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Research Article

Virtual Reality's Impact on Tourist Attitudes in Islamic Religious Tourism: Exploring Emotional Attachment and VR Presence

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This study explores the integration of immersive technologies, specifically virtual reality (VR), to enhance tourist experiences in the rapidly expanding religious tourism sector. Despite VR's potential, limited research has examined its impact on religious tourism. This study addresses this gap by investigating the role of emotional attachment in influencing VR presence during pre-, on-site, and postexperiences of VR-mediated religious tourism. A quantitative survey was conducted with 201 respondents who participated in VR religious tourism activities. The empirical analysis, conducted using SPSS and AMOS structural equation modeling (SEM), assessed how VR-mediated religious tourism impacts VR presence and tourist attitudes before actual visits. The findings enhance the understanding of VR's role in shaping Islamic religious tourists' attitudes and behaviors, revealing the positive influence of VR across different stages of the visit. The study also highlights the significant role of emotional attachment in enhancing previsit intentions, demonstrating its impact on visit intention and emotional connection. This research underscores VR's potential to improve value creation, influence attitude changes, and enhance user experiences in religious tourism. By extending the existing literature, this study offers new insights into how VR can be effectively utilized to boost tourist engagement and satisfaction in the religious tourism sector.

Keywords: emotional attachment; religious tourism; technology acceptance model; tourism; virtual presence; virtual reality; visit intention

1. Introduction

Technological advancements, including immersive technologies, have impacted the marketing techniques to promote tourism destinations [1]. Virtual reality (VR) aligns with the experiential marketing approach, which is based on providing outstanding experiences and immersive memories [2]. VR can bring people's dreams closer to reality [3]. It is "a fully immersive experience whereby a digital world is created to portray a different experience" ([1], p. 144). VR and its applications have been recently used in the tourism and hospitality industry to promote destinations and enhance travel experiences [3–5], as it offers an immersive experience and the ability to have a sense of place [6]. It is a powerful marketing tool [7, 8] that helps reduce the risk attached to the service's decision-making as it helps making informed

decisions and having more realistic expectations [9]. It has become accessible and easy for travel enthusiasts to experience virtual tours of tourist places and attractions worldwide [10].

Religious tourism is on the rise. Shinde [11] defined religious tourism as the "contemporary patterns of visitation to places of religious importance or pilgrimage sites where visitors aim to fulfil religious needs and recreational needs." Religion provides a moral compass for society and integrates ritualistic behavior with emotional sensations [12]. The value of the religious tourism market internationally is $15.07 billion and is expected to increase to $40.92 billion by 2033 [13]. Despite that, Armfield and Holbert [14] found that religious people were less likely to engage with technology; this is unlikely to be the case nowadays. In 2019, Pope Francis launched the "click to pray" app, which allows 1.3 Roman Catholics to pray with him [15]. Many research highlighted the importance of technology in enhancing religious travelers' experiences [16–19].

Islamic religious tourism represents a distinct and rapidly growing subset of the broader religious tourism domain. While religious tourism broadly includes pilgrimages and sacred site visits across multiple faiths—such as Christian visits to the Vatican or Hindu pilgrimages to Varanasi—Islamic religious tourism specifically encompasses activities related to Islamic rituals, heritage, and sacred geography, such as Hajj, Umrah, and visits to shrines or religiously significant locations [20]. This sector is driven by deeply spiritual motivations alongside sociocultural and sometimes political factors that shape Muslim travelers' engagement with religious experiences [21, 22]. As Battour and Ismail [21] note, Islamic tourism not only involves religious obligations but also leisure and educational travel that adheres to Islamic values. This diversification underscores the dynamic nature of Islamic religious tourism within the global religious tourism market. Consequently, studies examining Muslim religious tourists—particularly their use of emerging technologies such as VR—contribute meaningfully to the broader discourse on religious tourism innovation [23]. Therefore, the current study, while mosque-specific in its sampling, aligns with this subdomain and offers insights into Muslim tourists' perceptions of religious travel experiences facilitated by immersive technologies.

Furthermore, in understanding the complexity of religious travel motivations, it is essential to consider how spiritual and hedonic values interplay with functional intentions. Cohen [24] highlights that modern religious travel frequently merges spiritual search with experiential gratification, especially among postmodern tourists for whom religious sites offer existential meaning and emotional fulfillment. Similarly, Buzinde [25] argues that spiritual tourists are intrinsically motivated by personal growth, self-realization, and psychological well-being—values deeply aligned with the immersive and affective affordances of technologies like VR. These perspectives support the notion that religious tourism encompasses both hedonic enjoyment and utilitarian purpose, an idea increasingly relevant in the design of VR-mediated sacred experiences.

The application of VR in the marketing of the tourism and hospitality industry has been the focus of many studies, for instance, Huang et al. [26], Griffin et al. [27], Yung and Khoo-Lattimore [28], Beck et al. [29], Kim et al. [30], Dieck et al. [31], Jung et al. [32], Trunfio et al. [33], and Adachi et al. [34]. Huang et al. [26] and Yung et al. [35] studies are conceptual in nature, highlighting the impact of VR usage on tourism marketing. Yung and Khoo-Lattimore [28] and Beck et al. [29] provided a systematic literature review on VR and tourism research. While few studies are practical, Adachi et al. [34] looked at the sense of presence and its mediating role in the relationship between VR and destination image. Meanwhile, Tussyadiah et al. [5] investigated the impact of the VR experience on having a positive attitude toward travel destinations and visit intentions. The study revealed many positive implications of VR presence, as it increases enjoyment and interest in the tourism destination, and this positive change in attitude resulted in an increase in visit intention. In the context of religious tourism, Hwang et al. [17] examined the influence of spiritual experience on the evaluation of religious cultural heritage content, comparing delivery via VR to a web-based experience. However, many previous studies failed to address the factors influencing the adoption of VR experience in the context of religious tourism, and the effect of emotional attachment on VR presence is scarce. Therefore, this study is aimed at filling this gap by investigating the influence of emotional attachment on VR presence in the context of religious tourism.

Accordingly, the research questions of this study are as follows:

RQ1: How do the factors identified by Davis's technology acceptance model (TAM), specifically perceived ease of use and perceived usefulness, mediate the relationship between emotional attachment and VR presence in the context of Islamic religious tourism?

RQ2: How do hedonic and utilitarian values influence the adoption of VR experiences in the context of religious tourism?

2. Theoretical Background

2.1. Emotional Attachment. For many believers, religious tourism is not merely a physical journey but a deeply emotional and transformative experience [36, 37], rooted in factors like historical significance, religious rituals, and the perceived divine presence [38]. Sacred sites often carry a rich historical legacy, dating back centuries or even millennia, connecting believers to their shared heritage and evoking a profound sense of awe and reverence [39]. According to Ruback et al. [40], religious locations frequently possess a distinctive character, leading participants to cultivate a pronounced sense of place attachment, which shapes their perceptions, experiences, and interactions with the surroundings [41, 42]. This intricate interconnection between place attachment and emotional experience underscores the profound affinity believers have for religious locations, influencing their cognitive interpretation, level of engagement, and the consolidation of memories during the event.

Having established the profound emotional and transformative nature of religious tourism, it becomes imperative to explore the intricate facets of place attachment within this context. Delving deeper into the emotional fabric of

individuals' connections with specific locations, Manzo [43] sheds light on the diverse nature of these bonds and the rich tapestry of experiences they engender. In the context of religious tourism, where believers embark on journeys imbued with spiritual significance, the tangible and intangible elements of the destination experience hold elevated personal significance. Muslims are emotionally bonded with their Islamic religious destinations such as Masjid Al Haram, where they normally perform rituals like Umrah and Hajj [44]. These rituals, conducted with deep devotion and prayer, encapsulate the essence of Umrah, offering pilgrims a profound spiritual journey and the opportunity for self-reflection and reconnection with their faith [45]. The significance of emotional attachment holds paramount importance in the strategic planning of tourism development, recognizing tourism's multifaceted influence beyond physical transformations to encompass the nuanced evolution of place meanings [46]. This intricate relationship extends beyond visual alterations, permeating the emotional and interpersonal dimensions that define a destination's essence [47]. Understanding the emotional and interpersonal dimensions of place attachment becomes imperative in tourism development, aligning transformative effects with authentic experiences and emotional connections of the local community and visitors alike.

To further enrich the understanding of emotional attachment in religious tourism, Hosany and Gilbert [48] "emotional attachment model" proves instrumental. The model recognizes individual characteristics' influence on emotional attachment formation, including spiritual background, personal beliefs, and previous religious experiences. Specific destination features, such as historical significance and cultural richness, foster emotional resonance and enhance believers' connections [48]. Emotional attachment influences visitors' behavioral intentions, potentially leading to return visits, recommendations, and positive word-of-mouth communication, highlighting its importance in religious tourism experiences.

2.2. Visit Motivation (VM). Motivations for religious tourism span both intrinsic and extrinsic domains, often reflecting hedonic, utilitarian, and spiritual intentions [49, 50]. Motivation is a complex construct directly influencing travelers' attitudes, beliefs, and emotions [51]. Travel motivation is the driving force that stimulates the traveler's desire to take action [52–54]. It refers to a set of needs and wants that trigger a person to participate in a tourism activity and differs based on the individual lifestyle [53]. The motivation theory highlighted that tourists visit tourist destinations either to relax and escape from daily stress (anomie) or to have a new experience and achieve self-esteem Dann [55]. Wang [56] explained that there are three main VMs for religious attraction: spiritual experience, destination promotion, and attraction awareness.

2.2.1. Attraction Awareness. Attraction is one of the main components of tourism [57, 58]. Lew [57] defined attractions as all elements that drive travelers away from their homes, including activities to take part in, sceneries to observe, and experiences to encounter. Attractions can also be defined as "some phenomena, experiences, activities, sense of belonging or feeling offered at specific locations, at a cost or for free that pulls or motivates tourists with a need to travel out of their usual environments to be satisfied and without which no trip would be made" ([58], p. 2). Awareness refers to the presence of the brand in the minds of the target audience [56]. The availability of information is a main part of the tourist attractions. Leiper [59] highlighted that the tourist attraction is a system of three factors: the tourist, the central element, which might be a phenomenon or a place to visit, and the information factor. The tourist attraction only exists when connecting these three elements.

Attractions are what draw travelers to a destination. There would be no tourism without them. Destinations compete to develop and promote their attractions to convince travelers to visit [58]. Sangpikul [60] examined travel motivations and explained that destination attraction is a key motive for a visit.

2.2.2. Destination Promotion. The marketing efforts of tourist destinations influence the traveler's choice as it helps improve destination awareness and portray its image. These efforts must be planned around travel motives to be effective [61]. Destination promotion creates a link between the destination and its visitors [62]. Destination promotion helps creating the destination image, branding, and positioning [62], to motivate travelers to visit destinations [58, 62]. It also helps in developing a sense of familiarity with the information relevant to the destination and a positive attitude toward it [63]. The traveler decision-making process has three phases: prepurchase, purchase, and postpurchase. Destination promotion has an impact on the different phases of the decision-making process. At the prepurchase, it helps in creating destination awareness and triggers the travelers' need to travel. At the purchase stage, it provides the travelers with all relevant information to support the decision, and postpurchase, through reminders and sharing memories [64]. Muslim destinations are targeting the Muslim travel market by providing relevant facilities, products, and infra/superstructures [56].

2.2.3. Spiritual Experience. Jang and Cai [61] found that the eagerness for experience is a major travel motive. The eagerness for a spiritual travel experience has massively increased, as modern travelers are keen to improve their mental health, enhance their personal development, amplify their experience, and fasten their spiritual healing [65]. Many tourism destinations have progressed due to their attachments to sacred people, events, and places [66]. Religious motivation is the main drive to engage in spiritual tourism [56]. For many Muslims, spiritual travel—whether for pilgrimage (Hajj and Umrah) or nonobligatory religious journeys—serves not only to fulfil religious duties but also to promote introspection, emotional healing, and the strengthening of spiritual identity [67]. Islamic spirituality is inherently connected to the concept of travel, which is seen as both a physical and metaphysical journey toward self-purification and divine proximity [68]. This layered meaning of spiritual

travel often motivates devout Muslims to repeatedly engage in religious journeys and seek experiences that are both emotionally moving and spiritually transformative. As such, understanding the motivations of Muslim spiritual tourists requires consideration of religious obligations, emotional fulfilment, and faith-based intentions that distinguish Islamic spiritual travel from secular or recreational tourism [69].

2.3. Utilitarian Values. Babin et al. [70] define utilitarian value as a "utilitarian outcome resulting from some type of conscious pursuit of an intended consequence." Hence, utilitarian value is derived from the fulfilment of a user's utility needs—for example, information seeking [71], as well as the economic and rational benefits that add value to consumers when using the technology or media [70]. Specific utilitarian values include benefits such as perceived value for money, convenience, and time saving [72, 73]. Thus, users claim utilitarian benefits such as usefulness, providing information, increased productivity, and enhanced effectiveness in performing a specific task. Research suggests that often users who perceive utilitarian benefits from technology use tend to have positive intentions for continued use [74]. In particular, perceived usefulness has been found to be an extrinsic motivator and key determinant of use [75]. For instance, tourists may use VR to explore a destination and obtain information before a trip [29] or visit somewhere virtually that they could not visit in real life [76]. Individuals with a utilitarian focus concentrate on the instrumental, functional, practical, rational, and goal-oriented value that is provided by an experience [70].

Perceived utilitarian value is context specific and can also vary depending on the intended users. For example, some users may use VR to enjoy the scenery and beauty of a tourist site (e.g., hedonic value), whereas others would use VR to obtain useful information before visiting (e.g., utilitarian value) [76]. In the educational context, personalization has been reported as a key utilitarian value, because it reduces complexity and therefore increases satisfaction [77]. Therefore, utilitarian gratifications have been found to influence learning satisfaction positively [78]. However, this could vary depending on the users' specific learning goals. In the retail and marketing context, utilitarian value has been found to increase the likelihood of purchasing since technology users gain additional product information, can interact with product features, and gain a better comprehension [79]. Yet, perceived utilitarian value, such as usefulness of the technology, attention to the experience, knowledge, or interest in the product [80], is also context and user specific. Nonetheless, utilitarian values have been found to play an important part in influencing satisfaction, loyalty, intention to use, behavior, and attitudes [81, 82] and therefore have important implications on tourist satisfaction, behavioral intentions and experiences. While utilitarian outcomes in VR tourism often relate to knowledge gain, task facilitation, or planning benefits, recent scholarship has extended these concepts. For example, Tuominen [83] finds that VR environments designed with multisensory stimuli can enhance perceived usefulness and functional clarity in pilgrimage preparation. His work underscores that religious tourists evaluate VR not only for its immersive potential but also for its ability to support their spiritual goals and practical needs.

2.4. Hedonic Values. As an immersive technology, VR provides simulating and enjoyable experiences, creating hedonic value for users [84, 85]. Hedonic gratifications encompass a user's immediate response to pleasure as part of an experience [86]; thus, users express feelings such as enjoyment, passing the time, fantasy, escapism, and entertainment [87]. Hedonic value is defined as "more subjective and personal than its utilitarian counterpart and resulting more from fun and playfulness than from task completion" ([70], p. 646). Thus, hedonic values include benefits to the user, such as VR was truly fun, enjoyable, and made me feel good [74], and in this way influences tourists' behavior [76].

In the tourism context, hedonic value is considered the value derived from the experience such as the connection with the experience that produces rewarding and interesting experiences and creates positive emotional responses [80]. For instance, perceived enjoyment in VR has been found to have an effect on continued use [88]. Nam et al. [76] examined the authenticity of VR experiences, exploring the impact on enjoyment and satisfaction; for example, when people watch VR content, they are familiar with their enjoyment and satisfaction decreases, but they are still able to obtain useful information. This is consistent with other studies which reveal that hedonic gratifications are context specific [71]. For example, some studies revealed hedonic value positively influences behavioral intentions [84, 89], whereas in other contexts the results have not been reported as strongly. Similarly, hedonic value is subjective as an emotional response resulting from playfulness and fun [70]. Studies confirm the positive association between hedonic value and behavioral intentions [74]. For example, Kim et al. [88] demonstrated a positive association between hedonic value and mobile user engagement, and Hong et al. [90] proved that hedonic value is strongly correlated with the continued intention to use a smartwatch. In contrast, individuals with a strong hedonic focus note the entertainment and emotional value provided by an experience, that is, its non-instrumental, experiential, aesthetic, or affective value [70]. This has important practical implications for the design of VR experiences and intended target users, in that if the majority of intended users desire hedonic experiences, this should dictate decisions toward VR content and functionality [91].

2.5. Presence in VR. The sense of presence—often defined as the subjective feeling of "being there" in a place or environment—is a fundamental perceptual state that underlies how we experience both virtual and real settings [92]. In mediated contexts (e.g., VR), presence has been extensively studied, yet in real-world physical environments the concept is frequently taken for granted and left poorly defined. Researchers note that presence is multifaceted, encompassing dimensions like realism, immersion, and social richness [93], which makes it challenging to operationalize consistently outside of laboratory settings. Few studies explicitly define or measure presence in physical contexts, often assuming one's physical location automatically confers full "presence." Nonetheless, empirical work across domains suggests that a strong sense of presence can *serve as a perceptual trigger* for improved outcomes. For example, in education settings, a heightened sense of presence such as during

immersive field exercises or simulations has been linked to more engaging and enjoyable learning experiences and better knowledge retention [94]. Similarly, research in psychology highlights that a therapist's genuine presence and the client's here-and-now awareness can enhance trust and emotional connection, catalyzing better therapeutic outcomes. Taken together, these findings demonstrate that presence—even in nondigital settings—plays a pivotal role in shaping user perceptions and behaviors across diverse fields. In tourism, in particular, scholars are recognizing that the sense of being physically present at a destination (or evoking it through surrogates like VR) can heighten visitors' emotional attachment and interest [5]. Tourists who experience a strong sense of presence at heritage sites or attractions report deeper engagement and satisfaction, suggesting that designing tourism experiences to foster this "being there" feeling through authentic cues or immersive storytelling can significantly enhance outcomes.

Presence is one of the important factors influencing users' experience with VR, it is referred to the subjective experience of being in one place or environment, even when one is physically situated in another [93]. Lombard and Ditton [92] extensively reviewed the literature and presented six facets of presence; these include social richness, realism, transportation, immersion, social actor within medium, and medium as social actor, with transportation being acknowledged as one of the most discussed concepts in the context of presence [95]. Researchers propose various types of presence. Heater [96] suggests three categories: personal, social, and environmental presence. Additionally, Lee [97] identifies three types of presence: physical, social, and self-presence.

Presence in VR is extensively researched due to its impact on the user experience. Users perceive the virtual experience as real and enjoyable, and consequently, this positively influences their beliefs and attitudes. The effect of presence is not restricted to a specific domain but extends to various fields. In marketing, users tend to perceive ads more favorably, enhancing brand recall [98]. Investigations in the medical field revealed that high presence assisted in the treatment of spider phobia by exposing patients to virtual spiders [99]. In education, it leads to a more enjoyable learning experience [94]. Additionally, in tourism, it contributes to stronger interest toward destinations [5].

Instruments have been proposed to measure presence, including the Presence Questionnaire (PQ) [93], the Igroup Presence Questionnaire (IPC) [100, 101], and the ITC Sense of Presence Inventory (ITC-SOPI) [102]. Additionally, several factors influencing the sense of presence have been identified, including technological aspects [100, 101], user characteristics [103], and control over the environment [104].

2.6. Perceived Innovativeness. Perceived innovativeness relates to people's beliefs about a product having innovative features, a concept that reflects the newness and uniqueness of the technology [105]. It plays a crucial role in shaping people's attitudes and behaviors and influencing their intentions to use products [106].

People who perceive a product as more innovative are more likely to have a purchase intention compared to those perceiving it as less innovative [107]. Additionally, cognitive and domain-specific innovativeness enhance the actual adoption of new products [108]. The early adoption of innovative products is linked to people perceiving them as innovative [90]. In the hospitality sector, the use of innovative products like VR motivates people to visit premises [3]. This influence is similarly observed in the mobile commerce industry, where innovativeness positively impacts people's behavioral intentions toward mobile commerce [109].

The TAM by Davis et al. [110] which argues that "perceived usefulness" and "perceived ease of use" are significant factors influencing technology adoption constitutes the foundation for our research methodology. We incorporate substantial constructs like emotional attachment, VM (including attraction awareness, destination promotion, and spiritual experience), utilitarian values, hedonic values, VR presence, and perceived innovativeness in our extension of TAM to the context of VR-mediated religious tourism. The relationship between emotional attachment and TAM's "perceived usefulness" implies that VR content is valued more when there is a stronger emotional bond with it. VM: A number of factors, such as the attraction of religious locations and marketing campaigns, affect how easy and helpful people believe VR experiences to be, as well as their willingness to use them.

Utilitarian and hedonic values are related to the core TAM constructs by suggesting that practical benefits (utilitarian values) enhance perceived usefulness, while enjoyment and pleasure derived from the VR experience (hedonic values) influence both perceived ease of use and usefulness. VR presence, or the sense of "being there" within the VR environment, serves as an outcome of high perceived ease of use and usefulness, indicating a successful technology adoption. Lastly, perceived innovativeness reflects the advancements in VR technology that make experiences more immersive and intuitive, thereby enhancing both TAM factors and promoting adoption. By integrating these constructs with TAM, our research is aimed at providing a comprehensive understanding of the factors influencing VR adoption in religious tourism, thereby extending the application of TAM and offering new insights into technology adoption in this unique context.

3. Research Model and Hypothesis Development

Attitude is a significant concept in consumer behavior literature [5]; it is a psychological tendency concerned with the assessment of something and developing thoughts/feelings of favor or disfavor toward it [111]. Caldwell et al. [112] and Kim and Hunter [113] explained that the relationship between attitude and behavior is mediated by intention. Many studies have discussed the relationship between the attitude toward a tourism destination and the intention to visit it, for instance, Abraham et al. [114], Jalilvand et al. [115], Lam and Hsu [116], Phillips et al. [117], Rizky et al. [118], and Tussyadiah et al. [5].

Jalilvand et al. [119], Jalilvand et al. [115], and Rizky et al. [118] found that eWOM attitude toward a tourism

destination impacts travel intention. The same line of argument has been put forward by Tussyadiah et al. [5], who found that the post-VR attitude toward a tourism destination significantly influences the intentions to visit that destination.

H1 Attitude Change has an influence on Visit Intention

Several studies examined the impact of presence on users' performance [94, 99, 120]. Higher sense of presence positively influenced the effectiveness of users in completing tasks, and this trend is observed across different domains. In medicine, higher sense of presence improved the performance during the rehabilitation intervention programs [121]. Additionally, investigations in the education field demonstrated that the higher the presence, the better the learning outcomes [94]. Moreover, studies in the marketing domain illustrated that brand recall strengthens with an increase in the level of presence [122]. Therefore, this study hypothesized that VR presence has an influence on utilitarian values.

H2 VR Presence has an influence on Utilitarian Values

Utilitarian values have been shown to strongly influence people's attitudes, decision-making, and intentions to reuse. For example, Voss et al. [123] demonstrated that utilitarian values play a significant role in shaping people's attitudes toward a brand. This finding aligns with [124] findings that illustrated that utilitarian values influence consumers' intentions to search and make online purchases. Shin and Jeong [125] found that utilitarian values impact travelers' attitudes toward AR applications at tourism destinations. Moreover, Redda [126] highlighted that utilitarian values play a role in shaping users' attitudes toward online shopping and their intentions to make purchases. Akel and Armağan [127] further supported this by showing that utilitarian values influence users' intentions to continue using applications. Therefore, based on these findings, this study hypothesized that utilitarian values have an influence on attitude change.

H3 Utilitarian Values has an influence on Attitude Change

Hedonic values have been considered as an important factor influencing people's attitudes. In the area of online shopping, hedonic values have a strong influence in shaping the overall attitude toward a brand [123] and are determinants of consumer attitudes toward online shopping [126]. Hedonic values also contribute to individuals' purchase intentions [2, 106].

Regarding the adoption of technology and reuse intentions, Shin and Jeong [125] highlighted that hedonic motivations have a substantial impact on travelers' attitudes toward AR applications at tourism destinations. Additionally, Akel and Armağan [127] showed a correlation between hedonic values and the intention to continue using applications. This study hypothesized that hedonic values have an influence on attitude change.

H4 Hedonic Values has an influence on Attitude Change

Several studies have emphasized the influence of perceived innovativeness on utilitarian values [78]. In the mobile hotel booking context, innovativeness significantly affected utilitarian values [128]. These findings align with prior research demonstrating the impact of innovativeness on utilitarian values in the context of web consumption [129]. Consumer perception of innovativeness strongly influenced utilitarian attitudes [130] and impacted purchase intentions [106]. This study hypothesized that perceived innovativeness has an influence on utilitarian values.

H5 Perceived Innovativeness has an influence on Utilitarian Values

The relationship between VM and attitude has been the focus of many studies, including Abraham et al. [114], Hsu et al. [131], Huang and Hsu [132], and Kim et al. [133]. Huang and Hsu [132] found a significant influence of travel motivation of revisiting a destination on people's attitude toward visiting the destination in the future. Abraham identified similar results and explained that motivational factors have an influence on travelers' attitude toward visiting dark tourism destinations. Kim et al. [133] explained that travel motivations partially affect people's attitude to visit the destination. Moreover, Hsu et al. [131] found a direct link between travel motivation and a traveler's attitude to a destination. Therefore, this study hypothesized that travel motivation has an influence on attitude change.

H6 Visit Motivation has an influence on Attitude Change

Many studies from different backgrounds discussed the influence of emotions on attitude (e.g., Allen et al. [134], Nabi [135], Petty and Briñol [136], Porat and Tractinsky [137], Van Den Hooff et al. [138], and Abraham et al. [114]). Allen et al. [134] clarified that emotional experiences can be used as a predictor of people's attitudes, while Porat and Tractinsky [137] found that the aesthetics and usability of the website influence the visitors emotions, which in turn influence their attitude toward it. Along these lines is the study of Zablocki et al. [139], who explained the direct relationship between the emotional content of online reviews and attitude toward products. In tourism, Abraham et al. [114] explored the relationship between emotions and the desire to visit the Holocaust tourism site by the victims' descendants. The study found that emotions toward a destination have an impact on the desire to visit it through the mediating role of the destination image. This study hypothesized that emotional attachment has an influence on VR presence.

H7 Emotional Attachment has an influence on VR Presence

The influence of emotion on VM has been previously studied [140]. Ghosh and Sarkar [141] revealed that when individuals visualized the travel destination, it elicited positive emotions, thereby influencing their visit intentions. Furthermore, the study conducted by Hosany et al. [142] demonstrated that place attachment significantly enhanced visit intentions, indicating a predictive power of place attachment on revisit intentions [143]. Therefore, this study hypothesized that emotional attachment has an influence on VM.

H8 Emotional Attachment has an influence on Visit Motivation

4. Research Methodology

4.1. Measurement Instruments. The development of our constructs was influenced by insights and inputs from a review of existing literature and various technology adoption

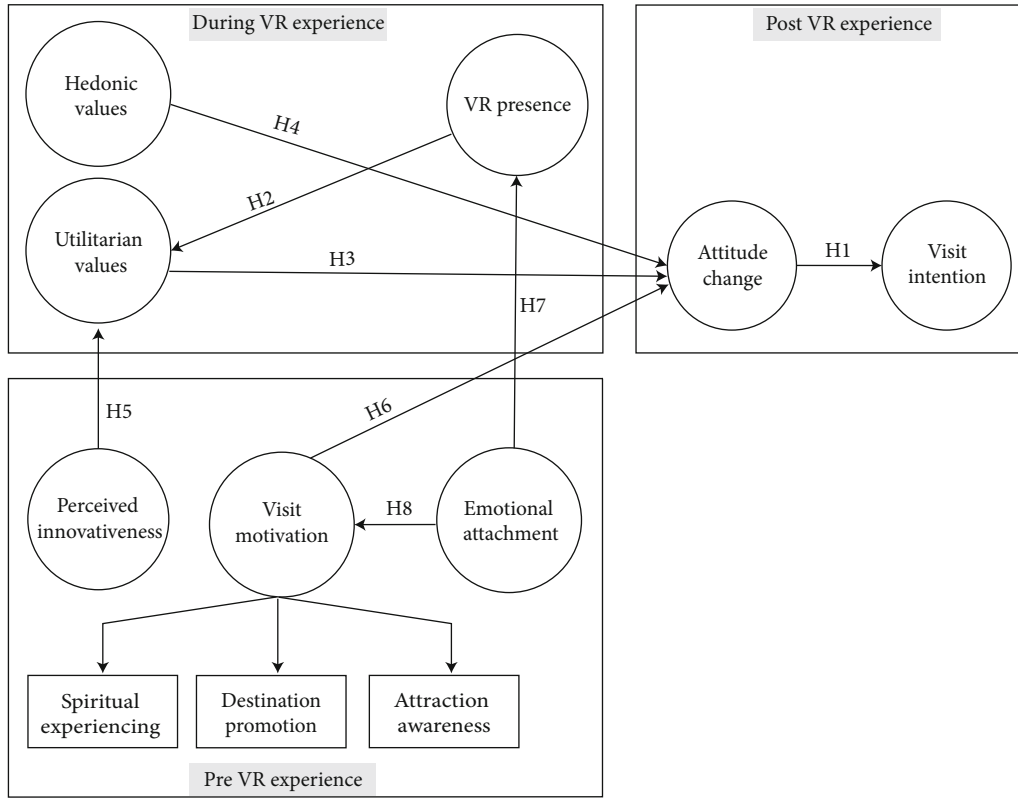


Figure 1: Research framework.

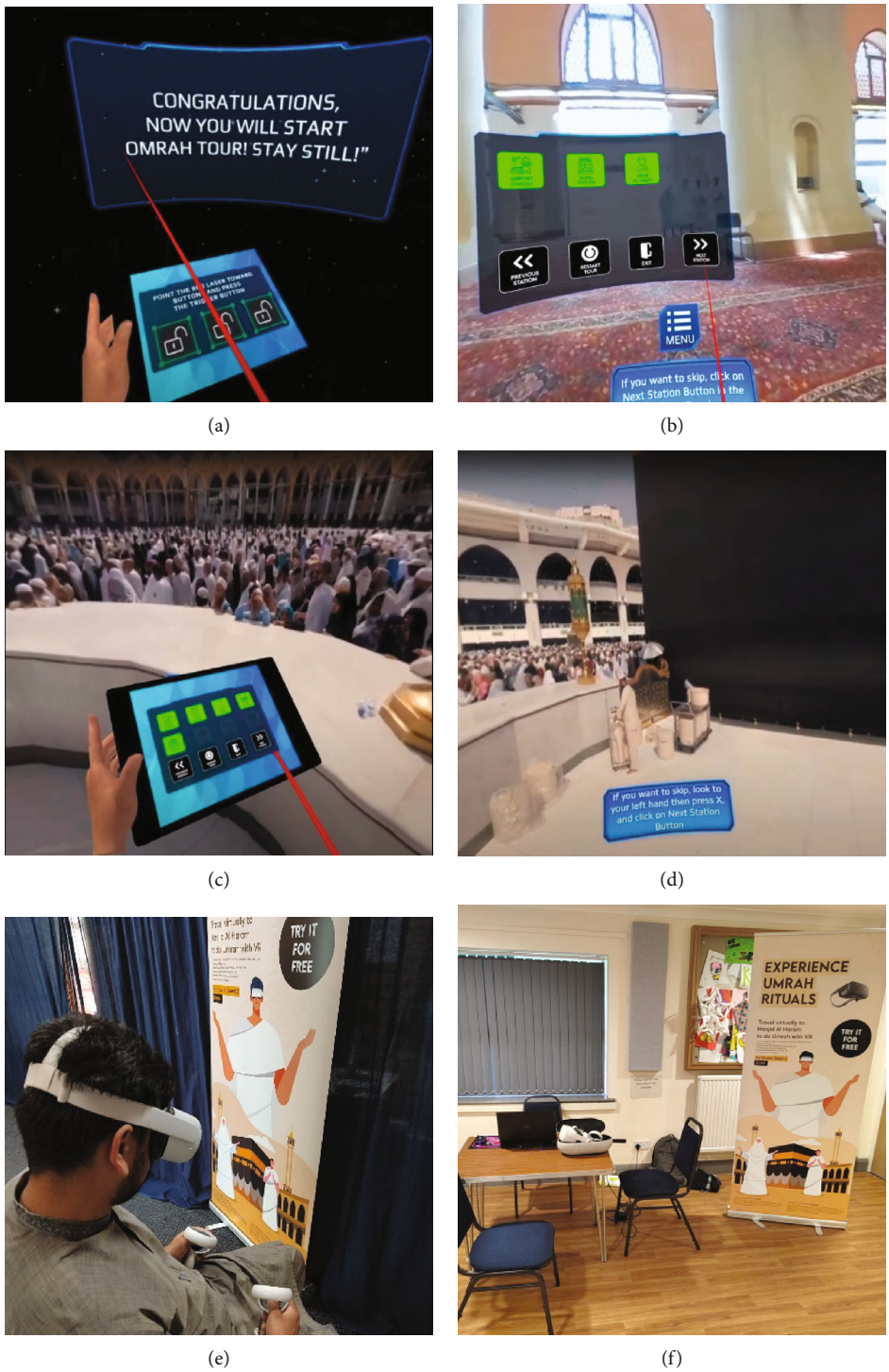
theories, including Davis's TAM [110]. Further, investigations were conducted on numerous studies that focus on the aspects surrounding the forthcoming theories, user experience, including hedonic and utilitarian values, VM, perceived innovativeness, and emotional attachment [41, 56, 144]. This comprehensive analysis results from the conceptual model presented in Figure 1. It was planned to employ established statistical methods to validate this model and its associated hypotheses.

In our effort to develop effective questionnaires, we drew upon the knowledge of various constructs and existing theories and models related to adoption, particularly emphasizing the TAM proposed by Davis et al. [110]. To develop our initial survey tool, we sought the input of six experts well-versed in the realm of human–computer interaction and information systems, each bringing a unique perspective on fostering the intention to use VR applications in religious tourism.

Among these experts, four were from academic backgrounds, holding PhDs in fields related to human–computer interaction and information systems, while the other two were industry professionals with over a decade of experience in research and development, specializing in strategies to combat cybercrime. These experts refined our preliminary set of 40 questions, leading to the exclusion of five questions. They advised that some of these questions were unsuitable for yielding reliable results, and others had issues with clarity and readability. Consequently, we proceeded with 35 well-considered questions spanning 10 different constructs. Three constructs were treated as the "first order" to be combined and considered as one construct in the analysis. These questions were strategically arranged, starting from simpler ones and gradually moving to those requiring more thought. In designing the questionnaires, we adhered to established guidelines, focusing on their layout, design, and clarity to ensure the absence of any ambiguous content. The details of these questionnaires are systematically presented in Appendix 1.

The VR tool employed in this study was an interactive application specifically designed by the authors to simulate the experience of Umrah rituals. This application was meticulously engineered to enable users to virtually traverse the Umrah journey through a series of distinct stages. It commences with the user's arrival at the airport, progresses through a virtual hotel visit, moves to the miqat point for preliminary Umrah preparations, and then digitally transports the user to the Masjid Al-Haram. This immersive journey encompasses all the essential rituals associated with the Umrah rituals. As depicted in Figure 2a, the system has a tutorial once the user starts to learn how to navigate and press the required button considering the user cannot see the controller during the experience. Then, users are trained by a preliminary tutorial to be able to familiarize themselves with the user interface during the experience. The floating user interface enables users to teleport from one station to another during the Umrah journey, as depicted in Figure 2b,c.

In terms of hardware, the Meta Quest 2.0 VR headset was selected for this study due to its advanced capabilities. The system's design emphasizes ease of navigation for first-



(a) (b) (c) (d) (e) (f)

FIGURE 2: (a) Tutorials on UI. (b) User interacting with UI. (c) Tablet UI for navigation. (d) Navigation at Masjid Al Haram. (e) User experiencing the Umrah journey. (f) Location of VR experience at Southampton Medina Masjid.

time users, allowing them to seamlessly interact with the virtual environment. This is achieved through a user-friendly interface that facilitates straightforward back-and-forth movement with minimal interaction required, as depicted in Figure 2d. The overarching aim of this VR system was to provide users with a realistic and educational preview of performing Umrah in a virtual setting.

4.2. Data Collection. Ethical approval has been obtained from the University of Essex before recruiting the study participants. The recruited participants were regular prayers at the Southampton Central Mosque in Southampton, United Kingdom, as depicted in Figure 2e,f. The participants are considered religious as they were in five prayers daily. An installation of a booth was constructed with the needed

informative visuals to invite them to participate in the VR tour. In regard to the sampling strategy, the participants were recruited from this readily accessible group, as they were deemed to have relevant Islamic religious engagement and potential interest in the VR simulation of Umrah rituals. Participants were invited to join the VR experience after completing their daily prayers, leveraging their presence and availability at the mosque.

This approach facilitated the efficient recruitment of individuals who are not only regular in their religious practices but also likely to have a vested interest in Islamic religious tourism, specifically the Umrah pilgrimage. While convenience sampling may limit the generalizability of the findings due to the nonrandom selection of participants, it was considered appropriate for the exploratory nature of this study, focusing on a specific community's experience with the VR application. A research assistant was recruited to invite participants to join the VR experience after they completed their prayers. The participants underwent a training session for the device usage, which lasted for 5 min, followed by an experience phase of 10 min, amounting to a total duration of 15 min.

The initial phase of the survey successfully engaged 214 participants. To measure the responses accurately, a 5-point Likert scale was employed, ranging from 1 (*strongly disagree*) to 5 (*strongly agree*). The experience was available for a month to receive adequate responses from June 2023 to July 2024. To maintain data integrity, we implemented two methods for filtering out invalid responses. Initially, in line with the established data filtering procedure, as Zhou et al. [145] suggested, we excluded participants who, according to the online tracking system, spent less than 5 min on the survey. This criterion is a common practice in survey research to ensure respondent engagement and data quality. Subsequently, the incomplete questionnaires were also excluded, leaving 201 valid responses.

5. Data Analysis and Results

To ensure coherence between the analytical approach and the study's research objectives, this section provides further clarification and methodological justification. The study investigated the influence of emotional attachment on VR presence and VM, as well as the role of utilitarian and hedonic values in shaping attitude change and visit intention, all within the framework of the TAM. Given the multidimensional structure of the constructs and the complexity of their interrelationships, structural equation modeling (SEM) using AMOS was selected as the most appropriate analytical technique. SEM is well established in behavioral and technology adoption research for its capacity to assess theory-driven models by simultaneously testing multiple hypothesized paths, including both direct and indirect effects, while controlling for measurement error. This methodological choice ensured a robust and comprehensive examination of the proposed conceptual model.

The following subsections present an in-depth analysis of the survey results. Initially, an overview of the demographic profile of the respondents is provided. A test of the reliability of the data follows this. Subsequently, the analysis delves into measuring and validating the proposed model using SEM. The preliminary data cleaning and descriptive statistics were conducted using SPSS, while the SEM analysis was performed using AMOS.

5.1. The Demographic Profile. The composition of the respondents in this study consisted of 92.5% male and 7.5% female participants. The highest level of participation was observed in the 26–34 age group, accounting for 67%, followed by the 18–25 age group with 64%. Subsequently, the 35–45 age group represented 48%, and the 46–60 age group constituted 22%. Regarding experience with Umrah rituals, 48.2% of the respondents had previously performed Umrah, while 51.8% had not. Additionally, the survey enquired about the respondents' familiarity with VR technology and their experience. The findings disclosed that the largest segment, 40.8%, was "slightly aware of it," followed by 27.8% who were "aware of it," and 26.3% who had "no previous knowledge." Only a minor proportion, 4.9%, reported being "completely aware of it." A detailed breakdown of the respondents' demographics and characteristics is presented in Table 1.

5.2. Results of Measurement Model. In order to evaluate the reliability of the latent constructs, this study utilized individual item loadings and composite reliability (CR), following the approach suggested by Hair et al. [146]. As detailed in Table 2, the CR values surpass the 0.80 threshold, indicating robust internal consistency, in line with the standards set by Nunnally and Bernstein [147]. Additionally, Cronbach's alpha values range between 0.80 and 0.94 and are considered quite highly scored. In light of these findings, CR is increasingly recognized as a more accurate measure of reliability [148–150]. The conceptual framework identifies "VM" as a second-order construct, encompassing three distinct subconstructs: SE, DP, and AA. In the process of conducting confirmatory factor analysis (CFA) for these constructs, VM's assessment involved evaluating the collective factor loadings of the aforementioned trio of subconstructs. Subsequent sections of the study will focus on evaluating the individual items within these subconstructs to verify their internal consistency and reliability. To confirm the creation of a valid and reliable instrument, five items, specifically AA1, HV4, VP1, UV4 and UV5, were removed due to their insufficient item loadings. The remaining items' loadings exceeded 0.70, affirming their suitability for the study.

To assess the convergent validity of the model, the average variance extracted (AVE) was utilized. The AVE values surpassed the minimum requirement of 0.5 (as shown in Table 2), aligning with the criteria outlined by Hair et al. [146]. For the purpose of evaluating discriminant validity, the Fornell–Larcker criterion, established by Fornell and Larcker [151], was utilized. This was evidenced by the square roots of the AVEs for each latent construct, as demonstrated in Table 3, which were observed to be higher than the intercorrelations of the latent variables, thereby indicating robust discriminant validity as per the standards mentioned in Hair et al. [146].

TABLE 1: Demographic characteristics ($N = 201$).

Attributes	Category	Frequency	Percentage
Age	18–25	64	31.8
	26–34	67	33.3
	35–45	48	23.8
	46–60	22	10.9
Ethnic group	Arab	71	35.3
	White British	1	0.5
	Hispanic or Latino	0	0
	Black or African American	17	8.4
	Native American or American Indian	1	0.5
	Asian/Pacific Islander	101	50.2
	Other	10	5
Gender	Male	186	92.5
	Female	15	7.5
Education	A-level	27	13.4
	College	52	25.8
	Bachelor	94	46.7
	Postgraduate	18	13.9
Relationship	Single	77	38.3
	Married or domestic partnership	121	60.2
	Divorced/separated	2	1
	Widowed	1	0.5
Participated in Umrah rituals before	Yes	97	48.2
	No	104	51.7
Familiar with VR	No previous knowledge	53	26.3
	Slightly aware of it	82	40.8
	Aware of it	56	27.8
	Completely aware of it	10	4.9

Furthermore, the discriminant validity of our model was also examined using the heterotrait–monotrait (HTMT) ratio. The HTMT ratios for all constructs remained below the 0.9 benchmark (as detailed in Table 4), further corroborating the presence of discriminant validity in our model in accordance with the guidelines proposed by Hair et al. [146].

5.3. Measurement of Second-Order Constructs. For evaluating the validity of the second-order constructs of VM, a methodology similar to that in Lankton and McKnight [152] and Ambalov [153] studies was articulated. This involved using CFA and a goodness-of-fit assessment conducted through SEM using the AMOS software. The process entailed several steps.

Firstly, the correlations among the first-order constructs within each second-order construct were investigated. These correlations were found to be significant ($p < 0.001$) and strong for VM, as the correlations varied between 0.79 and 0.90. Secondly, the factor loadings of the first-order constructs onto the second-order constructs were examined. These loadings were not only significant but mostly of a high magnitude, as detailed in Table 5.

Thirdly, the study compared the goodness-of-fit metrics for both the first-order and second-order measurement models, including all measured constructs of the proposed model. This comparison was guided by the principle, as noted by Marsh and Hocevar [154], that the fit indices for a higher-order model should not surpass those of the corresponding first-order model. The comparison yielded almost excellent results, as indicated in Table 6, which presents the fit statistics for both models. These findings confirmed the suitability of employing second-order structures to represent all constructs of VM and all other measured constructs in Figure 1.

Several indices were considered for assessing the model's goodness of fit, as highlighted by Hair [155] and [159]. Initially, the minimum fit function chi-square χ^2 was employed for this purpose. However, Hu and Bentler [158] noted the sensitivity of χ^2 to sample size and its occasional unreliability as a sole fit indicator. Consequently, the study also utilized the χ^2 to degrees of freedom ratio (χ^2/df), with values below 1.0 considered acceptable, aligning with the criteria set by Byrne [156]. Furthermore, this research incorporated a variety of additional fit indices recommended by

TABLE 2: Reliability and validity.

Construct	Items	Factor loadings	Mean	SD
Visit motivation (VM) (second order) CR = 0.751, AVE = 0.73, alpha = 0.87	SE	0.862	4.63	0.404
	DP	0.600		
	AA	0.520		
Perceived innovativeness (PI) CR = 0.81, AVE = 0.59, alpha = 0.81	PI1	0.808	4.54	0.497
	PI2	0.746		
	PI3	0.756		
Visit intention (VI) CR = 0.92, AVE = 0.80, alpha = 0.92	VI1	0.890	4.60	0.522
	VI2	0.931		
	VI3	0.859		
Hedonic values (HVs) CR = 0.80, AVE = 0.52, alpha = 0.80	HV1	0.508	4.61	0.458
	HV2	0.824		
	HV3	0.810		
	HV5	0.697		
VR presence (VP) CR = 0.83, AVE = 0.62, alpha = 0.82	VP2	0.736	4.32	0.604
	VP3	0.831		
	VP4	0.786		
Utilitarian values (UVs) CR = 0.80, AVE = 0.76, alpha = 0.80	UV1	0.793	4.68	0.438
	UV2	0.784		
	UV3	0.714		
Attitude change (AC) CR = 0.86, AVE = 0.67, alpha = 0.85	AC1	0.798	4.72	0.439
	AC2	0.801		
	AC3	0.858		
Emotional attraction (EA) CR = 0.94, AVE = 0.85, alpha = 0.94	EA1	0.934	4.80	0.418
	EA2	0.975		
	EA3	0.861		

Note: AA1, HV4, VP1, UV4, and UV5 were deleted because of low factor loading (< 0.7).

TABLE 3: Discriminant validity.

	Fornell–Larcker criterion							
Constructs	**VM**	**PI**	**VI**	**HV**	**VP**	**UV**	**AC**	**EA**
VM (second order)	*0.730*							
PI	0.314	*0.770*						
VI	0.464	0.648	*0.894*					
HV	0.084	0.056	0.038	*0.721*				
VP	0.338	0.623	0.595	0.056	*0.786*			
UV	0.302	0.707	0.700	0.067	0.656	*0.764*		
AC	0.353	0.456	0.652	-0.056	0.400	0.590	*0.819*	
EA	0.543	0.366	0.375	0.064	0.258	0.240	0.275	*0.925*

Note: The italics diagonal is the square root of AVE.

Hair [155], including the goodness-of-fit index, normed fit index, parsimony normed fit index, root mean square residuals, comparative fit index, adjusted goodness-of-fit index, and the root mean square error of approximation. The specific values, both actual and recommended, for these model fit indices are systematically presented in Table 6.

5.4. Structural Model. As shown in Table 7 and Figure 3, except for *H4*, the results of the path coefficient showed that all other hypotheses are supported. More specifically, AC ($\alpha = 0.72$, $p < 0.001$) was found to have a significant positive influence on VI, leading to support for *H1*. Moreover, VP ($\alpha = 0.72$, $p < 0.001$) and PI ($\alpha = 0.33$, $p < 0.001$) were found

TABLE 4: Heterotrait–monotrait (HTMT) ratio.

	HTMT ratio							
Constructs	**VM**	**PI**	**VI**	**HV**	**VP**	**UV**	**AC**	**EA**
VM (second order)	1							
PI	0.559	1						
VI	0.711	0.732	1					
HV	0.160	0.078	0.053	1				
VP	0.503	0.795	0.761	0.072	1			
UV	0.499	0.926	0.907	0.089	0.890	1		
AC	0.522	0.668	0.796	−0.073	0.583	0.716	1	
EA	0.628	0.425	0.433	0.074	0.299	0.277	0.323	1

TABLE 5: First-order factor loadings from the second-order factors.

First-order factor	Items	Loading	Alpha	Mean	SD	Second-order factor
Attraction awareness (AA)	AA2, AA3	0.799	0.70	4.60	0.516	Visit motivation (VM)
Spiritual experience (SE)	SE1, SE2, SE3	0.905	0.93	4.71	0.477	
Destination promotion (DP)	DP1, DP2, DP3	0.822	0.86	4.58	0.499	

Note: All factor loadings are significant at $p < 0.001$.

TABLE 6: First-order factor loadings from the second-order factors.

Fit index	Recommended value[a]	First- order	Second order/measurement model	Structural model
χ^2	NS at $p < 0.05$	652.760	674.325	847.56
df	n/a	360	374	394
χ^2/df	$1.0 < \chi^2/df < 3.0$	1.813	1.803	2.15
IFI	≥ 0.90	0.92	0.92	0.90
TLI	≥ 0.90	0.91	0.91	0.90
CFI	≥ 0.90	0.92	0.92	0.9
RMSEA	≤ 0.08	0.06	0.06	0.07

Abbreviations: CFI, comparative fit index; df, degrees of freedom; NFI, normed fit index; NS, not significant; RMSEA, root mean square error of approximation.
[a]Sources: Hair [155], Byrne [156], Field [157] and Hu and Bentler [158].

TABLE 7: Result summary.

Hypothesis	Path	Path coefficient	*p*	Results
H1	AC → VI	0.72	***	Supported
H2	VP → UV	0.23	***	Supported
H3	UV → AC	0.42	***	Supported
H4	HV → AC	−0.07	0.148	Not supported
H5	PI → UV	0.33	***	Supported
H6	VM → AC	0.24	***	Supported
H7	EA → VP	0.28	**	Supported
H8	EA → VM	0.30	***	Supported

*$p < 0.05$; **$p < 0.01$; ***$p < 0.001$; NS $p > 0.01$.

to have a significant positive influence on UV. Thus, these results ensure support for *H2* and *H5*. UV ($\alpha = 0.42$, $p < 0.001$) and VM ($\alpha = 0.24$, $p < 0.001$) were found to have a significant positive influence on AC, leading to support for *H3* and *H6*. On the other hand, EA ($\alpha = 0.24$, $p < 0.01$) was found to have a significant positive influence on VP, and EA ($\alpha = 0.30$, $p < 0.001$) was also found to have a significant positive influence on VM. These results led to support for *H7* and *H8*.

To conclude the analysis, the results affirm the validity and robustness of the model, confirming its alignment with the study's theoretical model and research objectives. All constructs were subjected to comprehensive reliability and validity assessments, including CR, AVE, and assessments of discriminant validity using the Fornell–Larcker criterion and HTMT ratios. The measurement and structural models demonstrated acceptable fit across established indices (e.g., CFI, TLI, and RMSEA), confirming their robustness. The structural model results aligned with the study's hypotheses: emotional attachment significantly influenced both VR presence and VM (H7 and H8), while utilitarian values mediated the effect of VR presence on

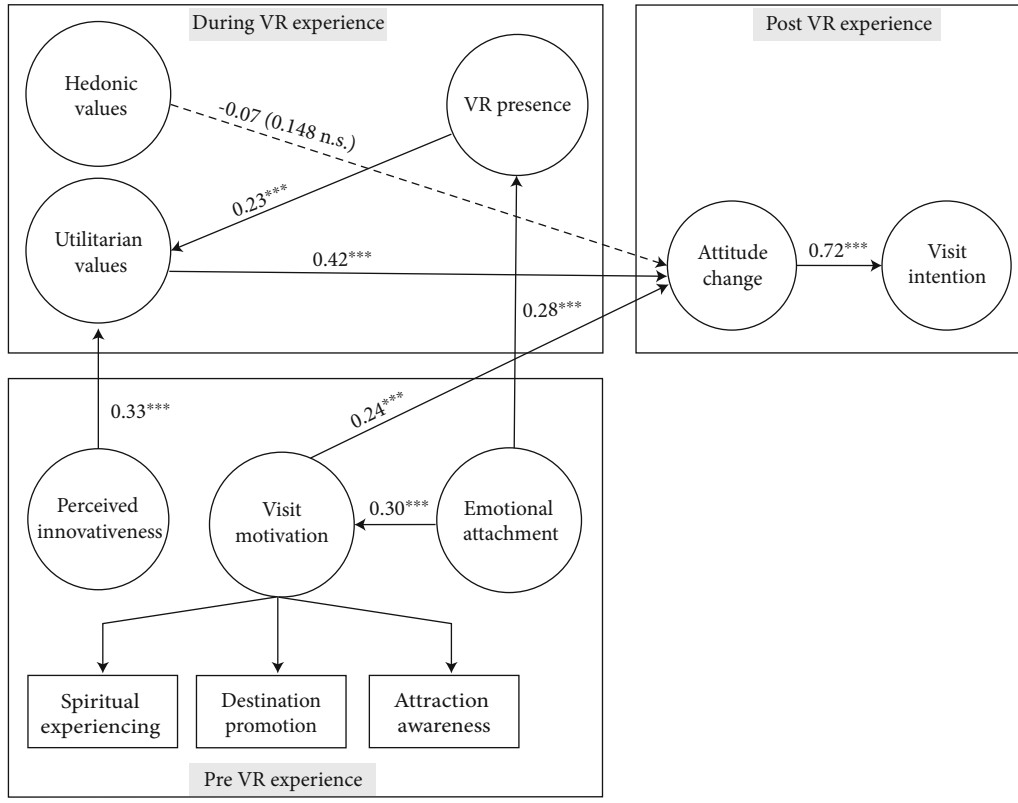


Figure 3: Measured model. Note(s): $^{*}p < 0.05$; $^{**}p < 0.01$; $^{***}p < 0.001$; ns, not significant.

attitude change (H2 and H3). Although hedonic values did not show a significant direct impact on attitude change (H4), they remain conceptually important for enhancing experiential quality. These findings validate the analytical model, demonstrating that the approach is both theoretically grounded and empirically sound. The study thus makes a meaningful contribution to the literature on technology acceptance, immersive experience design, and behavioral engagement in the context of Islamic religious tourism.

6. Discussion

6.1. Discussion of Findings. The main aim of this study was to investigate the influence of emotional attraction on VR presence within the framework of technology adoption theories, particularly drawing upon the principles of the TAM and other relevant adoption models that emphasize the significance of user perceptions and emotional engagement in adopting new technologies. This extends to exploring the pre-experience construct as an extension to the model represented in the study of Tussyadiah et al. [5]. In the realm of religious travel, the motivations and experiences of pilgrims often intertwine hedonic and utilitarian values, contributing to the complexity of their spiritual and personal journey [24]. Pilgrims, in embarking on religious journeys, frequently seek hedonic values, deriving pleasure and emotional fulfillment from sacred destinations, rituals, and communal worship experiences [39, 160]. Elements such as the aesthetic beauty of religious sites, the emotional resonance of spiritual practices, and the sense of belonging within a community contribute significantly to the hedonic aspects of religious travel [25]. Concurrently, utilitarian values play a substantial role, as pilgrims may approach their journeys with practical objectives, seeking spiritual knowledge, pursuing self-improvement, or fulfilling religious obligations [50]. These utilitarian aspects provide functional and instrumental benefits, contributing to personal growth, a deeper understanding of faith, or a sense of accomplishment in fulfilling religious duties [49].

In the context of this study, we extend this exploration into the virtual realm, investigating the influence of VR experiences on individuals' attitudes and intentions in religious tourism. The results illuminate a fascinating interplay of hedonic and utilitarian values, shedding light on the dynamics of attitude change and visit intention within the context of VR-mediated religious experiences. Our findings reveal that individuals positively influenced by VR experiences in religious tourism are more inclined to express an intention to visit religious sites or engage in related activities. This aligns with the broader understanding of hedonic values, as the immersive and aesthetically enriched virtual environments contribute to the pleasure and emotional aspects of the pilgrimage experience [161]. However, consistent with prior literature, such hedonic elements tend to heighten engagement without necessarily translating into behavioral change [74, 87], which may

explain why H4 was not supported in this study. While users reported enjoyment and immersion in the VR experience, these emotional responses did not significantly impact their attitudinal shift toward visiting the destination, suggesting that, in goal-directed contexts like religious tourism, functional and informational benefits may outweigh purely affective ones. Furthermore, the study uncovers a notable influence of VR presence on utilitarian values, emphasizing the impact of the immersive nature of VR experiences on individuals' utilitarian perceptions. The sense of presence in a virtual environment is shown to contribute significantly to practical and functional value assessments, aligning with the utilitarian dimension of religious tourism experiences facilitated by VR [83]. This finding supports H2, which demonstrated that a heightened sense of VR presence significantly enhances users' perceptions of utilitarian value. This aligns with prior research (e.g., [70, 76]), which emphasizes that immersive virtual environments can provide rational, task-oriented benefits such as information gathering, familiarity with spatial layout, and logistical planning, especially during the previsit decision-making phase.

These findings align with and contribute to ongoing debates in the literature concerning the dual role of religious tourism as both a spiritual and hedonic experience. For instance, Cohen [24] emphasized the blurring of boundaries between pilgrimage and leisure tourism in contemporary contexts, highlighting that religious travelers often seek both existential meaning and experiential satisfaction. Our results echo this, showing that emotional attachment—grounded in spiritual significance—coexists with perceptual triggers such as presence, which enhance enjoyment and immersion. Similarly, Buzinde [25] argued for a eudaimonic view of spiritual tourism, where intrinsic motivations, personal growth, and psychological well-being play a central role. The significant relationship we found between presence and behavioral intention supports this view, suggesting that affective and perceptual engagement with religious content can reinforce future travel behaviors. Furthermore, the utilitarian value of VR for religious users, as noted in the study of Tuominen [83] mixed-reality tourism research, is evident in our findings regarding perceived usefulness. Our participants viewed VR as both an emotionally and functionally valuable medium. By incorporating these multiple dimensions, the current study extends previous conceptualizations and affirms the view that Islamic religious tourism experiences—especially when technologically mediated—must be understood through a multidimensional lens. This supports calls for more integrative frameworks that reflect both spiritual aspirations and the affective-perceptual dynamics of religious travel.

Our study reveals that while utilitarian values and perceived innovativeness indeed influence attitude change, there is not significant evidence to support the hypothesis that hedonic values directly influence attitude change. This finding aligns with research by To et al. [124], which suggests that consumer tendencies to browse and make purchases online are predominantly shaped by utilitarian motives rather than hedonic ones. Furthermore, it is supported by the work of Al-Shamaileh and Sutcliffe [162], who demonstrated that hedonic factors play a minimal role in users' selection of mobile applications. This finding suggests that while practical benefits and perceptions of innovation play crucial roles in shaping attitudes [163], the emotional and pleasure aspects introduced through VR may not directly contribute to attitude transformation. This finding also supports the notion that hedonic value is highly context-dependent, often enhancing users' satisfaction with an experience without necessarily prompting attitudinal or behavioral change. As evidenced in the literature (e.g., [71, 80]), the influence of enjoyment and emotional gratification is not always a predictor of action, particularly in goal-oriented contexts. This may further explain why H4 was not supported in our study, where hedonic elements of the VR experience did not significantly influence attitude change. However, it is important to note that hedonic values can still play a significant role in shaping individuals' overall experiences and perceptions within VR-mediated religious tourism. The pleasure and emotional aspects facilitated by VR environments contribute to the overall richness of the pilgrimage experience [164], even if they may not directly impact attitude change. By acknowledging the nuanced dynamics of hedonic, utilitarian, and innovative values, practitioners and researchers can still leverage these insights to design more immersive and transformative VR interventions in religious tourism [165]. Despite the nonsignificant relationship between hedonic values and attitude change, the broader role of hedonic elements in shaping emotional engagement remains important. This aligns with the emotional attachment model [48], which posits that emotional resonance such as enjoyment and sensory immersion can enhance memory formation and user perception, even if it does not directly influence behavioral intent. In this context, hedonic value may still contribute indirectly to emotional attachment and presence, reinforcing the overall richness of the VR-mediated religious tourism experience.

Our study further supports the hypothesis that VM is a key driver of attitude change. Individuals with higher motivations to engage in religious tourism are more susceptible to positive attitude shifts when exposed to VR experiences, emphasizing the motivational aspect as a crucial determinant of attitude change [166]. Emphasizing the role of emotional connections, the study underscores the influence of emotional attachment on VR presence. Emotional engagement is shown to significantly enhance the sense of presence in virtual religious environments, contributing to the overall immersive experience and aligning with the hedonic dimensions of the pilgrimage. Similarly, the study reveals a positive influence of emotional attachment on VM. Emotional connections fostered through VR experiences contribute to individuals' motivations to engage in religious tourism, emphasizing the critical role of emotional elements in shaping VMs [167]. This finding supports H8, confirming that emotional attachment significantly influences VM. It directly builds upon the motivational constructs outlined in Section 2.2 (e.g., [55, 56]), where spiritual experience and attraction awareness are

key drivers of visit intention. In this study, these motivational components appear to be amplified through emotional resonance fostered by the immersive VR environment, reinforcing the idea that affective connection can activate deeper travel intentions even before a physical visit.

6.2. Theoretical Contribution. This study reveals a number of important theoretical and managerial contributions, offering valuable insights into the design and implementation of VR experiences in the context of Islamic religious tourism. The fundamental contribution of our study lies in its extension and application of technology adoption theories, notably the TAM, to the domain of VR-mediated religious tourism, with a specific focus on the previsit phase. By investigating the influence of emotional attachment on VR presence, our research not only corroborates existing findings on VR's positive impact during and postvisit tourist experiences, as highlighted by Tussyadiah et al. [5], but also significantly advances the understanding of VR's role in shaping tourist attitudes and intentions before the actual visit. This finding builds upon the theoretical premise outlined in the literature review (Section 2.1), where emotional attachment is shown to influence behavioral intentions and deepen users' connection with a place or experience [40, 47]. Our study confirms this through the significant effects of emotional attachment on both VR presence (H7) and VM (H8), highlighting how affective bonds enhance immersion and intention. By integrating emotional attachment into the TAM framework, this study addresses a gap in understanding how emotional constructs influence perceived usefulness and ease of use within immersive VR environments. This previsit perspective is particularly crucial in the context of Islamic religious tourism, where emotional attachment and spiritual anticipation play a critical role. Our study's insights into how VR can effectively harness these emotional and spiritual elements to enhance visit intention contribute fundamentally to the application and adaptation of TAM in the realm of VR experiences. By demonstrating the critical role of emotional attachment in enhancing the perceived usefulness and ease of use of VR technologies for previsit engagement, our findings offer a novel perspective on how technology adoption theories can be expanded and enriched to encompass the unique dynamics of VR-mediated experiences in Islamic religious tourism. Furthermore, this integration of emotional and spiritual dimensions into the VR experience complements the emotional attachment model [48], which posits that deeply personal connections influence behavioral intentions. Our findings reinforce this model by demonstrating that emotional attachment significantly enhances both VR presence (H7) and VM (H8), illustrating how immersive technologies can effectively mediate and activate these affective bonds in the context of Islamic religious tourism.

The opportunities of VR in tourism are widely explored. However, it still remains that "VR development presents research challenges to better understand the effectiveness of VR in providing alternative or surrogate tourism experiences and shaping consumer attitudes toward tourism destinations" ([5], p. 151). This study proves the relationship between emotional attachment to VR presence, demonstrating that tourists are positively influenced by VR-mediated religious tourism experiences and, therefore, more likely to visit Islamic religious sites or engage in related activities, such as pilgrimage, as a result of experiencing VR. Specifically, VR positively impacted users' utilitarian values and the sense of presence in the VR experience, contributing to practical and functional value creation and eliciting a positive attitude change. This corresponds to the literature on utilitarian values (Section 2.3), where users' perceptions of usefulness, convenience, and goal achievement are central to technology adoption [29, 72]. In our study, utilitarian value was significantly influenced by both VR presence (H2) and perceived innovativeness (H5) and, in turn, had a strong positive effect on attitude change (H3). These findings reinforce the theoretical model and highlight VR's relevance as a utility-driven tool for enhancing previsit decision-making in religious tourism. Although interestingly, and despite the demonstrated importance of user experience relying on utilitarian and hedonic values, our results rejected the idea that hedonic values directly influence attitude change. This supports consumer research studies, which suggest that users' browsing decisions are often more strongly influenced by utilitarian motives. Yet hedonic values still play a central role in impacting religious tourists' overall experiences and attitudes in VR-mediated religious tourism, increasing the richness and immersion in the experience. This finding reflects the dual role of hedonic values outlined in Section 2.4, where enjoyment and emotional fulfilment contribute to user engagement and satisfaction [76, 88], though they do not always translate into attitudinal or behavioral shifts. This is consistent with our result for H4, which was not supported, suggesting that while users may find VR experiences pleasurable, these emotions alone may not drive intention-related changes in the context of Islamic religious tourism.

Our findings bridge the current gap in literature examining the benefits and opportunities of VR as a tool to influence tourist attitudes and behaviors in the context of religious tourism. This makes a significant theoretical contribution by extending the current understanding of the role of VR-mediated tourist experiences into a new context. While previous research has primarily focused on secular tourism applications of VR (e.g., [76]), limited attention has been given to its use in religious or spiritually motivated travel. This study addresses that gap by demonstrating how VR can effectively simulate emotionally resonant and motivational aspects of pilgrimage experiences. Specifically, emotional attachment was found to significantly influence both VR presence (H7) and VM (H8), highlighting VR's capacity to foster spiritual engagement and previsit intention within religious tourism contexts. While research has examined the emotional and interpersonal dimensions of emotional attachment and VM, the influence of VR in strengthening the authenticity of the experiences, sense of presence, and

emotional connections in religious tourism has received limited attention. In addition, our findings contribute to the ongoing discourse on religious tourism by examining the interplay of hedonic and utilitarian values within the realm of VR experiences. Our findings offer valuable insights for practitioners and researchers seeking to enhance the design and implementation of VR interventions in religious tourism, acknowledging the nuanced dynamics of both experiential and functional dimensions. Further exploration into these dimensions holds the potential to enrich the immersive and transformative aspects of Islamic religious pilgrimage experiences facilitated by VR technology. In particular, this study reinforces theoretical arguments from the literature review (e.g., [46, 71]), emphasizing that authentic, emotionally resonant, and functionally useful VR content can simulate the depth of real-world spiritual experiences and enhance previsit engagement. This is reflected in our findings that emotional attachment significantly influenced both VR presence (H7) and VM (H8), while VR presence and perceived innovativeness contributed to utilitarian value (H2, H5), ultimately influencing attitude change (H3). These results provide empirical support for the idea that immersive VR experiences can meaningfully engage users both emotionally and functionally in a religious tourism context.

6.3. Managerial Contribution. This study outlines a number of opportunities for managers and practitioners in the field to capitalize and exploit the potential of VR-mediated Islamic religious tourism experience. Firstly, the results demonstrate the positive impact VR experiences create, in terms of increasing visit intention to religious sites or activities. Therefore, managers of tourist boards, suppliers, and marketers should consider incorporating VR-mediated religious experiences as part of their marketing and promotional efforts. For example, to promote a religious festival or pilgrimage event, VR should be incorporated as part of a promotional previsit experience. In this way, we suggest that VR should also be employed to increase the reach and engage nonvisitors, tapping into new market segments. For example, there is an opportunity to use VR-mediated Islamic religious tourism experience to exploit the newly termed "armchair" generation (e.g. those physically unable to travel due to health or age) by providing an alternative way to experience religious festivals and events. Particularly, post-COVID, this growing market is experiencing more demand for accessible and alternative ways to provide experiences for those unable to participate in real life.

Pre-COVID-19, Tussyadiah et al. [5] claimed, "destination managers are also faced with challenges to make strategic investment decisions in order to leverage VR technology to influence consumers' travel decisions." We argue that more than ever before as the global tourist economy is still recovering from the pandemic and adjusting to new ways of operating and addressing changing consumer demands, this has become even more of a challenge for destination managers. There is an increased need to justify investments to reduce perceived levels of financial risk. Our results demonstrate the opportunities and benefits from VR-mediated religious tourist experiences, illustrating the positive impacts VR creates on tourists' attitudes and behaviors. In this way, our study can help tourist managers and practitioners justify investment into innovative technologies such as VR to provide an enhanced experience, strengthen visit intention, and spark attitude change, better understanding of presence and its influence on user attitudes and behaviors. VR positively contributes to changing attitudes toward real Islamic religious tourism destinations and pilgrimages. Higher levels of presence correlate to increased interest toward destinations, therefore increasing visit intention and motivation. This is helpful for tourism marketers as a proof of concept to employ VR tools and create VR-mediated experiences as part of their marketing strategies.

7. Conclusion

This study investigated the role of VR in enhancing tourist attitudes and behaviors within the context of Islamic religious tourism, with a specific focus on the interplay between emotional attachment, VR presence, and technology adoption dynamics. By extending the TAM to incorporate emotional and motivational constructs, the research addressed two pivotal questions: (1) how perceived usefulness and ease of use mediate the relationship between emotional attachment and VR presence and (2) how hedonic and utilitarian values influence VR adoption in Islamic religious tourism. The findings, derived from a quantitative analysis of 201 participants engaging with a VR-mediated Umrah pilgrimage simulation, offer critical insights for both theory and practice.

The results highlighted the centrality of emotional attachment in shaping VR experiences. Emotional attachment not only strengthened users' sense of VR presence but also amplified their motivation to visit Islamic religious sites, validating its role as a precursor to both technological engagement and behavioral intentions. Furthermore, the study highlighted the dominance of utilitarian values—such as perceived usefulness and practical benefits—in driving attitude changes and visit intentions. While hedonic values, tied to enjoyment and immersion, enriched the experiential quality of VR, they did not directly influence attitude shifts, suggesting that religious tourists prioritize functional outcomes over purely sensory gratification in decision-making. These findings align with broader consumer behavior literature, where utilitarian motives often outweigh hedonic ones in goal-oriented contexts.

Theoretical contributions arise from the successful integration of emotional attachment and VR presence into TAM, providing a nuanced framework for understanding technology adoption in spiritually significant settings. This extension bridges a gap in existing literature, which has largely overlooked the emotional and spiritual dimensions of VR-mediated religious tourism. Practically, the study advocates for VR as a strategic tool in previsit marketing,

particularly to engage demographics such as the elderly or geographically constrained individuals ("armchair tourists"). By offering immersive previews of sacred rituals, VR can reduce perceived risks, build emotional connections, and ultimately boost visit intentions. This research illuminates VR's transformative potential in religious tourism, demonstrating how technology can deepen emotional engagement and practical value for pilgrims. By aligning technological innovation with the spiritual and utilitarian needs of travelers, stakeholders can unlock new opportunities for inclusive, meaningful, and sustainable tourism development.

8. Limitations and Further Studies

While this study provides valuable insights into the role of VR in religious tourism, several limitations must be acknowledged. First, the study's sample size was limited to 201 participants, all of whom were recruited from a single location, the Southampton Central Mosque in the United Kingdom. This convenience sampling approach may limit the generalizability of the findings to broader religious tourism contexts, including different cultural and geographical settings. Notably, the sample exhibited a significant gender imbalance, with approximately 92.5% male and 7.5% female participants. This disproportion reflects the participant pool naturally available during mosque prayer times and is consistent with cultural and contextual expectations within this setting. While such a ratio may be justifiable in religious environments that attract predominantly male participants, it may introduce contextual nuances that should be considered when interpreting the findings. Therefore, the implications of this gender imbalance should be considered when interpreting the results. Future research is encouraged to adopt more stratified sampling techniques to ensure better gender representation and to explore whether gender differences influence perceptions of VR experiences in religious tourism.

Second, the study primarily relied on self-reported data collected through a survey. While self-reports are commonly used in tourism and technology adoption research, they are subject to social desirability and recall biases. Participants may have overestimated or underestimated their level of engagement with the VR experience or their emotional attachment to religious tourism sites. Future studies could incorporate objective behavioral measures, such as biometric tracking or real-time user engagement analysis, to provide a more comprehensive understanding of user interactions and emotional responses within VR environments.

Another limitation is the focus on a single VR experience designed to simulate Umrah rituals. While this specific context provides valuable insights, it does not fully capture the potential of VR applications in other religious tourism experiences, such as pilgrimage sites of different faiths or digitally reconstructed historical religious sites. Future research should explore how VR can be used to enhance various forms of religious tourism beyond the Islamic context, including Christian, Hindu, Buddhist, and other faith-based travel experiences. The technological aspects of the VR experience also present limitations. The study utilized the Meta Quest 2.0 VR headset, which, while advanced, may not represent the full range of immersive VR technologies available. Factors such as VR hardware capabilities, graphical fidelity, and interactivity levels may influence user experiences differently. Future studies should explore the impact of emerging technologies, such as haptic feedback, artificial intelligence–driven virtual guides, and augmented reality (AR) integration, on religious tourism engagement and decision-making.

Additionally, while the study targeted practicing Muslims who represent a potential audience for religious tourism experiences, the sample was drawn exclusively from mosque attendees within Southampton, United Kingdom. As such, the findings reflect the perceptions of a religiously engaged community rather than verified nonresident tourists. This approach may limit the generalizability of the results to broader tourist populations. Future studies should consider collecting data from verified traveling pilgrims or from attendees of religious travel expositions and events to enhance the representativeness of religious tourist samples. Another important limitation of this study concerns the age distribution of the participants. The majority of the sample consisted of individuals under 34 years old, which may limit the generalizability of the findings to older Muslim populations. This demographic skew reflects typical mosque attendance patterns within the United Kingdom, where younger Muslims demonstrate higher levels of participation in communal religious activities compared to older cohorts [168]. Nevertheless, it remains essential to acknowledge that older adults may hold different attitudes, motivations, or levels of technology acceptance regarding VR-mediated religious tourism experiences. Future research should seek to engage a broader age range, potentially by recruiting participants through a wider variety of religious and community organizations, to capture a more representative spectrum of attitudes across the Muslim community.

This study focused on the previsit phase of religious tourism, examining how VR influences attitudes and visit intentions before physical travel. While this perspective is important, it does not account for the long-term impact of VR on actual visit behaviors and postvisit experiences. Longitudinal studies are needed to assess whether VR exposure translates into increased physical visits, improved on-site experiences, and lasting emotional connections with religious sites.

Finally, the study did not explore the ethical and theological implications of using VR in religious contexts. Some religious communities may perceive virtual representations of sacred sites as inappropriate or inadequate substitutes for real-world pilgrimages. Future research should investigate the acceptance of VR in religious communities, addressing potential ethical concerns and the role of religious authorities in shaping the adoption of VR for faith-based tourism.

Appendix 1

TABLE A1: Constructs, questionnaire items, and sources used in the study on VR-based Umrah experiences.

Constructs	Questionnaire items	Sources
Perceived innovativeness (PI)	PI1: Using the VR experience for Umrah visit is unique PI2: Using the VR experience for Umrah visit is new PI3: Using the VR experience for Umrah visit is creative	Hwang et al. [169]
Attraction awareness (AA)—*Visit motivation (VM)*	AA1: This attraction is a strong, significant representative of this religious belief AA2: I knew Masjid Al Haram a long time ago AA3: It has been my intention to visit this Masjid Al Haram for a long time	Wang [56]
Spiritual experience (SE)—*Visit motivation (VM)*	SE1: When I come to do Umrah or worship at Masjid Al Haram, I feel inner peace in my mind SE2: When I come to do Umrah or worship at Masjid Al Haram, I feel that it brings me closer to the practice of doctrine SE3: When I come to make Umrah or worship at Masjid Al Haram, I feel that everything is going well	Wang [56]
Destination promotion (DP)—*Visit motivation (VM)*	DP1: The advertisement for Umrah travel brought memories to my mind DP2: I found myself thinking of images of Masjid Al Haram when I read the advertisement DP3: The advertisement for Umrah travel reminded me of videos on Hajj and Umrah rituals in TV	Wang [56]
Emotional attachment (EA)	EA1: Visiting Masjid Al Haram makes me very happy EA2: Visiting Masjid Al Haram makes me feel good EA3: I am passionate about traveling to Masjid Al Haram and doing Umrah	Kim and Kim [170]
VR presence (VP)	VP1: During the VR Umrah tour, I had no external distractions VP2: During the VR tour, I felt like I was in another world VP3: It was strange to come back to reality after experiencing the VR tour VP4: During the VR tour, I lost track of time	Wang [56]
Hedonic values (HVs)	HV1:VR Umrah app looks professionally designed HV2: This VR application design guides the targets within the application HV3: The overall look and feel of VR Umrah app are visually appealing HV4: The VR application is user-friendly HV5: The application is aesthetically designed	Yang and Han [74]
Utilitarian values (UVs)	UV1: The Umrah VR App is practical UV2: The Umrah VR App is functional UV3: Overall, using VR for tourism promotion is beneficial UV4:VR Umrah App provides very useful service and information to me UV5:VR Umrah App is effective in motivating me to travel	Yuan et al. [171]
Attitude change (AC)	AC1: Using Umrah VR is a good idea AC2: I have a generally favorable attitude toward using VR for Umrah tourism AC3: I like the idea of using VR for similar visits such as Hajj	Kim and Park [172]
Visit intention (VI)	VI1: I intend to do Umrah frequently after experiencing the VR application VI2: I will continue to do Umrah in the future after experiencing the VR application VI3: I want to recommend doing Umrah to others after experiencing the VR application	Chung et al. [173]

Note: AA1, VP1, HV4, UV4, and UV5 were deleted because of low factor loading (< 0.7).

Data Availability Statement

Supporting data and materials are available upon request.

Ethics Statement

The study was approved by the research ethics committee at the University of Essex.

Consent

Informed consent was received from all participants. Consent for publication has also been received from all relevant parties.

Conflicts of Interest

The authors declare no conflicts of interest.

Author Contributions

The lead author's contribution included conceptualization, writing, methodology, data collection, and analysis. The second and third authors' contributions included data collection, conducting analysis, writing results, review, and editing. The fourth, fifth, and sixth authors' contributions included writing, supervision, and review. The seventh and eighth authors' contributions included writing and reviewing the manuscript.

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