

The impact of the metaverse on consumer behaviour and marketing strategies in tourism: a bibliometric review

El impacto del metaverso en el comportamiento de los consumidores y las estrategias de marketing en el turismo: una revisión bibliométrica

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Abstract

Objective and interest of the work: This paper focuses on analysing the existing literature on the impact of Metaverse technology on consumer behaviour, adoption and destination marketing. From a tourism perspective, Metaverse allows the fusion of physical and virtual realities, offering immersive experiences and the possibility of transforming the relationship between the destination and end user.

Design of the methodology: A bibliometric analysis was performed using the Bibliometrix software, an R tool for the bibliometric study of scientific data sources. The database selected was Web of Science, and peer-reviewed articles in English published up to 10 October 2023 were analysed. A Boolean approach was used with the keywords “framework tourism Metaverse” and “framework tourist Metaverse”.

Results: Trends in the scientific production of subject matter analysed from 2011 to 2023 stand out, with a total of 72 articles identified according to the criteria discussed. An annual growth rate of 34.48% was observed during the production of the documents. It highlights how technology associated with the metaverse influences the decisions and experiences of tourism service users.

Its value in terms of practical implications: This study examines the potential of Metaverse for ex situ immersive tourism and in situ experiences. It emphasizes the need for research on ethical behaviour, regulatory frameworks, and strategies for Metaverse integration in the tourism industry. Although it is not the first study on Metaverse, it is the only one known to focus on theoretical frameworks.

Keywords: virtual reality; augmented reality; immersive experiences; consumer behaviour; heritage conservation.

JEL Codes: Z33; O33

Resumen

Objetivo e interés del trabajo: Este trabajo se centra en analizar la literatura existente acerca del impacto de la tecnología asociada al Metaverso en el comportamiento y adopción de los consumidores y la comercialización de destinos turísticos. El Metaverso permite fusionar realidades físicas y virtuales, ofreciendo experiencias inmersivas y posibilidades de transformar la relación entre el destino y el usuario final.

Diseño de la metodología: Se realizó un análisis bibliométrico utilizando el software Bibliometrix, una herramienta R para el estudio bibliométrico. La base de datos seleccionada fue Web of Science, y se analizaron artículos revisados por pares en inglés publicados hasta el 10 de octubre de 2023. Se utilizó un enfoque booleano con las palabras clave “framework tourism Metaverse” y “framework tourist Metaverse”.

Resultados: Se destacan las tendencias en la producción científica de la temática analizada desde 2011 hasta 2023, con un total de 72 artículos identificados según los criterios comentados. Se observa una tasa de crecimiento anual del 34,48% en la producción y se destaca cómo la tecnología asociada al Metaverso tiene influencia en las decisiones y experiencias de los usuarios turísticos.

Su valor en términos de implicaciones prácticas: Este estudio examina el potencial del Metaverso en el turismo inmersivo ex situ y las experiencias in situ. Destaca la necesidad de investigar sobre el comportamiento ético, los marcos normativos y las estrategias para la integración de Metaverso en el turismo. Aunque no es el primer estudio sobre Metaverso, es el único conocido que se centra en marcos teóricos.

Palabras clave: realidad virtual; realidad aumentada; experiencias inmersivas; comportamiento del consumidor; conservación del patrimonio.

Códigos JEL: Z33; O33

1. Introduction

An emerging concept combining Virtual Reality (VR) and Augmented Reality (AR) technologies, among other technologies, promises to revolutionise the way people interact with digital environments (Buhalis et al., 2023). In the tourism context, its application is based on the merging of physical and virtual realities (Zhang et al., 2022), providing the potential to deliver immersive tourism experiences and enabling the transformation of relationships between end users and tourism destinations, allowing, among other possibilities, co-creation between tourism service stakeholders (Dwivedi et al., 2023). In the present study, the terminology outlined in the methodology section was used to demarcate the research scope through bibliometric analysis. This review articulates the following research questions in line with previously established objectives. (RQ1) How does Metaverse and its immersive nature influence tourists' intention to visit real-world destinations after experiencing them virtually? (RQ2) How do virtual environments associated with Metaverse affect consumer behaviour and decision-making processes in the tourism sector?

A holistic view exploring the Metaverse concept and its implications for business management is provided, focusing on a deeper understanding of consumer behaviour through the application of bibliometric analysis techniques (Donthu et al., 2021). Initially, a bibliometric analysis was conducted, and the findings were presented. These results facilitate the articulation of conclusions, limitations, future research directions, and recommendations from a business decision-making perspective. The emergence of Metaverse has catalysed a paradigmatic evolution in the domain of tourism, triggering an innovative spectrum of immersive tourist experiences. This study addresses these research questions using a bibliometric analysis of 72 articles sourced from the WoS database. This study makes three significant contributions to the literature in the context of emerging virtual technologies and in relation to the tourism industry. It takes an in-depth look at how the immersive nature of the Metaverse influences tourists' intention to visit real destinations after experiencing them virtually, thereby providing a comprehensive understanding of the theoretical frameworks involved (RQ1). Subsequently, the research reveals the ways in which immersive environments associated with the Metaverse affect consumer behaviour, seeking to shed light on psychological and behavioural dynamics (RQ2). These findings highlight the current research trends and future opportunities in the scope of Metaverse and its application to tourism. These findings can guide future research and contribute to the development of effective tourism practices from the perspective of Metaverse implementation in the tourism sector.

2. Literature review

Metaverse is defined as a collective virtual domain sprouted from the fusion between virtual reality and physically persistent VR, amalgamating AR, VR, and artificial intelligence technologies (Prerana et al., 2023). This technological fusion provides a medium for tourists to explore destinations in an immersive digital context prior to their physical visits or experience places that would otherwise be inaccessible owing to various restrictions. Regarding future research, there is a significant need to delve deeper into how Metaverse technologies can reshape the tourism industry (Dwivedi et al., 2022). Scholars need to explore ethical, legal, and policy-related concerns to ensure that stakeholders' rights are upheld during the adoption of the Metaverse. This demonstrates the need for comprehensive research to examine the potential implications and applications of Metaverse (Kraus et al., 2022). VR and AR are the cornerstones of the Metaverse concept for the tourism sector. VR provides total immersion in the digital world, whereas AR overlays digital information on our physical environment, enriching our perception of the real world. These technologies can deliver personalised experiences (Carvalho et al., 2023) from virtual tours to contextual information about tourist attractions and destinations (Dwivedi et al., 2022). The integration of an increased physical world and virtual reality that persists beyond physical reality, known as Metaverse (Zhang et al., 2022), reshapes the tourism landscape. Metaverse transforms the tourism landscape by intertwining physical and virtual reality. This novel trend outlines a scenario in which both consumers and businesses can innovatively co-create value and experience (Buhalis & Karatay, 2022; Neuhofer et al., 2014).

Metaverse is an emerging concept that encompasses a fully immersive shared virtual space that converges with the physical world and offers an advanced level of interactivity between users and the digital environment (Ishii et al., 1993; Kaplan, 2023). Despite these promising prospects, more research is needed to explore consumer motivations and behaviours towards using Metaverse for tourist travel (Zhou et al., 2023). Trends in Metaverse-related tourism generally revolve around immersive experiences provided by AR and VR technologies, offering simulated travel experiences without comfortably leaving home (Hilken et al., 2017; Scholz & Smith, 2016). The evolution of Metaverse has transformed the tourism industry (Prerana et al., 2023). With the help of platforms such as Roblox and Decentraland leading the way, immersive experiences have become central to tourism (Kaplan, 2023). As tourists increasingly seek unique and personalised experiences, the Metaverse offers a sustainable tourism solution, by reducing environmental impacts (Guttentag, 2010) and allowing for "try before you buy" (Tsai, 2020) explorations. Although its potential is vast, Metaverse cannot fully replace the emotional connection of physical travel (Dwivedi et al., 2022) and its integration into tourism brings forth challenges related to ethics, legalities, and policies (Kraus et al., 2022).

3. Methodology and data

The Bibliometrix solution (Aria & Cuccurullo, 2017), an R package designed for the bibliometric study of scientific data sources, was used for analysis. This tool provides answers for the quantitative analysis of the scientific literature and allows for the development of bibliometric investigations. This methodology has been widely used in fields such as the social sciences (Bornmann et al., 2016), health (Kokol et al., 2021), natural sciences (Aristovnik et al., 2020), technology (Zhao et al., 2020), environmental studies (Tan et al., 2021), business administration (Lizano-Mora et al., 2021) and the tourism sector (Koseoglu et al., 2016). One of the great advantages is that it allows for patterns and trends in the topics analysed, as well as analysing the connections within the scientific literature, allowing for a greater understanding of the topics analysed.

The Web of Science (WoS) database was selected as the main resource for this systematic analysis. This indexing source constitutes the most extensive collection of research journals worldwide (Zhu & Liu, 2020). Peer-reviewed articles, mainly written in English, were analysed, as they are considered the most legitimate scholarly source, published up to 10 October 2023. A Boolean approach (using the Boolean operator “OR”) was used, where the keywords chosen were “framework tourism Metaverse” and “framework tourist Metaverse”, using the title, abstract and keywords fields.

The breadth of the keywords used is justified by the specificity of the topic analysed, which makes it necessary to be specific. The Prisma Statement data methodology was used (Page et al., 2021) and following the guidelines of leading authors in the field of bibliometric analysis (Donthu et al., 2021) and literature review, data were extracted from the WoS source up to the aforementioned date. Each phase of the selection of working papers is described below.

Phase 1: Keyword and database search

- Database used: Web of Science.
- Search strings: developed using keywords and Boolean operators “framework tourism Metaverse” and “framework tourist Metaverse.”
- Initial number of results (n): 176.

Phase 2: Inclusion and exclusion criteria

- Disciplines considered: social sciences (other subjects) and business economics.
- Inclusion: journal articles including early access.
- Exclusion: book chapters, conference papers and articles not written in English.
- Number of articles after filtering (n): 75.

Phase 3: Manual review and coding

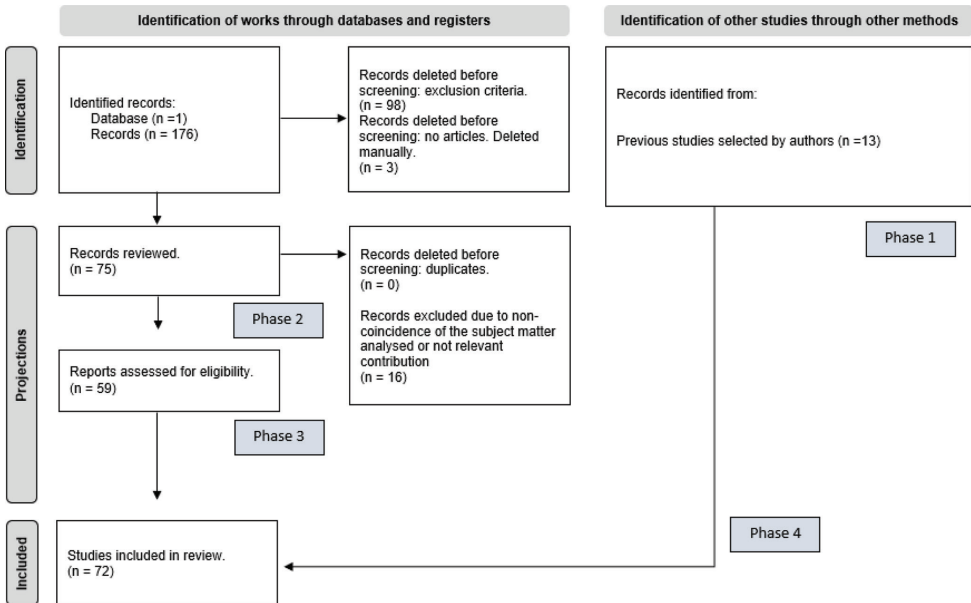
- Each article was carefully reviewed manually to ensure that it focused on the research field: frameworks for Metaverse in tourism.
- Number of articles after review (n): 59.

Phase 4: Inclusion of articles for analysis

- A snowball process was applied to include 13 key papers from the authors' reference lists.
- Final number of articles included in analysis (n):72.

These steps in the PRISMA 2020 methodology ensure a rigorous approach to the selection and filtering of relevant articles for studying frameworks in the context of the tourism Metaverse. Figure 1 illustrates the workflow employed in this study, which has been validated in numerous scientific studies. Following the presentation of the findings in this section, the research questions were validated using the 72 documents that were identified; these can be found in the Supplementary Material (Table S1). In addition to the aforementioned bibliographical analysis, a meta-analysis of the articles analysed was conducted, which led to a greater depth in the conclusions and results obtained.

Figure 1. Exclusion criteria and protocols used in the analysis



Source: Prepared by the authors based on the Prima 2020 Declaration.

4. Results

4.1. Overview and trends

An in-depth examination of production trends in a specific industry or subject, spanning from 2011 (the first document published) to 2023, resulted in a dataset collected from 44 diverse sources, such as books and journals. This is summarised in Figure 2. The research yielded 72 documents, with an average age of 1.32 years and 27.78 citations per document. The annual growth rate of document production was 34.48%, and 241 and 327 keywords were identified using Keyword Plus (ID) and author’s keywords (DE), respectively. A total of 227 authors contributed to this output, with five authors producing papers as single authors. The collaboration between authors is noteworthy, with an average of 3.42 co-authors per paper, and 34.72% of the papers have international co-authorships. In terms of document types, 49 were articles, 21 were early access articles, one was a review, and one was an early access review. Figure 3 shows the annual publication counts from 2011 to 2023 with a clear upward trend observed after 2020. During the early years from 2011 to 2019, the number of articles swung over several years, with no publications.

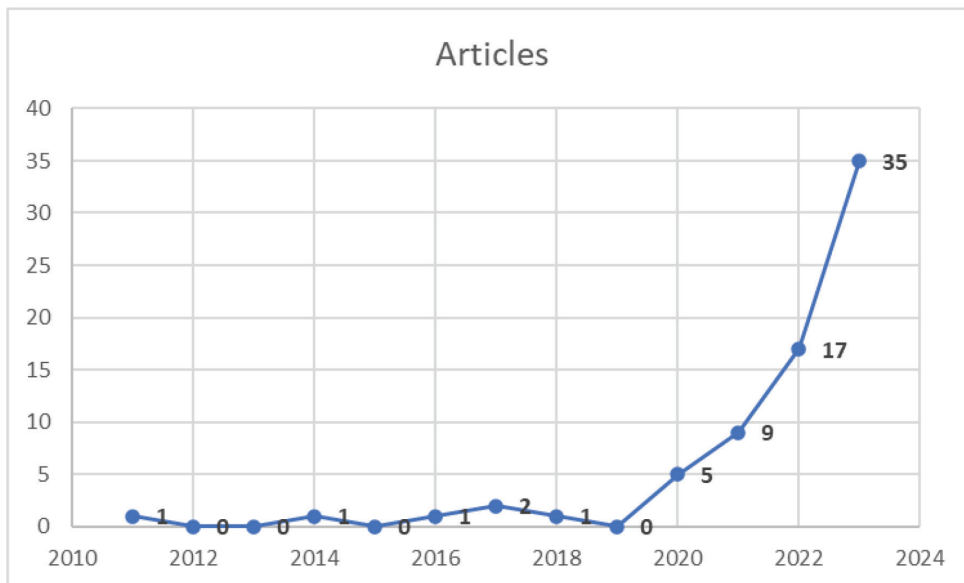
Figure 2. Overview of the Results



Source: authors’ elaboration.

4.2. Trend of the annual citations

According to Table 1, the analysis of these metrics indicates fluctuations in the recognition and interaction with articles over time. During the early years, although the number of publications was low, the average total citations per article was relatively high, especially in 2011, 2014, and 2016. Nevertheless, as the number of publications increased from 2020 onwards, the average total citations per article decreased, which could indicate a wider distribution of citations among a larger number of articles.

Figure 3. Annual scientific production

Source: authors' elaboration.

Table 1. Annual total citations per document

Year	N ¹	MeanTCperArt ²	MeanTCperYear ³	Citable Years
2011	1	215,00	17,92	12
2014	1	185,00	20,56	9
2015	0	0,00	0,00	0
2016	1	257,00	36,71	7
2017	2	25,00	4,17	6
2018	1	23,00	4,60	5
2019	0	0,00	0,00	0
2020	5	100,80	33,60	3
2021	9	20,89	10,44	2
2022	17	17,76	17,76	1
2023	35	7,89		0

¹ N, number of documents. ² MeanTCperArt, mean total citations per document. ³ MeanTCperYear, total citations per year.

Source: authors' elaboration.

4.3. Most influential documents

As showed in Table 2, the papers by Kim et al. (2018) and Dwivedi et al. (2023) are found to be particularly influential, with a high citation rate per year of 96.00 and 72.00 respectively, and a normalised CT of 3.81 and 9.13, respectively. This suggests that these papers have had a significant impact on the field, being widely recognised and cited by other researchers. Papers published in the *Journal of Travel Research*, *International Journal of Tourism Research*, and *Tourism Management* have a high number of citations, which may indicate the relevance of these journals

Table 2. Most cited documents

Author	Year	Title	Total Citations	Total Citations per Year
Kim M	2018	Exploring Consumer Behavior in VR Tourism Using an Extended Stimulus-Organism-Response Model	384	96,00
Huang Y	2015	Exploring the Implications of VR Technology in Tourism Marketing: An Integrated Research Framework	257	32,13
Mehmetoglu M	2011	Pine and Gilmore's Concept of Experience Economy and Its Dimensions: An Empirical Examination in Tourism	215	16,54
Tussyadiah I	2014	Toward a Theoretical Foundation for Experience Design in Tourism	185	18,50
Dwivedi Y	2023	Metaverse marketing: How the Metaverse will shape the future of consumer research and practice	72	72,00
Gursoy D	2022	The Metaverse in the hospitality and tourism industry: An overview of current trends and future research directions	72	36,00
Bec A	2021	VR and mixed reality for second chance tourism	65	21,67
Lee M	2020	Quality of VR and its impacts on behavioral intention	60	15,00
Fan X	2022	Immersive technology: A meta-analysis of augmented/VR applications and their impact on tourism experience	53	26,50
Buhalis D	2023	Metaverse as a driver for customer experience and value co-creation: implications for hospitality and tourism management and marketing	52	52,00

Source: authors' elaboration.

in the field. Furthermore, although some papers are more recent, such as those by Dwivedi et al. (2023) and Gursoy et al. (2023; 2022), they have accumulated a considerable number of citations in a short period of time, highlighting their relevance and influence in the academic community.

4.4. The most influential countries

Table 3 shows the influence of different countries on a specific field or topic, measured by the total citations and the average number of citations per article. For example, the United States has 635 citations and an average of 57.73 citations per article, reflecting high production and recognition in the field. Although Korea has fewer total citations (426), it has an impressive average of 106.50 citations per article, indicating a high citation rate per published paper. Norway and China also show a significant presence with 343 and 212 citations, respectively, albeit with different citation averages per article, 68.60 and 15.14, respectively, suggesting that articles from Norway are cited more frequently on average.

Table 3. Nationalities of the analysed authors

Country	Articles	Average Article Citations
USA	635	57,73
Korea	426	106,50
Norway	343	68,60
China	212	15,14
Australia	110	18,33
India	81	20,25
United Kingdom	78	13,00
Italy	33	11,00
Portugal	30	15,00
Sweden	23	23,00

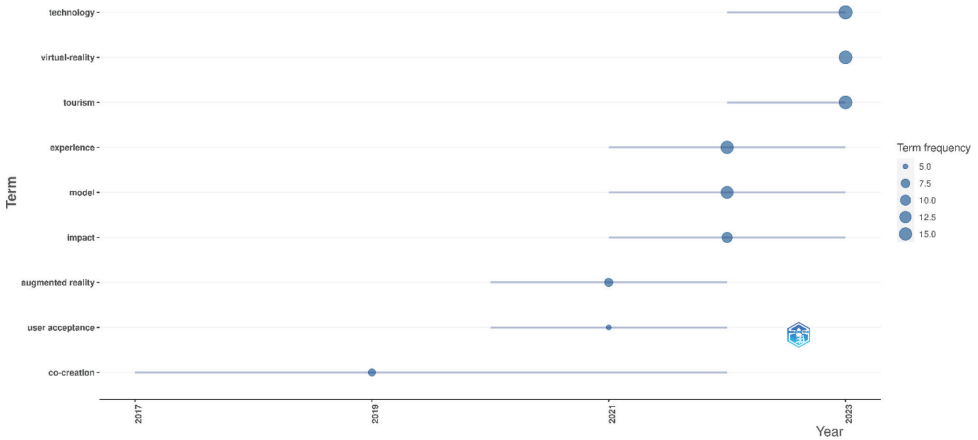
Source: authors' elaboration.

4.5. Trend topics

Figure 4 reflects thematic trends in a specific field, showing the evolution of certain topics over time. It can be seen that topics such as “co-creation” and “AR” were relevant in earlier years, around 2019 and between 2020 and 2022, respectively.

Conversely, in more recent years, from 2021 to 2023, themes such as “experience”, “model”, “impact”, “technology”, “tourism” and “VR” have gained prominence, with “technology”, “tourism” and “VR” being the most prominent in 2023.

Figure 4. Trend topics



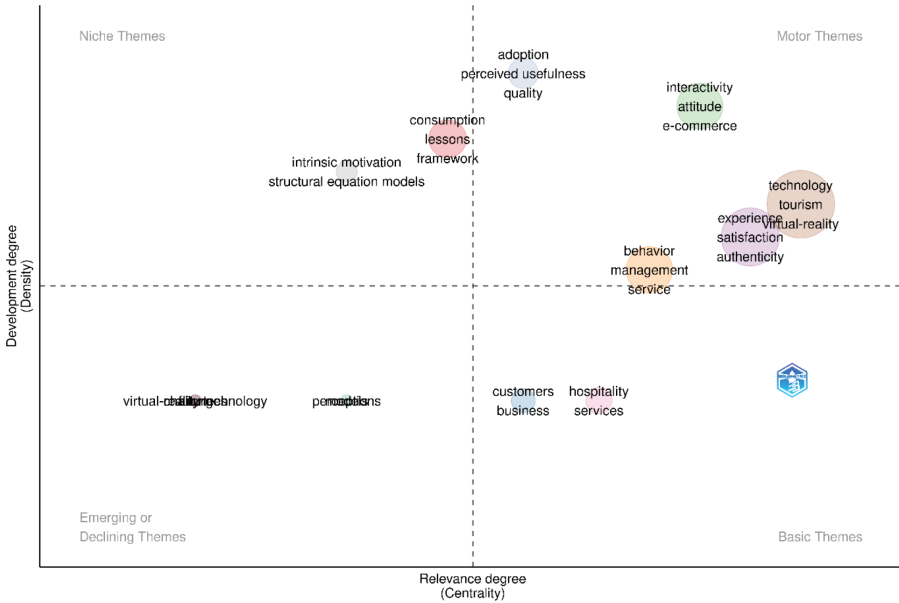
Source: authors' elaboration.

4.6. Thematic map terms and evolution

Figure 5 shows an analysis of the thematic map where relevant terms are grouped into clusters such as “consumption”, “customers”, “interactivity”, “experience”, “behaviour”, and “technology”. This reflects different areas of interest from a research perspective. Centrality metrics reveal the importance and position of each term within the thematic network. In this sense, terms such as “experience”, “technology”, and “tourism” show a high frequency of occurrence and high centrality values, indicating their central relevance in the analysed field of study. The different core discussions were defined using thematic groups. Specifically, technology and tourism interact. The second is between e-commerce, consumer experience and consumer behaviour. This allows for an organised structure that helps identify the main thematic areas, emerging trends, and interrelationships between different topics in the field of study.

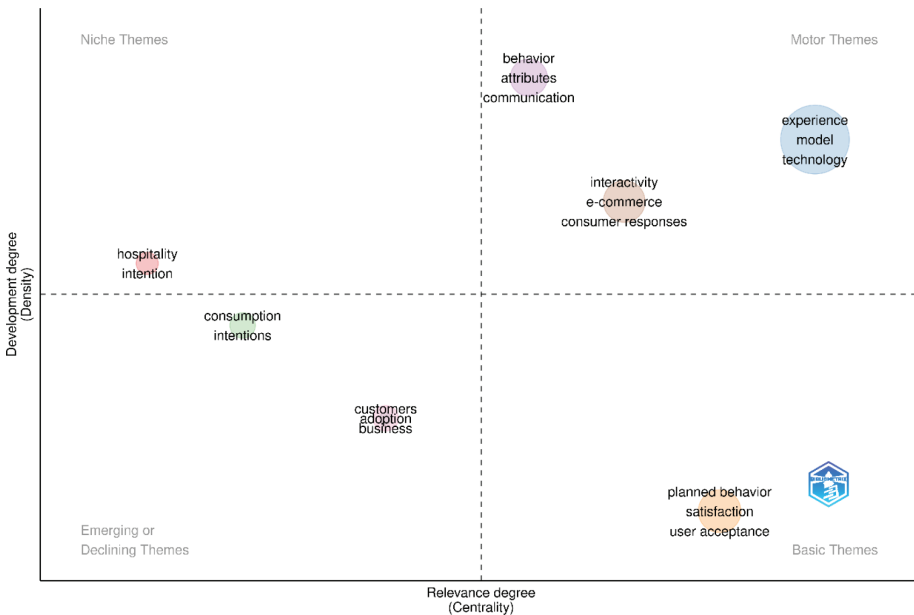
Figure 6 shows the analysis of thematic evolution, presenting a thematic structure and the relationship between the different terms grouped in clusters. In particular, terms such as “experience” and “model” appear as essential clusters, acting as bridges between other terms or clusters, reflecting their relevance in the investigated context. The diversity of terms presents in clusters such as “experience” and “planned behaviour” reflects a range of interrelated topics, from technology and VR to user

Figure 5. Thematic map terms



Source: authors' elaboration.

Figure 6. Thematic maps evolution



Source: authors' elaboration.

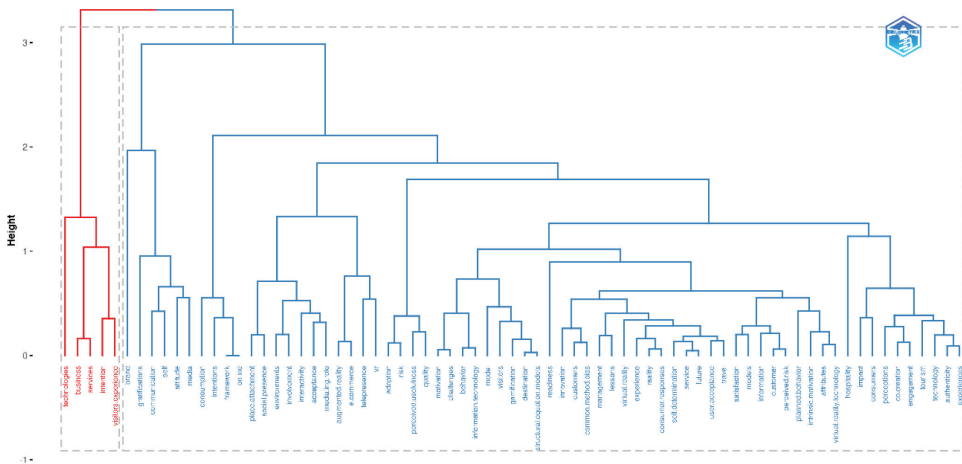
behaviour and satisfaction. This could indicate emerging trends or areas of interest in the domain under study. The presence of terms related to management and behaviour in their respective clusters shows a clear distinction in the nature of the issues discussed. Another case is the term “experience”, which shows an interesting transition, with connections to various clusters such as “hospitality”, “lessons”, “management”, and “VR” already in the period 2023, suggesting an evolution or expansion in the thematic discussion.

4.7. Clusters analysis: emerging themes

The distribution of terms in two-dimensional space reflected in Figure 7 shows a noticeable grouping into two distinct clusters: Cluster 1 (blue) and Cluster 2 (red). In Cluster 1, variables such as “technology”, “VR”, “AR”, and “e-commerce” reflected a strong bias towards technological themes. In addition, user experience-related variables such as “experience”, “satisfaction”, and “user acceptance” are clustered here, which could indicate a relationship between technology and user experience. Variables such as “tourism” and “hospitality” are also observed in this cluster, suggesting an intersection between technology and tourism/hospitality.

On the other hand, Cluster 2 (red) groups together variables such as “intention”, “visitors experience”, “business”, and “technologies”, which could reflect a different or complementary theme. The presence of “business” and “technologies” suggests a focus on how companies are adopting new technologies, while “intention” and “visitors experience” could be related to how visitors or consumers interact with these technologies. This distinction between the clusters and the

Figure 7. Cluster analysis



Source: authors' elaboration.

grouping of variables within them provides a structured view that could be crucial for understanding thematic relationships and emerging trends in the analysed domain.

5. Findings

This section addresses the answers to these research questions. Specifically, the first point addresses RQ1, trying to delve into how the immersive nature of Metaverse influences tourists' intention to visit real destinations after having experienced them virtually. The second point addresses RQ2, analysing how Metaverse affects consumer behaviour and attempts to shed light on the psychological and behavioural dynamics.

5.1. Intellectual structure and theoretical frameworks

Research in the field of Metaverse and the tourism sector is mainly focused on the interaction between emerging technologies (Samaddar & Mondal, 2023) and the tourism industry (Blaer, 2023; M. J. Kim et al., 2018). The dominant theme was the application and impact of VR on tourism (Wang et al., 2023). Other studies have highlighted how VR can enrich tourism experiences (Buonincontri & Marasco, 2017) and its use in destination promotion (Kilic et al., 2021; Tussyadiah, 2014). Furthermore, the concept of Metaverse (Ball, 2022), understood as an immersive virtual universe (Fan et al., 2022; Wei, 2023), is a relevant and recurrently analysed topic.

Another promising focus is the application of Metaverse in the dissemination and preservation of cultural heritage (Santoso & Gerald, 2022; Zhang et al., 2022). In addition, consumer behaviour (Ponte et al., 2021) and experience in virtual environments (Lee et al., 2020; Zheng et al., 2022) have been analysed as ways to adapt business strategies. Regarding the theoretical frameworks applied, particularly relevant is the use of Flow Theory and the Stimulus-Organism-Response (SOR) framework (Wang et al., 2023) attempts to deepen the understanding of the impact of these technologies on the tourism industry. Other studies have analysed strategies for the promotion of tourism destinations in virtual environments has been detected (Zhu et al., 2022). Finally, Table 4 provides a summary of the main themes analysed.

Several theoretical frameworks played a crucial role in this meta-analysis. One of these frameworks is the Flow Theory (Wang et al., 2023), which highlights the importance of complete engagement (Ahmad et al., 2023) in an activity and its impact on attitudes and behaviours, especially in the context of tourism. Another significant framework is the stimulus-organism-response model (Bird et al., 2023; Morrison et al., 2023; Wang et al., 2023), which suggests that external stimuli prompt specific responses and find applications in areas such as e-commerce. Affordance Theory (Zhou et al., 2023) emphasises how environments provide opportunities for

Table 4. Intellectual structure

Title	Themes
VR in Tourism	Application of VR in tourism. Impact of VR on the tourist experience. Use of VR for destination promotion.
Metaverse	Definition and concept of Metaverse. Applications of the Metaverse in tourism.
Cultural Heritage in Metaverse	Digitisation of cultural heritage. Use of the Metaverse for heritage conservation and promotion.
Consumer Behaviour and Customer Experience	Influence of virtual environments on consumer behaviour. Impact of VR on customer experience.
Theoretical and Conceptual Frameworks	Flow Theory. Stimulus-Organism-Response (S-O-R) framework.
Virtual Tourism	Benefits and challenges of virtual tourism.
Destination Marketing in Metaverse	Use of virtual tourism for destination promotion.
VR in Tourism	Application of VR in tourism. Impact of VR on the tourist experience. Use of VR for destination promotion.

Source: authors' elaboration.

certain behaviours (Ahn et al., 2022), particularly when it comes to technological interpretation. Organismic Integration Theory (Zhou et al., 2023), derived from the self-determination theory (Bird et al., 2023), distinguishes between intrinsic (Le et al., 2022) and extrinsic (Li & Chen, 2019) motivations for virtual tourism. Finally, Dual Processing Theory (Zheng et al., 2022) proposes a dual approach in which decisions are influenced by both cognitive reasoning (Kim et al., 2018) and affective reactions (Lavuri & Akram, 2023).

These theoretical frameworks significantly contribute to understanding consumer behaviour (Ahmad et al., 2023) and decision making (Gursoy et al., 2023; Morrison et al., 2023) in the context of emerging technologies that affect tourism, such as Metaverse. According to the Flow Theory (Wang et al., 2023), when individuals are fully immersed in a particular activity, they experience a state that can significantly influence their attitudes and behaviours. This theory suggests that immersive and interactive experiences in a virtual or immersive world can enhance tourists' overall experiences (Kim et al., 2018) and increase their intentions to visit a destination or pay for these services (Backman et al., 2015). Stimulus-organism-response theory is also applicable in the context of Metaverse in the tourism sector (Talwar et al., 2022). This suggests the presence of external stimuli such as VR experience and marketing. A summary of the theoretical frameworks analysed is presented in Table 5.

Table 5. Main theoretical framework

Theoretical frameworks	Themes
Flow Theory	Feeling of total involvement in an activity
Stimulus-Organism-Response (S-O-R) Framework	Interaction between stimuli, internal states and personal responses
Afordance Theory	How the environment provides possibilities for the behaviour of users
Organismic Integration Theory (OIT)	Distinguishes motivational regulatory processes in intrinsic and extrinsic forms
Dual Processing Theory	Decisions based on cognitive reasoning and affective reactions

Source: authors' elaboration.

5.2. Influence of the metaverse on tourism attitudes and behaviours

Consumer participation in Metaverse has proven to have a significant impact on attitudes and behaviours towards tourism in the real world. As Metaverse has become a virtual extension of reality, its influence on consumer perception and behaviour in tourism has grown exponentially.

- A. Immersive experiences and tourism decisions. According to a study on the use of VR in museum tourism (Wang et al., 2023), VR enriches tourism experience by allowing visitors to interact more deeply with museum exhibitions. This immersive interaction enhances the quality of the experience and motivates tourists to visit real places virtually after experiencing them.
- B. Metaverse as a Promotional Tool. This highlights how Metaverse has enabled travellers to visit destinations virtually, breaking the constraints of time and place (Wei, 2023). This ability to “visit” a destination before deciding to travel can influence the consumer’s final decision on whether to visit a place in the real world.
- C. Social interaction and emotional connections. Metaverse facilitates social interactions between users from different geographic locations, providing a sense of presence through avatar embodiment and physiological and psychological immersion (Wei, 2023). This emotional and social connection can influence consumers’ travel decisions, particularly during the post-COVID-19 era.
- D. Influence on Personalisation and Purchase Decisions. They highlight how virtual tourism experiences can influence consumers’ purchasing decisions (Wen & Leung, 2021). VR experiences such as virtual wine tours can evoke greater purchase intentions and willingness to pay, which can translate into real-world travel decisions.

6. Discussion and conclusions

The escalating relationship between Metaverse and tourism necessitates a comprehensive understanding of the impact of VR, thereby amassing significance in travel studies. Scholars have identified that when VR contributes to tourism promotion strategies (Kilic et al., 2021), it helps destinations to augment customer intention perceptions. Previous research has primarily scrutinised VR immersion formation and behaviour, along with psychological factors (Kim et al., 2022; Zheng et al., 2022).

With regard to consumer conduct within this context, an emphasis on value co-creation among stakeholders (Carvalho et al., 2023) is a Metaverse functionality. Advancements in travellers' experiences through consumer engagement across various stages are fostered by personalisation and a sense of ownership. A Metaverse's immersive interaction may cause expectations and client behaviours to change (Steriopoulos & Ooi, 2023), resulting in the creation of an interactive and scalable environment that captivates tourists, influencing their decision-making regarding purchases and information-gathering interactions (Jung et al., 2021). Marketing perspectives have introduced various novel platforms beyond tactics for brand management, including features such as mirrored worlds diagnostic AR that can provide possible virtual visits or enriched physical experiences (Dogan & Kan, 2020). These undertakings have the potential to expand client service quality and firm output, particularly in the tourist sector, by reshaping consumers' post-effects on interactions and purchasing decisions. However, infrastructure requirements face a few barriers, requiring legislative frameworks to be shaped specifically defining restrictions that usually relate to infrastructural expenses, further imposing privacy and security queries associated with open environments.

Metaverse leverages immersive experiences, such as those offered by VR, to afford travellers a comprehensive and insightful exploration of tourist locations (Talwar et al., 2022), giving them an initial glimpse of their potential real-life encounters. These original virtual, yet authentic journeys demonstrate powerful efficiency for tourism sites that might be logistically complex or subject to travel restrictions. Metaverse utilises immersive experiences, such as those provided by VR, to allow visitors a deep and meaningful exploration of tourism destinations (Bec et al., 2021), providing them with an early preview of what they can anticipate in real life. These once-virtual but lifelike adventures hold potent effectiveness for tourist spots that are either logistically challenging or have travel constraints enforced on them (Wang et al., 2023). Metaverse can facilitate societal relations (Bilotta et al., 2021) among users across various geographical regions, which is potentially advantageous for the consequences of the COVID-19 pandemic. Such relationships could be leveraged for activities, such as social events, group explorations, or shared experiences at virtual attractions (Wei, 2023). Leveraging NFTs and associated digital assets: organisations have the potential to initiate and trade Non-Fungible Tokens in addition to associated digital resources attached to tourism hotspots. This offers customers ownership opportunities for a certain portion of either location or experience (Wei, 2023).

Finally, embracing the Integration of Reality and Virtual Space: the Metaverse provides a platform to create experiences that complement real-world interactions, presenting an all-encompassing journey for tourists. Consider an art gallery as the case study. It is possible for tour infrastructure to incorporate virtual exploration and on-site visits smoothly (Yang & Wang, 2023).

Metaverse and tourism intersection

Metaverse, a fast-evolving digital frontier, has redefined the boundaries of the tourism industry. It is important to highlight the transformative potential of Metaverse in delivering immersive tourism experiences (Yang & Wang, 2023). Although Metaverse was initially perceived as a purely virtual realm, its impact on tourism has become increasingly relevant. Developed regions with technological capabilities led to this shift. However, emerging economies also make a notable contribution, indicating a global interest in using Metaverse for tourism.

Evolution of consumer behaviour in the Metaverse

Consumer behaviour within the Metaverse is a multifaceted domain that evolves in parallel with technological advances and societal changes. Initial interactions in Metaverse are driven by novelty and curiosity. However, as platforms have matured and become more immersive, deeper forms of engagement have emerged. Furthermore, insights are offered on how virtual experiences can influence real-world tourism decisions (Wang et al., 2023). The potential of the Metaverse to shape perceptions, attitudes and behaviours towards real tourism destinations is a rich area for exploration.

Marketing strategies in the Metaverse

Metaverse offers a unique canvas for marketing innovation. Traditional marketing paradigms have been reimaged to adapt to the immersive and interactive nature of Metaverse. The aim is to shed light on the myriad ways in which destinations can promote themselves in this digital realm (Wei, 2023). The possibility of leveraging virtual influencers to create virtual bespoke experiences is vast and unexplored.

In conclusion, this work details significant data on the evolution of the subject analysed, concluding that a growth in publications of more than 34% was observed. Through this first quantitative and qualitative analysis, emerging themes were observed, highlighting how the technology involved in the metaverse has the capacity to influence consumer behaviour and the marketing of tourist services. The metaverse, although still a recent trend, is positioned as one of the most promising technologies

that can have an impact on the tourism sector, a sector that, on the other hand, has historically always been prone to incorporating technological innovations.

7. Future research and limitations

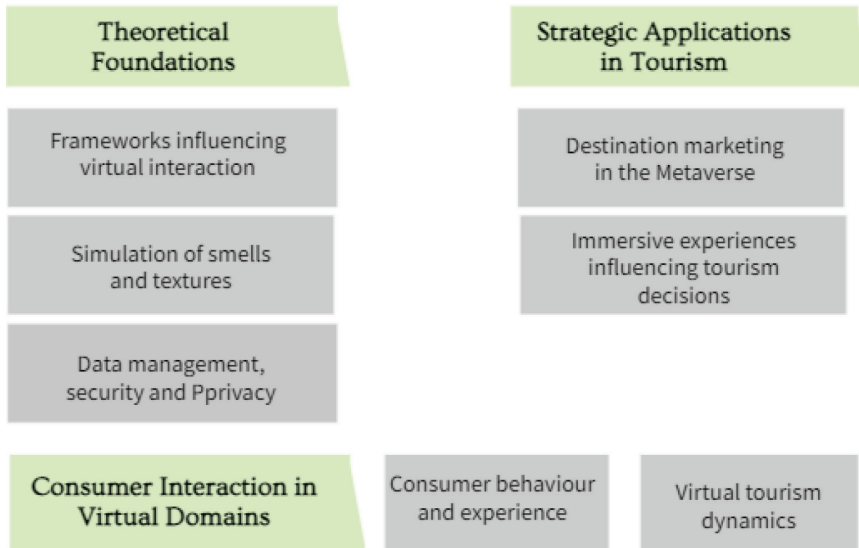
In the rapidly evolving digital sphere, the concept of the Metaverse has garnered considerable attention, both for its promises and its perplexities. As with all revolutionary shifts, the rise of the Metaverse, often deemed the next frontier of the digital experience, presents numerous implications for various sectors apart from tourism, a domain intrinsically connected to human experience, is at the confluence of this digital transformation. To adapt and innovate, it is essential to understand and anticipate the deep changes that engender the tourism dynamics. First, to aptly position ourselves within this new age, there is an urgent need to demystify the vast Metaverse ecosystem. The myriad platforms, technologies, and tools that underpin digital cosmos have a direct and indirect bearing on tourist destinations. The intricacies of these technologies will not only reshape how destinations are presented but also how they are perceived and experienced by potential visitors.

As any seasoned traveller or industry professional attests, the essence of tourism is rooted in the journey, often both literal and metaphorical. In Metaverse, these journeys have undergone dramatic metamorphosis. Mapping nuanced customer pathways in this novel environment from the initiation of interest to post-experience reflections offers an excellent opportunity to identify and harness touchpoints that can influence real-world tourism choices. However, as we navigate these promising avenues, it is paramount to treat caution and conscientiousness. Metamorphosis from a tangible world to a virtual world via advanced AR and VR technologies brings forth a plethora of ethical quandaries. Metaverse, in its vastness, blurs boundaries and challenges our understanding of privacy, data protection, and concepts of addiction. As these concerns emerge, it becomes imperative to address them within the unique context of tourism, ensuring that the evolution of the Metaverse sector remains responsible and grounded in ethical considerations. As we stand on the cusp of this digital dawn, it is crucial to embrace, understand, and critically assess Metaverse's interplay with tourism to ensure that the forward path is both progressive and principled.

Considering the rapid change in this technology, future research should address the impact of the metaverse not only to improve the experience of the sector but also the operational dynamics of companies in the sector by carrying out comprehensive studies that integrate marketing strategies, ethical and safety implications, and privacy inherent to these technologies. Understanding how virtual tourism experiences can complement and potentially enhance physical travel while addressing the challenges posed by such integration, warrants further exploration. Figure 8 presents a summary of these contributions.

This study has some limitations that must be considered. This research was based on articles extracted only from the Web of Science database, which might have

Figure 8. Charting Intellectual Journeys into Metaverse



Future research

1. Demystifying the Metaverse ecosystem in tourism context
2. Metaverse journeys: from initiation to reflection
3. Ethical Dimensions of Tourism in the Metaverse
4. Strategies for progressive and principled integration

Source: authors' elaboration.

omitted relevant perspectives from other sources, such as Scopus. This issue can be addressed in future research. Furthermore, the focus was specifically on Metaverse as applied to tourism; therefore, the results may not be generalisable to other contexts or industries in which Metaverse plays a role. As for the intrinsic nature of the Metaverse, while it promises to revolutionise many experiences, it cannot fully emulate the emotional connections provided by physical experiences. There are also significant ethical challenges associated with Metaverse that require further understanding and resolution.

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Appendix

Table S1. Number of documents analysed

	Document title	Publication Year
1	Pine and Gilmore's Concept of Experience Economy and Its Dimensions: An Empirical Examination in Tourism	2011
2	Toward a Theoretical Foundation for Experience Design in Tourism	2014
3	Exploring the Implications of Virtual Reality Technology in Tourism Marketing: An Integrated Research Framework	2016
4	The effect of information presentation modes on tourists' responses in Internet marketing: the moderating role of emotions	2017
5	Enhancing Cultural Heritage Experiences with Smart Technologies: An Integrated Experiential Framework	2017
6	Value logics for service innovation: practice-driven implications for service-dominant logic	2018
7	Exploring Consumer Behavior in Virtual Reality Tourism Using an Extended Stimulus-Organism-Response Model	2020
8	Serious games as interpretive tools in complex natural tourist attractions	2020
9	Quality of virtual reality and its impacts on behavioral intention	2020
10	Augmented reality enhancing place satisfaction for heritage tourism marketing	2020
11	BRINGING HERITAGE SITES TO LIFE FOR VISITORS: TOWARDS A CONCEPTUAL FRAMEWORK FOR IMMERSIVE EXPERIENCE	2020
12	Virtual pets want to travel: Engaging visitors, creating excitement	2021
13	Virtual reality and mixed reality for second chance tourism	2021
14	Virtual wine tours and wine tasting: The influence of offline and online embodiment integration on wine purchase decisions	2021
15	The impact of user perceptions of AR on purchase intention of location-based AR navigation systems	2021
16	Idealizing adventure tourism experiences: tourists' self-assessment and expectations	2021
17	Industry 4.0 technologies in tourism education: Nurturing students to think with technology	2021
18	Millennials' virtual reality experiences pre- and post-COVID-19	2021
19	Does emotional engagement matter in dark tourism? Implications drawn from a reflective approach	2021
20	THE EFFECT OF BROCHURE AND VIRTUAL REALITY GOGGLES ON PURCHASING INTENTION IN DESTINATION MARKETING	2021

(continued)

Table S1. Number of documents analysed (*continued*)

	Document title	Publication Year
21	Immersive technology: A meta-analysis of augmented/virtual reality applications and their impact on tourism experience	2022
22	Guided discussion or immersive play? Influence of on-site presentation platform on visitor satisfaction in a heritage attraction	2022
23	Investigating metaverse marketing for travel and tourism	2022
24	When Virtual Reality meets destination marketing: The mediating role of presences between vividness and user responses	2022
25	Does Vivid Imagination Deter Visitation? The Role of Mental Imagery Processing in Virtual Tourism on Tourists' Behavior	2022
26	Digitalization and sustainability: virtual reality tourism in a post pandemic world	2022
27	The metaverse in the hospitality and tourism industry: An overview of current trends and future research directions	2022
28	Virtual tourism atmospheres: The effects of pleasure, arousal, and dominance on the acceptance of virtual tourism	2022
29	The transformative learning nature of malaysian homestay experiences	2022
30	Consumers' intention towards the use of smart technologies in tourism and hospitality (T&H) industry: a deeper insight into the integration of TAM, TPB and trust	2022
31	When artificial intelligence meets the hospitality and tourism industry: an assessment framework to inform theory and management	2022
32	Virtual Tours Encourage Intentions to Travel and Willingness to Pay via Spatial Presence, Enjoyment, and Destination Image	2022
33	Virtual reality tourism to satisfy wanderlust without wandering: An unconventional innovation to promote sustainability	2022
34	The Bifold Triadic Relationships Framework: A Theoretical Primer for Advertising Research in the Metaverse	2022
35	Interpreting the perceptions of authenticity in virtual reality tourism through postmodernist approach	2022
36	Smart tourism: antecedents to Indian traveller's decision	2022
37	Metaverse for Cultural Heritages	2022
38	Virtual reality's impact on destination visit intentions and the moderating role of amateur photography	2023
39	Metaverse tourism for sustainable tourism development: tourism agenda 2030	2023
40	Metaverse marketing and consumer research: theoretical framework and future research agenda in tourism and hospitality industry	2023

(*continued*)

Table S1. Number of documents analysed (*continued*)

	Document title	Publication Year
41	Co-creative tourism experiences - a conceptual framework and its application to food & wine tourism	2023
42	Smile for the camera: Online warehouse tours as a form of dark tourism within the era of late capitalism	2023
43	Design affordance in VR and customization intention: Is customer inspiration a missing link?	2023
44	Travelling the Metaverse: Potential Benefits and Main Challenges for Tourism Sectors and Research Applications	2023
45	EXPLORING THE IMPACT OF VIRTUAL REALITY QUALITY ON TRAVEL INTENTION FROM THE PERSPECTIVE OF DESTINATION MARKETING	2023
46	Metaverse in services marketing: an overview and future research directions	2023
47	Metaverse marketing: How the metaverse will shape the future of consumer research and practice	2023
48	Metaverse in tourism: drivers and hindrances from stakeholders' perspective	2023
49	Effect of Display Methods on Intentions to Use Virtual Reality in Museum Tourism	2023
50	A Magic Leap in Tourism: Intended and Realized Experience of Head-Mounted Augmented Reality in a Museum Context	2023
51	AI-enabled technologies to assist Muslim tourists in Halal-friendly tourism	2023
52	Innovativeness or Involvement: How Virtual Reality Influences Nostalgic Emotion and Imagery in Travel Intention	2023
53	Interaction With Cutting-Edge Technologies: A Bibliometric Analysis and a Theoretical Framework	2023
54	Examining the Impact of the Fear of Missing Out on Museum Visit Intentions	2023
55	Rethinking Metaverse Tourism: A Taxonomy and an Agenda for Future Research	2023
56	Immersive Digital Tourism: The Role of Multisensory Cues in Digital Museum Experiences	2023
57	A buzzword, a phase or the next chapter for the Internet? The status and possibilities of the metaverse for tourism	2023
58	Role of virtual reality authentic experience on affective responses: moderating role virtual reality attachment	2023
59	Travelling in the digital world: exploring the adoption of augmented reality (AR) through mobile application in hospitality business sector	2023
60	AR and VR-based travel: a responsible practice towards sustainable tourism	2023

(continued)

Table S1. Number of documents analysed (*continued*)

	Document title	Publication Year
61	Embracing the paradox of customer experiences in the hospitality and tourism industry	2023
62	Transformative service research approaches for visitor experiences in major sporting events	2023
63	Smart hospitality: from smart cities and smart tourism towards agile business ecosystems in networked destinations	2023
64	Metaverse as a driver for customer experience and value co-creation: implications for hospitality and tourism management and marketing	2023
65	Beta tourist world: a conceptual framework for organizing an event in the metaverse	2023
66	Interactive webcam travel: supporting wildlife tourism and conservation during COVID-19 lockdowns	2023
67	THE ROLE OF IMMERSIVE FESTIVAL EXPERIENCES, IDENTITY, AND MEMORY IN CULTURAL HERITAGE TOURISM	2023
68	How does Metaverse affect the tourism industry? Current practices and future forecasts	2023
69	Employee learning in tourism experiences during Covid-19: a Communities of Practice perspective	2023
70	Metaverse tourism: conceptual framework and research propositions	2023
71	The impact of destination live streaming on viewers' travel intention	2023
72	Travel before you actually travel with augmented reality - role of augmented reality in future destination	2023