

## ***Exploring new realms or losing touch? Assessing public beliefs about tourism in the Metaverse—a big-data approach***

**Purpose.** The Metaverse is rapidly reshaping our understanding of tourism, yet the public perception of this new domain remains largely uncharted empirically. This paper builds on the Technology Acceptance Model (TAM) and Diffusion of Innovations Theory (DIT) to fill this gap, offering crucial insights that could inform scholars and practitioners in both the tourism and technology sectors.

**Design/methodology/approach.** Using a big-data approach, we applied machine learning to scrape comments made by social media users on recent popular posts or videos related to tourism in the Metaverse from three prominent social media platforms. The cleaning process narrowed down 15,461 comments to 2,650, which were then analysed using thematic, emotion and sentiment analysis techniques.

**Findings.** The thematic analysis revealed that virtual tourism evokes a complex range of public beliefs. While many express awe and excitement toward its immersive capabilities, others remain sceptical about authenticity compared to physical travel. Additional themes show people draw comparisons to real-world tourism, discuss technology's role, and note educational value and novelty. However, some comments raise concerns about potential societal harms, exploitation, and mental health impacts. Sentiment analysis found over half of the comments positive, though some were negative. Emotion analysis showed contentment, happiness, and excitement as most frequent, though sadness, worry, and loneliness also featured. Overall, perceptions of Metaverse tourism encompass enthusiasm yet substantial ambivalence.

**Originality/value.** This study is one of the first to comprehensively analyse public discussions on Metaverse tourism. It takes TAM and Rogers's DIT a step further and provides fresh insights

into how these theories can be employed in the emerging field of Metaverse tourism. The themes revealed new conceptual insights into multidimensional factors shaping public beliefs about Metaverse tourism and thus informing scholarly research on virtual interaction and technology acceptance regarding Metaverse tourism. Additionally, the results can help tourism providers, platforms, and marketers address salient public beliefs and sentiments/attitudes in developing marketing offerings, experiences, and communications. Over time, this analysis methodology can be used to track the evolving public perceptions of Metaverse tourism.

**Keywords.** Metaverse tourism, virtual reality, big data, thematic analysis, sentiment analysis, emotion analysis.

## 1. Introduction

Technology is one of the key drives of innovation in service industries. As a disruptive technology, the Metaverse represents an emerging virtual space that blends physical and digital worlds to create interactive, immersive experiences mediated by Virtual Reality (VR), Augmented Reality (AR), and Mixed Reality (MR) (Buhalis and Karatay, 2022; Kuru, 2023; Mahmoud, 2023). The term “metaverse” refers to a collective virtual shared space created by the convergence of virtually enhanced physical reality and physically persistent VR—it provides a fully immersive digital environment, AR overlays digital information on real-world elements, while MR blends real-world and digital elements, allowing interactions with both physical and virtual items (Dargan *et al.*, 2023; Venugopal *et al.*, 2023). As this technology rapidly evolves, it stands to substantially reshape and augment numerous real-world sectors, including tourism (Jo, 2023). In the Metaverse, travellers can explore digital recreations of destinations worldwide, interact with artificial representations, and engage in virtual tourism activities (Marques and Marques, 2023). Moreover, virtual tours incorporating 360-degree or 3D media modality technologies form the foundation for Metaverse tours (Buhalis *et al.*, 2023a). While promising, *Metaverse tourism* or what has been termed the eminent future of tourism (Solakis *et al.*, 2022), appears to afford opportunities for more accessible, inclusive, personalised, and sustainable travel such that it warrants systematic scholarly investigations.

However, as an emerging phenomenon, little research has empirically examined public perceptions surrounding tourism in the Metaverse. Indeed, we argue that establishing a premise for future research in this arena would require us to answer questions like: How do people feel about virtual travel versus physical trips? What potential benefits or drawbacks do they expect? We recognise that initial emotional responses often precede and inform the formation of beliefs about Metaverse tourism, shaping the overall attitudes towards this emerging domain (Eagly and Chaiken, 1993; Mou and Xu, 2017; Slovic *et al.*, 2007). Understanding these beliefs can

reveal multi-layered social and psychological factors shaping the acceptance and adoption of Metaverse tourism offerings. Additionally, these public viewpoints represent crucial practical insights for tourism promoters and providers seeking to navigate this new space.

We build our study on two key theories that have been widely used to study technology acceptance and diffusion - the Technology Acceptance Model (TAM) (Davis, 1989) and Rogers's Diffusion of Innovations Theory (DIT) (Rogers, 2010). We argue that the uniqueness of Metaverse tourism as an emerging technology-mediated experience warrants a novel application of these theories to understand public perceptions (Buhalis and Karatay, 2022; Buhalis *et al.*, 2023a; Buhalis *et al.*, 2023b; Dwivedi *et al.*, 2022; Go and Kang, 2023; Jafar and Ahmad, 2023; Koohang *et al.*, 2023; Solakis *et al.*, 2022). Our use of machine learning and big social media data analysis techniques also represents an innovative extension of previous applications of the TAM and Diffusion theories (He *et al.*, 2017; Mahmoud *et al.*, 2021; Wang and Wang, 2020). Overall, we aim to provide novel empirical evidence on public beliefs and sentiments (i.e. attitudes) regarding Metaverse tourism and the emotions behind those beliefs and sentiments while also further developing the theoretical understanding of technology acceptance and diffusion in this new context.

Therefore, this paper aims to comprehensively assess public beliefs regarding tourism in the Metaverse. Adopting a big data approach, defined as the analysis of extensive social media data, to extract public beliefs and sentiments/attitudes (He *et al.*, 2017; Mahmoud *et al.*, 2021) towards metaverse tourism, we use machine learning techniques to analyse thousands of social media comments discussing Metaverse tourism. The utilisation of machine learning in this context enables robust and efficient analysis of large-scale data, unveiling valid insights into public perceptions (Mariani and Baggio, 2022). Through thematic analysis, sentiment analysis, and emotion analysis, we identify key themes within this discussion and gauge the overall tenor of public perceptions. That said, the paper has three central objectives:

1. Reveal salient themes within the public discourse on Metaverse tourism using thematic analysis of social media comments to identify and conceptualise the beliefs about Metaverse tourism.
2. Assess the overall sentiment/attitude (positive, neutral, or negative) within this discussion using sentiment analysis.
3. Identify key emotions expressed regarding Metaverse tourism using emotion analysis.

We believe that by addressing these objectives, this study provides novel empirical insights and a conceptual foundation to inform scholarly understanding of public beliefs and overall sentiments/attitudes surrounding tourism in the Metaverse. Additionally, the findings offer practical implications for Metaverse tourism marketers and providers in fostering acceptance and engaging with public viewpoints. As virtual travel expands, this analysis establishes a methodology for continually monitoring the evolving public discourse.

## **2. Literature review**

### ***2.1. Tourism in the Metaverse***

While the Metaverse as a commercial reality has forever altered the gaming industry, it is still largely a conceptual technology with disruptive potential for many industries, including tourism (see Dwivedi *et al.* (2022) for the most comprehensive overview of all sectors where the Metaverse is making inroads). The Metaverse has gained prominence after Facebook's name change to Meta and its strategic repositioning of the company around the Metaverse (Anderson and Rainie, 2022; Gadekallu *et al.*, 2022; Huynh-The *et al.*, 2023; Krishnakumar and Lau, 2023).

The unprecedented growth of the tourism sector during the last decade, augmented by the temporary halt due to the global COVID-19 pandemic, which interrupted much of tourism

worldwide, created a unique opportunity for the Metaverse and the new digital technologies to address consumer renewed desires for travel experiences in a post-pandemic world (see Godovykh *et al.*, 2022). Research suggests that the Metaverse impacts tourism by facilitating social connections in the metaverse space where both peer-to-peer social interactions and tourist providers' business-to-consumer social interactions can enhance the consumer planning process or while on a trip experience or post-trip experience (see Buhalis and Karatay, 2022; Buhalis *et al.*, 2023b; Koo *et al.*, 2023; Li *et al.*, 2023).

While Tatavarti (2022) highlights the Metaverse's potential to enhance the tourism industry through increased accessibility, affordability, and the bridging of social gaps, it is crucial to also consider the limitations inherent in this digital transformation. The Metaverse may introduce issues such as reduced human interaction (e.g. Ozdemir *et al.*, 2023; Vo-Thanh *et al.*, 2022), potential data privacy concerns (e.g. Buhalis *et al.*, 2023b; Chen *et al.*, 2024; Liyanaarachchi *et al.*, 2023), and a digital divide (e.g. Liyanaarachchi *et al.*, 2023; Relinque-Medina and Álvarez-Pérez, 2024; Wong *et al.*, 2023b) where certain populations might lack the technological resources to participate fully. Additionally, there is the risk of creating a superficial or inauthentic tourist experience where the depth and richness of physical travel cannot be fully replicated (e.g. Mladenović *et al.*, 2023; Wong *et al.*, 2023b).

The immersive nature of the Metaverse allows for a digital experience encompassing various sensory perceptions (Chen *et al.*, 2023). Still, concerns have been raised about the potential psychological impact of prolonged virtual immersion (Henz, 2022; Ud Din and Almogren, 2023), and there is also the lack of authenticity and spontaneous interactions inherent in physical travel (Hadi *et al.*, 2024; Irimiás, 2023; Koles *et al.*, 2024; Wang *et al.*, 2023). Virtual reality (VR) technology, which has been widely studied for its ability to render realistic and complex physiological and psychological experiences (Liu *et al.*, 2022; Newman *et al.*, 2022; Schöne *et al.*, 2023; Vasser and Aru, 2020), offers an immersive experience that

enables tourists to feel present in a different physical place (D’Cunha *et al.*, 2019; Lee *et al.*, 2020; Melo *et al.*, 2022). The concept of presence is central to theories about advanced virtual environments, including immersive VR (Biocca, 2006; Felton and Jackson, 2022; Weber *et al.*, 2021). Additionally, VR-based devices are recognised for inducing dynamic audio-visual perceptions in humans (Mishra *et al.*, 2021). In recent years, Immersive Virtual Reality technology (IVR) has substantially improved in quality, affordability, and ability to simulate the real world (Araiza-Alba *et al.*, 2020). However, there are ongoing concerns about over-reliance on digital experiences potentially leading to disengagement from physical world activities and interactions (Alexanian *et al.*, 2022; Mazumdar *et al.*, 2024; Vero, 2023).

Moreover, research has shown that mild emotional stimuli presented in a non-immersive virtual environment can elicit actual stress responses (Alghamdi *et al.*, 2017; Dozio *et al.*, 2022). Furthermore, the COVID-19 pandemic has significantly influenced people’s leisure behaviour and has precipitated a shift in travel trends, thereby highlighting the need to understand the reconfigurations in the tourism industry, especially the rise of Metaverse tourism (Huang *et al.*, 2021; Palumbo, 2023). Thus, understanding the potential psychological impact of VR and the Metaverse, as well as the implications for well-being and social interactions, becomes crucial.

This shift towards virtual experiences presents a unique challenge and opportunity for tourism stakeholders. They must adapt to understand customer needs during all stages of their Metaverse travelling experience to provide personalised, diverse, culture-embedded, language-appropriate, interactive experiences to their customers (Dwivedi *et al.*, 2022; Fan *et al.*, 2022; Yang, 2023).

## ***2.2. Theoretical underpinnings of beliefs about tourism in the Metaverse***

This study examines how the public perceives tourism in the Metaverse, using an interdisciplinary approach that integrates technology, psychology, and social sciences. The research covers a wide range of public beliefs, from initial formation and perceived usefulness to societal diffusion and eventual behavioural intention. This approach provides a realistic understanding of the topic at hand.

The study is grounded in Davis's (1989) TAM and Rogers's (2010) DIT. TAM offers a foundational framework for understanding the motivations and acceptance of new technologies (e.g. Boo and Chua, 2022; Guo *et al.*, 2023; Huang *et al.*, 2023a; Pillai and Sivathanu, 2020) like tourism in the Metaverse. Therefore, by focusing on factors such as perceived usefulness, ease of use, and enjoyment, TAM provides critical insights into what drives or inhibits public adoption of Metaverse tourism. This leads us to argue that this approach is instrumental in informing tourism providers about key aspects that make metaverse experiences more compelling and acceptable to potential tourists such that studying public beliefs through this lens equips providers with essential information on how to design and refine Metaverse tourism offerings to meet tourist expectations effectively.

Complementing TAM, Rogers's (2010) DIT provides a broader perspective on how new ideas, such as metaverse tourism, permeate through society (Al-Sharafi *et al.*, 2023; Diogo and Veiga, 2022; Mun Lim, 2009). This theory highlights the importance of understanding the stages of public awareness, interest, evaluation, trial, and adoption of this novel form of tourism (Ayu Esteka *et al.*, 2022; Dabphet *et al.*, 2012; Ganglmair-Wooliscroft and Wooliscroft, 2016). In the context of qualitative research, examining these stages through social media discourse can offer deep insights into public sentiments and emotional responses related to each stage. Analysing the diffusion patterns of Metaverse tourism reveals crucial insights into the current



public perceptions and the likely trajectory of its adoption (Al-Emran, 2023; Jia *et al.*, 2023; Mehran *et al.*, 2023). Therefore, we echo previous research (e.g. Pan *et al.*, 2023; Sharma *et al.*, 2023) by arguing that this knowledge is vital for predicting future adoption rates and devising strategies that could expedite the diffusion process, especially given the emerging stage of Metaverse tourism.

The thematic, sentiment and emotion analyses of public discourse and beliefs about tourism in the Metaverse add a rich, qualitative dimension to the study, uncovering the perceived benefits, risks, emotions, and meanings associated with this emerging innovation (Yadav *et al.*, 2022; Zhao *et al.*, 2022). Importantly, while quantitative models like TAM provide structured insights, these qualitative analyses offer a more detailed exploration of tourist perspectives, capturing the emotional and psychological cues behind the acceptance and rejection of the implementation of innovative technologies (e.g. Safi *et al.*, 2018; Vogelsang *et al.*, 2013) like the Metaverse. As such, integrating TAM, DIT, and these qualitative methods into a comprehensive qualitative approach offers a framework to address existing knowledge gaps and derive strategic marketing insights. This triangulated approach promises both theoretical and practical value, providing tourism providers with a multifaceted understanding of public views on an innovation poised to disrupt the tourism industry. Figure 1 exhibits a working conceptual model visualising grounding the current study in TAM and DIT.

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### **3. Methods**

#### *3.1. Data Collection*

We utilised a big-data approach to identify public beliefs about tourism in the Metaverse. Our study was reviewed for ethical compliance and was approved by the

Institutional Review Board (IRB) of [Anonymised] University. The IRB agreed that informed consent was not necessary since the online comments were public. However, we anonymised all data and removed any personally identifiable information to ensure further ethical compliance.

We sourced data from Reddit, TikTok, and YouTube posted between January, 2020-December, 2022. We selected this timeframe to capture the most recent public opinion, coinciding with significant technological advancements and heightened public interest in the Metaverse. Each of these platforms caters to diverse demographics and has distinct modes of user interaction, offering a holistic view of public sentiment and beliefs. To further enhance the robustness of our data collection, we selected data sources known for their reliability and relevance in the context of Metaverse tourism. This included leading social media platforms like Reddit, TikTok, and YouTube, which are renowned for their extensive user engagement and diversity of opinions (Cho *et al.*, 2023; Iamnitshi *et al.*, 2023; Savolainen, 2022; Teng *et al.*, 2022). For Reddit, we extracted 3,849 comments from relevant subreddits r/VirtualTourism and r/Metaverse. From TikTok, we scraped 1,336 comments on posts tagged with hashtags including #virtualreality, #virtualtourism, #vrtravel, #virtualtour, #vrtour, and #Metaversetourism. For YouTube, a total of 10,276 comments were scraped from 19 popular videos identified using specific search keywords (e.g. Metaverse Travel, Virtual Tourism, Metaverse Hotel Experience, Virtual Reality Travel, VR Hotel, AR Travel Experience, Virtual Vacation, Digital Tourism, Metaverse Resorts, Blockchain Travel). These videos had been sorted based on their view count to ensure relevance and wider impact. In total, our initial dataset comprised 15,461 comments. The keywords and hashtags utilised in this study were selected based on their frequency and prominence after a content analysis of trending Metaverse tourism topics and extensive rounds of search on the social media platforms to ensure that the data collected was representative of the prevailing discussions.

To prepare the textual data for analysis, and in line with ensuring the highest quality of data for analysis, pre-processing and cleaning methods were applied using Python coding (see Appendix 1 and Appendix 2) to remove duplicate comments, filter out non-English comments, and eliminate meaningless or incomprehensible statements (e.g. spam), thereby ensuring that our dataset was representative and free of noise. This process narrowed the dataset to 2,650 comments suitable for qualitative analysis.

### *3.2.Data analysis—thematic analysis*

Using NVivo 12 software, a software application widely acknowledged for its utility in managing complex qualitative data sets (Ashaye *et al.*, 2023), initial codes were generated and subsequently grouped into overarching themes. NVivo was also utilised for assessing inter-coder reliability, in addition to its role in thematic analysis. The goal was to understand the complex array of public beliefs concerning Metaverse tourism. The thematic analysis followed a systematic process incorporating several labour-intensive stages to ensure validity and reliability, incorporating dual coding, multiple iterations, inter-coder reliability assessment, and third-party validation. Initially, a random subset of 200 comments was selected for exploratory analysis to identify potential themes. These emergent themes were used to establish a coding framework informed by both the preliminary examination and relevant literature.

Two independent researchers engaged in the coding process, contributing to the minimisation of individual biases and enhancing coding reliability (Saldaña, 2021). In the initial stage of open coding, researchers generated a range of codes inductively from the raw data. These codes encapsulated key ideas, patterns, and emerging themes relevant to public perceptions of Metaverse tourism. Examples of these initial codes included terms such as “Immersive Experience,” “Authenticity Concerns,” “Tech Scepticism,” and “Educational Value.” These were subsequently organised into a shared codebook, which was updated

iteratively throughout the research process to account for the complexity and dynamism of the data (Hack-Polay *et al.*, 2022; Thomas, 2016). We ascertained that data saturation was reached when no new themes or codes were identified in the latter stages of the coding process (approximately 60% of the dataset), thereby ensuring the comprehensiveness and validity of our analysis (Guest *et al.*, 2006). Following the open coding stage, axial coding was performed to explore interrelationships among the initial codes. This stage was instrumental in clustering codes into broader, more abstract categories. Subsequently, selective coding was employed to refine these categories into overarching, interpretative themes that constituted the primary focus of our study (Corbin and Strauss, 2015).

Inter-coder reliability was assessed using Cohen's Kappa coefficient to ensure consistency in the coding process (MacPhail *et al.*, 2015). Any instances of disagreements between coders were resolved through discussions. Cohen's Kappa ( $\kappa$ ) was calculated using the formula:  $\kappa = (P_o - P_e) / (1 - P_e)$ , where  $P_o$  is the relative observed agreement among coders, and  $P_e$  is the hypothetical probability of chance agreement. This calculation helped us determine the extent to which the agreement between the coders surpassed what would be expected by chance alone (e.g. Law *et al.*, 2023). The final Cohen's Kappa score of 0.827 indicated substantial agreement between the coders (Cohen, 2016; Landis and Koch, 1977). Moreover, validation was performed by a third coder reviewing a random sample of data. Their feedback was integrated through a consensus meeting, which helped refine the coding framework and added another layer of rigour to the findings. Ultimately, the identified themes were interpreted in light of existing literature, aligning findings with theoretical frameworks and highlighting avenues for future research (Boyatzis, 1998; Elo *et al.*, 2014; Fereday and Muir-Cochrane, 2016).

### *3.3.Data analysis—sentiment analysis and emotion analysis*

For the analytical framework, the refined dataset was analysed using the Sentiment Intensity Analyzer (SIA) based on the VADER lexicon (Hutto and Gilbert, 2014) from Python's Natural Language Toolkit (NLTK). The VADER lexicon was selected for its proven efficacy in capturing the sentiment in social media texts, making it suitable for the public comments in our dataset (Hossain and Rahman, 2022). It is also robust in understanding the sentiment expressed through idioms and emoticons, which are frequent on online platforms (Banik, 2023). Each comment was assigned a compound score that served as an aggregated measure of its sentiment polarity. The compound score was used for the classification criteria to classify the comments into 'Positive,' 'Negative,' and 'Neutral' categories based on predefined thresholds ( $> 0.05$  for Positive,  $< -0.05$  for Negative, and between these ranges for Neutral).

For the lexical choices, the emotion analysis employed a predefined list of emotion words grounded in seminal theories like Paul Ekman's basic emotions (Ekman, 1992) and Plutchik's Wheel of Emotions (Plutchik, 1980). The comments were tokenised, and each token was compared against this emotion lexicon. For frequency analysis, frequencies of each emotion were tabulated to assess the overall emotional tone of the public discussions on the selected platforms regarding tourism in the Metaverse. Finally, the results were visualised using Matplotlib, generating a bar chart for emotion frequencies and a pie chart for sentiment distribution. A word cloud was also produced to offer a qualitative snapshot of the corpus.

## **4. Results**

### ***4.1. Thematic analysis***

#### ***4.1.1. Concept 1: Virtual Experience and Authenticity***

This concept encompasses public beliefs regarding the Metaverse tourism experience itself and its perceived authenticity compared to real-world tourism. There is a spectrum of

opinions, from excitement about the immersive quality, as noted by Guttentag (2010), to scepticism about whether virtual experiences can truly replace physical experiences, mirroring concerns raised in previous research (e.g. Buhalis and Karatay, 2022; Cheong, 1995; El-Said and Aziz, 2021). The themes highlight an evaluation of Metaverse tourism on its own merits and in relation to traditional tourism.

#### *4.1.1.1. Excitement and Optimism About Virtual Experiences*

In the emergent landscape of Metaverse tourism, the theme of ‘Excitement and Optimism About Virtual Experiences’ distinctly captures the public sentiment, resonating with the immersive nature of the Metaverse as highlighted by Chen *et al.* (2023). The immersive quality of these experiences evokes a sense of awe and wonderment, positioning Metaverse tourism as an innovative frontier in the realm of travel and leisure. For instance, one user marvels at the experience by saying, *“Absolutely stunning. Thank you so much. I felt like I was walking the halls and having a cup of tea on the patio. Unbelievable.”* This vivid depiction underlines the emotional engagement and ‘realness’ that Metaverse tourism can offer, a concept central to Biocca’s (2006) account of the presence in virtual environments. Another comment, *“Watched this with my kids. Felt like I was there,”* aligns with research suggesting Metaverse tourism facilitates family bonding and collective experiences (Fan *et al.*, 2022; Liu *et al.*, 2023; Yoon and Nam, 2024)—it reinforces the notion that these experiences can not only be individually enriching but also serve as a collective family activity. Even though there is a recognition of its limitations—as one user cautiously notes, *“This will never live up to actually visiting there but it’s more than a start”*—the overarching sentiment indicates a pervasive optimism. Interestingly, this optimism borders on anticipation of future adoption, aptly encapsulated by the comment, *“Although it’s sad from afar, the fact of the matter is that we are all going to be addicted to it one day,”* highlighting both the pros and cons of this emerging phenomenon.

Enthusiasm is further evident in comments like, *“This is the most amazing thing I’ve ever seen.”* The anticipation for personal experiences is evident in another comment, *“I can’t wait to try this for myself.”* Echoing the futuristic vision, users assert, *“Virtual tourism is the future of travel”* and *“This is going to change the way we travel,”* aligning with the expectations of recent research (e.g. Büchel and Spinler, 2024; Dwivedi *et al.*, 2022; Gauttier *et al.*, 2024), indicating a belief in its transformative potential.

The theme is thus one of forward-looking enthusiasm, suggesting a significant shift in how travel and leisure are perceived and experienced. The idea of Metaverse tourism seems to be gradually gaining momentum as if it is an inevitable trend that will soon be embraced by many.

#### *4.1.1.2. Scepticism and Concerns About Authenticity*

This theme highlights a counternarrative to the rising excitement around virtual experiences. The sentiments expressed through these comments underscore concerns about the inability of Metaverse tourism to capture the authentic essence of physical travel. For example, one user dismissively states, *“This is the most useless thing I have ever seen,”* pointing to a fundamental question of value in the digital replication of real-world experiences. Another user echoes this scepticism by preferring tangible experiences, saying, *“I would much prefer to head out to the countryside rather than go inside this Virtual Reality world.”* These sentiments manifest resistance to trading the sensory richness and unpredictability of physical travel for virtual alternatives.

Furthermore, the comments also indicate that the public interest might be waning or at least diversifying. One comment notes, *“The hype is dead doesn’t mean the concept of the ‘metaverse’ is dead. It just means the buzzword is no longer sticking and public attention has moved elsewhere.”* This suggests that the initial enthusiasm may have been tied more to the

novelty of the concept rather than its sustained utility or appeal. Another user is more direct in their criticism, stating, “*It may look pretty, but it turned out to be a big piece of junk,*” signalling that the aesthetics of Metaverse tourism are not sufficient to eclipse its perceived shortcomings in delivering a fulfilling experience. Overall, the theme suggests that while Metaverse tourism may be a burgeoning field, it faces substantial hurdles in winning over sceptics who value the intangibility and authenticity that come with traditional travel.

Incorporating insights from previous research, the scepticism towards Metaverse tourism echoes broader concerns about digital experiences failing to replicate the authenticity and spontaneity of physical travel (Irimiás, 2023; Koles *et al.*, 2024). This resistance is further compounded by the fears of a superficial tourist experience (Mladenović *et al.*, 2023; Wong *et al.*, 2023b). Despite the potential benefits of Metaverse tourism in enhancing accessibility and affordability (Radanliev *et al.*, 2023; Tatavarti, 2022; Yaqoob *et al.*, 2023), the lack of genuine human interaction and potential data privacy concerns (Buhalis *et al.*, 2023b; Liyanaarachchi *et al.*, 2023; Ozdemir *et al.*, 2023; Vo-Thanh *et al.*, 2022) pose significant challenges. These theoretical underpinnings suggest a need for a balanced approach to developing Metaverse tourism experiences, one that addresses these concerns while harnessing the Metaverse’s potential.

#### *4.1.1.3. Comparisons Between Virtual and Real Experiences*

This theme navigates the fine line between the potential and limitations of Metaverse tourism. The comments reveal an evaluation of how these two forms of tourism measure against each other. For example, one user who had previously visited Japan reflects on their experience by saying, “*I been to Japan before but I was like [sic, age not specified] old so I don t [sic] remember it me [sic] want to scream Hopefully someday I get to go*”<sup>1</sup> This comment

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<sup>1</sup> The user's comment contains a typographical error. It omits specifying their age during a trip to Japan, making it unclear how 'old' they were and thus affecting their memory of the experience.



captures the longing for tangible experiences that a virtual visit might rekindle but can't entirely fulfil. Another user, who had high expectations, expressed disappointment by stating, "*I thought it would be more like Ready Player One, pretty boring,*" highlighting that Metaverse tourism might still have some ground to cover to meet the high expectations set by cultural representations.

On the other hand, a more positive outlook is represented by a comment from a user who had physically been on a ship: "*I had the fortune to be on the ship in person. It was even more luxurious than is here.*" This appreciation of luxury is echoed by another user, who sees potential in virtual tours of luxurious settings, remarking, "*Can we get a virtual tour of that dinky submersible that tourist submarine? It's beautiful and luxurious even by today's standards. Wow the second class dining saloon is almost as nice as the first class ones now.*" This suggests that while Metaverse tourism may not replicate the sumptuousness or grandeur of real-world experiences, it can serve as a point of reference or even a teaser for what is to come. Moreover, a tempered yet optimistic perspective is offered by a user who notes, "*This will never live up to actually visiting there but it's more than a start.*" Such a comment indicates a recognition that while virtual experiences might not replace real-world travel, they offer a novel form of engagement that may complement traditional tourism in various ways. In contrast, a user concerned about travel restrictions noted, "*This will ruin my fun. We are supposed to be going to London for Christmas but Boris might announce a 14 day quarantine period how likely do you think this is?*" highlighting the potential for Metaverse tourism to offer alternatives when real travel faces logistical challenges.

The complementary nature of real and virtual experiences is further emphasised by a work-from-home mom: "*As a work from home mom during the pandemic, my perspective is that the virtual will never replace being in person but is another tool in the toolbox.*" This aligns with the theoretical underpinnings of TAM, which suggests that while users recognise

the utility of new technologies, they also acknowledge their limitations (Davis, 1989). Moreover, a user's desire to preview locations virtually before visiting, "*I have had so many times when I have booked what I thought was a reasonable safe hotel and then I felt like I have walked my family into a war zone when we get there. I want to know what the room looks like AND what the neighborhood looks like. That way there is no deception,*" reflects DIT, indicating how innovations like Metaverse tourism can gradually become integrated into societal norms (Rogers, 2010).

However, the social aspect of tourism remains a challenge for virtual experiences. One user's comment, "*I do want to interact with people too much in real life. Do I want to interact with them in virtual reality? No, I'm such a boomer,*" highlights the psychological and social implications of virtual experiences as discussed in the literature (e.g. Frost *et al.*, 2022; Henz, 2022; Lavoie *et al.*, 2021; Palumbo, 2023).

Overall, this theme reveals a complex landscape where virtual and real experiences are not necessarily in competition but rather offer different facets of tourism that can co-exist and enrich the overall tapestry of travel.

#### *4.1.2. Concept 2: Technology and Accessibility*

This concept covers discussions around the technology powering Metaverse tourism and its implications for accessibility and inclusivity (e.g. Bulchand-Gidumal, 2022; Yung *et al.*, 2022). On the one hand, there is intrigue and curiosity about technical capabilities and future potential. On the other hand, there are concerns about hardware limitations, software issues, and the learning curve (e.g. Nijjer *et al.*, 2023; Özdemir Uçgun and Şahin, 2023; tom Dieck *et al.*, 2021; Yemenici, 2022). Overall, the technology and accessibility themes relate to the user experience.

#### 4.1.2.1. Discussions About Technology and Accessibility

The theme focuses on the practical aspects of Metaverse tourism, specifically regarding the hardware and software that make these experiences possible. Some users seem to be interested in the technological backbone of virtual experiences and how it influences their engagement. One user's comment, "*Curious about if the gear you still is the best in your opinion,*" reflects an interest in staying abreast of advancements in virtual reality equipment. Another user extends this curiosity to the realm of personalisation within the Metaverse, pondering, "*I wonder if people will be able to use VR to make changes in the interior or switch between popular layouts.*" This aligns with the literature that emphasises the potential of the Metaverse to enhance tourism through increased accessibility and personalisation (e.g. Dwivedi *et al.*, 2022; Radanliev *et al.*, 2023; Tatavarti, 2022). This question taps into the continually evolving nature of technology and its impact on the user experience. Another comment, "*Love watching these in the headset,*" underscores immersive hardware's role in elevating the experience, offering a direct endorsement of the technology in use.

Conversely, technology's role is not universally positive; it can also induce anxiety or discomfort. A user notes, "*The further I get into this video the more anxiety I get with the technology,*" and another user echoes this sentiment, expressing fear and discomfort: "*This technology scares me and makes me uncomfortable. I do not think I will ever use it.*" This reflects concerns raised in the literature about the emotional toll that high-tech experiences might inflict on some users (e.g. Yue, 2022). Furthermore, critiques about the current state of the technology, as voiced by a user, "*This VR stuff still needs a lot of development in my opinion. The visuals are not very good,*" align with ongoing concerns about over-reliance on digital experiences and the need for continued technological improvement (Alexanian *et al.*, 2022; Brownsword, 2022; Lnenicka *et al.*, 2024).

Questions about accessibility, such as, “*why my phone can’t see the Cardboard icon?*” and issues with technology functionality, “*I tried it on my phone but it’s not working properly,*” highlight the digital divide and technological challenges discussed in the literature (Liyanaarachchi *et al.*, 2023; Wang *et al.*, 2022; Wong *et al.*, 2023b).

The transformative power of technology in transcending physical barriers, as noted by a user, “*I felt like I have been to Japan. Technology is breaking all kind of physical barriers in human interactivity,*” is supported by research highlighting the immersive nature of the Metaverse (Chen *et al.*, 2023). In contrast, a user’s uncertainty about the technology’s future, “*The VR technology is just way ahead of its time but it surely is the future. It’s horrible though!*” reflects the complex sentiment around emerging technologies (Irimiás, 2023; Koles *et al.*, 2024).

Lastly, a user’s query about risks and tips for VR in real estate, “*I would like to ask what are the risks associated with this technology and I would like to start some projects in VR for real estate. Any tips?*” indicates the practical application of this technology in various sectors, resonating with the literature’s emphasis on the importance of understanding user needs and providing personalised experiences in the Metaverse (Dwivedi *et al.*, 2022; Guo *et al.*, 2024; Shin, 2022; Zallio and Clarkson, 2022).

Overall, this theme suggests that while technology is a central pillar of Metaverse tourism, it presents a spectrum of perspectives ranging from enthusiasm and curiosity to apprehension, which can significantly influence user engagement and satisfaction.

#### *4.1.2.2. Accessibility and Inclusivity*

The theme of ‘Accessibility and Inclusivity’ in Metaverse tourism, grounded in Davis’s (1989) TAM and Rogers’s (2010) DIT, brings to the forefront the democratising potential of Metaverse tourism. This digital realm, which Dwivedi *et al.* (2022) acknowledge for its

disruptive potential, offers an avenue for individuals who face various barriers to physical travel, whether due to disability, financial constraints, or other life circumstances. For instance, one user comments, *“Where I live it’s almost impossible and the price is quite high [...] for Virtual and stand-alone shooting the head it’s visible but it fits perfectly the aim of the experience. Thanks for these, [...] you’re helping me a lot.”* This complex response reveals how geographical and economic factors can limit access to traditional travel experiences, making Metaverse tourism a valuable alternative. Another user expresses gratitude for the virtual experience, stating, *“So much thanks, I can’t get out due to health but at least I have your videos.”* Here, the emphasis is on health-related constraints that make physical travel not viable, amplifying the importance of virtual platforms as a means of inclusive participation. These beliefs resonate with the concept of presence in virtual environments discussed by Biocca (2006) and the enhanced accessibility afforded by evolving VR technology (Araiza-Alba *et al.*, 2020).

Enriching this narrative, a user proclaims, *“Virtual tourism makes travel accessible to everyone,”* highlighting its universal reach in line with TAM’s focus on perceived usefulness. *“This is a great way for people with disabilities to travel the world,”* another user adds, reflecting the inclusiveness emphasised in Rogers’s theory. The comment, *“Virtual tourism can help to bridge the gap between the rich and the poor,”* echoes Wong *et al.*’s (2023b) concerns about the digital divide and the potential of the Metaverse to address it.

Other comments further illustrate its cultural impact: *“This is a great way to promote cultural understanding,”* *“Virtual tourism can help to connect people from all over the world,”* and *“This is a great way to learn about different cultures.”* These insights, aligning with previous research (e.g. Dwivedi *et al.*, 2022; Fan *et al.*, 2022; Martins *et al.*, 2022; Tran, 2024), underline Metaverse tourism as a tool for cultural exchange and understanding. Lastly, *“Virtual*

*tourism can help to break down barriers between people,*” captures its essence in fostering global unity, resonating with the emotional and psychological aspects of virtual experiences as discussed by Liu *et al.* (2022) and Alghamdi *et al.* (2017).

These comments highlight the significance of Metaverse tourism, which is not just a substitute or rival to traditional tourism but also plays a crucial role in broadening the horizons of people who are unable to travel. Virtual experiences help bridge the gap and provide opportunities for cultural exposure and exploration to those who might otherwise be excluded from such enriching activities.

#### *4.1.3. Concept 3: Societal Perspectives*

This concept groups together themes related to the perceived impact of Metaverse tourism on society and human behaviours. While there is noted interest in novelty and learning, reflecting Metaverse tourism’s educational affordances (Richter and Richter, 2023; Zhang *et al.*, 2022), others express concerns about social isolation or harm to well-being (Deng *et al.*, 2023; Oppert *et al.*, 2023; Wong *et al.*, 2022). There appears to be a tension between positive and negative societal implications.

##### *4.1.3.1. Interest in Novelty and Learning*

The theme encapsulates the curiosity and educational aspirations that many users associate with Metaverse tourism. While traditional travel has long been valued for its educational and perspective-expanding potential, Metaverse tourism is emerging as another platform for learning and discovery. One user anticipates this transformative aspect by stating, *“Virtual tourism will bring a new perspective to holiday,”* suggesting that the digital medium offers an alternative lens to explore and understand different cultures and destinations. Another user reinforces this idea by noting, *“This was awesome, for I learned so much with this; I saw more with your virtual tour than I did when I actually visited the Tower Of*

[...]” This comment highlights the surprising depth and educational value that well-crafted virtual experiences can offer, even surpassing some real-world experiences in terms of content exposure.

Furthermore, the theme reveals a curiosity about how Metaverse tourism intersects with other technological trends and platforms. For example, one user expressed, *“I’m interested to try this with games like VRChat; they have a nice concept as well as amazing graphics. Hope you can make a review about it.”* This interest in blending Metaverse tourism with gaming environments such as VRChat underscores the evolving nature of digital experiences, as discussed in the literature, where virtual environments are increasingly becoming platforms for innovative and engaging learning experiences (Al-Ansi *et al.*, 2023; Deng *et al.*, 2023; Fan *et al.*, 2022; Wong *et al.*, 2023a).

Further, users’ comments about the potential profitability and growth of Metaverse tourism, such as *“An interesting platform for earning if only it would work longer and not burst like a bubble in a month,”* and *“Virtual tourism will develop in the near future so I think it’s worthwhile to consider this project for investment,”* reflect the disruptive potential of the Metaverse in tourism as outlined by Dwivedi *et al.* (2022). The enthusiasm around the active community and anticipated advancements in technology, as seen in comments like *“The project team and telegram community are very active,”* resonate with the literature’s focus on the importance of understanding customer needs and providing personalised, interactive experiences (Aslam, 2023; Fan *et al.*, 2022; Rane, 2023).

The curiosity about integrating virtual tourism with NFTs and the Metaverse, highlighted by comments such as *“While the metaverse remains a developmental theme for many companies, some are already entering this world to offer opportunities to discover the world through NFTs,”* aligns with Rogers’s DIT. It suggests that new ideas like virtual tourism

in the Metaverse permeate society through stages of awareness, interest, and adoption (Rogers, 2010).

In summary, this theme suggests that Metaverse tourism is being recognised not just as a leisure activity but also as an educational tool capable of delivering rich, novel insights into places and cultures. The active participation and optimism for its future growth, as noted by users, further underscore its potential as a transformative platform in the realm of tourism and learning, reflecting the sentiments analysed in the literature.

#### *4.1.3.2. Concerns About Societal Impact*

This theme captures a range of anxieties about the broader repercussions of Metaverse tourism on society, echoing the concerns raised in the literature. One significant worry is that the socio-economic divide this form of tourism might exacerbate. As one user states, *“The poor people will be in [virtual tourism]. The rich people will keep doing classical tourism as usual,”* paralleling the digital divide concerns discussed by Wong *et al.* (2023b) and the potential data privacy issues highlighted by Liyanaarachchi *et al.* (2023). This mirrors TAM (Davis, 1989), which emphasises the role of perceived usefulness and accessibility in technology adoption, as well as Rogers’s (2010) DIT, highlighting how new technologies permeate through society.

Additional concerns involve loss of human connection and emotional intelligence. One user questions, *“If virtual tourism gets too realistic, will some people lose touch with what’s real versus simulation?”* This reflects the lack of authenticity in Metaverse tourism experiences, as noted by Irimiás (2023) and Koles *et al.* (2024). Another user’s comment, *“Virtual tourism is going to make people more isolated,”* resonates with Henz’s



(2022) and Ud Din and Almogren's (2023) discussions on the potential social isolation as a result of Metaverse tourism.

Additional comments focus on the social risks, warning that Metaverse tourism could promote isolation and perhaps even manipulation. For instance, a user lamentably asks, "*Do these people have no real life? What a sad existence,*" suggesting that over-reliance on virtual experiences could lead to a disconnection from 'real life' and authentic social interactions. The cryptic remark "*they isolate you to better dictate you*" brings up ethical risks related to behaviour and thought manipulation in virtual environments, a concern raised in studies on virtual reality and manipulation (e.g. Alghamdi *et al.*, 2017; Cockerton *et al.*, 2024; López, 2023; Zaralli, 2024). A user's view, "*This is a satanic attack on our society; all Humanity does [not] know how to interact with anyone; they do [not] know how to love; they [do not] know how [to] think for themselves; very, very dangerous,*" underscores fears about diminishing autonomy and emotional bonds, mirroring concerns about emotional stimuli and stress responses in virtual environments (e.g. Doma, 2024; Palumbo, 2023).

Finally, the direct statement "*Virtual tourism is going to destroy the travel industry*" aligns with the literature suggesting the disruptive potential of the Metaverse on traditional sectors (Büchel and Spinler, 2024; Dwivedi *et al.*, 2022; Gauttier *et al.*, 2024). Together, these beliefs signal concerns about adverse impacts spanning personal well-being to the economic vitality of the broader tourism industry.

#### *4.1.3.3. Mental Health Concerns*

This theme addresses concerns about the psychological impact of increasing reliance on Metaverse tourism. The comments suggest that the immersive nature of these digital experiences, while captivating, may come at the cost of genuine human interaction and mental well-being. One user articulates this fear by stating, "*So, you CAN'T do anything you want... I*

*see many limitations and false “PROMISES”... you’re “living” in a cartoon fantasy world with people who are most likely very UNHAPPY people who are lying to you about who they are and what they do... so any Cyber Bonding is totally fake and therefore harmful... you are living a DELUSION...*” This perspective aligns with concerns raised in the literature about the potential psychological impact of prolonged virtual immersion (e.g. Han *et al.*, 2022; Henz, 2022; Sadia Suhail *et al.*, 2022; Ud Din and Almogren, 2023) and the loss of authenticity and spontaneous interactions inherent in physical travel (e.g. Irimiás, 2023; Koles *et al.*, 2024).

Another user, although not a professional in the mental health field, raises a specific concern about how Metaverse tourism could exacerbate existing problems in digital behaviour: *“I am not a psychologist, but I am afraid virtual reality one day could bring the problem of “ context switchings“ ( web browsing) to the next level . Just imagine one switching environments one after another, out of boredom ... Perhaps this could cause a cognitive [health problems] or something...”* In line with previous research (e.g. Huang *et al.*, 2023b; Li, 2022), this is further highlighted with grave concerns about serious mental illnesses resulting from Metaverse tourism; a user comments: *“Like a Horror movie. This will give you in a long time Depression, Isolation and you will be hate your real life.”*

This is echoed by another user’s comment on potential addiction: *“The difference is you will be feed an endless supply of digital crack and you will be hopelessly addicted,”* which resonates with ongoing concerns about excessive dependence on digital experiences could result in decreased participation in physical world activities and interactions improvement (e.g. Alexanian *et al.*, 2022; Brownsword, 2022; Lnenicka *et al.*, 2024).

Further, the critique of virtual reality as a form of escapism that might contribute to societal detachment expressed in comments such as *“This whole mental sick living in a delusional world thing are going to destroy humanity to the core”* reflects the need for a more

understanding of the implications of Metaverse tourism on mental health and societal norms, as highlighted in the literature (Huang *et al.*, 2021; Palumbo, 2023).

Together, these comments spotlight collective anxiety about the unexplored mental health implications of Metaverse tourism, urging a more thorough investigation into its psychological impact as it continues to gain popularity. These sentiments, along with concerns about mental stress and the creepiness of the technology, underscore the complex psychological landscape surrounding Metaverse tourism and the importance of addressing these issues in its development and implementation (Alghamdi *et al.*, 2017; Mishra *et al.*, 2021).

#### *4.1.4. Concept 4: Data Privacy and Commercialisation*

This concept covers cynicism stemming from the commercial aspect of Metaverse tourism platforms, including data privacy issues and discussions around business opportunities (e.g. Alegro *et al.*, 2023; Koohang *et al.*, 2023; Monaco and Sacchi, 2023; Solakis *et al.*, 2022; Sun *et al.*, 2022; Verma and Dangi, 2023; Verma *et al.*, 2022). There are concerns that users' data may be exploited or that platform owners are prioritising profits over ethics.

##### *4.1.4.1. Privacy and Data Concerns*

This theme captures a growing apprehension about the potential misuse of personal information in Metaverse tourism platforms. Due to their history of handling user data, the discourse prominently features mistrust toward big tech companies, particularly those associated with *Mark Zuckerberg*. For example, one user sceptically notes, "*Meta verse? Nobody [wants you] to collect data on every single business meeting or whatever. People will rebel.*" This comment raises the alarm about the wide-ranging data collection that could be integral to Metaverse tourism, potentially compromising privacy in professional settings as well. Another user asks, "*What does this solve exactly other than giving the platform [the power] to control [the data] if it [shuts] off?*" echoing concerns about data control and

ownership when engaging with these platforms. Additionally, there is overt mistrust of the intentions behind implementing Metaverse tourism, especially as it relates to tech moguls like Zuckerberg. Two comments, “*No thanks Zuckerberg, I don’t need you spying on me in VR,*” and “*I don’t trust Zuckerberg with my data in any virtual worlds,*” illustrate the degree to which data privacy concerns are entangled with perceptions of the corporations behind Metaverse tourism (Mladenović *et al.*, 2023; Wong *et al.*, 2023b).

These concerns align with Rogers’s DIT, which emphasises the stages of public awareness and interest in new technologies like the Metaverse (Rogers, 2010), indicating a critical stage where trust and transparency are key to wider acceptance and adoption. Further, TAM, focusing on perceived usefulness and ease of use, suggests that for Metaverse tourism platforms to be widely accepted, they must not only offer valuable experiences but also ensure user trust in privacy and data security, providing insights for strategic marketing and development in the metaverse tourism industry (Calderón-Fajardo *et al.*, 2024; Dwivedi *et al.*, 2023; Fan *et al.*, 2022; Florido-Benítez, 2024; Zhong *et al.*, 2023).

#### 4.1.4.2. Commercialisation and Monetisation

This theme highlights a perspective that views Metaverse tourism less as a recreational or educational endeavour and more as a business opportunity ripe for exploitation. Users under this theme seem to be focused on the economic benefits and potential for monetisation that the technology affords. One user’s comment, “*I think I can make money from your [project],*” suggests that the user sees Metaverse tourism as a lucrative venture, offering the possibility of financial gains. This aligns with TAM, which posits that perceived usefulness is a key driver in the adoption of new technologies (Davis, 1989), indicating the potential for commercial success in Metaverse tourism. Further, this perspective is in line with the literature, which discusses the disruptive potential of the Metaverse in various industries, including

tourism, as a new frontier for enterprise (Anderson and Rainie, 2022; Chen, 2024; Dwivedi *et al.*, 2022; Mihalic, 2024).

Another user echoes this sentiment with a more strategic viewpoint: “*Become a virtual tour pro. Make [money]. Compete with real estate [agents] that have no formal training and work for free.*” This comment extends the concept of monetisation into specific industries like real estate, proposing that Metaverse tourism could even serve as a competitive platform against traditional business models (Chen *et al.*, 2023; Liu *et al.*, 2022). Also, this reflects Rogers’s DIT, indicating that innovative uses of technology, like in Metaverse tourism, can disrupt traditional markets and create new business opportunities (Rogers, 2010).

The theme reflects the commercial potential that many see in Metaverse tourism, envisioning it as a new frontier for enterprise. While concerns about societal and psychological implications may circulate, there is a segment of users who are keenly interested in leveraging the technology for financial gains. This emphasises the significance of providing customer-centric solutions in the Metaverse to leverage its business opportunities (Dwivedi *et al.*, 2022; Fan *et al.*, 2022; Hassan *et al.*, 2024; Mereu, 2024), emphasising a need for strategic approaches in marketing and developing Metaverse tourism platforms, taking into account Rogers’s and Davis’s theories (Davis, 1989; Rogers, 2010) to understand and exploit this commercial potential effectively. This suggests that as Metaverse tourism continues to evolve, it will inevitably be shaped by these commercial interests, potentially altering its focus and range of offerings.

Table 1 shows the number of comments and percentage frequency for each of the themes identified, ranked from the most frequent to the least. Figure 2 illustrates the themes and overarching concepts.

INSERT TABLE 1 ABOUT HERE

INSERT FIGURE 2 ABOUT HERE

#### *4.2. Emotion and sentiment analyses*

Based on the analysis of emotions shown in Figure 3, it can be inferred that the overall sentiment of users' comments was positive. Specifically, 49% of the emotions expressed were related to contentment (27%) and happiness (22%), while only 15% of emotions were related to sadness. The sentiment analysis results in Figure 4 supported this finding, showing that 53% of sentiments were positive, while 30% and 17% were neutral and negative, respectively. Finally, the word cloud in Figure 5 provides insights into users' most frequently used words in their comments. The words 'Metaverse' and 'people' were the most commonly used, indicating that these were the key topics of discussion. Overall, these findings suggest that the users had a positive experience and were satisfied with the content provided.

INSERT FIGURES 3, 4 & 5 ABOUT HERE

### **5. Discussion**

A big-data approach was used in this study to discover the public's opinions about tourism in the Metaverse. The study had three main objectives. First, to identify the key themes present in social media discussions about tourism in the Metaverse through thematic analysis.

Second, to evaluate overall sentiment using sentiment analysis. Third, to analyse emotions expressed about tourism in the Metaverse. Our exploratory study not only uncovers the multifaceted nature of public beliefs about Metaverse tourism but also significantly contributes to the understanding of virtual experience perceptions within the frameworks of the TAM and DIT. While some individuals were excited about the immersive experience, others expressed concerns about authenticity, technology, accessibility, societal impacts, data privacy, and commercialisation. Comparisons were also made to real-world tourism, with some comments raising concerns about potential harm. Overall, most comments showed positive sentiment, although some were negative. Aligning with TAM (Davis, 1989), the excitement and optimism expressed by some users regarding the immersive and innovative nature of Metaverse tourism reflects the perception of usefulness and ease of use. This indicates that Metaverse tourism is viewed as having relative advantage and trialability as an emerging innovation, echoing key concepts from DIT (Rogers, 2010). However, concerns about authenticity and technology accessibility barriers highlight issues of complexity that could inhibit adoption, again aligning with DIT. The positive emotions of contentment and happiness likely relate to perceived usefulness, while negative emotions connect to perceived barriers to use. While the predominant emotions of contentment and happiness align with our expectations of public enthusiasm for innovative tourism experiences, the presence of sadness reveals an unexpected depth of emotional engagement, highlighting the complex emotional landscape of Metaverse tourism.

Furthermore, while most users viewed tourism in the Metaverse in a positive light, with themes like “Excitement and Optimism About Virtual Experiences” and a high percentage of contentment and happiness emotions, this enthusiasm was tempered with significant scepticism and concern. Themes like “Scepticism and Concerns About Authenticity” and “Concerns About Societal Impact” likely relate to the observed negative and neutral sentiments. The

prominence of ‘Metaverse’ and ‘people’ in the word cloud suggests that public attention is focused on the broader human and societal implications of this virtual frontier. The discourse reveals a complex mix of optimism and caution, offering rich territory for scholars and industry experts to explore.

The study successfully accomplished its objectives by analysing social media data to better understand public beliefs about tourism in the Metaverse. The findings offer valuable insights for researchers on virtual interaction and technology acceptance related to tourism in the Metaverse. They also have practical implications for tourism providers, platforms, and marketers to develop offerings, experiences, and communications aligned with public perspectives.

Drawing from the existing literature on Metaverse tourism and technology acceptance, notably TAM and DIT, our findings align with the expectations envisioned in previous research, ranging from excitement about the immersive and innovative nature of Metaverse tourism, as underscored by Guttentag (2010), to scepticism regarding its authenticity and potential to replace real-world experiences, mirroring concerns highlighted by Buhalis and Karatay (2022) and El-Said and Aziz (2021). This contrast in public sentiment reflects the core principles of TAM, emphasising the significance of perceived usefulness and ease of use. While Metaverse tourism is perceived as beneficial due to its novel and immersive qualities, concerns about its ease of use and accessibility highlight significant barriers to its widespread adoption (e.g. Buhalis *et al.*, 2023b; Tatavarti, 2022), revealing an underlying digital divide (e.g. Buhalis *et al.*, 2023a; Tella *et al.*, 2023)..

Moreover, the study’s results align with the DIT, highlighting critical innovation attributes like relative advantage, compatibility, and complexity. The public’s interest in Metaverse tourism is due to the unique experiences it offers, indicating its perceived relative



advantage (Bolici *et al.*, 2020; Lu and Hsiao, 2022; Verma *et al.*, 2022). However, scepticism about authenticity and concerns over a technological divide raise issues related to compatibility and complexity when adopting this new tourism format (Frei-Landau *et al.*, 2022; Ye *et al.*, 2022). Hence, inclusive digital tourism strategies are necessary to address the differing needs and capabilities of various societal groups, ensuring equitable access and engagement (Bianchi and de Man, 2021; Verma *et al.*, 2022). The overall positive sentiment and curiosity about Metaverse tourism's educational potential, as revealed in the emotion and sentiment analyses, further highlight the increasing trialability and observability of this innovation (Bolici *et al.*, 2020; Frei-Landau *et al.*, 2022). Therefore, this research provides a comprehensive understanding of the current public perceptions of Metaverse tourism, offering valuable insights into the factors influencing the acceptance and diffusion of this emergent technology within the tourism industry. This will aid academic research and industry practice in navigating the evolving landscape of tourism in the digital era, as Metaverse tourism evolves into a more inclusive and accessible domain, catering to a broader spectrum of society by addressing the digital divide.

### ***5.1. Practical implications***

This section discusses the practical implications of our findings for tourism stakeholders and policymakers. It focuses on strategies to make the most of the favourable views of Metaverse tourism while also tackling the associated concerns and obstacles. Key themes include promoting accessibility and inclusivity, developing ethical guidelines, enhancing the virtual tourism experience, and ensuring privacy and security.

Our findings suggest that the public does not perceive Metaverse tourism as a concept opposed to real-life tourism but rather as 1) a substitute, 2) a tourism experience enhancer in all stages of a tourist's journey, and 3) a promotional tool for tourism services. Tourism

stakeholders such as destination management and marketing organisations, the hospitality industry and tour operators could capitalise on our findings by promoting positive emotions such as contentment and happiness associated with Metaverse tourism (52.5% of the positive sentiment). Tourism stakeholders should develop clear, targeted strategies to grow perceptions about Metaverse tourism while addressing the spectrum of opinions, from excitement about immersive experiences to scepticism about whether virtual experiences can truly replace physical ones. This could include offering affordable or free VR experiences to underprivileged groups, such as partnering with community centres or schools to provide access to VR equipment and content, and ensuring that these virtual tours are available in multiple languages and culturally sensitive formats, such as by collaborating with local cultural organisations and translators. Moreover, when it comes to the idea that Metaverse tourism can serve as an alternative, tourism stakeholders incorporating Metaverse applications should highlight the accessibility and inclusivity of this technology as a substitute for real-life tourism. This is especially important for individuals who are tight on finances or time or are facing health-related limitations.

Neutral sentiment (30.3%) indicates an area ripe for further engagement, with the aim to transform neutrality into positive sentiment by addressing specific emotions identified, such as curiosity and beliefs about cultural exposure and educational opportunities. However, while promoting societal benefits, stakeholders must also consider societal concerns such as manipulation, inequality, and the potential for exacerbating social divisions. The negative sentiment (17.2%) highlights concerns that align with societal beliefs about authenticity, technology accessibility, and potential harms that must be proactively addressed to reassure users about the safety and authenticity of Metaverse tourism. To address these concerns, stakeholders should develop ethical guidelines and standards for virtual content creation and usage, ensuring transparency and fairness. For example, concerning Metaverse tourism as a

tourism experience enhancer, the tourism stakeholders could introduce and offer VR gear and applications to enrich the tourist experience pre-trip, on-site and post-trip. This strategy should be part of an integrated marketing approach that highlights the seamless transition from virtual to physical experiences. Regular training sessions for staff on digital literacy and ethical practices in virtual environments should be implemented to enhance customer trust and safety. Furthermore, policymakers should consider societal concerns such as data manipulation and strive to protect tourists from such practices by establishing robust privacy and data protection laws, particularly for vulnerable tourists such as minors.

Additionally, this study found that Metaverse tourism can have a profound emotional impact on tourists, as shown in our emotion analysis. To capitalise on the dominant emotions of contentment and happiness, tourism organisations should design virtual experiences that not only entertain but also emotionally resonate with users. Tourism organisations should tailor virtual experiences to resonate with these emotions, fostering deeper engagement and leveraging emotions to create anticipation for real travel. The positive emotions expressed indicate an openness to Metaverse tourism that can be leveraged through carefully crafted experiences. However, negative emotions identified, such as sadness and worry, reveal beliefs about potential societal harms and exploitation, which virtual environments should aim to improve to create more welcoming spaces that cater to diverse comfort levels. To address this, tourism companies should prioritise user safety, privacy, and well-being in virtual environments, such as by implementing clear codes of conduct, moderation policies, and support services for users who may experience distress. For example, tourism companies can provide in-platform resources for mental health support, establish clear reporting mechanisms for harassment or abuse, and actively monitor and address any instances of user exploitation or manipulation.

Furthermore, platform designers can integrate sensory stimuli from the physical world into a virtual one, making Metaverse tourism a memorable and thrilling experience. As generative artificial intelligence is evolving exponentially, developing platforms with emotional artificial intelligence that can understand and react to users' emotions (e.g. chatbots) can significantly enhance the authenticity of the interaction between users and platforms in the Metaverse, enhancing the realism and interactivity of Metaverse experiences. This can be achieved by investing in advanced VR technologies that provide more lifelike and spontaneous interactions, as well as developing partnerships with tech firms to continuously improve the quality of virtual environments.

Stakeholders must also ensure that these platforms do not perpetuate or create new forms of inequality. This includes actively working against the digital divide by promoting broader access and preventing the Metaverse from becoming a space that privileges certain groups over others. In addition, hyper-real platforms have the potential to revolutionise the tourism industry within the Metaverse. By using advanced graphics, immersive audio, and realistic simulations, these platforms can create virtual worlds that are akin to realistic experiences. To leverage these opportunities, tourism organisations should invest in developing high-quality virtual content, collaborating with VR technology providers, and training their staff to effectively operate and maintain these platforms.

Aligned with this, hospitality and tourism organisations can use the Metaverse to co-create virtual experiences, allowing consumers to engage with them and other customers. Marketers should focus on promoting the societal benefits of Metaverse tourism. Metaverse tourism platforms offer the technical possibility of bringing people together from different walks of life, increasing the human feel and togetherness of the virtual experience, and creating social bonds. This is crucial for people who struggle with loneliness or perhaps may not have the possibility for real travel, such that, in light of our findings, Metaverse tourism platforms

have the potential to bridge societal gaps, offering inclusive experiences that cater to those unable to travel physically, thus democratising access to global destinations. In other words, Metaverse tourism platforms should recognise and actively address the societal concerns surrounding Metaverse tourism, particularly those related to manipulation and inequality, to ensure that the benefits of these platforms are distributed fairly and ethically.

Finally, privacy is another concern in Metaverse tourism in this study. Policymakers, such as the legislative bodies and local governments, should incorporate privacy and security concerns within policies and regulations. Policymakers can significantly impact the perception of Metaverse tourism by addressing concerns and ensuring tourist safety— they should consider societal concerns such as data manipulation and strive to protect tourists from such practices by establishing robust privacy and data protection laws. Particularly, vulnerable tourists such as minors need to be protected where necessary. This will help enhance the public's trust in the idea of Metaverse tourism as a secure and legitimate option.

In conclusion, the practical implications of our findings highlight the need for a proactive, multi-stakeholder approach to address the challenges and opportunities of Metaverse tourism. By focusing on promoting accessibility, inclusivity, and ethical practices, investing in high-quality virtual experiences, and establishing clear regulations and guidelines, stakeholders can leverage the potential of Metaverse tourism. This potential, when realised, will lead to the establishment of immersive, engaging, and socially conscious virtual travel experiences, offering a new and exciting dimension to the tourism industry.

### ***5.2. Research limitations and implications***

This study is not free from limitations. The generalisability of our findings is subject to several constraints. As the data were collected from three platforms with a global reach, yet only in English, this might only partially accommodate for cultural specificities. Future studies

may explore in depth the beliefs of specific demographics about Metaverse tourism and perhaps about a specific touristic destination. Moreover, the context in which the data were collected—during the years 2020 to 2022—could signify a unique period where sentiments towards Metaverse tourism were potentially influenced by global events such as the COVID-19 pandemic. Another limitation is that the data has been collected at one point in time only. This temporal snapshot means that the sentiments and emotions captured may have been subject to the extraordinary circumstances of the time, which saw heightened emotions and an accelerated shift towards digital experiences. People’s beliefs and sentiments might change over time. Tourists may remain sceptical at the early stage of Metaverse use and gradually change their beliefs and subsequent sentiments in light of their experience and expertise. Our research does not capture this dynamic and evolving nature of tourists’ interaction with the Metaverse. Therefore, while some insights from this study might hold over time, readers should be cautious in assuming the stability of these sentiments and beliefs outside the context of the study period. Future research could undertake a longitudinal study to assess whether tourists’ belief structure changes with evolutions in time and other circumstances.

To complement our analysis of secondary social media data, future research could make use of some primary data collection methods such as focus groups, in-depth interviews and surveys. These qualitative and quantitative techniques would allow for gathering additional insights directly from potential metaverse tourists to validate and expand on the key themes and findings identified in this study.

Since this study is based on data collected over a period when the COVID-19 pandemic was impacting most of the world, especially the tourism industry, people’s beliefs and sentiments towards Metaverse tourism might have been greatly affected by the stay-at-home orders and worldwide closures of touristic destinations. While tourism has recovered considerably post-pandemic, it has not yet returned to its pre-pandemic state (Huynh *et al.*,

2023; UNWTO, 2023). Future studies should further explore if there are any changes in people's beliefs and sentiments towards metaverse tourism in a non-restricted yet pandemic-altered world of tourism.

The study reveals diverging beliefs, sentiments/attitudes and emotions regarding Metaverse tourism. Future studies can use cluster analysis to understand different attitudes based on different personality types and/or lifestyles/values, including cross-cultural dimensions. This cluster analysis could prove useful for marketers targeting different clusters, especially when considering ethical and privacy concerns, as these factors can significantly influence attitudinal variables towards emerging technologies (e.g. Buchanan *et al.*, 2007; Lee and Rha, 2016). Future studies should investigate the reasons for this divergence in attitudinal constructs, focusing on the cognitive (belief) dimensions highlighted in the current findings, employing a mixed-methods approach for a comprehensive understanding, including qualitative methods to explore motivations behind scepticism. In particular, an avenue of research could investigate the triggers of negative emotions and the impact of technological familiarity on these attitudinal variables to best address the scepticism of some people regarding tourism in the Metaverse, where the role of emotional responses in shaping beliefs and attitudes towards Metaverse tourism should be a key focus. Also, a longitudinal study approach is recommended to observe the evolution of these beliefs and attitudes over time amidst the increased exposure to and evolution of Metaverse tourism technologies.

It is worth noting that the methods used for analysing emotions and sentiments are quite effective at capturing the prevalence of affective expressions. However, they are not designed to facilitate cross-tabulation with thematic codes. As a result, we conducted the sentiment and emotion analyses independently of the thematic analysis because the analytical tools we used did not support the integration of qualitative thematic findings with quantitative sentiment data. This presents a limitation in our ability to draw direct correlations between the thematic content

of the comments and their associated sentiments and emotions. Moving forward, it would be beneficial to explore innovative methodological frameworks that allow for the integration of sentiment and emotion analyses with thematic analysis. By doing so, we could cross-tabulate variables and gain a deeper understanding of the interplay between the themes discussed by tourists and their emotional and sentiment expressions. Therefore, an integrated approach could provide more detailed insights into how specific themes elicit particular sentiments and emotions, potentially informing more targeted and effective marketing and management strategies in the context of tourism in the Metaverse.



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