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DIGITAL TRANSFORMATION, COOPERATION AND GLOBAL INTEGRATION IN THE NEW NORMAL



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PROSPECTS OF VIRTUAL REALITY TOURISM APPLICATION IN VIETNAM TOURISM PROMOTION

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Abstract

Virtual reality technology is gradually changing many economic sectors, including the smokeless industry, which is tourism. Virtual reality tourism (VRT) is booming all over the world, including virtual experiences, such as visiting famous landmarks, experiencing cultural exploration and participating in entertainment activities. Thanks to virtual reality technology, virtual reality tourism trend is becoming one of the effective promotion tools of tourism products. Design a virtual experience in 3D space, so that tourists can experience and interact in the virtual destination, and stimulate the desire of potential tourists to experience the real destination. Through the evaluation, analysis and synthesis of some related documents, this paper puts forward the general theory of virtual reality and virtual reality tourism; Analyze the advantages, limitations and functions of virtual reality tourism in tourism promotion; The practical experience and lessons are given. On this basis, some measures are put forward to promote the application of virtual reality tourism in tourism promotion, which is helpful to effectively strengthen tourism promotion in Vietnam.

Keywords: tourism promotion, Vietnam tourism, virtual reality;

1. Introduction

Tourism is considered as one of the three key economic sectors of Vietnam, which is focused on investment, constantly developing and making positive contributions to socio -economic development. The slowdown of the tourism industry on a global scale due to the Covid-19 pandemic has raised the question of finding a direction for the tourism industry after the pandemic. Accordingly, digital transformation in the tourism industry is an inevitable trend in the context of the 4th Industrial Revolution to meet the needs of tourists, especially in the context of the post-pandemic recovery of the tourism industry. In that context, virtual reality (VR) technology provides users with the opportunity to go through a destination authentically from another place, enabling reality experience, navigation, and environmental interaction. VR has been proven to have a great influence on tourists' intention to choose tourism products. Therefore, promoting tourism through VR technology is an interesting suggestion for a new direction of the tourism industry.

However, research on the value of visitor experiences promoted in VR tourism marketing is still quite limited. Inheriting researches on VR and promoting tourism in Vietnam, the article analyzes the theoretical basis of VR, VR tourism, compares actual tourism with VRT and points out the advantages and limitations of tourism. VR may be considered as a basis for assessing the role of VR tourism in tourism promotion. At the same time, the article presents some lessons learned about VR tourism application in

tourism development promotion. On that basis, the authors propose a number of solutions to promote the application of VR tourism in the promotion and promotion of Vietnam's tourism.

2. Literature review

2.1. Theoretical foundations of virtual reality and virtual reality tourism

2.1.1. Theory of virtual reality

In 1968, in the research of a computer scientist Ivan Sutherland, he envisioned the Ultimate Display. When using this display, people can see a virtual world appear as a real physical world. Sutherland's vision of the final display includes: The virtual world that can be viewed through a head-mounted display; Calculator to maintain models in real time; The programs are suitable for users to interact with real-life objects in the most intuitive way.

Thus, the concept of VR has been around for decades, but the world only really realized in the early 90s. Stephen Ellis - a scientist working at NASA defines: Virtual environments are environments for communication and comparison: Like other media, they have both a physical part and an abstract part (Ellis, 1991). Subsequent research publications by Biocca, 1992, Lanier and Biocca, 1992, Meyer, Apple White and Biocca, all confirmed virtual reality as a form of communication (Biocca, 1992).

Later, when information technology developed, many scientists such as Burdea and Coiffet, 2003; Gutierrez, Vexo and Thalmann, 2008; Gutentag, 2010 agreed that virtual reality is the ability of users to navigate and interact resulting in a real-time simulation of one or more of their senses in a computer-generated 3D environment (Guttentag, 2010). Hore specifically, other researchers such as Cruz - Neira, Sandin, DeFanti, Kenyon and Hatt, Williams and Hobson have pointed out three factors that characterize virtual reality: (1) Visualization - visualization allows Users observe their surroundings thanks to a head-mounted monitor. (2) Immersion - Creating a sense of immersion that allows the user the ability to focus attention on information from the virtual world system and be immersed in it, perceive objects as in reality; (3) Interactivity - Interactivity represents a degree of control over the experience, usually achieved with sensors and input devices such as joysticks or keyboards (Williams and Hobson, 1995).

2.1.2. Theory of virtual reality tourism

As tourism communities become increasingly difficult, traditional images and videos, as well as modern 360 publications, still cannot meet the need to understand and experience the most authentic tourist destinations anytime, anywhere.

VRT was born on the basis of modern digital VR technology, an inevitable result to meet the needs of tourists around the world. The first step of VRT is the work of digitizing real space, through specialized equipment, we can scan all spaces from resorts, museums, hotels, resorts, entertainment spots, etc. location, etc. With the accuracy of all objects, the collected environment is up to 100% compared to the actual space. After performing the digitization step, the collected data will be processed and uploaded to the VR environment. Visitors from all over the world from here can experience the space digitized with vivid 3D devices such as VR glasses, or conventional 2D display screens such as phones, computers, ipads, etc.

VRT allows users to experience realistic images, lifelike feelings of digitized destinations in 3D environment without having to move, through the help of virtual reality technology with virtual reality technology. supporting tools such as smartphones, computers, virtual reality glasses, headsets, effect chairs... Popular VRT - enabled software and platforms include: Oculus, Google Cardboard, HTC Vive, PlayStation VR, VR360, etc. In particular, VR360 is software that supports creating and viewing VRT photos and videos.

The virtual reality travel model is a combination of many outstanding functions such as: Creating moves from above, viewers can easily manipulate to many different points to observe the 360-degree view from above; The height of the viewing angle can be changed so that the viewer can see a wider or more detailed view; Time to observe the overhead view is shown both day and night; The model is integrated with 4D map, the viewer can experience the vivid 4D landscape, while allowing the model to possess all the outstanding features of the 4D map; Combining 3D Tour technology and 360 VR Tour to create a virtual reality tour, accurately recreating the space inside the buildings. Viewers can easily move from the top view into any interior space; Integrated Google Map, showing the exact location of the viewer; Integrated Live Camera allows to observe the city, tourist destination in real time; Ability to integrate many other content: text, images, videos, links, banner ads...; Integrate booking features (booking, table booking, buying sightseeing tickets...); In addition, the virtual tourism model also has a number of other features such as sharing features, shortcuts to famous locations, model experience features...

2.2. Application of VRT in tourism promotion

2.2.1. Difference between travel in reality and virtual reality tourism

Previously, the traditional tourism industry, a large number of tourists would approach and learn about tourist destinations through images and videos available on the Internet. For the community of people who often travel, they will become more intelligent and fastidious, they not only observe images and videos, but also care about KOLs - influencers, individuals who travel previously shared, commented on where they want to go. However, review activities are also increasingly being directed in a positive direction. Therefore, in the midst of countless tourist destinations, tourists become distracted and difficult to choose, they begin to appear eager to experience the most authentic place to visit before choosing to come directly, or even there is a trend of traveling at home at a cheaper cost, avoiding risks and unmet expectations.

With VRT, technology was born at the right time to address the needs of travelers around the world. If tourists want to travel economically at home, just wear a VR device, wear headphones and a few simple steps, they will completely stand in the space where you want to go, move step by step, observe the whole thing. around, and interact with objects. If visitors want to consult the destination in advance, just ordinary devices such as phones, computers, ipads, ... They can observe the entire virtual space has been digitized. The authenticity of technology helps visitors fully trust the place you are about to visit, thereby making it easier for them to make decisions and choose the right destination that matches their interests.

For the tourist community who have a desire to travel at home, the digitization of places and places to visit will provide competitiveness for businesses in early access to these objects. On the contrary, for tourists who prefer to experience directly, they will also enjoy being exposed and experiencing with the destination's VR space before making a decision, surely 3D space will attract them more. compared to normal images and videos.

2.2.2. Advantages and disadvantages of virtual reality tourism

VR is now widely used in many fields, including tourism. There is a lot of material on the advantages and disadvantages of virtual reality in common. For example, there is article by Morel, Marion, et al (2015). Discussing the advantages and disadvantages of virtual reality tourism, we must definitely mention the research of scholars: Hassan, Azizul, et al. (2018), Voitik, N. V., & Maslov, M. D. (2019), Polishchuk, Elizaveta, et al. (2023). Combining the above studies, this article points out the following advantages and disadvantages of VRT.

Advantages: VRT presents many advantages, including:

- Save money and time: With VRT, you don't need to spend a lot of money and time to move to the actual location. You can enjoy a great experience without leaving your home.
- Enhancing travel experiences: VRT experiences provide users with an immersive and realistic experience, with amazing visuals, sounds, and graphics. You can enjoy the experience on hard-to-reach locations, or places that can't be reached due to geographical or cultural limitations.
- Custom spaces: With VRT, you can choose the places and experiences you want, and customize it to fit your preferences. You can choose from a wide range of activities and attractions to create your own unique travel experience.
- Convenience and flexibility: With VRT, you can access travel experiences anytime and anywhere. You don't have to wait until your vacation to enjoy the experience, you can access it right away.
- Safety and security: With VRT, you don't need to worry about security, accidents or any other dangers associated with actual travel. You can enjoy the experience safely and securely in your home.

Disadvantages

Although VRT has many advantages, such as saving travel costs and time, enhancing a great travel experience, it also has some disadvantages. Includes:

- Inadequate reality experience: While VR experiences are very realistic, they still can't completely replace actual experiences. You will not perceive the scents, sounds, steam and many other elements of the actual environment.
- Assistive device required: To experience VRT, you'll need to use an assistive device, such as a VR headset or VR glasses, which can be expensive and not accessible to everyone. okay with them.
- Cause dizziness and nausea: For some people, experiencing VRT can cause feelings of dizziness, nausea, or discomfort, which can impair the experience and create discomfort.
- No interaction with the local community: When you join VRT, you do not have the opportunity to interact with the local community and learn about the local culture, history and people. This can take away part of the travel experience.
- Lack of variety: While there are many different experiences offered in VRT, they still lack variety and it is difficult to find new and unique experiences.

2.2.3. The role of virtual reality tourism in tourism promotion

Many researchers claim that virtual reality is increasingly becoming an effective marketing tool for tourism consumers. Yun et al. found that among 46 VR and ER research papers published in 24 tourism journals between 1995 and 2016, 28.26% mentioned the role of VR and AR as marketing tools. These studies have found that VR and AR can serve as tools to increase destination awareness, brand, and marketing, in order to increase tourists. At the same time, these studies also focus on image themes and advanced information dissemination (Yun and Khoo Lattimore, 2019). Guttentag stated that VR can be applied not only to destination planning and management, but also to destination marketing (Guttentag, 2010).

In practice, VRT also brings many prices in the field of communication, advertising and tourism promotion. These values are also reinforced through academic research, as follows:

First, the VTR experience provides additional information to visitors during the planning stage and helps to overcome the intangible character of the sites. tourism product when visitors cannot try the product first. Scholars Bergel et al., and Guttentag, who point to technology's greatest strength is its ability to provide visitors with additional information during the planning stage through virtual experiences of the

destination (Guttentag, 2020). And according to research by Pantano and Servidio, all participants want to go to the real destination to compare with the virtual destination they have experienced (Pantano and Servidio, 2012).

Second, VRT has the ability to expand the customer segment to the maximum, regardless of tourist structure and easily convince tourists' beliefs through real experiences. Especially for those with limited access to tourism in the traditional way such as people with disabilities, the elderly, people with limited health, people with low incomes. Researchers such as Huang et al., Kim and Hardin discovered that the more visitors engage in VR interactions, the greater the positive feelings about the destination (Huang et al., 2016).

Third, through the feature of integrating the camera and other content such as: text, images, videos, links, banner ads, etc., it is possible to attach promotional information, events, cultural programs, etc. tourism, large trade, incentives to quickly and easily reach and attract tourists using the virtual tourism model. Therefore, VRT is the foundation to create an information channel to convey the messages and content (text, images, videos, 3D tour, 360 VR Tour, 3D objects...) that the tourism industry, businesses ... Tourism wants visitors to know.

Fourth, VRT, with the strength of bringing authentic experiences, providing true and vivid images, is also an effective advertising channel for destinations and tourism service businesses (hotels, resorts, restaurants, tourist areas...) helps increase the ability to sell traditional tourism programs from stimulating the tourists' need to come and experience in reality, attracting more visitors. Author Cheong considers VR as a marketing tool of travel agencies when it allows visitors to experience the activities and atmosphere at the virtual attractions and also the technical facilities for tourism there. This creates an image in the customer's mind and creates a desire to visit the real destination in the future (Cheong, 1995). In the same opinion, Hobson and AP William asserts that VR can "revolutionize" the field of promotion and sale of tours because travel agencies and companies can provide realistic and vivid simulations of the destination and thereby help customers Potential customers experience their future travel plans in VR using computer graphics, vivid three-dimensional images, and sound. Visitors wear head-mounted displays and compare destinations by taking a tour, walking through the markets, or can visit multiple destinations at once (Hobson and Williams, 1995).

Fifth, the VRT model has the ability to integrate booking features (booking rooms, booking tables, buying sightseeing tickets, booking cars...), integrating social networking applications (Facebook, Zalo, Whats app ...) to create convenience benefits when viewing, comparing, consulting and making a choice of tourism products, promoting the spending and shopping behavior of tourists right after visiting the city, reviewing tourism products. This helps bring a lot of economic value to both the city and tourism businesses as well as satisfy the needs of tourists themselves.

Sixth, the ability to easily share facilitates the VRT model to be known to the wider community, creating a viral effect and increasing brand awareness and reputation of the tourism industry and tourism businesses.

Seventh, the VRT model improves the experience and satisfaction of tourists when traveling, builds the image of smart tourist cities, virtual tourist cities with new, interesting and multidimensional colors for favorite tourist community from all over the world.

In general, for promotion and advertising activities in the tourism industry, VRT brings great value to the tourism industry of each country, province, city and service - tourism businesses. VRT plays the role of an effective communication and promotion tool from afar about cities in general and famous tourist

destinations and attractions in particular to tourists in remote regions and countries. geography. VR technology is a trend in the world, especially among young people, so the virtual tourism model easily attracts the attention and interest of the community, especially those wishing to visit and travel.

2.3. Virtual reality tourism application in Vietnam

In Vietnam, the VRT model is quite new and has not been applied much in practice. But in recent years, VRT has begun to appear in our country, starting to bring good effects on communication and tourism promotion.

First of all, about the museum system, according to the statistics of the Ministry of Culture, Sports and Tourism, there are 162 museums nationwide. Recently, some museums are making efforts to pursue VR to attract the public, especially young people. For example, since 2013, the National Museum of History has been a pioneer in building a 3D interactive virtual museum to increase the experience and interactivity for real preservation. Currently, when accessing the website of the National Museum of History, visitors will see the content "3D sightseeing". Here, the museum has built 4 regularly displayed tours, namely Vietnam prehistoric times, Dong Son culture, Ngo - Dinh - Tien Le - Ly - Tran and Oc Eo dynasties, and three contents on display. topic presentation. In addition to Vietnamese, this museum website also uses two languages, English and French, to reach more foreign audiences. In addition, Ho Chi Minh Museum has also built a virtual tour of the entire museum with an interface in three languages: Vietnamese, English and Chinese. Vietnam Fine Arts Museum with Vietnamese and English interfaces not only has 3D tours but also exhibits and virtual reality experiences with the cooperation of organizations. Other events such as the exhibition "Discovering the architectural heritage of One Pillar Pagoda - Dien Huu in real time with virtual reality technology" held on the occasion of Vietnam Cultural Heritage Day (Nguyen Thi Thanh Thanh et al., 2021).

Or the virtual museum product "Sea and islands of Vietnam" was assigned by the Institute of Post and Telecommunications Technology to the Institute of Information and Communication Technology to develop since 2014 in order to digitize the materials of the exhibition "Hoang Sa", "Vietnam's Truong Sahistorical and legal evidence" from 2013 to 2016, was revised and upgraded to the Exhibition. Through four exhibitions in Ha Nam, Vinh Long, Can Tho and Bac Kan in the fourth quarter of 2016, the number of visitors to software products Digital exhibition about Truong Sa and Hoang Sa using 3D VR technology has reached more than 20,000 turns (Nguyen Thi Thanh Thanh et al., 2021).

Typically, the tour to explore Son Doong cave (Quang Binh) through a VR model has been mentioned at https://www.nationalgeographic.com. The famous newspaper The Guardian (UK) voted, this is one of the ten most worth visiting virtual tours in the world, taking visitors through the caves with a 360-degree image system with high definition and high definition. experience the sound system associated with the landscapes... Recently, for the first time in the Northwest, a virtual tour of Moc Chau was carried out, providing interactive experiences, interesting sightseeing, just like the real thing. with places that have been digitized in 3D environment such as Dai Yem waterfall, Ang village pine forest... Some other famous places such as Hoan Kiem lake, City post office. In Ho Chi Minh City, museums and monuments have also been digitized to increase new experiences for visitors with VR technology.

NATIONAL SON DOONG 360
Exploring the world's largest cave by Marris Edition.

Figure 1. Exploring Son Doong Cave

(Source: nationalgeographic.com)

Typically, visitors can visit 20 different famous places in Ho Chi Minh City such as Ben Thanh market, Vinh Nghiem pagoda, Cu Chi tunnels... at https://www.visithcmc.vn/; in the tourist city of Da Nang, the virtual tourism model of Da Nang city was built and shown at https://danang.virtualtourist.vn/; In Hanoi capital, address http://hoankiem360.com.vn; http://hoankiem360.net.vn helps visitors discover tourist attractions in Hoan Kiem district. The main interface of the aforementioned sites is a 360-degree aerial view that allows visitors to observe the city overview through multi-dimensional and vivid images. The interesting thing is that viewers can interact with the application such as choosing any location to move from the overhead landscape into the inner space, zoom in, zoom out, rotate the angle, rotate 360 degrees... Time to observe the aerial landscape is shown both day and night. Along with images describing tourist destinations, the application also provides accompanying clips and vivid voiceovers (Nguyen Thi Hong Ha et al., 2021).



Figure 2. Virtual reality tourism in Da Nang city

(Source: website danang.virtualtourist.vn/)

On the other hand, Vietnamese travel and tourism businesses that invest in VR technology to market travel programs are also very rare, only Viettravel pioneered in announcing investment in VR360 technology with 55 purchased 3600 videos. copyright of famous destinations in the world. In 2021, this business has deployed a number of VRT service points using VR360 technology at the headquarters of Viettravel Hanoi and Da Nang, then replicated the Viettravel system nationwide to attract more tourists. Love new travel experiences. Meanwhile, Saigontourist tried to implement VRT but did not achieve the

desired effect, so the company temporarily stopped exploiting this segment (Nguyen Thi Thanh Thanh et al., 2021).

Through practice, it can be seen that VR technology helps to improve user experience, positively affecting the intention to choose attractions. However, attractions with VR technology application in Vietnam are not yet popular and are only for the purpose of public outreach or propaganda, but not for promotion to reach domestic and foreign tourists.

2.4. Some orientations to improve the application of virtual reality tourism in promoting Vietnam's tourism

The application of VR technology is a trend that shows high efficiency but also requires a long-term strategy and depends on the reinvestment strategy of the business. To develop VRT, it is necessary to have certain conditions and prerequisites - its essential foundation is the application of advanced scientific and technological achievements of the Industrial Revolution 4.0. about it, must understand the nature and grasp the laws of movement and development. Therefore, to promote the development of VRT in Vietnam, the discussion boldly proposes some basic solutions as follows:

Firstly, in order to develop the VRT model, it is necessary to have strong involvement of relevant levels, sectors and units in properly assessing the benefits of VRT, thereby having solutions for effective implementation., synchronized; It is necessary to have a general orientation for the development of science and technology, the application of science and technology in socio-economic life in general and tourism in particular as in Directive No. 16/2017/CT-TTg of the Prime Minister. Government noted: "...prioritize development of digital technology industry, smart agriculture, smart tourism, smart city"; widely disseminate the policy on tourism development associated with science and technology.

Secondly, develop and perfect a system of mechanisms and policies for increasing the application of science and technology in tourism, completing the system of documents guiding the development of tourism associated with VR technology. in the new situation. There should be mechanisms and policies to prioritize and encourage research and application of science and technology for the tourism industry: building industry databases; invest in the development of technology infrastructure; invest in the production of smart software, systems, programs, applications and utilities for the tourism industry; researching and applying advanced technologies to produce smart tourism products and services, VRT; researching and applying advanced technologies for destination management and development; technology application for tourism statistics; technology application for conservation and restoration of heritage values, tourism monuments.

Third, build and complete the VRT ecosystem in which science and technology factors play an important role in the formation and development of tourism products as well as destination development; connecting the State's management system with the VRT ecosystem, including: an integrated tourism data warehouse; tourist portal; mobile travel application; Digital map; means of supporting tourist information. Besides the information and utilities for tourists, this solution helps to make statistics, report data and information; manage feedback and suggestions of tourists about the quality of tourism services to specialized management agencies; can manage promotions, booking services, advertising for tourism businesses.

Fourth, it is necessary to upgrade and develop network infrastructure, improve the level of readiness for the application and development of information technology in tourism, invest in upgrading technical infrastructure and the level of information technology application. news in the tourism industry.

Fifth, it is necessary to promote the application of technology at enterprises and at the same time call on tourism businesses to actively and quickly transform digitally, build an information system about guests, products and services. Service; Proposing solutions, calculating costs, operating on the basis of analyzing data in a new scientific way can meet the needs of customers. Authorities and state management of tourism need to play the role of a connecting locomotive to facilitate and encourage units to quickly digitize destination data, thereby synchronizing to find directions for exploitation. effectively exploit this huge data source with VR technology, creating favorable conditions for building a VRT model suitable for practical conditions in Vietnam.

Sixth, the tourism industry needs to focus on training, fostering and developing human resources, ensuring that human resources in addition to professional qualifications in tourism must be able to meet the requirements of public use and operation. technology, ensuring the necessary qualifications and skills to maximize creativity, flexibility and enhance the adaptability of the tourism workforce to the development of tourism products and types. this in new condition. In addition, strengthening links between the tourism industry and the information technology industry - two strengths of Vietnam to soon develop applications and products in the field of tourism, increase communication opportunities, promote promote Vietnam tourism effectively.

Seventh, promote international cooperation in science and technology with developed countries to learn from experience, improve research capacity and apply science and technology to VRT development. Especially research, learn and apply VRT models that have been effectively deployed by countries in the region and the world.

Finally, promote communication on VRT development. It is important to know how to apply technology in product marketing through developing content on the website with modern technologies; use social networks to bring information and communicate with customers, improve the quality of experience with mobile applications; cooperation with digital platforms and electronic exchanges.

3. Conclusions and recommendations

VRT is known to the tourist community with mixed opinions, some say that actual travel is still more interesting and emotional; others favor VRT because of its convenience, lower cost, and avoidance of risks. However, the reality is that VRT will benefit the tourism industry in any way. This has been proven through some experiences of different VRT in practice that the authors have presented above. VRT is the inevitable development trend of world tourism in general and Vietnam tourism in particular, it will create a new face for world tourism in general and Vietnam's tourism industry in particular. In particular, it will be one of the important and effective solutions to enhance the promotion of Vietnam's tourism, an opportunity to promote the tourism industry, or even in the future may be a trend of the tourism industry smokeless industry. The authors think that the initiative, creativity, access to new technologies, transforming the way of operation and developing new products with VRT application will be a new direction to help Vietnam's tourism industry promote its image. Photographs to effectively reach tourists, contribute to overcoming difficulties, and soon restore the market after the pandemic.

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