

Assessing Digital Payment System Adoption among MSMEs in Kedah and Perlis: Preliminary Findings from a Pilot Study

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Abstract

This study aims to validate the measurement instrument for assessing digital payment adoption among Micro, Small, and Medium Enterprises (MSMEs) in Kedah and Perlis, Malaysia. The study integrates the Technology Acceptance Model (TAM) and the Information Systems Success Model (ISSM), with perceived security incorporated into the proposed framework. The measurement model consists of perceived usefulness, perceived ease of use, information quality, system quality, service quality, perceived security, and digital payment adoption. A quantitative research approach was employed using a structured questionnaire. Data were collected from 30 MSME respondents in Kedah and Perlis through purposive sampling and analysed using the Statistical Package for the Social Sciences (SPSS) and Partial Least Squares Structural Equation Modelling (PLS-SEM). Cronbach's alpha was used to assess internal consistency, while convergent validity was evaluated based on factor loadings, composite reliability, and average variance extracted (AVE). The results indicate that the measurement constructs demonstrated satisfactory to excellent internal consistency, with Cronbach's alpha values of 0.938 for digital payment adoption, 0.840 for perceived usefulness, 0.874 for perceived ease of use, 0.884 for information quality, 0.856 for system quality, 0.846 for service quality, and 0.874 for perceived security. The findings further indicate that most constructs achieved acceptable convergent validity based on composite reliability and AVE. Overall, the pilot study confirms that the measurement instrument demonstrates satisfactory reliability and validity for further empirical investigation. The study contributes methodologically by providing a validated measurement instrument for examining digital payment adoption among MSMEs, particularly within the context of Kedah and Perlis.

Keywords: Digital Payment Adoption, Pilot Study, MSMEs, Kedah, Perlis

Introduction

The global economy is undergoing a profound transformation driven by rapid advancements in Information and Communication Technology (ICT) and digital technologies, reshaping the

way individuals and businesses communicate, conduct business, and perform financial transactions. As countries continue to embrace digital transformation, the digital economy has emerged as an important driver of economic growth, innovation, and business development. In this context, digital payment systems have become an increasingly important component of modern financial services, providing faster, more convenient, and efficient alternatives to traditional cash-based transactions. Digital payments, defined as monetary transactions conducted electronically for goods or services purchased online (Gourab Ghosh, 2021), have gained increasing attention as businesses and consumers shift towards more convenient and accessible methods of conducting financial transactions. The continued development of digital payment technologies has therefore contributed to the broader movement towards a cashless economy.

The growing adoption of digital payment systems reflects the increasing integration of technology into everyday financial and business activities. Advances in financial technology, increasing internet accessibility, widespread smartphone usage, and supportive government initiatives have accelerated the acceptance of digital payment systems across different countries. Digital payments enable businesses to conduct transactions more efficiently while offering benefits such as convenience, accessibility, transaction speed, and transparency (Zhang, 2023). For businesses, particularly Micro, Small, and Medium Enterprises (MSMEs), the adoption of digital payment systems can support daily operations and facilitate transactions with customers in an increasingly digital business environment. Consequently, digital payment adoption has become an important area of research, particularly in understanding the factors that influence businesses' acceptance and use of digital payment technologies.

Following the global shift towards digitalisation, Malaysia has also experienced significant growth in the adoption of digital payment systems as the country continues its transformation towards a cashless society. Supported by technological development, increasing internet and smartphone penetration, and government initiatives promoting cashless transactions, digital payment methods have become increasingly common among consumers and businesses. Consequently, digital payment systems now play an important role in facilitating financial transactions across various sectors and supporting the development of Malaysia's digital economy (Samat & Bashri, 2024). The increasing reliance on digital payment technologies highlights the importance of understanding how businesses perceive and respond to these technologies within the Malaysian context.

Micro, Small, and Medium Enterprises (MSMEs) are recognised as an important component of Malaysia's economy due to their contributions to employment, business development, and economic growth. As consumer preferences increasingly shift towards cashless transactions, digital payment adoption has become more relevant to MSMEs seeking to improve operational efficiency, enhance customer convenience, and maintain competitiveness (Ahmad Ramli, 2021). However, the decision to adopt digital payment systems may be influenced by various technological and user-related factors. These may include the perceived usefulness and perceived ease of use of the technology, the information quality of the system, the quality of service provided, and users' perceptions of security. Understanding these factors is important for examining the readiness and willingness of MSMEs to incorporate digital payment systems into their business activities.

Despite the increasing importance of digital payment systems, their adoption among MSMEs may vary according to how business owners and decision-makers perceive the technology. Factors such as whether the system is useful and easy to use, whether the information provided is accurate and reliable, whether the system performs effectively, whether adequate service is provided, and whether transactions are perceived as secure may influence the acceptance of digital payment systems (Antoni & Supriadi, 2024). Therefore, examining these factors requires the use of reliable and valid measurement instruments that can accurately capture the perceptions and experiences of MSMEs regarding digital payment adoption.

Given this concern, there is a critical need to develop and validate a robust measurement instrument for examining the factors influencing the adoption of digital payment systems among MSMEs. Existing measurement instruments are often adapted from previous studies conducted in different technological, organisational, and geographical contexts, which may not fully reflect the characteristics and perceptions of MSMEs in Northern Malaysia. Therefore, ensuring that the measurement items are reliable and contextually appropriate is essential before proceeding to large-scale empirical analysis. In response to this need, the present study conducts a pilot study to evaluate the reliability and validity of the proposed measurement instrument for examining the factors influencing the adoption of digital payment systems among MSMEs in Kedah and Perlis, Malaysia.

Literature Review

Issues of the Adoption of Digital Payment Technology Adoption

In the early 2000s, e-payment was defined as a system that is classified into cash and cheque, like the traditional payment system. Both types of payment systems are direct payment systems, which means that a payment requires an interaction between the buyer and seller. Kaur et al. (2025) defined e-payment as payment made by electronic transfer of credit card details, direct credit, or other electronic means, other than payment by cheque and cash. With the advancement of technology, the definition of e-payment has also changed.

According to Al-Shamali et al. (2025), e-payment is a collection of components and processes that enable two or more parties to conduct financial transactions and exchange monetary value via electronic means. It means making payments without the use of physical cash; payments can be made via online transactions, mobile banking, debit and credit cards, cheques, and wire transfers. In other words, financial transactions can be carried out anywhere and anytime via the internet with the use of devices, which are computers or mobile phones (Hanafiah et al., 2024).

Bland et al. (2024) confirm that transitioning to electronic payments offers several advantages, including improved financial management efficiency and support for eco-friendly practices, and that the widespread use of wireless communication devices and mobile phones has facilitated payments, providing convenient access to e-payment mediums, enabling transactions for digital goods, internet-based purchases, and physical-world products and services. On the other hand, Qatawneh et al. (2024) confirm that the Malaysian government and the Central Bank of Malaysia (Bank Negara Malaysia) are intensively promoting it by reducing e-payment fees to encourage businesses and consumers to use cashless payment systems, and that the digital economy has been pivotal during the coronavirus pandemic in

overcoming various economic restrictions, with the Malaysian government launching MyDIGITAL as a national initiative to transform Malaysia into a digitally enabled nation.

Therefore, despite the efficiency gains and government promotion efforts, significant barriers to digital payment adoption persist across both developed and developing economies. Sharma & Sharma (2023) confirm that the current adoption of an e-payment service, which is also known as a cashless payment system in Malaysia, is still small, and many challenges are yet to be addressed, with compatibility and technology competence having a more significant relationship with the adoption of cashless payment systems among businesses, while firm size was not associated with adoption.

Technology Acceptance Model (TAM)

The Technology Acceptance Model (TAM), developed by Davis (1989), is one of the most widely used models in information systems for explaining and predicting users' acceptance of technology. TAM proposes that two key factors, Perceived Usefulness (PU) and Perceived Ease of Use (PEOU), determine users' attitudes toward adopting a new technology. PU is defined as the extent to which an individual believes that using a particular system will enhance their job performance. At the same time, PEOU refers to the degree to which a person believes that using the system will be free of effort (Davis, 1989). These beliefs influence a user's attitude, which then affects their behavioral intention and actual system usage.

Over the years, TAM has been extensively validated in numerous technological contexts such as e-commerce, mobile banking, and digital payment systems (Ghazalah & Abdallah, 2024). Due to its simplicity, empirical support, and predictive power, TAM is considered a robust and parsimonious model for explaining technology adoption behavior. The model's flexibility also allows researchers to extend it by incorporating additional variables such as trust, security, or system quality to fit the needs of specific studies. This makes TAM not only a foundational model but also a versatile tool for understanding how users accept emerging technologies (Patnaik et al., 2023).

Therefore, in this study, TAM is used to understand how Micro, Small and Medium Enterprises (MSMEs) in Malaysia adopt digital payment systems. PU is relevant in evaluating how MSMEs perceive the business value and efficiency brought by digital payments, while PEOU helps assess whether these systems are considered user-friendly and convenient by MSME decision-makers. Understanding these perceptions is crucial, as they directly affect the intention to adopt the technology. Therefore, TAM provides a solid theoretical basis for examining the behavioral intentions of MSMEs toward digital payment adoption, particularly in the fast-evolving financial technology landscape.

Information Systems Success Model (ISSM)

The Information System Success Model (ISSM), first introduced by DeLone and McLean (1992) and later updated in 2003, is a comprehensive framework for evaluating the success of information systems in organizations. The model initially comprised six interrelated dimensions: System Quality, Information Quality, Use, User Satisfaction, Individual Impact, and Organizational Impact. In their updated model, DeLone and McLean (2003) added Service Quality. They revised the outcome measures into Net Benefits, enhancing the model's

applicability to modern systems, including e-commerce, digital platforms, and financial technologies. The model posits that high system, information, and service quality lead to increased user satisfaction and intention to use, ultimately resulting in positive individual and organizational outcomes (Urumsah et al., 2023).

In the context of this study, three quality dimensions from the ISSM—Information Quality, System Quality, and Service Quality—are especially relevant. Information Quality refers to the accuracy, relevance, and timeliness of the content provided by the system (DeLone & McLean, 2003). System Quality reflects the system's performance, reliability, and user interface, while Service Quality focuses on the support provided to users, including technical assistance and responsiveness. These qualities are crucial in determining whether users, particularly MSMEs, find the digital payment systems reliable, efficient, and worth adopting (Urumsah et al., 2023).

Integrating ISSM with TAM allows this study to go beyond just user perceptions and behavioral intent. While TAM focuses on psychological acceptance (PU and PEOU), ISSM captures the technical and experiential quality of the system that influences these perceptions. For MSMEs in Malaysia, the successful adoption of digital payment systems depends not only on how useful and easy the systems seem, but also on how well they perform and how reliable the service infrastructure is (Barry et al., 2024). Thus, the ISSM serves as a complementary theory that enhances the explanatory power of this study's conceptual model (Nurherwening et al., 2021).

The Relationship between Perceived Usefulness (PU) and Digital Payment Technology

Perceived Usefulness (PU) is defined as the degree to which an individual believes that using a particular system will enhance job performance (Davis, 1989). Within the context of digital payment systems, perceived usefulness reflects the extent to which MSMEs believe that digital payment technologies can improve operational efficiency, reduce transaction costs, enhance transaction speed, and increase customer satisfaction. Since MSMEs often operate with limited financial and operational resources, technologies perceived as beneficial may become increasingly important in supporting business sustainability and competitiveness in a rapidly evolving digital economy.

Previous studies have consistently reported that perceived usefulness positively influences the adoption of digital payment systems and related financial technologies. Mohamad et al. (2022) highlighted that perceived usefulness significantly affects digital payment adoption among MSMEs in emerging economies by improving operational efficiency and business performance. Similarly, Kanapathipillai et al. (2024) found that technological readiness, including perceived usefulness, has a statistically significant positive relationship with digital payment adoption among MSMEs in Kedah and Perlis. Ming and Jais (2022) further reported that perceived usefulness is a strong predictor of e-wallet adoption among Kedah and Perlis users, suggesting that users are more likely to adopt digital payment technologies when they perceive clear practical and economic benefits.

Despite the widely recognized benefits of digital payment systems, the relationship between perceived usefulness and actual adoption behaviour may not always be straightforward. Several studies suggest that users may perceive digital payment systems as useful while still

hesitating to adopt them due to concerns related to trust, cybersecurity, perceived risk, and transaction safety (Norbu et al., 2024). In addition, fears of online fraud, cybercrime, and data security breaches may reduce users' confidence in using digital payment systems despite recognizing their potential benefits (Lestari et al., 2024). This indicates that perceived usefulness alone may not be sufficient to ensure digital payment adoption, particularly among MSMEs, which are more vulnerable to operational and financial risks.

In the context of Malaysian MSMEs, perceived usefulness is expected to play an important role in encouraging the adoption of digital payment systems as businesses increasingly seek efficient, flexible, and cost-effective transaction methods to remain competitive within the digital economy.

H1: Perceived Usefulness (PU) has a positive and significant influence on Digital Payment Technology Adoption

The Relationship between Perceived Ease of Use (PEOU) and Digital Payment Technology

Perceived Ease of Use (PEOU) refers to the degree to which an individual believes that using a particular system would be free of effort (Davis, 1989). In the context of digital payment systems, PEOU is considered an important factor influencing users' willingness to adopt new technologies, particularly among MSMEs with limited technical knowledge and digital experience. Digital payment platforms that are easy to learn, simple to navigate, and user-friendly are more likely to encourage adoption among business owners. Previous studies have shown that PEOU positively influences the intention to adopt digital payments. For example, Ming and Jais (2022) found that PEOU significantly affects e-wallet adoption in Malaysia, while Kanapathipillai et al. (2024) emphasized that technological readiness, including ease of use, significantly contributes to digital payment adoption among MSMEs. Similarly, Mohamad et al. (2022) highlighted that systems perceived as simple and convenient are more likely to achieve successful adoption in emerging economies.

However, despite the widespread recognition of PEOU as a determinant of technology adoption, existing findings remain inconsistent across different contexts and technologies. Several studies support the significant influence of PEOU on behavioral intention (Susiloadi et al., 2023), whereas other studies found that PEOU does not significantly affect adoption intention directly, especially in more advanced digital payment technologies such as facial recognition payment systems (Lim et al., 2024) and digital voice assistance technologies (Aslam et al., 2022). These inconsistencies suggest that the effect of PEOU may vary depending on the technological context, user characteristics, and environmental conditions.

Furthermore, studies indicate that PEOU may not independently determine digital payment adoption because its influence is often overshadowed by other factors such as trust, perceived risk, and security concerns (Norbu et al., 2024). Users may perceive a digital payment system as easy to use, but concerns regarding online fraud, cybersecurity, and privacy risks may still discourage adoption. In addition, some studies argue that PEOU functions indirectly by influencing perceived usefulness rather than directly affecting adoption intention (Handoko et al., 2024). This suggests that ease of use alone may not be sufficient to encourage digital payment adoption without the presence of trust, security, and perceived benefits.

The inconsistencies in previous findings indicate that the relationship between PEOU and digital payment adoption remains inconclusive, particularly in the MSME context. Therefore, this study proposes that PEOU positively influences the adoption of digital payment systems among MSMEs in Kedah and Perlis. In line with the Technology Acceptance Model (TAM), MSMEs are more likely to adopt digital payment systems when they perceive the systems as easy to understand and operate.

H2: Perceived Ease of Use (PEOU) has a positive and significant influence on Digital Payment Technology Adoption

The Relationship between Information Quality (IQ) and Digital Payment Technology Adoption
Information Quality (IQ) pertains to the quality of information that a system provides, including aspects like accuracy, relevance, timeliness, and completeness. High-quality information is essential for SMEs to make informed decisions and maintain efficient operations. In the context of digital payment systems, IQ can influence user satisfaction and trust, thereby affecting adoption rates.

Kaur et al. (2025) highlighted that the quality of information provided by electronic payment systems is a significant factor influencing their adoption among SMEs. Furthermore, Kanapathipillai et al. (2024) discussed the importance of technological readiness, which encompasses the quality of information systems, in driving digital payment adoption. Ming & Jais (2022) also noted that accurate and timely information enhances users' trust in e-wallet systems.

However, despite the theoretical importance of IQ, prior studies reported inconsistent findings regarding its relative influence on digital payment adoption. Some studies positioned IQ as a major determinant of adoption behaviour (Shanmugavel et al., 2024), while others found that factors such as perceived usefulness, trust, security, and social influence exerted stronger effects than IQ (Srivastava et al., 2023). Research conducted in Bahrain by Albastaki et al. (2022) revealed that security, privacy, reliability, and convenience were more dominant determinants of e-payment adoption, with IQ playing only a secondary role. Similarly, studies in developing economies suggested that digital literacy limitations, cash payment habits, and infrastructural barriers may weaken the influence of IQ on adoption decisions (Poudel et al., 2023).

In addition, previous literature highlights that the relationship between IQ and adoption intention may be influenced by contextual and moderating factors such as security concerns, trust, ICT literacy, and demographic characteristics (Nurdin, 2023). Although ISSM conceptualises IQ as a distinct construct, many studies indicate that users may prioritise security and privacy considerations over information-related attributes when deciding whether to adopt digital payment systems (Albastaki et al., 2022). This inconsistency suggests that IQ alone may not sufficiently explain digital payment adoption without considering the broader technological and environmental context.

In the context of MSMEs in Kedah and Perlis, accurate and timely payment information is essential for business operations, financial management, and customer transactions.

Therefore, this study proposes that higher levels of perceived information quality will positively influence MSMEs' adoption of digital payment systems.

H3: Information Quality (IQ) has a positive and significant influence on Digital Payment Technology Adoption

The Relationship between System Quality (SYSQ) and Digital Payment Technology Adoption
System Quality (SYSQ) refers to the technical performance characteristics of a digital payment system, including usability, reliability, adaptability, availability, and response time (Shanmugavel et al., 2024). Within the Information Systems Success Model (ISSM), system quality is considered an important determinant of user satisfaction and behavioural intention because users are more likely to adopt systems that are stable, efficient, and easy to operate. In the context of digital payment systems, high system quality ensures smooth transaction processes, minimal system downtime, fast response time, and secure payment experiences, which are crucial for MSMEs that rely on digital transactions for daily business operations.

Several studies have identified system quality as a significant factor influencing digital payment adoption and continuance intention. Shanmugavel et al. (2024) found that system quality significantly influenced user satisfaction and continuance intention toward digital wallets. Similarly, Pushparaj et al. (2025) reported that high system quality positively affected users' stickiness toward mobile payment applications, as users preferred platforms that offered convenience, fast accessibility, and reliable performance. In the Malaysian context, Musyaffi et al. (2023) identified system simplicity and reliability as important determinants influencing the adoption of electronic payment systems among SMEs. Kanapathipillai et al. (2024) also emphasized that technological readiness, including system quality, significantly affects digital payment adoption among businesses.

Despite these positive findings, previous studies have reported inconsistencies regarding the direct influence of system quality on adoption intention. In addition, studies based on TAM and UTAUT frameworks often identified performance expectancy, trust, security, and facilitating conditions as stronger predictors of digital payment adoption compared to system quality (Linge et al., 2023). Research in developing economies also indicates that security and trust concerns may overshadow the role of system quality in influencing users' adoption decisions (Al-Shamali et al., 2025).

Furthermore, the literature reveals inconsistencies in how system quality is operationalised across studies. Some researchers define system quality through usability, reliability, and response time (Pushparaj et al., 2025), while others extend the construct to include device quality and user interface design (Tun, 2021). The integration of ISSM with TAM and UTAUT frameworks also creates conceptual overlap between system quality, perceived ease of use, and facilitating conditions, making the independent effect of system quality difficult to isolate (Shanmugavel et al., 2024). These inconsistencies indicate that the influence of system quality on digital payment adoption remains context-dependent and requires further empirical investigation, particularly among MSMEs in Malaysia.

Nevertheless, based on the ISSM framework and prior empirical findings, this study posits that high system quality can improve operational efficiency, enhance user satisfaction, and encourage MSMEs to adopt digital payment systems.

H4: System Service Quality (SYSQ) has a positive and significant influence on Digital Payment Technology Adoption

The Relationship between System Service Quality (SSQ) and Digital Payment Technology Adoption

System Service Quality (SSQ) refers to the quality of support services provided to users by digital payment service providers, including responsiveness, technical assistance, reliability, and customer support (Shanmugavel et al., 2024). Within the Information Systems Success Model (ISSM), service quality is considered an important dimension influencing user satisfaction and behavioural intention toward information systems adoption. In the context of digital payment systems, high service quality enables MSMEs to receive timely assistance, resolve transaction-related issues efficiently, and develop greater confidence in using digital payment technologies for business operations.

Several studies have identified system service quality as a significant determinant of digital payment adoption and continuance intention. Shanmugavel et al. (2024) found that service quality significantly influenced user satisfaction and continuance intention toward digital wallets. Similarly, Pushparaj et al. (2025) reported that responsive and reliable customer support positively affected customer satisfaction and application stickiness in mobile payment systems.

Despite these positive findings, the empirical evidence regarding service quality remains inconsistent. Although service quality significantly affected user satisfaction, it did not directly influence adoption intention. Likewise, Tun (2021) reported that service quality was an insignificant determinant of behavioural intention toward mobile banking adoption. These findings suggest that service quality may influence adoption indirectly through mediating variables such as satisfaction and perceived usefulness rather than exerting a direct effect on behavioural intention. Furthermore, studies based on TAM and UTAUT frameworks often identify factors such as trust, security, performance expectancy, and facilitating conditions as stronger predictors of digital payment adoption compared to service quality (Nguyen et al., 2023).

The literature also highlights conceptual overlap between service quality and trust-related constructs. Attributes such as responsiveness, reliability, and assurance are frequently embedded within broader perceptions of trust and security in digital payment environments (Al-Shamali et al., 2025). This overlap creates inconsistencies in measurement and may explain the varying significance of service quality across studies. Additionally, contextual differences across countries and technological environments further influence the role of service quality in digital payment adoption. In developing economies, basic technical support and service reliability are often viewed as essential prerequisites for adoption, particularly among MSMEs with limited technological expertise (Tun, 2021).

Although prior findings remain mixed, service quality continues to be recognised as an important ISSM construct that may enhance users' confidence, satisfaction, and willingness to adopt digital payment systems. In the context of Malaysian MSMEs, reliable customer support and responsive service providers may encourage greater adoption of digital payment technologies by reducing operational difficulties and improving overall user experience.

H5: System Quality (SSQ) has a positive and significant influence on Digital Payment Technology Adoption

Overall, the framework of this study is shown in Figure 1

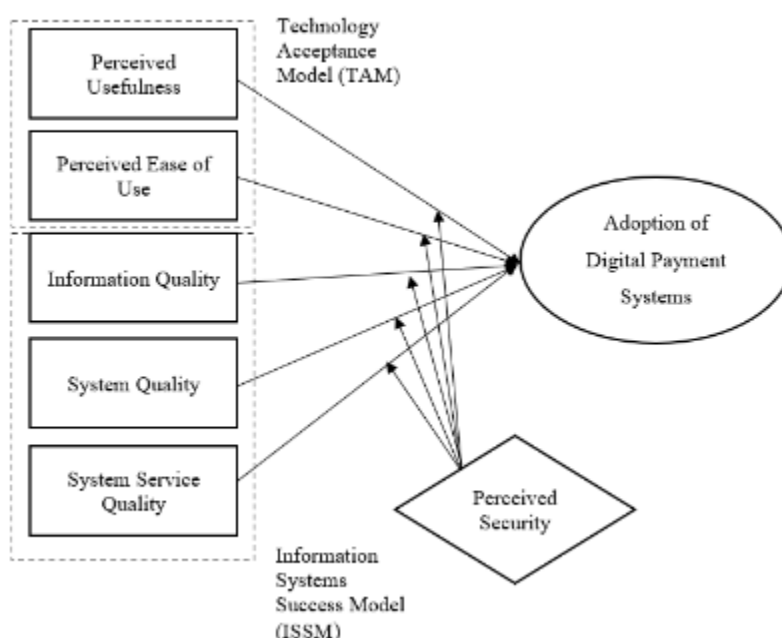


Figure 1: Research Framework of the study

Methodology

Research Design

This study employed a quantitative research approach using a cross-sectional survey design to examine the factors influencing digital payment adoption among Micro, Small, and Medium Enterprises (MSMEs) in Kedah and Perlis. A quantitative approach was considered appropriate because it enables the collection of numerical data for hypothesis testing and the examination of relationships among the proposed variables. Data were collected at a single point in time using a structured questionnaire distributed through an online survey platform (Siregar, 2025).

Data Analysis Process

This study analysed the data using SPSS version 25 is suitable for studies with small to moderate sample sizes and complex research models and investigated the determinants of digital technology acceptance. The data were analysed for kurtosis and skewness to determine whether the sample data passed the normality test. Subsequently, an exploratory factor analysis was conducted on the sample data to test the reliability and validity of the questionnaire. Thereby establishing the validity of the sample data.

Population and Sampling

The target population of this study comprised MSMEs operating in the states of Kedah and Perlis, Malaysia. These two states were selected due to their substantial number of MSMEs and their increasing participation in Malaysia's digital economy. The respondents consisted of MSME owners or individuals directly involved in business decision-making and digital payment usage. A non-probability purposive sampling technique was employed to ensure that only respondents with relevant knowledge and experience in using digital payment systems participated in the study. A total of 30 valid responses were successfully collected and used for data analysis. This step helps identify potential issues and allows for necessary refinements before full-scale data collection (Pulatama et al., 2025).

The pilot study also contributes to establishing face validity, ensuring that the instrument appears appropriate for measuring the intended constructs from respondents' perspectives. Descriptive research is used to systematically describe the characteristics of variables within a specific context, such as demographics and industries, including age, digital payment frequency, and payment types. Overall, this design aims to develop a comprehensive profile of the phenomenon under investigation by capturing its key features from individual, organizational, or industry perspectives (Lim et al., 2025). Table 1 shows all the demographic data.

Table 1

Descriptive Statistics of Respondents

Constructs	Substance	Frequency	Percent (%)
Gender	Male	12	40.0
	Female	18	60.0
State	Kedah	13	43.3
	Perlis	17	56.7
MSMEs Industry	Services	17	56.7
	Manufacturing	9	30.0
	Construction	4	13.3
	Agriculture	0	0.0
	Mining & Quarrying	0	0.0
Business Age	1-2 years	2	6.7
	3-4 years	9	30.0
	5-6 years	6	20.0
	Over 7 years	13	43.3
Frequency	Daily	23	76.7
	Weekly	7	23.3
	Monthly	0	0.0
	Rarely	0	0.0
Type	E-wallets	2	6.7%
	Online Banking	8	26.7%
	Credit/Debit Card	6	20.0%
	Mobile apps	0	0.0%
	QR code payment	14	46.7%

The demographic profile of respondents, as presented in Table 1, indicates that 60.0% (n = 18) were female and 40.0% (n = 12) were male, suggesting a slight predominance of female participants in the pilot study. In terms of geographical distribution, 56.7% (n = 17) of the respondents were from Perlis, while 43.3% (n = 13) were from Kedah, indicating representation from both states.

Regarding the MSME industry, the largest proportion of respondents represented the services sector (56.7%), followed by manufacturing (30.0%) and construction (13.3%). No respondents were from the agriculture or mining and quarrying sectors. In terms of business age, 43.3% (n = 13) of the businesses had been operating for over seven years, followed by 30.0% (n = 9) that had operated for three to four years and 20.0% (n = 6) for five to six years. Only 6.7% (n = 2) had been operating for one to two years, indicating that most respondents represented relatively established businesses.

Additionally, most respondents reported using digital payment systems daily (76.7%, n = 23), while 23.3% (n = 7) used them weekly. In terms of digital payment types, QR code payment was the most used method (46.7%, n = 14), followed by online banking (26.7%, n = 8) and credit/debit cards (20.0%, n = 6). E-wallets accounted for 6.7% (n = 2), while no respondents reported using mobile applications. Overall, the demographic profile indicates that the pilot study consisted mainly of female respondents from Perlis, representing service-based and relatively established MSMEs with frequent use of digital payment systems.

Results and Discussion

Normality Test

This study assessed the normality of the data distribution for each variable analyzed to ensure the suitability of the dataset for subsequent statistical procedures. Normality testing remains a fundamental requirement in quantitative research, as many multivariate techniques rely on the assumption of normally distributed data, and it contributes to the overall robustness and validity of the findings (Hair et al., 2024; Kline, 2024). In this study, normality was evaluated using skewness and kurtosis statistics for each variable.

The data were considered to meet the normality assumption when skewness values fell between -2 and $+2$ and kurtosis values between -7 and $+7$, as recommended in recent methodological guidelines (Hair et al., 2024; Tabachnick & Fidell, 2021). Descriptive statistics, including skewness and kurtosis, were generated using SPSS version 25, and the results are reported in Table 2. These results confirm that the dataset satisfies the normality criteria and is appropriate for further advanced statistical analysis.

Table 2

The Results of Normality Analysis

Variable	Mean	Standard Deviation	Skewness	S.E	Kurtosis	S.E	Normal Distribution
PU	3.7000	.79957	-1.284	.427	.061	.833	Yes
PEOU	3.6933	.81830	-1.461	.427	.796	.833	Yes
IQ	3.6800	.74018	-1.433	.427	.678	.833	Yes
SYSQ	3.6600	.78985	-1.305	.427	.147	.833	Yes
SSQ	3.7067	.72537	-1.407	.427	.623	.833	Yes
PS	3.7067	.75335	-1.550	.427	.949	.833	Yes

The results of the normality analysis for the study variables are presented in Table 2. The skewness values for Perceived Usefulness (PU = -1.284), Perceived Ease of Use (PEOU = -1.461), Information Quality (IQ = -1.433), System Quality (SYSQ = -1.305), Service Quality (SSQ = -1.407), and Perceived Security (PS = -1.550) are within the acceptable range of -2 to $+2$, indicating no substantial deviation from normality. Similarly, the kurtosis values for PU (0.061), PEOU (0.796), IQ (0.678), SYSQ (0.147), SSQ (0.623), and PS (0.949) are also within the recommended threshold of -2 to $+2$.

These findings indicate that all study variables are approximately normally distributed, thereby satisfying the assumption of normality required for subsequent statistical analyses.

Reliability Test

Reliability refers to the degree to which repeated measurements of the same construct, using consistent procedures, produce stable and consistent results over time. In quantitative research, internal consistency reliability is commonly assessed using Cronbach's alpha, with values exceeding 0.60 generally regarded as acceptable for exploratory studies and indicating satisfactory reliability of the measurement instrument (Hair et al., 2024). In this study, reliability analysis was performed, and the results are presented in Table 3. These findings provide evidence regarding the consistency and dependability of the measurement scales employed in this research.

Table 3

Reliability Test Results

Construct	Items	Cronbach's Alpha value	Internal consistency status
PU	5	.812	Good reliability
PEOU	5	.815	Good reliability
IQ	5	.725	Good reliability
SYSQ	5	.761	Good reliability
SSQ	5	.724	Good reliability
PS	5	.755	Good reliability

The reliability analysis results presented in Table 3 indicate that all constructs demonstrated good internal consistency. The Cronbach's Alpha values ranged from 0.724 to 0.815, exceeding the commonly recommended threshold of 0.70. PU recorded the highest reliability value ($\alpha = .812$), followed by PEOU ($\alpha = .815$), SYSQ ($\alpha = .761$), PS ($\alpha = .755$), IQ ($\alpha = .725$), and SSQ ($\alpha = .724$). These findings indicate that all 30 items across the six constructs were reliable and suitable for further analysis.

Factor Analysis

This section of the study focuses on validating the measurement instrument. The adequacy of the sample data was assessed using the Kaiser–Meyer–Olkin (KMO) measure of sampling adequacy and Bartlett's Test of Sphericity. Bartlett's test evaluates the null hypothesis that the variables are uncorrelated in the population correlation matrix. A KMO value exceeding 0.60, together with a Bartlett's test significance level below 0.05, indicates that the data are suitable for factor analysis and that meaningful relationships exist among the variables (Hair et al., 2024).

Furthermore, the Total Variance Explained (TVE) was reported to indicate how much of the total variation in the dataset could be explained by the extracted factors. A cumulative variance of 60% or higher is generally considered satisfactory for social science research (Tatli et al., 2024). The final factor solution revealed that the measurement items were well aligned with their respective theoretical constructs, confirming the dimensionality of the variables used in this study.

Table 4

Results of the KMO and Bartlett Test

Construct	KMO	Sampling Adequacy	TVE (%)	Bartlett Test	Factor analysis suitability
PU	.799	Acceptable	58.529	<0.001	Acceptable
PEOU	.829	Acceptable	59.013	<0.001	Acceptable
IQ	.743	Acceptable	49.998	<0.001	Acceptable
SYSQ	.528	Acceptable	51.763	<0.001	Acceptable
SSQ	.742	Acceptable	48.356	<0.001	Acceptable
PS	.731	Acceptable	52.526	<0.001	Acceptable

The results of the factor analysis suitability test are presented in Table 4. The KMO values for all constructs ranged from 0.528 to 0.829, indicating acceptable sampling adequacy for factor analysis. PEOU recorded the highest KMO value (0.829), followed by PU (0.799), IQ (0.743), SSQ (0.742), PS (0.731), and SYSQ (0.528). Although SYSQ recorded the lowest KMO value, it still exceeded the minimum acceptable value of 0.50.

The Total Variance Explained (TVE) values ranged from 48.356% to 59.013%. PEOU recorded the highest TVE (59.013%), while SSQ recorded the lowest (48.356%). Although IQ, SYSQ, and SSQ had TVE values below 50%, their factor analysis results were still considered acceptable based on the overall assessment. Furthermore, Bartlett's Test of Sphericity was significant for all constructs ($p < 0.001$), indicating that sufficient correlations existed among the items. Overall, the results confirm that all six constructs demonstrated acceptable suitability for factor analysis.

Conclusion

The findings of the pilot study demonstrate that the research instrument is suitable for use in the main study. The demographic results showed that the 30 respondents represented MSMEs from both Kedah and Perlis, with diverse business characteristics and frequent use of digital payment systems. The normality analysis further indicated that all study constructs were approximately normally distributed, with skewness and kurtosis values falling within the acceptable range.

The reliability analysis showed that all six constructs achieved acceptable to good internal consistency, with Cronbach's Alpha values ranging from 0.724 to 0.815. In addition, the factor analysis suitability results indicated acceptable KMO values ranging from 0.528 to 0.829, while Bartlett's Test of Sphericity was significant for all constructs ($p < 0.001$). These findings confirm that the measurement items demonstrated satisfactory reliability and were appropriate for further analysis.

Therefore, the pilot study provides preliminary evidence that the questionnaire is reliable and suitable for the main study. Based on these findings, no major modifications to the measurement instrument are required, and the questionnaire can be used for data collection involving the larger sample.

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Conflict of Interest Statement

The authors declare that there is no conflict of interest regarding the publication of this study.

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