

THE INFLUENCE OF MOBILE PAYMENT APP
ADOPTION ON PERSONAL SAVING BEHAVIOUR
IN MALAYSIA

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IN MALAYSIA

BY

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A research project submitted in partial fulfilment of the
requirement for the degree of

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DECLARATION

We hereby declare that:

- (1) This undergraduate research project is the end result of my own work and that due acknowledgement has been given in the references to ALL sources of information be they printed, electronic, or personal.
- (2) No portion of this research project has been submitted in support of any application for any other degree or qualification of this or any other university, or other institutes of learning.
- (3) The word count of this research report is 17,634.

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LIST OF ABBREVIATIONS

AVE	Average Variance Extracted
BNM	Bank Negara Malaysia
CVPAT	Cross-Validated Predictive Ability Test
DFL	Digital Financial Literacy
FL	Financial Literacy
FCI	Financial Capability and Inclusion
HTMT	Heterotrait-Monotrait Ratio
LM	Linear Model
PEOU	Perceived Ease of Use
PLS-SEM	Partial Least Squares Structural Equation Modelling
RMSE	Root Mean Square Error
TAM	Technology Acceptance Model
TPB	Theory of Planned Behaviour
VIF	Variance Inflation Factor

PREFACE

The rapid growth of financial technology has transformed how individuals manage their financial activities, particularly through the widespread adoption of mobile payment applications in Malaysia. While these platforms provide convenience and efficiency, they may also influence individuals' financial behaviour, especially in terms of spending and saving habits. This observation motivated the author to explore the behavioural impact of mobile payment usage.

This study was conducted to examine the relationships between mobile payment adoption, financial literacy, and personal saving behaviour among Malaysian users. A quantitative, cross-sectional approach was employed using an online questionnaire, and the data were analysed using Partial Least Squares Structural Equation Modelling (PLS-SEM).

The findings of this research aim to provide insights into how digital financial tools affect financial behaviour and to support the development of more responsible financial practices in an increasingly cashless society.

ABSTRACT

The rapid advancement of financial technology has accelerated the adoption of mobile payment applications in Malaysia, supporting the transition towards a cashless society. While these platforms provide convenience and efficiency, concerns have emerged regarding their impact on individuals' financial behaviour, particularly personal saving habits. This study examines the influence of mobile payment app adoption on personal saving behaviour, with financial literacy as a key factor.

A quantitative, cross-sectional research design was adopted. Data were collected through a structured online questionnaire distributed to Malaysian mobile payment users, yielding 275 valid responses. The data were analysed using Partial Least Squares Structural Equation Modelling (PLS-SEM). The study investigates four key relationships: the effects of transparency and perceived ease of use on mobile payment adoption, the relationship between adoption and financial literacy, and the influence of financial literacy on personal saving behaviour.

The findings indicate that transparency and perceived ease of use significantly influence mobile payment adoption. Mobile payment adoption is positively associated with financial literacy, which in turn enhances personal saving behaviour. All proposed hypotheses were supported.

This study contributes by providing an integrated framework linking mobile payment adoption, financial literacy, and saving behaviour in Malaysia, and offers practical insights for promoting responsible financial practices in a digital economy.

Keywords: Mobile Payment Adoption, Financial Literacy, Personal Saving Behaviour

CHAPTER 1: INTRODUCTION

1.0 Introduction

This chapter highlights some background information about the study. The research problems give an indication of some of the issues encountered in adopting mobile payment applications for savings. Also, it highlights some of the main themes of the study in the form of research questions and objectives.

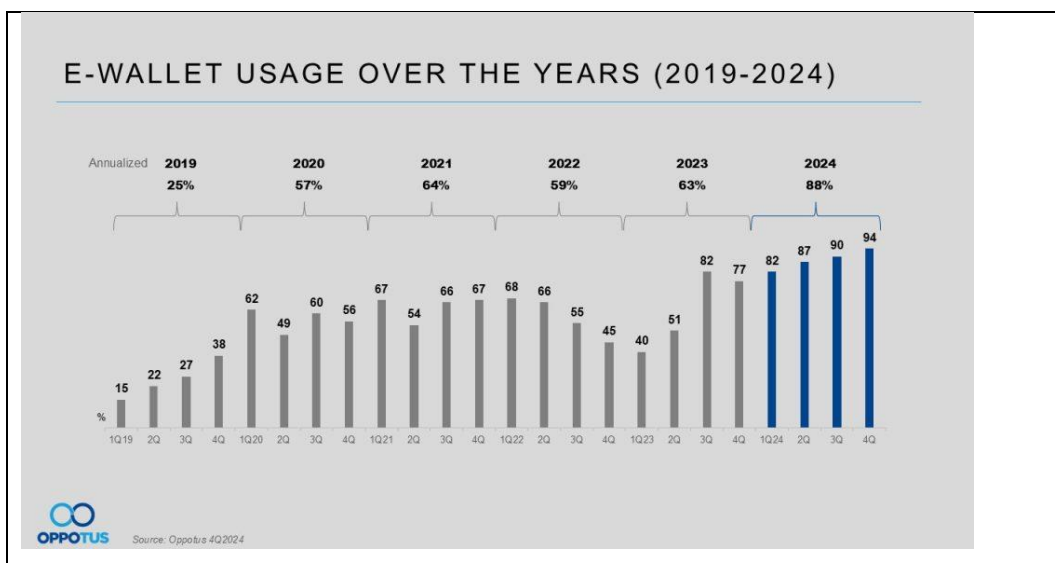
1.1 Research Background

Over the past two decades, there have been significant changes witnessed within the finance environment as a result of the increased adoption of mobile phones and technological advances. Governments, financial organizations, and consumers have increasingly opted to embrace cashless payment systems, which offer an efficient, reliable, and convenient option for conducting traditional cash payments in both advanced and emerging countries (World Bank, 2022). This shift can be attributed to improvements in internet accessibility, increased adoption of smartphones, and ongoing technological developments in the fintech industry (Statista, 2023).

Given the strategic nature of government programs and the fast-growing digital economy of the country, there have been extremely remarkable changes concerning the shift towards the concept of becoming a cashless state. The Malaysian government has actively promoted the use of digital payments to its citizens via government programs such as the Financial Sector Blueprint 2022-2026 and e-Tunai Rakyat stimulus program (BNM, 2022). A well-developed ecosystem of mobile payment services such as the Touch 'n Go eWallet, GrabPay, and Boost has played an important role in these processes. It is also worth mentioning that the outbreak of the coronavirus pandemic turned into an outstanding push-factor for developing cashless payment options due to the necessity of minimizing the infection rate by stopping using cash (Ozili, 2020).

Among the clearest indicators of Malaysia's transition to a cashless society is the prevalence of electronic wallets. The Malaysian Communications and Multimedia Commission states that in Malaysia, more than 24 million individuals had registered their electronic wallets, showing a substantial number of its adult population (curlecteam, 2026). As highlighted in an Ipsos study in 2022, Malaysia is among the countries with one of the highest mobile payment adoption rates in Southeast Asia, with close to 40% of the respondents claiming to use mobile payments on a regular basis (Cheong, 2025b).

Figure 1.1: E-wallet Usage in Malaysia



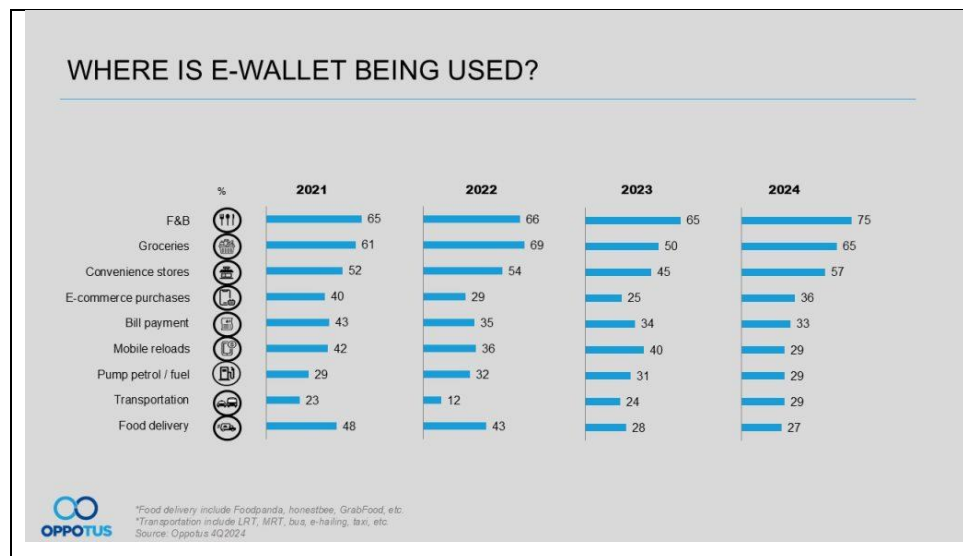
Source: Cheong (2025b)

The adoption rate of e-wallets in Malaysia has continued to grow steadily, as shown in figure 1.1. The growth has been particularly significant since 2019 to 2024 when the first case of the coronavirus disease emerged. The increase has been caused by structural change in technology, as well as inclusion measures put in place in Malaysia by the government to integrate citizens economically, as well as exogenous factors such as pandemics. It is evident that mobile payment systems have now become a common aspect of finance and have transcended age, socio-economic backgrounds, and geography.

1.1.1 Consumer Usage Behaviour

The frequency and use of mobile payment services have emerged as critical issues in consumer behaviour, surpassing mere adoption rates. As more consumers integrate these platforms within their daily financial routine, numerous studies have pointed out that the effectiveness of mobile payment platforms is far beyond mere occasional use (Liébana-Cabanillas et al., 2020). Based on the survey conducted by Cheong (2025b), the majority of users of mobile payments in Malaysia make use of their preferred platforms at least once weekly for different transactions including paying bills, shopping for groceries, receiving food deliveries, and peer-to-peer money transfer. The high frequency of use shows that many Malaysians have been able to turn mobile payment platforms from supportive financial tools to key transaction instruments.

Figure 1.2: Distribution of E-Wallet Usage by Transaction Type from 2021 to 2024



Source: Cheong (2025b)

The analysis of expenditure trends related to the use of mobile payments is another fascinating area of study. From research, it has been found that individuals who use mobile payment services tend to spend more than those using cash services. This is due to the ease with which digital payment is made and is less hassle-free (Faraz & Anjum, 2025; Doan Van Dinh,

2024). Based on information provided by the Department of Statistics Malaysia, the expenditures of households via digital platforms, including mobile payments, have greatly risen in Malaysia recently (Gong, 2025).

The majority of Malaysian mobile payment users engage with their platforms on a frequent basis, with daily and several times-weekly usages among the most common behavioural patterns (Malaysia Competition Commission (MyCC), 2025). Frequent use normalizes digital spending behaviour and could gradually shift users' perceptions of money, expenditure limits, and saving goals. The outcomes of this high level of engagement go above the transactional (Soman, 2001). Therefore, it is necessary to understand the relationship between the adoption of mobile payments and individual saving behaviour within the crucial behavioural setting provided by a combination of high usage frequency and rising expenditure levels.

1.1.2 Benefits of Mobile Payment

Mobile payment applications provide a number of well-known advantages, which have led greatly to their rapid and broad acceptance. The most important of these is the convenience to carry out financial transactions from almost anywhere at any time, which reduces the need to physically go to bank branches or carry actual cash (Davis, 1989; Venkatesh et al., 2003). That is very true to the concept of perceived ease of use, which, under the theory of Technology Acceptance Model (TAM), is considered one of the factors leading to the adoption of any technology because it is simple in terms of use (Davis, 1989). In that sense, the ease of scanning QR codes, making payments using mobile numbers, and keeping a track record of transactions through simplified applications has made the process of mobile payment adoption easier.

Another key benefit of mobile payment services is the increased financial transparency they provide to users. Digital payments provide recorded

transaction histories for users may easily access through their mobile applications, in contrast to cash transactions, which provide no automatic record (Ouyang, 2026). Due to this provided transparency, users may more accurately track their spending, identify their expenses, and gain a better understanding of their financial habits. Since users can identify inefficient spending and change their spending habits, if necessary, the availability of such detailed transaction data may help them make better financial decisions. Overall, these features offer mobile payment services as potential tools for more mindful and disciplined personal financial management, rather than just transactional tools.

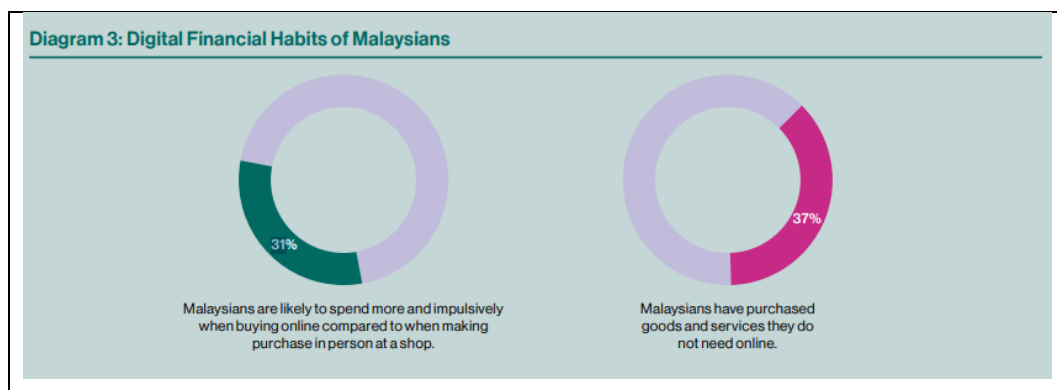
1.1.3 Financial Literacy

The competence to recognize and apply different types of financial competencies, including budgeting, saving, and personal financial management skills, among others, can be termed as financial literacy (Lusardi & Mitchell, 2014). Higher levels of financial literacy tend to afford an individual the capacity to manage finances and make sound financial decisions in pursuit of future financial goals. Financial literacy plays a significant role in adopting mobile payments because it influences the capacity of users to keep track of their finances and manage their spending patterns as they adopt mobile payments. Individuals with low levels of financial literacy might be more prone to indulge in impulse buying or spending owing to the lack of friction that the mobile apps afford. However, individuals who have adequate financial literacy skills are more likely to use such mobile payment technologies responsibly. As a result, financial literacy is the key influencing factor in understanding how Malaysian consumers' adoption of mobile payment apps eventually influences their personal saving habits.

1.2 Problem Statement

There have been many changes that have been brought about due to the adoption of digital financial services among Malaysians. The use of mobile payments has become more popular in Malaysia, owing to the emergence of electronic wallets, the introduction of contactless payments, and the growth of internet banking apps. As reported by Bank Negara Malaysia (2025), 92 percent of Malaysians had adopted digital financial services in 2024, compared to the 74 percent who adopted them in 2021. In essence, Malaysia is on its way to adopting a cashless economy, through favourable regulations and rising rates of smartphone adoption. However, while such trends enhance financial inclusiveness and convenience, they present some challenges for personal finance management.

Figure 1.3: Impulsive Online Spending and Unnecessary Purchases Among Malaysians



Source: Bank Negara Malaysia (2025)

Although there are many benefits of using mobile payments, recent studies reveal that the increasing digitization of financial transactions might exacerbate the lack of self-control among Malaysians' expenditure behaviour. Based on Bank Negara Malaysia (2025), the concept of "painless payment" is present, wherein the convenience of digital payment systems promotes impulsive buying because the smooth process of digital transactions makes individuals psychologically weaker against purchasing. As shown in Figure 1.3 of the Financial Capability and Inclusion Demand Side (FCI) Survey 2024, 31 percent of Malaysians admitted that they had higher chances of making an impulse purchase when shopping through online platforms than through physical stores. Furthermore, 37 percent confessed

that they have purchased unnecessary products or services while shopping online. Additionally, according to Bank Negara Malaysia (2025), many Malaysians still struggle with budgeting, maintaining a check on spending and following to planned spending limit. These issues are likely made worse by the ease with which mobile payment system function.

Decreasing saving outcomes and decreased financial well-being among Malaysians are evidence of these behavioural patterns. According to Bank Negara Malaysia (2025), just 58% of Malaysians reported actively trying to save money for the future in 2024, a reduction from 67% in 2021. Meanwhile, the percentage of Malaysians who sometimes or consistently need funds increased significantly from 14% in 2021 to 26% in 2024. These patterns suggest that Malaysians are putting a greater focus on short-term spending than long-term financial planning, which lowers their ability to save money and their financial stability. The Malaysia Financial Literacy and Capability (MYFLIC) Index's financial behaviour score also decreased from 61.9 in 2021 to 59.9 in 2024, supporting the concept that Malaysians' behavioural financial discipline has reduced during a time of growing digital financial activity Bank Negara Malaysia (2025).

In light of these interrelated issues, it is necessary to conduct research into how the adoption of mobile payments affects the savings habits of individuals in Malaysia. While it is beyond question that the benefits of digital financial systems and their impact on human behaviour, including their tendency towards impulsive purchases and saving less, need to be investigated thoroughly, it is essential to understand their correlation and the degree to which financial literacy plays a role in this process.

1.3 Research Questions

This study aims to explore the following research questions:

1. Is there a significant relationship between transparency and the adoption of mobile payment apps in Malaysia?
2. Is there a significant relationship between perceived ease of use and the adoption of mobile payment apps in Malaysia?
3. Is there a significant relationship between adoption of mobile payment apps and financial literacy among Malaysian users?
4. Is there a significant relationship between financial literacy and personal saving behaviour among Malaysian users?

1.4 Research Objectives

The objective of this study is to examine the influence of mobile payment app adoption on personal saving behaviour among Malaysian users. This study focuses on:

1. To examine the relationship between transparency and the adoption of mobile payment apps in Malaysia
2. To examine the relationship between perceived ease of use and adoption of mobile payment apps
3. To determine the relationship between adoption of mobile payment apps and financial literacy among Malaysian users
4. To assess the relationship between financial literacy and personal saving behaviour among Malaysian users

1.5 Significance of Study

Individuals with advanced financial literacy capabilities can generally be expected to budget their expenses, plan for future financial goals and make sound financial decisions. The adoption of mobile payments has been thoroughly examined through an analysis of technology acceptance models, but few research has been conducted on the behavioural and financial impacts of this adoption, especially in emerging market contexts (Davis, 1989; Venkatesh et al., 2003). This study presents deeper method of analysis that increases theoretical knowledge in both the fintech and behavioural finance sectors by including financial literacy as a key factor along mobile payment adoption in explaining personal saving behaviour. It is expected that the results will benefit to the current field of knowledge on how individual financial outcomes are influenced by digital financial advances.

At the individual level, this study is highly useful for Malaysian consumers in an increasingly cashless financial world. The study provides users a greater understanding of the psychological and behavioural potential risks connected to digital payments by explaining the ways through which the use of mobile payment apps affects spending and saving behaviour. Users can create focused saving goals, develop more disciplined financial habits, and use mobile payment capabilities more mindfully due to this understanding. The findings of this study can be used as a useful direction for those looking to improve their own financial management in modern times in an era where financial literacy skills are still inconsistent among demographic groups.

The results of this study are significant for the development of mobile payment applications by fintech software developers and other participants in the financial technology industry. In order to promote more financial responsibility among users, the study focuses on the importance of integrating financial management features into mobile payment platforms, such as spending trackers, saving goals, and real-time expenditure notifications. Fintech firms that implement the above functionalities will find themselves in an excellent position to thrive in the highly competitive digital payment landscape in Malaysia as well as increase the financial

security of their customer base. Thus, the study's conclusions may guide product development practices that balance business goals with beneficial social results.

From a policy perspective, this study provides solid findings that are readily applicable to regulatory bodies and policymakers aiming to promote responsible financial behaviour and financial literacy in the framework of a fast-digitalizing economy. The results of the study can be used by organizations like Bank Negara Malaysia and the Securities Commission Malaysia, which have supported a number of financial education developments, to improve current programs and more effectively target programs towards populations particularly susceptible to the negative behavioural effects of mobile payment adoption. To ensure that investments in the cashless payment system correspond with investments in financial literacy, it is also important that the study bolsters the need to incorporate financial literacy programs in digital economy programs across nations.

In conclusion, this study is extremely helpful from an academic, personal, business, and policy perspective. The study fills a significant void in the relation between financial well-being and technology advancement by offering empirical evidence on the effects of using mobile payment apps on savings behaviour and how financial literacy fits into this correlation.

1.6 Definition of Key Terms

Key Terms	Definition
Mobile Payment	The use of digital wallets or payment applications installed on smartphones for performing financial transactions, such as making payments, paying bills or transferring funds, is termed mobile payment in this study. Only app-based platforms, such as Touch 'n Go eWallet, MAE, GrabPay, ShopeePay, and similar ones, are eligible for mobile payment; independent credit card

	usage that isn't made possible by mobile payment apps is not.
E-Wallet (Electronic Wallet)	A digital application which allows users to save money electronically and conduct cashless transactions via a mobile device is known as an e-wallet. In Malaysia, e-wallets are governed by Bank Negara Malaysia and frequently incorporated with in app or QR code payment systems.
Cashless Society	A cashless society is an economic environment in which financial transactions are primarily conducted digitally or electronically rather than in cash. The phrase refers to Malaysia's continuous shift towards the widespread use of mobile payments and other digital financial services in this study.
Impulsive Spending	Impulsive spending is defined as unplanned and impulsive purchase activity that occurs without prior financial planning or careful consideration of budget limits. This study discusses impulsive spending as a possible behavioural result linked to the convenience and lower psychological barriers of using mobile payments.
Frictionless Payment	Frictionless payment refers to payment methods like one-tap payments and QR code scanning that require little time, effort, or conscious user decision making. The term "frictionless payment" is used in this study to characterise how mobile payment systems lower transaction effort, which may have an impact on financial behaviour and spending awareness.
Digital Financial Services	The use of digital payment applications or electronic wallets through smartphones in order to conduct financial transactions such as shopping, bills payments, money transfer, among others, is termed mobile payment in this study. In order to place mobile payment apps

	within Malaysia's digital finance ecosystem, the term is used widely in this study.
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1.7 Outline of Study

Chapter 1

This chapter gives information on the background of the study, its problem, and the scope of the research paper. It starts with an overview of the trend towards a cashless society in Malaysia, noting that there has been fast adoption of mobile payments because of government efforts, widespread use of smartphones, and the outbreak of the Coronavirus Disease 2019. The chapter then lays out the research questions and objectives, which focus on four key relationships: transparency, adoption for mobile payment apps, financial literacy and personal saving behaviour. It closes with the study's significance across academic, individual, industry, and policy perspectives, and defines key terms (e.g., mobile payment, e-wallet, frictionless payment).

Chapter 2

This chapter covers the theoretical and empirical basis of the study. It starts with a brief description of how each of the two theories, the TAM models and the TPB theory, validates the conceptual framework. This chapter proceeds to analyse the five variables of the study. The hypothesised relationships (H1–H4) are supported by previous empirical studies for each variable. The chapter wraps up by explaining the proposed conceptual framework and highlighting out four research gaps that this study is trying to fill: the literacy-adoption relationship's reversal, the lack of an integrated multi-construct model, the lack of data from the Malaysian context, and the focus on adoption intention rather than actual financial outcomes.

Chapter 3

This chapter explains the methodology used in the study. A standardised online questionnaire distributed through Facebook, Instagram, and WhatsApp was used in a quantitative, cross-sectional research design. There were no age, gender, or financial restrictions on the target demographic, which included Malaysian mobile payment app users. Convenience sampling was applied, while the sample size of at least 129 respondents was estimated through G*Power. The target number of respondents is between 150 to 200. The constructs were operationalized through the use of nominal, ordinal and 5-point Likert scale interval questions in the questionnaire that were taken from existing literatures. The procedures for processing data are explained, including checks for incompleteness, ineligibility, non-consent, and straight-lining. Descriptive analysis, measurement model evaluation and structural model evaluation are included in PLS-SEM analysis approach using SmartPLS 4.

Chapter 4

This chapter shows the results from the analysis. The descriptive analysis shows 275 valid respondents, the majority of them are female (67.6%), between the ages of 20 and 29 (82.2%), have a bachelor's degree (76%), are students (71.3%), and make less than RM1,000 per month (57.1%). All constructs had mean ratings in the "Agree" range, with Financial Literacy having the lowest score and Perceived Ease of Use having the highest. Results from the analysis of the measurement model showed that the assessment exhibited good reliability and validity; item PS2 had to be removed since its outer loading was lower than the threshold of 0.60 (0.523). All the average variance extracted was above 0.50, HTMT ratio below 0.85 and Fornell-Larcker criterion satisfied. The structural model evaluation showed positive predictive relevance using CVPAT, no multicollinearity (all VIF < 3.3), and an R^2 of 0.317 (moderate explanatory power). All four hypotheses were statistically supported at $p < 0.001$: H1 ($\beta = 0.503$), H2 ($\beta = 0.271$), H3 ($\beta = 0.485$), H4 ($\beta = 0.563$).

Chapter 5

This chapter concludes the study and considers the implications of it. It starts by providing an overview of the statistics that were conducted and analysis of significant findings made considering the four hypotheses that were tested in the study. The recommendations provided in the chapter are informed by the empirical findings of the study and consider the implication of the study to the three main stakeholders, namely mobile payment service providers, individual consumers and, financial institutions and policymakers. These include the use of convenience sampling, the skewed demographic profile, the cross-sectional research methodology, and the dependence on self-reported data, all of which limit how broadly the results may be used. Future study recommendations are then provided, including the use of qualitative or mixed methodological approaches, cross-cultural comparative studies, longitudinal research designs, probability-based sampling, and new predictor variables. The chapter ends with a general conclusion that encompasses key findings from this research study and also emphasizes the significance of financial literacy in predicting individual savings behaviour as well as how mobile payment application usage positively contributes to Malaysia's financial wellness.

CHAPTER 2: LITERATURE REVIEW

2.0 Introduction

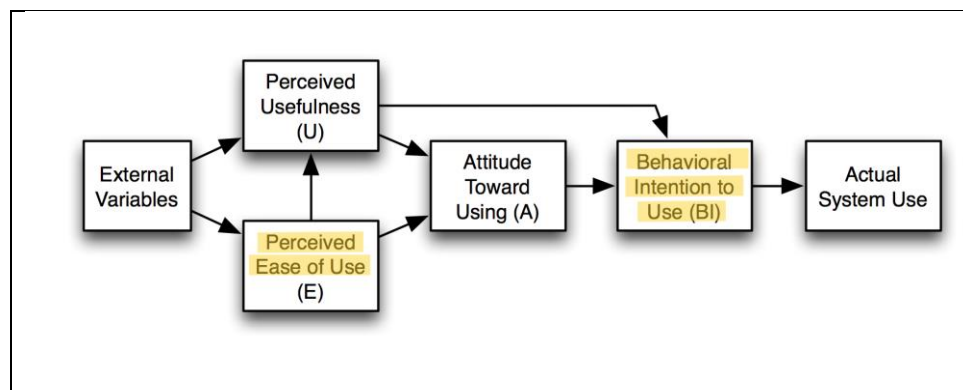
This chapter discusses the factors influencing personal saving behaviour for adoption of mobile payment app, focusing on one dependent variable—personal saving behaviour, four independent variables, transparency, perceived ease of use, adoption of mobile payment app and financial literacy. The conceptual framework and the hypothesis were developed based on past journals.

2.1 Underlying Theory

The theoretical basis for this research is dependent on the established theoretical basis of two major theories, including Technology Acceptance Model (TAM) and Theory of Planned Behaviour (TPB). This means that the two theories form the conceptual framework used to analyse how transparency and perceived ease of use influence the adoption of mobile payment and how this can influence financial literacy and saving behaviour. Each theory is looked by way of its history, its use in earlier studies and its particular applicability to the variables this study is studying

2.1.1 Technology Acceptance Model (TAM)

Figure 2.1: Technology Acceptance Model Framework



Source: Davis (1989)

The Technology Acceptance Model (TAM), initially developed by Davis (1989), was proposed as an explanatory model that aimed at predicting the acceptance of information technology systems by users. The Technology Acceptance Model is based on the Theory of Reasoned Action and suggest that the main determinants in determining one's intention to use a particular technology are the concepts of perception of usefulness and perception of ease of use. Perceived usefulness is related to how useful the system is thought to be when used by the user for improving his performance, whereas the perceived ease of use is associated with the ease with which the system is expected to be used by the user without any effort. Taken together, both these factors influence the technology use attitude, which influences the behaviour intentions and system usage. TAM is particularly useful for research looking at the adoption of digital financial services like mobile payment apps because of its well-known parsimony and empirical robustness.

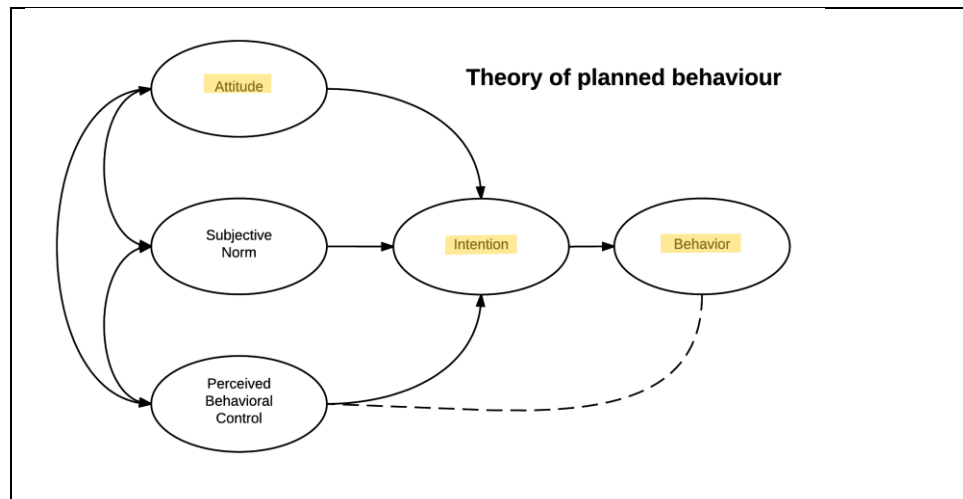
The concept of TAM has been used extensively in previous studies to analyse the adoption of digital payments and mobile payment technologies. More importantly, the research conducted by Gefen et al. (2003) and Venkatesh & Davis (2000) has provided evidence regarding the value of TAM variables under diverse conditions, making the theory indispensable in analysing technological adoption.

The following outlines the theoretical framework for the theory of perceived ease of use and transparency in regard to mobile payment app adoption within this research. The idea of perceived ease of use is among the key components of TAM theory that enables one to understand how the users' perception of the ease of using mobile payment applications can affect their adoption. Within this study, transparency is viewed as an extrinsic variable that can potentially impact the adoption of mobile payment apps, even though it is not among the core components of TAM, since it can influence both the perceptions of usefulness and trust. Indeed, the users are more prone to trust the mobile payment application and perceive it as useful when

they feel confident that it is transparent in terms of its operation, payment policies, and data utilization. This raises the likelihood of adopting the app.

2.1.2 Theory of Planned Behaviour (TPB)

Figure 2.2: Theory of Planned Behaviour Framework



Source: Ajzen (1991)

Theory of Planned Behaviour (TPB), proposed by Ajzen (1991), is a theoretical model based on social psychology, which explains the connection between attitudes, intentions and human behaviour. According to TPB, one's intention is the best indicator of his or her behaviour and there are three factors affecting people's intentions: attitude towards particular actions, subjective norms and perceived behavioural control. Attitudes stand for individual evaluation of certain actions, which can either be favourable or unfavourable; subjective norms involve individual feelings on whether or not he or she should behave in a certain way as a result of the social environment's expectation; and perceived behavioural control shows an individual's perception of ability to perform certain actions and how easily one could do it. The importance of TPB is evident in the study of financial behaviour, since it highlights the role of attitudes, social influence and self-respect in individual decision-making processes.

TPB has been widely used in research on financial behaviour as well as technology adoption. The broad predictive validity of TPB across a variety of behavioural domains has been proven by research by Sheppard et al. (1988) and Montaña and Kasprzyk (2015), indicating its usefulness as a theoretical framework for this study.

In the framework of this study, TPB provides a different theoretical viewpoint to TAM by explaining the social and motivational factors that explain the adoption of mobile payment apps and their corresponding effect on saving behaviour. The decision to adopt a mobile payment application can be understood through TPB as a planned behaviour influenced by the individual's attitude toward financial technology, social influence from peers or family members who use such applications, and their perceived ability to navigate digital payment systems. In addition to that, TPB allows researchers to develop an insight as to how adopting mobile payments applications can bring changes in saving habits. After an individual adopts the use of such applications, his or her behavioural intentions towards money management practices, which includes saving, will be affected by the norms and self-regulatory belief reinforced by the process of adopting this practice. The current study adopts TPB theory in order to demonstrate that the adoption of mobile payment applications, as a planned and deliberate action, leads to ideal circumstances for improved savings behaviours.

2.2 Review of Variables

The dependent variables are those that are affected by the independent variables. The dependent variable in this study is saving behaviour, while the independent variables include transparency, ease of use, adoption of mobile payments apps, and financial literacy.

2.2.1 Transparency

Transparency is defined by Bushman and Smith (2003) as the degree of openness by an organisation to disseminate information pertinent to the decision-making process of its stakeholders based on accurate and understandable information. In the context of mobile payment applications, transparency involves how well service providers communicate transaction details, pricing schedules, data policies, and security mechanisms. Consumers will be more likely to use a mobile payment app if they perceive it as transparent. As such, transparency becomes a critical criterion for consumer trust and adoption in digital financial services.

This hypothesis is empirically supported by Jünger and Mietzner (2019), who conducted a study of 324 German households on factors driving switching behaviour between traditional banking systems and FinTech firms. Their findings, based on logistic regression analysis, revealed that households who value transparency within financial services are significantly more inclined to adopt FinTech solutions. They posited that transparency helps bridge the gap between information asymmetries, leading consumers to better assess the value of services and prices, hence increasing their motivation to move towards FinTech.

Moreover, the connection between data privacy and mobile application adoption is also validated by Niaz and Karim's (2026) qualitative study focusing on the data privacy practice and the adoption process in the context of the users in Lahore, Pakistan. Using semi-structured interviews, it was revealed that privacy policies with transparency, particularly those providing clear disclosure on how the data is being utilized, was deemed as one of the critical factors in the process of adoption. The participants noted that apps that provide accessible and easy-to-understand policies would make the consumers feel more secure about installing the app, while difficult disclosure may hinder their interest in adopting it.

The supporting literature will add more understanding on the core factors underlying the relationship between transparency and adoption. As Gefen et al. (2003) assert, users tend to be confident and exhibit positive adoption intention when the processes involved within a particular technology seem consistent and predictable. Similarly, Luo et al. (2010) note that the perceptions held by consumers concerning the legitimacy and reliability of the security mechanisms adopted by a platform played a major role in reducing uncertainties and promoting the adoption of mobile banking. In the same spirit, Shareef et al. (2018) argue that perceived information quality is a key determinant of the likelihood of adopting mobile banking services, implying that adoption intention is positively impacted by the quality of information available.

In conclusion, from the review of the literature examined here, it is evident that there exists significant influence of transparency on the adoption of mobile payments. Even though the secondary sources cited above indicate that the bigger picture involves lower levels of uncertainty and higher reliability that create such relationships, the authors who provided primary sources include Jünger & Mietzner (2019), Niaz and Karim (2026). These results support the importance of transparency as a crucial factor affecting the adoption of mobile payment applications in the current investigation.

H1: Transparency in mobile payment apps related to the adoption of mobile payment app

2.2.2 Perceived Ease of Use

According to Davis (1989), perceived ease of use reflects an extent to which a potential user believes that using the target system will be effortless. Perceived ease of use related to the mobile payment application shows the consumer's perception regarding the easiness to complete payments using a digital platform. People will tend to have favourable perceptions about mobile payment systems and adopt them if they feel that the system is easy to use. Perceived ease of use, a crucial element of the Technology Acceptance Model, has proven time and again to be an important determinant of the intention to use financial services online (Venkatesh & Davis, 2000).

There exists substantial evidence in the literature on the relationship between perceived ease of use and mobile payment adoption. Tian and Chan (2024), for instance, conducted a survey among 371 respondents from Malaysia and observed that PEOU positively influences the behavioural intention to adopt mobile payment apps. Specifically, the researchers found that an individual who perceives mobile payment apps to be easy to use and effortless would develop a positive intention toward adopting such apps. In a similar vein, Tsai et al. (2022) reported that perceived ease of use positively predicts consumers' intentions to adopt mobile payment apps. Thus, it could be reasonably argued that people who find mobile payments easy to use would have a higher adoption rate.

Additional evidence supporting this causal link is provided by Kelly and Palaniappan (2023), who studied the usage of mobile payments among consumers in Ghana within the framework of the TAM model. Based on their research findings, it became apparent that perceived usefulness and perceived ease of use have a direct influence on the users' attitude toward the continuation of using mobile money services. It should be noted that, in this case, ease of use plays an important role not only in encouraging adoption but also in sustaining users' continued adoption of mobile payment technology. Likewise, Jaradat and Mashaqba (2014) found that PEOU is one

of the major determinants of intention to adopt mobile payment technology among consumers in Jordan; specifically, those users who perceived mobile devices as easy to use tended to adopt mobile payment technology.

The study of Ullah et al. (2022) has provided another piece of information on this topic by stressing out the significance of digital literacy in influencing perceived ease of use, which further impacts adoption intentions. In the case study conducted by Ullah et al., high digital literacy among Pakistani participants was associated with a high degree of perceived ease of use, which resulted in their increased intention to adopt m-payment and m-banking. In other words, the perceived ease of use is not only determined by the technological characteristics of a product but also by the skills and abilities of its user. When users feel equipped to engage with a mobile payment platform, the technology is perceived as less demanding, and adoption increases.

In general, all these pieces of research support the idea that ease of use significantly influences people's decision to install mobile payment apps. The more user-friendly these applications are, the higher the probability of their adoption.

H2: Perceived ease of use in mobile payment app is related to the adoption of mobile payment apps

2.2.3 Adoption of Mobile Payment Apps

The process by which people accept, incorporate, and actively use mobile-based digital payment platforms as a way to carry out financial transactions is known as the adoption of mobile payment apps (Rogers, 2003). The actual and consistent use of mobile payment apps in routine financial transactions, such as money transfers, bill payments, and retail purchases, is defined as adoption in this study. Adoption is influenced by a number of technological

and personal factors, such as the platform's perceived usability and transparency.

Financial literacy is shown to have a positive relationship with mobile payment use, as reported by increasing academic studies. Yoshino et al. (2020) studied the relationship between the two factors in Japan based on data from 25,000 respondents and found that financial literacy positively affects the probability of using fintech services, such as mobile payments applications. As it can be concluded, people possessing financial literacy have a better understanding of advantages and disadvantages of various digital payment platforms, thus lowering the level of uncertainty associated with fintech usage. Similarly, according to Long et al. (2023), in using Japan's representative data, the study showed that high levels of financial literacy positively increase the chances of embracing electronic payment solutions, including mobile payments. The role of financial literacy lies in reducing information costs when assessing financial innovations, enhancing people's capability to recognize their benefits.

For instance, the contribution of financial skills, which make up financial literacy, on the individual's intention to embrace mobile payment technologies may be demonstrated from Ullah et al.'s findings (2022). The study shows that there is an indirect positive effect between financial skills and adoption intention mediated by perceived usefulness. Thus, people who are more financially literate tend to find mobile payment solutions more useful. This study demonstrates the relevance of financial literacy to influence one's perception of the usefulness of technology and adoption. With financial literacy, people can easily grasp how mobile payment systems enhance their financial management practices.

In general, the study by (Al & Charilaos Mertzanis, 2024) revealed that there is a strong positive correlation between financial literacy and the growth of FinTech business based on analysing information from 114 countries. According to their findings, people who have sufficient financial knowledge are better at evaluating both pros and cons of using certain FinTech products

and services. As a consequence, such individuals become motivated to utilize financial platforms and their products and services. The higher tendency to utilize innovative financial technology solutions, such as mobile payment apps, becomes apparent due to this understanding of the financial environment. This idea is supported by Ankrah Twumasi et al. (2022). Based on their findings, financially literate individuals are more inclined to search for financial information and participate in financial market activities. All in all, these activities will result in using digital financial services.

In sum, based on the above discussion, one can say that through being exposed to digital financial instruments and activities, using mobile payment apps is expected to enhance users' financial literacy. This leads to the following conclusion: financial literacy is positively impacted by the use of mobile payment apps.

H3: Adoption of mobile payment app is related to financial literacy among Malaysian users

2.2.4 Financial Literacy

As stated by Lusardi and Mitchell (2007), financial literacy can be defined as the capability of an individual to comprehend and appropriately use the financial knowledge and skills to manage personal financial activities like budgeting, saving, investment, and managing debts. Financial literacy in relation to mobile payments adoption can therefore be said to be about how users are able to identify relevant financial information from the digital media and apply the same in ensuring improved financial health. High levels of financial literacy would allow individuals to take advantage of the available financial tools in mobile payment applications.

It is commonly known that financial literacy and saving behaviour are related in a variety of cultural and economic contexts. Peiris (2021) examined this relationship among employed individuals in Sri Lanka and

found that financial literacy has a direct and significantly positive influence on saving behaviour. The study further showed that financial literacy also shapes an individual's intention to save, which leads to actual saving behaviour, showing that the effect of financial knowledge on saving is both direct and indirect. This provides further proof that increased financial literacy can enhance saving behaviours as people are informed of the consequences of not saving adequately and benefits associated with savings.

Supporting the above claim, research by Mad et al. (2024) was conducted among youth in Malaysia in which the researchers found out that financial literacy and savings behaviour had a moderately strong relationship with each other such that financial literacy explained 26.5% of the variations in saving behaviours. Regression analyses indicated that as levels of financial literacy rose, saving behaviours were significantly boosted. Such findings are especially important when we consider that the Malaysian youth population is characterized with the problem of inadequate savings and poor financial management leading to a situation where most of the income received is spent on consumptions.

Moreover, Mireku et al. (2023) also add evidence supporting this relationship in their study conducted among the university students of Ghana, who were seen to show better behaviour when it came to finances due to their financial literacy, such as saving money. Based on the Family Resource Management Theory, the authors have argued that financial literacy can be termed a factor which affects financial decisions and behaviours. In simple terms, when a person possesses adequate financial literacy, he or she will make appropriate plans, budgets, and savings.

Choung et al. (2023) have added to the literature in this regard by proposing digital financial literacy (DFL), a term that encompasses financial literacy along with digital financial competencies. It was found in a study of adult Koreans that digital financial literacy has a positive correlation with financial well-being, and the association is due primarily to financial knowledge and capability against digital frauds. More interestingly, people

who had high levels of digital financial literacy showed better financial practices in terms of saving and risk management. Obviously, with the continuous growth of digital financial environment, digital financial literacy has been identified as one of the essential aspects of effective savings.

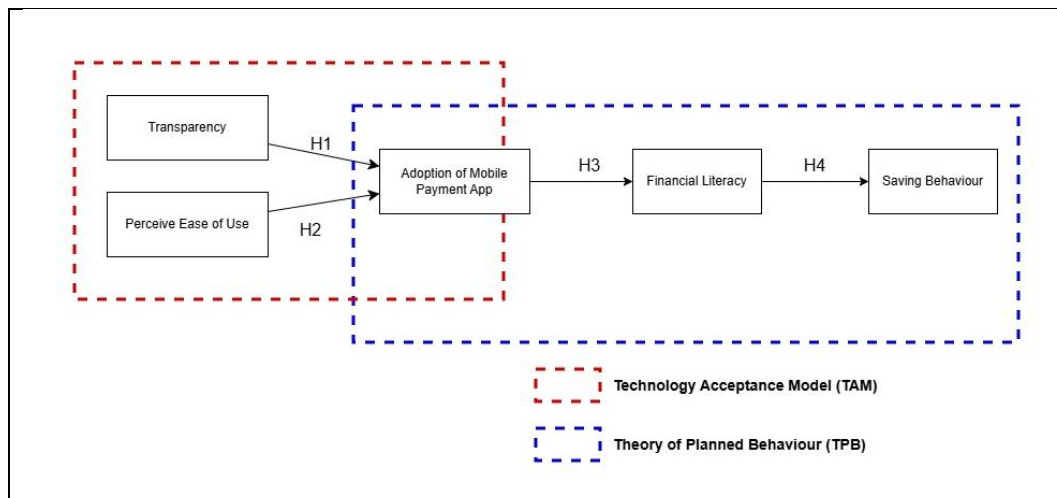
Moreover, according to the research conducted by Usman et al. (2025), financial literacy exerts a significant influence on behavioural intention to use digital payments, while the intention acts as a mediating factor in digital financial technologies adoption. Although the scholars investigated the problem of digital payment adoption rather than savings, their results reveal another dimension of the impact of financial literacy – those who possess financial knowledge have higher behavioural intention towards the use of financial technologies, which affects all other aspects of money management, such as savings.

Combined, these findings indicate that financial literacy is a strong predictor of individual saving behaviour. Individuals who comprehend finance-related concepts have an enhanced capacity to set up saving targets, budget their expenditures, and manage their finances. This provides support to the hypothesis that personal saving behaviour is positively impacted by financial knowledge.

H4: Financial literacy is related to personal saving behaviour among Malaysian users

2.3 Proposed Conceptual Framework

Figure 2.3: Conceptual Framework



Note: Developed for this study

H1: Transparency in mobile payment app is related to the adoption of mobile payment apps

H2: Perceived ease of use in mobile payment app is related to the adoption of mobile payment apps

H3: Adoption of mobile payment apps is related to financial literacy among Malaysian users

H4: Financial literacy is related to personal saving behaviour among Malaysian users

2.4 Research Gaps

The relationship between financial literacy and technology adoption has been the topic of a sizable body of research, most of which focuses on how people's willingness to use digital financial instruments and mobile payment systems is influenced by their previous financial literacy. However, there hasn't been much scholarly focus on the opposite link, which holds that using mobile payment apps

improves users' financial literacy. Such omission is critical because it overlooks the possible role of mobile payment platforms as vehicles for educating users in terms of transaction transparency, goal setting, and budgeting. Through its focus on mobile payment adoption as a precursor to financial literacy, the present study bridges such an omission by framing the adoption process as a catalyst for financial learning rather than simply an endogenous variable.

Secondly, existing studies regarding the adoption of mobile payments have been largely focused on examining particular variables like usefulness or ease of use without considering other elements which could shape adoption decisions and future financial outcomes (Davis, 1989; Venkatesh et al., 2003). In particular, ease of use and transparency as an external factor influencing adoption behaviour have rarely been combined into a single conceptual model. Moreover, few studies have developed an integrated framework that continuously captures the entire causal chain from perceived ease of use and transparency through adoption, financial literacy, and finally saving behaviour. In order to close this gap, the current study provides a detailed framework that combines these five factors and provides a more comprehensive understanding of the contexts in which the use of mobile payments leads to better personal financial outcomes.

Most empirical research on mobile payment adoption and its connection to financial behaviour has been carried out in developed economies, such as the US, Europe, and technologically advanced Asian nations like China and South Korea. Given digital financial infrastructure, regulatory settings, and user behaviour patterns change significantly in developing or emerging market contexts, the results of such studies may not be directly applicable. The rapid digitalization of the economy and the rise of the mobile payment system, backed up by schemes such as DuitNow and popularized by e-wallets in Malaysia, offers a unique and untapped setting. In embedding its analysis within the Malaysian scenario, this paper bridges the contextual gap and contributes context-specific empirical evidence to the broader body of literature on mobile payment apps and financial behaviour.

It is worth noting that a sizable number of studies conducted on the adoption intention associated with mobile payment applications tend to center their analysis

on predicting adoption intention as the endogenous variable while focusing their attention on factors driving users' intentions to adopt such applications instead of examining the financial implications of adopting mobile payment applications. This overemphasis on intention and underemphasis on the financial behaviour of users who adopt mobile payment applications represent a significant limitation within the existing literature, as it does not consider the impact that adoption intention has on the actual saving behaviour of individuals.

CHAPTER 3: METHODOLOGY

3.0 Introduction

The chapter provides a general introduction to the research method used in the current research. The chapter discusses research methodology in reference to how the research is carried out by means of research design, data collection, sampling, measuring constructs, and data analysis. All the sections in this chapter are adapted to reflect the nature of survey-based data collection and analysis because this study uses a primary quantitative research approach.

3.1 Research Design

The research method adopted for this study is an appropriate choice when numerical measurement and statistical associations among variables are key objectives (Hair et al., 2019). Based on actual data, quantitative research allows the researcher to objectively assess hypotheses and apply findings across a specific population (Creswell & Creswell, 2017). A quantitative approach provides the stringent standards and accuracy required to achieve significant results because this study aims to examine the relationship between Transparency, Perceived Ease of Use, Adoption of Mobile Payment Apps, Financial Literacy, and Personal Saving Behaviour.

Additionally, this study uses a cross-sectional research strategy, which collects data from respondents at the same time. In business and social science research, a cross-sectional design is frequently used when the goal is to gather information on the present attitudes, beliefs, or behaviours within a specific group (Morgan & Harmon, 2001). This approach is suitable for this study since it allows for the effective collecting of data from a wide range of respondents within the specified period, even though it does not allow for causal inference over time.

3.2 Data Collection Method

A structured, self-administered online questionnaire created with Google Forms was used to collect primary data for this study. One of the most practical and efficient methods for collecting quantitative data is the questionnaire approach, especially when it comes to respondents who range out geographically. Easy distribution, respondent privacy, less data entry errors, and the ability to quickly reach a large number of participants are among the many benefits of an online questionnaire (Evans & Mathur, 2005).

The survey was distributed electronically through Facebook, Instagram, and WhatsApp. The reason behind choosing these mediums is that both are extensively used by Malaysians and can reach out to participants of diverse demographics. The survey began with a brief introduction that explained the purpose of the research while keeping everything anonymous and asking for consent. Participants were assured about their voluntary participation in this study. Without their consent, the survey could not have been administered.

The survey comprised of two main sections. The second part had a series of questions related to the variables being tested with the help of a five-point Likert Scale, but the first one comprised a set of general demographic questions.

3.3 Sampling Design

3.3.1 Target Population

The study's target sample includes Malaysians who have used at least one mobile payment app. Mobile payment programs, such as Touch 'n Go eWallet, GrabPay, Boost, MAE by Maybank, and ShopeePay, are mobile based digital payment applications that allow cashless purchases. There are no age, gender, income, or educational requirements, as long as responders meet the basic qualifying condition of being a current or previous user of a mobile payment application in Malaysia.

This target group is considered suitable for the study since the main goal of the research is to understand how the use of mobile payment apps influences individual saving habits. These applications' users are in a perfect position to provide relevant and useful data on their experiences, usage habits, and financial behavioural results related to the adoption of mobile payments apps.

3.3.2 Sampling Frame and Sampling Location

A formal sample frame was not available for this study because Malaysia does not have a complete national registration of mobile payment app users. As a result, the study focused on respondent availability made possible by social media platforms on the internet. For this study, the virtual distribution channels, Facebook, Instagram, and WhatsApp, were used as an effective sample location. In the context of an online survey-based study, these platforms provided access to a broad cross-section of Malaysian mobile payment users across several areas, making them a usable and practicable option for a formal sample frame.

3.3.3 Sampling Element

The specific unit from which data are collected is known as the sample element, or sampling unit (Slater & Hasson, 2024). The Malaysian mobile payment application user is adopted as the unit of sampling for the research. In order to ensure that each participant's answer is independent, every single person interviewed is treated as an individual sampling unit and can only give one response.

3.3.4 Sampling Technique

In this study, the non-probability sampling design, specifically, the convenience sampling approach will be used. Convenience sampling is defined as the process of selecting individuals who will serve as participants in the study depending on whether they agree to participate and are available (Golzar et al., 2022). Considering the constraints that come along with conducting this study, including time, finance, and the incomplete sample size, the selection of convenience sampling becomes inevitable. Additionally, since participation is voluntary and individualized among readily available users, the distribution of the questionnaire online through social media networks becomes appropriate for this kind of sampling approach.

It is common practice in quantitative research studies of the same nature as this one, especially in the context of Malaysian academic research literature (Memon et al., 2025). However, the limitations related to precision and generalizability must be considered when interpreting the findings of this study.

3.3.5 Sampling Size

The selection of an adequate sample size is crucial in quantitative research as it affects the power, precision, and validity of the results (Cohen, 1988). According to (Hair et al., 2021), there is a ten-times rule when calculating the minimum required sample size for a PLS-SEM model. This guideline suggests that the minimum sample size should be ten times the number of the largest number of structural paths towards a certain construct in a PLS-SEM model. Therefore, this study needs a sample size of 50 participants. Nevertheless, there will be another approach used in determining the adequate sample size.

A statistical power analysis tool was used in this study to determine the minimal necessary sample size. To achieve this, G*Power (version 3.1), a well-known statistical software used for performing a priori power analysis, was employed. An a priori power analysis reduces the probability of type II error by estimating the minimum number of participants needed to detect an effect size at a given level of statistical power and significance.

G*Power used the F-test for Linear Multiple Regression with Fixed Model and R^2 deviation from zero. This type of test is suitable for study when the goal is to find the smallest sample size required in a multiple regression framework with a specific number of variables in order to identify a significant overall model fit. According to accepted statistical standards, the following input parameters were specified.

Figure 3.1: Selection of Test Family and Statistical Test in G*Power

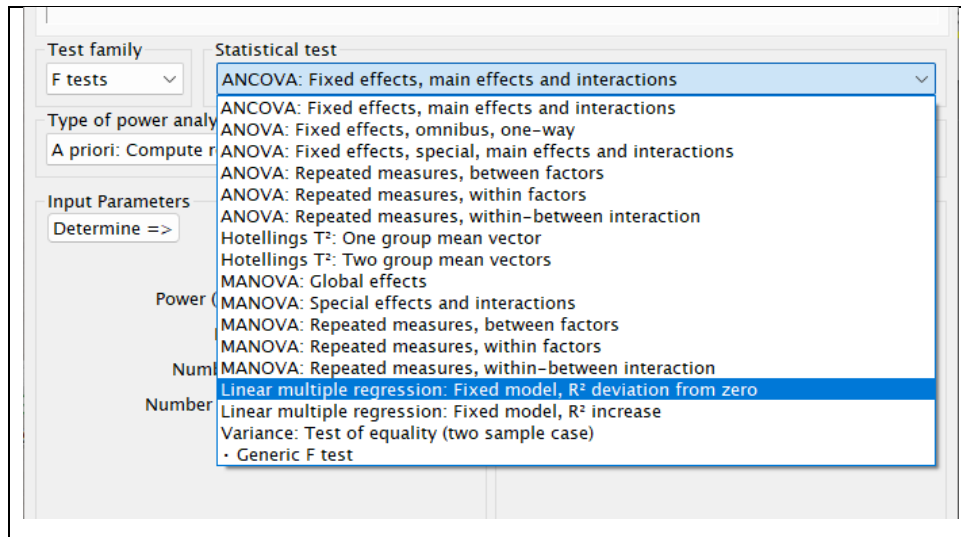
The screenshot shows the G*Power software interface. The 'Test family' dropdown menu is open, showing options: F tests (selected), Exact, F tests, t tests, χ^2 tests, and z tests. The 'Statistical test' dropdown menu is set to 'ANCOVA: Fixed effects, main effects and interactions'. The 'Determine' dropdown is set to 'Determine =>'. The 'Effect size f' is 0.25, ' α err prob' is 0.05, 'Power (1 - β err prob)' is 0.95, 'Numerator df' is 10, 'Number of groups' is 5, and 'Number of covariates' is 1. The 'Output Parameters' section shows 'Noncentrality parameter λ ', 'Critical F', 'Denominator df', 'Total sample size', and 'Actual power', all with question marks.

Input Parameters		Output Parameters	
Test family	F tests	Statistical test	ANCOVA: Fixed effects, main effects and interactions
Determine =>	Determine =>	Noncentrality parameter λ	?
Effect size f	0.25	Critical F	?
α err prob	0.05	Denominator df	?
Power (1 - β err prob)	0.95	Total sample size	?
Numerator df	10	Actual power	?
Number of groups	5		
Number of covariates	1		

Source: Generated using G*Power 3.1.9.7.

At first, the effect size (f^2) was set at 0.15, which Cohen (1988) stated was a medium effect size. Effect sizes for f^2 have been defined by Cohen (1988) as tiny (0.02), medium (0.15), and large (0.35). In social science study incorporating behavioural constructs, a medium effect size was chosen because it is seen as a conservative but acceptable assumption.

Figure 3.2: Selection of Linear Multiple Regression Model in G*Power



Source: Generated using G*Power 3.1.9.7.

Second, G*Power automatically applies default values for the statistical power ($1 - \beta$) and significance level (α) after selecting the proper statistical test, which is linear multiple regression (fixed model, R^2 deviation from zero). The probability of committing a Type I error was shown by the significance level, which was set at 0.05, which is generally accepted as the standard threshold for statistical significance in social scientific research (Hair et al., 2021). At the same time, the statistical power was set at 0.95, which reflects a 95% chance of accurately identifying a real effect if one exists. This number reflects a more stringent requirement for this study because it is above the minimum acceptable level of 0.80 suggested by Cohen (1988).

Figure 3.3: Input Parameters for Priori Power Analysis in G*Power

Test family
F tests

Statistical test
Linear multiple regression: Fixed model, R² deviation from zero

Type of power analysis
A priori: Compute required sample size – given α , power, and effect size

Input Parameters

Determine =>

Effect size f^2

0.15

α err prob

0.05

Power (1 – β err prob)

0.95

Number of predictors

4

Output Parameters

Noncentrality parameter λ

?

Critical F

?

Numerator df

?

Denominator df

?

Total sample size

?

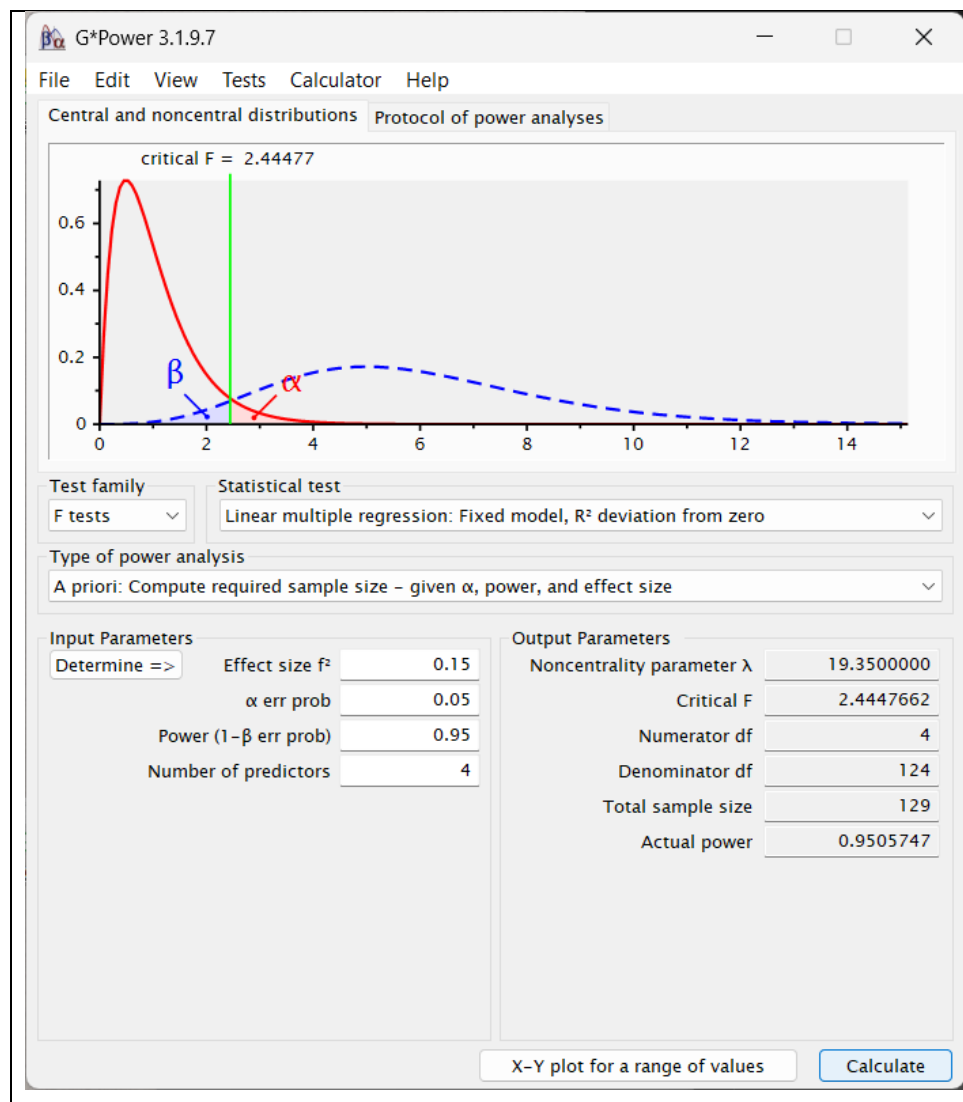
Actual power

?

Source: Generated using G*Power 3.1.9.7.

Third, the study's four independent variables, transparency, perceived ease of use, adoption of mobile payment apps, and financial literacy, were represented by the number of predictors, which was set at four.

Figure 3.4: G*Power Output Showing Required Minimum Sample Size



Source: Generated using G*Power 3.1.9.7.

The minimum sample size needed for the study is calculated by G*Power based on the input values mentioned above: $f^2 = 0.15$, $\alpha = 0.05$, power = 0.95, and four predictors. The critical F-value, degrees of freedom, and minimum sample size required to provide the required statistical power under the given conditions are all provided by the G*Power analysis's result (Faul et al., 2007).

The sample size used in this study is constrained by the minimum number of participants suggested by G*Power for this scenario. This study had the intention of gathering a total of between 150 and 200 useable responses that exceed the minimum requirement, 129 respondents, which would provide

enough statistical power for the subsequent PLS-SEM analysis by considering any incomplete or wrong answers that could be removed when cleaning the data. Based on the recommendations by Hair et al. (2021), it is attainable in terms of the time factor and enough for the purposes.

3.4 Pilot Test

A preliminary study was conducted to test whether the questionnaire contains clear and valid questions before carrying out the research survey. The primary objective of the pilot test is to ensure that no ambiguities, double-barrelled questions, or poorly worded items exist in order to avoid any negative effects on the data gathered (Creswell & Creswell, 2017).

In the literature, 30 respondents, whose characteristics are almost like those of the target population, will be selected to undergo the test (Saunders et al., 2023). They can then provide their input regarding the suitability and clarity of each item after completing the questionnaire.

Internal consistency was checked through Cronbach's alpha, which is commonly used as the best index for testing internal consistency for multi-items scales (Tavakol & Dennick, 2011). According to Hair et al. (2019), values of Cronbach's alpha not less than 0.70 may be viewed as sufficient internal consistency evidence of the scale. If the constructs do not meet the required level before the main data collection process, these constructs will be re-examined and revised or deleted if needed. Therefore, all constructs in this study can be regarded as reliable and meet the recommended standard. The survey tool is deemed appropriate for the main data collection process since there were no constructs below the required level and changes or deletion of items were made.

Table 3.1: Reliability Analysis of Pilot Test Using Cronbach's Alpha

Name of Variables	Cronbach's Alpha
Personal Saving Behaviour	0.660
Transparency	0.694
Perceived Ease of Use	0.937
Adoption of Mobile Payment Apps	0.781
Financial Literacy	0.812

Source: Author's own data analysis from SmartPLS.

3.5 Constructs Measurement

The measurement scale for study affects the types of data that may be gathered and the statistical analyses that can be used. According to Anjana B.S (2021), there are four types of measurement scales: nominal, ordinal, interval, and ratio. Every scale has unique characteristics and works well with different types of variables. This study uses all four types of measurement scales through the questionnaire, as detailed in the sub-sections below.

3.5.1 Nominal Scale

The most basic level of measurement is the nominal scale, which classifies respondents into different, mutually exclusive groups without implying a ranking or order among the groups (Anjana B.S, 2021). In order to gather categorical data for this study, such as gender (e.g., Male or Female) and mobile payment application usage status (e.g., Yes or No), nominal scale items were used in the demographic section of the questionnaire. For the target population of the study, these factors mainly function as screening criteria and background descriptions.

Table 3.2: Nominal Scale in Questionnaire

Question	Options
Gender	Male
	Female

Note. Developed for this study

3.5.2 Ordinal Scale

According to (Anjana B.S, 2021), an ordinal scale divides data into groups that can be meaningfully ranked or ordered, but the exact distances between the ranks are neither known nor necessarily equal. While it allows relative comparisons, the exact size of differences between groups cannot be determined. The demographic variables of age group, education level, and employment status in Section B of the questionnaire are measured using the ordinal scale in this study since each of these variables has categories that follow a natural sequence.

Table 3.3: Ordinal Scale in Questionnaire

Question	Options
Age Group	Below 20 years old
	20 to 29 years old
	30 to 39 years old
	40 to 49 years old
	50 years old and above
Education Level	Secondary school or below
	Diploma
	Bachelor's Degree
	Master's Degree
	Doctorate (PhD)
Employment Status	Student
	Employed (full time)
	Employed (part time)

Self-employed

Unemployed

Note. Developed for this study

3.5.3 Interval Scale

As mentioned by Anjana B.S (2021), the interval scale refers to the measurement scale where there is no true zero point, and the categories have ranking. Moreover, there are equal distances between similar points. With this measurement scale, different types of analyses can be performed, including the mean, standard deviation, and correlation tests. The measurement scale used to measure the constructs in Section C to G will be based on the five-point Likert scale, whereby 1 represents strong disagreement, 2 represents disagreement, 3 represents neutral position, 4 represents agreement, and 5 represents strong agreement. In business and social sciences research, the Likert scale is widely applied to capture the views and perceptions of participants.

Table 3.4: Interval Scale in Questionnaire

Likert Options	Code
Strongly Disagree	1
Disagree	2
Neutral	3
Agree	4
Strongly Agree	5

Note. Developed for this study

Table 3.5: The Origin of Constructs with Questionnaire References

Variables	Item Code	Original Question	Adapted Question	Source
Transparency	T1	Our firm uses GPS-enabled tracking systems to monitor pharmaceutical shipments in real time	I use mobile payment apps to monitor my spending transactions in real time	(Jesca Nabwile Wanjekhe & Machoka, 2025)
	T2	Implementing real-time tracking has led to cost savings in logistics and transportation	The mobile payment apps help to increase transaction transparency	
	T3	My organization keeps records of relevant information that lead to critical organizational decisions	Mobile payment apps keep record of transactions have led to critical decision making	(ter Hoeven et al., 2019)
	T4	My organization provide information in a systematic way	Mobile payment apps provide information in a systematic way	
	T5	My organization clearly show where to find relevant information	Mobile payment apps clearly show where I can find relevant information (etc: fees, transaction	

			history, or account details)	
Perceived of Use	PE1	I would find the system easy to use	I think using mobile payment apps is easy	(Venkat esh et al., 2003)
	PE2	It is easy for me to remember how to perform tasks using the electronic mail system	It is easy to perform the steps required to use mobile payment apps	(Davis, 1989)
	PE3	NFC payment (Davis, 1989) is convenient because the phone is usually with me	The payment system displayed is convenient because I usually carry the mobile phone with me	(Pal et al., 2015)
	PE4	NFC payment is convenient because I can use it anytime	The payment system displayed is convenient because I can use it anytime	
	PE5	People around seemed to be faster and more convenient in conducting transactions	People around seemed to be faster and more convenient in conducting transactions	(Elvina Dian Paramit a & Eko Ruddy Cahyad i, 2024)

Adoption for Mobile Payment	AMP1	I used mobile payment app frequently in my daily life	I used digital payment services frequently in my daily life	(Mohd et al., 2023)
	AMP2	The use of mobile payment app has become a habit for me	The use of digital payment services has become a habit for me	
	AMP3	I must use mobile payment app	I must use digital payment services	
	AMP4	Using mobile payment app has become natural to me	Using digital payment services has become natural to me	
	AMP5	I depend on mobile payment app in my financial transaction	I depend on digital payment services in my financial transaction	
Financial Literacy	FL1	I often learn about financial information consciously	I often learn about financial information consciously	(Ling, 2021)
	FL2	I have a better understanding of financial instruments. stock, T-bill,	I have a better understanding of basic financial concepts such as saving, interest and budgeting	

		future contract, option and etc.)		
	FL3	I understand the financial risks and consequences if an online payment account is stolen, misused, or accessed without my permission	Suppose a payment method has been stolen, misused, or accessed without the owner's permission. Please rate the SECURITY of each method against permanent financial loss or unwanted disclosure of personal information	(Greene et al., 2024)
	FL4	I am familiar with the fundamentals of finance management	I am familiar with the fundamentals of personal finance management	(Lone & Bhat, 2022)
	FL5	I am always willing to discuss financial issues	I am always willing to discuss financial issues	
Personal Saving Behaviour	PS1	I regularly manage to save some money from my income	I regularly manage to save some money from my income	(Lone & Bhat, 2022)

	PS2	I plan to reduce my expenses to save money	I plan to reduce my expenses to save money	(Ling, 2021)
	PS3	Achieving saving goals is not difficult for me	Achieving saving goals is not difficult for me	
	PS4	When risks come from, I have the available money to deal with them	When risks come from, I have the available money to deal with them	
	PS5	In order to save money, I often consider whether I really need something before I buy	In order to save money, I often consider whether I really need something before I buy	

Source: Developed by own research.

3.6 Data Processing

Prior to the data analysis stage, all data obtained from the respondents were systematically treated so that only the good quality data were used for the analyses. There are two main stages involved in the data treatment process: the data checking stage and the data removing stage.

3.6.1 Data Checking

Data validation entails the scrutiny of all submissions received to detect and highlight any issues that may have an impact on the validity of the study and

the quality of the data. All responses were assessed for completeness, eligibility, and quality after downloading the data set in its raw form from Google Forms. The first assessment entailed a preliminary examination of the entire dataset to uncover missing values, logical inconsistencies, and any patterns that might indicate that the participants were negligent or dishonest (Bloy et al., 2025).

In order to ensure that the respondents consented to participation and affirmed that they used one or more mobile payment apps in Malaysia, the data set was also assessed as part of the validation process. Respondents who did not meet these fundamental criteria were flagged for exclusion in the next phase. The initial assessment ensured that the dataset heading into the data exclusion phase was systematically organized and accurately labelled.

3.6.2 Data Removing

The process of removing responds from the dataset that are considered to be inaccurate, incomplete, or inappropriate for use in the primary analysis is known as data removal. The following criteria were used in the study to remove responses.

At first, responses that were not complete were removed. Given that incomplete responses might result in error or distort the results of the statistical analysis, respondents who missed one or more items from the Likert scale sections were removed from the dataset.

Second, responses from participants who failed to meet the eligibility requirements for the study were removed. In particular, those who claimed they had never used a mobile payment app in Malaysia were excluded since they did not belong to the target group as described and could not provide reliable information relevant to the research questions.

Third, responses from respondents who did not give their informed consent were eliminated. Only individuals who clearly stated their consent to participate at the beginning of the questionnaire were considered as valid respondents, and engaging in this study is completely voluntary. Responses from those who declined or did not answer the consent statement were not included.

Fourth, responses that were straight lining were found and removed. When a respondent chooses the same response option for every item on the questionnaire, regardless of the item's content, this is known as "straight-lining." This behaviour weakens the validity of the data and is reflective of inattention or careless response (Ward & Meade, 2022). By calculating the standard deviation of each respondent's Likert scale responds, straight-lining was identified. Straight-liners have been identified as respondents who recorded a standard deviation of zero, meaning they chose the same response value for each and every item. These respondents were then removed from the dataset.

3.7 Data Analysis

The technique employed to analyse the data collected for this study was the Partial Least Squares Structural Equation Modelling (PLS-SEM). The reason for this approach is because, according to Hair et al., Partial Least Squares Structural Equation Modelling is a variance-based structural equation modelling technique suitable for complex models and exploratory research. For the purposes of this study, it is a complete and effective analytical tool since it can assess both the measurement model, the relationship between constructs and their indicators, and the structural model, the hypothesized relationships among constructs.

3.7.1 Descriptive Analysis

Descriptive analysis was used to summarize and explain the respondents' demographic profile, and also to provide an insight of the response distribution for the study's variables. According to Sullivan and Artino (2013), descriptive statistics such as frequencies, percentages, means, and standard deviations were calculated for the Likert scale constructs and demographic items, respectively. Before inferential analysis, the descriptive analysis's findings add to a deeper understanding of the dataset and provide relevant details about the sample.

3.7.2 Measurement Model Assessment

The measurement model assessment is also referred to as the outer model evaluation. The evaluation includes assessing whether the fundamental latent constructs have been measured using the observable indicator variables. The measurement model assessment under PLS-SEM includes indicator reliability, discriminant validity, convergent validity, and internal consistency reliability (Hair et al., 2021).

3.7.2.1 Outer Loadings

As the main indicator reliability measurement in reflective measurement models, outer loadings shows the relationship between each of the indicator variables and their respective latent constructs (Hair et al., 2021). Because the latent construct accounts for over half of the variance within the item, the acceptable value for outer loading should be 0.70 or higher. Items with outer loadings less than 0.40 are often candidates for removal as they add very little explanatory power to the model. The variables that have loadings ranging between 0.40 and 0.70 may be included if excluding them does not improve the construct's composite reliability or AVE (Hair et al., 2021).

3.7.2.2 Cronbach's Alpha and Composite Reliability

Internal consistency reliability refers to the degree to which all the items of a scale are consistent in measuring the same concept. One of the most popular tools to measure internal consistency is Cronbach's Alpha, which shows how closely related and collectively measuring each item in a construct is (Hair et al., 2021). A Cronbach's Alpha value of 0.70 or above is normally considered as satisfactory, showing sufficient scale reliability. Values less than 0.70 show poor inter-item consistency, and values around 1.0 could mean item redundancy, in which different items measure the same thing without providing new information to the construct.

Composite Reliability is considered as a more reliable method for determining reliability in PLS-SEM because it considers for the outer loadings that are different from one another (Hair et al., 2021). Composite Reliability scores of 0.70 and above are considered satisfactory, while any score exceeding 0.90 requires further analysis due to possible redundancy among items.

3.7.2.3 Average Variance Extracted (AVE)

The extent to which the constructs are highly interrelated is termed convergent validity. The Average Variance Extracted (AVE) statistic, which indicates the average proportion of variance shared by the construct with its indicators, is used to test for convergent validity in PLS-SEM models (Fornell & Larcker, 1981). When the AVE statistic takes on a value of at least 0.50, then the construct has adequate convergent validity since it can explain at least half of the variance of its indicators. Unlike the above, Hair et al. (2021) point out that when the AVE is below 0.50, there is low convergent validity because most of the variances are due to errors of measurement than the concept itself.

3.7.2.4 Discriminant Validity

Discriminant validity was described as "how much a construct truly differs from other constructs in the model" (Fornell & Larcker, 1981). Two criteria, namely, HTMT ratio criterion and Fornell-Larcker criterion, were used to assess discriminant validity in this research.

As per Fornell-Larcker criterion, for each construct, the average variance extracted value should be more than the value of correlations between that particular construct and all other constructs in the model (Fornell & Larcker, 1981). This means that in each case, the variance of the construct should always exceed that of all other constructs in the model.

As stated by Henseler et al. (2015), the HTMT ratio serves as a better and stricter tool for testing discriminant validity. This equation requires the mean of the heterotrait-heteromethod correlation divided by the mean of the monotrait-heteromethod correlation. As explained by Kline (2011), any HTMT value below 0.85 can be taken as sufficient proof of discriminant validity, although those below 0.90 may also be acceptable based on the opinion of Gold et al. (2001). HTMT values exceeding the recommended range indicate that there are some similarities between the two constructs and therefore need to be reassessed.

3.7.3 Structural Model Assessment

Structural model testing was conducted for evaluating the relationships between latent variables proposed by the researcher, after evaluating the adequacy of the measurement model. For checking the structural model, which is also called the inner model, the parameters such as multicollinearity, path coefficients, coefficient of determination (R^2), and predictive relevance (Q^2) were considered.

3.7.3.1 Multicollinearity Test

The Variance Inflation Factor (VIF) technique has been employed for investigating whether there was a presence of multicollinearity among the predictor constructs prior to examining the structural model. Multicollinearity is defined as high correlation existing between two or more predictor variables, which may result in unstable estimates of path coefficients. In partial least squares – structural equation modeling (PLS-SEM), VIF less than 5.0 indicates a presence of acceptable multicollinearity (Hair et al., 2021). According to more cautious recommendations, VIF values are suggested to be less than 3.3, especially for research aiming for increased model resilience (Aslam & Li, 2025). In order to determine whether conceptual overlap or difficulties with model specification exist, constructs having VIF values higher than the acceptable limit would be further examined.

3.7.3.2 Structural Equation Modelling (SEM)

In the structural model evaluation, there is a need to analyse the path coefficients as well as the coefficient of determination (R^2) and the Cross Validated Predictive Ability Test (CVPAT).

The path coefficients are the standardised regression weights shows the strength and direction of the hypothesised relationships between the variables in the structural model. Higher positive correlations are represented by higher path coefficients which range from -1 to +1, where higher correlations are closer to +1. According to suggestion of Hair et al. (2019), the path coefficients were tested for their statistical significance using bootstrapping technique with 5,000 sub-samples. Any path coefficient will be considered statistically significant when its respective t-value exceeds 1.96 (95% confidence level) or 2.576 (99% confidence level).

The coefficient of determination (R^2) shows the proportion of variation in the dependent variable explained for by the independent variables. In terms

of PLS-SEM, values of 0.75, 0.50, and 0.25 are regarded as high, medium, and low, respectively (Hair et al., 2021). This means that the higher the value of R^2 , the greater the predictive power of the predictors over the dependent variable.

The predictive relevance of the structural model outside the sample was tested based on the Cross-Validated Predictive Ability Test (CVPAT) developed by Liengaard et al. (2021). The test consists of comparing the Root Mean Square Error (RMSE) value of the PLS-SEM model to that of a linear model (LM) benchmark using the CVPAT. In case the RMSE of the PLS-SEM is smaller than that of the LM, then the former has higher predictive relevance as regards the respective measure. Based on Hair et al. (2019), if all Q^2 predict values are positive, the model has predictive relevance.

3.8 Conclusion

The research methodology applied to the study was clearly explained in this chapter. To study the effects of Transparency, Ease of Use, Adoption of Mobile Payment Applications, and Financial Literacy on Personal Saving Behaviours among Malaysian users of mobile payment applications, it was decided to use quantitative, cross-sectional research methodology. For the purpose of collecting primary data, the study employed convenience sampling and distributed an online structured questionnaire via social media.

According to Cohen (1988) and Faul et al. (2007), the sample size was calculated using G*Power based on an a priori power calculations using a medium effect size ($f^2 = 0.15$), a significance level of $\alpha = 0.05$, a statistical power of 0.95, and four predictors. For the PLS-SEM analysis, a target of 150–200 useable responses were set to guarantee enough statistical power. The constructs measuring technique, which includes nominal, ordinal, and interval scales and uses the five-point Likert scale as the main measurement tool, was also covered in the chapter.

The data processing techniques, including data validation and data deletion, were clearly explained to ensure that only accurate and complete responses would be retained for analysis. Prior to full data collection, a pilot test would be conducted on 20-30 respondents to determine the reliability and validity of the survey instrument. Data analysis comprised descriptive analysis, measurement model testing (outer loadings, Cronbach's Alpha, Composite Reliability, Average Variance Extracted, and Discriminant Validity), and structural model evaluation (variance inflation factor [VIF], path coefficients, R^2 , and Q^2). The data analysis framework was constructed based on the PLS-SEM approach through the use of SmartPLS.

CHAPTER 4: DATA ANALYSIS

4.0 Introduction

The findings presented in this chapter are from the analysis of the data collected to fulfil the research purposes formulated by this study. These research purposes include the exploration of the impact of mobile payment application use on individual saving behaviour within Malaysia. This study made use of the statistical tool known as SmartPLS 4 to conduct Partial Least Square Structural Equation Modeling (PLS-SEM). There are three key sections in this chapter. The first section is about the descriptive analysis involving demographic profiles and central tendency measurements of the study's variables. The second section is regarding the measurement model analysis where the reliability and validity of the study's constructs were examined.

4.1 Descriptive Analyses

The descriptive approach was employed in order to give a short description of the sample's characteristics and responses within the constructs under study. The section presents the demographic makeup of the 275 participants and also the measures of central tendency of each construct.

4.1.1 Respondent Demographic Profile

Tables 4.1 to 4.5 provide a summary of the respondents' demographic characteristics. For further analysis, a total of 275 valid responses were collected.

Table 4.1: Frequency Distribution Respondents by Gender

Demographic Variable	Category	Frequency (n)	Percentage (%)
Gender	Male	89	32.4
	Female	186	67.6%

Source: Developed based on survey data (n=275)

Table 4.1 shows the gender distribution of responders. The majority of respondents were female, taking into consideration 186 respondents (67.6% of the entire sample), while male respondents resulted in 89 respondents (32.4%). This distribution shows that there are more female mobile payment app users in the sample, which could be reflective of broader trends in Malaysian women's adoption of digital payments.

Table 4.2: Frequency Distribution Respondents by Age Group

Demographic Variable	Category	Frequency (n)	Percentage (%)
Age Group	Below 20 years old	19	6.9%
	20 to 29 years old	226	82.2%
	30 to 39 years old	15	5.5%
	40 to 49 years old	7	2.5%
	50 years old and above	8	2.9%

Source: Developed based on survey data (n=275)

As shown in Table 4.2, the most common age group was 20 to 29 years old, with 226 respondents (82.2% of the total sample). Respondents under the age of 20 represented 6.9%, while those aged 30 to 39, 40 to 49, and 50 and up totalled 5.5%, 2.5%, and 2.9%, respectively. The demographic profile of active mobile payment app users in Malaysia is shown in the majority of the 20–29 age group, which is also aligned with the study's dissemination methods through social media platforms that younger people commonly use.

Table 4.3: Frequency Distribution Respondents by Education Level

Demographic Variable	Category	Frequency (n)	Percentage (%)
Education Level	Secondary School or below	16	5.8%
	Diploma	37	13.5%
	Bachelor's Degree	209	76.0%
	Master's Degree	13	4.7%

Source: Developed based on survey data (n=275)

The respondents' level of education is shown in Table 4.3. The majority had a bachelor's degree, taking into consideration 209 respondents or 76.0% of the total sample size. Those with a diploma made up 13.5% of the sample, followed by those with a master's degree at 4.7% and those with only a secondary school education at 5.8%. The majority of respondents have a degree, which is consistent with the age distribution and shows a highly educated sample that might be more familiar with mobile technologies and financial tools.

Table 4.4: Frequency Distribution Respondents by Employment Status

Demographic Variable	Category	Frequency (n)	Percentage (%)
Employment Status	Student	196	71.3%
	Employed (full time)	46	16.7%
	Employed (part time)	20	7.3%
	Self-employed	8	2.9%
	Unemployed	5	1.8%

Source: Developed based on survey data (n=275)

Table 4.4 shows the respondents' employment status. With 196 responders, or 71.3% of the sample, students made up the largest group. 16.7% of workers were full-time, 7.3% were part-time, and 2.9% and 1.8%, respectively, were self-employed and jobless. The high percentage of

students is consistent with the sample's age distribution and shows how easily accessible mobile payment apps are among Malaysian students.

Table 4.5: Frequency Distribution Respondents by Monthly Personal Income

Demographic Variable	Category	Frequency (n)	Percentage (%)
Monthly Personal Income	Below RM1,000	157	57.1%
	RM1,001 to RM3,000	64	23.3%
	RM3,001 to RM5,000	26	9.5%
	RM5,001 to RM7,000	14	5.1%
	Above RM7,000	14	5.1%

Source: Developed based on survey data (n=275)

Table 4.5 shows the respondents' monthly personal income distribution. The majority of respondents (157, or 57.1%) stated that their monthly income was less than RM1,000, which is consistent with the high percentage of students in the sample. 23.3% of respondents made between RM1,001 and RM3,000, 9.5% made between RM3,001 and RM5,000, and 5.1% each made between RM5,001 and RM7,000 and more than RM7,000. The sample's majority of students and young workers is shown in this income distribution.

4.1.2 Central Tendencies Measurement of Constructs

A central tendency analysis was used to determine respondents' level of agreement with the Likert-scale items for each construct. The mean and standard deviation for each item in each of the five constructs are shown in Table 4.6. It is important that item PS2, which is part of the Personal Saving Behaviour construct, was later removed during the evaluation of the measurement model since its outer loading was below the required minimum. However, for reporting completeness and transparency, its descriptive data are kept in Table 4.6.

Table 4.6: Central Tendencies Measurement of Constructs of Variables

Independent Variables (IVs)	Items	Mean	Standard Deviation
Personal Saving Behaviour	PS1	4.058	0.789
	PS2	4.160	0.721
	PS3	3.785	0.973
	PS4	4.004	0.851
	PS5	4.207	0.732
Dependent Variables (DV)	Items	Mean	Standard Deviation
Transparency	T1	4.084	0.798
	T2	4.196	0.702
	T3	4.164	0.733
	T4	4.175	0.723
	T5	4.193	0.829
Perceive Ease of Use	PE1	4.345	0.734
	PE2	4.255	0.724
	PE3	4.375	0.773
	PE4	4.338	0.712
	PE5	4.273	0.730
Adoption for Mobile Payment	AMP1	4.389	0.691
	AMP2	4.233	0.842
	AMP3	3.993	0.926
	AMP4	4.262	0.761
	AMP5	4.124	0.753
Financial Literacy	FL1	3.756	0.932
	FL2	3.989	0.788
	FL3	4.080	0.801
	FL4	3.927	0.854
	FL5	3.880	0.989

Source: Author's own data analysis from SmarPLS

4.1.2.1 Personal Saving Behaviour

With mean values ranging from 3.785 to 4.207, all five items fall into the "Agree" interpretation range. With the highest mean of 4.207 ($SD = 0.733$), PS5 shown that respondents consistently saved money without depending on outside incentives. Among the PS items, PS3 had the lowest mean of 3.785 ($SD = 0.975$) and the highest standard deviation, showing that while respondents agreed with this item, their responses to active expenditure tracking activity changed significantly. The overall trend shows that the study's respondents had positive personal saving behaviours.

4.1.2.2 Transparency

The central tendencies of the Transparency (T) construct, one of the four independent variables, are also shown in Table 4.6. All five items fell into the "Agree" interpretation range, with mean values ranging from 4.084 to 4.196. T1 had the lowest mean of 4.084 ($SD = 0.799$), whereas T2 had the highest mean of 4.196 ($SD = 0.703$). Respondents gave consistent answers, as seen by the comparatively low standard deviations for each item (range from 0.703 to 0.830). According to the overall findings, respondents strongly believed that mobile payment apps were transparent in how they provided information and recorded transactions.

4.1.2.3 Perceived Ease of Use

The central tendencies of the Perceive Ease of Use (PE) construct are shown in Table 4.6. The five constructs in this study had the highest mean scores, ranging from 4.255 to 4.375 for all five questions. Each component is in the "Agree" interpretation range. PE2 had the lowest mean of 4.255 ($SD = 0.725$), while PE3 had the highest mean of 4.375 ($SD = 0.775$). The low standard deviations for each question show that respondents' perceptions are highly consistent. Overall, the findings show that respondents strongly

believed mobile payment apps were simple and straightforward to use while making financial transactions.

4.1.2.4 Adoption for Mobile Payment Apps

The central tendencies of the Adoption for Mobile Payment (AMP) construct are shown in Table 4.6. All five of the items' mean scores were within the "Agree" interpretation range, ranging from 3.993 to 4.389. With the highest mean of 4.389 (SD = 0.692), AMP1 showed that frequent daily usage was the behaviour that respondents agreed upon the most. Among AMP items, AMP3 had the lowest mean of 3.993 (SD = 0.928) and the biggest standard deviation, showing that although respondents generally agreed, opinions on the perceived requirement of using mobile payment apps varied more. Overall, the findings show that mobile payment apps have been widely combined into respondents' everyday financial practices.

4.1.2.5 Financial Literacy

The central tendencies of the Financial Literacy (FL) construct, which had the lowest overall mean scores of the five constructs, are shown in Table 4.6. The mean scores for all five questions ranged from 3.756 to 4.080, with all falling within the "Agree" interpretation range. The highest mean of 4.080 (SD = 0.802) was found by FL3, showing that respondents were highly certain of their knowledge of digital financial risks. With the biggest standard deviation and the lowest mean of 3.756 (SD = 0.933), FL1 showed greater variation in the degree to which respondents actively seek out financial information. The overall findings show that respondents had a moderate to good degree of financial literacy, with their greatest strength being their understanding of digital financial risk.

4.2 Measurement Model Assessment

The measure model analysis was undertaken to test the validity and reliability of the variables that were included in this study. It entails the testing of the indicator reliability through outer loadings, internal consistency reliability via Composite Reliability, convergent validity via Average Variance Extracted (AVE), and discriminant validity via HTMT ratio and the Fornell-Larcker criterion in PLS-SEM (Hair et al., 2021). Below are the results from all tests.

4.2.1 Outer Loadings

Based on Hair et al. (2021), outer loadings analysis is conducted to determine how good each indicator can measure the latent variable. Prior to the final analysis, in the first measurement model, indicator PS2 has an outer loading of 0.523, which is lower than the recommended threshold of 0.60. Outer loadings below the cut-off point of 0.60 reduce the model's overall validity and reliability since they tend to cause measurement error and do not contribute enough to the measurement of constructs.

After the elimination of PS2 and PLS-SEM analysis, the outer loadings of the remaining indicators in the measurement model for the five constructs – Adoption for Mobile Payment (AMP), Financial Literacy (FL), Perceived Ease of Use (PE), Personal Saving Behaviour (PS), and Transparency (T) – have been clearly indicated in Table 4.7 below. According to Hair et al. (2021), the remaining indicators have acceptable item reliability and fall below the required threshold range of 0.60 to 0.80. There were no more items removed by the improved measuring model.

Table 4.7 Results of Outer Loadings

Constructs	AMP	FL	PE	PS	T
AMP1	0.698				
AMP2	0.794				
AMP3	0.701				
AMP4	0.766				
AMP5	0.703				
FL1		0.791			
FL2		0.788			
FL3		0.631			
FL4		0.726			
FL5		0.607			
PE1			0.774		
PE2			0.762		
PE3			0.744		
PE4			0.766		
PE5			0.679		
PS1				0.769	
PS3				0.776	
PS4				0.788	
PS5				0.625	
T1					0.609
T2					0.707
T3					0.708
T4					0.760
T5					0.756

Source: Author's own data analysis from SmartPLS.

4.2.2 Cronbach's Alpha and Composite Reliability

Table 4.8: Results of Cronbach's Alpha and Composite Reliability

Name of Variables		No. of Items	Cronbach's Alpha	Composite Reliability	Results of Reliability
Personal Saving Behaviour		4	0.726	0.830	Acceptable
Transparency		5	0.755	0.835	Acceptable
Perceived Ease of Use		5	0.799	0.862	Acceptable
Adoption for Mobile Payment		5	0.785	0.853	Acceptable
Financial Literacy		5	0.755	0.836	Acceptable

Source: Author's own data analysis from SmartPLS.

Table 4.8 shows that the internal consistency of all five constructs was satisfactory. In terms of Cronbach's Alpha, Personal Saving Behaviour had 0.726, Transparency had 0.755, Financial Literacy had 0.755, Adoption for Mobile Payment had 0.785, and Perceived Ease of Use had the highest at 0.799. Each construct's items consistently measure the same underlying concept, as shown by all Cronbach's Alpha values being within the acceptable range of 0.70 and above. The reliability of the measurement model is strengthened by a greater Cronbach's Alpha, which shows more inter-item consistency, which is, a closer relationship between the indicators within that construct.

For composite reliability, personal saving behaviour had a value of 0.830, while perceived ease of use had a composite reliability value of 0.862. Specifically, Financial Literacy recorded 0.836, Adoption of Mobile Payment Apps recorded 0.853, and Transparency recorded 0.835. All values are within the required range of 0.70 to 0.90, showing accurate measurement of the relevant constructs without significant item overlap. These results show that the study's measurement tools have sufficient internal consistency and reliability.

4.2.3 Average Variance Extracted (AVE)

Table 4.9: Result of Average Variance Extracted (AVE)

No.	Name of Variables	No. of Items	Average Variance Extracted (AVE)
1.	Personal Saving Behaviour	4	0.551
2.	Transparency	5	0.504
3.	Perceive Ease of Use	5	0.556
4.	Adoption for Mobile Payment	5	0.538
5.	Financial Literacy	5	0.508

Source: Author's own data analysis from SmartPLS.

Table 4.9 shows the AVE values for each of the five constructs. According to the Fornell and Larcker (1981) criteria, an AVE value of 0.50 or higher shows sufficient convergent validity. According to the table, all constructs have AVE values that meet or exceed this criterion, ranging from 0.504 (financial literacy) to 0.556 (perceived ease of use). These results show that all of the measurement model's constructs have sufficient convergent validity because, on average, each construct explains more than half of the variance in the indicators that correspond to it.

4.2.4 Discriminant Validity

Discriminant validity was assessed using two complementary techniques: the Heterotrait-Monotrait Ratio (HTMT) and the Fornell-Larcker Criterion.

Table 4.10: Result of Heterotrait Monotrait Ratio (HTMT)

Construct	AMP	FL	PE	PS	T
AMP					
FL	0.627				
PE	0.705	0.605			
PS	0.533	0.746	0.568		
T	0.839	0.765	0.750	0.805	

Source: Author's own data analysis from SmartPLS.

Table 4.10 shows the HTMT results, which demonstrate the ratio of between-construct to within-construct correlations. All HTMT values, ranging from 0.533 (between PS and AMP) to 0.839 (between T and AMP), fall below the conservative criteria of 0.85 proposed by Kline (2011), showing that all constructs differ from one another.

Table 4.11: Result of Fornell-Larcker Criterion

Construct	AMP	FL	PE	PS	T
AMP	0.734				
FL	0.485	0.713			
PE	0.566	0.471	0.746		
PS	0.401	0.563	0.437	0.742	
T	0.662	0.578	0.585	0.592	0.710

Source: Author's own data analysis from SmartPLS.

Furthermore, Table 4.11 shows the results of the Fornell-Larcker Criterion, with the diagonal value showing the square root of each construct's AVE and the off-diagonal values showing the inter-construct correlations. The fact that each construct's square root of the AVE is consistently larger than its correlation with any other construct in the model shows that sufficient discriminant validity. Through this approach, the two methods complement each other to ensure that all the concepts used are sufficiently valid in terms of discriminant validity.

4.3 Inferential Analysis

In the inferential analysis phase, the hypotheses about the relations between constructs are tested using the structural equation modeling (SEM). The results from multicollinearity test and SEM analysis are presented in this chapter, and include multicollinearity test, path coefficients, CVPAT, and coefficient of determination (R^2).

4.3.1 Multicollinearity Test

Table 4.12: Multicollinearity Test

Construct	Items	VIF Value
Personal Saving Behaviour	PS1	1.365
	PS3	1.537
	PS4	1.594
	PS5	1.199
Transparency	T1	1.268
	T2	1.442
	T3	1.397
	T4	1.492
	T5	1.441
Perceive Ease of Use	PE1	1.722
	PE2	1.664
	PE3	1.529
	PE4	1.620
	PE5	1.365
Adoption for Mobile Payment	AMP1	1.456
	AMP2	1.731
	AMP3	1.467
	AMP4	1.625
	AMP5	1.507
Financial Literacy	FL1	1.703

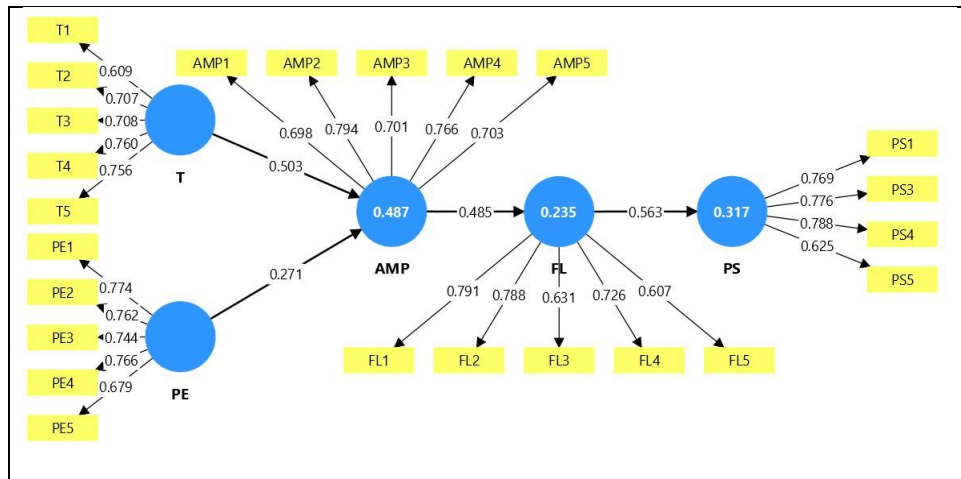
FL2	1.647
FL3	1.322
FL4	1.460
FL5	1.278

Source: Author's own data analysis from SmartPLS.

Multicollinearity was assessed to confirm the lack of a strong relationship among the predictors in the structural model. Table 4.12 presents the VIF values for the indicator variables of the five constructions. As stated by (Hair et al., 2021), VIF scores below 3.3 imply that multicollinearity is not present in a study. The VIF scores in the study, between 1.199 (PS5) and 1.731 (AMP2), are well below 3.3. These indicate that there is no problem of multicollinearity in the current model and that all indicator variables can be further analysed in the structure.

4.3.2 Structural Equation Modelling (SEM)

Figure 4.1: Original Structural Model



Source: Author's own data analysis from SmartPLS

Table 4.13: Coefficients of Determination (R^2)

Constructs	R-square	R-square adjusted
PS	0.317	0.315

Source: Author's own data analysis from SmartPLS.

In Table 4.13, the R^2 value for Personal Saving Behaviour is 0.317, with an adjusted R^2 of 0.315. These values show that the predictor constructs in the model explain for about 31.7% of the variance in personal saving behaviour. According to Hair et al. (2021)'s benchmark standards, an R^2 of 0.317 is in between the weak (0.25) and moderate (0.50) standards. This finding suggests that the structural model has a moderate explanatory power, which means that the model's constructs overall explain a significant but not all of the variation in personal saving behaviour among Malaysian mobile payment app users.

Table 4.14: Cross-Validated Predictive Ability Test (CVPAT) Results

Indicator	Construct	Q ² predict	PLS- SEM_RMSE	LM_R MSE (Bench mark)	Result (PLS- SEM vs LM)
PS	PS1	0.131	0.738	0.692	Worse
PS	PS3	0.086	0.934	0.937	Better
PS	PS4	0.115	0.804	0.767	Worse
PS	PS5	0.080	0.704	0.705	Better

Source: Author's own data analysis from SmartPLS.

Table 4.14 shows that all Q^2 predict values for the Personal Saving Behaviour construct are positive, showing the model's predictive relevance. In the RMSE comparison, two of the four retained indicators (PS3 and PS5) performed better under the PLS-SEM model than the linear benchmark model. The variations in RMSE values were insignificant, despite the fact that the remaining indicators (PS1 and PS4) performed slightly more effectively under the linear model. Overall, the CVPAT results confirm the

validity of the structural model for its intended analytical purpose by showing that the PLS-SEM model has enough predictive power for the Personal Saving Behaviour construct.

In the present situation, "Better" shows that the PLS-SEM model made predictions that were more consistent with the actual values found for those indicators since it had a lower RMSE than the linear benchmark (LM) model. This shows that PS3 and PS5's underlying relationships are better reflected by the PLS-SEM model, showing a better fit for these indicators within the structural model. On the other hand, "Worse" shows that the linear model slightly exceeded PLS-SEM when estimating PS1 and PS4 since the PLS-SEM model had a larger RMSE than the linear benchmark. However, this doesn't negatively impact the PLS-SEM model's overall predictive power because the changes in RMSE values between the two models are so minimal.

Overall, the CVPAT results show that the PLS-SEM model has sufficient predictive power for the Personal Saving Behaviour construct, supporting the validity of the structural model for its intended analytical purpose.

Table 4.15: Main Effects and Path Coefficients

Hypothesis	Beta	T-values	p-values	Result
H1: T > AMP	0.503	8.346	0.000	Accepted
H2: PE > AMP	0.271	4.065	0.000	Accepted
H3: AMP > FL	0.485	9.242	0.000	Accepted
H4: FL > PS	0.563	11.329	0.000	Accepted

Source: Author's own data analysis from SmartPLS.

H1: Transparency in mobile payment app is related to the adoption of mobile payment apps

According to the first hypothesis, the adoption of mobile payment apps is significantly positively influenced by transparency. The findings showed a t-value of 8.346, a p-value of 0.000, and a path coefficient of $\beta = 0.503$. Since the p-value is less than 0.05 and the t-value is more than 1.96, H1 is statistically supported.

H2: Perceived ease of use in mobile payment app is related to the adoption of mobile payment apps

According to hypothesis two, the adoption of mobile payment apps is significantly positively influenced by perceived ease of use. The results of the study showed a t-value of 4.065, a p-value of 0.000, and a path coefficient of $\beta = 0.271$. The results show that H2 is statistically supported.

H3: Adoption of mobile payment apps is related to financial literacy among Malaysian users

According to the third hypothesis, financial literacy is significantly improved by the use of mobile payment apps. With a t-value of 9.242, a p-value of 0.000, and a path coefficient of $\beta = 0.485$, H3 is statistically supported.

H4: Financial literacy is related to personal saving behaviour among Malaysian users

According to hypothesis four, personal saving behaviour is significantly improved by financial literacy. With a t-value of 11.329 and a p-value of 0.000, the analysis showed the greatest path coefficient in the model at $\beta = 0.563$, showing statistical support for H4.

4.4 Conclusion

In accordance with the quantitative research technique specified in Chapter 3, this chapter provided the results of the data analysis carried out using SmartPLS 4. The analysis was divided into three major stages: descriptive analysis, measurement model assessment, and structural model assessment.

The descriptive analysis showed that the sample ($n = 275$) was mainly made up of female respondents who classified as students, were between the ages of 20 and 29, had a bachelor's degree, and made less than RM1,000 per month. On the five-point Likert scale, the central tendency analysis showed generally positive mean scores for all constructs, with Financial Literacy showing the greatest variability and Perceived Ease of Use showing the highest mean values.

The measurement model assessment showed that all constructs were reliable and valid. After item PS2's outer loading fell below the required threshold, it was removed from the Personal Saving Behaviour construct. All other items then fulfilled the minimum requirements after the analysis was carried out again. Convergent validity was supported by Composite Reliability values ranging from 0.830 to 0.862 and all AVE values over 0.50. The HTMT ratios, all of which were below 0.85, and the Fornell-Larcker criterion, which showed that the AVE square root of each construct exceeds all inter-construct correlations, all showed discriminant validity.

The structural model assessment showed that multicollinearity was not an issue, since all VIF values were much lower than 5.0. The R^2 value of 0.317 showed that personal saving behaviour had a moderate level of explanatory power. With all Q^2 predict values greater than zero, the CVPAT analysis showed that the model has sufficient predictive relevance. At the $p < 0.05$ significance level, all four hypotheses were supported: H1 ($\beta = 0.503$, $p = 0.000$), H2 ($\beta = 0.271$, $p = 0.000$), H3 ($\beta = 0.485$, $p = 0.000$), and H4 ($\beta = 0.563$, $p = 0.000$).

CHAPTER 5: CONCLUSION AND IMPLICATIONS

5.0 Introduction

This chapter provides an overview of the statistical studies conducted and an in-depth discussion of the key findings on the four hypotheses set. It concludes with an overview of the study's contribution to the current state of knowledge on mobile payment adoption and personal saving behaviour in Malaysia. It also discusses the study's practical implications for relevant stakeholders, points out the research's limitations, and suggests recommendations for further research.

5.1 Summary of Statistical Analysis

5.1.1 Summary of Respondent Profile and Model Assessment

A structured online questionnaire that was distributed across social media platforms collected 275 valid responses. According to the descriptive analysis, the sample was mainly made up of female respondents (67.6%), who were between the ages of 20 and 29 (82.2%), had a bachelor's degree (76.0%), were full-time students (71.3%), and made less than RM1,000 per month (57.1%). The mean scores for all five constructs fall into the "Agree" range, with Financial Literacy having the lowest mean and Perceived Ease of Use having the highest, showing that respondents' self-evaluated financial knowledge was moderate.

The measurement model assessment supported each construct's reliability and validity. Given that item PS2's outer loading of 0.523 was below the minimal requirement of 0.60, it was removed from the Personal Saving Behaviour construct. All of the remaining indicators fulfilled the necessary requirements after re-evaluation. Convergent validity was confirmed by Composite Reliability values ranging from 0.830 to 0.862 and all AVE

values above the 0.50 threshold. The HTMT ratio and the Fornell-Larcker criterion both showed discriminant validity, with all HTMT values being less than 0.85.

The structural model assessment supported the lack of multicollinearity by showing that all VIF values fell between 1.199 and 1.731, much lower than the 3.3 threshold. The Personal Saving Behaviour R^2 value was 0.317, suggesting a moderate degree of explanatory power. All four hypotheses were statistically supported at $p < 0.001$ using bootstrapping with 5,000 subsamples, and the CVPAT supported significant predictive relevance.

5.1.2 Discussion of Major Findings

Table 5.1: Main Effects and Path Coefficients

Hypothesis	Beta	T-values	p-values	Result
H1: T > AMP	0.503	8.346	0.000	Accepted
H2: PE > AMP	0.271	4.065	0.000	Accepted
H3: AMP > FL	0.485	9.242	0.000	Accepted
H4: FL > PS	0.563	11.329	0.000	Accepted

Source: Author's own data analysis from SmartPLS.

H1: Transparency in mobile payment app is related to the adoption of mobile payment apps

According to the first hypothesis, the adoption of mobile payment apps is positive and significantly correlated with transparency. With a t-value of 8.346, a p-value of 0.000, and the greatest path coefficient in the model at $\beta = 0.503$, the results supported H1. From the results of the current study, it can be seen that transparency turned out to be the most significant predictor of adoption.

That means that transparency and openness with which information about charges, data security, and other features related to mobile payment services is provided are considered essential factors in the eyes of Malaysian consumers. If consumers find a service or a platform transparent, there is less perceived risk associated with sharing their financial details, thus, resulting in greater trust and use of mobile payment apps. In particular, considering the fast development of digital finance in Malaysia, for many users, especially for those who just started using such services, visibility of information matters significantly, making a big contribution to their trust in the platform. Overall, the findings of this research confirm the results obtained in studies conducted by Gefen et al. (2003) and Jünger and Mietzner (2019).

H2: Perceived ease of use in mobile payment app is related to the adoption of mobile payment apps

As the second hypothesis, the use of mobile payment applications is positively related to the perception of perceived ease of use. The path coefficient is found to be equal to $\beta = 0.271$ with t-value equal to 4.065 and p-value equal to 0.000. Thus, H2 has been proven. While the relation does not have as much impact on behaviour as transparency, it is still statistically significant and proves that ease of use is an important driver of adoption.

This study demonstrates the importance of perceived ease of use as a driver of inclusion of mobile payment apps into daily finance operations. As stated by TAM theory, perceived ease of use is one of the factors that can explain usage intentions (Davis, 1989). Ease of use can be expressed through convenient QR-code processing, easy navigation in applications and other features that make it easier for users, especially less informed about technology. The fact that the sample is primarily made up of young, users who are technologically for whom ease of use is already a basic expectation rather than a differentiating factor could be responsible for the slightly lower path coefficient compared to H1. This result is in accordance

with Tian and Chan (2024) finding that Malaysian consumers' intentions to use mobile payments were significantly predicted by perceived ease of use.

H3: Adoption of mobile payment apps is related to financial literacy among Malaysian users

According to the third hypothesis, financial literacy and the adoption of mobile payment apps are positively and significantly correlated. With a path coefficient of $\beta = 0.485$, a t-value of 9.242, and a p-value of 0.000, H3 was found to be supported. The research gap in which adoption is considered as a predictor of financial literacy rather than a result is one of the major study gaps found in the literature that this study covers.

The result implies that using mobile payment applications frequently leads to better financial literacy levels for the user. This might be due to the fact that frequent use of these applications leads to exposure to financial literacy-related features incorporated into the platform, such as transaction history, categorization of expenses, and real-time account balance updates. Through continuous exposure to these features, users' comprehension of financial literacy increases over time. It is especially important considering the fact that Financial Literacy obtained the lowest average score among all the constructs tested for central tendency measures, demonstrating that there is still considerable room for improvement in terms of financial literacy. The research results are consistent with those found by Yoshino et al. (2020) and Long et al. (2023).

H4: Financial literacy is related to personal saving behaviour among Malaysian users

According to the fourth hypothesis, personal saving behaviour is positively and strongly correlated with financial literacy. The model's strongest path coefficient ($\beta = 0.563$), t-value (11.329), and p-value (0.000) all supported H4. The study's most powerful direct predictor of individual saving behaviour is shown to be financial understanding.

According to the results of this research, the individuals with high levels of financial literacy are considerably more prone to exhibit savings behaviours. This may be attributed to the ability of the financial literate user in setting realistic savings objectives, understanding the consequences of their spending decisions, and resisting the temptation of consuming as induced by the frictionless experience of making mobile payments. According to Bank Negara Malaysia (2025), there was a decline in the number of Malaysians who save money from 67% in 2021 to 58% in 2024. Therefore, this evidence indicates the critical importance of financial literacy as a factor that decreases the behavioural risk factors associated with the usage of digital payments systems. Thus, the findings of the research have been consistent with the findings of Peiris (2021), who indicated that financial literacy significantly influenced savings. Additionally, the present research has been consistent with the findings of Mad et al. (2024).

5.2 Implications of the Study

5.2.1 Implications for Mobile Payment Providers

These results are relevant to any mobile payment application provider because, given the evidence in favour of hypothesis H1, the level of transparency proves to be the most powerful predictor of m-payment applications adoption ($\beta = 0.503$). Therefore, companies are expected to pay attention to transparency and ensure that the service platform they provide is informative about the transaction fees charged, their data protection policy, the security measures involved, and their service conditions. This means that they need to display pricing in a clear manner regardless of the consumer's financial literacy, disclose in an understandable form how data of their clients is utilized, and send notifications regarding every single transaction conducted.

Moreover, the evidence from the ease of use for hypothesis two ($\beta = 0.271$) indicates the need for continuous efforts by mobile payment providers to invest in UX design. Such problems as psychological and technical difficulties involved in using technology could easily be addressed through the availability of webpages in different languages, fast navigation, simpler setup procedures, and customer support services, particularly for elderly users or those with low levels of digital literacy. Making the digital payment process easy will certainly draw new customers as well as retain existing ones.

H3 findings reveal that there is a positive influence on the relationship between mobile payments usage and financial literacy ($\beta = 0.485$), thereby creating a window of opportunity for providers to incorporate elements of financial education within their services. With built-in financial tools such as goal setters, monthly savings statements, categorized expenses trackers, and personal expenditure analyses, mobile payment applications can serve as financial literacy resources, where simple transactions can be transformed into lessons in financial education.

5.2.2 Implications for Individuals Users

For Malaysian mobile payment app users, this study focuses on the importance of engaging with digital financial platforms mindfully and intentionally. The finding that personal saving behaviour is significantly estimated by financial literacy ($\beta = 0.563$, H4) shows that users who make an effort to improve their financial understanding are more likely to have positive saving outcomes. Users are advised to use the transparency features and financial management tools included into mobile payment apps, such as transaction tracking and spending analysis tools, as part of an intentional effort to track and control their own finances.

Additionally, consumers should be aware of the potential behavioural risks that come with the seamless nature of digital payments, such as the tendency

for impulsive spending. Users can take advantage of the convenience of mobile payment platforms in a way that supports rather than threatens their long-term financial stability through developing higher financial awareness and setting clear saving objectives through available app features.

5.2.3 Implications for Financial Institutions and Policymakers

The findings of the study also have significant implications for regulatory bodies and financial institutions. Since young individuals and students make up the majority of Malaysian users of mobile payment apps, the positive correlation between financial literacy and personal saving behaviour (H4) shows the importance of national financial literacy initiatives. The policymakers, including Bank Negara Malaysia and Securities Commission Malaysia, need to consider creating targeted financial education programs, which can be integrated into the websites popular among the youth population. Since the youth generation is already using mobile payment apps extensively, it offers an effective medium for imparting financial education within its context.

Also, considering the significance of transparency in determining the usage of mobile payment platforms (H1), the regulatory authorities need to ensure that the regulations related to digital financial services require and uphold transparency requirements in mobile payments. The requirements for open pricing, transparent privacy communications, and standardized user interfaces would not only protect the customers' interests but also facilitate greater adoption of mobile payment systems according to national objectives of financial inclusion. As the country moves towards a cashless economy with programs like Financial Sector Blueprint 2022-2026, it is crucial to create policies promoting mobile payment adoption and financial literacy to ensure that such a transition does not lead to financial instability but financial stability.

5.3 Limitations of the Study

Despite the fact that this study brings considerable improvement to the field of research on the usage of mobile payment applications and its influence on personal savings of Malaysians, there are certain limitations of this study that should be taken into consideration.

First of all, the research design utilized by this study implies the use of a convenient sample to obtain the needed information. Namely, this study involves respondents from social media platforms like Facebook, Instagram, and WhatsApp. It can be assumed that convenient sampling is not the same as probabilistic sampling technique. In this case, this method cannot provide a fully representative sample because the sample was more prone to respondents' participation in social networks than any other part of the Malaysian society of mobile payment application users.

Moreover, the sample of the participants is heavily biased toward the youth population between ages 20 to 29, constituting a majority of 82.2%, and comprises a significant number of students (71.3%) and people with lower incomes (57.1% earning below RM1,000 per month). Though such an analysis provides a good reflection on the target user group for mobile payment systems in Malaysia, it complicates forming generalizations about working adults, affluent individuals, or senior citizens, as their usage habits and savings tendencies can vary.

Thirdly, the research design used for this work is a cross-sectional design, meaning all data were collected at once. This methodology does not allow for the observation of shifts in factors like financial literacy or saving behaviour that can result from regular use of mobile payment apps, or does it allow for the development of causal inferences over time. Instead of reflecting long-term cause-and-effect trends, the relationships found in the structural model show relationships at a single point in time.

Fourth, a self-administered online questionnaire with a Likert-scale format was used to collect data for this study. As with any self-reported data, this approach is at risk for social desirability bias, which happens when respondents submit

responses that reflect how they want to be perceived rather than their actual behaviours and views. Constructs like financial literacy and personal saving behaviour, which depend on respondents' own evaluations of their knowledge and behaviours, are especially sensitive to this type of bias.

Although these limitations are known, they provide opportunities for further study rather than reducing the value of the findings.

5.4 Recommendations for Future Research

In order to produce a more representative sample across age groups, income levels, occupational categories, and geographical areas in Malaysia, future research should consider about using probability-based sampling techniques like stratified random sampling. This would improve the findings' generalisability among the student and young adult group which make up the majority of the current sample. Furthermore, extending the sample size above the 275 respondents in this study will strengthen statistical power and allow more complex analysis of subgroups, such comparing mobile payment users in urban and rural areas or between different income categories.

Another significant methodological improvement for the future studies is a longitudinal research design. Longitudinal research which follows the same respondents over time might provide more proof of the causal processes proposed in the current model because saving behaviour and financial literacy are dynamic entities that change over time. Researchers could more clearly determine if long-term use of mobile payment apps improves financial literacy as well as, in turn, improves saving outcomes.

Future studies might want to examine other factors that could improve the model's power for explanation. The R^2 of 0.317 for personal saving behaviour in the current study shows that a significant amount of the variance in this result is still unexplained. In an expanded model, variables including self-control, financial self-efficacy, peer influence, income stability, and awareness of financial hazards related

to digital payments could be included as further predictors or moderators. A greater awareness of the psychological processes relating the adoption of digital payments to saving behaviour may also be achieved through incorporating behavioural economics concepts like present bias and loss aversion.

Additionally, the same research methodology could be examined in different cultural and geographic contexts in future studies. Although Malaysia is the specific focus of this study, comparative research in other Southeast Asian countries, like Indonesia, Thailand, or Vietnam, each of which has a rapidly growing mobile payment system, would show whether the findings are specific to the context or remain true in a range of emerging market environments. Cross-cultural comparison studies might assist in determining whether the national level of financial literacy or regulatory system is a moderating variable for the associations under investigation in this paper.

Finally, through offering more nuanced insights into the mechanism behind the role of mobile payment app usage on financial literacy and savings habits at the individual level, qualitative or mixed-methods research methods in subsequent studies would complement the results obtained from this quantitative study. The motivation and cognition involved in the process can be revealed through qualitative research tools like in-depth interviews or focus groups among mobile payment application users.

5.5 Conclusion

The objective of this study was to look at how mobile payment app adoption influences personal saving behaviour in Malaysia, with a focus on four key relationships: transparency and adoption, perceived ease of use and adoption, adoption and financial literacy, and financial literacy and personal saving behaviour. All four hypotheses were statistically supported at $p < 0.001$ based on data collected from 275 valid respondents and tested using PLS-SEM. The largest predictor of mobile payment app adoption was found to be transparency ($\beta = 0.503$), followed by perceived ease of use ($\beta = 0.271$), showing that consumers are more likely to

adopt platforms when they believe it to be transparent, reliable, and simple to use. Adoption of mobile payment applications was also found to have a positive influence on financial literacy ($\beta = 0.485$), showing that frequent usage of digital financial platforms is an informal way to improve consumers' financial literacy. In turn, financial literacy showed out to be the model's strongest predictor of individual saving behaviour ($\beta = 0.563$), showing that people who have a better understanding of finance are more likely to engage in disciplined saving.

Overall, by developing a combined causal chain that connects financial literacy, perceived ease of use, and transparency through the adoption of mobile payments to individual saving behaviour, this study adds to the body of literature. From the findings of this study, it has been evident that the use of fintech brings substantial implications beyond being convenient for transactions, and also, that financial literacy plays an essential role in making decisions on adopting the practice of intelligent savings. It is emphasized in this research how crucial it is to incorporate the development of digital payments with efforts towards financial literacy in order to ensure that these mobile payments platforms do not act as a channel for impulsive spending.

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APPENDICES

Appendix 1: Official Ethical Approval Letter


UNIVERSITI TUNKU ABDUL RAHMAN

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Re: U/SERC/78-668/2026

23 February 2026

Dr Lim Boon Keong
 Head, Department of Finance
 Faculty of Accountancy and Management
 Universiti Tunku Abdul Rahman
 Jalan Sungai Long
 Bandar Sungai Long
 43000 Kajang, Selangor

Dear Dr Lim,

Ethical Approval For Research Project/Protocol

We refer to your application for ethical approval for your student's research project from Bachelor of Finance (Financial Technology) with Honours programme enrolled in course UKFN3026. We are pleased to inform you that the application has been approved under Expedited Review.

The details of the research projects are as follows:

No.	Research Title	Student's Name	Supervisor's Name	Approval Validity
1.	Determinants of E-Wallet Adoption Among Malaysian Consumers	Leong Ke Hao	Ms Salizatul Aizah Binti Ibrahim	23 February 2026 – 22 February 2027
2.	Digital Banking in Malaysia: Factors Influencing Its Adoption	Schumeichel Woo Seng Hui		
3.	Buy Now Pay Later (BNPL) vs Credit Cards: A Comparative Study of Payment Preferences Among Malaysian Consumers	Loh Zie Yeng	Dr Foo Meow Yee	
4.	The Influence of Mobile Payment App Adoption on Personal Saving Behaviour in Malaysia	Tan Yue Chun	Dr Eaw Hooi Cheng	
5.	Consumer Perception Towards the Application of Buy-Now-Pay-Later (BNPL) Services in Malaysia	Tan Kai Yang	Pn Faridah Hanum Binti Amran	
6.	Determinants of the Adoption of Buy Now, Pay Later (BNPL) and Effects on Personal Savings	Teo Zi Nuo	Dr Eaw Hooi Cheng	
7.	Exploring Factors Influencing the Intention to Continue Using Internet Banking	Khong Yuae Xin	Dr Tiong Kui Ming	
8.	Impact of Digital Payment System on Consumer Spending Behaviour in Malaysia	Bryan Chang Wai Shuen	Pn Farida Bhanu Binti Mohamed Yousoof	
9.	The Rise of Digital Lending: Are Young Adult More Vulnerable to Debt?	Kho Wen Ying	Dr Low Mei Peng	
10.	Investigating the Role of Government Support, Social Influence, and Value of Status Quo on TnG Ewallet Usage: A Moderated TAM Framework	Teo Zhe Yuan	Dr Agha Jahanzeb	
11.	The Impact of Cybersecurity Incidents on Customer Perception of Safety in Traditional and Digital Banks	Kanaga Rethnam a/l Paramanath Kumar	Pn Raja Nurul Aini Binti Raja Aziz	
12.	Regulatory Knowledge, Shariah Observance, and Borrowing Behaviour Among Buy Now, Pay Later (BNPL) Users in Malaysia Under the Consumer Credit Act 2025	Leong Fu Sheng	Dr Lim Boon Keong	

Kampar Campus : Jalan Universiti, Bandar Barat, 31900 Kampar, Perak Darul Ridzuan, Malaysia

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Website: www.utar.edu.my



No.	Research Title	Student's Name	Supervisor's Name	Approval Validity
13.	A Study on the Factors Influencing Intention to Use NFC Payment Among Generation Z in Malaysia	Leong Ker Ning	Ms Ung Leng Year	23 February 2026 – 22 February 2027
14.	The Hidden Wealth of Microtransactions: Analysing Cent Dilution in TNG eWallet GO+ Savings Interest	Duraiveerakaartigeyan	Dr Agha Jahanzeb	
15.	The Impact of Digital Payment Systems on Money Management Behaviour Among Malaysians	Lau Jing Er	Ms Ung Leng Year	
16.	The Psychology of Fintech: How Digital Payments Affect Consumer Spending Habits	Liew Ke Xin	Dr Pok Wei Fong	
17.	Adoption of e-KYC (Electronic Know-Your-Customer) Technology Among Gen Z: A Fintech RegTech Perspective	Tan Zheng Hong	Dr Agha Jahanzeb	

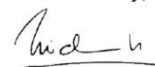
The conduct of this research is subject to the following:

- (1) The participants' informed consent be obtained prior to the commencement of the research;
- (2) Confidentiality of participants' personal data must be maintained; and
- (3) Compliance with procedures set out in related policies of UTAR such as the UTAR Research Ethics and Code of Conduct, Code of Practice for Research Involving Humans and other related policies/guidelines.
- (4) Written consent be obtained from the institution(s)/company(ies) in which the physical or/and online survey will be carried out, prior to the commencement of the research.

Should the students collect personal data of participants in their studies, please have the participants sign the attached Personal Data Protection Statement for records.

Thank you.

Yours sincerely,



Professor Dr Zuraidah Abd Manaf
Chairman
UTAR Scientific and Ethical Review Committee

c.c Dean, Faculty of Accountancy and Management

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PERSONAL DATA PROTECTION NOTICE

Please be informed that in accordance with Personal Data Protection Act 2010 ("PDPA") which came into force on 15 November 2013, Universiti Tunku Abdul Rahman ("UTAR") is hereby bound to make notice and require consent in relation to collection, recording, storage, usage and retention of personal information.

1. Personal data refers to any information which may directly or indirectly identify a person which could include sensitive personal data and expression of opinion. Among others it includes:
 - a) Name
 - b) Identity card
 - c) Place of Birth
 - d) Address
 - e) Education History
 - f) Employment History
 - g) Medical History
 - h) Blood type
 - i) Race
 - j) Religion
 - k) Photo
 - l) Personal Information and Associated Research Data
2. The purposes for which your personal data may be used are inclusive but not limited to:
 - a) For assessment of any application to UTAR
 - b) For processing any benefits and services
 - c) For communication purposes
 - d) For advertorial and news
 - e) For general administration and record purposes
 - f) For enhancing the value of education
 - g) For educational and related purposes consequential to UTAR
 - h) For replying any responds to complaints and enquiries
 - i) For the purpose of our corporate governance
 - j) For the purposes of conducting research/ collaboration
3. Your personal data may be transferred and/or disclosed to third party and/or UTAR collaborative partners including but not limited to the respective and appointed outsourcing agents for purpose of fulfilling our obligations to you in respect of the purposes and all such other purposes that are related to the purposes and also in providing integrated services, maintaining and storing records. Your data may be shared when required by laws and when disclosure is necessary to comply with applicable laws.
4. Any personal information retained by UTAR shall be destroyed and/or deleted in accordance with our retention policy applicable for us in the event such information is no longer required.

5. UTAR is committed in ensuring the confidentiality, protection, security and accuracy of your personal information made available to us and it has been our ongoing strict policy to ensure that your personal information is accurate, complete, not misleading and updated. UTAR would also ensure that your personal data shall not be used for political and commercial purposes.

Consent:

6. By submitting or providing your personal data to UTAR, you had consented and agreed for your personal data to be used in accordance to the terms and conditions in the Notice and our relevant policy.
7. If you do not consent or subsequently withdraw your consent to the processing and disclosure of your personal data, UTAR will not be able to fulfill our obligations or to contact you or to assist you in respect of the purposes and/or for any other purposes related to the purpose.
8. You may access and update your personal data by writing to us at_____.

Acknowledgment of Notice

- [] I have been notified and that I hereby understood, consented and agreed per UTAR above notice.
- [] I disagree, my personal data will not be processed.

.....
Name:
Date:

Appendix 2: Survey Questionnaire

Mobile Payment Adoption Survey

Acknowledgement and Introduction

Dear Respondent,

I am Tan Yue Chun, and I am a undergraduate students from the Faculty of Accountancy and Management (FAM), Universiti Tunku Abdul Rahman. I am currently conducting our Final Year Projects (FYP) titled "The Influence of Mobile Payment App Adoption on Personal Saving Behaviour in Malaysia".

The purpose of this questionnaire is to collect information on individuals' usage of mobile payment applications and their saving behaviour. Your participation in this study is entirely voluntary, and all responses will be kept confidential and used solely for academic purposes.

There are no right or wrong answers. Please answer all questions honestly based on your personal experience. The questionnaire will take approximately 3 - 5 minutes to complete.

By proceeding with this survey, you indicate your consent to participate in this study.

Thank you very much for your time and cooperation.

If you have any inquiries regarding this research project, please do not hesitate to contact me through email at stephanytan@1utar.my

* Indicates required question

Email *

Personal Data Collection Agreement

Please be informed that in accordance with Personal Data Protection Act 2010 ("PDPA") which came into force on 15 November 2013, Universiti Tunku Abdul Rahman ("UTAR") is hereby bound to make notice and require consent in relation to collection, recording, storage, usage, and retention of personal information.

1. Personal data refers to any information which may directly or indirectly identify a person which could include sensitive personal data and expression of opinion.

Among others it includes:

- a) Name
- b) Identity card
- c) Place of Birth
- d) Address
- e) Education History
- f) Employment History
- g) Medical History
- h) Blood type
- i) Race
- j) Religion
- k) Photo
- l) Personal Information and Associated Research Data

2. The purposes for which your personal data may be used are inclusive but not limited to:

- a) For assessment of any application to UTAR
- b) For processing any benefits and services
- c) For communication purposes
- d) For advertorial and news
- e) For general administration and record purposes
- f) For enhancing the value of education
- g) For educational and related purposes consequential to UTAR
- h) For replying any responds to complaints and enquiries
- i) For the purpose of our corporate governance
- j) For the purposes of conducting research/ collaboration

3. Your personal data may be transferred and/or disclosed to third party and/or UTAR collaborative partners including but not limited to the respective and appointed outsourcing agents for purpose of fulfilling our obligations to you in respect of the purposes and all such other purposes that are related to the purposes and also in providing integrated services, maintaining and storing records. Your data may be shared when required by laws and when disclosure is necessary to comply with applicable laws.

4. Any personal information retained by UTAR shall be destroyed and/or deleted in accordance with our retention policy applicable for us in the event such information is no longer required.

5. UTAR is committed in ensuring the confidentiality, protection, security and accuracy of your personal information made available to us and it has been our ongoing strict policy to ensure that your personal information is accurate, complete, not misleading and updated.

UTAR would also ensure that your personal data shall not be used for political and commercial purposes.

Consent:

6. By submitting or providing your personal data to UTAR, you had consented and agreed for your personal data to be used in accordance to the terms and conditions in the Notice and our relevant policy.

7. If you do not consent or subsequently withdraw your consent to the processing and disclosure of your personal data, UTAR will not be able to fulfill our obligations or to contact you or to assist you in respect of the purposes and/or for any other purposes related to the purpose.

8. You may access and update your personal data by writing to stephanytan@1utar.my. If you have any questions about this study at any time, please feel free to contact us.

Acknowledgment of Notice *

Mark only one oval.

☐ I have been notified and that I hereby understood, consented and agreed per UTAR above notice.

☐ I disagree, my personal data will not be processed.

Section A

Mobile Payment App Usage

Do you use mobile payment apps (e-wallets) such as Touch 'n Go, GrabPay, Boost, ShopeePay or others? *

Mark only one oval.

☐ Yes

☐ No

Section B

Demographic Profile

Please tick the option that best describes you.

Gender *

Mark only one oval.

- ☐ Male
- ☐ Female

Age Group *

Mark only one oval.

- ☐ Below 20 years old
- ☐ 20 to 29 years old
- ☐ 30 to 39 years old
- ☐ 40 to 49 years old
- ☐ 50 years old and above

Education Level *

Mark only one oval.

- ☐ Secondary School or below
- ☐ Diploma
- ☐ Bachelor's Degree
- ☐ Master's Degree
- ☐ Doctorate (PhD)

Employment Status *

Mark only one oval.

- ☐ Student
- ☐ Employed (full time)
- ☐ Employed (part time)
- ☐ Self-employed
- ☐ Unemployed

Monthly Personal Income *

Mark only one oval.

- ☐ Below RM1,000
- ☐ RM1,001 to RM3,000
- ☐ RM3,001 to RM5,000
- ☐ RM5,001 to RM7,000
- ☐ Above RM7,000

Section C

Perceived Ease of Use

- 1 = Strongly Disagree
 2 = Disagree
 3 = Neutral
 4 = Agree
 5 = Strongly Agree

PE1: I think using mobile payment apps is easy. *

Mark only one oval.

1 2 3 4 5

Stro ☐ ☐ ☐ ☐ ☐ Strongly Agree

PE2: It is easy to perform the steps required to use mobile payment apps. *

Mark only one oval.

1 2 3 4 5

Stro ☐ ☐ ☐ ☐ ☐ Strongly Agree

PE3: The payment system displayed is convenient because I usually carry the mobile phone with me. *

Mark only one oval.

1 2 3 4 5

Stro ☐ ☐ ☐ ☐ ☐ Strongly Agree

PE4: The payment system displayed is convenient because I can use it anytime. *

Mark only one oval.

1 2 3 4 5

Stro ☐ ☐ ☐ ☐ ☐ Strongly Agree

PE5: People around seemed to be faster and more convenient in conducting transactions. *

Mark only one oval.

1 2 3 4 5

Stro ☐ ☐ ☐ ☐ ☐ Strongly Agree

Section D

Financial Literacy

1 = Strongly Disagree

2 = Disagree

3 = Neutral

4 = Agree

5 = Strongly Agree

FL1: I often learn about financial information consciously. *

Mark only one oval.

1 2 3 4 5

Stro ☐ ☐ ☐ ☐ ☐ Strongly Agree

FL2: I have a better understanding of basic financial concepts such as saving, interest and budgeting. *

Mark only one oval.

1 2 3 4 5

Stro ☐ ☐ ☐ ☐ ☐ Strongly Agree

FL3: I understand the financial risks and consequences if an online payment account is stolen, misused or accessed without my permission. *

Mark only one oval.

1 2 3 4 5

Stro ☐ ☐ ☐ ☐ ☐ Strongly Agree

FL4: I am familiar with the fundamentals of personal finance management. *

Mark only one oval.

1 2 3 4 5

Stro ☐ ☐ ☐ ☐ ☐ Strongly Agree

FL5: I am always willing to discuss financial issues. *

Mark only one oval.

1 2 3 4 5

Stro ☐ ☐ ☐ ☐ ☐ Strongly Agree

Section E

Transparency

1 = Strongly Disagree

2 = Disagree

3 = Neutral

4 = Agree

5 = Strongly Agree

T1: I use mobile payment apps to monitor my spending transactions in real time. *

Mark only one oval.

1 2 3 4 5

Stro ☐ ☐ ☐ ☐ ☐ Strongly Agree

T2: The mobile payment apps help to increase transaction transparency. *

Mark only one oval.

1 2 3 4 5

Stro ☐ ☐ ☐ ☐ ☐ Strongly Agree

T3: Mobile payment apps keep record of transactions that have led to critical decision making. *

Mark only one oval.

1 2 3 4 5

Stro ☐ ☐ ☐ ☐ ☐ Strongly Agree

T4: Mobile payment apps provide information in a systematic way. *

Mark only one oval.

1 2 3 4 5

Stro ☐ ☐ ☐ ☐ ☐ Strongly Agree

T5: Mobile payment apps clearly show where I can find relevant information (etc: fees, transaction history, or account details). *

Mark only one oval.

1 2 3 4 5

Stro ☐ ☐ ☐ ☐ ☐ Strongly Agree

Section F

Adoption of Mobile Payment

1 = Strongly Disagree

2 = Disagree

3 = Neutral

4 = Agree

5 = Strongly Agree

AMP1: I used mobile payment app frequently in my daily life. *

Mark only one oval.

1 2 3 4 5

Stro ☐ ☐ ☐ ☐ ☐ Strongly Agree

AMP2: The use of mobile payment app has become a habit for me. *

Mark only one oval.

1 2 3 4 5

Stro ☐ ☐ ☐ ☐ ☐ Strongly Agree

AMP3: I must use mobile payment app. *

Mark only one oval.

1 2 3 4 5

Stro ☐ ☐ ☐ ☐ ☐ Strongly Agree

AMP4: Using mobile payment app has become natural to me. *

Mark only one oval.

1 2 3 4 5

Stro ☐ ☐ ☐ ☐ ☐ Strongly Agree

AMP5: I depend on mobile payment app in my financial transactions. *

Mark only one oval.

1 2 3 4 5

Stro ☐ ☐ ☐ ☐ ☐ Strongly Agree

Section G

Personal Savings

1 = Strongly Disagree

2 = Disagree

3 = Neutral

4 = Agree

5 = Strongly Agree

PS1: I regularly manage to save some money from my income. *

Mark only one oval.

1 2 3 4 5

Stro ☐ ☐ ☐ ☐ ☐ Strongly Agree

PS2: I plan to reduce my expenses to save money. *

Mark only one oval.

1 2 3 4 5

Stro ☐ ☐ ☐ ☐ ☐ Strongly Agree

PS3: Achieving saving goals is not difficult for me. *

Mark only one oval.

1 2 3 4 5

Stro ☐ ☐ ☐ ☐ ☐ Strongly Agree

PS4: When risks come from, I have the available money to deal with them. *

Mark only one oval.

12345

StroStrongly Agree

PS5: In order to save money, I often consider whether I really need something *
before I buy.

Mark only one oval.

12345

StroStrongly Agree

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