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MEASURING TOURIST PREFERENCES AND BEHAVIOR TOWARD SMART TOURISM DESTINATION PLANNING

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Abstract

This research examines how tourists perceive and engage with technology and sustainability concepts, particularly in relation to their utilization of QR codes at tourist sites. The investigation conducted by the researchers explores four key factors hypothesized to influence tourists' preferences and behaviors regarding technology: a) habits, b) risks, c) sustainability attitude, and d) motivation. An online survey was completed by 316 participants, including both locals and foreign visitors to the KL QR Trail. The data was collected between January and March 2022 and analyzed using the SmartPLS 3.1.1 software. The findings reveal that tourists' habits and sustainability attitudes influence significantly on their satisfaction, while motivation and risks were found to be insignificant predictors. Furthermore, customer satisfaction was found to influence behavioral intention. These outcomes underscore the significance of tourists' established habits and sustainability commitments for the effective implementation of smart tourism initiatives. Additionally, this study contributes to the comprehension of technology acceptance model and its integration with sustainability attitudes, particularly as it pertains to the adoption of QR codes at tourist destinations.

Keywords: smart tourism, QR Code, destination, sustainability attitude, habit, risk, motivation, tourist behavior

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INTRODUCTION

Technology plays a vital role in the sustainable development of tourist destinations. The concept of "smart tourism" emphasizes the interconnection and interactive use of multiple technologies, which has been found to improve tourist satisfaction (Höjer & Wangel, 2014). In fact, research in this field is increasing, particularly regarding how technology impacts tourist behavior and experiences (Mior Shariffuddin et al., 2023). Tourists nowadays demand various smart technologies, including IoT devices, AR, VR, and QR codes (Hamid et al., 2023). Among these, QR codes have gained widespread use due to smartphone adoption and can store significant data, making them useful for information dissemination, payment, and even pandemic control (Vu, 2020). Furthermore, Azmadi et al. (2022) note the rising trend of QR code usage in tourism destinations.

Moreover, the notion of smart tourism destinations integrates technology and sustainability, promoting sustainable progress and aligning with the technology acceptance model, as supported by various scholars (Azinuddin et al., 2022a; 2022b; 2022c; Azwar et al., 2023). Recent literature also underscores the importance of sustainability principles and their practical implementation, integrating green IT, smart energy, and waste management into tourism development, with an emphasis on technology adoption and sustainability attitudes (El Archi et al., 2023). However, there remains a need for further research in these areas.

According to Ye et al. (2020), various theories are employed when studying the use of technology. The Unified Theory of Acceptance and Use of Technology (UTAUT2) is a popular theory with significant relevance in technology adoption research. UTAUT2 proposes that individuals' technology usage is influenced by three additional factors: hedonic motive, cost or perceived value, and habit. UTAUT2 has come to dominate the field of technological advances adoption. However, there is still room for further development by incorporating other relevant variables that may influence technology adoption.

In this research, the investigation revolves around the behavior of tourists concerning the implementation of QR codes at various destinations, specifically regarding technology and sustainability. The QR Code trail is designed to encourage tourists to scan QR codes in order to access specific information about the tourist spots they visit along the trail. The study was conducted at the KL QR trail, which is recognized as the pioneering tourist destination to adopt this trail. Figure 1 demonstrates the theoretical framework. The primary focus of this study centers on four factors: i) habits, ii) risk, iii) sustainability attitude, and iv) motivation, which are hypothesized to have an impact on tourist satisfaction and loyalty.

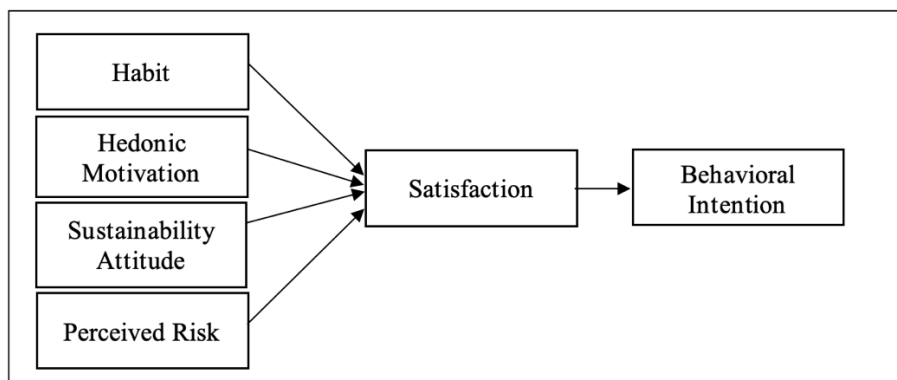


Figure 1: Theoretical Framework of the study

LITERATURE REVIEW

Adoption of QR codes in tourism

The QR code is an innovative advancement of the traditional barcode (Bi et al., 2008). The key attribute of the QR code system is its ability to authorize the retrieval of content from a website through a smartphone. To make this possible, the necessary web pages must be developed and integrated into a customized website (Emek, 2012). Emek's study (2012) examines the use of QR codes in various sectors of the tourism industry, including museums, galleries, accommodations, air travel, restaurants, bars, guided street tours, and open-air museums and shops. However, more research still needs to be done on the effectiveness, awareness, and customer satisfaction associated with using QR code technology. This contributes to the professional development of tourism destinations and technology integration and creates optimal conditions for tourists to access detailed information about destinations (Vu, 2020).

Theoretical Basis and hypothesis development

Venkatash et al. (2003) developed the Unified Theory of Acceptance and Use of Technology (UTAUT) to integrate and enhance several previous theories that sought to explain user acceptance and use of technology. These earlier theories include Davis's (1989) Technology Acceptance Model (TAM), Fishbein and Ajzen's (1975) Theory of Reasoned Action (TRA), and Ajzen's (1985) Theory of Planned Behavior (TPB). TAM focused on two crucial factors, perceived ease of use and perceived utility, to predict an individual's intention to adopt a technology: perceived ease of use and perceived usefulness. On the other hand, according to TRA, an individual's intent to engage in a behavior is determined by their attitude toward the behavior and subjective norms. TPB added the variable of perceived behavioral control, which represents an individual's perception of their capacity to perform the behavior, to TRA.

Venkatesh et al. (2012) introduced the Unified Theory of Acceptance and Use of Technology 2 (UTAUT2) as a comprehensive framework to build upon the UTAUT. UTAUT2 introduces three new constructs to the original UTAUT: hedonic motivation, cost or perceived value, and habit. In addition to the original UTAUT constructs of performance expectancy, effort expectancy, social influence, and facilitating conditions, these constructs are influenced by age, gender, and experience (Marikyan & Papagiannidis, 2021). UTAUT2 therefore incorporates the following concepts: performance expectation, effort expectation, social influence, facilitating conditions, hedonic motivation, price value, and habit.

Habit

Habit can be characterized as the degree to which a person engages in behaviors instinctively based on learned impulsiveness (Limayem et al., 2007). Venkatesh et al. (2012) further elaborated that habit reflects the impact of previous experiences or behaviors. A study by Tiara Imani and Herlanto Anggono (2020) on adopting QR codes in e-commerce emphasized that habit is the most influential factor in determining behavioral intention. Consequently, gaining insights into tourists' habitual use of technology can facilitate adoption in specific destinations.

H₁: *Habit has a significant influence on satisfaction.*

Hedonic Motivation

In accordance with a study by Venkatesh et al. (2012), pleasure or satisfaction associated with technological advances refers to hedonic motivation. Motivation is indispensable in predicting the adoption and usage of technology, as noted by Brown and Venkatesh (2005). Similarly, Zhang et al. (2012) suggested that the perceived entertainment degree of a specific technology positively influences a consumer's intention to use it. However, testing this factor in smart destinations after the pandemic is still limited. Therefore, there is a need to investigate further the impact of hedonic motivation on smart tourism destinations.

H₂: *Hedonic Motivation has a significant influence on satisfaction*

Sustainability Attitude

According to Hamid and Isa (2018), sustainability emphasizes three main pillars: economic, social, and environmental. Achieving sustainability requires active engagement from various stakeholders. A study by Abdullah et al. (2019) emphasized that tourists must possess a positive attitude toward sustainability to act responsibly. These attitudes encompass social, economic, and ecological

factors and public and personal involvement (Šaparnienė et al., 2022). However, existing research on sustainability attitudes predominantly focuses on environmental aspects. This in spite of the concept of sustainable tourism has posed a puzzle for individuals in the industry, as well as for policymakers, researchers, and governmental bodies, for an extended period (Rasdi et al., 2023). Therefore, it is imperative need to examine the sustainable attitudes of tourists that could impact their adoption of technology.

H₃: *Sustainability attitude has a significant influence on satisfaction*

Perceived Risk

Adeola (2007) defines perceived risk as the evaluation of prospective threats to a person's health or well-being. This risk perception can result in ambiguous and unexpected outcomes. The perception of risk in tourism is significantly influenced by both the physical and psychological characteristics and processes of travelers, including attention, perception, the impact of representation, memory, reasoning, and language abilities (Cui et al., 2016). The emergence of COVID-19 was perceived as a significant concern that would influence tourist behavior. Hanafiah et al. (2022) conducted a study that shed light on why participants evaluated the perceived health hazard as moderately high whereas expressing relatively low travel intentions. Consequently, it is necessary to investigate the connection between risk perception and tourist satisfaction.

H₄: *Perceived risk has a significant influence on satisfaction*

Usage Satisfaction and Behavioral Intention

According to Sánchez-Rebull et al. (2018), customer satisfaction is primarily associated with anticipation before traveling and experiences after traveling, which contribute to emotions of satisfaction or dissatisfaction. Several studies, such as those conducted by Bayih and Singh (2020) and Marques et al. (2021), have emphasized the factors that influence tourist behavior and satisfaction and their behaviors after visiting a destination. This highlights the significance of tourist satisfaction as it can influence their behavior towards the destination.

H₅: *Satisfaction has a significant influence on behavioral intention*

RESEARCH METHODOLOGY

Study Setting

The Dataran Merdeka Kuala Lumpur QR trail is chosen as the study setting as it exemplifies the characteristics of a smart tourism destination. The trail incorporates a QR code system that provides information about various

attractions along the trail. The seventeen featured attractions on the trail, which include the Kuala Lumpur City Gallery, Kuala Lumpur City Library, Dataran Merdeka Flagpole, Victoria Fountain, Zero Mile Kuala Lumpur, National Textile Museum, Lebuhraya Pasar Bridge, Kolam Biru River of Life, Jamek Mosque Pedestrian Bridge, Jamek Mosque, Sultan Abdul Samad Building, Union Jack Flagpole, Dataran Merdeka, St Mary Cathedral, Royal Selangor Club, Rumah Tangsi (Loke Chow Kit Mansion), and Kuala Lumpur Tourism Bureau.

METHODOLOGY

The study employed a causal research design, precisely a quantitative approach based on survey methodology. The choice of this approach was motivated by the aim of investigating tourists' behavior towards technology and their attitude towards sustainability when using QR codes at the KL QR Trail. To collect the data, non-probability purposive and snowball sampling techniques were utilized. The target population for this study was domestic tourists in Kuala Lumpur, which had an estimated population of 9.1 million in 2021. A total of 316 responses were obtained for the study; however, 17 online responses were deemed invalid due to needing to pass the screening questions or missing data. Therefore, only 299 responses were considered valid and included in the data analysis and hypothesis testing.

This study's questionnaire contained three distinct sections. Section 1 consisted of two queries to validate respondents' eligibility. Section 2 measured factors such as habit, hedonic motivation, sustainability attitude, perceived risks, tourist satisfaction, and behavioral intention. Section 3 collected demographic information, including gender, age, marital status, education level, occupation, monthly income, and frequency of technology usage. A Likert scale with five available responses—one for "strongly disagree" and five for "strongly agree"—was used in the survey. Pilot research was undertaken to verify the validity and reliability of the research instruments before the questionnaire in English and Malay was finalized. This study's instruments were adapted from previous research relating to the UTAUT theory (Çakiri & Çiftçi, 2019; Chang, 2012; Hanafiah et al., 2022; Malik et al., 2019; Vuksanović et al., 2021).

From January through March 2022, three months of data were collected at the attractions listed on the KL QR Trail. Questionnaires were distributed to tourists who scanned the QR codes provided on the trail and online for individuals who had previously visited the trail but had yet to complete the survey.

Statistical Package for the Social Sciences (SPSS) software was utilized to analyze the collected data. Prior to data analysis and reporting, the reliability of the data was assessed through reliability analysis to ensure consistency, stability, and goodness. Both constructs achieved acceptable reliability results, with Cronbach's Alpha coefficient values exceeding the minimum value of .70,

which is considered acceptable. Descriptive analysis was conducted using SPSS. The assessment and measurement model were tested using SEM PLS software to examine the hypothesis.

ANALYSIS AND DISCUSSION

Descriptive analysis of respondents

The study's sample consisted entirely of domestic tourists, with females accounting for 60.9% and males accounting for 39.1%. In terms of age, the findings revealed that 10% (n=30) of the participants were under 18 years old, 18.1% (n=54) were between 18 and 24 years old, 42.1% (n=126) fell into the 25-34 age range, 13.7% (n=41) were aged 35-44, 7.4% (n=22) were aged 45-54, and 8.7% (n=26) were 55 years old or older. In terms of daily technology usage, the majority of respondents, 62.5% (n=187), spent 5 to 7 hours using technology, followed by 28.1% (n=84) who spent 8 to 10 hours. A smaller percentage, 6.0% (n=18), used technology for more than 10 hours, 3.0% (n=9) used it for 2 to 4 hours, and the remaining 0.3% (n=1) used it for less than an hour.

Measurement model result

Initial evaluation of the reflective measures included convergent and discriminant validity analyses. Examining factor loadings, composite reliability, and average variance extracted (AVE) helped determine convergent validity. The majority of reflective products exceeded the prescribed loading threshold of 0.70. The composite reliability (CR) values, which ranged from 0.856 to 0.986, indicated a high degree of consistency among the items representing the latent construct, exceeding the recommended minimum of 0.7. The extracted average variance ranged from 0.530 to 0.945, exceeding the recommended cutoff of 0.5. Table 1 summarizes these findings.

Table 1: Loadings, composite reliability and average variance extracted

Construct	Items	Loadings	AVE	CR
Habit	Using QR codes to obtain information has become a habit for me.	0.883	0.736	0.918
	I am addicted to using QR codes to obtain information about the trail.	0.845		
	I always prefer to use QR codes to obtain information about the trail.	0.821		
	It is natural for me to use the QR code while visiting the trail.	0.882		
Sustainability Attitude	I support and buy local sellers' products while travelling.	0.890	0.522	0.852
	I use services provided by the local people while travelling.	0.834		

Construct	Items	Loadings	AVE	CR
	I respect the local cultures and traditions.	0.872		
	I participate in local tourism activities while travelling.	0.817		
Risk	I feel nervous about travelling because of the high number of COVID-19 cases.	0.937	0.907	0.967
	Travelling is risky for my health because of COVID-19.	0.947		
	I feel it is dangerous to travel because of COVID-19.	0.973		
Hedonic Motivation	Using the QR codes to obtain information about the attractions at KL QR Trail:		0.914	0.977
	Is fun for me as a tourist.	0.956		
	Is enjoyable for me as a tourist.	0.961		
	Is entertaining for me as a tourist.	0.957		
	Gives me a delightful feeling	0.949		
Satisfaction	I am satisfied with the QR code system (flow, design, and information provided) at the trail.	0.969	0.943	0.985
	I am satisfied with my QR code experience (smooth QR code system, sufficient information obtained, etc.) at the trail.	0.976		
	I am satisfied with the quality of the information provided by the QR code.	0.976		
	I am satisfied with the content provided by the QR code at the trail.	0.964		
Intention	I am willing to use the QR code provided at the KL QR Trail to obtain information again in the future.	0.955	0.931	0.976
	I am willing to recommend this QR code experience to other tourists in the future.	0.966		
	Given the opportunity, I will use/scan QR codes to obtain information at other tourism destinations.	0.973		

The second part is the discriminant validity that determined by comparing the AVE from each construct with its communal variances shared with other constructs. As suggested by (Henseler et al., 2015), the discriminant validity

is validated in this study with all the HTMT values below 0.90. The HTMT value from this study is highlighted in Table 2.

Table 2: HTMT Table

	habit	intention	motivation	risk	satisfaction
habit					
intention	0.143				
motivation	0.305	0.387			
risk	0.393	0.055	0.120		
satisfaction	0.250	0.347	0.324	0.049	
sustainability attitude	0.367	0.442	0.504	0.275	0.456

Table 3 displays the results of applying the Fornell and Larcker criterion validity criteria. Evidently, the latent AVE variables exceeded the minimum value of 0.50, and the AVE square roots were greater than the correlation values of the latent variables, establishing discriminant validity.

Table 3: Fornell-Larcker criterion

	habit	intention	motivation	risk	satisfaction	sustainability attitude
habit	0.858					
intention	0.153	0.965				
motivation	0.304	0.375	0.956			
risk	0.349	0.048	0.120	0.953		
satisfaction	0.249	0.338	0.318	0.053	0.971	
sustainability attitude	0.203	0.419	0.485	0.160	0.428	0.722

Structural model result

The structural model's validity was evaluated using the standard bootstrapping procedure, employing 5000 bootstrap samples and analyzing 203 cases to determine the significance of the path coefficients. The guidelines outlined by Hair et al. (2017) were adhered to, and the comprehensive estimates of the structural model can be found in Table 5. To begin with, the model reveals various direct and indirect effects. The findings indicate that habit has a significant impact on intention ($\beta=0.058$, $p=0.004$). Additionally, habit influences satisfaction ($\beta=-0.172$, $p=0.001$). On the other hand, motivation does not have a significant influence on intention ($\beta=0.035$, $p=0.139$) or satisfaction ($\beta=0.102$, $p=0.102$). The results also indicate that risk does not exert an influence on intention ($\beta=-0.026$, $p=0.284$) or satisfaction ($\beta=-0.076$, $p=0.267$), whereas satisfaction has a noteworthy effect on intention ($\beta=0.338$, $p=0.000$). Lastly,

sustainability attitude significantly influences both intention ($\beta=0.120$, $p=0.000$) and satisfaction ($\beta = 0.356$, $p=0.000$).

Table 4: Structural Model (direct)

	Beta value (B)	Standard Deviation (STDEV)	T Statistics	P Values	Decision
habit -> intention	0.059	0.020	2.899	0.004**	Supported
habit -> satisfaction	0.172	0.051	3.350	0.001**	Supported
hedonic motivation -> intention	0.035	0.023	1.481	0.139	Not supported
hedonic motivation -> satisfaction	0.101	0.063	1.639	0.102	Not supported
risk -> intention	-0.024	0.024	1.072	0.284	Not supported
risk -> satisfaction	-0.071	0.068	1.111	0.267	Not supported
satisfaction -> intention	0.344	0.053	6.440	0.000**	Supported
sustainability attitude -> intention	0.125	0.033	3.650	0.000**	Supported
sustainability attitude -> satisfaction	0.362	0.070	5.102	0.000**	Supported

Note: ** $p \leq 0.05$

The study findings, presented in Table 4, indicate a notable correlation between sustainability attitude, satisfaction, and intention ($\beta=0.120$, $p=0.000$). However, there was no significant association observed between risk, satisfaction, and intention ($\beta=-0.026$, $p=0.284$). Furthermore, the results reveal a significant influence ($\beta=0.058$, $p=0.004$) among the variables of habit, satisfaction, and intention. Table 5 provides a summary of the study's outcomes.

Table 5: Structural Model: Indirect

	Beta value (B)	Standard Deviation (STDEV)	T Statistics	P Values	Decision
sustainability attitude -> satisfaction -> intention	0.125	0.033	3.650	0.000**	Supported
risk -> satisfaction -> intention	-0.024	0.024	1.072	0.284	Not supported
habit -> satisfaction -> intention	0.059	0.020	2.899	0.004**	Supported

Note: ** $p \leq 0.05$

The R^2 value of 0.115 and 0.223 is above the 0.13 value as suggested by (Cohen, 1988), which indicates that this is a weak model. The effect size (f^2) in this study is small. Finally, predictive relevance (Q^2) is examined using the blindfolding process. The Q^2 value in this study is 0.104 & 0.209, which is larger than 0, indicating that the model has sufficient predictive relevance (Chin, 2010).

DISCUSSION AND IMPLICATIONS

This research highlights the positive impact that integrating smart tourism technologies, such as QR codes, can have on shaping tourist behavior and satisfaction. By leveraging technology, destinations can improve the travel experience for visitors, leading to greater happiness and a higher likelihood of tourists revisiting. The study specifically focuses on the adoption of QR codes and its influence on tourist satisfaction and revisiting intention, emphasizing the crucial role of this technology in shaping perceptions and experiences. These findings stress the importance of embracing smart tourism initiatives, including innovative technologies like QR codes, which can significantly enhance tourist satisfaction, happiness, and revisiting intention, ultimately benefiting the tourism industry.

This study's initial focus revolves around examining habit as a key determinant. Previous research has already established the significance of habits in various contexts. Additionally, this study provides evidence to support the notion that the habit of using technology directly influences the behavior of tourists at their destination. The findings of Abdul-Halim et al. (2022) align with the present research, emphasizing the impact of habit on individuals' behavioral intentions to utilize technology. Furthermore, this current study establishes a connection between habit and satisfaction, thereby supporting the hypothesis that habit significantly influences overall satisfaction. The current breakthroughs articulate the habits of the younger generation, revealing their inclination towards using QR codes and their frequent reliance on the internet in their daily lives. Furthermore, the study conducted an assessment of Sustainability attitudes using the UTAUT 2 model, which revealed a significant impact on both technology satisfaction and the intention to reuse it. The concept of sustainability attitude encompasses considerations related to the economy, society, and the environment, as Biasutti and Frate (2017) highlighted. This finding holds great importance today, as it indicates that individuals with such attitudes are likelier to incorporate technology into their everyday routines.

CONCLUSION

The findings revealed that two factors, namely habit and sustainability attitudes, had a significant impact on tourist satisfaction and their intention to revisit smart tourism destinations. This suggests a relationship between people's attitudes

toward sustainability and their engagement with technology at these destinations. However, two other factors, hedonic motivation, and perceived risk, were not found to significantly impact tourist behavior regarding the use of QR codes and their intention to revisit smart tourism destinations. Furthermore, with the current status of COVID-19 no longer being a global health issue, it is evident that people no longer consider it as a motivator or barrier to travel.

These insights can be valuable for Destination Management Organizations (DMOs) in reassessing their policies and strategies for smart tourism destinations. By maximizing the utilization of technological applications like QR codes, DMOs can enhance the competitiveness and performance of these destinations. Moreover, this study contributes to understanding the technology acceptance model and its integration with sustainability attitudes, specifically in the context of QR code adoption at tourism destinations. Future studies can explore other technologies adopted in smart tourism destinations and examine additional factors influencing satisfaction with QR code usage and the intention to revisit. Furthermore, it would be beneficial to investigate the integration of sustainability attitudes and technology habits concerning the adoption of technology for smart tourism destinations.

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