

Explore the Commercial Value of VR Technology in Digital Tourism from the Perspective of Marketing

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Abstract. With the rapid development of science and technology, VR technology has gradually become the new darling of the market. Especially in the field of digital tourism, its unique interactivity and immersion have brought unprecedented changes to the tourism industry. The commercial value of VR virtual reality technology in digital tourism can not be ignored, it not only brings more tourists and income to scenic spots, but also optimizes services and improves brand influence. In the future, with the further development of technology and the changing needs of consumers, the application of VR in digital tourism will be more extensive and in-depth. For the tourism industry, seizing the opportunity of this technological innovation will help it to maintain its leading position in the fierce market competition.

Keywords: marketing; VR virtual reality technology; Digital tourism; Commercial value

1 VR technology and digital tourism overview

1.1 VR technology

Virtual reality (VR) technology is a digital technology that generates a three-dimensional virtual world through computer simulation and simulates the user's senses such as vision. In the field of tourism, VR technology is changing the way people perceive and experience tourism, and promoting the development of digital tourism.

1.2 Digital tourism

Digital tourism is one of the concrete application forms of VR technology in the tourism industry. By integrating VR, AR, AI and other technologies into the travel experience, digital tourism enables users to more easily obtain travel information, plan trips, and enjoy travel services. The development of digital tourism not only improves the efficiency and user experience of the tourism industry, but also opens up new directions and possibilities for the development of the tourism industry. At present, the global digital tourism market is in a stage of rapid development. It is predicted that the global digital travel market will reach \$1.2 trillion by 2028. VR technology and digital tourism are profoundly changing the face and future direction of tourism. They provide users with a richer, more authentic and personalized travel experience, but also bring new business opportunities and development space for the tourism industry [1].

2 Application of VR technology in digital tourism

2.1 Display and publicity in scenic spots

VR technology has wide application value in digital tourism, especially in scenic area display. Through VR equipment, tourists can visit the scenic spot immersive, feel the details and atmosphere of the scenic spot, as if they are really in the scenic spot. This interactive tour enhances the sense of participation and immersion of tourists and enables them to have a deeper understanding of the characteristics and charm of the scenic spot [2]. For example, the Forbidden City, based on its own cultural relics collection, integrates IP elements into modern cultural and creative products such as mobile phone cases, jewelry and clothing, giving the original cold cultural relics a fresh image. This kind of cultural and creative products combined with VR technology are loved by consumers. In terms of scenic spot publicity, VR technology provides an innovative means of promotion for scenic spots. By making VR panoramic videos or VR promotional videos, scenic spots can present their own characteristics and highlights to potential tourists in a more vivid and three-dimensional way [3]. This way of publicity has a strong attraction and impact, can arouse the interest and curiosity of tourists, and promote the popularity and attractiveness of the scenic spot. In addition, publicity based on VR technology can also be disseminated through social media, we-media and other platforms. By sharing the link of VR panoramic video or two-dimensional code, the scenic spot can attract more people's attention and visit. This kind of publicity method has low cost and wide spread, which can effectively improve the popularity and influence of the scenic spot.

2.2 Virtual tour experience

VR technology in the virtual tour experience, has also been widely used and promoted. It is built on the basis of the real tourism landscape, through the construction of a virtual three-dimensional tourism environment to simulate or surreal scenery and other technologies, so that the public can experience the beauty of thousands of miles away without leaving home. Visitors only need to wear a pair of VR glasses to easily break the physical restrictions of space, personally visit the three-dimensional virtual environment, and see the beautiful scenery that cannot be touched in the real world [4]. For example, the German National Tourism Board has moved famous tourist attractions such as the Baltic Sea coast, Neuschwanstein Castle and Heidelberg Palace into VR technology, and visitors can remotely experience world-famous German tourist attractions through Oculus Rift 360-degree video and Microsoft HoloLens mixed reality technology. This "VR+ travel" model not only improves the experience of tourists, allowing them to preview VR in advance, reducing the cost of selection, but also satisfies the need to maintain interest in travel destinations during the COVID-19 travel restrictions, while also bringing greater expectations and more inspiration for real travel.

2.3 Interactive games and entertainment

With the rapid development of technology, VR technology has increasingly become an important field in the game and entertainment industry. Virtual reality technology can create a virtual environment that is very similar to the real world, so that players can personally feel the authenticity of the game and the feeling of being there. Provide players with a game

experience that transcends reality and becomes more realistic. In addition, in sports, movies, music and other entertainment, virtual reality can provide athletes with training and competition scenes for training, analysis and prediction to improve the skills of coaches and athletes. In the production of film, television and digital content, producers can use virtual reality technology to achieve scenes and effects that cannot happen in reality [5]. Musicians can play in a virtual reality environment while the audience interacts, joining the music with the musicians.

3 The commercial value of VR technology in digital tourism

3.1 Calculation of commercial value factors

The commercial value of VR technology in digital tourism cannot be ignored. VR technology can provide tourism companies with an immersive user experience, attract and retain tourists, and increase customer loyalty. At the same time, it also provides enterprises with innovative sales and marketing means to reduce traditional marketing costs and improve operational efficiency. It brings great competitive advantages and business opportunities for tourism enterprises. From the perspective of marketing, the commercial value of VR technology in digital tourism can be understood from different angles through the formula. In order to facilitate calculation and analysis, the following formula can be used for calculation:

$$BV = (E + I + C) - (Tc + Mc) \quad (1)$$

In the formula, BV, E, I, C, Tc and Mc respectively represent business value, tourist experience enhancement, brand image enhancement, market competitiveness increase, technology cost and market promotion cost.

Enterprises increase the input cost, the purpose is to improve the operating profit, the rate of return on investment is the key, through the formula can be calculated:

$$ROI = (R - C)/C \quad (2)$$

In the formula, ROI, R and C represent return on investment, income and cost respectively

In digital tourism, the number of customers to visit and the number of visits will also affect the marketing revenue of enterprises. The specific calculation formula is as follows:

$$CR = Cs/Tv \quad (3)$$

In the formula, CR, Cs and Tv respectively represent marketing conversion rate, conversion target and total visits.

In the enterprise marketing strategy, customer satisfaction represents the customer retention rate of the enterprise and directly affects the enterprise marketing interest rate, which can be calculated by the formula as follows:

$$CS = (Sc/Tc) * 100\% \quad (4)$$

In the formula, CS, Sc and Tc respectively represent customer satisfaction, the number of satisfied customers and the total number of customers.

3.2 Enhance the attraction and popularity of scenic spots

First of all, VR technology can provide tourists with an immersive travel experience, so that they feel the unique charm and atmosphere of the scenic spot, this new way of experience not only improves the participation of tourists, but also greatly enhances the attraction of the scenic spot. The immersive experience can attract more tourists to visit and increase the tourist flow and revenue of the scenic spot. Secondly, VR technology can be used in the marketing and promotion of scenic spots, through VR promotional videos, VR advertising, etc., scenic spots can show tourists the characteristics and charm, improve the interest and confidence of tourists. This interactive and experiential publicity can increase the visibility and brand value of the scenic spot, and enhance the competitiveness of the scenic spot in the market. In addition, the scenic spot can use VR technology to create a virtual social platform, so that tourists can exchange and share travel experience, increase interaction and social elements, and improve the participation and retention rate of tourists. At the same time, VR technology can also be used to promote new tourist attractions or activities [6]. For example, some tourist attractions or upcoming events that have not yet opened can be shown to the public in advance through VR technology to attract tourists' attention and expectations. This way can not only warm up the market in advance, improve the visibility of the activity, but also bring potential economic benefits to the scenic spot.

3.3 Innovative product and service models

The commercial value of VR technology in digital tourism has broad application prospects in innovative product and service models. Through VR technology, tourism companies can develop virtual tourism products, and users only need to wear VR devices to experience scenic spots around the world at home. This virtual tourism product not only reduces the travel cost, but also provides users with a more convenient and personalized travel experience [7]. At the same time, VR technology can also be combined with scenic entities to create unique interactive experience products, such as VR games, VR performing arts, etc., so as to enrich the connotation and form of tourism products. The traditional way of tourism service is usually guided explanation and tourists visit, and the introduction of VR technology makes the tourism service more intelligent and personalized. Tourist attractions can also cooperate with VR equipment manufacturers to jointly develop VR equipment suitable for the characteristics of scenic spots, so as to gain more market share. VR technology is used to carry out virtual marketing, attract potential tourists through virtual experience and virtual trial play, improve the visibility and reputation of scenic spots, and bring more competitive advantages to tourism enterprises [8].

3.4 Optimizing tourist experience and service quality

From a marketing perspective, VR technology can provide an innovative marketing tool for tourist attractions. With VR technology, attractions can create immersive virtual tourism experiences that attract the attention and interest of potential visitors. This innovative marketing method can break the limitations of traditional advertising, improve the participation and interaction of tourists, and increase the visibility and exposure of scenic spots. It can also help tourism companies better understand the needs and behaviors of tourists. By analyzing VR data, companies can understand tourists' behavior, interest points and preferences, so as to develop more accurate marketing strategies and personalized services.

This data-based marketing method can improve the marketing effect and tourists' satisfaction, and increase the sales and market share of enterprises [9]. VR technology can also be combined with other digital marketing channels, such as social media, search engines and email, to achieve multi-channel marketing promotion. Through cross-channel marketing cooperation, companies can increase brand awareness and influence, attract more potential tourists, and promote the sustainable development of attractions. In terms of improving service quality, VR virtual reality technology is mainly reflected in providing personalized services, enhancing visitor interaction and participation, enhancing brand image and visibility, and improving business operation efficiency. VR technology can also provide personalized travel experience and customize different travel routes and activities according to the interests and needs of tourists [10]. This personalized service can better meet the needs of tourists and improve the satisfaction and loyalty of tourists. Visitors can engage in virtual reality shows, interactive games and other activities to increase their engagement and retention. This interactive experience increases visitor engagement and satisfaction, contributing to the sustainable development of tourism. At the same time, tourism companies can also create a unique brand image and travel experience to attract more tourists. In these ways, it will bring more business opportunities and innovation to the tourism industry.

3.5 Expand sales channels and increase revenue sources

With the rapid development of VR technology, VR digitization has gradually become an important trend in the business field. VR digitization has brought huge business opportunities to the virtual tourism industry, providing rich business opportunities for enterprises and individuals. Expand sales channels through online tourism platforms, social media promotion, cross-industry cooperation, etc. See Table 1 for details;

Table 1 Sales channel classification table.

Sales channel	Specific mode description
Online travel platform	Cooperate with online travel platforms such as Ctrip and Qunar to embed VR content into the platform, so that users can experience the virtual reality of scenic spots or hotels online and enhance their purchase intention.
Social media	Publish VR content on wechat, Weibo, etc., to attract attention and share, and expand brand awareness and sales channels.
Mobile application	Develop specialized VR travel applications to provide immersive virtual travel experiences, attract users to download and use, and increase sales channels.
Offline experience store	Set up VR tourism offline experience store to let users experience the fun of VR tourism and promote product sales.
Cooperation with other industries	Cooperate with airlines, hotels, scenic spots and other tourism industries to jointly promote VR tourism products and services and expand sales channels.
Online advertising	VR tourism advertising through search engines, social media and other channels to increase brand awareness and sales.
Hold VR tourism activities	Hold VR tourism experience activities or festivals to attract users to participate and promote sales.

Increase revenue sources through virtual goods sales, advertising placements, paid experiences, membership systems and events, as detailed in Table 2, to achieve business value enhancement. Through continuous innovation and exploration of new business models, it will help digital tourism enterprises to maintain a leading position in the fierce market competition.

Table 2 Sources of income.

Source of income	Specific mode description
Sell virtual goods and privileges	Sell virtual goods and privileges, such as virtual souvenirs, virtual shooting items, virtual characters, etc.
Virtual advertising and sponsorship	Embedding advertising or brand sponsorship in the virtual tourism scene provides a platform for enterprises to display and promote.
Paid experience	Provide paid virtual travel experience services, such as customized tour routes, high-definition picture quality options, exclusive scenic spot experiences, etc.
Membership and subscription services	Launch a membership system or subscription service to provide members with more virtual travel experiences and privileges, such as free trials, member-only activities, and more.
Cross-border cooperation	Cross-border cooperation with related industries such as games, movies, sports, etc., to jointly launch VR tourism products and services.
Data analysis and value-added services	Through the collection of user data and behavior analysis, provide personalized value-added services, such as travel guide recommendations, customized itinerary planning, etc.

3.6 Enhance brand influence and market competitiveness

The commercial value of virtual reality technology in digital tourism, especially in enhancing brand influence, has a significant role. It enhances brand loyalty and awareness by creating immersive travel experiences that enable consumers to better understand and feel the values and features of travel brands. By creating unique brand experience, strengthening brand image, interactive marketing and social media promotion, as detailed in Figure 1, the brand influence of digital tourism has been effectively enhanced, and new business opportunities and development space have been brought to the tourism industry.

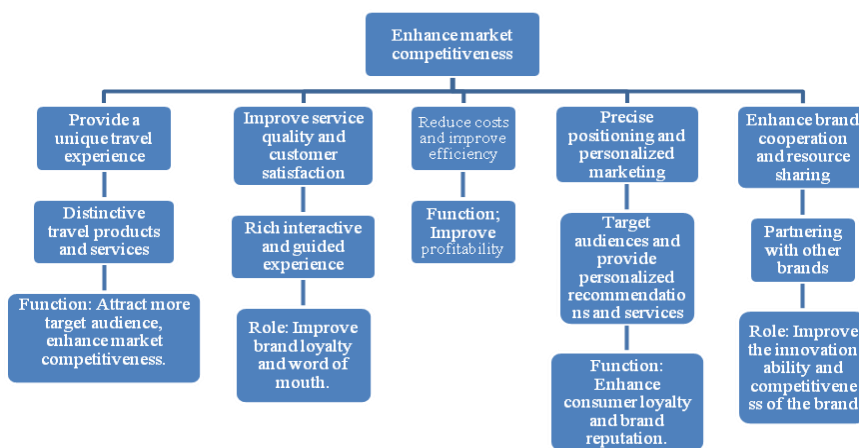


Figure 1 Methods to enhance brand influence.

VR technology provides consumers with distinctive products and services that meet consumers' needs for novelty and personalization. This allows travel brands to attract a larger target audience and increase market share. By providing a unique travel experience, improving service quality and customer satisfaction, reducing costs and improving efficiency are detailed in Figure 2. Enhance the profitability and competitiveness of enterprises.

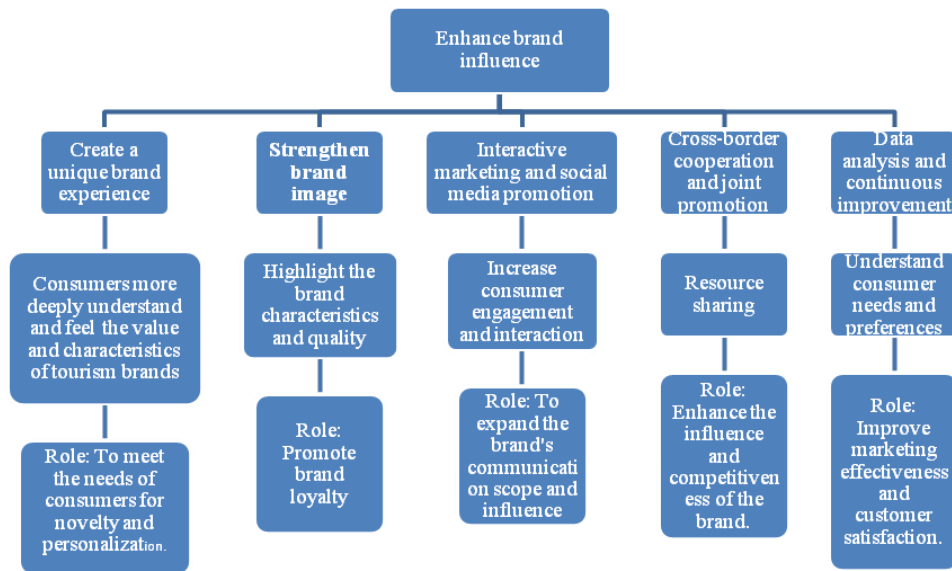


Figure 2 Methods to enhance market competitiveness.

4 Case study

In recent years, more and more scenic spots have begun to introduce VR technology to create smart scenic spots. Through VR equipment, visitors can have a deeper understanding of the historical and cultural background of the scenic spot, as well as various natural landscapes and cultural heritage. This immersive experience allows tourists to have a deeper understanding of the scenic spot and improve their participation and satisfaction. For example, Dunhuang Mogao Grottoes Scenic Area cooperated with Huawei to use Huawei river map technology to integrate the cultural relics and scenery of Mogao Grottoes, providing tourists with automatic object identification, self-explanation, cultural relic restoration, scene reproduction and other functions. Visitors can explore freely in the VR environment to fully understand and appreciate the precious cultural relics and historical background of the Mogao Grottoes. This innovative experience has attracted a large number of tourists, improved the visibility of the scenic spot and the number of visitors, and improved the commercial value of tourism.

5 Conclusion

VR technology has brought huge business value and development opportunities for digital tourism. For the tourism industry, seizing this opportunity and actively exploring and applying

VR technology will help it maintain its leading position in the fierce market competition. At the same time, it is also necessary to pay attention to and solve possible problems in the application of VR technology to achieve sustainable development.

About: This paper focuses on exploring the commercial value of VR technology in digital tourism from the perspective of marketing, aiming to analyze the current hot spots in this field and the future development direction.

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