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## Article

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# Exploring innovation resistance in tourism: barriers to metaverse adoption among tourists

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## ABSTRACT

Metaverse is a concept that envisions a future where the physical and digital worlds merge to form a shared space for people to experience and interact with each other. This research aims to study the underlying factors (functional, psychological and individual barriers) that build resistance toward metaverse among tourists. The study has used innovation resistance theory (IRT) to make the conceptual model. The study used a mixed-method approach to investigate the proposed model, with data collected from 26 tourists for qualitative analysis and 198 for quantitative analysis. The data were analysed using structural equation modelling for path analysis. For moderation, the study used process macro model no. 1. The study results showed that the use of metaverse experiences requires certain conditions that increase the cost of usage. Technology vulnerability, characterized by dependence on technology and anxiety about it, was identified as the main cause of innovation resistance also found that people who are not inclined to be innovative or inventive are less likely to embrace new technology and access to better resources, compatible devices, and user-friendly environments can help reduce the barriers that users face in adopting metaverse applications. Tourism, which is mainly related to pleasure and happiness, is strongly influenced by hedonic motivations.

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## KEYWORDS

Metaverse; tourism; innovation resistance; technology vulnerability; passive innovation resistance

## SUBJECTS

Artificial Intelligence; Hospitality; Tourism

## 1. Introduction

With the erratic development of technology, finding a place with no technology has become difficult (Jeong & Shin, 2019). According to Poushter (2016), the Pew Research Center recognised a notable increase in smartphone users with an inclined adoption of the internet and innovative technological devices for personal and professional uses. Tourists have become tech-savvy, and their utilisation and demands have increased with the increased ICT tools throughout travel activities (Li et al., 2017). The integration of tourism and smart technologies helps tourism destination service providers to expand their efficiency, provide better services, utilisation of available resources to the maximum for the quality of life of tourists during their visit to the destination (Jeong & Shin, 2019). Metaverse has been little discussed since a decade in tourism, hospitality and marketing literature (Oh et al., 2023). Prior studies addressed the conceptual understanding of metaverse applications in tourism and their potential uses. Yet, they lack empirical evidence and a theoretical base to support the hypothetical benefits (Buhalis et al., 2023). The metaverse stands as a transformative force in the tourism industry, introducing novel opportunities to reshape how individuals experience and engage with travel. This digital realm enables virtual exploration of destinations, offering tourists a preview of their intended destinations and fostering a deeper connection with places before physical travel.

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Metaverse describes a virtual world that exists entirely in the digital realm and can be accessed by users through the internet. It is often imagined as a collective virtual shared space created by converging virtually enhanced physical reality and physically persistent virtual reality (VR). It is a social space where users and digital objects interact in a shared environment. The concept of the metaverse is still mainly in the realm of science fiction; the term was first used in 1992 in a Neal Stephenson novel titled – Snow Crash (Joshua, 2017). Some believe it will significantly impact social life, enabling new forms of communication, collaboration, and community building. Some examples of metaverse applications currently being developed include VR tours, VR gaming, social VR, and virtual work environments (Buhalis et al., 2023).

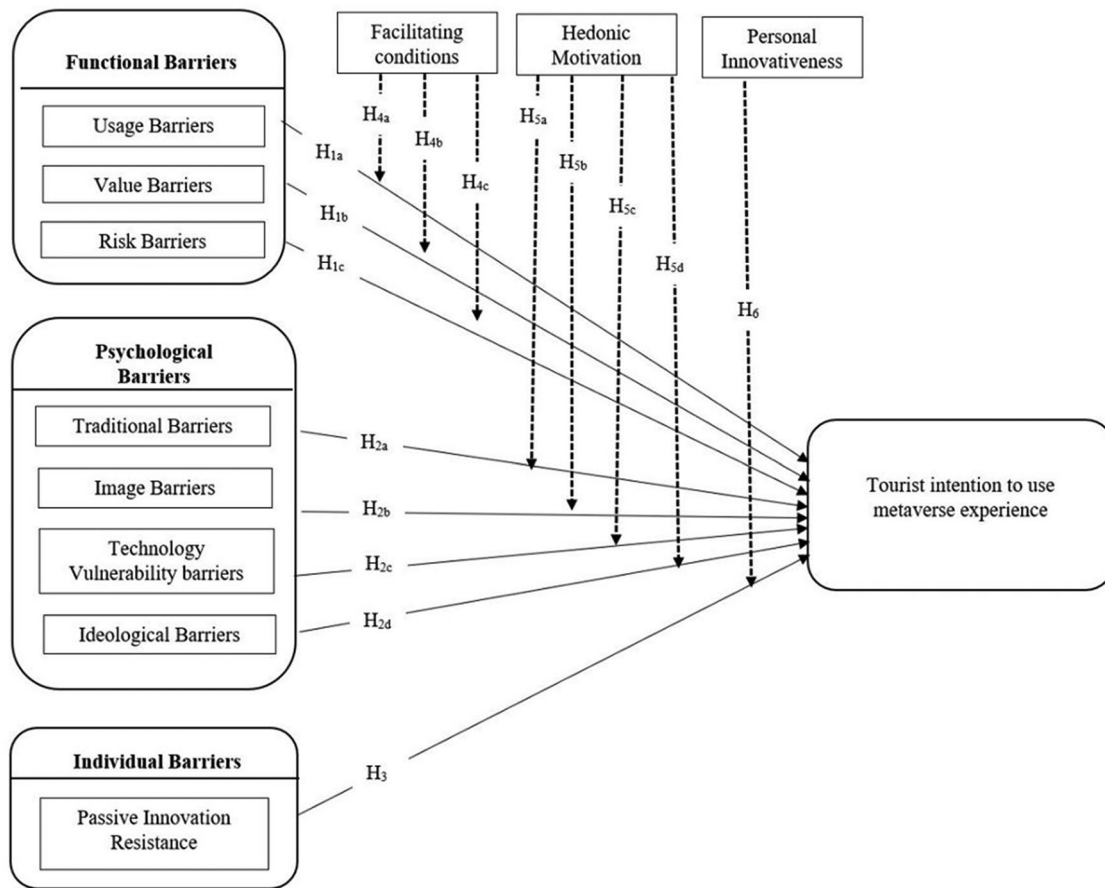
The metaverse, as a concept of a virtual world that integrates with the physical world, is still in its early stages of development and its full potential and implications are yet to be understood (Buhalis et al., 2023). There is a need for more research to better understand the factors that influencing people to resist to engage with this technology and the concerns that the public may have about it. Thus, we intend to fill this gap by studying the barriers that resist tourist from immersive experiences. Hence, we used Innovation Resistance Theory (IRT) to understand what factors resisting tourists not to adopt for new technologies. IRT provides an understanding of why consumers may resist or be reluctant to adopt new technology or innovations. This resistance can stem from potential changes to their current practices or belief system and can greatly impact the success or failure of new technologies. The prior research showed that, tourists resist new technologies due to lack of experience and comfort (Monaco, 2018), privacy concerns about their personal information (Tussyadiah et al., 2019); no motivation or not willing to try for new technologies (Cai & McKenna, 2023), also fear of technological failures (Hashemi et al., 2022). However, on the other hand India is the second fastest digital economy among 17 leading economies of the world due to several digital initiatives such as Digital India, Make in India, Startup India, and BharatNet (Ministry of Electronics & IT, 2019). Studying metaverse barriers in tourism is significant, as it helps identify challenges and obstacles hindering the integration of virtual environments into the tourism industry. Understanding these barriers enables researchers and industry professionals to develop solutions, fostering the seamless incorporation of metaverse technologies. Ultimately, this research contributes to enhancing the overall tourism experience, bridging gaps, and expanding opportunities for virtual tourism (Figure 1). Based on these contradictory results of the facts, we proposed the following research questions

**RQ1:** What are the various barriers that inhibits tourist's intention to use immersive experience such as metaverse?

**RQ2:** What are the drivers influencing behavioural intention to use metaverse powered tourism?

The study gives two major contributions to the existing literature. First, the qualitative approach of Interpretative Phenomenological Analysis (IPA) was leveraged, which is commonly used in understanding human behaviour and experiences in disciplines such as tourism and psychology. In the study, we used to understand the functional, psychological and individual barriers that restrict to use metaverse applications in tourism.

The present study is structured by offering background literature on the emergence of the Metaverse and its influence on the barriers that restrict to use in tourism (Table 1). The research design was framed to understand how functional, psychological and personal barriers affect the tourist resistance to immersive experience. Subsequently, the study was organised by a qualitative study followed by a quantitative study. Later data analysis results from analysis and a general discussion based on the results. The study contribution lies in uncovering nuanced issues such as user adaptation, and technological limitations. This knowledge enables the development of targeted strategies and solutions, advancing the successful implementation of metaverse technologies in tourism. Ultimately, it paves the way for an improved understanding of the intersection between virtual experiences and the tourism industry, fostering innovation and enriching the overall travel landscape. Finally, the study presented theoretical and managerial implications, limitations & directions for future research and conclusion.



**Figure 1.** Conceptual model.

**Table 1.** A notable journey of technology related contributions in tourism.

S. No	Contribution in tourism field	Authors	Year of publication	References
1	Co-create experiences with a range of services provided in travel, transport and tourism organisations	Dimitrios Buhalis	2022	(Buhalis, 2022)
2	Emphasis on the shift of the global tourism industry experiences from mass to smart tourists.	Gajdošík, Tomáš Maráková, Vanda Kučerová, Jana	2021	(Gajdošík et al., 2021)
3	VR immersive experiences	Dimitrios Buhalis	2019	(Buhalis, 2019)
4	Frameworks and e-Tourism	Dimitrios Buhalis	2020	(Buhalis et al., 2020)
5	Smart Tourism Development	Shafiee, Sanaz Rajabzadeh Ghatari, Ali Rajabzadeh Ghatari, Ali Rajabzadeh Ghatari, Ali	2021	(Shafiee et al., 2021)
6	Virtual, Augmented and Mixed reality 3D environment in tourism	Gaberli, Ü	2019	(Gaberli, 2019)
7	Augmented Reality in tourism	Yovcheva, Zornitza et al	2014	(Yovcheva et al., 2014)
8	Gamification applied in tourism for co-creation of experiences	Xu, Feifei et al	2017	(Xu et al., 2017)
9	Blend of mixed reality, virtual reality and augmented reality in effective blend of the physical and virtual worlds	Dimitrios Buhalis Karatay, Nurshat	2022	(Buhalis & Karatay, 2022)
10	The digital transformation disruptions value chain structures and practices in tourism	Dimitrios Buhalis et al.	2019	(Buhalis et al., 2019)

### 3. Theoretical underpinning

#### 3.1. Innovation resistance theory

The exploration of the metaverse in tourism marks a transformative intersection of technology and travel experiences. This evolving digital realm offers immersive, virtual environments that can revolutionize how people engage with destinations. By leveraging augmented and virtual reality, metaverse applications in tourism provide the potential for virtual exploration, pre-travel experiences, and enhanced storytelling. However, challenges such as technological barriers, user adoption, and other considerations must be addressed for a seamless integration. As researchers delve into metaverse barriers in tourism, they pave the way for innovative solutions, ultimately shaping the future of travel and broadening the horizons of destination experiences. The present study used Innovation resistance theory (IRT). IRT was first introduced by Ram (1987), and then it was changed by Ram and Sheth (1989) to explain consumer resistance through a number of barriers that hinder it for individuals to adopt innovative ideas. The term “innovation-resistance” refers to an attitude against new ideas and practises that leads to a refusal to change or adapt, hence preserving the status quo, Lee et al. (2019). IRT gives important information about how people react to new things. Researchers have acknowledged that customer resistance is a key factor in whether a new technological innovation is successful or not (Kaur et al., 2020a, 2020b; Talwar et al., 2020a). IRT says that customer resistance can be of two types: i) active and ii) passive (Yu & Chantatub, 2016). Active-resistance is created by a direct identification with the characteristics of innovation, whereas passive-resistance is mostly brought about by the innovations’ disagreement with the consumers’ pre-existing views (Yu & Chantatub, 2016). Passive innovation resistance and technology vulnerability are two facets that often impede technological adoption. Passive innovation resistance refers to subtle reluctance or hesitance individuals exhibit toward embracing new technologies, even without overt opposition. On the other hand, technology vulnerability reflects an organization’s or individual’s susceptibility to challenges arising from technological advancements. Both concepts highlight the importance of addressing psychological barriers and building resilience to change for successful technology integration. Understanding and mitigating these factors are crucial for fostering a more adaptive and tech-savvy environment. A usage barrier relates to how simple it is for consumers to use the service and what adjustments they must make to do so. A value barrier relates to the ratio of performance and the price of service in comparison to alternatives. The way things have always been done in the past constitutes a barrier known as “tradition barrier”. An image-barrier is created about how easy or complicated it is to use the service. A risk barrier indicates economic burden and uncertainty in selection, whereas a usage barrier implies time investment in the virtual environment (Heinze et al., 2017).

#### 3.2. Hypotheses development

##### 3.2.1. Usage barriers

Within the realm of online tourism industry, the intention to use is regarded as an important variable (Talwar et al., 2020b). Researchers have found a strong link between the usage- barriers and a person’s intention to use e-services like online-sales (Lian & Yen, 2013). Low technical Based on past studies that show that ambiguity is a cause of consumer resistance (Laukkanen, 2016), the following hypothesis is put forward:

**H1a:** Usage barriers inhibit the tourist’s intention to use metaverse experience

##### 3.2.2. Value barriers

A value-barrier emerges when innovation differs from the established value system. The resistance that develops when new ideas do not fit in with the established order is called a value barrier (Morar, 2013). The value barrier is related to how well a new product works and the amount of money it is worth than the old one. It is triggered when the new product falls short on either of those two things (Ram & Sheth, 1989). Several studies (O’Cass et al., 2013; Storey et al., 2016) demonstrate that service innovation is as problematic as product innovation. The idea of high-price is the most frequently cited barrier preventing

consumers from adopting an invention studies have identified cost as one of the factors which contributes to the poor adoption rates of smart services (Laukkanen et al., 2008, 2016). Following Hypothesis can be proposed on the basis of above studies:

**H1b:** Value barriers inhibit the tourist's intention to use metaverse experience

### 3.2.3. Risk barriers

The risk barrier is represented by the burden of financial responsibility and the uncertainty of choice (Heinze et al., 2017). Innovation's uncertainty and unpredictability are called risk barriers (Chen & Kuo, 2017). Such barriers might prevent people from adopting technologies (Kleijnen et al., 2009). An increase in resistance to new technologies is observed in the context of digital innovations when users perceive an elevated level of risk especially security risk (Mani & Chouk, 2018). Customer's perceptions of the risk they carry, and whether or not this risk is substantial enough to make them reject the innovation. These research provides the basis for the following hypothesis:

**H1c:** Risk barriers inhibit the tourist's intention to use metaverse experience

### 3.2.4. Traditional barriers

A person's intention to use is influenced by the tradition barrier because any potential contradiction results in a powerful backlash (Laukkanen, 2016). Previous research on the adoption of technology suggests that trust is a crucial factor that significantly affects the intention to use. In a number of situations, researchers have shown a negative association between tradition barriers and intention to use (Chemingui, 2013). The following hypothesis is therefore proposed:

**H2a:** Traditional barriers inhibit the tourist's intention to use metaverse experience

### 3.2.5. Image barriers

An image barrier is the negative perception of the innovation which is developed in the minds of people as a result of the invention's image or nature (Lian & Yen, 2013). Image barrier is resistance associated with the perceived complexity and usability of an innovation (Laukkanen et al., 2008). Trust in problem-solving makes people more inclined to act positively or negatively when faced with challenges, according to D'zurilla and Nezu (1990). Based on these studies, the following hypothesis can be proposed:

**H2b:** Image barriers inhibit the tourist's intention to use the metaverse experience

### 3.2.6. Technology vulnerability barriers

People may become more vulnerable to technology (adverse emotions, technostress, technophobia, etc.) as its significance in our society increases (Shu et al., 2011). Additionally, consumers who are unprepared for technology may experience anxiety, and those who are unable to manage their use of technology may become dependent on it (Chouk & Mani, 2016). On the basis of above studies, we can formulate our next hypothesis:

**H2c:** Technology vulnerability barriers inhibit the tourist's intention to use metaverse experience.

### 3.2.7. Ideological barriers

Robichaud and Dugas (2005) addressed views that indicate doubt about the ability to solve problems and a tendency to be pessimistic about results. According to Kleijnen et al. (2009), consumers may form a set of unfavourable notions about innovation if it goes against their values and beliefs. Consumers may lose faith in innovation's ability to deliver on its promises and develop scepticism about it as a result of this circumstance, based on Banikema and Roux (2014). With the development of new information and communication technologies (which have led to more promotional sources for information) and anti-market activist networks, this barrier has become more evident (proliferation of commercial counter-discourses).



The findings of the research lead us to establish our subsequent hypothesis:

**H2d:** Ideological barriers inhibit the tourist's intention to use metaverse experience

### 3.2.8. *Passive innovation resistance*

Rogers (1985) identified five distinct groups of persons whose attitudes, levels, and forms of resistance to innovation influence the time of its adoption. Due to their risk- and uncertainty-tolerance, innovators and early adopters are more receptive to new ideas. Rejection means that the customer has thought about the idea and decided not to use it, either because it is new and has not been proven or because the customer is naturally conservative (Kleijnen et al., 2009). Despite this fact, an optimistic attitude at first could still not be enough to avoid rejection (Kleijnen et al., 2009; Szmigin & Foxall, 1998). The above studies direct to formulate our next hypothesis:

**H3:** Passive innovation resistance inhibits the tourist's intention to use metaverse experience

### 3.2.9. *Moderating role of facilitating condition*

Researches indicates that users of Self-Service Technologies are less resistant to new ideas and less worried about the potential for loss when they believe they have sufficient personal resources to deal with any potential problems that may arise. Researchers Venkatesh and Sykes (2013) highlight the importance of the framework for deploying new technologies in their study. Shiferaw and Mehari (2019) argued that facilitating conditions have a positive effect on health record systems. Furthermore, Lau et al. (2019) found a favourable correlation between AR technology enjoyment and perceived value. The significance of the enjoyment component in the implementation of technology in their proposed model. As a result, the following sub-hypothesis has been developed:

**H4a:** Facilitating conditions antagonize the negative impact of usage barriers on tourist's intention to use metaverse experience.

**H4b:** Facilitating conditions antagonize the negative impact of value barriers on tourist's intention to use metaverse experience.

**H4c:** Facilitating conditions antagonize the negative impact of risk barriers on tourist's intention to use metaverse experience.

### 3.2.10. *Moderating role of hedonic motivation*

Hedonic motivation is an important and fundamental aspect in determining whether people adopt new technologies. According to earlier studies (Ch'ng et al., 2020; Herz & Rahe, 2020; Lee et al., 2019), Hedonic motivation (HM) and facilitating conditions (FC) are discussed as important factors that influence an individual's decision to adopt a technology. Lehdonvirta et al. (2009) used a perspective of sociology to investigate why people buy virtual items. Their findings imply that hedonic motivation is a fundamental force that may incorporate individual drive elements like the desire to get away from regular routines, find excitement or novelty, or interact with people virtually.

On the basis of above studies, we offer the following sub-hypotheses:

**H5a:** Hedonic motivation antagonize the negative impact of traditional barriers on tourist's intention to use metaverse experience.

**H5b:** Hedonic motivation antagonize the negative impact of image barriers on tourist's intention to use metaverse experience.

**H5c:** Hedonic motivation antagonize the negative impact of technology vulnerability barriers on tourist's intention to use metaverse experience.

**H5d:** Hedonic motivation antagonize the negative impact of ideology barriers on tourist's intention to use metaverse experience.



### 3.2.11. Moderating role of personnel innovativeness

Albaom et al. (2022) discussed how the innovativeness of the personnel influences visitor's intentions to use new technology. Individual creativity is the way each person reacts to novel concepts and techniques, regardless of what others have done before. Consumers are said to try new products or IT solutions because of their own innovativeness. The distinctive characteristics of individuals may have an impact on the decisions they make with relation to initiatives (Simarmata & Hia, 2020). According to Rogers (1985) theory of innovation dissemination, researchers have looked at personal inventiveness in the context of e-tourism as a risk-taking tendency, since people who go online have to take a chance and be uncertain. Personal innovativeness has been used as a mediator in many studies on information systems (Lee et al., 2019). Based on above studies, following hypothesis can be formulated:

**H6:** Personal innovativeness antagonize the negative impact of passive innovation resistance on tourist's intention to use metaverse experience.

## 4. Research methodology

### 4.1. Qualitative study using interpretive phenomenological analysis (IPA)

The qualitative study is designed based on the established narratives of interpretive phenomenological analysis (Dabengwa et al., 2023). Phenomenological studies offer adequate insights about the behaviour of participants and lived experiences of participants about the underlying phenomenon. IPA which involves the study of respondent's consciousness and subjective experiences of the world involved collection of in-depth data for exploring the behavioural structure underlying any given context (Casmir, 1983). Most commonly used in the disciplines of psychology, sociology and education, here we intend to use IPA to understand the initial resistance to use metaverse experience among Indian tourists. One of the author has conducted in-depth interview with 26 participants who have experienced metaverse based tourism during 2023. The participants were selected on the basis of judgemental sampling. For this purpose, the author visited the prominent malls in Mumbai city where the customers can virtually experience various tourist places. The author visited four such malls in Mumbai City and interacted with the customers who have experienced immersive experiences in tourism. After briefing the research requirement and obtaining the informed consent the author initiated in-depth interviews with the participants. The interviews were conducted over a span of four days covering one mall in a day and an interview lasted for average thirty minutes. The questions at par with the research dilemma were asked to understand the various barriers attributing to tourist resistance to immersive experiences (See Appendix A for the excerpts). The participants were offered refreshments at the end of each interview as a token of gratitude for their support and time. In addition to audio-recording the whole interview, the author also scribbled the points in her personal notebook for additional inputs.

#### 4.1.1. Results of qualitative analysis

The qualitative data collected were analysing systematically as per the recommendations of literatures (Smith et al., 2022). The first process involves transcription of all the audio recordings. After transcription we thoroughly went through the data to understand its structure and relevance. The second process pertaining to horizontalization of data was done by assigning equal weightage to all the statements. Further, we carefully extracted all the non-overlapping and non-repetitive statement to obtain a comprehensive data structure with 26 distinct themes. These sub-themes were encapsulated into nine discrete innovation barriers based on the commonalities observed in the participants responses (Table 2). The initial face validity of the themes was pronounced by cross checking with the original notes and observed that these themes adequately reflect the eloquent quotes and expressions describing the present context. We established the reliability and validity of these results by following the standard procedures of the literatures (Miles & Huberman, 1994). To ensure reliability we asked two independent researchers apart from the interviewer to extract themes from the transcripts. It was observed that these researchers obtained 84% and 79% agreement respectively with the explored main themes. This level of congruence is considered sufficient since it is higher than the standard

**Table 2.** Exploring the barriers leading to tourist resistance to immersive experience.

Barriers	Sub-themes	Contextual meaning	Examples of verbatims
Usage barriers	Inconvenient, ambiguity	This barrier indicates the user's resistance to innovation due to its inconvenience and unclear contents. This type of barriers occurs when learning a technology consumes much time.	<i>"I am not properly aware of the use of metaverse in tourism...the technology is more ambiguous to understand and use...these experiences are too much time consuming..."</i>
Value barriers	Costly	High cost of using technology is considered as a major barrier here. This barrier reflects the lack of value creation for the price paid by the users.	<i>"I feel metaverse experiences are more costly to explore...I don't get any value for the money am spending on metaverse...it is very costly to try metaverse tourism"</i>
Risk barriers	Risk, hacking, lack of trust	This barrier reflects the threats and safety issues faced by the users due to the use of latest technologies.	<i>"I feel the personal details can be compromised through these platforms... there are many threats of using metaverse...I don't trust these services of metaverse in tourism..."</i>
Traditional barriers	Poor services, unpleasant experience	These barriers reflect the resistance to move from the traditional experiences. In the present context it reflects the user's intention to physically visit a place rather than using assisted technologies such as metaverse	<i>"What this technology can offer in tourism, nothing. One should visit places directly than experiencing in this way...this will not replace the physical visits surely... I don't think metaverse will be effective in tourism..."</i>
Image barriers	Difficulty, complicated	This barrier indicates the resistance to technological innovation when those platforms are more complicated and difficult to use	<i>"I feel it more complex to use metaverse based platforms.... this technology is not user friendly in nature...the options are more confusing to me..."</i>
Technology vulnerability barriers	Technology anxiety, technology dependence	This indicates the resistance due to the fear of becoming addicted to technology. The indicate the fear that user's life will be controlled by metaverse which will affect their social and personal life.	<i>"I feel metaverse experiences are addictive in nature...the more I use it I am less connected to people...I am more dependent on metaverse which is affecting my social and personal life... this form of tourism is an addiction..."</i>
Ideological barriers	Sceptic, unsuccessful	This indicate the user resistance where they are doubtful about the performance and success of metaverse in experiencing various tourist places.	<i>"I feel that metaverse based tourism won't exist in long run...normally people will feel to visit places directly rather than these technologies...I don't think this will be successful in tourism due to more pleasure in actual visits..."</i>
Passive innovation resistance	Uncomfortable, lack of excitement	This indicates the individual level barriers due to user's uncomfortableness and lack of excitement towards a particular technology. This indicates the individual intention to stay in their comfort zone with the traditional methods.	<i>"I am quite happy with directly visiting the places rather than using metaverse... Visiting places are more thrilling and exciting than assisted technologies...I don't think I will be using any technology-based tourism due to this..."</i>

threshold of 70%. The minor discrepancies between these independent researchers and authors were settled based on mutual discussions. To establish validity, all the other authors and co-authors of this present study read and reread the transcripts and explored similar themes congruent to the interviewer. Thus, we ensured that the prior knowledge and psychological disposition of the interviewer does not affect the results of this phenomenological analysis.

**4.1.2. Ethics or institutional committee statement.** There was no ethics or institutional committee in place at our institution at the time the study was conducted. However, the reliability and validity of the scales used are established and included in the manuscript.

**4.1.3. Research ethics statement.** Before collecting the data, the oral consent was obtained from the participants. the researchers assured about the confidentiality of the collected data.

## 4.2. Quantitative study

### 4.2.1. Methods and materials

The study designed as descriptive research focuses to analyse the impact of various innovation barriers on tourist resistance to use immersive experiences in tourism. We entrusted the data collection process to a market research agency in India to cover respondents of diverse demographics easily. At par with the qualitative data, the quantitative data were also centred in Mumbai City, where the tourist have

experienced metaverse tourism. Since the penetration of metaverse based tourism experience are at its initial level and not accessible to larger section of the society we received total of 238 responses from the online survey. We have included two screening questions in the survey to ensure better reliability and consistency of the data. For instance, we included questions such as “Do you know about the application of metaverse in tourism?” and “Have you ever experienced metaverse based tourism?” Those respondents who have answered no to any of these questions were outrightly rejected from the data set. After filtering for the missing responses and data inconsistencies we were left with 198 useful data for further analysis. The participants of the study were from varied demographics. It was noticed that 79% of the respondents were male, 83% who have used immersive experiences were from Gen Z group aged between 16 and 26 years. It was quite interesting to note that even though participants have tried and experienced metaverse based tourism experiences they were highly resistant for actual visit intentions (72%). We also observed that most of the participants (67%) found these metaverse experiences unaffordable and costly.

#### **4.2.2. Measures**

The items used in the study were adapted from well-established scales of previous studies. The five item-scale indicating usage barriers, three items of value barriers, five items of risk barriers and two items of image barriers were adapted from the study of Laukkanen (2016). Two items indicating traditional barriers were measured using the items modified from (Kaur et al., 2020a, 2020b) and two items were adapted from (Laukkanen, 2016). The eight-item-scale measuring technology vulnerability barriers were modified from the literature of Charlton (2002) and Meuter et al. (2005). Four items measuring individual barriers were modified from the works of Heidenreich and Spieth (2013) and both items of ideological barriers were adapted from Morel and Pruyn (2003). Three items measuring hedonic motivation and five items reflecting facilitating conditions were modified from the research of Venkatesh et al. (2012) and personal innovativeness measured using five-item scale was adapted from the items of Agarwal and Prasad (1998). Finally, the outcome variable tourist resistance to metaverse experience was measured using the adapted items of Kleijnen et al. (2009).

#### **4.2.3. Measurement model and psychometric properties**

The essential properties of the measurement model were pronounced through CFA results. It was observed that all the factor loadings were significantly higher than 0.40 (Table 3). Convergent validity was confirmed through the AVE values (Table 3). We observed that all the AVE values were higher than 0.50 confirming the presence of convergent validity (Bagozzi & Yi, 1988; Henseler et al., 2015; Tavakol & Dennick, 2011). The presence of divergent validity was reflected by using square root of AVE values and inter-correlation between the constructs. It was noticed that all the off-diagonal values are less than the diagonal values (Table 4) indicating the distinctiveness of the study constructs. In addition, we also used Heterotrait–Monotrait ratio for reinforcing discriminant validity (Table 5). It was found that all these ratios were less than 0.90 indicating distinctiveness among constructs. Internal consistency was assessed using Cronbach Alpha and composite reliability (Table 3). We found that both these statistics were found satisfactory as per the recommendations of previous studies. Finally, the omnibus assumptions of normality was confirmed using the measures of skewness and kurtosis whereas the collinearity diagnostics using Variance Inflated Factor (VIF) and tolerance level were used to portray the absence of multi-collinearity issues in the model (Diamantopoulos & Siguaw, 2006).

#### **4.2.4. Common method bias**

The potential pitfalls of CMB were ousted by adhering to the peripheries of related literatures (Hulland et al., 2017). First, we conducted this research using mixed-method approach using two different narratives. The respondents of both these studies were anonymous to each other to reduce the biases. Further, the results of exploratory factor analysis confirmed the recommendations of Harman Single Factor test. We also did not observe any general factor in the explored factor structure (MacKenzie & Podsakoff, 2012). Then, we introduced a single unmeasured latent variable to the existing factor structure. It was observed that all the path coefficients remain significant marking the absence of issues related to CMB. As a measure of prudence, we have randomized the items in research instruments to avoid sequential

**Table 3.** Results of confirmatory factor analysis.

Constructs	Statement	Label	Loading	Cronbach $\alpha$	C.R	AVE
Usage barriers	Metaverse based tourism is more complicated	USB1	0.73	0.76	0.67	0.51
	In my opinion immersive experiences using metaverse are not much convenient	USB2	0.71			
	I feel using metaverse in tourism consumes my time	USB3	0.69			
	The metaverse features are not clear to me	USB4	0.74			
	I feel difficult to use metaverse in tourism	USB5	0.7			
Value barriers	I feel metaverse based tourism is more costly	VAB1	0.79	0.72	0.65	0.62
	The use of metaverse tourism increased my spending	VAB2	0.77			
	I feel that metaverse experience does not offer any advantages than the alternatives	VAB3	0.8			
Risk Barriers	I feel using metaverse is riskier in tourism	RSB1	0.79	0.75	0.64	0.61
	I fear that when I am using metaverse in tourism, I may tap on unnecessary contents	RSB2	0.76			
	I feel that my personal credentials can be misused	RSB3	0.78			
	I feel that when I am using metaverse, I may spend more money on tourism	RSB4	0.8			
	I feel that hacking personal details through metaverse is easy	RSB5	0.77			
Traditional barriers	When I use metaverse, I miss the actual visit experience	TRB1	0.81	0.78	0.65	0.63
	I find difficult to get proper information of various places using metaverse experience	TRB2	0.78			
	In my opinion the metaverse services offered in tourism are not pleasant	TRB3	0.8			
	I feel the metaverse services are not good in tourism	TRB4	0.79			
Image barriers	I feel that metaverse is too complicated to be useful	IMB1	0.82	0.74	0.61	0.66
	I feel that metaverse platforms are difficult to handle	IMB2	0.8			
Technology Vulnerability Barrier	I feel I can get addicted to metaverse based tourism	TVB1	0.83	0.78	0.62	0.69
	My social life is suffered due to metaverse experiences in tourism	TVB2	0.81			
	I feel like neglecting other important things due to metaverse experiences	TVB3	0.79			
	I feel metaverse experience may interfere with my work schedules	TVB4	0.8			
	I feel apprehensive about using metaverse in tourism	TVB5	0.84			
	The options in metaverse tourism are confusing to me	TVB6	0.87			
	I prefer to avoid metaverse experiences because it is unfamiliar to me	TVB7	0.82			
	I hesitate to use metaverse due to fear of technology	TVB8	0.88			
Passive Innovation Resistance	I don't feel metaverse based tourism is so exciting to use	PIR1	0.8	0.76	0.64	0.66
	I feel uncomfortable to use new technological products	PIR2	0.79			
	I don't feel like switching to metaverse tourism experiences	PIR3	0.81			
	I am more satisfied with traditional methods of visiting tourist places	PIR4	0.84			
Ideological barriers	I am sceptical about metaverse services	IDB1	0.82	0.77	0.62	0.65
	I don't think that metaverse tourism will be success	IDB2	0.79			

(Continued)

**Table 3.** Continued.

Constructs	Statement	Label	Loading	Cronbach $\alpha$	C.R	AVE
Tourist intention to metaverse experience	I am likely to oppose using metaverse based tourism services	IME1	0.73	0.76	0.60	0.53
	I am likely to be opposed to the discourses extolling the benefits of metaverse tourism services	IME2	0.71			
	I feel that metaverse based tourism is not meant for me	IME3	0.74			
Hedonic motivation	Using metaverse in social media platforms are fun	HEM1	0.72	0.78	0.63	0.54
	Using metaverse is more enjoyable	HEM2	0.75			
	Using metaverse is very entertaining	HEM3	0.73			
Personal innovativeness	I think I will use metaverse in social networking	PEI1	0.76	0.77	0.65	0.58
	I believe I am ready and capable of using innovative technologies such as metaverse	PEI2	0.74			
	When I hear about new information technology, I would look for ways to experiment with it	PEI3	0.78			
	I like to experiment with new IT products	PEI4	0.77			
	Among my peers, I am usually the first to try IT products	PEI5	0.75			
Facilitating conditions	I have the resources necessary to metaverse experiences	FAC1	0.72	0.73	0.67	0.52
	I have the knowledge necessary to use metaverse based immersive experiences	FAC2	0.7			
	Metaverse experience is compatible with other technologies I use	FAC3	0.74			
	I can get help from others when I have difficulties using metaverse based tourism	FAC4	0.71			
	Using metaverse is compatible with other technologies I use	FAC5	0.70			

**Table 4.** Divergent validity using Fornell–Lacker method.

Variables	USB	VAB	RSB	TRB	IMB	TVB	PIR	IDB	IME	HEM	PEI	FAC
USB	0.71											
VAB	0.23	0.79										
RSB	0.27	0.31	0.78									
TRB	0.28	0.23	0.22	0.80								
IMB	0.31	0.29	0.27	0.24	0.81							
TVB	0.32	0.26	0.24	0.28	0.25	0.83						
INB	0.29	0.21	0.24	0.22	0.20	0.28	0.81					
IDB	0.24	0.20	0.19	0.27	0.25	0.22	0.18	0.81				
IME	0.27	0.29	0.17	0.26	0.23	0.20	0.19	0.26	0.73			
HEM	0.28	0.25	0.21	0.24	0.32	0.29	0.34	0.28	0.26	0.73		
PEI	0.27	0.31	0.30	0.29	0.25	0.26	0.30	0.29	0.33	0.20	0.76	
FAC	0.22	0.25	0.21	0.24	0.28	0.27	0.29	0.31	0.34	0.23	0.34	0.72

biases and psychological dispositions of the respondents. In addition, detailed instructions to fill out the questionnaire reduced ambiguity and related biases. To strengthen our confidence, we also tested the inter-correlation between the constructs and found it within the threshold limits (Bagozzi et al., 1991) (Table 4). By systematically following these series of steps, we confirm that the current study is free from the concerns of common method variance.

## 5. Results of hypotheses testing

### 5.1. Impact of various barriers on tourist intention to use metaverse experience

The negative impact of various innovation resistance barriers on tourist intention to use metaverse is illustrated below using covariance-based SEM (Table 6). It was observed that all the three forms of functional barriers inhibits the tourist intention to use metaverse experience. It was observed that value barriers had the highest significant negative impact ( $\beta = -0.33$ ,  $H_{1a}$ ,  $p < 0.05$ ) followed by

**Table 5.** Divergent validity using HTMT ratio.

Variables	USB	VAB	RSB	TRB	IMB	TVB	PIR	IDB	IME	HEM	PEI
USB											
VAB	0.44										
RSB	0.56	0.70									
TRB	0.59	0.44	0.41								
IMB	0.70	0.63	0.56	0.47							
TVB	0.74	0.53	0.47	0.59	0.50						
INB	0.63	0.39	0.47	0.41	0.36	0.59					
IDB	0.47	0.36	0.34	0.56	0.50	0.41	0.31				
IME	0.56	0.63	0.29	0.53	0.44	0.36	0.34	0.53			
HEM	0.59	0.50	0.39	0.47	0.74	0.63	0.82	0.59	0.53		
PEI	0.56	0.70	0.66	0.63	0.50	0.53	0.66	0.63	0.78	0.36	
FAC	0.41	0.50	0.39	0.47	0.59	0.56	0.63	0.70	0.82	0.44	0.82

**Table 6.** Impact of innovation resistance on intention to use metaverse experience.

Relationships	$\beta$	S. E	C.R	$p$ value	Hypothesis	Decision
Functional barriers						
USB $\rightarrow$ IME	-0.29	0.02	-14.50	0.01**	H <sub>1a</sub>	Supported
VAB $\rightarrow$ IME	-0.33	0.07	-4.71	0.01**	H <sub>1b</sub>	Supported
RSB $\rightarrow$ IME	-0.22	0.10	-2.20	0.01**	H <sub>1c</sub>	Supported
Psychological barriers						
TRB $\rightarrow$ IME	-0.12	0.28	-0.43	0.08	H <sub>2a</sub>	Rejected
IMB $\rightarrow$ IME	-0.37	0.18	-2.06	0.01**	H <sub>2b</sub>	Supported
TVB $\rightarrow$ IME	-0.42	0.12	-3.50	0.01**	H <sub>2c</sub>	Supported
IDB $\rightarrow$ IME	-0.10	0.31	-0.32	0.06	H <sub>2d</sub>	Rejected
Individual barriers						
PIR $\rightarrow$ IME	-0.36	0.11	-3.27	0.01**	H <sub>3</sub>	Supported

usage barriers ( $\beta = -0.29$ ,  $H_{1b}$ ,  $p < 0.05$ ) and risk barriers ( $\beta = -0.22$ ,  $H_{1c}$ ,  $p < 0.05$ ) leading to acceptance of all three hypotheses (Table 6). Subsequently, it was observed that only image barrier and technological vulnerability barrier had significant negative impact since the  $p$  values for the path coefficients of traditional barriers ( $\beta = -0.12$ ,  $H_{2a}$ ) and ideological barriers ( $\beta = -0.10$ ,  $H_{2d}$ ) were greater than 0.05. It was noted that among the psychological barriers, technological vulnerability barriers had the highest negative impact on tourist intention to use metaverse. Both the hypotheses  $H_{2b}$  and  $H_{2c}$  were supported; however,  $H_{2a}$  and  $H_{2d}$  were rejected (Table 6). Finally, it was observed that passive innovation resistance also had significant negative impact on tourist intention to use metaverse experience ( $\beta = -0.36$ ,  $H_3$ ,  $p < 0.05$ ) hence supporting the acceptance of concerned hypothesis (Table 6). We have observed the model fit indices in congruences with the literatures related to SEM (Bagozzi & Yi, 1988).

### 5.1.1. Moderating role of facilitating condition

Table 7 depicts the results of moderating role of facilitating conditions in antagonizing the negative impact of functional barriers on tourist intention to use metaverse experience. It was found that interaction coefficient was significant for both usage barriers ( $\beta = 0.39$ ) and value barriers ( $\beta = 0.31$ ) confirming the presence of moderation for these two variables. It can be observed that the direct negative impact of these two functional barriers were significantly reverse in the presence of moderator (Table 7). In other words, higher and efficient the facilitating conditions the tourist intention to metaverse experience will be comparatively higher than lower facilitating mechanism. These results are further supported by the unparallel parsimonious measures (Figure 2).

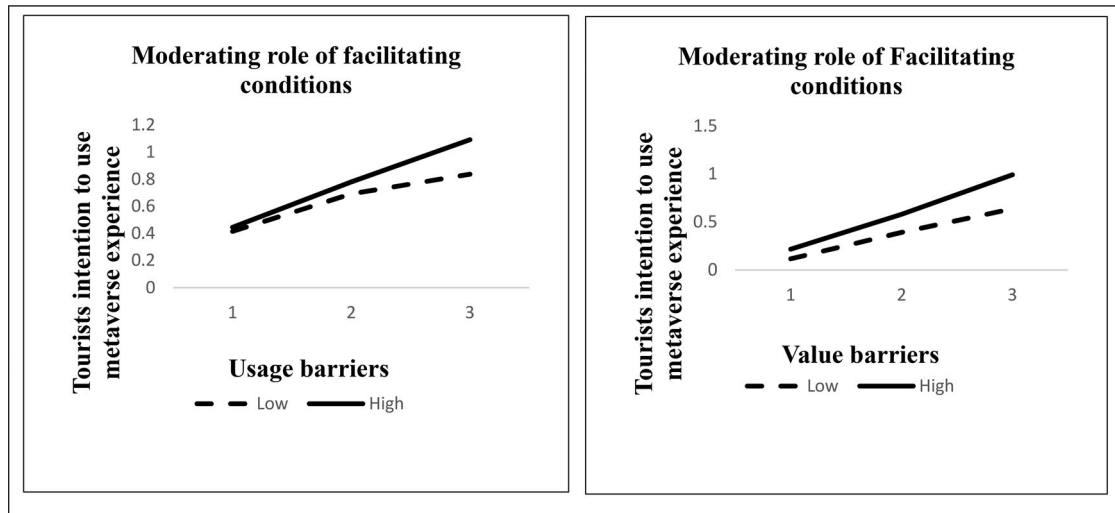
### 5.1.2. Moderating role of hedonic motivation

The results portraying the moderating role of hedonic motivation between the psychological barriers and intention to use metaverse in tourism is given below (Table 8). It was observed that hedonic motivation act as a significant moderator between three types of psychological barriers namely traditional barriers ( $\beta = 0.35$ ,  $H_{5a}$ ,  $p < 0.05$ ), image barriers ( $\beta = 0.37$ ,  $H_{5b}$ ,  $p < 0.05$ ) and technological vulnerability barriers ( $\beta = 0.42$ ,  $H_{5c}$ ,  $p < 0.05$ ) whereas, the interaction coefficient was found insignificant for the ideological barriers ( $\beta = 0.09$ ,  $H_{5d}$ ,  $p > 0.05$ ). Hedonic motivation was found to have higher level of conditioning the



**Table 7.** Conditional role of facilitating condition.

Path		Interaction coefficient	t-statistics	p	LLCI	ULCI	Hypothesis	Sig	Nature
USB →	IME	0.39	14.76	0.01	0.1268	0.1782	H <sub>4a</sub>	Yes	Antagonizing
VAB →	IME	0.31	10.29	0.01	0.1341	0.1669	H <sub>4b</sub>	Yes	Antagonizing
RSB →	IME	0.09	1.12	0.08	-0.1245	0.1755	H <sub>4c</sub>	No	NA

**Figure 2.** Parsimonious measure of moderation – FAC.**Table 8.** Conditional role of hedonic motivation.

Path		Interaction coefficient	t statistics	p	LLCI	ULCI	Hypothesis	Sig	Nature
TRB →	IME	0.35	20.15	0.01	0.1241	0.1759	H <sub>5a</sub>	Yes	Antagonizing
IMB →	IME	0.37	15.23	0.01	0.1342	0.1668	H <sub>5b</sub>	Yes	Antagonizing
TVB →	IME	0.42	9.67	0.01	0.1421	0.1579	H <sub>5c</sub>	Yes	Antagonizing
IDB →	IME	0.09	1.02	0.08	-0.1329	0.1671	H <sub>5d</sub>	No	NA

technological barriers compared to other forms of psychological barriers (Table 8). Similarly like the previous results of moderation, we found that hedonic motivation reverses the negative impact of innovation resistance factors on tourist intention to use metaverse. Hence hedonic motivation is considered as an antagonizing moderator implying that at higher levels of hedonic motivation tourist intention to use metaverse experience will be high. The parsimonious test of moderation also confirmed the presence of significant moderation (Figure 3).

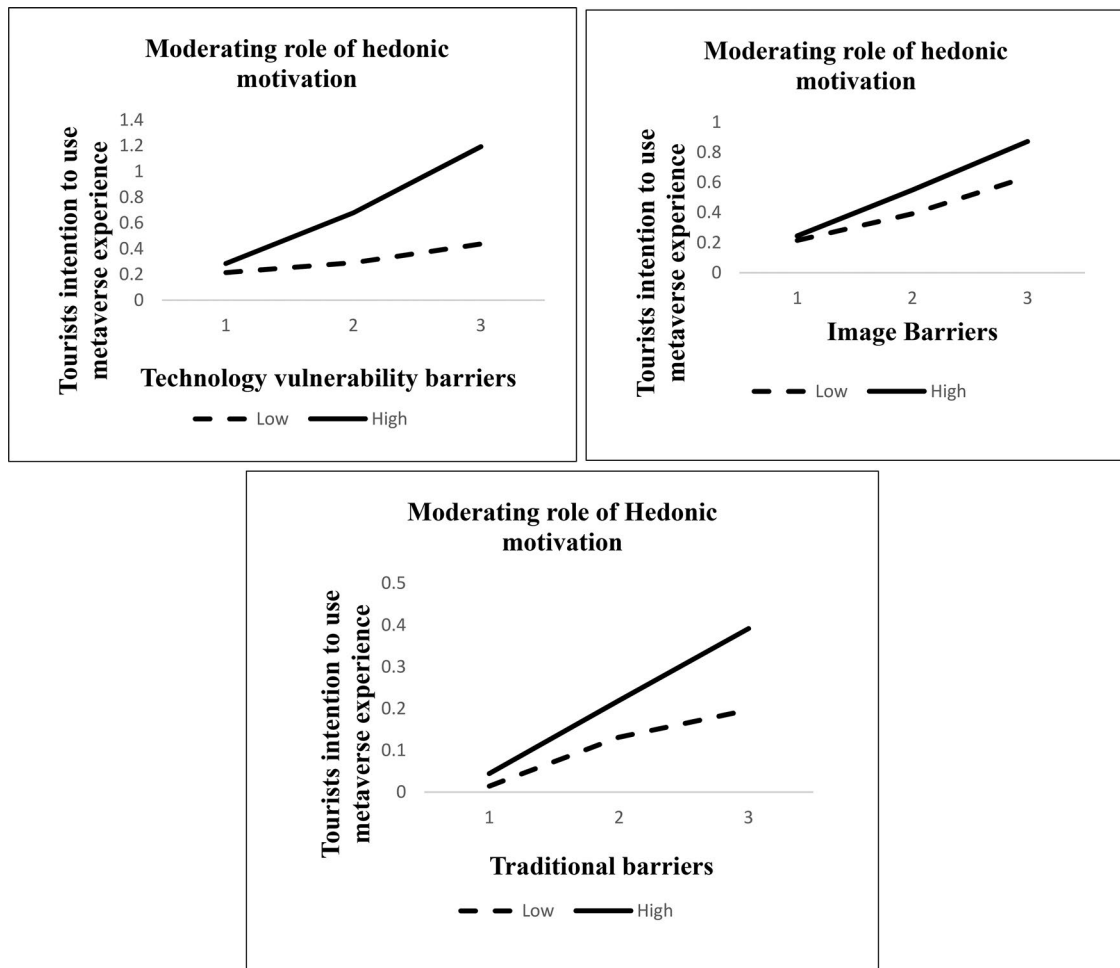
### 5.1.3. Moderating role of personal innovativeness

The moderating role of personal innovativeness between individual barrier and tourist intention to use metaverse experience is illustrated below in Table 9. It was found that personal innovativeness significantly moderates the negative impact of passive innovation resistance on tourist intention to use metaverse experience in such a way respondents with higher levels of personal innovativeness will have more intention to use the technology. The positive interaction coefficient ( $\beta=0.39$ ,  $H_6$ ,  $p<0.05$ ) depicts the presence of significant moderation in addition (Table 9) to the parsimonious measure (Figures 4 and 5).

## 6. General discussions


This study provides a pathbreaking approach to metaverse tourism experience among Indian users. Modelled using mixed method approach our research offers numerous insights about the acceptance of metaverse based tourism experience among the respondents. Deliberations about the potential application and possibilities of metaverse in tourism are still in nascent stage. Our study offers empirical

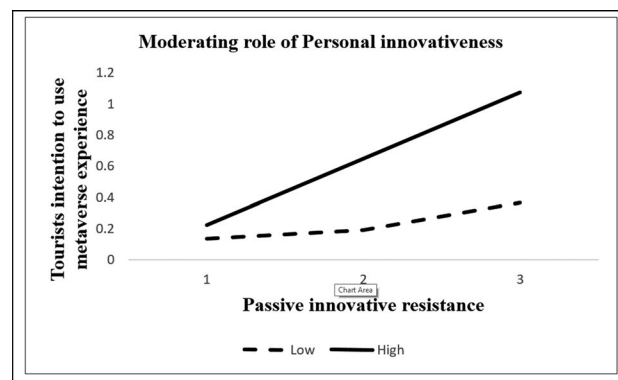




**Figure 3.** Parsimonious measure of moderation – HEM.

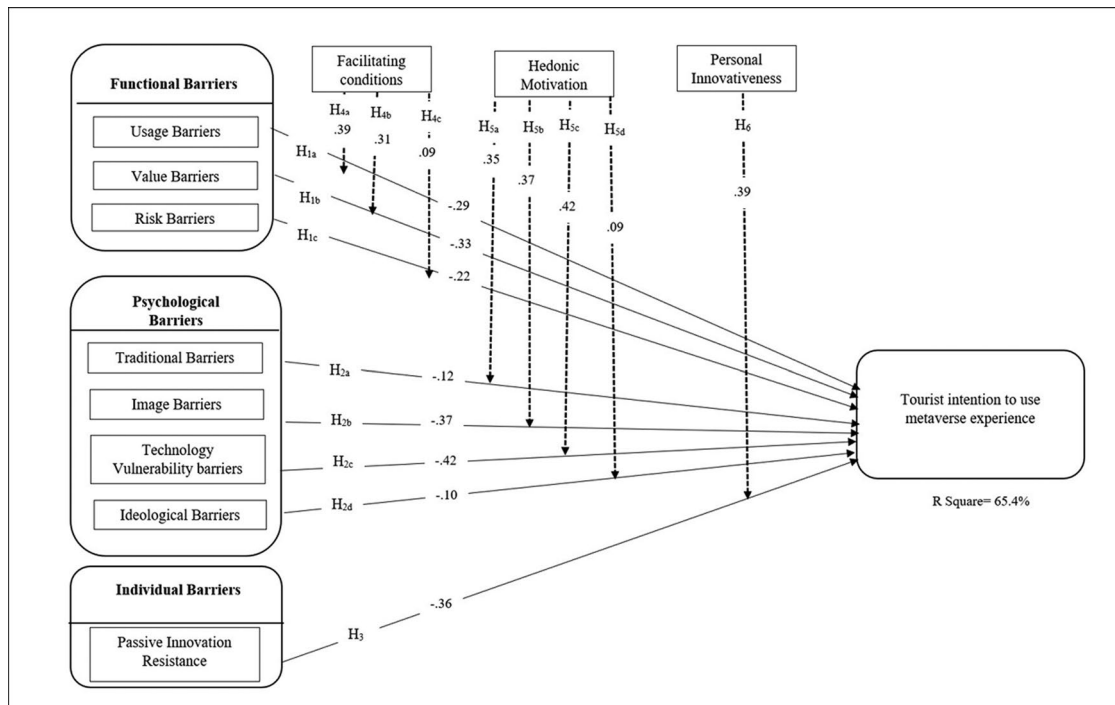
**Table 9.** Conditional role of personal innovativeness.

Path	Interaction coefficient	T statistics	p	LLCI	ULCI	Hypothesis	Sig	Nature
PIR  IME	0.39	18.23	0.01	0.1321	0.1689	H <sub>6</sub>	Yes	Antagonizing



**Figure 4.** Parsimonious measure of moderation – PEI.

evidence to understand the initial resistance among the users regarding metaverse experience in tourism. Grounded on extended version of Innovation Resistance Theory (IRT) the findings of our study portray clearcut insights about the various barriers inhibiting tourist intention to use metaverse experience. By incorporating interpretive phenomenology and quantitative analysis, specifically structural equation



**Figure 5.** Results of the conceptual framework.

modelling (SEM), the study seeks to offer a nuanced understanding of tourists' perceptions and potential barriers in adopting metaverse experiences. This pioneering investigation contributes significantly to the literature by filling the gap in understanding the intersection of metaverse and tourism, laying the foundation for future research and practical implications within the burgeoning field of virtual tourism experience.

The results of in-depth interviews using interpretive phenomenological analysis revealed the underlying barriers of tourist resistance to metaverse. The systematic analysis of the qualitative data revealed three functional barriers (usage barrier, value barrier, risk barrier), four psychological barriers (traditional barrier, image barrier, technology vulnerability barrier, ideological barrier) and one individual barrier (passive innovation resistance). Further the quantitative evidences were used to develop pragmatic insights about the underlying phenomenon.

The results of structural equation modelling signify the negative impact of various barriers on tourist intention to use metaverse experiences.  $H_{1a}$ ,  $H_{1b}$  and  $H_{1c}$  testing the impact of functional barriers on IME shows that all three functional barriers significantly and negatively impact the outcome variable. It was observed that value barriers had highest negative impact comparatively. Using metaverse experience requires more robust facilitating conditions which increases the usage cost. The additional hardware and infrastructure requirements to experience such technology inhibits the user intention to adopt a technology. The initial phases of metaverse are more ambiguous with various options unclear to the users. Also, the perceived threat due to hacking and theft of personal credentials were found as the major impediments affecting intention to use metaverse in tourism. The hypotheses  $H_{2a}$ ,  $H_{2b}$ ,  $H_{2c}$  and  $H_{2d}$  testing the negative impact of psychological barriers revealed that only image barrier ( $H_{2b}$ ) and technology vulnerability barriers ( $H_{2c}$ ) had significant impact on the outcome variable. Technology vulnerability characterized by technology dependence and technology anxiety were the major reason for innovation resistance. Like any other technology, the perception that increased use of metaverse also can lead to addiction is the major reason for the user's resistance to immersive experiences in tourism. We found that individual barriers reflected through passive innovation resistance ( $H_3$ ) also had significant negative impact on users' intention. When the respondents are neither inventive nor innovative, the intention to use latest technology will be negative. Previous studies have showed that Indian users are relatively sceptic and non-adaptive to emerging technologies. The fear of losing self-control and being addiction are on upfront leading to innovation resistance.

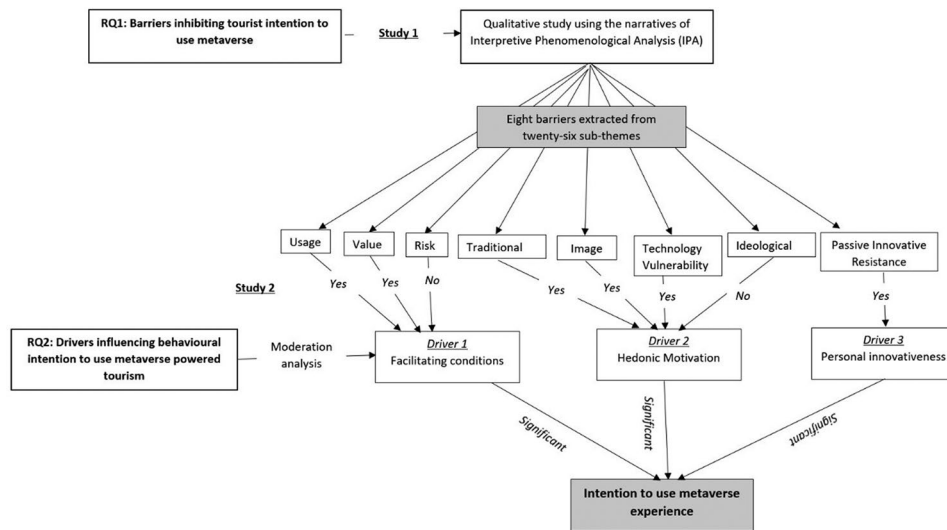
A series of moderation test was conducted to examine the conditional role of facilitating conditions, hedonic motivation and personal innovativeness in amplifying the negative impact of innovation resistance barriers regarding metaverse. The hypotheses testing the moderating role of facilitating conditions  $H_{4a}$ ,  $H_{4b}$  and  $H_{4c}$  between the functional barriers and outcome variables proved that higher level of facilitating conditions significantly antagonizes the negative impact of value and usage barriers whereas the presence of moderation is insignificant between risk barriers and the outcome variable. These results indicate that access to better resources facilitating technology adoption, compatible devices and user friendly environment significantly reduces the usage and value barriers the users face in metaverse applications. Innovative technologies such as metaverse requires robust mechanism and compatible assistance which enables easy adoption of the technology. The second test of moderation using hedonic moderation hypothesized between psychological barriers and outcome variable ( $H_{5a}$ ,  $H_{5b}$ ,  $H_{5c}$  and  $H_{5d}$ ) shows that higher level of users seeks for pleasure and happiness significantly antagonized the negative role of all forms of psychological barriers except ideological barriers. Tourism, which is mainly related to pleasure and happiness, is largely driven by levels of hedonic motivations. Our results confirms that users with higher levels of hedonic motivation negates the resistances caused due to traditional, image and technology vulnerability barriers. Users with higher level of HEM seeks for more pleasure and happiness from technology adoption ultimately leading to increased intention to use metaverse experience. The final set of test of moderation depicted the significant conditional effects of personal innovativeness in strengthening the tourist intention to use metaverse experience ( $H_6$ ). We found that at higher levels of personal innovativeness the negative impact of passive innovation resistance on the outcome variable was significantly antagonized. Personal innovativeness which depicts the thirst for being more inventive and innovative is a prerequisite to embrace any latest technologies. Individual with higher levels of personal innovativeness can easily accept and adapt latest technology in their life. Our results are more interesting considering the demographics and diversity of Indian population. The country with higher number of younger populations will witness more dramatic changes in tourism with the advent of metaverse. The researchers, academicians and practitioners have to patiently wait to understand the future consumer dynamism in metaverse powered tourism industry.

The present study builds up on a rich foundation of literature encompassing various domains such as virtual reality immersive experiences, e-tourism frameworks, smart tourism development, gamification in tourism, augmented reality in tourism to name a few. Our findings on the barriers to metaverse adoption among tourists resonate with the observations of Suanpang et al. (2022), who explored the implications of an extensible metaverse for a smart tourism city. They highlighted the potential of the metaverse in enhancing tourist experiences through immersive and interactive environments. However, our study extends this understanding by identifying specific functional, psychological, and individual barriers that tourists face in embracing metaverse technologies. Addressing these barriers is crucial for realizing the full potential of the metaverse in smart tourism cities, as suggested by Suanpang et al. (2022). By synthesising findings from these diverse strands of literature, the present study likely identified the key barriers to metaverse tourism adoption such as technological complexity, concerns about privacy and security and cultural or behavioural resistance. This comprehensive approach not only enables a nuanced understanding of the challenges an opportunity associated with metaverse tourism but also underscores the interdisciplinary nature of research in this field, highlighting the importance of integrating insights from various domains to inform theoretical frameworks and practical applications in tourism management and marketing (Figure 6).

### 6.1. Theoretical implications

The study presents three key theoretical implications. Firstly, it applies the crucial theoretical framework of IRT within the context of the metaverse in the tourism industry. This approach not only offers new avenues for future research on this topic but also addresses a gap in prior studies, which primarily focused on conceptual understanding without empirical evidence or a solid theoretical foundation, while overlooking perspectives of resistance.

Secondly, this research contributes to the existing literature by delving into the relationship between various functional, psychological, and personal barriers and tourists' intention to use metaverse experiences. Additionally, it examines the moderating effects of facilitating conditions, hedonic motivation, and



**Figure 6.** Overview of the findings of the study.

personal innovativeness. This expansion of knowledge enriches our understanding of the metaverse in the tourism industry.

Thirdly, the study sheds light on significant issues regarding tourists' intention to use metaverse experiences, with a specific focus on a group of Indian metaverse users, a demographic that has received limited attention despite India's ongoing digital revolution and anticipated growth in the tourism market. The conceptual model proposed in this study provides valuable insights for stakeholders, offering a clearer understanding of the potential of the metaverse in the tourism sector and its implications for various stakeholders.

Fourthly, Service providers and developers ought to prioritize enhancing facilitating conditions, encompassing the guarantee of access to superior resources, compatible devices, and a user-friendly environment.

By addressing facilitating conditions, stakeholders can create new opportunities for future research in the field of metaverse tourism, particularly in addressing the lack of empirical evidence and theoretical bases to support the hypothetical benefits. Moreover, understanding and mitigating psychological barriers, such as image and technology vulnerability, including passive innovation resistance, can further contribute to overcoming resistance and fostering a positive reception of metaverse tourism experiences among users.

By incorporating these insights, stakeholders can contribute to overcoming barriers and fostering a more positive reception of metaverse tourism experiences among users, ultimately advancing the field and driving its growth and innovation.

## 6.2. Managerial implications

The study has three managerial implications. Firstly, the findings of the study will assist service providers in enhancing their knowledge of customer behavior and attitudes towards metaverse experiences. In addition, they will help us to understand the different functional, psychological and personal barriers to tourist IME. Service providers can enhance their services by addressing any existing service gaps in the tourism metaverse. For instance, they can concentrate on reducing value, image, and technology vulnerability barriers, as these have direct relationships with tourists' IME. This will allow them to offer improved services to their customers.

For example, (1) The tourism industry can overcome barriers to increase consumer access to this innovative technology. (2) The tourism industry can offer customers a user-friendly environment. (3) The tourism industry can focus on hedonic motivation, as tourism is predominantly driven by pleasure and contentment. (4) Service providers can use the findings of the study to create and enhance their marketing approaches, aiming to more effectively target their end-users.

As a result, the negative effects of passive innovation on the intention of tourists to enjoy a metaverse experience were significantly antagonized by higher levels of personal innovation. Higher-level

innovators are more likely to accept and adapt the latest technologies in their lives, so service providers in the tourism metaverse should consider this as well.

In addition, our results are more interesting in light of the demographics and diversity of Indians. The country with a higher number of younger populations will witness more dramatic changes in tourism with the advent of the metaverse. To understand the future consumer dynamism in the tourism industry powered by the metaverse, researchers, academicians, and practitioners have to wait patiently. We can utilize the findings of our current study to understand user adoption behaviour, expectations, and facilitating mechanisms to take metaverse tourism to the next level.

## 7. Conclusion

Prior literature studying various aspects with Tourist intention towards the metaverse was in its infancy, but today, experts from all over the world are demonstrating a growing interest in gaining a deeper grasp of the metaverse's application in tourism. This study aimed to address two questions: What are the various barriers that inhibits tourist's intention to use immersive experience such as metaverse? What are the drivers influencing behavioural intention to use metaverse powered tourism? To address Research Question 1, we conducted a qualitative study utilizing interpretive phenomenological analysis and in-depth interviews. Our findings revealed three functional barriers - the usage barrier, the value barrier, and the risk barrier - as well as four psychological barriers - the traditional barrier, the image barrier, the technology vulnerability barrier, and the ideological barrier - and one individual barrier of passive innovation resistance that hinder the adoption of IRT in the context of tourism in the Metaverse experience. IRT was utilised to analyse the association between various barriers and IME. This study contributed to the growing metaverse experience literature in tourism, which is currently limited. By analysing tourist intention to metaverse experience barriers, it expands metaverse experience in tourism knowledge. To answer RQ2, we analysed data collected from 198 users in India and tested association between the different barriers toward IME. The study findings suggested a significant negative impact of various barriers on tourist intention to use metaverse experiences. It was also observed that value barriers had highest negative impact comparatively. A series of moderation test proved that higher level moderating variables: significantly antagonised the negative impact of various barriers. Impact of value and usage barriers were negatively antagonized by the moderating variable facilitating conditions. Whereas hedonic motivation significantly antagonized the negative role of all forms of psychological barriers except ideological barriers, and finally personal innovativeness. significantly antagonized negative impact of passive innovation resistance on the outcome variable, i.e IME.

Highlighting the benefits and unique features of metaverse tourism can also play a pivotal role in overcoming resistance rooted in perceived value. By showcasing how metaverse experiences align with users' desires for pleasure and happiness, and by considering innovative ways to engage users with varying levels of personal innovativeness, stakeholders can enhance the attractiveness of metaverse tourism offerings. Additionally, exploring the relationship between different functional, psychological, and personal barriers, as well as their interaction with facilitating conditions, hedonic motivation, and personal innovativeness, expands upon existing literature and provides valuable insights into the dynamics influencing tourists' intention to use metaverse experiences.

Moreover, the focus on a group of Indian metaverse users, who have received limited attention in prior research, is significant. Given India's ongoing digital revolution and the expected growth of its tourism market, understanding the unique challenges and opportunities presented by metaverse applications in this context is crucial. The conceptual model presented in this study not only assists stakeholders in gaining a better understanding of the logic, flow, and potential of the metaverse in the tourism sector but also emphasizes the importance of collaborations involving experts from various fields to comprehensively address the challenges and opportunities presented by metaverse applications. The results of the study have significant implications for various stakeholders in the market.

## 8. Limitations and future directions

The research work studied the qualitative data gathered from tourists in India. However, the study sample only consisted of a limited group of Indian tourists and travelers, making it difficult to apply the

results to the larger tourist population. To overcome this limitation, a more diverse research sample should be chosen, including tourists from various backgrounds and demographics, to achieve a better representation of the tourist community.

In addition, the study used judgmental sampling methods, which can result in a limited sample from a small segment of the research population. It is recommended to use alternative sampling methods to encompass a larger portion of the research population. Currently, the study only focuses on the tourism industry and could benefit from including additional industries like communication, education, health, etc. Furthermore, the study only collected data from 26 tourists for qualitative analysis and 198 for quantitative analysis. In the future, collecting more data could provide a more comprehensive understanding.

Although the Metaverse is still in its early stages of development for real-world applications, it offers many prospects for future research that involves interdisciplinary teams.

## Disclosure statement

No potential conflict of interest was reported by the author(s).

## Author contributions

Dr. Sowmya G has contributed in model development and Research Methodology. Dr. Aruna Polisetty has contributed in introduction and literature review part. Dr. Rimjhim Jha has contributed in theoretical concept and hypothesis development and Dr. Sarika Keswani has contributed in findings, conclusion implications and limitations.

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## Data availability statement

The data that support the findings of this study are available on request from the authors.

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## Appendix A

List of questions asked in the in-depth interviews (excerpts only)

1. How do you feel about the metaverse-based tourism experience?
2. Do you think that metaverse will revolutionize the tourism experience drastically?
3. Do you think that metaverse experience will lead to actual visit intentions?
4. What are the common issues you think are in metaverse-based tourism? Among those what are the issues you faced?
5. What are the various security threats you faced in using metaverse tourism?
6. Will you recommend the use of metaverse experience to others? Who are the users you think metaverse usage will be more common?