

Thank you, government! Your support facilitated my intention to use mobile payment in the new normal era

Mobile payment in the new normal era

Pick-Soon Ling

University of Technology Sarawak, Sibu, Malaysia

Xin-Jean Lim

Universiti Kebangsaan Malaysia, Bangi, Malaysia

Lim-Jin Wong

University of Technology Sarawak, Sibu, Malaysia, and

Kelvin Yong Ming Lee

Taylor's University, Subang Jaya, Malaysia

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Abstract

Purpose – This study aims to investigate the key determinants predicting users' behavioural intention (BI) in adopting mobile payment (m-payment) in the new normal era.

Design/methodology/approach – The mobile technology acceptance model (MTAM) was extended through attitudes, perceived trust, perceived risk and personal innovativeness (PI) with government support (GS) functioning as a moderator. A total of 245 valid responses were gathered from Malaysian m-payment users with purposive sampling and subsequently evaluated through partial least square-structural equation modelling.

Findings – Mobile usefulness and PI significantly predicted user BI to use m-payment. Based on the moderation analysis, GS strengthened attitude-based impacts on BI towards m-payment adoption.

Practical implications – The empirical outcomes provide stakeholders with pivotal implications to develop holistic policies and strategies that potentially catalyse m-payment usage in the new normal era.

Originality/value – This research expands the current body of knowledge by assessing the factors impacting m-payment usage intention in the new normal era. The four aforementioned MTAM elements and GS (moderator) were recommended to boost model workability and offer novel evidence from a distinct viewpoint.

Keywords Personal innovativeness, Mobile payment, Government support, Mobile technology acceptance model, New normal era

Paper type Research paper

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¡Gracias, gobierno! Su apoyo facilitó mi intención de utilizar el pago por móvil en la nueva era normal

Resumen

Objetivo – El objetivo de este estudio es investigar los determinantes clave que predicen la intención de comportamiento de los usuarios a la hora de adoptar el pago por móvil (m-payment) en la nueva era normal.

Diseño/metodología/enfoque – El modelo de aceptación de la tecnología móvil (MTAM) se amplió a través de las actitudes, la confianza percibida, el riesgo percibido y la capacidad de innovación personal, con el apoyo gubernamental como moderador. Se recogió un total de 245 respuestas válidas de usuarios malayos de pago por móvil mediante muestreo intencionado y se evaluó posteriormente mediante modelización de ecuaciones estructurales por mínimos cuadrados parciales (PLS-SEM).

Conclusiones – La utilidad del móvil y la capacidad de innovación personal predijeron significativamente la intención de los usuarios de utilizar el pago por móvil. Según el análisis de moderación, el apoyo gubernamental reforzó los efectos basados en la actitud sobre la intención conductual de adoptar el pago por móvil.

Limitaciones/Implicaciones de la investigación – Los resultados empíricos proporcionan a las partes interesadas implicaciones fundamentales para desarrollar políticas y estrategias holísticas que catalicen potencialmente el uso del pago móvil en la nueva era de la normalidad.

Originalidad – Esta investigación amplía el corpus actual de conocimientos al evaluar los factores que influyen en la intención de uso del pago por móvil en la nueva era normal. Se recomiendan los cuatro elementos MTAM mencionados y el apoyo gubernamental (moderador) para impulsar la viabilidad del modelo y ofrecer pruebas novedosas desde un punto de vista distinto.

Palabras clave Pago por móvil, Nueva normalidad, Apoyo gubernamental, Innovación personal, Modelo de aceptación de la tecnología móvil

Tipo de artículo Trabajo de investigación

感谢政府！你们的支持促进了我在新常态时代使用移动支付的行为意向

摘要

研究目的 – 本研究旨在探讨新常态时代用户使用移动支付 (m-payment) 行为意向的主要决定因素。

设计/方法/途径 – 通过态度、感知信任、感知风险和个人创新能力, 并以政府支持作为调节因素, 对移动技术接受模型 (MTAM) 进行了扩展。通过有目的的抽样, 从马来西亚移动支付用户中收集了 245 份有效回复, 随后通过偏最小二乘法结构方程模型 (PLS-SEM) 进行了评估。

研究结果 – 移动实用性和个人创新性可显著预测用户使用移动支付的行为意向。根据调节分析, 政府支持加强了态度对采用移动支付的行为意向的影响。

实际意义 – 实证研究的结果为利益相关者提供了重要的启示, 有助于他们制定全面的政策和战略, 在新常态时代促进移动支付的使用。

原创性/价值 – 本研究通过评估新常态时代影响移动支付使用意向的因素, 拓展了现有的知识体系。研究推荐了上述四个 MTAM 要素和政府支持 (调节器), 以提高模型的可操作性, 并从一个独特的视角提供了新的证据。

关键词 移动支付, 新常态 政府支持 个人创新移动技术接受模型

文章类型 研究型论文

1. Introduction

Advancements in mobile devices have revolutionised seamless payment methods through mobile payments (m-payments) (Ooi and Tan, 2016). Essentially, m-payment is an efficient, convenient and secure payment system that can be used beyond time and space (Leong *et al.*, 2020). In Malaysia, numerous m-payment platforms have been introduced, such as Boost, GrabPay, Touch *n* Go, Big Pay and Spay Global, and others (Ling *et al.*, 2023). In addition, the m-payment transaction value per capita in Malaysia rose from RM7.50 in 2019 to RM144.20 in 2021 (Bank Negara Malaysia, 2022). Compared with other countries in Southeast Asia, Malaysia (14%) recorded a relatively lower percentage of e-commerce

payments using digital wallets (Sticpay, 2021). Thus, m-payments can significantly affect market and corporate growth, particularly concerning borderless e-commerce.

The COVID-19 pandemic has inevitably altered the way in which everyone conducts monetary transactions. For instance, consumers find it safer to use online payment methods to avoid viral infections (Jayarathne *et al.*, 2023). The contactless feature of m-payment fulfils the user's expectation of maintaining physical distancing. Governments worldwide have encouraged the use of m-payment services (Suyunchaliyeva *et al.*, 2021) to flatten the infection curve of COVID-19 in the new normal era.

Generally, the "new normal" era is understood as the situation, wherein the pandemic is catalysing the service industry to reach the brink of chaos (Altinay and Arici, 2022). It signals a new occurrence that will affect the future, as the "old" normal is no longer attainable (Karjalainen *et al.*, 2022). Users' m-payment behaviour predictably differs based on novel circumstances in the new normal era, as COVID-19 has promoted the use of alternative payment approaches to prevent physical contact (Flavian *et al.*, 2020). Moreover, there are two reasons why COVID-19 has caused m-payment to be widely used: maintaining physical distance when making payments and an offering an increasing number of services using digital payment (Upadhyay *et al.*, 2022). It is deemed vital to internalise consumers' behavioural intention (BI) to use m-payment, which could be a dominant and secure contactless payment channel in this era.

Academically, the empirical work on m-payments can be divided into two phases: before the COVID-19 pandemic (Al-Saedi *et al.*, 2020; Handarkho and Harjoseputro, 2020) and during the COVID-19 pandemic (Jayarathne *et al.*, 2023; Loh *et al.*, 2022a; Upadhyay *et al.*, 2022). Nevertheless, m-payment studies that focus on the government's role in encouraging usage remain scarce, although it has been viewed as a critical factor in ensuring m-payment success in practice. For instance, in Malaysia, relevant government bodies have introduced several incentives such as *e-Tunai Rakyat*, *e-Penjana* and *Bantuan Khas Sarawakku Sayang* to citizens during the pandemic through the m-payment system (Lee and Jais, 2022). This strategy is expected to "kill two birds with one stone", wherein the government provides financial aid to those in need and normalises using contactless payments to mitigate the repercussions of the COVID-19 pandemic (Raman and Aashish, 2023). To address the gaps in the m-payment literature, this study has the following primary objectives: to examine the significant variables that affect users' BI to adopt m-payment in the new normal era and to examine the moderating effect of government support (GS) towards m-payment adoption among Malaysian citizens.

The mobile technology acceptance model (MTAM) was incorporated as the theoretical foundation. Concrete evidence on mobile settings is lacking (Ooi and Tan, 2016) as previous m-payment studies have primarily emphasised conventional models in other electronic contexts. This may prove insufficient to determine the intricacies of users' m-payment adoption behaviour (Loh *et al.*, 2022b) with only two elements suggested in MTAM – mobile usefulness (MU) and mobile ease of use (MEOU) – without considering the potential effect of users' personality variables, which has been proven crucial in determining technology adoption (Liebana-Cabanillas *et al.*, 2020; Loh *et al.*, 2022b; Sanchez-Torres *et al.*, 2018; Suyunchaliyeva *et al.*, 2021). This study addressed the aforementioned drawbacks by using MTAM as the base model and expanding it with four external variables that represent the user's personality (i.e. perceived trust [PT], perceived risk [PR], personal innovativeness [PI] and attitudes [ATT]). In addition, GS has been proposed as a moderator to establish a more holistic study framework given its pertinence in facilitating m-payment adoption. The extended model is believed to provide more robust findings and theoretically contribute to the literature, especially *vis-à-vis* m-payment adoption in emerging economies.

The paper continues with a literature review in Section 2, focusing on the underlying theory and hypothesis development. Section 3 explains the methodology used in this study

and Section 4 presents the analysis results. Section 5 details the discussion and implications of this study. Section 6 presents the conclusions of the study and limitations and suggestions for future research are discussed in Section 7.

2. Literature review

2.1 *Mobile technology acceptance model*

Ooi and Tan's (2016) MTAM addresses the current model shortcomings to comprehend the factors impacting the introduction of mobile technology. Because mobile devices are different from electronic devices (Lau *et al.*, 2021), MTAM is the most appropriate model for studying m-payment in the mobile context (Loh *et al.*, 2022b). The MTAM constitutes only two elements (usefulness and ease of use); thus, additional model constructs are necessary for subject matter investigation (Tew *et al.*, 2022). This study proposes an extended MTAM by incorporating ATT and three personality variables (PT, PR and PI) to generate a holistic understanding of the factors impacting m-payment adoption in the new normal era. The adoption of m-payment is influenced not only by the characteristics of mobile technology but also by the personality of the user. Essentially, GS moderated the relationship between the predictors and individuals' usage intention to acknowledge the substantial role of government-oriented factors in BI towards m-payment adoption. As mentioned in the previous section, the government introduced several initiatives and policies to cultivate m-payment adoption, especially in the new normal era. Therefore, apart from adding direct variables, this study expanded the MTAM by proposing GS as a moderator that could enhance the intention to adopt m-payment in the new normal era.

2.2 *Hypothesis development*

2.2.1 *Mobile usefulness*. MU refers to the extent to which transaction performance can be improved using m-payment (Yan *et al.*, 2021) and individuals' perceived benefits from using m-payment (Ooi and Tan, 2016). Users tend to display favourable ATT towards m-payment if the performed task is beneficial. Similarly, previous research has demonstrated the substantial effect of usefulness on ATT (Agyei *et al.*, 2020; Chawla and Joshi, 2020; Marakarkandy *et al.*, 2017). M-payment could elevate payment channel effectiveness and efficiency, as users can remotely and immediately pay bills and transfer money to a third party (Ooi and Tan, 2016). Individuals adopt m-payments, which provide them with a great deal of benefits, especially in the new normal era. Thus, this study proposes the following hypotheses:

- H1. There is a positive relationship between mobile usefulness and attitudes.
- H2. There is a positive relationship between mobile usefulness and behavioural intention.

2.2.2 *Mobile ease of use*. MEOU indicates the degree to which an innovation is easily manipulated with minimal learning and usage effort (Yan *et al.*, 2021), denotes people's viewpoints of m-payment learning and usage complexities (Ooi and Tan, 2016). Several studies have reported a positive correlation between ATT and ease of use correlation was reported in several past literature (Agyei *et al.*, 2020; Chawla and Joshi, 2018; Marakarkandy *et al.*, 2017). In this vein, individuals are prone to use a user-friendly and simplified m-payment platform that does not require intricate learning efforts, particularly in the new normal era. Thus, we propose the following hypotheses:

- H3. There is a positive relationship between mobile ease of use and attitudes towards it.
- H4. There is a positive relationship between mobile ease of use and behavioural intention.

2.2.3 Attitudes. ATT refer to the extent to which people favourably or unfavourably evaluate a specific entity (Ajzen, 1991). Users with favourable ATT towards technology are inclined to use it. Previous studies have thoroughly elaborated on the substantial role of ATT in technology adoption. For instance, Flavian *et al.* (2020) revealed that the intention to use m-payments is affected by ATT. Bailey *et al.* (2020) and Chawla and Joshi (2020) confirmed the positive impact of ATT on intention to use m-wallets. Upadhyay *et al.* (2022) also demonstrated that ATT is an influential factor in m-payment adoption. Therefore, we propose the following hypothesis:

H5. There is a positive relationship between attitudes and behavioural intention.

2.2.4 Perceived trust. PT denotes the extent of m-payment users' belief in service reliability and safety (Al-Saedi *et al.*, 2020). When using m-payments, it is more challenging to develop trust between users and service providers remotely compared with traditional transaction platforms (Ooi and Tan, 2016). Generally, individuals use a service only if the service provider is deemed trustworthy and reliable (Islam *et al.*, 2020). Sanchez-Torres *et al.* (2018) find that trust significantly affects the BI to adopt e-banking. Moreover, Suyunchaliyeva *et al.* (2021) confirmed the significant effect of PT on the intention to continue using m-payment services. Therefore, we propose the following hypothesis:

H6. There is a positive relationship between perceived trust and behavioural intention.

2.2.5 Perceived risk. PR denotes the perceived negative implications and uncertainty of technology (Ali *et al.*, 2021). On practical grounds, ambiguity is a palpable issue in m-payment usage given its virtual nature. Ooi and Tan (2016) state that PR is one of the factors affecting innovative technology usage intention. Although m-payment provides users with benefits in terms of convenience and efficiency, this method reflects a specific level of operational risk with a tendency to be misused by another party (Kalimic *et al.*, 2020). Although a few empirical studies have indicated a positive impact of PR on user behaviour (Aji *et al.*, 2020; Liebana-Cabanillas *et al.*, 2020), a significant negative role of PR on m-payment has also been documented (Raman and Aashish, 2021). Thus, we propose the following hypothesis:

H7. There is a positive relationship between perceived risk and behavioural intention.

2.2.6 Personal innovativeness. Patil *et al.* (2020) define PI as an individual's level of openness to experience and adopt specific innovations. This construct is particularly important for novel technologies because the degree of innovativeness encourages individuals to use unique technologies. Generally, users with high PI exhibit more favourable perceptions towards adopting new payment methods (Rahman *et al.*, 2020). Several studies have outlined the substantial effects of innovation-oriented factors (Handarkho and Harjoseputro, 2020; Loh *et al.*, 2022b; Rahman *et al.*, 2020; Suyunchaliyeva *et al.*, 2021). Therefore, we propose the following hypothesis:

H8. There is a positive relationship between personal innovativeness and behavioural intention.

2.2.7 Moderating effect of government support. The government, which significantly facilitates the utilisation of novel innovations (Lau *et al.*, 2021), could support effective regulatory policy development to promote and develop people's trust in services (Charag *et al.*, 2020). Similarly, GS has a crucial impact on innovative products and

services (Kim *et al.*, 2018). GS can emerge from distinctive perceptions, including network infrastructure, policy packages, internet speed and security assurance (Aji *et al.*, 2020). Notably, the Malaysian Government has launched multiple programmes, including *e-Tunai Rakyat*, *e-Penjana* and *Bantuan Khas Sarawakku Sayang* to encourage m-payment usage. From an academic perspective, the significant role of GS in BI has been recorded in the literature (Charag *et al.*, 2020; Chen *et al.*, 2019; Ojo *et al.*, 2022). This study also acknowledges the role of the GS in determining the BI to adopt m-payments by including GS as a moderator.

Empirically, the significant influence of the MU towards BI has been widely documented in the literature (Lew *et al.*, 2020; Tew *et al.*, 2022; Yan *et al.*, 2021). However, some studies have revealed an insignificant effect of usefulness on BI (Liebana-Cabanillas *et al.*, 2015; Sarmah *et al.*, 2021). This study proposes that the relationship between mobile device usefulness and BI can be enhanced by GS, as found in the literature. Moreover, the literature reveals a significant moderating effect of government-oriented variables (Ramanathan *et al.*, 2014; Jain *et al.*, 2022). Therefore, the following hypothesis is formulated:

- H9.* Government support moderates the relationship between mobile device usefulness and BI, wherein the positive relationship becomes stronger when government support is high.

Inconclusive findings on the impact of MEOU on BI still exist in the literature. For instance, Yan *et al.* (2021) found that MEOU had no significant effect on BI towards m-payments. Similarly, Lau *et al.* (2021) revealed an insignificant relationship between MEOU and the intention to use a mobile taxi-booking app. However, other studies have shown that the BI towards mobile wallets is significantly influenced by ease of use (Lew *et al.*, 2020; Tew *et al.*, 2022). Therefore, GS is also suggested as a moderator of the relationship between ease of use and BI. This proposition is in line with the literature in other contexts, where government-related variables significantly moderate the influence on BI (Kim *et al.*, 2018; Verma *et al.*, 2020). Thus, we propose the following hypothesis:

- H10.* Government support moderates the relationship between the ease of use of mobile devices and BI, and the positive relationship becomes stronger when government support is high.

The significant role of ATT towards BI in m-payments is dominant in the literature (Bailey *et al.*, 2020; Upadhyay *et al.*, 2022). Moreover, the literature reveals that government-related variables, such as perceived GS, play a crucial role in e-wallet usage (Ojo *et al.*, 2022). Therefore, this study added GS as a moderator of the relationship between ATT and BI, as this relationship could be further improved if the government provides certain policies and regulatory support. This assertion is based on government-related variables that moderate the relationship towards consumer behaviour in different contexts (Jain *et al.*, 2022; Verma *et al.*, 2020). Hence, the following hypothesis is postulated:

- H11.* Government support moderates the relationship between attitudes and behavioural intention, wherein the positive relationship becomes stronger when government support is high.

In addition, PT significantly influences BI regarding m-payments and/or e-wallets, as noted in several studies (Chawla and Joshi, 2020; Suyunchaliyeva *et al.*, 2021). However, the insignificant effect of trust-related variables has been reported in previous studies (Farah *et al.*, 2018; Sebastian *et al.*, 2023). With this inconclusive finding, the GS is suggested as a

moderator in the relationship between PT and intention, as support from government agencies could further increase the intention to use m-payments. For instance, [Ramanathan et al. \(2014\)](#) show that RFID adoption can be moderated through GS. This finding is supported by [Jain et al. \(2022\)](#), who found that electric vehicle adoption can be further enhanced with GS. Therefore, the following hypothesis is proposed:

H12. Government support moderates the relationship between perceived trust and behavioural intention; the positive relationship becomes stronger when government support is high.

PR is particularly important in determining the BI to adopt m-payments, and this postulation has been revealed in numerous studies ([Aji et al., 2020](#); [Liebana-Cabanillas et al., 2020](#)). However, this proposition is not always consistent, as some studies have reported an insignificant effect of PR on BI ([Al-Saedi et al., 2020](#); [Handarkho and Harjoseputro, 2020](#)). Therefore, the GS was included to moderate the relationship between PR and BI, as reported by [Jain et al. \(2022\)](#), who demonstrated that the negative influence of PR on BI would be reduced with support from the government. Hence, the following hypothesis is proposed:

H13. Government support moderates the relationship between perceived risk and behavioural intention, wherein the positive relationship becomes stronger with greater government support.

Finally, as revealed in past studies, innovativeness plays a crucial role in BI when adopting new technology, such as m-payment ([Suyunchaliyeva et al., 2021](#); [Loh et al., 2022a](#)). However, [Yan et al. \(2021\)](#) revealed an insignificant role of PI in the intention to adopt m-payment. This study proposes that GS is a moderator that enhances the impact of PI towards BI on m-payment. This is because government policies and incentives have improved the impact of PI towards m-payment adoption. This aligns with studies that found a significant moderating role of government-related variables on consumer behaviour ([Jain et al., 2022](#); [Ramanathan et al., 2014](#)). The proposed hypothesis is as follows:

H14. Government support moderates the relationship between personal innovativeness and BI and this positive relationship becomes stronger when government support is high.

[Figure 1](#) presents the research model based on the aforementioned hypotheses.

3. Methodology

3.1 Data collection and sample method

An online survey was conducted for data collection using Google Forms. The invitation link was shared with the target respondent through several platforms, such as Facebook, WhatsApp and email. The target respondents, current m-payment users located in Malaysia, were selected using purposive sampling. Malaysia was selected as the research location because the Malaysian Government has taken the initiative to offer several financial assistance schemes through the m-payment platform to promote the use of m-payment.

Three screening questions were included at the beginning of the questionnaire to ascertain respondents' eligibility to participate in this research. The respondents must be currently staying in Malaysia, users of any mobile payment service and have used m-payments during the new normal era. Only eligible individuals were invited to

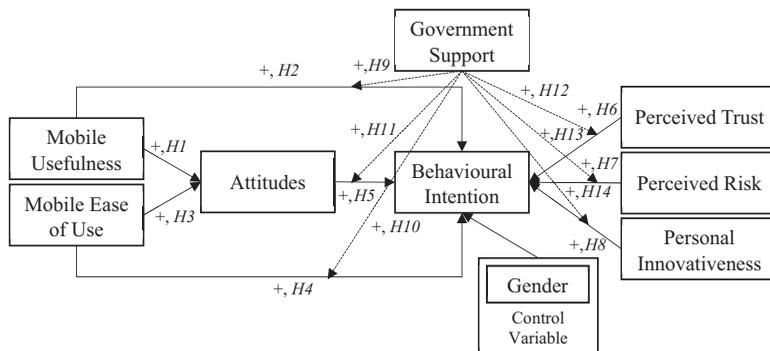


Figure 1.
Proposed research
framework

Notes: → Direct relationship; - - - - moderating relationship

participate. A total of 245 valid responses were gathered during the data collection period, from March to April 2022. This sample size fulfilled the minimum prerequisite of 189 responses suggested by the power analysis (based on 0.15 effect size, 0.95 power level and 13 predictors). The overall responses met the guidelines suggested by Kock and Hadaya (2018). Using Monte Carlo experiments, Kock's (2015) results revealed that, using the inverse square root method, the reasonable minimum sample size should be 160, whereas the gamma-exponential method illustrated a minimum sample size of 146.

3.2 Constructs and instruments

All measurement items were adapted from previous studies to maintain the validity of the content. Four items on mobile device usefulness and ease of use were derived from Loh *et al.* (2022a), whereas four items on ATT were elicited by Verma *et al.* (2020). Four items on PT and three on PR were adapted from Raman and Aashish (2021) and Tan *et al.* (2014). Four PI items were derived from Patil *et al.* (2020), four GS items were adapted from Lee and Jais (2022) and four BI items were elicited from Yan *et al.* (2021). Three academic experts reviewed the items to confirm their appropriateness in the context of m-payment. The items were first structured in English and subsequently translated into Bahasa Malaysia using back-to-back translation for the respondents' comprehension and convenience. A seven-point Likert scale ranging from 1 (strongly disagree) to 7 (strongly disagree) was used to measure all items.

3.3 Control variable

The domination of a particular subgroup of respondents may have confounded the results. Because most of the respondents in this study were female, gender was included as a control variable. As shown in Table 4, gender had no significant influence on the dependent variable (i.e. m-payment adoption intention). Thus, the results of this study were not affected by the overwhelming number of female respondents.

3.4 Analysis method

In this study, the partial least squares-structural equation modelling (PLS-SEM) was used to evaluate the proposed correlation using SmartPLS 3.2.9. PLS-SEM has been extensively used in past literature for its less stringent approach in non-normal data analysis. According to Hair *et al.* (2017), both measurement and structural models can be simultaneously

evaluated in terms of performance using PLS-SEM. In addition, Mardia's multivariate coefficient was used to evaluate the multivariate dataset normality before assessment. The data set proved to be non-normally distributed, with a kurtosis coefficient (110.0898) exceeding the threshold level of 20 (Byrne, 2013; Kline, 2011), thus confirming the adequacy of implementing PLS-SEM to analyse the recommended assumptions (Hair *et al.*, 2019).

4. Results

4.1 Profile of participated respondents

As shown in Table 1, most of the respondents were employed (50.2%), women (59.59%) between 21 and 30 years of age (50.61%), with educational qualifications constituting certificates, diplomas and bachelor's degrees (65.31%). Regarding income classification, approximately 70% of the individuals fell under the B40 category, 25% belonged to the M40 category and 5% belonged to the T20 category. The top three m-payment platforms used by respondents were Spay Global (31%), GrabPay (18%) and Touch 'n Go (16%).

The analyses were performed in two stages, as in PLS-SEM. The first stage involved a measurement model assessment, and the second stage involved a structural model assessment.

4.2 Measurement model assessment

Following Hair *et al.* (2017), the convergent validity was evaluated based on the outer loading and average variance extracted (AVE). The outer loading for all items ranged from 0.714 to 0.912, exceeding 0.708, excluding PI1 (deleted), indicating that validity was achieved at the item level. Similarly, convergent validity was also established at the construct level, as all the AVE values ranged from 0.636 to 0.780, which exceeded the satisfactory level at 0.50 (Bagozzi and Yi, 1988). Internal consistency was attained using composite reliability (CR) values. The results in Table 2 further show that the CR values for all constructs range from 0.874 to 0.924, exceeding the threshold level of 0.70 (Gefen *et al.*, 2000). Discriminant validity was assessed using the heterotrait-monotrait ratio of correlation. As presented in Table 3, all

Characteristics	Frequency (%)	Characteristics	Frequency (%)
<i>Gender</i>		<i>Income classification</i>	
Male	99 (40.41)	B40 (RM4,849 and below)	173 (70.61)
Female	146 (59.59)	M40 (RM4,850–RM10,959)	61 (24.90)
<i>Age</i>		T20 (RM10,960 and above)	11 (4.49)
20 and below	25 (10.20)	<i>Highest education</i>	
21–30	124 (50.61)	Primary School and Secondary School	41 (16.73)
31–40	68 (27.76)	Certificate, Diploma and Bachelor's Degree	160 (65.31)
41–50	18 (7.35)	Master's Degree and PhD	44 (17.96)
50 and above	10 (4.08)	<i>Most frequently used M-payment</i>	
<i>Occupation</i>		Boost	37 (15.10)
Employee	123 (50.20)	GrabPay	43 (17.55)
Self-employed	27 (11.02)	Maybank QRPay	10 (4.08)
Students	84 (34.29)	ShopeePay	29 (11.84)
Housewife	6 (2.45)	Spay Global	75 (30.61)
Retirees	5 (2.04)	Touch and Go	39 (15.92)
		Others	12 (4.09)

Note: RM is Ringgit Malaysia

Table 1.
Respondent profile

Measurement item	Loading
<i>Mobile usefulness (MU)</i>	
<i>Adapted from Loh et al. (2022a) CR = 0.9150; AVE = 0.7290; VIF = 2.654</i>	
Using mobile payment services to pay will increase my productivity/performance in the new normal era	0.840
Using mobile payment services to pay will enhance the effectiveness of my daily tasks in the new normal era	0.849
Using mobile payment services to pay will enable easier payment handling in the new normal era	0.861
Overall, I will find using mobile payment services to pay will be advantageous in the new normal era	0.867
<i>Mobile ease of use (MEOU)</i>	
<i>Adapted from Loh et al. (2022a) CR = 0.8800; AVE = 0.6490; VIF = 2.561</i>	
Learning to use mobile payment services to pay in the new normal era will be easy for me	0.796
Using mobile payment services to pay in the new normal era will not require a lot of mental effort	0.717
It will be easy for me to become skillful at using mobile payment services to pay in the new normal era	0.842
It is easy to follow all the steps to use mobile payment services to pay in the new normal era	0.859
<i>Attitudes (ATT)</i>	
<i>Adapted from Verma, et al. (2020) CR = 0.9100; AVE = 0.7170; VIF = 3.091</i>	
I believe that using mobile payment services is a good idea in the new normal era	0.846
I believe that using mobile payment services is wise in the new normal era	0.854
I believe that using mobile payment services is beneficial in the new normal era	0.903
I believe that using mobile payment services is interesting in the new normal era	0.780
<i>Perceived trust (PT)</i>	
<i>Adapted from Raman and Aashish (2021) CR = 0.9220; AVE = 0.7470; VIF = 2.323</i>	
I think that mobile payment services are trustworthy in the new normal era	0.836
The risk of an unauthorised party overseeing the transaction is low when using mobile payment services in the new normal era	0.846
The risk of abuse of usage information such as payment amount is low when using mobile payment services in the new normal era	0.875
The risk of abuse of consumer information, such as credit card numbers and bank account data, is low when using mobile payment services in the new normal era	0.899
<i>Perceived risk (PR)</i>	
<i>Adapted from Tan et al. (2014) CR = 0.9140; AVE = 0.7800; VIF = 1.730</i>	
I think that it is safe to use mobile payment services in the new normal era	0.901
I think that my personal data are safe while using mobile payment services in the new normal era	0.912
I believe the technology of mobile payment services is reliable in the new normal era	0.834
<i>Personal innovativeness (PI)</i>	
<i>Adapted from Patil et al. (2020) CR = 0.8980; AVE = 0.7470; VIF = 1.821</i>	
I would like to experiment with using mobile payment services in the new normal era	Deleted
Among my peers, I am usually among the first to try new ways of transaction mechanisms through mobile payment services in the new normal era	0.854
If I hear about new transaction mechanisms, such as mobile payment services in the new normal era, I look for ways to experiment with them	0.884
In general, I am not hesitant to try out new mobile payment services in the new normal era	0.854
<i>Government support (GS)</i>	
<i>Adapted from Lee and Jais (2022) CR = 0.9240; AVE = 0.7520; VIF = 1.640</i>	
The government encourages payment transactions using mobile payment services in the new normal era	0.833

Table 2.
Scale refinement

(continued)

Measurement item	Loading
The government ensures a smooth mobile payment server in the new normal era	0.788
The government encourages payment innovation via mobile payment services in the new normal era	0.848
The government gives incentives to mobile payment users in the new normal era	0.714
<i>Behavioural intention (BI)</i>	
<i>Adapted from Yan et al. (2021) CR = 0.8740; AVE = 0.6360; VIF = 2.580</i>	
I intend to increase the use of mobile payment services in the new normal era	0.877
I intend to use mobile payment services when opportunities arise in the new normal era	0.901
I would like to use mobile payment services for purchasing instead of traditional payment methods such as cash in the new normal era	0.837
I will strongly recommend to others to use mobile payment services in the new normal era	0.853

Table 2.

Constructs	MU	MEOU	ATT	PT	PR	PI	GS	BI
MU								
MEOU	0.7670							
ATT	0.8340	0.8590						
PT	0.4400	0.5690	0.5400					
PR	0.1807	0.3200	0.2140	0.7240				
PI	0.4500	0.5690	0.5200	0.6020	0.4510			
GS	0.5730	0.5430	0.5760	0.5330	0.3500	0.4530		
BI	0.7170	0.6410	0.6960	0.5440	0.3580	0.6980	0.6620	

Table 3.

Discriminant validity using HTMT

Notes: MU = mobile usefulness; MEOU = mobile ease of use; ATT = attitudes; PT = perceived trust; PR = perceived risk; PI = personal innovativeness; GS = government support; BI = behavioural intention

values were smaller than the threshold value of 0.90, indicating discriminant validity (Gold et al., 2001).

Harman's single-factor test was used to address single-source bias concerns. The empirical outcomes implied that all measurement items explained 39.86% (<50%) in one factor, indicating the absence of bias in the recommended model (Podsakoff et al., 2003). In addition, the variance inflation factors (VIF) in Table 2 obtained from the full collinearity test were used to examine common method bias (CMB). The results in Table 6 show that the VIF values for all constructs were below 3.30, confirming that CMB did not exist in the study (Kock, 2015).

4.3 Structural model assessment

In this study, a structural model assessment was performed to validate the inner model and the proposed hypotheses. Firstly, 63% of the variance in BI ($R^2 = 0.6328$) was explained by MU, MEOU, ATT, PT, PR and PI, whereas approximately 65% of the variance in ATT was explained by MU and MEOU ($R^2 = 0.6468$). This shows that the predictors exhibited a moderate effect in measuring the variance in both BI and ATT. Moreover, the Q^2 values of 0.4443 and 0.4397 also denote model predictive validity, as the value is greater than zero (Hair et al., 2017). Based on Cohen's (1988) guidelines, f^2 was adopted to measure effect size. As shown in Table 4, MU and MEOU reflect a moderate effect on ATT, MU demonstrates a

small effect on PI and PI has a medium effect on BI. The remaining four constructs did not affect the BI, as their f^2 values were under 0.02 (Cohen, 1988).

In line with Table 5, four of the eight proposed hypotheses (H1, H2, H3 and H8) were supported, whereas the remaining four (H4, H5, H6 and H7) were unsupported. The PI ($\beta = 0.3570, p < 0.05$) implied the highest impact on BI followed by MU ($\beta = 0.2790, p < 0.05$), whereas both MU ($\beta = 0.4320, p < 0.05$) and MEOU ($\beta = 0.4480, p < 0.05$) significantly influenced ATT. This finding shows that both PI and MU had a positive influence on BI, whereas MU and MEOU had positive and significant impacts on ATT.

The empirical outcomes also demonstrate the substantial moderating role of GS in the ATT–BI relationship (H11). Based on the interaction plot in Figure 2, the positive ATT–BI relationship was strengthened with high GS ($\beta = 0.1480, p < 0.05$) while not moderating the relationships between MU, MEOU, PT, PR and PI and BI. As such, H9, H10, H12, H13 and H14 were unsupported.

Table 4.
Coefficient (R^2),
predictive relevance
(Q^2) and effect size
(f^2)

Constructs	R^2	Q^2	f^2 (BI)	f^2 (ATT)
BI	0.6360	0.4570		
MU			0.0830	0.2920
MEOU			0.0030	0.3150
ATT	0.6470	0.4570	0.0270	
PT			0.0000	
PR			0.0000	
PI			0.2030	

Notes: MU = mobile usefulness; MEOU = mobile ease of use; ATT = attitudes; PT = perceived trust; PR = perceived risk; PI = personal innovativeness; GS = government support; BI = behavioural intention

Table 5.
Path coefficients and
hypotheses testing

Hypo.	Relationship	Beta	t -value	p -value	Decision
H1	MU → ATT	0.4320	6.0160	0.0000	Support
H2	MU → BI	0.2790	4.2720	0.0000	Support
H3	MEOU → ATT	0.4480	6.7760	0.0000	Support
H4	MEOU → BI	-0.0590	0.8520	0.1970	Not support
H5	ATT → BI	0.1830	2.4140	0.0080	Not support
H6	PT → BI	0.0110	0.1470	0.4420	Not support
H7	PR → BI	0.0050	0.0730	0.4710	Not support
H8	PI → BI	0.3570	5.6780	0.0000	Support
H9	MU*GS → BI	-0.0510	0.6970	0.2430	Not support
H10	MEOU*GS → BI	-0.0820	0.7270	0.2340	Not support
H11	ATT*GS → BI	0.1480	1.6760	0.0470	Support
H12	PT*GS → BI	0.0500	0.6260	0.2660	Not support
H13	PR*GS → BI	0.0180	0.2920	0.3850	Not support
H14	PI*GS → BI	-0.1250	1.9680	0.0250	Not support
<i>Control variable</i>					
	Gender	-0.0460	1.0920	0.1380	Not significant

Notes: MU = mobile usefulness; MEOU = mobile ease of use; ATT = attitudes; PT = perceived trust; PR = perceived risk; PI = personal innovativeness; GS = government support; BI = behavioural intention

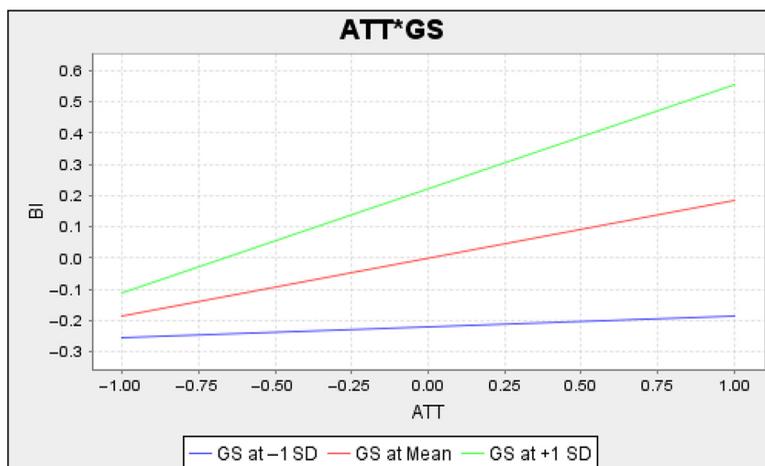


Figure 2.
The GS moderates the relationship between ATT and BI

5. Discussions and implications

5.1 Discussion

Following the paucity of concrete evidence, this study strives to bridge the existing knowledge gap by exploring the factors impacting m-payment adoption in the new normal era. The MTAM was extended with four additional variables, comprising three personality variables (PT, PR and PI) and ATT, whereas GS operated as a moderator. Notably, BI was significantly impacted by MU and PI based on data derived from 245 mobile payment users. In addition, both usefulness and ease of use were found to positively and significantly influence ATT. Furthermore, the moderating analysis revealed a significant moderating effect of GS in linking ATT and BI.

MU has demonstrated a positive and significant influence on ATT and BI in the new normal era. The substantial effect of usefulness on BI paralleled the findings of [Lau et al. \(2021\)](#) and [Lew et al. \(2020\)](#). [Yan et al. \(2021\)](#) found that consumers tend to use m-payment platforms that provide them with significant benefits. As users strive to avoid viral transmission through physical contact in the new normal era, the convenience and efficiency of m-payments become more useful than cash or credit card transactions.

The current research also demonstrated that the ease of mobile use substantially affected ATT, which is in line with the findings of [Bailey et al. \(2020\)](#). Nevertheless, ease of mobile use did not significantly relate to BI towards m-payment use in the new normal era. This lack of significance parallels the findings of [Ooi and Tan \(2016\)](#) and [Yan et al. \(2021\)](#). Perceivably, m-payment usage procedures have been simplified. Most users are technology-savvy given their experience in using various m-payment platforms, which renders ease of use a less crucial determinant of adoption.

An insignificant effect between ATT and BI was identified in this research as opposed to the studies of [Chawla and Joshi \(2020\)](#), [Marakarkandy et al. \(2017\)](#) and [Patil et al.'s \(2020\)](#). Based on the current empirical outcomes, users were not influenced by their ATT towards m-payments during the new normal era. A possible reason may be that users are getting accustomed to m-payment as they are encouraged to use it during the pandemic; hence, adopting m-payment in the new normal era is easy for them. Therefore, a positive or favourable m-payment ATT reflects a relatively lower impact on determining user behaviour.

PT demonstrated no significant relationship with BI, which contradicts previous studies (Al-Saedi *et al.*, 2020; Islam *et al.*, 2020; Sanchez-Torres *et al.*, 2018). This may have occurred because local m-payment platforms were authorised and regulated by the central bank. Users frequently have great confidence in such platforms because only well-established and reliable counterparts are permitted to operate locally.

An insignificant association between PR and BI was also found, similar to the results of Aji *et al.* (2020) and Liebana-Cabanillas *et al.* (2020). Thus, PR does not influence consumers to use m-payment in the new normal era despite the high-risk expectations of its employment. Most target respondents who were influenced by the highly educated younger generations recognised the risks related to m-payment usage and portrayed relatively high-risk tolerance levels.

The positive impact between PI and BI towards m-payment usage followed Handarkho and Harjoseputro (2020) and Loh *et al.* (2022a) who outlined the significant impact of innovativeness on new device adoption intention. Given the shift in user behaviours amidst COVID-19, PI facilitates users' m-payment adoption to practise a new normal lifestyle.

This study further proves the significant moderating effect of GS on users' behaviour towards m-payment adoption in the new normal era. In line with the aforementioned propositions (Jain *et al.*, 2022; Ramanathan *et al.*, 2014), GS played a crucial role in strengthening the ATT–BI correlation. Although ATT did not significantly or explicitly affect BI, this association was strengthened with GS. As such, GS is essential to increase ATT towards users' BI to use m-payments in the new normal era. This is particularly true, as the government has provided several incentives through m-payment and has enhanced Internet coverage facilities to promote the adoption of m-payment during and/or after the pandemic. Surprisingly, GS was found to have a significant moderating role in the relationship between PI and BI, albeit inversely. This unanticipated outcome could have resulted from distinctive research settings, whereas the current study emphasises the new normal era. The GS should be minimised because of its potentially adverse impacts on users' innovativeness in the new normal era.

5.2 Theoretical implications

Theoretically, this study significantly contributes to the existing literature on m-payment adoption in developing economies during the “new normal” era. It successfully identified and addressed previously identified research gaps through the extension of the MTAM, thereby enhancing the depth of our understanding of this subject matter.

The empirical findings of this research advocate for further extension of the MTAM by incorporating additional elements, specifically personality variables such as PT, PR and PI, alongside ATT. This augmentation would lead to a more comprehensive model capable of capturing the multifaceted factors that influence m-payment adoption.

Furthermore, this study examines a continuous variable, namely, GS, to investigate the relationship between ATT and BI towards m-payment usage. In contrast to previous research that primarily used categorical moderating factors, this approach makes a unique contribution to the m-payment literature. It highlights the substantial role of GS within the m-payment context, a facet that remains underexplored in the existing literature.

Considering that GS demonstrates a significant moderating effect on users' m-payment behaviour, future scholars should delve deeper into this area. An in-depth investigation of the role of GS in moderating the link between predictors and user intention holds great promise for advancing our knowledge in this domain.

5.3 Practical implications

This study offers valuable insights for stakeholders seeking to develop effective policies and strategies to foster the adoption of m-payment in the evolving landscape of the “new normal” era. Key stakeholders, including operators, government agencies and businesses, must prioritise two crucial factors, namely, “usefulness” and “personal innovativeness”, to enhance users’ intentions to use m-payment methods during this transformative period.

For m-payment operators, optimising the utility and benefits of their platforms, coupled with enhancing convenience and effectiveness, is of paramount importance. Simplifying user experience and reducing platform complexity can significantly encourage m-payment adoption. Businesses can support this by offering free and reliable Wi-Fi services that facilitate seamless transactions. Considering that user innovativeness has evolved with technological progress and policy changes in the new era, stakeholders should offer technology-related briefings and training to enhance users’ PI and technological readiness. Marketing campaigns that highlight the benefits of m-payments can also pique interest and boost user innovativeness.

The Malaysian Government plays a critical role in promoting m-payment adoption through policies and strategies that foster positive ATT towards m-payment usage. Prioritising privacy and security through legislative support is essential for building user confidence because security concerns can deter users. However, the government should be careful not to stifle PI by imposing overly restrictive measures. For instance, mandating the use of the *MySejahtera* application for contact tracing, though essential for public health, may inadvertently dampen users’ PI regarding m-payment adoption.

In conclusion, local governments should implement holistic and non-coercive initiatives to increase m-payment adoption intentions and promote its usage in the “new normal” era. A summary of the study’s conclusions and implications is presented in [Table 6](#).

5.4 Conclusions, limitations and suggestions for future research

Following the paucity of concrete evidence, this study strives to bridge the existing knowledge gap by exploring the factors impacting m-payment adoption in the new normal era. The MTAM was extended with four additional variables comprising three personality variables (PT, PR and PI) and ATT, along with GS operating as a moderator. Notably, BI was significantly affected by MU and PI based on data derived from 245 m-payment users.

Conclusions	Implications
MU significantly affect ATT and BI	Operators concentrate on improving the usefulness and benefits of their platform to encourage positive ATT and BI
MEOU significantly affect ATT	The difficulty and complexity of the platform should be reduced to promote the adoption by offering some technical support and backup. A free and stable Wi-Fi connection is also necessary to increase the usage
PI significantly affect BI	Stakeholders should articulate some strategies like providing briefings and training on the platforms to improve user’s innovativeness
GS strengthened ATT-BI	The significant moderating role of GS enriches the literature of the subject matter. Government support is required to cultivate the favourable and favourable ATT on the use of m-payment in the new normal era. Legislative support and internet accessibility are some of the supporting efforts from the government that may boost users’ ATT on m-payment usage

Notes: MU = mobile usefulness; MEOU = mobile ease of use; ATT = attitudes; PT = perceived trust; PR = perceived risk; PI = personal innovativeness; GS = government support; BI = behavioural intention

Table 6.
Conclusions and
implications

Moreover, both MU and MEOU positively and significantly influenced ATT. Furthermore, moderating analysis revealed that GS had a significant moderating effect on the ATT-BI correlation. In conclusion, this study revealed that only four direct hypotheses were supported for m-payment adoption and that GS strengthens the ATT–BI relationship. These findings are expected to benefit stakeholders in cultivating m-payment adoption and add new evidence to the literature on the moderating role of GS in consumer behaviour, especially in m-payment adoption.

Similar to previous studies, this study has certain limitations. Firstly, the findings may not be generalisable to other countries because of the exclusive focus on local users. Future research should aim to expand the geographical scope by including participants from diverse regions or conducting cross-national comparative studies to yield valuable insights. An intriguing avenue for further exploration could involve comparing users' m-payment usage intentions across privately owned platforms, such as Boost and Touch 'n Go and government-owned platforms such as SPay Global. The respondents were predominantly highly educated younger individuals: this demographic skew could compromise the overall reliability of the research. Future scholars should acknowledge this heterogeneity by examining differences among users based on various criteria, including age (millennials vs senior citizens), income level (B40 vs M40 and T20), urban vs rural residency and gender. Furthermore, to enhance the comprehensiveness of the MTAM, researchers may consider extending it to incorporate additional antecedents, such as user optimism and personal attributes, to better predict user behaviour in the context of m-payment adoption.

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Corresponding author

Pick-Soon Ling can be contacted at: ling.pick.soon@uts.edu.my

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