

THE ROLE OF MOBILE APPLICATIONS IN ENHANCING HOMESTAY PERFORMANCE IN MALAYSIA

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Abstract. The Malaysian homestay industry faces challenges in sustaining performance and competitiveness due to the limited adoption of digital technologies, particularly among rural operators. This pilot study examines the role of mobile applications in enhancing homestay performance in Malaysia using the Technological, Organizational, and Environmental (TOE) framework. A quantitative approach was employed using structured questionnaires distributed to registered homestay coordinators, with 30 completed responses analyzed using SPSS. The findings demonstrate good instrument reliability, with an overall Cronbach's Alpha of 0.872, while the KMO value of 0.742 and significant Bartlett's Test confirm sampling adequacy and validity. The study highlights that mobile application adoption is influenced by technological utility, organizational readiness, digital literacy, management support, customer demand, and government initiatives. Mobile applications provide opportunities to enhance operational efficiency, market visibility, customer engagement, and competitiveness. The study recommends digital training, affordable mobile solutions, and stronger stakeholder collaboration to facilitate wider adoption among Malaysian homestay operators.

Keywords: *mobile applications, homestay performance, TOE framework, Malaysia*

Introduction

In today's fast-evolving digital landscape, mobile applications have emerged as essential tools in transforming service delivery and operational management across various industries, including tourism and hospitality (Islam, 2021). Moreover, as mobile penetration rises globally, travelers increasingly expect seamless, real-time interactions and personalized services where they can experience often facilitated by mobile applications (Islam, 2021; Lin, 2021). In the tourism sector, apps like Booking.com, Agoda, and Airbnb have revolutionized how accommodation providers connect with guests, manage bookings, and promote their offerings (Ramlan et.al, 2023). Building on this trend, Malaysia's homestay program plays a central role in promoting community-based rural tourism (Mohamad, 2022). This program is managed by the Ministry of Tourism, Arts, and Culture (MOTAC), which enables travelers to stay with local families, immersing them in Malaysia's diverse culture while contributing to the socio-economic development of rural areas (Osman and Zakaria, 2020; Azman, 2020). However, despite its cultural richness and national recognition, many homestay operators continue to rely on outdated, informal methods of promotion and booking (Ramlan et al., 2023). Word-of-mouth, manual registration, and limited marketing efforts dominate, which significantly restricts their reach and profitability in the digital era (Nor, 2024; Kanel et.al, 2024).

Hence, the integration of mobile applications into homestay operations could substantially address these challenges. In addition, mobile apps not only offer visibility

to a broader market but also support functionalities such as real-time booking, cashless payment, digital reviews, and guest communication (Wang et al., 2016; Mohamad, 2022). These tools can enhance customer satisfaction, increase occupancy rates, and ultimately improve financial performance (Devadas and Jayasooriya, 2021; Ramlan et al., 2023). Yet, the adoption of it remains inconsistent, especially among rural operators who may face challenges such as digital illiteracy, lack of infrastructure, or perceived high costs (Murniati et al., 2023). Consequently, to better understand these dynamics, this pilot study applies the Technological, Organizational, and Environmental (TOE) framework to examine the factors influencing the adoption of mobile applications among homestay operators in Malaysia. Thus, by identifying key enablers and barriers, this research aims to provide actionable insights that can help strengthen the digital capabilities and competitiveness of Malaysia's homestay industry.

Problem statement

The Malaysian homestay program has been recognized for supporting rural development, cultural preservation, and inclusive tourism (Bhuiyan et al., 2011). Despite its importance, homestay operators often face inconsistent performance, particularly in terms of financial sustainability and competitiveness in the digital age (Mohamad, 2022). Many operators continue to depend on traditional methods for marketing, bookings, and customer communication, which are increasingly inadequate in a mobile-first tourism landscape (Ramlan et al., 2023). Mobile applications offer a promising solution by enabling real-time bookings, digital payments, and enhanced customer engagement (Wang et al., 2016; Lin, 2021). However, adoption among Malaysian homestay operators remains low, raising concerns about the sector's readiness for digital transformation. Moreover, barriers such as limited digital literacy, perceived high costs, weak management support, and minimal exposure to mobile technologies, especially in rural settings, continue to hinder adoption (Murniati et al., 2023; Mohamad, 2022). While earlier studies have examined social media use among SMEs and tourism operators (Islam, 2021; Mohamad, 2022), research on mobile application adoption in the homestay sector is scarce. Even fewer studies evaluate its impact on measurable outcomes, such as financial performance. Without understanding these dynamics, modernization efforts risk being fragmented and ineffective (Nor, 2024; Osman and Zakaria, 2020). This study addresses the gap by applying the Technological, Organizational and Environmental (TOE) framework to investigate determinants of mobile app adoption and its impact on homestay performance. Specifically, it seeks to identify the TOE factors influencing mobile app adoption among homestay operators and to examine how adoption affects financial performance.

Literature review

Digital transformation in tourism

The tourism industry has undergone a major shift with digital technologies. The growth of smartphones and high-speed internet has made mobile applications essential for both travelers and providers, supporting functions such as communication, booking, and payments to create seamless experiences (Islam, 2021). In addition, digital platforms such as Booking.com, Airbnb, and Agoda have revolutionized the way accommodations are searched, booked, and reviewed. Similarly, Ramlan et al., (2024) stated that these applications enable businesses to increase operational efficiency and

reach global markets with relatively low investment. Besides that, while large-scale hotels and urban tourism providers have quickly adopted these technologies, small and rural tourism businesses such as homestays often lag due to limited digital exposure and constrained resources (Islam, 2021). As the tourism sector becomes increasingly reliant on mobile-driven engagement, the digital readiness of service providers becomes a critical factor in sustaining competitiveness.

Mobile applications in tourism

Mobile applications act as multi-functional platforms that extend beyond marketing (Islam, 2021). They support real-time reservations, itinerary planning, in-app messaging, and customer reviews (Wang et al., 2016). Accommodation providers, offer greater control over customer management compared to traditional methods (Mohamad, 2022). Furthermore, apps enable businesses to collect data on customer preferences, allowing for personalized service delivery. In small tourism enterprises, adoption is linked to enhanced customer satisfaction, revenue growth, and brand credibility (Chatterjee and Kar, 2020). Nevertheless, barriers such as limited infrastructure, high perceived cost, lack of digital skills, and resistance to change persist in developing regions (Effendi et al., 2020). Despite these obstacles, mobile applications continue to demonstrate high potential to transform tourism operations.

Mobile application benefits for homestay operators

Mobile applications significantly enhance both the strategic and daily operations of homestays. On the operational side, they simplify tasks such as automated check-ins, calendar syncing, and guest communication, thereby saving time and reducing manual work (Mohamad, 2022; Gretzel et al., 2015). At the strategic level, they enable operators to showcase cultural identity and local stories while also reaching broader audiences (Ramlan et al., 2023). Furthermore, these tools improve booking management, facilitate guest feedback, and promote personalized experiences (Islam, 2021). By leveraging data insights, operators can tailor their services, resulting in greater customer satisfaction, stronger loyalty, and increased repeat visits. Consequently, studies confirm adoption improves occupancy, brand visibility, and guest retention (Chatterjee and Kar, 2020; Devadas and Jayasooriya, 2021).

Challenges of mobile application adoption in homestay settings

Despite their potential, mobile applications are underutilized by rural homestay operators due to a range of challenges. These include low digital literacy, especially among older or less-educated hosts, limited access to reliable internet, and concerns over cybersecurity. The financial burden of app development, maintenance, and digital platform fees further discourages adoption (Chatterjee and Kar, 2020). Moreover, cultural preferences for face-to-face engagement and informal business practices also play a role (Devadas and Jayasooriya, 2021). Addressing these challenges requires targeted support, such as localized training, digital incentives, and the development of simple, affordable app solutions aligned with rural needs (Wang et al., 2016).

Homestay program

The homestay program in Malaysia is a nationally endorsed community-based tourism initiative, designed to promote rural development, cultural preservation, and economic inclusion. Besides that, under the guidance of the Ministry of Tourism, Arts and Culture (MOTAC), registered homestays operate as clusters where visitors live with host families and engage in cultural activities. This is in line with Osman and Zakaria, (2020), who stated that the homestay program contributes not only to rural income but also strengthens social cohesion and intercultural understanding. Despite its potential, homestay operators face structural and operational challenges, including weak promotional strategies, low occupancy during non-peak periods, and difficulty competing with digital-savvy accommodation providers (Mohamad, 2022). Similarly, Ramlan et al, (2023) stated that most rural operators still rely on informal marketing such as word-of-mouth or local tourism offices, which restricts their reach. Yet, the lack of standardized systems for booking, customer feedback, and payment further exacerbates these challenges. Hence, integrating the mobile applications into homestay operations could address many of these limitations. Also, mobile apps allow for direct visibility on global platforms that give homestay operators tools to manage and grow their businesses more effectively (Devadas and Jayasooriya, 2021).

Homestay performance

Performance in the homestay sector can be assessed through both financial and non-financial indicators. Financial indicators include occupancy rates, sales growth, return on investment, and profitability. Meanwhile, the non-financial performance measures focus on customer satisfaction, repeat visitation, community involvement, and partnership with tourism authorities. Additionally, the mobile applications can influence both dimensions. On the financial front, apps improve visibility and simplify booking and cancellation processes. While on the non-financial side, apps allow real-time communication, instant feedback loops, and more personalized guest experiences (Devadas and Jayasooriya, 2021). Consequently, businesses that adopt mobile technologies are more agile and better able to respond to changing customer behaviors and market demands.

Technological, Organizational and Environmental (TOE) framework

The Technological, Organizational and Environmental (TOE) framework, offers a holistic perspective for examining the factors influencing technology adoption in organizations. It is frequently used in information systems and tourism research due to its comprehensive coverage of internal and external determinants. Technological Context refers to the perceived usefulness, ease of use, compatibility and complexity of the technology. In the context of mobile apps, this includes user interface design, integration with payment gateways, and multilingual support (Wang et al., 2016). Organizational Context is defined as encompassing internal readiness, which includes the resource availability, digital skills, management support and strategic vision. In homestays, which are often family-run, the owner's attitude and technological literacy are crucial. Environmental Context typically considers market pressure, customer expectations, competitive dynamics and government support. Customer demand for app-based engagement and the presence of tech-forward competitors can drive adoption (Kanel et al., 2024). In Malaysia, MOTAC's incentives and digital tourism campaigns also play a vital role. Hence, the TOE model is often complemented by the Technology

Acceptance Model (TAM) and Diffusion of Innovation (DOI) theory. TAM highlights perceived ease of use and usefulness as central to user acceptance (Davis, 1989), while DOI explains how social influence and communication channels affect innovation diffusion (Amini et al., 2023). Together, these frameworks help explain not only what factors affect adoption, but also why they matter in different contexts.

Materials and Methods

This pilot study investigates the impact of mobile application adoption on the financial performance of homestays in Malaysia. The research is framed using the Technological, Organizational, and Environmental (TOE) framework to identify the key determinants influencing mobile application adoption in the homestay context. This pilot serves as a foundational step in testing the research instrument and evaluating the preliminary relationships among the study variables.

Research design

A quantitative research approach was employed, using a self-administered structured questionnaire as the primary data collection tool. The study aims to explore how the adoption of mobile applications, particularly in areas like bookings, digital payments, guest communication, and reviews, relates to homestay financial performance. The questionnaire was carefully developed based on established constructs derived from the TOE framework, adapted for the context of mobile apps and rural tourism. The instrument included four sections: demographic information, TOE factors, mobile app usage and homestay performance. A seven-point Likert scale ranging from 1 (strongly disagree) to 7 (strongly agree) was used to measure respondents' levels of agreement.

Sampling and population

The population for this pilot study comprised registered cluster homestay coordinators under the Ministry of Tourism, Arts and Culture (MOTAC). These coordinators were selected as respondents because they are responsible for overseeing daily homestay operations, including promotion, bookings, performance reporting and interaction with government bodies. A purposive sampling technique was applied to ensure that participants had the relevant operational knowledge and experience using digital tools or mobile platforms. A total of 50 questionnaires were distributed during the pilot phase and 30 completed responses were returned, yielding a response rate of 60%.

Data collection procedures

In order to enhance accessibility, the questionnaire was designed bilingually in English and Bahasa Malaysia and distributed via Google Forms. The instrument collected data on the perceived usefulness, ease of use, compatibility, organizational readiness, customer pressure and regulatory support associated with mobile app use. Demographic data such as age, gender and location were also recorded. Respondents completed the survey within two weeks with follow-up from the researcher. The responses were coded and entered into SPSS Version 29 for preliminary analysis, including descriptive statistics, reliability test and validity assessments.

Results and Discussion

The data collected for this study were analyzed using SPSS software. Descriptive statistics were first applied to provide a general overview of the respondents' demographic profiles. Next, the reliability of the survey instrument was assessed using Cronbach's Alpha, which measured the internal consistency of the items. In terms of validity, the Kaiser-Meyer-Olkin (KMO) measure and Bartlett's test of sphericity were used to determine the suitability of the data for factor analysis. Moreover, the Kolmogorov-Smirnov and Shapiro-Wilk tests were conducted to verify the normality of the data distribution, ensuring the assumptions for further analysis were met.

Descriptive analysis

Based on *Table 1*, the descriptive analysis reveals that 63.3% of the respondents were male, while 36.7% were female. In terms of age distribution, half of the respondents (50%) were above 61 years old, followed by 40% aged between 41 and 60, and 10% in the 21 to 40 age group. Regarding the location of the homestays involved in this pilot study, the majority were from Sarawak, accounting for 40% of the total respondents. This was followed by Pahang with 20%, Negeri Sembilan at 16.7%, Selangor at 13.3%, and Kelantan with 10%. These figures provide a diverse regional representation of homestay operators across Malaysia.

Table 1. Demographic profiles.

Variables	Descriptions	Frequencies	Percentages
Gender	Male	19	63.3
	Female	11	36.7
Age	21-40	3	10
	41-60	12	40
	Above 61	15	50
Location	Sarawak	12	40
	Pahang	6	20
	N.Sembilan	5	16.7
	Selangor	4	13.3
	Kelantan	3	10

Reliability analysis

Table 2 shows the reliability test for this pilot study, Cronbach's Alpha was used to assess internal consistency. All constructs showed acceptable reliability, with an overall alpha of 0.872, indicating good measurement consistency.

Table 2. Reliability analysis.

Variables	Cronbach's Alpha	N of items
Overall	.872	38

Validity analysis

The Kaiser-Meyer-Olkin (KMO) test and Bartlett's Test of Sphericity were conducted. All KMO values exceeded 0.6, and significance values were below 0.05, validating the data for factor analysis. KMO value for homestay performance is 0.742, indicating good sampling adequacy for this construct. Bartlett's Test of Sphericity is significant ($p < 0.001$), confirming that the items are appropriate for factor analysis. This pilot study highlights the vital role of mobile applications in enhancing the homestay performance. By using the TOE framework, the findings show that adoption is driven by technological utility, organizational readiness particularly digital literacy

and management support, and environmental pressures such as customer demand and MOTAC's digital initiatives. However, rural operators remain disadvantaged by resource constraints, limited skills, and low awareness. These gaps emphasize the need for inclusive digital strategies to ensure equitable adoption and strengthen the long-term competitiveness of the homestay sector (*Table 3*).

Table 3. *Validity analysis.*

Variables	KMO values	Bartlett's Test of Sphericity (Sig.)
Homestay Performance	.742	<0.001

Conclusion

The integration of mobile applications into homestay operations represents a significant opportunity for improving performance, customer engagement, and long-term competitiveness. The findings from this study confirm that mobile apps enhance both operational efficiency and strategic visibility. However, adoption remains uneven, with rural homestay operators facing more significant challenges. Thus, by applying the TOE framework, this study provides a comprehensive view of the key enablers and barriers to mobile application adoption. The insights gained can guide targeted interventions by tourism stakeholders, technology developers, and policymakers to promote broader and more effective use of mobile apps in the Malaysian homestay sector.

Recommendation

In order to support wider adoption of mobile applications among homestay operators, several practical initiatives should be considered. One crucial step is to provide hands-on digital training which is particularly for those in rural areas. This is to improve confidence and skills in using mobile tools and in addition, develop affordable and easy-to-use apps tailored to the specific needs of homestay operations. Collaboration between government agencies and industry partners can help to overcome the cost and technical barriers. Moreover, sharing success stories of digitally advanced homestays through awareness campaigns and peer learning platforms can inspire more operators to adopt mobile technology as a key driver of business growth.

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Conflict of interest

The authors confirm that there is no conflict of interest involved with any parties in this research study.

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