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5D Virtual Reality and Tourists' Visit Intentions: The Role of Inherent Innovativeness

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Abstract
This study examines how tourists' attitudes towards 5-Dimensional Virtual Reality (5DVR) influence their behaviour in cultural tourism contexts, focusing on Islamic heritage destinations. 5DVR extends conventional VR by integrating multisensory stimuli, such as motion, haptics, and olfactory effects, thereby offering a deeper immersive experience. Guided by the attitude–behaviour framework, we examined tourists' attitudes towards 5DVR as the independent variable, satisfaction with 5DVR as a mediator, and intention to visit real destinations as the dependent variable, while testing inherent innovativeness as a moderator. An online survey with a quasi-experimental design was administered to 175 Indonesian tourists using a 5DVR platform. Satisfaction significantly mediated the relationship between attitudes towards 5DVR and visit intentions, while inherent innovativeness moderated the satisfaction–intention pathway but did not influence the attitude–satisfaction relationship. These results highlight the role of multisensory immersive technologies in shaping tourists' psychological responses and travel intentions. We suggest that managers can strengthen cultural tourism engagement by designing 5DVR experiences that emphasise sensory immersion, authenticity, and emotional appeal, while tailoring promotional strategies to innovative and tech-savvy market segments.

Key Words: 5D virtual reality, attitude, satisfaction, inherent innovativeness, visit intention, heritage destination.

JEL Classification: L83, M31, Z32

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1. Introduction

What if you could explore the wonders of ancient civilisations, walk through centuries-old landmarks, or witness historical events unfold—all without boarding a plane? This possibility is increasingly becoming a reality through the integration of virtual reality (VR) into tourism, enabling prospective travellers to engage with destinations through 360° tours, panoramic exploration, and interactive mapping (An et al., 2021; Tussyadiah et al., 2018). Empirical evidence shows that such virtual experiences enhance tourist satisfaction and foster positive behavioural inclinations, positioning VR as an essential instrument in destination marketing (An et al., 2021; Băltescu, 2021; Charista et al., 2023; Sousa et al., 2025). Furthermore, VR plays a pivotal role in cultural heritage preservation by providing immersive and emotionally resonant representations of historical sites, while simultaneously augmenting

the perceived allure and destination image within the perceptions of travellers (Anaya-Sánchez et al., 2024; Charista et al., 2023; Pakanen & Arhippainen, 2014; Sousa et al., 2024b).

The COVID-19 pandemic served as a catalyst for the rapid adoption of innovative technologies, positioning VR as a secure and accessible medium for showcasing destinations amidst travel restrictions (Charista et al., 2023; Castanho et al., 2021; Kim et al., 2020). Virtual tourism (Akhtar et al., 2021) emerged as a practical solution for maintaining visitor engagement during this period, enabling destinations to maintain visitor engagement and accelerating the integration of VR into tourism marketing strategies. In the post-pandemic era, VR continues to offer viable and financially beneficial strategies, particularly for eco-aware and digitally savvy travellers (Mavrin et al., 2024). According to Market Data Forecast (2024), the value of the global virtual tourism industry was USD 10.34 billion in 2024 and is anticipated to expand to USD 111.16 billion by 2033, underscoring the increasing practical and economic relevance of this dynamic sector.

Despite the increasing uptake of VR in the tourism industry, research exploring the impact of more advanced formats—such as 5-Dimensional Virtual Reality (5DVR)—on tourists' intention to visit real-world destinations remains limited. Research has primarily focused on conventional VR technologies (2D/3D) or specific tourism segments, often overlooking destinations with profound cultural significance (Liu et al., 2023; Sousa et al., 2024). Although 5DVR holds significant potential to enhance the tourism experience, its application in destination marketing remains limited. Despite the availability of tools such as 360° tours and immersive content (Folgado-Fernández et al., 2023) many tourism operators still underutilise VR as a personalised promotional strategy, highlighting a persistent gap between technological capability and practical implementation.

Although prior VR tourism research has primarily focused on 2D/3D or 360° immersive formats (Bogicevic et al., 2019; Verma et al., 2022), little is known about the behavioural implications of 5DVR, a tool that incorporates multi-sensory feedback such as motion, haptics, and olfactory cues. In particular, limited attention has been given to understanding how and when tourists' attitudes to 5DVR significantly influence their satisfaction and travel intentions (Batat & Hammedi, 2023; Heller, 2023). Research has tended to concentrate on national or regional contexts—such as the UK (Moorhouse, 2019; tom Dieck et al., 2018), Spain, Colombia (Escandon-Barbosa & Salas-Paramo, 2024), and North Cyprus (Yuce et al., 2020). We address these gaps by applying and testing 5DVR within the context of heritage tourism in Indonesia and situate our findings within the wider body of international research to demonstrate their global relevance.

Addressing these gaps is increasingly important given the wide-ranging applicability of 5DVR across domains such as tourism, education, cultural heritage promotion, and entertainment (Băltescu, 2021). By incorporating motion-synchronised platforms, multisensory stimuli (e.g. haptic and olfactory feedback), and real-time interactivity, 5DVR offers a deeper sense of immersion than that offered by conventional VR. Hence, 5DVR is expected to significantly influence consumer behaviour by enhancing presence, emotional resonance, and cultural engagement (Brogent Technologies, 2024; Sasu et al., 2024). A clearer understanding of the factors shaping user responses to this emerging technology will assist tourism managers and policymakers in designing more effective strategies that not only increase visitor satisfaction but also foster more meaningful and sustainable connections with destinations.

Building on the abovementioned gaps, we address the following research questions:

- RQ1: How do tourists' attitudes towards 5DVR influence their satisfaction with immersive experiences?
- RQ2: Does satisfaction mediate the relationship between attitudes and tourists' intention to visit a destination?
- RQ3: Does inherent innovativeness enhance or attenuate the effect of tourists' attitudes on their 5DVR satisfaction?
- RQ4: Does inherent innovativeness enhance or attenuate the effect of 5DVR satisfaction on tourists' intention to visit a destination?

To address these questions, we investigated the mental processes through which 5DVR affects travellers' behavioural responses following their immersive experiences. Specifically, we pursued the following objectives:

(1) To extend the attitude–behaviour framework to the context of immersive tourism by analysing how 5DVR influences tourists' attitudes, satisfaction, and intention to visit.
(2) To assess the intermediary role of satisfaction in the relationship between tourists' perceptions of 5DVR and their intention to visit real-world destinations, particularly heritage sites.
(3) To identify the moderating effects of inherent innovativeness on the links between (a) attitude and satisfaction, and (b) satisfaction and visit intentions.
(4) To generate practical insights for destination marketers and immersive technology designers seeking to leverage 5DVR experiences to influence tourist behaviour and support sustainable destination engagement.

Our contributions are threefold. First, we advance theoretical understanding by positioning satisfaction as a central mediating mechanism in the relationship between tourists' attitudes towards 5DVR and their intention to visit real-world destinations. This mediation model responds to recent calls for integrating both affective and cognitive evaluations in immersive media research (Batat & Hammedi, 2023; Heller, 2023), highlighting how specific features of 5DVR—such as sensory engagement, telepresence, and vividness—shape psychological responses that translate into behavioural outcomes (Sousa et al., 2024a; Tussyadiah et al., 2018). Second, we enrich existing knowledge by incorporating a significant stable personal characteristic—inherent innovativeness—as a pivotal moderating variable in the interplay between attitudes related to tourists' satisfaction with 5DVR and their intention to visit actual destinations; research indicates that consumer innovativeness is instrumental in the adoption and engagement of immersive technologies (Huang & Liao, 2015; Nilashi & Abumalloh, 2024). Third, we extend existing attitude–behaviour models into the culturally rich and spiritually meaningful context of Islamic heritage tourism, demonstrating the power of 5DVR to simulate emotionally engaging and symbolically meaningful experiences.

Finally, our investigation yields practical insights for destination marketers and tourism planners by illustrating how multisensory virtual experiences can drive demand while fostering sustainability. By facilitating immersive pre-travel engagement and mitigating the environmental impact of overtourism (Godovykh et al., 2022; Lu et al., 2022), 5DVR can support more intelligent and responsible tourism practices.

2. Literature review

2.1 Attitude–behaviour theories

Understanding the mechanisms that drive human behaviour has long been a central concern in social psychology, consumer behaviour, and tourism. Among the most influential frameworks in this domain are the following: the theory of reasoned action (TRA), proposed by Fishbein and Ajzen (1975), and its extension, known as the theory of planned behaviour (TPB), introduced by Ajzen (1991). These frameworks provide critical insights into the factors underlying human actions by positing that behavioural intentions—the immediate precursors of actual behaviours—are influenced by attitudes towards behaviours, subjective norms (perceived social pressures), and perceived behavioural control (Armitage & Christian, 2017; Giger, 2008).

In the context of virtual tourism, where consumers engage with advanced immersive technologies such as 5DVR, the TPB offers a robust foundation for understanding how psychological antecedents influence intentions to visit real-world destinations (Alnasser, Alkhozaim, 2024). Research on motivational psychology has refined this perspective by proposing a goal-based progression from attitude to action, where liking evolves into wanting, goal formation, and behavioural execution (Kruglanski et

al., 2015). This progression is particularly relevant in digital tourism, where immersive experiences can transform initial curiosity into a genuine desire and intention to physically engage with a given destination. Attitude construal theory also highlights the significance of contextual sensitivity in influencing evaluations and decision-making processes; rather than being stable dispositions, attitudes can be reconstructed on the basis of environmental cues, social influences, and media stimuli (Schwarz, 2007; Mura & Stehlíková, 2025). This finding has important implications for tourism marketing strategies that rely on emotional engagement and presence.

Complementing these models, the behavioural perspective model (BPM) (Foxall & Yani-de-Soriano, 2005) highlights the situational and contextual determinants of consumer behaviour. The model emphasises how structural elements, such as the sensory richness and interactivity of VR tourism, elicit approach or avoidance responses, thereby reinforcing affective engagement and behavioural intentions.

While the TPB emphasises the rational evaluation of attitudes, subjective norms, and perceived behavioural control that shapes tourists' intentions (Ajzen, 1991), the BPM highlights how situational reinforcement and environmental cues influence approach or avoidance behaviours (Foxall & Yani-de-Soriano, 2005). In the context of 5DVR tourism, these models are complementary: the TPB explains the cognitive appraisal process through which tourists develop attitudes towards immersive experiences, while BPM elucidates how the sensory richness and rewards embedded in 5DVR environments reinforce satisfaction and strengthen the likelihood of behavioural follow-through. Together, they demonstrate that rational evaluations initiate intention formation, whereas reinforcement mechanisms sustain and amplify intentions by embedding them within affective and experiential responses.

Collectively, these theoretical lenses offer a comprehensive foundation for examining how attitudes towards immersive tourism experiences shape tourists' satisfaction and the subsequent intention to visit. By integrating these perspectives with empirical variables such as consumer innovativeness, we extend the application of attitude–behaviour theories to the domain of multisensory digital tourism.

2.2 Attitude towards 5DVR in tourism experiences

Attitude plays a pivotal role in shaping how tourists evaluate and respond to immersive technologies such as 5DVR. Defined as an individual's overall evaluative judgment towards an object or behaviour, attitude has been extensively studied as a primary antecedent to both satisfaction and behavioural intention within the TPB and related theoretical frameworks (Ajzen, 1991; Armitage & Christian, 2017). In the context of 5DVR, tourists' attitudes are shaped by their perceptions of aesthetic appeal, usability, interactivity, and psychological engagement—all of which significantly influence the quality of their immersive experiences. In other words, multiple psychological and technological factors contribute to the formation of favourable attitudes towards 5DVR, with aesthetics, cognitive affordance, and system usability being the core drivers that, in turn, affect tourists' satisfaction (Erevelles et al., 2016; Sun, 2024) by facilitating seamless interaction with the virtual environment, enhancing enjoyment, and reducing cognitive friction. The perceived vividness and interactivity of the 5DVR system further support the development of positive attitudes by strengthening the sense of presence and control within the VR space (Kim et al., 2023).

From a tourism perspective, 5DVR provides a multi-sensory and emotionally engaging form of escapism that enriches visitors' hedonic experiences. Research has shown that entertainment value and opportunities for psychological escape—key experiential benefits of tourism—significantly contribute to favourable attitudes and subsequent satisfaction with VR-based exhibitions and heritage tours (Chang & Suh, 2025; Guo et al., 2024). These attitudes are not passive; rather, they arise from active immersion and interaction that stimulate stronger emotional responses and engagement (Pratisto et al., 2023; Wu et al., 2019). They serve as precursors to satisfaction by shaping how users interpret and emotionally respond to 5DVR environments. In high-quality VR settings, users often report higher satisfaction when they perceive the system as engaging, enjoyable, and aligned with their desire for a novel experience (Pratisto et al., 2023; Wu et al., 2019). Features such as high-resolution visuals, spatial audio, and embodied

interaction, delivered through head-mounted displays and synchronised effects, contribute to heightened telepresence, deeper emotional impact, and stronger experiential satisfaction (Shelstad et al., 2017; Yildirim et al., 2018). In summary, tourists' attitudes towards 5DVR technology—shaped by system design features, sensory richness, usability, and emotional engagement—play a fundamental role in determining their satisfaction levels. The more positively individuals evaluate their VR tourism experiences, the more likely they are to report a high level of satisfaction with the given VR platform or attraction. Therefore, we propose the following hypothesis:

Hypothesis 1. Individuals' attitudes towards 5DVR experiences influence their level of satisfaction with 5DVR.

2.3 The role of 5DVR satisfaction in shaping destination intentions

The satisfaction derived from 5DVR experiences plays a pivotal role in shaping tourists' intentions to visit real-world destinations. As immersive technologies become increasingly integrated into tourism marketing, understanding how satisfaction with 5DVR experiences translates into behavioural outcomes—particularly the intention to visit—becomes increasingly important. Research has shown that travellers who engage in immersive multisensory VR adventures are more inclined to express a desire to visit the physical locations they explored virtually (Manchanda & Deb, 2022; Sousa et al., 2024a). High-quality, vivid, interactive, and emotionally engaging VR experiences enhance users' flow states and psychological presence, leading to stronger satisfaction and increased behavioural intentions (An et al., 2021; De Canio et al., 2022; Ghorbanzadeh, 2022).

From a psychological perspective, satisfaction with immersive VR tourism is closely linked to mental imagery and hedonic expectations. VR environments allow users to experience the joy and fulfilment associated with actual travel, thereby strengthening their desire to transition from virtual to physical tourism (Skard et al., 2021). Telepresence, which embodies the experience of existing within a digital realm, further intensifies travellers' emotional and intellectual bonds with locales and strengthens their desire to explore (Kim et al., 2020; Tussyadiah et al., 2018). Moreover, research suggests that satisfaction with VR experiences improves destination awareness and perception; these, in turn, function as mediators between virtual exposure and travel behaviour (Lee & Idris, 2024). This effect is particularly pronounced when the VR content provides engaging narratives and multisensory cues that simulate real-world experiences (Alyahya & McLean, 2022).

Although satisfaction with immerse VR typically encourages physical visitation, some studies have cautioned that extreme emotional attachment to VR experiences may, in rare cases, reduce the urgency of real-world travel (Manchanda & Deb, 2022). Nevertheless, the prevailing scholarly consensus underscores the beneficial impact of 5DVR satisfaction on travellers' intentions—such as the desire to explore, return to, or endorse various destinations. Therefore, we propose the following hypothesis:

Hypothesis 2: Tourists' satisfaction with 5D virtual reality (5DVR) experiences positively influences their intention to visit the featured destinations.

2.4 Mediating role of 5DVR satisfaction

The satisfaction derived from 5DVR experiences is a key outcome of positive user interaction and a pivotal mechanism that links users' attitudes towards 5DVR with their intentions to visit real-world destinations. A growing body of literature highlights satisfaction as a potent mediator that shapes behavioural intentions in immersive tourism settings. Research has confirmed that positive attitudes towards VR significantly influences satisfaction; this, in turn, strengthens tourists' likelihood of intending to visit the physical destination showcased in the virtual experience (Kokkhangplu, 2024; Yersüren & Özel, 2024). When individuals perceive virtual reality content as pleasurable, vibrant, and all-encompassing, their satisfaction increases, intensifying their engagement with the portrayed destination and increasing the likelihood of their intention to visit (Latifi et al., 2024; Marasco et al., 2018). This

pattern underscores the role of VR satisfaction as a psychological bridge that connects attitudinal dispositions with concrete travel planning.

The psychological mechanisms underlying this mediation include telepresence, immersion, mental imagery, and enjoyment. These immersive attributes produce emotionally engaging and cognitively vivid simulations that stimulate users' desire and intention regarding real-world experiences (Alyahya & McLean, 2022; Tussyadiah et al., 2018). Telepresence and emotional engagement are particularly influential in 5DVR environments, as they deepen satisfaction and strengthen the psychological bridge linking attitudes to behavioural intentions. In particular, telepresence evokes a strong sense of 'being there' that increases tourists' satisfaction and motivation to experience a destination in person (Latifi et al., 2024). Furthermore, system and content quality—including factors such as visual appeal, narrative richness, and ease of interaction—directly affect VR satisfaction and mediate the transformation of interest into intent (Lee & Idris, 2024; Zhu et al., 2024). Satisfaction also boosts mental and emotional engagement, enabling users to form stronger cognitive associations with their destinations (Ouerghemmi et al., 2023). In other words, when tourists hold favourable attitudes towards 5DVR but are not yet committed to travelling, their satisfaction can serve as a critical factor that strengthens their intention to visit a destination. Therefore, we propose the following hypothesis:

Hypothesis 3: Tourists' satisfaction with 5DVR mediates the relationship between their attitudes towards 5DVR and their intention to visit their destinations.

2.5 Moderating role of inherent innovativeness

Inherent innovativeness—an individual's natural inclination to embrace new technologies—significantly influences how tourists perceive and engage with advanced experiences such as 5DVR. Individuals with high inherent innovativeness typically display favourable dispositions towards innovative products and services, driven by their openness to new experiences and eagerness to explore novel features (Dabholkar & Bagozzi, 2002; Frank et al., 2015; Frimpong et al., 2017; Hirschmen, 1980). These individuals are more attuned to the distinctive sensory attributes of 5DVR—such as haptic (touch) and olfactory (scent) feedback—that enhance their engagement and satisfaction. Hence, we propose two potential ways in which this variable can affect the relationships between tourists' attitudes, their satisfaction with 5DVR, and their intention to visit destinations.

First, inherent innovativeness can strengthen the relationship between attitude and satisfaction by amplifying the positive effects of favourable attitudes towards 5DVR on users' satisfaction. This is because inherently innovative individuals are more appreciative of the immersive and cutting-edge qualities of 5DVR; thus, they are likely to derive more satisfaction when they hold favourable attitudes towards 5DVR (Boateng et al., 2016; Fu & Elliott, 2013). Evidence from similar contexts demonstrates that inherent innovativeness enhances satisfaction with innovative products by increasing the tolerance for potential shortcomings and amplifying the enjoyment of high-quality experiences (Frank et al., 2015).

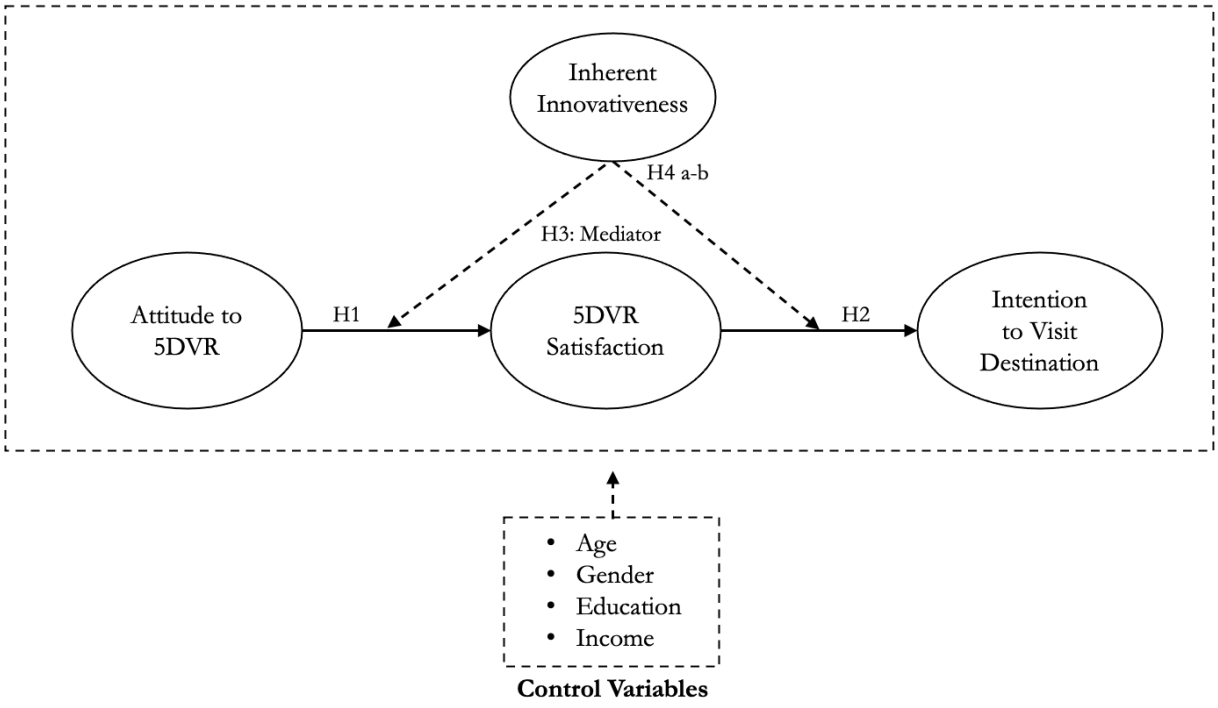
Second, inherent innovativeness may moderate the correlation between 5DVR satisfaction and tourists' intention to visit authentic heritage destinations. Tourists who possess a high degree of inherent innovativeness and are satisfied with their 5DVR experiences tend to exhibit stronger intentions to physically visit the destinations portrayed virtually. Their openness to new technologies not only enhances their virtual experience but also translates into a stronger desire to explore real-world counterparts of the immersive virtual environments (Boateng et al., 2016). Therefore, hypotheses 4a and 4b are proposed:

Hypothesis 4a: Inherent innovativeness moderates the relationship between tourists' 5DVR satisfaction and their intention to visit the destination.

Hypothesis 4b: Inherent innovativeness moderates the relationship between tourists' attitude towards 5DVR and their 5DVR satisfaction.

Our conceptual perspectives and hypotheses are illustrated in Figure 1 below.

Figure 1. **Conceptual framework**



Source: own model

3. Methods

3.1 Research design and approach

We employed a quantitative methodology and adopted a quasi-experimental framework to examine the causal relationships among tourists' perceptions of 5DVR, their levels of satisfaction with immersive experiences (SAT), and their propensity to visit actual destinations (INT). A quasi-experimental design was selected because random assignment was not feasible; however, this design enabled the approximation of causal inference in a real-world tourism context. Quasi-experimental designs are widely used in field-based research where participants naturally interact with immersive content (Hallberg & Eno, 2015; Shadish & Galindo, 2010); our quasi-experiment was conducted with Indonesian tourists who interacted with 'VR Journey Indonesia', a 5DVR simulation showcasing Islamic heritage sites. Instead of a random assignment, participants were selected through purposive and content-based sampling that targeted individuals who had publicly engaged with VR content on platforms such as Instagram and Facebook. This approach reflected real-world tourism behaviour and enhanced the ecological validity of our research (Hong, 2010).

Unlike traditional experimental designs, quasi-experiments enable natural exposure to interventions—in this case, the 5DVR experience—without researcher-controlled participant allocation. This strengthens the realism of the observed responses while supporting causal inferences in tourism behaviour research (Muse & Baldwin, 2021). To ensure methodological rigor, we incorporated control variables such as age, gender, income, and education in our study. Partial least squares structural equation modelling (PLS-SEM) was employed to analyse the direct and indirect relationships as well as the moderating impacts within our proposed framework.

3.2 Research scope and sampling

We focused on Indonesian tourists who experienced a 5DVR attraction developed by 'VR Journey Indonesia', a local partner of LightArtVR (that specialises in location-based VR motion rides). This 5DVR simulation offers an immersive experience of Islamic heritage destinations by integrating educational elements and entertainment tailored to the global Muslim travel market; as shown in Figure 2, the simulation includes immersive motion seats and culturally themed content. To ensure consistency in content and duration, our participants experienced the same standardised 5DVR simulation. Our target population comprised individuals aged 18 years and above who reported prior exposure to 5DVR content, either through direct interaction with the simulation at public events or through their engagement with related content on social media. We employed a purposive sampling strategy to recruit only those respondents who had genuine and relevant experience with the 5DVR application. This was complemented by content-based sampling that enabled the identification of individuals who had publicly shared photos or videos of their VR experiences on platforms such as Instagram and TikTok. These approaches ensured that our participants were not only familiar with the relevant technology but also reflective and communicative about their experiences, thereby enhancing the quality of the insights gathered.

From an initial dataset of 891 user-generated posts shared between January and November 2024, a pool of 400 potential participants was identified. Due to platform limitations and time constraints, personalised outreach was conducted with 310 individuals, yielding 181 responses, of which 175 were deemed valid and usable for analysis. Although our final sample size fell short of the initial target of 350, it met the requirements for PLS-SEM, a robust software well-suited for exploratory research with moderate samples and complex models (Hair et al., 2019). Thus, we deemed the sample appropriate for assessing the proposed relationships, including direct, mediated, and moderated effects.

Our sample predominantly comprised young and middle-aged digitally active travellers, the demographics most likely to engage in VR technologies. While the nature of our sample limited the generalisability of our findings to the broader population, it aligned with the profile of early adopters of immersive technologies. Thus, it offers meaningful insights into consumer behaviour within emerging markets.

Figure 2. **A 5DVR entertainment by VR Journey Indonesia (LightArtVR)**

Source: VR Journey Indonesia's official Instagram.

3.3 Constructs and questionnaire design

Our survey instrument was developed using previously established measurement scales to ensure content validity and measurement reliability. The core constructs that were measured included *attitude towards 5DVR*, *5DVR satisfaction*, *behavioural intention to visit*, and *inherent innovativeness*. All items were assessed using a 5-point Likert-type scale ranging from 1 (strongly disagree) to 5 (strongly agree). Attitude towards 5DVR was measured using three items adapted from Huang (2015) and Liu et al. (2023). These items assessed our respondents' overall evaluative judgments of the 5DVR technology, including its usefulness, pleasantness, and potential as an alternative to physical travel. Satisfaction with 5DVR was assessed using four items adapted from Sousa et al. (2024a), capturing the experiential quality of the simulation in terms of dimensions such as emotional fulfilment, interactivity, and the extent to which the experience met or exceeded expectations.

The intention to visit real destinations was measured using three items adapted from Tussyadiah et al. (2018). These items evaluated the extent to which our participants either planned or expressed a willingness to visit the destinations showcased in the virtual experience, making this construct a direct indicator of behavioural outcomes relevant to tourism marketing. Furthermore, inherent innovativeness was measured using three items adapted from Frimpong et al. (2020). These items reflected respondents' tendencies to seek novelty, explore unfamiliar experiences, and adopt innovative technologies—factors that are essential for understanding the heterogeneity in tourists' responses to 5DVR.

To ensure clarity and contextual appropriateness, a pilot test was conducted with 30 participants prior to our main survey. Feedback from the pilot test led to minor modifications in wording to enhance comprehension and cultural resonance among the Indonesian respondents, particularly in the context of heritage tourism. The final questionnaire was administered in Bahasa Indonesia and included structured closed-ended items. Appendix A presents the full list of our measurement items.

3.4 Data collection

Data were collected over a six-week period from early October to mid-November 2024. Primary data were gathered using an online structured questionnaire distributed to Indonesian tourists who had interacted with the 'VR Journey Indonesia' 5DVR experience. To ensure that respondents had relevant exposure to the technology, a content-based sampling strategy was used. Following the steps mentioned above, 175 survey responses were deemed valid and usable (Table 1), resulting in a response rate of approximately 58.4%. Importantly, each personalised invitation included a succinct overview of our study, a link to the online questionnaire, and assurances of confidentiality and anonymity to encourage sincere participation. Clear instructions accompanied the questionnaire to ensure consistent responses and minimise ambiguity. Moreover, ethical protocols were rigorously followed, informed consent was obtained prior to participation, and all data were collected in accordance with established academic research standards. By focusing on users who had demonstrably engaged with 5DVR content, we ensured that our findings would reflect authentic and reflective user experiences.

Table 1. **Respondent characteristics (*n* = 175)**

Variable	Level	n	%
Gender	Male	56	32.0
	Female	119	68.0
Age	18–25 years old	46	26.3
	26–35 years old	106	60.6
	36–45 years old	22	12.6
	46 and above	1	0.6
Education	High school or below	38	21.7

	College (Diploma)	19	10.9
	Bachelor's degree	104	59.4
	Master's degree	14	8.0
	PhD	0	0.0
Job Status	Student	19	10.9
	Employed Part-time	55	31.4
	Employed Full-time	91	52.0
	Seeking opportunities	6	3.4
	Retired	4	2.3
Income	Less than 1,000,000 IDR	16	9.1
	1,000,000–5,000,000 IDR	101	57.7
	6,000,000–10,00,000 IDR	35	20.0
	Above 10,000,000 IDR	23	13.1

Source: authors

3.5 Data analysis

Our dataset, comprising 175 valid responses, was analysed using PLS-SEM (SmartPLS 4). PLS-SEM was selected due to its suitability for exploratory investigations and its robustness in estimating complex models with relatively small to moderate sample sizes (Hair et al., 2019). Our analysis followed a two-phase methodology, commencing with an evaluation of the measurement model and a subsequent assessment of the structural model. The measurement model was scrutinised for internal consistency reliability using Cronbach's alpha and composite reliability (CR), with acceptable thresholds set at 0.70 or higher (Nunnally & Bernstein, 1994). Convergent validity was ascertained using Average Variance Extracted (AVE), recording values greater than 0.50. Discriminant validity was confirmed using the Fornell-Larcker criterion (Fornell & Larcker, 1981). To mitigate common method bias, Harman's single-factor test and full collinearity Variance Inflation Factors (VIFs) were also employed.

The structural model was assessed using a bootstrapping technique with 10,000 subsamples to determine the significance of path coefficients encompassing both direct and indirect effects. Additionally, thorough assessments for multicollinearity and indicator reliability were conducted to ensure adherence to ethical standards such as participant confidentiality and informed consent. This strategy ensured the validity and reliability of our findings and enriched the empirical exploration of our study's hypotheses.

4. Results & Discussion

4.1 Measurement model results

Our measurement model was evaluated through a comprehensive assessment of outer loadings, internal consistency reliability, convergent validity, discriminant validity, and common method bias. As illustrated in Table 2, all item loadings exceeded the minimum acceptable threshold of 0.70 and were statistically significant ($p < 0.001$), indicating strong indicator reliability. Moreover, all constructs demonstrated internal consistency reliability, with Cronbach's alpha values ranging from 0.767 (for inherent innovativeness or INV) to 0.797 (for INT) and CR values surpassing 0.860; these values exceeded the recommended threshold of 0.70 (Hair et al., 2019; Nunnally & Bernstein, 1994). Together, these findings confirmed the reliability of our constructs.

Convergent validity was also established, as all AVE values exceeded the 0.50 threshold, ranging from 0.606 (SAT) to 0.710 (INT). Thus, we confirmed that the indicators adequately represented their respective constructs (Fornell & Larcker, 1981). Discriminant validity was confirmed using the Fornell-

Larcker criterion; the square root of each construct's AVE was greater than its correlations with other constructs (see Table 3). For example, the square root of the AVE for attitude towards 5DVR (ATT) (0.830) exceeded its correlations with SAT (0.686), INT (0.220), and INV (0.148). To evaluate common method bias, we conducted Harman's single-factor test using SPSS. The foremost factor accounted for 28.82% of the total variance—well below the 50% threshold (Podsakoff & Organ, 1986)—suggesting the absence of a single predominant factor. Additionally, the full collinearity VIFs for all constructs remained below 3.3, further highlighting the absence of notable common method bias (Kock, 2015).

Table 2. **Results of measurement analysis**

Construct	Scale Items	Loading	p-values
Attitude to 5DVR	ATT1	0.883	0.000
	ATT2	0.865	0.000
	ATT3	0.734	0.000
5DVR Satisfaction	SAT1	0.749	0.000
	SAT2	0.743	0.000
	SAT3	0.794	0.000
	SAT4	0.825	0.000
Intention to Visit Destination	INT1	0.802	0.000
	INT2	0.872	0.000
	INT3	0.852	0.000
Inherent Innovativeness	INV1	0.807	0.000
	INV2	0.891	0.000
	INV3	0.777	0.000

Note: Detailed statements regarding the measurement of various constructs are presented in Appendix A
Source: authors

Table 3. **Convergent and discriminant validity indicators**

Construct	α	CR	AVE	MSV	ATT	INT	INV	SAT
1. Attitude to 5DVR	0.769	0.868	0.689	0.471	**0.830**			
2. Intention to Visit Destination	0.797	0.880	0.710	0.144	0.220	**0.843**		
3. Inherent Innovativeness	0.767	0.865	0.682	0.051	0.148	0.040	**0.826**	
4. 5DVR Satisfaction	0.782	0.860	0.606	0.471	0.686	0.380	0.225	**0.778**

Source: authors

Discriminant validity was further assessed using the heterotrait–monotrait Ratio (HTMT). All HTMT values fell short of the recommended threshold of 0.90 (Henseler et al., 2015), confirming the discriminant validity of the constructs (Appendix B).

4.2 Structural model results

Table 4 presents the results of our structural model assessment. According to these results, the model demonstrated a satisfactory overall fit, as evidenced by the following key indices: SRMR = 0.076, d_ULS = 0.528, d_G = 0.218, Chi-square = 231.624, and NFI = 0.745. These metrics align with acceptable standards for exploratory research, demonstrating sufficient alignment between our model and data (Hu & Bentler, 1999). Furthermore, the model explained 49.1% and 17.6% of the variances in SAT and INT, reflecting a moderate level of explanatory power. The Q^2 values for SAT (0.275) and INT (0.101) indicated commendable predictive relevance, surpassing the minimum threshold of 0.00 (Hair et al., 2017).

Beyond path significance, effect sizes (f^2) and confidence intervals provided additional insights into the strength and stability of the relationships. Attitude had a substantial effect on 5DVR satisfaction (f^2 = 0.837, β = 0.662, 95% CI [0.544, 0.760]), indicating that tourists' attitudes towards 5DVR are the primary drivers of such satisfaction. Satisfaction demonstrated a medium effect on intention to visit (f^2 = 0.201, β = 0.426, 95% CI [0.201, 0.575]), confirming its pivotal role in translating immersive experiences into behavioural intentions. Inherent innovativeness exerted only a small effect on satisfaction (f^2 = 0.025, β = 0.116, 95% CI [0.011, 0.211]) and did not directly predict tourists' intention to visit (β = –0.014, 95% CI [–0.117, 0.107]). Regarding moderation, we found that innovativeness exerted a small but significant moderating effect on the satisfaction–intention pathway (f^2 = 0.036, β = 0.153, 95% CI [0.029, 0.268]), while its effect on the attitude–satisfaction pathway was negligible (f^2 = 0.009, β = –0.064, 95% CI [–0.189, 0.069]). Overall, these results indicate that while the main model paths were robust and practically meaningful, innovativeness contributed chiefly by amplifying affective pathways rather than cognitive ones.

Moreover, our results confirmed several key hypothesised relationships. First, hypothesis 1 (H1) was supported, as attitude towards 5DVR had a significant and strong positive effect on satisfaction (β = 0.662, t = 9.715, $p < 0.001$). This finding highlights the critical role of user attitudes in shaping the emotional and cognitive responses to immersive VR experiences; it aligns with the TPB, which posits that positive attitudes significantly affect individuals' assessments of and satisfaction with a specific behaviour or experience (Ajzen, 1991). The positive effect of attitude on satisfaction also reinforces the insights from prior virtual tourism research (An et al., 2021; Liu et al., 2023), which demonstrate that immersive and multisensory experiences heighten enjoyment and ensure more favourable assessments.

Second, hypothesis 2 (H2), which proposed that satisfaction significantly influences tourists' intention to visit, was also confirmed (β = 0.426, t = 3.821, $p < 0.001$). This result indicates that tourists who report higher satisfaction with the 5DVR experience are more likely to develop behavioural intentions to visit the corresponding real-world destinations. It reinforces the notion that immersive and emotionally engaging simulations can effectively translate virtual experiences into real-world tourism behaviour (Skard et al., 2021; Sousa et al., 2024a). Moreover, it validates the role of satisfaction as a central outcome of experiential quality in VR; satisfaction enhances psychological involvement and encourages follow-through in terms of destination visits (Ghorbanzadeh, 2022; Tussyadiah et al., 2018).

Hypothesis 3 (H3) tested the mediating role of satisfaction in the relationship between attitude and intention to visit. The indirect effect was deemed statistically significant (β = 0.282, t = 3.124, p = 0.001), confirming that satisfaction serves as a critical mechanism through which tourists' attitudes towards 5DVR influence their behavioural intentions. This mediation effect highlights the important role of emotional fulfilment and perceived value in converting attitudes into real-world actions. The above findings align with those of prior research in experiential tourism and digital simulation (Lee & Idris, 2024; Zhu et al., 2024).

Regarding control variables, our results indicated that only education level had a significant negative effect on tourists' intention to visit (β = –0.173, t = 2.131, p = 0.017). This implies that individuals with higher levels of education may hold more critical expectations of VR content or require stronger persuasive cues to translate their VR satisfaction into real-world travel intentions. Conversely, age (β = –0.025, p = 0.379), gender (β = 0.144, p = 0.193), and income (β = 0.119, p = 0.078) did not significantly predict tourists' intention to visit, indicating that the appeal of immersive VR remained relatively uniform

across these demographic segments. Overall, these findings are align with prior research that has reported the lack of major demographic differences in digital content consumption, especially among technology-friendly populations such as millennials (Mathras et al., 2016).

4.3 Moderation analysis results

The moderating role of inherent innovativeness (INV) was tested across two key relationships: (1) between ATT and SAT, and (2) between SAT and INT. Hypothesis 4a (H4a) proposed that INV moderates the effect of ATT on SAT. However, our results indicated that this interaction was not statistically significant ($\beta = -0.064$, t = 0.820, $p = 0.206$). As illustrated in Figure 3 (INV × ATT), although a positive slope was observed across all levels of innovativeness, the differences between the slopes were minimal. This indicates that regardless of a tourists' level of innovativeness (low, average, or high), the impact of tourists' attitude on satisfaction remains relatively consistent, implying that inherent innovativeness does not significantly alter the strength of the attitude–satisfaction relationship in the context of 5DVR tourism. A possible explanation is the high baseline of technological receptiveness across our sample that predominantly comprised younger, digitally literate individuals; consequently, the variance in innovativeness might not have been sufficient to moderate the attitude–satisfaction pathway (Mo et al., 2021).

In contrast, hypothesis 4b (H4b) was empirically supported. The interaction effect of SAT and INV on INT was deemed statistically significant ($\beta = 0.153$, $t = 1.933$, $p = 0.027$). As shown in Figure 4 (INV × SAT), the slope of the relationship became steeper as INV increased, indicating a stronger positive relationship between SAT and INT among tourists with higher INV. This finding highlights that tourists with a greater propensity to adopt new technologies are more likely to convert their satisfaction with immersive VR experiences into actual visit intentions.

The above results align with prior research demonstrating that innovative tourists are more responsive to technological cues and more likely to act on their virtual experiences (Blut & Wang, 2020; Frimpong et al., 2017). In VR tourism, users who are naturally more exploratory and open to new experiences are more inclined to translate their satisfaction into real-world actions (such as visiting the destinations featured in VR simulations).

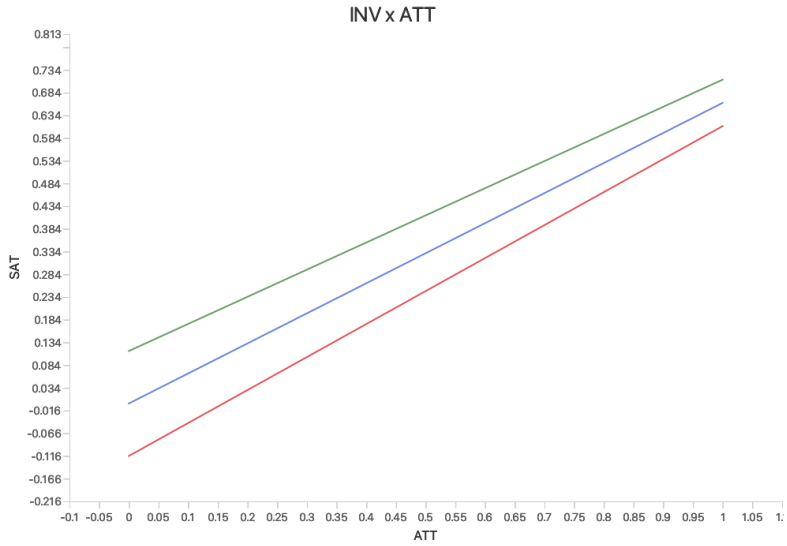
Table 4. **Structural model results**

H	Relationship	Standardized Estimate	T statistics	P values
Direct effects				
1	Attitude towards 5DVR -> 5DVR Satisfaction	0.662	9.715	**0.000**
2	5DVR Satisfaction -> Intention to Visit Destination	0.426	3.821	**0.000**
Mediation effects				
3	Attitude towards 5DVR -> 5DVR Satisfaction -> Intention to Visit Destination	0.282	3.124	**0.001**
Moderating effects				
4a	Inherent Innovativeness *x* Attitude towards 5DVR -> 5DVR Satisfaction	–0.064	0.820	0.206
4b	Inherent Innovativeness *x* 5DVR Satisfaction -> Intention to Visit Destination	0.153	1.933	**0.027**

Control effects				
	Age -> Intention to Visit Destination	–0.025	0.308	0.379
	Education -> Intention to Visit Destination	–0.173	2.131	**0.017**
	Gender -> Intention to Visit Destination	0.144	0.868	0.193
	Income -> Intention to Visit Destination	0.119	1.418	0.078

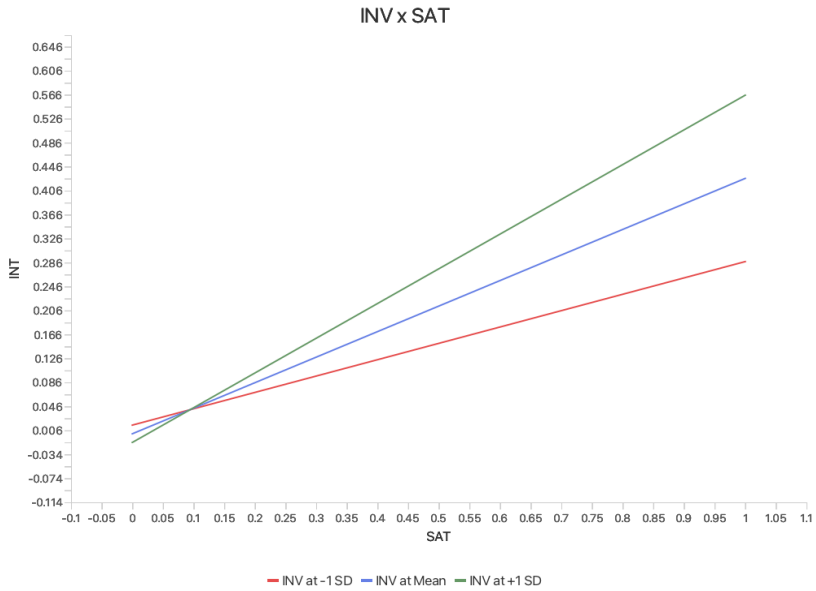
Source: authors

Figure 3. **Interaction effect of inherent innovativeness and attitude on satisfaction**



Source: Result obtained from SmartPLS 4

Figure 4. **Interaction effect of inherent innovativeness and satisfaction on intention to visit**



Source: Results obtained from SmartPLS 4

Overall, our findings highlight the novelty of our study in two ways. First, unlike previous research that has largely focused on conventional VR formats, we demonstrate how 5DVR, through its multisensory integration, generates deeper satisfaction that translates into behavioural intention, thereby extending existing theories of immersive media and attitude–behaviour relationship models. Second, our results are situated within an international comparative context rather than a single national setting, contributing to a broader understanding of VR adoption patterns worldwide. In this regard, competitive pressures have been found to drive VR adoption in the UK (Moorhouse, 2019; tom Dieck et al., 2018), whereas perceived risks have constrained VR adoption in Spain and Colombia (Escandon-Barbosa & Salas-Paramo, 2024); additionally, VR has enhanced tourists' visit intention in North Cyprus (Yuce et al., 2020). Our results align with these findings by reaffirming the persuasive power of immersive experiences, while introducing new evidence which demonstrates that 5DVR may overcome certain adoption barriers by delivering stronger sensory immersion and higher satisfaction. This comparative positioning reinforces the global scientific contributions of our study.

Although our findings provide meaningful insights, several contextual factors may influence how tourists respond to 5DVR. The novelty effect associated with immersive technologies may temporarily elevate satisfaction and intention without necessarily leading to sustained behavioural changes. Moreover, destination-level considerations—such as accessibility, travel cost, and perceived authenticity—may moderate the extent to which virtual satisfaction is translated into real visitation. Moreover, we must recognise that responses may vary across market segments: younger, tech-savvy VR users may show greater receptivity to 5DVR, whereas older tourists, heritage purists, and those who are less comfortable with digital technologies may evaluate their 5DVR experiences differently. These nuances indicate that future research should adopt more segmented and ecologically grounded approaches to deepen the understanding of behavioural intentions in immersive tourism contexts.

5. Implications

5.1 Theoretical implications

We offer three significant theoretical advancements in the literature on immersive technologies, consumer behaviour, and digital service adoption. First, by positioning tourists' satisfaction as a central mediating mechanism, we ensure deeper theoretical clarity on how psychological responses to immersive environments evolve into positive behavioural intentions, particularly within the context of tourism. In doing so, we address recent calls to integrate affective and cognitive evaluations in immersive media research (Batat & Hammedi, 2023; Heller, 2023). In our proposed model, user satisfaction serves as a crucial bridge between perception and action, underscoring the process through which 5DVR features—such as sensory engagement, telepresence, and vividness—shape real-world behavioural outcomes, thereby reinforcing the findings of Tussyadiah et al. (2018) and Sousa et al. (2024a).

Second, incorporating inherent innovativeness as a moderating variable provides clearer boundary conditions for the observed relationships by identifying specific consumer segments that are more receptive to immersive technologies. Thus, we extend existing theories by illustrating how individual-level traits—such as inherent innovativeness—can amplify or attenuate the effect of satisfaction on behavioural intentions, particularly among tourists who are more inclined to adopt novel technologies. Tourists with higher levels of inherent innovativeness tend to be more open to unfamiliar or experimental technologies, making them more responsive to the affective and experiential features embedded in 5DVR environments. This finding aligns with innovation diffusion theory (Dabholkar & Bagozzi, 2002) and personalisation frameworks that emphasise the role of consumer heterogeneity in technology adoption (Blut & Wang, 2020). It also highlights the important role of internal dispositions in shaping individuals' responses to VR environments.

The moderating effect of inherent innovativeness was deemed significant in the satisfaction–intention relationship but not in the attitude–satisfaction relationship. This finding reflects the nature of innovativeness as a trait that amplifies affective responses to rewarding experiences, rather than influencing cognitive evaluations (Blut & Wang, 2020; Frank et al., 2015). Attitudes towards 5DVR are mainly shaped by system usability and design quality—factors that tend to be perceived similarly by users. In contrast, satisfaction reflects a deeper emotional appraisal involving enjoyment, novelty, and experiential richness—domains in which individual differences regarding openness to innovation exert stronger effects. Consequently, inherently innovative individuals are more likely to translate high satisfaction into concrete visit intentions, reinforcing their profile as early adopters of immersive tourism technologies.

Third, we advance the conceptual boundaries of attitude–behaviour models by embedding them within the culturally rich context of Islamic heritage tourism involving VR simulations—a setting where emotional, symbolic, and experiential dimensions converge. This contextualisation not only reinforces the robustness of the TPB and related frameworks but also addresses an overlooked gap in the literature on post-pandemic digital service management, particularly in emerging markets with strong cultural and religious identities (Butt et al., 2022; Silva & Santos, 2021). By aligning the findings of established behavioural theories with new technological and cultural domains, we contribute to the ethical and sustainable development of immersive technologies. We emphasise the important role of user-centred, theoretically grounded models in advancing digital engagement across tourism, healthcare, and education. Considering immersive technologies are being increasingly integrated into consumers' daily lives, we establish a solid foundation for future theoretical advancements that account for the complex interplay between technology design, user psychology, and behavioural outcomes.

5.2 Managerial implications

We offer several actionable insights for tourism marketers, VR content developers, and destination managers seeking to enhance real-world tourism engagement through immersive technologies. First, our confirmation of tourists' attitudes towards 5DVR immersive technology underscores the pivotal influence of such attitudes on satisfaction; in turn, satisfaction affects tourists' intention to visit actual destinations. For practitioners, this finding highlights the importance of designing emotionally engaging and culturally resonant 5DVR experiences, particularly when promoting destinations such as Islamic heritage sites. To foster positive attitudes and maximise tourists' satisfaction, VR developers should prioritise sensory immersion, ease of interaction, and the authenticity of content. By incorporating vivid visuals, narrative-driven simulations, and culturally embedded cues, VR developers can enhance users' sense of presence and enjoyment, ultimately influencing their intentions to physically visit the destinations portrayed virtually. The immersive qualities of 5DVR also allow users to pre-experience destinations, reducing psychological distance and uncertainty in decision-making (Skard et al., 2021).

Second, we identify how satisfaction with virtual experiences serves a key mediating mechanism in the conversion of tourists' virtual experiences into actual intentions to physically visit and patronise destinations. Research has shown that satisfaction with immersive experiences positively influences travel motivation by stimulating mental imagery, emotional anticipation, and cognitive engagement (Latifi et al., 2024; Lee & Idris, 2024). Therefore, tourism managers should prioritise designing satisfactory VR experiences to enhance the likelihood of virtual tourists becoming real-world visitors.

Third, the significant moderating effect of inherent innovativeness reveals that consumer traits and inclinations influence the effectiveness of immersive technologies. Tourists with a higher propensity for innovation are more likely to be influenced by positive VR experiences; thus, they can become the ideal early adopters and promoters of 5DVR-based tourism. Managers should appeal to this segment through targeted strategies—such as innovation-driven campaigns, product trials, or influencer partnerships—that encourage the adoption of novel digital tourism experiences.

Finally, our findings explain how emerging immersive technologies affect consumers in different sectors (such as travel and tourism), contributing to a broader global shift towards sustainable, experience-rich tourism consumption and development. Integrating immersive technologies (such as 5DVR) into destination marketing strategies can enhance pre-travel engagement, manage tourist expectations, and encourage responsible visits. By leveraging 5DVR as both a promotional and educational tool, destination managers can foster deeper connections between tourists and culturally significant sites while alleviating the pressure on physical infrastructure.

5.3 Practical guidelines for tourism companies

We argue that tourism companies can strategically integrate 5DVR into their business models through pilot projects, bundled travel promotions, and collaborative marketing campaigns with local stakeholders. For instance, travel agencies can deploy 5DVR as a pre-trip orientation tool to enhance customer confidence; destination managers can incorporate 5DVR installations within visitor centres to showcase lesser-known sites and manage tourist flows. Hospitality providers may also adopt 5DVR as an upselling instrument, allowing potential guests to virtually explore accommodations or nearby attractions prior to booking. Moreover, by embedding immersive technologies throughout the key stages of customers' journey, firms can enhance engagement, reduce perceived risks, and foster stronger purchase intentions, thereby translating our findings into tangible competitive advantages. In fact, certain airlines and tourism boards have already begun using VR to offer pre-travel previews of destinations; similar 5DVR applications can be adopted to promote heritage sites or relatively obscure destinations.

6. Research limitations and recommendations for future research

6.1 Methodological limitations

We employed a cross-sectional, self-reported survey design that captured valuable user perceptions of 5DVR tourism experiences and restricted causal inferences. Thus, our findings reflect tourist behaviour at a single point in time and may not have captured how attitudes, satisfaction, and intentions evolve with repeated exposure to immersive technologies. Future research should adopt longitudinal or experimental designs to better track these dynamics and strengthen causal claims. Additionally, the reliance on self-reports can introduce potential biases, including social desirability and recall inaccuracies. Moreover, we relied on a single 5DVR scenario featuring Islamic heritage destinations; this may limit the generalisability of our findings to other tourism contexts and types of immersive experiences. Although Harman's single-factor test and collinearity checks indicated that common method bias was not a major concern, future studies could employ triangulated approaches—such as behavioural tracking, eye-movement analysis, or physiological measures—to ensure stronger validation (Tussyadiah et al., 2018).

6.2 Conceptual limitations

We primarily focused on the roles of attitude, satisfaction, and inherent innovativeness within attitude–behaviour framework. While these constructs provided meaningful insights, inherent innovativeness only partially explained the variations in tourists' intentions. Future research should, therefore, broaden the conceptual framework by incorporating additional psychological and experiential dimensions such as digital literacy, perceived authenticity, trust in technology, and emotional engagement (Blut & Wang, 2020; Ouerghemmi et al., 2023). These variables can enable a more comprehensive understanding of how heterogeneous consumer segments respond to immersive technologies. Furthermore, extending our model beyond the replication of established attitude–behaviour pathways can strengthen theoretical originality by allowing future research to explore new mediators or moderators

specific to 5DVR contexts (Batat & Hammedi, 2023). Furthermore, we did not account for participants' prior travel experiences with destinations featured in the 5DVR simulations; this may have influenced the processes through which immersive perceptions were translated into actual visit intentions. Future research should examine this aspect to yield a more nuanced understanding of the differences between first-time and repeat visitors. Additionally, we did not assess factors such as prior VR usage and digital literacy, despite their possible effects on how tourists evaluate and engage in immersive experiences. Future studies should include these factors to achieve a more nuanced understanding of user heterogeneity.

6.3 Future research directions

Our contextual focus on Indonesian users engaging with Islamic heritage-based VR content enhances the cultural relevance of our study but limits the generalisability of our findings. Future research should, therefore, examine alternative moderators—such as presence, risk perception, or demographic characteristics (e.g., age)—that may influence the translation of virtual experiences into real-world tourism behaviours. Future research can also explore how prior VR experience or digital literacy can moderate tourists' responses to 5DVR, considering technologically savvy users may engage with immersive features in ways that differ significantly from those of novice users. Comparative studies across countries and cultures must explore how factors such as national culture, digital access, or religious values influence tourists' responses to immersive VR content (Escandon-Barbosa & Salas-Paramo, 2024). Additionally, future research could collaborate with industry stakeholders to evaluate practical outcomes; for example, by testing whether 5DVR campaigns increase bookings or tourist flow (Akhtar et al., 2021). Future research can also compare how 5DVR influences first-time visitors compared to repeat visitors, as prior travel experiences may moderate the relationship between tourists' perceptions of immersive VR experiences and their visit intentions. Finally, as immersive technologies evolve, particularly through AI-driven personalisation and multisensory formats, future research should address issues of inclusivity, accessibility, and ethical considerations, especially when simulating culturally or spiritually significant sites (Silva & Santos, 2021). Addressing these issues can ensure the responsible deployment of immersive tourism technologies.

Although we demonstrate the potential of 5DVR to enhance tourists' satisfaction and visit intentions, we acknowledge its limitations regarding scope. Our findings were based on a single immersive scenario and self-report measures that could be vulnerable to novelty bias and social desirability. Future research should extend our insights using longitudinal or field-based designs that capture actual tourist behaviours in more diverse contexts. Moreover, the broader societal implications of 5DVR should not be overlooked: as immersive technologies gain traction in tourism contexts, questions regarding the accessibility, inclusivity, digital dependency, and authenticity of heritage representations have become increasingly relevant. Therefore, balancing innovation with cultural sensitivity and responsible marketing is essential for ensuring that 5DVR adoption contributes to sustainable tourism development and meaningful visitor engagement.

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Conflict of interest

The authors declare no conflict of interest.

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Appendix A: Construct Items

Construct	Scale Items	Items
Attitude to 5DVR	ATT1	I think it is a good idea to use 5DVR to travel.
	ATT2	Virtual travel will bring about a pleasant experience.
	ATT3	Virtual travel is an excellent alternative to visiting physical tourist destinations.
Satisfaction with 5DVR	SAT1	When watching 5D Virtual Reality content, it gives a feeling of gaining something.
	SAT2	When I watched 5D Virtual Reality content, I wanted to see more.
	SAT3	I'm satisfied with watching the content in 5D Virtual Reality.
	SAT4	The 5D Virtual Reality content presented is generally satisfactory.
Intention to Visit Real Destination	INT1	I plan to visit a place that appeared in my 5D Virtual Reality experience in the near future.
	INT2	I am willing to visit a place that appeared in my 5D Virtual Reality experience in the near future.
	INT3	After my 5D Virtual Reality experience I can see myself visiting the real destination in the future.
Inherent innovativeness	INV1	I am always seeking new ideas and experiences
	INV2	When things get boring, I like to find some new and unfamiliar experiences
	INV3	I like to continually change activities

Appendix B: Discriminant validity (HTMT values)

Construct	ATT	INT	INV	SAT	INV x ATT	INV x SAT
ATT						
INT	0.278					
INV	0.191	0.092				
SAT	0.885	0.477	0.287			
INV × ATT	0.117	0.066	0.185	0.179		
INV × SAT	0.167	0.087	0.257	0.269	0.754	