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REVIEW ARTICLE

Digitization trends in hospitality and tourism

***Montaudon-Tomas Cynthia*[1*], *Pinto-López Ingrid*[1], *Yáñez-Moneda Alicia*[2]**

[*1] *Facultad de Administración e Inteligencia de Negocios, Escuela de Negocios, UPAEP Universidad, Puebla 72000, México. E-mail: cynthiamaria.montaudon@upaep.mx*

[2] *Dirección de Hospitalidad y Turismo, Escuela de Negocios, UPAEP Universidad, Puebla 72000, México.*

ABSTRACT

This paper discusses the main trends that digitalization has brought about in hospitality and tourism. The basic approaches of Industry 4.0 and the processes and levels of technification are presented, as well as the digitization that has taken place in the tourism sector, highlighting the main technologies such as digital applications, mobile devices, Big Data, the internet of things, virtual assistants, the cloud, virtual and augmented reality, robots and chatbots, as well as new designations for tourism activities, such as smart tourism and e-tourism.

Keywords: trends; digitalization; technologies; Industry 4.0; tourism sector; smart tourism and e-tourism

1. Introduction

Digitalization has become present in all fields of human activity and has played a central role in the development of the tourism sector. These unprecedented changes have led to the incorporation of different technologies that support the consumer experience. Globally, in hospitality and tourism, digital transformation has made it possible for customer experience to become a profitable business, presenting a variety of opportunities.

This research first analyzes Industry 4.0, as well as various aspects of the fourth industrial revolution such as the digitization of business, interconnectivity, the digital revolution, the resulting transformation of management practices and the disruption of traditional employment.

This is followed by an analysis of digitization in the tourism sector, highlighting the main trends through a documentary-type study, from which the different digital technologies are discussed. A brief section on the limitations of the use of these technologies in Mexico is included. Finally, the results of the analysis and conclusions to the study are presented.

2. Theoretical framework

As part of the fourth industrial revolution, Industry 4.0 does not refer exclusively to the use of interconnected intelligent machines, it occurs sim-

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ultaneously with various developments in nanotechnology, renewable energy, and quantum computing, among others. It is from the fusion of these technologies and their interaction across biological, physical and digital domains that this unique revolution is generated and completely different from those that preceded it[1].

The global business environment is dynamic, complex, borderless[2] and technological. The term Industry 4.0 has been used to designate the combination of various innovations in digital technology aimed at transforming manufacturing sectors, being considered as a promising technology[3] that presents a techno-utopia character as a form of social construction of an ideal future. This movement started in Germany and the momentum was transmitted mainly to the United States, Japan, China, Great Britain and the Nordic countries.

In Germany, the Industry 4.0 label has characterized the debate on the future of the industrial sector, actions focused on research and development, as well as inherent policies[1,3] that highlight the forces that will shape the course of business.

The fourth industrial revolution, referred to by Schwab[1], describes a new generation of technological advances including sensors, robotics, artificial intelligence, precision medicine, 3D printing, advances in transportation, software as a service, new marketing models, and algorithms, as well as the integration of all these and other elements[4] that have brought about major technological changes with their consequent societal impact.

The three industrial revolutions of the past were detonated by technological innovations, such as the introduction of steam to mechanical manufacturing in the first revolution, the division of labor and the incorporation of electric power in the second, and the introduction of electronics, IT and programmable logic controllers to achieve industrial automation processes in the third.

The fourth industrial revolution builds on the third, but is not just an extension of it. The speed of developments is increasing unprecedentedly with an exponential rather than linear rate of progress, affecting virtually all product and service companies in all countries[1]. The trigger for this revolution is the advent and growth of the internet, which enables communication between humans and machines, reshaping production, consumption and transportation[1].

Moreover, the vision of Industry 4.0 is based not only on business and innovation policy discourse, but also on socio-political aspects and influencers, creating behavioral normative pressure[3] oriented towards modernity and innovation.

A global study by Price Waterhouse Coopers claims that industrial companies in all sectors worldwide have started to work on the basis of Industry 4.0 projects and that approximately one third of medium and large companies have achieved a high level of digitalization that will increase in the near future[4]. These companies are investing in training their employees, promoting the necessary organizational changes. However, the study suggests that the lack of expertise is an obstacle to progress.

The transition to Industry 4.0 is driven by several trends, such as reduced time to market with shorter innovation cycles and more complex products, the need for greater flexibility through mass-individualized production in volatile markets, market conditions demanding higher quality, traceability, the demand for increased resource efficiency as a competitive factor, and digital security.

The main interest in analyzing Industry 4.0 is based on the possibility it has to offer solutions to social changes, and therefore, to changes in tourism activity. A recurring theme in this type of analysis has been the loss of jobs and the apparent creation of new forms of work. The nature of employment will have to be modified according to new strategies, business models and platforms that allow talent to connect with the market in a different way[1].

2.1. Digitalization of business

The digitization of businesses is a long and complex process[5] that, however, has no way back. Continuous digitization has led to the designation of special names for companies that achieve major transformations. The most advanced in terms of digital transformation and innovation have been called digitari, and outperform their less digitally savvy peers[6].

Billions of people are interconnected with each other through mobile devices with high processing and storage capacity and unlimited access to new knowledge, the world is a system where interconnections have an impact on complexity.

The digital revolution, resulting from the continuous convergence of real and virtual worlds, is the main driver of change, transformation and innovation. It is not exclusively about the computerization of information, but about the creation of networks between people and things through information technologies (IT), facilitating activities.

Digital transformation provides industrial and service sectors with unparalleled opportunities for value creation. Content and business operations have been digitized, leading to the disintermediation of entire industries, such as banking and travel services, or music and video marketing, among others. Even the media have been digitized, transforming newspapers, books and magazines, as well as television and film content.

Administrative practices have also been modified, labor markets have created disruptions in traditional employment and have forced a reconsideration of the personal skills needed[1]. With the digital revolution, activities will emerge that will grow significantly, others will become more efficient and still others will provide an entire experience[7] redefining the traditional view of the world.

The impacts on the digital revolution have generated a great deal of debate among politicians, economists and industry leaders. To address them, the World Economic Forum created a Digital Transformation of Industries program that explores various aspects and raises questions related to the projected impact, the challenges that will be faced to make a positive contribution and the steps that will need to be taken to ensure the benefits. It is estimated that digitalization will lead to losses of between 2 million and 2 trillion jobs by 2030, which will have an impact on wages and working conditions[7].

Despite these issues, there are more favorable contributions towards the creation of a capable workforce adapted to the machine age. The employment potential is high in several sectors, and it is claimed that up to 6 million jobs will be created for the digital era between 2016 and 2025. However, for these jobs to be effective, it is necessary to change the traditional skills of employees and train a new generation of talent[7].

In this sense, businesses are moving towards digitalization in many ways and at three main levels (**Table 1**).

Table 1. Level of digitalization and social activities

Low digitization	Medium digitization	High digitization
Use of email, office software, internet pages, financial software and for customer feedback or evaluations, applications for online collaborative work, video conferencing.	Computerized reservation systems, interactions with suppliers, analytical tools, interactions with government services, Costumer Relationship Management systems, mobile applications, instant chat, or professional networks.	Mobile platforms to provide real-time information, connected with various stakeholders.

Source: own elaboration

2.2. Digitization of the tourism sector

Tourism is one of the most relevant industries in various countries. In fact, according to the World Tourism Organization, this sector accounts for more than 10% of the GDP of the world's economy, is vital for the growth of most developing economies and has the potential to create millions of jobs, as well as

to promote entrepreneurship and innovation.

The tourism sector is highly fragmented, and subsectors such as transportation providers, lodging, restaurants, catering, and personal services face different challenges and present diverse opportunities with respect to digitization. Digital technologies give small businesses in emerging destinations direct access to a global market of consumers[8].

Digitalization has touched all segments of the tourism ecosystem. It provides the tools, frameworks and technologies to create or add value to tourism products, services and experiences. Bookings are confirmed instantly and an entire trip can be planned at the touch of a finger[9]. Today more than ever, the industry's success depends on its ability to share, learn, collaborate and innovate.

Digital platforms have significantly reduced the costs involved in the production of various tourism services[1], so this sector has become a spearhead of digital transformation, to respond to new challenges involving travelers seeking unique experiences, new products and greater connectivity. This transformation is supported by four main technologies: the cloud, social networks, mobile devices and information and communication technologies, which allow hospitality and tourism companies to establish close relationships and experiences with customers, while accessing new business opportunities[5].

Technology is a force for change that presents opportunities to increase efficiency and customer service integration in hospitality. However, the industry faces serious challenges in training employees in the use of new technologies and in standardizing software and hardware design, especially since some hotels have systems that do not communicate with each other[10].

Empirical studies have been developed on the use of digital technologies for the purchase of tourism services and experiences, the main trends that are impacting the hotel and tourism industry are:

1. Mobile integration.

2. Artificial intelligence (AI) and Chatbots 3.

3. Internet of Things (IoT) Integration.

4. Focus on data.

5. Reputation.

6. Virtual and augmented reality[11]. In tourism, digitization presents opportunities to expand market reach, increase growth, improve operational efficiencies and thus its competitive advantage.

Tourism can be a powerful driver of development, but digital platforms are disrupting the sector, affecting how destinations facilitate tourism, develop products, collect data, access markets, and attract visitors. This disruption has industry-wide effects, making it a challenge for emerging markets struggling to leverage tourism for development[8].

ICTs have disrupted the industry, creating tourism connectivity from new applications. These have been largely responsible for the variety and volume of tourism services, as well as transforming the traditional roles of tourism producers and their customers[12].

Similarly, digital disruption has made all destinations, small or large, compete in the global market. There is no product without customers, and dispersed customers become accessible. However, this could happen only if they use digital technology. The current digitalization has made many tourism industries face a new stage of development, such as smart destinations, smart cities, smart airports, smart seaports, smart seaports, smart hotels and other industries adopting digital transformation[13].

According to a World Economic Forum white paper, digitalization is the cause of large-scale transformations in business, providing unparalleled opportunities for value creation and capture[7], while also representing a major source of risk.

2.3. Digitalization in the sector in Mexico

It is considered that in Mexico the incursion

into digital technologies is still incipient, however, the hospitality and tourism industry already has various technological tools to improve its processes and increase its profits[12]. The digital transformation of the tourism sector is not an option, but an essential strategy to respond to new segments, emerging needs and new tourism behaviors. However, in the case of our country, the structure of small hotel companies limits the capacity to incorporate ICTs in their operations[12].

3. Methods

This study is of a documentary type and presents a wide selection of digital technologies used in the hospitality and tourism sector, where their main applications and advantages are presented. In this sector, a form of artificial intelligence called expert systems makes it possible to make certain basic services available 24 hours a day.

Other systems include the increase in smart room communications, the creation of spaces for business travelers through port connectivity[10], among others. The different technologies are described below.

3.1. Digital devices

The cell phone is at the same time the tourist guide, the travel agency, the restaurant locator, the map and more. Tourists and travelers are increasingly using digital devices or mobile devices in their trips, moving away from traditional agencies and approaching new intermediaries. The devices are used for information searches, transportation ticket management, hotel and restaurant reservations, or event tickets, to name a few uses. From the perspective of companies, mobile devices are used to respond to the demands of tourists, to position their offer and to provide timely service quality[5].

Mobile technologies have great utility in tourism, as travelers move in unfamiliar environments and require information to solve practical problems as well as to enrich their tourism experience[14].

Research on the use of mobile technology in tourism has been characterized by three basic strands: human-computer interactions, the adoption of mobile services, and the impact of technology on the tourism experience[15].

The industry has significantly increased the use of personal digital assistants or PDAs, which allow for more efficient and effective time management. One example is restaurants, which employ them to transmit orders to the kitchen, issue consumption notes, receive credit card payments from customers, and even perform service evaluations. In hospitality they are employed to verify the status of rooms, services, control of amenities and beverages, among others[10].

3.2. Recognition technology (biometrics)

These technologies are useful for authentications, as well as for verifying and guaranteeing the identity of travelers. The big advantage is that, unlike multiple documents with security considerations, biometrics are difficult to forge[16]. They include fingerprints and facial recognition, which are used for check in and check out processes, enable purchases, and detect whether the age on an ID is correct or not[17]. They are currently used in airports, hotels, restaurants, cabs, etc.

Over time, its use has spread to multiple areas. It serves, for example, to identify how many people enter a store, as well as their ages, ethnicities, and genders. This is useful for management, as it allows them to better understand the movement of people in order to adapt marketing strategies. Sentiment analysis and facial recognition are also used to generate real-time feedback. A traveler can check in and enter their hotel room using facial recognition and pay “with their face”[17], however, there are certain groups that oppose its use, appealing to security issues and respect for personal privacy[18].

3.3. APPs

The number of digital applications developed for the tourism sector has multiplied worldwide,

ranging from applications that fulfill the functions of travel agencies for a new segment of autonomous consumers, to applications for transportation services that improve the user experience by sending notifications about delays, incidents, additional services, calendars of events at destinations, or information about local activities.

Digital applications are at the center of reservations for transportation and lodging[12], even applications have been developed to control the temperature and television in hotels[19]. There are others that aim to build loyalty or offer new experiences and personalized attention. Mobile devices have been considered as the most appropriate tool to give employees and customers digital applications and services, as well as to establish real-time communication[12].

3.4. Chatbots

Chatbots are generally used as information acquisition interfaces, such as extracting product details. Travel chatbots are commonly known as virtual travel agents, and they emerge as a tool that can learn from consumers from diverse actions such as reservations, service searches or emails, and the creation of itineraries through calendars. They understand simple questions and provide answers almost immediately[20]. The advantages of their implementation include ease of use, speed in handling incidents, savings in response time and direct customer contact at all stages of the journey[21].

Chatbots have been used to obtain information on immigration documentation, to access useful advice, to process necessary documents, to provide cultural data on the areas of the world they wish to visit, as well as on the social and cultural rules of the city. This technology allows the creation of a centralized intelligence base that creates alliances between companies in the sector, considering relevant information, such as the reason for the trip, the length of the trip, the destination, the activities carried out and the costs or expenses. This has an influence on the personalization of the customer experience.

3.5. Virtual assistants and robots

Virtual assistants can help manage activities, such as remembering meetings, managing to-do lists, taking notes, or getting directions to a site. Virtual assistants and robots solve problems related to labor shortages through digital intelligence systems. Examples of these are Siri and Alexa, and in the specific case of hospitality companies, a case study is Watson.

The Hilton chain has a robot that responds to customer questions and learns from interactions intelligently. In Japan, robot personnel have been applied to services such as baggage porters, reception, and information tools, among others. In China, during 2020, robots were used to prevent coronavirus contagions in hospitals.

Some of the services in which a virtual travel assistant excels include itinerary planning, reservation management, visa process management, securing the best deals, travel expense management, and recommendations[22].

3.6. Big Data

Big Data is a term that describes large volumes of complex, variable and high velocity data, which require advanced techniques and technologies for its capture, storage, distribution, management and analysis of information[23].

Big Data has been considered the best ally of the hotel industry, it is based on relevant information and data on reservations, it allows examining databases to analyze tourists' expenditures, reasons for their trips, country of origin and travel time. It also facilitates correlating information with governments and other stakeholders. All this makes it possible to achieve better segmentation for more effective marketing campaigns[19].

Through its use, destination recommendations can be issued according to age, gender, budget and

previous visits, and it is even possible to identify trends[20].

Xiang and Gretzel[24] demonstrated that social media are an essential part of the search tools during the travel planning process, as is participation in blogs and virtual communities. Similarly, there are studies linked to the relationship between guest experience and satisfaction[25]. Internet queries, hotel and flight bookings can be monitored on various servers and search engines. By consulting online behavioral data, companies and governments can forecast sales, occupancy and consumption patterns of tourists through analysis with Big Data tools[23].

3.7. Internet of things

The internet of things is supported by sensors that are becoming smaller, cheaper and smarter, which are installed in all fields of tourism activity to simplify processes[1]. They facilitate the operations of hotels, airlines and other tourism service providers, connecting smart devices, systems and processes to improve their efficiency. In tourism, connectivity is extended to objects and devices, data is collected and communicated through the internet. Included are means of payment control, electronic ticketing, information generation, integration of sensors in cars, luggage, buildings, etc.[19].

Also included are a multitude of destination-related features, deepening traveler knowledge, smart payment mechanisms, generation of useful data for various industry players, smart destinations, sound, and the automation of products and services. There are also thermostats that adjust according to schedules or sudden changes in temperature, lighting according to the time of day[20], wake-up calls, electronic keys, and more.

The internet of things makes it possible to provide real-time information on flight connections, notifications, registration to hotels and services, as well as the generation of QR codes for access. The experience is enhanced by sensors that identify well-being, such as anxiety levels, heart rate, body temperature and hydration, so that staff can provide appropriate services.

3.8. Social networking

Social networks have become a very relevant form of communication in the area of tourism, as they allow two-way communication with customers. They have a great capacity for persuasion thanks to the fact that positive and negative evaluations can immediately go viral. Social networks are an important tool for the analysis of tourists' attitudes and this is confirmed by the increase in purchases and recommendations to other users. Building a successful brand based on tourism service implies that each offer must be a unique value proposition, based on customer experience[26], where social networks play a role of importance.

Social networks are essential for information search and decision making, tourism promotion, and focus on best practices to interact with consumers[27]. Videos of pleasant or unpleasant moments, photographs, and even audios that are transmitted through social networks, can favor or harm a company.

3.9. The cloud

The digitization of the sector requires technological platforms that consider the information and services offered.

Cloud computing is a technological service delivery model that allows on-demand access, and through a network, to a set of shared and configurable resources that can be quickly allocated and released with minimal management by the service provider[28].

This tool is essential in hospitality and tourism because it improves efficiency in the accommodation, catering, intermediation, transportation and promotion sector by providing storage capacity, applications, cost savings and results in simplification and flexibility of processes. The cloud is beginning to be the basis of ICTs applied to the tourism sector, providing unified access to content, services

and applications, and allowing the coordination of groups and the development of team projects[5,28].

For the Valencian Institute of Tourism Technologies INVAT.TUR[29], cloud computing is one of the technologies that has contributed most in recent years to the innovation of tourism services and products. Its main advantages include cost savings, flexibility, accessibility and mobility, automatic updates, scalability, security and standardization.

3.10. Virtual and augmented reality

Virtual reality can be used in tourism to enable an experience of the product or service before, during and after purchase. This can provide an emotional experience through virtual tours of cities and buildings, landscapes, museums and other particular destinations[30].

Virtual and augmented reality has been applied in different tourism contexts to enhance the visitor experience. These contexts include archaeological exhibits, museums, hotels, restaurants and more. These technologies are changing customer experiences in a new environment, where physical and virtual objects are integrated at different levels providing interactive experiences and creating virtual worlds or places of imagination that encompass play, performance, creative and ritual practices[31]. In the past, virtual reality experiences were expensive and limited to specific sectors, but the technology has been democratized[32] and its use has expanded.

Virtual and augmented reality is based on computer-generated environments with scenes and objects that appear to be real, making the user feel that they are immersed in their environment. It is one of the technologies with the highest projected growth potential. According to the latest forecasts, investment in virtual reality and augmented reality will multiply 21 times in the next four years, reaching 15.5 billion Euros in 2022.

3.11. E-tourism

It is a logical sequence of digitization of all value chain processes in the travel and tourism industry. Some activities need special agents and portals, for this, through e-tourism, electronic information, electronic reservations and payments are offered. E-tourism disseminates information, but is focused on direct sales and the elimination of the physical and temporal barriers of traditional commerce.

Also known as travel technology, e-tourism refers to the adoption of information and communication technologies (ICTs) by tourists and businesses. It transforms processes and value chains in the tourism industry. This development reshapes the landscape of commerce[33]. Typically, its products are complex and intangible, its production and consumption experiences are inseparable, its inventories of goods and services are perishable, and the consumption experience varies according to the individual tourist at different times. In addition, the industry is complex in nature and requires a great deal of effort to coordinate different types of services, as well as the delivery of information to reduce uncertainty during contact moments.

3.12. Smart tourism

Smart tourism is an important component of smart cities. It is based on the application of ICTs to develop innovative tools and approaches to improve tourism. It connects hardware, software and networks, enabling interaction between tourists, stakeholders and physical objects.

Smart cities are urban models that promote sustainable growth in all its dimensions. In the field of tourism, they address business ties based on smart destinations. Smart tourism a term that has been used to describe the increased use of information and communication technologies in tourism destinations, which allows massive amounts of information to be converted into value propositions[34,35].

Sigala[36] describes smart tourism as changing all or some of the following five market elements:

object of exchange, actors, structure, institutions and practices. In tourism, the term Smart destinations is also used to refer to those cities that incorporate sustainability and technology in all phases of the value chain, and are able to manage them in the long term[37]. The smart destination contemplates suppliers, users, other actors and systems that interact with each other through technological services, starting from three main perspectives: technological development, suppliers and consumers[38].

This is tourism that aggregates and consolidates information about destinations and provides on-site experiences that are rich for users by technologies, generating value from a business perspective. Sources of information include infrastructure, social connections, governments and organizations[37]. Tourism entities interact in real time with data and information from digital devices.

4. Results

New trends must be supported by smart devices, which demand power and connectivity. In addition, there is a gap between digital and non-digital devices, and their application requires knowledge and infrastructure.

Capable talent is essential, however, often in the tourism sector in Mexico there is a lack of technological resources to realize the digital potential, partly due to lack of knowledge. Operational skills are required to transition to e-business and e-commerce, as well as interconnectivity to transition to Smart Tourism or intelligent tourism.

Currently, the national tourism sector uses new digital technologies in digital kiosks, access systems, guest check-in and check-out process management, room management, chatbots, online reservations, opinions in forums, blogs and social networks, free internet in accommodations and digital hotel keys. These technologies are already part of the traveler's reality, but there is still a long way to go to take full advantage of the benefits of digitalization in the sector.

5. Conclusions

The advent of the Internet and various IT tools has opened a new horizon for tourism-related services. Digital services and products are essential for all companies, regardless of their size. Their influence has been so important that most consumers in the tourism sector are using them as the main tool to plan their trips.

Contemporary technology has several roles in the tourism sector. It can enable, facilitate and improve services, as well as change consumption patterns, impacting pre-sales and post-trip experiences.

Digitalization increasingly influences the way travel is planned, new destinations are explored and promoted, but it also impacts the travel experience. New technologies are changing and will continue to change the face of tourism in the coming years. Numerous challenges are created, for which countries, destinations, and especially commercial entities, need to find an answer. Otherwise, a wave of digitalization could wipe them out of the market. At the same time, opportunities are being created that will need to be utilized.

New technologies related to digitalization in the tourism sector are still in their infancy, but are expected to completely revolutionize the industry soon.

Although there is a wide variety of technologies developed for different fields and with important applications in the tourism sector, their use in Mexico has not been documented in empirical studies. There is still strong resistance from less technological companies; some have rigid structures that hinder digitization; lack of personnel with the necessary digital skills; lack of regulation of some services; lack of knowledge of the benefits; structural deficiencies, such as failures in internet networks, and, even, high costs, as well as lack of consumer confidence regarding their information being on the internet[39].

Hoteliers have not visualized that many of these

technologies could benefit them, as they are increasingly competing in a digital and traveler experience marketplace, which puts them at a disadvantage with respect to companies that are embedded in these applications.

Conflict of interest

The authors declare no conflict of interest.

References

1. Schwab K. The fourth industrial revolution. New York: Currency; 2017.
2. Terrell RS, Rosenbusch K. How global leaders develop. Journal of Management Development 2013.
3. Hirsch-Kreinsen H, Weyer J, Wilkesmann M. Grune Kapitalisten im System der Finanzierung von Technologie-entwicklung-Das Beispiel der Photovoltaik-Branche (Spanish) [Grune capitalists in the system of financing technology development-The example of the photovoltaic industry]. Dortmund: Technical University of Dortmund; 2016.
4. Geissbauer R, Vedso J, Schrauf S. Global Industry 4.0 Survey: Building the digital enterprise. London: PwC; 2016. Available from: https://www.pwc.com/gx/en/industries/industries-4.0/landing-page/industry-4.0-building-your-digital-enterprise-april-2016.pdf.
5. Fundación Orange. La transformación digital en el sector turístico (Spanish) [Digital transformation in the tourism sector]. Madrid: España; 2016. Available from: http://www.fundacionorange.es/wp-content/uploads/2016/05/eE_La_transformacion_digital_del_sector_turistico.pdf
6. Capgemini. Digitari [Internet]. 2019. Available from: https://www.capgemini.com/resources/?search_term&filter_content_type&filter_label&filter _research
7. World Economic Forum. Digital enterprise narrative [Internet]. 2016. Available from: http://reports.weforum.org/digital-transformation/wp-content/blogs.dir/94/mp/files/pages/files/digital-enterprise-narrative-final^anuary-2016.pdf.
8. World Bank. Digital platforms and the future of tourism [Internet]. 2018. Available from: https://www.worldbank.org/en/news/feature/2018/09/25/digital-platforms-and-the-future-of-tourism-a-world-tourism-celebration.
9. BBC Travel. How digitalization is revolutionizing the travel industry [Internet]. 2020. Available from: http://www.bbc.com/storyworks/travel/the-new-tourism-trend/technology-redefine-tourism- industry
10. Walker JR, Walker JT. Introduction to hospitality: Pearson new international edition. 4th ed. London: Pearson; 2013.
11. Pindzo R, Brjaktarovic L. Digital transformation of tourism. Tourism International Scientific Conference Vrnjacka Banja 2018; 3(1): 340–355.
12. Milenio. Tianguis turístico (Spanish) [Tianguis tourist] [Internet]. 2019. Available from: https://www.milenio. com/tianguis-turistico
13. Pranita D. Digitalization: The way to tourism destinations competitive advantage (Case study of Indonesia marine tourism). KnE Social Sciences 2018; 3(11): 243–253.
14. Gretzel U. Travel in the network: Redirected gazes, ubiquitous connections and new frontiers. In: Levina M and Kien G (editors). Post-global Network and Everyday Life. New York: Peter Lang; 2010. p. 41–58.
15. Dickinson JE, Hibbert JF, Filimonau V. Mobile technology and the tourist experience: (Dis)connection at the campsite. Tourism Management 2016; 57: 193–201.
16. Murison M. Biometrics enter the travel industry [Internet]. 2019. Available from: https://travelshift.com/blog/biometrics-travel-industry/.
17. Williams K. Biometrics: The “about face” hospitality needs [Internet]. 2018. Available from: https://hospitalitytech.com/biometrics-about-face-hospitality-needs
18. Tanner DA. Biometrics could accelerate the travel growth [Internet]. 2019. Available from: https://www.tourism-review.com/travel-growth-may-be-helped-by-biometrics-news11280
19. Vidal B. The new technology and the travel revolution [Internet]. 2019 Dec 5. Available from: https://www.wearemarketing.com/blog/tourism-and-technology-how-tech-is-revolutionizing-travel.html.
20. Revfine. The latest technology trends in the hospitality industry form 2019 [Internet]. 2019. Available from: https://www.revfine.com/techno-logy-trends-hospitality-industry/
21. Guelcome. Chatbots in hotels [Internet]. 2020. Available from: https://guelcom.net/chatbots-hoteles-fitur-2019-implementation-use-tourism/
22. Enache MC, Avram C, Rusu R, et al. Virtual assistants in tourism. Risk in Contemporary Economy 2019; 93–100.
23. Amaya M, Carlos M, Magana E, et al. Tourism destination evaluation using data science technology. Studies and Perspectives in Tourism 2017; 26(2): 286 – 305.
24. Xiang Z, Gretzel. Role of social media in online travel information search. Tourism Management 2010; 31(2): 179–188.
25. Xiang Z, Schwartz Z, Gerdes J, et al. What can big data and text analytics tell us about hotel guest experience and satisfaction? International Journal of Hospitality Management 2015; 44: 120–130.
26. Zivkovic R, Gajic J, Brdar I. The impact of social media on tourism. Singidunum Journal of Applied Sciences 2014; 758–761.
27. Zeng B, Gerritsen R. What do we know about social

media in tourism? A review. Tourism Management Perspectives 2014; 10: 27–36.
28. Guasch V, Soler JR. Cloud computing, tourism and data protection. Journal of Tourism Analysis 2014; 17(1): 61–68.
29. Instituto Valenciano de Tecnologías Turísticas (Spanish) [Internet]. 2020. Available from: https://www.invattur. es/
30. Barnes S. Understanding virtual reality in marketing: Nature, implications and potential. Implications and Potential 2016; 25.
31. Boellstorff T, Nardi B, Pearce C, et al. Ethnography and virtual worlds: A handbook of method. Princeton: Princeton University Press; 2012.
32. Martín-Gutiérrez J, Mora CE, Anorbe-Díaz B, et al. Virtual technologies trends in education. EURASIA Journal of Mathematics Science and Technology Education 2017; 13(2): 469–486.
33. Mariani M, Baggio R, Buhalis D (editors). Tourism management, marketing, and development: Volume I: The importance of networks and ICTs. New York: Springer; 2014.
34. Gretzel U, Sigala M, Xiang Z, et al. Smart tourism: Foundations and developments. Electron Markets 2015; 25: 179–188.
35. Hunter WC, Chung N, Gretzel U, et al. Constructivist research in smart tourism. Asia Pacific Journal of Information Systems 2015; 25(1): 105–120.
36. Sigala M. From demand elasticity to market plasticity: A market approach for developing revenue management strategies in tourism. Journal of Travel and Tourism Marketing 2015; 32(7): 812–834.
37. Gretzel U, Werthner H, Koo C, et al. Conceptual foundations for understanding smart tourism ecosystems. Computers in Human Behavior 2015; 50: 558–563.
38. Kim D, Kim S. The role of mobile technology in tourism: Patents, articles, news, and mobile tour app reviews. Sustainability 2017; 9(11): 2082.
39. Watkins M, Ziyadin S, Imatayeva A, et al. Digital tourism as a key factor in the development of the economy. Economic annals-XXI 2018; (169): 40–45.