

# Self-Service Kiosks: A Study on Usability and Customer Perception in Hospitality Industry in Malacca

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## ABSTRACT

The hospitality industry, in recent years, has undergone widespread digitalization with self-service kiosks (SSKs) being one of the key innovations aimed at enhancing operational efficiency, reducing customer wait time, and enhancing overall service experience. The research explores SSK usability and attitude of customers towards SSKs in Malacca's hospitality industry in Malaysia, a city rich in cultural heritage and having a rapidly developing tourism sector. Although the application of these technologies has seen growing prevalence globally, minimal research of this kind has been conducted in the Malaysian context, particularly in culturally oriented destinations where cultural diversity and digital literacy levels can have a bearing on user acceptance. Drawing upon the Technology Acceptance Model (TAM), this study evaluates how usage experience, features and functionality, and perception and attitudes contribute to the successful adoption of SSKs in hospitality settings.

**Keywords:** Self-Service kiosks, customer perception, usability, hospitality technology, tourism, Malacca, user experience, technology acceptance, digital service innovation.

## INTRODUCTION

Self-service kiosks (SSKs) have become a central component of digital transformation within the hospitality industry. As service providers seek to improve efficiency, reduce operational costs, and enhance customer autonomy, kiosks increasingly facilitate tasks such as check-in, ordering, and payment without direct staff interaction (Lee, 2022; Kim & Park, 2023). The post-pandemic shift toward contactless service delivery has further accelerated their adoption worldwide (Singh & Kumar, 2022). In tourism-driven economies, these technologies are often positioned as solutions to rising service expectations and growing visitor volumes.

In Malaysia, particularly in major tourist destinations such as Malacca, hospitality operators have begun integrating SSKs to streamline service processes and improve guest convenience (Tan & Aziz, 2021). Malacca, a UNESCO World Heritage city that attracts millions of domestic and international visitors annually, faces continuous pressure to deliver fast, reliable, and culturally sensitive service experiences. Several heritage hotels and tourism establishments have implemented multilingual kiosk systems to shorten queues, expedite check-ins, and enable self-directed transactions. While such initiatives promise operational benefits, their effectiveness ultimately depends on customer acceptance and perception.

Despite the growing presence of kiosks in Malaysia's hospitality sector, empirical research examining their usability and customer perception within this specific cultural and technological context remains limited. Much of the existing literature on self-service technologies has been conducted in technologically mature markets such as the United States, Japan, and Singapore, where digital literacy levels and technological exposure are relatively high (Chong & Tan, 2023). Malaysia presents a different landscape. Its multicultural society, linguistic diversity, and varying levels of digital readiness require service technologies to be inclusive, adaptive, and culturally responsive.

Moreover, Malaysia's national digital transformation agenda, including initiatives such as My DIGITAL, emphasizes the integration of technology to enhance public and private sector service delivery. In the hospitality sector, this includes the promotion of contactless, hygienic, and user-centered technologies (Singh & Kumar, 2022). However, technological deployment alone does not guarantee acceptance. The digital divide, defined by unequal access to and familiarity with digital systems, remains a barrier for certain demographic groups, including older adults and visitors from less digitally advanced regions (Peña & Aquino, 2023). Without careful consideration of usability and customer perception, kiosk implementation risks alienating segments of the population rather than improving service experiences.

Against this backdrop, a critical gap emerges: how do customers in a multicultural tourism destination perceive and evaluate self-service kiosks, and what factors shape their acceptance? Understanding this is essential not only for academic inquiry but also for practical decision-making in hospitality management. If kiosks are introduced primarily to enhance operational efficiency, yet fail to align with local expectations and user capabilities, their strategic value becomes questionable.

This study therefore examines the usability and customer perception of self-service kiosks within the hospitality industry in Malacca. It investigates the extent to which these kiosks are usable in the local hospitality context, explores how customers evaluate them in terms of satisfaction, convenience, and perceived usefulness, and analyzes the factors that shape customer acceptance and continued use of kiosk technology.

To achieve this, the study seeks to assess kiosk usability, evaluate customer perceptions with particular attention to satisfaction and perceived usefulness, and examine the relationship between kiosk features, user experience, and overall customer satisfaction. The significance of this study extends beyond localized service evaluation. For policymakers and industry stakeholders, particularly the Ministry of Tourism, Arts and Culture (MOTAC), the findings provide empirical guidance on how digital service technologies can be aligned with Malacca's heritage identity. Multilingual interface design, culturally appropriate visuals, and accessible system features are not merely technical considerations; they are strategic elements in balancing innovation with inclusivity. By identifying the determinants of kiosk acceptance in a culturally diverse tourism environment, this research contributes to the development of user-centered digital transformation strategies within Malaysia's hospitality sector.

## LITERATURE REVIEW

The growing incorporation of digital technologies in the hospitality industry has brought about major innovations, with self-service kiosks (SSKs) emerging as a transformative element. These technologies not only improve operational efficiency but also transfer service control to customers. In Malaysia, especially in Malacca, a city rich in culture and tourism, SSKs are gradually increasing in popularity. The effectiveness of these kiosks largely relies on customers' perceptions, experiences, and interactions with them. To grasp their influence completely, this literature review examines three essential constructs: usage experience, features and functionality, and customer perception and attitudes, backed by frameworks like the Technology Acceptance Model (TAM), Theory of Planned Behavior (TPB), and Usability Heuristics.

### Customer Perception and Attitudes

Customer perception and attitudes toward self-service kiosks are central to understanding technology acceptance in hospitality settings. Perception reflects how users evaluate the usefulness and usability of kiosk systems, while attitudes capture their overall evaluative orientation toward interacting with the technology. Together, these constructs influence continued usage and acceptance. The Technology Acceptance Model (Davis, 1989) explains that perceived usefulness and perceived ease of use shape user attitudes and behavioral intention. In hospitality environments, perceived usefulness relates to efficiency and time-saving benefits, whereas perceived ease of use reflects clarity and simplicity of interaction (Tan & Lim, 2021). When kiosks are viewed as efficient and easy to operate, customers are more likely to develop favorable attitudes.

However, perception formation is not purely functional. Emotional comfort, digital confidence, and cultural compatibility also influence evaluation. Studies in Malaysia show that digitally proficient users demonstrate stronger acceptance of self-service technologies, while less experienced users may experience uncertainty or resistance (Khoo & Tan, 2023). In multicultural destinations such as Malacca, multilingual interfaces and

culturally appropriate design further enhance perceived value and inclusivity (Sani & Abdul, 2023). Thus, customer perception emerges from both system performance and user-related factors.

### Usage Experience

Perceived Ease of Use (PEU) is the extent to which a person believes that he or she can use a technology easily (Davis, 1989). As a basic principle, data-driven studies reveal a powerful association between the delight of the user and a specified system performance (Karim et al., 2020). Convenience for users, particularly time-saving, is the primary factor that drives the adoption of Online Food Delivery Services (OFDS) (Joshi & Bhatt, 2021). A poorly designed user interface may turn users away (Ramayah & Ignatius, 2005). Navigation and design are essential elements in improving the consumer experience (Kee et al., 2022).

### Social Influence

Usage experience refers to prior interaction with similar self-service technologies. Familiarity reduces uncertainty and increases confidence when encountering new systems. According to the Theory of Planned Behavior (Ajzen, 1991), past behavior influences future intention by shaping attitudes and perceived control. Positive prior experiences enhance perceptions of usefulness and ease of use, reinforcing acceptance (Tan & Aziz, 2021). Conversely, negative encounters may generate distrust and reluctance toward similar technologies (Khoo & Tan, 2023). In Malaysia’s diverse digital landscape, differences in technological exposure between urban and less digitally experienced users may significantly shape kiosk perception (Yusof & Ismail, 2023). Usage experience therefore operates as a psychological facilitator of acceptance by increasing familiarity and reducing cognitive barriers.

### Features and Functionality

Features and functionality encompass the structural design and technical attributes of kiosk systems, including interface layout, responsiveness, language options, and payment integration. According to usability principles (Nielsen, 1994), clarity, consistency, and user control are essential for effective interaction. Well-designed kiosks enhance satisfaction and task efficiency, whereas poor navigation or limited language support can undermine user perception (Kim & Park, 2023). In culturally diverse tourism contexts, multilingual interfaces and inclusive design features are particularly important to ensure accessibility (Lee, 2022). While strong functionality supports positive evaluation, its impact may depend on the user’s prior familiarity with similar technologies.

### Research Framework

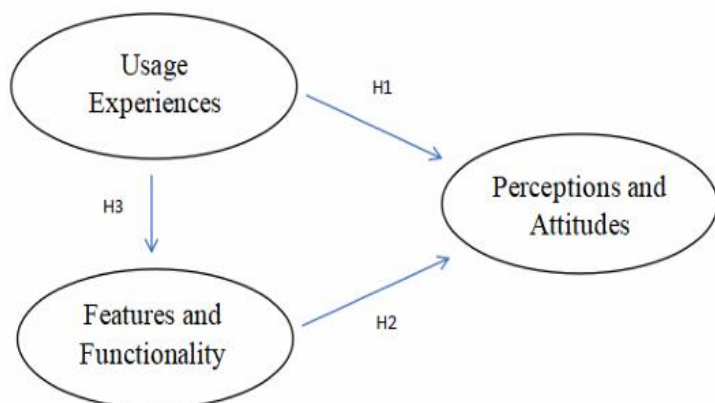


Figure 1: The conceptual framework

This study is grounded in the technology acceptance model (tam), the theory of planned behavior (tpb), and usability theory to explain customer acceptance of self-service kiosks in hospitality settings. the technology acceptance model (davis, 1989) posits that perceived usefulness and perceived ease of use shape user attitudes and behavioral intention. in the context of self-service kiosks, perceived usefulness reflects efficiency and service enhancement, while perceived ease of use relates to the simplicity of interactions. usage experience is expected

to strengthen perceived ease of use through familiarity, whereas features and functionality influence both perceived usefulness and ease of use by determining system effectiveness. perception and attitudes represent the evaluative outcomes of these beliefs and are central to technology acceptance (tan & lim, 2021; khoo & tan, 2023). the theory of planned behavior (ajzen, 1991) further explains that attitudes and perceived behavioral control influence intention. prior experience enhances perceived control by increasing confidence in using kiosk systems, particularly in culturally diverse environments where digital readiness varies. usability theory complements these perspectives by emphasizing clarity, responsiveness, and user control as critical determinants of interaction quality (nielsen, 1994). beyond technical performance, user experience perspectives highlight that emotional comfort and satisfaction also shape technology evaluation. by integrating tam, tpb, and usability theory, this study adopts a multidimensional framework that accounts for cognitive beliefs, behavioral tendencies, and design factors in explaining kiosk acceptance within malacca's multicultural hospitality context.

## METHODOLOGY

This chapter delineates the research methodology employed in this study, comprising research design, unit of analysis, sample size, sampling technique, measurement instrumentation, data collection procedures, and data analysis techniques.

### Research Design

This study employed a quantitative research design to examine customer perceptions of self-service kiosks within hospitality settings in Malacca. A descriptive and causal approach was adopted to identify key factors influencing user satisfaction and acceptance. Data were collected through a field survey conducted in a natural setting, with questionnaires distributed online via social media platforms to reach a broad range of respondents. The design enables comparison of customer satisfaction related to self-service kiosks within selected hospitality environments.

### Unit of Analysis and Sampling Size

The target population comprised domestic and international tourists visiting Malacca who had experience using self-service kiosks in hospitality settings. This population was selected to examine usability and customer perception within an active tourism environment. A non-probability convenience sampling technique was employed due to practical access constraints and the exploratory nature of the study. Respondents were approached through online distribution channels, focusing on tourists familiar with self-service kiosks in central Malacca. Although convenience sampling limits generalizability, it is appropriate for studies examining user perception in specific service contexts. The final sample consisted of 384 respondents, consistent with the recommended sample size for large populations as suggested by Krejcie and Morgan (1970). This sample size provides sufficient statistical power for regression analysis and hypothesis testing.

### Sampling Technique and Instrumentation

A structured self-administered questionnaire was developed to measure the constructs within the research framework. Measurement items were adapted from established studies with minor modifications to ensure contextual relevance. The questionnaire comprised three sections. The first section collected demographic information, including gender, age, occupation, state of origin, and frequency of self-service kiosk usage. The second section measured the independent variables related to service quality dimensions, including tangibles, reliability, responsiveness, assurance, and empathy. The final section assessed the dependent variable, focusing on customer satisfaction with self-service kiosks in Malacca's hospitality sector. All construct items were measured using a five-point Likert scale ranging from strongly disagree to strongly agree. The instrument contained approximately 27 items in total.

### Data Collection and Analysis

This research utilized quantitative methods, generating statistics through techniques such as arranged interviews or surveys to carry out comprehensive research studies. Although the extent of this type of research is much larger than that of qualitative studies, the time span of the interaction with the topics is notably briefer. Through a survey, primary data was collected through this method from both international and domestic travelers coming to Melaka. An organized survey utilized the method of administering a questionnaire. Furthermore, the investigator utilized secondary data, which refers to information that has been acquired earlier and is readily

available to the researcher. Data from secondary sources was collected through a selection of archived journals linked to this study and government entities like Tourism Melaka. The data was scrutinized through the Statistical Product and Service Solutions (SPSS) application, utilizing descriptive statistics, Pearson's correlation, and various regression analyses.

### Research Findings

The Cronbach's Alpha coefficient for all variables in this research surpasses 0.6, which is considered an acceptable level of reliability (Sekaran, 2019).

Table 1: Reliability Analysis

Variable	No. of Item	Cronbach's Alpha
Usage Experiences	11	0.74
Perception and Attitudes	8	0.87
Features and Functionality	5	0.70

### Demographic Analysis

This section gives a snapshot of the demographic traits of the 384 individuals who took part in the study. As shown in Table 1, every participant was over 18 years of age (100.0%), adhering to the inclusion criteria established for the research. In terms of gender, the sample comprised 155 males (40.4%) and 229 females (59.6%), revealing a greater engagement among female participants. When looking at occupations, the largest group was students (54.7%), followed by those who were employed (39.8%), and a lesser fraction were unemployed (5.5%). This breakdown indicates that the majority of the sample consists of individuals either in the educational sphere or participating in the job market. Regarding the respondents' places of origin, the distribution was relatively even with Melaka (44.3%) and other Malaysian states (44.5%), while 11.2% hailed from outside Malaysia. This range of backgrounds enriches the findings by including various geographical viewpoints. In conclusion, every respondent confirmed they have used a self-service kiosk (100.0%), which corresponds to the study's aim of assessing user experiences, perceptions, and attitudes toward self-service kiosk systems. In summary, the demographic profile illustrates a youthful, educated, and geographically varied group that aligns well with the research's objectives.

Table 2: Demographic Analysis

Category	Demographic	Frequency	Percentage
Gender	Male	155	40.4
	Female	229	59.6
Age	Above 18 years old	384	100.0
Occupation	Student	210	54.7
	Employed	153	39.8
	Unemployed	21	5.5
Origin	Melaka	171	44.5
	Other Malaysian states	43	11.2
	Outside Malaysia	29	7.6
Kiosk Usage	Have used	384	100.0

### Correlation Analysis

To investigate the links among the three main variables: Usage Experience, Features and Functionality, and Perception and Attitudes, a correlation analysis was done. The strength and direction of the linear connections

among these variables were assessed using the Pearson correlation coefficient ( $r$ ). All correlations, as shown in Table 4, were found to be positive and statistically significant at the 0.01 level (2-tailed), hence pointing to strong relationships between each pair of variables. With a coefficient of  $r = 0.877$ , the strongest correlation was seen between Usage Experience and Perception and Attitudes; this implies that people with more extensive or positive experience employing self-service kiosks are more likely to view the technology favourably. Emphasizing that users' experiences are heavily influenced by the design, responsiveness, and usability of the kiosks, a similarly strong link was found between Usage Experience and Features and Functionality ( $r = 0.796$ ). Moreover, at  $r = 0.808$ , the link between Features and Functionality and Perception and Attitudes was also strong. This means that users who see the kiosk capabilities as efficient and user-friendly are more likely to form a favourable attitude and opinion towards the whole 24 self-service experience. These findings highlight the related character of user perception, system capability, and user experience, hence underlining the need to prioritize usability and interface quality in order to boost consumer satisfaction and acceptance.

Table 3: Correlations Analysis

Variables	Usage Experience	Features and Functionality	Perception and Attitudes
Usage Experience	1	.796**	.877**
Features and Functionality	.796**	1	.808**
Perception and Attitudes	.877**	.808**	1

### Multiple Regression Analysis

Table 4 presents the regression results examining the effects of usage experience and features and functionality on the dependent variable. Both predictors demonstrate statistically significant relationships, with  $p$ -values below .001, indicating that the observed effects are unlikely due to chance. Usage experience emerged as the stronger predictor, with an unstandardized coefficient ( $B = 0.611$ ) and a standardized beta ( $\beta = 0.638$ ). This suggests that higher levels of prior experience are associated with substantial increases in the dependent variable. The large  $t$ -value ( $t = 16.905$ ) further confirms its significance, supporting H1. Features and functionality also showed a positive and statistically significant effect ( $B = 0.261$ ,  $\beta = 0.300$ ,  $t = 7.953$ ). Although its influence is weaker than usage experience, the results support H2, indicating that system design characteristics contribute meaningfully to the outcome.

The overall regression model was highly significant ( $F = 769.408$ ,  $p < .001$ ). The adjusted  $R^2$  value of .801 indicates that approximately 80.1% of the variance in the dependent variable is explained by the two predictors, reflecting strong explanatory power. The correlation coefficient ( $r = .802$ ) further indicates a strong positive relationship between the combined predictors and the outcome variable.

Table 4: Multiple Regression Analysis

Independent Variable	Unstandardized B	Std. Error	Beta	t-value	p-value
(Constant)	-0.910	0.076	–	-12.033	<.001
Usage Experiences	0.611	0.036	0.638	16.905	<.001
Features and Functionality	0.261	0.033	0.300	7.953	<.001

Note. Dependent Variable = Perception and Attitudes. Adjusted  $R^2 = 0.801$ .

## DISCUSSION

The research findings indicate the increasing relevance of self-service kiosks (SSKs) in the Malaysian hotel industry, in particular in a tourist hub such as Malacca. The information supports that usage experience is the key driver of customer perception and satisfaction. With a high standardized beta score ( $\beta = 0.638$ ), usage experience was most powerful as a predictor of customer perception, substantiating the argument that convenience, speed, and simplicity are inherent to a good kiosk technology experience (Kim & Park, 2023). This aligns with the Technology Acceptance Model (TAM), whereby perceived ease of use and usefulness are decisive variables of technology adoption (Davis, 1986; Baba et al., 2023).

The study found that while customers desire quickness from kiosks, they may not always receive reliable technology, system responsiveness, language support, and pleasant interfaces. This is particularly concerning in a multicultural society like Malaysia, where language diversity and technological expertise require accessible design. The low mean value of 2.0179 in the descriptive analysis further confirms this, as users may face limitations in personalization, screen navigation, and access to information, potentially lowering their satisfaction levels.

The study suggests that hospitality firms should focus on creating robust, linguistically accessible, and culturally sensitive kiosks for operational effectiveness. This includes incorporating Bahasa Malaysia, English, Mandarin, and Tamil-compatible interfaces for local tourist destinations and foreign visitors, reflecting the Malacca linguistic landscape. Additionally, features like audio guidance, touch calibration, and real-time assistance options should be prioritized to accommodate elderly and disabled individuals, promoting equal digital inclusion.

Further, the high correlations realized between variables, particularly between usage experience and customer perception ( $r = 0.877$ ) and between features and customer perception ( $r = 0.808$ ) emphasize the interdependence of system performance and user satisfaction. This reinforces the importance of customer-centricity in kiosk deployment, whereby user feedback is encouraged positively and integrated into iterative design cycles. Kiosk solutions must not be one-size-fits-all; instead, they must reflect the demographic, cultural, and psychological profiles of their users in order to be relevant and impactful (Gupta & Sharma, 2021).

In conclusion, this study provides empirical evidence that well-designed and simple-to-use self-service kiosks may significantly enhance customer satisfaction and operational effectiveness in hospitality settings. Their success, however, depends on thorough considerations in implementation that take into account local conditions, cultural adaptability, and usability in technology. With tourism rising in Malacca, integrating smart service solutions like SSKs offers a viable way to strengthen the delivery of services, as they are implemented in line with users' requirements and expectations.

## CONCLUSION AND RECOMMENDATION

Despite its contributions, this study is subject to several limitations. First, the research was geographically confined to Malacca, a culturally rich and internationally recognized tourism destination. While this context provides valuable insight into the intersection of digital technology and heritage tourism, the findings may not be fully generalizable to other regions within Malaysia or Southeast Asia where tourist demographics, infrastructure development, and digital readiness levels differ. For instance, customer expectations in technologically advanced cities such as Singapore or Kuala Lumpur may contrast sharply with those in rural or resort-based destinations. Future research should therefore expand the geographical scope to include diverse tourism settings, such as beach resorts, hill retreats, and rural communities, in order to better understand how contextual factors influence kiosk usability and customer perception (Singh & Kumar, 2022).

Second, the dissatisfaction observed regarding kiosk functionality highlights the need for practical improvements in system design. Hospitality providers should prioritize interface refinement, including clearer screen layouts, improved touch sensitivity, and multilingual visual and audio guidance. Incorporating real-time feedback mechanisms within kiosk systems may also enable operators to identify service gaps more efficiently. Advanced adaptive features, such as AI-driven personalization or recognition systems for returning customers, could further enhance perceived value and long-term loyalty (Cheng & Lee, 2024). However, technological

enhancement alone is insufficient. The findings reinforce the continued importance of human interaction in hospitality services. A hybrid service model, in which kiosks are supported by trained frontline staff, may better accommodate tourists who prefer personal assistance or require additional support (Zhang & Lee, 2024). Investment in employee digital competence is therefore essential to bridge automation with personalized service delivery.

Methodologically, future research should consider adopting mixed-method approaches that combine quantitative surveys with qualitative interviews or focus groups. Such designs would provide deeper insight into emotional responses, cultural influences, and motivational drivers that are not fully captured through structured questionnaires. Longitudinal studies may also help determine whether repeated exposure to kiosk systems strengthens loyalty, revisit intention, and sustained satisfaction over time. Furthermore, emerging technologies such as voice-enabled kiosks and mobile-integrated self-service platforms present promising avenues for further investigation.

Overall, while this study advances understanding of self-service kiosk adoption within Malaysia's hospitality sector, its contextual and methodological limitations underscore the need for broader sampling strategies and deeper contextual analysis. Continued research is necessary to ensure that digital transformation initiatives in tourism remain inclusive, adaptive, and aligned with evolving customer expectations.

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