Application of Information Technologies to Improve the Quality of Services Provided to the Tourism Industry Under the COVID-19 Restrictions

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Summary

The modern stage of society's development is characterized by the rapid penetration of information technologies into all spheres of life. Their use contributes to improving the quality of tourism services, as well as the competitiveness of tourism industry enterprises. The role of information technology in tourism is growing more and more every year, which determines the relevance of the study of modern trends in the use of information technology in the tourism sector. The purpose of the study is to determine the possibilities of using information technologies to improve the quality of services provided to the tourism industry under the COVID-19 restrictions. The article systematizes the main approaches to the "cluster" category and provides an original definition of the "regional tourist cluster" concept. Based on an expert survey, the main trends in the introduction of information technologies in the tourism industry under the COVID-19 restrictions have been identified, which include virtual reality and augmented reality, speech recognition technologies, photo, video, audio (contactless control technologies), mobile IT applications and Big Data technologies. It has been concluded that the vast majority of improvements in the organization of tourism services under restrictions will be based on the organization of virtual solutions and online activities. The types of tourism services will also change, and information technology will help their development and dissemination.

Keywords:
information technologies, tourism industry, virtual reality, virtual excursion, contactless control technologies

1. Introduction

Tourism and its functioning facilities have ceased their activities due to the COVID-19 pandemic and the actions imposed by the restrictions. Researchers [1] noted that unemployment in the main segments of the industry reached 50-60%. Globally, hotel occupancy has fallen by 85-95% in the weeks following the start of lockdowns [2]. The workload of airlines decreased by about 75-80% at the peak of the coronavirus crisis, most carriers and network distributors reduced their staff to the level of "minimal survival" [3]. The processing time for refund applications increased to 30-90 days, which put the travel companies themselves on the verge of bankruptcy [4].

Even if all the restrictions adopted due to the fight against COVID-19 are lifted, the main conclusion is that there are no guarantees that various problems like new pandemics, cataclysms, and even wars cannot occur even shortly. The tourism industry needs to consider more and more risks in its work, including those that were not previously perceived as unlikely [5]. According to the conclusions of experts [6], the global tourism industry will not be able to reach pre-crisis indicators in the coming years and it is already necessary to analyze the steps for the future development of the industry. One of the directions of the future development of the industry is the continuation of large-scale digitalization and the use of the latest information technologies that will ensure close integration and communication between the consumer and the service provider during its implementation, improving the quality and speed of receiving services, the ability to consider the needs of each client and effective feedback [7, 8].

Considering recent world events that have significantly affected the state of the tourism industry in the world, tourism requires new approaches to organization and management, especially with the use of modern digital technologies that can significantly increase the efficiency of providing a tourist product [9, 10]. The digitalization of tourism today is influenced by trends that are constantly changing and will continue to transform the industry into new types of tourism services in the post-pandemic period [11, 12].

2. Literature Review

According to researchers, the tourism industry is one of the most active consumers of modern IT, which is due, firstly, to the importance of the time factor, since there is an objective need for timely transmission of information about tourist products, which is possible primarily due to the use of modern IT [13]. Secondly, information about tourism products should be simultaneously available to any participants in the tourism chain anywhere in the world, which can also be provided by modern IT [14]. Thirdly, the tourism product consists of a large number of elements that also require quick information to coordinate their provision to consumers of the tourism product [15]

D.A. Fennell [16] believes that modern IT is being actively introduced into the field of tourism business, and its use becomes an essential condition for increasing the competitiveness of any tourist enterprise. According to researchers [17], tourism is an informational type of economic activity, in the sense that the information resources of tourism enterprises are their main resources.

The degree of development of information resources determines the overall level of informatization. Thus, D. Buhalis [18] notes that IT should provide integration and communication; improve the quality of services; transmit a large amount of information; increase the speed of service and efficiency of activities, the ability to consider the needs of each client, and effective feedback. The study [19] emphasizes that the effectiveness of marketing in tourism increases due to IT, and the consumer has the opportunity to quickly obtain the necessary high-quality information about tourism services and products. According to [20], IT in tourism is a system of methods of transmitting and processing information based on the use of technical means that can be used in the management of tourism enterprises. According to researchers [21, 22], the introduction of such new IT as virtual and augmented reality into the tourism sector is a necessary prerequisite for its normal existence because tourist products are sold (offered, ordered) in the form of information. The application of virtual reality technologies in the tourism industry is being investigated in the field of its use in organizing visits to museums [23], nature tours [24], and visits to historical attractions [25].

The study [26] analyzes methods for evaluating the effectiveness of IT in the activities of tourism enterprises and the possibilities of their application in management and marketing. It also provides recommendations for modifying organizational management structures under the influence of IT.

The study [27] is of interest within the framework of the problem under study, in which the effectiveness of the sites of tourist organizations created using the latest eye-tracking technology is evaluated. The subject of the study [28] was mobile information services, which demonstrated significant potential, both as a source of information for customers about the territory and as a high-quality communication channel with travel service providers.

Despite a significant number of scientific developments on the introduction of information technologies in the tourism sector, this problem is not fully disclosed, since the tourism sector continuously introduces modern IT, changes the forms and methods of offering and providing services, and opens up and develops new opportunities, especially in conditions of restrictions caused by COVID-19 [29].

The purpose of the study is to analyze the possibilities of using information technologies to improve the quality of services provided to the tourism industry under the COVID-19 restrictions.

Research objectives:

1. to identify the main trends of IT implementation in the tourism industry under the COVID-19 restrictions;
2. to analyze the possibilities of using IT in the conditions of restrictions caused by COVID-19.

3. Methods

The following research methods were used in the course of the study:

- analysis of scientific literature on the problem of IT implementation in the tourism industry under the COVID-19 restrictions;

- an expert survey, the results of which highlighted the main trends in the implementation of IT in the tourism industry under the COVID-19 restrictions.

The expert survey was carried out using the e-mail service. Emails with the question "What, in your opinion, are the main trends in the implementation of IT in the tourism industry under the restrictions caused by COVID-19?" were sent to 65 experts, of which 35 people were employees of travel companies and 30 people were representatives of the IT sector engaged in the implementation of IT in the tourism industry. The letter expressed a suggestion to justify the answers in a free form.

Responses were received from 54 experts. The answers were taken into account, the percentage of expert mentions of which exceeded 50%.

All participants were warned about the purpose of the survey and the intention of the organizers of the study to publish the results in a generalized form.

Further, the ranking of expert opinions was carried out, the consistency of which was evaluated by the value of the concordance coefficient using the SPSS software product.

4. Results

Based on the expert survey, the main trends of IT implementation in the tourism industry under the conditions of restrictions caused by COVID-19 were determined (Table 1).

Table 1: The main trends of IT implementation in the tourism industry under the COVID-19 restrictions

No.	IT	Content	%*	Rank
1	VR (virtual reality) and AR (augmented reality) technologies	for visualization of tourist destinations or individual tourist products	88.9%	1
2	speech recognition technologies, photo, video, audio (contactless control technologies)	to simplify the provision of services (the use of chatbots and artificial intelligence) and security	77.8%	2
3	mobile IT applications	integration of consumer experience in mobile devices	74.1%	3
4	Big Data technologies	convergence and close interaction of tourism and medical technologies	64.8%	4

Note: compiled based on the expert survey;* – the percentage of expert mentions; the value of the concordance coefficient $W = 0.85$ ($p<0.01$), which indicates a strong consistency of expert opinions.

5. Discussion

The results of determining the main trends of IT implementation in the tourism industry under the COVID-19 restrictions (Table 1) provided opportunities for further analysis of the features of their functioning.

Thus, the trend toward the use of virtual reality technologies and the choice of virtual excursions by experts during the pandemic as the main form of work in the world was not accidental. A study of the marketing advantages of a travel product has shown the convincing effectiveness of virtual tours. Customers who saw a virtual tour before ordering a service agreed to order the service immediately by almost 67%, and the doubt disappeared completely in combination with a demonstration video [24].

However, according to the experts, the greatest use of VR technology during the lockdown period was in the activities of museums. The introduction of a quarantine regime, the temporary closure of borders, and the restriction of movement between settlements have become not forced security measures for the tourism industry, but a test of survival. All subjects of tourist activity suffered significant economic losses, which put the issue of their further functioning on the agenda [29]. This situation raised the question of transforming the format of work to preserve the main function of museums and retain visitors.

This is confirmed by the opinion of researchers [23] that the creation of a museum website or pages on social networks is no longer sufficient for full-scale and effective digital attraction. The online presentation should not be a digital copy of what is in the physical halls of the museum. It turned out to be important to use the capabilities of those media that provide the institution with autonomy, multi-layered multimedia, and holistic content. Not just to show the exhibition to those in front of the screens, but to tell the story with the help of materials that can be freely accessed on the Internet. This approach will allow museums to become a new kind of science communicator, using already available open scientific materials. Therefore, most of the museums that continued to work after the quarantine of 2020 focused on online communication building a communication strategy [28].

According to [23], almost 70% of museums have increased their presence on the Internet, since museums were closed due to social restriction measures (quarantine). 80% of museums have stepped up their online activities in response to the overall increase in the visibility of digital cultural heritage on the Internet. Almost 80% of museums have reallocated staff functions to meet current needs, while more than 30% of museums have reallocated staff functions to include them in the digital team. 16% of the respondent museums have increased their budget for Internet activities. The study [25] showed that those online services are the most popular among museum institutions that require less additional financial resources and/or specialized experience and skills (hashtags in social networks, events around an existing online collection, and similar events).

Most of the institutions already had digital data at the time of the quarantine measures (online collections, 3D tours, virtual museums, online publications, digital exhibitions). The Google Arts & Culture platform has come in handy for many (especially within the framework of the representation of traditional mediums), which is one of the most effective ways for art and historical museums to become digital due to the virtual tour function.

Today, Google Arts & Culture offers more than 2,500 free virtual tours of cultural organizations around the world. Museums such as the Louvre, the National Gallery of Art in Washington, the Johannesburg Art Gallery, the British Museum, and others have emphasized the availability of their virtual tours, which allow visitors to easily explore their collections from a distance. To arouse more interest in such tours, museums can supplement this digital content with a list of compositions on Spotify to accompany virtual galleries, or recommend a drink or dish that will successfully complement the experience of a certain virtual tour, and share the experience on social networks [21].

Other museum institutions resorted to digitization after being quarantined. A large number of exhibitions and events were already planned when the lockdown was announced in many countries. This made it possible to

attract employees who were left without work in the physical space, as well as immediately focus on the interactive component of projects. A striking example was the GAMeC Museum of Contemporary Art in Bergamo, which launched its streaming radio for two months of quarantine, and the MUO Museum of Arts and Crafts in Zagreb, which initiated numerous partner Internet platforms [23].

Therewith, museums with a high level of information technology implementation have overcome these difficulties much easier. For example, the leaders of the world cultural and educational tourism, the Louvre, and the Hermitage museums switched their work to a remote mode during quarantine. A significant amount of coverage of their expositions with virtual excursions provided them with a leading position in online viewing in quarantine conditions. Thus, the Hermitage was virtually visited by about 30 million people during the two months of quarantine. The project started with a virtual tour in Italian in support of the residents of Italy, who were experiencing the terrible consequences of the pandemic. The first excursion for the week was viewed by 245 thousand visitors. This practice has been continued in other languages [30].

Thus, virtual and online excursions and panoramic photos have become an opportunity not only to preserve the internal visitor in the conditions of the pandemic but also a powerful marketing tool, self-promotion to attract foreign tourists in the future.

The necessity and prospects of this area of work are shown by the global trend toward expanding the scope of virtual reality applications. Isolated cases of evaluation of museum exhibitions, and cultural heritage objects eventually turned into a routine and norm and led to the appearance in 2020 of the world's first virtual museum – VOMA (Virtual Online Museum of Art) [29].

Speaking about the introduction of contactless control technologies, it should be noted that San Francisco Airport, United Airlines, and SITA jointly developed and implemented projects of innovative safe self-service solutions in response to quarantine restrictions during the COVID-19 pandemic that reduce passenger contact with agents, improve customer service and reduce information processing time. This refers to the SITA biometric solution, which provides fast service to United Airlines passengers in the SFO through the introduction of human face recognition technology as a boarding pass [16]. This technology provides convenience, speed, and epidemiological safety of work at airports from check-in to boarding.

One of the first examples of virtual interaction with clients in the hospitality industry was presented by the Marriot hotel chain, which used chatbots in more than 5,000 of its hotels back in 2017 [13].

Touch terminals and self-service kiosks have become widespread everywhere in developed countries, which displace devices with various types of contactless interfaces. The same trend applies to remote controls and switches, key cards, and even elevator call buttons [17].

Researchers [19] note a significant spread of voice technologies in many areas, the introduction of which in the tourism and hotel industry will grow rapidly. The proliferation of mobile applications and smart homes leads to the fact that many users are accustomed to voice assistants. This makes it possible to use the popularity of such a solution in the tourism business. People today value simplicity and speed more than ever before, and voice technology will become an important part of the industry's comprehensive response to growing demand.

Another direction will also be the use of Big Data technology, the convergence and close interaction of tourism and medical technologies. First of all, this concerns the analysis of medical screening data and information about the vaccination of tourists, which is likely to be integrated into the processes of customs and border control, and which will be taken into account when checking security at airports and other transport hubs. In this context, digital technologies will be more actively used to control crowds of people and adjust work depending on the capacity of facilities. Technical means and software applications will be able to warn the responsible departments of the company and regulatory authorities about the need for maintenance and cleaning, and about the risks to the health of employees and visitors.

6. Conclusion

The COVID-19 pandemic and isolation measures around the world have directly affected the entire chain of creation of a tourist product: development, production, distribution, and access. International organizations, governments, non-governmental organizations, and businesses quickly responded to the challenges of the pandemic with new measures to support the tourism sector to protect and promote the diversity of forms of tourism activities. The consequences of the pandemic for the tourism sector as a whole will be felt for a long time after its end and may require additional financial investments and organizational measures.

It can be assumed that the vast majority of improvements in the organization of tourism services under restrictions will be based on the organization of virtual solutions and online activities. The types of tourism services will also change, and information technology will help their development and dissemination.

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