

Examining Mobile Payment Adoption Through Extended Mobile Technology Acceptance Model (MTAM): A Micro Entrepreneur's Perspective

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ABSTRACT

This research employs the extended Mobile Technology Acceptance Model (MTAM) to explore the elements affecting the adoption of mobile payments. Mobile payment systems have swiftly changed the economic environment, providing a convenient and secure method for transactions, especially for micro-entrepreneurs. Nevertheless, there remains a crucial need to comprehend the factors affecting their adoption to improve their accessibility and usefulness. This research explores the connections between essential determinants of mobile payment adoption, such as mobile ease of use, mobile usefulness, social influence, and mobile self-efficacy, specifically among micro-entrepreneurs. The structural equation model (SEM) was utilised to assess these connections, thoroughly analysing the foundational factors. By pinpointing the most influential predictors, this research seeks to add to the expanding body of knowledge on mobile payment adoption and provide practical insights for policymakers, financial institutions, and technology developers.

Keywords: *Mobile Technology Acceptance Model (MTAM), Mobile Payment Adoption, Micro-entrepreneurs*

1.0 INTRODUCTION

The rapid digitalisation of financial services has revolutionised payment systems, with mobile payments emerging as a transformative technology in the digital economy (Patil et al., 2020; Wang et al., 2019). Mobile payments are reshaping financial transactions through technological innovation. This digital transformation has fundamentally altered how consumers interact with financial services (Alkhowaiter, 2020), creating new opportunities and challenges in the payment ecosystem (Karsen et al., 2019). Despite the growing availability of mobile payment solutions, their adoption rates among entrepreneurs vary significantly across different demographics and regions (Cao & Li, 2023; Wang & Zhang, 2023). These variations are particularly pronounced in developing economies where digital readiness and environmental pressures play crucial roles in adoption decisions (Lee & Park, 2022). Recent studies have identified that small and medium enterprises (SMEs) face unique challenges in mobile payment adoption, influenced by internal organisational factors and external market conditions (Kumar et al., 2022). However, there are limited reviews and empirical studies on small and micro-businesses (Mamun et al., 2018; Samer et al., 2019), representing a glaring research gap as more than 90% of SMEs in Malaysia are represented by micro-businesses (SMECorp, 2022).

Furthermore, mobile payments are now trending in popularity and convenience (Mayanja, 2020), emerging as one of the most demanded payment methods among consumers (Nguyen et al., 2022). Thus, understanding entrepreneurs' mobile payment adoption is a crucial focus in this study, with the Mobile Technology Acceptance Model (MTAM) serving as the fundamental framework for predicting their behaviours. The MTAM, an extension of the traditional TAM, provides a more specialised framework for understanding mobile technology adoption through determinants such as mobile self-efficacy, trust, and social influence (Liu et al., 2023; Kim & Lee, 2022). Thus, this study investigates the connections between essential determinants of mobile payment adoption, including mobile ease of use, mobile usefulness, social influence, and mobile self-efficacy, specifically among micro-entrepreneurs.

2.0 LITERATURE REVIEW

2.1 DEVELOPMENT OF MOBILE PAYMENT ADOPTION IN MALAYSIA

The adoption of mobile payment systems in Malaysia has progressed significantly over the past two decades, fuelled by advancements in FinTech, government initiatives, and changing consumer behaviours (Ojo et al., 2022). Initially, mobile payments were limited due to technological constraints and low smartphone penetration. Early adoption was mainly among urban consumers, with cash-on-delivery and bank transfers dominating. The FinTech revolution in the 2010s marked a turning point, with digital wallets like Touch 'n Go eWallet, Boost, and GrabPay gaining popularity for their convenience and integration with e-commerce and services (Mun et al., 2017; Wen & Chin, 2023). Government initiatives, such as Bank Negara Malaysia's Financial Sector Blueprint 2022-2026 and the e-Tunai Rakyat programme, have incentivised digital payment use, further boosting adoption rates (Bank Negara Malaysia, 2021). The COVID-19 pandemic accelerated this trend as social distancing measures increased the preference for contactless payments (Tee & Ong, 2016). Today, mobile payment systems are widely used, most notably among micro-entrepreneurs. However, challenges persist, particularly in rural areas with limited internet access and digital literacy. Financial inclusion remains a focus, as 17.5% of micro-entrepreneurs lack banking services (Rahman & Islam, 2023). Despite the progress, addressing these challenges is essential to ensure that mobile payment adoption benefits merchants (Ojo, 2023), particularly micro-entrepreneurs.

A recent study stated from a practical viewpoint that understanding factors among consumers that influence the adoption of mobile payment is essential for entrepreneurs, app developers, and digital service marketers (Bashir et al., 2024). However, both are equally crucial to adopt this type of digital payment, specifically mobile payment, because they are recognised as tools for enhancing financial inclusion and operational efficiency (Liu et al., 2020; Mutiso & Reuben, 2021). Most micro-entrepreneurs still rely on cash-based transactions, especially in traditional business practices like stalls, night markets, and others without permanent premises. This dependence on cash transactions only is one of the barriers to adopting

mobile payment (Nani,2019). Businesses accustomed to only using cash significantly involve entrepreneurs who face challenges utilising electronic wallets or any online payment and banking system (Pueblos & Timoteo,2023). A study by Nyeko et al. (2024) confirmed that SME businesses can gain a competitive advantage by enhancing their capabilities through improved financial literacy. Thus, understanding those related determinants is crucial in embracing mobile payment adoption among micro-entrepreneurs.

2.2 MOBILE TECHNOLOGY ACCEPTANCE MODEL (MTAM) AND MICRO-ENTREPRENEURS

The Mobile Technology Acceptance Model (MTAM) is an extension of the Technology Acceptance Model (TAM) introduced by Davis (1989) and Liu et al. (2023). It was specifically designed to address the adoption of mobile technology. Research has highlighted its relevance to micro-entrepreneurs who are increasingly relying on mobile technologies like mobile payments and digital platforms to receive payments from their customers and enhance their business operations (Agarwal & Chua, 2020; Chen et al., 2023). It is important to understand the technology adoption behaviours of micro-entrepreneurs to support their growth in the digital economy (Kunt et al., 2018). Despite extensive research on technology acceptance, there remains a gap in understanding the specific factors influencing mobile payment adoption in the current digital landscape, especially among entrepreneurs (Slinger, 2024). Asiedu et al. (2019) highlighted the elements driving the acceptance of mobile phone technology in the processes of informal micro-entrepreneurship, along with the challenges in utilising mobile technology. By understanding these factors, service providers and local authorities can better address entrepreneurs' concerns and enhance adoption rates.

2.3 CORE CONSTRUCTS AND EXTENDED MOBILE TECHNOLOGY ACCEPTANCE MODEL (MTAM) AND THEIR RELEVANCE TO MICRO-ENTREPRENEURS

The MTAM has two core constructs: usefulness and ease of use. Perceived usefulness is the degree to which a person believes that using a specific technology enhances their job performance, whereas ease of use is the degree to which a person believes that using the technology is effortless (Davis,1989; Karahanna et al.,1999). Recent studies underscore that mobile usefulness related to mobile technologies must demonstrate clear benefits, such as improving efficiency, reducing transaction costs, or expanding customer reach to encourage adoption (Asiedu et al., 2019; Aslam et al., 2021). Consumers' perceived ease of use of mobile banking services will affect how they perceive the benefits they receive (Mohammadi, 2015). As mentioned in Davis (1989), perceived ease of use refers to the extent to which a person believes that using a particular system will be effortless. This definition emphasises the word "easy", which means free of effort (Paramita, 2023). Thus, micro-entrepreneurs are more likely to adopt mobile technologies if they find them easy to use (Afolayan and Harpe, 2019).

Social influence is one of the extended constructs in this study. According to Luo et al. (2015), although usefulness and ease of use are strong predictors of mobile technology adoption among consumers, the variable of social influence must also be considered to determine acceptance. This determinant exerts a significant effect on the behavioural intention to adopt mobile payment (Wang & Dai, 2020). Huang et al. (2024) emphasised that peer influence within educational settings can significantly affect technology adoption, and that a similar dynamic exists in entrepreneurial contexts where micro-entrepreneurs rely on social networks for guidance and support. Thus, social influence is a key construct in the MTAM, which aligns well with the collaborative nature of micro-entrepreneurial communities. Self-efficacy is an individual's self-assessment of his/her ability to complete a specific mission and is considered one of the most critical factors affecting behaviours (Bandura,1982). Mobile technology is the degree to which an individual believes that he/she can achieve a specific task/job using mobile technology (Compeau & Higgins,1995; Jaradat et al., 2018). It has also been argued that self-efficacy could predict intentions and adoption (Singh et al., 2018; Pavlou & Fygenson, 2006). Thus, extending the mobile self-efficacy determinant as a construct (Wang et al., 2003) in the MTAM is highly relevant, especially for studying micro-entrepreneurs. By focusing on these elements, the literature review can effectively link the MTAM

constructs with the specific situations faced by micro-entrepreneurs by addressing their unique challenges and opportunities.

3.0 METHODOLOGY

This study adopts a quantitative research design to examine the factors influencing mobile payment adoption among micro-entrepreneurs. The Mobile Technology Acceptance Model (MTAM) serves as the theoretical framework, incorporating constructs such as mobile ease of use (MEOU), mobile usefulness (MU), mobile self-efficacy (MSE), and social influence (SI). The study aims to analyse the relationships between these constructs and the behavioural intention to adopt mobile payment systems. The research examines micro-entrepreneurs who run small businesses without permanent locations, such as street vendors and hawkers in the state of Pahang. A convenience sampling approach was employed due to its simplicity and accessibility. The micro-entrepreneurs were selected based on their willingness and availability to engage in the study. This sampling technique enables the researchers to rapidly gather data from participants who are ready and accessible to respond (Etikan et al., 2016). A total of 97 questionnaires were distributed to micro-entrepreneurs found in local markets or business operations. A well-organised questionnaire was employed for gathering the needed data. This questionnaire consists of two parts: 1) demographic information entailing the participants' age, gender, type of business, and familiarity with mobile payment systems, and 2) the MTAM constructs, namely MEOU, MU, MSE, and SI, measured using a 5-point Likert scale (1 = Strongly Disagree, 5 = Strongly Agree). IBM SPSS (version 25) was used to perform the Descriptive Analysis for summarising the demographic features and mobile payment usage patterns. This was followed by the Reliability Analysis, where Cronbach's alpha was computed to verify the internal consistency of the constructs. Subsequently, the Correlation Analysis using Pearson correlation was executed to investigate the relationships between the MTAM constructs and mobile payment adoption. Lastly, Multiple Regression Analysis was carried out to determine the most significant predictors of mobile payment adoption among the respondents. Based on the table below, the study uses a structured questionnaire to measure key constructs.

Table 1: Constructs and Sources

Constructs	Sources	Cronbach's alpha
Mobile Usefulness	Ling et al. (2024)	0.915
Mobile Self-efficacy	Loh et al. (2022)	0.789
Mobile Ease of use	Ling et al. (2024)	0.880
Social Influence	Wei et al. (2021)	0.912
Mobile Payment	Widayani et al. (2022)	0.954

4.0 RESULT AND DISCUSSION

The respondents' demographic profiles were analysed for the Descriptive Analysis (Table 2). There is a balanced gender split with a slightly higher proportion of females at 51.5% (50 respondents). There is also a diverse age distribution, with most of the respondents being under the working age group. Most of the respondents are in the 33-37 years age bracket (19.6% or 19 respondents), while the youngest and oldest age groups constitute smaller portions. A significant majority of the respondents are Malays (97.9%), with very minimal representation from other races (Chinese and Indigenous, 1% each). This reflects the predominant ethnic makeup of the study's target group. In terms of business characteristics, most of the businesses are formally registered (88.7% or 86 respondents) and relatively new (less than 5 years) (29.9% or 29 respondents). Food and drinks are the primary items sold, reflecting the typical offerings of micro-entrepreneurs (70.1% or 68 respondents). In terms of payment preferences, most of the enterprises adopt mixed payment methods (cash and digital), highlighting an ongoing shift towards digitalisation (56.7% or 57 respondents). In addition, Maybank is the preferred bank for receiving payments (35.1% or 34 respondents), but some (17.5% or 17 respondents) do not use a banking service for receiving payments.

Table 2: Descriptive Analysis

No	Items	Frequency	Percentage(%)
1	GENDER		
	Male	47	48.5
	Female	50	51.5
2	AGE		
	18-22	8	8.2
	23-27	12	12.4
	28-32	14	14.4
	33-37	19	19.6
	38-42	13	13.4
	43-47	11	11.3
	48-52	9	9.3
	53-57	7	7.2
	58-62	2	2.1
3	RACE		
	Malays	95	97.9
	Chinese	1	1.0
	Indigenous	1	1.0
4	BUSINESS REGISTRATION		
	Yes	86	88.7
	No	11	11.3
5	YEARS OF RUNNING A BUSINESS		
	Less than 5 years	29	29.9
	6 to 10 years	27	27.8
	11 to 15 years	23	23.7
	16 years and above	18	18.6
6	ITEMS		
	Foods/Drinks	68	70.1
	Vegetables	8	8.2
	Fruits	11	11.3
	Toys	2	2.1
	Plants	3	3.1
	Meats	3	3.1
	Fishes	2	2.1
7	METHODS OF PAYMENT RECEIVED		
	Cash Only	42	43.3
	Cash/QR Pay & others	55	56.7
8	PREFERRED/ BANK USED TO RECEIVE PAYMENT		
	Maybank	34	35.1
	Agro Bank	2	2.1
	Bank Simpanan National	6	6.2
	Bank Islam	16	16.5
	CIMB Bank	11	11.3
	Affin Bank	1	1.0
	Public Bank	6	6.2
	Hong Leong Bank	1	1.0
	Ambank	2	2.1
	RHB Bank	1	1.0
	None	17	17.5

In the Reliability Analysis conducted, all the variables demonstrated Cronbach's Alpha values exceeding 0.8. A 5-point Likert scale was used for measuring the variables, of which all demonstrated Cronbach's Alpha values with no items deleted. The scale ranged from 1 (strongly disagree) to 5 (strongly agree). For the factors to be considered reliable and consistent, the coefficient alpha must not be less than 0.7, and it is more acceptable if the score is close to 1 (Salkind, 2014). The results for the instrument's reliability are reported in Table 3. All the constructs showed good to excellent reliability (values > 0.8), indicating that

the questionnaire items are well-designed for measuring each determinant. The Mobile Payment construct has the highest reliability (0.954), followed by Mobile Ease of Use (0.936), showing a strong consistency in responses. These high-reliability scores ensure the robustness of the analysis and conclusions drawn from the data. Therefore, this study's findings on mobile payment adoption and its determinants namely mobile usefulness, mobile ease of use, mobile self-efficacy, and social influence are highly reliable and significant.

Table 3: Reliability Test Using Cronbach's Alpha

Determinants	
Mobile Usefulness	0.930
Mobile Self-efficacy	0.894
Mobile Ease of use	0.936
Social Influence	0.864
Mobile Payment	0.954

The Pearson correlation coefficient was applied to measure the correlation between the MTAM constructs (mobile usefulness and mobile ease of use), mobile payment adoption, social influence, and mobile self-efficacy. Table 3 shows that mobile payment usefulness and self-efficacy have a strong positive correlation with $r = 0.822$. Mobile ease of use and mobile self-efficacy at $r = 0.877$ show the strongest correlation, indicating a strong positive relationship. Social influence and mobile payment adoption also show a strong correlation with $r = 0.735$. Thus, conclusively, all correlations are significant at the 0.01 level (as indicated by **).

Table 4: Matrix Correlations

Determinants	Mobile Usefulness	Mobile Self-efficacy	Mobile Ease of use	Social Influence	Mobile Payment
Mobile Usefulness	1				
Mobile Self-efficacy	0.822**	1			
Mobile Ease of use	0.761**	0.877**	1		
Social Influence	0.517**	0.657**	0.709**	1	
Mobile Payment	0.596**	0.728**	0.776**	0.735**	1

Note: ** Correlation is significant at 0.01 level (two-tailed)

Table 5 presents the coefficients from the Regression Analysis, which must be $p < 0.05$ to be significant. Both the determinants of mobile ease of use and social influence are significant predictors of mobile payment adoption. Social influence has the most substantial effect with a highly significant value ($p < 0.001$, $\beta = 0.359$). At the same time, mobile ease of use has a strong and significant positive impact at $p = 0.005$, $\beta = 0.393$. However, mobile self-efficacy and usefulness have minimal and statistically insignificant effects. Both do not significantly contribute to predicting mobile payment adoption in this model. Mobile usefulness has values of $p = 0.780$, $\beta = -0.030$, which show that it does not have a significant effect, whilst mobile self-efficacy has values of $p = 0.237$, $\beta = 0.171$, which show a positive but statistically insignificant effect. Table 4 also presents the Model Summary, which provides information about the strength and explanatory power of the regression model used in the analysis. The regression model is strong and reliable, as indicated by the high R Square (67.7%) and adjusted R Square (66.2%). Thus, the independent variables (social influence, mobile usefulness, mobile ease of use, mobile self-efficacy) are significant determinants of mobile payment adoption. The findings emphasise the importance of these factors in driving user behaviour, with social influence and ease of use playing particularly critical roles.

Table 5: Coefficient

	Model	Unstandardized coefficients		Standardized coefficients	t	Sig.
		β	Std. error			
1	(Constant)	.775	.246		3.143	.002

	Mobile Usefulness	-.027	.098	-.030	-.280	.780
	Mobile Self-efficacy	.155	.130	.171	1.191	.237
	Mobile Ease of use	.350	.120	.393	2.912	.005
	Social Influence	.357	.085	.359	4.221	<.001
<i>Model Summary</i>						
<i>Model</i>	<i>R</i>	<i>R²</i>	<i>Adjusted R²</i>	<i>Std. error of the estimate</i>		
1	0.823	0.677	0.662	0.51946		

5.0 CONCLUSION

The results of this research offer important insights regarding the adoption of mobile payments among micro-entrepreneurs. The demographic profile of the sample shows a balanced gender distribution with most of the participants being middle-aged (aged 33–37) and a significant proportion of over 90% being Malays. Most of the respondents manage registered businesses, primarily selling food and beverages. More than half (56.7%) use a mix of cash and digital payments, 43.3% continue to rely exclusively on cash, whilst 17.5% were without access to banking services, indicating an urgent necessity for improved financial inclusion efforts (Rahman & Islam, 2023). The Correlation Analysis indicates that Mobile Ease of Use (MEOU) and Social Influence (SI) have the strongest positive connections with mobile payment adoption. The Regression Analysis further establishes that SI ($\beta = 0.359$, $p < 0.001$) and MEOU ($\beta = 0.393$, $p = 0.005$) are the most significant predictors, highlighting the essential impact of peer influence and system usability in driving adoption (Venkatesh et al., 2003; Kim & Lee, 2022). Conversely, Mobile Usefulness and Mobile Self-Efficacy do not emerge as significant predictors, implying that practical advantages and user confidence may not be the key factors affecting adoption in this setting (Davis, 1989; Compeau & Higgins, 1995). These results emphasise the importance of boosting social influence through community involvement, streamlining payment platforms to enhance adoption, and implementing targeted financial inclusion initiatives to overcome challenges from the perspective of micro-entrepreneurs (Kumar et al., 2022; Lee & Park, 2022). However, these determinants might result in different findings in other respondent cultures, infrastructures, and financial literacy, which also play important roles in technology adoption (Nanda et al., 2020). According to Jamidin et al. (2024), factors in cryptocurrency adoption are determined by gender, income, and awareness, besides attitudes. Therefore, the limitations of this study may be confined to only one state in peninsular Malaysia.

Future research may explore unexamined sub-topics in this domain, including environmental factors and other demographic profiles, to yield valuable insights into the impact of mobile payments adoption on the growth and sustainability of micro-entrepreneurs while aiding the formulation of supportive policies and technologies through the investigation of these subjects. The findings offer practical implications for the government and mobile payment service providers to enhance policies that support micro-entrepreneurs in developing their digital infrastructures. Enhancing data privacy and security for e-commerce services is essential to strengthening user confidence in the future adoption of mobile payments. It can aid micro-entrepreneurs in increasing their revenue and enabling further growth. This study demonstrates that mostly rural micro-entrepreneurs must acquire essential entrepreneurship digital skills crucial for developing adaptable entrepreneurs capable of addressing unforeseen future challenges.

Declaration of Generative AI and AI-assisted technologies

This work was prepared using Grammarly for grammar and language refinement. This tool allowed the author(s) to examine and edit the content, and the author(s) accept full responsibility for the publication.

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