use to develop their development and implementation strategies, information systems, travel behaviour, marketing, urbanism, destination management and administration, as well as the increasingly important data analytics and data science (Jovicic, 2019). As part of the fourth industrial revolution, digitalisation and informatisation became important in socio-economic development and improved life quality. As part of the emergence of smart cities, smart destinations have developed specifically in Europe. Both phenomena emerged as a result of the global process of urbanisation.

Digitalisation processes have become an important factor for touristic destination if it focuses on innovation initiatives and networking among all stakeholders (from politics and companies to universities and research centres) to contribute to a more successful economic development. Moreover, these processes enable regional transformation into smart regions (Roblek and Anthopoulos, 2018). Thus, developing a smart economy is based on creating new companies and business models based on digitalisation processes and developing and implementing citizen-centric technologies. In this context, people are important and necessary to achieve development breakthroughs and represent qualified human capital to operate in new digital ecosystems (Sepasgozar et al., 2019).

In smart destinations, it is important that there is social cohesion among the population and a range of services and events for tourists (González-Reverté, 2019). The goal of a smart destination must be to ensure the quality of life (environmental, economic and social) for both residents and tourists when living together. Both smart destinations and smart cities have the same characteristics, and digital technologies parallel the sustainability paradigm (Briciu et al., 2020). Both smart cities and smart touristic destinations need to be capable of responding to different and diverse needs, which include the existence of the domestic population, ensure sustainable economic growth as well as the highest possible life quality through investments in human capital, to ensure the participation of the government, and infrastructure in order to be able to support the dissemination of the information among all the stakeholders (Sánchez-Corcuera et al., 2019; Weidenfeld, 2018). The European experience has shown that smart destinations require optimal urban management models (smart public transport, smart healthcare, smart tourism services, digitalisation of geodata, smart public administration etc.). In their research, Boes et al. (2015) state that smart destinations represent a place in possession of the infrastructure and technological applications such as cloud computing, sensors that provide access to the internet, and end-user Internet service systems such as video maps, GPS, tag clouds, blogs, podcasting, applications, etc.), which can promote the very cocreation of the values which are related to the tourist's experiences and which create benefits for them, for the industry as well as for the host destination. In 2020 and 2021, additional attention was given to the applications that provide information about the COVID-19 infections and the control of the application of protection measures in smart destinations (Radojević et al., 2020).

As far as theme tourists are concerned, digital travellers and the general public's behaviour has changed dramatically. Today, contemporary tourists are interested in participating more actively

in the processes that concern them, and they are also more and more interested in using social tools to validate their identity reputation. Besides the previously mentioned, tourists obtain, evaluate, and buy tourist products and services and express their experience value has changed tremendously. New technologies have increased their tendency to participate in co-production and evaluate the same process (Pencarelli, 2020). Innovative digital technology now makes it possible to get a real-world impression of the content of the sights you will see on your trip before you go. Both virtual and augmented technologies enable, for example, virtual visits to natural and cultural sites, planning, reservations, experience gathering and information sharing. Digital technologies thus enable the emergence of new channels for shaping responsible and sustainable consumer behaviour.

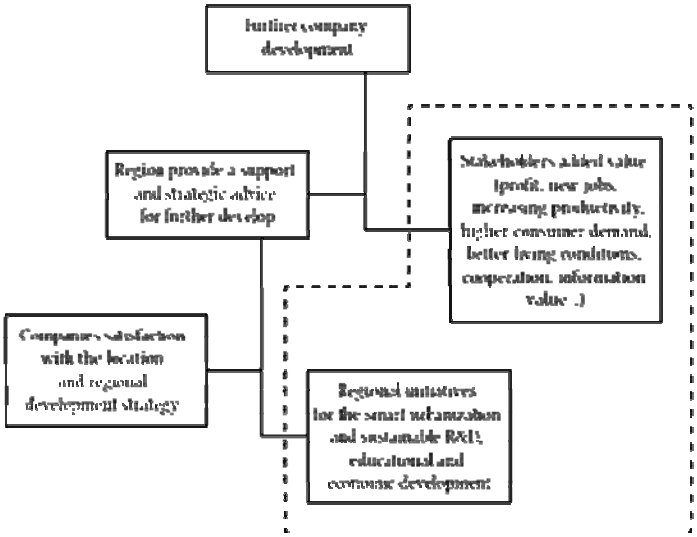
The digital ecosystem is changing the usual forms of action in the field of tourism. According to Brunswicker (2016), tourist regions and cities business systems (urban data management) have influenced the emergence of open innovations systems and the closed innovation processes that operate as a rule according to the second cybernetics large network theory structure. Thus, tourism companies and destinations are virtually forced to implement innovative technological solutions in marketing and communication. In tourism, innovation processes in products and services are becoming more open, and the importance of external knowledge and the involvement of different professional structures of external actors (Bogers et al., 2017). The inclusion of digital marketing strategies for tourism companies also means transforming sustainable principles into business processes. Preparing and implementing digital transformation means for both tourism businesses and destinations to be able to manage knowledge related to the whole tourism experience (e.g., augment experiences in museums, both online and offline, but at the same time be ready to adopt new innovative processes and provide access to open data (Buhalis and Sinarta, 2019). In order to evaluate open innovation at the level of the tourism product (STD), several aspects need to be taken into account, including the nature of the tourism product, different structures and decision-makers and destination management organisations (DMOs), as well as different business processes and collaborations within the destination (Kozicka et al., 2019; Pikkemaat et al., 2018). In next subchapter is presented a case in which we try to explain some basic factors that have an impact on an ecosystem (village, city, region) digital transformation in a smart urban ecosystem (e.g., smart touristic destination, which can also be understood as a part of smart city, smart village, smart region).

3. Research methodology

3.1 Development of a smart ecosystem

Let us look at the actual conditions for the emergence of a smart ecosystem (e.g. the region's digital transformation). We find that it involves solving a complex problem, which is made possible by the interaction of natural, technological, social and human elements (Bozeman, 2000). In practice, European regions have become smarter in recent years by developing a quadruple helix model that includes knowledge sharing and visualisation of collective interaction in the urban ecosystem: (1) educational system, (2) economic system, (3) natural environment, (4) media- and culture-based public sphere (also called "civil society"), (5) and the political system). An important factor in the economic success of a community ecosystem. Figure 1 depicts factors that enable regional smartness / smart urbanisation (Roblek and Anthopoulos, 2018).

Figure 1: Factors for enabling regional smartness/smart urbanisation (Roblek and Anthopoulos, 2018)



Smart urbanisation itself must be linked to a strategy for regional (or another ecosystem) sustainable development. Development strategies must ensure that the region becomes an important and complete part of providing mechanisms for local research institutes, universities and other actors (it comes to clustering or alliances between organisations). The role of decision-makers in regions and cities should focus on developing programs that include transforming rural suburbs into business incubators, development and education centres, and specialised technology parks. In addition, it is important to design financial development programs (repayable and non-repayable funds) that promote research and development (Lawton, 2018). It is an important strategy because the firms that drive innovation become increasingly productive through smart technologies, which can help create jobs and increase consumer demand through additional income (compensatory effect) (Willard, 2012). It is going for an essential measure that will also be needed to transform and adapt in education and employee development (Weber, 2015). As part of digital education, it is necessary to learn about open-source solutions and program a mobile application themselves. Furthermore, it is necessary to analyse the relationships between all members of the Quadro-helix model and find ways to provide public and private funding for technological solutions that provide digital end to end interactions between stakeholders and data-driven processes (e.g., cloud computing, big data analytics) in the urban ecosystem. To this end, it will be necessary to develop an analytical framework consisting of four strands: (1) supporting the establishment of the Quadro-helix models and enabling the equal roles of all stakeholders; (2) implementing social, digital technological innovation in a framework that positions citizens as active users; (3) implementing social, digital technological innovation for the benefit of the community; (4) evaluating social, digital technological innovation in light of citizens' experiences and needs; and (5) providing education at both the educational institution and enterprise employee levels on the processes of digitisation, digital transformation, and programming skills themselves (Roblek et al., 2021).

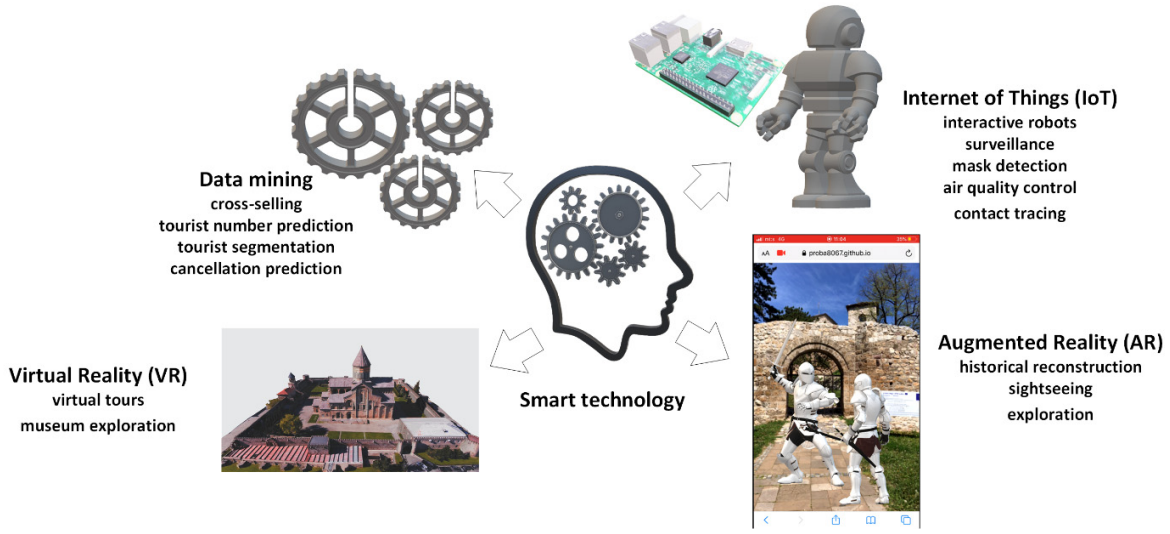
In summary, we can conclude that digital transformation is enabling a transformation of the human ecosystem. The digitalisation of business processes, education, health services, sales services, and important tourism and hospitality services within this ecosystem. Thus, there is a complex cross - "cyber community social interactions" between the ecosystem actors in the urban environment. For these reasons, urban ecosystem leaders' goal should be to increase interaction

between technological development companies and stimulate changes in formal and (in) formal social relations between all stakeholders in the region involved in smart urbanisation. The aim of such regional development framework strategy should result in increasing the citizen's quality of life (hard domains- infrastructure, transport, mobility and natural resources; soft domains: culture, tourism, social inclusions and economy welfare) and value-added for all stakeholders that include: (i) knowledge sharing, (ii) citizen satisfaction, (iii) existence of an ecosystem of stakeholders and their collaboration in innovative ways (Roblek and Anthopoulos, 2018).

3.2 Smart technology for post-COVID tourism

It is identified that state-of-art information and communication technologies play a crucial role when it comes to the revival of the tourism sector in the post-COVID era, especially data mining (Petrović et al., 2021-1), virtual reality (Sari et al., 2021), augmented reality (Hawkinson, 2018) and internet of things (Verma and Shukla, 2019), as illustrated in Fig. 2.

Figure 2: Smart technology for post-COVID tourism



Data mining aims to discover useful patterns and knowledge from enormous data about events of importance, users, and their interactions with others and the environment. Typical scenarios include tourist segmentation based on clustering, tourist number prediction relying on regression, excursion and services cross-selling based on association rule mining and booking cancellation prediction leveraging classification methods (Petrovic et al., 2021-1)

Virtual reality (VR) provides a fully immersive interactive experience within virtual 3D worlds. In this environment, the user can explore the surroundings and interact with 3D objects. Furthermore, different responses can be generated as an outcome of this interaction, such as animation, text visualisation, voice and multimedia playback. Therefore, this kind of technology is highly relevant for tourism, as it enables novel usage scenarios, such as virtual tours, museum and destination exploration (Lugrin et al., 2018).

On the other side, augmented reality (AR) allows the overlay of animated 3D objects and multimedia content on realistic images coming from the camera stream. This way, many interesting use cases in the tourism sector become possible, such as 3D historical reconstruction enabling to relive the past at historical locations, self-guided sightseeing and exploration (Petrovic et al., 2021-3), which are especially important for post-COVID tourism under new circumstances (Mohanty et al., 2020).

Finally, the internet of things (IoT) refers to the network of small, low-power devices ranging from affordable credit card-sized microcomputers to sensors and smart tags. Apart from tourist experience enhancement (Verma and Shukla, 2019.), IoT is crucial for tourism in the post-COVID era, as these affordable systems are responsible for tasks that aim to reduce this disease's spread, such as mask detection, contact tracing, and air quality control (Petrović et al., 2021-2). Moreover, assistive robots based on affordable IoT devices can be used for different purposes, such as surveillance of monuments and museums or interaction with tourists (Petrović et al., 2021-4).

4. Conclusion

The emergence of information and communication technologies is also becoming extremely important for rural development. Thus, the operation "Interactive Tourism for All" came to the fore in the EU in response to the guidelines on developing accessible tourism in Europe. As accessible tourism in Slovenia is still in its infancy, this is an excellent opportunity to develop new niche tourism products, which will be intended for vulnerable groups of people with reduced mobility and the elderly, deaf, blind and partially sighted or other people with special needs. Furthermore, due to innovation and new technologies, they will also interest other visitors and tourists. The concept of accessibility in operation refers to i) increasing accessibility for people with special needs; with the help of virtual reality and modern audio equipment and equipment for adaptation to blind and partially sighted people and people with reduced mobility, we will enable the viewing of natural and cultural sights that we would not otherwise be able to access; ii) access to endangered or protected cultural and natural heritage; as it will be recorded or recreated with the help of new technologies and virtual reality; this will make it possible to see these sights, while at the same time preserving them for future generations (Razvoj podeželja, 2020).

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