FACTORS INFLUENCING CONSUMERS' INTENTION ON ADOPTION TOWARDS NFC MOBILE WALLET

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List of Abbreviations

NFC	Near Field Communication
HMSAM	Hedonic Motivation System Adoption Model
DOI	Diffusion of Innovation
TAM	Technology Acceptance Model
UTAUT	Unified Theory of Acceptance and Use of Technology
USD	United Stated Dollar
CAGR	Compound Annual Growth Rate
AC	Absorptive Capacity
C	Curiosity
J	Joy
DEF	Design Expectations Fits
DA	Design Aesthetics
IA	Intention towards Adoption of NFC Mobile Wallet
AVE	Average variance extracted

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PREFACE

This research project is submitted in partial fulfillment of the requirements for the Bachelor of Degree in Marketing. This research project is made up of the effort done from January 2019 until August 2019. This research project was supervised by Mr. Garry Tan Wei Han and written by Ms. Hor Hui Ling, Ms. Teo Su Xian, Mr. Ho Sau Kit, Mr. Tan Junn Hann, and Mr. Wong Wei Lun.

ABSTRACT

This study is investigating on the elements or factors influencing consumers' intention on adoption towards NFC mobile wallet.Based on the research, it shows that there are 57% of Malaysian used a smartphone, and it will be estimated to increase in the following years by 1% (Statista, 2019). Since the percentage diffusion of smartphones will be increase, thus it enhances the opportunities in creating a value added payment method to customers.

The NFC can be explained by wireless data transfer that detects the communication without the need of internet connection. NFC mobile wallet is a contactless payment; the explanations on the factors influencing adoption of NFC have been including HMSAM, MISC, and additional construct, which is absorptive capacity. Since there are many of the research are focusing on the basic foundation theory of DOI, TAM, and UTAUT, so the study will address the technology acceptance in intrinsic and extrinsic motivation. 300 questionnaires distribute randomly to shoppers, but only 297 are usable.

This paper is able to enhance the literature on user-related factors and system-specific factors in the NFC mobile payments. It delivers valuable recommendation to researchers in their investigation on the issues related to the NFC mobile payment. It also brings some managerial implications by assist the advertising campaign, designation of the mobile wallet by focusing on target market's expectation and needs, and its appearances.

CHAPTER 1: RESEARCH OVERVIEW

1.1 Research Background

The history of **mobile payment** is dated back in year 2004, whereby FeliCa Networks has joint ventured with Sony Corporation and NTT DoCoMo Inc., enabling contactless payment (Kharif& Chen, 2018). As being defined by Gao and Waechter (2015), m-payment is a point-of-sales payment made via portable electronic devices, such as smartphones, tablets, smart watches and etc, over mobile network. It is also described as payments being made for products, services and utility bills through mobile devices by employing wireless and other alternatives communication methods (Leong, Hew, Tan &Ooi, 2013).

As highlighted by World Economic Forum (2017), **growing market for mobile payment** has reached an increased rate of 39.2% Compound Annual Growth Rate (CAGR). Solely on United States, it is forecasted to reach USD 128 billion in year 2021 (Toplin, 2018). Moreover as mentioned in McKinsey & Company October article (2018), stated that global payments revenue is estimated to surge to USD 3 trillion within five years time and Asia-Pacific market is dominating nearly half of the revenues.

Merely on NFC mobile wallet itself, in year 2015, in an article contributed by Convenience Store Decisions (2015), it stated Deloitte was forecasting **volumeof adoption and spending** using NFC-smartphones should be risen gradually once consumers are more familiar with the procedures and usage. Meanwhile, as found in Khalilzadeh et al. (2017), transaction value of NFC m-payment in year 2015 has hit USD 8.71billion. Also during the year, Samsung has launched Samsung Pay (NFC-based m-payment system) in its high-end

smartphones products (The Star, 2019). As dated in 2018, solely in Korea, it has surpassed 10 million users and contributing USD 17.02 billion to the accumulated transaction values. According to CisionPRWeb (2019), only 22% of card issuers are offering contactless cards, but 67% are planning to go for this offering in the future years. Besides that, it also mentioned NFC-based m-payment like Apple Pay and others are expected to spur adoption rate. Further discussing on another supporting statistics found by eMarketer (2018), merely China's market itself, it is forecasted to account for 56% of proximity m-payment users in year 2021. NFC has been widely adopted by industry such as transportation, entertainment (i.e. theme park, music festival), as seen taking advantages on convenience and efficiency it offers (Liebana-Cbanillas et al., 2018; The Star, 2019). Companies can offer smooth checkout process and efficient queue management; meanwhile, enriching customer service experiences (Lefter, 2013).

Narrowing down to Malaysia market, as stated in the quarterly bulletin of Bank Negara Malaysia (2018), mobile phones could act as a mean to facilitate payments in the country without any additional infrastructure costs. It is attributable to the high penetration rate of mobile phones in the country. Also supported by statistics of the CAGR of financial transactions via mobile banking has risen up to 91% for the past seven years (Bank Negara Malaysia, 2018). Hence, it is able to indicate that there is a rose of Malaysians' familiarity on payment transactions via mobile channels. Besides that, the **government** of the nation has established **initiatives** on migrating existing payment landscapes to m-payment. From 1st wave: 2013-replacing cheques with e-fund transfer, to; 2nd wave: 2015-replacing cash via debit cards; and followed by 3rd wave: 2018-eliminating cash and cheques by encouraging mobile payment (Bank Negara Malaysia, 2018). In conjunction with the initiatives, the ecosystem of m-payment in this nation is expected to become more vibrant as there is seen to have surging of newly entrants and innovative mobile payment solutions.

As reported by Liu (2019) in an article in Oriental Daily, it stated several **major digital wallet players in Malaysia market**, consisting Alipay, WechatPay, PayPal, Maybank QRPay, GrabPay, Boost, Fave Pay, Touch'n Go eWallet and etc. Instead of solely offering

hassle-free payment services, most of them are able to track and store rewards earned per transactions, enhancing m-payment service experience (Burnette. 2018).

So, what is NFC mobile wallet?According to Dragovic, Stankov and Vasiljevic (2018), Near Field Communication (**NFC**) is a technology developed from Radio Frequency Identification (RFID) technology, whereby, it can works within short distance.Also explained by Ramos-de-Luna, Montoro-Rios and Liebana-Cabanillas (2016), NFC is initially developed by Sony and Philips in aiming for enabling transaction of data from both sender and receiver within 10cm distance. Similarly, Ramos-de-Luna et al. (2016) did stated NFC feature is still functioning even mobile devices are turned off.

Dragovic et al. (2018) highlighted the **differentiation of NFC** comparing to other m-payment alternatives is on its fast set-up ability, better functionality, which then lead to enhanced customer experience. Other attractions of NFC are with minimum effort required by users; it offers speed and secures purchasing transactions by just waving or touching mobile devices with contactless point-of-sales terminals (Pham &Ho, 2015). According to Khalilzadeh, Ozturk and Bilgihan (2017), they mentioned that NFC system uses low power consumption and wide range of availability and uses (executed in any existing mobile terminals).

1.2 Research Problem

In fact with so much potentials and expectations have been documented through the past researches, yet the **adoptionrates are still not reaching massive utilization** and lower than other mode of m-payment options (Tan et al., 2013; Pham & Ho, 2015). Nielsen Malaysia (2019) has found 67% of Malaysian consumers are using various form of cashless

payments, including credit or debit card, online banking and only 8% using mobile wallet. Worst still, NFC is seemed to be stalled at the position since in it was introduced, even the late comers (i.e. QR codes) has gain more usage rate than NFC m-payment (The Star, 2018). As being agreed by both industry and retail experts predicting future trends of m-payment, investments made has gone stagnant, in which, leading to frustration and doubt of business operators (Convenience Store Decisions, 2015; Ooi& Tan, 2016). Tan et al., (2013), also further elaborated that infrastructures supporting on NFC m-payment has been available in the market since year 2010, but the market is still skeptical on its adoption. Moreover, according to Sharma, Mangla, Luthra and Al-Salti (2018), less significant adoption rate of the growing mobile wallet technology is partly due to several factors inhibiting users to embrace the innovation. Also, as mentioned by Lee (2019), the reasoning behind low adoption rate in Malaysia market also including users' confusion due to cluttering of digital wallet apps, subpar internet coverage and etc.

Besides that, as reported in an article of The Star (2019), RAM Ratings stated market **competition** for mobile payment in Malaysia will be intense although it is still in infant phase, as 48 non-bank digital money issuers have granted licenses from Bank Negara. With such low adoption rates and emerging players, **sustainability** of digital wallet company in the industry has become concern. Sustainability will only be achieved when users are willing to use and have **continuance** intention, or else companies will be dumping lots of funding in building market share and surviving in the intense market competition, even it is a loss-making business (Lee, 2019; The Star, 2019).

Great expectations should not come with great loss. Regardless huge potentials portrayed by NFC, its successful emergence are depending on consumers' widespread adoption (Ooi& Tan, 2016). Thus, in order to make investments and forecast a worth, businesses should understand underlying reasons and factors influence consumers to adopt NFC-based m-payment as their mobile wallet. In which circumstance will encourage consumers to have intention in using it.

1.3 Research Objectives

Prior to previous literature research, this study is pursuing to address the following objective:

- To determine elements or factors influencing consumers' intention adoption towards NFC mobile wallet.

1.4 Research Questions

As to attain the mentioned research objectives, the following research questions should be answered beforehand:

- What are the factors influencing consumers intentions on adoption towards NFC mobile wallet?
- How the mentioned factors affect the intentions on the adoption?

1.5 Research Significance

Although there is many research have been done on factors influencing on the adoption of mobile payments and mobile wallets options, but much effort is on conducting analysis about security, trust and cost factors. In which, not much is being discussed on user-related factors and system-specific factors. Nielsen (2018) suggested that sustainability requires companies understanding and empathizing on consumers' concerns and how their

products can offer solutions for enhanced lifestyle. Hence, studying user-related factors enable company to have insights on further sustainability in the industry. As for system specific factors, it is refer as characteristics, features and context of technology or information system (Hong, Chan, Thong, Chasalow and Dhillon, 2014). In which, it also plays significant role in studying adoption level of mobile wallets.

Besides that, as mentioned by Pham and Ho (2015), little emphasis is being put on in **encouraging usage on this form of m-payment**. Since success of NFC adoption is depends on users' awareness and behavior on the intention to use NFC as their mobile wallet, user-related factors and system-specific factors will be studied in this paper (Ooi& Tan, 2016).

Furthermore, in conjunction with Malaysia's government initiatives in transformation Malaysia payment landscape to mobile payment, the mobile payment market will become more competitive than ever (Bank Negara Malaysia, 2018). Hence, understanding the underlying intention in adopting NFC m-payment, is able to **aid company cater better personalization and standout in the clutter**. The findings of this study can lead to **effective and efficient** formulation on marketing-related strategy in encouraging consumer adoption of related m-payment technology. In terms of academic contribution, findings are able to **facilitate better resources or information** on adoptions of NFC-related m-payment for future further discussions or research purposes.

This paper will be presented in following sequences: Chapter 2 reviews on the background of related theories and analysis of past literatures of related variables. Chapter 3 explaining proposed methodology employed in this paper. Chapter 4 is discussing on the findings and analysis of results. Lastly, Chapter 5 reviewing the implications, limitations and recommendation on future research.

CHAPTER 2: LITERATURE REVIEW

2.1 Underlying Theories

The models that included in this research are HMSAM, MISC, and additional construct, absorptive capacity. The reason of choosing these theories instead of basic foundation theory which is DOI, TAM, and UTAUT is because there are too many researchers that focus on the basic foundation theory when doing research on this topic.Although both of HMSAM and MISC are discussing more on the online video game, but, they have the similarity with the DOI, TAM, and UTAUT which is they also focus on technology acceptance in intrinsic motivation and extrinsic motivation.

2.1.1 Hedonic Motivation System Adoption Model (HMSAM)

Hedonic Motivation System Adoption Model (HMSAM) is a HMS-specific system acceptance model as compared to broad TAM extension, alternative theory perspective (Lowry, Gaskin, Twyman, Hammer & Roberts, 2013). This model primarily explained on the system adoption based on intrinsic motivation rather than extrinsic motivations. Intrinsic motivation refers to behaviour that is driven by internal reward. For example, users may feel enjoy, excited and funwhen using NFC. Besides, for those individual who are interested in NFC, they will feel curious about it, and will increase their intention to adopt NFC mobile payment. It explained that adoption of system might due to pleasure seeking, rather than productivity, in which traditionally information system researchers have ignored the fact.

This theory originally is focusing on affecting adoption on video games, social networking sites and virtual worlds, which then related to deep immersion(which required a deep mental involvement in activities) (Lowry et al., 2013). As mentioned, user adopting relevant system is more concern on intrinsic rewards, mostly through the process or experience of using it (process-oriented context).Hence, in wake of that, this paper is to adopt this theory as to study more on user related factors that influences them to have the intention in using new technology. The constructs of HMSAM include: perceived ease of use, perceived usefulness, control, immersion, behavioural intention to use, curiosity and joy. However, this paper is adopting only curiosity and joy, since it emphasized on user related factors. Reason of omitting perceived ease of use and perceived usefulness from TAM is due to its widely used in related research studies. Omitting control and immersion is due to the constructs is explaining on deep immersion when using the systems, in which they are more relevant to video games instead of mobile wallet.

2.1.2 MultimotiveInformation System Continuance Model (MISC)

This theory is basically describes and forecasts the discrete cognitive processes through how the system fulfill a range of motives and expectations and gradually lead to continuance intention. Researchers must consider the role of expectation in system use. The design structures that have potential to contribute to the study on system include design aesthetics, perceived ease of uses, and design expectation fit. Based on study of Lowry, Gaskin and Moody (2015), they conducted a test on different information system contexts which include online gaming (hedonic), online learning (intrinsic), and online paid work (extrinsic). MISC prove that it is able to support across various system.

One of the variable, design expectations fit emphasis on fit between the design of technology and expected task. For instance, if a user craving for intrinsic motivation when

dealing with a technology, but the design of technology is focus towards extrinsic motivation, then design of expectation fit will be low. It will only be high when the expectations of task match the design. The other variable is design aesthetics which discussed about the appropriateness and professionalism of user interface. For instance, user interface that is artistically, properly, and professionally design will be likely prefer over the less artistically ones. However, some of the design looks unprofessional in order to avoid user over focus on the design element. This paper is adopting only design aesthetics and design expectation fit since it mainly discussed on system expectation factors that affecting adoption of system. Reason of omitting perceived ease of use from TAM is due to its widely used in related research studies, but not in mobile wallet context, this paper intent to do so by adopting this theory.

2.1.3 Absorptive capacity

Absorptive capacity is being added to the conceptual framework. This variable is not from any theory. It was introduced by Cohen and Levintal. Previously in study of Pham and Ho (2015), it mentioned that this constructs was used in firms' perspective before, but they adopted it into consumers' perspective. This model is adopting in this study because it is suit the studies which the intention towards adopting NFC mobile wallet by discussing about theinnovation, learning and information technology. Through this model, new value, external information may be recognize, thus integrate it and apply it for marketable purpose. For instance, when an individual have prior knowledge of mobile application and payment, they are able to understand and apply the knowledge in the NFC mobile wallet, thus it will increase the adoption level of NFC mobile wallet.

2.2 Review of Variables

2.2.1 Dependent Variable

Intention towards adoption of NFC Mobile Wallet

The term intention is often defined as the action, perceived notion between oneself, or future behaviour of someone (Balachandran, 2015). Behavioural intention can be defined as performance of aperson's intention by particularactionlike the corresponding behavioursablebe predicted when an individual acts voluntarily (Kuan, Ann, Badri& Tan, 2014). Sometimes the decision to make full use of an innovation also can be defined as adoption (Balachandran, 2015).Thus,Mafe, Blas &Tavera-Mesias (2010) said that intentions indicate the motivational reasons that affectmanners which indicates the willingness and hardness to try and engagement in a behaviour of the effort put. The adoption also can be defined in terms of implementation, usage, utilization, or satisfaction and the most widely usedsingle measures of adoption is satisfaction (Liu &Guo, 2008, Balachandran, 2015).

2.2.2 Independent Variables

(User-Related Factors)

1) Absorptive Capacity

Cohen and Levinthal introduced absorptive capacity and this concept has been tested in many researches which include strategic innovation, organizational learning and information technology (Pham and Ho, 2015). Absorptive capacity can be meant by applying new knowledge, assimilate and to value of an ability of an organizational member. Absorptive capacity also can be define as the absorption of individual or firm on the limitation to the rating or quantity of scientific or technological information (Cohen and Levinthal, 1990). According to Hayes (2011), absorptive capacity can be known as the relevant knowledge that appear in the external environment and has the ability to generate innovations and absorb the knowledge. There are three interrelated components on absorptive capacity which the first one is individual capacity for understand the external knowledge which individual used the knowledge to facilitate the acquisition stage; second is assimilating the knowledge which is using the new knowledge on the adoption and finally is the utilization capacity which is to apply the knowledge to the task (Pham et al, 2015).

2) Curiosity

Curiosity can be defined as sensory and cognitive curiosity of his or her has arouses the user's experience (Oluwajana, Idowu, Nat, Vanduhe, Fadiya, 2018). Curiosity also can be meant by "a heightened arousal of sensory and cognitive" inquisitiveness or increase in interest (Agarwal &Karahanna, 2000). Excitement is being amplifies by the Human-system interaction in curiosity (Lowry, Gaskin, Twyman, Hammer, Roberts, 2013).

3) Joy

Joy is defined as fun, enjoyment or pleasure that result from using technology(Chopdar, Korfiatis, Sivakumar, Lytras, 2018). It is important in understanding the intention of Malaysian towards adoption of the NFC mobile wallet (Venkatesh, Thong, Xu, 2012). In information technology research, joy is one of the factors that directly influence the intention towards adopt NFC mobile wallet. It is an intrinsic motivation resulting from carrying out an

activity, and has impact towards intention towards adopting NFC mobile wallet (Chopdar et al, 2018). So, Joy may be a forecaster of consumers' behavioural intention to use technology since it has been verified by several studies in the field of mobile technologies and online social network (Venkatesh et al, 2012).

(**System-Specific Factors)**

1) Design expectation fits

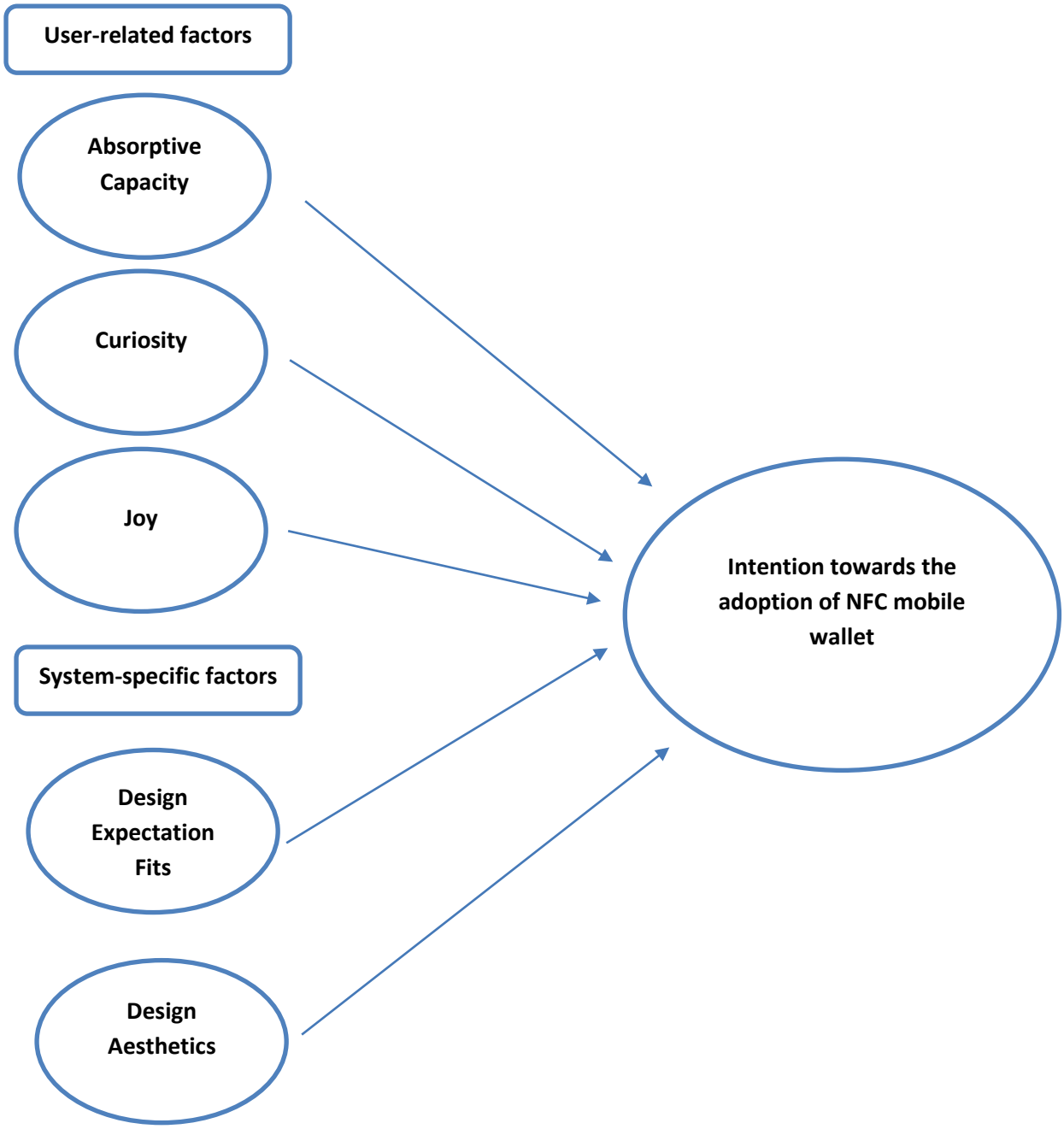
Design expectation fits can be term as the expected task and the fits between the designs of the technology (Lowry, Gaskin and Moody, 2015). Design expectation fits can be referring to whether the expected interaction matches the design of the software (Lowry, et al, 2015). Performance of products and services of the anticipations of the customers can be define as expectation (Elkhani&Bakri, n.d).

2) Design aesthetics

Design aesthetics refer to the professionalism and appropriateness of a user interface (Lowry, Gaskin, Moody, 2015). Design aesthetics also can be define as "web appearance", "visual appeal", "aesthetic experience" and "complexity, order, and legibility" (Cai and Xu, 2011).Aesthetics has categorized into two categories which are the classical and expressive (Lavie and Tractinsky, 2004). Classical aesthetics is referring to pleasantness, cleanliness, clarity, order and symmetry and it denotes the orderliness of the design (Bhandari, Neben, Chang, Chua, 2017).Traits such as creativity, fused with special effects, novelty, and sophistication and being fascinating are the definition of expressive aesthetics (Bhandari et al, 2017).

2.3 Conceptual Framework

Figure 1: Proposed Conceptual Framework



Adapted from: (Lowry, Gaskin, Twyman, Hammer & Roberts, 2013; Lowry, Gaskin & Moody, 2015; Pham &Ho, 2015)

2.4 Hypothesis Development

Absorptive capacity is not just apply at organizational level but also on user's adoption of new technology (Pham et al, 2015). In other words, assuming that if individual have prior knowledge on mobile applications, mobile payment and understanding on NFC mobile payment, they are more likely to have intention to accept NFC mobile payment (Pham et al, 2015).

H1: Absorptive capacity *has a significant relationship* on the intention towards adoption of NFC mobile wallet

Stimuli evokes curiosity and people give attention to stimuli that are personally interesting, when people are more curious about something or particular set of stimuli, people are more likely to devote to pursuing that curiosity towards mobile payment because of more attention (Lowry, Gaskin, Twyman, Hammer, Roberts, 2013).

H2: Curiosity *has a significant relationship* on the intention towards adoption of NFC mobile wallet

Perceived enjoyment do have the linkage with the usage intention and has already been verified by the previous studies under the areas of mobile technologies and online social networks (Hew, Leong, Tan, Lee, Ooi, 2017).

H3: Joy *has a significant relationship* on the intention towards adoption of NFC mobile wallet

To have more positive attitude toward using the technology, highly motivated user will have more positive expectations and subsequently towards mobile payment (Lowry et al, 2015). A person's cognition on mobile payment can easily expressed the expectation because it is typically directly measured (Lowry et al, 2015)

H4: Design expectation fits *has a significant relationship*on the intention towards adoption of NFC mobile wallet

Aesthetics has immense impact on usability issues that will have significant effect on individual's perception towards the quality of the mobile application and similarly, it will have same impact on usability of mobile payment as well (Zhang &Adipat, 2005). Perceived as useful, easy to use and enjoyable are more likely with the systems of high quality design aesthetics (Lowry et al, 2015).

H5: Design aesthetics *has a significant relationship* on the intention towards adoption of NFC mobile wallet

CHAPTER 3: METHODOLOGY

3.1 Research Design

A research design is a systematic plan or design that provides guidance in order to investigate and study a specific research problem (Burns & Bush, 2010).

3.1.1 Types of Research Design

Quantitative research method will be used in focusing on the survey of this research. This is because quantitative research method is research approaches that often come in line with surveys and experiments by collecting numerical data that will be analyse by using mathematical based methods or predetermined measurement which will provide statistical data. (Aliaga& Gunderson, 2000).Therefore, quantitative research method will be used to study the determinants that influences Malaysian intention towards adoption of Near Field Communication (NFC) mobile wallet. This research approach can be fitted into the study as it is able to gather additionalinformation from huge sample size of population will be able to target numerous amounts of target respondents (Saunders, Lewis, & Thornhill, 2012). Hence, questionnaires will be used in order to obtain quantitative data.

3.1.2 Nature of Research Design

This research is a descriptive research.Descriptive research is the research that will be involving numerical data in order to answer the research questions of the research. The function of descriptive research is to determine the characteristics of the observed problem or phenomenon and to find the possible relationship between the variables (Malhotra, Nunan&Birks, 2017).

3.1.3 Time Horizon of research Design

Furthermore, it will be a cross sectional design survey. Cross sectional design survey will be applied so that the respondents of the survey will not be intentionally sampled again in the future, this will also aids in acquiring representative sampling and also minimize response bias (Rindfleisch, Malter, Ganesan, & Moorman, 2008). In this type of design, the information gathered from the respondents will represent what is happening at the specific period of time (Rindfleisch, Malter, Ganesan, & Moorman, 2008).

3.2 Sampling Design

According to Malhotra, Nunan and Birks (2017), sampling plan is designed as following processes. It starts from deciding target population, specifying the sampling frame and sampling techniques, finalizing the sample size to executing the whole plan. Also,

mentioned by Tan (2017), it is a process of choosing respondents from the population of interest, in aiming to make inferences of the studied sample on target population.

Also, defined by Low (2016), target populations are those who possess elements or objects that fits the desired criteria and it must be precisely define, as inferences are to be made based on it. Balachandran (2015) commented thatconsumers are the one who pays and consumes goods and services. As this study is focusing on mobile wallet payment, the target respondents must be someone who routinely involved in checkout process. Hence, **Malaysian consumers** are being chosen as the target populations of this paper. Target population is then further narrowed down based on several units and criteria to become the sample target respondent.

The sampling units consists of **universitiesand colleges students**, the one that falls within the age brackets and are more exposed to new technology; and **working adults**, who are more likely to own a credit card and also falls within the age range.

Respondent must be **citizens of Malaysia**, in hope to enable generalization of findings in Malaysian context. Additionally, according to Tan et al. (2013) and Balachandran (2015), target respondent are more likely to have intentions to adopt NFC mobile wallet if they possess at least a **smartphone** and a **credit or debit card**. Furthermore, it is also stated that target respondents who possesses these criteria are more relevant to study, since NFC m-payment required the presence of both smartphone and debit or credit card, and the knowledge of using them.

Additionally, age preferences for the sample falls in the range of 18 years old to 64 years old. The reasoning behind this age bracket is due to the population percentage they are holding. As being addressed by Department of Statistics Malaysia (2018), population aged between 15 to 64 years old are being named as young and working age range. In which, they

hold up to 22.58 million over total population of 32.39 million. It is consider the age bracket that holds the largest portion of population. Equally important, 97.7% of individuals who aged 15 years old and above were using mobile phones, as dated in year 2017 (Department of Statistics Malaysia, 2018). Besides that, the eligible age for applying credit card is 21 years old for principal cardholder and minimum 18 years old for supplementary cardholder (iMoney.my, 2019). As disclosed by Maybank (n.d.), age limit for credit card application is set at 65 years old. In terms of debit card, minimum eligible age is at 18 years old (Public Bank, n.d.).

Collection of data will be held in five shopping malls located in Klang Valley, since mall-intercept survey tool is being used. The stated malls are One-Utama, Midvalley Megamall, The Gardens, Ikea Cheras and MyTown. **Klang Valley** was designated as sampling location its 8.3 million high population density (dated in year 2018), as reported by Department of Statistics Malaysia (2019). Further reference from Ooi and Tan (2016), Klang Valley population density held one-fifth of Malaysian's total population. In addition, supported by the statistics reported by Malaysian Communication and Multimedia Commission (2017), there is another supporting reason in selecting Klang Valley since it has 185.7% of mobile phone penetration rate and is the highest among entire states. Moreover, it is the heartland of Malaysia's businesses and economics industries (Tan, Lee, Hew &Ooi, 2018; Ooi& Tan, 2016). Fair balance of variety ethnics and age brackets of sample respondents can be found, thus, enable wider representation.

It will be duration of six-week for data collection, dating from **11 May 2019 to 8 June 2019**. During these six weeks time, it is expected to have more store traffic in the malls since there are several public holidays fall within the period of time (Ruban, 2017). Stunning store decorations can be one of the reasons of attracting store foot. According to Malaysian Employers Federation (2019), available public holidays in Federal Kuala Lumpur include Hari Wesak (19 May), Hari Nuzul Al-Quran (22 May), Hari Raya Puasa (5 & 6 June).

Sampling frame is not available in this study as fixed list of consumers visiting each and every chosen shopping malls are not found. As recommended by Sit, Ooi, Loke and Tan (2011), adequate estimation of obtaining meaningful **sample size** is within the parameter ratio of 15:1 to 20:1. Hence, any sample size formed by the ratios within the range is assumed satisfactory to be studied. This paper will adopt 20:1 ratio for the sample size, forming 300 usable sample sizes.

Non-probability sampling technique will be used, since it is designed to obtain data which do not have sampling frame (Malhotra et al., 2017). Of all probability sampling methods, purposive sampling is chosen in this study.It is also addressed as judgemental, selective or subjective sampling techniques (Malhotra et al., 2017). Selected elements are chosen based on researchers' judgement and believing that they can represent the population of interest. Similar approach from Tan et al. (2018) is being adopted in this study as well, upon distributing survey forms, pre-qualifying questions will be asked beforehand to filter potential adopters from non-adopters.

3.3 Data Collection Methods

3.3.1 Primary Data

Person administered questionnaire will be distributed prior to target respondent for purpose of obtaining the primary data. Primary data refers to the information commonly gathered by researchers to solve problems or questions on the moments.(Malhotra, Nunan&Birks, 2017).Person administered survey is the survey which is without any

computer assistance during distribution of questionnaires. There will be manpower that will distribute questionnaires or survey form in the malls in order to acquire data from the respondents (Malhotra, Nunan&Birks, 2017). Therefore, mall intercept interview will be carried out. The data collected from the respondents through the questionnaire will be the primary data of this paper. Structured questions are chosen for the study, as it will be close-ended and scale questions which will apply with 7-point Likert scale. English with simple grammar will be used to enhance the understanding of the respondents towards the questionnaire. Pilot test, a trial test will be carried out in order to detect flaws of our survey form which will further refine our questionnaires in the future.Proposed 20 respondents which have relevant knowledge and are capable in mobile payment systems and credit or debit card usage are involved in the pilot test,in aiming to get feedback on clarity, wording and format of the questionnaire (Leong et al., 2013;Ooi& Tan, 2016)

Constructs	Items	Description	Adapt from	Measurement
Absorptive Capacity (AC)	AC1	I will adopt NFC mobile wallet if I have **necessary knowledge** in the NFC mobile wallet.	Pham and Ho (2015)	Interval
	AC2	I will adopt NFC mobile wallet if I have **technical capability** to use NFC mobile wallet.		
	AC3	I will adopt NFC mobile wallet if I have **information** on the use of mobile payment related services.		
	AC4	I will adopt NFC mobile wallet if I am **capable to achieve my goals** of tasks by using it.		
	AC5	I will adopt NFC mobile wallet if I can make payment using it by **applying knowledge** from other mobile payment services.		
Curiosity (C)	C1	I will adopt NFC mobile wallet if using it will **excite** my curiosity.	Lowry, Gaskin, Twyman, Hammer and Roberts (2013); Barnes, Pressey&Scornavacca (2018)	Interval
	C2	I will adopt NFC mobile wallet if using it will **make** me curious about it.		
	C3	I will adopt NFC mobile wallet if using it will **arouse** my imagination.		
	C4	I will adopt NFC mobile wallet if using it will make me more **interested to know more** information about it.		
Joy (J)	J1	I will adopt NFC mobile wallet if I have **fun** using it during payment.	Lowry et al. (2013); Barnes et al. (2018); Balachandran (2015)	Interval
	J2	I will adopt NFC mobile wallet if paying with it provides me **a lot of enjoyment**.		
	J3	I will adopt NFC mobile wallet if I **enjoy** using it for making payment.		
	J4	I will adopt NFC mobile wallet if I am **pleasure** when using it.		
	J5	I will adopt NFC mobile wallet if using it is an **entertaining** experience.		

	J6	I will adopt NFC mobile wallet if using it is an **interesting**experience.		
Design Expectations Fits (DEF)	DEF1	I will adopt NFC mobile wallet if I can interact with the system to **achieve goals** specific to my needs.	Lowry, Gaskin and Moody (2015)	Interval
	DEF2	I will adopt NFC mobile wallet if the system interactive features is aiding me to **accomplish** my task.		
	DEF3	I will adopt NFC mobile wallet if the system permits me to **receive tailored content** to my needs by interacting with it.		
	DEF4	I will adopt NFC mobile wallet if the system **sufficiently meets** my needs.		
	DEF5	I will adopt NFC mobile wallet if the design of the system is **relevant** in achieving my needs.		
Design Aesthetics (DA)	DA1	I will adopt NFC mobile wallet if its system design is **attractive.**	Lowry et al. (2015)	Interval
	DA2	I will adopt NFC mobile wallet if its system looks **professionally designed**.		
	DA3	I will adopt NFC mobile wallet if graphics provided in the system is **meaningful**.		
	DA4	I will adopt NFC mobile wallet if graphics provided in the system is **relevant**.		
	DA5	I will adopt NFC mobile wallet if overall look and feel of the system is **visually appealing**.		
Intention towards Adoption of NFC Mobile Wallet (IA)	IA1	I am **likely** to use NFC mobile wallet for payment in the near future	Tan et al. (2013); Balachandran (2015)	Interval
	IA2	Given the opportunity, **probably** in near future I will use NFC mobile wallet for payment.		
	IA3	I am **willing** to use NFC mobile wallet for payment, if I have access to it.		
	IA4	I will **think** about using NFC mobile wallet for payment.		

	IA5	I will **recommend** NFC mobile wallet to my family and friends for making payment in future.		

Table 1: Questions Origin

3.4 Proposed Data Analysis Tool

Statistical Package for Social Science software (SPSS) will be used for descriptive analysis. Descriptive analysis refers to the statistical techniques which are being used by the researchers to summarize the primary data that had been collected to a simple and understandable form of data (Low, 2016).

Partial Least Squares Structural Equation Modelling (PLS-SEM) will be used in this study by using Adanco. Adanco is a variance-based structural equation modelling. It can implement some limited-information estimators or ordinary least squares regression based on sum scores (Adanco, n.d). Additionally, it is user-friendly in terms of the user interface, in which it smoothen the process of tabulating and analyzing the data.

Measurement Model Evaluation

Reliability Analysis is the statistical techniques that will be used in this study. Reliability Analysis is the tool that is used to ensure the extent is parallel through the objects that are verified and error-free that might influence the outcome in the findings (Low, 2016).Cronbach's Coefficient Alpha is used in reliability analysis in order to determine internal consistency ofentire items, ranged from 0 to 1 (Lai, Law, Liew, Phua& Tang, 2014). It is suggested that constructs are reliable if alpha is beyond 0.7 and should not be lower than 0.4, otherwise should be eliminated (Oliveira et al., 2016). Other than that, Adanco do have another 2 measurements for reliability under the same threshold of Cronbach's Coefficient Alpha which are Dijkstra-Henseler's rho (ρA) and Jöreskog's rho (ρc).

Rules of Thumb for Cronbach's Coefficient Alpha

Level of Reliability	Alpha ranges
Very good reliability	0.80 to 0.95
Good reliability	0.70 to 0.80
Fair Reliability	0.60 to 0.70
Poor Reliability	< 0.60

Source from Malhotra et al. (2017)

The measurement for validity of the reflective measurement model, it is depending on the convergent validity and discriminant validity which is Fornell-Larcker Criterion. Convergent validity reveals the extent to which two measures capture a common construct(Carlson &Herdman, 2010). Average variance extracted (AVE) of each latent variable is measured in order to assess the convergent validity,the optimal threshold value compulsory to be atleast of 0.50 (Kline, 1988). According to Tan and Ooi (2016), each of the indicators should possess loading of a lowest of 0.70. However, to define the discriminant validity of the model, factor loading and Fornell-Larcker test would be accessed. Stated in Fornell-Larcker criterion, in order to establish discriminant validity, the AVE of the each construct should be bigger than the squared correlation with any other construct (Tan, el al., 2016).

Structural Model Equation

The coefficient of determination is the level and significance of path coefficient that being measured in structural model as the main objective of prediction-oriented PLS-SEM is to provide explanation on the variance of target dependent variable (Mooi, 2017).Nevertheless, the rule of thumb in marketing research context categorizes 0.75 as substantial, 0.50 as moderate and 0.25 as weak (Mooi, 2017). Standardized beta coefficient were interpreted and measured by the individual path coefficients for each indicator.

Determination of hypotheses significance level is measured as to its path coefficients, t-statistics and p-value. In this study significance level was set at $\alpha = 0.05$.

CHAPTER 4: DATA ANALYSIS

4.1 Response Rate

300 questionnaires are erratically issued for shoppers who visited those five chosen shopping malls in Klang Valley. All of the 300 questionnaires are being filled and returned, but only 297 are usable, and the remaining 3 incomplete responses are being discarded. According to Rasoolimanesh, Taheri, Gannon, Vafaei-Zadeh and Hanifah (2019), the minimum sample size can be generated through Gpower, a power based analysis. Minimum sample size will be generated based on its effect sizes, alpha levels and power values (Cunningham &McCrum-Gardner, 2007). Since the alpha level of this study is p =0.05 and the power is 0.80, hence, the minimum sample size for this proposed framework is 92 respondents. Thus, the number of collected data is sufficient for running data analysis in this study.

4.2 Descriptive Analysis

4.2.1 Demographic Profiles

Table 2 Respondents' Demographic Profile

Demographic Profile		Frequency	Percentage
Gender	Male	123	41.4
	Female	174	58.6
Age	20 years and below	53	17.8
	21 to 30 years old	95	32
	31 to 40 years old	77	25.9
	41 to 50 years old	44	14.8
	51 to 60 years old	18	6.1
	60 years old and above	10	3.4
Employment	Unemployed	26	8.8
	Self- employed	52	17.5
	Working professional	138	46.5
	Student	81	27.3
Income	Below or equal to RM 1000	92	31.0
	RM 1001 to RM 2000	15	5.1
	RM 2001 to RM 3000	29	9.8
	RM 3001 to RM 4000	60	20.2
	RM 4001 and RM 5000	47	15.8
	RM 5001 and above	54	18.2
Frequency of using credit or debit card (per month)	1 to 5 times	99	33.3
	6 to 10 times	51	17.2
	10 times and above	82	27.6
	I don't use credit or debit card every month. I only will use it when necessary.	65	21.9

Table 2 portrays 58.6% of samples are female and 41.4% are male.

Majority of the respondents are aged between 21 to 30 years old and currently are working professional. Besides, 31% of them were reported earning monthly income of below or equal to RM1000. For the frequency of using credit or debit card (per month), out of 33.3% of our respondents are using 1-5 times.

4.3 Measurement Model Evaluation

4.3.1 Construct Reliability

Table 3 Construct Reliability

Construct	Dijkstra-Henseler's rho (ρ_A)	Jöreskog's rho (ρ_c)	Cronbach's alpha(α)
Absorptive Capacity	0.8886	0.9176	0.8877
Curiosity	0.9184	0.9414	0.9169
Joy	0.9025	0.9258	0.8999
Design Expectation Fits	0.8878	0.9169	0.8867
Design Aesthetics	0.8483	0.8905	0.8463
Intention to adopt	0.8886	0.9182	0.8886

Table 3 shows the verified and illustrated of the reliability of this study. As mentioned earlier, it is suggested that constructs are reliable if Cronbach's alpha is beyond 0.7 and should not be lower than 0.4, otherwise it should be eliminated. Based on our research, the value of **Dijkstra-Henseler's rho (ρ_A), Jöreskog's rho (ρ_c), and Cronbach's alpha(α)**exceeds the required value, which is beyond 0.7. Therefore, all construct are considered to have achieved the internal constructs reliabilities (Mooi, 2017).

4.3.2 Convergent Validity

Table 4 Convergent Validity

Construct	Average variance extracted (AVE)
Absorptive Capacity	0.6901
Curiosity	0.8007
Joy	0.7141
Design Expectation Fits	0.6880
Design Aesthetics	0.6193
Intention to adopt	0.6920

Table 4 shows the result of convergent validity. Convergent validity refers to the extent of vary approaches of construct measurement will generate similar results (Hew, Leong, Tan, Ooi, Lee, 2017). Average Variance Extracted (AVE) is used as the criterion to

test the result of convergent validity. The minimum threshold of validated value should be higher than 0.5. From table 4, since the entire AVE values are above 0.5, it can be confirmed that the convergent validity were statistically validated (Oliveira, Thomas, Baptista& Campos, 2016)

4.3.3 Discriminant Validity (Fornell-Lacker Criterion)

Table 5 Discriminant Validity: Fornell-Larcker Criterion

Construct	Absorptive Capacity	Curiosity	Joy	Design Expectation Fits	Design Aesthetics	Intention to adopt
Absorptive Capacity	0.6901					
Curiosity	0.2046	0.8007				
Joy	0.2310	0.4686	0.7141			
Design Expectation Fits	0.4108	0.1852	0.1806	0.6880		
Design Aesthetics	0.3107	0.2814	0.2938	0.4530	0.6193	
Intention to	0.2820	0.2855	0.2843	0.3448	0.3782	0.6920

adopt						

Squared correlations; AVE in the diagonal

Table 5 shows the discriminant validity of this study evaluated by Fornell-Larcker criterion. Discriminant validity referred to the difference between the constructs and its indicator relative to other constructs and their indicators in the table shown above (Tan, Ooi, Chong and Hew, 2013). Since the table shown that the square of AVE for each of the variables is greater than their respective inter-construct correlations (Chopdar, Korfiatis, Sivakumar and Lytras, 2018). Hence, discriminant validity is achieved (Hew, Leong, Tan, Ooi and Lee, 2017).

4.3.4 Loadings

Table 6 Loadings

Indicator	Absorptive Capacity	Curiosity	Joy	Design Expectation Fits	Design Aesthetics	Intention to adopt
AC1	0.8474					
AC2	0.8085					
AC3	0.8400					
AC4	0.8246					

AC5	0.8325					
C1		0.9074				
C2		0.9132				
C3		0.8982				
C4		0.8595				
J1			0.8658			
J2			0.8463			
J3			0.8362			
J4			0.8187			
J5			0.8575			
DEF1				0.8427		
DEF2				0.8247		
DEF3				0.8292		
DEF4				0.8254		
DEF5				0.8252		
DA1					0.7948	
DA2					0.7770	

DA3					0.8195	
DA4					0.7599	
DA5					0.7823	
IA1						0.8537
IA2						0.8524
IA3						0.8234
IA4						0.8250
IA5						0.8039

Table 6 showed the results of loadings. A loading of an item will be used to determine how much each item is contributing to eachvariable. Therefore, high loading scores indicating better variable. According to Fornell and Larcker (1981), each of the indicators should equip with loading of minimum 0.70. The table above showed that all the indicators seems to have hit the requirement which exceeds 0.70.

4.3.5 Indicator Multicollinearity

Table 7 Indicator Multicollinearity

Indicator	Absorptive Capacity	Curiosity	Joy	Design Expectation Fits	Design Aesthetics	Intention to adopt
AC1	2.4023					

AC2	1.9973					
AC3	2.2945					
AC4	2.0889					
AC5	2.0984					
C1		3.6983				
C2		3.8366				
C3		3.0499				
C4		2.2020				
J1			2.9945			
J2			2.7776			
J3			2.2389			
J4			2.1193			
J5			2.4417			
DEF1				2.4041		
DEF2				2.2984		
DEF3				2.0506		
DEF4				2.1570		

DEF5				2.1791		
DA1					1.9673	
DA2					1.6998	
DA3					2.0176	
DA4					1.7801	
DA5					1.8686	
IA1						2.7852
IA2						2.7327
IA3						2.1228
IA4						2.1302
IA5						1.9325

Examination on Variance Inflation Factor (VIF) and tolerance are done in accordance to clarify multicollinearity problem. All VIF values are below conservative threshold of 5, hence, there is no violation to the multivariate analysis in this research (Venkatesh, Thong and Xu, 2012).

4.4 Hypothesis Testing

4.4.1 Direct Effects Inference

Table 8 Direct Effects Inference

Hypothesis	Original Coefficient	Standard Bootstrap Results					Percentile Bootstrap Quantiles				Significant or Insignificant
		Mean Value	Standard Error	t-value	p-value (2-sided)	p-value (1-sided)	0.5%	2.5%	97.5%	99.5%	
AC ->IA H1	0.1123	0.1107	0.0732	**1.5335**	0.1255	**0.0627**	-0.0752	-0.0374	0.2582	0.2971	Insignificant
C ->IA H2	0.1627	0.1681	0.0765	**2.1276**	0.0336	**0.0168**	-0.0281	0.0173	0.3136	0.3588	Significant*
J ->IA H3	0.1440	0.1406	0.0849	**1.6956**	0.0903	**0.0451**	-0.0987	-0.0260	0.3035	0.3433	Insignificant

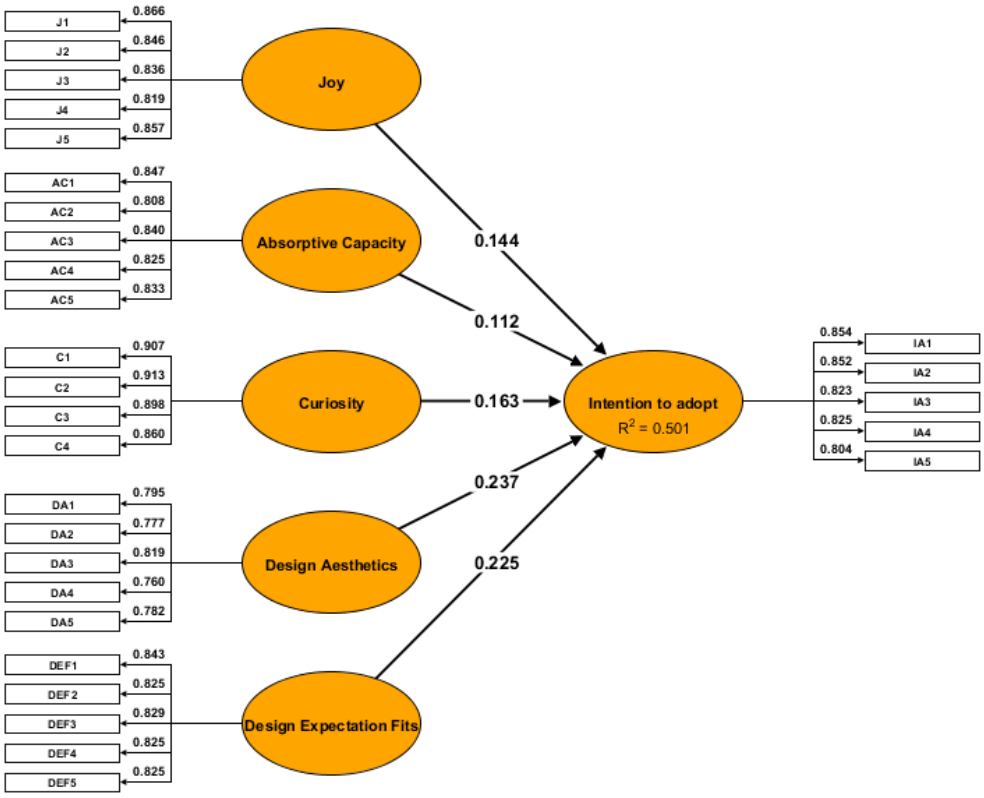
DEF ->IA H4	0.2247	0.2266	0.0802	**2.8013**	0.0052	**0.0026**	0.0155	0.0647	0.3736	0.4097	Significant **
DA ->IA H5	0.2368	0.2389	0.0770	**3.0754**	0.0022	**0.0011**	0.0432	0.0809	0.3902	0.4287	Significant**

Source: Adanco

Note:

a) AC = Absorptive Capacity; C = Curiosity; J = Joy; DEF = Design Expectations Fit; DA = Design Aesthetics; IA = Intention towards Adoption of NFC Mobile Wallet
b) Significant at:
*** p< 0.001; ** p < 0.01; * p < 0.05

Figure 1 Results of Structural Model



Source: Adanco

As shown from Figure 1, the structural model disclosed that 50.1% of variance in intention to adopt NFC mobile wallet can be explained by the constructs (R^2 = 0.501). However, out of the five constructs, only three of the constructs are significant to explain the intention in adopting NFC mobile wallet. The following constructs are C ($\beta = 0.163$, $p < 0.05$), DEF ($\beta = 0.225$, $p < 0.01$) and DA ($\beta = 0.237$, $p < 0.01$). Hence, it shows the meaning that H2, H4 and H5 are significant and successful in predicting the consumers' intention in adopting NFC mobile wallet. On the contrary, constructs that are failed in predicting the

linkage between intention of adoption are AC ($\beta = 0.112$, $p < 0.05$) and J ($\beta = 0.144$, $p < 0.05$), thus, H1 and H3 are not supported.

4.4.2. Effect Sizes, f^2

Table 9 Effects Overview

Effect	Beta	Indirect effects	Total effect	Cohen's f^2
Absorptive Capacity -> Intention to adopt	0.1123		0.1123	0.0133
Curiosity -> Intention to adopt	0.1627		0.1627	0.0260
Joy -> Intention to adopt	0.1440		0.1440	0.0197
Design Expectation Fits -> Intention to adopt	0.2247		0.2247	0.0449
Design Aesthetics -> Intention to adopt	0.2368		0.2368	0.0503

Table 9 portrays the results of each path coefficient's effect sizes, based on Cohen's f^2. As being discussed by Mooi (2017), comparable measurements are generated by effect sizes as to level of predictive relevance. In which it has three levels of indication, consisting small (0.02), medium (0.15), and large effect size (0.35) (Tan, Lee, Hew, Ooi and Wong, 2018). Results shown above indicated that AC, C and J have small effect on intention to adopt NFC mobile wallet (IA). Meanwhile, DEF and DA have relatively medium effect on IA.

CHAPTER 5: DISCUSSION, CONCLUSION & IMPLICATIONS

5.1 Discussions of Major Findings

5.1.1 Absorptive Capacity (AC) and Intention towards the Adoption of NFC Mobile Wallet (IA)

Absorptive capacity which is H1 is supported in this study due to its p-value surpassed 0.05. Therefore, it has no significant relationship between AC and IA (Hayes, 2011). Absorptive capacity can be known as the relevant knowledge that appears in the external environment and users has the ability to generate innovations and absorb the knowledge (Hayes, 2011).

Yes, people who have prior background knowledge about mobile payment can easily adapt to NFC mobile wallet but NFC is not well-known in the market, there are insufficient channels or counters that establish this kind of technology (Pal, Vanijja and Papasratorn, 2015). Although some of the devices may have enabled NFC but payment are still cannot make due to the non-availability of such specialized payment gateways and people would like to adopt when it is more popular (Pal et al, 2015). Absorptive capacity does not affect their performance directlyfor understanding the systems because they still have to assimilate it so that they can internalize the new knowledge into his or her task environment (Park, Suh and Yang, 2007). Hence, it can be explain that absorptive capacity is not significantly affect the IA in this study.

5.1.2 Curiosity (C) and Intention towards the Adoption of NFC Mobile Wallet (IA)

Based on the results, **H2 is supported** in this study since p-value is over 0.05. Therefore, it has significant relationship between curiosity and intention to adoption(Lowry, et al, 2013). Curiosity is one's arouses interest on infrequent or exotic characteristics, which emphasize on attention. According to Lowry et al (2013), it highlightedthat freshness can enhance curiosity and attention. People will give more attention when they feel there is something interesting. The findings explained people who are more curious may be more likely to perceive NFC mobile wallet as more stimulating, thus it can motivate individual to find out what is hidden inside (Okazaki, Navarro, Mukherji, Plangger, 2017). They will seek out informationregardless the outcome is good or bad. For them, they will consider the process of seeking out information as feeling of rewarding, as they can learn something new through the process (Wiggin, Reimann, Jain, 2018).

5.1.3 Joy (J) and Intention towards the Adoption of NFC Mobile Wallet (IA)

According to above findings, it revealed that **H3 is not supported**, and there is no significant relationship between J and IA. The above finding is in line with previous studies done by Trachuk and Linder (2017). It is surprising that the finding is contradicting to most of the previous studies related to adoption of mobile payments, for instance (Mooi, 2017; Tan &Ooi, 2018; Venkatesh, Thong and Xu, 2012; Kuan, Ann, MohdBadri& Tang, 2014).

One possible explanation is due to Joy is not considering the main factor affecting the respondents' decision in adopting NFC mobile wallet. According to Tamborini, Bowman, Eden, Grizzard and Organ (2010), enjoyment is practically defined as need satisfaction and is not bound specifically or merely to pleasure seeking only. Mobile payment is categorized as personal activity, in which it is activity that meant to fulfil needs and meeting goals (Chopdar, Korfiatis, Sivakumar&Lytras, 2018). Unlike social media apps, in which it is more to social activity and enjoyment shall be the main factor affecting adoption and continuance usage. In majority of cases, mobile payment apps emphasizing on providing speed, convenience and secured payments, and all of these are to satisfy consumers' needs and aiding them in enhancing their quality of life (Chiriac, Hurduzeu, Rosca&Zavera, 2018; Holm, Liu & Ding, 2018). Also mentioned by Chong (2016), enjoyment will come after perceived ease of use of technology, which also can be interpreted as consumers' needs is being satisfied first (easy to use technology), later only they will feel enjoyable using it. In short, unfulfilled needs create unpleasant emotions, similarly if the mobile wallet unable to fulfil the needs of users, how can they be enjoyable when using them. Hence, this might be explaining the reason Joy is not significantly affecting IA in this study.

5.1.4 Design Expectations Fit (DEF) and Intention towards the Adoption of NFC Mobile Wallet (IA)

Based on the results, it is clearly showed that **H4 is supported** in this study because its p-value is below 0.5. Therefore, there is a significant relationship between the design expectation fits and the adoption of NFC mobile wallet(Chopdar, Korfiatis, Sivakumar and Lytras, 2018; Lowry, Gaskin and Moody, 2015).

According to Chopdar et al (2018), design expectation fits refers to the user consider the design of NFC mobile wallet was designed to be fit the usage of the mobile transactions.

If the users of NFC mobile wallet found out that the NFC mobile payment have been designed to fit the use of the expectations of the users, NFC mobile wallet will be used more frequently by the users (Lowry et al., 2015). When the design of the NFC mobile wallet fits the expectation of the users, they will also tend to find out that the NFC mobile wallet will bring benefits to them. Thus, they will have higher intention to adopt the NFC mobile wallet (Chopdar et al., 2018). Not only that, with user-friendly and convenience design of NFC mobile wallet that fit the expectation of the users will also enable the users to adopt the NFC mobile wallet. Therefore, it can be showed that design expectation fits is significantly affect the IA in this study.

5.1.5 Design Aesthetics (DA) and Intention towards the Adoption of NFC Mobile Wallet (IA)

Based on the findings, the p-value of design aesthetics are less than 0.01, therefore **H5 is supported** and there are significant relationship between DA and IA. Based on the research that had been conducted by Victoria, Hope, Loranger& Rea (2017), before developing a mobile application, it is important for a developer to understand how to make the application attractive to users and receive positive reaction from them. A good design aesthetics can assists users to ensure quality of the application (Lu, Wei, Yu & Liu, 2016).

Mobile payment application with high quality design aesthetics are more likely to be perceived as usefulness, ease of use and enjoyable that will likely affect a user's belief towards the potential performance of the mobile payment application because based on previous research it is found that design aesthetics impact the perceived performance and satisfaction of an application (Lowry et al., 2015). Users may feel satisfied towards mobile payment application due to the well-designed mobile payment application that is attractive to them (Chen, 2018).

5.2 Implications of Study

In terms of **managerial implications**, since **AC** is not the main factor of consideration, organizations should emphasized on increasing the availability of NFC point-of-sales terminals and NFC-enabled mobile phones, in order to encourage usage of NFC mobile wallet. In addition, other than Apple and Samsung, smartphone companies like Oppo, Vivo or Huawei should incorporate NFC payment functions in wider range of smartphones, not only restricting it on high-end smartphones only. Next, for **C**, companies advertising campaigns should be creative enough to stimulate target market's attention in order to enhance their curiosity and lead to adoption. For instance, Apple Inc. normally introduces new iPhone features using teaser advertisements first in order to generate target market's attention and increase curiosity on its prices. Thus, target market will pay attention to the new products and follow up its news accordingly.

Next, as **J** has need satisfaction as predecessor, hence, companies should focus on satisfying needs and leading to enjoyment of using mobile wallet might be more useful than focusing only on J itself. As for **DEF**, smartphones manufacturers should highlight on designing the mobile wallet according to target market's expectation and needs. For example, the design has to be user friendly, convenient and is simplified as user can pay with a touch. Lastly, **DA** stressing on making NFC mobile wallet application look as interesting as possible as to attract more users to adopt into it. For example, Samsung's NFC mobile wallet is simple and attractive, and it helps in creating user awareness on its existences.

From **academic standpoint**, this research contributed psychological constructs describing user-related factors that previously being widely adopted in mobile gaming and technologies researches into adoptions of mobile wallet. In wake of that, it also became a stepping stone for the framework to be replicated in further studies on mobile payments and technologies. Meanwhile, instead of focusing only on users' usage behaviour, system-specific

factors also reminds researchers on the importance of mobile wallet's system infrastructures in affecting adoption level as well.

5.3 Limitations and Recommendations of the Study

Since this study is executed in Malaysia and only Malaysian respondents were involved, the findings might not be able to generalize to other countries (Leong, Hew, Tan &Ooi, 2013). Cultural diversity and ethnicity are not taken into account in these findings, and as mentioned by Khalilzadeh, Ozturk and Bilgihan (2017), one's cultural traits might affect his or hers technology adoptions. Hence, it is suggested that cross-national researches should be done in future, as to generalize the framework in different geographical regions (Leong et al., 2013).

Studying on customers' retention is also crucial as attracting new consumers. Instead of relying only the behavioural intention to adopt factors, further research should incorporate other potential constructs that affecting the continuance usage, such as service quality, government policy, gender, experiences and etc (Leong et al., 2013). Moreover, longitudinal study is suggested instead of cross-sectional studies in order to increase the predictive effects of the model. Studying and comparing on the stages of adoption are able to provide meaningful insights of consumers' willingness to adopt and continuance behaviour (Pham &Ho, 2015).

Next, the respondents of this paper are users of mobile phone and credit or debit cards, hence, respondents bias may incur in terms of usage behaviours as compared to non-users' (Tan et al., 2013). Thus, as to have clearer picture on the differences of usage behaviour of

both users and non-users, it is recommended that future research should consider taking into account of the non-users groups.

Last but not least, as mentioned in discussion, availability of NFC point-of-sales terminals and devices are important in affecting NFC mobile wallet adoption rates. Hence, further research should also consider both consumers' and merchants' perspectives.

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UNIVERSITI TUNKU ABDUL RAHMAN

FACULTY OF BUSINESS AND FINANCE

FINAL YEAR PROJECT (FYP)

DETERMINANTS THAT INFLUENCES MALAYSIAN'S INTENTION TOWARDS ADOPTION OF NEAR FIELD COMMUNICATION (NFC) MOBILE WALLET

Survey Questionnaire

Dear respondent,

We are undergraduates from University Tunku Abdul Rahman, whom major in Bachelor of Marketing. Currently, we are conducting research for our final year project, on "Determinants that Influences Malaysian's Intention towards Adoption of Near Field Communication (NFC) Mobile Wallet". This research is conducted to study on the factors that influencing Malaysians to adopt NFC mobile wallet.

Near Field Communication (NFC) mobile wallet is contactless payment (using smartphones). Payment can be done within 10 cm distance by waving or tapping the smartphones with the point-of-sales terminal. Credit or Debit card information is embedded in the smartphones and act as a wallet for NFC payment purpose.

Instructions: Please answer ALL questions

i. This questionnaire is divided into 3 sections:

Section A: Demographic Information

Section B: Factors Influencing the Adoption of NFC Mobile Wallet

Section C: Intention to Adopt NFC Mobile Wallet

ii. Completion of survey will take you approximately 5 to 10 minutes.

All information will be held confidential and only be used for our research work.

Section A: Demographic Information

Please **tick** your answer on the following questions:

1. **Gender:**
   - ○ Male
   - ○Female

2. **Age:**
   - ○20 years and below
   - ○21 to 30 years old
   - ○31 to 40 years old
   - ○41 to 50 years old
   - ○51 to 60 years old
   - ○60 years old and above

3. **Current employment status?**
   - ○Unemployed
   - ○Self- employed
   - ○Working professional
   - ○Student

4. **What is your monthly income?**
   - ○Below or equal to RM 1000
   - ○RM 1001 to RM 2000
   - ○RM 2001 to RM 3000
   - ○RM 3001 to RM 4000
   - ○RM 4001 and RM 5000
   - ○RM 5001 and above

5. **Frequency of using credit or debit card (per month):**

- ○ 1 to 5 times
- ○ 6 to 10 times
- ○ 10 times and above
- ○ I don't use credit or debit card every month. I only will use it when necessary.

Section B: Factors Influencing the Adoption of NFC Mobile Wallet

Please indicate how strongly or disagree on the statements given on the following Likert scale.

Please circle only ONE answer which BEST describes your response.

(1= Strongly Disagree, 2 = Disagree, 3 = Slightly Disagree, 4 = Neutral, 5 = Slightly Agree, 6 = Agree, 7 = Strongly Agree)

Absorptive Capacity

No.	Questions	Strongly Disagree	Disagree	Slightly Disagree	Neutral	Slightly Agree	Agree	Strongly Agree
AC1	I will adopt NFC mobile wallet if I have **necessary knowledge** in the NFC mobile wallet.	1	2	3	4	5	6	7
AC2	I will adopt NFC mobile wallet if I have **technical capability** to use NFC mobile wallet.	1	2	3	4	5	6	7
AC3	I will adopt NFC mobile wallet if I have **information** on the use of mobile payment related services.	1	2	3	4	5	6	7
AC4	I will adopt NFC mobile wallet if I am **capable to achieve my goals** of tasks by using it.	1	2	3	4	5	6	7
AC5	I will adopt NFC mobile wallet if I can make payment using it by **applying knowledge** from other mobile payment services.	1	2	3	4	5	6	7

Curiosity

No.	Questions	Strongly Disagree	Disagree	Slightly Disagree	Neutral	Slightly Agree	Agree	Strongly Agree
C1	I will adopt NFC mobile wallet if using it will **excite** my curiosity.	1	2	3	4	5	6	7
C2	I will adopt NFC mobile wallet if using it will **make** me curious about it.	1	2	3	4	5	6	7
C3	I will adopt NFC mobile wallet if using it will **arouse** my imagination.	1	2	3	4	5	6	7
C4	I will adopt NFC mobile wallet if using it will make me more **interested to know more** information about it.	1	2	3	4	5	6	7

Joy

No.	Questions	Strongly Disagree	Disagree	Slightly Disagree	Neutral	Slightly Agree	Agree	Strongly Agree
J1	I will adopt NFC mobile wallet if I have **fun** using it during payment.	1	2	3	4	5	6	7
J2	I will adopt NFC mobile wallet if paying with it provides me **a lot of enjoyment**.	1	2	3	4	5	6	7
J3	I will adopt NFC mobile wallet if I **enjoy** using it for making payment.	1	2	3	4	5	6	7
J4	I will adopt NFC mobile wallet if I am **pleasure** when using it.	1	2	3	4	5	6	7
J5	I will adopt NFC mobile wallet if using it is an **entertaining** experience.	1	2	3	4	5	6	7

Design Expectation Fits

No.	Questions	Strongly Disagree	Disagree	Slightly Disagree	Neutral	Slightly Agree	Agree	Strongly Agree
DEF1	I will adopt NFC mobile wallet if I can interact with the system to **achieve goals** specific to my needs.	1	2	3	4	5	6	7
DEF2	I will adopt NFC mobile wallet if the system interactive features is aiding me to **accomplish** my task.	1	2	3	4	5	6	7
DEF3	I will adopt NFC mobile wallet if the system permits me to **receive tailored content** to my needs by interacting with it.	1	2	3	4	5	6	7
DEF4	I will adopt NFC mobile wallet if the system **sufficiently meets** my needs.	1	2	3	4	5	6	7
DEF5	I will adopt NFC mobile wallet if the design of the system is **relevant** in achieving my needs.	1	2	3	4	5	6	7

Design Aesthetics

No.	Questions	Strongly Disagree	Disagree	Slightly Disagree	Neutral	Slightly Agree	Agree	Strongly Agree
DA1	I will adopt NFC mobile wallet if its system design is **attractive.**	1	2	3	4	5	6	7
DA2	I will adopt NFC mobile wallet if its system looks **professionally designed**.	1	2	3	4	5	6	7
DA3	I will adopt NFC mobile wallet if graphics provided in the system is **meaningful**.	1	2	3	4	5	6	7
DA4	I will adopt NFC mobile wallet if graphics provided in the system is **relevant**.	1	2	3	4	5	6	7

DA5	I will adopt NFC mobile wallet if overall look and feel of the system is **visually appealing**.	1	2	3	4	5	6	7

Section C:Intention to Adopt NFC Mobile Wallet

Please indicate how strongly or disagree on the statements given on the following Likert scale.

Please circle only ONE answer which BEST describes your response.

(1= Strongly Disagree, 2 = Disagree, 3 = Slightly Disagree, 4 = Neutral, 5 = Slightly Agree, 6 = Agree, 7 = Strongly Agree)

Intention to Adopt

No.	Questions	Strongly Disagree	Disagree	Slightly Disagree	Neutral	Slightly Agree	Agree	Strongly Agree
IA1	I am **likely** to use NFC mobile wallet for payment in the near future	1	2	3	4	5	6	7
IA2	Given the opportunity, **probably** in near future I will use NFC mobile wallet for payment.	1	2	3	4	5	6	7
IA3	I am **willing** to use NFC mobile wallet for payment, if I have access to it.	1	2	3	4	5	6	7
IA4	I will **think** about using NFC mobile wallet for payment.	1	2	3	4	5	6	7
IA5	I will **recommend** NFC mobile wallet to my family and friends for making payment in future.	1	2	3	4	5	6	7

-Thank you for taking your time to answer our survey.-

~THE END~

AC1	AC2	AC3	AC4	AC5	C1	C2	C3	C4	J1	J2	J3	J4	J5	DEF1	DEF2	DEF3	DEF4	DEF5	DA1	DA2	DA3	DA4	DA5	IA1	IA2	IA3	IA4	IA5
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Turnitin Comprehensive Report

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ABSTRACT

This study is investigating on the elements or factors influencing consumers' intention on adoption towards NFC mobile wallet.Based on the research, it shows that there are 57% of Malaysian used a smartphone, and it will be estimated to increase in the following years by 1% (Statista, 2019). Since the percentage diffusion of smartphones will be increase, thus it enhances the opportunities in creating a value added payment method to customers.

The NFC can be explained by wireless data transfer that detects the communication without the need of internet connection. NFC mobile wallet is a contactless payment; the explanations on the factors influencing adoption of NFC have been including HMSAM, MISC, and additional construct, which is absorptive capacity. Since there are many of the research are focusing on the basic foundation theory of DOI, TAM, and UTAUT, so the study will address the technology acceptance in intrinsic and extrinsic motivation. 300 questionnaires distribute randomly to shoppers, but only 297 are usable.

This paper is able to enhance the literature on user-related factors and system-specific factors in the NFC mobile payments. It delivers valuable recommendation to researchers in their investigation on the issues related to the NFC mobile payment. It also brings some managerial implications by assist the advertising campaign, designation of the mobile wallet by focusing on target market's expectation and needs, and its appearances.

CHAPTER 1: RESEARCH OVERVIEW

1.1 Research Background

The history of **mobile payment** is dated back in year 2004, whereby FeliCa Networks has joint ventured with Sony Corporation and NTT DoCoMo Inc., enabling contactless payment (Kharif& Chen, 2018). As being defined by Gao and Waechter (2015), m-payment is a point-of-sales payment made via portable electronic devices, such as smartphones, tablets, smart watches and etc, over mobile network. It is also described as payments being made for products, services and utility bills through mobile devices by employing wireless and other alternatives communication methods (Leong, Hew, Tan &Ooi, 2013).

As highlighted by World Economic Forum (2017), **growing market for mobile payment** has reached an increased rate of 39.2% Compound Annual Growth Rate (CAGR). Solely on United States, it is forecasted to reach USD 128 billion in year 2021 (Toplin, 2018). Moreover as mentioned in McKinsey & Company October article (2018), stated that global payments revenue is estimated to surge to USD 3 trillion within five years time and Asia-Pacific market is dominating nearly half of the revenues.

Merely on NFC mobile wallet itself, in year 2015, in an article contributed by Convenience Store Decisions (2015), it stated Deloitte was forecasting **volumeof adoption and spending** using NFC-smartphones should be risen gradually once consumers are more familiar with the procedures and usage. Meanwhile, as found in Khalilzadeh et al. (2017), transaction value of NFC m-payment in year 2015 has hit USD 8.71billion. Also during the year, Samsung has launched Samsung Pay (NFC-based m-payment system) in its high-end smartphones products (The Star, 2019). As dated in 2018, solely in Korea, it has surpassed 10 million users and contributing USD 17.02 billion to the accumulated transaction values.

According to CisionPRWeb (2019), only 22% of card issuers are offering contactless cards, but 67% are planning to go for this offering in the future years. Besides that, it also mentioned NFC-based m-payment like Apple Pay and others are expected to spur adoption rate. Further discussing on another supporting statistics found by eMarketer (2018), merely China's market itself, it is forecasted to account for 56% of proximity m-payment users in year 2021. NFC has been widely adopted by industry such as transportation, entertainment (i.e. theme park, music festival), as seen taking advantages on convenience and efficiency it offers (Liebana-Cbanillas et al., 2018; The Star, 2019). Companies can offer smooth checkout process and efficient queue management; meanwhile, enriching customer service experiences (Lefter, 2013).

Narrowing down to Malaysia market, as stated in the quarterly bulletin of Bank Negara Malaysia (2018), mobile phones could act as a mean to facilitate payments in the country without any additional infrastructure costs. It is attributable to the high penetration rate of mobile phones in the country. Also supported by statistics of the CAGR of financial transactions via mobile banking has risen up to 91% for the past seven years (Bank Negara Malaysia, 2018). Hence, it is able to indicate that there is a rose of Malaysians' familiarity on payment transactions via mobile channels. Besides that, the **government** of the nation has established **initiatives** on migrating existing payment landscapes to m-payment. From 1st wave: 2013-replacing cheques with e-fund transfer, to; 2nd wave: 2015-replacing cash via debit cards; and followed by 3rd wave: 2018-eliminating cash and cheques by encouraging mobile payment (Bank Negara Malaysia, 2018). In conjunction with the initiatives, the ecosystem of m-payment in this nation is expected to become more vibrant as there is seen to have surging of newly entrants and innovative mobile payment solutions.

As reported by Liu (2019) in an article in Oriental Daily, it stated several **major digital wallet players in Malaysia market**, consisting Alipay, WechatPay, PayPal, Maybank QRPay, GrabPay, Boost, Fave Pay, Touch'n Go eWallet and etc. Instead of solely offering hassle-free payment services, most of them are able to track and store rewards earned per transactions, enhancing m-payment service experience (Burnette. 2018).

So, what is NFC mobile wallet?According to Dragovic, Stankov and Vasiljevic (2018), Near Field Communication (**NFC**) is a technology developed from Radio Frequency Identification (RFID) technology, whereby, it can works within short distance.Also explained by Ramos-de-Luna, Montoro-Rios and Liebana-Cabanillas (2016), NFC is initially developed by Sony and Philips in aiming for enabling transaction of data from both sender and receiver within 10cm distance. Similarly, Ramos-de-Luna et al. (2016) did stated NFC feature is still functioning even mobile devices are turned off.

Dragovic et al. (2018) highlighted the **differentiation of NFC** comparing to other m-payment alternatives is on its fast set-up ability, better functionality, which then lead to enhanced customer experience. Other attractions of NFC are with minimum effort required by users; it offers speed and secures purchasing transactions by just waving or touching mobile devices with contactless point-of-sales terminals (Pham &Ho, 2015). According to Khalilzadeh, Ozturk and Bilgihan (2017), they mentioned that NFC system uses low power consumption and wide range of availability and uses (executed in any existing mobile terminals).

1.2 Research Problem

In fact with so much potentials and expectations have been documented through the past researches, yet the **adoptionrates are still not reaching massive utilization** and lower than other mode of m-payment options (Tan et al., 2013; Pham & Ho, 2015). Nielsen Malaysia (2019) has found 67% of Malaysian consumers are using various form of cashless payments, including credit or debit card, online banking and only 8% using mobile wallet. Worst still, NFC is seemed to be stalled at the position since in it was introduced, even the late comers (i.e. QR codes) has gain more usage rate than NFC m-payment (The Star, 2018). As being agreed by both industry and retail experts predicting future trends of m-payment, investments made has gone stagnant, in which, leading to frustration and doubt of business operators (Convenience Store Decisions, 2015; Ooi& Tan, 2016). Tan et al., (2013), also

further elaborated that infrastructures supporting on NFC m-payment has been available in the market since year 2010, but the market is still skeptical on its adoption. Moreover, according to Sharma, Mangla, Luthra and Al-Salti (2018), less significant adoption rate of the growing mobile wallet technology is partly due to several factors inhibiting users to embrace the innovation. Also, as mentioned by Lee (2019), the reasoning behind low adoption rate in Malaysia market also including users' confusion due to cluttering of digital wallet apps, subpar internet coverage and etc.

Besides that, as reported in an article of The Star (2019), RAM Ratings stated market **competition** for mobile payment in Malaysia will be intense although it is still in infant phase, as 48 non-bank digital money issuers have granted licenses from Bank Negara. With such low adoption rates and emerging players, **sustainability** of digital wallet company in the industry has become concern. Sustainability will only be achieved when users are willing to use and have **continuance** intention, or else companies will be dumping lots of funding in building market share and surviving in the intense market competition, even it is a loss-making business (Lee, 2019; The Star, 2019).

Great expectations should not come with great loss. Regardless huge potentials portrayed by NFC, its successful emergence are depending on consumers' widespread adoption (Ooi& Tan, 2016). Thus, in order to make investments and forecast a worth, businesses should understand underlying reasons and factors influence consumers to adopt NFC-based m-payment as their mobile wallet. In which circumstance will encourage consumers to have intention in using it.

1.3 Research Objectives

Prior to previous literature research, this study is pursuing to address the following objective:

- To determine elements or factors influencing consumers' intention adoption towards NFC mobile wallet.

1.4 Research Questions

As to attain the mentioned research objectives, the following research questions should be answered beforehand:

- What are the factors influencing consumers intentions on adoption towards NFC mobile wallet?
- How the mentioned factors affect the intentions on the adoption?

1.5 Research Significance

Although there is many research have been done on factors influencing on the adoption of mobile payments and mobile wallets options, but much effort is on conducting analysis about security, trust and cost factors. In which, not much is being discussed on user-related factors and system-specific factors. Nielsen (2018) suggested that sustainability requires companies understanding and empathizing on consumers' concerns and how their products can offer solutions for enhanced lifestyle. Hence, studying user-related factors enable company to have insights on further sustainability in the industry. As for system specific factors, it is refer as characteristics, features and context of technology or information system (Hong, Chan, Thong, Chasalow and Dhillon, 2014). In which, it also plays significant role in studying adoption level of mobile wallets.

Besides that, as mentioned by Pham and Ho (2015), little emphasis is being put on in **encouraging usage on this form of m-payment**. Since success of NFC adoption is depends on users' awareness and behavior on the intention to use NFC as their mobile wallet, user-related factors and system-specific factors will be studied in this paper (Ooi& Tan, 2016).

Furthermore, in conjunction with Malaysia's government initiatives in transformation Malaysia payment landscape to mobile payment, the mobile payment market will become more competitive than ever (Bank Negara Malaysia, 2018). Hence, understanding the underlying intention in adopting NFC m-payment, is able to **aid company cater better personalization and standout in the clutter**. The findings of this study can lead to **effective and efficient** formulation on marketing-related strategy in encouraging consumer adoption of related m-payment technology. In terms of academic contribution, findings are able to **facilitate better resources or information** on adoptions of NFC-related m-payment for future further discussions or research purposes.

This paper will be presented in following sequences: Chapter 2 reviews on the background of related theories and analysis of past literatures of related variables. Chapter 3 explaining proposed methodology employed in this paper. Chapter 4 is discussing on the findings and analysis of results. Lastly, Chapter 5 reviewing the implications, limitations and recommendation on future research.

CHAPTER 2: LITERATURE REVIEW

2.1 Underlying Theories

The models that included in this research are HMSAM, MISC, and additional construct, absorptive capacity. The reason of choosing these theories instead of basic foundation theory which is DOI, TAM, and UTAUT is because there are too many researchers that focus on the basic foundation theory when doing research on this topic.Although both of HMSAM and MISC are discussing more on the online video game, but, they have the similarity with the DOI, TAM, and UTAUT which is they also focus on technology acceptance in intrinsic motivation and extrinsic motivation.

2.1.1 Hedonic Motivation System Adoption Model (HMSAM)

Hedonic Motivation System Adoption Model (HMSAM) is a HMS-specific system acceptance model as compared to broad TAM extension, alternative theory perspective (Lowry, Gaskin, Twyman, Hammer & Roberts, 2013). This model primarily explained on the system adoption based on intrinsic motivation rather than extrinsic motivations. Intrinsic motivation refers to behaviour that is driven by internal reward. For example, users may feel enjoy, excited and funwhen using NFC. Besides, for those individual who are interested in NFC, they will feel curious about it, and will increase their intention to adopt NFC mobile payment. It explained that adoption of system might due to pleasure seeking, rather than productivity, in which traditionally information system researchers have ignored the fact.

This theory originally is focusing on affecting adoption on video games, social networking sites and virtual worlds, which then related to deep immersion(which required a deep mental involvement in activities) (Lowry et al., 2013). As mentioned, user adopting relevant system is more concern on intrinsic rewards, mostly through the process or experience of using it (process-oriented context).Hence, in wake of that, this paper is to adopt this theory as to study more on user related factors that influences them to have the intention in using new technology. The constructs of HMSAM include: perceived ease of use, perceived usefulness, control, immersion, behavioural intention to use, curiosity and joy. However, this paper is adopting only curiosity and joy, since it emphasized on user related factors. Reason of omitting perceived ease of use and perceived usefulness from TAM is due to its widely used in related research studies. Omitting control and immersion is due to the constructs is explaining on deep immersion when using the systems, in which they are more relevant to video games instead of mobile wallet.

2.1.2 MultimotiveInformation System Continuance Model (MISC)

This theory is basically describes and forecasts the discrete cognitive processes through how the system fulfill a range of motives and expectations and gradually lead to continuance intention. Researchers must consider the role of expectation in system use. The design structures that have potential to contribute to the study on system include design aesthetics, perceived ease of uses, and design expectation fit. Based on study of Lowry, Gaskin and Moody (2015), they conducted a test on different information system contexts which include online gaming (hedonic), online learning (intrinsic), and online paid work (extrinsic). MISC prove that it is able to support across various system.

One of the variable, design expectations fit emphasis on fit between the design of technology and expected task. For instance, if a user craving for intrinsic motivation when dealing with a technology, but the design of technology is focus towards extrinsic motivation, then design of expectation fit will be low. It will only be high when the expectations of task

match the design. The other variable is design aesthetics which discussed about the appropriateness and professionalism of user interface. For instance, user interface that is artistically, properly, and professionally design will be likely prefer over the less artistically ones. However, some of the design looks unprofessional in order to avoid user over focus on the design element. This paper is adopting only design aesthetics and design expectation fit since it mainly discussed on system expectation factors that affecting adoption of system. Reason of omitting perceived ease of use from TAM is due to its widely used in related research studies, but not in mobile wallet context, this paper intent to do so by adopting this theory.

2.1.3 Absorptive capacity

Absorptive capacity is being added to the conceptual framework. This variable is not from any theory. It was introduced by Cohen and Levintal. Previously in study of Pham and Ho (2015), it mentioned that this constructs was used in firms' perspective before, but they adopted it into consumers' perspective. This model is adopting in this study because it is suit the studies which the intention towards adopting NFC mobile wallet by discussing about theinnovation, learning and information technology. Through this model, new value, external information may be recognize, thus integrate it and apply it for marketable purpose. For instance, when an individual have prior knowledge of mobile application and payment, they are able to understand and apply the knowledge in the NFC mobile wallet, thus it will increase the adoption level of NFC mobile wallet.

2.2 Review of Variables

2.2.1 Dependent Variable

Intention towards adoption of NFC Mobile Wallet

The term intention is often defined as the action, perceived notion between oneself, or future behaviour of someone (Balachandran, 2015). Behavioural intention can be defined as performance of aperson's intention by particularactionlike the corresponding behavioursable be predicted when an individual acts voluntarily (Kuan, Ann, Badri& Tan, 2014). Sometimes the decision to make full use of an innovation also can be defined as adoption (Balachandran, 2015).Thus,Mafe, Blas &Tavera-Mesias (2010) said that intentions indicate the motivational reasons that affectmanners which indicates the willingness and hardness to try and engagement in a behaviour of the effort put. The adoption also can be defined in terms of implementation, usage, utilization, or satisfaction and the most widely usedsingle measures of adoption is satisfaction (Liu &Guo, 2008, Balachandran, 2015).

2.2.2 Independent Variables

(User-Related Factors)

1) Absorptive Capacity

Cohen and Levinthal introduced absorptive capacity and this concept has been tested in many researches which include strategic innovation, organizational learning and

information technology (Pham and Ho, 2015). Absorptive capacity can be meant by applying new knowledge, assimilate and to value of an ability of an organizational member. Absorptive capacity also can be define as the absorption of individual or firm on the limitation to the rating or quantity of scientific or technological information (Cohen and Levinthal, 1990). According to Hayes (2011), absorptive capacity can be known as the relevant knowledge that appear in the external environment and has the ability to generate innovations and absorb the knowledge. There are three interrelated components on absorptive capacity which the first one is individual capacity for understand the external knowledge which individual used the knowledge to facilitate the acquisition stage; second is assimilating the knowledge which is using the new knowledge on the adoption and finally is the utilization capacity which is to apply the knowledge to the task (Pham et al, 2015).

2) Curiosity

Curiosity can be defined as sensory and cognitive curiosity of his or her has arouses the user's experience (Oluwajana, Idowu, Nat, Vanduhe, Fadiya, 2018). Curiosity also can be meant by "a heightened arousal of sensory and cognitive" inquisitiveness or increase in interest (Agarwal &Karahanna, 2000). Excitement is being amplifies by the Human-system interaction in curiosity (Lowry, Gaskin, Twyman, Hammer, Roberts, 2013).

3) Joy

Joy is defined as fun, enjoyment or pleasure that result from using technology(Chopdar, Korfiatis, Sivakumar, Lytras, 2018). It is important in understanding the intention of Malaysian towards adoption of the NFC mobile wallet (Venkatesh, Thong, Xu, 2012). In information technology research, joy is one of the factors that directly influence the intention towards adopt NFC mobile wallet. It is an intrinsic motivation resulting from carrying out an activity, and has impact towards intention towards adopting NFC mobile wallet (Chopdar et al, 2018). So, Joy may be a forecaster of consumers' behavioural intention to use technology since it has been verified by several studies in the field of mobile technologies and online social network (Venkatesh et al, 2012).

(System-Specific Factors)

1) Design expectation fits

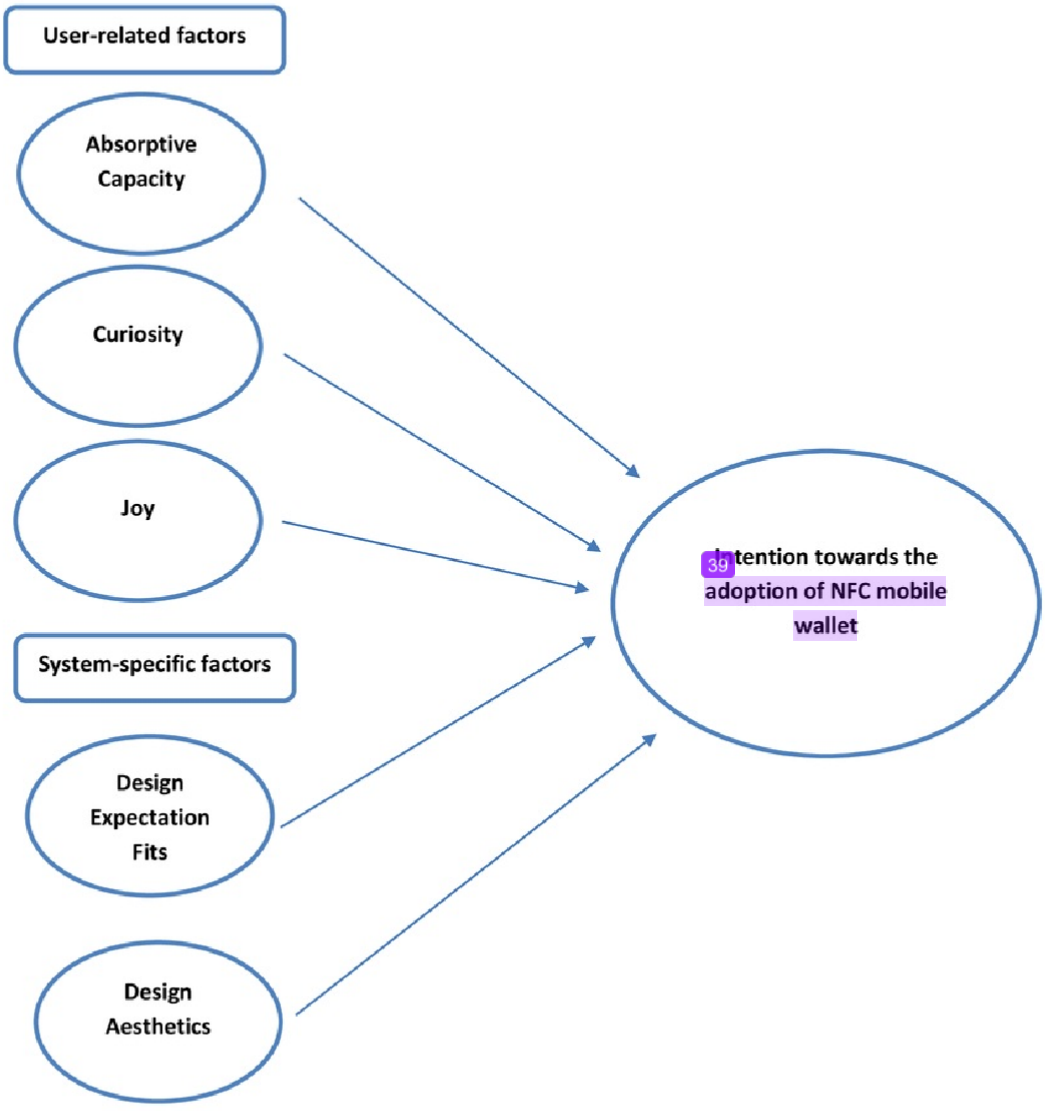
Design expectation fits can be term as the expected task and the fits between the designs of the technology (Lowry, Gaskin and Moody, 2015). Design expectation fits can be referring to whether the expected interaction matches the design of the software (Lowry, et al, 2015). Performance of products and services of the anticipations of the customers can be define as expectation (Elkhani&Bakri, n.d).

2) Design aesthetics

Design aesthetics refer to the professionalism and appropriateness of a user interface (Lowry, Gaskin, Moody, 2015). Design aesthetics also can be define as "web appearance", "visual appeal", "aesthetic experience" and "complexity, order, and legibility" (Cai and Xu, 2011).Aesthetics has categorized into two categories which are the classical and expressive (Lavie and Tractinsky, 2004). Classical aesthetics is referring to pleasantness, cleanliness, clarity, order and symmetry and it denotes the orderliness of the design (Bhandari, Neben, Chang, Chua, 2017).Traits such as creativity, fused with special effects, novelty, and sophistication and being fascinating are the definition of expressive aesthetics (Bhandari et al, 2017).

2.3 Conceptual Framework

Figure 1: Proposed Conceptual Framework



Adapted from: (Lowry, Gaskin, Twyman, Hammer & Roberts, 2013; Lowry, Gaskin & Moody, 2015; Pham &Ho, 2015)

2.4 Hypothesis Development

Absorptive capacity is not just apply at organizational level but also on user's adoption of new technology (Pham et al, 2015). In other words, assuming that if individual have prior knowledge on mobile applications, mobile payment and understanding on NFC mobile payment, they are more likely to have intention to accept NFC mobile payment (Pham et al, 2015).

H1: Absorptive capacity *has a significant relationship* on the intention towards adoption of NFC mobile wallet

Stimuli evokes curiosity and people give attention to stimuli that are personally interesting, when people are more curious about something or particular set of stimuli, people are more likely to devote to pursuing that curiosity towards mobile payment because of more attention (Lowry, Gaskin, Twyman, Hammer, Roberts, 2013).

H2: Curiosity *has a significant relationship* on the intention towards adoption of NFC mobile wallet

Perceived enjoyment do have the linkage with the usage intention and has already been verified by the previous studies under the areas of mobile technologies and online social networks (Hew, Leong, Tan, Lee, Ooi, 2017).

H3: Joy *has a significant relationship* on the intention towards adoption of NFC mobile wallet

To have more positive attitude toward using the technology, highly motivated user will have more positive expectations and subsequently towards mobile payment (Lowry et al,

2015). A person's cognition on mobile payment can easily expressed the expectation because it is typically directly measured (Lowry et al, 2015)

H4: Design expectation fits *has a significant relationship*on the intention towards adoption of NFC mobile wallet

Aesthetics has immense impact on usability issues that will have significant effect on individual's perception towards the quality of the mobile application and similarly, it will have same impact on usability of mobile payment as well (Zhang &Adipat, 2005). Perceived as useful, easy to use and enjoyable are more likely with the systems of high quality design aesthetics (Lowry et al, 2015).

H5: Design aesthetics *has a significant relationship* on the intention towards adoption of NFC mobile wallet

CHAPTER 3: METHODOLOGY

3.1 Research Design

A research design is a systematic plan or design that provides guidance in order to investigate and study a specific research problem (Burns & Bush, 2010).

3.1.1 Types of Research Design

Quantitative research method will be used in focusing on the survey of this research. This is because quantitative research method is research approaches that often come in line with surveys and experiments by collecting numerical data that will be analyse by using mathematical based methods or predetermined measurement which will provide statistical data. (Aliaga& Gunderson, 2000).Therefore, quantitative research method will be used to study the determinants that influences Malaysian intention towards adoption of Near Field Communication (NFC) mobile wallet. This research approach can be fitted into the study as it is able to gather additionalinformation from huge sample size of population will be able to target numerous amounts of target respondents (Saunders, Lewis, & Thornhill, 2012). Hence, questionnaires will be used in order to obtain quantitative data.

3.1.2 Nature of Research Design

This research is a descriptive research. Descriptive research is the research that will be involving numerical data in order to answer the research questions of the research. The function of descriptive research is to determine the characteristics of the observed problem or phenomenon and to find the possible relationship between the variables (Malhotra, Nunan&Birks, 2017).

3.1.3 Time Horizon of research Design

Furthermore, it will be a cross sectional design survey. Cross sectional design survey will be applied so that the respondents of the survey will not be intentionally sampled again in the future, this will also aids in acquiring representative sampling and also minimize response bias (Rindfleisch, Malter, Ganesan, & Moorman, 2008). In this type of design, the information gathered from the respondents will represent what is happening at the specific period of time (Rindfleisch, Malter, Ganesan, & Moorman, 2008).

3.2 Sampling Design

According to Malhotra, Nunan and Birks (2017), sampling plan is designed as following processes. It starts from deciding target population, specifying the sampling frame and sampling techniques, finalizing the sample size to executing the whole plan. Also, mentioned by Tan (2017), it is a process of choosing respondents from the population of interest, in aiming to make inferences of the studied sample on target population.

Also, defined by Low (2016), target populations are those who possess elements or objects that fits the desired criteria and it must be precisely define, as inferences are to be made based on it. Balachandran (2015) commented thatconsumers are the one who pays and consumes goods and services. As this study is focusing on mobile wallet payment, the target respondents must be someone who routinely involved in checkout process. Hence, **Malaysian consumers** are being chosen as the target populations of this paper. Target population is then further narrowed down based on several units and criteria to become the sample target respondent.

The sampling units consists of **universitiesand colleges students**, the one that falls within the age brackets and are more exposed to new technology; and **working adults**, who are more likely to own a credit card and also falls within the age range.

Respondent must be **citizens of Malaysia**, in hope to enable generalization of findings in Malaysian context. Additionally, according to Tan et al. (2013) and Balachandran (2015), target respondent are more likely to have intentions to adopt NFC mobile wallet if they possess at least a **smartphone** and a **credit or debit card**. Furthermore, it is also stated that target respondents who possesses these criteria are more relevant to study, since NFC m-payment required the presence of both smartphone and debit or credit card, and the knowledge of using them.

Additionally, age preferences for the sample falls in the range of 18 years old to 64 years old. The reasoning behind this age bracket is due to the population percentage they are holding. As being addressed by Department of Statistics Malaysia (2018), population aged between 15 to 64 years old are being named as young and working age range. In which, they hold up to 22.58 million over total population of 32.39 million. It is consider the age bracket that holds the largest portion of population. Equally important, 97.7% of individuals who aged 15 years old and above were using mobile phones, as dated in year 2017 (Department of Statistics Malaysia, 2018). Besides that, the eligible age for applying credit card is 21 years old for principal cardholder and minimum 18 years old for supplementary cardholder (iMoney.my, 2019). As disclosed by Maybank (n.d.), age limit for credit card application is

set at 65 years old. In terms of debit card, minimum eligible age is at 18 years old (Public Bank, n.d.).

Collection of data will be held in five shopping malls located in Klang Valley, since mall-intercept survey tool is being used. The stated malls are One-Utama, Midvalley Megamall, The Gardens, Ikea Cheras and MyTown. **Klang Valley** was designated as sampling location its 8.3 million high population density (dated in year 2018), as reported by Department of Statistics Malaysia (2019). Further reference from Ooi and Tan (2016), Klang Valley population density held one-fifth of Malaysian's total population. In addition, supported by the statistics reported by Malaysian Communication and Multimedia Commission (2017), there is another supporting reason in selecting Klang Valley since it has 185.7% of mobile phone penetration rate and is the highest among entire states. Moreover, it is the heartland of Malaysia's businesses and economics industries (Tan, Lee, Hew &Ooi, 2018; Ooi& Tan, 2016). Fair balance of variety ethnics and age brackets of sample respondents can be found, thus, enable wider representation.

It will be duration of six-week for data collection, dating from **11 May 2019 to 8 June 2019**. During these six weeks time, it is expected to have more store traffic in the malls since there are several public holidays fall within the period of time (Ruban, 2017). Stunning store decorations can be one of the reasons of attracting store foot. According to Malaysian Employers Federation (2019), available public holidays in Federal Kuala Lumpur include Hari Wesak (19 May), Hari Nuzul Al-Quran (22 May), Hari Raya Puasa (5 & 6 June).

Sampling frame is not available in this study as fixed list of consumers visiting each and every chosen shopping malls are not found. As recommended by Sit, Ooi, Loke and Tan (2011), adequate estimation of obtaining meaningful **sample size** is within the parameter ratio of 15:1 to 20:1. Hence, any sample size formed by the ratios within the range is assumed satisfactory to be studied. This paper will adopt 20:1 ratio for the sample size, forming 300 usable sample sizes.

Non-probability sampling technique will be used, since it is designed to obtain data which do not have sampling frame (Malhotra et al., 2017). Of all probability sampling methods, purposive sampling is chosen in this study.It is also addressed as judgemental, selective or subjective sampling techniques (Malhotra et al., 2017). Selected elements are chosen based on researchers' judgement and believing that they can represent the population of interest. Similar approach from Tan et al. (2018) is being adopted in this study as well, upon distributing survey forms, pre-qualifying questions will be asked beforehand to filter potential adopters from non-adopters.

3.3 Data Collection Methods

3.3.1 Primary Data

Person administered questionnaire will be distributed prior to target respondent for purpose of obtaining the primary data. Primary data refers to the information commonly gathered by researchers to solve problems or questions on the moments.(Malhotra, Nunan&Birks, 2017).Person administered survey is the survey which is without any computer assistance during distribution of questionnaires. There will be manpower that will distribute questionnaires or survey form in the malls in order to acquire data from the respondents (Malhotra, Nunan&Birks, 2017). Therefore, mall intercept interview will be carried out. The data collected from the respondents through the questionnaire will be the primary data of this paper. Structured questions are chosen for the study, as it will be close-ended and scale questions which will apply with 7-point Likert scale. English with simple grammar will be used to enhance the understanding of the respondents towards the questionnaire. Pilot test, a trial test will be carried out in order to detect flaws of our survey form which will further refine our questionnaires in the future.Proposed 20 respondents which have relevant knowledge and are capable in mobile payment systems and credit or

debit card usage are involved in the pilot test,in aiming to get feedback on clarity, wording and format of the questionnaire (Leong et al., 2013;Ooi& Tan, 2016)

Constructs	Items	Description	Adapt from	Measurement
Absorptive Capacity (AC)	AC1	I will adopt NFC mobile wallet if I have **necessary knowledge** in the NFC mobile wallet.	Pham and Ho (2015)	Interval
	AC2	I will adopt NFC mobile wallet if I have **technical capability** to use NFC mobile wallet.		
	AC3	I will adopt NFC mobile wallet if I have **information** on the use of mobile payment related services.		
	AC4	I will adopt NFC mobile wallet if I am **capable to achieve my goals** of tasks by using it.		
	AC5	I will adopt NFC mobile wallet if I can make payment using it by **applying knowledge** from other mobile payment services.		
Curiosity (C)	C1	I will adopt NFC mobile wallet if using it will **excite** my curiosity.	Lowry, Gaskin, Twyman, Hammer and Roberts (2013); Barnes, Pressey&Scornavacca (2018)	Interval
	C2	I will adopt NFC mobile wallet if using it will **make** me curious about it.		
	C3	I will adopt NFC mobile wallet if using it will **arouse** my imagination.		
	C4	I will adopt NFC mobile wallet if using it will make me more **interested to know more** information about it.		
Joy (J)	J1	I will adopt NFC mobile wallet if I have **fun** using it during payment.	Lowry et al. (2013); Barnes et al. (2018); Balachandran (2015)	Interval
	J2	I will adopt NFC mobile wallet if paying with it provides me **a lot of joyment**.		
	J3	I will adopt NFC mobile wallet if I **enjoy** using it for making payment.		
	J4	I will adopt NFC mobile wallet if I am **pleasure** when using it.		
	J5	I will adopt NFC mobile wallet if using it is an **entertaining** experience.		
	J6	I will adopt NFC mobile wallet if using it is an		

		terestingexperience.		
Design Expectations Fits (DEF)	DEF1	I will adopt NFC mobile wallet if I can interact with the system to **chieve goals** specific to my needs.	Lowry, Gaskin and Moody (2015)	Interval
	DEF2	I will adopt NFC mobile wallet if the system interactive features is **ling** me to **accomplish** my task.		
	DEF3	I will adopt NFC mobile wallet if the system permits me to **receive lored content** to my needs by interacting with it.		
	DEF4	I will adopt NFC mobile wallet if the system **sufficiently meets** my **eds**.		
	DEF5	I will adopt NFC mobile wallet if the design of the system is **evant** in achieving my needs.		
Design Aesthetics (DA)	DA1	**vill** adopt NFC mobile wallet if its system design is **attractive.**	Lowry et al. (2015)	Interval
	DA2	I will adopt NFC mobile wallet if its system looks **professionally signed**.		
	DA3	I will adopt NFC mobile wallet if graphics provided in the system is **eaningful**.		
	DA4	I will adopt NFC mobile wallet if graphics provided in the system is **levant.**		
	DA5	I will adopt NFC mobile wallet if overall look and feel of the system **visually appealing**.		
Intention towards Adoption of NFC Mobile Wallet (IA)	IA1	I am **likely** to use NFC mobile wallet for payme in the near future	Tan et al. (2013); Balachandran (2015)	Interval
	IA2	Given the opportunity, **probably** in near future I will use NFC mobile wallet for payment.		
	IA3	I am **willing** to use NFC mobile wallet for payment, **if** I have access **it.**		
	IA4	I will **think** about using NFC mobile wallet for payment.		
	IA5	I will **recommend** NFC mobile wallet to my family and friends for making payment in future.		

Table 1: Questions Origin

3.4 Proposed Data Analysis Tool

Statistical Package for Social Science software (SPSS) will be used for descriptive analysis. Descriptive analysis refers to the statistical techniques which are being used by the researchers to summarize the primary data that had been collected to a simple and understandable form of data (Low, 2016).

Partial Least Squares Structural Equation Modelling (PLS-SEM) will be used in this study by using Adanco. Adanco is a variance-based structural equation modelling. It can implement some limited-information estimators or ordinary least squares regression based on sum scores (Adanco, n.d). Additionally, it is user-friendly in terms of the user interface, in which it smoothen the process of tabulating and analyzing the data.

Measurement Model Evaluation

Reliability Analysis is the statistical techniques that will be used in this study. Reliability Analysis is the tool that is used to ensure the extent is parallel through the objects that are verified and error-free that might influence the outcome in the findings (Low, 2016).Cronbach's Coefficient Alpha is used in reliability analysis in order to determine internal consistency ofentire items, ranged from 0 to 1 (Lai, Law, Liew, Phua& Tang, 2014). It is suggested that constructs are reliable if alpha is beyond 0.7 and should not be lower than 0.4, otherwise should be eliminated (Oliveira et al., 2016). Other than that, Adanco do have another 2 measurements for reliability under the same threshold of Cronbach's Coefficient Alpha which are Dijkstra-Henseler's rho (ρA) and Jöreskog's rho (ρc).

Rules of Thumb for Cronbach's Coefficient Alpha

Level of Reliability	Alpha ranges
Very good reliability	0.80 to 0.95
Good reliability	0.70 to 0.80
Fair Reliability	0.60 to 0.70
Poor Reliability	< 0.60

Source from Malhotra et al. (2017)

The measurement for validity of the reflective measurement model, it is depending on the convergent validity and discriminant validity which is Fornell-Larcker Criterion. Convergent validity reveals the extent to which two measures capture a common construct(Carlson &Herdman, 2010). Average variance extracted (AVE) of each latent variable is measured in order to assess the convergent validity,the optimal threshold value compulsory to be atleast of 0.50 (Kline, 1988). According to Tan and Ooi (2016), each of the indicators should possess loading of a lowest of 0.70. However, to define the discriminant validity of the model, factor loading and Fornell-Larcker test would be accessed. Stated in Fornell-Larcker criterion, in order to establish discriminant validity, the AVE of the each construct should be bigger than the squared correlation with any other construct (Tan, el al., 2016).

Structural Model Equation

The coefficient of determination is the level and significance of path coefficient that being measured in structural model as the main objective of prediction-oriented PLS-SEM is to provide explanation on the variance of target dependent variable (Mooi, 2017).Nevertheless, the rule of thumb in marketing research context categorizes 0.75 as substantial, 0.50 as moderate and 0.25 as weak (Mooi, 2017). Standardized beta coefficient were interpreted and measured by the individual path coefficients for each indicator. Determination of hypotheses significance level is measured as to its path coefficients, t-statistics and p-value. In this study significance level was set at $\alpha = 0.05$.

CHAPTER 4: DATA ANALYSIS

4.1 Response Rate

300 questionnaires are erratically issued for shoppers who visited those five chosen shopping malls in Klang Valley. All of the 300 questionnaires are being filled and returned, but only 297 are usable, and the remaining 3 incomplete responses are being discarded. According to Rasoolimanesh, Taheri, Gannon, Vafaei-Zadeh and Hanifah (2019), the minimum sample size can be generated through Gpower, a power based analysis. Minimum sample size will be generated based on its effect sizes, alpha levels and power values (Cunningham &McCrum-Gardner, 2007). Since the alpha level of this study is p =0.05 and the power is 0.80, hence, the minimum sample size for this proposed framework is 92 respondents. Thus, the number of collected data is sufficient for running data analysis in this study.

4.2 Descriptive Analysis

4.2.1 Demographic Profiles

Table 2 Respondents' Demographic Profile

Demographic Profile		Frequency	Percentage
Gender	Male	123	41.4
	Female	174	58.6

Age	20 years and below	53	17.8
	21 to 30 years old	95	32
	31 to 40 years old	77	25.9
	41 to 50 years old	44	14.8
	51 to 60 years old	18	6.1
	60 years old and above	10	3.4
Employment	Unemployed	26	8.8
	Self- employed	52	17.5
	Working professional	138	46.5
	Student	81	27.3
Income	Below or equal to RM 1000	92	31.0
	RM 1001 to RM 2000	15	5.1
	RM 2001 to RM 3000	29	9.8
	RM 3001 to RM 4000	60	20.2
	RM 4001 and RM 5000	47	15.8
	RM 5001 and above	54	18.2
Frequency of using credit or debit card (per month)	1 to 5 times	99	33.3
	6 to 10 times	51	17.2
	10 times and above	82	27.6
	I don't use credit or debit card every month. I only will use it when necessary.	65	21.9

Table 2 portrays 58.6% of samples are female and 41.4% are male.

Majority of the respondents are aged between 21 to 30 years old and currently are working professional. Besides, 31% of them were reported earning monthly income of below or equal to RM1000. For the frequency of using credit or debit card (per month), out of 33.3% of our respondents are using 1-5 times.

4.3 Measurement Model Evaluation

4.3.1 Construct Reliability

Table 3 Construct Reliability

Construct	Dijkstra-Henseler's rho (ρ_A)	Jöreskog's rho (ρ_c)	Cronbach's alpha(α)
Absorptive Capacity	0.8886	0.9176	0.8877
Curiosity	0.9184	0.9414	0.9169
Joy	0.9025	0.9258	0.8999
Design Expectation Fits	0.8878	0.9169	0.8867
Design Aesthetics	0.8483	0.8905	0.8463
Intention to adopt	0.8886	0.9182	0.8886

Table 3 shows the verified and illustrated of the reliability of this study. As mentioned earlier, it is suggested that constructs are reliable if Cronbach's alpha is beyond 0.7 and should not be lower than 0.4, otherwise it should be eliminated. Based on our research, the value of **Dijkstra-Henseler's rho (ρ_A), Jöreskog's rho (ρ_c), and Cronbach's alpha(α)**exceeds the required value, which is beyond 0.7. Therefore, all construct are considered to have achieved the internal constructs reliabilities (Mooi, 2017).

4.3.2 Convergent Validity

Table 4 Convergent Validity

Construct	Average variance extracted (AVE)
Absorptive Capacity	0.6901
Curiosity	0.8007
Joy	0.7141
Design Expectation Fits	0.6880
Design Aesthetics	0.6193
Intention to adopt	0.6920

Table 4 shows the result of convergent validity. Convergent validity refers to the extent of vary approaches of construct measurement will generate similar results (Hew, Leong, Tan, Ooi, Lee, 2017). Average Variance Extracted (AVE) is used as the criterion to test the result of convergent validity. The minimum threshold of validated value should be higher than 0.5. From table 4, since the entire AVE values are above 0.5, it can be confirmed that the convergent validity were statistically validated (Oliveira, Thomas, Baptista & Campos, 2016)

4.3.3 Discriminant Validity (Fornell-Lacker Criterion)

Table 5 Discriminant Validity: Fornell-Larcker Criterion

Construct	Absorptive Capacity	Curiosity	Joy	Design Expectation Fits	Design Aesthetics	Intention to adopt
Absorptive Capacity	0.6901					
Curiosity	0.2046	0.8007				
Joy	0.2310	0.4686	0.7141			
Design Expectation Fits	0.4108	0.1852	0.1806	0.6880		
Design Aesthetics	0.3107	0.2814	0.2938	0.4530	0.6193	
Intention to adopt	0.2820	0.2855	0.2843	0.3448	0.3782	0.6920

Squared correlations; AVE in the diagonal

Table 5 shows the discriminant validity of this study evaluated by Fornell-Larcker criterion. Discriminant validity referred to the difference between the constructs and its indicator relative to other constructs and their indicators in the table shown above (Tan, Ooi, Chong and Hew, 2013). Since the table shown that the square of AVE for each of the variables is greater than their respective inter-construct correlations (Chopdar, Korfiatis, Sivakumar and Lytras, 2018). Hence, discriminant validity is achieved (Hew, Leong, Tan, Ooi and Lee, 2017).

4.3.4 Loadings

Table 6 Loadings

Indicator	Absorptive Capacity	Curiosity	Joy	Design Expectation Fits	Design Aesthetics	Intention to adopt
AC1	0.8474					
AC2	0.8085					
AC3	0.8400					
AC4	0.8246					
AC5	0.8325					
C1		0.9074				
C2		0.9132				
C3		0.8982				
C4		0.8595				
J1			0.8658			
J2			0.8463			
J3			0.8362			
J4			0.8187			
J5			0.8575			

DEF1				0.8427		
DEF2				0.8247		
DEF3				0.8292		
DEF4				0.8254		
DEF5				0.8252		
DA1					0.7948	
DA2					0.7770	
DA3					0.8195	
DA4					0.7599	
DA5					0.7823	
IA1						0.8537
IA2						0.8524
IA3						0.8234
IA4						0.8250
IA5						0.8039

Table 6 showed the results of loadings. A loading of an item will be used to determine how much each item is contributing to each variable. Therefore, high loading scores indicating better variable. According to Fornell and Larcker (1981), each of the indicators should equip with loading of minimum 0.70. The table above showed that all the indicators seems to have hit the requirement which exceeds 0.70.

4.3.5 Indicator Multicollinearity

Table 7 Indicator Multicollinearity

Indicator	Absorptive Capacity	Curiosity	Joy	Design Expectation Fits	Design Aesthetics	Intention to adopt
AC1	2.4023					
AC2	1.9973					
AC3	2.2945					
AC4	2.0889					
AC5	2.0984					
C1		3.6983				
C2		3.8366				
C3		3.0499				
C4		2.2020				
J1			2.9945			
J2			2.7776			
J3			2.2389			
J4			2.1193			
J5			2.4417			

DEF1				2.4041		
DEF2				2.2984		
DEF3				2.0506		
DEF4				2.1570		
DEF5				2.1791		
DA1					1.9673	
DA2					1.6998	
DA3					2.0176	
DA4					1.7801	
DA5					1.8686	
IA1						2.7852
IA2						2.7327
IA3						2.1228
IA4						2.1302
IA5						1.9325

Examination on Variance Inflation Factor (VIF) and tolerance are done in accordance to clarify multicollinearity problem. All VIF values are below conservative threshold of 5, hence, there is no violation to the multivariate analysis in this research (Venkatesh, Thong and Xu, 2012).

4.4 Hypothesis Testing

4.4.1 Direct Effects Inference

Table 8 Direct Effects Inference

Hypothesis	Original Coefficient	Standard Bootstrap Results					Percentile Bootstrap Quantiles				Significant or Insignificant
		Mean Value	Standard Error	t-value	p-value (2-sided)	p-value (1-sided)	0.5%	2.5%	97.5%	99.5%	
AC ->IA H1	0.1123	0.1107	0.0732	**1.5335**	0.1255	**0.0627**	-0.0752	-0.0374	0.2582	0.2971	Insignificant
C ->IA H2	0.1627	0.1681	0.0765	**2.1276**	0.0336	**0.0168**	-0.0281	0.0173	0.3136	0.3588	Significant*
J ->IA H3	0.1440	0.1406	0.0849	**1.6956**	0.0903	**0.0451**	-0.0987	-0.0260	0.3035	0.3433	Insignificant
DEF ->IA H4	0.2247	0.2266	0.0802	**2.8013**	0.0052	**0.0026**	0.0155	0.0647	0.3736	0.4097	Significant **

DA ->IA **H5**	0.2368	0.2389	0.0770	**3.0754**	0.0022	**0.0011**	0.0432	0.0809	0.3902	0.4287	Significant**

Source: Adanco

Note:

a) AC = Absorptive Capacity; C Curiosity; J = Joy; DEF = Design Expectations Fit; DA = Design Aesthetics; IA = Intention towards Adoption of NFC Mobile Wallet
b) Significant at:
*** p< 0.001; ** p < 0.01; * p < 0.05

Figure 1 Results of Structural Model

Source: Adanco

As shown from Figure 1, the structural model disclosed that 50.1% of variance in intention to adopt NFC mobile wallet can be explained by the constructs (R^2 = 0.501). However, out of the five constructs, only three of the constructs are significant to explain the intention in adopting NFC mobile wallet. The following constructs are C (β = 0.163, $p < 0.05$), DEF (β = 0.225, $p < 0.01$) and DA (β = 0.237, $p < 0.01$). Hence, it shows the meaning that H2, H4 and H5 are significant and successful in predicting the consumers' intention in adopting NFC mobile wallet. On the contrary, constructs that are failed in predicting the linkage between intention of adoption are AC (β = 0.112, $p < 0.05$) and J (β = 0.144, $p < 0.05$), thus, H1 and H3 are not supported.

4.4.2. Effect Sizes, f^2

Table 9 Effects Overview

Effect	Beta	Indirect effects	Total effect	Cohen's f^2
Absorptive Capacity -> Intention to adopt	0.1123		0.1123	0.0133
Curiosity -> Intention to adopt	0.1627		0.1627	0.0260
Joy -> Intention to adopt	0.1440		0.1440	0.0197
Design Expectation Fits -> Intention to adopt	0.2247		0.2247	0.0449
Design Aesthetics -> Intention to adopt	0.2368		0.2368	0.0503

Table 9 portrays the results of each path coefficient's effect sizes, based on Cohen's f^2. As being discussed by Mooi (2017), comparable measurements are generated by effect sizes as to level of predictive relevance. In which it has three levels of indication, consisting small (0.02), medium (0.15), and large effect size (0.35) (Tan, Lee, Hew, Ooi and Wong, 2018). Results shown above indicated that AC, C and J have small effect on intention to adopt NFC mobile wallet (IA). Meanwhile, DEF and DA have relatively medium effect on IA.

CHAPTER 5: DISCUSSION, CONCLUSION & IMPLICATIONS

5.1 Discussions of Major Findings

5.1.1 Absorptive Capacity (AC) and Intention towards the Adoption of NFC Mobile Wallet (IA)

Absorptive capacity which is H1 is supported in this study due to its p-value surpassed 0.05. Therefore, it has no significant relationship between AC and IA (Hayes, 2011). Absorptive capacity can be known as the relevant knowledge that appears in the external environment and users has the ability to generate innovations and absorb the knowledge (Hayes, 2011).

Yes, people who have prior background knowledge about mobile payment can easily adapt to NFC mobile wallet but NFC is not well-known in the market, there are insufficient channels or counters that establish this kind of technology (Pal, Vanijja and Papasratorn, 2015). Although some of the devices may have enabled NFC but payment are still cannot make due to the non-availability of such specialized payment gateways and people would like to adopt when it is more popular (Pal et al, 2015). Absorptive capacity does not affect their performance directly for understanding the systems because they still have to assimilate it so that they can internalize the new knowledge into his or her task environment (Park, Suh and Yang, 2007). Hence, it can be explain that absorptive capacity is not significantly affect the IA in this study.

5.1.2 Curiosity (C) and Intention towards the Adoption of NFC Mobile Wallet (IA)

Based on the results, **H2 is supported** in this study since p-value is over 0.05. Therefore, it has significant relationship between curiosity and intention to adoption(Lowry, et al, 2013). Curiosity is one's arouses interest on infrequent or exotic characteristics, which emphasize on attention. According to Lowry et al (2013), it highlightedthat freshness can enhance curiosity and attention. People will give more attention when they feel there is something interesting. The findings explained people who are more curious may be more likely to perceive NFC mobile wallet as more stimulating, thus it can motivate individual to find out what is hidden inside (Okazaki, Navarro, Mukherji, Plangger, 2017). They will seek out informationregardless the outcome is good or bad. For them, they will consider the process of seeking out information as feeling of rewarding, as they can learn something new through the process (Wiggin, Reimann, Jain, 2018).

5.1.3 Joy (J) and Intention towards the Adoption of NFC Mobile Wallet (IA)

According to above findings, it revealed that **H3 is not supported**, and there is no significant relationship between J and IA. The above finding is in line with previous studies done by Trachuk and Linder (2017). It is surprising that the finding is contradicting to most of the previous studies related to adoption of mobile payments, for instance (Mooi, 2017; Tan &Ooi, 2018; Venkatesh, Thong and Xu, 2012; Kuan, Ann, MohdBadri& Tang, 2014).

One possible explanation is due to Joy is not considering the main factor affecting the respondents' decision in adopting NFC mobile wallet. According to Tamborini, Bowman, Eden, Grizzard and Organ (2010), enjoyment is practically defined as need satisfaction and is not bound specifically or merely to pleasure seeking only. Mobile payment is categorized as

personal activity, in which it is activity that meant to fulfil needs and meeting goals (Chopdar, Korfiatis, Sivakumar&Lytras, 2018). Unlike social media apps, in which it is more to social activity and enjoyment shall be the main factor affecting adoption and continuance usage. In majority of cases, mobile payment apps emphasizing on providing speed, convenience and secured payments, and all of these are to satisfy consumers' needs and aiding them in enhancing their quality of life (Chiriac, Hurduzeu, Rosca&Zavera, 2018; Holm, Liu & Ding, 2018). Also mentioned by Chong (2016), enjoyment will come after perceived ease of use of technology, which also can be interpreted as consumers' needs is being satisfied first (easy to use technology), later only they will feel enjoyable using it. In short, unfulfilled needs create unpleasant emotions, similarly if the mobile wallet unable to fulfil the needs of users, how can they be enjoyable when using them. Hence, this might be explaining the reason Joy is not significantly affecting IA in this study.

5.1.4 Design Expectations Fit (DEF) and Intention towards the Adoption of NFC Mobile Wallet (IA)

Based on the results, it is clearly showed that **H4 is supported** in this study because its p-value is below 0.5. Therefore, there is a significant relationship between the design expectation fits and the adoption of NFC mobile wallet(Chopdar, Korfiatis, Sivakumar and Lytras, 2018; Lowry, Gaskin and Moody, 2015).

According to Chopdar et al (2018), design expectation fits refers to the user consider the design of NFC mobile wallet was designed to be fit the usage of the mobile transactions. If the users of NFC mobile wallet found out that the NFC mobile payment have been designed to fit the use of the expectations of the users, NFC mobile wallet will be used more frequently by the users (Lowry et al., 2015). When the design of the NFC mobile wallet fits the expectation of the users, they will also tend to find out that the NFC mobile wallet will bring benefits to them. Thus, they will have higher intention to adopt the NFC mobile wallet (Chopdar et al., 2018). Not only that, with user-friendly and convenience design of NFC

mobile wallet that fit the expectation of the users will also enable the users to adopt the NFC mobile wallet. Therefore, it can be showed that design expectation fits is significantly affect the IA in this study.

5.1.5 Design Aesthetics (DA) and Intention towards the Adoption of NFC Mobile Wallet (IA)

Based on the findings, the p-value of design aesthetics are less than 0.01, therefore **H5 is supported** and there are significant relationship between DA and IA. Based on the research that had been conducted by Victoria, Hope, Loranger& Rea (2017), before developing a mobile application, it is important for a developer to understand how to make the application attractive to users and receive positive reaction from them. A good design aesthetics can assists users to ensure quality of the application (Lu, Wei, Yu & Liu, 2016).

Mobile payment application with high quality design aesthetics are more likely to be perceived as usefulness, ease of use and enjoyable that will likely affect a user's belief towards the potential performance of the mobile payment application because based on previous research it is found that design aesthetics impact the perceived performance and satisfaction of an application (Lowry et al., 2015). Users may feel satisfied towards mobile payment application due to the well-designed mobile payment application that is attractive to them (Chen, 2018).

5.2 Implications of Study

In terms of **managerial implications**, since **AC** is not the main factor of consideration, organizations should emphasized on increasing the availability of NFC point-of-sales terminals and NFC-enabled mobile phones, in order to encourage usage of NFC mobile wallet. In addition, other than Apple and Samsung, smartphone companies like Oppo, Vivo or Huawei should incorporate NFC payment functions in wider range of smartphones, not only restricting it on high-end smartphones only. Next, for **C**, companies advertising campaigns should be creative enough to stimulate target market's attention in order to enhance their curiosity and lead to adoption. For instance, Apple Inc. normally introduces new iPhone features using teaser advertisements first in order to generate target market's attention and increase curiosity on its prices. Thus, target market will pay attention to the new products and follow up its news accordingly.

Next, as **J** has need satisfaction as predecessor, hence, companies should focus on satisfying needs and leading to enjoyment of using mobile wallet might be more useful than focusing only on J itself. As for **DEF**, smartphones manufacturers should highlight on designing the mobile wallet according to target market's expectation and needs. For example, the design has to be user friendly, convenient and is simplified as user can pay with a touch. Lastly, **DA** stressing on making NFC mobile wallet application look as interesting as possible as to attract more users to adopt into it. For example, Samsung's NFC mobile wallet is simple and attractive, and it helps in creating user awareness on its existences.

From **academic standpoint**, this research contributed psychological constructs describing user-related factors that previously being widely adopted in mobile gaming and technologies researches into adoptions of mobile wallet. In wake of that, it also became a stepping stone for the framework to be replicated in further studies on mobile payments and technologies. Meanwhile, instead of focusing only on users' usage behaviour, system-specific factors also reminds researchers on the importance of mobile wallet's system infrastructures in affecting adoption level as well.

5.3 Limitations and Recommendations of the Study

Since this study is executed in Malaysia and only Malaysian respondents were involved, the findings might not be able to generalize to other countries (Leong, Hew, Tan &Ooi, 2013). Cultural diversity and ethnicity are not taken into account in these findings, and as mentioned by Khalilzadeh, Ozturk and Bilgihan (2017), one's cultural traits might affect his or hers technology adoptions. Hence, it is suggested that cross-national researches should be done in future, as to generalize the framework in different geographical regions (Leong et al., 2013).

Studying on customers' retention is also crucial as attracting new consumers. Instead of relying only the behavioural intention to adopt factors, further research should incorporate other potential constructs that affecting the continuance usage, such as service quality, government policy, gender, experiences and etc (Leong et al., 2013). Moreover, longitudinal study is suggested instead of cross-sectional studies in order to increase the predictive effects of the model. Studying and comparing on the stages of adoption are able to provide meaningful insights of consumers' willingness to adopt and continuance behaviour (Pham &Ho, 2015).

Next, the respondents of this paper are users of mobile phone and credit or debit cards, hence, respondents bias may incur in terms of usage behaviours as compared to non-users' (Tan et al., 2013). Thus, as to have clearer picture on the differences of usage behaviour of both users and non-users, it is recommended that future research should consider taking into account of the non-users groups.

Last but not least, as mentioned in discussion, availability of NFC point-of-sales terminals and devices are important in affecting NFC mobile wallet adoption rates. Hence, further research should also consider both consumers' and merchants' perspectives.

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UNIVERSITI TUNKU ABDUL RAHMAN

FACULTY OF BUSINESS AND FINANCE

FINAL YEAR PROJECT (FYP)

DETERMINANTS THAT INFLUENCES MALAYSIAN'S INTENTION TOWARDS ADOPTION OF NEAR FIELD COMMUNICATION (NFC) MOBILE WALLET

Survey Questionnaire

Dear respondent,

We are undergraduates from University Tunku Abdul Rahman, whom major in Bachelor of Marketing. Currently, we are conducting research for our final year project, on "Determinants that Influences Malaysian's Intention towards Adoption of Near Field Communication (NFC) Mobile Wallet". This research is conducted to study on the factors that influencing Malaysians to adopt NFC mobile wallet.

Near Field Communication (NFC) mobile wallet is contactless payment (using smartphones). Payment can be done within 10 cm distance by waving or tapping the smartphones with the point-of-sales terminal. Credit or Debit card information is embedded in the smartphones and act as a wallet for NFC payment purpose.

Instructions: Please answer ALL questions

i. This questionnaire is divided into 3 sections:

Section A: Demographic Information

Section B: Factors Influencing the Adoption of NFC Mobile Wallet

Section C: Intention to Adopt NFC Mobile Wallet

ii. Completion of survey will take you approximately 5 to 10 minutes.

All information will be held confidential and only be used for our research work.

Section A: Demographic Information

Please **tick** your answer on the following questions:

1. **Gender:**
   - O Male
   - OFemale

2. **Age:**
   - O20 years and below
   - O21 to 30 years old
   - O31 to 40 years old
   - O41 to 50 years old
   - O51 to 60 years old
   - O60 years old and above

3. **Current employment status?**
   - OUnemployed
   - OSelf- employed
   - OWorking professional
   - OStudent

4. **What is your monthly income?**
   - OBelow or equal to RM 1000
   - ORM 1001 to RM 2000
   - ORM 2001 to RM 3000
   - ORM 3001 to RM 4000
   - ORM 4001 and RM 5000
   - ORM 5001 and above

5. **Frequency of using credit or debit card (per month):**
   - O1 to 5 times
   - O6 to 10 times
   - O10 times and above
   - O I don't use credit or debit card every month. I only will use it when necessary.

Section B: Factors Influencing the Adoption of NFC Mobile Wallet

Please indicate how strongly or disagree on the statements given on the following Likert scale.

Please circle only ONE answer which BEST describes your response.

(1= Strongly Disagree, 2 = Disagree, 3 = Slightly Disagree, 4 = Neutral, 5 = Slightly Agree, 6 = Agree, 7 = Strongly Agree)

Absorptive Capacity

No.	Questions	Strongly Disagree	Disagree	Slightly Disagree	Neutral	Slightly Agree	Agree	Strongly Agree
AC1	I will adopt NFC mobile wallet if I have **necessary knowledge** in the NFC mobile wallet.	1	2	3	4	5	6	7
AC2	I will adopt NFC mobile wallet if I have **technical capability** to use NFC mobile wallet.	1	2	3	4	5	6	7
AC3	I will adopt NFC mobile wallet if I have **information** on the use of mobile payment related services.	1	2	3	4	5	6	7
AC4	I will adopt NFC mobile wallet if I am **capable to achieve my goals** of tasks by using it.	1	2	3	4	5	6	7
AC5	I will adopt NFC mobile wallet if I can make payment using it by **applying knowledge** from other mobile payment services.	1	2	3	4	5	6	7

Curiosity

No.	Questions	Strongly Disagree	Disagree	Slightly Disagree	Neutral	Slightly Agree	Agree	Strongly Agree
C1	I will adopt NFC mobile wallet if using it will **excite** my curiosity.	1	2	3	4	5	6	7
C2	I will adopt NFC mobile wallet if using it will **make** me curious about it.	1	2	3	4	5	6	7
C3	I will adopt NFC mobile wallet if using it will **arouse** my imagination.	1	2	3	4	5	6	7
C4	I will adopt NFC mobile wallet if using it will make me more **interested to know more** information about it.	1	2	3	4	5	6	7

Joy

No.	Questions	Strongly Disagree	Disagree	Slightly Disagree	Neutral	Slightly Agree	Agree	Strongly Agree
J1	I will adopt NFC mobile wallet if I have **fun** using it during payment.	1	2	3	4	5	6	7
J2	I will adopt NFC mobile wallet if paying with it provides me **a lot of enjoyment**.	1	2	3	4	5	6	7
J3	I will adopt NFC mobile wallet if I **enjoy** using it for making payment.	1	2	3	4	5	6	7
J4	I will adopt NFC mobile wallet if I am **pleasure** when using it.	1	2	3	4	5	6	7
J5	I will adopt NFC mobile wallet if using it is an **entertaining** experience.	1	2	3	4	5	6	7

Design Expectation Fits

No.	Questions	Strongly Disagree	Disagree	Slightly Disagree	Neutral	Slightly Agree	Agree	Strongly Agree
DEF1	I will adopt NFC mobile wallet if I can interact with the system to **achieve goals** specific to my needs.	1	2	3	4	5	6	7
DEF2	I will adopt NFC mobile wallet if the system interactive features is aiding me to **accomplish** my task.	1	2	3	4	5	6	7
DEF3	I will adopt NFC mobile wallet if the system permits me to **receive tailored content** to my needs by interacting with it.	1	2	3	4	5	6	7
DEF4	I will adopt NFC mobile wallet if the system **sufficiently meets** my needs.	1	2	3	4	5	6	7
DEF5	I will adopt NFC mobile wallet if the design of the system is **relevant** in achieving my needs.	1	2	3	4	5	6	7

Design Aesthetics

No.	Questions	Strongly Disagree	Disagree	Slightly Disagree	Neutral	Slightly Agree	Agree	Strongly Agree
DA1	I will adopt NFC mobile wallet if its system design is **attractive.**	1	2	3	4	5	6	7
DA2	I will adopt NFC mobile wallet if its system looks **professionally designed.**	1	2	3	4	5	6	7
DA3	I will adopt NFC mobile wallet if graphics provided in the system is **meaningful.**	1	2	3	4	5	6	7
DA4	I will adopt NFC mobile wallet if graphics provided in the system is **relevant.**	1	2	3	4	5	6	7
DA5	I will adopt NFC mobile wallet if overall look and feel of the system is **visually appealing.**	1	2	3	4	5	6	7

Section C:Intention to Adopt NFC Mobile Wallet

Please indicate how strongly or disagree on the statements given on the following Likert scale.

Please circle only ONE answer which BEST describes your response.

(1= Strongly Disagree, 2 = Disagree, 3 = Slightly Disagree, 4 = Neutral, 5 = Slightly Agree, 6 = Agree, 7 = Strongly Agree)

Intention to Adopt

No.	Questions	Strongly Disagree	Disagree	Slightly Disagree	Neutral	Slightly Agree	Agree	Strongly Agree
IA1	I am **likely** to use NFC mobile wallet for payment in the near future	1	2	3	4	5	6	7
IA2	Given the opportunity, **probably** in near future I will use NFC mobile wallet for payment.	1	2	3	4	5	6	7
IA3	I am **willing** to use NFC mobile wallet for payment, if I have access to it.	1	2	3	4	5	6	7
IA4	I will **think** about using NFC mobile wallet for payment.	1	2	3	4	5	6	7
IA5	I will **recommend** NFC mobile wallet to my family and friends for making payment in future.	1	2	3	4	5	6	7

-Thank you for taking your time to answer our survey.-

~THE END~