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STUDY OF THE INFLUENCE OF VIRTUAL TOUR ON GEN-Z TOURISTS' INTENTION TO VISIT TOURIST DESTINATIONS IN INDONESIA: A CASE STUDY OF BOROBUDUR TEMPLE

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ABSTRACT

This research explores the impact of virtual tours on Generation Z's intention to visit Borobudur Temple, particularly in the context of the tourism industry's recovery following the COVID-19 pandemic. By focusing on Gen-Z—known for their strong digital engagement—the study examines how their motivations and perceptions of technology influence their intention to participate in physical tourism after experiencing virtual tours. The research combines elements from Motivation Theory and the Technology Acceptance Model (TAM) to evaluate variables such as perceived usefulness, ease of use, intrinsic motivation, and hedonic value. Quantitative data were gathered from Gen-Z participants who took part in a virtual tour of Borobudur, and the findings reveal significant correlations between these factors and their intention to visit. Notably, perceived usefulness and hedonic value were found to be the strongest predictors of visit intention. The study concludes that virtual tours function not only as informational previews but also as persuasive tools within destination marketing. It emphasizes the need to design immersive and appealing virtual experiences that align with Gen-Z's preferences, as such content can effectively enhance their interest in visiting destinations in person.
Keywords: Virtual Tour, Generation Z, Technology Acceptance Model, Virtual Reality

ABSTRAK

Penelitian ini mengeksplorasi pengaruh tur virtual terhadap niat Generasi Z (Gen-Z) untuk mengunjungi Candi Borobudur, terutama di tengah dampak pandemi COVID-19 terhadap sektor pariwisata di Indonesia. Dengan menyoroti Gen-Z sebagai generasi yang akrab dengan teknologi digital, studi ini mengkaji bagaimana motivasi mereka serta persepsi terhadap penerimaan teknologi membentuk keinginan mereka untuk melakukan kunjungan secara fisik setelah berinteraksi dengan tur virtual. Penelitian ini menggabungkan Teori Motivasi dan Model Penerimaan Teknologi (TAM) dalam menganalisis variabel-variabel utama seperti persepsi terhadap manfaat (usefulness), kemudahan penggunaan, motivasi intrinsik, serta nilai hedonis. Melalui data kuantitatif dari responden Gen-Z yang telah mengikuti tur virtual Borobudur, penelitian ini menelaah keterkaitan antara faktor-faktor tersebut dan niat untuk berkunjung secara langsung. Temuan menunjukkan bahwa baik aspek penerimaan teknologi maupun faktor motivasional berperan penting dalam memengaruhi niat kunjungan Gen-Z. Secara khusus, persepsi kegunaan dan motivasi hedonis merupakan dua faktor yang paling berpengaruh. Artikel ini juga menguraikan bahwa tur virtual tidak hanya menjadi sarana pratinjau digital, melainkan juga berfungsi sebagai alat promosi yang efektif dalam strategi pemasaran destinasi. Hasil penelitian menekankan pentingnya menyusun pengalaman tur virtual yang menarik dan imersif sesuai dengan preferensi Gen-Z, agar mampu meningkatkan minat mereka terhadap kunjungan wisata secara langsung.
Kata kunci: Tur Virtual, Generasi Z, TAM, Realitas Virtual

INTRODUCTION

In the aftermath of the COVID-19 pandemic, the Indonesian government has persistently introduced various initiatives aimed at revitalizing the tourism industry. Technological and scientific advancements

have significantly reshaped this sector. Among these innovations is the virtual tour an advanced tool that leverages internet connectivity and artificial intelligence to offer a modernized travel experience (Fadilah & Sugihartono, 2024). This technology enables users to enjoy immersive and interactive explorations, granting them autonomy to navigate destinations, select viewpoints, and access content tailored to their interests.

As Generation Z emerges as a key demographic characterized by their preference for engaging and interactive digital experiences, virtual tours present a compelling solution to satisfy their expectations. Despite the surge in the development and adoption of virtual tours—particularly as a response to the downturn in physical travel during and after the COVID-19 outbreak (Fiqhie & Achmadi, 2019; Paramartha et al., 2023; Riyanto & Rochima, 2023) there remains a lack of clarity on how these experiences impact Gen-Z's actual intent to visit real-world tourist destinations.

To explore user behavior regarding this technological adoption, several frameworks have been proposed. These include the Technology Acceptance Model (TAM) introduced by Venkatesh & Davis (2000), and integrated approaches that combine motivation theory with TAM, such as those by Rahimizhian et al. (2020) and Zhao & Huang (2022).

This research utilizes a hybrid framework that merges motivation theory with the TAM to analyze Gen-Z's adoption of virtual tour technology. Drawing from prior studies, motivation theory will be used to explain users' internal drives to engage with virtual tours, while TAM will assess perceptions related to the system's usability and perceived benefits. The integration of both theories aims to offer a more in-depth understanding of how Gen-Z interacts with virtual tours. The focus of this study is Borobudur Temple, one of Indonesia's most iconic tourist sites, which experienced a substantial decline in visitors during the pandemic (BPS, 2024).

LITERATURE REVIEW

Virtual Reality (VR)

Virtual reality (VR) is a human-computer interface that replicates either real or fictional environments, enabling users to interact through multiple sensory channels such as visual, auditory, tactile, olfactory, and gustatory inputs. These features make VR both immersive and interactive commonly referred to as the "two I's." However, a less recognized but equally important feature is imagination. Beyond being a high-level interface or medium, VR also serves practical purposes by offering solutions to real-world problems, the effectiveness of which depends significantly on human creativity (Burdea & Coiffet, 2024). Thus, VR can be understood as a triad comprising **immersion, interaction, and imagination**.

Virtual Tour

A virtual tour is a digital simulation of a physical location, typically composed of stitched images or videos (Osman et al., 2009). These simulations aim to reproduce the environment authentically through multimedia elements such as videos, images, texts, narration, and sound effects (Aguilera et al., 2014; Spielmann & Mantonakis, 2018).

According to Koutsoudis et al. (2007), virtual tours are generally accessed via the internet using standard computing devices, allowing users to navigate the virtual environment using a monitor and a mouse. However, as noted by Barbieri et al. (2017), technological advancements have enabled these tours to be experienced using immersive tools such as VR headsets, which enhance realism and interactivity by allowing users to see, hear, and feel as though they are physically present in the simulated location.

Borobudur Temple Virtual Tour

The Borobudur Temple virtual tour is a digital experience that enables users to explore the temple remotely from anywhere

in the world. This tour was developed by Visual Anak Negeri, a production house specializing in VR content for purposes such as education, promotion, and entertainment. They also serve as a co-branding partner for Wonderful Indonesia, the national tourism brand promoted by the Ministry of Tourism and Creative Economy (Visual Anak Negeri, 2024). The tour was officially launched in June 2022 and is accessible online.

From a technological standpoint, the Borobudur virtual tour has reached a high level of maturity. Based on Taufik (2005), the Technology Readiness Level (TRL) indicates how prepared a technology is for real-world application. With the use of 360-degree visuals and robust software platforms, this tour is considered to be at TRL 9, indicating full functionality and successful deployment.

Generation Z (Gen-Z)

Gen-Z represents the first generation of true digital natives, having grown up in an environment saturated with the internet, mobile technology, and social media (Kotler et al., 2022). In Indonesia, a survey by IDN Research Institute (2024) found that 90% of Gen-Z respondents consider travel as a form of emotional healing and a necessary break from their fast-paced lives. This generation values opportunities to discover new places, cultures, and cuisines, and they are positioned to play a significant role in the development of the national tourism sector. Gen-Zs are not only consumers but also actors within the tourism pentahelix spanning academia, business, and governance many of whom are active in tourism entrepreneurship and form a key target demographic for destination marketing.

Marketing 5.0

Marketing 5.0 involves leveraging human-mimicking technologies to create, communicate, and deliver customer value at every stage of the customer journey. Among these are AI, natural language processing (NLP), sensors, robotics, AR, VR, IoT, and blockchain (Kotler et al., 2022). The integration of these technologies supports businesses in crafting personalized customer experiences. In this paradigm, it is increasingly essential to build detailed customer profiles and use data-driven insights to deliver tailored content and recommendations at scale.

Technology Acceptance Model (TAM)

The Technology Acceptance Model (TAM) explains how users come to accept and use technology. According to TAM, behavioral intention to use a technology is primarily influenced by two factors: perceived usefulness and perceived ease of use (Marikyan & Papagiannidis, 2023). Developed as a derivative of the Theory of Reasoned Action (TRA), TAM posits that a user's intention to adopt a system is shaped by their beliefs about the system's capabilities. Perceived usefulness refers to the degree to which a person believes that the technology will enhance their performance (Jogiyanto, 2007).

Expectancy Theory

Expectancy theory, also known as the expectancy theory of motivation, posits that individuals choose specific behaviors based on the expected outcomes of those behaviors (Oliver, 1974). This theory suggests that motivation is not simply about desiring an outcome, but rather about the cognitive evaluation of how likely a certain action will lead to a desired result. Vroom (1964) described motivation as a decision-making process governed by an individual's beliefs about the likelihood of achieving valuable outcomes. The theory's core components include expectancy (belief that effort leads to performance), instrumentality (belief that performance leads to outcome), and valence (value of the outcome) (Condrey, 2005).

METHODS

This research investigates how virtual tours affect the interest of Generation Z tourists in visiting destinations in Indonesia, with a focus on Borobudur Temple. The process began by selecting a representative sample from the Gen-Z population.

Following that, an online survey was administered to gather demographic information, participants' experiences with the Borobudur Temple virtual tour, their perceptions of the site, and their level of interest in making a physical visit.

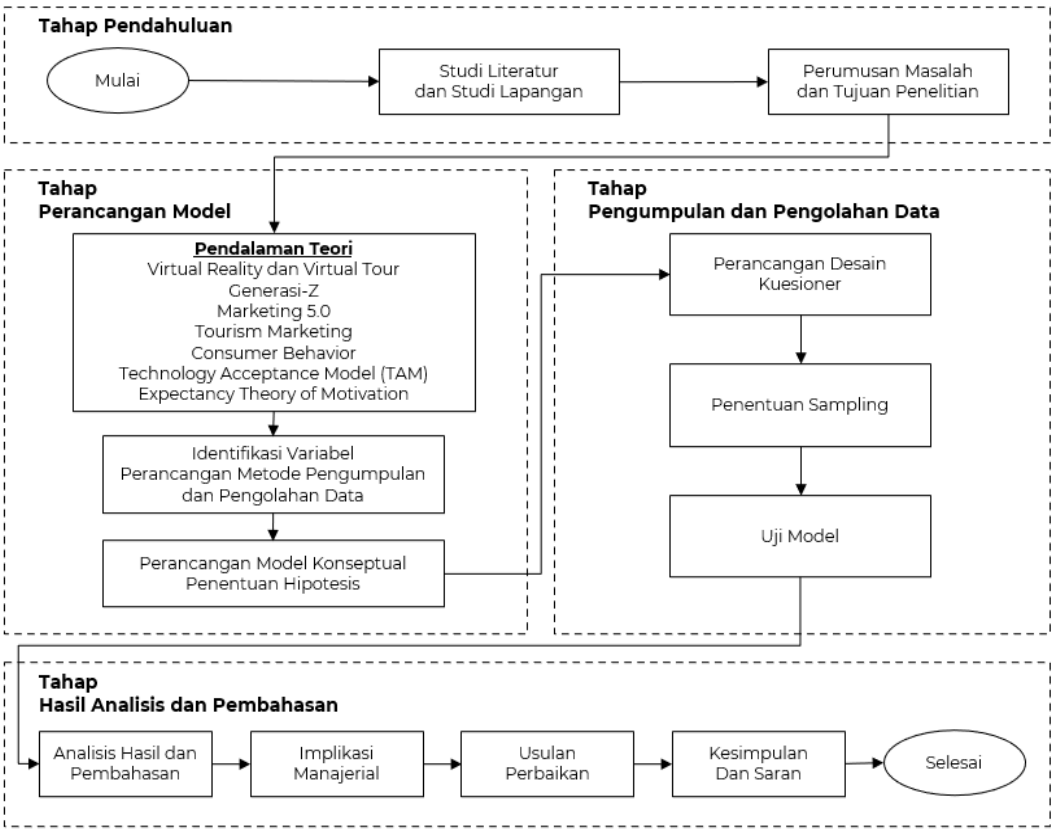

Figure 1. Research Steps

Source: Authors, 2025

Sampling

This research distinguishes between the population and the sample. According to Sugiyono (2013), the population encompasses not only the number of subjects or objects under study but also the entire set of characteristics they possess. The population targeted in this study includes all Generation Z (Gen-Z) tourists in Indonesia. A sample, on the other hand, is a subset of the population selected to represent the entire group. An effective sample reflects the diversity and similarities within the population, enabling researchers to generalize findings from the sample to the broader population.

In this study, the sample consists of Gen-Z individuals living in Indonesia who have interacted with the virtual tour of Borobudur Temple provided via a link in the questionnaire. The sampling method follows the guideline by Hair et al. (2019), which suggests a minimum sample size of 10 times the number of latent variables or indicators in the path model. Based on this rule, at least 100 respondents are required. To enhance result reliability, this study employs a larger sample of 400 respondents.

Data Collection

The data in this study is categorized into primary and secondary data sources. As defined by Sugiyono (2013), primary data is obtained directly from respondents, while secondary data is collected indirectly, such as from documents or other people's reports. Primary data was collected through questionnaires distributed to Indonesian tourists who met the criteria specifically,

Gen-Z individuals who had experienced the Borobudur Temple virtual tour via the provided link. Respondents were instructed to engage with the virtual tour before completing the questionnaire to ensure accurate responses based on firsthand experience.

Secondary data was sourced from academic books, journals, reports from the Ministry of Tourism and Creative Economy, the Central Statistics Agency (BPS), and findings from previous research and statistical databases.

Measures

The primary data collection instrument in this study was a questionnaire. This method involves presenting respondents with a series of written questions or statements. As noted by Sugiyono (2013), questionnaires are effective when the researcher has a clear understanding of the variables being measured. The questionnaire was designed to assess the influence of virtual tours on the intention to visit tourist destinations.

Items in the questionnaire were structured using a 5-point Likert scale to gauge attitudes, opinions, and perceptions regarding the virtual tour of Borobudur Temple. Gen-Z respondents were required to view the virtual tour and provide feedback based on their interaction with the technology.

To analyze the data, the study employed Structural Equation Modeling (SEM) using the Partial Least Squares (PLS) approach commonly referred to as PLS-SEM. This method, introduced by Wold (1985) and supported by Ghozali (2006), is advantageous due to its minimal assumptions, tolerance of non-normal data, and suitability for small sample sizes. PLS-SEM is particularly effective for analyzing complex models involving multiple constructs and relationships. Following Hair et al. (2019) and Henseler et al. (2016), the analysis tested both the measurement (outer) model and the structural (inner) model using SmartPLS 3.0 software.

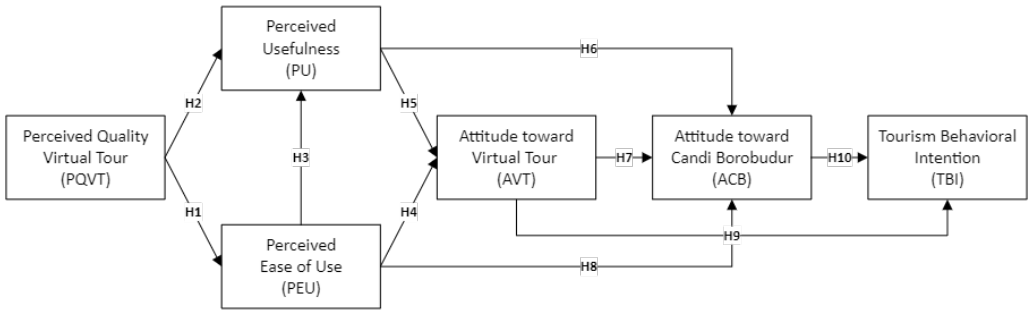

Figure 2. Conceptual Model Modified from Zhao & Huang (2022).

Source: Authors, 2025

Hypotheses Formulation

The following hypotheses were proposed and tested in this study:

- **H1**: Perceived Quality of Virtual Tour (PQVT) positively influences Perceived Ease of Use (PEU).
- **H2**: Perceived Quality of Virtual Tour (PQVT) positively influences Perceived Usefulness (PU).
- **H3**: Perceived Ease of Use (PEU) positively influences Perceived Usefulness (PU).
- **H4**: Perceived Ease of Use (PEU) positively influences Attitude Toward Virtual Tour (AVT).
- **H5**: Perceived Usefulness (PU) positively influences Attitude Toward Virtual Tour (AVT).
- **H6**: Perceived Usefulness (PU) positively influences Affective-Cognitive Behavior (ACB).

- **H7**: Attitude Toward Virtual Tour (AVT) positively influences Affective-Cognitive Behavior (ACB).
- **H8**: Perceived Ease of Use (PEU) positively influences Affective-Cognitive Behavior (ACB).
- **H9**: Attitude Toward Virtual Tour (AVT) positively influences Tourist Behavioral Intention (TBI).
- **H10**: Affective-Cognitive Behavior (ACB) positively influences Tourist Behavioral Intention (TBI).

Results

Respondent Demographics

Data collection was carried out through an online platform, with a minimum target of 100 Generation Z participants. Upon the conclusion of the survey, a total of 400 respondents were recorded, most of whom were confirmed to fall within the Generation Z category (individuals born between 1997 and 2009). A small number of participants who did not meet the Generation Z criteria were excluded from the analysis. A detailed statistical summary of the demographic characteristics of the valid respondents is presented below:

Table 1. Respondent Characteristics

Characteristics	Category	Respondents	
		Qty	%
Gender	Male	177	44.25%
	Female	223	55.75%
	Total	**400**	**100.00%**
Birth Range	1997 – 2009	400	100.00%
	Total	**400**	**100.00%**
Education	Elementary – Senior High (SD–SMA)	141	35.25%
	Diploma (D1–D3)	84	21.00%
	Vocational High School (SMK)	1	0.25%
	Bachelor's Degree (Strata 1)	170	42.50%
	Master's Degree (Strata 2)	4	1.00%
	Total	**400**	**100.00%**
Occupation	High School Students	48	12.00%
	University Students	203	50.75%
	Workers	101	25.25%
	Entrepreneurs/Freelancers	48	12.00%
	Total	**400**	**100.00%**

Based on Table 4.1, all 400 respondents (100%) fall within the Gen-Z age bracket, defined as those born between 1997 and 2009. By 2025, this group will be between 16 and 28 years old, representing individuals entering early adulthood. This suggests that virtual tours have been explored by a substantial number of young adults. The gender distribution shows that female respondents make up the majority at 55.75%, while male respondents account for 44.25%. This implies that virtual tours may hold greater appeal for women, who are often considered to have a stronger interest in travel and new experiences compared to men. These insights may serve

as a valuable reference for future research focusing on behavior differences based on demographic characteristics. In terms of educational background, most respondents hold a Bachelor's degree (42.50%), followed by those with elementary to senior high school education (35.25%), and diploma-level education (21.00%). A very small portion of the respondents hold a Master's degree (1.00%) or have graduated from vocational high school (0.25%). These findings indicate that virtual tour platforms are appropriately aimed at the Gen-Z market segment, which is predominantly made up of individuals who are either in high school or college, thus aligning well with the intended research target.

SEM-PLS Results

All analyses were performed using the SmartPLS 3.0 software. The survey data collected was analyzed through Structural Equation Modeling - Partial Least Squares (SEM-PLS) to examine the relationships between the study variables. This approach aims to shed light on Gen-Z's acceptance of the Borobudur Temple virtual tour. The outcome of the analysis will inform managerial recommendations for enhancing the virtual tour experience. The evaluation is divided into two stages: the outer model and the inner model. The outer model analysis began with testing for convergent validity, where each indicator must achieve a loading factor above 0.6. However, the loading results indicated that several items particularly TBI3 and TBI4 failed to meet the minimum threshold of >0.6 and therefore had to be removed from the model. The final results obtained after refinement are as follows:

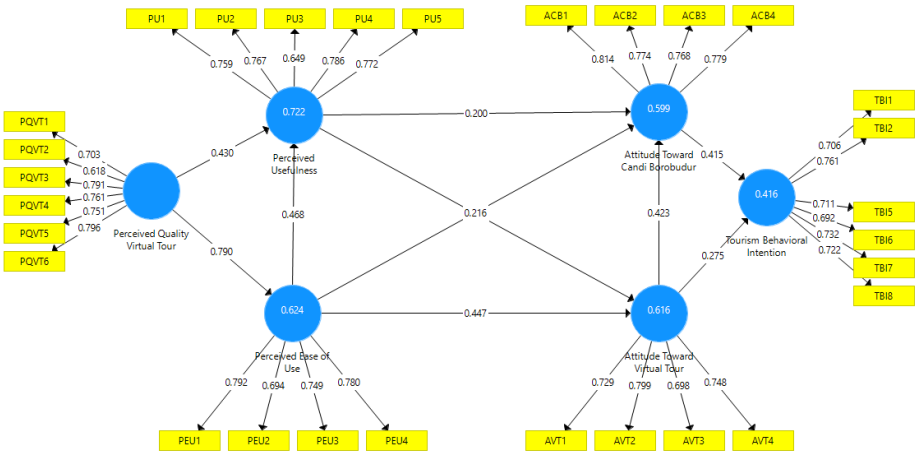

Figure 4. Conceptual Model – Outer Model Test Results After Indicator Elimination Using SmartPLS 3.0

Source: Authors, 2025

The outer model evaluation also involves testing the Average Variance Extracted (AVE) for each construct, where the value must exceed 0.50. In addition, a reliability test is conducted using Cronbach's alpha, which should be greater than 0.7 (Hair et al., 2019). The findings presented below indicate that all constructs have met the minimum thresholds for both AVE and Cronbach's alpha. Therefore, it can be concluded that the outer model has successfully passed the evaluation criteria.

Table 2. AVE and Cronbach's Alpha Values

Variable	AVE	Cronbach's Alpha
Perceived Quality Virtual Tour (PQVT)	0.546	0.832
Perceived Usefulness (PU)	0.560	0.802
Perceived Ease of Use (PEU)	0.569	0.747
Attitudes toward Virtual Tour (AVT)	0.554	0.731
Attitudes toward Candi Borobudur (ACB)	0.615	0.791
Tourism Behavioral Intention (TBI)	0.520	0.815

Source: Authors, 2025

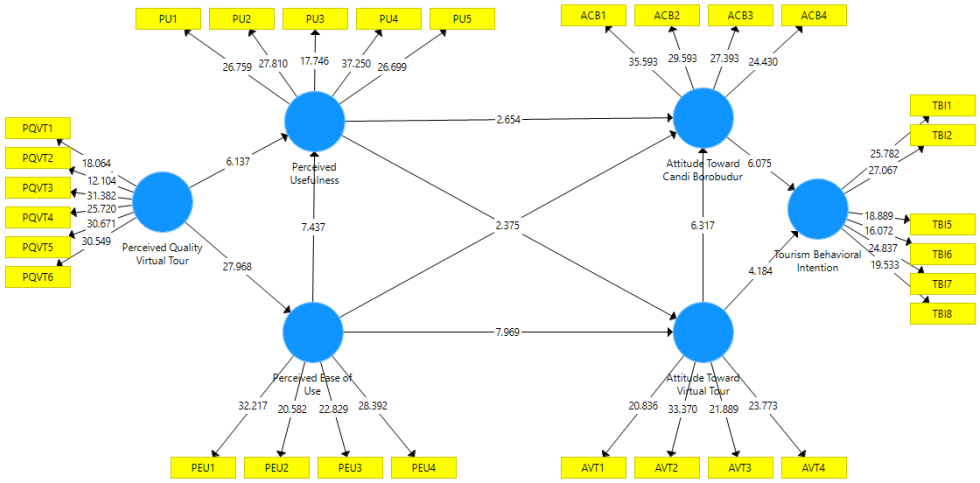

Figure 5. T-Statistics Values of the Inner Model in SmartPLS 3.0

Source: Authors, 2025

The R-Square values presented in this model are below 0.75, which, according to Hair et al. (2019), suggests a moderate level of explanatory capability. This implies that the model can adequately explain Gen-Z's acceptance of the Borobudur Temple virtual tour. As such, the model possesses a reasonable level of predictive validity regarding the virtual tour experience at Borobudur Temple. The Inner Model Test results are as follows:

Table 2. Inner Model Results

	Original Sample (O)	*Sample Mean (M)*	*Standard Deviation (STDEV)*	*T Statistics (|O/STDEV|)*	*P Value*	Conclusion
Perceived Quality Virtual Tour → Perceived Ease of Use	0.790	0.791	0.028	27.968	**< 0.05**	**H1 accepted.** PQVT has a positive impact on PEU.

Perceived Quality Virtual Tour → Perceived Usefulness	0.430	0.434	0.070	6.137	**< 0.05**	**H2 accepted.** PQVT has a positive impact on PU.
Perceived Ease of Use → Perceived Usefulness	0.468	0.464	0.063	7.437	**< 0.05**	**H3 accepted.** PEU has a positive impact on PU.
Perceived Ease of Use → Attitudes towards Virtual Tour	0.447	0.445	0.056	7.969	**< 0.05**	**H4 accepted.** PEU has a positive impact on AVT.
Perceived Usefulness → Attitudes towards Virtual Tour	0.377	0.379	0.058	6.565	**< 0.05**	**H5 accepted.** PU has a positive impact on AVT.
Perceived Usefulness → Attitudes towards Candi Borobudur	0.200	0.200	0.075	2.654	**< 0.05**	**H6 accepted.** PU has a positive impact on ACB.
***Attitudes towards Virtual Tour → Attitudes towards* Candi Borobudur**	0.423	0.421	0.067	6.317	**< 0.05**	**H7 accepted.** has a positive impact on ACB.
***Perceived Ease of Use → Attitudes towards* Candi Borobudur**	0.216	0.219	0.091	2.375	**< 0.05**	**H8 accepted.** PEU berpengaruh positif terhadap ACB.

Attitudes towards Virtual Tour → Tourism Behavioral Intention	0.275	0.275	0.066	4.184	**< 0.05**	**H9 accepted.** AVT has a positive impact on TBI.
Attitudes towards Candi Borobudur → Tourism Behavioral Intention	0.415	0.417	0.068	6.075	**< 0.05**	**H10 accepted.** ACB has a positive impact on TBI.

An intriguing aspect of the bootstrapping results is that all hypotheses were supported. This outcome contrasts with the findings of previous research by Zhao and Huang (2022), in which several hypotheses (H2, H6, and H9) were not accepted. As noted by Cleveland (2013) and Sun et al. (2013), variations in hypothesis testing results can stem from various internal factors, such as the statistical techniques employed, sample size, differing assumptions, and the existence of unobserved latent variables. In addition, external influences particularly socio-cultural conditions may also contribute to these discrepancies (Czerny, 2017). Compared to Zhao and Huang's (2022) study, the current research mainly diverges in terms of external socio-cultural contexts and the potential presence of latent variables that warrant further investigation in future studies.

DISCUSSION

The results derived from the SEM-PLS analysis affirm that all constructs from the integration of the Technology Acceptance Model (TAM) and Expectancy Theory tailored to Gen-Z consumer behavior—have a positive and significant effect on the acceptance of the Borobudur Temple virtual tour. Key variables found to be influential include perceived quality of the virtual tour (PQVT), perceived usefulness (PU), perceived ease of use (PEU), attitudes toward the virtual tour (AVT), attitudes toward Borobudur Temple (ACB), and tourism behavioral intention (TBI). This study adds valuable insights into how Gen-Z engages with virtual tourism. With all hypotheses supported, the findings expand upon the classical TAM framework and build on prior research (Zhao & Huang, 2022) by integrating elements of Motivation Theory an approach that has not yet been widely applied to virtual tourism in the Indonesian context. It enhances understanding of how perceived usefulness, ease of use, and internal motivation interact to influence digital tourism behavior. Interestingly, this modified TAM model suggests that perceived usefulness alone is insufficient to directly shape travel intentions. A virtual tour may be deemed useful, but unless it positively shifts perceptions of Borobudur Temple, it may not lead to an increased intention to visit.

While this study adopts a similar conceptual foundation to Zhao & Huang (2022), it differs in its findings, primarily due to differing cultural and motivational contexts. The analysis supports the application of an updated TAM, enriched with Motivation Theory, to the Gen-Z digital tourism segment in Indonesia. It highlights a behavioral shift among Gen-Z in the post-pandemic era, where immersive and emotionally engaging experiences are

more likely to drive travel intentions. This aligns with the principles of Marketing 5.0, emphasizing how technology can be leveraged to foster emotional connections and deliver personalized digital tourism experiences.

Based on the findings, several policy recommendations can be proposed:

1. For Borobudur Destination Managers: Enhance the virtual tour experience with high-quality visuals and interactive systems that meet Gen-Z's expectations for immersive engagement.
2. For Government and Tourism Authorities: Provide support for digital tourism infrastructure through funding and technical assistance, particularly in research and innovation related to virtual tourism as part of national tourism recovery strategies.
3. For Tourism Stakeholders: Promote strategic online-to-offline campaigns to increase Gen-Z's motivation to physically visit destinations like Borobudur Temple.

In the context of Marketing 5.0, the development of virtual tours should evolve from being merely promotional tools into strategic platforms for delivering rich and personalized user experiences. These tours should be emotionally resonant, human-centered, data-informed, and capable of inspiring real-world tourism behavior particularly among digitally native Gen-Z travelers. As such, attention must be paid to technological and business development, including interface design, user-centered research, and marketing strategies that enhance the destination's appeal through digital innovation.

CONCLUSION

The findings of this research demonstrate that the perceived quality of virtual tours evaluated using TAM constructs of perceived usefulness and ease of use significantly impacts Gen-Z users' behavioral intentions to visit Borobudur Temple. Moreover, motivational drivers such as curiosity and a desire to explore heritage sites also play a crucial role in increasing user engagement with the platform and their intent to eventually visit the site in person. Future studies are encouraged to explore brand development strategies aimed at more broadly promoting Borobudur's virtual tour. Additionally, research should investigate the effects of online-to-offline (O2O) and offline-to-online (O2O) transitions in virtual tourism technology. International tourists also present a valuable target segment for future investigations. Furthermore, integrating gamified elements into virtual tours could enhance the educational aspect and user engagement. Other potential research directions include examining the user experience of virtual tours to determine whether engagement is driven by positive, memorable elements or hindered by usability issues. Future studies could also incorporate more structured testing environments such as login-based systems to better track user participation and session duration, ensuring a more controlled analysis of user interaction.

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