

Digital Natives Acceptance of Near Field Communication (NFC) Mobile Payment

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Abstract

The proliferation of smartphones has inspired innovations like Near Field Communication (NFC) mobile payments to substitute cash, cards and cheques. However, the adoption rate of NFC mobile payments among the digital natives in Malaysia is low attributing it to their unfamiliarity with digital platforms. This study aims to investigate the factors (perceived usefulness, perceived ease of use, and perceived risk) determining the intention to use NFC mobile payments among digital natives in Malaysia. The research methodology included a self-administered questionnaire and snowball sampling procedure on social networks distributed among Generation Y (age 13-28) and Generation Z (age 29-43). A cross-sectional was undertaken on a sample of 500 NFC mobile payment users for the study. The data was collected and analyzed using the Statistical Package for Social Science (SPSS). The results of the analysis reveal that perceived usefulness, perceived ease of use, and perceived risk have a significant relationship towards the intention to use NFC mobile payment. Therefore, the study underlines the key factor influencing the adoption of NFC mobile payment as perceived risk. Digital natives are more accustomed to digital technologies and would find NFC mobile payment as convenient, speedy, and flexible that compatible with their lifestyle.

1. Introduction

This chapter elucidates the research background concerning Near Field Communication (NFC) mobile payments. It is then followed by the problem statements of our study that have been identified. After stating the problems at stake, research questions are formed which then come along with research objectives respectively. Additionally, this chapter highlights the importance of the research and to whom it might be significant. Finally, the scope of research is laid out in words to further illustrate in summary the area in which the study will be explored in where parameters are specified.

1.1 Background of the Research

The increasing use of smartphones has led to the development of mobile payment technologies, such as Near Field Communication (NFC) mobile payments. This technology has enabled contactless cards to be replaced with virtual cards in smartphones (Wang, Lu, Li, Li, & Liang, 2017), leading to a trend shift in contactless transaction designs (Turk, & Cosar, 2015; Zheng, Ni, Liu, & Liang, 2019). Near field communication (NFC) technology was developed in the late 1800s by Thomas Edison and patented by Charles Walton utilizing RFID technology in 1983. However, the technology was first invented in the early 2000s by a consortium of companies, including

Sony, Philips, and Nokia. The technology was designed to enable contactless communication between devices such as smartphones, payment terminals, and smart cards (Kang, Song, Kim, Lee, & Kim, 2021). In close proximity to a receiver within 4 cm where two devices can communicate with one another using the short-range wireless communication (Luna, Montoro-Ríos, Liébana-Cabanillas, & Luna, 2016).

In recent years, NFC mobile payments have become increasingly popular with many smartphones now equipped with NFC technology (Juniper Research, 2018). NFC mobile payments enable users to make secure and convenient payments using their smartphones, without the need for cash or physical cards. A report by Juniper Research, the global number of mobile contactless payment users is expected to reach over 760 million by 2020, up from 440 million in 2018. It highlights the increasing adoption of contactless payment technology and the availability of mobile payment platforms like Apple Pay, Samsung Pay, and Google Pay as key drivers of this growth. NFC technology has many applications, including mobile payments, access control, ticketing, and data transfer (Chen, & Chen, 2015). Industry sectors like transportation and entertainment are adopting NFC mobile payments because of its convenience and efficiency (Liébana-Cabanillas, Molinillo, and Ruiz-Montañez, 2018).

Concentrating on the Malaysian market, Bank Negara Malaysia (2018) reported that mobile phones in facilitating payments and reduce the use of cash in Malaysia without additional infrastructure costs. The data reveals that the compound annual growth rate (CAGR) for financial transactions conducted through mobile banking has surged to 91% over the past seven years, indicating a growing preference for the mobile channel among Malaysian consumers. This trend aligns with the global trend of increasing mobile payment adoption (Liébana-Cabanillas, García-Maroto, Muñoz-Leiva, Ramos-de-Luna, 2020). The government has encouraged to migrate existing payment landscapes to m-payment, such as replacing cheques with e-fund transfers, replacing cash via debit cards, and eliminating cash and cheques (Wei & Tsu, 2018). Now, there are over 40 different NFC payment types in Malaysia, indicating that the use of the technology is expanding (Alam, Awawdeh, & Muhamad, 2021).

Dragovic, Stankov, and Vasiljević (2018) highlighted the distinguishing features of Near Field Communication (NFC) when compared to other mobile payment alternatives. NFC offers several advantages that contribute to its popularity in the mobile payment space. NFC is far faster to set up, user-friendly with better user experience. The user will be more inclined to view the mobile device as a useful payment method if they are familiar with mobile phones and their features (Liébana-Cabanillas *et al.*, 2020). In addition, NFC also allows fast and safe purchase transactions with minimal user effort by waving or contacting mobile devices with contactless point-of-sale terminals (Agárdi & Alt, 2022). Liébana-Cabanillas *et al.*, (2018) quoted many mobile devices currently include different services that enhance customers' usability. As a result, future risk can be reduced and user intention to continue using them.

1.2 Problem Statement

Technology has revolutionized the way we live, work, and communicate, enabling mobile devices such as smartphones to become an integral part of our lives. Mobile technology has advanced significantly in recent years with mobile payment being a prominent example. Curry, 2023 mentioned that over two billion people utilise mobile payments globally. Despite the increasing availability and usage of mobile payment systems globally, the adoption rate of NFC mobile payment in developing countries remains relatively low (Malarvizhi, Mamun, Jayashree, Naznen & Abir, 2022). According to a report by the Malaysian Communications and Multimedia Commission (MCMC) states that only 13% of mobile phone users using NFC mobile payment as of 2020. While NFC technology is integrated into most modern smartphones, many Malaysians still prefer to use traditional payment methods such as cash or credit cards.

According to a report by Enberg, 2019, global mobile payment users experienced significant growth due to the adoption of smartphones and the convenience of mobile payment solutions. The continuous advancement in mobile payment systems has made financial transactions more accessible and convenient. Mobile payments have increased even more because consumers prefer cashless transactions to avoid coronavirus disease. Hilmy (2022) reported that smartphone use increased significantly about 100% during the Covid-19 pandemic and the penetration rate in Malaysia is 88.79% (Statista, 2022). However, Mohd Heikal's survey found that 59% of smartphone users do not trust mobile payment applications due to lack of knowledge, skill, or confidence.

NFC mobile payment solutions are becoming increasingly popular (Li, Wong, Chau, Pan, and Koh, 2020), but there is a gap in acceptance and usage among digital natives. Referring Prensky (2001), digital natives are often defined as individuals who have grown up in the digital era. The usage of digital technology and payment options is seen differently by different generations (Generation Y and Generation Z). Digital natives have lower barriers to adopting new technology, but lack of acceptance for NFC mobile payment solutions due to unfamiliarity with digital platforms (Pham & Ho, 2015). Also, only a few studies examining the acceptance of mobile payments by particular generations (Agárdi and Alt, 2022). This raises concerns about the factors hindering the widespread acceptance and utilization of NFC mobile payment technology within this tech-savvy demographic.

The popularity of mobile payment systems like Apple Pay, Samsung Pay, and Google Pay has seen a significant uptick in recent years because users can easily make purchases by touching or scanning their smartphones at checkout terminals. However, the slow uptake of the technology may limit its widespread adoption of this technology such as increased efficiency and security in transactions (Mun, Khalid, and Nadarajah, 2017). With that, it is of the utmost importance to understand the elements that influence the desire of Malaysians to use NFC mobile payments in order to promote wider adoption and utilization of this technology. Therefore, several factors may influence the intention of Malaysians to adopt NFC mobile payment, such as perceived usefulness, perceived ease of use and perceived risk.

Therefore, to achieve the research objectives relationship between perceived usefulness and intention to use NFC mobile payment among digital natives in Malaysia is determined. Furthermore, the relationship between perceived ease of use and intention to use NFC mobile payment among digital natives in Malaysia also determined. Consequently, the relationship between perceived risk and intention to use NFC mobile payment among digital natives in Malaysia is identified.

1.3 Scope of the Research

This study delves the factors influencing the intention of digital natives in Malaysia to use Near Field Communication (NFC) mobile payment. The respondents of this study are digital natives including Generation Y (1980-1994) and Generation Z (1995-2010) were required to be smartphone users. These generations are often early adopters of new technologies, heavily reliant and engaged in mobile technology which influenced their acceptance of NFC mobile payments (Agárdi and Alt, 2022). NFC users are often chosen in this research because they have firsthand experience and are familiar with and actively use NFC technology (Liébana-Cabanillas *et al.*, 2020). Their attitudes, intentions, and experiences can provide valuable insights into the potential adoption and diffusion of this payment technology among the broader population.

The population of this study will be users who intend to use NFC mobile payment in Malaysia. Referring to Devanesan (2020), Malaysia records the most digital users and will reach 310 million in Southeast Asia (SEA) in 2025. In the digital transformation of the economy, the acceptance of digital payments has increased most among tech-savvy consumers (Statista, 2023). Altounjy, Alaeddin, Hussain and Kot (2020) Mobile payment have become a trend among young smartphone users, businesses like retailers and restaurants are accepting NFC mobile payments as an option (Treece, 2023). Prior to selection, respondents were also queried about their usage of NFC mobile payment (Aris, Ismail, & Mohezar, 2022). They were excluded from the sample frame if they did not use this method of payment.

1.4 Significance of the Research

This study delves the factors influencing the intention of digital natives in Malaysia to use Near Field Communication (NFC) mobile payment.

1.4.1 Theoretical Significance

There have been numerous studies on mobile payment undertaken in Malaysia in the past, however, there have been few studies on NFC mobile payment. In which, not much is being discussed on security factors. By focusing specifically on NFC mobile payment in Malaysia, the study fills the gap in existing literature, Zhang, Khan, Cao, and Khan, (2023) suggested future studies on the topic should include the factor of perceived risk on existing and potential m-payment users. Similarly, Luna *et al.* (2016) have suggested that research be conducted with the goal of improving the perceived usefulness of NFC mobile payments and making them easier to use. This research adds to the existing body of knowledge by throwing light on the variables that impact customers' desire to utilize NFC mobile payment in Malaysia. As a result, the findings of this study might provide a useful foundation for future researchers investigating digital natives' openness to NFC mobile payment technology in Malaysia.

1.4.2 Practical Significance

The impact of this research extends beyond the digital natives. The findings have had an impact on the merchants and various stakeholders involved in the implementation of Near Field Communication (NFC) mobile payment systems. In the course of their company operations, they will gain essential knowledge about digital natives in Malaysia in reference to the implementation of the novel payment system. Aside from this, the findings of this research will help mobile phone software developers, mobile phone manufacturers, financial institutions, and other relevant parties get a better knowledge of the features and qualities that digital natives value while utilizing NFC mobile payment systems. Hence, this knowledge will guide them in refining and enhancing their products to better cater for the needs and expectations of the customers. By aligning goods and services with the demands and needs of digital natives, businesses can improve customer satisfaction. To offer

innovative and convenient payment options, reducing the potential loss of customers who prefer NFC mobile payments over traditional methods.

1.5 Conclusion

Some examples of how your references should be listed are given at the end of this template in the 'References' section, which will allow you to assemble your reference list according to the correct format and font size. In conclusion, this chapter provides an overview of the research on NFC mobile payments, including the background, problem statements, research questions, aims, and scope. The widespread availability of NFC technology in smartphones enables secure and convenient purchases without cash or physical cards (Wang et al, 2017; Liébana-Cabanillas *et al.*, 2018). The problem statement identifies issues such as low adoption rates in developing countries (Malarvizhi *et al.*, 2022), lack of confidence among smartphone users (Mohd Heikal), and limited acceptance by digital natives (Agárdi and Alt, 2022). This study focuses on Generation Y and Z, aiming to explore the relationship between perceived usefulness, ease of use, risk, and intention to use NFC mobile payment. The study contributes to filling the literature gap and provides insights for stakeholders to enhance customer satisfaction. It adopts and modifies the TAM model to understand digital natives' acceptance of NFC mobile payments.

2. Literature Review

The present chapter concentrates on a literature review pertaining to the acceptance of Near Field Communication mobile payment technology among digital natives in Malaysia. It introduces the relevant literature related to consumer adoption of NFC mobile payment systems in Malaysia. The beginning of the chapter provides an overview of NFC technology, followed by an examination of the use of NFC mobile payment as a dependent variable. In addition, it explores the Technology Acceptance Model (TAM) covers various factors including perceived usefulness, perceived ease of use and perceived risk as independent variables. This is then followed by a literature review matrix evaluating the relation to the problem of the research. Last but not least, this chapter reaches its conceptual framework whereby it briefly explains the beliefs on how certain variables are related to each other before concluding the chapter.

2.1 Overview of Near Field Communication

Near Field Communication (NFC) is a technology that enables two devices to communicate with each other wirelessly over a short range of 4 cm or less when placed in close proximity to a receiver (Luna *et al.*, 2016). NFC is a subset of radio frequency identification (RFID) technology that enables card readers and certain devices to interact with one another over a short distance. As a result, NFC devices are built on RFID technology mixed with wireless communication (Almaiah, Al-Rahmi, Alturise, Hassan, Lutfi, Alrawad, Alkhalfaf, Al-Rahmi, Al-sharaieh, Aldhyani, 2022). Gupta and Narayan (2020) supported the idea that NFC and RFID use similar mechanical principles, however NFC is specifically tailored for mobile devices and operates at 13.56 MHz, whereas RFID operates at a higher frequency.

NFC mobile payment constitutes a collaboration between mobile phone manufacturers, operating system vendors, and banking organizations (Curran, Millar, and Garvey, 2012). NFC mobile payments are contactless payment terminals that enable customers to use their mobile phones to make payments at the POS (Gupta *et al.*, 2020). ApplePay and SamsungPay are two examples of such payment methods. The process is divided into three phases: registration, validation, and authentication. On a mobile device, the built-in payment method is simple to set up. The fact that consumers may be influenced to adopt NFC payment systems due to their ability to shorten the check-out process with minimal effort (Ooi & Tan, 2016). Thus, the access speed allows customers to purchase products from a merchant's store easily and conveniently (Agárdi & Alt, 2022).

In the modern age, almost all smartphones come equipped with a built-in NFC reader. This means that a smartphone with NFC capabilities may serve both as a reader and a tag. It can be used for mobile payments, such as Apple Pay, Samsung Pay, Google Pay and PayPal act as NFC chips to make contactless payments, with permission from the issuing bank or financial institution (Herget & Krey, 2021). The user simply holds their phone close to a compatible payment terminal, and the two devices communicate with each other using NFC technology to process the payment. NFC-enabled smartphones can be used to make payments at a wide range of merchants, including retail stores, restaurants, and transportation services. Therefore, it has gained widespread popularity in recent years due to its use in mobile payment systems and other applications.

2.2 Technology Acceptance Model

Technology Acceptance Model (TAM) is a prevalent theoretical construct utilized to explain the process by which users adopt new technology. Davis (1986) proposed a model which has undergone refinement and extension by numerous scholars (Zhang *et al.*, 2023; Aris, Ismail, & Mohezar, 2022). The TAM proposes that a user's intention to use technology is primarily determined by two factors: perceived usefulness and perceived ease of use. This model has been widely employed in research on various aspects of mobile technology, including healthcare information systems (Jaradat & Smadi, 2013), commerce (Chon, Chan, & Ooi, 2012; Su, Nguyen, Nguyen, Luu, & Phuoc, 2022), and NFC payment (Tan, Ooi, Chong, & Hew, 2014; Pal, Vanijjab, & Papasratorn, 2015; Luna *et al.*, 2016). Thus, the TAM model is one of the most frequently used to pinpoint what influences how well a technology is received.

The TAM was established to understand human acceptance of technology and to hypothesize the link between an individual's intention for a specific behavior and that individual's actual behavior (Davis, 1989; Venkatesh *et al.*, 2003; Boni, 2016). It speculates on two specific cognitive beliefs, namely perceived usefulness and perceived ease of use. A limited study focused on consumer acceptance of NFC mobile payments, highlighting the need for further research. In addition, the influence of perceived risk as a predictor has not often been considered by studies. This study adopted the revised model TAM of Sinha, Fukey, Balasubramanian and Hanafiah (2021), which included the dimension of risk perception into the original framework of TAM. Thus, the authors hypothesized that individuals' attitudes of perceived usefulness, ease of use and perceived risk were the critical factors affecting an individual's acceptance of NFC mobile payment. The revised TAM is shown in Fig. 1.

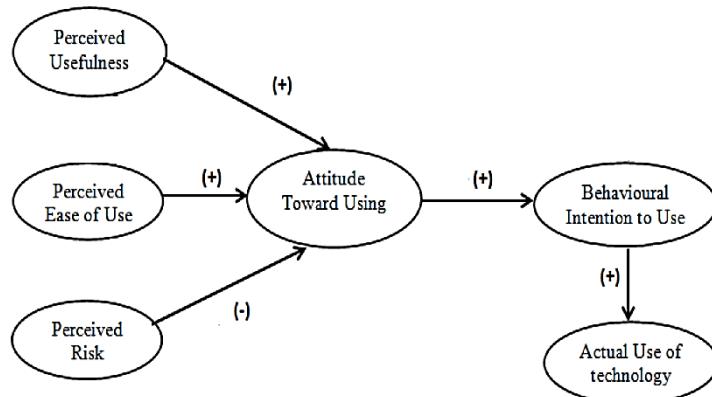


Fig. 1 Revised TAM with perceived risk

2.3 Intention to Use NFC Mobile Payment

The term intention is often defined as the action, perceived notion between oneself, or future behaviour of someone. The function of intention as a behavioural predictor (Venkatesh, Smith & Morris, 2003), as it shows an individual's willingness to engage in a specific activity (Malarvizhi *et al.*, 2022). On the other hand, the acceptance of the technology is strongly influenced by intention (Pham & Ho, 2015). The prediction of behavioral intention to use a technology and technology use is a commonly studied area in the field of technology acceptance and adoption (Davis, 1989). With that, the intention of NFC mobile payment refers to a consumer's willingness or readiness to use a mobile device equipped with NFC technology to make payments for goods and services (Lin, Lin and Ding, 2020). It is a psychological state that precedes actual behavior and reflects a consumer's readiness to engage in a particular action, in this case, making payments through an NFC-enabled mobile device.

2.4 Perceived Usefulness

Perceived usefulness (PU) encompasses the user's belief that a particular technology will enhance their performance or productivity (Davis, 1989). It is the extent to which the system is related to the productivity and effectiveness of the system. Many research investigations have demonstrated that perceived usefulness significantly and favourably affects one's propensity to utilise NFC mobile payment. The assumption made by technology acceptance models is that perceived usefulness has a positive impact on the intention to use (Aris, Ismail, & Mohezar, 2022; Luna *et al.*, 2016; Pal *et al.*, 2015). Thus, perceived usefulness holds the potential to provide a practical, convenient, and efficient mobile payment system through NFC technology. Both generations use mobile payments, although Generation Z users are more likely to do so regularly and for a larger variety of purchases than Generation X users, according to research by Agárdi and Alt (2022). In addition, Generation Z users perceive more favourable security and convenience in their perceptions of mobile payments.

2.4.1 The Relationship Between Perceived Usefulness and Intention to Use NFC Mobile Payment

Consumers' impression of how using mobile technologies or services improves their performance PU (Almajali, Al-Okaily, Al-Daoud, Weshah, & Shaikh, 2022). It is the degree to which technology is perceived as beneficial in improving the efficiency, convenience, and security of transactions. Particularly, mobile technologies or services resemble the NFC-mobile technology used in this research. Numerous studies from different countries have shown how usefulness influences mobile payment adoption in Malaysia (Aris *et al.*, 2022), Pakistan (Zhang *et al.*, 2023), Indonesia (Sun, Zhang, & Liao, 2021), and so on. The convenience of NFC mobile payments was also shown to significantly influence the willingness of consumers to adopt the technology. Several research have looked at the connection between how practical NFC mobile payments are and how likely people are to actually utilize them. Lin, Lin, and Ding (2020) conducted a study which discovered that the perceived usefulness of NFC mobile payments has a notable positive impact on the intention to use such payments among users in Taiwan. The hypothesis states that users who perceive NFC mobile payment as useful for improving transaction efficiency, convenience, and security are more likely to have a positive intention to use NFC mobile payment.

H₁: Perceived usefulness has a positive correlation with intention to use NFC mobile payment.

2.5 Perceived Ease of Use

Perceived ease of use (PEOU) refers to users' belief that technology is easy to comprehend and operate (Davis, 1989). The degree to which a person feels at ease utilizing mobile technology for NFC payments. This implies that using mobile payments such as NFC may be done more quickly and easily without having to learn them and more likely to adopt it. Furthermore, prior studies have shown that PEOU has a favorably positive impact on perceived usefulness. Hence, through perceived usefulness, perceived ease of use indirectly influences the intention to use (Shin & Lee, 2014). A study conducted by Ondrus and Pigneur (2007) NFC mobile payments are preferred over other forms of mobile payment due to its simplicity. These results suggested that people would rather use card technology than their mobile phones to make purchases. Similar findings were made by Pal *et al.* (2015), found a strong positive correlation between PEOU and the uptake of NFC mobile payments. Perceived ease of use and perceived usefulness are two significant predictors that strongly influence the adoption of NFC mobile payment systems by users.

2.5.1 The Relationship Between Perceived Ease of Use and Intention to Use NFC Mobile Payment

Perceived ease of use (PEOU) is how easy consumers find learning and utilization of mobile technology (Davis, 1989). The research conducted by Boni (2016) has provided substantial evidence that the attitudes of Millennials play a favorable role in their inclination towards utilizing NFC mobile payments. This is due to the fact that compared to prior generations, Millennials often have a higher level of technological literacy and are more receptive to technology. Furthermore, the relationship between perceived ease of use and intention to use contactless NFC payments is confirmed in several studies (Aris *et al.*, 2022; Oliveira, Thomas, Baptista, & Campos, 2016; Chen & Nath, 2008) that have examined mobile application adoption. Similarly, studies have shown that perceived ease of use positively affects the intention to use mobile payments (Li, Wang, Wangh, & Zhou, 2019; Li, Liu, & Heikkilae, 2014). If the ease of use of a technology is positively correlated with its adoption and future usage by users. Thus, the hypothesis states that users are more likely to prefer technologies that require minimal effort and are convenient to use to make NFC mobile payments.

H₂: Perceived ease and use has a positive correlation with intention to use NFC mobile payment.

2.6 Perceived Risk

Perceived risk (PR) is the extent to which a potential user views mobile payment to be dangerous (Almaiah *et al.*, 2022). It indicates the individual's subjective evaluation of the likelihood and severity of harm or loss associated with a decision or action. Based on Agárdi and Alt (2022), this can be a barrier to mobile payment adoption as people may alter their attitudes and behaviours to protect themselves. Consumers are becoming more aware of identity hackers, leading to a reluctance to use NFC mobile payments. There are concerns when using NFC mobile payment that users might face which are financial and privacy. Both risks harm the intention to use mobile payment (Luna *et al.*, 2016; Chin, Onwujekwe, & Harris, 2020), with financial risk causing monetary loss and privacy risk exposing private information. However, users must be aware of potential risks when using NFC mobile payments. Additionally, mobile payment systems provide improved security features such as biometric identification (Herget & Krey, 2021) or PIN authorization during transactions (Hendered, 2022). Thus, NFC has been gaining popularity in recent years owing to its convenience and user-friendly nature.

2.6.1 The Relationship between Perceived Risk and Intention to Use NFC Mobile Payment

Payment security is a major concern for customers, especially when it comes to new methods of buying goods and services that use mobile technology (Luna *et al.*, 2016). Many studies already in existence have investigated the direct impact of perceived risk on consumer intentions to adopt NFC mobile payment. According to Schierz (2010) there is a favourable correlation between attitudes towards adopting mobile payment systems and perceived risk. As a result, customers who wish to use NFC technology, particularly mobile transaction systems, must pay close attention to the security problem. The security of mobile payment services is often an issue for consumers to use mobile payment services are stronger in Malaysia (Chuah, Stella, Trey, & Ivey, 2019). For secured or risk-free transactions, authenticity and non-repudiation are further necessary. It would be advantageous for NFC services to reassure users that there is no risk of hacking or the interception of personal data (Boni, 2016). For NFC applications to be effectively implemented successfully, the hypothesis suggests that users who perceive NFC mobile payment to be risk-free.

H₃: Perceived risk has a positive correlation with intention to use NFC mobile payment.

2.7 Conceptual Framework

According to the revised model, perceived risk as a variable in the Technology Acceptance Model (TAM) to provide a more comprehensive analysis of the potential risks associated with Near Field Communication (NFC) mobile payment. This will aid in understanding individuals' behaviour that intend to use NFC mobile payments. The independent variables include perceived usefulness (PU), perceived ease of use (PEOU) and perceived risk (PR), meanwhile, the dependent variable is the intention of NFC mobile payment. The conceptual framework of this study is shown in Fig. 2.

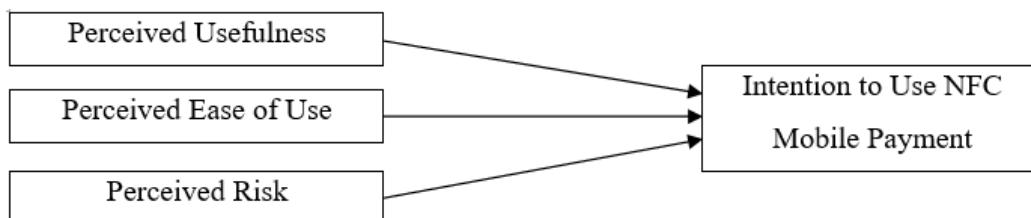


Fig. 2 Conceptual framework

2.8 Conclusion

To sum up, the concept of Near Field Communication (NFC) is discussed, followed by an explanation of how users adopt new technologies using the Technology Acceptance Model. The intention to use technology plays a significant role in its adoption (Davis, 1989), particularly among Generation Z users who perceive NFC mobile payment as secure and convenient. Perceived ease of use and usefulness are the main predictors of NFC mobile payment adoption (Pal *et al.*, 2015), while perceived risk can hinder the adoption (Agárdi and Alt, 2022). The chapter explores the relationship between perceived usefulness, ease of use, perceived risk, and the intention to use NFC mobile payments. Based on literature reviews, a research model and hypotheses are developed, highlighting the importance of users perceiving NFC mobile payment as beneficial and easy to use (Ooi & Tan, 2016; Agárdi & Alt, 2022). Additionally, the study acknowledges that the perceived risk associated with authentication and non-repudiation directly impacts consumer intentions to use NFC mobile payment (Schierz, 2010; Chuah *et al.*, 2019). A conceptual framework is presented to guide the study's variables.

3. Methodology

This chapter provides a description of the method that was used in the conduct of this study in order to accomplish the objectives of the research. Every step taken to complete this study will be covered in this chapter, starting with the research design, research process, unit of analysis, population, sampling technique, and research instruments used for this study. In this study, the data are analyzed and interpreted using a quantitative approach. Questionnaires are employed as a quantitative tool. There are several data collection and analysis strategies that will be used which are relevant to this study. It provides a thorough justification of the selected analysis method and data collection technique including the methods implemented to maintain validity and reliability. It is important to clearly explain the approach used to conduct the investigation.

3.1 Research Design

Research design is a process that is applied to ensure that the data collected during a study is capable of providing an effective solution to the research problem (Marczyk, DeMatteo & Festinger, 2021). It usually includes the methods of data gathering and the role of instruments in facilitating data surveying. The plan was created to address the research questions and control the variation in the study. The design of this analysis influences the sort of information to be gathered and, consequently, its results.

Correlational research is a type of research design that investigates the relationship between two or more variables, examining the strength, and direction of the relationship (Bhandari, 2021). The researcher can make decisions on whether to accept or reject hypotheses to determine the relationship between variables. It looks at the relationships between dependent and independent variables of the research and expressing the patterns with numbers. Hence, the correlational research design outlined in this study will provide insights into the relationship between the factors of digital natives' acceptance towards NFC mobile payment and their intention to use it.

The type of research design used for this research is a quantitative approach. Quantitative research is the process of collecting and analyzing numerical data to make inferences, verify correlations, and expand findings to a wider population (Bhandari, 2020). Therefore, a quantitative research method will be used to study the determinants that influence the intention to use NFC mobile payment among digital natives in Malaysia. To ensure inclusivity and to reach a wider range of participants, the questionnaire is designed in two languages: English and Malay.

3.2 Research Process

The research started with the identification of problem statements and a title was chosen based on it. Subsequently, identify the research objectives in accordance with the research questions. The study aimed to establish a correlation between perceived usefulness, perceived ease of use, perceived risk, and intention to use NFC mobile payment among digital natives in Malaysia.

Next, a literature review of Near Field Communication (NFC), the Technology Acceptance Model (TAM), intention to use NFC mobile payments, perceived usefulness, perceived ease of use, and perceived risk was explained. After critically reviewing the literature, the hypothesis development and conceptual framework were highlighted.

Research methodology is indeed crucial to design the plan for collecting, measuring, and analyzing data to answer the research questions (Sekaran and Bougie, 2016). Primary data were collected through questionnaires in two languages (English and Malay) and processed using the Google form method to collect data.

Subsequently, the collected data were analyzed using SPSS software. All results were compiled and presented in table charts. Then, the discussion and conclusions were explained about the objectives of the study. Finally, the limitations of the study and recommendations for future research were given. Fig. 3 shows the research process flow chart of this study.

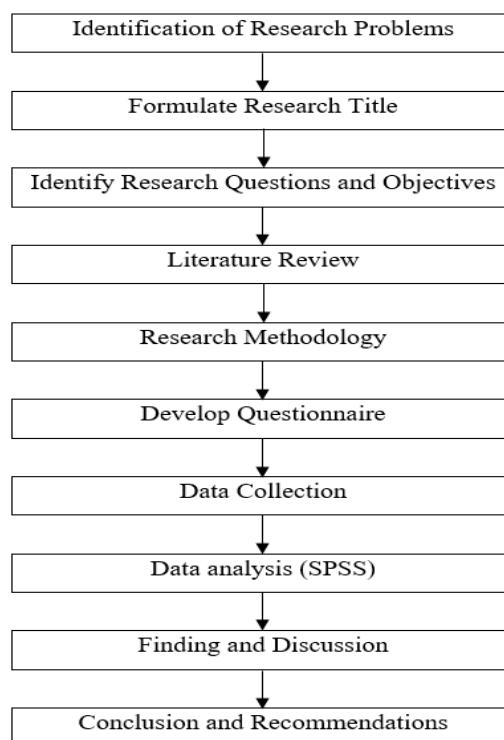


Fig. 3 Research process

3.3 Unit of Analysis

The term "unit of analysis" pertains to the level of aggregation of the data that is gathered during the subsequent phase of data analysis, as stated by Sekaran and Bougie (2016). The problem statement focuses on how to raise the intention to use NFC mobile payments, then this study is interested in an individual who belongs to digital natives who use NFC mobile payments in Malaysia. The unit of analysis here is the individual which are Generation Y and Z. The target population for this study is digital natives between the ages of 21 to 40. The target population is then further narrowed down based on various units and criteria to identify the target individuals of the sample.

Following the demographic characteristics of the respondent's gender, age, ethnicity, educational level, monthly income, state, district or division, and frequency of NFC mobile payments usage in a month. Generation Y and Z are often referred to as digital natives due to their exposure and familiarity with digital technology from a young age. However, excluding individuals age 21 and below from a study because they are high school students with no income. Therefore, these questions help gather information about the respondents' characteristics and usage patterns, providing insights for the research analysis. The demographic questions that are used to target the respondents are displayed in Appendix C and D.

3.4 Population and Sampling

3.4.1 Population

A target population refers to a specific group of individuals sharing similar attributes that are identified as the intended audience for products or research (Whaley, 2023). It encompasses a group of people who can be accurately distinguished from the general population. The study will focus on users in Malaysia who have the intention to use NFC mobile payment. Since this study is intended to investigate the intention to use NFC mobile payments, the population from which to be drawn was defined as all individuals who are digital natives. These individuals, who have grown up in the digital era, are expected to have a higher familiarity and comfort level with technology.

Mobile payment has become popular among young smartphone users, and retailers and restaurants are adopting NFC mobile payments (Altounjy *et al.*, 2020; Treece, 2023). According to Devanesan (2020), Malaysia has the highest number of digital users in Southeast Asia, projected to reach 310 million by 2025. The acceptance of digital payments has seen significant growth among tech-savvy consumers during the digital transformation of the economy (Statista, 2023). The age range of the study's target group is 21 to 40 year old digital natives. Prior to participant selection, individuals were asked about their usage of NFC mobile payment (Aris *et al.*, 2022), and those who did not use this payment method were excluded from the sample.

3.4.2 Sampling Techniques

Sampling refers to the systematic process of carefully selecting individuals, objects, or events that are deemed appropriate to serve as a representative sample of the entire population (Sekaran and Bougie, 2016). According to Saunders, Lewis, and Thornhill (2019), there exist two distinct sampling techniques, namely probability sampling and non-probability sampling. The current study tapped a non-probability sampling approach to procure the samples, given the absence of a sampling frame. For this study, snowball sampling (also called referral sampling) was chosen where it is difficult to identify digital natives of the desired population. Questionnaires were carried out and the sample grows like a snowball being rolled in the snow.

3.4.3 Sample Size

Sample size pertains to the number of samples in research. The sample is the portion of the population in a study (Sekaran and Bougie, 2016). The sample size of this present study is 500. According to Zikmund, Babin, Carr, and Griffin (2009), a study should possess a sample size ranging from 300 to 500 if there is no sampling frame for the study. Since there is no sampling frame for this study, the sample size is determined based on the range suggested by previous researchers. For this study opted for the maximum sample size which are recommended by Malhotra and Peterson (2006) that a larger sample size enhances the generalizability of findings.

3.5 Unit of Analysis

A self-administrated questionnaire was used in this study. The question was partitioned into five different sections which are Section A is about demographic information of the respondents which consists of seven questions about respondent's profile and one question about usage of NFC mobile payment. Section B inquiries about the intention to use NFC mobile payment, while Section C asked about perceived usefulness, Section D is perceived ease of use and Section E focuses on perceived risk. The questionnaire uses five points Likert-scale in Section B, C, and D which are presents in Table 1.

Table 1 Five points likert scale

Scale	Interpretation
1	Strongly disagree
2	Disagree
3	Neutral
4	Agree
5	Strongly agree

Table 2 shows the questions for Section B, C, D and E of the questionnaires. These sections likely cover different aspects related to NFC mobile payment, such as intention to use NFC mobile payment, perceived usefulness, perceived ease of use, and perceived risk. The questions use in the study were adopted (Zhang *et al.*, 2023; Shin *et al.*, 2014; Pham and Ho *et al.*, 2015; Luna *et al.*, 2016; Pal *et al.*, 2015; Zhao *et al.*, 2019; Chen and Nath, 2008) from past research and modified to adapt the NFC mobile payment context.

Table 2 Research instruments

Constructs	Items	Description	Source
Intention to Use NFC Mobile Payment	I1	I am willing to use NFC mobile payment in the future.	Zhang <i>et al.</i> , 2023
	I2	I intend to increase my use of NFC mobile payment in the future.	Zhang <i>et al.</i> , 2023; Shin <i>et al.</i> , 2014
	I3	I intend to use NFC mobile payment when an opportunity arises.	Zhang <i>et al.</i> , 2023
	I4	I intend to recommend NFC mobile payment to my family and friends.	Pham and Ho, 2015
	I5	I plan to continue using the NFC mobile payment.	Shin <i>et al.</i> , 2014
Perceived Usefulness	PU1	I find the NFC mobile payment system is a useful mode of payment.	Luna <i>et al.</i> , 2016

(PU)	PU2	I find that using NFC payment make transaction process easier.	Pal <i>et al.</i> , 2015; Luna <i>et al.</i> , 2016
	PU3	I find that using NFC payment allows me to make quicker payments.	Pal <i>et al.</i> , 2015; Luna <i>et al.</i> , 2016
	PU4	I find that using NFC payment to be a convenient option for making payments.	Pal <i>et al.</i> , 2015
	PU5	I find that the NFC mobile payment system would be beneficial and efficient.	Shin <i>et al.</i> , 2014
Perceived Ease of Use (PEOU)	PEOU1	I find that the NFC mobile payment easy to use.	Pal <i>et al.</i> , 2015; Shin <i>et al.</i> , 2014
	PEOU2	I find that the NFC mobile payment procedure is clear and understandable.	Pal <i>et al.</i> , 2015
	PEOU3	I find that following all the steps required in the NFC mobile payment procedure is easy.	Luna <i>et al.</i> , 2016
	PEOU4	I find that learning to use NFC mobile payment to be easy for me.	Pal <i>et al.</i> , 2015; Shin <i>et al.</i> , 2014
	PEOU5	I find that becoming skilled at using the NFC mobile payment.	Pal <i>et al.</i> , 2015; Luna <i>et al.</i> , 2016
Perceived Risk (PR)	PR1	I find that using NFC mobile payment raises the financial risk.	Zhao <i>et al.</i> , 2019
	PR2	I find that using NFC mobile payment increases the risk of unauthorized access to the linked card.	Zhao <i>et al.</i> , 2019
	PR3	I find that using NFC mobile payment raises the probability of credit or debit card fraud.	Zhao <i>et al.</i> , 2019
	PR4	I find that using NFC mobile payment may loss the confidentiality information.	Pham and Ho, 2015; Chen and Nath, 2008
	PR5	I find that NFC mobile payment have insufficient security.	Chen and Nath, 2008

3.6 Pilot Study

A pilot study is a small feasibility study designed to evaluate different components of methods to be used in a larger study (Nancy K. Lowe, 2019). The purpose of conducting a pilot test is to enhance the questionnaire's quality by making necessary modifications and adjustments before administering it to the target population (Zikmund, 2003). Also, to ensure the quality of research discussions and data accuracy should be taken before actual data collection. Besides, a pilot test is enabled to improve the clarity of questions, smooth the flow of questions, and examine the average time taken by each respondent to complete this survey.

Hertzog (2008) recommended that the number of participants for the pilot study be approximately 10% of the actual sample size for the study. For this pilot study, 50 participants, which is 10% of the total sample size were recruited who have relevant knowledge and can use NFC mobile payment are involved. Despite the number of respondents in the pilot study being less than expected and the real numbers in this survey, it is helpful to measure the survey before using the research instruments for the actual data. Any errors that emerged from the pilot test were fixed. The pilot test was carried out until no errors were found and further changes were made.

3.7 Data Collection Procedures

Primary data refers to the firsthand information obtained from respondents that is used in the research to collect information about the topic. The primary sources of data collection encompassed various methods such as observation, interviewing, and questionnaires. Primary data has not been published, changed, or altered by human beings so it is more reliable and valid (Kabir, 2016). The researcher used a questionnaire to collect the primary data from respondents in this research. The questionnaire is a tool commonly employed in research to gather data from respondents through a series of reformulated questions utilizing various scales (Sekaran *et al.*, 2019).

To estimate the NFC mobile payments acceptance of digital natives, an online survey was conducted from September 2023 to January 2024. Table 3 presents the timeline for data collection leading up to the pilot test and the subsequent main study.

Table 3 Collection period of data

Scale	Collection Period	Data Collected
Pilot Test	September 2023 – October 2023	50
Actual Test	November 2023 – January 2024	500

3.8 Data Analysis

After the data collection process, the gathered information was arranged and reviewed. The collected data was then compiled into an Excel file and systematically coded. To address the research questions, the Statistical Package for Social Sciences (SPSS), a computer application, was employed for analysis. The quantitative statistical software programs available in SPSS were utilized to achieve the research objectives. These objectives encompass reliability analysis, descriptive analysis, normality analysis, and correlation analysis.

3.8.1 Descriptive Analysis

Descriptive analysis serves as the initial stage in the overall data analysis process, aimed at presenting the data in a comprehensive and organized manner. This analysis encompasses two main categories: measures of central tendency and measures of variability. It is used to describe the profile of respondent which included gender, age, ethnicity, educational level, monthly income, state, district or division and the frequency of NFC mobile payment usage. Also, the dependent variable of intention to use NFC mobile payment as well as independent variables of perceived usefulness, perceived ease of use and perceived risk. In this research, the focus was on utilizing measures of central tendency to calculate the mean or average of the data. Table 4 shows the agreeableness level according to mean interpretation by Wiersma.

Table 4 Agreeableness level according to mean

Mean	Central Tendency Level
1.00 – 2.33	Weak
2.34 – 3.67	Moderate
3.68 – 5.00	High

Source: Wiersma Samsudin, Awang, and Ahmand (2017)

3.8.2 Reliability Analysis

Reliability refers to the ability to generate a consistent result in something (Zikmund, 2009), the level of accuracy in a measurement influences reliability. The purpose of the reliability test is conducted for pilot study and actual study to measure consistency. Reliability tests were used for pilot testing in this research to ensure that the study instruments were reliable. Tests should always use the same set of research instruments and be conducted on a group of people in the research population. Table 5 shows the rule of thumb for Cronbach's Coefficient Alpha.

Table 5 Rule of thumb on cronbach's alpha

Mean	Central Tendency Level
<0.6	Poor
0.6 to <0.7	Moderate
0.7 to <0.8	Good
0.8 to <0.9	Very Good
0.9>	Excellent

Source: Hair et al (2003)

3.8.3 Normality Test

Normality analysis is employed to assess the suitability of the data set for a normal distribution model and to ascertain the likelihood of the data conforming to such a distribution (Saunders, 2019). In assessing normality, statistical tests that are commonly utilized such as the Kolmogorov-Smirnov test (K-S) and the Shapiro-Wilk test (S-W). These tests help in determining the degree to which the data set aligns with a normal distribution.

The tests yield test statistics (D for Kolmogorov-Smirnov and W for Shapiro-Wilk), degrees of freedom (df), and a probability (p-value). A probability reported as 0.000 does not signify zero but rather indicates a value less than 0.001. If the probability or p-value exceeds 0.05, it suggests that the data is likely to follow a normal distribution. A p-value of 0.05 or lower indicates that the data is unlikely to be normally distributed.

3.8.4 Correlation Analysis

Correlation analysis is a statistical method used to evaluate the association between a dependent variable and multiple independent variables. In this study, the dependent variable is the intention to use NFC mobile payment, whereas the independent variables include perceived usefulness, perceived ease of use, and perceived risk. The correlation analysis normally used in the study included Pearson and Spearman correlation. The Pearson correlation is used if the data is normally distributed while the Spearman correlation is used if the data is not normally distributed. Table 6 presents the strength of the relationship between variables used to analyze the acquired outcomes.

Table 6 Correlation Coefficients

Correlation Coefficient	Strength Description
$\pm 0.81 - \pm 1.00$	Strongest
$\pm 0.61 - \pm 0.80$	Strong
$\pm 0.41 - \pm 0.60$	Moderate
$\pm 0.21 - \pm 0.40$	Weak
$\pm 0.00 - \pm 0.20$	Weak to No Relationship

Source: Hair et al (2010)

3.9 Conclusion

The researcher used a quantitative survey design in this study. The questionnaires were administered by the researcher to collect the data from a sample size of 500 respondents who are digital natives that use NFC mobile payment in Malaysia. The consent of respondents was obtained. During the administration of the surveys and the compilation of the findings, the researcher ensured the anonymity, discretion, and confidentiality of the respondents. The research process was explained and presented. Subsequently, study instruments were prepared and used primary data for data collection. With the use of descriptive statistics, data was examined. Then, by comparing collected data to a normal distribution with the same mean and standard deviation as the sample, the Kolmogorov-Smirnov test (K-S) and Shapiro-Wilk test (S-W) are intended to assess the normality of the data. The pie charts and bar graphs were used to illustrate the data once frequency tables were created.

4. Data Analysis and Results

Chapter 4 in the research embarks on a detailed exploration of the data collected during our study. This chapter is about the data analysis and findings for the questionnaires that have been distributed to the respondents through social networks. All of the data that was collected from respondents were analyzed by using Statistical

Package for Social Science (SPSS) software. Reliability analysis, demographic analysis, descriptive analysis, normality test and correlation analysis were discussed in this chapter.

4.1 Response Rate

The process of initiating a study on social networks involved sending questionnaires to potential participants either through private messages or by posting them on a timeline. The invitations included a brief explanation of the study and provided a link to the research. Respondents must fulfil all the characteristics of an NFC mobile payment user who belongs to Generations Y and Z (21 – 40 years old) and a consumer in Malaysia to fill in the questionnaire. Then, participants were asked to further share the questionnaire link with others in their network (Liébana-Cabanillas *et al.*, 2020). Thus, excluding individuals aged 21 and below from the study due to their status as high school students with no income.

Researcher distributed 500 questionnaires to individual digital natives aged 21 to 40 in Malaysia with the intention to use NFC mobile payment. The sample size in this study, consisting of 500 individuals, aligns with the recommendations of previous researchers who suggest a range of 300 to 500 when there's no sampling frame (Zikmund *et al.*, 2009). However, there are 500 sets of questionnaires that are successfully returned to researchers. The response rate of this study is 100%. The questionnaire's response rate is stated in Table 7 below.

Table 7 Response rate

Item	Description
Questionnaire distributed	500
Questionnaire form that returned to the researcher	500
Percentage of respondents' feedback	100%

4.2 Pilot Study

This pilot study aimed to assess the effectiveness of a questionnaire designed to measure digital natives' acceptance of NFC mobile payments. By assessing study feasibility and practicality of research, obtain valuable feedback from respondents through a pilot testing phase to refine and improve the questionnaire before its actual deployment. The study utilized a small sample of 50 participants who were representative of the target population. It has been used which was distributed from the sample size of the research conduct this pilot test. The result of the questionnaire was analysed using SPSS software.

Specifically, respondents provided feedback on the questionnaire's educational level options, expressing if the choices accurately represented their backgrounds and suggesting any missing categories. Thus, the researcher considered the suggestions made by respondents and revised the questionnaire accordingly. Adjustments included separation of SPM, Diploma, Foundation, Master and PhD options and adding new categories such as PMR, Matriculation in educational level. This iterative process not only improves the inclusivity of the questionnaire but also demonstrates the importance of respondent feedback in refining demographic variables to accurately reflect the diversity of the study population.

4.2.1 Descriptive Analysis for Pilot Test

The descriptive analysis of respondent chosen language for the questionnaire provides valuable insights into the linguistic preferences of the study participants. The data reveals that a significant majority, comprising 92.0% (46) of the sampled participants opted for the English language, while the remaining 8.0% (4) chose Malay.

Table 8 shows that the question designed in Section A is related to demographic information of the respondent. In general, questions related to gender, age, ethnicity, education level, monthly income, state, district or division and frequency of NFC mobile payment usage. All the data from the questionnaire answered has been analyze and the result were summarized in the table and pie chart as well that contains frequency and percentage.

Table 8 Demographic information of respondents collected for pilot study

Demographic Profile	Details	Frequency	Percentage (%)
Gender	Male	21	42.0
	Female	29	58.0
Age	21 – 25	28	56.0

	26 – 30	15	30.0
	31 – 35	5	10.0
	36 – 40	2	4.0
Ethnicity	Malay	18	36.0
	Chinese	25	50.0
	Indian	7	14.0
Educational Level	SPM	5	10.0
	STPM/Diploma/Foundation	10	20.0
	Degree	30	60.0
	Master/PhD	5	10.0
Monthly Income	Less than RM500	15	30.0
	RM501 to RM1000	5	10.0
	RM1001 to RM2000	6	12.0
	RM2001 to RM 3000	11	22.0
	RM3001 to RM4000	7	14.0
	RM4001 and above	6	12.0
State	Johor	9	18.0
	Melaka	9	18.0
	Negeri Sembilan	5	10.0
	Pahang	3	6.0
	Selangor	4	8.0
	Perak	4	8.0
	Pulau Pinang	4	8.0
	Kedah	3	6.0
	Terengganu	1	2.0
	Sabah	2	4.0
	Sarawak	1	2.0
	Wilayah Persekutuan Kuala Lumpur	5	10.0
District/ Division	Batu Pahat	2	4.0
	Johor Bahru	4	8.0
	Muar	2	4.0
	Segamat	1	2.0
	Alor Gajah	1	2.0
	Melaka Tengah	8	16.0
	Rembau	2	4.0
	Seremban	3	6.0
	Bentong	1	2.0
	Kuantan	1	2.0
	Raub	1	2.0
	Gombak	1	2.0
	Klang	2	4.0
	Petaling	1	2.0
	Hilir Perak	2	4.0
	Kinta	1	2.0

	Kuala Kangsar	1	2.0
	Northeast Penang Island	3	6.0
	Southwest Penang Island	1	2.0
	Baling	1	2.0
	Kota Setar	1	2.0
	Kulim	1	2.0
	Kuala Terengganu	1	2.0
	Sandakan	2	4.0
	Kuching	1	2.0
	Wilayah Persekutuan Kuala Lumpur	5	10.0
Frequency of NFC Mobile Payment Usage (per month)	I don't use NFC mobile payment	7	14.0
	1 to 5 times	13	26.0
	6 to 10 times	10	20.0
	11 to 15 times	4	8.0
	16 to 20 times	8	16.0
	More than 21 times	8	16.0

4.2.2 Reliability Analysis for Pilot Test

Reliability analysis was used to ensure the internal consistency of obtained data (Sekaran *et al.*, 2019) with cronbach's alpha (α) is the used to measure the reliability analysis.

Table 9 Reliability statistics for intention to use NFC mobile payment

Reliability Statistics		
Cronbach's Alpha	Alpha Based on Standardized Items	N of Items
0.812	0.821	5

Table 10 Item-total statistics for intention to use nfc mobile payment

Item-Total Statistics					
	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Cronbach's Alpha if Item Deleted
I1	16.60	7.796	0.592	0.394	0.782
I2	16.74	6.768	0.656	0.545	0.758
I3	16.86	6.776	0.508	0.536	0.814
I4	16.96	6.570	0.696	0.610	0.745
I5	16.60	7.429	0.599	0.607	0.777

The reliability test for intention to use NFC mobile payment is 0.812, which is very good (Hair *et al.*, 2003).

Table 11 Reliability statistics for perceived usefulness

Reliability Statistics		
Cronbach's Alpha	Alpha Based on Standardized Items	N of Items
0.888	0.892	5

Table 12 Item-total statistics for perceived usefulness

Item-Total Statistics					
	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Cronbach's Alpha if Item Deleted

PU1	17.32	5.977	0.742	0.571	0.863
PU2	17.24	5.329	0.763	0.656	0.857
PU3	17.08	5.871	0.775	0.651	0.856
PU4	17.20	5.592	0.773	0.615	0.854
PU5	17.24	5.860	0.620	0.457	0.891

The reliability test for perceived usefulness is 0.888, which is very good (Hair *et al.*, 2003).

Table 13 Reliability statistics for perceived ease of use

Reliability Statistics		
Cronbach's Alpha	Alpha Based on Standardized Items	N of Items
0.883	0.891	5

Table 14 Item-total statistics for perceived ease of use

Item-Total Statistics					
	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Cronbach's Alpha if Item Deleted
PEOU1	16.68	6.875	0.814	0.711	0.838
PEOU2	16.74	6.809	0.753	0.667	0.850
PEOU3	16.64	6.929	0.733	0.630	0.854
PEOU4	16.64	6.562	0.809	0.680	0.836
PEOU5	16.82	6.926	0.540	0.358	0.908

The reliability test for perceived ease of use is 0.883, which is very good (Hair *et al.*, 2003).

Table 15 Reliability statistics for perceived risk

Reliability Statistics		
Cronbach's Alpha	Alpha Based on Standardized Items	N of Items
0.955	0.955	5

Table 16 Item-total statistics for perceived risk

Item-Total Statistics					
	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Cronbach's Alpha if Item Deleted
PR1	11.84	26.015	0.792	0.683	0.958
PR2	11.68	23.855	0.919	0.873	0.937
PR3	11.96	24.529	0.823	0.708	0.954
PR4	11.78	23.236	0.940	0.899	0.933
PR5	11.94	24.670	0.905	0.840	0.940

The reliability test for perceived risk is 0.955, which is excellent (Hair *et al.*, 2003).

4.3 Actual Study

4.3.1 Descriptive Analysis for Demographic Profile

The examination of language selection among respondents in the questionnaire yields valuable insights into the linguistic preferences of study participants. The findings indicate a notable majority, with 483 (96.6%) of the sampled participants favoring the English language, while the remaining 17 (3.4%) opted for Malay.

Table 17 illustrates that questions in Section A pertain to the demographic information of the respondents, encompassing aspects such as gender, age, ethnicity, education level, monthly income, state, district or division,

and frequency of NFC mobile payment usage. The collected questionnaire responses have been analyzed, and the results are summarized in tabular formats, providing insights into frequency and percentage distributions.

Table 17 Demographic information of respondents collected for actual study - gender

Demographic Profile	Details	Frequency	Percentage (%)
Gender	Male	245	49.0
	Female	255	51.0

Table 17 depicts the number of respondents that have been categorized by gender. The respondents are categorized into two groups: male and female. The data reveals that out of the total respondents, there are 245 individuals who identify as male and 255 individuals who identify as female. This suggests that there is a lower participation frequency among males in this research compared to females. This is inferred from the fact that the percentage of male respondents (49.0%) is slightly less than the percentage of female respondents (51.0%). Thus, consider no gender bias or imbalance in the research sample size that can cause generalizable of the findings.

Table 18 Demographic information of respondents collected for actual study - age

Demographic Profile	Details	Frequency	Percentage (%)
Age	21 – 25	176	35.2
	26 – 30	147	29.4
	31 – 35	152	30.4
	36 – 40	25	5.0

Table 18 shows the number of respondents that have been categorized by age. Respondents are categorized into four age groups: 21-25 years old, 26-30 years old, 31-35 years old, and 36-40 years old. The age group with the highest representation is 21 to 25 years old, comprising 35.2% of the total respondents. Followed by 147 respondents (29.4%) aged 26 to 30 years old and 152 respondents (30.4%) age of 31 to 35 years old. The age group with the lowest representation is 36 to 40 years old, constituting only 5.0% of the total respondents.

With that, the majority of respondents fall within the 21 to 35 years old range, making up a significant proportion of the total sample. The term "digital natives" usually describes those who grew up with digital technology, and many in the 21 to 35 age range fit this description. This group came of age when technologies like the internet, smartphones, and social media became widely used.

Table 19 Demographic information of respondents collected for actual study - ethnicity

Demographic Profile	Details	Frequency	Percentage (%)
Ethnicity	Malay	219	43.8
	Chinese	200	40.0
	Indian	81	16.2

Table 19 illustrates the number of respondents that have been categorized by ethnicity. Respondents are categorized into three major ethnic groups: Malay, Chinese, and Indian. The number of Malay respondents have a total of 519 respondents (43.8%) while the total number of Chinese respondents is 200 (40.0%) out of 500. Besides that, the total number of Indian respondents is 81 (16.2%) out of 500.

The majority of respondents belong to the Malay ethnic group, followed by the Chinese ethnic group, with the Indian ethnic group having the smallest representation. Different ethnic groups may have distinct cultural norms and attitudes towards technology, financial transactions, and privacy. These cultural factors can influence the adoption of new payment technologies like NFC. Cultural backgrounds may impact people's trust in new technologies, with some ethnic groups being more or less receptive to adopting mobile payment solutions based on their historical experiences and perspectives.

Table 20 Demographic information of respondents collected for actual study – educational level

Demographic Profile	Details	Frequency	Percentage (%)
Educational Level	PMR	1	0.2
	SPM	42	8.4
	STPM	40	8.0
	Matriculation	16	3.2
	Foundation	16	3.2
	Diploma	83	16.6
	Degree	210	42.0
	Master	68	13.6
	PhD	24	4.8

Table 20 demonstrates the number of respondents that have been categorized by educational level. The majority of respondents are degree holders, which is 210 respondents and 42.0% of the total sample size. The sequence followed by respondents from diploma background as a second largest of respondents which is 83 persons or 16.6% of the respondents. The following respondents from Master background which is 68 respondents or 13.6%. There are 42 SPM respondents (8.4%), 40 STPM respondents (8.0%), and 24 PhD respondents (4.8%). Respondents with Matriculation and Foundation background have 16 respectively with 3.2% and only 1 PMR respondents (0.2%).

The data indicates a diverse distribution of respondents across various educational levels, with a significant portion having completed a degree. This observation prompts a deeper exploration into the potential implications of educational attainment on the utilization of NFC (Near Field Communication) mobile payment methods. Degree holders undergoing higher education might generally possess higher levels of digital literacy. This familiarity and comfort with technology, including mobile devices and digital payment methods, could contribute to higher NFC mobile payment usage. They might find it easier to learn and use these kinds of technologies.

Table 21 Demographic information of respondents collected for actual study – monthly income

Demographic Profile	Details	Frequency	Percentage (%)
Monthly Income	Less than RM500	62	12.4
	RM501 to RM1000	20	4.0
	RM1001 to RM2000	75	15.0
	RM2001 to RM 3000	129	25.8
	RM3001 to RM4000	105	21.0
	RM4001 and above	109	21.8

Table 21 demonstrates the number of respondents that have been categorized by monthly income. Respondents are categorized into different income brackets, ranging from less than RM500 to RM4000 and above. There are 62 respondents (12.4%) have monthly income less than RM500, 20 respondents (4.0%) have monthly income of RM501 to RM1000, 75 respondents (15.0%) have monthly income of RM1001 to RM2000, 129 respondents (25.8%) have monthly income of RM2001 to RM3000, 105 respondents (21.0%) have monthly income of RM3001 to RM4000, and 109 respondents (21.8%) have monthly income of RM4000 and above.

The data indicates a diverse distribution of respondents across various income levels, with a significant portion falling within the RM2001 to RM3000 range. This range potentially representing an average salary for certain segments of the population in Malaysia, underscores the nuanced nature of economic conditions within the country. However, it is important to note that the cost of living can vary across different regions. Individuals with higher incomes are more likely to own smartphones and other devices that support NFC technology. Therefore, access to the necessary technology is a prerequisite for using NFC mobile payments.

Table 22 Demographic information of respondents collected for actual study - state

Demographic Profile	Details	Frequency	Percentage (%)
State	Johor	103	20.6
	Melaka	52	10.4
	Negeri Sembilan	59	11.8
	Pahang	23	4.6
	Selangor	94	18.8
	Perak	13	2.6
	Perlis	10	2.0
	Pulau Pinang	72	14.4
	Kedah	6	1.2
	Kelantan	6	1.2
	Terengganu	8	1.6
	Sabah	4	0.8

Table 22 reveals the number of respondents that have been categorized by state. The data indicates a diverse distribution of respondents across various states, with Johor (103 respondents) having the highest representation. The states with the highest representation are Johor (20.6%), Selangor (18.8%), and Pulau Pinang (14.4%). There are among the more densely populated states in Malaysia. Higher population density often results in a larger pool of potential survey participants. Also, these states tend to have well-developed infrastructure and better connectivity, facilitating easier access to information and surveys conducted through various channels, including online platforms.

Meanwhile, the lowest number of respondents are from Sabah and Wilayah Persekutuan Putrajaya which are 4 respondents or 0.8% for each state. Kedah, Kelantan, Terengganu, Sabah, Sarawak, and Wilayah Persekutuan Putrajaya, each constituting less than 2% of the total respondents. These states, especially those in East Malaysia (Sabah and Sarawak), might have lower population density or less urbanization compared to states like Johor, Selangor, and Pulau Pinang. Some of these states are known for their rural characteristics, and residents in rural areas may have different levels of access to information and technology, potentially leading to lower survey participation.

Table 23 Demographic information of respondents collected for actual study - district or division

Demographic Profile	Details	Frequency	Percentage (%)
District/ Division	Batu Pahat	14	2.8
	Johor Bahru	47	9.4
	Kluang	1	0.2
	Kota Tinggi	26	5.2
	Mersing	1	0.2
	Muar	6	1.2
	Pontain	3	0.6
	Segamat	5	1.0
	Alor Gajah	1	0.2
	Melaka Tengah	49	9.8
	Jasin	2	0.4
	Jempol	1	0.2
	Kuala Pilah	2	0.4
	Port Dickson	7	1.4
	Rembau	4	0.8
	Seremban	45	9.0
	Bentong	1	0.2

Bera	2	0.4
Cameron Highlands	2	0.4
Kuantan	11	2.2
Lipis	2	0.4
Maran	1	0.2
Pekan	2	0.4
Raub	1	0.2
Rompin	1	0.2
Gombak	6	1.2
Hulu Langat	3	0.6
Hulu Selangor	13	2.6
Klang	8	1.6
Kuala Langat	22	4.4
Kuala Selangor	24	4.8
Petaling	9	1.8
Sabak Bernam	2	0.4
Sepang	7	1.4
Began Datuk	1	0.2
Hilir Perak	3	0.6
Hulu Perak	2	0.4
Kerian	1	0.2
Kinta	2	0.4
Kuala Kangsar	2	0.4
Perak Tengah	2	0.4
Perlis	10	2.0
Seberang Tengah	6	1.2
North Seberang Perai	4	0.8
Northeast Penang Island	22	4.4
South Seberang Perai	28	5.6
Southwest Penang Island	12	2.4
Kota Setar	2	0.4
Kuala Muda	1	0.2
Kulim	2	0.4
Langkawi	1	0.2
Bachok	1	0.2
Kota Bharu	2	0.4
Kota Krai	2	0.4
Tanah Merah	1	0.2
Besut	1	0.2
Kuala Nerus	1	0.2
Kuala Terengganu	3	0.6
Marang	1	0.2
Setiu	2	0.4
Sandakan	2	0.4

Tawau	2	0.4
Miri	1	0.2
Sarikei	2	0.4
Sibu	1	0.2
Sri Aman	1	0.2
Wilayah Persekutuan Kuala Lumpur	41	8.2
Wilayah Persekutuan Putrajaya	4	0.8

Table 23 indicates the number of respondents that have been categorized by district or division. Melaka Tengah in Melaka emerges as the district with the highest number of respondents, totaling 49 individuals. This constitutes 9.8% of the total sample. The sequence followed by respondents from Johor Bahru was located in Johor as a second largest of respondents of 47 or 9.4%. The following respondents from Seremban with 45 respondents or 9.0%.

The data reveals a diverse representation of respondents from a multitude of districts and divisions across Malaysia. Urban districts or divisions may have higher adoption rates due to better access to technology, greater awareness of digital payment methods, and a higher concentration of businesses that accept NFC payments. Certain regions stand out with higher respondent frequencies, such as Melaka Tengah (9.8%), Johor Bahru (9.4%), and Seremban (9.0%). While, rural districts may face challenges related to technological infrastructure and awareness.

Table 24 Demographic information of respondents collected for actual study – state

Demographic Profile	Details	Frequency	Percentage (%)
Frequency of NFC Mobile Payment Usage (per month)	I don't use NFC mobile payment	31	6.2
	1 to 5 times	97	19.4
	6 to 10 times	74	14.8
	11 to 15 times	94	18.8
	16 to 20 times	71	14.2
	More than 21 times	133	26.6

Table 24 indicates the number of respondents that have been categorized by frequency of NFC mobile payment usage. A notable segment of respondents, comprising 6.2% (31 respondents) of the total sample, indicates that they don't use NFC mobile payment at all. There are 97 respondents (19.4%) use 1 to 5 times NFC mobile payment, 74 respondents (14.8%) use 6 to 10 times NFC mobile payment, 94 respondents (18.8%) use 11 to 15 times NFC mobile payment, 71 respondents (14.2%) use 16 to 20 times NFC mobile payment. The data highlights a substantial proportion of 133 respondents (26.6%) who use NFC mobile payments more than 21 times per month.

Frequency of usage provides a tangible measure of actual behavior. By examining how often individuals use NFC mobile payments, researchers gain insights into real-world adoption patterns. High frequency of usage may indicate a higher level of user comfort and positive experiences with NFC mobile payments. Individuals who use this technology frequently likely find it convenient, reliable, and satisfying. On the other hand, low or no usage may suggest potential barriers, concerns, or dissatisfaction that need exploration.

4.3.2 Descriptive Analysis for Intention to Use NFC Mobile Payment, Perceived Usefulness, Perceived Ease of Use and Perceived Risk

This study primarily employed measures of central tendency to compute the mean or average of the data. The interpretation of agreeableness levels based on mean values, as per the classification by Wiersma, Samsudin, Awang, and Ahmand (2017).

Table 25 Descriptive analysis for intention to use nfc mobile payment, perceived usefulness, perceived ease of use and perceived risk

Descriptive Analysis					
	Intention To Use NFC Mobile Payment	Perceived Usefulness	Perceived Ease of Use	Perceived Risk	
N	Valid	500	500	500	500
	Missing	0	0	0	0
Mean		3.9680	4.0172	3.9364	3.6444
Std. Deviation		0.77118	0.73554	0.80770	1.02005
Minimum		1.00	1.00	1.00	1.00
Maximum		5.00	5.00	5.00	5.00

Table 25 illustrated the overall mean for dependent and independent variables. The highest observed overall mean is 4.0172 in PU with a corresponding standard deviation of 0.73554. Mean levels falling between 3.68 and 5.00 are considered high in agreeableness.

In contrast, the lowest overall mean is associated is PR registering a mean of 3.6444 and a standard deviation of 1.02005. The interpretation is that the agreeableness level is moderate where mean between 2.34 and 3.67.

Consequently, the overall mean for intention to use NFC mobile payment is 3.9680 with the standard deviation of 0.77118. The overall mean for PEOU is 3.9364 with the standard deviation of 0.80770. The agreeableness levels for intention to use NFC mobile payment and perceived ease of use falls under high central tendency level.

4.3.3 Reliability Analysis for Actual Study

Table 26 Reliability statistics for intention to use nfc mobile payment

Reliability Statistics		
Cronbach's Alpha	Alpha Based on Standardized Items	N of Items
0.794	0.796	5

Table 27 Item-total statistics for intention to use nfc mobile payment

Item-Total Statistics					
	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Cronbach's Alpha if Item Deleted
I1	15.82	9.941	0.643	0.429	0.735
I2	15.73	10.078	0.585	0.379	0.752
I3	15.95	9.797	0.562	0.341	0.760
I4	15.99	10.254	0.513	0.279	0.775
I5	15.87	9.954	0.575	0.352	0.755

The reliability test for intention to use NFC mobile payment is 0.794, which is good (Hair *et al.*, 2003).

Table 28 Reliability statistics for perceived usefulness

Reliability Statistics		
Cronbach's Alpha	Alpha Based on Standardized Items	N of Items
0.812	0.812	5

Table 29 Item-total statistics for perceived usefulness

Item-Total Statistics					
	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Cronbach's Alpha if Item Deleted
PU1	15.99	9.210	0.630	0.431	0.767
PU2	16.04	8.776	0.599	0.429	0.776
PU3	15.99	8.381	0.678	0.499	0.749
PU4	16.18	9.513	0.550	0.340	0.789
PU5	16.15	9.441	0.544	0.319	0.791

The reliability test for perceived usefulness is 0.812, which is very good (Hair *et al.*, 2003).

Table 30 Reliability statistics for perceived ease of use

Reliability Statistics		
Cronbach's Alpha	Alpha Based on Standardized Items	N of Items
0.849	0.850	5

Table 31 Item-total statistics for perceived ease of use

Item-Total Statistics					
	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Cronbach's Alpha if Item Deleted
PEOU1	15.60	10.970	0.705	0.504	0.807
PEOU2	15.76	10.730	0.654	0.443	0.819
PEOU3	15.72	10.966	0.598	0.367	0.835
PEOU4	15.82	10.461	0.713	0.518	0.803
PEOU5	15.83	11.034	0.630	0.398	0.826

The reliability test for perceived ease of use is 0.849, which is very good (Hair *et al.*, 2003).

Table 32 Reliability statistics for perceived risk

Reliability Statistics		
Cronbach's Alpha	Alpha Based on Standardized Items	N of Items
0.906	0.906	5

Table 33 Item-total statistics for perceived risk

Item-Total Statistics					
	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Cronbach's Alpha if Item Deleted
PR1	14.62	17.575	0.740	0.629	0.890
PR2	14.54	16.742	0.775	0.651	0.882
PR3	14.54	16.902	0.748	0.586	0.889
PR4	14.62	16.908	0.789	0.651	0.880
PR5	14.57	17.072	0.767	0.669	0.884

The reliability test for perceived risk is 0.906, which is excellent (Hair *et al.*, 2003).

4.3.4 Normality Test

Normality analysis is utilized to evaluate whether the dataset is appropriate for a normal distribution model and to determine the likelihood of the data adhering to such a distribution. The Kolmogorov-Smirnov test (K-S) and the Shapiro-Wilk test (S-W) are two frequently used tests for normality, aiding in assessing the extent to which the dataset conforms to a normal distribution. Before correlation analysis normality test become a key step to decide whether a data set is well modelled by normal distribution and calculate how the variable under data set is normally distributed.

Table 34 Descriptives

Descriptives		Statistic	Std. Error
	Mean	3.9680	0.03449
95% Confidence Interval for Mean	Lower Bound	3.9002	
	Upper Bound	4.0358	
	5% Trimmed Mean	4.0413	
Overall Mean	Median	4.2000	
Intention to Use NFC Mobile Payment	Variance	0.595	
	Std. Deviation	0.77118	
	Minimum	1.00	
	Maximum	5.00	
	Range	4.00	
	Interquartile Range	0.40	
	Skewness	-1.704	0.109
	Kurtosis	3.228	0.218

The descriptive is not informative as established tests for normality that take into account both Skewness and Kurtosis simultaneously.

Table 35 Tests of normality

	Tests of Normality					
	Kolmogorov-Smirnov ^a			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
Overall Mean						
Intention to Use NFC Mobile Payment	0.269	500	0.000	0.811	500	0.000

The normality test is significant, where the p-value for intention to use NFC mobile payment is 0.000 which is less than 0.05. In this case the data is non-normal. Thus, this data is not normally distributed, the research will proceed with the Spearman correlation analysis.

4.3.5 Correlation Analysis

Correlation analysis, a statistical method employed in this study, assesses the relationship between a dependent variable (Intention to use NFC Mobile Payment) and several independent variables (Perceived Usefulness, Perceived Ease of Use, and Perceived Risk).

Before the correlation analysis can be executed, the test of normality will be carried out first to identify whether the test results obtained are parametric or nonparametric. Based on the data distribution which is shown by Kolmogorov-Smirnov and Shapiro-Wilk, can conclude that the normality test results are not normal as the p-value is < 0.01. With that, the correlation analysis that will be used is Spearman.

Table 36 Results of Spearman' Correlations

		Correlations				
		Overall Mean Intention to Use NFC Mobile Payment	Overall Mean Perceived Usefulness	Overall Mean Perceived Ease of Use	Overall Mean Perceived Risk	
Spearman's rho	Overall Mean Intention to Use NFC Mobile Payment	Correlation Coefficient	1.000	0.689**	0.650**	0.332**
		Sig. (2-tailed)	.	0.000	0.000	0.000
		N	500	500	500	500
	Overall Mean Perceived Usefulness	Correlation Coefficient	0.689**	1.000	0.606**	0.318**
		Sig. (2-tailed)	0.000	.	0.000	0.000
		N	500	500	500	500
	Overall Mean Perceived Ease of Use	Correlation Coefficient	0.650**	0.606**	1.000	0.452**
		Sig. (2-tailed)	0.000	0.000	.	0.000
		N	500	500	500	500
	Overall Mean Perceived Risk	Correlation Coefficient	0.332**	0.318**	0.452**	1.000
		Sig. (2-tailed)	0.000	0.000	0.000	.
		N	500	500	500	500

**. Correlation is significant at the 0.01 level (2-tailed).

Table 36 shows correlations between intention to use NFC mobile payment and perceived usefulness, perceived usefulness, perceived ease of use, perceived risk. The correlation between PU and intention to use NFC mobile payment is 0.689 and p-value < 0.01. So, there is a strong relationship and positive correlation between IV and DV and significant. Therefore, H₁ is supported.

Second, it can be interpreted that the correlation between PEOU and intention to use NFC mobile payment is 0.650 and p-value < 0.01. So, there is a strong relationship and positive correlation between IV and DV and significant. Therefore, H₂ is supported.

Third, the results of the correlation between PR and intention to use NFC mobile payment is 0.332 and p-value < 0.01. So, there is a weak relationship and positive correlation between IV and DV and significant. Therefore, H₃ is supported.

4.4 Summary of Hypothesis

Based on the correlation analysis results, hypothesis testing results for H₁, H₂ and H₃ are shown in Table 37 as below:

Table 37 Summary of hypotheses

Hypothesis	Result	Interpretation
H ₁ : Perceived usefulness has a positive correlation with intention to use NFC mobile payment.	Supported	Strong
H ₂ : Perceived ease of use has a positive correlation with intention to use NFC mobile payment.	Supported	Strong
H ₃ : Perceived risk has a positive correlation with intention to use NFC mobile payment.	Supported	Weak

4.5 Conclusion

In this chapter, the data have been analyzed and the five main categories in the questionnaire have been discussed. The categories are the demographic information of respondents, intention to use NFC mobile payment, perceived usefulness, perceived ease of use and perceived risk. Both the pilot study and the actual study's reliability analyses show an acceptable level of reliability. Most of the respondents agreed that the usefulness of this technology has a significant impact on the intention to use NFC mobile payment. Based on the result of the normality test, there is a non-normal distribution, and the Spearman correlation analysis is used in the study. Overall, the aim of the study is to evaluate the relationship between intention to use NFC mobile payment and perceived usefulness, perceived ease of use and perceived risk. The study discovered all hypotheses which are H₁, H₂ and H₃.

5. Discussion and Conclusion

This chapter summarizes and discusses the results obtained in the research study which is separated into four sections. The first section contributes to an overview of the study. The second section deals with the research objectives followed by the research limitations as a whole, as a result of this study. Lastly, the fourth section discusses research recommendations and future study based on the results to improve future related research. In general, this chapter aims to cover-up the end result of the study.

5.1 Overview of Study

This study examined the factors that influencing the intention to use NFC mobile payment among digital natives in Malaysia. The purpose of this research is to identify the relationship between perceived usefulness, perceived ease of use and perceived risk with the intention to use NFC mobile payment. Moreover, in this research, the respondents are the users of NFC mobile payment, specifically individual that grown up in digital era in Malaysia. The research is done using quantitative research methods whereby the researchers use questionnaires, which are created and executed on Google Forms and distributed on social networks. Researchers received 500 questionnaires at the end of the survey between the ages of 21 to 40.

To get the data analysis involves employing descriptive statistics and assessing the impact of uncertainty through the use of SPSS software. The researcher continues to meticulously analyze the gathered data, incorporating Spearman Correlation to explore relationships among various variables. The findings indicate a robust correlation between perceived usefulness and perceived ease of use with the intention to use NFC mobile payment. Conversely, the relationship between perceived risk and the intention to use NFC mobile payment is comparatively weaker. The efficient utilization of resources and tools, such as SPSS, has enabled the timely completion of this research within a relatively short timeframe.

The anticipated results would be derived from empirical research and data analysis. It suggests that digital natives in Malaysia are likely to adopt NFC mobile payment if they perceive it as beneficial. A positive correlation between perceived ease of use and intention to use NFC mobile payment would imply that the ease with which digital natives can use this payment method influences their intention to adopt it. Conversely, it suggests that concerns or perceived risks associated with this payment method may deter digital natives from adopting it.

5.2 Discussion

5.2.1 Relationship between perceived usefulness and intention to use NFC mobile payment among digital natives in Malaysia

Research objective 1 was explored and understand the significant influence of perceived usefulness on the intention to use NFC mobile payment among digital natives in Malaysia. Spearman correlation analysis was used to answer this aim. The findings have shown that the correlation coefficient for perceived usefulness is 0.689, meaning that there is a strong relationship and positive correlation between perceived usefulness and intention to use NFC mobile payment. It supported by the hypothesis 1 is accepted where perceived usefulness has a positive correlation with intention to use NFC mobile payment. Thus, it suggests that the context can shape consumers' perception of the usefulness of NFC mobile payments for their transactions.

Besides that, perceived usefulness significantly influences consumer acceptance of NFC mobile payments (Zhang *et al.*, 2023 and Sun *et al.*, 2021). The research has not only underscored the importance of convenience in NFC mobile payments but has also established a significant connection between the practicality of such transactions and consumers' willingness to adopt this technology (Aris *et al.*, 2022 and Lin *et al.*, 2020). The finding discovered that Generation Y and Z perceived greater usefulness in NFC mobile payments when the usage is transparent, comprehensible, and the payment steps are straightforward (Agárdi *et al.*, 2022).

Therefore, the perceived usefulness could facilitate a convenient, applicable, and fast checkout process through mobile payments are major motivations for consumers to adopt it.

The conclusion that can be drawn for the first research objective is that perceived usefulness has the highest impact on the intention to use NFC mobile payment. This is due to the fact that the overall mean for perceived usefulness is higher than intention to use NFC mobile payment, which represents the users perceived the NFC mobile payment system as a useful mode, quicker and more efficient payments of transaction process had a higher impact on openness to adoption and utilization of NFC mobile payments in the future.

5.2.2 Relationship between perceived ease of use and intention to use NFC mobile payment among digital natives in Malaysia

Research objective 2 was explored and understand the significant influence of perceived ease of use on the intention to use NFC mobile payment among digital natives in Malaysia. The Spearman Correlation result that tested the relationship between perceived ease of use and intention to use NFC mobile payment shows a p-value of 0.650. There is a strong relationship and positive correlation between perceived ease of use and intention to use NFC mobile payment. It supported by the hypothesis 2 is accepted where Perceived ease and use has a positive correlation with intention to use NFC mobile payment. It emphasizing the importance of user-friendly experiences in influencing behavior.

Research has consistently demonstrated that PEOU positively impacts the intention to use NFC mobile payment. This suggests that the adoption of mobile payment methods is more likely when individuals can use them swiftly and effortlessly without requiring extensive learning (Almaiah *et al.*, 2022). With that, given they familiarity with multiple mobile payment platforms, most users are technologically proficient, making the ease of use a less critical factor influencing adoption (Ling, Lim, Wong and Lee, 2024) compare to usefulness. An alternative explanation is that NFC mobile payment transactions involve fewer steps compared to other mobile payment systems. Consequently, the majority of customers perceive NFC mobile payments as straightforward, demanding minimal effort to comprehend. Thus, the level of comfort a person experiences when using mobile technology for NFC payments is crucial.

The second research objective can be concluded by drawing from the results presented in Chapter 4. The results of the descriptive analysis in Chapter 4 show that the overall mean for perceived ease of use are slightly higher than the overall mean for intention to use NFC mobile payment. This shows that the steps in the NFC mobile payment process is perceived as easy and the procedure is clear and understandable had slight impact on the intention to use this payment method compared to perceived usefulness.

5.2.3 Relationship between perceived risk and intention to use NFC mobile payment among digital natives in Malaysia

Research objective 3 was explored and understand the significant influence of perceived ease of use on the intention to use NFC mobile payment among digital natives in Malaysia. Spearman correlation analysis was used to answer this aim. The correlation result between perceived risk and intention to use NFC mobile payment shows a p-value of 0.332. It indicates weak relationship and positive correlation between the variables. As such hypothesis 3 is supported where perceived risk has a positive correlation with intention to use NFC mobile payment. This suggests that perceived risk may not be a significant factor influencing the intention to use NFC mobile payment in the context under study.

The study also poses significant security and privacy risks affect the intention to use NFC mobile payments (Ling *et al.*, 2024). Consumers are increasingly conscious of the threat of identity theft, resulting in a hesitancy to utilize NFC mobile payments. The result is further supported that the direct influence of perceived risk on consumer willingness to adopt NFC mobile payment. Notably, in Malaysia, heightened security concerns (Chuah *et al.*, 2019) stress the importance of user attention to authenticity and non-repudiation. The discussion emphasizes the need for users to pay close attention to security issues, focusing on authenticity and non-repudiation for secure transactions. Zhang *et al.* (2023), the study also found that perceived risk did not significantly affect consumer acceptance. Despite concerns, NFC's popularity grows due to convenience and user-friendly characteristics.

The conclusion can be drawn from the results presented in Chapter 4, which concern the relationship between perceived risk and intention to use NFC mobile payment. The results obtained show that using NFC mobile payment is perceived as potentially increasing financial risks, concern of unauthorized access to linked cards and fraud have lesser impact on intention to use NFC mobile payments.

5.3 Discussion Limitation of Study

There are some challenges and limitations to complete this research. The first of the study's shortcomings is its inability to generalize its results. The data collection is limited to Malaysia where the findings may not represent the willingness to adopt NFC m-payment in other economies. The reason is that countries vary considerably in terms of culture, degree of development, and other factors that may affect the acceptance of mobile technology.

Second, the study restricts its scope to the examination of NFC mobile payment only. Explore by comparing the results with other mobile payment systems like QR codes or biometrics would be an interesting expansion of our research. This limitation narrows the comprehensive understanding of digital natives' acceptance behaviors across various mobile payment platforms.

Third, the study primarily focuses on digital natives, a specific demographic group characterized by their familiarity and comfort with digital technologies. As a result, the findings potentially limit the generalizability of findings to other age groups or demographics less accustomed to technology. Digital natives exhibit unique behaviors influenced by their digital upbringing, and these behaviors may not necessarily generalize to older generations or individuals less accustomed to technology.

5.4 Recommendations

An imperative need for recommendations to improve the shortage of research. Future researchers may perform a comparative study to expand the scope of the study by gathering data from other countries. The reason is that countries are very different in their culture, level of development, and other factors that can influence how people accept and use mobile technology. However, this may introduce a potential source of bias as it is unclear how individuals do not use these methods of payment. To address this issue in future studies, it could broaden their investigation by conducting a comparative analysis and collecting data from additional countries to enhance the study's scope.

Furthermore, this research only focuses on examining mobile payment paving the way for future investigations to extend their scope. Future research would be to compare our findings with other mobile payment systems, such as QR codes or biometrics. Also, target m-payment users to identify the intention to use NFC mobile payments. Thus, it can explore additional variables, such as risk, the presence of alternatives, and security, as independent variables for predicting the intention to adopt.

Last but not least, diversify the sample population. Broaden participant inclusion across diverse age groups, technological familiarity levels, and demographic backgrounds to ensure a representative and inclusive sample, thereby strengthening the external validity of the study. To add on, conduct a comparative analysis by examining digital natives alongside older generations or individuals less familiar with technology. This allows for a nuanced understanding of how acceptance behaviors differ across demographic segments, providing insights into potential generational or technological adoption trends.

5.5 Conclusion

In a nutshell, the purpose of this study is to examine the factors that affect the intention to use NFC mobile payment among digital natives in Malaysia. An extended TAM model with perceived risk has been used in this study to predict the intention to use NFC mobile payment. This study shows that there is a considerable correlation between perceived usefulness, perceived ease of use and perceived risk with intention to use NFC mobile payment. The findings of this study suggest that PU and PEOU have a significant strong positive relationship with the intention to use NFC mobile payment. While, PR has a weak positive relationship with intention to use NFC mobile payment. Through data analysis and discussion, the objectives of the research have been achieved and are supported by previous research.

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Conflict of Interest

Authors declare that there is no conflict of interests regarding the publication of the paper.

Author Contribution

*The authors confirm contribution to the paper as follows: **study conception and design:** Y.C.W. and N.M.N.; **data collection:** Y.C.W.; **analysis and interpretation of results:** Y.C.W. and N.M.N.; **draft manuscript preparation:** Y.C.W. and N.M.N.. All authors reviewed the results and approved the final version of the manuscript.*

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