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Role of Virtual Reality in Tourism in Kenya

Mercy Deche and Casty Mugoh

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THE KENYA INSTITUTE FOR PUBLIC POLICY RESEARCH AND ANALYSIS (KIPPRA)

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Kenya Institute for Public Policy Research and Analysis

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This paper is produced under the KIPPRA Young Professionals (YPs) programme. The programme targets young scholars from the public and private sector, who undertake an intensive one-year course on public policy research and analysis, and during which they write a research paper on a selected public policy issue, with supervision from senior researchers at the Institute.

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Abstract

Countries are investing in the fourth industrial revolution (4IR) by recognizing new niches for different industries and leveraging on them to achieve sustainable growth. Tourism being a significant driver in economic growth, the government recognizes the need for tourism diversification through promotion of niche products to achieve the sector's potential. There have been efforts to embrace the emerging technologies presented by 4IR to meet the evolving tourism trends thus remaining a leading and innovative player in the global tourism landscape. The findings indicate a most probable future that leverages on VR to facilitate access to restricted and protected areas. The future presents tourists who are tech-savvy, demand immersive experiences but have increased desire for sustainable practices. Also, the study anticipates a scenario where VR dominance in marketing tourism will be experienced. This future is characterized by robust stakeholder collaborations and sufficient policies and laws on VR as well as stringent data protection measures. However, a major impediment towards achieving this future would be the high cost of VR technology and the required infrastructure. To cater for the VR boom in ecotourism and VR use in marketing, the government may provide oversight mechanisms in adoption and usage of VR coupled with concrete regulations to enhance privacy, responsible and sustainable practices. Further, it is imperative that incentives are offered vide tax breaks and subsidies to make VR technology affordable and promote the utilization of renewable energy sources in VR studios. There will be need for international collaboration to standardize the cross-border practices and regulations for a sustainable VR ecotourism.

Abbreviations and Acronyms

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1. Introduction

Virtual reality technology presents an alternative tool for promoting tourism by complimenting traditional strategies that are employed to grow the tourism industry. This technology is integral to the Fourth Industrial Revolution (Industry 4.0) which employs technologies such as Internet of Things (IoT), robotics, virtual reality among others to fuse the physical, digital, and biological worlds (Khan, 2024). Industry 4.0 anchors on previous industrial revolutions including the first and second, by building on the digital revolution. Economies are investing in industrial 4.0 by recognizing new niches for different industries and leveraging on them to achieve sustainable growth (Fox & Signé, 2021). This builds a firm platform for the adoption of virtual reality leveraging on digital revolution to provide simulated experiences for prospecting tourism.

Virtual reality (VR) is one of the most significant developments in the ICT (Information and Communication Technologies) field with an enormous impact on the tourism industry (Guttentag, 2010). VR is a technology that uses computer-generated 3D environment to create a physical immersion and psychological presence. VR offers a wide range of useful applications such as planning, marketing, and customer experience in the tourism industry.

The tourism sector remains a significant driver of economic growth and development worldwide. In Kenya, the sector contributes about 9 per cent of the country's GDP (Gross Domestic Product) while accounting for more than 10 per cent of total employment and 18 per cent of the foreign exchange (Revised National Tourism Policy, 2020). However, it relies majorly on traditional marketing methods such as Marketing Destination Representatives (MDRs) to garner attention as a tourist destination. These methods are limited in capturing the immersive and interactives experiences sort by tourists thus failing to meet the evolving tourism trends. Notably, traditional methods affect the sustainability of tourism products during unprecedented disruptions causing uncertainties in the industry.

Adoption of modern tools for tourism promotion in Kenya is low though gaining momentum. For instance, with low adoption of VR to promote Kenya's diverse tourism offerings, the country risks falling behind in presenting its unique offerings, potentially resulting in decreased tourism revenues, fewer job opportunities, and a failure to fully capitalize on the sector's potential as a catalyst for economic development. Addressing this gap becomes imperative to ensure that Kenya remains a leading and innovative player in the global tourism landscape.

The broader aim of this study is to investigate the role of virtual reality in the Kenyan tourism industry. The specific objectives of the study are to: i) Identify the drivers of change in adoption of virtual reality in the Kenya’s tourism sector. ii) Identify projections on the future of virtual reality in enhancing the tourism industry in Kenya by 2063.

This study aims to provide policy evidence on efforts and projections that promote the tourism industry by leveraging on virtual reality. The government recognizes that the travel and tourism industry is evolving rapidly, and tourist needs have

changed across generations. The Bottom-up Economic Transformation Agenda focuses on diversifying tourism by promoting niche market products including adventure tourism, sports, and cultural tourism. Further, the Ministry of Tourism and Wildlife (2020) is aware that business leaders in the industry need to continuously embrace the latest developments and trends to boost the sector and the economy. The unprecedented changes resulting from adoption of virtual reality (VR) in the tourism sector in various parts of the world prompts the Kenyan industry to be forward-thinking and fully prepared for the integration of the technology.

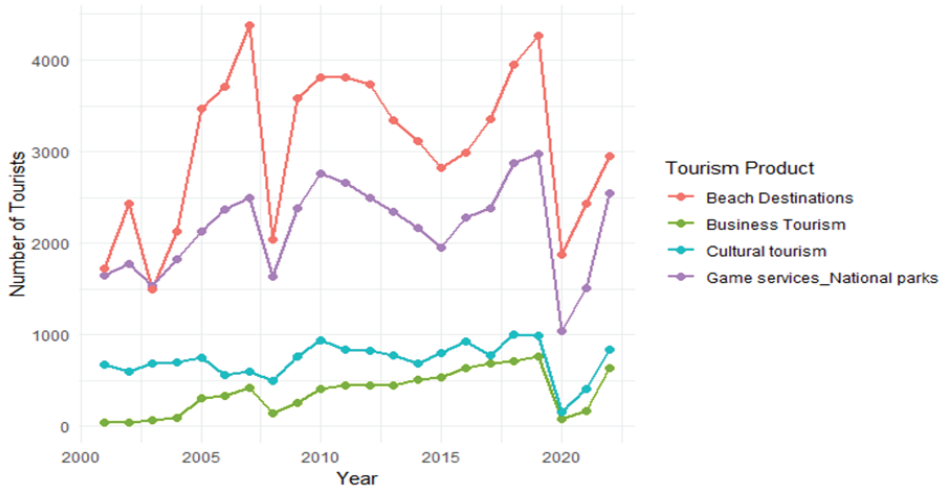
2. Situational Analysis of Tourism Industry

2.1 Trends in the Tourism Industry

Kenya's tourism sector presents a crucial economic contributor encompassing of cultural heritage, MICE tourism, wildlife safaris, health, and sports tourism. In 2022, the sectors contribution to the GDP and employment stood at 6.4 per cent which represented an annual change of +37.9 per cent and 7.9 per cent reflecting an annual change of +11.4 per cent respectively. (WTTC Economic Impact Kenya, 2023)

Domestic visitors spending generated 67.8 per cent (KES411.6 billion) of total spending in 2022 contrasted with 32.2 per cent (KES195.5 billion) for foreign visitor spending or international tourism. Domestic visitor spending is expected to rise by 5.5 perc cent per annum to KES 773.0 billion and visitor exports are expected to rise by 4.6 per cent per annum to KES 329.0 billion from 2023-2033 (WTTC Economic Impact Kenya, 2023)

Figure 2.1: Tourism experiences growth in Kenya from 2001-2022



Source: Kenya Economic Survey Report 2023

Figure 2.1 above show the trends in the growth of various tourism experiences in Kenya. Beach destinations have remained the most preferred tourism experience over the course of 22years and is followed closely by games services and national parks. This trend reinforces the fact that Kenya is largely a beach and game safari country. Business and cultural tourism have not made any significant growth within the preferred period as contrasted with games safaris and beach destination. Furthermore, it is evident that Kenya's tourism sector had a fall in 2008 and 2020 owing to post-election violence and the Covid-19 pandemic, respectively. However, as the country is slowly recovering from the effects of the pandemic, a boom in tourism is emerging and expected to continue. To promote

sustainable growth in the sector amidst any unprecedented events and grow the different tourism destinations, adopting emerging 4IR technologies is paramount.

2.2 Legal and Regulatory Frameworks related to Tourism in Kenya

Within the international realm, Kenya bares a duty under the Sustainable Development Goals (SDGs) target 8.9 and 12.B to devise and implement policies and tools to monitor sustainable development impacts towards achieving sustainable tourism that creates jobs and promotes local culture and product. In addition, target 9.B seeks to ensure support for domestic technology development, research, and innovation in developing countries by ensuring a conducive policy environment for, inter alia, industrial diversification and value addition to commodities.

At the regional level the country has ratified several policies that impact on its tourism industry, particularly, the marketing strategy. The Inter-governmental Authority on Development (IGAD) Sustainable Tourism Master Plan aims to avail to it members a framework for sustainable tourism development. The specific objective lies in detailed analysis of the prevailing status of tourism development and providing a detailed roadmap for the implementation of strategies and actions.

The East African Community (EAC) Tourism Marketing Strategy 2021-2025 strives to make EAC a leading sustainable regional tourism destination in Africa by developing and promoting inclusive and sustainable intra-regional and international tourism across the region.

At the national level, a plethora of policies and legislations have been enacted and implemented to achieve sustainable tourism that advances the nation's economic objectives. The Constitution of Kenya, 2010 as the ground norm provides for cultural rights which includes their preservation thereof. Culture is a key component of tourism in Kenya. Further, the Constitution provides for land use and management. This is a critical consideration for tourism development and in particular Article 60 requires use of public land e.g., wildlife reserves and ecological areas for the benefit of the larger society.

The Kenya Visions 2030 acknowledges that the tourism is highly competitive and subject to price changes despite the ability of premium parks and niche products to fetch higher prices irrespective of season. To revive the industry, the country's aspirations are to re-strategize its marketing model, develop niche products including cultural tourism and make proper use of underutilized parks. The National Tourism Blueprint 2030 intends to identify crucial drivers and enablers of tourism growth for the country and provide a practical implementation plan to attain the country's tourism and economic goals. It enumerates the weakness and strengths of the tourism sector and the viable opportunities for its revival. In addition, the New Tourism Strategy 2021-2025 acknowledges the need to utilize technology in marketing the tourism sector and outlines various marketing strategies. It advocates for the push of digital marketing content to create awareness on what Kenya has to offer and trigger searches which can be pushed through Kenya Tourism Board (KTB) or proprietary channels.

Table 2.1: Aspects of Tourism governed under the various Laws

No.	Aspect/Issue	Statute	Regulator	Lacunas/Gaps
1.	Tourism Regulation	Tourism Act 2011	Tourism Regulatory Authority	Pricing Content creation
2.	Tourism Research and Analysis	Tourism Act 2021	Tourism Research Institute	
3.	Tourism Marketing	Tourism Act 2011	Kenya Tourism Board	
4.	Tourism Protection	Tourism Act 2011	Tourism Protection Service	
5.	Business Tourism	Tourism Act 2011	Kenyatta International Convention Centre	
6.	Tourism Financing	Tourism Act 2011	Board of Trustee (Tourism Fund)	
7.	Adjudication of cases	Tourism Act 2011	Tourism Tribunal	
8.	Tourism and hospitality training Capacity building	Tourism Act 2011	Kenya Utalii College	
9.	Wildlife conservation	Wildlife Conservation and Management Act (Cap 376)	Kenya Wildlife Service	Lack of proper regulation on use of VR in wildlife conversation. Ethics in content creation in relation to animal welfare and cultural sensitivities
10.	Wildlife training and research	Wildlife Conservation and Management Act (Cap 376)	Wildlife Research and Training Institute	

The Tourism Act, 2011 serves as the primary legislative instrument that regulates the conduct of tourism activities in Kenya and aims at providing for the development, management, marketing, and regulation of sustainable tourism (Table 1). The Act establishes the various regulatory institutions which include the Tourism Regulatory Authority, Kenya Tourism Board, Tourism Research Institute, Tourism Protection Service, Tourism Fund, Tourism Finance Corporation, the Kenya Utalii College, and the Kenyatta International Convention Centre.

In addition, the Wildlife Conservation and Management Act 2013 provides for protection, conservation sustainable use and management of wildlife in the country. Game reserves are Kenya's primary tourist attraction hence the need for effective protection and management. The Act also establishes the Wildlife Research and Training Institute to foster research, data collection, and analysis in respect of wildlife.

Table 2: Aspects arising from adoption and use of Virtual Reality governed under various legislations.

No.	Aspect/Issue in usage of virtual reality	Statute	Regulator	Lacunas/Gaps
1.	Privacy/data protection	Data Protection Act, 2019 Constitution of Kenya 2010	Office of the Data Protection Commissioner	Content creation, pricing, jurisdiction and imposition of criminal liability.
	Virtual crimes	Computer Misuse and Cyber Security Act	National Computer and Cybercrimes Co-ordination Committee Kenya National Police Service	
	Intellectual property	Copyright Act Cap 130 Industrial Property Act Cap 509	Copyright Board Kenya Industrial Property Institute	

The Country like many other jurisdictions does not possess a policy, legal or institutional framework that address the concepts of virtual reality adoption and usage in the tourism sector. Despite the foregoing, certain aspects arising from the

integration of VR in the tourism sector can be regulated under other existing laws. For instance, the aspect of privacy and data protection in VR can be regulated under the existing Data Protection Act 2019; Intellectual Property aspects can be governed by the Industrial Property Act (Cap 59) and the Copyright Act (Cap 130), and the concept of virtual crimes can be dealt with under the Computer Misuse and Cyber Security Act. However, these enactments provide a general regulation rather than a tailored regulatory framework for the adoption and usage of virtual reality in the tourism industry. In addition, vital aspects such as jurisdiction, criminal liability imposition, content creation and pricing remain unaddressed.

Despite all these instruments, the tourism sectors in Kenya still faces challenges. Firstly, Kenya operates on an outdated marketing strategy which does not offer clear directions on marketing the various tourism products offered in the country. There is no tailored marketing strategy for the various products as Kenya's Tourism Strategy focuses on capitalizing on the brand and targeting of markets rather than identification of the iconic aspects of the products. Secondly, the instruments have not effectively dealt with the tourism pricing aspects and players within the market are free to determine the prices for various products thus leading to undervaluation or overvaluation of the products.

3. Literature Review

This section discusses some of the theories aligned with the objectives of the study and studies that have been done previously about the potential of the tourism sector in enhancing the tourism industry.

3.1 Theoretical Framework

The theoretical foundation for this study is grounded in the Technology Acceptance Model and Technology Readiness Index Model

3.1.1 Technology Acceptance Model

The Technology Acceptance Model (TAM), initially proposed by Fred Davis in 1986 and later extended by Davis and Richard Bagozzi, identified two key factors determining the acceptance of a computer system: perceived usefulness and perceived ease of use. Perceived usefulness is the user's subjective belief that the system will enhance job performance, while perceived ease of use refers to the user's expectation of the system's ease of operation. TAM views technology acceptance as a three-step process, involving external factors, cognitive responses, and affective responses, ultimately influencing user behavior. In the context of Virtual Reality (VR) in tourism, TAM becomes instrumental in understanding how users perceive the ease of interacting with VR content and the value they see in using VR for travel experiences. This perception is crucial for estimating future demand and guiding the tourism industry in adopting VR technology.

While TAM has been critiqued for its simplicity and limited understanding of acceptance antecedents, researchers have extended the model to include additional factors influencing technology acceptance. These extensions consider subjective norms (social pressures or expectations) and image (impact on self-image or social identity). Examining subjective norms and image is essential in comprehending the social and cultural dynamics influencing the acceptance of VR in Kenyan tourism. Extended technology acceptance models have faced their own limitations, with TAM, for instance, being criticized for its organizational context specificity. However, the model is augmented with the Technological Readiness Model to overcome these limitations. Overall, TAM and its extensions provide a valuable framework for understanding the complex dynamics of technology acceptance, offering insights into user perceptions and behaviors, especially in the context of VR adoption in the Kenyan tourism industry.

3.1.2. Technological Readiness Model (TRM)

The Technology Readiness Model (TRM), initially introduced by Parasuraman in 2000, evaluates individuals' preparedness to adopt technology based on their perceived levels of optimism, innovativeness, discomfort, and insecurity (Parasuraman, 2000). These four personality dimensions collectively shape

individuals' inclinations toward embracing modern technologies. Optimism and innovativeness act as cognitive catalysts, reflecting positive expectations and openness to technology, while discomfort and insecurity serve as cognitive barriers, indicating concerns and reservations about modern technologies. Technology readiness, a blend of positive and negative beliefs, varies among individuals and influences their predisposition to engage with technological advancements (Parasuraman & Colby, 2007).

Assessing the optimism and innovativeness of tourists and industry players towards Virtual Reality (VR) offers insights into potential adoption rates and enthusiasm for immersive experiences. Conversely, examining discomfort and insecurity factors among Kenyan tourists and stakeholders provides valuable insights into potential barriers hindering widespread VR adoption in tourism. The TRM framework enables the development of targeted strategies for enhancing VR adoption in Kenyan tourism. Policymakers and businesses can tailor interventions by addressing factors such as optimism, innovativeness, discomfort, and insecurity to create a more conducive environment for VR technologies.

Importantly, TRM facilitates user segmentation based on technology readiness levels. Understanding the diverse readiness levels among Kenyan tourists and industry stakeholders allows for a nuanced approach to VR implementation. This ensures that strategies align with the specific needs and concerns of different user segments. Additionally, TRM provides a foundation for assessing the long-term acceptance and integration of VR in Kenya's tourism sector. By tracking changes in users' technology readiness over time, the model supports ongoing evaluations and adjustments to strategies for sustained success.

3.2 Empirical Literature

3.2.1 Drivers of Change in Adoption of Virtual Reality in the Kenya's Tourism Sector

In recent years, the tourism sector has witnessed an exponential growth in technology adoption. Virtual reality is one of the emerging technologies with an increased demand for the experiences it offers in the industry. Past and present discussions have explored the drivers of VR in the tourism industry terming the 4IR technology as either a threat to the industry, an experience enhancer, or a potential marketing tool (Bogicevic et al., 2019; Cheong,1995; Flavián et al., 2021).

For instance, de Lurdes Calisto & Sarkar (2024) conducted a systematic review of 54 studies to understand the potential of VR in tourism and hospitality and its key determinants. The study revealed that VR is currently being used because of its ability to enhance travelers' experiences through immersive exploration of destinations and attractions. Further the technology's usefulness as a marketing tool for businesses continues to increase its demand. The study highlighted that VR has become a critical tool in generating a new model of tourism.

Hoang et al. (2023) used data from 512 local and international tourists in Vietnam who had taken part in a VR experiment to investigate how VR can enhance

telepresence and travel intentions thus promoting sustainable tourism industry. The study had two groups of tourists with the treatment group using VR sets and the control group employing the 2D screen. The results showed that the VR-based tours reported greater telepresence compared to their 2D counterparts. The study showed that the use of VR enhanced the intentions to travel to the marketed destination. The authors recommended tourism companies to develop and sell virtual tours of nature-based destinations to their customers to promote demand.

In the contrary, Xie-Carson et al., (2023) used a discrete choice model to investigate consumers' choice of virtual influencers (VI) among 29 adult Instagram users located in Australia and found out that the respondents preferred human-like VIs over 3D animated VIs with the least preferred being 2D animated VIs. According to the study, tourism practitioners seeking to adopt VI marketing on social media should consider the most up-to-date technology that includes images that show case destinations from different angles. Presentation of the tourism setting, influenced by the quality of VR technology, is a key selling point for prospective tourists, so quality VR sets should be used to take the images to be posted. However, the study notes that VI marketing is an emerging phenomenon which offers significant opportunities for growth in the tourism industry.

Aljinović et al. (2023) investigated the potential and obstacles of employing virtual tourism in protected and conserved areas post-COVID. From the study, VR showed significant potential in inspiring visitors to pursue conservation actions. VR provides avenues for revenue generations and reducing the seasonality impacts. The study revealed that virtual tourism can promote sustainable tourism by reducing unnecessary green gas emissions from transportation, minimizing disturbance to species and their habitats. Among other opportunities were potential to enable customers get acquainted remotely with a destination before actual visit, therefore inspiring future in-person travel; helps break spatial, monetary, temporal, and other barriers that hinder in-person visits to the destinations.

Some of the challenges found in the study included limited connectivity due to limited internet access to remote areas, loss of local livelihoods that relied on income from in-person tourists, costly technology in adopting virtual tours. The authors recommended consideration of technical feasibility, collaboration between tourism and other relevant ministries, and local engagement and benefit-sharing in realization of the benefits.

To understand whether VR could save the tourism industry in South Africa in the wake of COVID-19, Verkerk (2022) used case studies, open-ended interviews, and conceptual research method. The study proved VR as a beneficial tool for tourism in the country especially in education and entertainment, marketing and planning, accessibility, and sustainability. For instance, a student-run business at the University of Pretoria offered entertainment to potential students through a virtual tour of the campus on Zoom. Two Oceans Aquarium, in Cape Town enabled tourists to virtually view penguins while physically exploring the aquarium. The study showed that VR was being used by the tourism-related companies and organizations as an opportunity to generate tourism revenue by allowing them to pay upfront before exploring the virtual destination.

Another common use of VR in generating tourism revenue was the use of VR-related games. However, VR presented several barriers to the industry including loss of tourism revenue, health concerns, technological issues, access, and the digital divide and tourist experience. The study concluded that VR's potential to rescue the country's tourism industry was limited by electricity issues, particularly frequent power outages caused by the Electricity Supply Commission. This posed a risk to VR technology due to the potential damage from powerful surges during these disruptions. Another key challenge was the huge digital divide in the country with most of the population living in rural areas with inadequate access to the internet.

3.2.2 The Future of Virtual Reality in Enhancing the Tourism Industry in Kenya by 2063

In reviewing the literature to understand the past, present, and future of virtual tourism Verma et al. (2022) highlights technology and sustainability as strategic pillars. The study discusses VR as one of the key technologies in realization of virtual tourism both in the present and future. The study notes the potential of substituting traditional tourism with telepresence using VR wearable gadgets and immersive technology that triggers sensory experiences in the future.

A similar study by Guttentag (2010) indicates that VR's future roles in tourism sector has both significant opportunities and challenges. He argues that as VR technology advances resulting in creation of immersive experiences, concerns might emerge on privacy of the VR data. In the study, there are issues around VR substituting physical tourism and thus the authenticity of various destinations.

A systematic literature review of studies related to the potential future developments concerning VR showed that the technology is being developed as part of smart tourism (Pestek & Sarvan, 2020). According to the study, this technology not only can provide information about destinations and attractions but is likely to become a new tourism service. However, there have been difficulties with tourists keeping up with modern technology. The authors note that VR will change the way in which tourists experience destinations by making them more interactive and providing detailed navigations to help in trip-planning.

A study by Naik et al., (n.d.) to investigate the future of virtual reality in tourism using a case of India indicates that most reputed tourism companies continue to understand the importance of VR and are optimistically looking forward to adopting it. The research argues that VR will become the new normal to demonstrating destinations with advanced technology and cost-effectiveness being key drivers. The study pointed out that VR business will achieve a global growth of about 80 billion US dollars by 2025 and given its accelerated commitment its value will be around 182 dollars. The study adds that several reports such as the International Data Corporation 2018 and Skyscanner indicate that VR bears the highest potential for growth and is likely to experience a 21 times investment in the next few decades. During the fourth industrial revolution where both technology and sustainability are pertinent issues, VR is a critical tool in realizing the potential of

virtual tourism in developing countries and especially in Kenya. This study seeks to explore the potential of VR to promoting the Kenyan tourism industry.

4. Methodology

4.1 Scenario Development for the Future of VR in Tourism Sector

This study seeks to develop scenarios about the future of virtual reality in the Kenyan tourism sector. The research is guided by two main objectives: To identify the key drivers of change in adoption of VR in the tourism sector and to identify projections on the future of virtual reality in enhancing the tourism industry in Kenya by 2063. The research expert team will consist of diverse stakeholder groups mainly from both the public and private sectors. The scenario development was built on a two-round Delphi survey with a target of 30 participants from the public and private sectors.

A set of projections were used to prompt future developments within the survey. A DEFT framework (including drivers, enablers, frictions, and turners) was applied to structure the development of the projections. After screening 37 relevant articles to gain overview of trends 14 drivers of change in adoption VR were derived. Afterwards, desk research resulted in 14 future projects derived from each of the drivers of change. The Delphi study participants assessed each of the 14 projections regarding (i) their estimated probability of occurrence and (ii) estimated sectoral impact. In addition, they had to give their opinion about the future of VR in the tourism industry. Based on qualitative and quantitative assessments from the data generated from the Delphi survey, there was scenario development.

4.2 Delphi Technique

The study employed the Delphi method which is an interactive multi-stage forecasting method that relies on experts to identify technical developments and trends. This approach's objective is to structure complex group opinions and develop consensus on future developments among experts.

4.2.1 Formulation of Delphi Projections

The first step of this approach was to develop a set of projections on the future of virtual reality through desk research. The study followed DEFT analysis framework, a well-established framework in the forecasting literature, in structuring the drivers of change and future projections. A thorough desk review resulted in a final set of 14 projections for the Delphi Survey.

4.2.2 Recruitment of Panel Experts

The study focused on the research scope, desired panel heterogeneity, and availability of experts in the area under investigation in the recruitment of the panel participants. The target panel size was 30 respondents to have a heterogeneous structure of stakeholders. Heterogeneity of experts deliver more

accurate estimate and more diverse viewpoints which reduce certain polarization of preferences and responses (Yang et al., 2023). The potential experts were identified through a networking approach and search in professional social networks (such as LinkedIn). The selection criteria were based on the technical specialization in tourism, ICT, policy space, and expression of interest in VR in tourism. The experts needed to show capabilities of delivering suitable statements about future developments and to be interested in the study results.

4.2.3 Execution of Delphi Survey

For the Delphi Survey, the study used Google Forms to create a questionnaire for Round 1 and 2 surveys. In the first Round, the questionnaire had 31 questions where only two were open-ended and 29 were closed-ended. Out of the 29 closed-ended questions, 28 of the questions asked the experts to evaluate the 14 projections according to their estimated probability of occurrence and the industry impact for the year 2063. The probability of occurrence was measured in percentages ranging from zero to 100 (where 0=" very low" to 100 per cent=" very high"). In addition, the industry impact was measured on a 5-point Likert scale (ranging from 1=" very low" to 5=" very high impact".

After collecting 26 responses from the participants, of which 9 were from the tourism experts, 5 from policy space, 5 from ICT, 4 from the private tour companies, and 3 tourists, the results were analyzed. The analysis involved calculation of the mean, standard deviation, upper and lower thresholds from the probability of occurrence scores. The upper and lower threshold was used as a test-statistic to show whether the respondents had achieved consensus on the probability of occurrence for a specific projection. The formula for obtaining this threshold was X ☐☐1*sd. This approach also known as the Empirical Rule ensures that approximately 68 per cent of the data falls within one standard deviation of the mean (Chan, 2022). The responses whose standard deviation was within the threshold indicated consensus was achieved for a specific projection.

The interquartile range (IQR) was used as a test-statistic for consensus for the 5-Likert scale scores which showed the projections' impact in the industry. IQR was obtained from the formula IQR=Q3-Q1; where Q1 is the first quartile and Q3 is the third quartile. IQR represents the middle 50 per cent of the observations (Sekaran and Bougie, 2013). An IQR≤2 which is considered appropriate in determining consensus for most Delphi studies was adopted in this study (Becker & Roberts, 2009; Giannarou et al., 2019). The study considered a threshold consensus of 75 per cent agreement among participants for both impact and probability of occurrence scores (Barrios et al., 2021; Diamond et al., 2014; Foth et al., 2016; Hsu & Stanford, 2007).

A second Delphi round was conducted after failure to achieve 75 per cent consensus for the probability of occurrence. Round 2 survey included projections that did not reach consensus in Round 1. During the second survey, panelists were given feedback on Round 1 results and asked to reevaluate their responses on the specific projections. Round 2 survey consisted of 6 open-ended and 6 closed-

ended questions relating to the projections that did not meet consensus in Round 1. Participants were expected to explain their reasoning for rating every projection in Round 2 survey. The motivation of Round 2 survey was to improve consensus among expert evaluations and thus achieve higher data validity (Von der Gratch and Darkow, 2010).

4.2.4 Scenario Development

The average estimated impact and average estimated probability of occurrence in Round 2 survey was used for scenario development. A scenario cluster plot was developed to indicate the most probable scenario from the aggregated means of the experts' quantitative assessments. Further desk research was conducted to verify the projections under each of the scenarios. The detailed presentation of the scenarios is in the results section.

5. Results

This section highlights the findings from the Delphi technique to address the two objectives in this study.

5.1 Drivers of Change in Adoption of Virtual Reality as the Future of Tourism Industry

This section discusses the key factors driving adoption of virtual reality in the tourism sector. These factors are derived from various studies that have explored applications of VR in tourism, including opportunities and challenges.

Table 3: The driving forces of virtual reality in tourism

DETF analysis	Factors informing the future of VR in Tourism	Citations
Drivers	Increasing demand for Immersive experiences	Ouerghemmi et al., (2023), Israel et al., (2023), Wang, J. (2024); Park & Stangl (2020); ILO. (2022), Jawarneh et al., (2023)
	Accessibility and convenience	Aljinović, et al. (2023); Zhang et al., (2022)
	Education and Awareness	Fauzi et al., (2023), Shen et al., (2022)
	Marketing and branding	Rather et al., (2024), Hollebeek et al., (2023), Tiusanen, (n.d.), Chan et al., (2023)
Enablers	Government support	Patel et al., (2023); Kunitake, (n.d.)
	Infrastructure development	Yang et al., (2022); Srinivasan et al., (2024)
	VR content creation	Singh Raikwar, (2021),
	Collaboration amongst stakeholders	Serravalle et al., (2019); Vinodan & Meera, (2024) ; Fazio et al., (2023)

Frictions	Limited awareness	Fauzi et al, (2023); Kubitzek, B. (2021); Merkx, C., & Nawijn, J. (2021).
	Technological challenges	Polishchuk et al., 2023; Rauscher et al., (2020)
	Affordability	Jenny, (2017); Wen et al., (2023),
Turners	Cost considerations	Dieck, M.C.; Jung, T. A (2018); Escobar-Rodríguez, T.; Carvajal-Trujillo, E (2014);Tourism in the Metaverse: Can Travel Go Virtual? | McKinsey, (n.d.)
	Content quality	Aljinović et al., (2023); Kubitzek, B. (2021)
	Data privacy	Chan, P. (2022); Dick, E. (2021); Henriksson, E. A. (2018)

5.2 Projections on the Future of Virtual Reality in Enhancing the Tourism Industry in Kenya by 2063

Based on desk review and expert analysis from Round 1 and Round 2 surveys, a set of 14 projections on the future of virtual reality in tourism were developed. Table 4 provides the set of the projections that guided scenario development.

Table 4: Projections of VR in the tourism sector in 2063

No.	Projections for 2063
	Drivers
1	In 2063, VR tours will have replaced the physical tourism
2	In 2063, virtual reality applications will be majorly employed in protected and conserved areas
3	In 2063, there will be growing research and development on VR technology making it more user-oriented
4	In 2063, VR technology will replace the traditional marketing approaches
	Enablers
5	In 2063, the government will have implemented sufficient policies and laws for VR adoption in tourism
6	In 2063, there will be full integration of VR technology into the tourism infrastructure.

7	In 2063, the VR content creation will have evolved to offer immersive and personalized experiences growing the number of tourists
8	In 2063, there will be robust collaboration amongst stakeholders facilitating seamless adoption VR in tourism
	Frictions
9	In 2063, there will be low uptake of VR technology and thus tourists will not fully capitalize on the available immersive experiences
10	In 2063, use of outdated technologies and insufficient connectivity leading to limited VR adoption in tourism
11	In 2063, the cost of VR technology and infrastructure will still be high therefore out of reach for many tourists
	Turners
12	In 2063, there will a significant decrease in the cost of VR technology thus high uptake in the sector
13	In 2063, tourists will experience high quality and immersive VR experiences due to advancement in technology
14	In 2063, there will be stringent data protection regulations owing to consumer demand for transparency in data collection and handling

5.2 The Future of Virtual Reality in Enhancing the Tourism Industry by 2063

5.2.1 Delphi Survey

Table 5 shows the results of the Delphi survey including the IQR of the impact of the 14 projections for both Round 1 and Round 2 surveys. It also displays the upper and lower thresholds from the probability of occurrence of the projections for both surveys. The descriptive statistics (IQR, lower and upper thresholds) depict the consensus development in Delphi Round 1 and 2. The participants reached a consensus of 92.86 per cent on the projections' impact in Round 1, which improved to 100 per cent in Round 2. Similarly, a consensus in 9 out of 14 projections (64.29 per cent) was reached after Round 1 and 12 out of 14 (85.71 per cent) after Round 2.

The fact that the projections fulfill the interquartile range criterion of ≤2 of 75 per cent after Delphi Round 1 and 2 shows that different stakeholders appreciate the impact that virtual reality has in revolutionizing the tourism industry. Despite the diverse pool of experts from policy space, tourism industry, and ICT there was convergence of opinions on how impactful the projections would be in tourism come 2063.

Results on estimates for the probability of occurrence show that consensus was reached for most of the projections using the criterion LT≤SD≤UT. During

Round 1, consensus was reached for Projection 1 (VR replacing physical tourism), Projection 5 (Sufficient policies and laws), Projection 6 (full integration of VR), projection 8 (stakeholder collaboration), Projection 9 (Low VR uptake), Projection 10 (outdated technologies), Projection 11 (High cost of VR and infrastructure), Projection 12 (decrease cost of VR), and Projection 14 (stringent data protection). After Round 2, additional consensus was reached on Projection 2 (VR use in conserved and protected areas), Projection 4 (VR replacing traditional marketing), and Projection 7 (evolution of VR content). Aside from consensus or dissent, there was scenario mapping as shown in Figure 1.

Table 5: Respondents Consensus on the VR Future Projections in Round 1 and 2

VR Projections for 2063	Round 1	Round 2							
		IQR	SD	LT	UT	IQR	SD	LT	UT
	Drivers								
1	Physical tourism replaced	1.25	28.37	11.88	66.96				
2	Applications in protected and conserved areas	1.25	23.86	27.00	74.92		31.41	28.27	91.09
3	Growing R&D on VR technology	1.00	26.24	27.00	74.92		27.46	43.51	98.43
4	VR replace the traditional marketing	2.00	25.80	31.67	81.79		31.94	18.87	82.75
	Enablers								
5	Sufficient policies and laws	1.25	28.79	18.54	75.90				
6	Full integration of VR	2.00	27.25	18.54	75.69				
7	Evolution of VR content creation	1.00	26.04	32.25	85.06		28.45	26.39	83.28
8	Robust collaboration amongst stakeholders	1.50	27.07	23.71	80.14				
	Frictions								
9	Low uptake of VR technology	2.25	25.18	14.94	67.75	2.00			

10	Outdated technologies and insufficient connectivity	2.00	28.05	22.61	77.39				
11	High cost of VR technology and infrastructure	2.00	31.69	19.18	80.82				
	Turners								
12	Significant decrease in the cost of VR	2.00	25.54	21.69	74.46				
13	High quality and immersive VR experiences	1.00	23.29	38.78	86.22		26.59	43.41	96.59
14	Stringent data protection regulations	1.00	27.56	22.83	81.01				

5.2.2 Scenario Development

Figure 5.1: Scenario Cluster Map

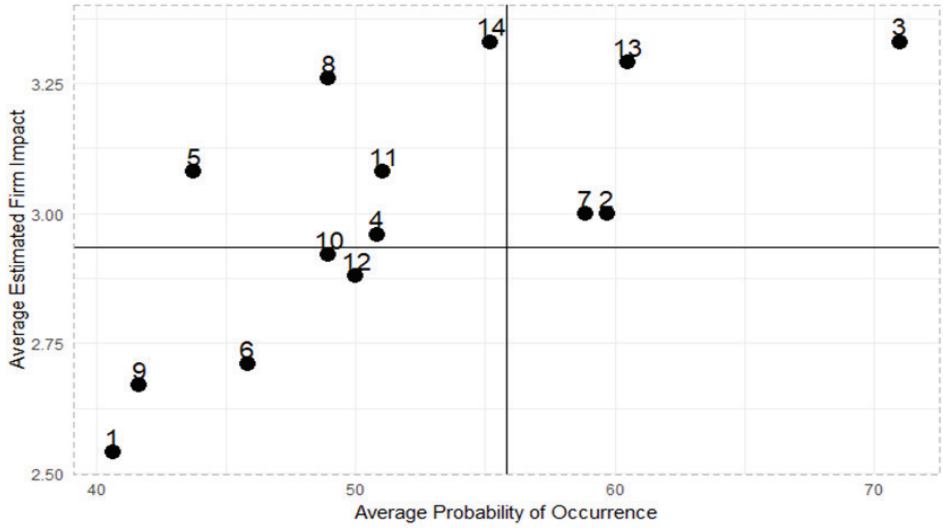
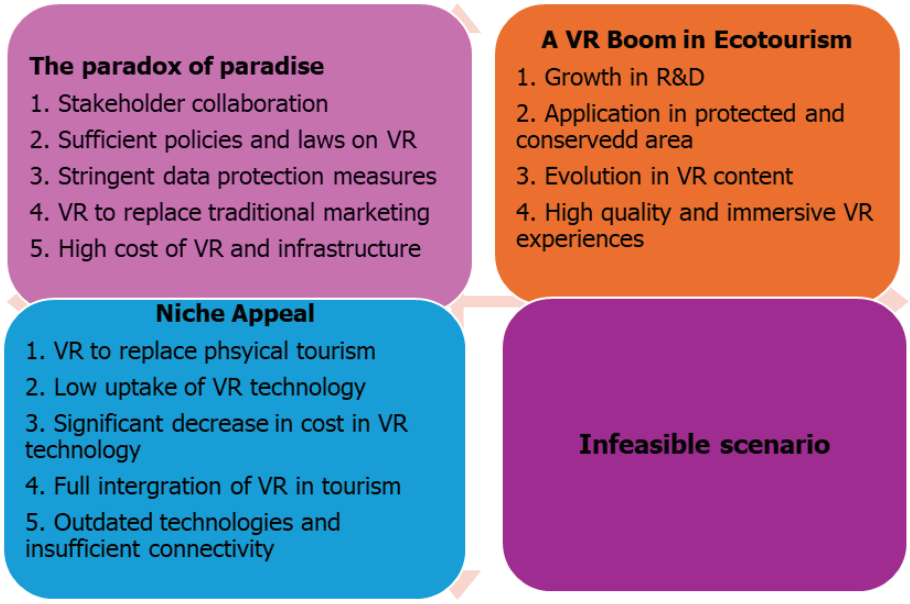


Figure 5.2: Possible Futures of VR in Tourism in 2063 in Kenya



One of the major contributions of this study is developing a scenario with the most probable future in the tourism industry in 2063 which considers the role of virtual reality technology. In addition, the study looks to foresight and develop a wildcard scenario whose probability of occurrence is low but bears far-reaching implications that could unprecedently disrupt the tourism industry. Figure 2 and 3 results show the three possible scenarios developed from the 14 projections in the Delphi survey. Figure 3 shows an interpretive clustering result for the probable scenarios of 2063.

5.2.2.1 A Most Probable Future for Virtual Reality in the Kenyan Tourism Industry in 2063

The scenario cluster for the most probable future contains those projections evaluated by the expert panel with the highest probability of occurrence and highest impact in 2063. The most probable future of virtual reality in the Kenyan tourism is characterized by; Projection 2 (application of VR in protected and conserved areas), Projection 3 (increased R&D on VR), Projection 7 (evolution of VR content), and Projection 13 (high quality and immersive VR).

The most probable future, being a VR Boom in Ecotourism, shows that R&D advancements in VR will make the technology more user-friendly and affordable. Consequently, there will be a surge in VR adoption and particularly in exploration of fragile ecosystems. In addition, advancement in technology will result in improved VR content thus providing personalized tours.

A VR boom will see a growth in ecotourism in the country which allows tourists to experience stupendous natural wonders and endangered species bolstering

a deeper appreciation for environment. Furthermore, human impact on the environment will be considerable reduced on sensitive ecosystems as the need for physical travel will be eliminated. In this era of climate change disaster, an increase in environmental conservation efforts is imperative. Therefore, a boom in responsible tourism adds to the conservation efforts and can generate the much-needed revenue in conversation efforts.

5.2.2.2 A Wildcard Scenario

Researchers in scenario development recommend analysis of eventualities with low probabilities but a high impact on the industry. This scenario also known as wildcard looks at the consequences surprising events or developments (Grassini & Ratcliffe, 2024). The futurist John L. Petersen (2000) in his book "Out of the Blue" discusses 80 wildcards of the future and their impact. The wildcard scenario in this study pictures possible situations in the future for which key stakeholders including the policy makers, ministry of tourism and the Kenyan government might prepare contingency plans to improve the tourism sector. Analysis of this scenario supports government ministries and agencies by making them more aware of events and developments which have minimal chances of occurring but could have fundamental impact on the tourism industry.

The wildcard scenario as shown in Figure 3 is characterized by; Projection 4 (VR to replace traditional marketing), Projection 5 (Sufficient policies to support VR adoption), Projection 8 (Stakeholder collaboration), Projection 11 (High cost of VR and infrastructure), and Projection 14 (stringent data protection). These projections are five wildcards that enhance a future with immense potential for VR tourism in Kenya in 2063.

The projection on robust collaboration among stakeholders is a wildcard of unprecedented collaboration where VR developers, travel agencies, and the government work together to promote virtual tourism. There is also a possibility of a marketing revolution with the tourism marketing campaigns shifting entirely to VR. In addition, the surprising future would show the establishment of a legal framework characterized by robust policies and laws that govern VR tourism and address the data privacy concerns.

The paradox of paradise highlights the tensity between advancements in technology and accessibility. In this scenario, the industry experiences may be classified to serve the different income categories. Basic, which would refer to a less appealing choice could be more affordable. This means that the hyper-realistic experiences would be at a premium level, a luxury reserved for only those who have the necessary financial muscle. On the other hand, this scenario could see the establishment of data co-ops among the various stakeholders in the sector to facilitate transparency and user control over data collection.

6. Conclusion and Policy Recommendations

6.1 Conclusion

This study aimed at closing a policy gap with respect to the role of virtual reality in the tourism industry. More specifically, two policy questions guided the research: (1) What are the drivers of change in adoption of virtual reality in the Country's tourism sector? and (2) What are projections on the future of virtual reality in enhancing the tourism industry in Kenya by 2063?

In 2063, the Country anticipates a tourism sector that incorporates VR to enhance sustainability and minimize environmental impact. This will ensure that the industry strikes a balance between economic growth and environmental sustainability. Chiefly, VR technology will be employed as market strategy to complement and supplement the existing marketing strategies and adopted for tourism in protected and conserved areas. In addition, tourists' experiences will be more immersive due to the advancement in VR technology as this will an evolvement on the quality of content created.

Notably, there is an unprecedented future that indicates possibilities of VR tourism. However, there are challenges that are likely to impede the widespread adoption of VR. Some of the future possibilities include strong collaboration among stakeholders which is likely to result in sufficient policies and laws in supporting adoption of virtual reality. The future will have stringent data protection measures coupled with VR replacing the traditional marketing. One major challenge likely to prevent this scenario is the high cost of VR and the infrastructure involved in fully adopting the technology.

6.2 Policy Recommendations

By using scenario development this study makes two major policy contributions on the future of tourism industry in Kenya. In growing the tourism potential using VR, the two levels of government in collaboration with development partners, private sector and the community at large may consider the following recommendations:

Ecotourism

1. The Ministry of Tourism and Wildlife can set up a VR Ecotourism Certification Board intended to provide oversight in content creation, which would guarantee scientific accuracy, responsible environmental representation, and adherence to ethical standards.
2. The Governments in partnership with the private sector can invest in VR creating VR Ecotourism Centres in public spaces to avail affordable access to high quality VR experiences for the larger community.
3. Relevant stakeholders to collaborate with health experts to VR usages guidelines which will address aspects of age restrictions for defined experiences, session durations and obligatory rests to promote digital well-being and hygiene.

4. Incentivize VR studios to embrace sustainable practices through tax breaks and/or subsidies for employing renewable energy source and ecofriendly hardware.
5. Conclude bilateral and multilateral agreements and policy frameworks to provide co-ordination and consistency in regulating cross border aspects and promote sustainable VR ecotourism practices globally.

Promotion of VR adoption in tourism

1. Create clear guidelines for data collection, storage and usage in the realm of VR tourism experiences to enhance consumer privacy while affording personalization of experiences.
2. Offer subsidies to make VR technology more accessible and affordable to low-income earners and educational institutions.
3. Establish regulations focused on ensuring VR tourism experiences promote sustainable travel practices in the physical environment. This would entail educating users about responsible tourism standards and principles and show support to local communities.

References

Aljinović, B., Åberg, U., Danelutti, C., and Spenceley, A. (2023). Virtual tourism in protected and conserved areas. Retrieved from: https://iucngreenlist.org/wp-content/uploads/2023/02/GIZ-Virtual-Tourism.pdf

Becker, G., and Roberts, T. (2009). Do We Agree? Using a Delphi Technique to Develop Consensus on Skills of Hand Expression. Journal of Human Lactation: Official Journal of International Lactation Consultant Association, 25, 220–225. https://doi.org/10.1177/0890334409333679

Bogicevic, V., Seo, S., Kandampully, J. A., Liu, S. Q., and Rudd, N. A. (2019). Virtual reality presence as a preamble of tourism experience: The role of mental imagery. Tourism Management, 74, 55-64. https://doi.org/10.1016/j.tourman.2019.02.009

Boyd, S. W. (2006). The TALC model and its application to national parks: A Canadian example. The tourism area life cycle, 1, 119-138.

Butler, R. (1997). Modelling tourism development. Tourism, development and growth: the challenge of sustainability, 109-125.

Butler, R. (2024). Tourism destination development: the tourism area life cycle model. Tourism Geographies, 1-9.

Chan, C.-H., Wong, K., and Lui, I. (2023). Marketing Tourism Products in Virtual Reality: Moderating Effect of Product Complexity (pp. 318–322). https://doi.org/10.1007/978-3-031-25752-0_34

Chan, P. (2022). An Empirical Study on Data Validation Methods of Delphi and General Consensus. Data, 7, 18. https://doi.org/10.3390/data7020018

Cheong, R. (1995). The virtual threat to travel and tourism. Tourism management, 16(6), 417-422. https://doi.org/10.1016/0261-5177(95)00049-T

Chirisa, I., Mutambisi, T., Chivenge, M., Mbasera, M., Sidambe, M., Muchenje, B., ... and Zengeni, D. (2020). Scope for virtual tourism in the times of COVID-19 in select African destinations. Journal of Social Sciences, 64(1-3), 1-13.

Davis, F. D. (1985). A technology acceptance model for empirically testing new end-user information systems: Theory and results (Doctoral dissertation, Massachusetts Institute of Technology).

de Lurdes Calisto, M., and Sarkar, S. (2024). A systematic review of virtual reality in tourism and hospitality: The known and the paths to follow. International Journal of Hospitality Management, 116, 103623.

Dick, E. (2021). Balancing user privacy and innovation in augmented and virtual reality. Information Technology and Innovation Foundation.

Fauzi, W. J., Radzuan, N. R. M., Rosli, A. K., Ngah, E., and Romli, A. (2023). Tertiary Educators' Awareness of and Readiness to use Virtual Reality (VR)

in Remote Online Learning.

Fazio, G., Fricano, S., Iannolino, S., and Pirrone, C. (2023). Metaverse and tourism development: Issues and opportunities in stakeholders' perception. Information Technology and Tourism, 25(4), 507–528. https://doi.org/10.1007/s40558-023-00268-7

Flavián, C., Ibáñez-Sánchez, S., and Orús, C. (2021). The influence of scent on virtual reality experiences: The role of aroma-content congruence. Journal of Business Research, 123, 289-301. https://doi.org/10.1016/j.jbusres.2020.09.036

Garrod, B., and Dowell, D. (2020). Experiential marketing of an underground tourist attraction. Tourism and Hospitality.

Gore, S., Borde, N., and Hegde Desai, P. (2024). Mapping tourism strategy patterns on tourism area life cycle. Journal of Hospitality and Tourism Insights, 7(1), 329-351.

Grassini, S., and Ratcliffe, E. (2024). The Virtual Wild: Exploring the Intersection of Virtual Reality and Natural Environments. In N. Finneran, D. Hewlett, and R. Clarke (Eds.), Managing Protected Areas: People and Places (pp. 327–351). Springer International Publishing. https://doi.org/10.1007/978-3-031-40783-3_17

Guttentag, D. (2010). Virtual reality: Applications and implications for tourism. Tourism Management, 31, 637–651. https://doi.org/10.1016/j.tourman.2009.07.003

Guttentag, D. (2010). Virtual reality: Applications and implications for tourism. Tourism Management, 31, 637–651. https://doi.org/10.1016/j.tourman.2009.07.003

Henriksson, E. A. (2018). Data protection challenges for virtual reality applications. Interactive Entertainment Law Review, 1(1), 57-61.

Hoang, S. D., Dey, S. K., Tučková, Z., and Pham, T. P. (2023). Harnessing the power of virtual reality: Enhancing telepresence and inspiring sustainable travel intentions in the tourism industry. Technology in Society, 75, 102378.

Hollebeek, L., Rather, R., Loureiro, S., and Hasan, R. (2023). Exploring Tourists' Virtual Reality-Based Brand Engagement: A Uses-and-Gratifications Perspective Citation. Journal of Travel Research, 63. https://doi.org/10.1177/00472875231166598

Israel, K., Zerres, C., and Tscheulin, D. K. (2023). Virtual Reality — Substitute for a Real Experience? The Role of User Motivation, Expectations and Experience Type. International Journal of Innovation and Technology Management, 20(03), 2350018. https://doi.org/10.1142/S0219877023500189

Jawarneh, M., Alshar'e, M., Dewi, D. A., Al Nasar, M., Almajed, R., and Ibrahim, A. (2023). The Impact of Virtual Reality Technology on Jordan's Learning Environment and Medical Informatics among Physicians. International

Journal of Computer Games Technology, 2023, 1–9. https://doi.org/10.1155/2023/1678226

Jenny, S. (2017). Enhancing tourism with augmented and virtual reality.

Jiang, C., and Phoong, S. W. (2023). A ten-year review analysis of the impact of digitization on tourism development (2012–2022). Humanities and social sciences communications, 10(1), 1-16.

Khan, A. (2024). The Emergence of the Fourth Industrial Revolution and its Impact on International Trade. ASR Chiang Mai University Journal of Social Sciences and Humanities, 11. https://doi.org/10.12982/CMUJASR.2024.007

Kubitzek, B. (2021). Virtual reality in tourism. Opportunity or pitfall?: Explorative case study of a place-based virtual reality experience of Mariebergsskogen.

Kunitake, Y. (n.d.). The Potential of Virtual Reality for the SDGs: Infrastructure Development through Content and Cultural Policies.

Lochmiller, C. R. (2021). Conducting thematic analysis with qualitative data. The Qualitative Report, 26(6), 2029-2044.

Merkx, C., and Nawijn, J. (2021). Virtual reality tourism experiences: Addiction and isolation. Tourism Management, 87, 104394.

Naik, M. S., Patil, M. A., and Botre, M. P. (n.d.). Virtual Tourism: Concept and Future.

Ouerghemmi, C., Ertz, M., Bouslama, N., and Tandon, U. (2023). Impact of Virtual Reality on Tourism. Encyclopedia.

Parasuraman, A. (2000). Technology Readiness Index (TRI) a multiple-item scale to measure readiness to embrace new technologies. Journal of service research, 2(4), 307-320.

Parasuraman, A., and Colby, C. L. (2007). Techno-ready marketing: How and why your customers adopt technology. The Free Press.

Patel, M., Bhatt, M., and Rathore, N. (2023). Promoting the Smart Tourism by Implementing Virtual Reality and Augmented Reality. Asian Journal of Engineering and Applied Technology, 12, 28–34. https://doi.org/10.51983/ajeat-2023.12.1.3634

Pestek, A., and Sarvan, M. (2020). Virtual reality and modern tourism. Journal of Tourism Futures, 7(2), 245–250. https://doi.org/10.1108/JTF-01-2020-0004

Petersen, J. L. (1999). Out of the blue: How to anticipate big future surprises. (No Title).

Petkus Jr, E. (2004). Enhancing the application of experiential marketing in the arts. International Journal of Nonprofit and Voluntary Sector Marketing, 9(1), 49-56.

Polishchuk, E., Bujdosó, Z., El Archi, Y., Benbba, B., Zhu, K., and Dávid, L. D. (2023). The theoretical background of virtual reality and its implications for the tourism industry. Sustainability, 15(13), 10534.

Rather, R. A., Hollebeek, L. D., Loureiro, S. M. C., Khan, I., and Hasan, R. (2024). Exploring Tourists' Virtual Reality-Based Brand Engagement: A Uses-and-Gratifications Perspective. Journal of Travel Research, 63(3), 606–624. https://doi.org/10.1177/00472875231166598

Rauscher, M., Humpe, A., and Brehm, L. (2020). Virtual Reality in Tourism: Is it 'Real' Enough? Academica Turistica, 13, 127–138. https://doi.org/10.26493/2335-4194.13.127-138

Schiopu, A. F., Hornoiu, R. I., Padurean, M. A., and Nica, A. M. (2021). Virus tinged? Exploring the facets of virtual reality use in tourism as a result of the COVID-19 pandemic. Telematics and Informatics, 60, 101575.

Şeker, F., and Kamil, U. N. U. R. (2022). The experience economy analysis of distinct destinations. Journal of multidisciplinary academic tourism, 7(2), 31-43.

Serravalle, F., Ferraris, A., Vrontis, D., Thrassou, A., and Christofi, M. (2019). Augmented reality in the tourism industry: A multi-stakeholder analysis of museums. Tourism Management Perspectives, 32, 100549. https://doi.org/10.1016/j.tmp.2019.07.002

Shen, S., Xu, K., Sotiriadis, M., and Wang, Y. (2022). Exploring the factors influencing the adoption and usage of Augmented Reality and Virtual Reality applications in tourism education within the context of COVID-19 pandemic. Journal of Hospitality, Leisure, Sport and Tourism Education, 30, 100373. https://doi.org/10.1016/j.jhlste.2022.100373

Singh Raikwar, A. (2021). Creating Virtual Reality Experiences in Tourism Business: Emerging Phenomenon (pp. 116–127).

Srinivasan, S., SHerkar, D. A., J, J., Indora, A., and Mukherjee, D. R. (2024). Tourism Innovation and The Role of Technology In Enhancing Visitor Experiences. Educational Administration: Theory and Practice, 30(4), Article 4. https://doi.org/10.53555/kuey.v30i4.1702

The Government of Kenya (2018). The Sector Plan for Tourism 2018-2022. Retrieved 8 January 2024, from https://www.planning.go.ke/wp-content/uploads/2020/11/SECTOR-PLAN-FOR-TOURISM-2018-2022.pdf

The Ministry of Tourism and Wildlife (2020). Digitizing travel and tourism industry in Kenya.

The Ministry of Tourism, Wildlife and Heritage (2022). Kenya Annual Tourism Sector Performance Report (2022).

The Revised National Tourism Policy (2020). Enhancing Resilience and Sustainable Tourism in Kenya.

Tiusanen, P. (n.d.). Virtual reality in destination marketing.

Tourism in the metaverse: Can travel go virtual? | McKinsey. (n.d.). Retrieved 1 May 2024, from https://www.mckinsey.com/industries/travel-logistics-and-infrastructure/our-insights/tourism-in-the-metaverse-can-travel-go-virtual

Tsaur, S. H., Chiu, Y. T., and Wang, C. H. (2007). The visitors' behavioral consequences of experiential marketing: An empirical study on Taipei Zoo. Journal of Travel and Tourism Marketing, 21(1), 47-64.

Uysal, M., Woo, E., and Singal, M. (2011). The tourist area life cycle (TALC) and its effect on the quality-of-life (QOL) of the destination community. In Handbook of tourism and quality-of-life research: Enhancing the lives of tourists and residents of host communities (p. 423-443). Dordrecht: Springer Netherlands.

Verkerk, V-A. (2022). Virtual Reality: Saving Tourism in South Africa? African Journal of Hospitality, Tourism and Leisure, 11(1):278-299. https://doi.org/10.46222/ajhtl.19770720.225

Verma, S., Warrier, L., Bolia, B., and Mehta, S. (2022). Past, present, and future of virtual tourism-a literature review. International Journal of Information Management Data Insights, 2(2), 100085.

Vinodan, A., and Meera, S. (2024). Technology adoption among Indigenous tourism stakeholders: Scale development and validation. Information Technology for Development, 0(0), 1–29. https://doi.org/10.1080/02681102.2024.2345374

Wen, X., Sotiriadis, M., and Shen, S. (2023). Determining the Key Drivers for the Acceptance and Usage of AR and VR in Cultural Heritage Monuments. Sustainability, 15(5), Article 5. https://doi.org/10.3390/su15054146

Xie-Carson, L., Magor, T., Benckendorff, P., and Hughes, K. (2023). All hype or the real deal? Investigating user engagement with virtual influencers in tourism. Tourism Management, 99, 104779.

Yang, C., Yan, S., Wang, J., and Xue, Y. (2022). Flow Experiences and Virtual Tourism: The Role of Technological Acceptance and Technological Readiness. Sustainability, 14(9), Article 9. https://doi.org/10.3390/su14095361

Yang, X., Xu, Z., and Xu, J. (2023). Large-scale group Delphi method with heterogeneous decision information and dynamic weights. Expert Systems with Applications, 213, 118782. https://doi.org/10.1016/j.eswa.

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