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Exploring Generation Z Motivations to Use Metaverse for Travel Planning

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ABSTRACT

Technology-enabled travel planning has been adopted by businesses and consumers. Travel portals and aggregators increasingly offer technology tools, such as metaverse, AI applications, and chatbots to facilitate travel. The consumer motivations to use metaverse as a travel planning tool and its effect on purchase intention have been underexplored. To bridge this gap, this study explores how different dimensions of motivated consumer innovativeness (MCI) influence consumer attitudes toward metaverse and use intention. The study utilizes a sequential mixed-method approach consisting of two phases. Phase 1 collected qualitative data through interviews with 30 Generation Z (Gen Z) adults with metaverse virtual travel and travel planning experience. Based on Phase 1 findings, Phase 2 surveyed 354 participants and applied quantitative analysis. The study revealed that Gen Z tourists were motivated by functional and cognitive factors when engaging with the metaverse. The study explains the role of metaverse in travel planning and offers practical implications for travel and tourism stakeholders. The findings highlight the need for engagement strategies that blend technological innovation with immersive experiences to align with Gen Z's views on innovation and interaction in order to enhance the metaverse experience.

1 | Introduction

Consumers access travel product information through traditional and internet sales channels (Backhaus et al. 2023; Tsai 2024). The internet has augmented the information accessible to travelers through the knowledge and insights of other travelers through trip narratives, blogs, and social media platforms. Consumer behavior in service industries is increasingly influenced by technologies such as augmented reality (A.R.), virtual reality (V.R.), mixed reality (M.R.), and extended reality (X.R.) or the metaverse (Jung et al. 2024). These technologies enable consumers to engage in immersive experiences that intensify engagement (Kılıçarslan et al. 2024; Narin 2021). They also influence travel planning and the tourism experience, with factors such as performance expectancy, price value, innovativeness, and involvement influencing behavioral intention (Buhalis, Leung, and Lin 2023; Shamim et al. 2024). The metaverse allows travelers to virtually experience important landmarks, attractions, and cultural sites. It can aid in travel planning as travelers can virtually view accommodation and activities to guide their decision making (Buhalis and Karatay 2022).

Travel planning has become a complex process which no longer involves a single point of purchase (Leung et al. 2013; Shin and Kang 2024). With the growth of immersive and AI-driven applications, travel planning has become easier, accessible, and often free (Prados-Castillo et al. 2025). These platforms suggest eco-friendly travel options and highlight sustainable practices,

which align with Generation Z (Gen Z) values and commitment to responsible travel (Jafar and Ahmad 2023). By leveraging AI-powered tools, eco-conscious Gen Z travelers can make more sustainable choices (Chang et al. 2024; Ribeiro et al. 2023). They receive personalized recommendations based on their preferences, streamline the booking process, and access real-time updates on flight status and weather conditions (Zaman et al. 2022). As Gen Z increasingly participates in the commercial sphere, it is imperative for businesses to understand their distinctive behaviors and sustainability-driven needs (Zhong et al. 2024). They are reshaping the consumer landscape through their adeptness with technology, pragmatism, and socio-political consciousness (Barrera and Shah 2023).

Gen Z use technology to focus on cost-effective, yet environmentally responsible travel experiences (Chang et al. 2024; Ding et al. 2022). This compels tourism businesses to understand the factors that motivate choices, attitudes, and intentions (Hwang et al. 2020; Hwang and Lee Jay 2019; Vandecasteele and Geuens 2010). Research has emphasized the significance of exploring motivational goals that impact attitudinal and behavioral intentions (Kaur et al. 2024; Lin CJ et al. 2022). Functional, hedonic, social, and cognitive motivations play a critical role in the use of innovative services, especially for this generation that seeks both practical and sustainable solutions (Chakraborty et al. 2023; Vandecasteele and Geuens 2010).

Vandecasteele and Geuens (2010) developed the motivated consumer innovativeness (MCI) scale to measure customer motivations to use innovative products and services, which may be applied to metaverse use motivations. There are limited studies on the MCI scale and its use in travel planning (Um et al. 2022). Despite the growing relevance of immersive technology in tourism, a notable research gap prevails regarding the motivations stimulating Gen Z consumers to engage with the metaverse (Akour et al. 2022) The motivations for the adoption of metaverse services for travel planning, particularly in the context of sustainability, remain largely undocumented (Gil-Cordero et al. 2023). Studies have explored Gen Z metaverse acceptance and behavior using technology acceptance models, but there is a lack of motivational theories that identify the role of different types of motivation during travel planning (Calderón-Fajardo et al. 2024; Mandal et al. 2024; Monaco and Sacchi 2023). The emergence of the metaverse represents a transformative opportunity for various sectors, notably travel planning, as it allows the application of attribution to decision making (Hassan and Saleh 2024). Academic research has predominantly concentrated on industries such as real estate, e-learning, retail, and finance, often overlooking the integration of the metaverse with travel planning (Dubey et al. 2022; Mohamed et al. 2023). Investigating consumer motivations through the lens of MCI (Hwang and Lee Jay 2019) is critical to understanding this evolving landscape.

The primary aim of the study was to investigate how the various dimensions of MCI influence consumer attitudes toward their willingness to utilize the metaverse for travel planning (Chang et al. 2024; Ribeiro et al. 2023). This study employs a sequential mixed-method approach, integrating qualitative insights to develop self-constructed measures, which enhance the conceptual model's precision and accuracy. Participants from Canada, India, and the United States were chosen for the study to enable regional triangulation and gain valuable insights into the global influence of the metaverse for travel planning (Kotus et al. 2015). These countries embody a diverse array of cultural and technological settings, making them ideal for the exploration of Gen Z's interactions with metaverse travel planning (Van de Vijver and Leung 2021). Although the study centers on Gen Z, the implications of the findings extend beyond this demographic, potentially influencing broader travel practices, trends, and strategies. By shedding light on the evolving preferences of digitally savvy consumers, the research aims to inform stakeholders about possible shifts in consumer behavior over time, providing actionable insights to harness the metaverse for the development of sustainable travel planning.

2 | Metaverse, Consumer Innovativeness and Gen Z Travel Planning

The metaverse can foster a more sustainable approach to travel by promoting behaviors that reduce the physical travel demands. As a platform that closely mimics real-world environments, it allows users to engage in shared experiences, transactions, and real-time interactions (Dwivedi et al. 2022; Kılıçarslan et al. 2024). Travelers can explore destinations, interact with local communities, and virtually immerse themselves in cultural experiences before making the physical journey. This early engagement may help to reduce unnecessary travel and promote eco-friendly decision-making. Hospitality and tourism groups are increasingly establishing a presence within the metaverse, leveraging it to foster engagement and create new trading opportunities (Narin 2021; Buhalis, Lin, and Leung 2023; Buhalis and Karatay 2022).

The metaverse is rapidly transforming virtual travel experiences, with a focus on destination exploration (Loureiro et al. 2020; Rauschnabel et al. 2022). Metaverse platforms provide travelers with valuable resources that save time and money, contributing to more mindful travel planning (Lee et al. 2023). This integration represents not just a technological innovation but a fundamental shift in how destinations are researched and experienced. While these tools bring remarkable efficiency and immersive possibilities, they are not a universal solution to all travel planning challenges. Their growing adoption does, however, reflect a broader trend toward digital innovation and the gamification of tourism (Xu et al. 2017). The use of the metaverse also enhances autonomy, self-expression, and overall quality of life, further aligning with the sustainability goals of modern travelers.

The transformative use of this technology has been adopted by tourism websites such as *Expedia* and booking.com, which have played a crucial role in facilitating travel planning, accommodation bookings, and overall travel experiences (Deng et al. 2024). Travelers often use travel booking websites that offer information with potential exposure to new experiences. Information-based connections between users and online platforms are providing a new dynamic within the user experience (Shamim et al. 2024). Understanding motivations prior to an actual visit to the destination can be beneficial for travelers as they get to know the places in advance and accordingly, they can plan their itinerary well before the visit. An understanding of what triggers

individuals to explore the metaverse before travel may also help to reduce unwanted travel experiences, risks, and uncertainty (Ameen et al. 2023; Hadi et al. 2024; Martínez González et al. 2017; Shamim et al. 2024).

Gen Z, born between 1997 and 2012, is a critical demographic for the metaverse (Lamba and Malik 2022). The generation is entering adulthood with potential purchasing power and discretionary income (Ding et al. 2022). Their innate tech proficiency aligns with the metaverse's immersive potential and reflects their digital-centric travel preferences. Gen Z's familiarity with technology and inclinations toward responsible choices position them as key tourism sustainability drivers (Chen 2024). Their engagement with virtual experiences enhances their understanding of sustainable tourism practices. Given the fast pace of modern life, preplanning before reaching destinations can play a very significant role. Metaverse platforms allow real-time engagement with stakeholders, providing seamless integration between virtual and real-world experiences. This experience resonates with Gen Z's preference for memorable, authentic, and digitally enhanced adventures and experiences (Angmo and Mahajan 2024; Shin and Kang 2024).

Gen Z is familiar with extended versions of the metaverse, such as Minecraft, Roblox, and other immersive platforms (Ghali et al. 2024). Gen Z adults exhibit greater financial sophistication than preceding generations did at the same age. Gen Z's reliance on technology for everyday tasks also makes them receptive to using AI and virtual platforms for travel planning. They use virtual tools and apps to research destinations, find economic deals, and book accommodation, seeking convenience and efficiency in their travel planning process (Deng et al. 2024). Gen Z is also known to prioritize sustainability in their purchase decisions (Calderón-Fajardo et al. 2024). The integration of the metaverse into travel planning services presents a significant opportunity to promote sustainability within tourism (Chen 2024). By integrating sustainable practices into the metaverse, travel providers can appeal to this demographic's values (Ferdous et al. 2024). Virtual platforms can be utilized to educate Gen Z about the environmental impacts of travel and promote eco-friendly alternatives, such as carbon offset programs and sustainable accommodation options. Having access to itinerary information can save time once within a destination and help identify accommodation and food that appeals (Deng et al. 2024). Metaverse platforms may contribute to the lowering of carbon footprints through improved travel planning (Paliwal et al. 2024; Buhalis and Karatay 2022).

Motivation is defined as an individual's psychological pressure to attain an objective. Innovativeness is defined as the speed at which individuals adopt any new technology or product. The MCI scale can assess innovativeness in a domain-specific service context (Vandecasteele and Geuens 2010). These motivation sources have been found to influence consumer innovativeness traits. Innovation adoption is also driven by functional, hedonic, cognitive, and social consumer motivations, as shown in Figure 1 (Saeed et al. 2014).

Socially-Motivated Consumer Innovativeness (sMCI) is linked to achieving social relationship goals (Vandecasteele and Geuens 2010). sMCI assesses an individual's willingness to try new products or services to enhance social interactions or relationships. There is a desire to connect with others by adopting innovative products. Virtual reality platforms like the metaverse facilitate socio-cultural engagement and community interaction. Several studies have identified that high social motivation correlates with positive attitudes toward the adoption of new technology (Chung et al. 2018; Srivastava et al. 2024). sMCI promotes the use of metaverse platforms for travel planning within consumer segments, particularly Gen Z (Goo et al. 2022). Travelers are using the metaverse to be a pioneer of innovative travel planning.

Functional-Motivated Consumer Innovativeness (fMCI) is associated with consumers comfort, quality, and dependability (Vandecasteele and Geuens 2010). fMCI is self-reported innovativeness facilitated by functional performance. In tourism, advanced navigational tools and simulators enhance virtual trip planning and destination previews, which help planning (Tussyadiah et al. 2018). The immersive and interactive nature of the metaverse and VR has significantly enhanced the functional aspects of travel planning, allowing users to explore destinations, compare accommodations, and plan itineraries more effectively (Xiang et al. 2015). It proposes a positive connection between fMCI and Gen Z's metaverse tourism planning.

Hedonic-Motivated Consumer Innovativeness (hMCI) relates to emotional engagement (Venkatraman and Price 1990). Behavior in virtual reality tourism is influenced by hedonic motivations, such as positive emotions and flow. Hedonic pleasure reflects the desire for excitement by sensory simulation and gratification (Cheung et al. 2024). The emotional appeal motivates travelers to explore destinations and plan trips using metaverse technology. This can enhance the overall travel planning experience and decision-making process. Technological advancements facilitate emotional engagement, pleasure, and collaborative development, catering to Gen Z's curiosity, excitement, and pleasure.

Cognitive-Motivated Consumer Innovativeness (cMCI) refers to the fulfilment of intrinsic value and epistemic motivation

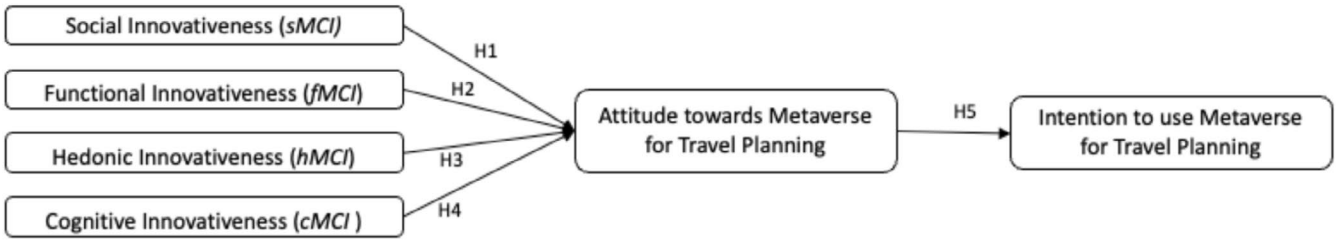

FIGURE 1 | Proposed conceptual model.

(Venkatraman and Price 1990). Travelers' inclination to visit destinations is impacted by perceptions of utility of property and the destination to be visited (Huang et al. 2016, 2013). Within immersive and aesthetically pleasing experiences, metaverse tourism improves contentment and well-being and allows an evaluation of the destination. Metaverse platforms that provide cognitive engagement and exploration, can enhance the travel planning experience, creating the motivation to discover and plan prior to visitation.

2.1 | Attitude Toward the Metaverse and Intention to Use for Travel Planning

Users' innovative mindset positively influences their intent to engage with online technology. This indicates a potential link between positive attitudes toward innovation and the adoption of metaverse technology for travel planning (Herrero and San Martín 2012). Attitudes toward new technology within tourism are strongly influenced by experiential tools and attitude while making the travel plans. (Qin et al. 2021; Çolakoğlu et al. 2024). Using the metaverse in the pre-planning phase offers unique and immersive experiences as well as provides convenience, saving time and enhancing the travel planning process (Chan et al. 2023). The literature suggests that a positive attitude toward the metaverse is crucial to drive intention to use within travel planning. Therefore, the following hypotheses are proposed:

H1. *sMCI in tourism has a positive effect on consumer attitudes toward travel planning.*

H2. *fMCI in tourism has a positive effect on consumer attitudes toward travel planning.*

H3. *hMCI in tourism has a positive effect on consumer attitudes toward travel planning.*

H4. *cMCI in tourism has a positive effect on consumer attitudes toward travel planning.*

H5. *Consumer attitudes affect the intention to use metaverse platforms for travel planning.*

3 | Methodology

This study utilizes a sequential mixed methods design, involving qualitative analysis followed by quantitative analysis (Creswell and Plano Clark 2017). Combining qualitative and quantitative methodologies enhances precision, supports interpretation, and can reveal potential causal relationships (Mayring 2001). The approach allows for the exploration and testing of variables and dimensions and increases the potential for the generalization of the qualitative results from a small sample (Morse 1991; Creswell et al. 2003).

The data collection strategy included two phases (See Figure 2). In Phase 1, a qualitative approach was undertaken. In-depth interviews were conducted with 30 Gen Z individuals to attain detailed insights. These interviews guided the development of the questionnaire. Developed from a survey of the literature, the MCI scale was integrated. The scale was initially developed by Vandecasteele and Geuens (2010) and constructs and measurement items relevant to this study's context were then developed. In Phase 2, a quantitative approach was employed using a structured survey to collect data (Bryman and Bell 2011).

Study 1 adopted a qualitative research design to develop an appropriate measurement scale for the utilization of metaverse platforms for travel planning. Qualitative interviews were deemed a suitable strategy to gather rich, contextual information (Morse 1991). The insights garnered from these interviews were crucial for the development of the questionnaire for the quantitative study. The collection of qualitative data aimed to explore Gen Z motivations to engage with metaverse platforms for travel planning. A purposive sampling method was employed to identify and recruit 30 participants aged between 19 and 28 years who demonstrated relevant experience and knowledge of virtual tours, travel planning, and metaverse applications. Recruitment was conducted through social media platforms, including Facebook, where targeted virtual tour and travel-focused groups served as primary channels. To ensure familiarity with the metaverse, potential participants were pre-screened using a short eligibility questionnaire that assessed their prior engagement with metaverse platforms (e.g., Horizon Worlds, Decentraland) and their participation in virtual travel or tour-related activities. Inclusion criteria required participants to have used a metaverse platform at least once for travel-related exploration or engagement. Individuals without any prior experience or awareness of metaverse applications were excluded to maintain the study's focus on informed user perspectives. During September 2023, individuals were screened through direct outreach. An assessment of their willingness to engage in the interviews followed Gilbert's (2008) guidelines.

The qualitative interviews were conducted virtually through WhatsApp audio and Zoom calls, facilitating flexible and convenient communication. Each interview lasted between 30 and 44 min, allowing in-depth discussion of participant experiences, motivations, and perceptions related to travel planning within the metaverse. To ensure participants' familiarity with the concept, researchers included a direct question regarding their prior knowledge of the metaverse at the beginning of each interview. It helped establish a baseline understanding of their responses. To mitigate potential sample bias, specific criteria were established for participant selection (Frost 2024), including

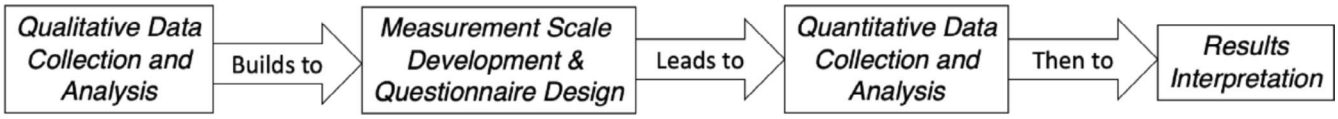

FIGURE 2 | Data collection process. Source: Explanatory sequential design (adopted from Creswell, 2011).

prior experience with virtual tours and active engagement with metaverse applications. Efforts were made to diversify the sample by recruiting participants from various socio-economic backgrounds, geographical locations, and educational levels (Table 1), thus providing a more comprehensive perspective of Gen Z's motivations.

The questions asked during the interview centered on four key themes:

i. *Familiarity and initial impressions*: To understand their awareness and initial impressions of the use of metaverse platforms for travel planning.

ii. *Engagement and usage patterns*: To explore how frequently and extensively participants use the metaverse for travel planning and the features they found most useful.

iii. *Influences on travel planning decisions*: To assess how the metaverse influences travel decisions, destination choice, and itinerary planning.

iv. *Social interaction and recommendations*: To understand the influence of peer recommendations and reviews on travel plans.

TABLE 1 | Demographic profile.

Demographic category	Percentage
Age group	
1997–2005	70%
2005–2012	30%
Gender	
Male	50%
Female	50%
Country	
India	55%
Canada	35%
USA	10%
Social media usage	
Daily	100%
Education	
Graduate	50%
Undergraduate	50%
Travel experience	
Frequent traveller	50%
Occasional traveller	30%
Limited travel experience	20%
Virtual travel experience	
Yes	95%
No	5%

A qualitative content analysis approach outlined by Elo and Kyngäs (2008), was applied to analyse the interview data. It involved continuously comparing collected data to develop themes, by organizing information through coding and categorization. These insights were used to develop constructs for the questionnaire. The inclusion/exclusion of attributes in the study framework was determined based on a 10% induction rate threshold, following Fishbein and Middlestadt (1995).

The measurement scale/questionnaire development process employed the MCI scale developed by Vandecasteele and Geuens (2010), which assesses four dimensions of innovativeness: functional, hedonic, social, and cognitive. Consumer attitudes were measured using items adapted from Bagozzi et al. (2003). Intention to use metaverse platforms for travel planning was assessed based on items developed by (Han et al. 2018). Measurement items were generated through a review of the literature and in-depth interviews with ten Gen Z participants, allowing for contextual relevance and clarity. In total, 26 items were created (see Appendix A, Table A1). These items underwent a rigorous review process involving four tourism researchers, who engaged in multiple discussions to refine the language and ensure the suitability of items until consensus was reached. Participants evaluated these items using a five-point Likert scale, where 1 represented strongly disagree and 5 indicated strongly agree. The structured questionnaire encompassed the measurement items for MCI, attitudes, and intention to use metaverse platforms, together with sociodemographic data collection (Hair et al. 2011).

Study 2 engaged quantitative research design to gather data by employing a snowball sampling technique, targeting travel enthusiasts across India, Canada, and the USA. This non-probabilistic method allows existing participants to recruit future participants from their social networks (Creswell et al. 2003). The use of snowball sampling was strategically chosen to mitigate the limitations often associated with traditional sampling methods, such as sample bias and reduced generalizability. Data collection commenced in January 2024 and continued until March 2024. The recruitment process involved reaching out to potential participants through personal networks and social media platforms, such as Facebook and LinkedIn. Participants were encouraged to share the survey link with their acquaintances who matched the travel enthusiast demographic criteria. The method ensured a diverse sample and facilitated engagement with participants who had a genuine interest in the subject matter. A total of 450 travel enthusiasts were approached, resulting in 345 valid responses after filtering for completeness and engagement. Data were collected online using Google Forms, which provided a convenient platform for participants to complete the survey. To further ensure a representative sample, outreach was conducted through educators, colleagues, and friends, which contributed to a well-rounded dataset.

To assess the reliability and validity of the collected data, first-order confirmatory factor analysis (CFA) was performed using IBM AMOS-26. The analysis evaluated model fit and construct validity, ensuring that the measurement scales performed as intended. Following the CFA, structural equation modeling (SEM) was employed to explore the relationships among the theoretical constructs and to provide robust insights into the interplay between consumer innovativeness and attitudes toward metaverse platform use.

4 | Results: Finding and Analysis

The findings are presented in two sections: the outcomes of the qualitative analysis, which contributed to the measurement scale, and the examination of the structural model during the quantitative phase, including hypotheses paths.

Study 1 qualitative phase results explored the motivations of Gen Z individuals regarding their intention to use metaverse platforms for virtual tours and tourism planning. The analysis revealed that participants had demonstrated a strong interest in virtual travel experiences and considered them to be both a supplement to, and a potential replacement for, physical travel (Table 2).

Familiarity and initial impressions were established as 85% of the participants indicated that they were aware of metaverse platforms. The use of social media platforms such as Instagram and TikTok had informed their knowledge. Approximately 70% stated that they found the concept intriguing and innovative, while 30% were concerned about the practicality and accuracy of virtual travel compared to real-world experiences. About 60% felt comfortable and confident using metaverse platforms for travel planning. The remaining 40% faced difficulty navigating and understanding metaverse platforms.

Usage and engagement patterns illustrated that respondents had an average of one session per week, whilst 50% of participants used metaverse platforms frequently for travel planning. The most common engagement among participants was with virtual tours and immersive destination previews, involving 75% of them. One participant stated, "I appreciated the ability to virtually view the places before I decided to travel". A portion of participants indicated that they had used AI-driven tools for itinerary planning, totalling 40%.

TABLE 2 | Behavioral profile of participants toward metaverse use and travel planning ($n = 30$).

Category	Percentage
Familiarity with metaverse (Awareness)	
Yes	100%
No	0%
Use of metaverse for travel planning	
Yes	80%
No	20%
Traditional travel frequency	
Rarely	20%
Occasionally	40%
Frequently	60%
Virtual travel frequency	
Rarely	20%
Occasionally	40%
Frequently	60%

When exploring influence on travel planning decisions, about 75% of participants stated that the metaverse significantly influenced their choice of travel destinations. One participant stated, "I have often explored lesser-known destinations that I have found through virtual tours, I might not have considered them otherwise". Participants indicated that they appreciated the convenience of exploring multiple destinations from home and the ability to plan trips more efficiently. The immersive experience was a major benefit (70% of participants). A participant highlighted, "I appreciated virtual hotel tours and activity previews, it helped me to make quick decisions". Around 35% of participants mentioned technical limitations, such as occasional lag and low-resolution graphics, while others suggested a preference for physical travel and real-world experiences.

When social interaction and recommendations were examined, around 80% of the participants found social interactions and peer recommendations within platforms to be helpful. One participant stated, "I participated in several virtual travel communities to share experiences and seek advice". Most participants relied on peer reviews and ratings, trusting feedback from other users who had virtually visited destinations and accommodations, with this group making up 70%. Enhancements to user interfaces such as better navigation and integration with other travel apps and extensions were suggested by 50% of the participants. They also wanted improved graphics and more detailed virtual environments. Many (70%) expressed a high likelihood of using the metaverse for future travel planning. They believed it would continue to evolve and offer even more comprehensive travel planning features.

Most participants were aware of the metaverse and found it intriguing, although some remained skeptical about its practicality. Despite this, many felt comfortable and confident using the metaverse for travel planning. The frequency of use varied, with many engaging with virtual tours and immersive previews. The metaverse influenced participants' destination choices and itinerary planning, offering an immersive experience that allowed for personalized travel exploration. Social interaction and peer recommendations within the metaverse played a crucial role in shaping travel plans. While participants appreciated the technological features, they highlighted the need to improve user interfaces and content quality. The participants perceived the metaverse to be a valuable tool for travel planning, expressing a high likelihood of continued use and anticipating its evolution to enhance travel in the future. These responses closely align with the MCI scale, enabling a comprehensive assessment of their intentions.

Study 2 quantitative phase results tested the measurement model and validity as well as the relationship between attitudes (AT) and motivational dimensions. Table 3 depicts the model fit assessed through confirmatory factor analysis. The Chi-square/degree of freedom (CMIN/df) ratio yielded a value of 3.067, indicating a good fit as it was below the recommended threshold of 5. The Tucker-Lewis index (TLI) and comparative fit index (CFI) values were slightly below the threshold of 0.9 at 0.855 and 0.869, respectively, suggesting a good, though not excellent, fit. The RMSEA value of 0.084 falls within the acceptable range of less than 0.1, supporting the notion of a good fit.

Hypothesis testing (Figure 3) revealed that *sMCI*, emphasizing social recognition, was significantly linked to positive attitudes

TABLE 3 | Measurement model fit summary.

Measure	Recommended value	Results value	Remark
Chi-square/ degree of freedom (CMIN/df)	< 5	3.067	Good fit
Tucker Lewis index (TLI)	> 0.9	0.855	Good fit
Comparative fit index (CFI)	> 0.9	0.869	Good fit
Root mean square error of approximation (RMSEA)	< 0.1	0.084	Good fit

(AT) ($p < 0.001$). *fMCI*, focused on practical benefits, also correlated with favorable attitudes toward metaverse adoption ($p = 0.030$). *hMCI*, representing pleasure, indicated that those who enjoy metaverse experiences were more supportive of its integration into travel planning ($p = 0.016$). *cMCI*, centered on intellectual stimulation, demonstrated a robust relationship with attitudes ($p = 0.041$), suggesting that individuals seeking cognitive challenges were more engaged with the metaverse. Among these factors, cMCI had the highest estimate (0.86), highlighting its dominant influence on positive attitudes, while sMCI (0.84) reflected a slightly weaker association. Thus, cognitive motivation emerged as the most critical driver for positive attitudes toward metaverse adoption in travel planning.

There was also a strong correlation between social innovativeness and functional innovativeness (Estimate = 0.79, $p = 0.003$), indicating that those valuing social recognition also recognized the practical benefits of the metaverse. The link between social

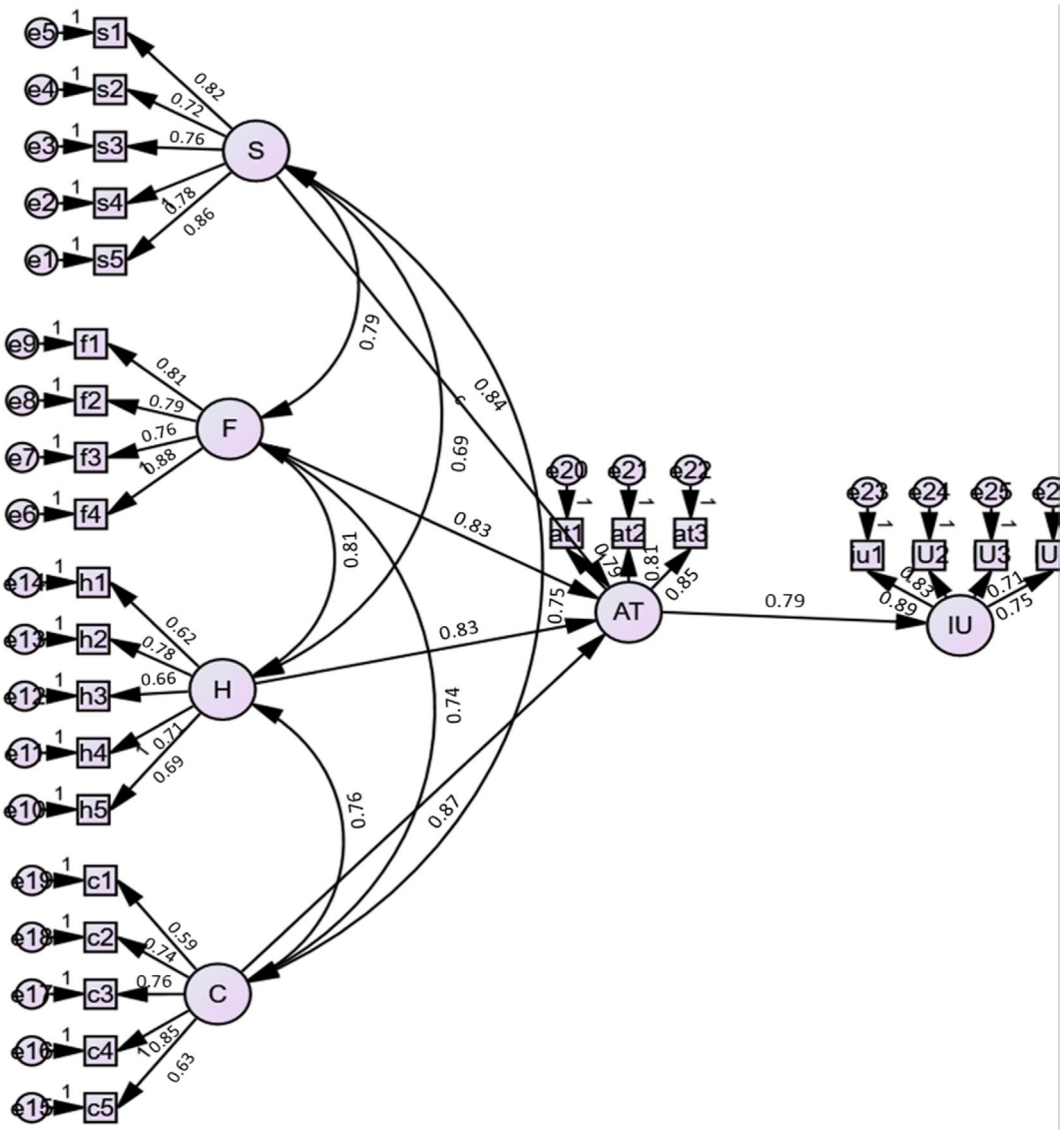

FIGURE 3 | SEM path diagram.

innovativeness and cognitive innovativeness (Estimate = 0.87, $p < 0.001$) reinforced that individuals seeking social distinction were inclined to engage in cognitive challenges within the metaverse. The interplay between functional and hedonic innovativeness suggests that practical benefits and pleasurable experiences coexist and enhance engagement with metaverse activities.

Standardized path coefficients and 95% confidence intervals were reported to clarify the magnitude and reliability of each relationship, enhancing the interpretation of practical significance across the model. All five hypotheses were validated, confirming the statistical significance of relationships between sMCI, fMCI, hMCI, cMCI, and consumer attitudes. The strong correlation between attitudes and intention to use (I.U.) (Estimate = 0.79, $p = 0.003$) underscores that positive attitudes significantly boost Gen Z tourists' willingness to adopt metaverse coefficients. Figure 3 shows that positive attitudes (AT estimate = 0.77) closely relate to the desire to integrate the metaverse into daily life. The I.U. estimate of 0.66 also indicates that favorable attitudes enhance the likelihood of active engagement with the metaverse.

5 | Discussion: Gen Z's Perceptions and Motivations to Use Metaverse for Travel Planning

This study explored Gen Z's perceptions and motivations to use metaverse for travel planning. The metaverse is revolutionizing the travel and tourism sector, providing benefits across organizational realms. It enhances value, co-creation, and user engagement for Gen Z. The findings highlight that functional benefits significantly motivate Gen Z's adoption of the metaverse, as they value dynamic interactions and cognitive stimulation. The research shows that functional and cognitive innovativeness significantly influence behavior. Gen Z is primarily driven by functional benefits such as convenience, sustainability, cost effectiveness, and safety, overshadowing social or hedonic motivations. The study advocates for the blending of the technology with experience to align with Gen Z values. To remain competitive and meet evolving consumer expectations, tourism and travel businesses must proactively prepare for the use of metaverse platforms.

The study explored the motivations and intentions of Gen Z in relation to the use of the metaverse in travel planning. The analysis revealed that cognitive, functional, social, and hedonic motivation factors significantly influenced attitudes toward the metaverse, thereby impacting behavioral intentions in the context of travel planning. These findings are consistent with earlier research (Huang et al. 2013; Mandal et al. 2024). The prominence of cognitive motivations indicates a critical shift in travel planning preferences among Gen Z. Unlike prior generations, who may have prioritized entertainment or enjoyment, Gen Z is actively seeking intellectually stimulating experiences. It suggests a growing trend toward educational and transformative travel experiences that foster personal growth and critical thinking. By prioritizing cognitive engagement, Gen Z signals a departure from superficial leisure activities, placing greater value on experiences that contribute to their knowledge and understanding of the world. Further, functional and social motivations significantly shape Gen Z's perceptions of the metaverse as a viable tool for travel planning. The emphasis on practicality reflects a generation that values efficiency and effectiveness in their travel experiences. Gen Z is not merely looking for entertainment; they seek platforms that facilitate meaningful connections and streamline the planning process. The metaverse, with its potential for immersive social interaction and practical applications, serves as a powerful medium for this demographic to connect with others while exploring travel options.

Contrary to prevailing beliefs, hedonic factors play a relatively minor role in Gen Z's engagement with the metaverse for travel planning. This highlights a critical transformation in consumer behavior, where the allure of enjoyment is secondary to the quest for knowledge and connectivity. As such, tourism stakeholders must recognize that creating experiences within the metaverse should prioritize cognitive and functional aspects to resonate with this audience effectively. The findings indicate that Gen Z is increasingly seeking travel experiences that align with their values. The metaverse can provide innovative solutions that cater to their desire for educational and socially connected experiences and reducing environmental impact. The emphasis on cognitive, functional, and social motivations signifies a critical evolution in consumer preferences, reflecting a more sophisticated understanding of travel as a vehicle for growth and connection. As tourism navigates the challenges of sustainability, the metaverse is emerging as a platform that can enhance travel experiences while aligning with the Sustainable Developmental Goals (SDGs) (Buhalis, Leung, Fan, et al. 2023). The research calls for a re-evaluation of tourism strategies that prioritize these motivations, ultimately paving the way for a more sustainable and responsible future in the travel and tourism sector.

6 | Contributions and Conclusions

The findings of the study present significant theoretical implications developed within the MCI framework. This is particularly so for problem recognition, information search, evaluation of alternatives, and post-purchase behavior in travel planning. Gen Z's quest for unique and immersive experiences aligns with MCI theory, which posits that innovative consumers are motivated by a desire for novelty and distinctive experiences (Rauschnabel et al. 2019). The demographic's heavy reliance on social media, peer reviews, and influencer endorsements highlights the MCI model's capacity to understand online information-seeking behavior and may highlight the role of social influence in shaping consumer choices. Gen Z's evaluation of alternatives accentuates the significance of high-quality technology, cost-effectiveness, and convenience—key components of MCI that emphasize functional innovation. Their purchasing decisions are increasingly driven by easy access, seamless transactions, and exclusive content, reflecting the MCI's focus on early adoption and the urgency often fueled by fear of missing out (FOMO) (Priporas et al. 2017). Immersive digital environments can, therefore, enhance user engagement and motivation by making activities more enjoyable and rewarding. Gen Z are accustomed to interactive experiences and therefore the metaverse's ability to gamify travel planning may influence the decision-making process and foster eco-conscious behaviors by making sustainable choices more appealing and accessible (Zichermann 2011).

In post-purchase contexts, Gen Z's inclination toward community sharing and continuous improvement reinforces the MCI perspective that innovative consumers value participation in product development through feedback and co-creation. It fosters a sense of community, thereby enhancing customer loyalty and long-term engagement. The study identifies a pivotal convergence between MCI and eco-conscious behavior among Gen Z travelers. Their commitment to sustainability is reflected in their preference for travel planning solutions that prioritize environmental impact reduction. The integration of the metaverse in travel planning may offer a platform for eco-conscious practices by allowing users to visualize and evaluate the environmental impact of their travel choices. It further implicates that the MCI framework can effectively capture not only the motivations driving technology adoption but also the broader socio-environmental consciousness shaping Gen Z's travel behaviors. Cognitive motivations may therefore lead Gen Z to prefer unique, immersive travel experiences that leverage cutting-edge technology.

To capitalize on these insights, travel stakeholders should develop compelling content that caters to Gen Z's desire for immersive, eco conscious, and shareable experiences. Visually engaging virtual tours, interactive elements, and gamified experiences are essential for enhancing cognitive engagement. Leveraging influencer marketing on platforms such as Instagram, TikTok, and YouTube will expand reach and create authentic connections with this demographic. Customization options should allow users to personalize their virtual experiences based on individual interests and preferences, enhancing overall satisfaction. The metaverse can serve as a platform where travelers experience immersive previews of destinations, accommodation, and activities. This will reduce uncertainty and help consumers make informed decisions. It is particularly beneficial in reducing post-purchase dissonance and improving customer satisfaction, as Gen Z can "try before they buy" by experiencing virtual tours of hotels, restaurants, or attractions before making final bookings. Stakeholders must identify which specific metaverse features most effectively foster cognitive engagement and social connectivity, as these can serve as powerful tools to shape travel planning behaviors. Travel businesses can also facilitate group travel planning within the metaverse, creating opportunities for collaborative itinerary development and peer interactions. The approach enhances user experiences and fosters community and shared excitement around travel, thereby increasing engagement and loyalty. In particular, travel agencies and platform developers can enhance user experience and engagement by incorporating gamification elements, such as virtual travel challenges or rewards systems, to increase interactivity and encourage return visits. Integrating interactive features like real-time decision-making scenarios, virtual guided tours, and personalized avatars can provide a more immersive and engaging travel planning experience. These strategies would not only improve user engagement but also promote brand loyalty by offering a more dynamic and customized approach to virtual travel experiences. By aligning metaverse applications with these interactive features, stakeholders can attract and retain the growing Gen Z demographic, who are more inclined to engage with gamified and interactive content. The long-term implications of these findings for sustainable tourism practices also warrant consideration. The metaverse offers an opportunity for stakeholders to promote sustainable tourism by highlighting eco-friendly travel options or raising awareness of environmental issues through virtual experiences. Virtual tours may feature eco-conscious destinations or encourage environmental options, promoting more sustainable choices.

The widespread adoption of metaverse travel planning may disrupt traditional tourism and local economies. Stakeholders must navigate these changes carefully, assessing potential challenges while adapting to evolving consumer preferences (Singh et al. 2024). Aligning marketing strategies with the motivations identified in this study enables the tourism stakeholders to foster a more sustainable and innovative future. By emphasizing the cognitive and functional benefits of metaverse engagement, they can enhance user experiences and contribute to sustainable tourism initiatives. These outcomes can pave the way for a more responsible approach to travel in the digital age. Further investigation is required to explore how these findings can be adapted and applied to meet the needs of various stakeholders. Future research in tourism and consumer behavior can be directed toward assessing acceptance levels, perceived utility, and metaverse adoption challenges. Research should also focus on reimagining the travel and experience landscape, aiming to leverage the potential of the metaverse for innovative and engaging tourism offerings.

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Ethics Statement

Participants provided informed consent before participating in the study.

Data Availability Statement

The data that support the findings of this study are available from the corresponding author upon reasonable request.

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Appendix A

TABLE A1 | Motivation and attitude measurement scales.

Indicator	Construct and scale item	Source	Estimate
Social innovativeness			
S1	I enjoy using the metaverse for travel planning because it allows me to impress others with the innovative way I explore destinations.	Vandecasteele and Geuens (2010).	0.82
S2	I appreciate experiencing the metaverse for travel planning as it sets me apart from those who have not yet embraced this technology.		0.72
S3	I like to try out the metaverse for travel planning and share my experiences with others.		0.76
S4	I like to outdo others and prefer to do this by experiencing/buying new products through metaverse, which my friends have yet to do.		0.78
S5	I consciously seek out new experiences like using the metaverse for travel planning, which are visible to others and earn me respect.	Authors formulated	0.86
Functional motivation			
F1	If a new time-saving service like the metaverse for travel planning becomes available, I would purchase or try it immediately.	Vandecasteele and Geuens (2010).	0.81
F2	If a new service through metaverse gives me more comfort than my current product, I would not hesitate to buy/try it.		0.79
F3	Improved functionality in metaverse technology enhances my willingness to use it in tourism.		0.76
F4	If an innovation like metaverse is more functional, then I buy/try it.	Authors formulated	0.88
Hedonic innovativeness			
H1	Using novelties like metaverse for travel planning gives me a sense of personal enjoyment.	Vandecasteele and Geuens (2010).	0.62
H2	It gives me a good feeling to acquire and experience the metaverse for travel planning. Innovations like the metaverse make my travel planning exciting.		0.78
H3	The discovery of novelties like metaverse makes me playful and cheerful.		0.66
H4	Acquiring/experiencing an innovation like metaverse makes me happier.	Authors formulated	0.71
H5	The novelty and excitement of experiencing metaverse technology for travel planning contribute positively to my happiness.		0.69
Cognitive innovativeness			
C1	I mostly buy/try experiencing the metaverse as it satisfies my analytical mind.	Vandecasteele and Geuens (2010).	0.51
C2	I find innovations like metaverse that need a lot of thinking intellectually challenging and therefore I buy/try experiencing them instantly.		0.74
C3	I often buy/try new products that make me think logically.		0.76
C4	I am an intellectual thinker who buys/tries new products like metaverse because they set my brain to work.		0.85
C5	I tend to be drawn to new products like the metaverse for travel planning that challenge my cognitive abilities and stimulate my thinking processes.	Authors formulated	0.63

(Continues)

TABLE A1 | (Continued)

Indicator	Construct and scale item	Source	Estimate
Attitudes			
AT1	I have a positive view toward using the metaverse for travel planning as it offers innovative and engaging experiences.	Bagozzi et al. (2003)	0.79
AT2	I hold a constructive attitude toward embracing the metaverse for travel planning due to its potential to enhance various aspects of my travel experiences.		0.81
AT3	I maintain a favorable outlook on the metaverse, appreciating its potential to elevate my interactions and engagements.		0.85
Intention to use			
IU1	Due to its enticing attributes and potential benefits, I am strongly inclined to incorporate metaverse into my activities.		0.89
IU2	My intention to use metaverse is resolute, rooted in the belief that it will contribute positively to my overall experiences.		0.83
IU3	I am determined to integrate the metaverse into my routine for travel planning, as its offerings align with my preferences and aspiration	Authors formulated	0.71
IU4	I intend to engage with the metaverse for travel planning, motivated by the conviction that it will enrich my interactions and engagements with destinations.		0.75