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MAIN DIRECTIONS OF USING DIGITAL TECHNOLOGIES IN TOURISM

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Abstract:

This article examines the introduction of digital technologies in the tourism industry, which leads to wider dissemination of information about tourist sites, as well as the potential applications of 3D technologies in Uzbekistan's tourism sector. Furthermore, several examples illustrate the use of 3D modeling technologies for achieving various goals and objectives in the tourism sector. The advantages of 3D visualization, such as realistic images, interactivity, and marketing opportunities, are described. The article presents information about attractions in Spain and France, as well as 3D models of sacred sites in Saudi Arabia, as examples of international experience

Keywords: Tourism industry, 3D technologies, virtual reality, augmented reality, 3D modeling, visualization, virtual travel, 3D scanning.

INTRODUCTION. The increasing penetration of digital technologies into the tourism industry is creating many new opportunities and conveniences for its main consumers, tourists. Undoubtedly, as a result, information about a particular tourist object spreads to the public faster, interest in it increases, and, ultimately, they have a desire to physically visit the object viewed virtually.

In an era of rapid technological development, the tourism industry is undergoing profound changes. One of the most important innovations is 3D technology, which has great potential to revolutionize people's interaction with cultural heritage and tourist objects. Uzbekistan, a country famous for its ancient cities, architectural monuments and high culture, can greatly benefit from the introduction of 3D technology in the tourism sector.

Using the capabilities of virtual reality, augmented reality and 3D modeling, Uzbekistan has the opportunity to create an immersive and interactive travel experience that meets the changing demands of modern travelers. These technologies can transport visitors back in time, allowing them to virtually explore ancient cities, witness historical events, and interact with reconstructed artifacts.

3D modeling technologies are playing an important role in increasing efficiency in the tourism industry, improving the quality of services, and creating new experiences for tourists. In addition, scientists have studied the advantages of using 3D technology in tourism and demonstrated its capabilities. Research by Marasco et al. has shown that VR can overcome physical barriers and provide equal opportunities for everyone to experience and appreciate cultural heritage sites.

As is known, Uzbekistan has been paying special attention to the development of the tourism industry in recent years, especially pilgrimage tourism. Naturally, the development of this industry directly depends on the level of implementation of innovative and digital technologies in it. The New Uzbekistan Development Strategy for 2022-2026 sets the goal of increasing the number of domestic tourists to 12 million and bringing the number of foreign tourists visiting the republic to 9 million within the framework of the "Travel around Uzbekistan" program. Using the innovative activity factor in the regional development of tourism as a catalyst for development will be an important step in achieving this result.

Goals and objectives: This article comprehensively substantiates the fact that 3D modeling technologies in the tourism sector serve to implement various goals and objectives and create convenient opportunities for tourists to visit the desired object or place of worship and obtain the necessary information about them. In this regard, information on projects implemented in a number of advanced countries of the world, in particular, Spain, France and Saudi Arabia, is given as an example. The possibilities of their application in such areas as creating tourist maps, presenting hotels and restaurants, and preserving historical monuments are revealed. Virtual reality (VR) and augmented reality (AR), programs such as Blender, 3ds Max, SketchUp, which are used to create 3D models, are described.

MATERIALS AND METHODS: When writing a scientific article, first of all, the Presidential Decrees and Resolutions on the development of tourism in our country, as well as the relevance of the rapid development of the tourism industry, in particular, pilgrimage tourism, for the national economy, play a key

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role. In the process of scientific analysis, relevant information was obtained from the scientific works of the World Travel and Tourism Council (WTTC), foreign and republican scientists, as well as Internet resources. During the study, methods of identifying trends in economic processes and monographic research based on theoretical methodological, systematization principles, comparative analysis, systematic analysis of statistical data were used.

DISCUSSION

Digital technologies have become an integral part of tourism activities today, changing people's travel styles, enjoyment, satisfaction from travel, and interaction with the surrounding world. In particular, mobile applications, booking services through the Internet of Things (IoT), 3D, VR, AR tours and artificial intelligence are opening up new opportunities for consumers of tourism services to optimize and customize their trips based on their individual preferences. According to the Travel and Tourism Competitiveness Report, 82 percent of tourists now say that mobile devices are the main tool during their trip, which reflects the increasing dependence of tourism on digital technologies. Also, according to research conducted by the international organization TripAdvisor, 74 percent of tourists prefer to use mobile devices to obtain information and advice during their trips. ari.

Today, the following modern technologies are rapidly entering the tourism industry:

• 3D modeling programs: Programs such as Blender, 3ds Max, SketchUp are used to create 3D models.

• Virtual reality (VR) and augmented reality (AR): These technologies can provide users with more interactive experiences.

3D visualization is of great importance in the tourism industry, playing a major role in increasing the attractiveness of objects for tourists, increasing marketing effectiveness, and preserving cultural heritage.

Nowadays, experts are increasingly paying attention to the potential of 3D technologies, which are leading to a revolution in the tourism industry. One of the main areas of research is the use of virtual and augmented reality to improve the experience of visitors to cultural heritage sites. For example, Pietro et al., in their study, demonstrated the effectiveness of AR (Augmented reality) applications in providing interactive and engaging tours of historical sites in Spain, which AR demonstrated to improve visitor understanding, enjoyment, and overall satisfaction.

3D modeling technologies in the tourism industry serve various purposes and objectives. The main ones are focused on the following:

1. Visualization of tourist attractions: 3D models can be used to realistically display tourist attractions, historical monuments, and cultural objects.
2. Route planning: Depicting tourist routes in 3D format makes it easier for tourists to create convenient and effective travel plans.
3. Tourism infrastructure design: 3D modeling of hotels, restaurants, and other service facilities can be used to determine their effective location and design.

To achieve the above goals, the following tasks are required:

• Promotion of tourist products: 3D models will create the opportunity to organize virtual tours, enrich advertising materials and attract tourists.

• Application in educational and training processes: There is an opportunity for tourism professionals to conduct practical training using 3D models, improve knowledge and skills.

• Protection of tourist sites: 3D modeling will preserve accurate images of historical and cultural monuments and can be used in their restoration and protection.

Visualization of tourist sites, that is, the creation of their virtual landscape, is usually carried out using 3D modeling technologies. This method has a number of advantages and allows us to present tourist sites and shrines in a realistic and attractive way.

Since we have set ourselves the goal of creating 3D models of shrines in our country, of course, we will have to turn to world experience in this regard. Here are some examples from around the world:

A number of projects have been implemented in Spain to realistically present tourist attractions, historical monuments and cultural sites using 3D models.

City of Arts and Sciences in Valencia: This complex was designed by Santiago Calatrava, and its 3D models allow visitors to explore the architectural design and structures in detail.

Los Palacetes de Banús project: Located in Malaga, the 3D visualization programs for this project were provided by Miriada Group, which allow visitors to get acquainted with the exterior and surroundings of the complex.

These projects demonstrate how 3D technologies are being used in tourism and cultural heritage conservation in Spain. Through 3D models, tourists and researchers will be able to study historical and cultural sites in more depth, analyze their architectural features and organize virtual tours.

In France, a number of projects have been implemented to realistically display tourist attractions, historical monuments and cultural sites through 3D models. Here are some of them:

Eiffel Tower: The 3D model of the famous Eiffel Tower in Paris is a resource that is widely used in the fields of architecture, design, education and 3D printing, is a

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high-resolution and available in many formats. Through this model, it is possible to study not only the enchanting view and love of the historical structure, but also its technical aspects in depth. Consumers can choose and use one of the sources that is convenient for them, such as Sketchfab, CGTrader, Free3D, TronHoo.

Arc de Triomphe: The "Arc de Triomphe" in the French capital of Paris is one of the most remarkable and most visited landmarks of the city. Built in honor of Napoleon Bonaparte's Great Victory at the Battle of Austerlitz, this Arch is a symbol of Paris. To date, not one, but several 3D models have been created, most of which are commercialized, that is, their use is organized on a paid basis. 3D models Through it, tourists and researchers will have the opportunity to study historical and cultural sites in more depth, analyze their architectural features and organize virtual tours.

Notre-Dame de Paris Cathedral in Paris: This cathedral is one of the most famous examples of Gothic architecture in the world. 3D models of this historical monument have been created for various purposes, and they are important in education, research and preservation of cultural heritage.

3D models of pilgrimage sites in Saudi Arabia are important for pilgrims and researchers. Here are some examples:

3D virtual program of the Prophet's Mosque: The Saudi Arabian government has launched a program that allows users to visit the Prophet's Mosque in 3D format virtually. Through it, users can see different parts of the mosque online. Through the 3D virtual program, you can go to any place in the Prophet's Mosque. When you first click, a list of special places in the mosque is given. Then, the user enters the place indicated by the user virtually.

Al-Aziz Sharbatli Mosque: The world's first 3D-printed mosque, the Al-Aziz Sharbatli Mosque, was inaugurated in Jeddah, Saudi Arabia, on March 6, 2024. Built by the Chinese company Guanli, the mosque was "printed" using the latest fourth-generation construction technologies. The mosque took 6 months to complete and covers an area of 5,600 square meters.

The fierce competition between countries that earn significant income from the tourism industry, large tourism companies, as well as tourist attractions and shrines is pushing them all to keep up with the times, that is, to increasingly involve digital technologies in the industry. Therefore, the rapid spread of modern 3D technologies in the tourism sector opens up vast opportunities for showcasing tourism products and improving the customer experience of using these technologies.

RESULTS

Based on the examples we have considered above and the experience of foreign countries, the following can be cited as the main directions of application of digital technologies, in particular 3D technologies, in the tourism sector:

Virtual Reality (VR)

• Creating full virtual tours of hotels, attractions, museums, shrines and cities.

• Using VR helmets or 360° video, giving customers the opportunity to "try out" a trip or excursion before buying it.

Augmented Reality (AR)

• Mobile applications that allow adding digital objects and necessary information to the environment.

• Interactive guides: when a tourist looks at a place of interest with a smartphone camera, he receives information about the historical background of the place, opening hours, ticket prices, etc.

3D modeling and 3D scanning

• Creating accurate 3D models of architectural monuments, historical sites and natural landscapes.

• Digital reconstruction (for example, to preserve cultural heritage and show places of interest to tourists).

3D maps and geographic information systems

• Detailed 3D maps of the terrain, landscape details, tourist attractions, hotels, transport locations.

• Helps tourists find their way in an unfamiliar place and plan their route.

Interactive holograms and multimedia installations

• Holographic images of historical figures, events or objects in museums and excursion centers.

• Enhance the effect of "participation" and increase the excitement of visitors.

These technologies increase the competitiveness of tourism companies, help differentiate their products from others, encourage early bookings, and improve brand image.

CONCLUSION

In conclusion, it can be said that in order to successfully implement tourism using 3D technologies in historical sites, shrines, and museums, it is necessary to carefully plan all stages. At the same time, systematically analyzing the results, listening to the opinions of tourists, and making appropriate changes to the programs taking them into account will create the basis for the long-term and effective implementation of this project.

The productive use of advanced world practices in Uzbekistan and its wider implementation in practice serve the development of our national economy.

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