

## IMPROVING DIGITAL TECHNOLOGIES IN THE TOURISM BUSINESS

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### Abstract

The article is devoted to present a theoretical discussion about the virtual reality tools on tourism sector, with focus on recent recent experiences. It has been established that the epidemiological and economic situation that has developed in the world at present indicates the need for the introduction of digital technologies in all spheres of life as well as the entertainment sector, which includes the tourism industry. It has been showed that it is not possible to meet the growing needs of consumers without the introduction of the latest technologies. The purpose of the development of digital technologies in the tourism sector is to create the necessary prerequisites for the development and improvement of the state of the tourist services market, its diversity due to new types of tourism, improving the financial condition, as well as sustainable growth in the level and quality of life of citizens in the current period and for the future.

**Keywords:** Virtual reality; Efficiency; Financial condition; Technology; Sustainable growth.

## APRIMORANDO AS TECNOLOGIAS DIGITAIS NO SETOR DO TURISMO

### Resumo

O artigo é dedicado a apresentar uma discussão teórica sobre as ferramentas de realidade virtual no setor de turismo, com foco em experiências recentes. Foi estabelecido que a situação epidemiológica e econômica que se desenvolveu no mundo atualmente indica a necessidade da introdução de tecnologias digitais em todas as esferas da vida, bem como no setor do entretenimento, que inclui a indústria do turismo. Foi provado que não é possível satisfazer as necessidades crescentes dos consumidores sem a introdução das tecnologias mais recentes. O objetivo do desenvolvimento das tecnologias digitais no setor do turismo é criar os pré-requisitos necessários para o desenvolvimento e melhoria do estado do mercado de serviços turísticos, a sua diversidade devido a novos tipos de turismo, melhorando a condição financeira, bem como o crescimento sustentável no nível e qualidade de vida dos cidadãos no período atual e para o futuro.

**Palavras-chave:** Realidade virtual; Eficiência; Situação financeira; Tecnologia; Crescimento sustentável.

## MEJORA DE LAS TECNOLOGÍAS DIGITALES EN EL NEGOCIO DEL TURISMO

### Resumen

El artículo está dedicado a presentar una discusión teórica sobre las herramientas de realidad virtual en el sector turístico, con enfoque en las experiencias recientes. Se ha establecido que la situación epidemiológica y económica que se ha desarrollado en el mundo en la actualidad indica la necesidad de introducir las tecnologías digitales en todas las esferas de la vida, así como en el sector del entretenimiento, que incluye la industria del turismo. Se ha demostrado que no es posible satisfacer las crecientes necesidades de los consumidores sin la introducción de las últimas tecnologías. El objetivo del desarrollo de las tecnologías digitales en el sector turístico es crear las condiciones necesarias para el desarrollo y la mejora del estado del mercado de servicios turísticos, su diversidad debido a los nuevos tipos de turismo, la mejora de la condición financiera, así como el crecimiento sostenible del nivel y la calidad de vida de los ciudadanos en el período actual y para el futuro.

**Palabras clave:** Realidad virtual; Eficiencia; Condición financiera; Tecnología; Crecimiento sostenible.

## 1 INTRODUCTION

The formation and development of the information society make it possible to create and promote a new culture based on interaction not only with real objects and feelings of existence but also with their specially designed models, graphic images, and virtual ghosts. In this case, virtuality is the most important characteristic of modern social reality.

Therewith, digital technologies can effectively replace direct communication with natural, historical, architectural, and other spiritual and real objects of reality. The tourism industry is also undergoing significant changes in this sense.

In the international agenda digital technology is a growing field of research in the last years in diverse themes, such as digital tourism in general (Nikolskaya et al, 2019), digital Technology in Tourism Education



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(Campos, 2005; Munar & Gyimóthy, 2013; Adukaite et al. 2016; Balula et al., 2019; Çınar, 2020); digital marketing and social media in tourism (Djuraeva & Khurramov, 2015; Happ & Ivancsó-Horváth, 2018; Andrade et al., 2018; Nascimento, 2019; Kayumovich, 2020a; b; Tuan et al., 2021); and the role of customer of generation Z in digital tourism (Liberato et al., 2018b).

Moreover, it is analysed the relation between digital tourism and economic development (Watkins et al., 2018; Khurramov & Boboqulov 2019); the development of the tourism business with focus on the use of digital technologies in rural territory (Keschyan, 2020), and the implications of technology of information on hospitality (Bezvesilnaya et al., 2020). Concerning the actual context, the acceptability in using virtual tourism during the pandemic in China (Lu et al., 2022) indicates the importance and increasing of this kind of tourism.

Tourism management and policies is also a research field impacted by digital technology, with focus related to creative tourism, or “playable cities” (Marques & Borba, 2017); tourism policy (Anjos et al. 2006); smart tourism cities (Buhalis & Amaranggana 2013; Libertato et al 2018a); and technology for strategic tourism management (Buhalis, 2003).

In terms of concrete actions, in Europe context, special emphasis is being giving to the smart tourism destinations in the last decade. This is the case of Spain that have a National Policy of Tourism with that highlights the promotion of innovation in public and private tourism sector since 2012 (López de Ávila et al., 2015). In Portugal, the case of the city of Porto is also underlined (Liberato et al., 2018a).

In the Republic of Kazakhstan, a State program Digital aims to improving the living standards through digital technologies (Mussina et al. 2020). And in the Russian Federation the model of the digital platform “Tourism 4.0” is being developed (Klimova and Glumova (2020).

The aim of this paper is to present a theoretical discussion about the virtual reality tools on tourism sector. It is proposed to observe some existing experiences in recent years. Particular attention is taken to the pandemic period, as a conditioning factor of improvement of virtual tourism consumption.

Following this introduction, it is presented a methodology section with a description of data collection. Then the theoretical discussion focuses on the virtual tourism, presenting its main features and advantages. As a conclusion of the section, it is presented some case studies of virtual reality applied in tourism recently. Finally, main points are underlined in the conclusions of the paper.

## 2 LITERATURE REVIEW

Global society has changed with the evolution of information and communication technologies (Watkins et al., 2018; Liberato et al., 2018b). In this sense, Munar and Gyimóth (2013) presented the concept of “turistus digitalis” to observe society and technology relations concerning tourism sector. As an example, in Brazil the process of co-creative remaking of the city of Recife are generating engagement among citizenship and tourism, as well as creates interactive connections between tangible and intangible culture (Marques & Borba, 2017).

The time and spatial restrictions to tourism have been reduced or even eliminated by the new digital economy (Bezvesilnaya et al., 2020). Internet has substantially contributed to maximising the distribution of information in hospitality offer of products and services (Watkins et al., 2018). In this context, tourism marketing visual representations are promoting positive images to encourage consumers to visit a destination (Voronkova, 2018).

On the side of customers, the social media is playing an important role in decision making process of tourists (Andrade et al., 2018; Nascimento, 2019). According to Klimova and Glumova (2020, p. 16), “74% of travelers in the world are planning their trip online”. Individual or institutional clients, specially of the Generation Z and the Generation Me - of the digital natives - have demanded innovative business models in tourism, such as the electronic sales channels (Liberato et al., 2018b).

On the other hand, despite technologies are a tool to reach innovation in tourism sector, it is not incorporated by all enterprises, specifically the tour operators, due to risk measures (Khurramov, 2020), even though the ones which do not adapt will be at risk (Klimova and Glumova, 2020).

In fact, the regulation of the conventional schemes on the new digital basis is a challenge, such as in booking and reservation systems, in transport logistics, and routing (Bezvesilnaya et al., 2020). Moreover, the tourism offer must be adapted to virtual platforms and process, as mobile applications designed for tourists (Nikolskaya et al., 2019). In a general scenario, innovations will be driven in two axes: “through independent tour planning and the purchase of tickets and hotels separately; by acquiring package tours online” (Klimova and Glumova, 2020, p. 19).

## 2 METHODS

The study was carried out based on Russian State Social University, Financial University under the Government of the Russian Federation, Leonov

Moscow Region University of Technology, Russian State University of Tourism and Service and Moscow Polytechnic University in 2021-2022.

The methodological basis of the research was the dialectical method of scientific cognition and generally scientific methods of cognition (Burykin et al., 2018): the abstract-logical method was used to define the concept of virtual tourism and identify its features; the method of induction and deduction (Shaymardanova et al., 2019) – to study the essence and main aspects of the introduction of modern digital technologies in the tourism business. Content analysis was used to grouping and classification – when considering the main types of virtual tourism; economic-statistical – to identify trends in the development of virtual tourism. The systematic method (Golovetsky et al., 2019) was used to assess the possibilities of digital technology development in the tourism industry.

Information was recollected during 2021-2022. The information base of the research was the fundamental provisions of the theories of international tourism; periodicals; official statistical data; information resources of the global Internet, and the results of scientific research (Burykin et al., 2018; Golovetsky et al., 2019; Shaymardanova et al., 2019).

It was tried to systematize the main aspects of the development of the tourist market in the course of the research, develop measures to coordinate activities between the participants of the tourism industry, determine the individual characteristics of the tourist business in the conditions of digitalization.

### 3 RESULTS

Currently, the introduction of digital technologies in the tourism industry is radically changing not only business processes but also in general all aspects of the tourism sector. The most used latest directions of digital development in tourism should include Blockchain technology, which implements a distributed database that is not connected to a common server.

In this context, the virtual tourism can be already considered an innovation process that is being merged to tourist practices as a niche of market (Khurramov, 2020). For being so, it is important to characterize virtual tourism and the challenges to its implementation in tourism system.

#### 3.1 Virtual Tourism

The virtualization, such as the use of virtual reality (VR), is growing in all spheres of the society (Voronkova, 2018; Almeida, 2019). This is the case of the sectors of security, healthy, education and games (Almeida, 2019). In that regard, tourism sector is

gradually incorporating such technologies. An example of VR application is the virtual reconstructions of heritage sites (Shaikh et al., 2018).

Virtual Reality provides an immersive experience of a tourist destination, as the tourist can visualize and even to use the attractions in a 3D or 360° environment (Feierherd, et al., 2019). As people can interact with virtual environment VR provides a hyperrealistic experience (Almeida, 2019). Therefore, a virtual tour is a way to realistically display a three-dimensional multi-element space on a flat screen. The elements of a virtual tour, as a rule, are spherical panoramas connected to each other by interactive links-transitions. It creates a "participation effect" in the viewer – bright, memorable visual images.

One market opportunity to the application of these technologies is the creation of new attractions, apart from influence the decision-making process to choose a destination to travel (Feierherd, et al., 2019). So, It is possible to find not only potential customers, but also maintain the interest of regular ones with the help of virtual tours. They will significantly save time by demonstrating the real advantages and characteristics of a product or service to the client in a virtual space. On the other side, there is still a small number of digitalized tourist destinations (Voronkova, 2018), what is a restriction to the growing of products and services.

In terms of its components, the practice has shown that the virtual tourist space consists of several components, namely: the information field (the totality of all information about tourist activities); information flows (the totality of data transmitted in the virtual information space via a specific communication channel); digital resources (automated databases, websites, programs, and networks); legal and institutional measures (digital law, international regulatory documents, international treaties); digital technology market.

Research shows that each type of virtual tourism is already characterized by its type of tourist: virtual extremists, collectors, etc. To some extent, this refers to the formation of a virtual tourist community. In this case, three criteria can be distinguished for the separation of virtual tours:

1) *The type of basic need satisfaction.* It is possible to distinguish ethnic, household, historical, educational, cult, nostalgic, entertaining.

2) *The degree of technological presentation of information.* It can be divided into two levels: low and high-tech.

3) *The purpose of creating the tour.* The following purposes of creating virtual tours can be distinguished: informational and introductory; advertising and demonstrational; training and cultural and educational; social rehabilitational; entertaining.

In addition, firstly, by classifying virtual tours, it is possible to adapt the classifications to them that are used to describe tours in their classical sense, and secondly, to modernize the existing classification to meet modern requirements. In these conditions, virtual tours have several specific features by which they can be distinguished, namely the degree of technology and the purpose of creating a tour.

Meanwhile, new technologies have the potential to improve the sectors of the tourism industry, which may be of interest to both the consumer and the producer of tourist services. Significant advantages for the consumer are such features as:

- The ability to virtually travel to any place in the world, existing and non-existing. Today, the development of virtual tourism can contribute to a significant cultural and spiritual uplift of consumers. The interest in the surrounding world increases, as well as the desire to learn something new.

- Safety, because when using this service, the consumer does not go beyond one room, the risk of injury, illness, and other unpleasant sensations is reduced to zero (Rao & Krantz, 2020).

Another advantage of virtual tourism is the promotion of sustainability (as it reduces the gas emissions from transportation) (Lu et al., 2022) and enhance 'virtual accessibility' for the elderly and disabled people (Medeiros et al., 2021; Lu et al., 2022), as well as the reduction of seasonality (Pitoska, 2013). Moreover, it can substitute visiting protected areas, or sites that were closed to the public (Voronkova, 2018; Verma et al., 2022), as in the case of "guided tours in the Lascaux caves in France famous for their Paleolithic rock paintings that have been closed since 1963" (Voronkova, 2018, p. 2).

However, the use of VR in sectors such as archeology or culture is still in at an early stage of development (Almeida, 2019).

Finally, VR has always been a very relevant advantage, but now the weight of this feature has increased even more, given the epidemiological situation in the world, since COVID-19 pandemic. As virtual tourism can provide immersed experience

without being in the destinations, it contributed to stay-at-home order during COVID-19 pandemic (Verma et al., 2022; Lu et al., 2022). But, even after pandemic people has showed interest into virtual tourism (Lu et al., 2022; Rausser et al., 2021).

In the digital society It is important not only to develop and implement a new type of organization but also to ensure the creation of organizational systems and networks with which the newest organizations can mutually cooperate. In this context, tourism system has adapted to new platforms and technological tools, as well as the agents that operate in this system.

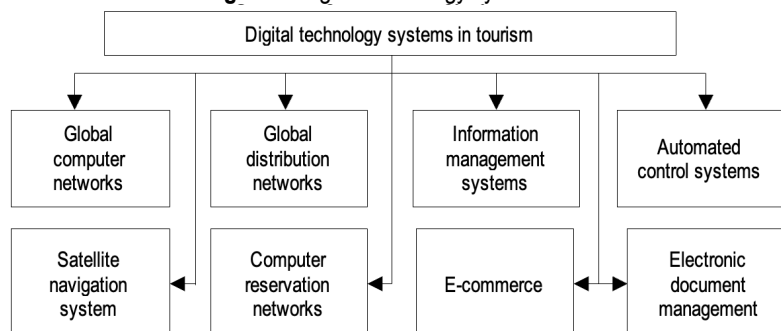
### 3.2 Digital Technology Systems in Tourism

According to many researchers, various factors are affecting virtual tourism as a social and market phenomenon, but basically, two main issues are relevant: the readiness and ability to connect to the network and the interoperability of the modern world wide web and virtual tourism.

Many of the digital technologies, such as platforms, devices, and tools for creating content, contribute to the development of virtual reality. In addition, it becomes possible to replace personal experience with virtual experience, which can lead to a situation where the real travel experience becomes the sphere of wealthy travelers. Meanwhile, less well-off people are likely to prefer traveling through an easily accessible and reproducible virtual reality.

Research suggests that virtual reality describes a computer-generated three-dimensional environment in which users can navigate and possibly interact with it. In addition, the influence of digital technologies on the tourist product not only enhances the work of business processes and the activities of tourist enterprises but also makes it possible to diversify the offered product and make it more accessible and in demand. In these conditions, in-depth digitalization leads to the emergence of global computer networks, global distribution systems, information management systems, as well as automated control systems (Figure 1).

Figure 1. Digital technology systems in tourism.



Source: own elaboration.

### 3.3 Case Studies of Virtual Tourism

A striking example of the progress of virtual tourism can be considered the international technology exhibition in the Olympic Games Tokyo 2020, where First Airlines, a Japanese company, offered to travel to cities such as Rome, Paris, New York, Florence, Hawaii without leaving the building, with full absorption into virtual reality, using not only hearing and vision but also the sense of smell and tactile sensations.

Previously, First Airlines had focused more on the elderly and people with disabilities who do not have the opportunity to visit another country through long-distance flights, despite their health condition, but the customer contingent has significantly expanded during the pandemic, prompting the company to improve.

There are also quite significant advantages when looking at the situation through the eyes of the manufacturer of such services. Firstly, such a product is reusable. The recorded video exists in a virtual system and has no expiration date, can be rebuilt to meet the requirements of modern technology and individual consumers. Secondly, taking into account the specifics of the traditional tourist business, before releasing a tour for sale, the agency must form it, organize several factors (transfer, accommodation, catering).

Virtual tourism reduces such necessities to zero in these conditions. Thus, the cost of the tour is falling, which makes it possible, firstly, to make a big profit for the travel company, and secondly, to reduce the cost of the tourist product, making it more affordable, and together with the right marketing policy – no less popular than real travel.

Thirdly, there is a multiplicity of technical support. A movie, a program, a virtual model can be used many times, as well as technical support, in the form of augmented reality glasses, premises, augmented reality sensors. Fourthly, unreal reality. Today, there are a sufficient number of cults of virtual worlds into which many users daily delve.

Another example of the implementation of VR is the cases of some important museums, such as “the Louvre, the Palace Museum, and the Smithsonian National Museum of Natural History” that have their online virtual tour services (Yang et al, 2022, s.p.). Observing such experiences, it is evident how virtual tourism is developing quite rapidly, as it has several properties that attract the attention of the consumer and the manufacturer of such services. This direction receives an increasing number of users every year due to its uniqueness.

Also, virtual excursions in time and to the main sights of the city have become widespread in the last

few years. Thus, the “Wonderland in VR” (Switzerland), “Virtual Reality” (USA), “L'impossible devient possible” (France) companies were created, offering virtual trips to the old corners of the city, video reconstruction of which combines documentary reconstruction of religious buildings, with the help of modern technologies.

Considering the criteria to distinguish the motivation, as mentioned in previous section, virtual tours in museums have a cultural purpose, while the virtual flights offered by First Flight are entertaining activities.

Now such excursions are free, but the user pays only for renting a virtual reality headset. Receiving the service, he/she moves for 30 minutes in an empty room, which is designed for such a journey, and listens to an electronic guide, simultaneously immersing himself/herself in the virtual world. It is worth considering that such excursions are interesting not only to tourists but also to residents, which, of course, contributes to the general cultural uplift and spiritual development of society.

## 4 DISCUSSION

The theoretical review showed that, the growing demand for tourist services from different regions around the world accelerates the market demand for virtual services in the travel and tourism system. Travel companies are investing in virtual technologies to improve customer interaction.

In addition, the constant growth in the number of consumers of tourist services, meanwhile, does not reduce the relevance of the task of forming a proposal for new products.

It is noteworthy that tourists are becoming more demanding, tourist practices are developing and the desire to get new impressions is growing, specially in Me Generation. In this context, new types of tourism and new directions are emerging. Concerning the tourism system organization, types of communication, transport, services are improving, the consumer of services is becoming more informed and experienced (Fomicheva, Kataeva, Sulyagina, Evstratova, & Chardymyskiy, 2019; Kozlov, Budarnikov, Zhuravleva, Gonzalez, & Lebedeva, 2018; Nikolskaya, Anzorova, Potapov, Dekhtyar, & Lebedev, 2018). Travel agencies are increasingly aware of the need to bring new products and services to the market in a volatile environment.

In these conditions, digital technologies are a prerequisite for improving competitiveness, increasing the consumption of tourist services, and achieving economic success. Therefore, when it comes to the

innovations in tourism, first of all, this refers to the development and promotion of new tourist products, the introduction of new management and organizational solutions, the application of new principles of providing services using modern digital technologies (Khurramov, 2020).

In many ways, innovations in tourism are due to the emergence of an information society that forms a digital, virtual reality with specific social, cultural innovations in tourism, which involves the creation of a new product (Khurramov, 2020). Currently, virtual reality can offer marketers a particularly effective way to give potential travelers a hint of what to expect when they order a real travel service.

The virtual tours can be observed from the the motivation to travel, from the technological presentation or from the propose to create the tour.

Customers usually want to get enough details before booking a hotel, resort, or trip. More recently, potential tourists have been able to browse online videos and traveler reviews or search for opinions on Facebook or other social media sites (Voronkova, 2018; Galizina et al., 2021). However, the use of virtual reality reduces the decision-making process exponentially as it provides a pre-experience of the real place to visit (Feierherd, et al., 2019).

A significant number of travel companies and hotel chains are already offering virtual reality elements in their applications and on websites so that users can get a digital version of their resort facilities and rooms. Travel agencies were able to significantly reduce the level of dissatisfaction with services through the pre-screening due to the use of such technologies.

On the other hand, the technology systems in tourism are as complex as the tourism system itself. As it works in a digital sphere communication among diverse agents and the management of information can be more efficient to provide a great service to customers. But to reach such a perfect reality the integration of systems around the word must be integrated, what in some cases is not possible in actual days.

## 5 CONCLUSION

The paper had the object to present a theoretical discussion about the virtual reality tools on tourism sector with focus in recent years. It was observed that due to pandemic period, there was improvement of virtual tourism consumption. It can be concluded that the epidemiological and economic situation that currently exists in the world indicates the need to introduce digital technologies in all spheres of life, including the entertainment sector, as well as the tourism industry.

Virtual reality was observed to have advantages in the decision-making tourist process. Additionally, it can promote sustainability and the accessibility for the elderly people. Moreover, the tourist experience in museums and other events can be converted in unique experiences.

It was observed that the issue of the tourism industry development in the context of the evolution of digital technologies is very relevant since it includes an improvement in the economic situation and provides an opportunity to stabilize the financial condition of countries.

The purpose of the development of digital technologies in the tourism sector is to create the necessary prerequisites for the development and improvement of the state of the tourist services market, its diversity due to new types of tourism, improving the financial condition, as well as sustainable growth in the level and quality of life of citizens in the current period and for the future.

The paper contributes to the conceptualization of virtual tour and offering a general view of recent application of VR in diverse situations. Its was identified, nevertheless, that the main challenge is related to the regulation of the conventional schemes on the digital platforms, as well as the growing of digitalized tourist destinations, that could be able to offer new VR experiences.

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**Table 1.** CRediT author statement

Term	Definition	Author 1	A.2	A.3	A.4	A.5
Conceptualization	Ideas; formulation or evolution of overarching research goals and aims	+			+	
Methodology	Development or design of methodology; creation of models		+	+		+
Software	Programming, software development; designing computer programs; implementation of the computer code and supporting algorithms; testing of existing code components	+		+	+	
Validation	Verification, whether as a part of the activity or separate, of the overall replication/ reproducibility of results/experiments and other research outputs	+	+			+
Formal analysis	Application of statistical, mathematical, computational, or other formal techniques to analyze or synthesize study data			+	+	+
Investigation	Conducting a research and investigation process, specifically performing the experiments, or data/evidence collection	+	+		+	
Resources	Provision of study materials, reagents, materials, patients, laboratory samples, animals, instrumentation, computing resources, or other analysis tools			+		+
Data Curation	Management activities to annotate (produce metadata), scrub data and maintain research data (including software code, where it is necessary for interpreting the data itself) for initial use and later reuse	+	+		+	
Writing - Original Draft	Preparation, creation and/or presentation of the published work, specifically writing the initial draft (including substantive translation)	+	+	+	+	+
Writing - Review & Editing	Preparation, creation and/or presentation of the published work by those from the original research group, specifically critical review, commentary or revision – including pre-or post-publication stages		+	+		+
Visualization	Preparation, creation and/or presentation of the published work, specifically visualization/ data presentation	+		+		+
Supervision	Oversight and leadership responsibility for the research activity planning and execution, including mentorship external to the core team		+		+	
Project administration	Management and coordination responsibility for the research activity planning and execution	+	+	+	+	+
Funding acquisition	Acquisition of the financial support for the project leading to this publication	+	+	+	+	+

Source: adapted from Elsevier (2022, s/p), based upon Brand et al. (2015).

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