

The Development of Virtual Tourism in the Island of Crete, Greece. A SWOT Analysis

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ABSTRACT: The island of Crete, Greece has plenty of extremely beautiful natural landscapes and rich historical and cultural monuments which attract tourists from all over the world. The island is a popular tourism destination worldwide hosting millions of tourists annually while its tourism industry is prosperous. The current technological progress in virtual reality allows the development of virtual tourism complementarily to traditional physical tourism. The development of virtual tourism in Crete has been studied using SWOT analysis identifying its strengths, weaknesses, opportunities and threats. SWOT analysis assists in developing the best strategy for the future management of virtual tourism in the island. Taking into account the challenges that the tourism industry faces nowadays regarding overtourism and climate crisis the development of virtual tourism in Crete complementing physical tourism might mitigate these challenges. The present work could be useful to policy makers and to stakeholders of the prosperous tourism industry in Crete who should develop a strategic plan for the promotion of virtual tourism in the future enriching the tourism product offered to potential visitors.

KEYWORDS: Crete-Greece, strategic plan, SWOT analysis, tourism industry, virtual tourism

1. INTRODUCTION

The island of Crete, Greece located in eastern Mediterranean basin is a popular global tourism destination hosting an increasing number of visitors every year. The increasing number of tourists in the island is related with phenomena of overtourism which combined with the climate crisis threaten the prosperous local tourism industry [1], [2], [3]. The advances in the information and communication technologies as well as in virtual reality (VR) and in augmented reality (AR) have facilitated the development of a new type of tourism, the virtual tourism (VT) [4], [5], [6], [7], [8], [9], [10]. The development of VT in Crete can help in the mitigation of the undesired impacts of overtourism and climate crisis on the local tourism industry. The analysis of strengths, weaknesses, opportunities and threats (SWOT) of VT in Crete can facilitate the development of a strategic plan for the promotion of VT in the island [11], [12], [13], [14].

The aim of the current work is the SWOT analysis related with the development of virtual tourism in the island of Crete, Greece.

The text is structured as follows: After the literature review the tourism industry in Crete and the concept of VT are analyzed. In the following two sections the concept and the usefulness of SWOT analysis as well as the SWOT analysis of the VT in Crete are stated. The strengths, weaknesses, opportunities and threats of VT are described. The text ends with discussion of the findings, the conclusions drawn and the citation of the references used.

The current study is innovative due to lack of similar studies in the island of Crete, Greece. It fills an existing gap related with a SWOT analysis of VT in the island. The work could be useful to policy makers and the stakeholders of the local tourism industry who should develop a strategic plan regarding the promotion of VT in Crete.

2. LITERATURE SURVEY

The combined impacts of overtourism and climate crisis on the tourism industry of Crete have been studied [1]. The author stated that the climatological conditions in Crete have changed affecting the tourism industry while overtourism has harmful impacts on it. He mentioned that the local tourism stakeholders should cooperate to develop appropriate policies to mitigate the undesired impacts of overtourism and climate crisis on the local tourism industry. The carrying capacity of tourism in Crete has been studied [2]. The authors stated that the natural and manmade environment in Crete can sustain a polymorphic tourism product in the island. They proposed the linking of visitors with culture, nature and the environment in a harmonious way in Crete. The overtourism in Crete has been evaluated [3]. The author stated that during 2023 6,237,366 tourists arrived in Crete while their mean resident time was 5.43 days. He also estimated the tourism density at 4,120 bed-nights per km² per year and the tourism intensity at 55.63 bed-nights per resident per year. The state-of-the-art in virtual tourism has been reviewed [4]. The authors stated that many studies examine the use of virtual reality as a marketing tool in the pre-travel phase. They have classified virtual

tourism as non-immersive, semi-immersive and fully immersive mentioning that virtual reality is at the infancy stage. The use of virtual reality technologies in tourism has been analyzed [5]. The authors stated that various studies have identified the positive impact of virtual tourism. They mentioned that the demand for e-tourism due to travel restrictions has increased while virtual experiences of tourists have pros and cons. The existing literature regarding the use of virtual reality in tourism has been reviewed analyzing 84 papers [6]. The authors stated that many studies explore the use of virtual reality and augmented reality in tourism industry. They mentioned that these technologies can create different tourism activities providing added value to tourists. The future in tourism trends focusing on VR has been studied [7]. The authors stated that virtual reality technologies are used in digital marketing while tourism has started to use these technologies. They also mentioned that tourism industry can benefit from the use of VR technologies. The literature related to VR in tourism has been reviewed [8]. The author stated that the current era of metaverse intertwines with the daily life redefining human experience. She also mentioned that although the initial set up of immersive VT seems costly tourism market could justify the investment. The use of VR in tourism focused on Thailand has been studied [9]. The authors investigated the impact of virtual experiences and destination image on travel intention. They stated that virtual experiences and destination images significantly enhance their travel intention. The past, present and future of virtual tourism reviewing the literature have been examined [10]. The authors stated that virtual tourism can be conceived as a massive transition towards tech-based sustainable tourism. The concept of SWOT analysis has been explored [11]. The author stated that SWOT analysis evaluates the internal strengths and weaknesses and the external opportunities and threats in an organization's environment. A SWOT analysis of tourism in Baoting, Hainan, China has been realized [12]. The author stated that Baoting has rich natural and cultural resources but for various reasons tourism has not been successfully developed. He mentioned that the analysis provided a preliminary assessment of tourism in this area. A SWOT analysis of tourism in Lawachara National Park in Bangladesh has been implemented [13]. The authors used questionnaires from the visitors in the park and other data to identify the strengths, weaknesses, opportunities and threats of tourism choosing the optimum management strategies in the park. The use of SWOT analysis in improving the performance in tourist attractions in China has been studied [14]. The author tried to identify the internal factors in SWOT analysis which can be improved promoting the development of tourism attractions in the country. The development of virtual tourism analyzing 415 surveys has been studied [15]. The authors stated that the evolution of technology makes possible to discover destinations without the need to travel. They mentioned that the prior knowledge of VR increases the willingness to use virtual tourism activities. The VR and AR

in tourism context analyzing 56 journal papers and 325 conference proceedings have been studied [16]. The authors stated that VR and AR techniques are evolving creating valuable opportunities for tourism. They mentioned that VR has been applied in planning, managing, promoting, educating and transforming tourist experiences. The VT in the way to digital economy has been examined [17]. The author stated that VR is used mostly in advertising tourist products as well as in guided tours. She also mentioned that the future of virtual tourism depends on the improvement of technical capacity for designing virtual tours and creating content for them. The post-Covid-19 tourism reviewing the existing literature has been explored [18]. The authors stated that virtual tourism is a practical and valuable option of mass tourism which can replace mass tourism after the pandemic. They mentioned that virtual spaces must develop more features and value additions to achieve tourists' satisfaction in the future. The impacts of VR technology on tourists' experience have been analyzed [19]. The authors analyzed 119 on-line comments from tourists who visited Seville and Barcelona in Spain using VR technology. They stated that their empirical analysis provided useful information to promote the abovementioned tourism destinations according to the desires of the visitors. The concept of SWOT analysis has been studied [20]. The author stated that SWOT analysis is a process by which a group of stakeholders: a) identify inhibitors and enhancers of performance, b) analyze those factors, and c) decide what future actions to take with regards to those factors. The service quality in tourism industry using SWOT analysis has been evaluated [21]. The authors analyzed 1,026 questionnaires that were distributed during the departure of tourists in a Greek island. The results were used to develop a strategic plan for the quality improvement of the overall tourism product. The Indian tourism industry has been analyzed using the SWOT methodology [22]. The author stated that every tourism destination has some strengths and weaknesses which may attract tourists while the external environment may exhibit several opportunities and threats. The rural tourism in Iran using SWOT analysis has been assessed [23]. The authors stated that the country has 75,000 villages with important history. They focused on Masouleh village, Gilan, Iran exploring the best strategies to develop the local tourism using a survey and field studies. The tourism potential in Crete analyzing the climatological data has been explored [24]. The authors stated that the analysis of the meteorological data in the island indicated that the natural tourism potential is high and, thus, an extension of the tourism period is possible. The carbon emissions of tourism industry in Crete, Greece have been evaluated [25]. The author estimated the carbon emissions at 488.77 kgCO₂ per visitor. He stated that international and domestic flights combined by tourists' arrivals by ships had the highest share, at 80.69%, in the total tourism-related carbon emissions. The virtual tourism experiences have been explored [26]. The authors investigated the willingness of tourists to pay for virtual

tourism experience examining 660 participants. They stated that tourists had a strong intention to use virtual tourism for free but when they asked to pay their intention to use it was limited. The virtual reality in tourism and hospitality sector analyzing 54 papers in this field has been reviewed [27]. The authors stated that virtual reality is becoming the reality in which we live, work and play. They also mentioned that virtual reality technologies are continuously improving bringing new challenges to tourism and hospitality.

3. THE TOURISM INDUSTRY IN CRETE

Crete, the largest of the Greek islands, is one of the most popular tourist destinations in Mediterranean basin. Known for its rich history, stunning landscapes, and warm hospitality, the island attracts millions of visitors each year. The tourism industry plays a vital role in Crete's economy, providing employment opportunities, supporting local businesses, and preserving cultural heritage. While the industry continues to thrive, it also faces challenges that require strategic planning to ensure sustainable growth. Tourism is a major economic pillar of Crete, contributing significantly to the island's Gross Domestic Product. With its combination of historical landmarks, breathtaking natural beauty, and vibrant cultural traditions, Crete offers a diverse range of attractions for different types of travelers. The industry provides employment for thousands of locals, from hotel staff and tour guides to restaurant owners and artisans. Additionally, tourism fuels other sectors such as agriculture, transportation, and retail, making it an essential part of Crete's overall economic stability. Crete's tourism industry thrives due to its diverse offerings. Some of the island's main attractions include:

3.1 Historical and Cultural Tourism

Crete boasts a rich historical legacy, with archaeological sites dating back to the Minoan civilization, one of the earliest in Europe. The Palace of Knossos, the ancient city of Phaistos, and the Archaeological Museum of Heraklion attract history enthusiasts from around the world. Additionally, Crete's traditional villages, monasteries, and Venetian-era architecture provide a glimpse into the island's cultural heritage.

3.2 Beach and Coastal Tourism

With its crystal-clear waters, golden sands, and picturesque coastlines, Crete is famous for its stunning beaches. Popular seaside destinations include Elafonissi Beach, Balos Lagoon, and Vai Beach, known for its exotic palm forest. These beaches attract thousands of sun-seekers and water sports enthusiasts each year.

3.3 Nature and Adventure Tourism

Beyond its beaches, Crete offers breathtaking natural landscapes, including the Samaria Gorge, one of Europe's longest canyons, and the White Mountains (Lefka Ori). Hiking, rock climbing, and wildlife observation are popular

activities, attracting adventure travelers looking for unique outdoor experiences.

3.4 Culinary and Agritourism

Crete's world-renowned cuisine is another major draw for tourists. Visitors can enjoy traditional Cretan dishes such as dakos, moussaka, and fresh seafood, often paired with local wines and raki. Agritourism is also gaining popularity, with travelers visiting olive groves, vineyards, and farms to experience traditional food production and rural life.

Despite its success, Crete's tourism industry faces several challenges that require attention for long-term sustainability.

3.5 Seasonality

Crete's tourism is highly seasonal, with peak visitor numbers between May and September. During the winter months, many hotels and businesses shut down, leading to economic instability for workers reliant on tourism. Efforts to promote year-round tourism, including cultural festivals and winter retreats, could help address this issue.

3.6 Overcrowding and Environmental Concerns

The increasing number of tourists can put pressure on Crete's natural and cultural resources. Overcrowding at popular beaches and archaeological sites, along with pollution and waste management issues, can threaten the island's environmental sustainability. Responsible tourism initiatives, such as visitor quotas and eco-friendly policies, are essential to mitigate these impacts.

3.7 Infrastructure and Development

As tourism grows, Crete must continuously invest in infrastructure, including roads, airports, public transportation, and accommodation facilities. Poorly managed development can lead to over-construction and loss of the island's authentic charm. Sustainable urban planning and investment in eco-friendly accommodations can help balance growth with preservation.

3.8 Competition from Other Destinations

Crete faces competition from other Mediterranean destinations, such as Spain, Italy, and Turkey. To maintain its appeal, the island must continuously innovate and diversify its offerings. Promoting niche tourism markets such as wellness tourism, digital nomad retreats, and eco-tourism can help Crete stand out.

To ensure long-term success, Crete must adopt sustainable tourism strategies that balance economic growth with environmental and cultural preservation. Government policies, community involvement, and private-sector investments will play a crucial role in shaping the future of tourism on the island. Embracing digital transformation, promoting alternative tourism experiences, and investing in eco-conscious initiatives will help Crete remain a top travel destination. Several characteristics of the tourism industry in Crete are presented in table 1.

Table 1. Several characteristics of Crete and its tourism industry

Surface of Crete	8,336 Km ²
Length of coastline	1,040 km
Residents in Crete (Census 2021)	617,360 residents
Average annual air temperature (Heraklion city)	18.9°C
Annual hours with sunshine (Heraklion city)	2,780 hours
Average annual precipitation (Heraklion city)	460 mm
Average annual sea temperature (Heraklion city)	20.1°C
Tourist’s beds (2021)	193,928
Arrivals in Crete in 2023	6,327,366 tourists
Number of airports for tourists’ arrivals	3
Number of seaports for tourists’ arrivals	6
%, arrivals in Crete to arrivals in Greece in 2023	17.7 %
Overnight staying of tourists in Crete in 2023	34,342,891 bed-nights
%, overnight staying in Crete to overnight staying in Greece in 2023	23.3 %
Average days of staying in Crete in 2023	5.43 days

Source: [1]

4. VIRTUAL TOURISM: A NEW ERA OF TRAVEL

Virtual tourism has emerged as a revolutionary concept in the travel industry, offering immersive experiences that allow people to explore destinations from the comfort of their homes. With advancements in digital technology, including virtual reality, augmented reality, and 360-degree video tours, virtual tourism is becoming an increasingly popular alternative to traditional travel. This innovative approach provides accessibility, sustainability, and economic benefits while also presenting challenges that must be carefully managed. Understanding the impact of virtual tourism and its potential future developments is essential for travelers, businesses, and policymakers alike.

Virtual tourism refers to the use of digital technology to create realistic and interactive travel experiences. Unlike traditional tourism, which requires physical travel, virtual tourism enables users to explore destinations through digital platforms. This can include 3D-rendered environments, virtual museum tours, live-streamed experiences, and VR simulations that replicate real-world locations. The concept of virtual tourism has gained momentum in recent years due to technological advancements and global events such as the Covid-19 pandemic, which limited physical travel. During travel restrictions, many institutions, including museums, national parks, and historical sites, turned to virtual tourism to engage audiences and maintain interest in tourism. As a result, virtual tourism is now recognized as a viable supplement to traditional travel. The benefits of Virtual Tourism include:

4.1 Accessibility and Inclusivity

One of the most significant advantages of virtual tourism is its ability to make travel experiences accessible to a broader audience. Many individuals, including those with disabilities, financial constraints, or travel restrictions, may find it

difficult to visit certain destinations in person. Virtual tourism eliminates these barriers, allowing people to explore landmarks, cultural sites, and natural wonders regardless of their physical location or personal circumstances.

4.2 Sustainability and Environmental Impact

Virtual tourism contributes to sustainable travel by reducing the carbon footprint associated with traditional tourism. Air travel, transportation, and overcrowding at popular tourist destinations contribute to environmental degradation. By providing an alternative way to experience travel, virtual tourism helps alleviate the negative environmental impacts of mass tourism, preserving cultural and natural heritage sites for future generations.

4.3 Economic Opportunities

The development of virtual tourism creates new economic opportunities for businesses and local communities. Tourism organizations, museums, and cultural institutions can monetize virtual experiences through online ticket sales, premium content, and interactive guided tours. Additionally, virtual tourism serves as a powerful marketing tool that can inspire travelers to visit destinations in person, ultimately boosting traditional tourism revenue.

4.4 Educational and Cultural Enrichment

Virtual tourism enhances education by providing students and researchers with access to historical sites, museums, and cultural landmarks worldwide. Schools and universities can integrate virtual experiences into their curricula, enabling learners to explore world heritage sites and historical events in an engaging and interactive manner. This fosters a deeper understanding of global cultures and historical contexts.

However, digital tourism has several challenges and limitations such as:

4.5 Lack of Physical and Sensory Engagement

Despite its benefits, virtual tourism cannot fully replicate the sensory and emotional experiences of traditional travel. The feeling of touching historical artifacts, tasting local cuisine, and engaging with local communities are integral parts of the travel experience that cannot be replicated through digital platforms. As a result, virtual tourism may not satisfy travelers seeking authentic and immersive experiences.

4.6 Technological Barriers

High-quality virtual tourism experiences require advanced technology, including high-speed internet, VR headsets, and interactive software. Not all users have access to these resources, especially in developing regions with limited digital infrastructure. Additionally, creating and maintaining virtual tourism platforms requires significant investment in technology, skilled professionals, and ongoing updates to ensure a seamless user experience.

4.7 Economic Risks for Traditional Tourism

While virtual tourism presents economic opportunities, it also poses risks to traditional tourism-dependent economies. If virtual experiences become a substitute rather than a complement to physical travel, businesses such as hotels, restaurants, and tour operators may suffer financial losses. It is essential to strike a balance between virtual and traditional tourism to ensure that both sectors thrive.

4.8 Cybersecurity and Data Privacy Concerns

As virtual tourism relies on digital platforms, it is vulnerable to cybersecurity threats, data breaches, and hacking. Users may be hesitant to engage with virtual experiences if they feel their personal information is at risk. Implementing strong cybersecurity measures and data protection policies is crucial to maintaining user trust and the credibility of virtual tourism platforms.

4.9 The Future of Virtual Tourism

As technology continues to evolve, the future of virtual tourism looks promising. Innovations such as artificial intelligence (AI), holographic projections, and advanced VR simulations will further enhance the quality and realism of virtual travel experiences. Additionally, the integration of virtual tourism with traditional tourism can create hybrid experiences, where travelers use virtual tools to plan their trips, explore destinations beforehand, and enhance their physical travel experiences. Governments and tourism organizations must collaborate to develop policies that support virtual tourism while ensuring its sustainable integration with traditional travel. Investment in digital infrastructure, training for professionals, and ethical guidelines for virtual experiences will be essential in shaping the future of this emerging industry.

5. SWOT ANALYSIS: A STRATEGIC PLANNING TOOL

SWOT analysis is a strategic planning tool used by businesses, organizations, and individuals to assess their internal strengths and weaknesses, as well as external opportunities and threats. By evaluating these four key factors, decision-makers can develop effective strategies to achieve their goals, improve performance, and gain a competitive advantage in their respective industries. SWOT is an acronym that stands for Strengths, Weaknesses, Opportunities, and Threats. Each component plays a crucial role in shaping an organization's strategic direction:

5.1 Strengths

These are the internal attributes and resources that give an organization an advantage over competitors. Strengths may include a strong brand reputation, loyal customer base, skilled workforce, innovative products, or efficient supply chains. Identifying strengths helps organizations leverage their advantages to maintain a competitive edge.

5.2 Weaknesses:

These are internal factors that may hinder an organization's success. Weaknesses could include poor financial management, lack of technological advancements, inefficient processes, or limited market presence. Recognizing weaknesses enables organizations to address and mitigate them, turning challenges into opportunities for growth.

5.3 Opportunities:

These are external factors that an organization can exploit to achieve its objectives. Opportunities may arise from market trends, emerging technologies, favorable government policies, or shifts in consumer behavior. By identifying and capitalizing on opportunities, organizations can expand their reach and improve profitability.

5.4 Threats:

These are external challenges that may negatively impact an organization. Threats could include economic downturns, increased competition, regulatory changes, or disruptive technological advancements. Understanding threats allows businesses to prepare contingency plans and minimize risks.

Benefits of SWOT Analysis

SWOT analysis offers several advantages to organizations seeking strategic direction such as:

- a) **Improved Decision-Making:** By evaluating internal and external factors, organizations can make informed decisions that align with their goals and resources.
- b) **Competitive Advantage:** Identifying strengths and opportunities allows organizations to develop unique selling propositions and differentiate themselves from competitors.
- c) **Risk Management:** Recognizing weaknesses and threats helps organizations proactively address potential challenges before they escalate.

- d) Strategic Planning: SWOT analysis serves as a foundation for developing organizations strategies, marketing plans, and growth initiatives.
- e) Enhanced Resource Allocation: organizations can allocate resources more effectively by focusing on areas that offer the highest potential for success.

6. A SWOT ANALYSIS OF VIRTUAL TOURISM IN CRETE

The strengths, weaknesses, opportunities and threats of developing virtual tourism in Crete are presented below.

6.1 The Strengths of Developing Virtual Tourism in Crete, Greece

One of the key strengths of virtual tourism in Crete is its ability to make the island’s historical and cultural heritage more accessible to a global audience. Crete is home to several ancient archaeological sites, such as the Minoan Palace of Knossos, Phaistos, and the ruins of Gortyna. By leveraging high-definition virtual tours and augmented reality experiences, visitors can explore these iconic locations in great detail from anywhere in the world. This not only enhances global interest in Cretan history but also helps preserve delicate historical sites by reducing physical foot traffic and the associated risks of deterioration. Additionally, virtual tourism in Crete promotes sustainable tourism by minimizing environmental impact. Traditional tourism often results in increased carbon emissions due to air travel and other transportation methods. By providing an alternative means of exploring Crete, virtual tourism can help reduce the energy consumption and the carbon footprint associated with

travel while still enabling people to appreciate the island’s beauty. Moreover, virtual experiences can help manage over-tourism in peak seasons, easing the pressure on popular sites and ensuring that natural and cultural landmarks are not overwhelmed by large crowds. Another major advantage of developing virtual tourism in Crete is its potential economic benefits. While traditional tourism is a significant contributor to Crete’s economy, it is also vulnerable to global crises, such as the Coved-19 pandemic, which severely impacted the industry. Virtual tourism can serve as a reliable supplementary revenue stream, attracting international visitors who may not have the means or opportunity to travel physically. Museums, hotels, and tour operators can offer paid virtual experiences, including guided tours, interactive exhibits, and exclusive online events, generating additional income for local businesses. Furthermore, virtual tourism in Crete has significant educational value. Schools and universities worldwide can integrate virtual tours into their curricula, allowing students to explore Crete’s archaeological wonders, traditional villages, and natural landscapes without leaving their classrooms. This approach fosters a deeper understanding of Greek history and culture while making education more engaging and interactive. Virtual reality experiences can also be tailored to accommodate people with disabilities who may face physical barriers when traveling in person. As virtual tourism continues to evolve, it has the potential to complement traditional travel, making Crete an even more accessible and attractive destination for future generations. The strengths of developing virtual tourism in Crete are presented in table 2.

Table 2. Strengths of developing virtual tourism in Crete

1	The historical and cultural heritage of Crete is more accessible to a global audience
2	Virtual tourism in Crete promotes sustainable tourism by minimizing environmental impact. Virtual tourism can help reduce the carbon footprint associated with travel while still enabling people to appreciate the island’s beauty
3	The development of virtual tourism in Crete has potential economic benefits. Museums and cultural monuments can offer paid virtual experiences increasing their revenues
4	The development of virtual tourism in Crete has significant educational value
5	Virtual reality experiences can accommodate people with disabilities who may face physical barriers when traveling in person
6	Virtual tourism can reduce tourists’ congestion in several popular historical and cultural monuments

Source: own estimations

6.2 The Weaknesses of Developing Virtual Tourism in Crete, Greece

Although digital technology allows people to explore the island remotely, virtual tourism cannot fully replace the authentic experience of physical travel. Understanding the limitations of virtual tourism is crucial in ensuring that it complements rather than replaces traditional tourism in Crete. One of the primary weaknesses of virtual tourism in Crete is the lack of sensory and immersive experiences that physical

travel provides. Tourists visiting Crete in person can engage with the island’s vibrant atmosphere, enjoy its traditional cuisine, feel the sea breeze, and interact with locals. Virtual tourism, despite its advancements, cannot replicate these multisensory experiences, which are essential to the overall travel experience. This limitation makes virtual tourism less appealing for those who seek a tangible and emotional connection with their destination. Another challenge of virtual tourism is the technological barrier. High-quality

virtual experiences require advanced digital infrastructure, including high-speed internet, virtual reality headsets, and interactive software. Not all potential users have access to these technologies, particularly in developing countries or rural areas with limited connectivity. Additionally, Crete itself must invest in digital resources and skilled professionals to develop and maintain virtual tourism platforms, which can be costly and resource-intensive. Virtual tourism may also impact the local economy negatively. Traditional tourism is a major contributor to Crete’s economy, supporting businesses such as hotels, restaurants, transportation services, and local artisans. If virtual tourism becomes a substitute for physical travel rather than a complement, it could lead to a decline in revenue for these sectors. The loss of direct interaction between tourists and local businesses may reduce opportunities for employment and economic growth in Crete’s tourism-dependent communities. Furthermore, virtual tourism does not generate the same level of

community engagement and cultural exchange as traditional tourism. When visitors physically travel to Crete, they engage with local traditions, attend cultural festivals, and interact with residents, fostering a deeper appreciation of the island’s heritage. Virtual experiences, however detailed, cannot provide the same level of human connection and cultural immersion, potentially reducing the impact of tourism on preserving and promoting Crete’s unique identity. Another significant issue is the potential for over-reliance on virtual tourism. While it serves as a valuable tool during global crises, such as the Covid-19 pandemic, it should not replace efforts to sustain and enhance traditional tourism. If stakeholders focus too much on digital experiences, they may neglect necessary infrastructure improvements for in-person tourism, ultimately affecting the long-term appeal of Crete as a travel destination. The weaknesses of developing virtual tourism in Crete are presented in table 3.

Table 3. Weaknesses of developing virtual tourism in Crete

1	Lack of sensory and immersive experiences that physical travel provides
2	High-quality virtual experiences require advanced digital infrastructure
3	Virtual tourism may also impact the local economy negatively reducing the tourism-related revenues
4	Virtual tourism does not generate the same level of community engagement and cultural exchange as traditional tourism
5	Over-reliance on virtual tourism may reduce the efforts to improve the traditional in-person tourism

Source: own estimations

6.3 The Opportunities of Developing Virtual Tourism in Crete, Greece

One of the most significant opportunities that virtual tourism provides is increased accessibility. Many people, including those with physical disabilities, financial limitations, or travel restrictions, may find it challenging to visit Crete in person. Virtual tourism allows them to explore the island’s stunning landscapes, historical sites, and cultural landmarks from anywhere in the world. High-quality virtual tours, augmented reality experiences, and interactive content can bring Crete’s unique heritage closer to a global audience without requiring physical travel. Virtual tourism also promotes sustainability by reducing the environmental impact associated with traditional tourism. Over-tourism and excessive foot traffic at popular sites can lead to environmental degradation and the wear and tear of historical landmarks. By offering virtual experiences, Crete can minimize its ecological footprint while still attracting and engaging tourists. This approach can help preserve the island’s natural and cultural treasures for future generations. Another major advantage of developing virtual tourism in Crete is the economic potential it holds. The digital tourism industry is growing rapidly, providing new revenue streams for local businesses. Museums, tour operators, and cultural institutions can monetize virtual experiences through

online ticket sales, exclusive digital content, and virtual guided tours. Additionally, virtual tourism can serve as a marketing tool to entice travelers to visit Crete in person, further boosting the local economy. Moreover, virtual tourism offers valuable educational benefits. Schools, universities, and researchers can use digital platforms to explore Crete’s archaeological sites, ancient ruins, and cultural traditions in a more interactive and engaging way. Virtual reality and augment reality applications can provide in-depth historical context, allowing users to experience reconstructions of ancient civilizations and significant events in Crete’s history. This fosters a greater appreciation and understanding of Greek heritage among students and scholars worldwide. Additionally, virtual tourism can enhance Crete’s global visibility and competitiveness in the tourism industry. With increasing demand for digital experiences, offering high-quality virtual tourism options can position Crete as a leader in innovative travel solutions. By adopting advanced technologies such as 360-degree video tours, drone footage, and interactive storytelling, Crete can create compelling virtual experiences that attract international attention and investment. The opportunities of developing virtual tourism in Crete are presented in table 4.

Table 4. Opportunities of developing virtual tourism in Crete

1	Virtual tourism provides increased accessibility. It allows people with physical disabilities or financial limitations to explore Crete
2	Virtual tourism also promotes sustainability by reducing the environmental impact associated with traditional tourism minimizing its ecological footprint
3	Virtual tourism in Crete holds an economic potential
4	Virtual tourism offers valuable educational benefits
5	Virtual tourism can enhance Crete’s global visibility and competitiveness in the tourism industry.
6	Virtual tourism may reduce over-tourism and excessive foot traffic at popular sites and monuments

Source: own estimations

6.4 The Threats of Developing Virtual Tourism in Crete, Greece

One of the major threats to virtual tourism in Crete is the potential for reduced physical tourism. As more travelers opt for virtual experiences, there is a risk that traditional tourism could decline, leading to financial losses for local businesses, including hotels, restaurants, and transportation services. Crete’s economy relies heavily on physical tourism, and a shift towards digital experiences could disrupt employment opportunities and income sources for the local population. Another significant challenge is the digital divide. Not all potential tourists have access to high-speed internet, advanced devices, or virtual reality headsets required to fully experience virtual tourism. This gap in accessibility could limit the reach of Crete’s virtual tourism initiatives, reducing its effectiveness in attracting a global audience. Additionally, Crete itself must invest in high-quality digital infrastructure and skilled professionals to develop and maintain these virtual experiences, which can be costly and resource-intensive. Cybersecurity threats and data privacy concerns also pose risks to virtual tourism in Crete. As virtual experiences rely on digital platforms, they become vulnerable to cyberattacks, hacking, and data breaches. Users may be hesitant to engage with virtual tourism if they feel their personal information or payment details are at risk. Ensuring secure platforms and robust cybersecurity measures is crucial

to maintaining trust and credibility in virtual tourism services. Furthermore, there is a risk that virtual tourism could diminish the cultural and emotional engagement associated with traditional travel. While digital experiences can showcase Crete’s archaeological sites, landscapes, and traditions, they cannot fully replace the sensory and interactive aspects of visiting in person. The lack of direct cultural exchange with locals, traditional food experiences, and the physical exploration of sites may reduce the overall impact of tourism on cultural appreciation and preservation. Environmental concerns also arise with the increased use of digital technologies. Virtual tourism relies on energy-intensive servers, data centers, and advanced computing resources, which contribute to carbon emissions. If not managed sustainably, the environmental benefits of reduced physical travel could be offset by the ecological footprint of digital infrastructure. Additionally, the commercialization of virtual tourism could lead to issues of authenticity and misinformation. Poorly designed virtual experiences may present an inaccurate or overly commercialized version of Crete’s culture and history. This could distort perceptions and fail to convey the island’s true heritage, ultimately undermining the authenticity that makes Crete a unique destination. The threats of developing virtual tourism in Crete are presented in table 5.

Table 5. Threats of developing virtual tourism in Crete

1	Virtual tourism in Crete reduces physical tourism
2	Virtual tourism results in financial losses for local businesses, including hotels, restaurants, and transportation services
3	Not all potential tourists have access to high-speed internet, advanced devices, or virtual reality headsets
4	Cybersecurity threats and data privacy concerns pose risks to virtual tourism in Crete
5	Virtual tourism could diminish the cultural and emotional engagement associated with traditional travel
6	Virtual tourism relies on energy-intensive servers, data centers, and advanced computing resources, which contribute to carbon emissions
7	Commercialization of virtual tourism could lead to issues of authenticity and misinformation

Source: own estimations

7. DISCUSSION

The current developments of VR and AR technologies allow the development of VT in many destinations worldwide. Virtual tourism is revolutionizing the travel industry by offering accessible, sustainable, and economically beneficial experiences. While it cannot replace the authenticity of physical travel, it serves as a valuable complement that enhances education, cultural appreciation, and environmental conservation. It can be used as a marketing tool to promote tourism destinations or in cases of unexpected events like the Covid-19 pandemic. The tourism industry in the island of Crete, Greece is well developed and prosperous. The island has many natural and monumental attractions hosting more than six million visitors every year. However, the tourism industry is threatened from overtourism and climate crisis. The promotion of VT can mitigate climate change due to greenhouse gas emissions caused a) by in-person tourism, and b) overtourism caused by the presence of a high number of tourists in a specific location at the same time. However, VT reduces the income caused from the physical presence of tourists in Crete. SWOT analysis is a valuable tool for assessing an organization's internal and external environment. The SWOT analysis of VT in Crete identified its strengths, weaknesses, opportunities and threats assisting in the development of a strategic plan for its growth in the future. SWOT analysis though has various limitations such as lack of prioritizing the actions by importance, the subjectivity, the static view and the oversimplification of complex situations. Future work should be focused in the implementation of a PESTEL analysis for VT in Crete.

8. CONCLUSIONS

A SWOT analysis regarding the development of VT in Crete has been realized. The tourism industry in Crete is a vital economic driver, offering a diverse range of attractions that cater to history lovers, nature enthusiasts, and beachgoers alike. However, challenges such as seasonality, environmental concerns, and infrastructure development must be addressed to ensure sustainable growth. As the world embraces digital transformation, VT will continue to play a significant role in shaping the future of global travel, offering new opportunities for exploration and connection in an increasingly interconnected world. SWOT analysis is a valuable tool for assessing an organization's internal and external environment. It provides a structured approach to navigating challenges and capitalizing on opportunities. In today's competitive and ever-changing landscape, leveraging SWOT analysis can be the key to long-term success and sustainability. The SWOT analysis of VT in Crete has indicated its pros and cons suggesting that it should be developed complementing the physical tourism in the island.

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