

VIRTUAL REALITY TOURISM APPLICATION: INSIGHTS FROM TOURISM ENTERPRISES

APLICACIÓN DE LA REALIDAD VIRTUAL EN TURISMO:
PERSPECTIVAS DE LAS EMPRESAS TURÍSTICAS

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Abstract

In a context of robust digital change within the tourism sector, virtual reality tourism has emerged as a promising trend to augment the tourist experience and facilitate enterprises in innovating their business models. This study seeks to assess the extent of access to and experience with virtual reality tourism among tourism enterprises in Ho Chi Minh City, while also reflecting strategies to enhance the implementation of this technology in the industry. The research employed a quantitative survey involving 100 representatives from tourism enterprises in Ho Chi Minh City. The findings demonstrate that businesses view virtual reality tourism favorably and have access to a range of virtual reality tourism options via various platforms. Companies also concur that virtual reality tourism is a useful tool for promoting tourism, improving experiences, and creating new tourism-related products. The study suggests management implications to encourage tourism businesses to increase awareness, access, and application of virtual reality tourism more successfully.

Keywords

Virtual Reality, Virtual Reality Tourism, Tourism Business, Smart Tourism.

Resumen

En un contexto de fuerte transformación digital en el sector turístico, el turismo de realidad virtual se ha convertido en una tendencia prometedora para mejorar la experiencia turística y facilitar la innovación de los modelos de negocio de las empresas. Este estudio busca evaluar el grado de acceso y la experiencia con el turismo de realidad virtual entre las empresas turísticas de Ciudad Ho Chi Minh, a la vez que refleja estrategias para mejorar la

implementación de esta tecnología en el sector. La investigación empleó una encuesta cuantitativa a 100 representantes de empresas turísticas de Ciudad Ho Chi Minh. Los resultados demuestran que las empresas valoran positivamente el turismo de realidad virtual y tienen acceso a diversas opciones de turismo de realidad virtual a través de diversas plataformas. Las empresas también coinciden en que el turismo de realidad virtual es una herramienta útil para promover el turismo, mejorar las experiencias y crear nuevos productos relacionados con el turismo. El estudio sugiere implicaciones de gestión para incentivar a las empresas turísticas a aumentar el conocimiento, el acceso y la aplicación del turismo de realidad virtual con mayor éxito.

Palabras clave

Realidad Virtual, Turismo de Realidad Virtual, Negocio Turístico, Turismo Inteligente

1. INTRODUCTION

In the context of technology playing an increasingly important role in enhancing the travel experience, virtual reality tourism has become a prominent trend in the world. (Verma et al., 2022). This technology allows users to explore destinations intuitively and vividly through a simulated virtual environment, thereby providing an interactive and realistic emotional experience before taking the actual journey (Peštek & Sarvan, 2020). In many developed countries, virtual reality tourism is not only used as an effective destination promotion tool but also contributes to restructuring traditional tourism products, aiming for sustainable development, and adapting to new trends as digital transformation, smart tourism or post-pandemic tourism (Idris et al., 2021).

In Vietnam, especially in Ho Chi Minh City (HCMC), virtual reality tourism is considered a digital transformation solution in tourism and promotes the development of smart tourism. Virtual reality tourism has been initially exploited in promotional activities, promotion and enhancing the experience for tourists. Applications include 360° digital tourism maps, solutions to integrate virtual reality technology into museum operations. Hotels and travel businesses also exploit virtual reality tourism to help tourists access products more intuitively. However, in general, the exploitation of virtual reality tourism by businesses is still limited.

Based on the above practical gap, this study was conducted to understand the awareness and views of tourism businesses in Ho Chi Minh City on the application of virtual reality tourism in business and promotion activities. Through surveying and analyzing opinions from businesses operating in the tourism sector, the study provides useful management implications in promoting digital transformation in the Vietnamese tourism industry. The research results are expected to contribute to the theoretical and practical foundation in developing smart tourism models, in line with the trend of innovation in the era of technology 4.0.

2. LITERATURE REVIEW

2.1. Virtual reality tourism

Virtual reality technology (VR) and virtual reality tourism are becoming increasingly popular in the world thanks to their high applicability and ability to effectively support real tourism (Zhang & Hwang, 2024). The rapid development of digital technology has opened up new opportunities for the tourism industry, in which VR is considered an important tool to help recreate space vividly, bringing rich experiences to visitors (Beck et al., 2019; Verma et al., 2022). In fact, more and more destinations, museums, historical sites and travel companies in the world are applying VR to attract visitors, support promotion and expand access to potential customers.

Virtual reality tourism is a form of tourism that uses VR technology to simulate locations, providing realistic experiences through supporting devices to help visitors visit or experience in a virtual environment (Beck et al., 2019; Verma et al., 2022). Virtual reality tourism is currently implemented in many different forms. One of the most popular forms is 360-degree virtual tours, where visitors can observe the entire view of a destination through images or videos shot using 360-degree technology (Wu & Lai, 2022). In addition, 3D space simulation is also a widely applied method, especially in the field of cultural heritage preservation and reproduction (Huang et al., 2013). These technologies allow for the accurate reproduction of architectural works and historical spaces, helping viewers visualize more clearly the places they want to explore. Some more advanced applications also use comprehensive virtual reality, allowing users to interact directly with the virtual environment through devices such as VR glasses or gesture control.

2.2. Application of virtual reality tourism in tourism businesses

In the business context, virtual reality tourism is studied as a tool to increase marketing effectiveness and enhance competitiveness. According to research by Tussyadiah et al. (2018), businesses can use virtual reality technology to create interactive touchpoints with customers, thereby improving decision-making ability, increasing service booking intention and strengthening brand image (Tussyadiah et al., 2018). The application of virtual reality tourism in destination marketing has been shown to increase customer satisfaction and commitment (Chang & Chiang, 2022). In addition, virtual reality also helps businesses optimize advertising costs, expand markets and increase accessibility to new customer segments, especially the young, tech-savvy generation. (Peštek & Sarvan, 2020).

Virtual reality technology extends beyond the business realm, finding widespread application in the preservation and promotion of cultural and historical heritage. Many

museums and relic sites around the world have integrated virtual reality to recreate historical spaces, restore artifacts or facilitate visitors to visit remotely. Studies have also shown that digitizing relics and artifacts using virtual reality technology not only brings educational and conservation value, but also enhances accessibility and attracts international tourists. In the context of sustainable tourism development and adaptation to digital transformation trends, many countries have considered virtual reality an inseparable part of the smart tourism development strategy (Idris et al., 2021). Recent studies show that, when applied properly, virtual reality tourism can enhance the tourist experience, raise awareness of cultural heritage, and promote actual travel behavior after the virtual experience (Yung & Khoo-Lattimore, 2019).

3. METHOD

The study used quantitative methods, specifically a questionnaire survey with a convenience sample.

Quantitative data was collected through a survey of tourism business representatives in Ho Chi Minh City to assess the level of preparation in terms of technology, human resources, finance and proposed support policies. The study used a questionnaire with a 5-point Likert scale to measure business perspectives. The survey sample was selected by a convenience method, focusing on managers at the level of Department Head or higher in the product, marketing or technology department. The survey was conducted online from September to November 2022 via email and the Zalo group connecting tourism businesses.

After checking and cleaning the data, the study obtained 100 valid responses. The data was processed using SPSS 24.0 software to analyze the readiness level and recommendations of businesses for applying virtual reality technology in tourism business activities.

4. RESULTS AND DISCUSSION

4.1. Sample profile

The businesses participating in the survey are travel businesses (domestic, international, domestic and international) headquartered in Ho Chi Minh City with a number of 100 businesses. The people who received the survey and responded had positions from Department Head and above. A preliminary descriptive statistic of the businesses participating in the response are shown below.

In terms of enterprise size, the largest number is enterprises with 10 to less than 50 employees, accounting for 50% (50), the lowest number is enterprises with more than 100 employees, 2% (2), enterprises with 50 to less than 100 employees account for 24% (24), similarly, enterprises with less than 10 employees account for 24% (24). In terms of total

enterprise capital, enterprises participating in the survey are also mainly concentrated in the type of micro-enterprises and small enterprises with the following charter capital: the largest proportion is under 3 billion VND, 52% (52), followed by from 3 billion to less than 50 billion, 34% (34), from 50 to less than 100 billion, 8% (8), over 100 billion, 6% (6). Combining both capital and labor factors, the survey sample is mainly micro and small enterprises, which is also a characteristic of travel businesses because this group is often young, newly established businesses or has a small staff size.

4.2. Types of virtual reality tourism that have been approached and information channels accessed

Regarding the types of virtual reality tourism that have been approached, the study offers some popular types according to the actual development of virtual reality tourism in the world and in Vietnam for businesses to choose from (table 1).

Table 1 – Types of virtual reality tourism that business representatives have experienced

STT	Concept	Frequency	Frequency (%)
1	Satellite mapping applications can view panoramic views of remote locations.	23	14.6%
2	Search for travel information on websites, with 360 video clips, panoramic photos with sound, ...	31	19.7%
3	Search for travel information on apps, with 360 video clips, panoramic photos with sound, ...	32	20.4%
4	Free online travel through products	21	13.4%
5	Virtual reality experiences at tourist destinations (museums, monuments, ...)	36	22.9%
6	Buy pre-designed virtual reality tour packages through websites	4	2.5%
7	Purchase virtual reality tours with local guides and personalized support devices	9	5.7%
8	Never experienced any of the above products or services	1	0.6%
	Total	157	100.0%

Source: Research results

Among the above types, business representatives have experienced virtual reality at tourist destinations (museums, monuments, ...) the most with 22.9% (36), followed by searching for tourism information on applications, with 360 video clips, panoramic photos with sound, ...

with 20.4% (32), searching for tourism information on websites, with 360 video clips, panoramic photos with sound, ... accounting for 19.7% (31). For professional and package virtual reality tourism types, representatives of these businesses have not used them commonly, for example, buying virtual reality tourism programs through local guides and personalized support devices accounts for only 5.7% (9); Buying pre-designed package virtual reality tourism programs through websites accounts for 2.5% (4). This is also the common situation for the development of virtual reality tourism products, mostly experiences at museums, historical and cultural relics.

First, virtual reality experiences at tourist destinations are the most popular type, accounting for 22.9%. This result shows that businesses tend to approach virtual reality through museums, relics or exhibition centers, where this technology is applied to recreate historical spaces or expand the visiting experience. In Ho Chi Minh City, some virtual reality tourism applications have also been exploited, although they are still very basic.

For virtual reality technology experiences in on-site tourism, there are now many units such as museums, monuments, tourism businesses, hotels, etc. that provide virtual reality experience activities for tourists to increase satisfaction and excitement when visiting tourist attractions. For example, the application of Smart Museum 3D/360 technology has been introduced at the Southern Women's Museum to serve virtual reality tours and smart interactions during the tour. Or at the Saigon - Gia Dinh Special Forces Museum, virtual reality technology is also exploited so that visitors can visit many different locations in the city or look back at images of the past in a vivid way. Some hotels also apply virtual reality technology to introduce tourist attractions and tourism programs in the city for visitors to conveniently look up, learn and make a tour schedule.

For more basic versions, Ho Chi Minh City is building a 3D/360 Smart Interactive Tourism Map Application system with the aim of improving the city's tourism promotion work, while affirming the city's development through the application of high technology in tourism promotion and advertising. According to the report of the Department of Tourism in 2023, it attracted 185,000 interactions from tourists from 48 countries and territories. In the near future, this map will connect famous and typical tourist attractions in Ho Chi Minh City with those in 62 provinces and cities across the country, creating virtual reality technology products that help tourists learn about their tour programs before visiting. This is Ho Chi Minh City's virtual reality tourism platform with full range of tourist attractions and related tourism services for tourists to refer to before conducting tourism activities.

In addition, searching for information through online platforms that integrate 360-degree technology is a clear trend, with a rate of 19.7% on websites and 20.4% on mobile applications. This result reflects the fact that businesses mainly approach virtual reality as a tool to support information search instead of experiencing a complete tourism product. Ho Chi Minh City is a place with a high level of Internet usage, so it is understandable that businesses often look up information through websites or applications. However, this also

shows that virtual reality is not yet seen as an independent tourism product, but only plays a supporting role in the tourism planning process.

Furthermore, the proportion of free VR tourism experiences (13.4%) is significantly higher than that of paid programs. This suggests that businesses may have had access to some VR tourism content but are not yet ready to invest in more premium products. Ho Chi Minh City has many technology startups developing free or trial VR content to promote destinations, but the level of application in actual business is still very low. In addition, commercial VR tourism programs are still not popular, with only 2.5% of businesses having purchased a package program and 5.7% having experienced personalized products through tour guides. This result suggests that VR tourism in Ho Chi Minh City has not been exploited as a product with economic value. The current market mainly focuses on free content or experiences at destinations, while professional VR business models have not been widely deployed.

In addition to the types, the study also investigated the sources of information that tourism businesses have accessed virtual reality tourism, thereby assessing the popularity of this technology among tourism businesses. The main objective is to determine which communication channels play an important role in providing information about virtual reality tourism, as well as the level of initiative of businesses in learning and updating the technology.

Table 2 – Sources of information to access virtual reality tourism

STT	Concept	Frequency	Frequency (%)
1	Virtual reality tourism programs and products on the Internet	40	30.1%
2	Conference on tourism and technology	20	15.0%
3	Through other travel businesses	19	14.3%
4	Through social networks, newspapers, ...	31	23.3%
5	Through training programs on tourism	18	13.5%
6	Through foreign partners	5	3.8%
	Total	133	100.0%

Source: Research results

The survey results show that tourism businesses in Ho Chi Minh City mainly access information about virtual reality tourism through online platforms and digital media, with the Internet (30.1%) and social networks and newspapers (23.3%) being the two most popular channels. Meanwhile, more specialized channels such as tourism-technology seminars (15.0%), other travel businesses (14.3%), and training and coaching (13.5%) have lower levels of access. Notably, international partners account for only 3.8%, showing limitations in

connecting with technology from foreign markets.

First, the Internet and social networks are the most popular sources of information, reflecting the trend of businesses prioritizing online channels to learn about virtual reality tourism technology. Ho Chi Minh City is one of the cities with the highest Internet and social network usage rates in the country, leading to businesses tending to search for information through these platforms. Accessing via the Internet helps businesses quickly update trends and experience VR products on the market. However, this method can also cause information to be scattered, unsystematic, and inaccurate when a business does not have a specific basis for evaluation.

In addition, the rate of accessing information through seminars and training programs is still limited, although Ho Chi Minh City is the center of many major events on technology and tourism. This result shows that virtual reality tourism has not really become a central topic in training programs or specialized seminars. This situation can make it difficult for businesses to clearly understand the potential of applying VR to business operations, as well as limit opportunities to connect with experts in the field. Moreover, the level of connection with international partners is very low, although Ho Chi Minh City has an advantage in attracting foreign investment. The survey results reflect those businesses have not yet proactively sought cooperation with international technology companies. In addition, accessing information through other tourism businesses also accounts for a certain proportion, showing that the tourism industry in Ho Chi Minh City tends to learn and share information internally.

4.3. Business perception of virtual reality tourism applications

Virtual reality tourism can be applied to many functions in the tourism sector: virtual reality tourism planning can be applied to many functions in the tourism sector: trip planning, general management, marketing and PR, information exchange, new ways of entertainment, education and training, access to restricted tourist areas or conservation destinations, either before, during or after the trip (Beck et al., 2019). For travel businesses, in general, virtual reality tourism has 3 main applications: tourism promotion, enhancing the experience at the destination and creating new tourism products.

Table 3 – Business perception of virtual reality tourism applications

STT	Variable	Medium	DLC	References
1	Virtual reality tourism enhances business image to tourists	3.66	0.798	Agree
2	Virtual reality tourism helps businesses reach customers more effectively	3.74	0.828	Agree
3	We use virtual reality tourism as a promotional channel.	3.66	0.848	Agree

4	We apply virtual reality tourism to create more tourism products/services at the destination.	3.62	0.878	Agree
5	Virtual reality tourism creates new tourism products	3.76	0.822	Agree
6	Virtual reality tourism helps businesses operate more effectively	3.64	0.802	Agree
7	We apply virtual reality tourism to create new tourism products/services.	3.68	0.683	Agree

Source: Research results

The research results presented in Table 4 show that tourism businesses in Ho Chi Minh City have a high level of consensus on the role and effectiveness of virtual reality tourism applications. All survey statements received agreement from businesses, with the average value ranging from 3.62 to 3.76 on a 5-point Likert scale, showing a positive and relatively uniform perception of this technology.

Specifically, the statement "Virtual reality tourism creates new tourism products" received the highest consensus from businesses, with an average value of 3.76 and a standard deviation of 0.822. This reflects businesses' positive assessment of the ability to create added value and diversify tourism products through virtual reality technology.

Next, the statement "Virtual reality tourism helps businesses reach customers more effectively" also recorded a high level of consensus, with a mean value of 3.74 and a standard deviation of 0.828.

This result shows that businesses are clearly aware of the role of virtual reality tourism as a modern marketing tool, helping to expand the reach of potential customers in a more flexible and creative way than traditional methods.

The remaining statements have a relatively even level of consensus. The statement "We apply virtual reality tourism to create new tourism products or services" has a mean value of 3.68 (standard deviation 0.683), reflecting the positive trend of businesses in integrating technology into product development activities.

The two statements "Virtual reality tourism enhances the image of the business to tourists" and "We apply virtual reality tourism as a promotional channel" have a mean value of 3.66, with standard deviations of 0.798 and 0.848, respectively. This shows that virtual reality tourism is not only seen as an effective marketing tool but also a means to contribute to building a more vivid and attractive brand image of the business in the eyes of tourists.

In addition, the statement "Virtual reality tourism helps businesses operate more efficiently" has a mean of 3.64 and a standard deviation of 0.802, indicating that businesses also highly appreciate the indirect impact of this technology on overall business performance. Finally, the statement "We apply virtual reality tourism to create more tourism products or services at the destination" has the lowest consensus among the survey statements, with a

mean of 3.62 and a standard deviation of 0.878. Although this is the statement with the lowest mean, it is still within the agreement level, reflecting the recognized potential of this technology in enhancing the experience at a real destination.

The research results show that tourism businesses in Ho Chi Minh City have a positive and relatively uniform perception of the application of virtual reality technology in tourism promotion activities. This shows a certain change in the approach of businesses to digital technology, especially in the context of the tourism industry gradually recovering and restructuring towards sustainability and adapting to the global digitalization trend.

Notably, the statement with the highest mean value was "Virtual reality tourism creates new tourism products" ($M = 3.76$; $SD = 0.822$), clearly reflecting the positive perception of businesses towards the innovative role of virtual reality technology in product development. This result is consistent with previous studies emphasized that virtual reality is not only a technological tool but also a platform to restructure tourism services towards personalization, high interaction and flexibility in terms of content (Yung & Khoo-Lattimore, 2019). Similarly, the statement "Virtual reality tourism helps businesses reach customers more effectively" ($M = 3.74$; $SD = 0.828$) also achieved a high level of consensus, showing that businesses are clearly aware of the potential of virtual reality as a modern means of communication and marketing.

Results are also supported by previous studies that suggest that virtual reality technology has the potential to create rich experiential touchpoints between businesses and customers, thereby improving the effectiveness of brand messaging and increasing the conversion rate from inquiry to purchase (Chang & Chiang, 2022; Yung et al., 2021). Virtual reality tourism can help tourists visually review the products and tourism programs that businesses offer, for example, previewing the attractions, hotel rooms or experiences included in the tour program. Through this, the image of the tourist destination is enhanced and the tourism demand of tourists will also increase (Kim & Hall, 2019).

Therefore, these tourists can make the decision to buy a tour program faster and more conveniently than if they could not preview it. The tourism brand of the business is thereby enhanced in the eyes of the buyer through transparency and commitment to the quality of the tour program. From here, businesses can also design virtual reality tour programs to promote instead of just using conventional static images or video clips. These solutions are also effective for tourist accommodation establishments when tourists are completely immersed in the space of the room they intend to book (McLean & Barhorst, 2021; Zeng et al., 2020).

Overall, the results show the readiness and goodwill of businesses in applying virtual reality tourism to their business and promotional activities. This positive perception is an important basis for implementing digital transformation programs in the tourism sector in Vietnam. At the same time, the results also reflect the global trend of integrating technology into tourism products, thereby enhancing the competitiveness of businesses in the context of an increasingly digital market and changing consumer behavior toward visual, fast and highly interactive experiences.

4.4. Policy implications for promoting tourism businesses to apply virtual reality tourism

Raising awareness and accessibility of virtual reality tourism among tourism businesses in Ho Chi Minh City requires appropriate management strategies to take advantage of the potential of this technology in the context of strong digital transformation. To promote this process, there need to be synchronous solutions from management agencies, tourism organizations and businesses themselves.

Firstly, it is necessary to strengthen communication activities and in-depth training on virtual reality tourism to raise business awareness.

Currently, most tourism businesses in Ho Chi Minh City access information via the Internet and social networks, but lack a solid knowledge base to understand the potential of applying virtual reality to their business models. Therefore, tourism organizations and management agencies need to organize more seminars and workshops on virtual reality technology, inviting technology experts and pioneering businesses to share practical experiences. At the same time, virtual reality training programs in tourism need to be integrated into courses at universities and tourism training centers, helping businesses gain a deeper insight into how to apply this technology to their business operations.

Second, it is necessary to create a mechanism to encourage and support businesses to test virtual reality applications in tourism activities.

One of the barriers that prevent businesses from being interested in virtual reality is the high investment cost and lack of understanding of suitable business models. Solutions should focus on creating breakthroughs in science, technology development, innovation, and national digital transformation while implementing Resolution 57-NQ/TW of the Politburo, issued on December 22, 2024. Therefore, Ho Chi Minh City needs to have policies to support finance or tax incentives for businesses investing in virtual reality technology, especially small and medium enterprises. In addition, Ho Chi Minh City can implement pilot projects on virtual reality tourism, cooperate with technology companies to build free or low-cost VR products for tourism businesses to experience before applying them in practice. Such initiatives will help businesses reduce investment risks and have a practical basis to evaluate the effectiveness of VR technology in business operations.

Third, tourism businesses need to proactively invest in and integrate virtual reality tourism technology into their product and service development strategies, in order to enhance customer experience value and diversify tourism options.

The research results show that businesses appreciate the role of virtual reality tourism in creating new products and increasing services at destinations, reflecting the urgent need to innovate tourism product content to adapt to modern consumption trends. Integrating this technology can help businesses design vivid simulation experiences, allowing customers to “try out” the destination before making a decision, thereby increasing conversion and satisfaction levels.

Fourth, virtual reality tourism should be viewed by businesses as an effective promotional and communication tool, especially in reaching target customer segments in a more intuitive and engaging way.

From the research results, it can be seen that virtual reality tourism is not only a technical support factor, but also has strategic value in branding and connecting with the market. Businesses can take advantage of the virtual reality platform to deploy interactive promotional campaigns, introduce tourism products through 360° experiences, or create online tours, helping customers clearly visualize the services they will experience. This approach is especially effective in reaching international customers, young customers, or those who are not ready to pay but are in the stage of learning about the destination. When exploited properly, this technology will not only increase communication effectiveness but also enhance the connection between customers and brands, thereby contributing to boosting revenue and expanding the market for tourism products.

Fifth, it is necessary to strengthen cooperation between tourism businesses and technology units to develop highly commercial virtual reality tourism products.

Currently, most businesses in Ho Chi Minh City are only using virtual reality as a tool to support information lookup, and there are not many truly attractive VR tourism products to generate revenue. To solve this problem, there needs to be a close connection between tourism businesses and technology companies to build virtual reality tourism models with economic value, such as themed virtual tours, personalized VR tourism experiences according to customer preferences, or virtual tour guide programs combined with real services. Ho Chi Minh City is a center of startups and innovation, so promoting cooperation between the tourism industry and the technology sector will create a strong driving force for the development of competitive VR products.

5. CONCLUSION

The research results show that tourism businesses in Ho Chi Minh City have a clear awareness and approach to virtual reality tourism, but most of them only use tools to support

information search such as satellite maps, tourism websites with 360° content or mobile applications with integrated panoramic photos and sound. Meanwhile, more in-depth experiences, such as complete virtual reality tours, are still limited. In particular, the rate of businesses that have purchased or provided full virtual reality tourism services through websites or tour guides is still very low, reflecting the lack of readiness in terms of business models. In addition, the research also shows that the Internet and social networks are the most popular information channels for businesses to approach virtual reality tourism, while specialized seminars, training programs and international cooperation have not been fully utilized.

The research results show that tourism businesses in Ho Chi Minh City have a positive perception of the application of virtual reality tourism in promotional activities. Virtual reality tourism is considered an effective tool for creating new tourism products, reaching customers, enhancing the business image, and supporting business activities. This shows the potential and feasibility of this technology in the development and communication strategies of tourism businesses.

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