The role of government in accelerating financial inclusion through digital payment system

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Declaration

We hereby declare that:

1. **This research was done by both students from UCSI University, and the amount of effort put into this research was shared equally.**
2. **This research has adopted previous research projects/ journals/ articles/ websites from qualified researchers and certified websites. All sources were cited and listed under the references list with an appropriate manner.**
3. **This research consists of 96 pages, that includes 12 pages of reference listed below. Cover page is excluded.**

List of Abbreviation

AFI	Alliance for Financial Inclusion
AML/CFT	Anti-Money Laundering & Counter Financing of Terrorism
ASEAN	Association of Southeast Asian Nations
ATM	Automated teller machine
BNM	Bank Negara Malaysia
CBK	Central Bank of Kenya
CCK	Communication Commission of Kenya
CNP	Card-not-present
CP	Card-present
CSR	Corporate Social Responsibility
DFTZ	Digital Free Trade Zone
EMV	Europay, Mastercard & Visa
FATF	Financial Action Task Force on Money Laundering
GDP	Gross Domestic Products
GfK	Gesellschaft für Konsumforschung (Germany's largest market research institute)
GPFI	G20 Global Partnership for Financial Inclusion
ISACA	Information Systems Audit and Control Association
IBFT	Interbank Funds Transfer
IBG	Interbank Giro
IT	Information Technology
KYC	Know-your-customer
MCA2010	Malaysian Competition Act 2010
MCMC	Malaysian Communications and Multimedia Commission
MDEC	Malaysian Digital Economy Corporation

MDR	Merchant Discount Rate
MTEC	Malaysian Technology Development Corporation
NFC	Near-Field Communication
NGO	Non-Government Organization
PIN	Personal Identification Number
POS	Point-of-Sale
PPP	Public Private Partnership
PUD	Pick-up-device
QR Code	Quick Response Code
R&D	Research & Development
SE	Social Enterprise
SMS	Short Message Services
SPSS	Statistical Package for the Social Science
UFA	Universal Financial Access

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Chapter 1: Introduction

In Chapter 1, there will be several parts disclosed for the purpose of understanding how government could improve financial inclusion through digital payment system. Firstly, this study highlighted the definition about financial inclusion, and review on international response towards financial inclusion. Second is to introduce the origin of payment system, to explore on how payments evolve from 6000 BC to 21st century and further information and statistics will be explain in clear and full details. Next is the problem statement/ identification that describe the purpose and the problems that lead to this study. Objectives will also be stated clearly as it represents the aim of the study.

1.1 What is Financial Inclusion?

According to World Bank Group (2018), financial inclusion means that individuals and businesses have access to useful and affordable financial products and services that meet their needs – transactions, payments, savings, credit and insurance, which are delivered in a responsible and sustainable way. Meanwhile, Sarma and Pais (2008) define financial inclusion as a process whereby a person has the ability to access to any finance products and services in a civil, transparent and equitable manner at a decent cost. As for Hannig & Jansen (2010), financial inclusion was illustrated as a main intention is to gather the "unbanked" population into a proper and formal financial system, so these unbanked population do share the opportunity to access financial services ranging from savings, payments, and transfers to credit and insurance. Cnaan, Moodithaya, & Handy (2012) also noted that the concept of financial inclusion is to help the poor citizens access financial services at a lower cost, and fight against poverty, regardless of the motivation behind it.

1.2 Government on Financial Inclusion

In this research, there are three main roles of government, which are policymakers, regulators and government agencies to facilitate the implementation of strategies.

Policymakers are the authorities involved in formulating policies and held the responsibility to lead the development of regulatory responses. Since technology innovations and advancements of infrastructure has brought in opportunities and enhancements for financial inclusion, all policymakers require a firm understanding of the possible hidden risk that may occur from these innovations. The Alliance for Financial Inclusion (AFI) was the first sharing platform that provides knowledge and evidence on financial inclusion, allowing policymakers to exchange knowledge and effectively making changes for upcoming policy, and also enable financial inclusion to fully utilize its potential (Lee, 2013).

Since 2010, 55 countries and above have made improvements and changes to financial inclusion, and more than 30 countries have either developed or launched a national financial inclusion strategy. As the majority of policyholders have set financial inclusion as their priority, many countries have encouraged banks and non-banks to compete, innovate, and expand financial services. Currently, the importance of financial inclusion has been imposed globally as:

- United Nations has included financial inclusion act as an enabler for one of the 17 Sustainable Development Goals.
- The G20 Global Partnership for Financial Inclusion (GPFI) implements G20 High-Level Principles for Digital Financial Inclusion, pursuing governments to publicize digital approach to financial inclusion.
- The World Bank Group vision: Universal Financial Access (UFA) by 2020, has incorporated financial inclusion as a key to success to overcome poverty in the low-income group.

Government agency is an organization established by the government that is responsible for overseeing and administration of specific purposes. The examples of government agencies involved in the digital payment ecosystem in Malaysia are Malaysia Digital Economy

Corporation (MDEC), Malaysian Technology Development Corporation (MTDC), SME Corporation Malaysia etc. The establishment of MDEC is to pioneer the transformation of digital economy in Malaysia. It has launched several initiatives that focused around promoting inclusive adoption of technology, to encourage more Malaysians to embrace technology in their daily lives and improve their social welfare. In 2015, MDEC launched two key national programmes to help underserved populations to earn additional incomes through digital ways, which are eRezeki and eUsahawan (MDEC, 2017).

The most critical regulator in digital payment ecosystem in Malaysia is Bank Negara Malaysia (BNM). BNM ensures that all segments of the society have equal access to financial services and monitor the payment system infrastructure to enhance the efficiency, integrity, reliability and security of the payment instruments. As regulator, BNM is committed itself to protect the public interest and clearly disclose the responsibilities and rights of all stakeholders (Malaysia, 2018). The BNM also plays a role in implementing measures to prevent the misuse of digital payment for money laundering and revoke an approval or license granted to the payment service providers, which failed to comply with the requirements or guidelines, such as made a false statement in the information or documents submitted.

1.3 Definition of Payment System

Payment system is a system that applies to pay out their financial transactions through the transfer of monetary value, with the assistance of instruments, institutions, standards, and technologies (Kokkola, 2010). It could be known as the infrastructure that supports all the financial and economic activities. Nowadays, no economic activities are possible without the transfer of money. A sophisticated payment system will build a safe and efficient financial market. Payment systems can be physical, electronic or virtual and each system has its own procedures and protocols.

1.4 Evolution of Payment System & Method

(A) Barter system

Barter system was the first payment method introduced for the exchange of specific goods and services. It was the original technique of exchange, started all the way back to 6000 BC before coins and notes were invented. During the ancient era, people would exchange their goods and services for other goods and services in return. Barter system was essentially adopted by Phoenicians after introduced by the Mesopotamian tribes. These Phoenicians eventually bartered goods to those located in other cities, even across oceans. Soon, the bartering system was enhanced by the Babylonians. Their goods were exchanged for beneficial items such as food, weapons, tea, spices etc. As for the empire of Roman, salts were considered valuable as part of a transaction. The officials will give bags of salts as salaries for the Roman soldiers. Bartering once again became popular in the 1930s during the Great Depression. Due to many citizens lack of money and jobless, people tend to trade their belonging in order to obtain food to feed their families (Barter System History: The Past and Present, 2017).

(B) Coins

At the beginning of 600 BC, a king in Lydia named Alyattes minted the first official currency by using coins as the main form of transactions (Goldsborough, 2014). These coins were origin made from electrum, which is a mixture of gold and silver that occurs naturally. Each coin has been stamped with pictures that acted as denominations. The currency created by King Alyattes succeed on helping the country increased its internal and external trade, making it to become one of the richest empires in the world. At the same time, the Chinese had a different manner of producing coins, which they poured molten bronze into moulds. The first Chinese coins were made into two different shapes. The first has the shape of a knife blade with a handle while the second has the shape resembled the metal part of a spade. Both of the designs were copied by all the states in China during the Zhou dynasty. Later in the late 3rd century BC, the first emperor of China - Shi Huang Di introduced the more rational round coin. They had a square hole in the

middle and casted in bronze, and subsequently these coins were being used for the next 2000 years in China (Smith, 2016).

(C) Notes

The idea of having paper currency firstly appeared in Sweden during the 17th century. In 1656, Johan Palmstruch issued credit notes which can be exchanged for a fixed number of silver coins from his bank. His notes consist of eight hand-written signatures on it and can be used to purchase any goods in the market if the holder was convicted that he or she can exchange it for coins at the bank. The first official paper currency issued by European governments began from the colonial governments in North America. Due to the shipments between Europe and the colonies took a long time, the colonists often ran out of cash as their businesses expanded. In 1685, soldiers were issued playing cards denominated and signed by the French governor to use as cash instead of getting coins from France.

Slowly, the public gain confidence on paper currency, especially when they knew that this currency was issued by national bank and backed by government reserves. Thus, the paper currency slowly gains credibility and reliability in the eyes of the pubic. It became acceptable that the government decided to impose a ban on the rights of the bank notes holder in exchange for silver. This ban was successfully imposed in Britain during the war against Napoleon, lasted from 1797 to 1821. After the Napoleonic war, with government issuing the bank notes, the major risk was no longer bankruptcy of the bank, but inflation. (History of Money, n.d.)

The shift to paper money in Europe enhanced the international trade. Banks and the ruling classes started buying currencies from other countries and the first currency market was created. The value of the country's currency was affected by the stability of government or monarchy and its ability to trade in international market. The intense competition between nations eventually lead to currency wars, where competing countries will try to affect the value of the competitor's currency by making the other goods too expensive or eliminating their currency completely.

(D) Cards

Over the last 50 years, cards payment has emerged as a driving force for the explosion of the global economy, such as credit cards, debit cards etc. In 2004, card payment transactions amounted more than USD12 trillion worldwide. The use of cards has been estimated to save countries about 1% of GDP over the cost of paper-based payments (International, June 2003). Since their introduction in 1946, card payment has become the fastest, most secure, most convenient and most cost-effective payment method in the world. In Sweden, the payments made in cash only accounted for 2% of all payments and expected to drop to 0.5% in 2020 (Misasi, M. 2017, Feb 27).

As in other countries in Southeast Asia, cash still rules in Malaysia. However, the card payments are steadily growing. There are over 50 million cards in Malaysia, while the population size in Malaysia is 30 million (Ho, 2017). Among the cards, credit cards are the most popular payment card in Malaysia. The credit card is expected to be dominant up to 2020, due to attractive rewards and promotion issued by card issuers. Besides the effective marketing strategy of the issuers, the increase in card volume is also due to better economy in Malaysia, improving infrastructure and system in banking sector, increased card acceptance at point-of-sale (POS) terminals at retail and public transport system. The adoption of EMV standards make the card payments more secure (Paul, 2016). Unlike cash, the payment cards can be blocked immediately if it has been stolen.

(E) Digital payment

Besides card payments, digital payment is getting more popular too. Digital payment is a point-of-sale (POS) transaction made or received with a mobile device (TechTarget, 2015). Digital payment technology can be categorized into two types, which are proximity and remote. Proximity digital payment refers to contactless payments employing near-field communication,

while remote payments are made through smartphone application or web browser. The mobile phone is used as a device to authenticate personal data that is saved remotely and SMS is used to authorize payment (Chang, 2014).

1.5 Introduction of Digital Wallet

Digital wallet is a digital version of a physical wallet. However, it is not only a way to pay with device, it could include the functions of actual wallet with all of its content and behaviors and integrating it into a digital device. It is invented by David Chaum, an American cryptographer in 1983.

Digital wallet consists of five types of components:

1. **The mobile wallet**: the most well-known type of mobile payment. "Tap and go" method is used to make a payment with NFC (Near Field Communication) wireless technology built-in in our smartphone
2. **Mobile as point of sale (POS)**: merchant uses their mobile devices to process payment.
3. **Mobile payment platform**: there are companies like PayPal that permits us to make peer-to-peer payments to our friends or pay a merchant online. These top payment solutions will become the future of payment
4. **Direct carrier billing**: this is when we purchase an app or game on our smartphone and the charge is imposed into our monthly cell phone bill
5. **Closed loop payment**: these are digital payment systems developed by a company itself, such as Touch 'n Go digital wallet.

For customers, digital wallets reduce carrying around a bulky wallet. The users no longer need to worry if they forgot their cash, credit card and ID at home. All that information is kept in the mobile device. An individual's bank account can also be linked to the digital wallet. They might also have their driving license, medical card, loyalty cards and other ID documents stored

in the phone. In Japan a digital wallet could verify the age of the buyer to the store when purchasing alcohol (REPUBLIK, 2017).

Additionally, using digital wallets saves our time. Instead of inserting a card into an EMV terminal, we can just touch and go. And when we do shopping online, we no longer have to queue and race against time to complete a transaction before the session expires, such as buying movie or air tickets. We can make instant payment online. Nowadays, digital wallets also provide us access to bill payments, loan payment, insurance scheme, micro-lending etc.

Digital wallets also offer customer perks like promotions, cash back rewards, earning bonus points and track our accounts easier. For business, we have immediate access to funds, cut down transaction fees by removing third parties and no huge initial investment in an expensive POS system. Additionally, digital wallets provide access to real-time data, maintain a competitive advantage and improves user experience since we are providing secure and instant payment methods. Conventional banks are also developing respective digital wallet apps that allow us to transfer funds, review account, establish budget, and receive alert notification via social media.

1.6 Problem Statement/ Identification

There was a major and rapid evolution of payment system in the past 30 years, but some significant challenges still remain. A report published by Global Financial Inclusion (2017) has estimated two billion individuals yet remain excluded from any formal financial services. Globally, 59% of adults pinned scarcity of income as key reason for financial exclusion, which implies that financial services are not yet affordable or designed to fit low income users. Other barriers for financial inclusion include distance from financial service providers, lack of necessary documentation papers, lack of trust in financial service providers and religion. Besides that, certain groups are more financially excluded than others, such as women, rural poor, aboriginals and hard-to-reach populations. For example, the gender gap in developing countries

is estimated at 9 percentage points: 59% of men reported having an account in 2014, while only 50% of women did.

In Malaysian context, an article published by Bank Negara Malaysia has stated that a large number of citizen who lives in rural areas were unaware about the availability of financial product and services. Even though an estimated of 99% Malaysian were inclusion onto financial services, the second highest rate in ASEAN after Singapore, however it revealed that the level of awareness of the various financial services and products on offer varies between the different segments of the population. In 2014, there was 82% of adults in the urban areas are account holders, while only 74% of adults in the rural areas having account (Financial Inclusion in Malaysia: Distilling Lessons for Other Countries, 2017).

There are two main problems faced by the Malaysian government in terms of financial inclusion. The first problem is the need to reach out to the remaining underserved population. Adults in rural areas have commonly faced difficulties in having an account at a financial institution due to the high cost faced by banks in opening branches and facilities in small villages and remote areas. The second problem is how to ensure that the people with access to financial services actually use their accounts actively. Many reasons may hinder the active use of their accounts, such as convenience, transaction costs, ease of use etc. Thus, it is crucial for the policy-makers or regulators to understand the problems, play a greater role and come out with strategies to further improve the rate of financial inclusion in Malaysia.

1.7 Research Objectives

- To examine the role of government in developing digital payment ecosystem in Malaysia
- To examine the impact of digital wallet on the financial inclusion in Malaysia
- To study the disruptive effects of modern digital wallet on the current banking system in Malaysia

- To analyze the factors that affecting the usage of various payment instruments in urban and rural areas

1.8 Scope of Investigation

- Our research will be focusing on the citizen or permanent residents of Malaysia. Questionnaires will be given and each details of the respondents will be credit for the purpose of our research.
- Interviews will be conducted with the stakeholders involved in the digital wallet ecosystem in Malaysia, such as government agencies, financial institutions, fintech companies and potential beneficiaries.
- Only legal digital wallet providers that operate in Malaysia will be investigated and used in our research. We will not input any unauthorized digital wallet providers into our research.

1.9 Significance of Study

The study will give the readers a comprehensive and clear insights on how digital wallet can be used as an effective tool to improve financial inclusion in Malaysia and the role of government in the strategies implementation and development. The United Nations targeted financial inclusion as one of the 17 Sustainable Development Goals (SDG) that need to be achieved in 2030 and the World Bank Group has set financial inclusion as a key for poverty eradication in the underserved groups. However, most of the people in Malaysia still has less awareness about financial inclusion. Through this study, the readers could understand more about the digital wallet ecosystem and its impact on the financial inclusion. The findings of the research will provide government especially policy makers and regulators to realize the shortcomings of the current strategies and improve or initiate new strategies that suit the demand of the digital wallet users and underserved population. For other players in the digital payment ecosystem, such as fintech companies, banks and merchants, they can understand how they work

together with the government sector and utilize the policy and government supports to accelerate the growth of digital payment system and financial inclusion in Malaysia. For the users and underserved population, this study will voice out their concerns and change their conservative mindset and perspectives towards digital wallet, starting to adopt digital wallet and eventually change their lifestyle and financially included.

Chapter 2: Literature Review

2.1 Basic Description

In this chapter, we will discuss and highlight the main source of material to support our context. Sources of data from other researchers will be disclosed and credited for the purpose of our study. Firstly, the study will provide an overview of digital wallet and its impacts on financial inclusion. Additionally, the study will also introduce the role of government can play in promoting the development of ecosystem of digital wallet, as well several examples and framework that being verified by qualified researchers. This chapter will also cover the factors and challenges that affect the adoption rate of digital wallet in Malaysia through the research done, either by local or foreign researchers.

2.2 Overview of Digital Wallet and Financial Inclusion

2.2.1 Review on Digital Payment Usage and it Importance.

In many advanced countries around the world, the popularity of using digital payment has been sustainability growing, causing the acceptance of non-cash transactions and settlements popular among the residents. A data from Forex Bonuses has shown that Canada ranked on the top with highest popularity on using cashless payment, followed by Sweden ranked on second and United Kingdom on third. France, United States, and China were also on the list as they show signs of improving and increasing awareness of cashless payments.

As the developing countries moving forward on building a cashless society in the following years. Malaysia is necessary to have an advance payment system integrate in both urban and rural areas for every resident to access advance financial services and products which available and accessible in Malaysia. It is absurd to participate in a modernized economy without access to forms of electronic payment. Mallat (2007) acknowledged that a well-develop payment system is crucial on developing future business models and creating new products. A new mobile channel plus an integrated electronic payment system could expedite the expansion of new business models, creating a multi-channel and multi-device environment for all users.

Besides, a well-built payment system could also improve financial inclusion at those least developing countries. Malaguti (2015) believes that the technology expansion and innovation of communication tools could built a well-develop payment system that attract individuals from rural areas to engaged on financial services, and also applicable to provide mobility to individuals who are disabled or lived under difficult conditions.

2.1.2 Payment Method of Digital Wallet

Although that function of digital payment services may look alike and some do require to have an Internet connection. However, there are various digital payment methods commonly being used in Malaysia. They are *near-field communication (NFC)*, *quick response (QR) codes*, *barcodes* and *cloud technology*.

NFC is a short range and high frequency wireless communication technology, which data are exchanged between each other in close proximity. Consumer carries out a transaction by tapping or waving their cards or mobile device at a merchant's POS device. While barcode and QR codes do store information that can be read by scanner or code reader application installed in a mobile device. Cloud technology uses remote servers to store data, eliminating upfront investments in software and hardware, and removing volume limits on stored data. One way to

make a cloud-based digital payment is to use a consumer's mobile phone number with a personal identification number (PIN) entered into a PIN pad at a merchant's POS (Pandy, 2013).

2.1.3 Digital wallet services and its target markets

Since a digital wallet could offer variety of services for all individuals, Malaguti (2015) has broadly categorized digital wallet into three categories, which based on a target population usage on the services offered by an existing product. Sometimes a target population would only utilize one of the services given even though there are other beneficial services offered by the same product.

- Credit-transfer services for a large population
    - Most products will offer the same and common transfer services to all individuals, such as enabling money transfer to remote areas. Their primary target is to offer mobility services to individuals who have difficulties. ACCION International approves that digital wallets do help families to transfer remittances to their loved ones without having to travel to nearby bank branches to conduct transaction (ACCION, 2015).
- Payment services for a focus population
    - Several products were meant to be simplified and built for those disadvantaged population. This includes providing a less complicated services for those unbanked individuals to conduct minor transactions. Besides, some services even promoting micro business for a small group of population to start-up their own businesses, educating them on how to keep track of their activities, paid for supplies and other functional tools.
- Articulated digital payment as an overall solution
    - Most products don’t just limit on proving basic transaction services, but also satisfying additional articulated demands to attract more consumers. Several companies or government agencies will provide several alternative choices for

individuals to adopt, such as enabling individuals to paying utility bills through digital wallets, or allowing individuals to receive wages or social welfare from companies and government without a prerequisite of having a bank account

2.3 Government's Initiatives for Financial Inclusion

2.3.1 Financial Inclusion Framework

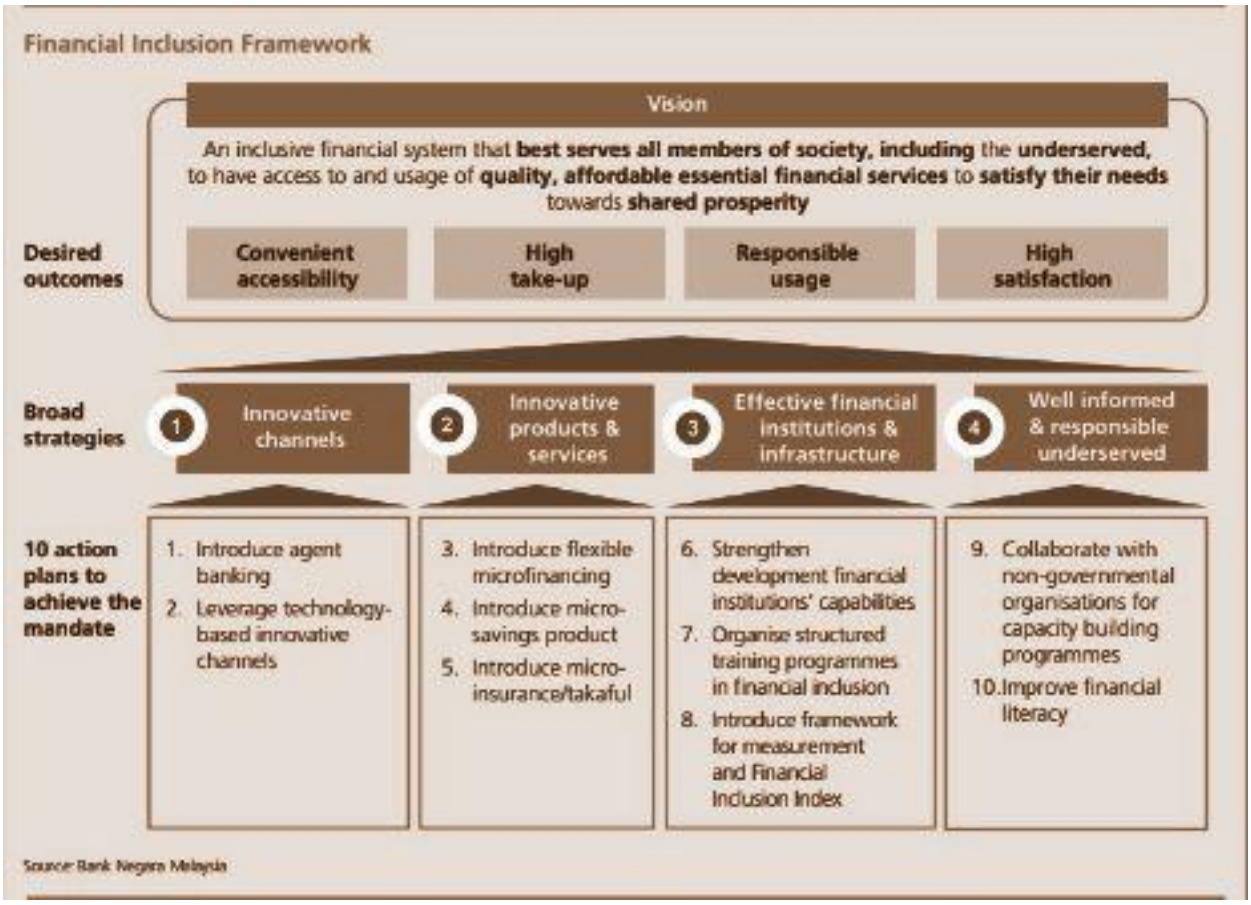

Figure 2.1: Malaysian Financial Sector Blueprint (Source: BNM)

The figure above shows the original framework taken from the Malaysian Financial Sector Blueprint. It was introduced in 2011 and its vision specifies on serving all members of society, including the 'unbanked' and 'underserved', to experience financial services that is fully available, affordable, and accessible. Under the framework, there are four desired outcomes

which are known as: *convenient accessibility*; *high take-up*; *responsible usage* and *high satisfaction*. All these outcomes were linked to four strategies, and each strategy comes with different schemes and procedures that enable Malaysia to enhanced long-term financial inclusion before reaching 2020 (Rahman, 2017).

Convenient Accessibility

According to A.Jones (2008), the meaning of convenient accessibility is the ability to gather those individuals and providing them with accessible financial services, that enable them to believe it and found convenient while using it. It is an important element for the credit union to develop a strategy that assists low-income population to be included in long-term financial services.

In Malaysia, the convenient accessibility has been equipped as a measurement for the accessibility of financial access points. According to most BNM reports, most residents in districts and subdistricts do access to financial services either from banks or banking agent. banking agent are retail outlets that allowing individuals to withdraw or deposit money without having to proceed to any bank branches. It could be at the post offices, convenience stores, or public stations in a neighborhood (Demirguc-Kunt & Klapper, 2012). BNM has also stated that approximate 63 million transaction volume were conducted via banking agent in 2015.

Besides, the number of the population who subscribe to digital wallets has been accelerating since 2011. Bank institutions have aimed to boost the volume of electronic payment transaction per capita and reduce the usage of cheques by more than half before reaching the year 2020. Currently, BNM and banks institutions have joined forces to educate the public about the benefits of using e-payments, and to expand e-payments infrastructures to every corner of Malaysia (Driving towards electronic payments, n.d.).

High Take-up

High take-up is a measurement that used to determine the rate and usage of a particular financial services by a population. As previously mentioned, Malaysia have accounted 99% percent of individuals access to formal financial services including having at least one bank account. As in 2017, the Deputy Finance Minister of Malaysia have stated that there are 3.6 million credit card holders actively using credit card for transaction in Malaysia (3.6m credit card holders in Malaysia as at June, 2017). However, Visa also reported that 7 out of 10 Malaysian are willing to adopt digital wallets such as Alipay as an alternative payment method choice. Nevertheless, a Nielsen report also highlight that 68% of Malaysian would likely to adopt and increase the usage of digital wallets in future if the security has been improved. Even though BNM's report shows that financial inclusion has been enhancing since 2011. However, there are also remaining individuals that do not have experience on financial services on the poorest region of Malaysia (Driving towards electronic payments, n.d.; Massive Drop in Number of Unbanked, says New Report, 2015)

According to a press release from World Bank Group, the expansion of technologies and the increase of mobile phones usage have accelerating financial inclusion among the poorest household and women, particularly on Sub-Saharan African countries. Although having mobile money accounts may help individuals manage household income, boost job creation, and linked to other social welfare, however there are plenty room for improvement on financial inclusion among the poor people. Besides, the affordability of mobile phones yet remains a challenge especially on the low-income segment as they hardly afford any mobile phone while struggling to feed their families. Secondly, there are barriers on decrease gender gap on account ownership as Global Findex 2014 reported that 58% of women own an account compared to 65% of men own an account. The South Asia has the largest gender gap where only 37% of women own an account compared to 55% of men with account. (Klapper, n.d.; Global Findex 2014: Financial Inclusion, 2014)

Responsible Usage

Responsible usage is a quantification that measures whether a particular financial service or product is been utilized appropriately. Since 2011, Malaysian with an active deposit account has increased from 87% to 92% and it reveal that Malaysian has the habit of deposit money in their bank accounts. As for the usage of digital wallets, the Nielsen report shows that the are 34% of Malaysian are currently using digital wallets for purchasing goods and services. In spite of the fact that the number of Malaysian gaining interest and in favor on adopting digital wallets. However, there is not much merchants were able to provide platforms for Malaysian to try-out the features available on their digital wallets. Thus, the government has taken initiatives to boost Malaysian to gain experience on digital payment such as launching e-services platforms for user to pay utilities via electronic devices. Furthermore, the government also join forces with banks and financial institution to provide educations to merchants and young Malaysian, encouraging them to take part in the digital economy and be bold to try out the new financial technologies (Growing Use of Digital Wallets (Summary of studies by country), 2018; Shafie, 2007).

High Satisfaction

High satisfaction is the index that helps to determine the Malaysian' satisfaction level when adopting any financial services given. Previously, there are 73% of Malaysian were satisfied on the overall of services provided by financial institution since 2011. The low-income segment were also proved to be satisfied as they were recorded an increased to 73% compare towards 61% in 2011. As on the aspect of digital wallets, Malaysia have approximated 30 legal digital wallet platform and it is expected to be increasing to 40 by the end of 2018. Despite having so many digital wallets implemented in Malaysia, however Malaysian are dissatisfied on most digital wallets as they are not user-friendly and troublesome on setting up. For example, a digital wallet recently developed by Touch 'n Go has been temporarily suspended after introduced for three days. The application was backlashed by Malaysian users due to inconvenience and features weren't promising as previously promised by them (Wong, 2018; Pikri, 2017)

2.3.2 Non-Banks on Financial Inclusion

While the growth of technology viewed to be core of future developments and opportunities to both financial and non-financial institutions. The banks and non-banks have realised that consumers became more dependent on electronics devices to conduct minor transactions and remittances (Hartmann, 2006). X.com (founded by Elon Musk) and Confinity first introduced online money transfer back in 1998 as both soon to be known as PayPal later in 2001. After the first generation of smartphones bloomed in 2007, more and more digital wallets were introduced such as Google Wallet which was released in 2011, while both Apple Pay and Samsung Pay released in 2014 and 2015 (Rampton, 2016).

As the non-bank institutions has rapidly becoming an important role in financial services, especially on the area of financial payments. They have been in consistently developing payment instruments that suitable for all users and target those who were previously out of contact from the financial system. Non-banks were defined as any entity involved in the provision of retail payment services whose main business is not related to taking deposits from the public and using these deposits to make loans (Joifin, 2017).

According to Bank for International Settlements (2014), the presence of non-banks penetrates the growth of payment system, including the potential influence towards financial inclusion. They were viewed as competitors by banks as both parties literally compete to maximize the number of end users. While these healthy competitors basically tried to promote and extend their products and services to everyone, the unbanked population were also given an alternative payment instrument as individuals were free to choose any services given from both sides. For example, the mobile operators were capable to extend their services by building applications that served with financial purposes. Non-banks could also team up with banks, together improve financial inclusion and bring significant impact on enhancing payment and financial services to all individuals.

Besides, banking agent does play a role on financial inclusion too. In fact, the World Bank Group (2017) has estimated that 97.4% of the rural areas in Malaysia have access to financial services that comes from banking agent and bank branches. Since banking agents has been viewed as a tool of success, many nations adopt this strategy to outstretch those unbanked population in order to persuade them to have at least an deposit account. For example, the central bank in Kenya has approach this strategy and allowing banks to hire banking agents to expand the network and offer financial services on their behalf. Currently, they have over 10 thousand of active banking agent and approximate 30% of Kenyan resident access to financial services. They also expected to increase to the number to 70% before reaching 2030. In short, the existence of banking agents is view as a win-win strategy for the government, banking agents and also the individuals that lived in remote areas (Ho, 2017).

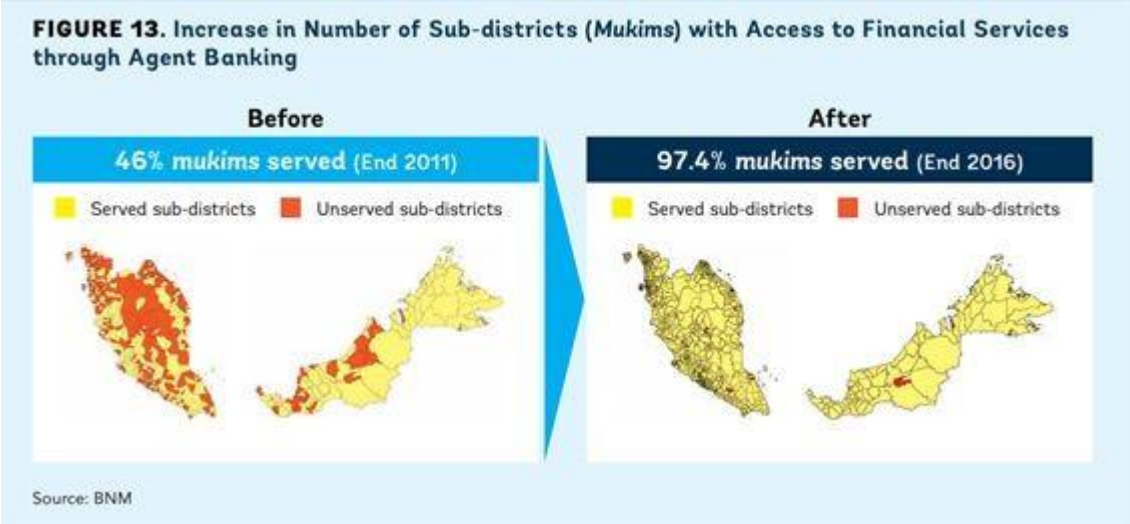

Figure 2.2: Geographical area on sub-districts with formal financial services (Source: BNM)

2.3.3 Legal and Regulatory Framework

The legal and regulatory framework is the cornerstone to financial inclusion by completely addressing entire pertinent risks and by sheltering consumers, together encouraging innovation and fair competition among institutions. As financial technology (Fintech) industries

continue to develop and expand for the following years, regulators require to keep in track and accept the convenience given by the latest technologies while diminishing risks for all consumers. Fintech describes as any business that equip technological innovation to serve customers with financial products and services, which includes micropayments, banking schemes, pension schemes, insurance services, and other related financial services. Thus, a good legal and regulatory framework is necessary to ensure both financial system and customers are under protection.

Based on the CGD's report named Financial Regulations for Improving Financial Inclusion (2016), there are three principles act as a guideline for regulatory purposes: identical services should share same regulation, balance both previous and current regulations, and construct regulation based on the level of risk. Relying the principles at above, the report further reconstructs three specific and advance regulatory area into following:

1. Competition Policy
2. Leveling the Playing Field
3. Know-your-customer (KYC) Rules

Competition policy

The primary objective of competition policy is to strengthen the competitiveness and attracts new providers to enter the markets and industries. This also includes safeguard the interests of consumers, enhance market's efficiency through technology innovation, and ensure fair price competition between suppliers (Riley, n.d.).

Because each provider having differences in their activities and operation, regulators should inspect the current market situation and reinforce the regulations. However, these regulations for entry for new providers should be dissimilar between traditional players, such as banks and non-bank digital services providers. If new providers do present a clear and firm supervisory, regulatory, and consumer protection framework, they will be given a chance to

displace their services and products, enable both traditional and latest providers to offer a variety of services and products to all consumers.

Leveling the playing field

The level playing field defines that identical services are treated equitably, and each provider does not share the similar chance to succeed. Under financial services, the level playing field has been empowered by regulations. Providers with similar services and functions will be regulate under a same set of regulations and compete equally among themselves. For financial inclusion, the level playing field ensures more persistent consumer protection across service providers. Since there are variety of services available on market frontier, it reduces the range for regulatory arbitrage and other falsifications (Consumer protection: Leveling the playing field in financial inclusion, 2010).

Know-your-customer rules

Know-your-customer (KYC) rules is basically pinpoint suspicious activities by identifying each consumer's transaction format, background, and intentions. KYC regulations are important as it counters money laundering and terrorist financing conduct by anonymous and criminals.

To retain the integrity of the financial services and system, the institution of finance should verify customers' identity to ensure their both customers and financial institution are well-protect. Criminals and anonymous could potentially disrupt the financial stability as they mainly illegal use of customer's identity to damage, abuse, and corrupt for their personal interests and advantages. The knowledge of each customer also in concern for financial inclusion because financial institutions will not extend products services to unidentified customers. Consequently, strict KYC rules are crucial for the stability of both financial inclusion and financial integrity (Wojciechowska, n.d.).

2.3.4 Case studies - The impacts of digital wallet on financial inclusion in countries

(A) Kenya:

In Kenya, the M-Pesa is being recognized as one of the most successful digital payment service provider around the world. One of the most interesting part is that M-Pesa implemented an SMS-based money transfer system that permits users to either transfer, deposit and withdraw money using their mobile devices. Since its launched by Safaricom in March 2007, the programme has successfully draw the attention of 15.2 million users and transferred more than US$1.4 trillion electronic funds (Meredith, 2013). In fact, M-Pesa has contributed significantly in poverty eradication and financial inclusion efforts in rural areas of Kenya.

Before M-Pesa was introduced in Kenya, the Kenyans need to transfer remittances at local offices such as banks, government offices, bus companies and more. Nevertheless, this posed the problems of time-consuming, higher costs, insecure and unreliable. The ability to transfer funds through commercial bank is substantially undermined due to only minority of rural Kenyans has access to bank account. The lack of access to financial services, combined with the increasingly widespread use of smartphones gave rise to an informal practice of using smartphone as an alternative to traditional banking systems. Since it was launched, M-Pesa has successfully expanded their services to facilitate microloan repayment, which beyond its initial role as a money transfer service. The first new service provided allows its users to withdraw money from their M-Pesa account at any ATM. In 2009, M-Pesa provided bill payment service. The biggest user for this service is the electric utility company, which now has about 20% of its customers paying through M-Pesa. Safaricom also partnership with 25 banks and 700 businesses to facilitate bank transfers, fund deposits, payment of utility bills, insurance premiums, loan instalments and recently open interest earning bank deposit accounts electronically through their mobile devices.

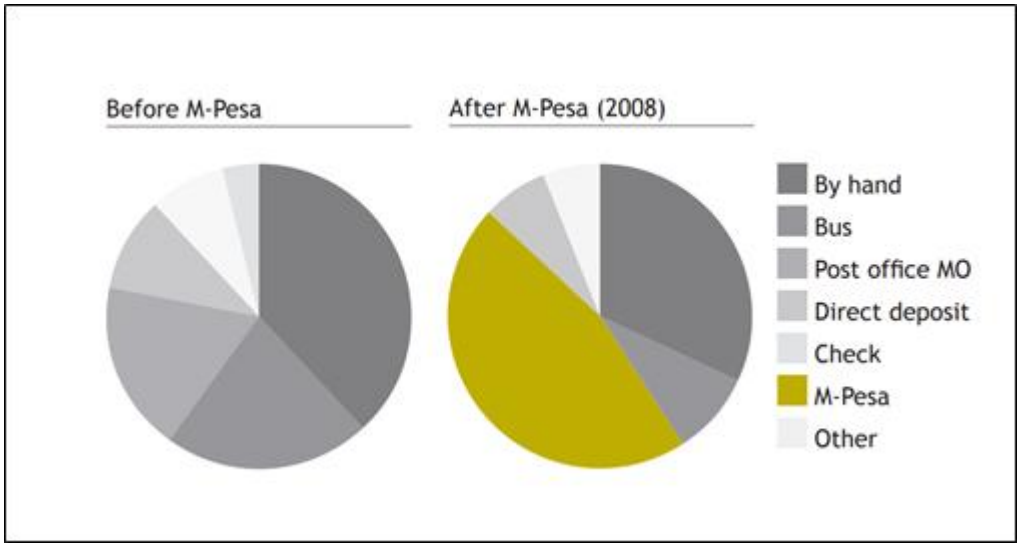

***Figure 2.3**: The usage of M-Pesa compared to other money transfer products. (Source: AFI)*

Besides, the Central Bank of Kenya (CBK) policymakers understood that there is a need of a solid regulatory framework for M-Pesa as well as the consumer that are using it. Since M-Pesa was introduced in 2007, the CBK together with CCK, FATF, and other intergovernmental organization have join forces to mitigate financial risk. In 2011, Kenya was placed in the grey list by FATF due to incompetence in the AML/CFT regulation. In response, the CBK implemented new regulation which requires M-Pesa to monitor suspicious financial activities, strengthen the transaction security, and educated its agents. In addition, the CBK also advised M-Pesa to enhance KYC procedures and all suspicious activities required to be reported to Financial Reporting Centre (FRC). Subsequently, Kenya was removed from the grey list in 2014 by FATF.

As M-Pesa permits the safe transfer and storage of money, rural Kenyans no longer need to spend long time to travel to urban areas to pay for their basic services. This can help to save money on more economically productive activities and usefully spend the money on food and long-term savings, slowly improving their level of financial independence (Enabling mobile money transfer: The Central Bank of Kenya's treatment of M-Pesa , 2010; Ndung'u, 2017).

(B) China

In 2016, there are more than 500 million citizen of China used mobile payments and transacted more than ¥58.8 trillion on nonbank mobile apps. According to the China Research Insights, approximately 84% of adults claim that they are comfortable for using the digital wallet and prefer not carrying cash on their wallets and purses.

The China's digital wallet providers also known as third-party payment providers built their platform on the basis of banks' access and connectivity infrastructure. The users register their payment card number to digital wallet, so both bank account and mobile device act as requisite conditions for access. Besides that, Chinese payments providers tend to connect customers into an in-app universe, consists of bundled services offered by providers, from ticket booking to tax payments.

The rise of fintech giants such as Ant Financial (provider of Alipay) and Tencent (provider of WeChat Pay) has increased both access and active use of digital wallets and then helped millions of rural residents get rid of financial exclusion. Both companies see payments as a mean, not an end. The multiple services are connected together with a single digital wallet. In China, households in villages are learning from each other on how to set up a small business that sells traditional and fresh products on Taobao. While, WeChat users could promote their products or services directly and easily through WeChat's social media posts or its business accounts.

China's first pivotal area and financial inclusion model city was established in Ningbo by the end of 2017. This model city contains more than 3200 financial service network points and 2273 villages. The virtual financial services provided are money transfer, loan applications and cash management. Based on Ningbo's experiences, the development of digital tools not only provides conventional financial institutions and fintech companies the platforms to improve financial inclusion, but also drives the development and growth of society. Those who depends

on the informal financial services, such as rural poor, small business owners, unemployed people, elders and disabled now could be included in the formal financial system (Aveni & Roest, 2017; Yue, 2017)

2.4 Factors that Restrict Adoption of Digital Payments

2.4.1 Age of Consumer

A research by van der Horst and Matthijsen (2013) has described that the senior citizens will tend to stick with one payment compare to the young ones. They have strong emotional preference on using cash as their main choice of payment compare to other payment methods. It is believed that changing the payment behaviour of a person is significantly hard but it is not impossible. ACCION International, a non-profit organization who supports microfinance had stated that aging population might have difficulties on dealing with the latest payment system. However, it is advised that having an advance electronic payment provides convenience older people with lower mobility distributing payment such as remittances from family to other places (ACCION, 2015).

Meanwhile, the millennials prefer to use cards and other electronic payments as their payment choice. The millennials, also known as Generation Y, are the people whom born during to 80's and 90's. As they now at their age of 20's and 30's, they were connected with the latest technology, and have a higher purchasing power compared to the other generations. Thus, many technology-related and financial industries view millennials as the core and influencer in market. Nonetheless, the usage of e-payments has been growing sustainability every year as more and more resident starting to participate on using electronic payments. (Moorty et al,. 2014; Kim and Hahn, 2012)

On the other hand, Bagnall et al., (2014) also described that young generation would prefer using the latest payment infrastructure while old generation would tend to hold and spend in cash, if all

the factors are same and held constantly. But in reality, a consumer's behaviour may varies due to demography, geography, spending habits, and other personal requirements or traits. Thus, it is believed that consumer's behaviour on selecting a payment method is not dependent to the age of consumer. A final justification on the role of age could only be given with estimations.

2.4.2 Income & Education Inequalities

A report from European Commission (2008) has describe that both income and education level have a strong connection linked to financial exclusion. Previous research in Europe has shown that people who were unemployed, single parents, insecure jobs, and disability had an above average level of exclusion. As for education, people with poor education background would mainly exclude from using financial services, while some misbelief that financial services were only to be given to people that are rich. Thus, it is conclude that those resident with poor education background and lower income are more likely to be excluded from formal financial services as they lack of finance education and knowledge.

On the other hand, Kosse and Jansen (2012) have determined that a consumer's income and his/her education background is positively related to the usage electronic payments. Consumers that are earned high incomes and received better education level are more likely to use electronic payment devices, either at the point of sales or in remote transactions. Vice versa, consumers who earned lower income and have lower education background tend to deal with transactions using cash. Besides, people with high income have a greater opportunity cost, they dislike that taking large amount of time deal with large transaction using cash.

Although most journals support that consumers with high incomes and education background will decline on using cash. However, cash is still one of the main transaction tool used by all consumer regardless of education background or income level. A research done by von Kalckreuth, Schmidt, and Stix (2014) determines that cash is mainly used as a tool for monitoring personal expenses. Specifically, their prediction is that those consumers who have

difficulties in monitoring cash flows, especially impulse purchaser, will use cash for transactions and monitor their spending.

2.4.3 Security

Security is one of the main concerns that restrict and exclude consumers from engaging with digital payments. According to Krishnan, Sentosa et. al. (2017), the individuals and organization were extremely worried about the security in digital payment, which makes them wonder whether platform system could keep consumers' data confidentiality from unauthorized access, uses, alteration and destruction. As both parties wished to shield their personal data from being leaked or exposed, they highly recommend that consumers should educated themselves to avoid given private information, such as passwords to unverified and unknown parties.

As in Malaysia, the Bank Negara Malaysia regularly conducting roadshows, seminars, and educational programs, together with other industries to educate the public of the security and benefits of using e-payments. In addition, BNM had successfully achieve its goal in 2013, where consumers' rights and interest of financial services and products were protected under the Financial Services Act 2013, and Islamic Financial Services Act 2013. Former Deputy Governor of Malaysia has urged policymakers to creating awareness on e-payments and strengthen the security platform in digital payment in order to prevent consumer fall into fraud incidents.

Besides, the Information System Audit and Control Association (ISACA) conducted a global survey in 2016 and found that 23% of the respondent believed that mobile devices are safe enough to keep their personal data. While, 47% answered that digital payments are not secure enough. Surprisingly, the survey also stated that there are 87% of respondents anticipated that digital payment data breaches will increase at the following year (Rampton, 2016). Meanwhile, another survey conducted by GfK Global has reported that 20% of American adults state that their main concern of security of digital payment is the interception of payment information or personal data by someone. While 13% of the respondents feared that their mobile devices are

being hacked. The other security concerns are installation of malware and virus on the device and unauthorized access to lost or stolen mobile device (Portal, 2015).

Although most digital payments platform would update their security to ensure all data from their consumer were safeguard and minimize the risk of being hack or breach. However, Rämänen (2011) believes that the perceived security of mobile service can be enhanced through the involvement of trusted stakeholders. Given an example, the digital payment platform must implement tougher security measurement such as having a certain requirement for password complexity, standardized authentication mechanism, utilization of biometric identifications and a must on having a verification sign of a trusted and independent companies.

2.4.4 Transaction Cost

Hayashi and Klee (2003) has stated the following, whereby the use of a payment method may be correlated with the transaction amount. But, the transaction amount may not be the only determinant of payment choice. Kosse and Jansen (2012) determined that the transaction amount and goods categories would affect consumer's behaviour on selecting a payment method. The consumer would prefer using cash on small transaction amount while large transaction amount would highly recommended using cards or digital wallets as payment choice. Besides, both Viehland and Siu (2007) also further explained that people would use digital payments for billing small amount of transaction, as nowadays mobile phones have an advance system to track micropayments.

According to the consumer's perspective, the high transaction cost restrains the users from actively using their digital wallet. From the qualitative research done by (Niina Mallat, 2007), the interviewee states that if he noticed that purchase on vending machine with a mobile device costs higher than using coins, then he thought that digital payment is unnecessary and he will use coins instead. Another interviewee states that high transaction cost could kill good ideas

from the beginning because no one is willing to bear the additional cost of digital wallet as long as debit cards and other payment work.

Payment processing cost increases the cost per transaction and adds on burden to the merchants. The processing cost relies on the underlying payment methods to which digital wallets are linked. If payment cards are bound to the digital wallet, higher interchange fees will be charged because customers do not present their payment card physically at the POS terminal. The payment might be considered as card-not-present (CNP) transaction instead of card-present (CP) transaction, which incur higher interchange fees to the merchants by the service providers (Bradford, 2014).

2.4.5 Perceived Ease of Use

Perceived ease of use can be defined as the degree to which a person do believes that using a particular system would be free of effort (Davis, 1989).

Schierz et al. (2009) described that perceived ease of use, perceived usefulness, and trust are the most admissible factors directed related to digital payment acceptance. Most results were achieved certify that are relevant to digital payment related instruments and services. However, due to the nature and quality of data received from respondents, it is hard to justify the credibility as the sample data collected does not represent to the whole population. Besides, neither any supportive research nor test of this proposition was employed. Therefore, a further exploration and research must be conduct in order to verifying their exploratory findings.

Dahlberg et al, (2015) also highlighted a problem, which is most people do not understand the actual meaning behind the ease of use and what it is compared to, even though perceived ease of use has been recognized as a major influence on payment instruments. The context ease of use has been generally explored by most of the researchers, however some researches were misleading and opposed the contexts of actual real-world payment scenarios.

From their perspectives, these various digital payments were regarded as "*one of the alternative"* instead of "*the one and only alternative*" when consumers decide to pay or settle for their personal financial transactions.

Furthermore, Zhou (2011) did an empirical test on digital payment services and recommend that the government, bank institution and mobile operators could try to advertise a propaganda, provide a friendly-users application, and online help to users to be comfort and familiarize the operation available within the digital payment. This may enable users to basically understand the system functions and improve their perceived ease of use.

2.4.6 Perceived Usefulness

Perceived usefulness is defined as the degree to which a person does believes that using a particular system would enhance his or her job performance (Davis, 1989).

According to Francisco et al (2014), they believed that perceived usefulness will illustrate when a person finds usefulness in a given technology and successfully attain result from it, but with the condition that the environment is needed to be connected with the internet. They do acknowledge that digital payment provides usefulness to the consumer and advantage could be seen within it.

As for Vijayasarathy (2004), his idea of perceived usefulness is when a consumer feels that he or she could find convenience during the process on using it. This includes doing online purchases, finding useful information, able to make comparison on products, and to deal transaction on a fast pace. They believe that consumer do aware the existence of a given technology, but they may not equip it as they felt their currently in-hand technologies are usable and they are comfort with it.

2.4.7 Trust

Trust is an important aspect because a consumer needs to rely and have confidence in using a given technology. Several researchers have approved that a customer's faith is crucial for the development on every digital payment instrument, which also a key to determine the successfulness of a technology (Xu and Gutiérrez, 2006; Siau & Shen, 2003; Mallat, 2007). There are also studies which proved trust has a strong influence on customers behavior, allow them willingness to engage in digital wallets (Wang et al., 2003).

As the purchaser and vendor dealing transaction in virtual environment, both parties are required to bear the risk because digital may contain uncertain risk higher than the traditional payments. Zhou (2011) has stated that consumers who deal transaction via online requires to have a great level of trust and risk tolerance as most online transaction present a high degree of uncertainty and risk.

Moreover, the extension of trust from Muda et al. (2015) also justify that trust should be as the main crucial for it. Consumer will not engage in any form of financial transaction through digital wallet if they lack of trust on adopting it. Besides, consumer was hardly to verify the credibility and monitor the actions of the vendor.

Chapter 3: Methodology

3.0 Introduction

In this chapter, we will begin on the data collection outlook whereby it highlights on the research methods that will be using to carry out the examination. We will examine how Malaysian government impact the digital payment ecosystem in Malaysia and how digital wallets act as a tool to help a nation to improve the financial inclusion. Besides, this research also investigate on how digital payment will change the current banking system and determine what are the factors that affecting the usage of various payment instruments in urban and rural areas. This research will conduct both qualitative and quantitative research to gain comprehensive insight on how government accelerating financial inclusion through the digital payment system.

3.1 Data Collection Outlook

The data collection outlook reviews on how information are being collected in order to generate results and form a conclusion. There are wide range of techniques can be chosen such as setting up a face-to-face interview, conducting online surveys, or examining previous records and articles to gather reliable sources for research (The University of Minnesota., 2018). As stated previously from above, our research will be conducted through two different approach, whereby the research of the study focus on both qualitative and quantitative data gathered from both sides.

The first approach for this study will be conducted through qualitative research, which enable researchers to approach specific details on a topic and access to primary data. Primary data could be known as the original data source which data is collected first hand by a researcher. An advantage of having primary data in hand is that the sources given by selected respondents is specially tailored for the purpose of this study. Although primary data is time-consuming and expensive, however it helps in the interpretation of data due to targeted issues are addressed precisely (Salkind, 2010). Qualitative research generally is used to explore and investigate certain issues. The findings of the research cannot straight away be used to make a conclusion because they are not conclusive and comprehensive enough. However, it is very useful when we wish to get a deep understanding on complicated topic and develop sound rationale for further decision making, especially when a final course of action is recommended (Comparison of Qualitative and Quantitative Research, 2018).

The second approach is conducted through quantitative research, which is an inexpensive way of gather huge amount of sources from a large sample of respondents. The collected data will be used as a secondary data to support the primary data previously gathered. Compared to primary data, secondary data is ease to obtain and it's a low-cost option to gather alternative data to support our research topic (Institute for Work & Health, 2015). The approach for it will be

conducting through an online survey using Google Form, with provides mobility for researchers to spread the survey to a selected area. The main purpose of conducting quantitative research is to determine the relationship between independent variable and dependent variable within a population. The questions are clearly defined to ensure the answers gained from the respondents meet the research objectives (California, 2018).

3.2 Benchmarking

Benchmarking is the process of identifying the high standard products, services or processes in the industry and then making necessary improvements to reach those standards (Dean Elmuti and Yunus Kathawala, 1997). The objectives of benchmarking are identifying and getting better insight on high quality processes, creating pressure for improvement and revealing the underlying problems in the country (Helgason, 1997).

The basic idea of benchmarking is simple:
(i) Look for a nation that is best at what our own country does or want to achieve
(ii) Study how it achieves that results
(iii) Make plans for improving our own performance
(iv) Gather all necessary resources and implement the plans
(v) Monitor and evaluate the results

For our studies, we will pick some benchmark countries as role model such as China and Kenya. The reasons that we selected these two countries are both are developing countries and started to develop digital payment almost at the same time. From the literature review, we found that the use of digital wallet helped to alleviate poverty and enhance financial inclusion in rural areas of Kenya and China. In benchmarking, we will identify what are the reasons that promote financial inclusion through digital wallet, what should our country should do for us to catch up with the benchmarked countries (Bhaskar Chakravorti & Ravi Shankar Chaturvedi, 2016). Then,

we should identify what are our primary levers to close the digital gap and how do these levers compare in terms of their impact.

3.3 Indicators for Financial Inclusion

There are three main types of indicators to consider when measuring financial inclusion are:

- **Access indicators** measure the number of outreach of financial services, such as the number of bank branches, ATMs or point of sale (POS) devices in the rural areas, or demand-side barriers that faced by customers to access financial services, such as cost, time and information.
- **Usage indicators** measure how regularly customers use the financial services, such as the duration and frequency of the financial product or services over time. For example: number of transactions made per account and average balance in the saving account.
- **Quality** measures whether financial products or services meet customers' needs, customers' satisfaction, the range of options available to customers, and clients' awareness and understanding of financial products

3.3.1 Surveys on Financial Inclusion

Demand-side data surveys provide information about users of financial services, which gathered through surveys. This data helps understand users'

- financial needs (met and unmet),
- barriers faced when seeking formal financial products or services, and users' socio-economic and demographic characteristics such as gender, income, race, occupation, age or education level.

3.4 Methods used

3.4.1 Quantitative Research - Survey

Quantitative method focus on generating statistics and numerical data based on the sample data collected from a large group of respondents. It mainly concentrates on measurable data and take accounts on respondents' point of view, attitude and other defined variable to form a conclusion (DeFranzo, 2011). However, quantitative method typically focus on the surface of a problem and researchers only uncovers pattern in research instead of getting deeper understanding from the underlying problem.

As for our topic, the focus area of the research will be on those individuals who are living in the urban area or rural area currently or previously. The urban area is Cheras district, Kuala Lumpur and rural area is Lundu, a small town in Sarawak. According to (Department of Statistics Malaysia Official Website, 2015), the definition of urban is at least has a population of 10,000 with at least 60% of the population are involved in non-agricultural activities.

Non-probability sampling is used to sample anyone from the urban or rural area based on our subjective judgment. There are many types of non-probability sampling, the method that we used is purposive sampling. The reason that using non-probability sampling instead of probability sampling is because we are interested in the intricacies of the sample being studied. Our main objective is not to generate a conclusion from the survey since the results of the survey will be used to support the points from the interview. In addition, compared with probability sampling, the process of selecting units for the sample is much easier, faster, and more direct (Dissertation, 2012).

The data will be collected using Google Form, an web application that enable users to draft questionnaires. The online survey will be distributed to minimum of sixty respondents, with a condition that at least thirty respondents are from on urban area and rural area. The questionnaire contains questions about several main defined variables in the study. They are background of the respondents (gender, age, education and income level), convenience and accessibility, law and regulation, awareness about digital wallet and knowledge on financial

inclusion. Certain variable will be given a scale from 1 to 5, whereby 1 means strongly disagree and 5 means strongly agree for selected variables.

The collected data will be tested using Statistical Package for the Social Science (SPSS), a software that enable user to produce statistical analysis. We will be using independent sample t-test in to determine the relationship between independent and dependent variables. The independent variable will be the respondents living area, which either at the urban or rural area. Before analyse the data generated by the independent t-test, there are two conditions that need to be fulfil. The first condition is that determine which row of number should be used under the column of Levene's test. If the significant is less than 0.05 (eg. < 0.05), then we will select the row data at '*equal variances not assume*'. If the significant is more than 0.05 (eg. >0.05), then we will go for the row data at '*equal variance assume*'. After passing the first condition, we will compare the significant (2-tailed) under the column of t-test. Since the $\alpha = 0.05$, if the p-value is less than α, we will automatically reject the null hypothesis. Thus we can conclude that there is significant evidence to prove that the independent variable (the urban/rural area) does affect the the dependent variable (eg. the convenience of using digital payment) and vice versa if $\alpha > 0.05$. Moreover, the data which collection from the survey will be generated into frequency tables to show the percentage of respondents selected the given options.

3.4.2 Qualitative Research - Interview

Qualitative method is the collection of ideas, opinions and problems from a small group of selected respondents. It delivers insights into the problem, develop ideas, uncover trends in thought and opinions, and dive deeper into the problem. Qualitative data is flexible and interesting because research could gain bold ideas, comprehensive views, and complete details on certain areas of a topic.

Besides survey, we also conducted semi-structured interview to focus group. The focus group is "a group comprised of individuals with certain characteristics who focus discussions on

a given issue or topic" (Anderson, 1990). In our study, the focus group comprised of executives from the government agencies, founders of fintech companies and payment service provider, senior manager from banks and NGO who deal with rural communities. Semi-structured interview involves a series of open-ended questions based on the topic research that we would like to study. The open-ended questions provide opportunities for both interviewer and interviewee to discuss some topics in more detail, such as attitudes and perceptions, feelings and ideas about a topic (Nigel Mathers, 1998). In our research, the focus group is used as primary source of data, which means they may be supported and validated by the findings of quantitative research (Morgan, 1996).

When drafting out the interview questions, we have done a lot of studies and reading on the current trend of digital payment system locally and internationally, previous strategies and initiatives launched by the government and what are the impacts, challenges and problems that slow down the adoption rate and financial inclusion in Malaysia etc. It is important to ensure that the answer gained from the interview are able to cover and meet the research objectives. Since we aim to study the potential impacts of digital wallet on improving financial inclusion and the role of government in this development. Thus, the interview questions are focusing on the current adoption rate of digital wallet in Malaysia, impacts or benefits that digital wallet can bring to the financially excluded population, the strategies and initiative that government can introduce and last but not least, the readiness or feasibility of digital wallet as a tool for improving financial inclusion. The main focus of the interview is the role of government can play in developing digital payment ecosystem in Malaysia, hence we further categorize the question in five aspects which are infrastructure and facilities, law and regulation, managing transaction volume and cost, awareness and financial education and last but not least collaboration with different stakeholders. After collecting all the inputs from the interviewee, we will start to analyse and categorize them into the five aspects above. In the discussion part, we would combine the results analysed from the qualitative and quantitative research together.

Chapter 4: Result and analysis

4.1 Result of qualitative research

Interviewee	Infrastructure & facilities	Regulation	Driver of transaction cost and volume	Awareness and education	Collaboration & partnership
1	-more technology -based infrastructure	-more accessible banking system		-encourage design thinking to understand target group -build empathy on communities	-incentives to NGOs and social enterprise -corporate social responsibility department of large corporations -funding to service providers

2	-standardization of QR code	-competition policy -reduce money laundering	-grants for merchants -reduces interbank rate, instant transfer rate, overnight rate		
3	-centralized and localized digital payment platform -improve interoperability -stable Internet and bigger coverage -fintech hub -digital identity	-standardization of QR code		-awareness talks and campaign	-collaborate with current government initiatives -collaborate with Telco, banks and nonbank
4		-issue e-money license -limit cash option in certain areas		-financial literacy and exposure	-government agencies (MDEC, MaGIC) -e-wallet providers

5		-data privacy law -anti-money laundering law	-incentives and privileges		
6		-less regulation and strict rules for operators -sounder data protection system			-cross border collaboration -collaboration with different industries
7			-secure, loyalty system, better users system -an integrated platform to accumulate transaction volume and influence	-improve visibility and awareness	-associated with Digital Free Trade zone -promote offline to online model

Table 4.1 Tabulation of interviewee responses

4.1.1 : Role of Kenyan Government towards Financial Inclusion

In 2003, Kenyan government developed two five-year policy blueprints, which are Economic Recovery for Wealth and Employment Creation. These blueprints emphasize on better financial access, better regulatory environment and more competition in the financial industry. To avoid market dominance, the weaker Monopolies and Price Control Act was replaced by The Kenyan Competition Act No.12 of 2010. In order to build trust, the Trust law has been enacted, which the Central Bank of Kenya will supervise the operation of payment platform and trust account. Once the digital money is stored in the SIM card, it was simultaneously stored in the trust account. The digital payment service provider, Safaricom cannot access to these funds and the funds still be protected in case of Safaricom bankruptcy. As efforts to reduce crimes on digital payment, the Central Bank of Kenya requests Safaricom improve their KYC procedures and supervision.

To promote interoperability, the Kenyan government introduced the National Payment System Act, that requires payment service providers to use system that allows interoperability with other payment systems locally or globally. The reasons to encourage interoperability are increased convenience, cost savings, easier to spread the usage and more choices for customers. The M Pesa application is preloaded in the SIM card, with the all the information such as name, ID numbers, date of birth etc. This means that the rural residents also need to own SIM card by Safaricom, instead of owning a smartphone.

More of the Kenyans are unfamiliar with digital payment, extensive training and support are provided by the Safaricom to the customers. The training session includes how to find M Pesa menu, steps required to enter and exit the application, steps to transfer funds etc. Safaricom also spent huge amount of money in running roadshows and education campaign in the rural areas of Kenya. Simple brochures on the operation of M Pesa are printed with clear and colorful instructions and distributed to everyone to help them get familiar with M Pesa faster and easier.

One of the way implemented to increase transaction volume and lower transaction cost is the registration for M Pesa account is free. The charges for P2P transfer is $0.40, withdrawal is $0.33 and for balance inquiries is $0.013. The minimum deposit amount is $1.25 and no minimum balance requirement. The merchants get the commissions from the service provider instead of directly from the customers. This means the cost of transaction by using M Pesa is same as using cash, but with higher convenience and time saving.

The success of M-Pesa was also boosted by the collaboration between public and private sectors. The idea of M-Pesa was started by English mobile network operator- Vondafone. The Central Bank of Kenya plays a role to facilitate and promote the launch of M Pesa. M Pesa also partners with one of the largest ATM service providers-the PesaPoint, to allow the users to withdraw money from any PesaPoint ATM over the country. addition, M Pesa gained the seed funding from Department for International Development for early development. Other functions added into M Pesa are bill payments, social protection payments and acquire solar-powered lightning.

4.2 Discussion

4.2.1 Infrastructure and facilities

Digital ID is the electronic form of an individual's identity card. Personal details such as owner's name, IC number, contact number, address, digital signatures are contained in the digital ID. Inability to comply with customer ID requirements is one of the largest infrastructural obstacles for financial inclusion as many underserved communities do not have reliable forms of ID. Thus, digital ID programme can promote the access to bank or e-money accounts. It can be used for welfare payments, utility payments, insurance premium payments and credit application (5 reasons for Electronic National ID Cards, 2018).

The primary benefit of having digital ID includes having the ability to access to any form of services provided by both government and private sectors. Individuals could receive social utilities from the government such as free healthcare, free education, government allowance, transportation discounts and even more. As for the private sector, individuals have the freedom on choosing wide range of services that are affordable and suit on them. Since digital ID has been caught in subject on helping to overcome financial inclusion among the poor, the Malaysian government has decided to integrate a platform through digital ID to monitor the performance of low-income household and meanwhile assisting them to overcome poor condition by providing needs and social benefits (Jones B., 2017).

Besides, individual that have access to digital ID also enable to adopt it as a digital payment instrument. Individuals with digital ID could transfer remittances to their families or their loves one by providing identification to banks or bank agents that locate nearby. Since digital ID have the ability to ameliorate the financial inclusion of a nation, many government are willing to collaborate with private-sector organization on develop an affordable digital deposit account for unbanked individuals to access. As a matter of fact, the platform also enables banks and financial services provider to verify their customer's problematics, conduct KYC research, innovate and customize additional financial features to suit customer demands. Secondly, digital wallets permitting individuals to perform any financial transaction without the requirement of having cash and cards. The beneficiary mostly will be on the urban residents because urban areas have the platform accessibility to digital ID recognition system. They could conduct transaction activities via mobile devices without the necessity of carrying stuffed wallets or purses on their hands. Furthermore, residents could also minimize the risk of burglary and lost when comes to cash and cards too (Wilson, 2016).

Interoperability is the ability of customers of competing financial service providers to transact with each other via a single transaction account. The most common type of interoperability is scheme interoperability, mean that banks join a scheme and agree to comply with the rules set by that scheme (Benson, 2012).

Interoperability can promote economies of scale, risk management and reduce fixed costs that make payment services more convenient and enhance financial viability of the service. Currently there is no standardized nationwide payment platform for digital payment in Malaysia. Each financial institutions or companies launches their digital wallets or payment device. For example: Boost, Touch and Go, AliPay, Maybank2U, CimbClick, Fave etc. This brought inconvenience to the users and merchants as they need to install different apps from different providers and the merchants need to install different POS devices in order to accept payments. Thus, government should build a centralized and localized payment platform that connects all the digital wallet available in Malaysia together in order to enhance the interoperability.

It will be a great idea that this government initiated payment platform could collaborate with another scheme from other countries, which allowing the users of domestic digital wallet to use the service in other countries. Collaboration is the key component for the success of interoperability. Government alone cannot drive the interoperability, it is important for the participation of the financial institutions, fintech companies and telco. So far, the digital money interoperability is only limited to person-to-person transfers. More complicated scenario like person-to-enterprise interoperability is limited because it depends on the participation of enterprise in the scheme.

However, not all the digital wallet providers will join the interoperability initiatives. This is because this initiative may harm their dominant position in the industry and reduce competitive advantage. the implementation of this platform may reduce innovation. This is because if the platform is implemented too early, it may discourage providers from entering the market due to concerns of competitors taking advantage of large start-up investments. As the platform is centralised, competitors do not need to innovate and find new solutions as they can piggyback off other actors in the market (Tilman Ehrbeck, February 2012). Thus, the recommended interoperability approach is ex-post or voluntarily. Ex-post approach is government should mandate interoperability after there is a clear evidence that a large industry

player is too dominant until monopolizing the market and suppressing competition. While voluntarily approach is encouraging financial service providers and private sectors to join the scheme voluntarily by offering certain privileges or benefits.

Dependent Variable	P-value for t-test	Conclusion
Do you think that is it convenient for you to use credit/debit as instrument in your area	0.02	-Reject null hypothesis. -The urban/ rural areas do affect the dependent variable
Do you think that is it convenient for you to use e-payment as instrument in your area	0.00	

Table 4.2: T test result - Convenience on credit/ debit cards and e-payment.

From the survey that we achieved, we use independent t-test to determine whether those dependent variables have significant effect toward the independent variable. The independent variable that we will be targeting are both urban and rural areas which respondents currently living at. According to the data generated by SPSS, we realized that the convenient on credit/debit card and convenient on digital payment has significant effect on the adoption of digital payment on both rural and urban areas. Since both p-value of the above dependent variable are less than alpha = 0.05, thus we can reject the null hypothesis and conclude that the living area of respondent (both urban and rural) does affect the convenient on using either credit/debit card and digital payment at their areas. From our point of view, the main reason might be due to imbalance of facilities and services among both sides. The urban residents will have more advanced facilities and better services received compare to those residents that living at rural. Thus, we strongly believe that the urban residents felt more convenient when using any form of financial services compared to those rural residents.

Dependent Variable	P-value for t-test	Conclusion

Are the banks near and easy to reach in your area?	0.750	-Do not reject the null hypothesis. -The urban/ rural areas don't affect the dependent variable

Table 4.3: T test result - Respondents view on bank location

As for the two variables between the respondent geographical area and the bank distance, the data generated by SPSS shows that there is not significant effect on the relationship of bank distance and respondent geographical area. Thus, it is concluded that financial services provided to both urban and rural residents are not affected regardless of the banks location. Based on our perspective and facts given, Malaysia achieve the highest financial inclusion level in 2017 and 97.4% of residents living in sub district does received financial services from banks and banking agents. As a matter of fact, we believed Malaysian does not have opinion regarding the banks location since they already received financial services either from bank branches or banking agents.

4.2.2 Regulation

Consumer protection law

In order to offer better user experience and add value to the customers, the digital wallet providers are applying big data intensively. Big data helps the digital wallet providers to offer more individualized service and more precise market segmentation. There are a lot of data can be generated in a quick and accurate way, such as history transaction, social media interaction, users behavior or preference and personal details. Technology advancements make it easier for the government, businesses, service providers and other individuals to gain a great deal of information without their knowledge. These data usually are shared and even traded among the businesses in the market.

There are two main aspects in terms of consumer protection, which are data security and privacy. Although nowadays digital wallets are highly encrypted in storing customers data, data security and privacy are still major concern for many people. From the survey, security is the main factor that affects the adoption rate of digital payment, regardless of urban or rural areas. For the service provider side, a digital security incident could cause loss of trust from the customers, damage the reputation and image, drop in revenue and stock price or face a lawsuit. For the demand side, many users are still not clear about their right as they are unsure who to contact if there are issues arise. For example: the mobile device is stolen or lost, digital wallet account has been hacked, identification problem etc. These might cause disputes between the customers with the merchants, service providers and banks.

Law is the most effective tool to prevent abuse of data and protect customer's privacy. In 2010, the Personal Data Protection Act of 2010 was enacted. It regulates the processing of personal data in commercial activities and for those who sell personal data or allow the third parties to use the data without permission, penalties of RM100,000 or one year imprisonment will be imposed (Farah Mohd Shahwahid, May 2014). However, the punishment would not impede the companies to take illegal action as they believe that the personal information could bring more value to them. Thus, the government should stricten the customer protection law such as revoking their operating license and put under blacklist. In addition, the government should promote international or cross border cooperation to mitigate digital security risk, strengthen privacy protection and reduce the risk of transborder flow of customer data.

The government should set a clear and functional regulatory framework for the nonbank service providers and mobile network operators. They are the key players in reaching the underserved population in rural areas. Regulators must set a licensing requirement to define who can provide digital payment services and act as agents. The approved payment service providers must comply with monthly reporting requirement, providing details about security software used against virus or malware, system and servers used to maintain the database for audit. Since the rural residents have less awareness and knowledge on security and privacy risk, the government

should amend the existing law to avoid the abuse and breach of personal data by the unethical service providers. It takes long time for the underserved population and technology laggers to build trust on the digital payment and virtual transaction, thus more security and privacy protection should be given to them to prove that using digital wallet is much safer and convenient than using cash.

Competition policy

The government could boost the development of the digital payment system by encouraging innovation and competition. In 2010, the Malaysian Competition Act 2010 (MCA2010) was enacted and the Malaysian Competition Committee was established in 2011. The MCA2010 contains the provision on horizontal agreements, vertical agreements and abuse of dominance. However, the current act doesn't contain the provision on merger controls. This might provide space for the merger and acquisition of similar digital payment service providers and have a detrimental effect on competition (COMPETITION ACT 2010: Act 712, 15 August 2016).

There are two reforms on the competition policy should be implemented by the government. The first reform is liberalization of regulation. The liberalization of regulation promotes the entry of new digital payment service providers to compete with the existing players in the market. This includes reduce license application requirements and eliminate some restrictions on the businesses' operation. Deregulation will ease the entry into market, and then to increase competition. It is a consensus that competition is the key driver for innovation. In order to increase competitive advantage and attract more users, service providers must provide better quality of services, offers attractive benefits and privileges such as cash rebates, free lifetime membership, zero interest instalment plan for certain products and services etc. The digital wallet providers might partner with prominent companies in the market to increase their benefits and credibility.

In addition to break the barriers for market entry, the competition policy also should emphasize on reducing market dominance or monopoly. In Malaysia, the monopolies happen in certain industries, such as Astro in satellite television industry and Tenaga Nasional Berhad in utilities industry (Dawam, 2015). The first disadvantage of monopoly is consumers will be charged high prices for low quality of products and services. Besides that, monopoly also will demotivate the company to innovate and invest in R&D, end up with out-dated products and services available to the customers and impossible for them to think on bringing social change and address challenges.

Besides competition from local companies, there will be foreign competition in the digital wallet market, such as AliPay, Wechat, Samsung Pay etc. The competition from foreign companies will create greater pressure on the local service providers to innovate and improve their service quality. The foreign competitors will bring in their talents and skills, spend large amount of investment in R&D, different corporate governance and culture, using different level of technology and facilities. The entry of foreign digital payment service providers gives more options and benefits to the local customers. For a sound and effective competition policy, government should eliminate barriers for the foreign companies to enter domestic market, such as reducing tariff and taxes on foreign companies, imposing same licensing and accreditation standards and enhancing patent systems.

High competition allows the digital service providers to put more efforts in exploring new customer group by offering products and services that suit that group, such as more user-friendly digital wallet apps for low education level people, and marketing strategies that in turn raise public awareness on digital wallet. The users could voice control over the functions available in the digital wallet app and digital ID to access all financial services. Since high proportion of people from urban areas are aware of digital payment and started to adopt it in their daily lives, the service providers could swift their target customers from urban areas into rural areas. Instead of fighting the market share with existing players in the urban area, there will be

more profit opportunities in the unexplored group of population, eventually becoming the market leader in certain area.

Anti-crime law

Since the usage of digital payments has been growing sustainable in large number. The government acknowledge that potential threats might occur and criminals may try to take advantage by abusing the system. In order to protect consumer from property loss and falling into undesirable incidents, the Malaysian government enacted legislation to prevent individuals or criminals abusing digital wallet for criminal activities. For example, the section 4 of Anti-Money Laundering & Counter Financing of Terrorism (AML/CFT) penalty criminals and lawbreakers that used digital payments for financing terrorism or taking part in profit-making crimes. The AML/CFT also have strong connection towards financial inclusion because AML/CFT measures required to be on the same pace as financial inclusion index. If a country with large amount of resident remain cash-oriented and excluded in formal financial services, thus it will demolish the effectiveness of AML/CFT, sink the efforts of FATF, and incidents of money laundering plus financing terrorism will be increased subsequently.

The FATF is an intergovernmental body that focus on countering money laundering and terrorism financing take places in around the nation worldwide. It implements international standards on AML/CFT to fight against these uncivilized crimes and recommend nations to improve integrity on financial ecosystem. Since 2010, FATF has been promoting financial inclusion as it tried to boost the effectiveness of AML/CFT regimes in order to maintain a high standard of morality on the financial ecosystem. Furthermore, the FATF also provide assistance to regulators to revised AML/CFT and restructure the regulation to be aligns with the vision and mission of financial inclusion. This includes lowering strict regulation on low-risk individuals having access to financial services, promoting innovation of technologies, providing guidelines and education on how to use digital payments and more (Anti-money laundering and terrorist financing measures & financial inclusion, 2011).

Although Malaysia have solid regulations to control and maintain the security of digital payments. However, incidents such as malicious ransomware attacks, phishing and scamming are increasing year by year and infected worldwide financial security. Many users are concerned whether the security of digital payments is effective against cyber attacks and worried that how government would overcome the situation if related incidents suddenly erupt in Malaysia.

Consider that technology has been evolving at a fast pace, how well does the security on technology withstand cyber attacks especially on financial technologies? To reduce the loophole on the digital payment, the government should reinforce the existing regulation and revise it once again in order to identify any flaws that yet to be amend and enact into the regulation. Besides, the government can pressure banks and non-bank institution to add alternative authentication, such as fingerprint authentication or biometric reader (eg. iris scan) to verify the user's identity before making any transaction. Moreover, encryption programs should be listed in digital payment system as to prevent any personal details and data fall into the hands of criminals (STANLEY & BUCKLEY, 2016).

Dependent Variable	P-value for t-test	Conclusion
Do you think the currently legal and regulatory framework is efficient to improve the e-payment ecosystem in Malaysia?	0.259	-Do not reject the null hypothesis -The urban/ rural areas does not affect the dependent variable
Do you think that the current legal and regulatory framework is sufficient and efficient for the improving of financial inclusion?	0.854	

Table 4.4: T test result - Legal and regulatory framework

According to the data from above table, the p-value of t-test shows that there is no significant effect on the respondent's geographical area. Since p-value is more than α, thus we can conclude

that there the respondent's geographical area does not affect the respondent. The is due to the legal and regulatory framework enforced by the government are applicable to all Malaysian, regardless from urban or rural areas. Both urban and rural respondents do not think that current legal and regulatory framework is efficient to improve the e-payment ecosystem and financial inclusion in Malaysia. Thus, government should put more efforts in revising current policies or law to boost the confidence of the public.

4.2.3 Driver of transaction cost and volume

Transaction cost

Transaction cost is the main barrier for financial inclusion. Minimum balance requirement and fees for opening account usually stop the underserved population to access to bank account and other financial services. Travel time and transportation cost also can be considered as indirect transaction cost. In order to encourage more Malaysians, especially financially excluded population to adopt digital wallet, government should put more efforts in lowering cost per transaction. Currently there are instant interbank funds transfer charge (IBFT), interbank GIRO charge (IBG), processing fees and merchant discount rate (MDR) applied when carrying out digital payment transaction. For IBFT, the fees per transaction is RM0.53 and for IBG, it is RM0.10 (Interbank Money Transfer: IBG vs IBFT, 2018).

In order to reduce the transaction cost, the government should waive the IBFT fees of RM0.50. Although RM0.50 is not a big amount, it is significant if the transaction amount is low. When small amount transaction is carried out frequently, it might give the perception to the users that using digital payment is more expensive than using cash and cards. The main attractions for using digital wallet are convenience, time saving and many benefits or privileges offered. However, the current digital wallets available in the market did not provide user-friendly platform and good users experience yet. For instance, Touch n Go digital wallet has been criticized due to troublesome top up mechanism and there are only two pick-up-device (PUD)

terminals in the whole country (Wong, 2018). In order to use the digital wallet, the users have to incur extra transportation costs to reach the PUD terminals and waste unnecessary time. Besides that, some digital wallets have set minimum balance requirement in order to carry out money transfer and other functions in the apps, maximum transaction per day, withdrawal limit and maximum amount per transaction. These limitations indirectly increase the costs as the users might need go to the banks or ATM when the transaction is really urgent and important. Customers will prefer using cash or cheque since they cannot feel the convenience and accessibility of using digital wallet.

To encourage more small merchants to accept digital payment, the reduction in merchant discount rate should be implemented. Since the merchants have to invest capital in acquiring point-of-sale terminal and QR code scanner to accept digital payment, charging a high MDR will further increase the adoption cost and discourage them to accept digital payment.

In order to enhance the adoption of digital wallet, the government should also increase the cheque processing fees from RM0.50 to RM1.00. Currently, the cheque usage per capita in Malaysia was 6.6%, which was 33 times higher than average in developed countries (Berhad, 2015). This can be numericalized as RM480 million was incurred to process the cheque. By reducing the usage of cash and cheque, government could lower down transaction and delivery costs, administrative overheads, notes and cheque printing costs, in which this saving can be used to further develop digital payment infrastructure in rural areas and provide subsidies to small merchants and underserved communities. To drive the growth of digital payment usage, the government should require the banks to utilize the fees collected from the cheque processing into incentives for customers to adopt digital wallet such as waiving IBTF fees, security token fees and monthly maintenance fees. In promoting the digital payment, one invisible cost should be highlighted, which is cash handling cost. These costs includes opportunity cost such as interest forgone, risk of theft and counterfeit notes.

In our research, we recommend that by reducing transaction costs of digital payments, deliver an accessible and secure platform, and educate merchants on using digital platform on rural areas. Hence, the rural populations would be more willing to adopt digital payment and then eventually increase their access to financial services.

Transaction volume

The government can shift the government-to-person (G2P) payment from cash to digital form, specifically straight away transferred to their digital wallet. The government-to-person payment includes social welfare payment, pension funds, grants and subsidies.

In 2014, 62% of G2P recipients globally received their payments from cash to a bank account or digital wallet. While, the currency-in-circulation over GDP was about 6%, which was 100% higher than average in developed countries (Payments Network Malaysia Sdn Bhd, 2015). This shows that Malaysia still heavily rely on cash usage. In 2017, the Malaysian government have spent 5% of its GDP on social welfare programme and reform on the G2P payment mechanism can hugely drive the transaction volume of digital payment.

The current problems when receiving G2P payments are long queue in the banks, ATMs run out of cash, no active use of the account to make further transaction after withdrawing the money and hard to check the application results. If G2P payments are digitalized, the payment will be associated with a financial tool, such as bank or digital wallet account. This tool not only provide the service of money transfer, but also provide extra functions such as notifications alert, check our balance, online transfer or purchase, utilities bill payment etc.

Digitalizing the government-to-person payment could increase the speed of transfer, reduce costs, and help the people to get familiar with the latest digital payment. There is a clear evidence that many recipients are motivated to open bank account and adopt new technology in order to receive the government-to-person payment. Slowly this will enhance financial inclusion.

When this G2P payment mechanism is stable and efficient, the government can move further step in driving the transaction volume of digital payment by limiting cash options in certain areas. For example: public administrative such as paying utilities bills, summons, renewing foreign employees' working permit, passport renewal and medical fees in the public hospital. The reasons of testing the feasibility of this idea in the public sector are this kind of transactions from the public administration activities accounts for the high proportion of cash transaction in Malaysia and huge funding are allocated for public sectors every year. If the idea is not feasible in the public sector, its implementation in the private sector will be even harder. Thus, limiting cash usage in the public sector will be one of the best ways to drive up the daily transaction volume and encourage higher adoption of digital payment.

4.2.4 Awareness and education

Awareness campaign

The government itself, such as Ministry of Finance or Ministry of Science, Technology and Innovation can host awareness events on digital finance to the public. The government also can collaborate with other government agencies and universities to co-organize events to raise public awareness by acting as speakers, sponsor, strategic partners or board of advisory. This campaign aims to raise digital awareness and educate the public about digital payment solutions for day to day transaction. One of the factors that lead to slow adoption of digital payment in Malaysia is lack of awareness of the public to the latest technology trend happens around us, such as Fourth Industrial Revolution, Artificial Intelligence, Blockchain, especially for the elders, rural communities and less educated groups. Since they have lack of understanding on the digital payment, it is no wonder that they lack of trust and strong resistance on adopting it.

For the awareness campaign, it is important to give the public especially from those in the rural areas, a better understanding on the current and future trend of digital payment and

ecosystem in Malaysia, the importance of transformation into digital payment society, the benefits that we can get and how every stakeholder can contribute in this transformation. Several sessions can be conducted such as sharing or forum by experienced speakers or digital industry leaders, workshop to teach people how to use the digital wallet, exhibition to showcase the digital wallet providers in the market etc. In order for governing to implement the strategies effectively and reform the payment system successfully, it is crucial for the potential users and beneficiaries to change their mindset and perception on digital payment.

Dependent Variable	P-value for t-test	Conclusion
Do you agree that financial inclusion is important to all individuals?	0.375	-Do not reject the null hypothesis -The urban/ rural areas does not affect the dependent variable
Do you agree that e-payment could help improve financial inclusion?	0.602	

Table 4.5: T test result - Respondents view on financial inclusion

According to the data from above table, both dependent variable doesn't have any significant effect because the p-value for t-test is greater than α. Hence, we do not reject the null hypothesis and we can conclude that urban/ rural areas do not affect the dependent variable. From our perspective, we believed that Malaysian did not have much knowledge and deep understanding on the meaning of financial inclusion. Secondly, most Malaysian living at urban are still relying on cash heavily. As for those living in rural, they felt that it's not necessary to have e-payment since most digital payment unavailable at the rural. Thus, it supports the points that government should initiate more awareness event in order to change their conservative mindset and wrong perception on digital payment.

Financial literacy education

Financial literacy is an important driving factor towards financial inclusion. It can be defined as “a combination of awareness, knowledge, skills, attitude and behavior necessary to make sound financial decisions and ultimately achieving financial wellbeing” (Atkinson, 2011). In order to inculcate financial literacy, government should provide financial education in formal and informal way.

A lack of awareness on different types of financial products and documentation requirements, low level of trust and perception on digital payment create obstacles for its access. People wouldn't adopt it if they have no knowledge on how the digital wallet works and its advantages. Some communities, especially low education level, orang asli and rural people found it hard to deal with digital payment providers because they speak different language and don't understand the terminology used in the financial sector, even don't know how to use smartphone although having it (Mahalingam, 2017).

The financial education programme should target largely financially excluded groups and use different approaches to channel education. Generally, the aim of the financial education is to focus on the use of financial products. The basic skills need to be included in financial education for financial inclusion are how to use financial services and products, day-to-day financial management, credit management and long term financial planning. It is important to cover topics such as consumer’s rights, insurances, remittance and retirement. Government can use road-show, exhibitions and media campaigns that can provide broader coverage and exposure. Combining education with entertainment and broadcasting with media and social network can be an effective way. An financial educational radio or TV campaign can incorporate fun elements or latest trends, with the intended learning objectives being set. Call-to-action after the broadcast such as provide useful contact numbers of financial service providers, financial education providers etc, should be emphasized in order to achieve the intention of the programme. Compared to traditional classroom learning, this channel might attract the interest of target groups and they feel more comfortable to access the information and knowledge.

4.2.5 Collaboration and partnership

Non-government organization, social enterprise and corporate social responsibility department

Firstly, the government should collaborate and partner with non-government organization (NGO), social enterprise (SE) and corporate social responsibility (CSR) department of corporate. The reasons are these organizations are working directly with the underserved population and understand the real challenges or problems faced by the communities. Generally, these NGO or SE are working on providing basic financial education to the rural people, creating job opportunities for the unemployed, educate poor children about IT etc. Compared to other stakeholders, their feedback and suggestions are more be in their shoes. Before taking any action, understanding the target community and building empathy are very important, to ensure the solution is effective and sustainable. For example: there is a perception that people from rural areas didn't adopt digital payment due to troublesome reaching nearby bank branches or they prefer using cash instead of non-cash instrument. But for those Malaysian who living at rural areas, they have acknowledged the benefits given by non-cash instruments and they are accessible to nearby banks. For those who are not dealing with the rural communities directly, they can never understand what are truth behind. Instead of investing large amount of money to the communities directly, government might provide more subsidies and supports to the NGO, SE or CSR departments to magnify their social impact, and motivate more people to take initiatives to fight against the problem of financial exclusion.

Private sector

In 2006, the government has introduced Public Private Partnership (PPP) as an effort to encourage private sectors to produce public goods and services. The implementation of PPP has brought many benefits to the public, such as LRT projects, KL sentral and highways (Khairuddin Abd. Rashid, 2016). Currently PPP mainly focuses on construction, management and maintenance. Now it is the time to extend the partnership to the digital payment sector. The

government could engage with the mobile network operator, banks and nonbanks, either from local or foreign to build an inclusive and integrated digital financial ecosystem. There are 32 digital payment solutions providers in Malaysia and many private companies (Touch n Go, Maybank, Celcom, Axiata) are investing huge capital in creating their digital payment platform. However, currently there is no clear collaboration and partnership among these players, which make it hard to form visibility and exert great influence in the market. Thus, government should play a catalytic role in connecting all public and private companies together.

Through collaboration with different industries, the current digital payment service providers can expand their range of financial services, to provide more benefits and convenience to their users. For example: by collaborating with Touch ‘n Go, the digital wallet can be used to top up their touch n go and access to all public transport. By collaborating with insurance companies, the digital wallet can be used to buy insurance and pay the monthly premium. By collaborating with utilities company, the users can make their bill payment with same digital wallet account. During certain period, the merchants or companies participated in the digital wallet platform might give some promo code, bonus points and discount, in order to build brand loyalty and encourage active use of the account.

The collaboration between public and private sector improves the users experience and confidence of the users, thus motivates more laggers to adopt digital payment. The underserved communities could have access to different services by using one digital wallet, which they need to travel long distance and time to cities to get the services previously. Thus, what government can do in fostering partnership and collaboration is providing tax incentives to the private sectors who works on financial inclusion, financially support such as subsidies or interest-free loan, and sound copyright or patent law to protect the interest of private players.

Foreign government and companies

Besides collaboration with different players in the domestic ecosystem, it is crucial to promote regional collaboration for cross-border digital payments across ASEAN or ASIA. In 2017, several leading payment system providers in ASIA were signing a Memorandum of Understanding to enable real time cross border payments by connecting the payment infrastructure respectively (SMEBIZ, 2017). They are PayNet from Malaysia, NETS from Singapore, Rintis from Indonesia, ITMX from Thailand and NAPAS from Vietnam. This kind of collaboration helps to expand cross-border payment landscape, leverage the combined expertise and resources, and eventually achieve the vision of establishing an interoperable payment system across the region. It is hard for the local payment service provider to initiate and form the collaboration with payment service providers in other countries, thus government should take a lead and acts as intermediary to build the linkage, especially regional governmental organization such as ASEAN, APEC, Commonwealth etc.

An example of collaboration between local government and foreign private sector is the launch of Digital Free Trade Zone (DFTZ) in Cyberjaya. This DFTZ is developed through the strategic collaboration of MDEC and Alibaba Group from China (MDEC, MALAYSIA LAUNCHES WORLD'S FIRST DIGITAL FREE TRADE ZONE, 2017). DFTZ will provide physical and virtual zones to facilitate small medium enterprise (SME) in Malaysia to capitalize and utilize the convergence of digitalized economy and cross-border eCommerce activities. AliPay, a payment service provider under Alibaba collaborates with Maybank and CIMB to launch AliPay barcode system which enables visitors from China to make payments using their Alipay digital wallet when spending in Malaysia and enable Malaysian merchants to expose to huge China market.

In order to achieve financial inclusion, the local government and relevant stakeholders should brainstorm on how to involve financially excluded population and underserved communities in the collaboration above. For example, government could allocate certain percentage of seats in DFTZ to small enterprises from the rural areas to expand their market or

encourage the local entrepreneurs to transform the business model from offline to online with subsidies and education provided.

The main objective of collaboration is to build a dynamic, fast-growing and sustainable digital ecosystem and improve the service quality and user-experience of digital wallet. To improve financial inclusion through adopting digital payment, it is important to give the underserved and unbanked population an impression that "with one digital wallet, they could access to many financial services and benefits".

Dependent Variable	P-value for t-test	Conclusion
Are you satisfied with the services provided by the credit/ debit card issuers?	0.534	-Do not reject the null hypothesis -The urban/ rural areas do not affect the dependent variable

Table 4.6: T test result - Respondents' satisfaction on financial services provided

According to the data from above table, both dependent variable doesn't have any significant effect because the p-value for t-test is greater than α. Hence, we do not reject the null hypothesis and we can conclude that urban/ rural areas does not affect the dependent variable. From our perspective, both urban and rural respondents are quite satisfied with the services offered by the payment service providers. Since, nowadays more benefits and privileges are offered by the banks on bank account holders, such as high interest rate and bonus points. Additionally, the more merchants and services providers accept digital payment such as Uber, Grab, Fave, 7 Eleven etc. If there is any problems happened on the authentication of identity, users could call the customer hotline anytime and anywhere.

4.3 Chapter summary

Based on the analysis and discussion from the interviews and survey, we could summarize the results as different stakeholders in the digital payment ecosystem have different perspectives on financial inclusion and role of government should play in developing the digital

wallet ecosystem. The government agencies such as MDEC emphasize on collaboration and innovation in order to develop sustainable ecosystem and align with the vision of the long term national development plan. The fintech companies are more straightforward. They focus on the merchants as they are their potential customers and look for profitability and market penetration. While, NGOs focus more on the infrastructure and facilities, awareness and education to the financially excluded population as they realized these factors are the main barriers from slowing down the adoption of digital payment in the rural areas based on their exposure and experience.

We also can conclude that all the interviewee agree that Malaysia is ready to transform itself from cash-oriented society to digital wallet society. There are some obstacles and potential risks that might slow down the progress, such as trust, security, lack of awareness and infrastructure, but we can see that government are working hard to address those challenges and introduce more initiatives in order to achieve the vision of cashless and financial inclusive society. Although there is a long way to achieve the vision, we are in the right track and direction and every stakeholder in the ecosystem should expand their role to achieve the vision together.

Chapter 5: Conclusion

5.1 Conclusion

From the research, we realized that there are many factors affect the rate of adoption of digital payment in Malaysia and there are many ways that government can implement to accelerate the financial inclusion. The fundamental for the transformation of payment system is infrastructure and facilities. Infrastructure and facilities are always linked to the convenience and accessibility of the products and services. Without convenient and accessible infrastructure and facilities, it is hard for the service providers to reach to the rural people and also make the rural residents to approach and access to financial services. In addition to provide infrastructure and facilities, it is crucial for the rural residents to aware and understand how the technology works. Adoption cannot be achieved if the payment service providers keep launching new products and services, but no one to use it. The underserved communities should be equipped with sufficient

knowledge and skills on operating mobile device, connecting to the Internet and basic financial methodology, before they can really enjoy the benefits and convenience offered.
It is crucial to seek balance between cooperation and competition when implementing certain strategies. Cooperation promotes wider range of financial services via sharing of resources, expertise and skills, but it might raise the risk of monopoly and market dominance, which in turn that the merged company has high power to control market price and lower quality of services provided. In customers' perspective, competition is healthy as it promotes innovation and reduce the costs. However, the government should constantly regulate and monitor the market to ensure that there is a same level of playing field for all players, regardless it is public or private. Sharing of data commonly encourages the digital service providers to offer more individualized and personalized users experience, but without a doubt it might raise the security and privacy concern to the users. The government as a regulator and strongest entity in the country should step out to build trust and confidence of the public to the digital payment. Intervention sometimes is necessary and useful in maintaining public confidence and trust and protecting the basic right of the customers.

It is easier for the financially-excluded population to access to bank account and other financial services when digital ID and interoperability are launched, but it is equally important for the government to ensure that they are using the account and digital wallet actively and productively. We don't want to see that they are just one-time user, stop using the digital wallet after receiving the G2P payment. Thus, the government should ensure that the cost per transaction is well controlled to ensure that the burden of underserved users are reduced, without neglecting the profitability of the service providers. The government also should reform on the operation of public sector, by adopting digital wallet to carry out transactions and reducing the usage of papers and cash. This transformation will further enhance the efficiency and productivity of the government sectors.

5.2 Limitations and recommendations

There are some limitations in our research. Firstly, we only managed to interview seven experts in the sector consists of government agencies (MDEC), fintech companies (AppPay), payment solution providers (iPay88 Sdn Bhd), social entrepreneurs and digital wallet provider (Touch n Go). We did not manage to interview the merchants from rural areas due to geographical barriers. Merchants are the main players in the digital wallet ecosystem, without getting their insight and perspectives hinder us to provide a more comprehensive research result. There is possibility that every interviewee does bring his/ her own assumption and biases on certain issues or which angle deserved to emphasize in the interview. This will make the findings of the interview less accurate and valid.

It is good to have survey as extra resources to validate the findings. However, the weakness of our survey is small sample size (which is 38 respondents from urban areas and 30 respondents from rural areas). Small sample size may produce misleading results if there is outlier present in our sample. Our area of study also just focus in Cheras (urban area) and Lundu (rural area), which can truly and completely represent the situation of other urban area and rural area in other parts of Malaysia. The extent of development in rural areas in different region of Malaysia might different too.

We should ensure that the interview will involve all the stakeholders in the digital payment ecosystem in Malaysia, from policy makers, regulators, banks, non-banks, fintech companies, NGOs, merchants, and eventually users from both rural and urban.
In order to increase the reliability and validity, we should interview at least two people from the same stakeholders. It is necessary to prepare questions with different focus and expected outcomes to different stakeholders. For example: instead of asking questions about law and regulation to every stakeholder such as fintech companies or merchants who have less knowledge about this area, we can focus this questions to regulators or policy makers, so that the insight or knowledge shared will be more reliable and less assumption or biases.

Regarding the survey, we recommend to conduct survey with similar topic and questions, but with larger sample size, which is at least 100 respondents for each area. Large sample size can reduce margin error, which provides more accurate results. If there is outlier present in the sample, the distortion to the result wouldn't be less significant. To get a comprehensive and reliable survey data regarding financial inclusion in Malaysia, we must cover several areas in Malaysia since different state has their different demographic and social structure. For example: rural areas in Sarawak might produce wide difference results with the rural areas in Johor. Those rural areas in Johor might have better infrastructure than rural areas in Sarawak and the factors affecting financial exclusion might totally different. Hence, it is crucial for the researchers to prior study and take those factors into account.

5.3 Implications of study

In conclusion, the studies have achieved our research objectives. By conducting survey, we understand what are the reasons that affecting the adoption rate of digital payment in the urban and rural areas. So, the recommendation and suggestion of the research would be more reliable and applicable to our society. From the interview with different stakeholders present in the digital payment ecosystem, we understand that what kind of support they need from the government, which could be categorized into infrastructure and facilities, transaction cost, law and regulation, awareness and financial education and stronger collaboration among public and private sector. We found that the government has a significant and decisive role in implementing the strategies to foster financial inclusion and rapid growth of digital payment. Different countries have their own different recipe of success. Since their demography and consumer behavior are different with our country, there is no standard benchmark for the comparison and unable to follow all strategies implemented by the government in other countries. Our country has our own unique challenges, advantages and disadvantages. Thus, Malaysian government need to form a long-term strategies roadmap that suit our country, which is called in Malaysian perspectives. Every interviewee agree that digital wallet is a good tool to improve financial inclusion in Malaysia as this technology solves the convenience and accessibility challenges

faced by the traditional banks, insurance companies, utilities companies and other financial service providers. Although it might takes time to show the impact of digital wallet on financial inclusion in Malaysia, but for now we are in the right direction and track.

Appendix

(A) Biodata of interviewee

Name	Organization	Designation	Experience
Gopi Ganesalingam	Malaysia Digital Economy Corporation (MDEC)	Vice President of Enterprise Development Consulting	-focuses on developing Malaysian tech companies into regional & global players -drive the nation's digital economy in a more holistic manner -developed a sustainable digital economy with vibrant ICT industry, transformative use of digital solutions by government, businesses and citizens
Jenna Huey	Malaysia Digital Economy Corporation (MDEC)	Fintech, Blockchain, Law and Ecosystem Builder	-Developing fintech ecosystem and landscape in Malaysia at national level -Managing stakeholders like regulators, Fintech VC, startups, banks, companies, accelerators and government agencies -Looking for international and local partners to build FINTECH ecosystem
Hakim Omar	Public Bank	FinTech & Digital Innovation Team	-connect FinTechs, Startups and Scaleups with the right stakeholders at the right angle for a successful partnership. -evaluate new opportunities and propose areas for innovation related to online/internet banking realm to ensure Public Bank continue to navigate successfully
Calvin Yeap	iPay88 Sdn Bhd	Head of	-strategizing and leading a broad

		Marketing	range of marketing activities with strong emphasis on fostering close collaborations and strategic partnerships with various business partners, industry associations, and regulatory bodies
Desmond Tay	AppPay Sdn Bhd	Managing Director	-enable Brick-and-Mortal businesses to go on O2O Commerce and Mobile Payment via Mobile App Solutions
Heislyc Low	Startup Mamak	Founder	-founded Startup Mamak, a community for technology start-up entrepreneurs in 2011 -founded global network of startups and mentors that helps entrepreneurs launch great technology companies around the globe.
Lih Ren Chang	Touch n Go	Project Manager	-develop successful online marketing strategies and companies' goals -project manager in e-wallet team
Ellynita Hazlina	Social Enterprise Alliance	Chairperson	-building businesses with the potential to transform markets for social benefits -develop vibrant and healthy ecosystem for social enterprises to sustain impact and better empower underserved communities -networkers, educators, experts, lobbyists and advocators of social enterprises and social innovators

(B) Interview questions

1. Electronic payments as a whole have grown rapidly from about 3.5% of all retail transactions in China in 2010 to about 17% in 2015. The largest digital payment service provider in China - Alibaba and Ant Financial have created an entire financial and technology ecosystem that provide users with access to a wide variety of both financial and non-financial products and services, such as Alibaba Cloud (system information and data support), sesame credit (credit scoring), Ant Fortune (wealth management), Taobao (C2C), Tmall (B2C), Aliexpress etc. We have found that ecosystem leverages synergy between all of their products. **Describe the current adoption rate of digital payment in Malaysia and what are the reasons behind.**

2. As we know that Financial inclusion has been identified as an enabler for 7 of the 17 Sustainable Development Goals (SGD) and The World Bank Group has put forward an ambitious global goal to reach Universal Financial Access (UFA) by 2020. **Describe the situation of financial inclusion in Malaysia and why it is important to us**

3. Kenya's M-Pesa, a mobile money service which allows users with or without bank accounts to transfer and make payments through a basic mobile phone. Since its launch in 2007, M-Pesa has become an integral part of Kenya's economy: M-Pesa transactions account for 20% of gross domestic product (GDP) and it is used ubiquitously (by at least one individual in 96% of Kenyan households and by 75% of the unbanked population). Results from a recent, large-scale multi-round panel survey suggests that access to mobile money (defined as proximity to M-Pesa agents) improved per capita consumption and lifted 194,000—or 2% of Kenyan households—out of poverty. **Do you think that digital wallet is a good tool to accelerate financial inclusion in Malaysia too?**

4. What are the specific role that government can play in modernizing payment system to create a financially inclusive society?

5. In your opinion, is Malaysia ready to be cashless society?

(C) Survey questions

Accelerating Financial Inclusion: The Role of Payment Systems

Financial inclusion is interpreted as having access to and using the type of financial services that meet the user's needs. Efficient and safe payment system plays an important in fostering financial inclusion as individuals and firms can interact in the economy in an easier and faster ways.

Dear respondents,

We are final year students from UCSI University and both are currently undertaking Bsc.(Hons) Actuarial Science and Bsc.(Hons) Actuarial Science and Finance. Our title for this research topic is "Accelerating Financial Inclusion: The Role of Payment Systems".

We are pleased to invite you to participate in a questionnaire survey of this study. The question will take 4-5 minutes of your valuable times. Your participation in this survey will be greatly appreciated. All response will be kept strictly confidential and it's mainly for education purpose.

Thank you!

Sincerely,
Chai Ming Xuan 1001436975
Lai Chun Jie 1301334942

Section 1

What is your gender?

- ❑ Male
- ❑ Female

What is your age?

- ❑ Under 18
- ❑ Between 19-25
- ❑ Above 25

What is your current level of education?

- ❑ Did not attend school
- ❑ Primary level

- ❑ Secondary level
- ❑ College / Degree
- ❑ Post graduate

Which area are you from?

- ❑ Urban / city
- ❑ Rural / sub urban

Do you own a smartphone?

- ❑ Yes
- ❑ No

Do you have credit cards / debit cards?

- ❑ Yes
- ❑ No

Please rate your comfort level with latest e-payment technology

- ❑ Very low
- ❑ Low
- ❑ Medium
- ❑ High
- ❑ Very High

What is the payment method that you most frequently use?

- ❑ Cash
- ❑ Credit cards/ debit cards
- ❑ Electronic payment such as Apple Pay / E wallet
- ❑ Cheque
- ❑ Online banking or transfer

What is the amount per transaction on e-payment?

- ❑ Below RM50
- ❑ RM 51 - RM 500
- ❑ RM 501 - RM 1000
- ❑ Above RM 1000

Is the payment method depends on the occasion?

- ❑ Yes
- ❑ No

Section 2: Accessibility and convenience

	Strongly Disagree	Disagree	Neutral	Agree	Strongly
Do you think that it is convenient for you to use credit cards or debit cards as instruments in your area?	**1**	**2**	**3**	**4**	**5**
Do you think that is convenient for you to use e-payment as instrument in your area?	**1**	**2**	**3**	**4**	**5**
Are you satisfied with the services provided by the credit card or debit card issuers?	**1**	**2**	**3**	**4**	**5**
Are the banks near and easy to reach in your area?	**1**	**2**	**3**	**4**	**5**

What is the main reason that make you less frequent to use e-payment?

- ❑ Unfamiliar with the payment method
- ❑ Internet accessibility unavailable
- ❑ Privacy and security concerns
- ❑ Excessive cost and fees
- ❑ Inconvenient
- ❑ Inaccessible in stores and outlets

What is the main advantage to make you adopt e-payment?

- ❑ Time saving
- ❑ Expenses control
- ❑ Reduce risk of lost or theft
- ❑ Convenient (anytime, anywhere)
- ❑ User friendly

Section 3: Legal Framework and Knowledge on Financial Inclusion

Do you understand the meaning the financial inclusion?

- ❑ Yes
- ❑ No

<u>Financial Inclusion definition: Financial inclusion describes a process whereby a person has the ability to access to any finance products and services in a civil, transparent and equitable manner at a decent cost</u>

Do you understood the definition of financial inclusion based on above explanation?

- ❑ Yes
- ❑ No
- ❑ Maybe

	Strongly Disagree	**Disagree**	**Neutral**	**Agree**	**Strongly Agree**
Do you agree that financial inclusion is important to all individuals?	**1**	**2**	**3**	**4**	**5**
Do you agree that e-payment could help improve financial inclusion?	**1**	**2**	**3**	**4**	**5**

Do you have enough knowledge on the current e-payment ecosystem in Malaysia?

- ❑ Yes
- ❑ No
- ❑ Maybe

	Strongly Disagree	**Disagree**	**Neutral**	**Agree**	**Strongly Agree**
Do you think the current legal and regulatory framework is efficient to improve the e-payment ecosystem in Malaysia?	**1**	**2**	**3**	**4**	**5**

Do you think that current legal and regulatory framework is sufficient and efficient for the improving of financial inclusion?	1	2	3	4	5

(D) Survey results

a) Frequency Table

Note: The frequency table will be arranged in ascending order according to the survey.

What is your gender?					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Female	41	60.3	60.3	60.3
	Male	27	39.7	39.7	100.0
	Total	68	100.0	100.0	

What is your age?					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Above 25	4	5.9	5.9	5.9
	Between 19-25	60	88.2	88.2	94.1
	Under 18	4	5.9	5.9	100.0
	Total	68	100.0	100.0	

What is your current level of education?					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	College / Degree	56	82.4	82.4	82.4
	Post graduate	3	4.4	4.4	86.8
	Secondary level	9	13.2	13.2	100.0
	Total	68	100.0	100.0	

Which area are you from?					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Rural / sub-urban	30	44.1	44.1	44.1
	Urban / city	38	55.9	55.9	100.0
	Total	68	100.0	100.0	

Do you own a smartphone?					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	68	100.0	100.0	100.0

Do you have credit cards / debit cards?					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	No	5	7.4	7.4	7.4
	Yes	63	92.6	92.6	100.0
	Total	68	100.0	100.0	

Please rate your comfort level with latest e-payment technology					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	High	33	48.5	48.5	48.5
	Low	2	2.9	2.9	51.5
	Medium	27	39.7	39.7	91.2
	Very high	3	4.4	4.4	95.6
	Very low	3	4.4	4.4	100.0
	Total	68	100.0	100.0	

What is the payment method that you most frequently use?					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Cash	48	70.6	70.6	70.6
	Credit card / debit cards	14	20.6	20.6	91.2
	Electronic payment such as Apple Pay / E wallet	2	2.9	2.9	94.1
	Online banking or transfer	4	5.9	5.9	100.0
	Total	68	100.0	100.0	

What is the amount per transaction on e-payment					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Above RM 1000	2	2.9	2.9	2.9
	Below RM50	14	20.6	20.6	23.5
	RM 501 - RM 1000	12	17.6	17.6	41.2
	RM 51 - RM 500	40	58.8	58.8	100.0
	Total	68	100.0	100.0	

Is the payment method depends on the occasion?					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	No	7	10.3	10.3	10.3
	Yes	61	89.7	89.7	100.0
	Total	68	100.0	100.0	

Do you think that it is convenient for you to use credit cards or debit cards as instruments in your area?					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1	4	5.9	5.9	5.9
	2	6	8.8	8.8	14.7
	3	25	36.8	36.8	51.5
	4	26	38.2	38.2	89.7
	5	7	10.3	10.3	100.0
	Total	68	100.0	100.0	

Do you think that is convenient for you to use e-payment as instrument in your area?					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1	3	4.4	4.4	4.4
	2	8	11.8	11.8	16.2
	3	21	30.9	30.9	47.1
	4	30	44.1	44.1	91.2
	5	6	8.8	8.8	100.0
	Total	68	100.0	100.0	

Are you satisfied with the services provided by the credit card or debit card issuers?					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1	1	1.5	1.5	1.5
	2	8	11.8	11.8	13.2
	3	25	36.8	36.8	50.0
	4	31	45.6	45.6	95.6
	5	3	4.4	4.4	100.0
	Total	68	100.0	100.0	

Are the banks near and easy to reach in your area?					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1	2	2.9	2.9	2.9
	2	5	7.4	7.4	10.3
	3	22	32.4	32.4	42.6
	4	23	33.8	33.8	76.5
	5	16	23.5	23.5	100.0
	Total	68	100.0	100.0	

What is the main reason that make you less frequent to use e-payment?					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Excessive cost and fees	8	11.8	11.8	11.8
	Inaccessible in stores and outlets	16	23.5	23.5	35.3
	Inconvenient	1	1.5	1.5	36.8
	Internet accessibility unavailable	8	11.8	11.8	48.5
	Privacy and security concerns	25	36.8	36.8	85.3
	Unfamiliar with the payment method	10	14.7	14.7	100.0
	Total	68	100.0	100.0	

What is the main advantage to make you adopt e-payment?					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Convenient (anytime, anywhere)	29	42.6	42.6	42.6
	Expenses control	4	5.9	5.9	48.5
	Reduce risk of lost or theft	5	7.4	7.4	55.9
	Time saving	26	38.2	38.2	94.1
	User friendly	4	5.9	5.9	100.0
	Total	68	100.0	100.0	

Do you understand the meaning the financial inclusion?					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	No	49	72.1	72.1	72.1
	Yes	19	27.9	27.9	100.0
	Total	68	100.0	100.0	

Do you understood the definition of financial inclusion based on above explanation?					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Maybe	26	38.2	38.2	38.2
	No	5	7.4	7.4	45.6
	Yes	37	54.4	54.4	100.0
	Total	68	100.0	100.0	

Do you agree that financial inclusion is important to all individuals?					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1	1	1.5	1.5	1.5
	2	1	1.5	1.5	2.9
	3	24	35.3	35.3	38.2
	4	31	45.6	45.6	83.8
	5	11	16.2	16.2	100.0
	Total	68	100.0	100.0	

Do you agree that e-payment could help improve financial inclusion?					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	2	3	4.4	4.4	4.4
	3	22	32.4	32.4	36.8
	4	34	50.0	50.0	86.8
	5	9	13.2	13.2	100.0
	Total	68	100.0	100.0	

Do you have enough knowledge on the current e-payment ecosystem in Malaysia?					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Maybe	42	61.8	61.8	61.8
	No	19	27.9	27.9	89.7
	Yes	7	10.3	10.3	100.0
	Total	68	100.0	100.0	

Do you think the current legal and regulatory framework is efficient to improve the e-payment ecosystem in Malaysia?					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1	2	2.9	2.9	2.9
	2	4	5.9	5.9	8.8
	3	47	69.1	69.1	77.9
	4	15	22.1	22.1	100.0
	Total	68	100.0	100.0	

Do you think that current legal and regulatory framework is sufficient and efficient for the improving of financial inclusion?					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	2	6	8.8	8.8	8.8
	3	41	60.3	60.3	69.1
	4	19	27.9	27.9	97.1
	5	2	2.9	2.9	100.0
	Total	68	100.0	100.0	

b) The Independent t-test Table

Table on Next Page

Independent Samples Test										
		Levene's Test for Equality of Variances		t-test for Equality of Means						
									95% Confidence Interval of the Difference	
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Lower	Upper
Do you think that it is convenient for you to use credit cards or debit cards as instruments in your area?	Equal variances assumed	.661	.419	3.284	66	.002	.744	.227	.292	1.196
	Equal variances not assumed			3.202	55.137	.002	.744	.232	.278	1.209
Do you think that is convenient for you to use e-payment as instrument in your area?	Equal variances assumed	1.383	.244	3.680	66	.000	.796	.216	.364	1.229
	Equal variances not assumed			3.578	54.130	.001	.796	.223	.350	1.243
Are you satisfied with the services provided by the credit card or debit card issuers?	Equal variances assumed	1.880	.175	-.624	66	.534	-.125	.199	-.523	.274
	Equal variances not assumed			-.638	65.800	.526	-.125	.195	-.514	.265
Are the banks near and easy to reach in your area?	Equal variances assumed	2.298	.134	.310	66	.758	.077	.249	-.421	.575
	Equal variances not assumed			.320	65.838	.750	.077	.241	-.404	.558
Do you agree that financial inclusion is important to all individuals?	Equal variances assumed	1.905	.172	-.893	66	.375	-.175	.196	-.568	.217
	Equal variances not assumed			-.917	65.992	.362	-.175	.191	-.557	.206
Do you agree that e-payment could help improve financial inclusion?	Equal variances assumed	.802	.374	.524	66	.602	.096	.184	-.271	.464
	Equal variances not assumed			.517	58.641	.607	.096	.187	-.277	.470
Do you think the current legal and regulatory framework is efficient to improve the e-payment ecosystem in Malaysia?	Equal variances assumed	.331	.567	-1.138	66	.259	-.174	.153	-.478	.131
	Equal variances not assumed			-1.166	65.927	.248	-.174	.149	-.471	.124
Do you think that current legal and regulatory framework is sufficient and efficient for the improving of financial inclusion?	Equal variances assumed	.368	.546	-.185	66	.854	-.030	.161	-.352	.292
	Equal variances not assumed			-.190	65.907	.850	-.030	.157	-.344	.284

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