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# Exploring the elements of smart tourism technology impact on memorable tourist experiences: A case study in Ho Chi Minh City

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## Abstract

The integration of Smart Tourism Technologies (STTs) into the tourism sector has significantly transformed how tourists engage with destinations, particularly by enhancing the dimensions of informativeness, accessibility, interactivity, personalization, and security. This study investigates the influence of STTs on the formation of memorable tourist experiences in Ho Chi Minh City, Vietnam, with a specific focus on the moderating role of emotional arousal. Grounded in Emotion Appraisal Theory, the research examines how tourists' emotional responses to STT features contribute to the perceived quality and memorability of their experiences. Data were collected through a structured survey of 485 visitors at major tourist sites in the city. The empirical findings reveal that all five dimensions of STTs exert a significant positive impact on memorable experiences, and emotional arousal significantly moderates the effects of informativeness, accessibility, interactivity, and personalization. These results advance the theoretical understanding of emotion-technology interplay in tourism and provide actionable guidance for destination managers and technology developers seeking to craft emotionally resonant smart tourism solutions.

**Keywords:** Accessibility, Emotional arousal level, Informativeness, Interactivity, Memorable tourist experience, Personalization, Security, Smart tourism technologies.

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## 1. Introduction

In the digital age, technological advancement has profoundly transformed how individuals access and consume tourism services. The rapid evolution of modern technologies has introduced new channels for interaction and experience, offering enhanced convenience and enriched engagement for tourists [1]. Against this backdrop, smart tourism has emerged as a

strategic development direction, attracting growing attention from scholars, policymakers, and destination management organizations. According to Ye, et al. [2] smart tourism has experienced notable growth and plays a pivotal role in reshaping the contemporary tourism ecosystem.

In Vietnam, particularly in Ho Chi Minh City, the country's largest economic, cultural, and tourism hub, smart tourism has been recognized as a key solution for improving service quality and enhancing destination competitiveness. As reported by the Viet Nam National Authority of Tavakol and Dennick [3] the application of smart technologies has improved tourism promotion, enabled personalized service delivery, and contributed to the broader objective of sustainable tourism development.

Parallel to these technological developments, the concept of memorable tourism experience has gained increasing academic attention. Smart technologies not only enhance operational efficiency and service quality but also foster immersive and emotionally engaging experiences that influence tourist satisfaction, memory formation, and behavioral intentions such as revisit and recommendation [4]. Nonetheless, smart tourism faces persistent challenges, including concerns about data security and privacy, technological fragmentation, and the complexity of service personalization [5]. These challenges emphasize the need for empirical research to explore how specific dimensions of smart tourism technologies affect tourists' experiences in specific local contexts.

While the overarching role of smart technologies in shaping tourism experiences has been widely acknowledged [4, 6] studies focusing on the distinct technological attributes, namely informativeness, accessibility, interactivity, personalization, and security, remain limited, particularly in urban destinations within Vietnam. Ho Chi Minh City, which is actively pursuing the development of a smart tourism ecosystem, still lacks empirical evidence concerning the influence of these technological dimensions on tourists' lived experiences. Furthermore, although emotional arousal is widely recognized as a significant factor in experience formation, its moderating role in the relationship between smart tourism technologies and memorable tourism experiences has not been sufficiently addressed in the existing literature.

To address these gaps, this study aims to examine how specific elements of smart tourism technologies contribute to memorable tourist experiences in Ho Chi Minh City, a city striving to become a leading smart tourism destination in Southeast Asia. The city has seen increasing adoption of digital innovations, including virtual reality, 3D and 360-degree content, artificial intelligence, and integrated electronic platforms, all intended to enhance data driven decision making and optimize visitor experiences [7]. In parallel, user generated content on platforms like TripAdvisor has highlighted various factors contributing to the memorability and satisfaction of experiences at iconic sites such as the Cu Chi Tunnels [8].

Although previous research has underscored the overall contribution of smart technologies to enhancing tourist experiences [4, 6] little is known about the functional roles of specific components such as information provision, system accessibility, user interactivity, personalized service, and perceived security in urban tourism settings like Ho Chi Minh City. This study also introduces emotional arousal as a critical moderating variable that may influence how technological features translate into memorable experiences. Despite ongoing efforts, concerns regarding data privacy and the effective integration of smart systems continue to pose challenges in optimizing the potential of smart tourism [9].

By addressing these research gaps, this study seeks to offer both theoretical and practical contributions. It provides destination managers and tourism planners with empirical insights into how technological and emotional factors interact to shape tourists' experiences. In doing so, the study supports the formulation of targeted strategies aimed at improving service quality, fostering positive tourist memories, and reinforcing Ho Chi Minh City's position in the competitive global tourism landscape.

## 2. Literature Review and Hypothesis Development

### *2.1. Overview of Bibliometric Analysis*

#### *2.1.1. Database Management*

Bibliometric analysis is a quantitative research method used to examine the structure, development, and trends of scientific literature by identifying and analyzing citation relationships between publications. As a large-scale data analysis approach, bibliometrics enables researchers to map the intellectual landscape of a particular domain and to identify emerging research areas and influential contributions within that field [10]. Accordingly, this study employs bibliometric analysis to systematically synthesize the existing literature on Smart Tourism Technologies (STTs).

The data search was conducted on February 27, 2025, at multiple time intervals. The analysis focused exclusively on peer-reviewed journal articles published in English. The keyword "Smart Tourism Technologies" was used to search within the "TOPIC" field of the selected database. Based on these search parameters, an initial total of 2,427 publications from 1999 to 2025 were retrieved.

To facilitate further analysis and visualization of the bibliometric data, the collected records were imported into VOSviewer, a specialized software tool for constructing and visualizing bibliometric networks. This step enabled a comprehensive exploration of co-authorship patterns, keyword co-occurrences, and citation linkages, which formed the basis for identifying research clusters and thematic developments within the field of smart tourism technologies.

2.1.2. Growth in the Number of Published Papers and Citations

An analysis of publication trends related to smart tourism technologies from 1999 to February 2025 provides a comprehensive overview of the research landscape, revealing a total of 2,427 published works. This growth underscores the increasing academic interest in smart tourism technologies across multiple disciplines. Between 1999 and 2014, the field remained relatively underexplored, with only a small number of publications recorded. By 2014, the total number of publications had reached just 24, and the volume of research fluctuated in the subsequent years. However, since 2015, there has been a noticeable surge in scholarly attention, culminating in a peak of 184 publications in 2022.

This upward trajectory indicates not only the expanding scope of research but also the deepening engagement of academic communities with smart tourism technologies and their associated domains. The rapid increase in scholarly output reflects the relevance of the topic in the context of digital transformation, technological innovation, and the evolving expectations of modern travelers. Given this momentum, it is expected that research on smart tourism technologies will continue to gain traction, particularly as the topic intersects with a wide range of industries and societal shifts.

In terms of citations, the 2,427 publications identified between 1999 and February 2025 have collectively accumulated over 15,393 citations, including self-citations. Citation patterns reveal a consistent upward trend, reflecting growing recognition of prior research in the field. During the initial period from 1999 to 2014, the total number of citations remained modest, with only 727 citations recorded over fifteen years. In contrast, the following decade witnessed a significant acceleration, with citations reaching 5,228 in 2023 and rising further to 6,143 in 2024.

This citation growth suggests that researchers are increasingly building upon existing literature to substantiate their arguments and situate their work within broader academic debates. The growing citation volume not only signifies intellectual engagement with foundational studies but also reinforces the status of smart tourism technologies as a dynamic and influential area of inquiry in contemporary tourism research.

*2.1.3. Country-Wise Publication Trend*

The analysis of country-level publication trends highlights the global relevance and widespread academic interest in the field of smart tourism technologies. The distribution of research output across countries reflects varying levels of engagement and illustrates the diversity of scholarly perspectives and contextual challenges in examining memorable tourism experiences and related technological applications. By identifying the most active contributors, this analysis offers insight into the geographic spread of research efforts and the collaborative dynamics that underpin the development of this academic domain.

The People's Republic of China leads in research productivity, contributing a total of 291 publications. This demonstrates the country's substantial commitment to exploring and advancing smart tourism technologies. Italy follows with 137 publications, reflecting consistent scholarly engagement, particularly in areas related to tourism innovation and digital transformation. Other prominent contributors include Spain with 128 publications, the United States with 88, South Korea with 82, and the United Kingdom with 67 publications. These figures indicate strong institutional and policy support for smart tourism research across both Western and Asian contexts.

In addition, several emerging economies and developing countries also show notable participation in this research domain. Malaysia, Portugal, India, and Taiwan contribute 58, 54, 53, and 49 publications respectively, highlighting growing interest in leveraging technology for tourism development. The presence of these countries in the dataset underscores the expanding global research community engaged in investigating smart tourism technologies and their implications.

Overall, the distribution of publications across countries suggests an increasingly interconnected research environment, where scholars from diverse geographic and cultural contexts collaborate to address the opportunities and challenges associated with technology-driven tourism experiences. This trend not only reinforces the global scope of smart tourism technologies but also points to the potential for cross-border knowledge sharing and innovation in shaping the future of the tourism industry.

*2.1.4. Co-Occurrence Analysis – Author keywords*

The co-occurrence analysis of author keywords was conducted to identify the major thematic areas and intellectual structure of research on smart tourism technologies. Using VOSviewer software, the study classified keywords into twelve distinct clusters based on their frequency and co-occurrence relationships, as visualized in Figure 1. This mapping provides a comprehensive overview of the research landscape and highlights the diversity of topics and interdisciplinary connections within the field. The findings reveal the following key clusters:

Cluster 1 (Red) represents research related to smart tourism experiences and tourist behavior. Keywords such as smart tourism technology, tourist satisfaction, perceived value, revisit intention, tourism experience, and customer engagement appear frequently. The focus is on how smart technologies enhance perceived service quality, emotional responses, and behavioral intentions [11, 12].

Cluster 2 (Green) focuses on smart cities, destination management, governance, and sustainability. It includes terms such as smart city, smart destination, urban planning, value co-creation, and destination management. These studies highlight the strategic and policy-level implications of smart tourism infrastructure and governance models [13, 14].

Cluster 3 (Yellow) emphasizes artificial intelligence and machine learning applications in tourism. Frequent keywords include recommender system, deep learning, sentiment analysis, machine learning, and neural networks. The studies explore personalization, user profiling, and predictive modeling to enhance service experiences [15, 16].

Cluster 4 (Blue) focuses on research methodology and technological frameworks, including big data, systematic literature review, internet of things, and topic modeling. It reflects the growing use of data-driven methods and bibliometric tools in tourism research [10, 17].

Cluster 5 (Light Blue) deals with immersive technologies and ubiquitous computing, such as augmented reality, virtual reality, smart space, and ubiquitous computing. The focus is on enhancing user immersion, presence, and interactive engagement in tourism experiences [18, 19].

Cluster 6 (Purple) Keywords in this cluster include sustainability, e-tourism, environment, and renewable energy. Research emphasizes sustainable development goals and the role of smart technologies in promoting responsible tourism behavior [20, 21].

Cluster 7 (Orange) relates to mobile applications, simulation, education, and tourism innovation. It highlights the importance of technological infrastructure in supporting knowledge dissemination and service design in tourism [22, 23].

Cluster 8 (Dark Green) addresses privacy, blockchain, security, and e-commerce. Keywords such as privacy, blockchain, place branding, and smart contract indicate a research emphasis on digital security, trust, and ethical concerns in the digital tourism environment [24, 25].

Cluster 9 (Gray) focuses on device use and tourist–technology interaction, with keywords including smartphone, smart hotel, customer satisfaction, and tourist behavior. The research explores how mobile technologies shape user perceptions and experiences.

Overall, the co-occurrence analysis of author keywords demonstrates the multidisciplinary nature of smart tourism technology research. The integration of topics such as artificial intelligence, sustainability, user behavior, and digital infrastructure indicates a maturing field with strong conceptual and practical relevance. Figure 1 provides a visual representation of the identified clusters and their interconnections.

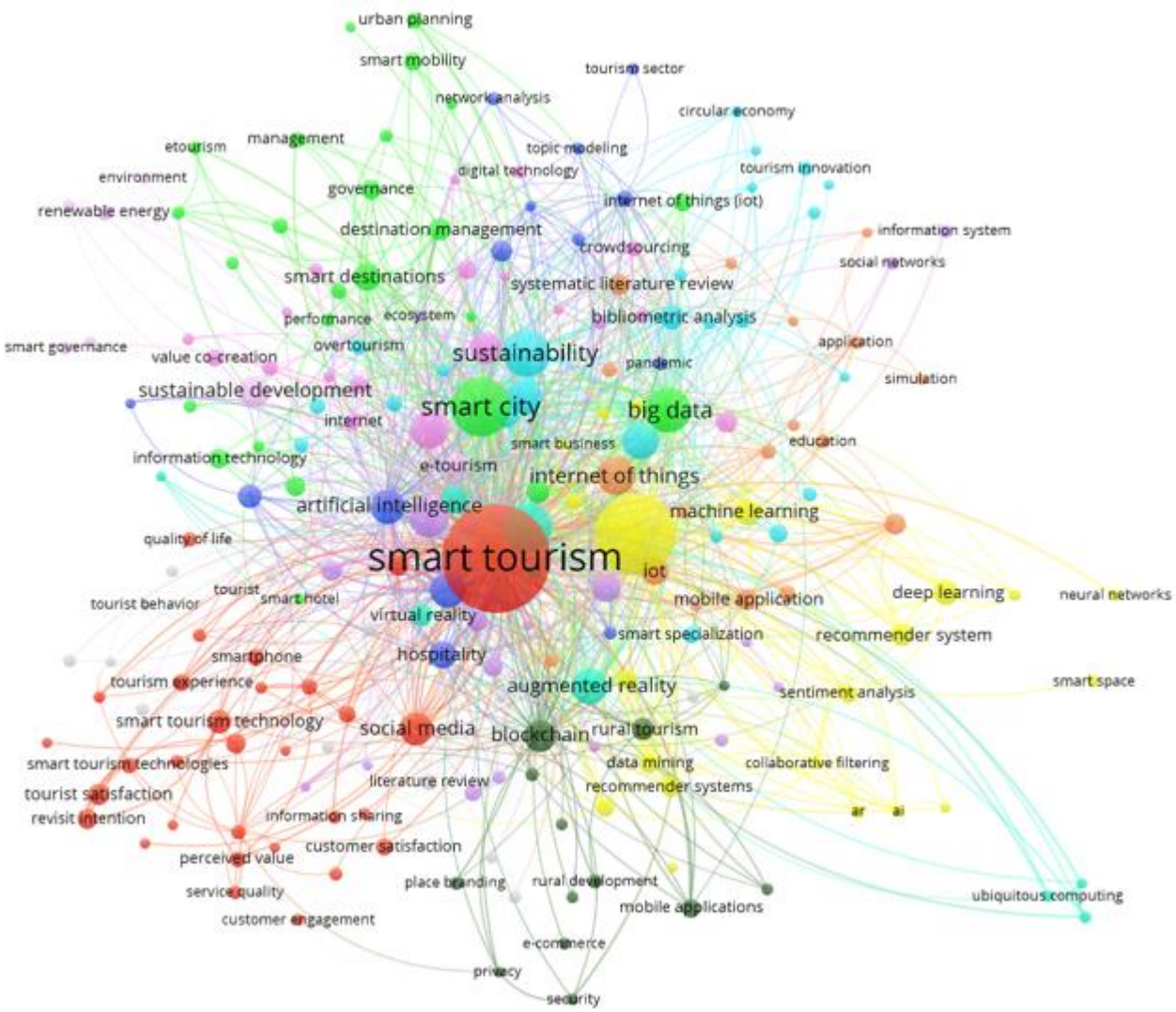


**Figure 1.**
Keyword co-occurrence results.

### *2.2. Theoretical Perspectives to Understand the Impact of Smart Tourism Technologies on Memorable Tourist Experiences*

To examine how smart tourism technologies (STTs) shape memorable tourist experiences (MTEs), this study adopts two complementary theoretical lenses: the Appraisal Theory of Emotion and the Social Exchange Theory. These perspectives provide a conceptual foundation for understanding both the internal emotional processes and the external social dynamics involved in tourists' interactions with smart tourism environments.

The Appraisal Theory of Emotion posits that emotional responses are driven not solely by external events, but by individuals' cognitive evaluations or appraisals of those events [26]. In the context of tourism, this theory suggests that

tourists' emotional arousal is influenced by their interpretation and assessment of various stimuli encountered during their travel experience, including technological interfaces, digital services, and interactive features at smart destinations.

Magda Arnold, one of the pioneers of appraisal theory, emphasized that different appraisals of the same event can elicit different emotional reactions, while similar appraisals often lead to consistent emotional outcomes [27]. This theoretical framework has been expanded by contemporary scholars who argue that emotions are adaptive responses to appraised events that are deemed personally relevant or goal congruent [28, 29]. For instance, a tourist's perception of artificial intelligence in a smart tourism setting may elicit feelings of excitement, curiosity, or even anxiety, depending on their prior experience, cultural background, and expectations.

Recent empirical work has also shown that emotional arousal serves as a critical moderator in the relationship between technological features and memorable experiences [30]. Specifically, tourists who appraise smart technologies as useful, reliable, or entertaining are more likely to experience heightened emotional engagement, thereby enhancing the memorability of the tourism encounter. This framework offers valuable insight into the psychological mechanisms through which STTs affect experience quality and long term memory formation.

In parallel, the Social Exchange Theory offers a sociological perspective that explains how interactions among stakeholders including tourists, service providers, and local communities are shaped by perceptions of reciprocal benefits and costs [31, 32]. According to SET, individuals engage in social exchanges with the intention of maximizing personal benefits while minimizing associated costs. These exchanges are influenced by values, expectations, and perceived fairness, making the theory highly relevant for tourism studies.

In the smart tourism context, SET helps explain how tourists evaluate their engagement with smart services, local infrastructure, and community support systems. When tourists perceive that the use of smart technologies leads to improved efficiency, personalization, or enjoyment, they are more likely to feel satisfied and reciprocate with positive behaviors such as revisiting, recommending, or sharing their experiences [33]. Conversely, if the perceived costs outweigh the benefits such as privacy concerns or system complexity, tourists may withdraw from engagement.

SET has also been widely applied to explore host community attitudes toward tourism development. For example, Ward and Berno [34] and Bimonte and Punzo [35] emphasize that residents' willingness to support tourism depends on their evaluation of tourism's social, economic, and environmental impacts. This theoretical framing also applies to tourists, who assess whether their investment of time, money, and attention is reciprocated by meaningful experiences facilitated by smart technologies.

Together, the Appraisal Theory of Emotion and Social Exchange Theory provide a holistic understanding of how both emotional and rational evaluations shape the outcomes of smart tourism experiences. By integrating these perspectives, the study captures the dynamic interplay between individual emotion and social interaction in the formation of memorable and meaningful tourism experiences.

### *2.3. Hypothesis Development*

#### *2.3.1. Proximal Outcomes of Smart Tourism Technologies*

Smart tourism technologies (STTs) are widely recognized as essential tools for enhancing memorable tourist experiences in the digital age. By offering real time information, streamlining service processes, and enabling greater interaction between tourists and destinations, STTs contribute significantly to experience quality and satisfaction [36]. These technologies not only optimize travel logistics but also foster deeper emotional and cognitive engagement, allowing tourists to form meaningful connections with destinations.

From a behavioral perspective, the perceived usefulness of STTs plays a pivotal role in shaping how tourists explore, evaluate, and remember their travel experiences. Torabi, et al. [4] emphasize that tourists increasingly rely on digital tools to search for attractions, compare alternatives, and plan activities that align with their interests. This behavior is often linked to stronger memory formation, as personalized and context aware interactions support vivid and emotionally salient experiences.

In line with this, Afzal, et al. [37] argue that memorable tourist experiences mediated by smart technologies enhance not only satisfaction and loyalty but also destination image and long term engagement. As tourists interact with digital guides, review platforms, and location based services, they experience greater autonomy and emotional resonance, which contributes to more enduring destination relationships.

Moreover, Oluyinka, et al. [38] demonstrate that the use of STTs at tourist sites improves both the immediacy of satisfaction and downstream behavioral outcomes such as intention to revisit. Their findings confirm that the integration of technology into destination services is not only functional but also experiential in nature, impacting memory, behavior, and tourist decision making.

Jeong and Shin [6] further highlight the experiential value of technologies such as mobile navigation tools, city guide apps, mobile payments, and real time transit platforms. These tools simplify travel logistics, reduce uncertainty, and allow tourists to better engage with their environment, ultimately reinforcing the emotional and cognitive dimensions of memorable tourism experiences.

Collectively, prior research suggests that different dimensions of STTs contribute in distinct ways to tourists' perceived experience quality. These dimensions include informativeness, accessibility, interactivity, personalization, and security. Based on this literature, the following hypotheses are proposed:

*$H_1$: The informativeness of smart tourism technologies positively influences memorable tourist experiences.*

*$H_2$: The accessibility of smart tourism technologies positively influences memorable tourist experiences.*

*$H_3$: The interactivity of smart tourism technologies positively influences memorable tourist experiences.*

*$H_4$: The personalization of smart tourism technologies positively influences memorable tourist experiences.*
*$H_5$: The security of smart tourism technologies positively influences memorable tourist experiences.*

*2.3.2. The Moderating Role of Emotional Arousal Levels*

Emotional arousal has been widely acknowledged in tourism literature as a key psychological factor influencing how tourists process and respond to experiential stimuli. In the context of smart tourism, arousal levels are considered particularly relevant due to the immersive and interactive nature of technology mediated experiences.

Wang, et al. [39] noted that arousal plays a mediating role between environmental stimuli and tourist experience outcomes. When tourists engage in destination activities at moderate arousal levels, they tend to be more emotionally involved and derive greater enjoyment, which enhances their ability to form memorable tourist experiences. Thus, arousal serves as an essential internal mechanism that regulates how environmental cues are translated into experiential outcomes.

Building on this foundation, Chen, et al. [30] emphasized that emotional arousal levels can also function as a moderator between smart tourism technologies and tourists' experiential responses. Their findings suggest that different levels of arousal generate different emotional and behavioral patterns, which in turn affect how tourists evaluate and remember their travel experiences. High arousal interactions with AI based tourism services, such as receiving instant support or personalized suggestions, are perceived as more engaging and emotionally meaningful.

Oh, et al. [40] define arousal as the intensity of physiological responses to stimuli, ranging from calmness to excitement. In tourism, arousal is not only a reflection of emotional state but also an indicator of the sensory and cognitive intensity of the experience. High levels of arousal may enhance focus, memory encoding, and affective connection, while low arousal may result in passive or less memorable experiences.

Huang and Bu [41] further demonstrated that memorable tourist experiences positively influence both recommendation and revisit intentions through the sequential mediating effect of emotional arousal and memory. This highlights the importance of considering arousal not just as an outcome but as a dynamic factor shaping how tourists respond to various dimensions of smart tourism technologies.

Based on these theoretical insights, the study proposes the following hypotheses regarding the moderating role of emotional arousal in the relationship between the key attributes of STTs and memorable tourist experiences:

*H6: Tourists' emotional arousal level moderates the relationship between informativeness and memorable tourist experiences.*

*H7: Tourists' emotional arousal level moderates the relationship between accessibility and memorable tourist experiences.*

*H8: Tourists' emotional arousal level moderates the relationship between interactivity and memorable tourist experiences.*

*H9: Tourists' emotional arousal level moderates the relationship between personalization and memorable tourist experiences.*

*H10: Tourists' emotional arousal level moderates the relationship between security and memorable tourist experiences.*

Based on the summary of the previous literature review, the research model is presented as follows Figure 2:

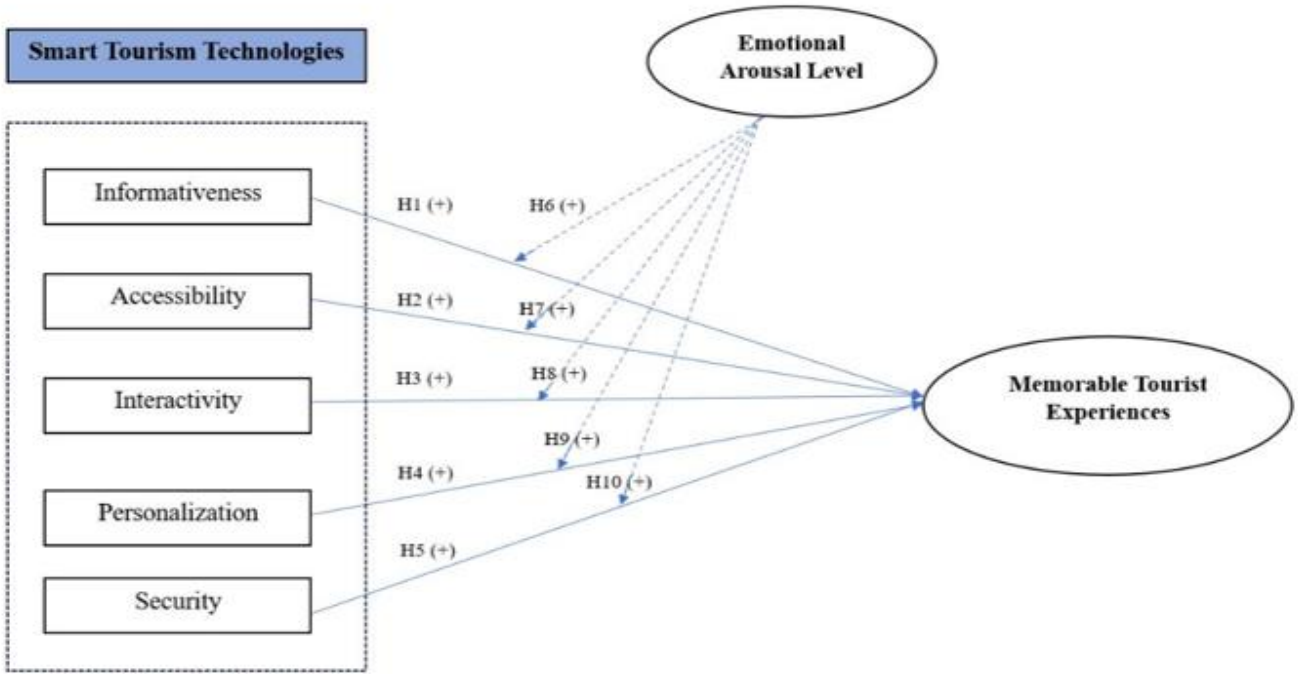


**Figure 2.**
Research model.

## 3. Methodology

### *3.1. Sample Description*

This study begins with a comprehensive review of the literature on smart tourism technology. Based on a clear theoretical analysis, 10 research hypotheses were developed to test the relationships between the variables in the proposed model. The study was then conducted in two phases to assess the reliability of the measurement instrument and determine the proposed model.

Pre-testing at the initial stage is essential to ensure the clarity of the questionnaire. At the same time, to determine whether any adjustments are needed before conducting the official survey. A pilot test was conducted with 50 respondents who were tourists in Ho Chi Minh City. The results showed that all participants had a good understanding of the questionnaire. In addition, a principal component analysis (PCA) was conducted, and the results showed that all measurement items converged well on their respective factors. The Cronbach's alpha coefficients for the scales in the research model ranged from moderate to high reliability, namely: 0.79 for Informativeness, 0.81 for Accessibility, 0.77 for Interactivity, 0.83 for Personalization, 0.85 for Security, 0.76 for Memorable Tourist Experience, and 0.73 for Emotional Arousal Level. These values exceeded the recommended minimum threshold of 0.70 [3, 42] indicating good internal consistency of the scales. Therefore, the questionnaire was used for formal data collection without any further adjustments.

In the next stage, a sampling plan was conducted to ensure that appropriate groups of respondents were included in the study. This study specifically focused on experienced travelers who use smart tourism technologies (e.g., apps, websites, virtual reality experiences, chatbots, e-wallets for payment, QR codes, etc.) to enhance their travel experiences in Ho Chi Minh City. A convenience sampling method was used. The survey was conducted through both face-to-face (printed questionnaire) and online (Google Form) formats. A total of 530 responses were distributed, with 485 valid responses. Data collection was conducted from March to April 2025.

### *3.2. Measures*

To ensure conceptual clarity and measurement validity, this study was selected based on a thorough review and synthesis of prior validated instruments. The research model includes seven core constructs, each measured using scales established from previous studies. The constructs of the study include: Informativeness (3 items) adapted from Jeong and Shin [6] Accessibility (5 items), Interactivity (items), Personalization (4 items), and Security (5 items) borrowed from Pai, et al. [43]. Memorable tourist experience (3 items) adapted from Torabi, et al. [4] and Emotional arousal (3 items) borrowed from Güzel, et al. [44].

### *3.3. Method of Analysis*

SPSS version 28 was used to conduct data quality checks and show descriptive statistical analyses. SmartPLS 4 software was used to judge the measurement model and test the research hypotheses. In this study, partial least squares about structural equation modeling (PLS-SEM) was used over covariance-based structural equation modeling (CB-SEM) for several key reasons. First, PLS-SEM mentions greater statistical power when handling comparable sample sizes [45]. Additionally, PLS-SEM is more effective for tiny sample sizes, which is common in organization about behavior or social psychology research [46]. This method also does not suggest the data to see strict normality assumptions [47] thus improve its reliability when dealing with data sets with skewed distributions. Finally, considering the exploratory nature of the current study, the use of PLS-SEM was considered more highly recommended than CB-SEM [48].

### *3.4. Common Method Bias Control*

To address potential problems with typical method bias, CMB all kinds of diagnostic procedures were used in the study. First, an exploratory factor analysis was done using the Harman single-factor test for all measurement items. The results showed that a single factor did not explain the majority of the variance, suggesting that CMB was not a serious issue in this dataset.

Also, a complete collinearity test was done using the VIF values. All VIF values were under the conservative limit of 3.3 proposed by Kock [49]. This once more proved that multicollinearity and common method bias were not problems in the model. It was also seen in the appraisal of the measurement model that the average variance extracted values for the two latent constructs, alpha and beta, were below the acceptable threshold of 0.5 [50].

This shows inadequate convergent validity and implies that these constructs did not manage to explain more than 50% of the variance of their indicators. While Cronbach's Alpha and Composite Reliability yield acceptable values, low AVE values reflect poor internal consistency of the underlying measurement itself. Therefore, after recommendations by Hair, et al. [46] the Alpha as well as Beta constructs were dispensed from the final model in aid of ensuring robustness and validity for the measurement framework.

In short, results from both Harman's single-factor test and full collinearity checks indicate that common method bias has little impact. Also, fine-tuning the measurement model by removing low-performing constructs boosts the study's validity and reliability.

## 4. Empirical Results

### *4.1. Descriptive Statistics*

The characteristics of the respondents are presented in Table 1. The majority were female (50.1%), aged 18 to 30 (66.4%), and most had a university degree (45.4%). In terms of monthly income, the highest response rate was from those earning less than 10 million VND (51.1%). The majority of respondents reported having part-time jobs (33.8%). In terms

of exposure to smart travel technology, the highest response rate was from those exposed to it for less than a year (30.7%). In addition, the highest annual travel frequency was 1-2 times/year (42.9%).

**Table 1.**
Profile of respondents (N=485).

| Characteristics | | N | Percent |
|---|---|---|---|
| Gender | Male | 192 | 39.6 |
| | Female | 243 | 50.1 |
| | Other | 50 | 10.3 |
| Age | 18 - 30 | 322 | 66.4 |
| | 31 - 40 | 99 | 20.4 |
| | 41 - 50 | 51 | 10.5 |
| | 51 and older | 13 | 2.7 |
| Education Level | High school | 123 | 25.4 |
| | College/Academy | 83 | 17.1 |
| | University | 220 | 45.4 |
| | Postgraduate | 59 | 12.2 |
| Monthly Income | Under 10 million | 248 | 51.1 |
| | 10 million – 20 million | 115 | 23.7 |
| | 20 million – 30 million | 83 | 17.1 |
| | Over 30 million | 39 | 8.0 |
| Employment Status | Full-time employment | 140 | 28.9 |
| | Part-time employment | 164 | 33.8 |
| | Unemployed | 65 | 13.4 |
| | Retired | 14 | 2.9 |
| | Freelance | 102 | 21.0 |
| Duration of Smart Tourism Technology Usage | Less than 1 year | 149 | 30.7 |
| | 1-2 years | 128 | 26.4 |
| | 3-4 years | 84 | 17.3 |
| | More than 4 years | 124 | 25.6 |
| Average Number of Trips per Year | 1-2 times | 208 | 42.9 |
| | 3-4 times | 110 | 22.7 |
| | More than 4 times | 167 | 34.4 |
| Purpose of the Trip | Business | 186 | 29.2% |
| | Leisure travel | 248 | 38.9% |
| | Business and leisure combined | 193 | 30.3% |
| | Other | 10 | 1.6% |
| Smart Devices Used at the Destination | Smartphone | 355 | 47.3% |
| | Tablet | 161 | 21.4% |
| | Camera | 124 | 16.5% |
| | Apple Watch | 111 | 14.8% |
| Stage of Smart Tourism Technology Usage | Before the trip | 249 | 32.0% |
| | During the planning phase | 261 | 33.5% |
| | While traveling | 269 | 34.5% |

Regarding the purpose of the trip, the majority of responses were for leisure travel (38.9%). Notably, there were 10 responses categorized as "Other," which referred to purposes such as studying, visiting relatives, relocating, seeking medical treatment, and attending events. Most respondents used smartphones as their primary device at the destination (47.3%), followed by tablets (21.4%), cameras (16.5%), and Apple Watches (14.8%). Lastly, approaching about the phase during which they used smart tourism technology the most was while traveling (34.5%), followed by during the planning phase (33.5%), and before the trip (32%).

*4.3. Assessment of the Measurement Model*

In terms of Cronbach's Alpha, the items in this study showed acceptable reliability, with all Cronbach's Alpha values exceeding 0.7 [51]. The correlation coefficient is also considered a measure of the extent to which the value of one variable is related to the value of another variable. For example, if the correlation coefficient is 0.5, it means that one variable moves in the same direction with half the magnitude of the movement of the other variable [47]. The detailed results are shown in Table 2 as follows:

The Accessibility scale measures aspects related to smart tourism technology, based on the framework of Pai, et al. [43] with 5 items. A Cronbach's Alpha of 0.935 indicates good stability of the measurement items. The CR and Rho-a values are 0.942 and 0.953, both exceeding the required threshold of 0.7, confirming its excellent reliability. Additionally, the AVE value of 0.836 exceeds the minimum threshold of 0.5, indicating strong convergent validity. However, one item,

"When visiting Ho Chi Minh City, I can look up information without complicated registration procedures on tourism websites" has a relatively low loading (0.563), which may require further consideration. Nevertheless, the other items have high loadings above 0.7, ensuring the overall reliability of the construct.

The Emotional Arousal construct, based on the framework of Torabi, et al. [4] has a total of 3 items. It shows high reliability with Cronbach's Alpha of 0.912, demonstrating high stability. The CR value of 1.258 and AVE of 0.832 show that excellent measurement stability and suitable convergent. All measurement items illustrate high factor loadings, remarkably with the item "I feel enthusiastic" (0.966), do mention that the strong emotional arousal is made by smart tourism technology. All factor loadings exceed the suggest threshold of 0.7, making sure the validity and reliability of the construct.

The Informativeness scale depends on the framework of Jeong and Shin [6] with only 3 items. It does mention high reliability, showing Cronbach's Alpha of 0.902 and CR of 0.904. The AVE value of 0.836 recommends excellent convergent reliability. Most items show high factor loadings, especially the item "Smart tourism technology provides useful information about Ho Chi Minh City" (0.929), showing that smart tourism technology in Ho Chi Minh City brings useful data that is suitable for tourists' demand. The high factor loadings of all measurement items further a strong the reliability and validity of the Informativeness construct with the model.

The move to the Interactivity construct, based on the framework of Pai, et al. [43] has 4 items. With a Cronbach's Alpha of 0.932 and a CR of 0.937, it shows high reliability. The AVE value of 0.829 approve strong convergent validity. All item loadings exceed 0.7, showing the strong interactivity of smart tourism technology in Ho Chi Minh City. Items such as "high response speed" (0.918) and "high interactivity" (0.923) demonstrate the effect of technology in tourists' interactive needs.

The Memorable Tourism Experience construct, borrowed from the framework of Torabi, et al. [4] has of 3 items. It has an extent Cronbach's Alpha of 0.919 and a CR of 0.921, do mention excellent reliability. The AVE value is 0.861, exceeding the threshold of 0.5, indicating very high convergent validity. All item loadings exceed 0.7, with a question "Smart tourism technologies provide me with memorable experiences" (0.935) becoming same the prominent, indicating that smart tourism technologies have strong support to creating memorable experiences for tourists.

The Personalization construct, depend on the framework of Pai, et al. [43] with 3 items in total. It has a Cronbach's Alpha of 0.915 and a CR of 0.926, indicating very good reliability. The AVE is 0.854, ensuring high convergent validity. However, the item "When visiting Ho Chi Minh City, smart tourism technology provides me with easy-to-use directions and information" has a low loading (0.475), which may need to be reconsidered in the model. However, the remaining items, such as "When visiting Ho Chi Minh City, smart tourism technology offers travel information that aligns with my needs" (0.907), still maintain the overall validity and reliability of the construct.

The Security construct, based on the framework of Pai, et al. [43] includes 5 items. It shows excellent stability and reliability, with a Cronbach's Alpha of 0.933 and a CR of 0.952. The AVE of 0.830 surpasses the required threshold, demonstrating good convergent validity. Although the loadings for most items are high, the item "When using smart tourism technology, my personal information could be accessed and misused by malicious individuals while conducting transactions" has a low loading (0.655), which may require adjustment in the model.

**Table 2.**
Construct reliability and validity.

| Constructs | Items | Loading | Alpha | CR | Rho | AVE |
|---|---|---|---|---|---|---|
| Accessibility | | | 0.935 | 0.942 | 0.953 | 0.836 |
| | A1. When I arrive in Ho Chi Minh City, I can use smart tourism technology anytime, anywhere. | 0.873 | | | | |
| | A2. When I arrive in Ho Chi Minh City, I can easily use smart tourism technology. | 0.891 | | | | |
| | A3. When I arrive in Ho Chi Minh City, I can easily find smart tourism technology. | 0.894 | | | | |
| | A4. When I arrive in Ho Chi Minh City, I can look up information without needing a complicated registration process on the tourism website. | 0.563 | | | | |
| | A5. When I arrive in Ho Chi Minh City, I can easily access smart tourism technology from various related websites. | 0.880 | | | | |
| Emotional Arousal Level | | | 0.912 | 1.258 | 0.937 | 0.832 |
| | E1. I feel excited. | 0.863 | | | | |
| | E2. I feel enthusiastic. | 0.966 | | | | |
| | E3. I feel active. | 0.904 | | | | |
| Informativeness | | | 0.902 | 0.904 | 0.938 | 0.836 |
| | IF1. Smart tourism technology provides useful | 0.929 | | | | |

| | | | | | | |
|---|---|---|---|---|---|---|
| | information about Ho Chi Minh City. | | | | | |
| | IF2. Smart technology helps me with sightseeing in Ho Chi Minh City. | 0.920 | | | | |
| | IF3. Using smart technologies in Ho Chi Minh City has helped me have a complete trip. | 0.893 | | | | |
| Interactivity | | | 0.932 | 0.937 | 0.951 | 0.829 |
| | IT1. When I arrive in Ho Chi Minh City, I can find many questions and answers from other tourists on smart tourism technology. | 0.903 | | | | |
| | IT2. When I arrive in Ho Chi Minh City, the smart tourism technology I use has a high response speed. | 0.918 | | | | |
| | IT3. When I arrive in Ho Chi Minh City, the smart tourism technology I use is highly interactive. | 0.923 | | | | |
| | IT4. When I arrive in Ho Chi Minh City, I can easily share tourism information content on smart tourism technology. | 0.899 | | | | |
| Memorable Tourist Experiences | | | 0.919 | 0.921 | 0.949 | 0.861 |
| | M1. Smart tourism technologies provide me with memorable experiences. | 0.935 | | | | |
| | M2. Smart tourism technologies have created unique experiences that made my trip more enjoyable. | 0.934 | | | | |
| | M3. Smart tourism technologies offer many unforgettable experiences throughout my journey. | 0.915 | | | | |
| Personalization | | | 0.915 | 0.926 | 0.946 | 0.854 |
| | P1. When I arrive in Ho Chi Minh City, smart tourism technology allows me to receive information tailored to my personal needs. | 0.878 | | | | |
| | P2. When I arrive in Ho Chi Minh City, smart tourism technology provides me with directions and information easily. | 0.475 | | | | |
| | P3. When I arrive in Ho Chi Minh City, smart tourism technology provides tourism information that matches my needs. | 0.907 | | | | |
| | P4. When I arrive in Ho Chi Minh City, I can use smart tourism technology to receive information suited to my needs. | 0.881 | | | | |
| Security | | | 0.933 | 0.952 | 0.951 | 0.830 |
| | S1. When using smart tourism technology, I don't have to worry about my personal information being excessively collected. | 0.881 | | | | |
| | S2. When using smart tourism technology, I believe that my privacy is securely protected. | 0.891 | | | | |
| | S3. When using smart tourism technology, I am confident that my important information is kept secure. | 0.907 | | | | |
| | S4. When using smart tourism technology, my personal information could be accessed and misused by malicious parties during transactions. | 0.655 | | | | |
| | S5. Smart tourism technology provides an appropriate level of security to protect my personal information. | 0.888 | | | | |

For the measurement model analysis, the study used Fornell and Larcker's factor table, as well as the HTMT index. All the indices showed the discriminant quality of the scale.

**Table 3.**
Fornell-Larcker criterion and HTMT ratios.

| Constructs | A | E | IF | IT | M | P | S |
|---|---|---|---|---|---|---|---|
| Accessibility | **0.914** | 0.067 | 0.465 | 0.253 | 0.299 | 0.182 | 0.272 |
| Emotional Arousal Level | 0.063 | **0.912** | 0.174 | 0.162 | 0.074 | 0.145 | 0.080 |
| Informativeness | 0.427 | 0.157 | **0.914** | 0.367 | 0.431 | 0.353 | 0.469 |
| Interactivity | 0.239 | 0.159 | 0.340 | **0.911** | 0.489 | 0.227 | 0.350 |
| Memorable Tourist Experiences | 0.279 | 0.085 | 0.393 | 0.456 | **0.928** | 0.380 | 0.273 |
| Personalization | 0.167 | 0.135 | 0.318 | 0.213 | 0.352 | **0.924** | 0.336 |
| Security | 0.257 | 0.087 | 0.433 | 0.328 | 0.260 | 0.312 | **0.911** |

**Note:** The bold numbers in diagonal rows are the second level of the AVE index of the corresponding variables
* Below the diagonal elements are the discriminant validity.
Above the diagonal elements are the HTMT values.

*4.4. Assessment of the Structural Model and Hypothesis Testing*

The R-squared ($R^2$) statistic indicates how effectively a model forecasts the outcome of the dependent variable, with values ranging from 0 to 1. It is widely recognized as a standard criterion for assessing the quality of regression analyses across various scientific fields [52]. Moreover, $R^2$ is acknowledged as an important indicator of in-sample predictive power [53]. As presented in Table 4, all adjusted $R^2$ values exceeded 0.10, suggesting that the explained variance for each endogenous variable was adequate [54].

Furthermore, to evaluate the explanatory contribution of each exogenous variable in the model without being influenced by sample size (i.e., the strength of the relationships in the structural model), we calculated the $f^2$ effect size, which indicates the change in $R^2$ when an exogenous variable is excluded from the model. The $f^2$ values, as shown in Tables 5 and 6, ranged from 0.020 to 0.350, with all values greater than or equal to 0.020 (except for the $f^2$ values for hypotheses H5 and H10, which were not statistically significant), indicating small to medium effect sizes [55].

Finally, the $Q^2$ values for the dependent variables, root mean squared error (RMSE), and the linear regression benchmark model (LM benchmark) were computed to evaluate the predictive relevance (i.e., out-of-sample predictive power) of the structural model concerning the relevant dependent variables [56, 57]. All $Q^2$ values ranged from 0.000 to 0.613, with values greater than 0.000 (Table 4). Furthermore, most indicators in the PLS-SEM analysis exhibited lower RMSE values compared to the LM benchmark model, suggesting that the structural model achieved a medium level of predictive capability [56].

**Table 4.**
R square, adjusted R square, and Q square.

| Constructs | $R^2$ | Adjusted $R^2$ | Predictive relevance $Q^2$ |
|---|---|---|---|
| Accessibility | N/A | N/A | 0.000 |
| Emotional Arousal Level | N/A | N/A | 0.000 |
| Informativeness | N/A | N/A | 0.000 |
| Interactivity | N/A | N/A | 0.000 |
| Memorable Tourist Experiences | 0.738 | 0.732 | 0.613 |
| Personalization | N/A | N/A | 0.000 |
| Security | N/A | N/A | 0.000 |

*4.5. Test Results of Direct Relationships*

The standardized path coefficients, t-values, and statistical significance levels presented in Table 5 reveal several noteworthy findings. The path coefficient from the informativeness of Smart Tourism Technologies (STTs) to memorable tourist experiences was significant ($\beta = 0.236$, $t = 5.861$, $p < 0.001$), confirming Hypothesis H1. This result is consistent with the findings of Elshaer and Marzouk [36] and Oluyinka, et al. [38] who argued that the real-time provision of information empowers tourists to take control of their journeys and contributes to deepening their experiences.

Hypothesis H2, concerning accessibility, was also supported ($\beta = 0.081$, $t = 2.156$, $p < 0.05$), although the effect size was relatively modest. This finding indicates that easy access to smart applications and platforms can enhance tourist experiences—consistent with the argument of [6], but its influence appears limited compared to other factors such as interactivity and personalization.

Notably, interactivity emerged as the strongest predictor of memorable tourist experiences ($\beta = 0.348$, $t = 9.865$, $p < 0.001$), confirming Hypothesis H3. This finding is consistent with the findings of Afzal, et al. [37] who mention the role of interactive features in helping travel, compare places, and feel more connected to them. So, tourists can have personal and emotionally resonant experiences.

Hypothesis H4, with personalization, was supported with a vital path coefficient (β = 0.272, t = 6.978, p < 0.001). This result shows that the ability to design content and recommend to individual preferences is necessary to make memorable experiences, suitable with the views of Jeong and Shin [6].

In contrast, Hypothesis H5, it refers to security, was not supported (β = 0.012, t = 0.443, p > 0.1). This mentions that although security is a fundamental necessary factor of the technological experience, it does not directly affect to the creation of memorable tourist experiences. Contrary to initial expectations, this result implies that tourists may perceive security as a fundamental criterion, rather than a salient factor that enhances memory.

**Table 5.**
VIF and results for direct effects.

| Hypotheses | β | T-statistic | Result | $f^2$ | VIF |
|---|---|---|---|---|---|
| $H_{1.}$ Informativeness —> Memorable Tourist Experiences | 0.236 | 5.861*** | Supported | 0.129 | 1.643 |
| $H_{2.}$ Accessibility —> Memorable Tourist Experiences | 0.081 | 2.156** | Supported | 0.020 | 1.264 |
| $H_{3.}$ Interactivity —> Memorable Tourist Experiences | 0.348 | 9.865*** | Supported | 0.350 | 1.322 |
| $H_{4.}$ Personalization —> Memorable Tourist Experiences | 0.272 | 6.978*** | Supported | 0.233 | 1.205 |
| $H_{5.}$ Security —> Memorable Tourist Experiences | 0.012 | 0.443 | Not Supported | 0.000 | 1.399 |

**Note:** *p < 0.10; **p < 0.05; ***p < 0.01.

*4.6. Moderating Effect Testing*

As shown in Table 6, the moderating role of emotional arousal level showed remarkable results. Hypothesis H6, which stated that emotional arousal level moderates the relationship between informativeness and memorable tourist experiences, was confirmed (β = 0.252, t = 3.892, p < 0.01). This result suggests that tourists with higher levels of emotional arousal will be more likely to convert information provided by Smart Tourism Technologies (STTs) into memorable experiences. This is consistent with the argument of Wang, et al. [39] who emphasized that moderate levels of arousal help tourists respond more positively to environmental stimuli.

Similarly, Hypothesis H7 was confirmed (β = 0.106, t = 2.140, p < 0.05), indicating that the level of emotional arousal has a positive moderating effect on the relationship between accessibility and memorable tourist experiences. Although the effect size is relatively modest, this result indicates that the ease of access to smart platforms becomes more important when tourists are in a high emotional state. This is consistent with the study by Oh, et al. [40] who described emotional arousal as a factor that enhances sensory and emotional experiences in the tourism context.

Next, the results also confirmed Hypothesis H8 (β = 0.245, t = 3.688, p < 0.01), indicating that the effect of interactivity on memorable tourist experiences is enhanced by higher levels of emotional arousal. This result highlights that tourists with high levels of emotional engagement are more likely to make the most of the interactive features of STT, as Chen, et al. [30] pointed out. These interactions promote deeper exploration to connect with the destination, thus enhancing memorability.

Accordingly, Hypothesis H9 was also confirmed (β = 0.226, t = 3.569, p < 0.01), indicating that the level of emotional arousal significantly increases the relationship between personalization and memorable tourist experiences. It shows that the positive impact of personalized content and recommendations on tourists is influenced when they are in an emotionally aroused state. This supports the views of Huang and Bu [41], who suggested that positive emotional arousal enhances memory and behavioral outcomes.

In contrast, Hypothesis H10 was not confirmed (β = -0.037, t = 1.058, p > 0.10), indicating that emotional arousal did not have a significant moderating effect on the relationship between security and memorable tourist experiences. This suggests that, regardless of emotional state, tourists may perceive security as a basic requirement rather than an emotional factor that enhances the memorability of the experience.

Overall, these results highlight the subtle role of emotional arousal in shaping how different technological attributes influence tourists' experiences. They also highlight the importance of designing smart tourism environments that are highly emotionally arousing to enhance the effectiveness of STTs in creating memorable travel moments.

**Table 6.**
Results for moderating effects.

| Hypotheses | β | T-statistic | Result | $f^2$ | VIF |
|---|---|---|---|---|---|
| $H_{6.}$ Informativeness*Emotional Arousal Level —> Memorable Tourist Experiences | 0.252 | 3.892*** | Supported | 0.159 | 2.495 |
| $H_{7.}$ Accessibility*Emotional Arousal Level —> Memorable Tourist Experiences | 0.106 | 2.140** | Supported | 0.035 | 1.612 |
| $H_{8.}$ Interactivity*Emotional Arousal Level —> Memorable Tourist Experiences | 0.245 | 3.688*** | Supported | 0.252 | 1.192 |
| $H_{9.}$ Personalization*Emotional Arousal Level —> Memorable Tourist Experiences | 0.226 | 3.569*** | Supported | 0.180 | 1.258 |
| $H_{10.}$ Security*Emotional Arousal Level —> Memorable Tourist Experiences | -0.037 | 1.058 | Not Supported | 0.004 | 2.066 |

**Note:** *p < 0.10; **p < 0.05; ***p < 0.01.

## 5. Discussion and Conclusion

### *5.1. Findings*

This study examined the impact of Smart Tourism Technologies (STTs), including informativeness, accessibility, interactivity, personalization, and security, on memorable tourism experiences (MTEs) in Ho Chi Minh City, and analyzed the moderating role of emotional arousal in these relationships. Drawing on the Emotion Appraisal Theory, the study provides empirical evidence on the psychological and technological mechanisms that contribute to the formation of memorable experiences in the context of a smart urban destination.

The analysis revealed that all STTs dimensions, except security, had positive and statistically significant impacts on memorable tourism experiences. Notably, interactivity appears like the strongest predictor of such experiences ($\beta = 0.348$). In contrast, the security size did not show a significant impact, suggesting that *tourists may simply see it a require normal rather than a value that added a feature to their travel experience*.

Importantly, the results checked the moderating role of emotional arousal level. Specifically, when emotional arousal level with high extent, informativeness ($\beta = 0.252$), accessibility, interactivity, and personalization of memorable experiences are amplified. This supports the point that tourists' emotional states play a vital role in the process and can responding to technological features, and helping shape their overall experience [39].

Academically, this study contributes to the ever-rising body of knowledge on the effect of STTs in the context of smart destinations. The study is clear that the role of emotional factors depends on the appraisal theory framework. In practical terms, the findings suggest that place managers and technology development should prioritize interactivity and personalization features in STT design, and see tourists' emotional state as an important factor in optimizing the effectiveness of technology in improving tourist experiences.

### *5.2. Implications*

This paper has contributed to both theoretical and practical implication. Theoretically, this study tries to examine how Smart Tourism Technologies (STTs) affect tourists' Memorable Tourism Experience (MTE) in Ho Chi Minh City. The study does mention that STTs directly influence tourists' memorable experience and checks how Emotional Arousal Level (EAL) moderates this relationship.

The findings show that STTs significantly improve MTE by raising the quality of tourism experience, bringing real-time information, optimizing processes, and improving interactions between tourists and destinations [37]. This integrates the Emotion Appraisal Theory [28] which is suitable for enriching the literature on this topic in Ho Chi Minh City.

Lastly, the study knows Emotional Arousal Level (EAL) as a moderator in the relationship between STTs and MTE, do mention about the role of moderate emotional arousal level to helping tourists create memorable experiences, especially when different levels of arousal influence tourists' emotions and behaviors, leading to change travel experiences [40].

Regarding practical implications, this study brings important recommendations for tourism organizations when they use smart tourism technology to create memorable experiences and effectively stimulate tourists' emotions.

To start, travel organizations should focus on the development and maintenance of smart technology activities to help improve the tourist experience. This needs organizations to use more updated technologies, such as mobile applications, IoT, and blockchain systems, to bring real-time information, personalized services, and solutions to ensure that tourists can access and easily explore destinations.

Second, the development of interaction and personalization in tourism experiences is a key factor in helping tourists feel more attached and engaged with the destination. Tourism organizations must invest in technology applications and AI gamification to improve interaction, thereby improving satisfaction, but also creating an innovative and interesting tourism environment to explore.

Finally, this study has emphasized the role of emotional arousal level in creating memorable tourism experiences. Tourism organizations should design activities and events such as cultural events, adventure activities or nature-based experiences to strongly stimulate tourist emotions, leave a lasting impression and remind them of the destination. Personalization of experiences should also be emphasized to meet the emotional needs of each tourist. In addition, tourism managers should train staff to set a condition for tourists, create a pleasant travel environment and stimulate positive emotions, thus encouraging tourists to return and share their experiences.

### *5.3. Limitations and Future Research*

Despite fulfilling its research objectives, this study still faces certain limitations that should be addressed in future investigations. First, the scope of the survey is limited to tourists in Ho Chi Minh City. Therefore, future studies may expand the geographical scope to Vietnam or other developing regions to increase the generalizability of the findings. In addition, the sample may be expanded to include other areas related to smart tourism, such as marketing innovation, process innovation, organizational innovation, service/product innovation, and overall travel satisfaction.

Second, this study focuses on four aspects of smart tourism technology—Informationality, Accessibility, Interactivity, and Personalization—as key predictors of Memorable Tourist Experiences (MTEs). Future studies may explore additional variables such as Co-creation and Privacy in the context of smart tourism.

Third, this study examined the moderating role of Emotional Arousal Level (EAL) in the relationship between smart tourism technology and MTE. Future studies could consider incorporating individual-level factors such as year, region, or ICT readiness level (Information and Communication Technology) as potential boundary conditions in this relationship.

Fourth, the use of previously established measurement scales may introduce bias and may not fully capture cultural nuances or contextual differences. Hence, future studies could adopt in-depth interview methods to develop culturally adapted and context-specific questionnaires tailored to the research framework.

Lastly, instead of relying solely on self-reported data from tourists, future research could incorporate data from multiple sources, such as third-party intermediaries or both tourists and service providers, to enable more objective and robust assessments of memorable tourist experiences.

## References


[1] D. C. Ukpabi and H. Karjaluoto, "Consumers' acceptance of information and communications technology in tourism: A review," *Telematics and Informatics*, vol. 34, no. 5, pp. 618-644, 2017.

[2] B. H. Ye, H. Ye, and R. Law, "Systematic Review of smart tourism research," *Sustainability*, vol. 12, no. 8, p. 3401, 2020. https://doi.org/10.3390/su12083401

[3] M. Tavakol and R. Dennick, "Making sense of Cronbach's alpha," *International Journal of Medical Education*, vol. 2, pp. 53–55, 2011.

[4] Z.-A. Torabi, A. A. Shalbafian, Z. Allam, Z. Ghaderi, B. Murgante, and A. R. Khavarian-Garmsir, "Enhancing memorable experiences, tourist satisfaction, and revisit intention through smart tourism technologies," *Sustainability*, vol. 14, no. 5, p. 2721, 2022.

[5] L. R. Safitri and A. Abdurrahman, "The effect of smart tourism technologies, memorable tourism experiences, and tourist satisfactions on traveller loyalty (study on traveller users of the tiket. com app)," *Jurnal Pamator: Jurnal Ilmiah Universitas Trunojoyo*, vol. 16, no. 1, pp. 153-172, 2023.

[6] M. Jeong and H. H. Shin, "Tourists' experiences with smart tourism technology at smart destinations and their behavior intentions," *Journal of Travel Research*, vol. 59, no. 8, pp. 1464-1477, 2020. https://doi.org/10.1177/0047287519883034

[7] A. Huynh Diep Tram, G. Ha Nam Khanh, and L. Ho Thi Huong, *The impact of smart tourism ecosystem on tourists' return intention.* Vietnam: The Case of Ho Chi Minh City, 2024.

[8] T. D. Quang, N. M. Dang Vo, H. Van Nguyen, Q. X. Thi Nguyen, H. Ting, and T. Vo-Thanh, "Understanding tourists' experiences at war heritage sites in Ho Chi Minh city, Vietnam: A netnographic analysis of TripAdvisor reviews," *Leisure Studies*, vol. 43, no. 4, pp. 624-643, 2024.

[9] M. Tiwari, R. Pathak, and K. Kapoor, "Blockchain in smart tourism: balancing innovation and data security," *Information Systems Frontiers* vol. 26, no. 2, pp. 339–355, 2024.

[10] N. Donthu, S. Kumar, D. Mukherjee, N. Pandey, and W. M. Lim, "How to conduct a bibliometric analysis: An overview and guidelines," *Journal of Business Research*, vol. 133, pp. 285-296, 2021. https://doi.org/10.1016/j.jbusres.2021.04.070

[11] J.-H. Kim, J. B. Ritchie, and B. McCormick, "Development of a scale to measure memorable tourism experiences," *Journal of Travel Research*, vol. 51, no. 1, pp. 12-25, 2012.

[12] B. Neuhofer, D. Buhalis, and A. Ladkin, "Smart technologies for personalized experiences: A case study in the hospitality domain," *Electronic Markets*, vol. 25, no. 3, pp. 243-254, 2015. https://doi.org/10.1007/s12525-015-0182-1

[13] K. Boes, D. Buhalis, and A. Inversini, "Smart tourism destinations: ecosystems for tourism destination competitiveness," *International Journal of Tourism Cities*, vol. 2, no. 2, pp. 108-124, 2016.

[14] U. Gretzel, M. Sigala, Z. Xiang, and C. Koo, "Smart tourism: Foundations and developments," *Electronic Markets*, vol. 25, no. 3, pp. 179-188, 2015. https://doi.org/10.1007/s12525-015-0196-8

[15] I. P. Tussyadiah and D. Wang, "Tourists' attitudes toward proactive smartphone systems," *Journal of Travel Research*, vol. 55, no. 4, pp. 493-508, 2016.

[16] Z. Xiang, D. Wang, J. T. O'Leary, and D. R. Fesenmaier, "Adapting to the internet: Trends in travelers' use of the web for trip planning," *Journal of Travel Research*, vol. 54, no. 4, pp. 511-527, 2015.

[17] Y. Li, C. Hu, C. Huang, and L. Duan, "The concept of smart tourism in the context of tourism information services," *Tourism Management*, vol. 58, pp. 293-300, 2017. https://doi.org/10.1016/j.tourman.2016.03.014

[18] I. P. Tussyadiah, D. Wang, T. H. Jung, and M. C. Tom Dieck, "Virtual reality, presence, and attitude change: Empirical evidence from tourism," *Tourism Management*, vol. 66, pp. 140-154, 2018.

[19] D. I. D. Han, J. Weber, M. Bastiaansen, O. Mitas, and X. Lub, *Virtual and augmented reality technologies to enhance the visitor experience in cultural tourism in augmented reality and virtual reality: The power of AR and VR for business*. Cham: Springer International Publishing, 2019.

[20] X. Font and J. Lynes, "Corporate social responsibility in tourism and hospitality," vol. 26, ed: Taylor & Francis, 2018, pp. 1027-1042.

[21] F. Femenia-Serra, B. Neuhofer, and J. A. Ivars-Baidal, "Towards a smart tourism experience: The role of smart tourism technologies," *Sustainability*, vol. 11, no. 2, p. 646, 2019.

[22] S. Shafiee, A. R. Ghatari, A. Hasanzadeh, and S. Jahanyan, "Developing a model for sustainable smart tourism destinations: A systematic review," *Tourism Management Perspectives*, vol. 31, pp. 287-300, 2019.

[23] D. Buhalis and Y. Sinarta, "Real-time co-creation and nowness service: lessons from tourism and hospitality," *Journal of Travel & Tourism Marketing*, vol. 36, no. 5, pp. 563-582, 2019.

[24] V. Tiwari, A. Mishra, and S. Tiwari, "Role of data safety and perceived privacy for acceptance of IoT-enabled technologies at smart tourism destinations," *Current Issues in Tourism*, vol. 27, no. 19, pp. 3079-3094, 2024.

[25] C. Koo, S. Shin, and U. Gretzel, "Privacy concerns in smart tourism: A privacy calculus perspective," *Tourism Management*, vol. 89, p. 104440, 2022.

[26] I. J. Roseman and C. A. Smith, *Appraisal theory. In K. R. Scherer, A. Schorr, & T. Johnstone (Eds.), Appraisal processes in emotion: Theory, methods, research*. New York: Oxford University Press, 2001.

[27] E. N. Rodkey, "Magda Arnold and the human person: A mid-century case study on the relationship between psychology and religion," Doctoral Dissertation York University, Toronto, Canada, 2015. https://yorkspace.library.yorku.ca/items/296bd4c7-fc7d-40a7-9e97-241ad2b96a0e

[28] A. Moors, P. C. Ellsworth, K. R. Scherer, and N. H. Frijda, "Appraisal theories of emotion: State of the art and future development," *Emotion Review*, vol. 5, no. 2, pp. 119-124, 2013. https://doi.org/10.1177/1754073912468165

[29] C. A. Smith, E. M. Tong, and P. C. Ellsworth, *The differentiation of positive emotional experience as viewed through the lens of appraisal theory. In M. M. Tugade, M. N. Shiota, & L. K. Kirby (Eds.), Handbook of positive emotions*. New York: Guilford Press, 2014.
[30] X. Chen, X. Luo, and J. Gao, "Exploring the impact of artificial intelligence technologies on tourists' smart experiences: The moderating role of emotional arousal level," *Asia Pacific Journal of Tourism Research*, vol. 30, no. 1, pp. 57-71, 2025.
[31] G. C. Homans, "Social behavior as exchange," *American Journal of Sociology*, vol. 63, no. 6, pp. 597-606, 1958.
[32] R. Nunkoo, "Toward a more comprehensive use of social exchange theory to study residents' attitudes to tourism," *Procedia Economics and Finance*, vol. 39, pp. 588-596, 2016. https://doi.org/10.1016/S2212-5671(16)30303-3
[33] S. C. H. Corrêa and M. d. S. Gosling, "Travelers' perception of smart tourism experiences in smart tourism destinations," *Tourism Planning & Development*, vol. 18, no. 4, pp. 415-434, 2021. https://doi.org/10.1080/21568316.2020.1798689
[34] C. Ward and T. Berno, "Beyond social exchange theory: Attitudes toward tourists," *Annals of Tourism Research*, vol. 38, no. 4, pp. 1556-1569, 2011.
[35] S. Bimonte and L. F. Punzo, "Tourist development and host–guest interaction: An economic exchange theory," *Annals of Tourism Research*, vol. 58, pp. 128-139, 2016.
[36] A. M. Elshaer and A. M. Marzouk, "Memorable tourist experiences: The role of smart tourism technologies and hotel innovations," *Tourism Recreation Research*, vol. 49, no. 3, pp. 445-457, 2024. https://doi.org/10.1080/02508281.2022.2027203
[37] I. Afzal, M. B. Majid, M. I. Tariq, and A. Nasir, "Investigating the impact of smart tourism technologies on tourist satisfaction, engagement & image and with the mediation of memorable tourist experience," *Pakistan Journal of Humanities and Social Sciences*, vol. 12, no. 1, pp. 164–177-164–177, 2024.
[38] S. A. Oluyinka, M. E. A. Ala, M. N. Cusipag, and R. L. Ferrer, "Original Research Article Experiences and intention to revisit destinations: Technology factors toward tourist satisfaction," *Journal of Autonomous Intelligence*, vol. 7, no. 5, 2024.
[39] J. Wang, C. Xie, Q. Huang, and A. M. Morrison, "Smart tourism destination experiences: The mediating impact of arousal levels," *Tourism Management Perspectives*, vol. 35, p. 100707, 2020.
[40] H. Oh, A. M. Fiore, and M. Jeoung, "Measuring experience economy concepts: Tourism applications," *Journal of Travel Research*, vol. 46, no. 2, pp. 119-132, 2007.
[41] R. Huang and H.-M. Bu, "Destination attributes of memorable chinese rural tourism experiences: Impact on positive arousal, memory and behavioral intention," *Psychology Research and Behavior Management*, pp. 3639-3661, 2022.
[42] J. C. Nunnally and I. H. Bernstein, *Psychometric theory*, 3rd ed. New York: McGraw-Hill, 1994.
[43] C.-K. Pai, Y. Liu, S. Kang, and A. Dai, "The role of perceived smart tourism technology experience for tourist satisfaction, happiness and revisit intention," *Sustainability*, vol. 12, no. 16, p. 6592, 2020.
[44] Ö. Güzel, I. Sahin, and C. Ryan, "Push-motivation-based emotional arousal: A research study in a coastal destination," *Journal of Destination Marketing & Management*, vol. 16, p. 100428, 2020.
[45] J. F. Hair, J. J. Risher, M. Sarstedt, and C. M. Ringle, "When to use and how to report the results of PLS-SEM," *European Business Review*, vol. 31, no. 1, pp. 2-24, 2019. https://doi.org/10.1108/EBR-11-2018-0203
[46] J. F. Hair, G. T. M. Hult, C. M. Ringle, and M. Sarstedt, *A primer on partial least squares structural equation modeling (PLS-SEM)*. Thousand Oaks, CA: Sage Publications, 2022.
[47] M. Sarstedt, C. M. Ringle, D. Smith, R. Reams, and J. F. Hair Jr, "Partial least squares structural equation modeling (PLS-SEM): A useful tool for family business researchers," *Journal of Family Business Strategy*, vol. 5, no. 1, pp. 105-115, 2014.
[48] E. E. Rigdon, "Choosing PLS path modeling as analytical method in European management research: A realist perspective," *European Management Journal*, vol. 34, no. 6, pp. 598-605, 2016. https://doi.org/10.1016/j.emj.2016.05.006
[49] N. Kock, "Common method bias in PLS-SEM: A full collinearity assessment approach," *International Journal of e-Collaboration*, vol. 11, no. 4, pp. 1-10, 2015.
[50] C. Fornell and D. F. Larcker, "Evaluating structural equation models with unobservable variables and measurement error," *Journal of Marketing Research*, vol. 18, no. 1, pp. 39-50, 1981.
[51] D. O. Francis *et al.*, "Voice-related patient-reported outcome measures: A systematic review of instrument development and validation," *Journal of Speech, Language, and Hearing Research*, vol. 60, no. 1, pp. 62-88, 2017.
[52] D. Chicco, M. J. Warrens, and G. Jurman, "The coefficient of determination R-squared is more informative than SMAPE, MAE, MAPE, MSE and RMSE in regression analysis evaluation," *Peerj Computer Science*, vol. 7, p. e623, 2021.
[53] T. Gneiting and J. Resin, "Regression diagnostics meets forecast evaluation: Conditional calibration, reliability diagrams, and coefficient of determination," *Electronic Journal of Statistics*, vol. 17, no. 2, pp. 3226-3286, 2023. https://doi.org/10.1214/23-EJS2180
[54] R. F. Falk and N. B. Miller, *A primer for soft modeling*. Akron, OH: The University of Akron Press, 1992.
[55] J. Cohen, *Statistical power analysis for the behavioral sciences*, 2nd ed. New York: Routledge, 2013.
[56] W. W. Chin, *How to write up and report PLS analyses. In V. Esposito Vinzi, W. W. Chin, J. Henseler, & H. Wang (Eds.), Handbook of partial least squares: Concepts, methods and applications*. Berlin, Germany: Springer, 2010. https://doi.org/10.1007/978-3-540-32827-8_29
[57] J. Henseler, C. M. Ringle, and M. Sarstedt, "A new criterion for assessing discriminant validity in variance-based structural equation modeling," *Journal of the Academy of Marketing Science*, vol. 43, no. 1, pp. 115-135, 2015.