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THE APPLICATION OF VR AND AR TECHNOLOGIES IN TOURISM

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Abstract: In modern conditions of constantly changing tourist preferences, it is impossible to imagine the development of tourist activity without innovations. Innovations in tourism make it possible to increase the volume of services sold and, as a result, provide the company with revenue growth. This article describes one of such innovative types of tourism - virtual. The study provides its definition, purpose and objectives, as well as advantages and role in the modern tourism industry.

Keywords: tourism, virtual tourism, VR/AR tourism, excursion, prospects, sensations.

It is impossible to imagine the promotion of any type of activity and sphere of production without the introduction of new technologies and scientific achievements, improvement of existing models taking into account the evolution of the market and customer needs, as well as without the ability to be mobile among competitive companies. These changes determine the innovative way of development of the industry [1].

Innovations in tourism are innovations and fresh unusual ideas in the travel and leisure industry. The result of the introduction of such innovations is an increase in the flow of tourists and an increase in profits [2].

One of such innovative types of tourism is *virtual tourism.* Virtual tourism is a type of tourism that uses 3D and 4D effects, innovative programs and spherical panoramas to help travel those who cannot afford real travel for one reason or another. This includes maps and three-dimensional routes that allow you to see which objects are currently in a certain place.

The integration of virtual elements into a person's daily life allows you to modify the world around you, thereby creating an ideal environment for the development of the tourism industry in VR and AR format. In the field of travel and recreation, augmented reality technology is widely used, where every tourist, regardless of age, social status, budget, or health restrictions, can visit anywhere in the world without leaving home. Virtual tourism implies a journey, but not in the real world, but in the virtual world and for this you do not need to issue a large package of documents, a visa, etc., it is enough just to have a laptop, computer or even a phone. Thanks to this technology, the risks of traveling are reduced, since the tourist is in his own house, which means that the probability of crashing an airplane, getting into a car accident, getting sick is reduced to minimum values [3, p.132]

What are the advantages of using virtual reality technologies in tourism?

Firstly, the possibility of a quick and comprehensive acquaintance with the intended destination. When using virtual reality technologies, the client gets the opportunity to use not only the organs of vision, but also hearing, smell, touch and receives more accurate data, on the basis of which a decision about a trip is made.

Secondly, the use of virtual reality opens access to any travel for people with disabilities. They can visit the most inaccessible places without harming their health.

Thirdly, the use of augmented reality can be an excellent addition to the excursion program if the object of the display has been partially preserved or is located in a hard-to-reach place. With the help of new technologies, anyone will be able to see how people lived in different epochs, how cities looked several thousand years ago.

Fourth, the demonstration of a tourist destination in a virtual space allows you to set any conditions for the display: change the weather, the time of year, the number of vacationers. A tourist can get more complete information about life in a destination in different conditions and approach the preparation of his trip more consciously.

Fifth, the introduction of VR technologies expands the possibilities of budget travelers who prefer to plan their own route, search for information about destinations and display objects, book tickets and accommodation facilities. New technologies allow you to get any information with a few clicks.

Sixth, VR technology provides opportunities for the development of tourism business. For tour operators, this is an opportunity to reduce costs and time for viewing and exploring various destinations, transfers, accommodation facilities and food outlets. But the quality of the final tourist

product will not suffer, as the tour operator will be able to evaluate all the necessary infrastructure in the virtual space.

The possibilities of using VR and AR technologies in tourism are unlimited:

- demonstration of display objects in the AR space at exhibitions, in museums in order to show additional properties of the object or the possibilities of its application in the real world; - using VR technologies to make virtual tours in order to assess infrastructure and destination;

- the use of AR technologies at airports, accommodation facilities, catering facilities to obtain the necessary information (for example, using QR codes);

- the use of AR technologies in the creation of mobile guides to tourist destinations allows tourists not only to get the necessary information, but also to look at the destination in different periods of its existence.

- the use of VR technologies as a separate attraction in a tourist destination.

Currently, as is known, there is an unfavorable epidemiological situation in the world due to the spread of the Covid-19 coronavirus infection, the beginning of which was registered in China on December 8, 2019 and continues to this day. Kazakhstan was affected by the virus in March 2020, when it was decided to introduce a self-isolation regime throughout the country, close borders for movement both to other countries and between cities and settlements, close a number of enterprises in various fields of activity, including tourist firms, hotels, catering establishments switched to contactless delivery. All this caused severe damage to the tourism business, many companies went bankrupt, many people lost their jobs. " 82% of entrepreneurs noted the negative impact of COVID-19 on business: 69% of enterprises have reduced profitability, and 23% noted that their business has completely stopped," follows from the report issued by FusionLab [4].

"The coronavirus pandemic has cost the global tourism industry the number of foreign tourists has decreased by 3.8 times. " - according to the statistics of the World Tourism Organization.

Most people during the pandemic were forced to stay in their homes and apartments, from which they were allowed to leave only to the nearest grocery stores, so many companies opened access to free paid VR tours, excursions that would help in organizing leisure at home, and in general a small list of services was created, thanks to who could see the panorama of the city, see the sights, learn a lot of interesting information about the countries and even try to cook national cuisine. Based on data from open sources, a list of non-commercial services has been compiled that will allow you to go on a virtual trip to anywhere in the world [5]:

1) The Swiss Tourism Office offers everyone who wants to "go on a trip" along the country's famous railway route: Grand Train Tour from Montreux to Zermatt;

2) On the website of the tourism office in Japan, you can find various virtual tours in a panoramic format: from walking through bamboo forests to cherry blossoms;

3) The world's southernmost observatory, the European Southern Observatory (ESO), also has its own VR tours. It is located in the Chilean Atacama Desert and is considered one of the best places for stargazing.

4) On the website Kayak.com a number of routes have been collected that will interest fans of unusual tours. The meaning of these virtual tours is to spend time in one city, while using a variety of interactive features: listening to national music, a helicopter tour over Amsterdam, recipes of national dishes that the user will try to cook on their own and much more. There are such virtual tours in London, Paris, Sydney, Mexico City and Rio deJaneiro.

5) Separately, it is worth highlighting several services from Google at once, for example, Google Earth. This service allows you to view the sights included in the UNESCO Heritage list. In Google Maps, you can walk a track around Everest. And the Google Arts&Culture service, in addition to visiting famous museums, also gives you the opportunity to walk through the Carlsbad caves in the USA or the Chauvet Cave in France, famous for prehistoric rock paintings.

Thus, it can be concluded that VR tourism began to develop during the crisis and pandemic of 2020, people began to use virtual travel services more often to diversify their lives when staying at home for a long time due to the unfavorable epidemiological situation. In the future, virtual

tourism has great prospects for development, as the number of tourism companies that will introduce this technology into their field of activity may increase due to the fear that such a crisis may recur and it will be difficult for companies to survive in such conditions.

Potential of AR/VR technologies application in tourism.

It's no secret that AR/VR technology is becoming increasingly popular each year. This kind of user engagement, which combines the virtual and real worlds or completely immerses the user in the virtual, is appealing due to its potential. These changes can be used in a variety of fields, including tourism. But first, you must define the terms "augmented reality" and "virtual reality".

AR, which is augmented reality, is a technology that allows us to add components from the virtual, digital world to our actual environment. These digital pieces can also interact with real-world objects, resulting in a virtual representation of that interaction. The user simply requires a smartphone to use this technology, however cameras with a distance sensor can provide far better results. Because of its lack of pretension in terms of technology, this technology has become quite popular in the mobile application market. Not only are various attraction applications made using this technology that are not designed for repeated usage by the user, but also valuable reusable applications that employ AR as a supplementary tool for presenting information, such as in maps, are created using this technology. The Dreams of Flight initiative, during which the Moscow City Museum launched the augmented reality installation Eyes of Icarus, is an exemplary example. Visitors begin their journey by flying over Moscow skyscrapers while riding the Empire Tower elevator to a height of 215 meters.

And talking about the VR (obviously, virtual reality) is a technology and equipment combination that allows the user to immerse himself in a completely virtual environment using all of his senses, not just vision: touch, hearing, smell, and so on. Virtual reality is significantly more difficult to implement in a mass setting since it necessitates the purchase of a specialized device that not everyone can afford. And, unlike a smartphone, which can be used on the go, the device's ability to be utilized is limited by the necessity for a specifically prepared room. The InterContinental hotel chain, for example, allows guests to take virtual tours to all of the chain's hotels as well as to significant destinations in other locations.

Based on the foregoing, it is clear that the majority of investment and interest is focused on AR rather than VR technologies.

The potential of AR/VR in tourism is only limited by the creators' imagination. An AR/VR application can both complement an already existing historical location, such as reviving it or displaying additional information, and be a completely unique product, such as assisting with map orientation by displaying AR hints on the street, VR showing a tourist his future hotel and assisting with a decision, or becoming a kind of sensations attraction in which the user's remaining senses can be used in the helmet. So to quietly structure this process we could divide it into 5 components: planning, booking, flight, navigation and lastly, sights. Let's stop on each of these.

First of all, it is a planning step- choosing a destination for a holiday is frequently a difficult task for first-time visitors. By wearing a virtual reality helmet, tourist may get a rough idea of what awaits him in a certain location, as well as see the location during various times of the year, in various weather conditions, and times of the day.

Booking is a second procedure in which VR is fully revealed to the average user, in our opinion. Choosing a place to stay has always been difficult, but the fear of selecting a beautiful room based solely on the picture has made it difficult and repulsed users for a long time, but VR now allows you to completely eliminate this fear. By donning a virtual reality helmet, travelers will be able to see exactly what will be waiting for them in the room and outside the window. And what are the room's actual dimensions? Below is an example of such an application.
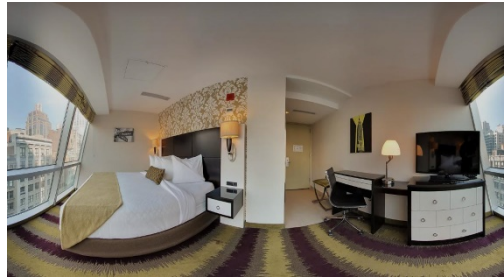
Pic.-1 Choosing a room at the hotel via the VR technology.

Moving on, many travelers try to avoid period of flying by sleeping, but the duration of the flight does not always allow them, or the common unwillingness to sleep. A VR helmet, which, unlike a smartphone, entirely immerses you and allows you to be distracted, can also alleviate this problem. This solution also allows tourists to smooth out the negative immediately upon arrival, replacing it with the feeling of changing one entertainment to another. In addition, VR is much more convenient, unlike the traditional monitors built into chairs that have become so far, due to the lack of the need to embed devices.

Third, unlike traditional navigation, AR navigation is far more convenient and understandable, just turn on the camera, and reality will be "augmented" with inscriptions and signs showing where to turn, what menu is available, and how children are treated. If the tourist needs to get somewhere, helpful arrows will be displayed, clearly indicating where the individual must turn. There is an example of such an application.
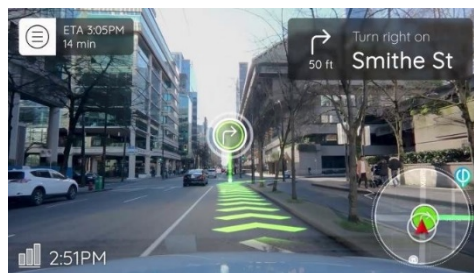
2 pic. AR navigation.

Concluding all points, there is no doubt that attractions are an important point of the tourism industry, and augmented reality can incredibly expand the range of emotions from a regular excursion and complement it. We can illustrate the process of historical development or show an object if it is temporarily unavailable since we are using AR. By increasing the amount of information available and bringing the much-needed "life" to museums and exhibitions, such technology can help them become more popular. For example, if we sell a massage service in a VR helmet, the person will be physically interacted with, his sense of smell will be occupied with incense, and his ears will be occupied with music, and at the end of the procedure, the person will leave not in his hometown but in a tourist destination.

Conclusion

Taking into account all of the preceding points as well as the research approach, we believe that the use of AR or VR technologies as additions to attractions is a very relevant direction, but there are concerns- will a potential tourist prefer spending time in a VR helmet to going on a tourist tour? Definitely not. VR is now unable to portray the whole range of emotions that a tourist journey may deliver, hence it is too early to consider VR as a tourism replacement. In tourism, AR and VR are always viewed as additions, not a complete replacements. Although potential VR tourism is possible, it is still interesting for users with disabilities or other physical inability to get out, for example, borders of countries closed due to a pandemic.

In a matter of minutes, you may be in the city and country you've always wanted to visit thanks to virtual reality technologies. Walk through the streets and enjoy the sights that you could

only see in photographs before. Alternatively, use virtual reality technologies to demonstrate the client all of the benefits of the planned trips (that is, a virtual catalog of a travel agency). See the hotel from the inside, learn about the neighborhood, the employees, and the hotel's infrastructure, walk down the promenade, stop by restaurants and SPA centers, and other destinations that await you on this excursion.

As a result, we can confidently state that augmented and virtual reality solutions in tourism are diversified and can be used at many stages of the client's journey. Travel agencies can use AR and VR to improve service quality, promote themselves as innovative, bring more attention to their brand, and, most importantly, increase profits. The only way to see the difference is to try it.

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