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Title

THE ROLE OF PAYMENTS REGULATION IN MOBILE PAYMENTS ADOPTION:

THE CASE OF MOGALE CITY, GAUTENG PROVINCE, SOUTH AFRICA

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1623241

A research report submitted to the Faculty of Commerce, Law and Management, University of the Witwatersrand, in partial fulfilment of the requirements for the degree of Master of Management by Research

Johannesburg, 2023

DECLARATION

I, Samuel Tebogo Phajane, declare that this research report is my own unaided work and all sources have been acknowledged by means of complete references. It is being submitted for the degree of Master of Management in Research at the University of Witwatersrand, Johannesburg (Republic of South Africa), and has previously not been submitted for any degree or examination at any other university.

……..

Samuel Tebogo Phajane

28 February 2023

ACKNOWLEDGEMENTS

I would like to thank God for the gift of life and the never ending revelations he continues to bring to the fore, and this research report is by no small measure a moment of discovery and the putting together of a tapestry of information that the universe reveals to me. I would also like to thank my family without any pressure of having to name each one singularly, but it is greatly important to give a special word of gratitude to the mother of my children Mmamotse moradi wa Bokako, my daughters Tlotliso and Thateho for their unwavering support and care throughout this tough journey which was complicated by the health scare mid-journey. My hearty gratitude also goes to Zipporah "Mmane" Makhubela my housekeeper who became so dependable during this period.

Go botlhe Bafokeng baga mmaphalanyana mo ke tsalwang teng, le ho Bataung ba ha Molete moo ke tloholang teng kea tshepa le tla ananela boiteko baka ntshetshopeleng ya tsebo le ya setjhaba haholoholo se sootho. Bo-Phajane, Bo-Mosebi, Bo-Tsholo, Bo-Ramatlotlo, Bo-Rakhetsi, Bo-Mankoe, Bo-Ramaele, Bo-Khotle le bohle bao ke sa ba tsebeng feela ba ileng ba eba teng phelong bona pele honna, mme thapelo tsa bona eleng tsona tse nketelletseng pele ho nkopela mahlohonolo ho Mmopi wa ntho tsohle. Ho batho ba bileng teng kgodisong yaka ho tloha boseeng haholoholo batho ba Molapo e Soweto, Gauteng le ho mesuwe le mesuwetsana e bapetseng karalo ho fumaneng haka tsebo eka Ramasedi aka le etsetsa ka mohau wa hae o hlokang ho thijwa. Nka lebala jwang mohlankana e molele ka seemo a letseka la mathe mora Phajane, Tsietsi Abrahama ntate waka, le thope e tshwana e nnyantshitsheng le neng le sisa nnete, ebile a nkutlwisisa ho feta bohle bao ke phetseng le bona ho fihla nakong ena moradi wa Rakhetsi ka sebele Mapitso Jeanette Mma-'Musa mme waka. Ka ha Modimo o nthatile kesa motsebe, eka lerato la hae leka le fihlela bohle mme ale sitsa ka mohau wa hae o kekeng wa lekanngwa.

A special thank you to Professor Brian Armstrong, who has not only been patient with me but allowed the discovery process in our quest for answers to unravel at its own pace. A very big thank you goes to the support staff at Wits especially Mmabatho for always giving me an ear during my times of need.

ACRONYMS

SA	Republic of South Africa
SARB	South African Reserve Bank
MNO	Mobile Network Operator
FSCA	Financial Sector Conduct Authority
NPS	National Payment System
UCC	Uniform Commercial Code
MFS	Mobile Financial Services
TAM	Technology Acceptance Model
PASA	Payments Association of South Africa
PCH	Payments Clearing House
MMO	Mobile Money Operator
CAGR	Compound Annual Growth Rate
TOE	Technology Organisational Environment
PU	Perceived Usefulness
PEoU	Perceived Ease of Use
PR	Perceived Risk
PT	Perceived Trust
ATM	Automated Teller Machine
EFT	Electronic Funds Transfer
PoS	Point of Sale
TA	Thematic Analysis
R&D	Research and Development

ABSTRACT

The objective of this research is to develop an understanding of why mobile payments adoption has remained so low or insignificant for a country such as South Africa with a very economically unequal society. One of the areas where this imbalance manifest itself is in the very limited access to financial services or what is also termed financial exclusion for that segment of the population that is at the bottom of the economic spectrum. One of the basic financial services that should be accessible to each member of society, is the ability to conduct basic commercial transactions digitally as it allows members of society the ability to build a financial record. Having a financial record allows individuals and enterprises access secondary financial services such as loans and investments. However contrary to this logically sound expectation the adoption of mobile payments has remained very low or at best insignificant to make an impact to financial exclusion.

It is within this context that the objective to conduct this research was conceptualized. The research process first looks at the evolution of mobile payments going back to the early 2000s, and then also evaluates how other countries have approached the deployment of mobile payments looking at both the regulatory posture of those countries and the adoption rates.

Three areas of theory or theoretical framework are utilized to assess the various aspects of delivering a viable mobile payments ecosystem. The first is the Uniform Commercial Code (UCC) Payments Theory which is more a legal instrument than a theory, but is useful in evaluating that sound regulatory obligations are in place and are observed by participants throughout the payments ecosystem. The second theory is the Technology Acceptance Model which is used to determine whether the drivers of accepting technology innovation are in place. The third is the Technology Organisational Environment theory whose purpose is to examine the adoption process followed by companies when investing in IT products and services.

Mogale City is a local municipality, in the Gauteng Province, of South Africa and has been selected as the primary site for the research as it is a microcosm of the South African society, in that it provides access socio-economic conditions of urban, township, farming and informal settlements. Through a mixed-method research approach that combines both the qualitative and quantitative research processes, it responds to the research questions “To what extent does mobile payments regulation enable the ability of a mobile payment deployment to scale-up” and “What influences the end-user to adopt mobile payments innovation at scale”. This is achieved through the testing of P1: Bank-led mobile payments regulation inhibit the rapid growth and adoption of mobile payments by the end-users, and H2 : The simplicity of the service components of technology innovation drive high adoption rates by end-users” .

The findings of the research highlight the need to re-look at the regulatory framework for mobile payments in the SA context, so as create an environment conducive for all market players to thrive. Both the P1 and H2 hypothesis were affirmed by the research process. With the end-result the advancing an argument that it is necessary to make adjustments to the NPS framework, such that it allows mobile money to be issued as a new payment instrument, a process that would also include the establishment of a new PCH which allows banks and non-banks as participants.

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CHAPTER 1: GENERAL INTRODUCTION

1.1 PURPOSE OF THE STUDY

South Africa first launched mobile phone services in 1994 and in the last two and half decades a general increase in the number of active mobile phones has been experienced. This increase in active mobile phones has been accompanied by a general increase of access to the service by the general populace. Although South Africa has one of the most sophisticated banking/financial system in the world, there exists a socio-economic structure of the country which is sometimes defined as having two parallel economic sectors existing side-by-side, referred to as the first and second economy respectively. With the first-economy characterised as being similar to any first-world economy in terms of high levels of affluence, education and general standards of living by the segment of the population that falls within this group. Where else the second-economy represents that segment of the population that is marginalised, mostly financially excluded, predominantly staying outside of the main urban centres, with high levels of poverty and low levels of education and is also similar in socio-economic character to any third-world population.

Financial exclusion has been identified as one of the key barriers to a world without poverty. In many third-world (Pal & Ansari, 2022), more than half of the population's households do not have an account with a financial institution, whilst small enterprises often highlight their difficulty in accessing and affording financing as a key constraint on their growth. This exclusion limits the ability of the poor to save, repay debts, and manage risk responsibly. On a macroeconomic level, financial constraints resulting from the financial exclusion of the poor can slow economic growth and exacerbate inequality, (Donovan & Development, 2012).

Mobile payments have the potential to increase levels of financial inclusion, and the M-PESA experience provides an indication of the potential mobile payments provide in delivering an alternative approach that focuses on building payment rails on which a broader set of financial services can ride, (Donovan & Development, 2012). The purpose of this study is to explore what alternative regulatory framework options can be considered to bring about increased financial inclusion in South Africa with a specific focus on the second economy, by exploiting the alternative payment rails offered by mobile payments and technology developments, especially opportunities that the fourth industrial revolution potentially presents.

1.2 CONTEXT OF THE STUDY

The full potential of mobile money is yet to be realised, with many people in the developing countries still lacking a viable alternative to the cash economy and informal financial services whilst almost two billion of them have mobile phones. However the mobile money industry has found it challenging to launch and scale-up services for the unbanked because many a policy and regulatory environments are genuinely not enabling (Di Castri, 2013).

There is general acknowledgement that financial exclusion is a source of risk for the world's financial system, with the global Standard Setting Bodies (SSBs) finding resonance in the goal towards full financial inclusion, acknowledging that it affirms objectives of financial stability, integrity, and consumer protection. Mobile money is recognised as having the capacity to contribute to all of these objectives, driving economic and social growth through a cash-lite economy and digital pathways to financial inclusion (Di Castri, 2013).

The view on the table is that regulators should recognise that for mobile money to succeed it is imperative to create an open and level playing field that allows non-bank mobile money providers, including mobile network operators (MNOs) to come into the market (Di Castri, 2013). By allowing both banks and non-bank providers, especially MNOs, to launch mobile money deployments, and putting in place effective and proportionate mechanisms to manage the unique inherent risks associated with this industry, mobile money has immense potential to significantly expand financial inclusion. Mobile money has the capacity to be delivered through lower transaction costs structure, deliver improved access to underserved areas, and higher levels of customer convenience (Di Castri, 2013).

Differences in the various countries' economic, regulatory and banking infrastructure are amongst some of the key reasons why the adoption of mobile-money has varied across markets. Countries such as Kenya, Tanzania and Ghana had limited banking and payments infrastructure and were more receptive to the deployment of mobile payments and achieved great adoption success, becoming great value-add to both consumers and merchants (Gupta, 2013). In contrast countries such as South Africa, India, Bangladesh, and Uganda where mobile payments are classified as banking transactions and therefore require a banks involvement when executed, the success of deployments has been very limited if at all exists or very muted at best (Gupta, 2013).

Key lessons from the rollout of M-PESA in Kenya has been a demonstration that the power of unbundling traditional banking services has led to an increased reach of services to the poor people in an unprecedented manner. The choice for policymakers and regulators is whether to allow such unbundling to proceed and determine the appropriate regulatory intervention to facilitate such activity. By allowing M-PESA to experiment, the Kenyan regulatory authorities

have provided a great deal of insight into new possibilities and consequences for regulation (Klein & Mayer, 2011). What the MPESA deployment has illustrated with clarity is the existence of a manner in which payments systems can be disaggregated into component services, namely exchange, storage, transfer and investment. It therefore makes it an imperative that regulation should mirror the disaggregation and be structured by service rather than along traditional institutional lines, like it exists for a bank-led model. The question then is what type of regulation is appropriate for each type of service (Klein & Mayer, 2011). Mobile payment transactions are expected to reach up to 1.31 billion in 2023, increasing from 950 million in 2019, and the value transfer facilitated is expected to exceed 14 trillion dollars in 2022, up from 3.1 trillion in 2017 (Rabaa'i et al.).

On the other end of the spectrum is the traditional bank-led regulation model that has determined the pace of development for the financial sector in most economies, where promotion of innovation in the financial sector has however been an ancillary outcome for the authorities. This factor, coupled with the significant barriers to entry posed by banking regulation somewhat explains why the industry has developed at its own pace of innovation without fearing the entry of new players with radically different approaches, a position where being challenged by alternative models that will serve as catalysts for change is contained (González-Páramo, 2017).

The regulatory stance in South Africa (SA) regarding mobile-money has mostly referenced electronic money, which is a subset of e-banking (Lawack-Davids & Tech., 2012). Electronic money encompasses the following five characteristics to this definition, namely, monetary value represented by a claim on the issuer, money is stored in electronic form, money is issued on receipt of funds, electronic money is generally accepted as a means of payment by persons other than the issuer; and it is redeemable for physical cash or a deposit into a bank account on demand. Storing "money" on a mobile phone could satisfy the definition of electronic money as defined in SARB's 2009 position paper (Lawack-Davids & Tech., 2012). The legal and regulatory framework with regards to e-banking would apply to mobile banking. In South Africa the legal framework comprises of the following, South African Reserve Bank Act, National Payment System Act, Banks Act, Exchange Control Regulations (in the case of cross-border transactions) and Financial Intelligence Centre Act (Lawack-Davids & Tech., 2012).

The South African Reserve Bank Act of 1989 (Act No 90) read together with the Constitution Act of 1996 (Act No 8) determine the primary goal of the Reserve Bank. In section 224 of the

Constitution and section 3 of the Reserve Bank Act it is stated that the primary objective of the Bank is to protect the value of the currency of the Republic in the interest of balanced and sustainable economic growth. Section 224(2) of the Constitution further determines that the Reserve Bank, in pursuit of its primary objective, must perform its functions independently and without fear, favour or prejudice. Regular consultation must, however, take place between the Minister of Finance and the Reserve Bank (Van der Merwe, 2004).The National Payment System Act, sets out the rights and obligations of each party involved in effecting a payment through the payment system. A fundamental requirement for a stable and secure payment system is that it should operate in a well-defined legal environment (Lawack-Davids & Tech., 2012).The Banks Act, No. 94 of 1990 (the Banks Act), is the principal legal instrument which seeks to achieve credibility, stability and economic growth (Moloi, 2014). The exchange control system in South Africa is used primarily to monitor and control capital movements by SA residents. SA has, however, now reached a stage where there are no exchange controls on the movement of funds for non-residents and effectively no controls on current account transactions. Resident corporates, financial institutions and private individuals all have limited scope to make investments abroad, (Cross, 2003). The Financial Intelligence Centre Act (FICA) 38 of 2001 (FICA) compels certain persons and institutions, defined as "accountable institutions" within the Act, to identify and verify the identity of a new client before any transaction may be concluded or any business relationship is established (De Koker, 2005).

SA's regulatory position has resulted in greatly constrained mobile payments deployments which have failed to provide the intended value-add benefit to the targeted consumers. This has resulted in mobile payments solutions that are not ubiquitous, not sufficiently differentiated from existing banking products but greatly constrained due to them not being interoperable. In the last decade several failed mobile payments deployment failures have been noted, although the financial exclusion challenge in what is termed the second economy persists.

1.3 RESEARCH PROBLEM

The objective of the research is to develop an understanding of the relationship between the following variables, namely mobile phone access, national payments regulative framework and consumer as well as merchant adoption patterns in driving the increased utilisation of mobile payments within the South African economy.

The research question is therefore, “What is the relationship between mobile phone technology, the national payments regulative framework and consumer as well as merchant adoption patterns in driving the increased utilisation of mobile payments within the South African economy?”

Existing literature suggests that three models for handling mobile payments fundamentally exist, that is, (1) mobile network operator (MNO) led, (2) bank and financial institution led and (3) third party led, with numerous variations or combinations of these being possible (Duane et al., 2014). It is acknowledged that in practice, an accepted mobile payment model to facilitate the widespread adoption still remains elusive. Ultimately, consumers will play a key role in determining the ‘winning’ model, as consumer and merchant buy-in for any proposed mobile payment model is pivotal for the success of any mobile money solutions.

Regulatory restrictions are some of the key factors driving the structure of partnerships and ecosystem participants in the various markets. In some markets, non-bank players will have more motivation and competitive advantage than banks, and bank-based regulation can deny these companies from leading a deployment. In other markets, banks with a mass retail ambition may have strong motivation to lead implementation, but the absence of appropriate agent banking regulations may place them at a disadvantage (Lai, 2015).

The ubiquity that a mobile phone presents, provides a compelling business case and it has been an influential factor in the adoption of mobile payment systems, particularly when the majority of the population is unbanked, both in the developed and developing countries, (Dennehy & Sammon, 2015). When it comes to mobile payments, the chicken-or-egg analogy is frequently referenced to best describe the challenge facing merchant and consumer adoption issues. On one hand, merchants are unwilling to invest in the systems needed to enable mobile payment transaction unless there is consumer demand, whilst on the other hand, consumers will not use mobile payment systems unless merchants accept them (Dennehy & Sammon, 2015).

For financial inclusion to truly happen, a significant majority of the adult population must have the capacity, skills, knowledge and understanding to make the best use of financial products and services, including mobile money accounts that may not necessarily require one to have an account with a financial institution (Aro-Gordon, 2017). It had earlier been expected that mobile technology would reach globally ubiquity by the early 2020s a projection slightly impacted by the global shut-down due Covid-19 however the world is still on a trajectory to reach 70 percent of the world population using smartphones and 90 percent on mobile broadband networks, and it is

within this context that the role of mobile money such as M-Pesa, is seen as playing a significant role in bypassing traditional banking, in terms of accelerating financial inclusion, such as its been the case with M-PESA in Kenya. Mobile money has the advantage of ease of use, however its operational efficacy still depends on internet connectivity, mobile phone coverage and affordability of the mobile phones (Aro-Gordon, 2017).

The regulatory stance in SA with regards to mobile-money has mostly referenced electronic money, which is a subset of e-banking. This has therefore meant that the legal and regulatory framework with regards to e-banking would apply to mobile payments. The end-result from this regulatory stance is that the SA deployed mobile payment solutions have been based on a bank-led model, whose structure has an inherent limitation in that it is a closed loop system. In the context of mobile payments, a closed loop is created when subscribers of a bank sponsored mobile payments solution are unable to use their instruments outside their sponsoring bank network, this includes not being able to conduct commercial transactions or funds transfer with subscribers outside of their mobile payments solution or sponsoring bank. The challenge with a close-loop system is that a customer is unable to send or receive money nor pay another customer in a different system. With SA having multiple banks and MNOs, a closed-loop system has a parallel co-existence to systems deployed by other MNOs and the interoperable payments rail utilised by banks (Gupta, 2013). The mobile payment deployments in SA which were implemented by MNOs have thus far failed to gain traction and meaningful scale to be sustainable due to the closed-loop deficiency which then resulted in the early deployments failing or being aborted.

1.4 RESEARCH OBJECTIVES

The objectives of this research is to achieve the following:

i. Develop an understanding of how regulation influences the ability for mobile payments deployments to achieve scale in the markets which it is launched, and

ii. Develop an understanding of what drives end-users (consumers/merchants) to adopt technology innovation specifically as it relates to mobile payments.

1.5 SIGNIFICANCE OF THE STUDY

The findings of the study would serve as a contribution to society and benefit the following communities:

Policy makers. Data derived from the study should enable policy makers improve their understanding of how the current policies on mobile money and payments, are constraining societal development in the space of financial inclusion and non-cash based payments, which is an area that is critical for driving socio-economic development.

The South African Reserve Bank. The study should possibly highlight to the SARB that current National Payments System, has a particular bias that favours banks which has throttled the sustainable development of alternative payment rails in South Africa, although non-banks have made several attempts to introduce alternative models and continue to do so.

Innovation management scholars. Data from the study must serve to enhance existing understanding and paradigms in terms what are the drivers of change or influences that come into effect when an individual consumer makes a new technology adoption choice. In the same vain what influences enterprises especially merchants when they have to make decisions to adopt new technology solutions for conducting business.

1.6 DELIMITATIONS OF THE STUDY

The study has focused on the mobile payments regulation in South Africa and how it has enabled the bank-led mobile payments model to thrive, whilst constraining the development of alternative models.

The research aimed to develop an understanding of what has influenced the decision by merchants (from small to large) to accept different payment methods and what the limitation with mobile payment method has been. In almost a similar manner developed a view of what drives consumers to adopt the use of alternatives to cash in order to pay for goods and services, and what the limiting factor for mobile payments growth has thus far been. This research was confined to the developments, behaviours and patterns of consumers and merchants in the South African market context.

The other element of the research was to develop a view of what components of a broad-term referred to as "mobile technology" are critical in the development of mobile money and payments. The context within which mobile technology is assessed has covered the following components:

i. solutions provided by the carrier network in terms data and messaging services;
ii. network coverage and available services;
iii. the actual handset features and functionality; and
iv. the cost of services offered by MNOs to merchants and consumers.

1.7 DEFINITIONS OF TERMS

Financial Inclusion, entails key aspects of access to formal financial services, such as payments, savings, insurance, credit, and so on by the vulnerable or low income groups at an affordable cost. Properly executed financial inclusion initiatives can lead to a process of strong and sustained growth and efficient delivery of social security benefits to the under-privileged sections of the society (Aro-Gordon, 2017).

Mobile money, ecosystems create the platform for mobile transactions and these ecosystems use a currency known as mobile money. Mobile money allows consumers to store electronic value in a mobile wallet on their mobile phone (Finau, Rika, Samuwai, & McGoon, 2016).

Mobile payment, is defined as a payment that is carried out via the mobile phone, that is, any conventional or new payment system which enables financial transactions that can be made securely from one organisation or individual to another over a mobile network (Van der Heijden, 2002). Mobile payments are also defined as, a transfer of funds in return for a good or service, where the mobile phone is involved in both the initiation and confirmation of the payment. This definition dovetails with the view expressed that the use of an application-enabled mobile phone as a payment form, substitutes for a cheque, cash or a card, to eventually create a mobile wallet (Dennehy & Sammon, 2015).

Mobile Wallet, mobile wallet or e-wallet allows for the safe storage of money, providing a compelling alternative to storing money under the mattress or in goods such as livestock, which are risky and insecure (Lai, 2015).

e-Banking, is the use of electronic delivery channels for banking products and services. It is regarded as a subset of e-finance, with the most important electronic delivery channels being the Internet, wireless communication networks, automated teller machines (ATMs), telephones and mobile phones (Lawack-Davids & Tech., 2012)

Interoperability, is a system which allows for cross operation participation between and across participants, and in the case of a mobile payments system it would be cross operation between banks and MNOs (Gupta, 2013). Interoperability is also defined as to the ability of diverse systems and organisations to work together ('inter-operate'). The term is in many instances utilised in a technical systems engineering sense, or alternatively in a broad sense, taking into account social, political and organisational factors that affect system to system performance (Gillis et al., 2012).

Closed loop system, is a system where all transaction data is captured within the system and utilises a single owner that has contracts with all card or electronic-mechanism holders and merchants employing the system. The single owner authorises and settles all transactions. It is also a single owner that obtains a fee, typically from the merchant, for enabling the transaction (Hruska, 2013).

Financial Regulation, regulation and supervision denote respectively the establishment of rules relating to a particular industry and the monitoring and enforcement thereof (Botha & Makina, 2011). Financial regulation is therefore important for designing and maintaining an efficient and effective financial markets, financial institutions, financial service providers and lies at the very core of the country's economic wellbeing (Falkena et al., 2001).

South African Reserve Bank(SARB), is a central bank of the republic and within the context of a payments system is considered a neutral agent, that is in the best position to oversee and supervise the NPS. The SARB derives its powers and duties relating to its function of providing clearing and settlement facilities to banks within section 10(1)(c) of the South African Reserve Bank Act. This subsection empowers the SARB to establish, operate, oversee and regulate payment, clearing and settlement systems (Lawack-Davids & Tech., 2012).

National Payments System(NPS), it is through the national payment system that money is transferred between buyers and sellers in commercial and financial transactions. If properly [i]conducted, the development of the national payment system has the capacity to reduce overall transaction costs and expand the opportunities for commercial and financial transactions in an economy (Gillis et al., 2012).

Fourth Industrial Revolution, is building on the third industrial revolution, with the digital revolution that has been occurring since the middle of the last century, and is characterized by a fusion of technologies that is blurring the lines between the physical, digital, and biological spheres (Schwab, 2017).

Monetary Policy, is defined by central banks as those actions that influence the availability and cost of money and credit. Because market participants' play an important role in determining

prices and economic growth, the definition of monetary policy can also include the directives, policies, statements, and actions of a central bank that influence future market perceptions (Bernanke, 2020).

Financial Sector Conduct Authority (FSCA), was initially established under the FSB Act to, supervise and ensure compliance with the relevant laws that regulate the provision of financial services and financial products by financial institutions in South Africa. The FSCA was empowered to develop and promote financial education and l literacy programmes by financial institutions and/or other bodies representing relevant persons in the SA financial services industry (Chitimira, 2020).

Money, is that for which all other goods and services are traded. This fundamental characteristic of money must be contrasted with those of other goods. For instance, food supplies the necessary energy to people, whilst capital goods permit the expansion of infrastructure which in turn permits the production of a larger quantity of goods and services (Kubát, 2015).

Money Supply, is simple terms is defined as combined value of the currency and the total commercial bank deposits (Shostak, 2000).

Payments Clearing and Settlement Systems (PCSS), consist of a network of interconnected elements (such as central operators, participants, and settlement agents) where operational problems at any one of these key elements can potentially disrupt the system as a whole and negatively affect financial stability of a country (McPhail, 2003).

Payment Clearing House, the organisation that operates a clearing system is referred to as a clearing house. A clearing system is a mechanism for the calculation of mutual positions within a group of participants with the end-goal being to facilitate the settlement of their obligations to each other (McPhail, 2003).

Payments Association of South Africa (PASA), is a body that facilitates engagement of the payments industry with the SARB to ensure that the national payment system in maintained and enhanced from time to time (Maistry, 2021).

1.8 ASSUMPTIONS

The existence of two parallel economies is a commonly acknowledged and accepted factor within the South African context referred to as the first and second economies.

The second economy is characterised by underdevelopment, minimum contribution to the gross domestic product (GDP), comprises a large percentage of the population, incorporates the poorest of the rural and urban poor, is structurally disconnected from both the first and the global economy and is incapable of self-generated growth and development. While the first economy, is modern, operates with advanced technology, is integrated with the global economy and produces a bulk of the county's wealth (Valodia & Devey, 2012).

This acknowledgement of an existence of the second economy makes it is necessary to prioritise financial inclusion, and mobile payments can be one the enablers of financial inclusion within the second economy.

Although different mobile payments business models exist, with the most visible ones being the bank-led model (*a bank controls the customer relationship and provides mobile services as a channel*), MNO-led (reduces/*removes the involvement of banks in the payment delivery, clearing and settlement processes*) and the partnership model (*where MNOs and third-party service providers such as dealers collaborate and partner to create a payments ecosystem*) (Merritt & Systems, 2011).

The South African regulatory framework has not been an enabler for the development of business models that challenge the bank-led model in the mobile payments space. This has resulted in the previous failed attempts by Vodacom mobile payments (MPESA) and MTN mobile money which were built as closed-loop system and were enabled by a bank to interact with the NPS. This research focuses on understanding how the SA regulatory framework in its current form has been has been a limiting factor to the development of a properly functioning and thriving mobile payments ecosystem.

The theoretical perspective for analysing payment systems and options is derived from Article 3 of the Uniform Commercial Code (UCC) which in purest form is not a theory but a legal framework, however for the purpose this research best captures the essence of how third party facilitated payments mechanisms are treated within a National Payments infrastructure— UCC is viewed as the codified law of negotiable instruments is a linguistic maze which expresses payment precepts in confusingly intertwined phrases, (Khan, 2008). Simply put however, payment systems can be viewed as a legally regulated industry in which financial institutions provide professional services to transfer monies from account holders to payees. Due to payment systems having preceded the emergence of financial institutions, payment systems are seldom viewed as payment services (Khan, 2008).

Principles of payment systems determine liability. They are derived from statutes, not contracts. They are mandatory, not optional. They allocate loss to various parties involved in payment services. They address questions of fairness and efficiency. They guide legal professionals in resolving payment disputes. They chart a normative path for future payment systems. Despite differing historical origins of payment devices and despite the progression of payment services from tangible to intangible medium, the legal principles of authorisation, negligence, and dishonour constitute the common core of payment systems. According to the principle, no payment must be made unless it is authorised. No account holder should be held liable for unauthorised payments, the loss of unauthorised payments, should fall on financial institutions (Khan, 2008).

For the purpose of evaluating the acceptance and adoption of mobile payments and mobile money, the Technology Acceptance Model (TAM) was utilised. Due to available research on TAM, which describes the factors that drive consumers to accept e-commerce and on-line transactions, TAM as a model is a relevant point of departure that helps inform the understanding of consumer and merchant behaviour in the adoption of mobile payments and mobile money. It is broadly acknowledged that with electronic payments and in the same way with mobile payments, consumers delegate or surrender their control during the transacting process to merchants and enablers of the ecosystem. As a result thereof a risk of potential monetary loss exists, since consumers have to rely on electronic confirmation of the executed transaction, becoming vulnerable in the process and totally reliant on third-party provided information to confirm transactional movements (Pavlou, 2003).

For the purpose of this research the following proponents of TAM were evaluated that is:

i. Perceived usefulness;
ii. Perceived ease of use;
iii. Perceived risk; and
iv. Perceived trust.

Technology-organizational-environmental (TOE) framework which was developed by Tornatzky and Fleischer to examine firm-level adoption of various IS/IT products and services, was used to assess the journey by South African firms especially merchants when making investment choices regarding mobile payment deployments. TOE as a framework emerged as a widespread theoretical perspective on IT adoption, with its incorporation of technological, organizational and environmental variables making TOE advantageous over the other adoption models in studying technology adoption, technology use and value creation from technology innovation (Gangwar, 2015). The TOE framework

is also free off industry and firm-size restrictions, and as such provides a holistic picture for user adoption of technology, its implementation, foreseeing challenges, its impact on value chain activities, the post-adoption diffusion among firms, and factors influencing business innovation-adoption decisions (Gangwar, 2015).

CHAPTER 2: LITERATURE REVIEW

2.1 INTRODUCTION

This study is driven by a need to develop a perspective of how the reach of financial services can be extended to those members of society regarded to be on the fringes, of what is classified as the vibrant economy. The globe and specifically South Africa has experienced a phenomenon where the rate of mobile phone penetration has reached levels where almost every adult member of the population has a mobile phone or access to one. Whilst on the other hand the level of access to financial services especially the most basic element thereof that is, the ability to transact electronically when conducting commerce remains elusive to a sizeable part of the population. Although the banking sector in SA has made several attempts to close the gap of financial inclusion, this gap has stubbornly remained intact especially for the peri-urban and rural communities.

The review of literature process assessed the focal points and challenges encountered during the different phases of the mobile payments evolution process from the period early-2000s until around the period this research is conducted. The assessment process looks at role of different stakeholders in the mobile payments space, the role of technology and the regulatory regimes and frameworks adopted during or at the time of these different phases.

Incorporated in the evaluation process was an attempt to look at the set-up of some of the mobile payment deployments in a few African countries (Kenya, Nigeria, Ghana), India and Fiji, with aim being to develop a view of how they are structured, how effective they have been in addressing the financial inclusion challenge, the adopted regulatory framework within a particular market and the adoption rates of the service. This was intended to aid the development of the lenses through which the SA mobile payment deployments were assessed and the impact that regulation has had on their viability.

Another focal point of this literature review process, was the study the factors that generally influenced society's decision to adopt new technology solutions. This process involved the assessment of the relevance of technology adoption theories in building an understanding of the prevailing adoptive trends for the South African consumer and merchant in terms of mobile payments.

2.2 DEFINITION OF TOPIC AND BACKGROUND

A mobile-payment, is defined as a transfer of funds in return for a good or service, where the mobile phone is involved in both the initiation and confirmation of the payment. This definition incorporates a view that the use of an application-enabled mobile phone as a payment form, serves as substitute for a cheque, cash or a card, to eventually create a mobile wallet. Consumers can utilise a mobile phone to pay at the Point of Sales (PoS) or to purchase goods from cyber merchants. For the purpose this study this definition of mobile payments, includes any funds transfer transaction which occurs without the exchange of any goods or services (Dennehy & Sammon, 2015).

2.2.1 THE EVOLUTION OF MOBILE PAYMENTS

2000 - 2005

In the early 2000s, given the observed volume of mobile phones that were in the hands of the world population, a view that the phone could be effectively used as a transactional device began to gain traction. This view was especially prominently voiced within the telecommunications industry, which was looking for ways to counteract the decline of revenues in their traditional business and pursue the option where consumers are allowed to pay for products and services using their mobile phones (Van der Heijden, 2002). Recognised as a fundamental requirement to enable the execution of transactions using a mobile phone was an effective mobile payment system. The challenge at that stage was that no standardised, and widely adopted mobile payment system had yet emerged, and it was at the time believed to be one of the factors that inhibited widespread use of mobile phone for commerce, (Van der Heijden, 2002). Due to mobile payment systems broadly encompassing the retail sector, the financial services sector and the telecommunications sector, the prevailing view at the time was that the introduction of mobile payments should ideally be prepared by a consortium of market players. These players could possibly include telecommunications operators(Telco's), airtime resellers, banks, credit card companies, third party clearing houses, hard & software suppliers, solution integrators and retailers (Van der Heijden, 2002).

2006 - 2010

Around 2006, it was recognised that mobile operators needed more traffic and larger markets for mobile content services and applications, they had a huge customer base and their influence felt more prominent and louder than most other parties involved in the mobile

payments space. There was however, a view that they cannot fully handle a mobile payment system, as they had very limited experience in payment services (B Choi et al., 2006). It was felt that the financial sector has people that have a better handle of payment services and therefore can advance mobile payments faster as they have been working in the field for years and can better understand the intricacies involved in getting the system to function properly . The key players in the financial sector included banks, credit card companies and other financial institutions (B Choi et al., 2006). Device manufacturers, as producers of the mobile phones that are used by the customers, were viewed as controlling the technology and capabilities of the end-user-device which in turn affects the implementation and deployment of a mobile payment service. It was therefore considered a non-negotiable for mobile phone manufacturers to be aligned with each other and develop a common approach to mobile device payment capabilities (B Choi et al., 2006). The role of government was that it would be responsible for setting standards and regulations for the players involved in mobile payments, govern the service providers to ensure that no company becomes a monopoly, and regulate the device manufacturers and software providers to ensure the compatibility from phone to phone (B Choi et al., 2006).

It was acknowledged that for mobile payment services to succeed, all key players must work together and follow a wide range of criteria to keep the services working. Each faction could not be single-minded and exclusively think of the technical or business aspects pertinent to them. It was understood that consumers would require a solution that will be easy and convenient to use with a small learning curve (B Choi et al., 2006). Another key expectation for success was interoperability. In financial services, interoperability has always been a highly contentious topic, and its progress has been uneven and in many cases rather slow. By standardising the payment services, the interconnection of networks and systems would become more cost-effective and technically easier to operate. The industry believed that mobile payment development should be based on standards and open source technologies that will allow any system to interact with another system on a global scale at all levels (B Choi et al., 2006).

Security, trust and privacy was regarded key, as users must trust the mobile payment system to allow them access to their value-store account. This caused the need to incorporate the secure banking practices on the part of the merchant and service provider. All steps in the payment process had to be secured and trusted, not only from the technological standpoint,

but also from the social standpoint. If the payment system did not deliver secure transactions, customers would not adopt this method of payment (B Choi et al., 2006).

During the period towards and around 2010, approaches to adopting mobile payment services differed across the globe as a result of a variety of factors, which included the regulatory and legal environments, access to supporting technologies, economic constraints, and experience with antecedent products and services. Consumer need and experience represent key components of each of these variables and were the ultimate determinants of adoption (Merritt & Systems, 2011). With the most successful of mobile payments initiatives, whose focus was predominately on the unbanked in emerging markets, the mobile network operator fulfilled the role of drawing the ecosystem together, by providing the infrastructure for the payment system and overseeing the agent network. In this process, mobile operators could derive additional revenue for the incremental data transmission to their voice network operating systems, either in cooperation with a bank partner or independently (Merritt & Systems, 2011). In instances where MNOs offered mobile money to consumers through the use of agent networks without the involvement of a bank partnership, MNOs provided the clearing and settlement capability for the transactions they facilitated (Merritt & Systems, 2011).

Different mobile payments business models had emerged depending on the regulatory climate, consumer culture, and demographics that existed during this period. The first model being the Bank-led model, characterised by the financial institution controlling the customer relationship and providing mobile services primarily as a new channel to other services already in place. The second model being the MNO-led model, characterised by a reduction or total removal of the involvement of the financial institution in the payment delivery, clearing and settlement processes. MNOs became dominant in the emerging markets, within the areas of mobile money transfer market, creating the customer relationship and providing the service distribution channel. The third model being a partnership model, characterised by equal involvement of financial institutions, MNOs and third-party service providers such as the dealers who make up the ecosystem partner and collaborate to provide payment services (Merritt & Systems, 2011).

During this early evolution phase of mobile payments, mobile network operators discovered that consumers in developing countries wanted the ability to fund other phone accounts,

typically friends and family members with whom they exchange remittances. In many instances the recipient of the airtime would want to cash out the value. MNOs responded to this consumer need and as a result thereof, airtime was now being used as a store of value that had replaced cash and barter-based transfer systems in many countries that have traditionally relied upon informal value exchange systems (Merritt & Systems, 2011).

The risk of anonymity in mobile payments was mitigated by the introduction of new authentication technologies such as voice recognition and fingerprinting to verify identification and utilisation of appropriate know-your-customer programs, particularly at vulnerable points of a transaction when cash withdrawals are conducted. Employing more sophisticated control systems to flag unusual account activity, based on a customer's user profile, was required to detect highly complex money laundering schemes, (Merritt & Systems, 2011).

Mobile payments combined the regulatory environments of both telecommunications and banking into a new paradigm that ultimately demanded a collaborative engagement process to balance intervention for risk mitigation with market innovation. The regulatory landscape evolved differently country by country including the adopted mobile payments business model. Due to this factor, it became essential for telecom and financial regulators to coordinate a risk-based approach to understanding risks in mobile money transfer services and establish oversight for mobile money and payment regulation. When considering the future, policy and regulation on an international basis was critical to consider shared infrastructures that works harmoniously to address emerging risks in retail payments while recognizing the benefits of innovation and increased financial inclusion (Merritt & Systems, 2011).

2011 - 2015

By 2012, mobile payment growth was viewed as being dependent on the support of the decreasing costs of GSM communications, devices and applications. An important factor for mobile payments growth was considered to be end-user awareness and the products and services compliancy to fast and simple payments methods, (Toma, 2012). Around this period mobile payments matured from just being a money transfer mechanism, but became an enabler for the purchase of products and goods using mobile-payment methods although the catalogue was still limited to electronic content such as applications, eBooks, games, video-

on- demand, music, ringtones, wallpapers. Hard goods such as concerts tickets, books, journals, magazines, as well as access services such as transportation fare – bus, subway or train, parking meters, cinema access and other services (Toma, 2012).

Up to the period 2013, the dominant narrative had been that mobile banking, payment and commerce should be synonymous with the financial sector, a view whose case was under challenge. Significant differences could be observed between institutions, countries and regions. New players such as Google, Apple, PayPal, mobile operators and technology companies were also entering the arena. These companies were taking strong positions and had the capability and knowledge to move much faster on the opportunities of mobility than traditional banks. With the capability of these new entrants into the market, banks no longer had the exclusivity of being service providers in the payments area, and banks' traditional customer relationships were being challenged through the emergence of social networks, applications and rich media providing new platforms for direct end-user engagement (Flatraaker, 2013)

Changes in technology and customer expectation were mutually accelerating each other, speeding up technology development, customer demands and adoption. They were also facilitating the emergence of new business models and brought more power into the 'hands' of the customer (Flatraaker, 2013). Mobile operators (MNOs) were faced with the challenge of high rates of customer churn and potential future fall in revenues from the traditional connectivity business such as voice calls, SMS and data traffic. A move towards the payments arena to acquire new revenues and reduce churn was observed. With their core infrastructure and business that is built around the UICC SIM, they were now trying to build new businesses using this technology, near field communication contactless payments at the point of sale being one example (Flatraaker, 2013).

By 2014, the notion that Smart Phones could become valuable and critical business tools for the delivery of M-Commerce products and services had been touted by academics, professionals and the media. Smart Phones had the capacity to enable the delivery of a wide range of transactional M-Commerce products and services, including highly individualised and location-based Smart Mobile Media Services (SMMS) (Duane et al., 2014). A broad range of industry experts predicted that the extent of SMMS available through Smart Phones and other Smart Mobile Media Devices will increase significantly over the coming years, as

increasing numbers of commercial entities invest in M-Commerce platforms and applications, to satisfy growing consumer demands for fully fledged multichannel retailing. When the future of M-Commerce is contextually envisaged there was a realisation that it would be important to establish a standardised, interconnected and widely accepted mobile payment (m-Payment) system (Duane et al., 2014).

Around 2015, mobile money ecosystems were rapidly evolving in markets across the globe, with at least 259 deployments in 89 countries. The evolution of the mobile device as a predominant infrastructure in developing markets presented an opportunity for established players to connect to a section of the populace that had until this point been excluded from the traditional financial services model. The problem of being 'unbanked' is not just a function of poverty, but also of the cost, travel distance and paperwork involved in opening an account (Lai, 2015). The increased speed of financial transactions could create real savings for those living in emerging markets. These people would be able to save critical time for working by not having to travel to urban centres to withdraw, deposit money or pay bills, in certain instances travel time to the institution and back takes several hours. Service time at the bank or post office also takes a while with waiting times of up to two hours and the entire trip potentially taking away over half a day's salary (Lai, 2015).

A mobile wallet which allows for the safe storage of money, provided a compelling alternative to storing money under the mattress or in goods such as livestock, which are risky and insecure. Using mobile money, people would have no need to carry cash around or hand it over to informal providers of financial services. Mobile money could also be used to buy goods and services either formally (person-to- business) or informally (person-to-person) without the risk of handling cash (Lai, 2015).

Regulatory restrictions remained a key factor driving the structure of partnerships in various markets. In some markets, non-bank players would have more motivation and competitive advantage than banks, but bank-based regulation denied these companies an opportunity to lead an implementation. In other markets, banks with a mass retail ambition may have had strong motivation to lead implementation, but the absence of appropriate agent banking regulations placed them at a disadvantage. To support financial inclusion, the levelling of playing fields for different types of institutions in terms of key factors such as issuing e-money, identifying and using agents and accessing communication channels was critical (Lai,

2015). The ubiquity of the mobile phone provided a compelling business case and it had been an influential factor in the adoption of mobile payment systems, particularly when the majority of the population is unbanked, both in the developed and developing countries (Dennehy & Sammon, 2015).

When it came to mobile payments, the chicken-or-egg analogy is frequently referenced to best describe the challenge facing merchant and consumer adoption issues. On one hand, merchants are unwilling to invest in the systems needed to enable a mobile payment transaction unless there is consumer demand. On the other hand, consumers choose not use mobile payment systems unless merchants accept them (Dennehy & Sammon, 2015).

Although mobile payments had become topical in recent years, the levels of success in attracting critical levels required for mass adoption by consumers and merchants has been uneven. In order to reach critical mass, a number of key requirements that influence adoption, simplicity and usability, universality, interoperability, security, privacy and trust, cost, and speed need to be met. Failure to address these requirements might explain why mobile payments have not lived up to the hype as promised by its proponents in some markets (Dennehy & Sammon, 2015). The delivering of a mobile payment system is a classic example of an ecosystem as there are several stakeholders from multiple industries: consumers, merchants, MNOs, financial institutions, mobile device manufacturers, software and technology providers and regulators. During this period different types of business models through which mobile payments could be delivered were identified that is, bank-centric model, telecom-centric model, collaborative model or independent service provider model (Dennehy & Sammon, 2015).

2016-Current

By this period, the focus began to shift towards questioning what is limiting the mass adoption of mobile payments such that they reach a critical scale in most markets where mobile payments have been deployed. In this instance low adoption trends across various countries were looked at from both consumer and merchant side.

The worldwide mobile payment volume in 2015 was estimated at US$450 billion with an expectation that it could surpass US$1 trillion by the early 2020s (Madan & Yadav, 2016). Despite the inherent benefits of mobile wallet and payment technology, the number of actual users of this service had remained low, when compared to other recent forms of cashless, non-contact payment modes such as credit cards and online payment systems. For example, only

17.1% of mobile internet users had ever used mobile payment in China, and in the US, this figure was at about 12%. A similar trend of low adoption rates for mobile payment systems had been observed in many European countries such as UK and France (Gao & Waechter, 2017). In India a country with 145 million unbanked families, mobile payments were estimated to grow from US$86 million in 2011 to US$1.15 billion in 2016. A compound annual growth rate of 68% although at first sight looks progressive, is quite minimalistic for a country with financial inclusion challenges such as India (Madan & Yadav, 2016).

Although there is acknowledgement that Kenya witnessed a transformation through M-Pesa's mobile payments serving 80 percent of the unbanked people in 2007, and in India although it took a currency note crisis that was triggered by the demonetization in 2016 for mobile payments to reach the cash-centric masses (Pal & Ansari, 2022). The unorganized sectors, including the local vendors, who for longest of times were dependent on cash for daily transactions switched to mobile payments as a safety net to continue business during the banknote crisis (Pal & Ansari, 2022). Especially in the case of India government policies also served as a critical catalyst for greater financial inclusion and digitisation. The four years between 2016 of the first push by demonetization upto 2020, witnessed the greatest digital finance transformation which can be recognized as the payment revolution. The unified payments interface (UPI) enabled individuals to directly transfer funds across banks through mobile phones and it was during this period that monumental growth of UPI could be witnessed with a sizeable growths in volumes and amounts of transactions, that could at times be reaching numbers as high as 20,000 percent (Pal & Ansari, 2022). Such numbers showed significant participation of the citizens in the modern payment system. However, there remains some doubt about the benefits of mobile payments reaching the truly marginalized population of the unbanked and illiterate population (Pal et al., 2020). A majority of the poorest citizens still did not own a smartphone or did not have adequate digital literacy to transact digitally (Pal & Ansari, 2022). A fundamental problem possibly lied in the attitudes and intentions of the customers at the bottom of the pyramid whose adoption of mobile wallets would be capable of providing the required level of scale and profitability to this relatively new technology (Pal & Ansari, 2022).

Whilst mobile payments were reaching dominant levels as a payment method in parts of East and Southern African as well as parts of Asia, they still were in their infancy in Europe despite a high mobile phone penetration rate and service providers' considerable investments in the technology. A phenomenon best articulated by classifying mobile payment as an

example of the puzzle of abundance, a situation whereby the potential of a new disruptive technology is not tapped by the masses even though it potentially offers substantial benefits to them (Rittiboonchai & Chienwattanasook). Various research studies including this one attempt to address this puzzle by investigating factors that influence the intention to use such disruptive technologies. Mobile payment has been drawn upon as an example of and an appropriate use-case to develop and test a refined technology acceptance model. Results from some of the current studies indicate that the intention to use mobile payment services is positively affected by perceived usefulness, perceived compatibility, perceived personal innovativeness, and perceived social influence, but is negatively affected by perceived risk. Both perceived costs and perceived risk mitigate the positive impact of several other characteristics. Early research findings of the studies conducted in Europe provide points of leverage to better tap the potential of mobile in similar contexts (Madan & Yadav, 2016).

The strategic position of a merchant in the economic marketplace should be taken into account when one tries to understand their mobile payment adoption process. Within a mobile payment ecosystem, merchants are supposed to acquire knowledge about their partners, including their resources, needs, capabilities, strategies and other relationships, by exchanging information within the network. In this process, critical internal and external resources are necessary for an organization to position itself in the market place as well as within the business ecosystem (Guo & Bouwman, 2016). If a merchant adopts a strategy of operation excellence in the case of mobile payment, the perceived costs associated with mobile payment are very high based on their own resource configurations e.g. infrastructure, human resources and financial resources. In this case, the merchants in question might be lustful to adopt mobile payment because the aim is to minimize costs. If a merchant adopts a strategy of customer intimacy, the merchant would adopt mobile payment with their aim being to service their customers and in turn to realize long-term customer loyalty. When a strategy of product leadership is adopted, innovative merchants are more likely to adopt mobile payment with the main focus being to keep up-to-date with products or services (Guo & Bouwman, 2016). Based on the afore mentioned merchant adoption approaches noted, the following observed trends emerge:

i. Observed trend 1: The internal and external resource configurations of merchants determine their willingness to implement an m-payment platform.
ii. Observed 2a: The internal and external resource configurations of merchants determine their strategic position.

iii. Observed 2b: Merchants with a strategy of customer intimacy or of product leadership are more likely to adopt mobile payment.

Merchants were regarded as critical in adopting mobile payments thus facilitating new business models, that promote the disintermediation of traditional intermediaries, so as to offer different possibilities for growing their businesses, and to reduce transaction costs (Afeti & Amanfo, 2021). This could be achieved at the backdrop of merchants believing that mobile payments adoption and the use thereof has the capacity to improve operational efficiency to their businesses, there however could be instances of fraud, particularly in the peer-to-peer transfer sector, data breaches, data security, and privacy concerns. It is thus imperative for service providers of mobile payments to place significant focus on measures to enhance technological issues regarding privacy protection and risk mitigation that can enhance trust thus improve mobile payment adoption (Afeti & Amanfo, 2021).

2.2.2 MOBILE PAYMENT DEPLOYMENTS IN SOME DEVELOPING COUNTRIES

Kenyan Case

M-PESA is a small-value electronic payment and store of value system that is accessible from ordinary mobile phones. Which has experienced phenomenal growth since introduction by mobile phone operator Safaricom in Kenya in March 2007. It already had 14 million customers (*about 68 percent of Kenya's adult population*) and processed more transactions domestically than Western Union does globally (Mas & Radcliffe, 2010) by 2016. Introduction of M-PESA had enabled change and deflated the costs of money transfer service in Kenya, although other factors such as technological change could also be to some extent have influenced the price drop besides M-PESA (IDRISS et al.).

M-PESA's market success could be interpreted as the interplay of three sets of factors, (Mas & Radcliffe, 2010):

(i) pre-existing country conditions that made Kenya a conducive environment for a successful mobile money deployment;

(ii) a clever service design that facilitated rapid adoption and early capturing of network effects; and

(iii) a business execution strategy that helped M-PESA rapidly reach a critical mass of customers, thereby avoiding the adverse chicken-and-egg (two-sided market) problems that afflict new payment systems.

Safaricom exploited the fact that most Kenyans now have mobile phones. Users buy a sim-card with the M-PESA application for their phone. Once signed up they have an electronic account and they may deposit money into it, withdraw money from it or send money from their account to that of another M-PESA account holder. To deposit and withdraw, they use cash merchants signed up with M-PESA. Some 23,000 such merchants operated out of small huts, shacks or rooms all across the country (Klein & Mayer, 2011).

The cash merchants are called M-PESA "agents". The word agent together with the acts of depositing or withdrawing money suggests that merchants perform services on behalf of the account provider, M-PESA, and like a bank branch performs some services offered by banks. In fact, the merchants do not dispose of M-PESA's cash or other assets like a bank branch employee does for a bank. They transact with their own money – either in the form of book entry money(BEM) or cash. It is a service equivalent to the exchange of coins for bills that is allowed to happen without bank regulation anywhere in the world (Klein & Mayer, 2011).

The merchants invest in their own business by acquiring an M-PESA account and deposit money of their own into it. Once the merchant holds electronic BEM at M-PESA, they can sell BEM to another person for cash. At the same time the merchant needs to hold cash to be able to buy BEM from another person by selling cash. When customers visit the cash merchant to deposit money into their account they give cash and receive M-PESA's BEM via mobile phones. When they withdraw cash they transfer BEM via phones to the cash merchant's M-PESA account and receive cash in return (Klein & Mayer, 2011).

The M-PESA system as a whole has an overall holding of the net deposits from customers. It could just keep this net cash received in a safe but it is required by the Central Bank of Kenya to invest the net balances in regulated banks for safe-keeping. Presently the Central Bank does not allow interest on these deposits to be paid to M-PESA depositors; instead, interest income is covenanted to charity. The M-PESA system is thus compensated for net balances as if they were kept in a safe-deposit box (Klein & Mayer, 2011).

The M-PESA example has demonstrated the power of unbundling traditional banking services in order to reach poor people. The fundamental choice for policymakers and regulators is whether to allow such unbundling and later determine what regulatory intervention is appropriate or if any is necessary. By allowing M-PESA to experiment, Kenyan regulatory authorities have provided a great deal of insight into new possibilities and consequences for regulation. What has been demonstrated is the way in which payments systems can be disaggregated into component services, namely exchange, storage, transfer and investment. Regulation should reflect this and be structured by service rather than along traditional

institutional lines, like a bank. The question then is what type of regulation is appropriate for each type of service (Klein & Mayer, 2011)?

Nigerian Case

The context for Nigeria is that, the implementation of financial inclusion strategy was an emerging concern in the horizon of banks' regulation and supervision (Umoh, 2016). A number of policies that were targeted and financial inclusion had upto that point not had the desired impact on the Nigerian economy due to lack of access to finance, with the end-result being that Nigeria remains lowly ranked when compared to its peers like South Africa and Kenya in financial inclusion (Aro-Gordon, 2017).

Amongst the attempts aimed at resolving the high rate of financial exclusion in Nigeria, a National Financial Inclusion Strategy (NFIS) was designed with its intent being to reduce the number of adults in the population who were excluded from the formal financial market, from 52.5 percent in 2008 to 20 percent by the early 2020s. In order to achieve this objective, a number of strategic measures were embarked upon to enhance financial inclusion. These measures included, Know-Your-Customer (KYC), agent banking framework, national financial literacy programme, cashless policy, and mobile payment system, and establishing linkages between commercial banks, governments, and microfinance banks for funding micro, small and medium enterprises (MSMEs), as well as diverse credit enhancement schemes and programmes, (Aro-Gordon, 2017).

Around 2021, Nigerian Communication Commission (NCC) estimated that 198.6 million Nigerians subscribed to mobile services, accounting for 96% of the population where else smartphone adoption continues to also rise rapidly and it was expected to reach 75% of total connections by 2025 (Nnene, 2022).

In the 1990s, the Central Bank of Nigeria (CBN) undertook banking sector reforms to consolidate the sector increasing the minimum capital base of any bank to NGN 25 billion. This led to a significant reduction in the number of banks from 89 to 24 in 2005. By 2011, Nigeria had 20 MNOs with 93 million mobile subscribers, up from 266,000 in 2001. In 2012, rural areas mobile phone coverage stood at 40% with an expectation that the number would rise to 60% by 2015 and 100% by 2017. Mobile penetration increased to 71.5% in 2012 and

was expected to rise to 97.7% by the 2020s, (Ondiege, 2015). The Nigeria Communications Commission (NCC)which regulates MNOs, had the responsibility to ensure that MNOs and subscribers were free to use any mobile payments system of their choice, they were not receive deposit from the public except in the respect of prepaid air time billing of their subscribers, and were not allowed the use of the prepaid airtime for retail purchases (Nnene, 2022). This seemed to have led to limited impact on financial inclusion when compared to the case of Kenya where regulators had allowed MNOs to handle financial transactions, (Ondiege, 2015). The CBN annual economic report, 2014 suggested that the Kenyan payments system which was characterised as being, simple and a cheap way to transfer money should be replicated as the model for enhancing financial inclusion in Africa, especially considering that majority of Africans live in villages and rural areas (Aro-Gordon, 2017).

Ghana Case

Mobile money was first launched in Ghana in the year 2008. The population of Ghana was over 25 million and over 80% of the population was unbanked whilst mobile phone usage as at 2013 was over 100% (Tagoe & Affairs, 2016). Although mobile phone penetration was estimated at more than 25 million in 2012, mobile money subscribers were estimated to be a lowly 4.1million. Apart from the fact that mobile payments uptake and usage remained low, active users remained even lower at less than 10 per cent of the mobile payment subscriber base (Osei-Assibey, 2015).

The Bank of Ghana (BOG) Summary of Economic and Financial Data Report showed growth across all the key indices between in the fiscal year 2020/21. Registered Mobile Money (MoMo) accounts increased by 25% from 32.7 million to 40.9 million, active MoMo accounts increased from 14.7 million to 17.5 million, the total number of transactions from 193 million to 295 million, the total value of transactions from GHS30.1 billion to GHS67.9 billion, MoMo interoperability complete transactions from GHS126.6 million to GHS990.7 million, and MoMo total number of transactions from 1.6 million to 6.2 million (Bank of Ghana, 2021). These growth highlighted a high interest in mobile commerce and mobile payments by merchants and consumers (Akanferi et al., 2022).

According to the Bank of Ghana's(BoG) 2014 strategic payments system roadmap for Ghana, two of the key objectives of the payment system in Ghana were (Tagoe & Affairs, 2016):

i. to discourage the use of cash for transactions whilst encouraging the use of paper-based instruments for payments as part of the short-term development plan; and
ii. to develop an integrated electronic payment infrastructure that will enhance interoperability of payment and securities infrastructures.

Although, there was the Payment System Policy and Oversight division at BoG, which in part oversaw the activities of mobile money operations(MMO). The BoG recognised the Telco's as participants in payment system but only in the capacity as providing the telecommunication infrastructural arrangement for the payment system. Thus the central bank and commercial banks played more active roles because the BoG recognised them as financial intermediaries while the Telco's were recognised as playing a more passive role. No concrete legislative framework for MMO existed as, the BoG saw the MMO as part of other electronic payments platform such as Ghana Interbank Payment and Settlement Systems Limited (GhIPPS) (Tagoe & Affairs, 2016). Although initially assumed that Ghana's regulatory framework would have a limiting effect for MNOs' effectiveness being a bank-led model, a spike experienced in mobile payments adoption around the time of writing this report had been very much led by MNOs. The mobile money service in Ghana, driven mainly by MNOs has proven to be a great transformer in its financial services industry. It is anticipated that mobile money will serve as a tool to drive financial inclusion across the country and a vital delivery mechanism for the adoption of mobile commerce and mobile payments in Ghana to increase consumer banking (Akanferi et al., 2022).

Fiji Case

Mobile phones' advanced functionality and technological capacity enabled the creation of an alternative platform for financial transactions, and this had enabled Telco's to offer some services ordinarily provided by commercial banks, (Finau, Rika, Samuwai, McGoon, et al., 2016). Fiji, is the second-largest economy in the South Pacific and one of the first Pacific Island countries to introduce mobile money. In Fiji unlike countries such as Kenya, Ghana or Haiti it already had a relatively well-developed banking infrastructure, with six commercial banks of which were multinationals. The central bank of Fiji, had used national financial inclusion strategies to advocate for mobile money in general as well as the deployment of mobile payment initiatives for unbanked rural dwellers. In this process it had worked closely with commercial banks, MNOs, and other development partners such as the Pacific Financial Inclusion Programme, (Finau, Rika, Samuwai, McGoon, et al., 2016).

Mobile payments were primarily facilitated by three MNOs (Vodaphone, Digicel, and Inkk), which collectively had an estimated reach 90% of Fiji's population. Banks leveraged MNOs' reach to enhance their own banking services to rural areas.

Vodafone launched Fiji's first mobile payments service, known as M-Paisa, based on the Kenyan M-PESA. M-Paisa was initially conceived as facilitating loan disbursements and repayments from micro-finance institutions such as South Pacific Business Development, but later evolved to include utility bill payments. M-Paisa enabled rural dwellers to receive loans welfare allowances, salary payments and also facilitated foreign remittances in collaboration with World Remit, (Finau, Rika, Samuwai, McGoon, et al., 2016). In 2011, Digicel introduced its own mobile money product, called Digi Money and like M-Paisa, it offered a wide range of services, including overseas money transfers through KlickExas well as domestic and international bill payments, (Finau, Rika, Samuwai, McGoon, et al., 2016)..

Vodafone Fiji, had 95% market share which was approximately 880,000 customers, with smart phones estimated at about 500,000 and about 480,000 social media users. MPAISA was launched in 2010 processing about 350,000 transactions per month processing 10 million FJD per month (Goundar, Mohammed, Devi, & Lal, 2021). The strongest deterrent to using mobile payments were the perception that it was costly and this view was supported by the findings of locally conducted research, where it was discovered that agents refused to disburse the full amount of funds received through mobile money. Users of mobile payments indicated that agents forced them to spend a portion of the funds they received in-store, although they wanted to use the money for other items outside of the channel (Goundar et al., 2021)

Due to conflicts with agents, customers preferred to withdraw the full amount of funds received via mobile payments rather than saving some of it in their mobile wallets, although they are actually cheaper than a conventional bank account. Agents insisted on users spending money in store as they used their personal cash to pay users and sometimes merchants would not have enough cash on hand for customer withdrawals. Float management and lack of liquidity were the two biggest challenges agents encountered. In Fiji unlike in Kenya implicit costs of mobile payments incurred by recipients, as opposed to senders in Kenya served as a major deterrent to adoption. Users also perceived mobile wallets as unsafe due to a limited understanding of the dual layer of protection available to them, as a result thereof they were reluctant to use their mobile wallets as a savings mechanism. Thirdly financial literacy could assist consumers to more accurately evaluate the value of mobile payments versus other

means. Lastly demographic factors such as age also played a part in influencing consumers' perceptions regarding benefits and thus adoption (Finau, Rika, Samuwai, McGoon, et al., 2016).

Although regulation did seem to be the contributing factor to low adoption and effective use of mobile money in Fiji, financial literacy on the consumer side and the liquidity challenges on the merchant side seemed to be even the major influencers of user take-up and usage a situation that seemed to still persist at the time of conducting this research.

India Case

India had a very limited network of 69,160 bank branches and 60,153 ATMs around 2011, however the at the time m-banking guidelines of the Reserve Bank of India(RBI) were very much based on a 'bank-driven' model and allowed mobile banking/payment only for existing customers of banks. Mobile payments were merely seen as another channel for accessing bank accounts and appeared far away from their full potential for contribution to financial inclusion (Ketkar et al., 2012). The view on the success of the deployment of mobile banking varied based on who takes the lead, how supportive the financial regulation of the country considered was to be to mobile banking and whether mobiles were deployed for additive banking or transformational banking. Collaboration between mobile operators and banks was an imperative for the successful growth and vibrant mobile banking and convergence of payments and mobile communications was not just logical factor of evolution, but an inevitable development (Ketkar et al., 2012).

Until the historic banknote crisis of around 2017/18 resulting from demonetization, India had been amongst the low adopters of mobile money, when a rapid prominence of mobile payments from near absence was experienced. For mobile payments to be able to significantly contribute to financial inclusion, usage needs within the economy needed to be sustained even beyond the transient forces of the initial demonetization push (Pal & Ansari, 2022). Government-led initiatives such as Digital India and extreme focus on financial inclusion, along with fast penetration of smartphones, directionally pointed to exponential growth in the use of digital payments. Newer features in the digital payments domain such as unbounded fund transfers between wallets and bank accounts, mobile wallets would emerge to be an even integral part in India's financial ecosystem. India's mobile wallet industry was estimated to grow at a CAGR of 148 per cent and was expected to reach US$4.4 billion by 2022 (Pal & Ansari, 2022; Sarwal). With the advent of the global players venturing into

digital payments, especially in the m-pay domain, as well as the already existing array of home grown m-wallets/aggregator apps, India was seeing a constant war between all the options available in the market (Pal, 2022)

Unified Payments Interface (UPI), classified as instant real-time payment mechanism launched and developed by National Payments Corporation of India (NPCI), a regulated entity facilitating inter-bank transactions. It facilitated instant transfer of funds between two bank accounts on a mobile platform, and also enabled the customer to keep their bank account anonymous while transferring money. This option was available for integration over both desktop & mobile platforms. In the m-commerce space, NPCI launched this capability in December 2016, totally disrupting the then existing market of mobile wallets, and other payment aggregator apps (Pal, 2022).

The trajectory at the time of this research was undertaken pointed to the payments landscape in India that was undergoing a major digital transformation with the emergence of instantaneous, cashless, paperless, financial transactions, with digital payments expected to reach US$1 trillion by 2023 from the value of less than US$200 billion in 2017-18 (Pal, 2022).

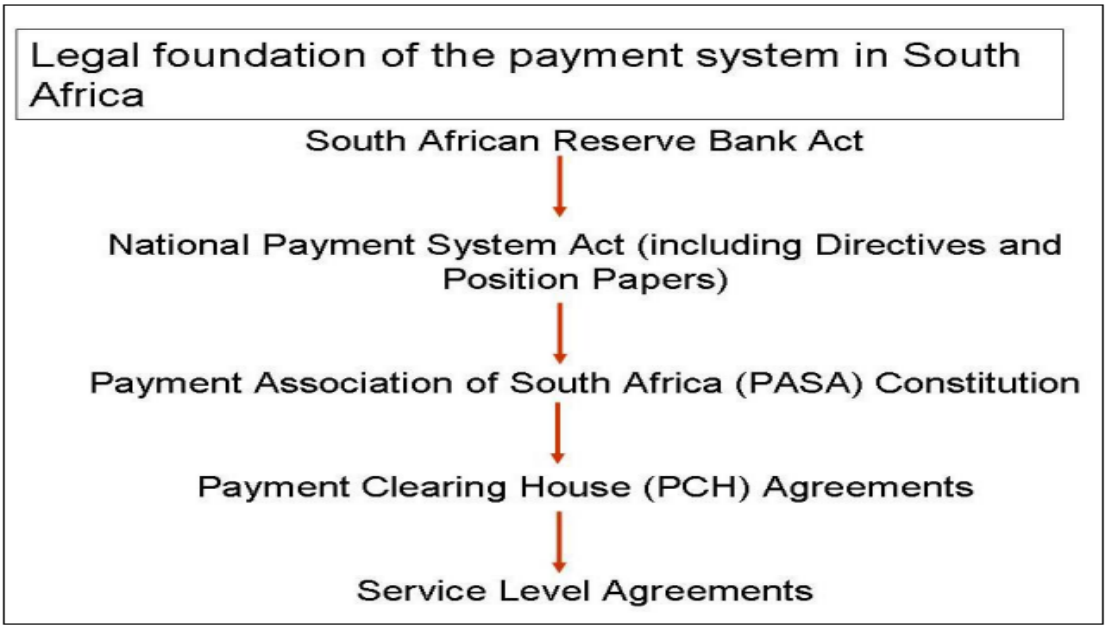
2.2.3 MOBILE PAYMENT DEPLOYMENTS IN SOUTH AFRICA

At the time of this research was conducted SA was classified a middle-income country with a developed infrastructure in terms of roads, rail-network, harbours, electricity grid and telecoms network. It however remained a country with great contradictions where on one hand it was highly developed but also had pockets of great poverty and underdevelopment (Borg & Persson, 2010).

In terms of SARB's 2009 Position Paper, in the case of person-to-person payments, when money is sent by the payer to a beneficiary in the form of electronic value and such money is not due to the beneficiary as a result of an established obligation, participants involved in this type of transaction potentially contravene section 7 of the NPS Act unless undertaken within an infrastructure provided by banks as the transaction is be classified as deposit-taking. In terms of the Banks Act, the taking of deposits from the general public by an unregistered person (non-bank) is a criminal offence. Another distinct and key pronouncement within the 2009 Position Paper is that only South African registered banks may issue electronic money (Lawack-Davids & Tech., 2012).

From this perspective, for non-banks wanting to enter the e-money space, the prevailing interpretation was that the 2009 Position Paper limits their access to the payment system, as non-banks have to enter into a sponsoring arrangement with a bank, which comes with cost implications. Furthermore, the 2009 Position Paper was mute when one considers the opportunity presented by the high growth and penetration rates of mobile telephony that were transforming cell phones into banks in other parts of Africa (Lawack-Davids & Tech., 2012). The legal payments framework for SA is therefore captured in fig 2.2.3.

Fig 2.2.3 SA legal payments framework



Proximity mobile payments were an area of interest in the context of South Africa for several reasons. There was a plethora of mobile payment applications available in the country, with the most popular being SnapScan. A Mastercard survey in 2017 revealed that 31% of respondents used mobile payments, and 70% of them used apps such as SnapScan, Zapper, FlickPay, and Gust Pay. This review attempted to build a context on proximity mobile payments that were applicable to the commonly used apps in South Africa, based on a few studies had investigated why the adoption levels had remained low. Some of the reasons advanced in terms of the transition from cash to digital payments were that they could be divided into push and pull factors. Classified in the following manner negative factors can push people away from using a technology while positive factors can pull people to a technology. Thus, the push-pull framework in terms of the reviewed research had a potential to serve to build an understanding of the switching behaviour, which in the context on the referenced study was switching from using cash to digital payments. There factors that were

considered as contributing to push factors within the South African context (Eksteen & Humbani, 2021), included an increase in cases where people are robbed, and about 1.1 million of such cases were recorded in 2019/20 South African Police Service (SAPS) report. Based on these statistical facts, logically one would naturally believe that there would have been a faster transition to digital payments, yet the reality was somewhat disappointing, as only about 6.4 million out of a total of 20 million smartphone users were expected to be users of proximity mobile payments by at least the end of 2023. On the basis that mobile penetration rate exceeded 90% South Africans had immense potential to be major users of proximity mobile payments (Eksteen & Humbani, 2021).

With mobile phones at the time anticipated to become a common tool for initiating, authorising and completing transactions, the on the ground experience had been that many mobile payment service efforts had failed, for instance M-Pesa, that was developed by Vodacom in 2010, was discontinued after 6 years non-impressive uptake despite what was potentially seen as inviting conditions in the South African context (Humbani, 2021), although a re-launch had been undertaken numbers regarding real take-up were yet to be published, at the time of conducting this research.

SA mobile payment deployments have been less impactful in driving financial inclusion when compared to peer countries. Experiments began comparatively early and pioneering models such as Wizzit and MTN Mobile Money which emanate from SA, but the role that non-banks can play in issuing e-money is circumscribed by the current guidance note on e-money which has frustrated some potential innovators. To further enhance its environment, SA would have to amend its position, for an example by creating a category of regulation for non-bank as e-money issuers, or licensing banks to operate a limited mandate banks which allows operators to facilitate payments and also prescribes instruments on where float is to be invested, (Humbani, 2021).

The two biggest MNOs Vodacom and MTN have made several attempts to deploy mobile money solutions to the market, however they had at the time the research was conducted been unsuccessful in achieving the desired adoption as well as usage rates. Their deployments were also close-loop systems which were fundamentally dependent on a sponsoring bank to in order to access the national payment rails. Although each deployment tried to cultivate its own network of dealers/merchants as well actively advertise and promote their offering to the market, the lack of interoperability consistently became one of the constraints for adoption and take-up.

2.2.4 THEORY 1 - ARTICLE 3 OF THE UNIFORM COMMERCIAL CODE (UCC) PAYMENTS THEORY

Although not a theory but a legal framework, Article 3 of the Uniform Commercial Code (UCC) provides an appropriate framework for analysing payment systems from a legal and regulatory perspective—the codified law of negotiable instruments is a linguistic maze which expresses payment precepts in very confusing and intertwined phrases, (Khan, 2008). Simply put however, payment systems is viewed as a legally regulated industry in which financial institutions provide professional services to transfer monies from account holders to payees. Due to payment systems having preceded the emergence of financial institutions, payment systems were seldom viewed as payment service (Khan,2008).

Principles of payment systems determine liability. They are derived from statutes, not contracts. They are mandatory, not optional. They allocate loss to various parties involved in payment services. They address questions of fairness and efficiency. They guide legal professionals in resolving payment disputes. They chart a normative path for future payment systems. Despite differing historical origins of payment devices and despite the progression of payment services from tangible to intangible medium, the legal principles of authorisation, negligence, and dishonour constitute a common core of payment systems. According to the principle, no payment must be made unless it is authorised. No account holder should be held liable for unauthorised payments, the loss of unauthorised payments, should fall on financial institutions (Khan, 2008). Article 3 suggests the following key principles:

i. In Part II, the authorisation principle forges a legal relation between authorisation and liability, carrying a powerful idea that authorised payments may be lawfully charged against the account holder who authorises them. This principle is critical to understanding the payment services that financial institutions provide to consumers and businesses. According to the principle, no payment must be made unless it is authorised. And no account holder should be held liable for unauthorised payments. The loss from unauthorised payments, therefore, must fall on financial institutions (Khan, 2008).

ii. Part III, argues that the negligence principle encompasses a simple truth that persons involved in payment services sometimes breach the duty of care attendant to the authorisation principle. In such cases, the authorisation principle is subordinated to the negligence principle. For an example, suppose an account holder writes a cheque

in a negligent manner such that the amount on the cheque altered, say from R10 to R100. Strict application of the authorisation principle imposes on the account holder a liability of no more than $10, however under the negligence principle, the account holder is liable for the altered amount of R100 because the alteration is as a result of the account holder's negligence. Likewise, if a bank fails to detect a visible alteration on a cheque due to its negligence and pays the altered amount, the loss falls on the negligent bank and not on the account holder (Khan, 2008).

iii. Part IV, examines the dishonour principle, which is also a principle of liability. The dishonour principle applies to cases where financial institutions dishonour payments. This principle consists of two distinct parts: rightful dishonour and wrongful dishonour. A financial institution has a right to dishonour forged or altered cheques. On the opposite end, wrongful dishonour occurs when a financial institution dishonours an authorised payment through negligence, mistake, or malice thus placing a dual duty on financial institutions (Khan, 2008).

iv. Part V, which is intended to guide present and future payment systems develops a principled framework and a common vocabulary for harmonising various payment services. The principled framework, a succinct recapitulation of the three principles, proposes what the parameters of the law of payment systems are. The common vocabulary binds diverse payment systems together, erasing conceptual confusion and terminological variations that occupy the current payment laws. The principled framework and the common vocabulary reinforce each other while forging a stable analytical structure that legal professionals may consider in designing the future course of payment systems (Khan, 2008).

The key proponents of Article 3 of UCC, are very relevant for this research project as they best articulate responsibilities and obligations of various parties in the execution of a payment transaction. The obvious limitation of this theory which this research project aims to challenge is the articulation of the store-of-value provider as a financial institution which in the case of mobile payments may also be an MNO as well. Restricting one's view to this narrative where structure of payments pivots around the financial institution can be a contributor to existence of a strong bias towards bank-led mobile payments regulation in a significant number of markets (Khan,2008).

2.2.5 THEORY 2 - TECHNOLOGY ACCEPTANCE MODEL

Several theoretical frameworks for technology acceptance and behavioural change were considered, and based on established socio-economic base factors which do not necessarily form part of the study, that can potentially have an impact on the psychology of a society at the time of considering the adoption of technology innovation namely regulation, prevalence of mobile telephony, access to data and electricity, and an existing need for an instrument alternative to cash in conducting commerce and other social payments. Based on this context and the inherent construct within the various frameworks considered, a high-level evaluation and assessment of each framework for suitability to provide guidance in terms of its appropriateness to assist in developing a suitable tool to determine constraints in mobile payments adoption within the context of either an enabling or restricting regulatory environment was conducted.

The Theory of Reasonable Action (TRA) is one of the contemporary and very popular theories used in assessing the people's behavioural propensity to adopt innovation, and in terms of this framework the key determining factor of the behavioural change intention is one's attitudes towards making a change. In simple terms the individual's attitude towards innovation, influences their intention to make a behavioural change 'and ultimately adopt a new behaviour. This framework has been used extensively to study individual's behavioural adjustment in the field of medicine to determine what drives individuals to make or alter their behaviour in support of medical interventions or advancements (Montano, 2015) For the purpose of this research the TRA is somewhat limited in that it places greater focus on attitude as the core determinant of behavioural change where both regulation and psychological impact of innovation are considered less critical factors.

Theory of Planned Behaviour (TPB) was introduced by **Taylor and Todd** and according to the TPB there are only three main factors influencing behaviour intention and actual behaviour adoption which are attitude, subjective norms and perceived behaviour control (Conner, 2020). For the same deficiencies that were considerations when evaluating TRA as the theoretical lenses on which to base this research, TPB also fell short as it places emphasis on attitude and subjective norms as key drivers of behavioural change but fails to adequately deal with what could be termed hygiene factors such as regulations and other social factors.

Unified Theory of Acceptance and Use of Technology (UTAUT), suggests that four core constructs (performance expectancy, effort expectancy, social influence and facilitating conditions) are direct determinants of behavioural intention and ultimately behaviour, and that these constructs are in turn moderated by gender, age, experience, and voluntariness of use in terms of Venkatesh's perspective (Abbad, 2021). Although UTAUT almost comes close to

being a suitable framework for this study, it however somewhat falls short on being appropriate for evaluating a payment instruments as it does not adequately deal with issues such as risk although it seemed to adequately to address performance and effort related factors as considered factors.

In terms of assessing what influences the consumer or merchant to adopt mobile payments as a solution for their payment needs the Technology Acceptance Model (TAM) was considered the most appropriate theoretical framework as it provided a structure that deals with the following factors perceived usefulness, perceived ease of use, trialability, perceived risk and perceived trust which would be determinants of behavioural change. TAM was established on the premise that the contracts, perceived usefulness and perceived ease of use are fundamental determinants of system adoption (Tobbin et al., 2011) as such was adequately broad to deal with issues relevant to the studies.

The context for evaluating acceptance and adoption by consumers of mobile-money or mobile-payments was referenced to the acceptance process for business-to-consumer (B2C) electronic commerce. The outlook for B2C electronic commerce depended not only on consumer acceptance of Internet technologies as viable transaction means, but on consumer recognition of Web retailers as reliable merchants. Due to this development, a comprehensive model that describes factors that drive consumers to accept e-commerce and on-line transactions was a useful reference for mobile payments, in that it helped create a meaningful departure point for understanding consumer behaviour in the adoption of digital innovations, (Tobbin et al., 2011). In the context of mobile payments as in the e-commerce space there firstly is a risk of monetary loss, since consumers have to rely on electronic confirmation of the executed transaction and thus become vulnerable to depending on information provided by third parties. Secondly, the risk of loss of privacy associated with providing personal information during the execution of the transaction existed. As a result thereof there exists an important delegation of authority that consumers surrender during the transacting process, . When users decide to adopt technology innovation it is assumed that the following key outcomes are fulfilled in their minds:

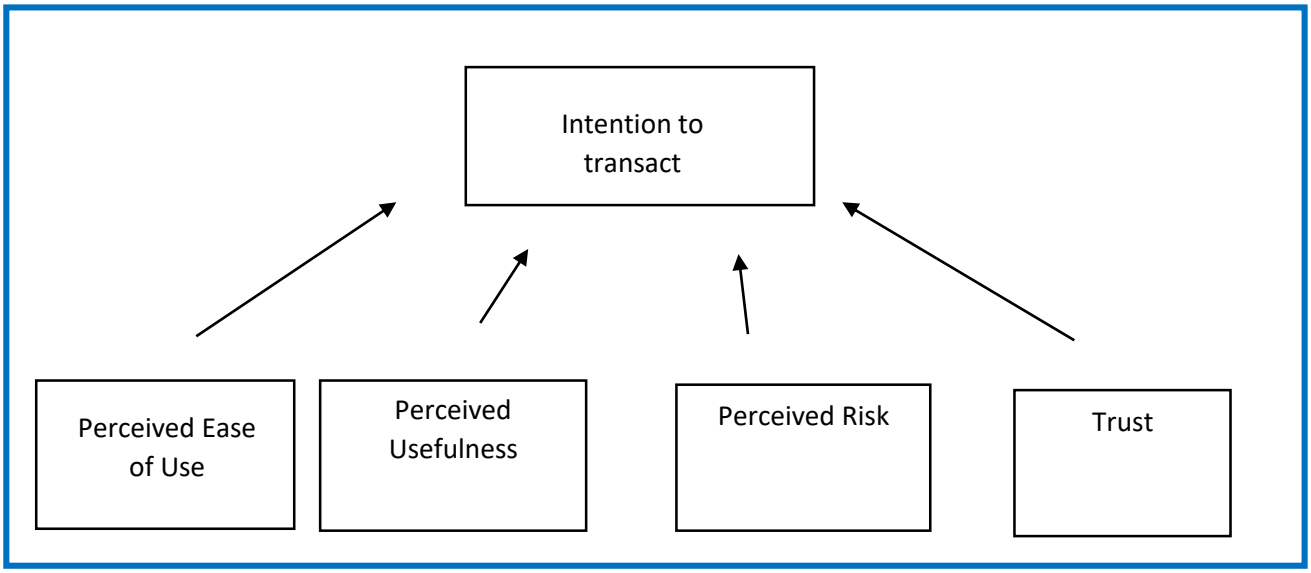
i. *Perceived Usefulness (PU***),** is the degree to which a person thinks that using a particular system enhances his or her performance (Tobbin et al., 2011);
ii. *Perceived Ease of Use (PEOU),* is "the degree to which a person believes that using a particular system is free of effort (Tobbin et al., 2011).

iii. *Trialability*, is the degree to which an innovation may be experimented with on a limited basis before making an adoption (or rejection) decision (Tobbin et al., 2011);

iv. *Perceived Risk ,is* defined as a belief by the consumer about the potential uncertain negative outcomes, is controlled or mitigated (Tobbin et al., 2011); and

v. *Perceived Trust*, is defined as a measure of consumer's level of assurance that the service will be provided with minimum possible hindrance to ones way of life (Tobbin et al., 2011).

Fig 2.2.5 What drives end-user's intention to use a payments transacting system

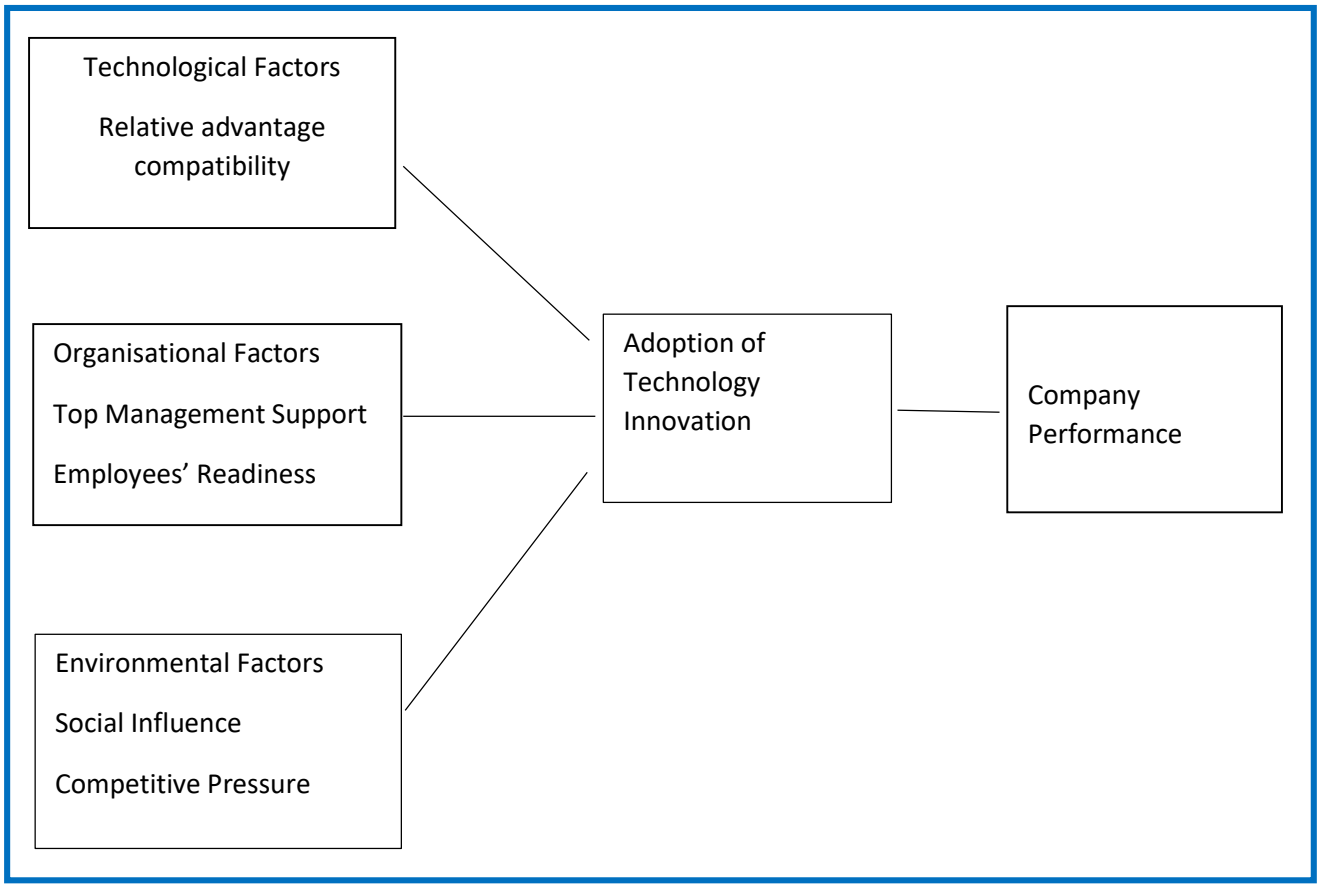


TAM was an important tool for this research to help assess what influences the end-user's decision to either opt-in or opt-out of adopting new innovation and in this case mobile payments. It was quite useful to develop an understanding of where end-user placed more emphasis in rationalising their decision making. Without a structured way of assessing the decision-making process regarding innovation adoption a risk of assuming pure irrelevance to end-user needs might be the simplest answer one gets to, without properly understanding the psychological process followed in making the opt-in or opt-out decision by the decision maker. This research study therefore utilised TAM significantly by evaluating the five key outcomes in order to make conclusions and draw insights of how end-users look at mobile payments, and why they decided to use it as a payment method replacing already heavily utilised ones such as cash and electronic payments.

2.2.6 THEORY 3 – TECHNOLOGY ORGANISATIONAL ENVIRONMENT

Technology-organisational-environmental (TOE), developed for the purpose of examining the adoption of various IS/IT products and services at a company/firm level, was utilised to assess the journey by South African firms in making technology choices regarding mobile money deployments. TOE as a framework broadly provided a theoretical perspective on IT adoption, inclusion of technological options, organisational and environmental variables made TOE the most favourable tool over other adoption models in studying organisational technology adoption, technology use and value creation from technology innovation (Gangwar, 2015). The TOE framework was also free of industry and firm-size biasness or restrictions, and as such provided a holistic picture for user adoption of technology, its implementation, foreseeing challenges, its impact on value chain activities, the post-adoption diffusion among firms, factors influencing business innovation-adoption decisions and to develop better (Gangwar, 2015). Based on the aforesaid proponents in the TOE framework it made it a suitable tool for assessing the organisational adoption outcomes that were used for this research.

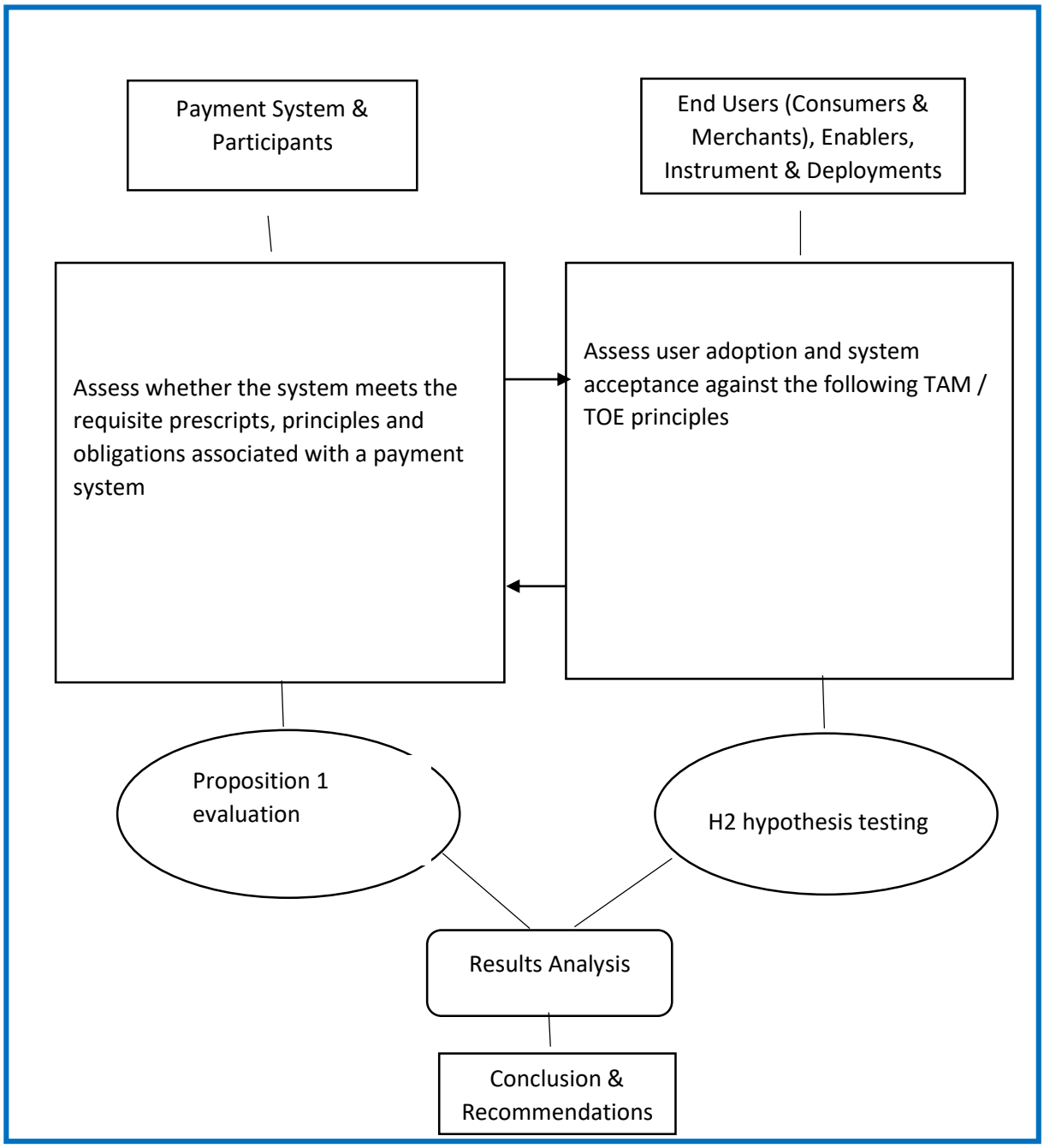
Figure 2.2.6 a TOE Conceptual Framework



TOE evaluated in conjunction with TAM and UCC had the ability to provide a context of how technology choices by enterprises/companies that made a choice to deploy mobile payments as well as a lens that could be used to assess the technology adoption choice decisions by Small Medium Enterprises (SME) that are key in any mobile payments ecosystem.

Figure 2.2.6b outlined the construct of the research process, where on the right side it evaluated the payment solutions whether in operations or as envisaged aspirational constructs to ensure that they pass the prescribed legal mast as required for any properly functioning payment system. This was achieved by evaluating existing and aspirational payment system constructs where necessary, and looking at the participants of a particular construct and this got aggregated into Proposition 1. On the right of the diagram end-users, enablers, financial instrument and deployments options suited to delivering an aspired to adoption trend, were evaluated and assessed. This process aggregated in the testing of hypothesis 2. The results of the two hypothesis being tested were analysed and ultimately delivered as a set of conclusions and recommendations in relation to the achievement of desired to adoption rates and patterns for mobile payments.

Figure 2.2.6b Diagrammatic Outline of the Research Construct



2.3 MOBILE PAYMENTS THEORETICAL FRAMEWORK

Figure 2.3 Diagrammatic outline of the Theoretical Framework

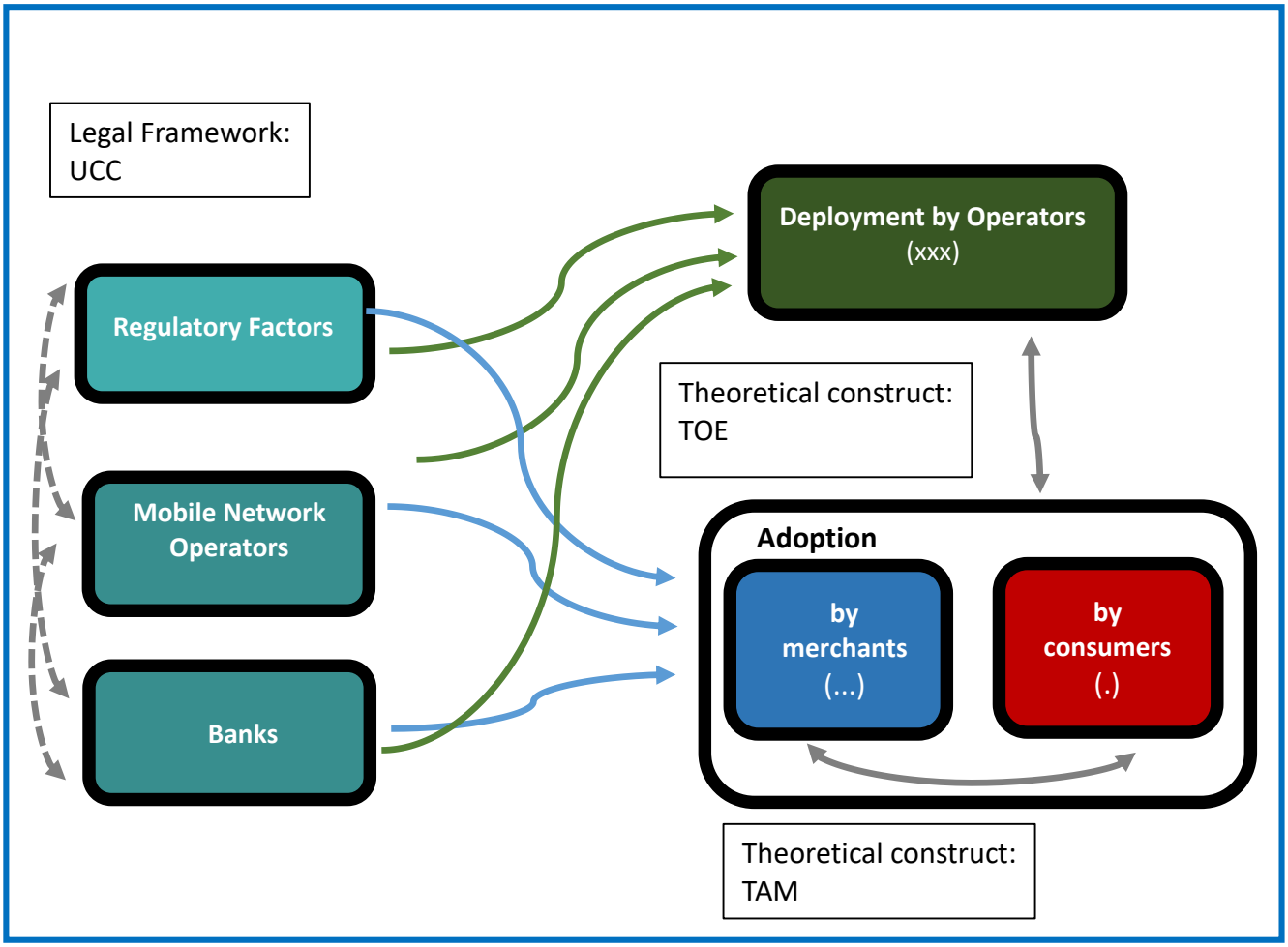


Fig 2.3 attempts to provide a snapshot view of the various theoretical options considered in the process of developing an understanding of the optimal structural framework that could aid in the development of an appropriate model to achieve the desired increase in mobile payments adoption. The legal framework UCC articulates the roles and obligations undertaken by the various key stakeholders in enabling an effective mobile payments ecosystem, namely Regulatory factors, MNOs and Banks. These stakeholders should in a properly structured manner enable mobile payment operators to orchestrate deployments that bring services to the ultimate users within the market in the form mobile payment solutions. Once mobile payment solutions are deployment in the market by operators the level of adoption by both merchants and consumers is achieved. In order to best understand the drivers of adoption two theoretical constructs that is TOE which is best suited to assess what informs merchants as enablers of the mobile payments ecosystem in their consideration of

adoption, and TAM as a framework that best provides guidance in the assessment of what drives the appetite of the ultimate end-users of the ecosystem merchants and consumers alike to use the solution.

2.3.1 REGULATORY STRUCTURAL OPTIONS FOR IMPLEMENTING MOBILE PAYMENTS

2.3.1.1 Mobile Network Operator(MNO) Led

An "MNO-led" regulatory model, means that the MNO is in control of the full process of facilitating a mobile payment transaction, including running the mobile network, performing cash-ins or cash-outs, transferring funds, and settling (Robb etal, 2015). In this model, the MNO as the Mobile Financial Services(MFS) operator, gets approval from the regulator to run Mobile Financial Services and owns the MFS-platform, as was the case with M-Pesa in Kenya and M-Paisa in Afghanistan (Voorrips etal, 2012) at the time of conducting this research.

2.3.1.2 Bank Led

A "Bank-led" regulatory model is where MNOs are only involved at the level of providing the primary network infrastructure for facilitating mobile payment transactions. A matter of critical importance with this model is that, MNOs still require banks to 'host' them in order to access the payments system (Robb etal, 2015). The bank is the de-facto MFS operator and owns the MFS-platform, backed by an MNO to provide the mobile channel (SMS, USSD, data). A mobile wallet as a store-of-value may be integrated with a bank product, such as a bank deposit account or a card. Some of the deployed examples of this construct were at the time of conducting this research Wizzit in South Africa, MPESA in South Africa and WING in Cambodia (Voorrips etal, of 2012)

2.3.1.3 Third-Party Led

In the case of a "Third-party led" regulatory model, a third party is the MFS operator and owns the MFS platform. Multiple banks and MNOs could come together as participants on the MFS platform. Some of the examples of this construct at the time this research was conducted were Obopay/Nokia money, MobiKash in Kenya and YellowPepper in Latin America (Voorrips etal, 2012).

Table 2.3.1.3 Summary table of mobile payments regulatory models

			Mno-led	Bank-led	3rd Party-led
REGULATION			**Yes/No**	**Yes/No**	**Yes/No**
	i.	Is an MFS operator a bank?	No	Yes	No
	ii.	Is an MFS directly approved by the regulator to do payments?	Yes	Yes	Yes
	iii.	Does an MFS operator require a bank sponsorship to participate in the payment system?	No	Yes	No
UCC ARTICLE 3	iv.	Does an MFS operator seek payer's approval before effecting any payments? **(Authorisation Principle)**	Yes	Yes	Yes
	v.	Does an MFS operator hold the payer liable if the payer is negligent when authorising payment? e.g. wrong value approved or allowing 3rd parties to use the payers payment instrument (**Negligence Principle)**	Yes	Yes	Yes
	vi.	Does an MFS operator dishonour payments in the event of suspected dishonesty/fraud? (**Dishonour principle)**	Yes	Yes	Yes

2.4 FIRST RESEARCH QUESTION

The first research question aimed to develop an understanding of how regulation influences the ability for mobile payment deployments to achieve scale in the markets within which it is launched. The cases evaluated in this research assessed mobile payment deployments in countries which were peer countries to South Africa (SA) although some may have banking and financial systems that can be considered less sophisticated when compared to SA. The financial inclusion challenges are however a common thread that exist in the markets or cases evaluated as part of this research. Except for Kenya which adopted an MNO-led regulatory framework for mobile payments, in all the other cases the adopted regulatory framework for mobile payments is a bank-led model, with India having re-positioned their regulatory stance

at a later stage around 2017/18 to become more of a hybrid between MNO and Bank led models.

Which leads to the development of a research question, "*To what extent does mobile payments regulation enable the ability of mobile payment deployment to rapidly scale-up*".

The Proposition 1 (P1): "Bank-led mobile payments regulation inhibit rapid growth and adoption of mobile payments by the end-users."

Where by "bank-led mobile payments regulation" means that the regulatory authority largely collaborates with the banking industry in the development of regulation that governs mobile payments.

2.5 SECOND RESEARCH QUESTION

The second research question aimed to develop an understanding of what drives end-users (consumers/merchants) to adopt technology innovation specifically as it relates to mobile payments. TAM was a useful guideline when one assessed the adoption enablers/inhibitors of mobile payment in SA. The various cases evaluated in the literature review have presented a mixed bag of outcomes from an adoption perspective with Kenya showing sustained growth on one hand and the SA context at the time of the research presenting failed deployments due to sub-scale adoption levels and low subscriber numbers. Kenya seemed to be the lone ranger in its adoption of an MNO-led regulatory framework for mobile payments, where else all the other markets had a bias more towards adopting a regulatory framework that is bank-led for mobile payments at the time the research was conducted.

Which leads to the development of a research question, "*What influences the end-user to adopt mobile payments innovation at a rapid scale*".

The H2: "The simplicity of the service components of technology innovation drive high adoption rates by end-users."

2.6 CONCLUSION OF LITERATURE REVIEW

The first section of the literature review focused on how the perceptions and key areas of focus in the space of mobile money evolved from the period starting from around the year 2000 to 2020/1. In the early 2000s due to the growth in mobile phone adoption, a view that the phone can be used as a transactional tool began to gain traction. By 2006 MNOs began to recognise the importance of

increasing network usage, however the dominant view at the time was that people from the financial sector are best equipped to manage payments. Around 2010 more mobile payments were rolled-out across the globe but each market adopted a unique approach, informed by a unique set of regulatory and legal frameworks and access to supporting technologies peculiar to each market's construct.

Around 2012 the growth of mobile payments was seen as being facilitated by the decreasing cost for communication, devices and applications. Mobile payments began to fulfil more than just money-transfer transactions but began to facilitate product purchase. Around 2013, a new challenger model to both traditional bank facilitated payments and mobile payments in the form of Google Pay, Apple Pay and Paypal emerged. By 2014, smart phones were recognised as critical business tools for the delivery of the m-commerce products. Around 2015, the world had seen about 259 mobile payment deployments in 89 countries being launched. Regulatory restrictions remained a key challenge towards enabling the mobile payments to be ubiquitous or interoperable across the various deployments and this had become a critical success factor. From around 2016-2022 the dominant question became what one can consider an evaluation of what is limiting the mass adoption of mobile payments as an emerging theme.

This demonstrates that the world's view of the role of mobile payments continues to evolve and at the time the research was conducted there were emerging questions on whether regulation or legal framework of a particular country is an enabler of rapid adoption or an inhibitor. A common view across various parts of the globe is that mobile payments should help reduce the levels of financial exclusion.

The second section of the literature review focused on reviewing the impact of mobile payments in various countries where they had been deployed. In Kenya, MPESA had been deployed with great success, some of this success could be attributed to a conducive environment, clever designing and a business execution strategy that enabled it to quickly establish critical mass. In Nigeria a number of policies aimed at addressing financial inclusion had been launched by the time this research was conducted, however MNOs were not allowed to receive deposits with an exception being for pre-paid airtime, which could not be used for retail purchases. These policy restrictions had somewhat contributed to a low financial inclusion impact of mobile payments in that country. Ghana, launched its mobile payments in 2008 but the uptake remains very low. The payments system policy of Ghana recognises MNOs' participation in payments system only as providing telecoms infrastructure and nothing beyond that, which again is a deviation once more from how Kenya approached mobile payments.

The central bank of Fiji had used the nation's financial inclusion strategies to advocate for mobile payments initiatives for the unbanked at the time this research was conducted. Although 51% of the adult population had activated mobile money accounts activity rates remain very low, with the strongest deterrent being cost associated with the service. In the case of India, mobile banking guidelines by the Reserve Bank of India were based on the bank-driven model. As a result, mobile banking was seen as another channel for accessing bank accounts, thus the adoption of mobile banking as a payments option had remained very low.

The success of mobile payments in SA remains an elusive goal, even though financial inclusion remains a challenge especially within the low-income segments, as quiet a significant amount of commercial transactions was still conducted using cash for this segment. The SARB's 2009 Position Paper, at the time this research was conducted remained the basic referral point when one considers mobile payments. It made quite a few key guiding principles which were limiting for non-banks wanting to participate in the payments system. These included the fact that only banks can issue e-money (*whose description covers mobile money*), only banks can take deposits from the public and non-banks have to be sponsored by banks. As a result, the mobile payments had come at significant costs for MNOs, with very constrained functionality which also did not enable ubiquity. In the decade prior to conducting this study, SA had seen several failures of mobile payments a factor that could not be entirely attributed to a sophisticated banking system of the country but to some extent also included limitations inherent in the mobile payment deployments and their failure to address the problems for the market segment for which they were targeting. Wizzit, Vodacom and MTN have made several attempts in this space but with little to no success.

In order to assess what influences the consumer or merchant to adopt mobile payments as a solution for their payment needs the Technology Acceptance Model (TAM) was used. TAM was established on the premise that the contracts, perceived usefulness and perceived ease of use are fundamental determinants of system adoption (Tobbin et al., 2011). For the purpose of this study and the assessment of the SA situation TAM's proponents best reflect the intended direction and focal area that this research paper aims to take.

CHAPTER 3: RESEARCH METHODOLOGY

3.1 Introduction

This study examines the role of mobile payments regulation in influencing the viability of mobile payment deployments and the rate at which it gets adopted as a payment method by the population where it is rolled-out. It also assesses the effect of the simplicity of the service components of technology innovation in driving high adoption rates by end-users, in this case consumers and merchants. The literature review conducted in chapter 2 outlined and discussed the concepts relevant to the study, and this chapter focuses on the overview of the research method that was followed.

In this research project the questions that needed clarification by the study were not top of mind to most members of the general public (consumers and merchants) who were the targeted subjects for the study. The reason these questions were not top of mind to the public is that although they dealt with payments on a daily basis their exposure to mobile payments was limited. In order to address this challenge, the research focused on two key areas in the quest to understand their impact on mobile payments adoption namely regulation and technology innovation. The research study was based on a mixed-methods approach, that is a semi-structured interview as a qualitative research study to gather data from institutions that have deployed mobile payments in South Africa and quantitative research study to assess what the drivers of adoption for consumers and merchants were.

Mixed methods research design is defined as those methods of research design that include at least one quantitative method and one qualitative method, where neither type of method is inherently linked to any enquiry paradigm (Creswell & Clark, 2017).

Mixed methods is an instrument most suited for this research study, as it enabled the distinct cohorts of communities targeted by the study that is 1) Mobile Payment deployers and 2) End-Users (Merchants and Consumers) to be assessed with appropriate rigour considering their distinct characteristics in the mobile payments architectural matrix.

3.2 Research Approach – Mixed method

Two main methods of research were utilised in this study: qualitative method research, using semi-structured interviews and a quantitative method of research using questionnaires. The quantitative research method was efficient at getting to the 'structural' features of social life, whilst qualitative studies were usually stronger in terms of 'processual' aspects (Bryman, 2017). The qualitative research method was selected for the research of institutions that were involved in the deployment of mobile payments in order to build an in-depth view of how regulation had contributed to the lack of success of mobile payments and their failure to scale-up in the SA market. Structured interviews as a research exercise was utilised targeting the four companies that have attempted deploying mobile payments in SA for the undertaken research. To guide this process a semi-structured assessment template was designed and used in the process, so as to standardise the evaluation process in order to ensure that the responses provided by the companies interviewed were evaluated in a standardised and consistent manner so that the outcome delivers results could be easily analysed.

For the quantitative research study component, various communities for Mogale City were randomly sampled, with a representative sample (500 questionnaires) comprising of both consumers (targeting 450) and merchants (targeting 50). A sample size of 500 was an appropriate size to assist in the development of inferences on a population size of between 800,000 and 900,00 (Creswell & Clark, 2017), which was the size of the population of the Mogale City as per census report of 2011, which was the latest census report at the time the research was conducted. Of the 500 questionnaires that were send-out the response rate was 100% with getting completed 450 and 50 questionnaires returned by the targeted groups consumers and merchants respectively.

The Mogale City community was selected as its sub-communities were a representative of the microcosm of SA communities. The communities of Tarlton and Hekpoort represented the farming communities, the community of Muldersdrift squatter camp represented the informal-dweller community, the communities of Kagiso and Munsieville represented the township/peri-urban communities and the communities of Nordheuwel, RantenDal, Silverfields and Rangeview represented suburban communities. The proponents of TAM and TOE were used to establish how the respective end-user communities made contact with a technology innovation, that its perceived usefulness and perceived ease of use are fundamental determinants of adoption, (Tobbin et al., 2011). The questionnaires assessed key features of TAM/TOE whether perceived or based on experience as it relates to mobile payments and covered the following key proponents: through the questions asked.

The end-user's view on the four key proponents of TAM informed how likely they are to adopt and be comfortable with new technology innovation. This part of the study was aimed at developing a view on H2: "The simplicity of the service components of technology innovation drove high adoption rates by end-users".

The four companies, representing institutions that had deployed mobile payments in SA, would in the process of their deployment have had to comply with the relevant NPS regulation that relates to mobile payments. The SA NPS regulations as it related to mobile payments had a bias towards a bank-led model as outlined in the literature review at the time of the study, the 2009 Position Paper expressly stated that it is only South African registered banks that may issue electronic money and non-banks wanting to enter the mobile money space had to access the payment system by entering into a sponsoring arrangement with a bank (Lawack-Davids & Tech., 2012). Their deployment experience would also have enabled them to develop an understanding of what the enablers or inhibitors of end-user adoption of their solution had been, and to what extent regulation had informed how they designed and structured their solutions. This part of the research is intended to inform view of, P1: "Bank-led mobile payments regulation inhibit rapid growth and adoption of mobile payments by end-users".

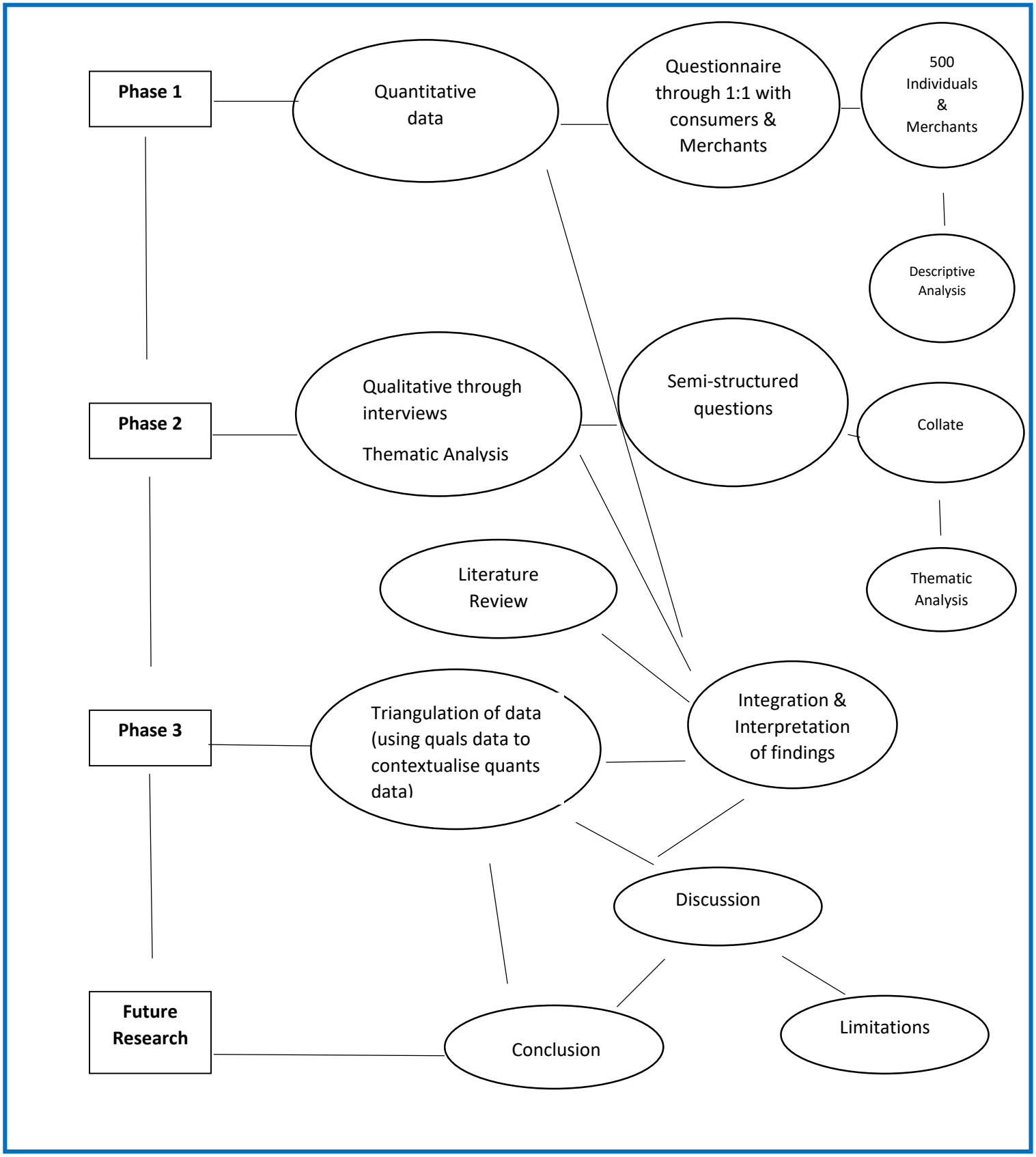
Through the process of the triangulation of the P1 and H2 research processes, addressed the research question that is, "What is the relationship between mobile phone technology, national payments regulative framework and consumer as well as merchant adoption patterns in driving the increased utilisation of mobile payments within the South African economy?"

3.2.1 Research Design

Research designs are processes and procedures for collecting, analysing, interpreting, and reporting data in research studies. These designs represent various models for doing research, which have distinct names and procedures associated with them. The usefulness of research designs is that they help guide the methods and decisions that researchers must make during their studies and set the logic by which they make interpretations at the end of their studies (Creswell & Clark, 2017). For the purpose of this study a fixed mixed methods design approach was followed, where the use of qualitative and quantitative method was predetermined at the start of the research process and procedures were implemented as planned (Creswell & Clark, 2017). This research was approached utilising the sequential explanatory approach, where the quantitative research (questionnaires) was the first phase, then followed by phase two which was the qualitative research (interviews) and phase

three which was the process data triangulation (using qualitative data to contextualise quantitative data). The final step was the conclusion process outlining contribution to the body of knowledge and future research and outlining of the research limitations.

Figure 3.2.1 Research Design – Mixed Methods, Sequential Explanatory Approach



The research process was broken into three distinct phases with the first two executed in parallel and not necessarily in series. The first phase involved a process to gather quantitative data through a set of 500 questionnaires that were sent out to merchants and consumers respectively, then loading the raw data from the questionnaires onto the IBM SPSS statistical tool so as to develop structured packaging of the feedback. The second phase covered a process of interviewing key officials from the companies that have deployed mobile money based on a set of standard questions posed to each company. Consolidated the feedback into standard headings, then analyse them using a process called thematic analysis into structured themes per sub-category. Phase three included juxtaposing the results of phase one and two against proposition/hypothesis and the research questions. Ultimately triangulating the results of the respective research process to end-up with logical conclusion to the proposition/hypothesis and research questions and then the interpretation of the findings. The final phase was drawing conclusions, articulating recommendations as well as contribution for the future research of specific areas within the area of mobile payments adoption.

3.3 Data Collection Methods

To develop an understanding on how regulation has impacted the adoption of mobile payments interviews were conducted with officials from the four institutions that have deployed mobile payments in SA. A deductive method of research where hypothesis-relevant facts were collected, and the hypothesis was either supported by the evidence of those facts or it was refuted by them was employed. In this process the ethics of the research assessment which are that, at minimum the presented facts and views should not be amended was adhered to (Wengraf, 2001).

In order to research TAM as well as TOE and how each targeted user groups makes a choice on the adoption of technology innovation, questionnaires were utilised for data collection. The research study was aimed at two distinct groups of end-users that is consumers and the merchants, and questionnaires were designed for each distinct group. Because of the target sample group was not expected to always be conversant in the English language, some support to assist with translation of the questions into the language understood by the informants was provided. Critical to this translation process was to ensure that fundamentals of the questions asked were not altered during the translation process. Quantitative research method was useful to help quantify opinions, attitudes and behaviours and find out how the whole population felt about a certain issue or set of issues. For the purpose of this study the quantitative research model was used to conduct inferential research because the focus was trying to explain how TAM/TOE influences adoption of technology innovation. The ultimate goal of any quantitative research was to generalise the “truth” found in the samples to the population (Wengraf, 2001).

3.4 Population and Sample

To evaluate for Proposition 1 (P1) evaluation data will be gathered through a process of interviews of the four companies that have launched mobile payments solutions in SA, targeted at the SA population. To test for the H2 hypothesis data will be gathered from specific communities within Mogale City, with Mogale City selected as the primary site for the research study as it is a representative microcosm of the SA population.

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3.4.1 Population

Market players that have rolled mobile payments solutions make-up the total population of institutions that have ventured into the mobile payment space in SA market, and they are a finite number of 4. In this group first it is the SA MNOs, who also have operations in other international markets which include other African countries and as such they have gained significant knowledge and insights in the deployment of mobile payments based on their experiences in the other markets where they operate as well. Some of the most successful mobile payment deployments such as MPESA which had become a game-changer as well as a golden standard for mobile payments through which other mobile payments deployments are benchmarked, had been implemented in partnership with SA based MNOs. These SA based MNOs were assessed on their experience on mobile payment deployments and how regulation had contributed to the success or lack there off in various countries. The second group had the likes of Wizzit Bank, that was at the time of conducting the research a subsidiary of the SA Bank of Athens and was launched in 2005 to offer mobile banking facility to the unbanked and the under banked in the low income segment of the market. Wizzit offered a mobile phone based banking facility that enabled banking facility across all wireless networks in SA. The bank facilitated mobile payments specifically person to person transfers and offered a payment service for paying for goods, settlement of utility bills and buying cell phone airtime only. All transfers, bill payments and airtime purchases could be made via any basic cell phone however a debit card was also issued for use at ATMs and Electronic Funds Transfer at Point of Sale (EFTPos) machines. The bank had evolved over the years and now offered mobile finance through products such as funeral insurance facility and extended credit to long term users (Makore, 2010).

Mogale City Local Municipality community which served as a main case-site for evaluating H2, is an area situated at the western side of Gauteng province. According to Census 2011, Mogale City had a total population of 820 995 of people, of which 75,6% were black African, 21,0% were white, 0,8% were coloured, and 2,2% were Indian/Asian. The community had 134 635 economically active people (representing both employed or unemployed but looking for work), and of these, 24,6% were

unemployed. Of the 60 706 economically active youth (15–34 years) in the area, 32,3% were unemployed (Geyer, 2015).

3.4.2 Sampling Method

The research study looked to answer two critical questions with regards to the adoption of mobile payments in SA, with the first being the role that regulation plays and the second being the role that technology innovation plays in driving adoption of the service by the targeted communities. In an attempt to address the first question, the research was done through interviews of the institutions that have rolled out mobile payments solutions. To answer the second research question, a random sampling process in order to draw a sample that is representative of the Mogale City population was undertaken, as Mogale City had been selected for having microcosmic characteristics of SA population. The research process was in the form of a structured questionnaire with specific questions targeted at either consumers or merchants.

The four companies with either failed or at the time had active mobile payments solutions deployed formed a cohort of the reviewed case studies, for evaluating the impact of regulation on the success and rapid adoption of mobile payments, especially in the SA context where mobile payments regulation had at the time of the research a bias towards banks. Prior to initiating and undertaking the study the researcher already had basic information on the terrain of mobile payments in SA. According to the researcher's own observation the ability of the non-bank deployed mobile payment solutions to be successful was quite constrained because of their inability to provide inter-operability which therefore limited the ability of the deployments to be ubiquitous to the same levels that cash is. To limit and contain the author's own bias, the research process was clinically followed.

In order to calculate the sample size a tool from surveysystem.com had been employed and it automatically calculated the sample size with the only required inputs being the population size, confidence interval and confidence level (Geyer, 2015). The population of Mogale City's economically active individuals is 134 635, confidence level of 95 and a confidence interval of 5, the required minimum sample size for the study is 383 however the author had opted for a sample of 500 (*comprising 450 consumers, 50 merchants*).

Confidence interval (sometimes referred to as margin of error) is the plus-or-minus figure usually reported in newspaper or television opinion poll results. For example, if you use a confidence interval of 5 and 47% percent of your sample picks an answer you can be "sure" that if you had asked the question of the entire relevant population between 42% (47-5) and 52% (47+5) would have picked that answer. The **confidence level** informs of how sure one can be of the results of the research, is expressed as a percentage and represents how often the true percentage of the population who would pick an answer lies within the confidence interval. The larger your sample size, the more accurate the answers can truly reflect the population, however relationship is not linear therefore doubling the sample size does not halve the confidence interval (Marra & Bogue, 2006).

3.5 Research instrument

Research Objective 1

To research the first research objective, "what is the impact of regulation on the adoption of mobile payments?", a qualitative research approach using a structured questionnaire was selected as the most suitable research method. The principal method for the collection of data were face-to-face or online interviews with a key individual from the companies identified as part of the study group depending on the interviewee's preferred engagement method. The semi-structured questionnaire covered a number of factors considered critical to this problem statement such as NPS and mobile payments relationship, the relationship between mobile phone technology and mobile payments, the relationship between regulation and the country's mobile payments model choice and the relationship between banks' influence and NPS regarding the regulation of mobile payments.

Qualitative Interviews

Face-to-face or online interviews were conducted with the officials of the four institutions that had implemented a mobile payments deployment within the SA borders, and for use by the SA consumers and merchants. This approach allowed for effective participation and was suitable to both face-to-face and telephonic interviews, using a standardised set of question to eliminate the risk of the two interviewing approaches from delivering unreliable outcomes. The same set of questions were asked in a similar manner irrespective of the interview platform and where necessary the questions were repeated or clarified. Semi-structured interviews are those in-depth interviews where the respondents have to answer a set of pre-set open-ended questions, that are based on semi-structured interview guide, which is a schematic presentation of questions or topics and need to be explored by the interviewer (Jamshed, 2014).

Research Objective 2

To conduct research on the second objective, "assessed the relevance of technology adoption theories in building an understanding of the consumer and merchant mobile payments adoptive trends in South Africa", a quantitative research approach using questionnaires targeting the two targeted sample groups (merchants and consumers) was conducted. Two samples representative of their respective target groups were randomly selected, one representing the consumers and the other representing the merchants. A sampling process that ensured that the representation of the various dynamics that informed the selection of Mogale City as a case-site were adhered to and recognised. The merchant questionnaire, covered factors such as the enterprise's average turnover per month or year, whether mobile payments in exchange of goods/services was accepted in their enterprise, what influenced the enterprise's decision to accept cash or electronic payments and whether they were willing to accept mobile money for the payments of goods and services. The consumer questionnaire, covered factors such as, demographic information such as age and level of education, preference in terms of payment method and what influenced their choice.

The utilisation of samples to obtain relatively precise information about a population is quiet an efficient technique, and costs less than a complete census. The sampling method enabled the researcher to make inferences about the overall population and it surprisingly may also prove more accurate than a complete census, because the latter has greater potential for non-sampling error (Geyer, 2015).

3.5.1 External validity or Transferability

External validity, examined whether or not an observed causal relationship should be generalized to and across different measures, persons, settings or times, (Calder et al., 1982). In the literature review an observation of mobile payment deployments across different countries and markets was made, with the aim being to ensure that the structure of the research questions and ultimately the hypothesis can consistently deliver a similar set results irrespective of where in the world the research is conducted. If the regulatory regime has an impact on the adoption of mobile payments or technology innovation has an impact of mobile payments adoption, which are the identified causal factors for this study when observed under the same context will deliver result that will mean the same thing across any market or geography. The set of questions asked and results for both the qualitative and quantitative part of the experiment are generally transferable for a study conducted under a similar context.

3.5.2 Internal validity of Credibility

Internal validity, addressed whether or not an observed co-variant should be considered a causal relationship (Calder et al., 1982). The purpose of testing for the impact of the two variables in one study that is national payments regulation as well as technology innovation, and their impact on mobile payments adoption was to avoid the risk of evaluating each co-variant in isolation and possibly end-up with the risk of overemphasising its impact on the observed research outcomes. Because one would have to triangulate two somewhat distinct processes to come to a conclusive outcome of the research, the risk from overemphasizing the casual impact to the observed outcome of the study wasgreatly reduced, thus improving the level of the study's credibility.

3.6 Procedure for data collection

To gather data to test the first question, does the regulatory framework impact on the adoption patterns of mobile payments in SA, the research process involved conducting semi-structured interviews of the companies identified as fitting the research parameters (companies that have deployed mobile payment solutions in SA). In order to gather data relating to the second question, that is, does technology innovation influence or impact the adoption of mobile payments, the opted for research method was to conduct face-to-face surveys with members of the selected communities of Mogale City using standard questionnaires. The process of guiding the subjects to complete the questionnaires was administered by the author of this research study.

3.7 Data analysis and interpretation

Thematic Analysis (TA), is a method of research that enables the researcher to systematically identify, organise, and offer insight into patterns of meaning (themes) across a data set. Through focusing on meaning across a data set, TA allowed the researcher to see and make sense of collective or shared meanings and experiences. This method of research is thus a way of identifying what is common to the way a topic is talked or written about and of making sense of those commonalities (Braun et al., 2018). TA was used as it enabled the researcher to structure the data collected from the various subjects to assess and evaluate alignment with P1, and construct meaning out of the outcomes of the evaluation process. TA involved multiple iterations of revisiting the conceptualisation process, data collection, analysis and interpretation to ensure that shared meaning and common experiences were adequately surfaced by the process.

Descriptive Analysis, was used for this study as it were based on the general premise of constructivist inquiry and as such assumed a naturalistic perspective. This research design was appropriate for this research study as the questions focused on exploring the who, the what, and the where of events or experiences and gaining insights from informants regarding a phenomenon poorly understood by the subjects that is mobile payments and related regulatory instruments. Another attractive factor to this type of research method was that it employs applications of scientific method by critically analysing and examining the source materials, by analysing and interpreting data, and by arriving at generalization and prediction. Furthermore, Descriptive Analysis as a method of evaluation identifies, describes and quantitates attributes of a product therefore it is a valuable tool for providing information on product features, appearance thus could effectively be utilised for product and process development (Kemp, 2018).

3.8 Limitations of the study

A limitation of the design of a study or research is the systematic bias that the researcher didn't or couldn't control, but has the potential to inappropriately affect the results of the research (Price & Murnan, 2004).

For the first research question the following limitations were embedded in the study:

- An analysis of how an interpretation of the phenomena unique in one of the subjects assessed might be transferred to other institutions that were being researched;
- Because the research outcomes were based on how the research semi-structured interview outcomes were analysed and then interpreted as the views of the research subjects on how mobile payments were impacted by regulation, a risk existed that it might not be easy to recreate the research conditions for a different period even within the same institution.

For the second research question the following limitations are embedded in the study:

- Variants could have a correlation or association but not have a causal relationship existence;
- The is a risk that the correlation findings might not be generalised to other communities; and
- The survey might limit the respondent into a particular response, thus limiting their capacity for self-expression on the matter being researched.

3.9 Validity or Reliability (quantitative study) and Trustworthiness (qualitative study)

Reliability

Reliability, was based on the results that were obtained from an evaluation instrument and was not a property inherent in the creation of the instrument itself. From that point of view, it therefore was critical to speak of reliability as a factor of test scores or measurement rather than of the test or the instrument (Capraro & Capraro, 2002).The extent to which results were consistent over period and an accurate representation of the total population under a research study is referred to as reliability and if the results of a study can be reproduced under a similar methodology, then the research instrument is considered to be reliable (Golafshani, 2003).

The selection of Mogale City as the site for research was because it has various characteristics that are representative of both the physical dwelling and the income-level groups or class levels of the general SA populace. The process of selecting the sample size was based on not only randomly selecting the participants in the study but also ensuring that each demographic group is allocated a similar weighted-average as would apply in the total population. The questionnaires delivered a consistent set of results even if the sampling procedures were replicated in a different environment.

Objectivity

Objectivity, was a fundamental component of research content analysis because it covered details that directly affect the overall quality of the judging or evaluation process. A significant amount of past content-analysis research had either failed to perform or report measurements of objectivity or had not made available the objectivity-related procedures that were followed. The absence of detailed reporting in itself does not mean that the steps for objectivity measurement were omitted, their absence create a concern for judging precision and the capacity to adequately replicate (Levitt, 2022).

To limit the measurement process from having a high degree of measurement bias, the utilisation of Thematic Analysis (TA) as a method of research enabled the research process to systematically identify, organise, and offer insight into patterns of meaning (themes) across a data set in a structured and consistent manner. With limitation of author biasness controlled in the study and the associated outcomes having a tolerable amount objectivity built in.

3.10 Ethical considerations

The individuals, small enterprises and companies that were involved in the research process provided full unforced and informed consent for participating in the research. Their permission was sought and they were made fully aware that the purpose of the research relates to studies done towards a Master's

degree. The participants were informed that this is an anonymous research process and none of their feedback and input into the research process can be linked back to the participants. It was indeed envisaged that participants would be quite comfortable with this research approach and therefore be comfortable to engage the process and be open and honest in their responses, as it was indeed the case. It was clarified to the individual participants that no monetary benefit will accrue to them for participating in the process, and some individuals elected not to engage with the process as result thereof. Those who participated had an understanding that the aim of the research is to help towards the improvement of everyone's welfare, by contributing in the body of knowledge with regards to understanding some of the challenges that are limiting in the goal of most societies, that of attaining broad-based or universal financial inclusion.

In acknowledgement of the fact that participants in the questionnaire based survey had varied levels of formal education, although the primary language used in the research process was English, where necessary the question was first asked in English and translated into their respective vernacular language. The mostly used vernacular languages were there colloquial Sotho/Tswana or Zulu dialects used by the residents of Mogale City. The participants mostly responded to the questions in the language that the questions were asked.

3.11 Research Process

In conducting this research study, a mixed method approach for gathering data was utilised. Mogale City was selected as a research site because it had the demographic representation dynamic from a socio-economic perspective that closely represented the general South African context. A mixed-methods approach was the most appropriate and relevant because data came from a variety of sources, and the process for gathering this data was necessarily suited for gathering data across all the groups targeted for the study. For the consumer and merchants group a quantitative research approach was utilised and for the group consisting of enterprises who've been involved in mobile money deployments a quantitative research approach in the form semi-structured interviews was utilised, as they were a more suitable data gathering tool.

3.11.1 External validity or Transferability

External validity, examines whether or not an observed causal relationship should be generalized to and across different measures, persons, settings or times, (Calder et al., 1982). In the literature review it was assessed or observations were made of mobile payment deployments across different countries and markets, with the aim being to ensure that the structure of the research questions and ultimately the evaluation or hypothesis can consistently deliver a similar set results irrespective of where in the

world the research is conducted. If the regulatory regime has an impact on the adoption of mobile payments or technology innovation had an impact of mobile payments adoption, which were the identified causal factors for this study, when observed under the same context would deliver result that would mean the same thing across any market or geography. The set of questions asked and results for both the qualitative and quantitative part of the experiment were generally transferable for a study conducted under a similar context.

3.11.2 Internal validity or Credibility

Internal validity, addressed whether or not an observed co-variant should be considered a causal relationship (Oberlader, 2021). The purpose of testing and/or evaluating for the impact of the two variables in one study that is national payments regulation as well as technology innovation, and their impact on mobile payments adoption was to avoid the risk of evaluating each co-variant in isolation and possibly end-up with the risk of overemphasising its impact on the observed research outcomes. Because one would have to triangulate two somewhat distinct processes to come to a conclusive outcome of the research, the risk from overemphasizing the casual impact to the observed outcome of the study is greatly reduced, thus improving the level of the study's credibility.

3.12 Procedure for data collection

To gather data to test the first question, does the regulatory framework impact on the adoption patterns of mobile payments in SA, the research process involved conducting face-to-face interviews with key individuals in the companies identified as fitting the research parameters (*companies that have deployed mobile payment solutions in SA*) as first choice, and where it was not possible to conduct face-to-face interviews opted for online or telephonic interviews as the alternative method for gathering data. In order to gather data as it relates to the second question that is, does technology innovation influence or impact the adoption of mobile payments, the opted for research method was to conduct face-to-face surveys with members of the selected communities of Mogale City using standard questionnaires. The process of guiding the subjects to complete the questionnaires was administered by the author.

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3.13 Conclusion

In conducting this research study, a mixed method approach for gathering data was utilised. Mogale City was selected as a research site because it provided a demographic representation dynamic from a socio-economic perspective that closely represented the general South African context. The mixed-methods research approach was the most appropriate and relevant method because data was extracted from a variety of sources, and the data gathering process was designed so as to acquire suitable data across all the groups targeted for the study. For the consumer and merchants group a quantitative research approach was utilised and for the group consisting of enterprises who had been involved in mobile money deployments a qualitative research approach in the form semi-structured interviews was employed.

CHAPTER 4: PRESENTATION OF RESULTS (Quantitative Research) FINDINGS (Qualitative Research) AND DISCUSSION

4.1 Introduction

This chapter provides and outlines the findings of both the qualitative and quantitative research. Responses to the questionnaires utilised for the quantitative research process, were loaded onto IBM SPSSS from this process the outcome was graphs summarising the resultant research outcomes are produced.

The findings of the research outcomes for the qualitative research process which covered four operators that had at the time the research was conducted deployed mobile payment solutions in South Africa, where the findings by each operator was presented individually in order to establish whether a common experience amongst them was indeed observed or not. If common themes were indeed observed from the responses of the research participants, then further evaluated to see if they indeed supported or refuted the experience being evaluated. The experience being evaluated especially by the qualitative component of the research aimed to make observations whether bank-led mobile payments regulation either inhibit or support the rapid growth and adoption of mobile payments by end-users. The role of regulation in any payments system is to ensure that the principles of Article 3 UCC theory are observed and adhered to, with the main purpose being to protect the end-users of the payments system. Also encompassed in this part of the research process was the intent to build an understanding of the deployment choices by companies that had already embarked in this mobile payments journey. The question at hand which was presented in the research outcomes was whether the banks should have the exclusive mandate or other entities such as mobile network operators and others should be empowered to execute the mandate of overseeing as well as be the custodians of customer deposits on behalf of the regulators, for the purpose of benefitting the economy by driving the objective of improved societal financial inclusion outcomes.

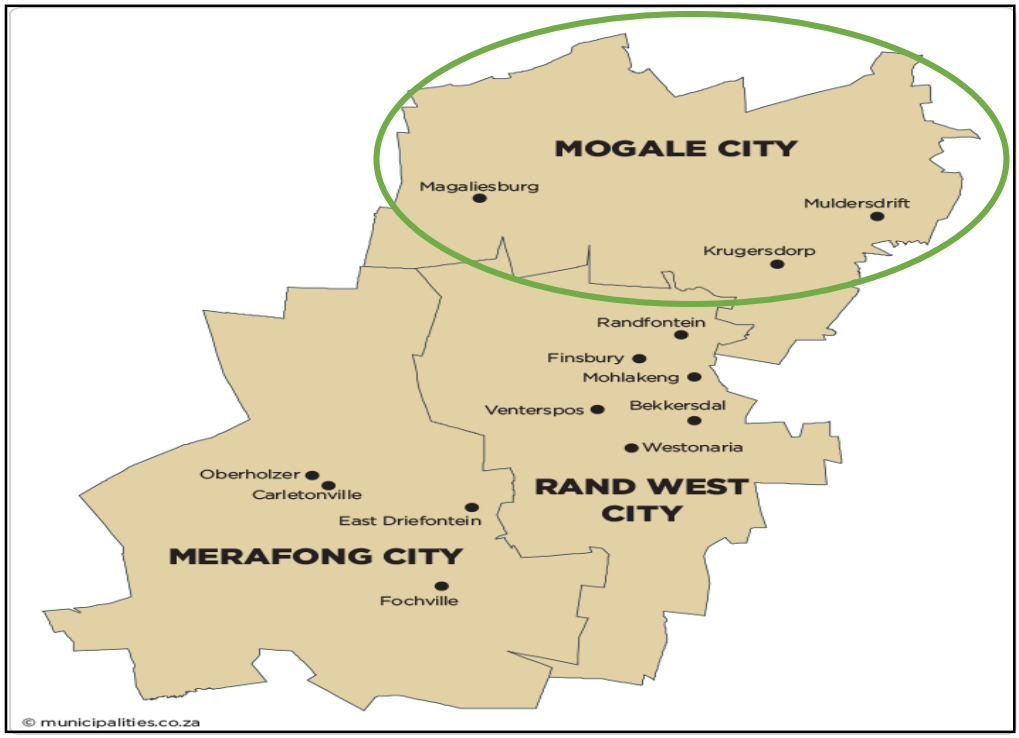
The other set of research which was the quantitative research component based on gathering data from 500 questionnaires covering 50 merchants and 450 consumers randomly selected within several localities of Mogale City, covering sub-urban, peri-urban, informal and farming community settlements. The quantity of questionnaires was pegged at 50 for merchants and 5450 for consumers to as best as possible recreate a real-live weight 1:10. The rationale for the size of the sample of 500

was already alluded to in the paragraph 3.2 in the previous chapter, for ease of reference it again is articulated here (*a sample size of 500 was an appropriate size to assist in the development of inferences on a population size of between 800,000 and 900,00 (Creswell & Clark, 2017), which was the size of the population of the Mogale City as per census report of 2011, which was the latest census report at the time the research was conducted*.)Through a set of standard questions responses were evaluated using descriptive analysis. The purpose of the quantitative research component of this research was to **determine what influences the payment end-user decision in adopting technology innovation and in this case mobile payments**. The basis of the assessment was guided by the principles of TAM as a framework.

4.1.1 Mogale City Locality

Mogale City Local Municipality, is a local municipality in the West Rand District Municipality, of the Gauteng Province, in South Africa, it is the area where the qualitative part of the research is conducted.

Fig 4.1.1 Map of Mogale City and surrounding localities



Mogale City geographic locality is depicted on the map in Fig 4.1.1 above.

4.2 Qualitative Research Findings

As the research approach aimed to keep the identity of the operators participating in the research process anonymous, they were referred to as operator A, B, C or D. The purpose of the qualitative research process was to establish the impact of regulation in the adoption mobile payments, articulated in market reach as well as the technology deployments options by operators, to this effect each of the operators were requested to respond to a standard set of 6 questions. The research process only targeted MNOs and a non-bank who were mobile money operators and as such the research instrument was likely to have in it that inherent bias.

The responses had been organised through a thematic analysis process into a structured pattern, with the coding process aided by the semi-structured interviews which then assisted in organising responses into common themes. This process of presenting results in this manner was guided by the principle on organising data for a TA process which were covered in paragraphs 3.7 and 3.9 in the previous chapter and can be summarised as follows, TA as a method of research enabled the research process to systematically identify, organise, and offer insights into patterns of meaning (themes) across a data set in a structured and consistent manner. The resultant findings of the process as captured and presented in Table 4.2 below are an outcome systematically identifying, organising and offering insights into themes in a manner allows for consistent structural presentation of the raw information so as to enable the analysis to be conducted which is covered in chapter 5.

Table 4.2 Qualitative Research responses by Mobile payment operators.

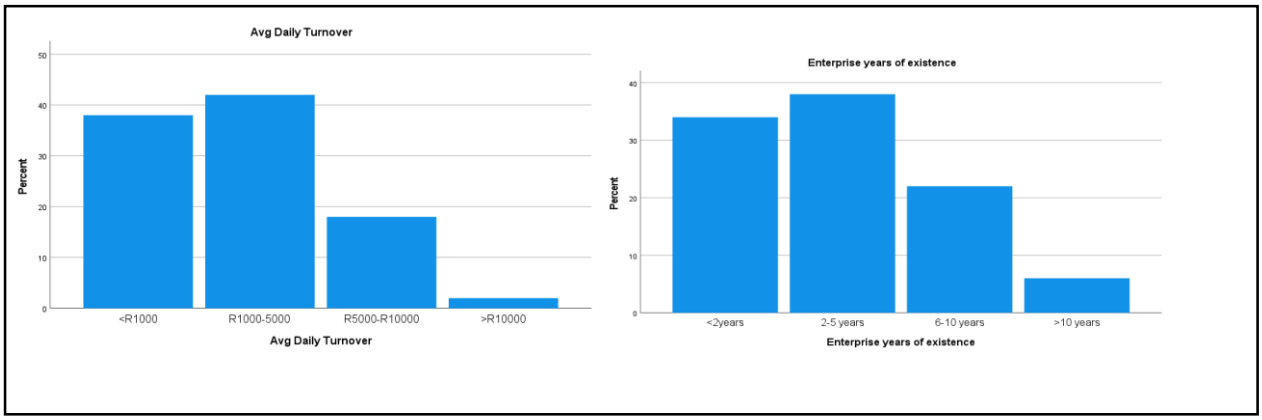
Research Question	Operator A Response	Operator B Response	Operator C Response	Operator D Response
a. What is your company's view on the relationship between NPS and the growth of mobile payments?	• It is important for the creation of structure and governance so as to enable the different market participants to have clearly articulated rules of engaging the system.	• The regulation of any industry for as long as it does not stifle competition, the entrance of new players and not opaque should be an enabler for growth.	• Alignment with the payment system is pivotal for the development of any digital payment instrument this is the case with mobile payments.	• As a new entrant in this space our capacity to play has been largely informed by what we can do through our sponsor bank lenses, guided by the PASA and NPS prescripts.

b. How does your company view mobile phone technology and it impact on mobile payments?	• As seen in the other markets where we operate and mobile payments are rolled out it has had a very transformational capacity.	• Since the advent of mobile telephony we've seen growth of what can be referred to as airtime currency that has not been fully utilised to drive transformative development in the areas that democratise financial services	• Mobile phone technology has the capacity to contribute to the developmental goal of improving financial inclusion in most developing countries. The successful delivery of remittance use-case is a case in point.	• Our view is that there is great opportunity to advance financial inclusion leading with payments that are enabled by mobile technology. Other secondary financial instruments will hang-off that framework.
c. From your company's perspective is there a relationship between payments regulation and the development of a dominant mobile payments model for a country?	• When one juxtaposes what the experience has been, in markets which can be classified as having an underdeveloped banking system, regulation evolved from market experience as the was no established turf to protect. The same can't be said about SA.	• A relationship between payments regulation, payments infrastructure which includes the various settlement windows does indeed exist. When one mirrors the disproportionate growth of mobile money in SA and outside SA even for communities with similar needs it does indeed back the question whether we have opted for an appropriate policy regime	• The mobile payments model is influenced by the dominant voice in the structuring of industry regulations for any country. In countries where they have an under developed/utilised banking system, different outcomes compared to developed ones have been observed. So there is indeed a bearing.	• That symbiotic relationship should by all means be acknowledged by all industry players' regulators and market participant alike. It should be the heartbeat that determines the pace of societal financial services transformation.
d. What is your company's view on the voice of banks in the development of a regulatory framework governing payments in SA?	• What the banking industry has achieved in SA is phenomenal for a country with our historical background and geo-political positioning. However other voices should be given space to assist in moving the dial on financial inclusion.	• In SA the voice of the banking industry which largely has ownership of the payments infrastructure that is critical for establishing alternative network options has been significantly loud. A hybrid model for transformational purposes is a necessary consideration.	• In the context of the markets where we operate, to some degree depending on the structure of the payment infrastructure, banks do have an ear of the policy makers and regulators in how the payment system evolves. In the SA that is indeed the case	• The South African banking system is renowned internationally for its soundness and resilience during the toughest economic times. That strength should be harnessed to advance the broader society and that is definitely possible, including in developing mobile payments
e. In your company's view how best can payments regulation serve as a catalyst that enables all forms of electronic payments incl. mobile payments?	• One has to consider the history of electronic payments in SA which largely evolved off the cheque and credit card model. The is merit it allowing other voices such as MNOs and Retailers to be co-architects of the transformation journey.	• Mobile payments compete with all forms of payment methods such as physical currency, electronic currency and lately crypto-currency. Although physical cash remains the most dominant the is an opportunity and a sense of market readiness that can be advanced by an enabling regulatory stance for mobile payments.	• The view that my company holds is that policy and regulation correctly utilised can greatly assist in driving and getting the country advance digital payments through allowing new entrants and market enablement.	• Payments are key indicators of economic activity of any country. Enabling more transactions to be conducted digitally can only enhance the country's standing from an economic valuation perspective.

f. What are the key contributing factors to the lack of adoption of the mobile payment solution you've deployed?	• In our company's case our play has mostly been limited to remittance transfers, but other use-cases can be feasible wit if cost to service the market are enabled to come down, through direct participation in PASA and the enablement of a more interoperable settlement arrangement.	• In our cases the ability to clearly differentiate ourselves through pricing is curtailed by arrangements we have with the sponsoring bank. Our mobile payment solutions must reach the same level of ubiquitousness that cash has to be attractive.	• We have not sufficiently invested in the R&D process to get alternatives that will be beneficial to our customers beyond the obvious use-cases.	• It is important to uncover and in a very meaningful way address societal challenges through innovative solutions. Lesson's continue to be learned but no silver bullet in our view exist but a lot of small but meaningfully coordinated steps will help to advance society.

4.3 Quantitative Research Results – Merchants

4.3.1 *Demographic make-up of the Merchants operating in Mogale City*



The total sample size of the merchants covered by the research was 50, which were randomly selected covering various geographic areas within the Mogale City locality. The only limitation regarding the sample was that large retail outlets such as the likes of Pick&Pay and Checkers were excluded from the sampling process, as key decision makers critical for responding to the research questions were based at head-office which was located outside the geographic area of Mogale City that was covered for the purpose of this research. Within the sample 72% of the merchants had been in existence/operating for a period of between 1 month up to 5 years and 28% had been existence for more than five years. Of these merchants 80% generated less than R5000 daily turnover, 18% generated between R5000 – R10000 and only 2% generated more than R10000. This can could possibly be attributed to the fact that large retail outlets were excluded from the sample however an assumption could be made that although large retailers trade significantly sizeable volumes their representation in the population would be lower in comparison to smaller operators.

For the next set of graphs to be evaluated a five-point scale was used which should be translated as per the table below

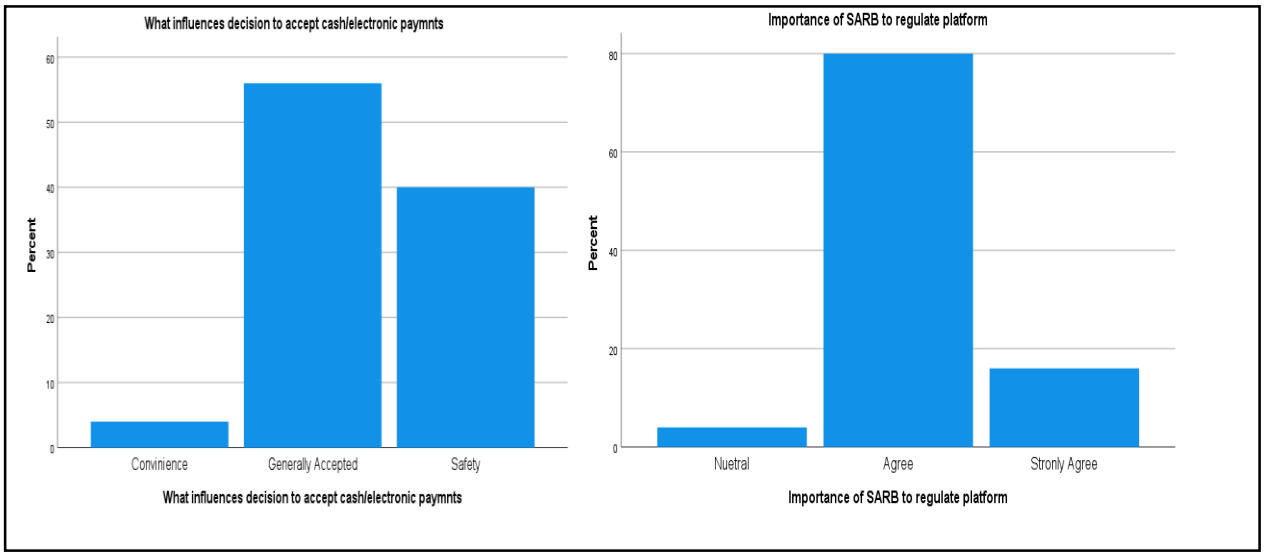
Table 4.3.1 Interpretation of the 5-point scale

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

The descriptors or numbers were used on various graphs in order to preserve the essence that should be conveyed by the graph. In instances where the sample had not selected a particular variable and

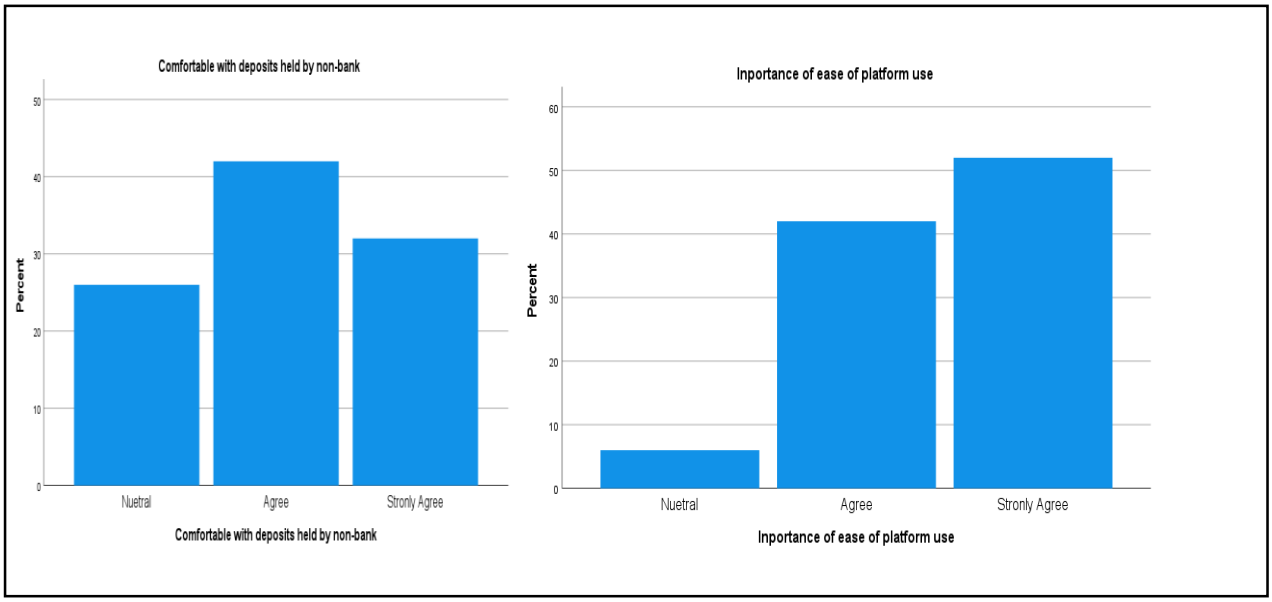
there are null values SPSS does not show the variable on the *x-axis*. On graphs where the mean was the basis for analysis a 6-point scale is reflected so as to allow for the distribution curve to accurately reflect on such graphs.

4.3.2 *Merchants - What influences decision to accept payment method and the Importance of regulation*



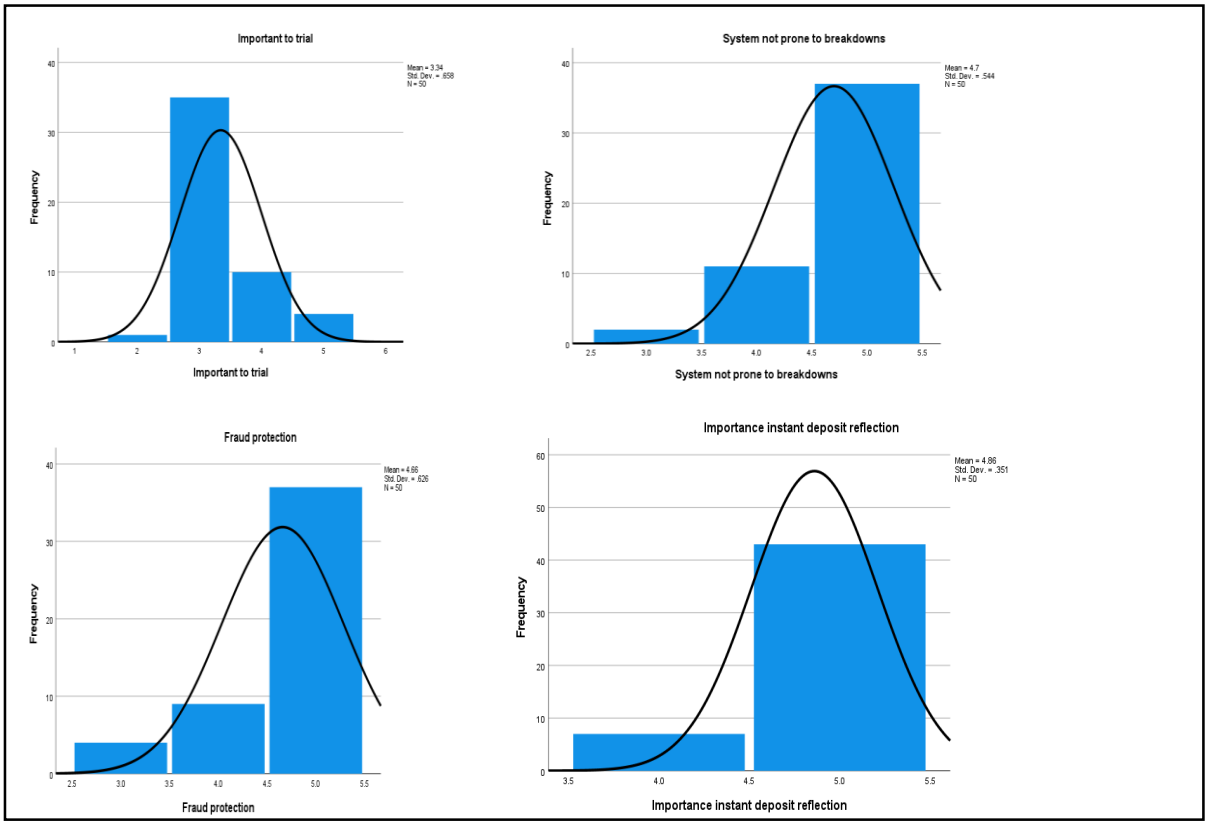
The decision by merchants to accept either cash or electronic instruments as a payment method was largely influenced by it being generally accepted from 56% of the respondents and safety from 40% of the respondents. Convenience was not a critical influencer in informing the merchants decision to accepting any form of payment instrument. Overwhelmingly merchants regarded regulatory oversight of the platform by the SARB as being very important with 96% of the respondents either agreeing or strongly agreeing to this question. However only about 75% of the respondents were comfortable with their deposits being under the custodian of non-banks.

4.3.3 *Merchants - Comfortable with deposits being held by a non-bank and Importance of ease of Use*



Overwhelmingly merchant regarded the ease at which a user can navigate the platform as being important with 94% of the respondents either agreeing or strongly agreeing when asked to indicate how they valued the ability easily use the system as a key driver to them adopting to use the platform.

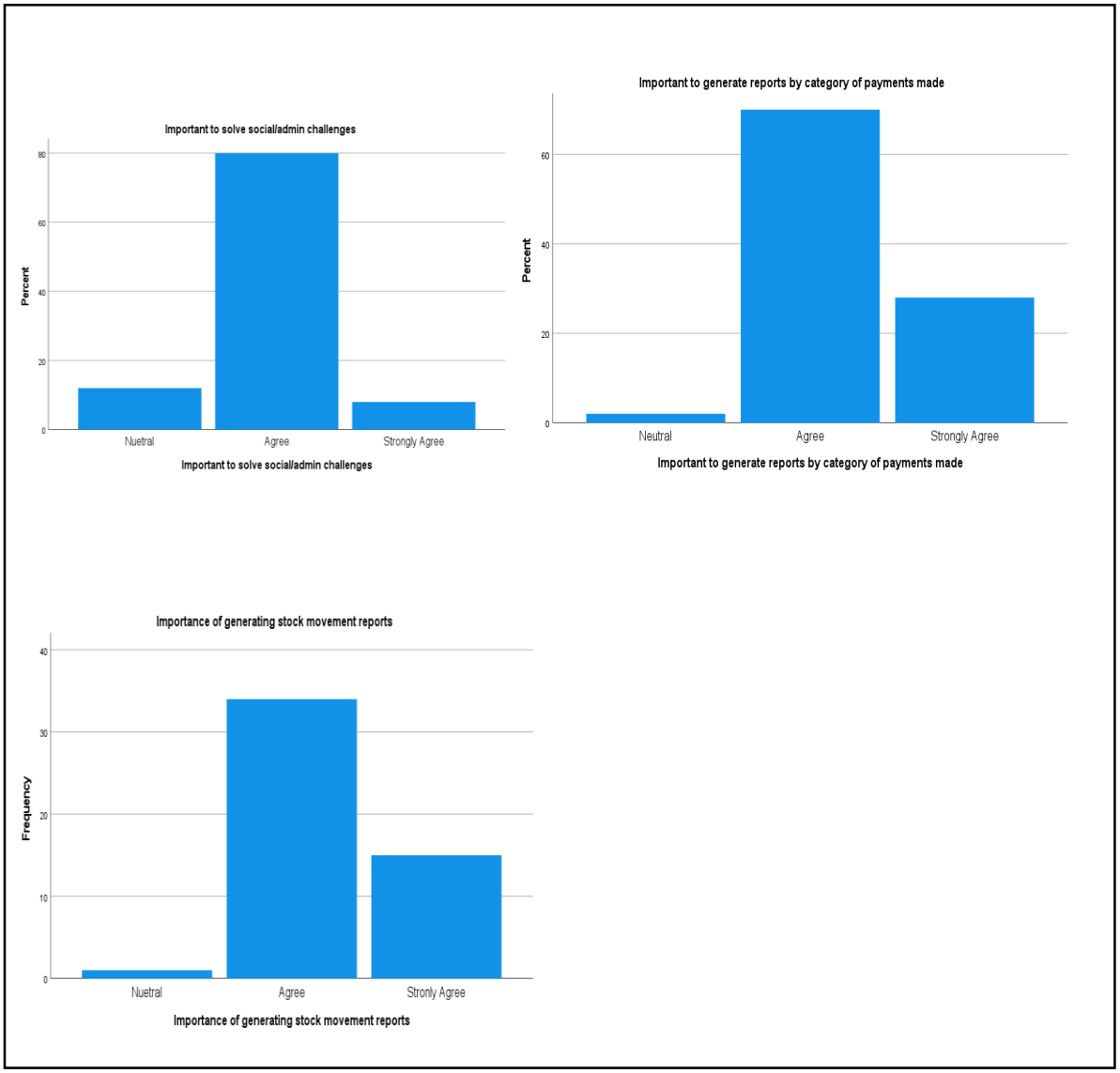
4.3.4 *Merchants - Measures the importance of platform trialability, trust and risk (breakdown; fraud protection; instant deposit reflection)*



In terms of the other key proponents of TAM trialability, perceived risk and trust the results of the merchant's views as per the graphs in 4.3.4, which indicated the following:

- The trialability graph presents a normal curve with most scored around the mean of 3.34 which was neutral response from most respondents, 70% of the respondents were neutral and 28% either agreed or strongly agreed;
- Perceived risk, which was measured through both the fraud protection graph and the and the proneness of the platform to breakdowns, with both graphs providing a normal distribution curve with a long tail on the left and a curve skewed to the right. In both graphs no respondent disagreed to the proposed questions but responded overwhelmingly either agreeing or strongly agreeing at 96% for no keenness with a mean of 4.70 (Agree) to breakdowns and 92% keen on protection against fraud with a mean of (4.66);
- The variable importance of deposits reflecting instantly, measures the respondents trust of the platform which has a mean score of 4.86, which is reflective 100% of the respondents choosing the option of agree or strongly agree (*86% respondents*).

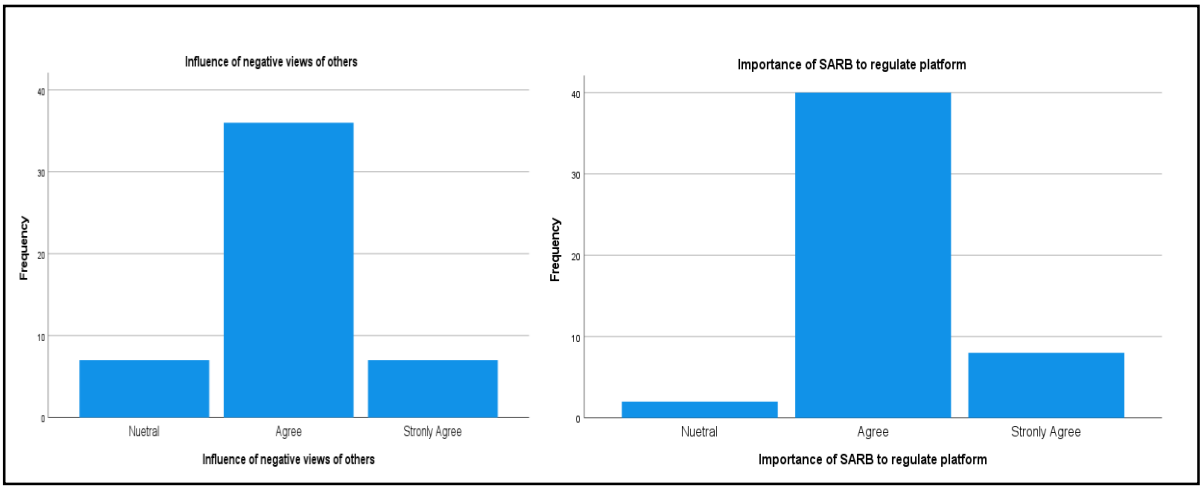
4.3.5 *Merchants - Measures the importance of mobile payments effect on enterprise effectiveness*



On the first graph which measures the importance of the platform's ability to solve administrative issues a summed score of 88% for customers either agreed or strongly agreed.

The second graph measured views of merchants on the platform ability to generate reports by category of the various payments made, with a resultant 98% which is a summed up view for both agree or strongly agree.

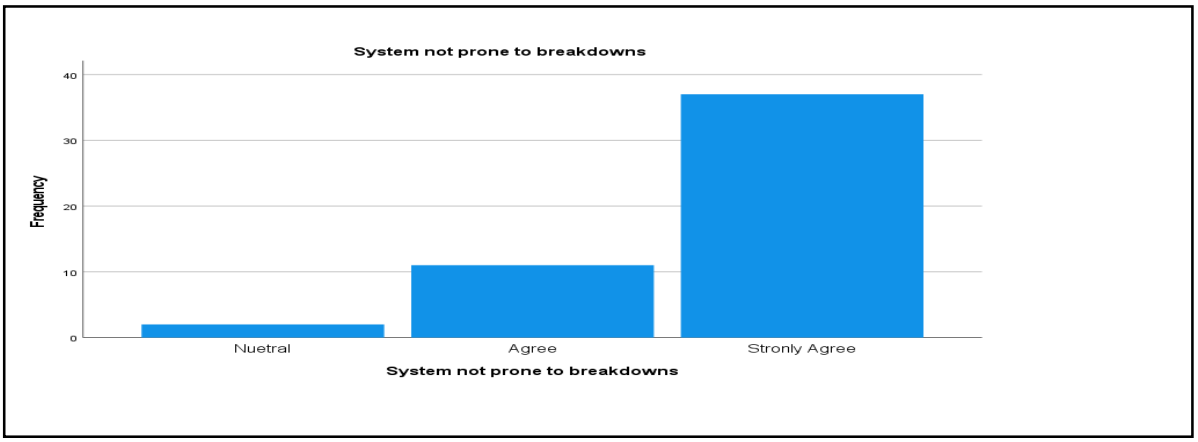
4.3.6 *Merchants -Measures the importance of how environmental factors affect the enterprises views on investing in mobile payments*



The first graph measured the extent negative views by others would impact the enterprises decision to deploy a mobile payments solution. With 72% of the respondents agreeing, 14% strongly agreeing and 14% holding a neutral stance. On an aggregate 86% of the respondents agreed that views of others would have an influence on their views regarding mobile payments.

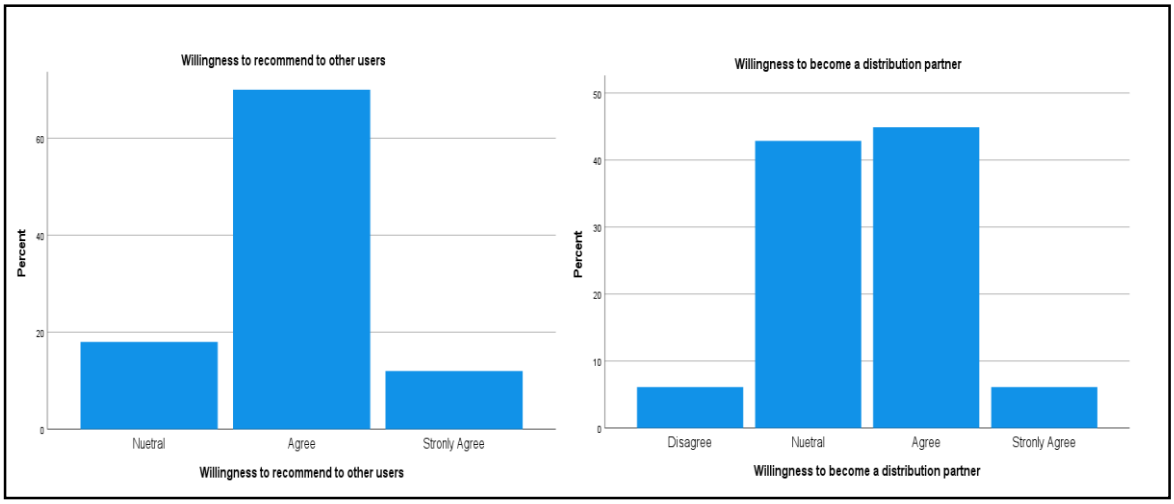
The second graph measured merchant views on the importance of SARB regulating the mobile payments ecosystem, where 80% of the respondents agreed, 16% strongly agreed and the rest which is 4% were neutral. This results in a summed up score for agree to the SARB/government of the ecosystem of 96%.

4.3.7 *Merchants - Measures the importance of how technological factors influence the enterprise's views on mobile payments*



On the measure of how important is it that the system is not prone to breakdowns, respondent's views provided the following result, 74% strongly agree, 22% agree and 4% hold a neutral view.

4.3.8 *Merchants - Measures the willingness and influencing factors for the to be mobile payment agents*

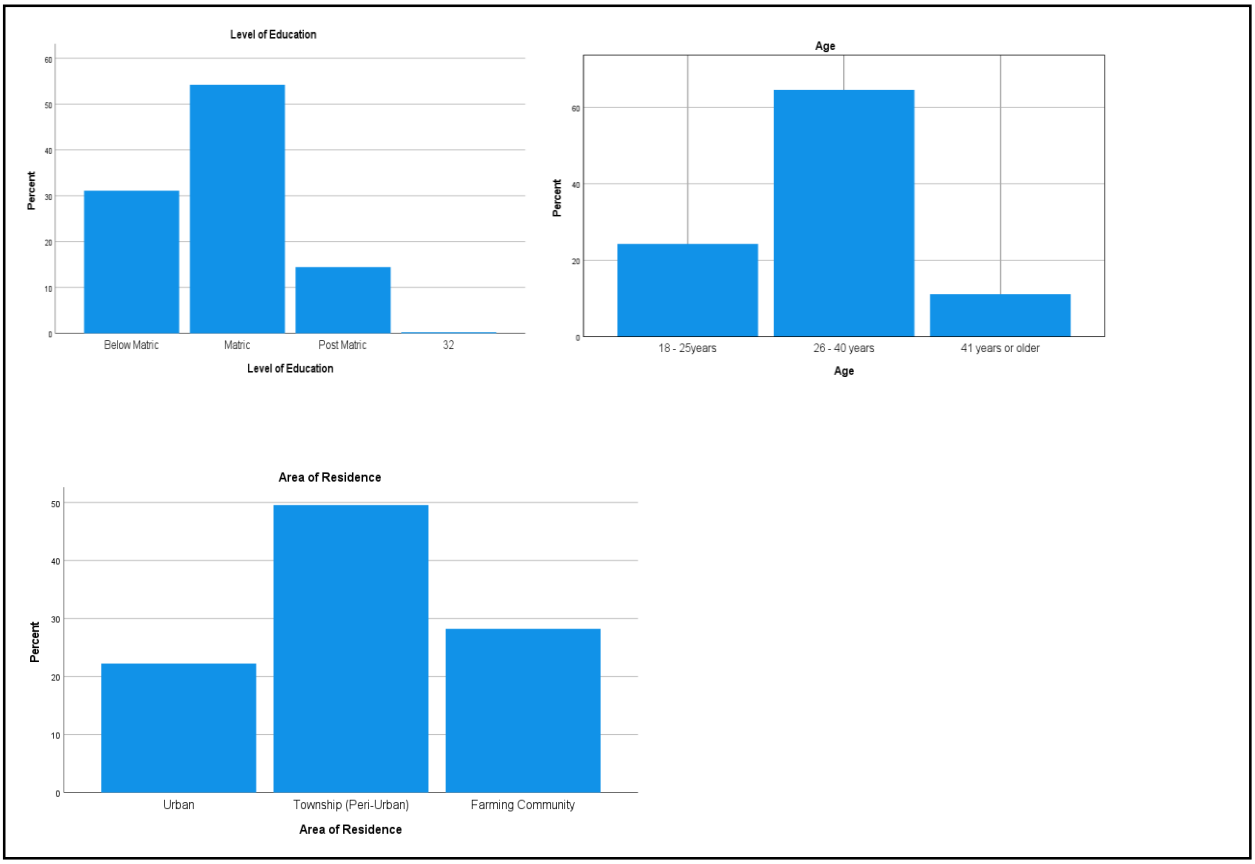


The first graph measured the willingness of merchants to promote the mobile payments platform/ecosystem to other merchants or users. In this regard 70% of the respondents selected option agree, 18% selected the option neutral and 12% selected the option strongly agree. These views of the respondents on this variable departed from the norm where the two highest responses were either for agree or strongly with the neutral option being the second most popular response by the sampled merchants.

The second graph the willingness of merchants to become distribution partners of the mobile payments solution. This variable presented a very interesting set of results which totally departed from what could be classified as a standard response set where the scores for agree or strongly agree are interchangeably the highest or second highest depending on the measured variable with extremely high scores for the leading variable. In this case respondents' views were as follows 45% - Agree, 43- Neutral, and both Disagree and Strongly Agree stood at 6% respectively

4.4 Quantitative Research Results – Consumers

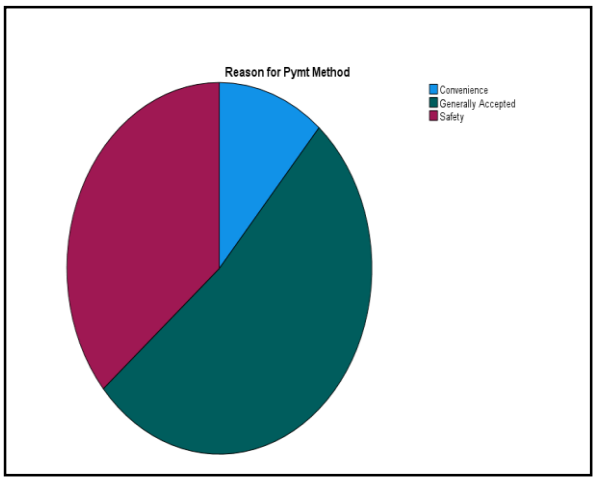
4.4.1 Consumers - Demographic profile of Consumer Sample based on Level-of-Education, Age and Classified Area-of-Residence



The results of the demographic make-up of the sample were as follows:

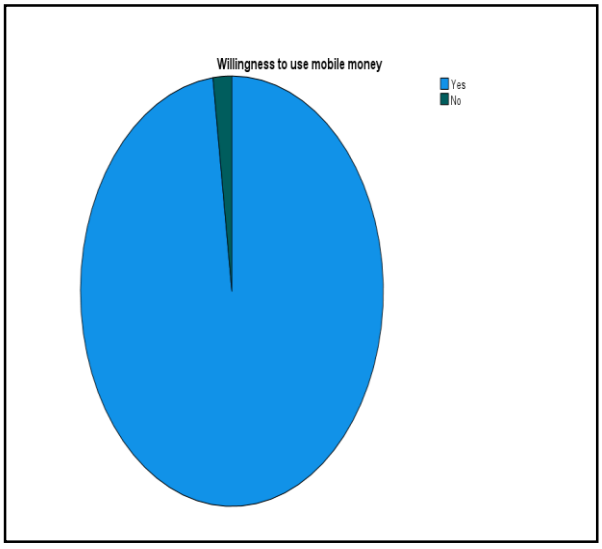
- The level of education make-up of the sample was that 54.3% had matric, 31.1% had a level of education below matric and 14.4% had a post-matric qualification;
- The age profile of the sample comprised of 64.6% being between the ages of 26 to 40, 23.3% being between the ages of 18 to 25 and 11.1% being 41 years or older;
- In terms of where the sample resided based on the three broad categories urban, peri-urban/township and farming the sample results were 49.6% resided in the peri-urban areas (mostly Kagiso and Munsieville), 28.2% resided in the farming communities (Tarlton, Hekpoort, Magalies and Mudelsdrift) and 22.2% resided in what it classified as urban dwellers (Noordheuwel, Kenmare, RantenDal and Dan Pienerville).

4.4.2 Graph Demographic profile of Consumer Sample –What influences choice of payment method



The results of what informs the sample in terms of what payment method to utilise when paying for goods or services, were as follows, i) influenced by it being generally accepted at 52.5%, ii)36.2% addressing the issues of risk and safety and iii)11.3% was influenced by convenience.

4.4.3 Graph Demographic profile of Consumer Sample –Willingness to use mobile money



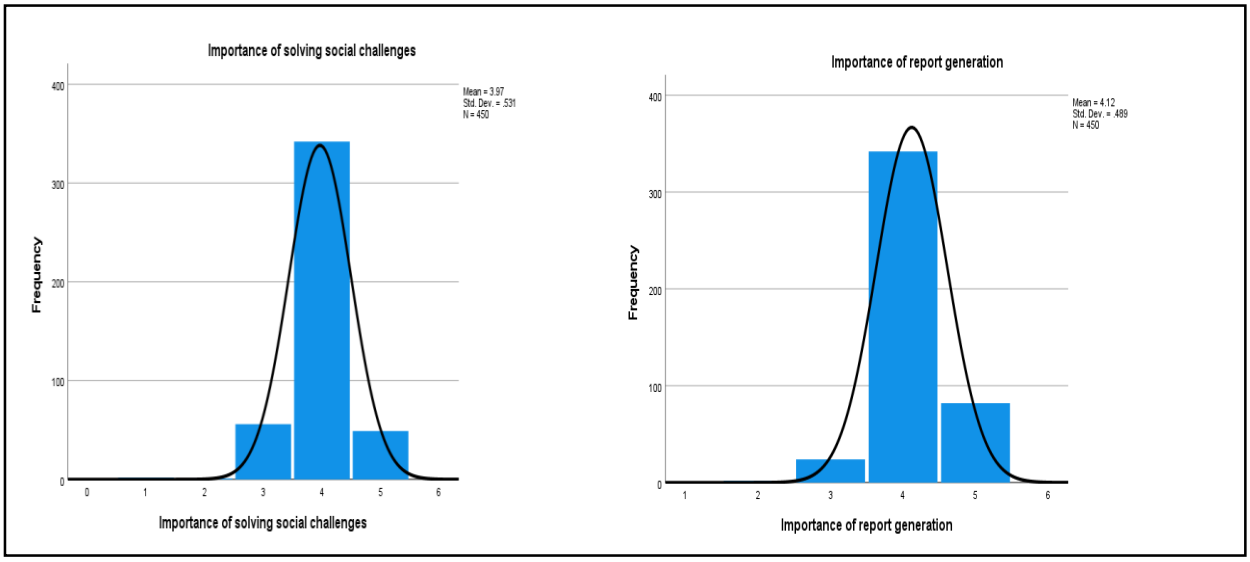
From the sample results 98% of respondents responded Yes to the question if they would be willing to utilise mobile money as a method of payment.

4.4.1 Consumer Results - Importance of Perceived Usefulness

To measure perceived usefulness two questions were asked to the consumer sample group, that is:

i. How important is it that the payment instrument solves either social or life's ever complex administrative challenges? and
ii. Whether it is important for the payment platform to generate reports outlining all payments made within various descriptive categories?

4.4.1.1 3Graph Consumer – Measure of solutions Perceived Usefulness



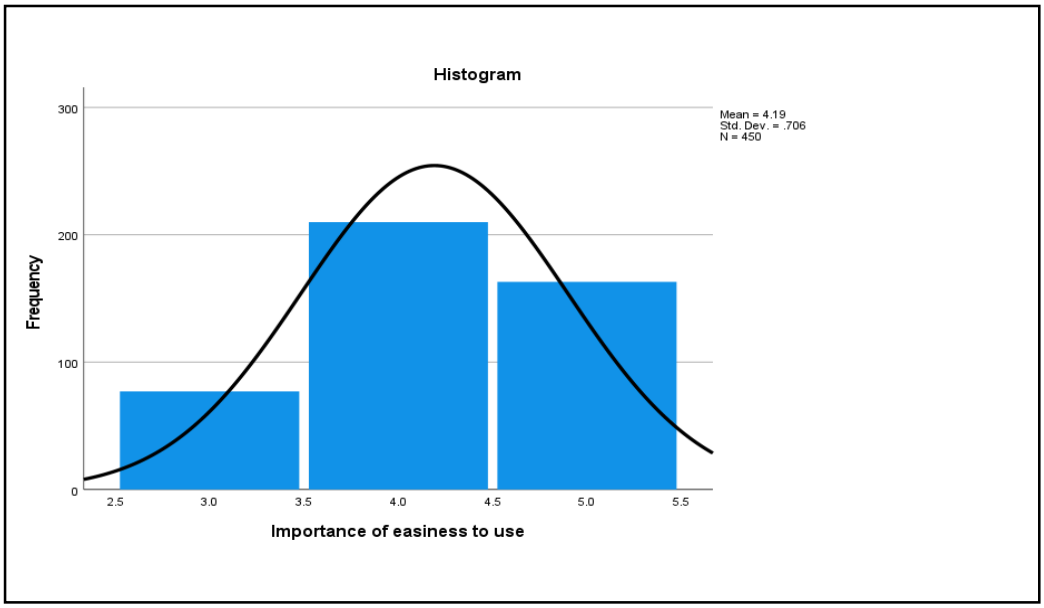
Results of the samples responses to the questions measuring solution's perceived usefulness by the consumers is summarised in graph 4.4.2.1, which provided the following results:

i. Results to the question of solving social challenges had a statistical mean of 3.97 and a median of 4. This presented a normal bell curve with a flat long tail on the left as most scores were around mean, the score indicated that 87% of the responses were either agreeing or strongly agreeing with the question asked;

ii. In an almost similar pattern results to the question on the importance of report generation, the mean was 4.12 and the median of 4. It presented in a normal bell curve with a long tail on the left where only 6% of the results were either neutral or in disagreement to the question, an overwhelming 94% of the respondents agreed to the question (*76% Agree; 18% Strongly Agree*).

4.4.2 Consumer Results - Importance of Perceived Ease of Use

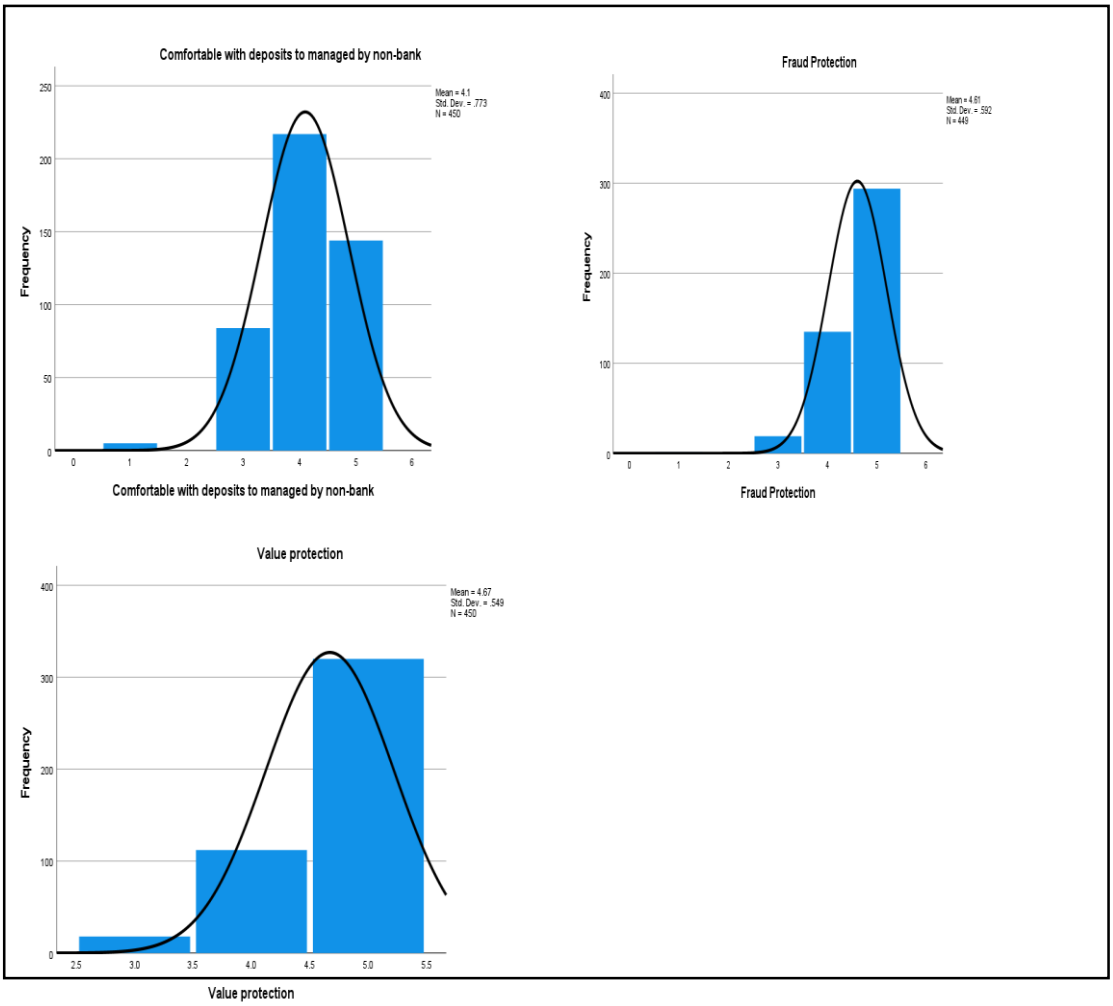
4.4.2.1 3Graph Consumer – Measure of solutions Perceived Ease of Use



The results of a variable that measures the importance of the easiness to use the platform delivered the following result, a mean score of 4.19, with low standard deviation of 0.7 as most scores were clustered around the mean. It provided a normal bell curve although a bit flat as the result of the scores representing agree and strongly agree being very close at 46.7% and 36.2% respectively.

4.4.3 Consumer Results - Importance of Perceived Trust of the platform

4.4.3.1 Graph Consumer – Measure of solutions Perceived Trust



The measurement of the importance of Perceived Trust of the platform was derived from the variables level of comfort with deposits being managed by a non-bank, as well protection from fraud and the possible erosion of capital value. The results for each variable were as follows:

i. **Deposits managed by a non-bank**

Results from sample presented a normal bell curve with mean of 4.1, a standard deviation of 0.77, 50% of the respondent with selected option agree and 32% strongly agreed. The results also presented an outlier with 1.1% of the respondent strongly disagreeing to the proposed question;

ii. **Protection from fraud**

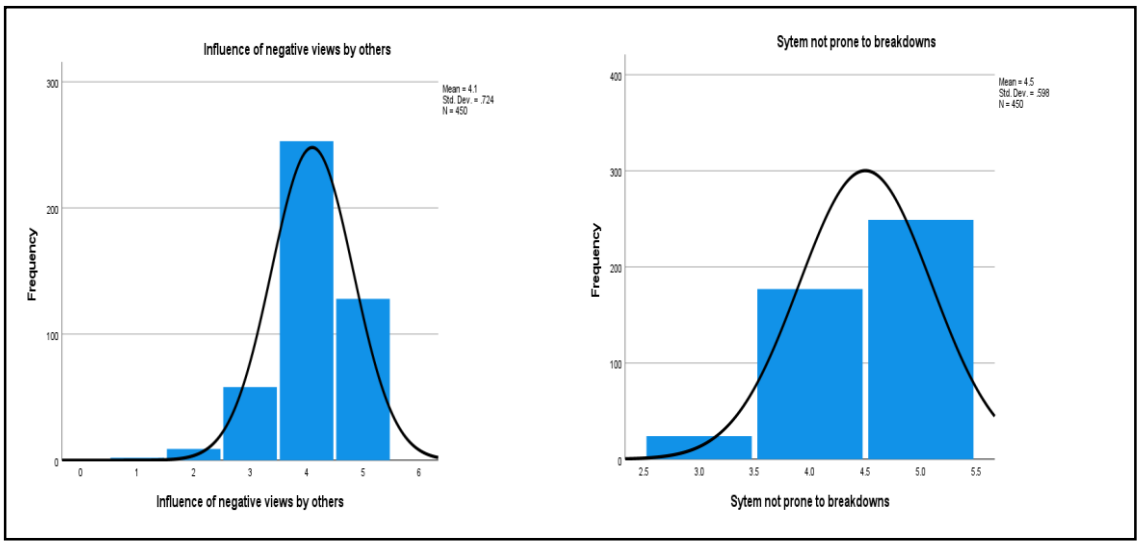
The result presented a normal bell curve with a long left tail, with a high mean of 4.61, with most responses at 66% strongly agreed and 30% agreed.

iii. **Protection of the value of capital deposited**

The result for protection of value presented bell curve with most scores clustered around a high mean of 4.67 towards the right, a low standard deviation of 0.54. High number of respondents at 71.1% selected the strongly agreed option

4.4.4 Consumer Results - Importance of Perceived Risk of the platform

4.4.4.1 Graph Consumer – Measure of solutions Perceived Risk



In order to measure the perceived risk of mobile payment solutions two variables were utilised, namely the influence of negative views by others and how important is it that the system is not prone to breakdowns? The results for the measure of as per *graph 4.4.4.1* are the following:

i. **influence of negative views by others**

The sample responses hads a mean score of 4.1, with a standard deviation of 0.72, and they presented a normal bell curve. In terms of the breakdown of the responses 56.2% respondents agreed to the question and 28% strongly disagreed and 16% were either neutral of in disagreement to varying degrees;

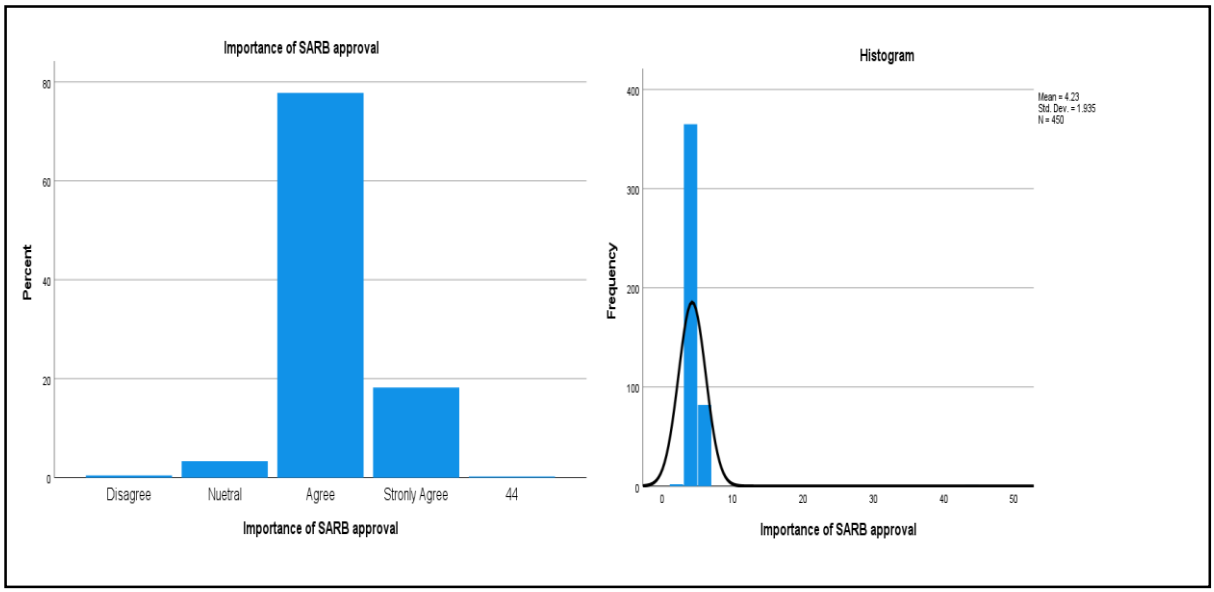
ii. **important that the system is not prone to breakdowns**

In terms of the importance of the system not being prone to breakdowns the results presented a mean score of 4.5 and a standard deviation of 0.59. The highest number

respondents at 55.3% strongly agreed to the question, 39.3% Agreed and 5.3% were neutral. The resultant responses presented a flatter bell curve.

4.4.5 Consumer Results – Important that mobile payments are approved by the SARB/government

4.4.5.1 Graph Consumer – Measure of the importance of Regulatory approval



In order to determine the importance of regulation from the perspective of the consumers, respondents were asked, how important is it that the mobile payment system is approved by the SARB or government. The responses were as follows 78% of the respondents agreed that it is important and 18% strongly agreed to the question. This provided a mean score of 4.23 with a standard deviation of 1.935.

4.5 Conclusion

The findings and results of each of the research processes were presented separately in the preceding sections of this chapter. Both the findings of the qualitative research process and results of the quantitative research process are captured without any interpretation which will be dealt with in the next chapter.

CHAPTER 5: DISCUSSION OF THE RESULTS AND FINDINGS OF THE RESEARCH PROCESS

5.1 Introduction

Covered in this chapter is the analysis of the findings from the both the results of the quantitative and the qualitative and research process guided by the theoretical framework outlined in chapter 2. Responses from the qualitative research process by the different operators were analysed and organised into common themes so as to facilitate the process of making the appropriate conclusive arguments. Of the four mobile payments participants operating in the SA market, three also have active operations in other markets outside SA where they provided a mobile payments platform. This allowed them to provide more colourful perspectives to the research process as their views are not only be limited to the SA context. The output of the Thematic Analysis process, aimed to assess whether the system meets the prescripts, principles and obligations associated with a payment system. The results of the quantitative research process enabled the analysis process to assess both the mobile payments end-user adoption propensity and the mobile payments operator platform deployment effectiveness in driving take-up and usage utilising and take-up, with the theoretical lenses which were theoretical constructs TAM and TOE employed in this process.

5.2 Mobile Payment Operator Views pertaining to Proposition 1

As indicated in Chapter 4 the qualitative research responses were collated into six thematically structured broad groups and in this chapter the aim is to analyse the respective responses by the different participants.

#1 What is your company's view on the relationship between NPS and the growth of mobile payments? Each operator responded as such:

- Operator A, it is important for the **creation of structure** so that different participants to have clearly **articulated rules of engaging the system**;
- Operator B**,** it does **not stifle competition**, the **allows the entrance of new players, not opaque** and is an **enabler for growth**;
- Operator C, it is **pivotal for the development** of any digital payment instrument
- Operator D, it is **informed by** what we can do through our **sponsor bank** lenses, guided by the PASA and NPS prescripts.

When analysed the responses by the different operators, they present no point of commonality with each providing a distinct view, however Operator D's views were almost an outlier as it deferred a lot to the sponsor bank. However, in an attempt to summarise these responses the following theme emerged, **NPS is pivotal for the creation of structure and clearly articulated rules of engagement for the various participants, which should serve as an enabler for growth by not stifling competition and allowing entry of new players in the market.**

#2 How does your company view mobile phone technology and it impact on mobile payments? Each operator responded as such:

- Operator A, it has had a very **transformational capaci**ty;
- Operator B, airtime currency has not been fully utilised to **drive transformative development**;
- Operator C, has the capacity to contribute to the developmental goals of **improving financial inclusion**;
- Operator D, there is great opportunity to **advance financial inclusion leading with payment**s.

All operators acknowledged the potential that mobile phone technology presented in advancing transformation objectives that can greatly advance and democratise financial services through inclusion. The emerging theme from these responses was that **mobile phone technology when fully utilised has the transformational capacity to contribute to the developmental goals of improving societal financial inclusion leading with payments.**

#3 From your company's perspective is there a relationship between payments regulation and the development of a dominant mobile payments model for a country? Each operator responded as such:

- Operator A, in markets with an underdeveloped banking system, **regulation evolved purely from market needs** as there was no established turf to protect;
- Operator B, looking at the **disproportionate growth of mobile money in SA vs outside SA even for communities with similar needs it does indee**d raise questions;
- Operator C, **mobile payments model is indeed influenced by the dominant voice in** the structuring of industry regulations;
- Operator D, a **symbiotic relationship should by all means be acknowledged** by industry players, regulators and market participant alike.

The views expressed by the operators, although at first glance appear distinct, on further observation a common thread was identified or complementary perspectives in their responses to the question was visible. These responses can be summed up into an emerging theme, that is, **the mobile payments regulatory model is influenced by the dominant voice in the market, as such disproportionate growth in SA vs countries with almost similar markets conditions, where regulation evolved purely from market needs as the was no established turf to protect was experienced.**

#4 What is your company's view on the voice of banks in the development of a regulatory framework governing payments in SA? Each operator responded as such:

- Operator A, what the banking industry has **achieved in SA is phenomenal,** however other voices should be given space to **assist in moving the dial** on financial inclusion;
- Operator B, the **voice of the banking industry which owns the payments infrastructure** that is critical for establishing **alternative networks** is significantly loud;
- Operator C, in terms of the **payments infrastructure banks do have an ear of the** policy makers;
- Operator D, the SA banking system is **renowned internationally for is soundness and resilience during** the toughest economic times, **a strength that should be harnessed** for the advancement of the broader society.

Operators do recognise the importance of the role that banks play in the payments sector, but also raised a need for policy makers to incorporate alternative voices in their exploration of alternative policy solutions, another issue that was presented in the responses is that of ownership of the payment infrastructure by banks. Responses were summed up as follows, **what SA's banking system has achieved was phenomenal, and a result the SA banking system was internationally renowned for its soundness and resilience during tough economic times, a strength which should be harnessed to improve financial inclusion.**

#5 In your company's view how best can payments regulation serve as a catalyst that enables all forms of electronic payments incl. mobile payments?

- Operator A, electronic payments **in SA evolved at the back of the cheque and credit card models**. There is merit in allowing **other voices such as MNOs and retailers to inform the transformation journey**;
- Operator B, although **physical cash remains** the most dominant payment method, there exist an **opportunity to exploit prevailing market readiness** that can further be advanced by an **enabling regulatory stance**;
- Operator C, **policy and regulation if correctly utilised** can greatly assist in getting **the country to advance digital payments by allowing new entrants and market enablement**;
- Operator D, enabling more **digital transacting capability** can only **enhance the country's standing from an economic valuation perspective**.

On this question each operator response seems quiet distinct, however some alignment can be drawn from the various perspectives, in that there is acknowledgement that banking solutions have driven progress thus far but an opportunity for further progress exists. The emerging theme was this one, **digital payment in SA evolved at the back of the banking solutions (*cheque and credit card models*), however the use of physical cash remains stubbornly high, correctly utilising policy and regulation presents an opportunity to exploit the prevailing market readiness by allowing new entrants**.

#6 What are the key contributing factors to the lack of adoption of the mobile payment solution you've deployed?

- Operator A, our play has mostly been **limited to remittance transfers,** but other use-cases can be feasible if the **cost to service can be allowed to be more efficient**;

- Operator B**,** our mobile payment solutions must provide **the same level of ubiquity as cash for them to be attractiv**e and rapidly scale-up;
- Operator C**, insufficient investment in the R&D process to get alternative solutions** that will be beneficial to our customers is acknowledged;
- Operator D**,** it is important to in a **very meaningful way surface and address societal** challenges through innovative solutions, however **no silver bullet in** our view exists, but a lot of **small meaningfully coordinated steps** will help to advance society.

On this question, operators do not visibly share a common perspective but a common thread can be noted, that only limited use-cases have thus far been explored and the need for innovation is important. The emergent theme from the operator responses was this, **operator play is mostly limited to remittance transfers, there's been insufficient investment in the R&D process, the same level of ubiquity as cash for alternative innovations to be attractiv**e **and in a meaningful way surface must be achieved, so that solutions must address societal challenges whilst the is acknowledgement that no silver bullet solving the problem.**

Table 5.2 Emerging themes from the qualitative research process.

Emerging themes	
#1	▪ **NPS is pivotal for the creation of structure and clearly articulated rules of engagement for the various participants, which should serve as an enabler for growth by not stifling competition and allowing entry of new players in the market.**
#2	▪ **Mobile phone technology when fully utilised has the transformational capacity to contribute to the developmental goals of improving societal financial inclusion leading with payments**
#3	▪ **The mobile payments regulatory model was influenced by the dominant voice in the market, thus disproportionate growth in SA vs countries with almost similar markets conditions is evident, where regulation evolved purely from market needs as the was no established turf to protect meaningful growth had been noted**
#4	▪ **What SA's banking system had achieved is phenomenal, being internationally renowned for soundness and resilience during very tough economic times, that strength should be harnessed to improve financial inclusion**

#5	▪ **Digital payments in SA evolved at the back of the banking solutions (*cheque and credit card models*), however the use of physical cash remains stubbornly, correctly utilising policy and regulation presents an opportunity to exploit the prevailing market readiness comditions by allowing new entrants**
#6	▪ **Operator play was mostly limited to remittance transfers, there's been insufficient investment in the R&D process, same level of ubiquity as cash for alternatives to be attractive and in a meaningful way surface must be achieved and solutions must address societal challenges whilst the is acknowledgement that no silver bullet exists.**

Based on the emerging themes from the qualitative research a deduction could be inferred that P1: Bank-led mobile payments regulation does inhibit rapid growth and adoption by end-users. Alternative models that allow greater acknowledgement of alternative voices, presented an opportunity for other market players to confidently invest in innovation with an understanding that their returns will be aligned to the investment they make. The regulation should facilitate confidence to investment by new entrants without them fearing that that their voices will be stifled by those wanting to maintain the status-quo. The solution lies in drawing lessons from what has so far been achieved in the advancement of digital payments, an acknowledgement that cash payments remain dominant and that mobile phone technology has achieved a level of market penetration that could not be foreseen a quarter of a century ago.

5.3 Mobile Payment End-user Views pertaining to Hypothesis 2

Two sets of respondent groups namely, merchants and consumers who in the context of this research were representatives of the mobile payments end-user community were each asked to respond to a questionnaire, with a set of questions designed to solicit perspectives specific to each

end-user group. The questionnaires were designed to cover respondents' characteristics in relation to the TAM and TOE theoretical frameworks.

5.3.1 Merchants' Perspective

Merchants had a very unique and dynamic role within a properly functioning mobile payments ecosystem, they are an end-user and a beneficiary of the value provided by the platform on one hand, and on the other hand they should fulfil a role of an enabler of the ecosystem of bringing financial services to the communities that they service, which encompasses undertaking the following responsibilities:

- Technology investor;
- Deposit taking/Withdrawal;
- Customer acquisition; and
- Liquidity provider.

It therefore required that in the assessment of merchants within the ecosystem both functions be effectively analysed. The effects of failure to adequately recognise this unique dynamic were visible in Fiji case referenced earlier in chapter 2, where one of the deterrents to using the platform was the cost associated with the platform, because agents insisted that customer spend some of the funds they wanted to withdraw in-store before being allowed to do a withdrawal. This might have been caused by merchants not being adequately compensated within the ecosystem for their role as enablers of the platform. Where else in the case of M-PESA in Kenya, merchants were recognised for fulfilling the enabler responsibilities and thus were fairly rewarded for their role in the ecosystem and the investment they had to outlay in order to establish their enterprise, the was also covered more succinctly in chapter 2.

To adequately assess the two distinct roles fulfilled by the merchant in driving the effectiveness of the mobile payments ecosystem, the role of merchants as mobile payment end-users was assessed using TAM and for analysing their role as an ecosystem enabler TOE was utilised.

5.3.1.1 Assessing Merchants as mobile payments end-users using TAM

A. Perceived Ease of Use (PEoU)

To assess PEoU, respondents were asked a question, "how important is the ability to easily use the solution in order for them to decide to use it?", to which a combined sum score of 94% was a result for both the agree and strongly agree responses. It therefore can be inferred that an intuitive platform, with easy to use interfacing mechanics as part of the solution was placed very high in the order of important considerations by potential users and therefore it was essential to give that priority when aiming to get a technology innovation to be accepted by the targeted population.

B. Perceived Usefulness (PU)

In order build an analysis of the importance placed by users place in the usefulness delivered by the solution to their needs, the following variables were considered, (i) how important is it that the payment instrument solves social/administrative challenges? (ii) is it important that the platform generates reports of all payments in their various categories? (iii) and is it important for the platform to generate reports of all payments and stock movements?

Results for variable (i) were that 88% of the respondents viewed it is as important based on a summed up score for both the agree and strongly agree options. For variable (ii) the summed up score for the agree and strongly agree was 98%. Similarly, for variable (iii) the summed up score for agree was also 98%.

Based on this result, it could be argued that the use-cases that were to be delivered by the mobile payments solution should address issues that were perceived valuable in terms of solving the user needs in order to deliver a high propensity for adoption.

C. Perceived Risk (PR) and Perceived Trust (PT)

In order to assess the solution's perceived risk and perceived trust the following variables were assessed:

- important that the system were not prone to breakdowns, 96% of the respondents opted for the option agree or strongly agree;
- important that the system regulated by SARB/government; for this variable 96% of the respondents either selected the option agree or strongly agree;

- comfort that that deposits are stored and managed by an entity that is not a bank; this variable 96% of the respondents selected the option agree or strongly agree, which presented a normal bell curve, skewed to the right;
- expectation that the system protects the user from possible fraud, for this variable 92% of the respondents either selected the option agree or strongly agree;
- expectation that the value of deposits is protected, the results for this variable are that 100% of the respondents selected the option agree or strongly agree;
- critical that deposits into mobile money account reflect instantly; for this variable 100% of the respondents selected agree or strongly agree option.

Based on the responses on each of the variables considered, the data for almost all considered variable presented a strong result that is either agree or strongly agree with the lowest scoring variable getting a result of 92% and the scores for the rest of the variables being above the 92%. As a result, an inference could therefore be drawn that by addressing issues associated with risk and trust in terms of the platform or system was of significant importance to merchants as end-users of the platform or ecosystem.

D. Conclusion

It can therefore could be argued that merchants as end-users place a significant importance to the key components TAM, that is, perceived ease of use, perceived usefulness, perceived risk and trust to an almost equal level. Which informs the argument that if the issues relating to the components of TAM were unambiguously and intentionally addressed mobile payments could potentially have a high propensity to be accepted by merchants as end-users.

5.3.1.2 Assessing Merchants as mobile payments ecosystem enablers using TOE

A. Technological Factors

In order to analyse the importance placed by merchant in their decision on whether to invest in a payments solution or not, the variable considered was the importance placed by an enterprise in the knowledge that the system is not prone to breakdowns as a key factor in their decision making process. This considered variable did not address other technological factors such as access to the internet and electricity which were viewed as already standard operational hygiene factors already fulfilled in the SA context for the purpose of this research. The result to the question posed to the sample yielded the following outcome 74% strongly agree, 22% agree and 4% was ambivalent/neutral in their view. From this result where 96% of

the sample responses were in affirmation, it could be inferred that a merchant is likely to deploy a technology solution if it did not present with it complex challenges of intermittent or sporadic breakdowns.

B. Organisational Factors

To assess how merchants, placed the importance of organisational effectiveness as a key influence to their decision to deploy/invest in mobile payments platform, results of the two variables were considered, that is i) the importance of a payment instrument in solving administrative challenges and ii) the importance that the platform is able to generate reports of all payments made in their various categories. Results of the sample responses indicated that for variable (i) 88% of the responses were either agree or strongly agree and for variable (ii) 98% of the responses were either agree or strongly agree. From this result it could be argued that, addressing factors that improve organisational effectiveness was one of the important drivers in the enterprises decision to either invest in or deploy mobile payments platform as an enabler.

C. Environmental Factors

Another set of variables evaluated in this process and related to the importance placed by enterprises on environmental factors considered the following variables i) the extent to which negative views by other users of the system would influence its decision to use the payment solution and ii) the importance to the enterprise that mobile payments are regulated by the SARB. The resultant outcome from the sample responses was as follows for variable (i) 86% of the responses were either agree or strongly and for variable (ii) 96% of the responses were either agree or strongly. As a result of this outcome, it could be inferred that it is important that the early adopters of the platform derive a very positive value as their views will affect and have a bearing in the decision of subsequent investors of the platform. If their views about the platform were negative subsequent investors/deployers of the platform could be listful to do so. The responses to variable (ii) indicated that an established trust between society and the SARB was already in existence and as such an assumption that there was a deferral of any oversight risk to the capabilities that the SARB already has in place could be made. To this effect it could be argued that if the views of earlier adopters of the platform were positive and it was regulated by the SARB there was a strong likelihood by merchants to invest in the platform.

D. Willingness to be an agent of the solution factor

This factor could also be viewed as representing organisational factors that influenced the enterprises decision to deploy a mobile payments solution. Respondents were asked to respond to the following questions (i) if the system works efficiently for you, how willing are you to promote it to other users and (ii) Would you be willing to become a distribution partner of the mobile payment system?

The response to variable (i) indicated the following result 70% agree, 12% strongly agree and 18% hold a neutral stance. This results indicated that a strong summed up view of 82% which a very positive result, however an almost 20% of the response being neutral could be attributed as an indication of the unsureness to become ambassadors of an initiative that could still present challenges.

Responses to variable (ii) gave an interesting set of results 45% agree, 43% neutral, 6% agree and 6% disagree. From this result on a summed view there is an evenly spread level of polarisation with 51% agreeable to be distributors and 49% being ambivalent or disagreeable. In a normal democracy this outcome would pass the mast but in the process of bringing innovation it indicated a strong need to build a sense of trust, inherent value and a convincing value proposition for the community considered as key enablers of the ecosystem to buy into the technology innovation.

E. Conclusion

Based on the responses provided to the key indicating factors that drive adoption in terms of TOE which was based on three heads of this framework technological, organizational, and environmental as key indicators of the technology innovation adoption by enterprises. It could be argued that there was a strong likelihood for the innovation to be adopted by merchants, however initial groundwork in ensuring that your early adopters had a positive experience was pivotal to the success of the take-up. The initial investment in getting the buy-in and support of your merchant community as enablers of the platform who were required to promote it and to get them to become willing distributors of the product to the communities that they service.

5.3.1.3 Conclusion assessing merchants as both enablers and users of the platform

The findings of this part of the research process highlighted the importance of recognising the dual roles that were very distinct, fulfilled by merchants which was that of being payment system enablers as well as being the payment system end-users in their participation within a mobile payments ecosystem. What might not be obvious during the process of cold face execution was the dichotomy that these two roles present, making it necessary that it was a considered requirement in the design of the market structure and the reward or incentive mechanics so as to adequately drive the desired behaviour by merchants of not only adopting but also serving as promoters of the mobile payments system. According to the data, merchants did not naturally or in an overwhelming manner respond positively when asked if they would be willing to promote mobile payments. A country which had dealt more elegantly in their design of M-PESA as referred to in chapter 2, was Kenya which recognised in the business execution strategy the dichotomous role fulfilled by merchants thereby avoiding the two-sided market/chicken-and-egg problem that tends to afflict new payment systems. In the other cases referenced earlier in chapter 2 of this study, especially those that had adopted a bank-led mobile payments model the design of the system had not adequately attended to this structural distinction in the design of mobile payments ecosystem. As a result, the two-sided market effect was evidenced in the performance outcomes, a market feature present in the case of mobile payments in SA.

Significant importance had to also be placed in addressing the needs that deliver the value that merchants could derive in the enhancements of their day-to-day experience relating to cash/payments collection, their ability to build management system that encompassed the movement of the product/service they sell and addressed the risks associated with cash handling or the movement of money, which were all proponents of TAM. This evidence was encompassed in the responses provided by merchants to questions that aimed to either directly or indirectly solicit perspectives on issues of perceived usefulness, perceived ease of use, perceived risk and trust.

It also was of equal importance that in order to avoid the adverse effects brought about by not adequately rewarding merchants for their role as enablers, promoters and markets makers of the system. A role that comes with a lot of responsibility, which is not only limited to a need for upfront capital investment but substantive requirements to convince consumers of the life

improvement effect that an alternative payments value proposition could bring to their lives. This section of the reports equally dealt with TOE proponents with the aim being to build a better understanding of merchants as system enablers and the driving factors of that effect, as it equally dealt with TAM proponents which looked more at merchants as system end-users and what the driving factors of that effect were.

5.3.2 Consumers' Perspective

5.3.2.1 Introduction

The section of the research aimed to provide an analysis of the research results for consumers that was covered in chapter 4 of this report. The structure of the analysis was guided by the theoretical framework TAM which was introduced in chapter 2, and its key proponents, that is, perceived ease of use, perceived usefulness, perceived trust and perceived risk, shall be evaluated from the perspective of the consumers.

5.3.2.2 Perceived Ease of Use (PEoU)

The variable that measured the importance of the easiness to use the platform delivered the following result, a mean of 4.19, standard deviation of 0.7, a normal but a bit flat bell curve. The results for strongly agree were 46.7% and 36.2% for agree, providing 83% as a sum for agree. From this result it could be argued that consumers placed some importance to the level of easy navigation and intuitiveness of the mobile payments platform, as a factor that would drive their attraction to using it as a payment mechanism of choice.

5.3.2.3 Perceived Usefulness (PU)

To measure PU response results for variables, i) solves social/administrative challenges – statistical with mean of 3.97, a normal bell curve with a flat long tail on the left as most scores were around mean, with 87% of the respondents choosing either agree or strongly agree options, and ii) for the importance of report generation, the mean was 4.12, also presenting in a normal bell curve with a long tail on the left, and an overwhelming response for agree 94% (*76% Agree; 18% Strongly Agree*). From this result it could be inferred that the mobile payments solution must deliver functionality that is considered useful to the potential users in order for it to be deemed a sufficiently attractive lifestyle or payment mechanism of choice.

5.3.2.4 Perceived Trust (PT)

To measure the importance of PT by the consumers as end-users the variables i) level of comfort with deposits being managed by a non-bank, ii) protection from fraud, iii) possible erosion of capital value and iv) importance of SARB managing the platform. For each of these variables the lowest score for a summed up accept or strongly accept is 80%, with variable i) at 80%, variable ii) at 96% and variable iii) at 96% variable iv) at 96%. All variables also present a mean of at least 4 which is very high for a 5-point scale an indication that the respondents opted for the agree or strongly agree option in most instances. Based on this result it can be inferred that PT is placed very high in the order of significance that the instrument must deliver on, in order for the consumers to accept it and willingly adopt it as a useful innovation and an alternative payment instrument they choose as a standard.

5.3.2.5 Perceived Risk (PR)

The measurement of PR is derived from the variables the two variables, namely i) the influence of negative views by others and ii) how important is it that the system is not prone to breakdowns? The summed up score for agree or strongly agree are 84% and 95% respectively. Based on the results from these responses it can be concluded that consumers prioritise risk protection when they do indeed decide to use any payment instrument. The PR measuring variables are to be looked at in collaboration with PT measuring variables, once the risk is eliminated or reduced from the payment system the level of trust should be easy to attain. However, it is not the intention of this research to do an in depth study of this correlation.

5.3.2.6 Conclusion

The evaluation of the results from the sampled consumers who were randomly selected within the various communities of Mogale City, provided a strong argument, that the evaluated components of TAM were considered very important by this group, in determining whether to use or not to use a payment instrument. The variables measuring both PR and PT it could argued that they were also talking to the components proposed by UCC which were introduced in chapter 2, for which these components were designed to ensure that various participants had clearly defined and articulated mandates and responsibilities when a transaction is executed within a non-cash based payment system, which in most cases is facilitated by third parties necessitating the importance of eliminating ambiguity regarding responsibilities within a payment system.

5.4 Conclusion Mobile Payment End-user Views pertaining to Hypothesis 2

The sample results of the variables that measure PU and PEoU proponents of TAM directly talk to H2: The simplicity of the service components of technology innovation drive high adoption rates by end-users. The other proponents of TAM namely PT and PR relate more to the adoption drivers and the customer experience components, therefore are more ancillary to the H2 question but they are very critical in ensuring that the technology innovation not only delivers the expected customer promise of safety with in-built risk control mechanics that addresses execution mandates of parties transacting in mobile money as proposed in the UCC legal framework.

The importance placed by the sample group on the PU and PEoU supported the assumption build into H2 and presented a strong correlation that simplicity of the technology innovation does indeed, drive high adoption rates of technology innovation. This view also seemed to be in alignment with that which is referred to in chapter 2 in reference to the SA mobile payments case, where it referred to the push and pull factors relating to the transition to cash to digital payments. The classification of these factors which could also be viewed as adoption drivers were structured such that negative factors push people away from using technology innovation whilst positive factors reinforce and pull people to the technology innovation. These measured proponents of TAM especially PU and PEoU could be viewed as positive factors which meticulously presented a strong correlation to the assumption build into H2. In the case of India that was referenced to in chapter2, the transition to demonetisation resulting from the banknote crisis of 2017/18 served as a catalyst for the change experienced in the payments landscape of that country, it is recognised in the literature that newer features in the digital payments domain should emerge for the transition to be sustained within the country's financial ecosystem.

5.5 Aligning the P1 evaluation and H2 hypothesis results

The results of the research process presented an outcome that support both P1 evaluation and H2 hypothesis. Where in P1: Bank-led mobile payments regulation does inhibit rapid growth and adoption by end-users and H2: The simplicity of the service components of technology drive high adoption rates by end-users.

The affirmation of both the proposition and hypothesis highlights an inherent structural deficiency in the bank-led mobile payments regulatory regime, which according to some responses from the operators interviewed as part of the qualitative research process brought to the fore a fact that mobile payments had largely delivered the remittance transfer use-case but very limited research and development work had at the time of the research been undertaken in order to effectively deliver other use-cases that address other societal challenges in relation to transitioning from cash payments. The under-funding in product development and possibly even in the distribution capacity of the ecosystem by operators, who in the absence of an enabling structural framework possibly would find it difficult to justify the investment to their shareholder representatives when returns remain elusive now and in the foreseeable future. It is important to recognise that any major capital investment project undertaken by operators would naturally undergo a very stringent and rigorous process that must at least be based on sound assumptions with a promise to deliver an economic return for the capital invested. It was acknowledged that in the form that the business case for mobile payments was framed at the study is conducted, it would be a very tough ask to get the capital approved by the shareholder representatives who are mandated to approve such decisions based on the quantum of investment required. Similarly, without a properly defined role for merchants as well as continuous investment in the R&D of the product that end-users interact with, rapid product adoption will remain an elusive objective.

There is a need reorganise the structural framework of the mobile payments ecosystem in order to unlock the potential value it holds for the economy, through delivering at the very least a promise of a sound returns for operators, merchants as enablers as well as improving the lives of the end-user by simplifying their interaction with payments which is a key requirement to drive technology adoption.

CHAPTER 6. CONCLUSIONS AND RECOMMENDATIONS

6.1 Introduction

The first research question aimed to develop an understanding of how regulation influences the ability for a mobile payments deployment to achieve scale in the market within which it is launched. Where else the second research question aimed to develop an understanding of what drives end-users to adopt technology innovation which in the case of this study, is mobile payments.

The findings of this research highlighted a need to re-evaluate the regulatory framework for mobile payments in the SA context, as evidenced in the emerging themes captured in chapter 5, with the emerging **theme #1** in summary highlighting "the importance of the NPS to create a structure and clearly articulated rules of engagement by the various participants, which would serve as an enabler for growth by not stifling competition and allowing entry of new players in the market". The structure in terms of NPS as a policy was normally articulated through a regulatory framework as referenced in chapter 2, which is a guide of how the various participants of a payment system interact, through clearly defined rules of engagement by the various participants so as to ensure that it creates a conducive environment that allows all the market players a fair opportunity to thrive. Emerging **theme #3**, The mobile payments regulatory model was at the time of the study said to be influenced by the voice of existing players, who were mostly banks in the SA market, thus disproportionate growth in SA vs countries with similar market conditions was evident, where regulation in those markets contrary to SA evolved purely from market needs as the was no established turf to protect, meaningful growth had been noted. Theme #3 highlighted the importance of regulation in facilitating the viability of new players to enter the market, enabled by regulation that addresses a market need vs being informed by the structure of a particular industry.

In a similar fashion the research brought to the fore a need to give proper treatment and recognition to the value that merchants bring into the mobile payments ecosystem which is not only confined to just being end-users of the product but a critical market enabler by bringing a service distribution as well as a customer acquisition responsibility. The role of merchants as enablers is quite evident in the Kenyan M-PESA case, where taking up a merchant role carries with it an upfront requirement in the form of equity in order to fund the BEM they hold with the operator so as to be able trade in mobile money and facilitate the ability to swap it for cash.

6.2 First research question conclusions

The first research question, aimed to develop an understanding of how regulation influences the ability for mobile payment deployments to achieve scale in the markets within which it operates.

To recap what was outlined in chapter 2, in the SA context, participating in the transacting of electronic money, unless conducted within the infrastructure provided by banks it is deemed illegal in that it contravenes both the Banks Act (*requires any entity that holds public deposits for a period longer that 24-hours to be registered as a bank*) and the NPS Act (*prescribes mandates for the various payment system participants*). Furthermore, the 2009 NPS Act Position Paper pronounced that only a registered SA Bank may trade or issue electronic money (*mobile money falls within this class*), as such non-banks must enter into a sponsoring arrangement with a bank in order to participate within this market.

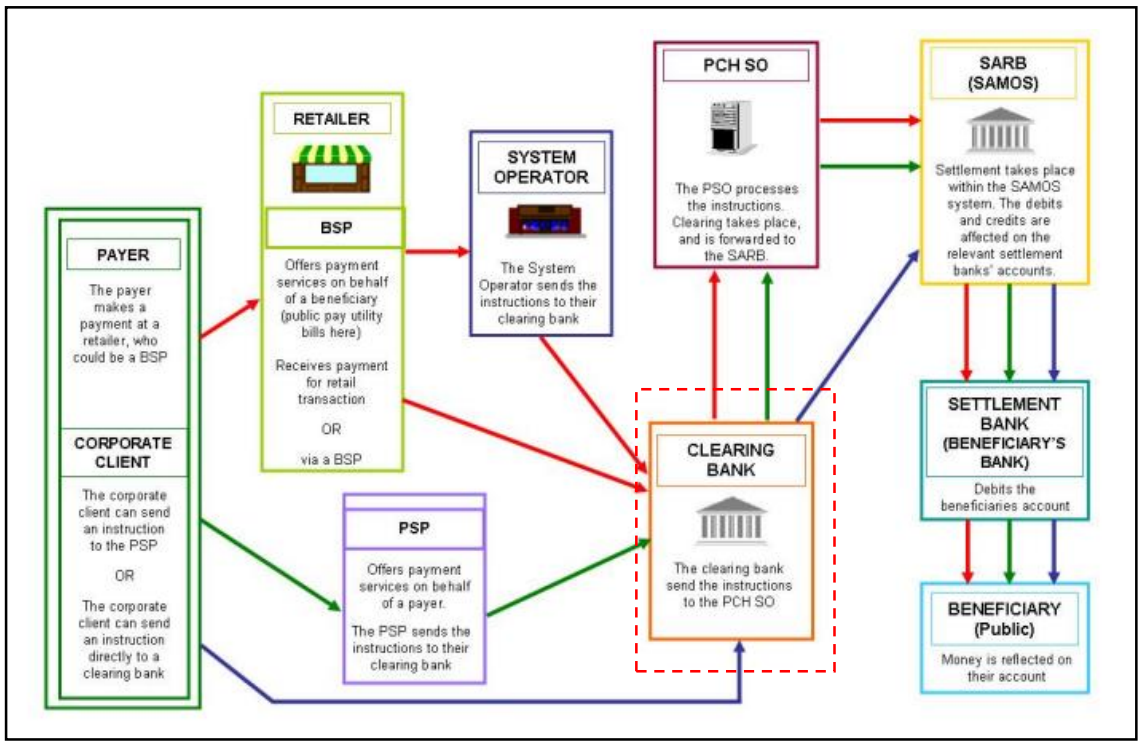
Fig 6.2.1 provides a summarised view of the current legal foundation of the payment system in SA.

Fig 6.2.1 Current legal foundation of the payment system in SA



The SA regulatory framework for mobile payments at the time of the study had a short-coming, by classifying mobile money as electronic money as referenced to in chapter 2 and could only be issued by banks, thus any entity or persons transacting in this instrument could only do so under the auspices of a bank, as such the clearing and settlement of this instrument could only happen within a bank structure from a legal framework perspective. This constraint whether intentional or accidental could possibly be resolved by treating mobile money as a unique financial instrument in the same way it does with electronic money, and similar financial instruments. This short-coming in the current set-up then permeates throughout the payments framework that is facilitated by the NPS Act. It then was even more pronounced at the payments clearing level as it created an unintended deficiency of creating an extra tier which limits the interoperability and ubiquitioness of mobile money as a payment instrument. Because the payment instrument can only be cleared by the sponsoring bank, it creates a deficiency that renders each operator's ecosystem a closed loop as inter-clearance amongst the various mobile payments offerings is not possible.

F*ig 6.2.2 SA Payments and Settlement Infrastructure*



To unlock the constraints inherent in the incumbent payments framework, required the reconsideration of two areas within the current legal and regulatory framework. First being the review of the deposit taking responsibilities and mandates currently limited to banks and consider introducing a possible alternative model where a deposit taking licence for the purpose of facilitating mobile money is introduced, with clearly prescribed mandates that would possibly limit the unintended risk to the economy by placing restrictions in terms of which financial instruments the licence holder is to invest the deposits in order to limit the associated risk. This different type of deposit taking licence would potentially allow non-banks to enter this space provided that they are able to fulfil all the prescribed licence requirements. The second area that required a review was the clearing house layer which should allow operators who were non-banks to be able to participate in the clearing of mobile money as a financial instrument.

Deposit taking institutions in the period around when the study was undertaken increased the share of non-traditional revenue in their total income, and this change in business models is a global phenomenon. Traditional revenues often referred to as the net interest margin (NIM), which is the ratio of net interest income to the interest earning assets or net interest profitability. A key motivation behind the dilution and diversification to non-traditional business activities was that in a highly concentrated banking systems, it helped reduce the volatility of profits and also increase banks stability (Saksonova, 2014).

Traditionally the business of banking was about generating income from the margin that banks generate when they on-lend money from deposits to third parties if put simply, although in practice it is more complex than that. Progressively banks were generating income from alternative streams and payments facilitation ws a low hanging fruit as banks were custodians of customer deposits. However, the reach of the infrastructure created by banks is nowhere near that which has been created by MNOs in terms of market access.

With the introduction of the selling of pre-paid airtime by MNOs the discipline to manage, account and report on pre-aid airtime balances has developed in these institutions over two decades. Pre-paid airtime is treated as a liability on the MNO's balance sheet in manner almost similar to how a bank would treat a deposit, and only when it gets to be used, does it get recognised as revenue on the income statement. It will off-course require developing a more appropriate regulatory regime for MNOs to be licenced as deposit-takers of mobile money but the discipline and lessons from managing pre-paid airtime should enable the ground to be covered quiet rapidly (Theron,2011).

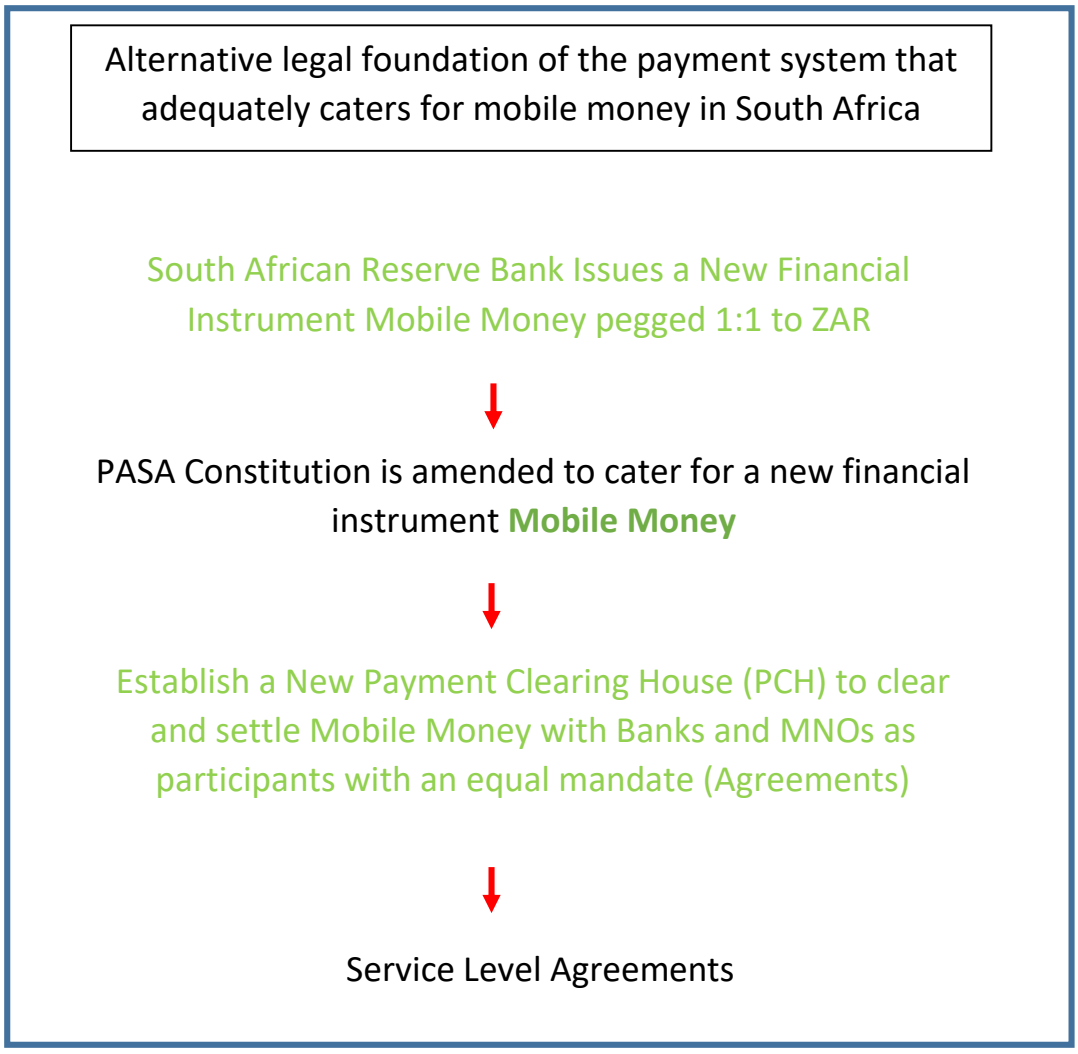
MNOs already operate within an environment where there is interconnection which is the physical and logical linking of telecommunications systems in order to enable any user of one network to communicate with a user of another network. This involves the leasing of facilities by an

Electronic Communications Network Service (ECNS) licensee to other licensee or persons exempt from requiring a licence, in order to provide services to end-users. Interconnection and Facilities Leasing Regulations principles inform the commercial agreements of parties seeking to interconnect or lease facilities (Theron, 2011). The regulations provide a framework for the negotiation of interconnection or facilities leasing agreements. This had become an essential requirement for a very competitive sector. The interconnection commercial agreements facilitated how inter-use of the ECNS licensee (which MNOs are) facilities was reported, accounted for and the payment and settlement for the use of each other's facilities was conducted (Theron, 2011). This already had features similar to a clearing house structure, however, further work might indeed need to be undertaken in order to bring MNOs interconnection agreements to the same level and rigour of a payments clearing house.

Based on the commonalities that exist within these parallel structures the banking enabled national payments infrastructure and the operations of MNOs that facilitate the interconnection infrastructure, as well as the handling and managing of pre-paid airtime also having commonalities to a certain extent with the management of bank deposits, an opportunity to explore a hybrid model that allows banks and MNOs to on an equal footing participate in an alternative mobile payment infrastructure that eliminates deficiencies with the current payments infrastructure for mobile money exists.

Features of an alternative mobile payments infrastructure are outlined in Fig 6.2.3

Fig 6.2.3 Alternative legal foundation for a mobile payment system



The SARB issues a new bond(s) to provide liquidity for this new financial instrument called mobile money, and allows all mobile money deposit-taking licensees (banks, MNOs or other operators) to participate in the bond(s) auction as market makers. A register of issued capital is held by a new central mobile money register or gets recorded by the monetary policy authority as money supply. Mobile money deposit-taking licensees become issuers of this instrument in the market. The role of a mobile money issuer would encompass a set of new requirements which will include:

- Holding a sub-register of mobile money deposits held by end-users (merchants and consumers);

- Cultivating a distribution network that facilitates the trading in mobile which allows for conversion of cash into mobile money and vice-versa;
- Development of products and use-cases that will drive the competitive use of mobile within the economy;
- Oversight and/or fulfilment of the compliance and risk function in terms of vetting the end-users dealing/trading in the instrument; and
- Participate in the inter-operator clearing and settlement process as members of a PCH.

The PASA constitution should be amended to accommodate a new settlement window so that it allows for the inter-trade position clearing and settlement of mobile money by operators. A new payments clearing and settlement body should be established comprising of operators from both the banking and telecoms industries who are issuers of mobile money as well as representatives of regulatory authorities. A consideration to define a set of new inter-operator clearing and settlement rules should be made, taking into account the peculiarities associated with trading in mobile money. Lastly operational service level arrangements between operating participants should be considered and an agreement and the formalisation into service level agreements, should form part of these considerations.

Establishing a new legal framework for facilitating the trading and exchanging in mobile money would serve as a key and necessary building block towards driving an improved mobile payment adoption trajectory.

6.3 Second research question conclusions

The objective of the second research question is to develop an understanding of what drives end-users (merchants/consumers) to adopt technology innovation specifically as it relates to mobile money.

As alluded to in chapter 2, in accordance with the SA payments framework, non-banks wanting to enter the mobile money space can only do so through a sponsoring bank, which creates a very complex and operationally limiting arrangement. These mobile payment deployments are closed-loop ecosystems where transacting by end-users affiliated to different mobile money operators is impossible. As a result, both the subscription and transacting volumes of mobile payments have been very low, making mobile money deployments a very non-viable investment case for those that deploy the platform and those who should serve as enablers to the market. Some of the operators interviewed for the qualitative research portion of this report have indicated that remittance transfers have been the only use-case showing some form of viability and promise, they also indicated a low appetite to further invest in product research and development.

The quantitative research portion of this study highlighted that merchant participation in the mobile ecosystem is still not properly defined thus creating a confused dynamic where merchants are regarded as enablers but not adequately compensated for that role, a problem exacerbated by low transacting volumes. Most of the mobile payment deployments have limited functionality enabled, as such have an inherent constraint in delivering the aspired to product acceptance levels contribute to poor customer adoption, falling way short of the necessary adoption threshold as articulated through the components of TAM. SA mobile payment deployments have been less impactful in driving financial inclusion when compared to peer countries.

The research process guided by TOE and TAM has successfully aided the discovery process of the root-cause of this low adoption rate drivers which emanate from the inefficient, constrained and non-interoperable structure of the mobile payment deployments at this stage.

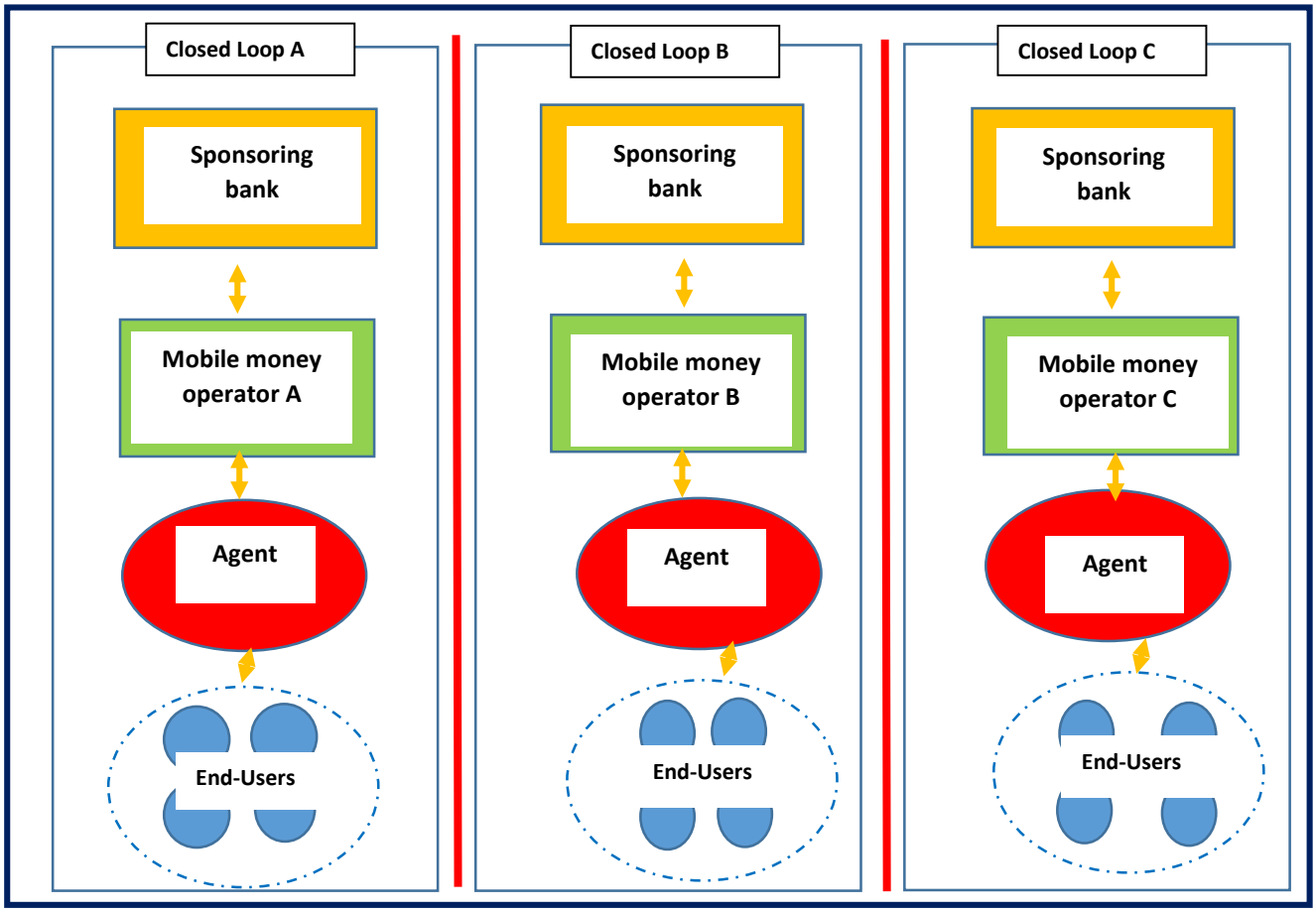
Fig 6.3.1 Depicts the current set-up of mobile deployments wherein each deployment is a closed-loop, transacting across the deployments totally impossible as there are virtual Chinese walls prohibiting/disabling interoperability. As a result, the mobile money used in this set-up is not ubiquitous across all deployments and must first be converted to cash or cash equivalent before entering a different close-loop ecosystem. The current structure of mobile payment has the following characteristics:

- Each deployment operates as a closed-loop eco-system; cross eco-systems clearance is non-attainable;
- End-users can only transact with agents or other end-users within affiliated mobile money solution;

- Each operator must independently establish an arrangement with a sponsoring bank; and
- The sponsoring bank hold and aggregate account for the operator and sub-accounts for the end-users.

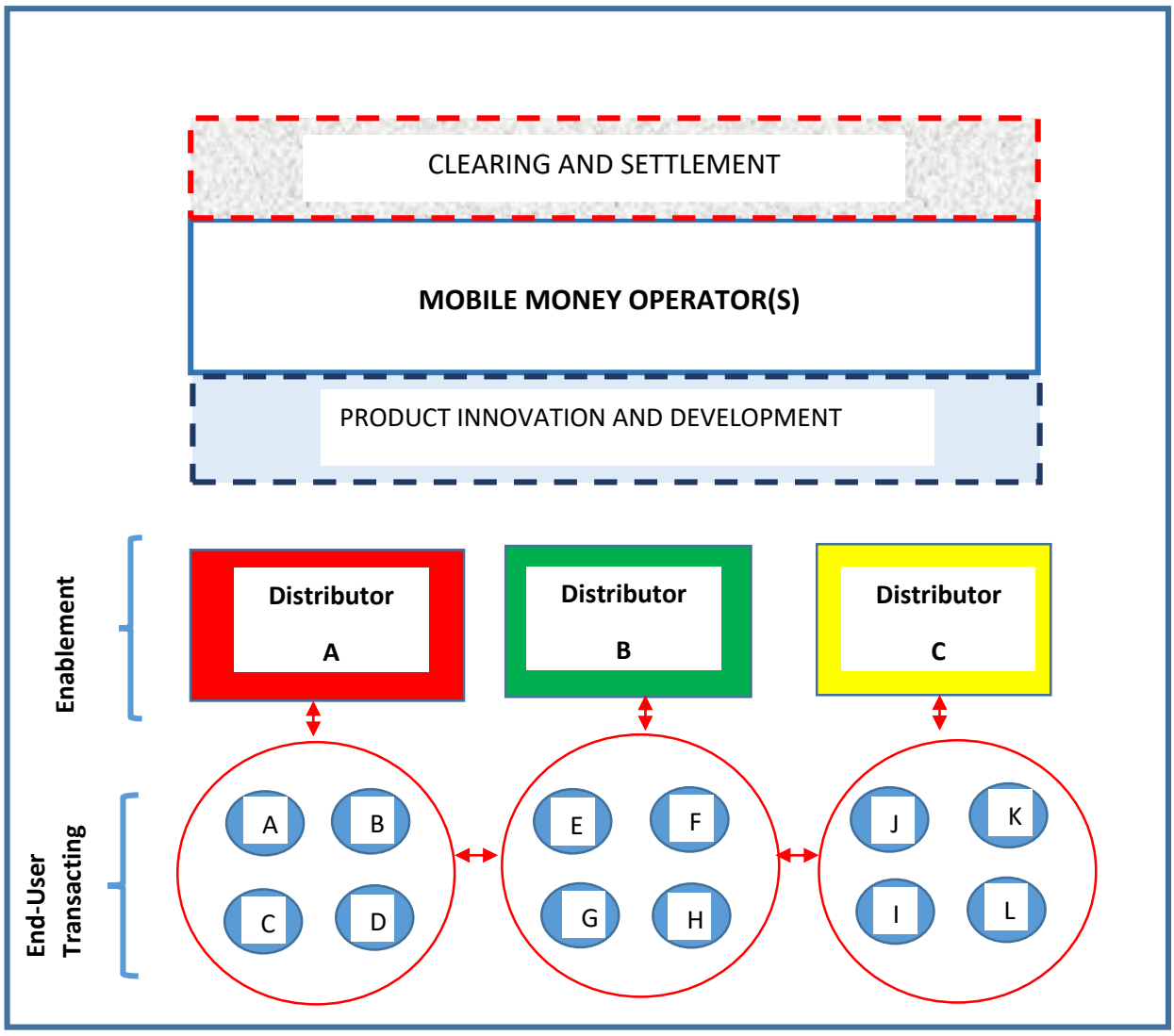
In a country like SA where banking payment rails have evolved to facilitate interbank clearance, absence of interoperability is an innovation that belongs to the stone-age and cannot serve as a building block to further advance innovative developments that can aid in driving the aspired to adoption rates required, to at a rapid scale transition cash to mobile payments.

Fig 6.3.1 Structure of current mobile money deployments



An alternative market interfacing mobile payments structure that is built on the foundation created by the alternative legal and regulatory framework as proposed in section 6.3.1, which recommends the issuing of a new digital financial instrument mobile money, a clearing and settlement structure that accommodates cross-industry participants (banks and MNOs). Such a development will also facilitate the development of market enabler layer which could be resourced and managed by the retail sector.

Fig 6.3.2 Alternative market-interfacing structure for mobile payments



An alternative market interface structure creates a capacity to draw both from the developmental experiences of the banking sector and the most recently achieved unprecedented and almost universal mobile phone penetration by MNOs. With a continued expectation that data prices would come down, political-will is a necessary ingredient that will foster concerted collaboration across industries, to adopt and implement the proposed adjustments to the legal framework and payments foundation, in a manner that facilitates interoperability, clarity of market structure, the clarity in the role players' participation responsibilities and provides a conducive environment for the investment in product development, not only addresses but resolves those factors that make cash remain a dominant payment instrument.

The proposed alternative structure as depicted in Fig6.3.2 aims to address constraints in the current mobile payments framework by addressing the following manner:

characteristics:

- All mobile money operators become licenced issuers of the financial instrument mobile money;
- A new PCH is established where all mobile operators are participants to facilitate counter clearing and settlement amongst members;
- Mobile payment operators differentiate themselves in the market through innovate product development and distribution capabilities;
- A distribution network that enables expanded market reach is allowed to develop based on a response to market dynamics;
- Each distributor acquires customers on behalf of their affiliate operator; and
- At a transacting level end-users are able to transact through any mobile payments channel in the eco-system irrespective of the operator they are affiliated to.

Both P1 and H2 have served to highlight constraints in the current bank-led mobile payments regime, but the study has also not directed the solution seeking process in the direction of the MNO-led mobile payments regime. It instead points towards a collaborated hybrid model drawing on the strengths of both industries (banking and telco) to drive towards a more harmonised mobile payments model that will ultimately deliver improved levels of societal financial inclusion as an ultimate goal.

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ANNEXURE A

QUESTIONNAIRE

Quantitative Research - Questionnaires

3.1.1 Consumer demographic questions

i. What is your age?
ii. What is your level of education?
iii. Where do you reside?
iv. What influences your choice of payment method? (1. Convenience; 2. Generally Accepted; 3. Safety)
v. Would you be willing to use mobile money as a payment method for buying goods and services? (1. Yes;2No)

3.1.2 Merchant demographic questions

i. For how long has this enterprise been in existence?
ii. What is your enterprise's average turnover per day?
iii. Does your enterprise accept both and electronic payments in exchange of goods/services? (1. Yes; 2. No)
vi. What influences your enterprise's decision to accept cash or electronic payments? (1. Convenience; 2. Generally Accepted; 3. Safety)
iv. Would you be willing to accept mobile money for the payments of goods and services? (1. Yes; 2. No)

3.1.3 Consumer and Merchant mobile payments adoption decision-making process, assessment questions

i. On a scale of 1-5, how important is it that the payment instrument solves social/administrative challenges in you deciding to use a payments solution?
ii. On a scale of 1-5, is it important for the platform to generate reports of all payments made various category?
iii. On a scale of 1-5, how important is it that the ease of use in you deciding to use a payments solution?
iv. On a scale of 1-5, how important is it for you to you as a user to use the platform for a period before fully signing-up for a long-term commitment?
v. On a scale of 1-5, how important is it for you trial the payments solution before deciding to use it?
vi. On a scale of 1-5, to what extent would the negative views by other users of the system influence your decision to use a payment solution?
vii. On a scale of 1-5, how important to your decision on using payments solution is knowing that the system is not prone to breakdowns?

viii. On a scale of 1-5, If the system works efficiently for you, how willing will you be to promote it to other users?

3.1.4 Merchants – Regulatory and other adoption drivers

i. On a scale of 1-5, how important to you for mobile payments to be regulated by SARB/government?
ii. On a scale of 1-5, is it important for the platform to generate reports of all payments and stock movements?
iii. On a scale of 1-5, how important is it that the ease of use in you deciding to use a payments solution
iv. On a scale of 1-5, How comfortable are that your deposits are stored and managed by an entity that is not a bank?
v. On a scale of 1-5, Would you expect the mobile payments system to protect you from the risk of possible fraud?
vi. On a scale of 1-5, Would you expect the value of your deposits to be protected (eg. from fluctuations associated with forex) at all times?
vii. On a scale of 1-5, Is it critical that deposits/payments made into your mobile money account to reflect instantly?
viii. On a scale of 1 -5, Do you expect your suppliers to accept payment from your business using mobile payments as a solution?
ix. On a scale of 1-5, Do expect your employees to accept their salaries/wages into their mobile money accounts.
x. On a scale of 1-5, How important is it that mobile payments cost less than the traditional electronic payments?
xi. On a scale of 1-5, Would you be willing to become a distribution partner for the mobile payment system? (allow customers to deposit or withdraw cash from your enterprise)

3.1.5 Consumers – Regulatory and other adoption drivers

i. On a scale of 1-5, How important to you that mobile payments are approved by the SARB/government?
ii. On scale of 1- 5, Would you expect mobile payments are regulated in manner similar to banks if not provided by banks?
iii. On scale of 1-5, Are you comfortable that deposits are stored and managed by an entity that is not a bank?
iv. On a scale of -5, Do you expect this system to protect you from the risk of any possible fraud?
v. On a scale of 1-5, Do you expect the value of your money to be protected (eg. from fluctuations associated with forex) at all times?
vi. On a scale of 1-5, Do you expect payments/deposits made into your account to reflect instantly?
vii. On a scale of 1-5, Would you expect the system to allow you to make payments electronically to another users account?
viii. On a scale of 1-5, Is it important for you to be able to withdraw money in a form of cash? Yes
ix. On a scale of 1-5, Do you expect the cost of mobile payments to be cheaper when compared to other electronic payments?

x. On a scale of 1-5, Would you be comfortable with an exclusively online customer on-boarding process that utilises only your phone?

ANNEXURE B

INTERVIEWS WITH INSTITUTIONS THAT DEPLOYED MOBILE PAYMENTS

Semi-structured interview questions guide:

a. What is your company's view on the relationship between the national payments systems and the growth of mobile payments?
b. How does your company view mobile phone technology and its impact on mobile payments?
c. From your company's perspective/experience is there a relationship between payments regulation and the development of a dominant mobile payments model for a country or is it is participants that determine their model of preference?
d. What is your company's view on the voice of banks in the development the regulatory framework governing mobile payments for SA?
e. In your company's view how best can payments regulation serve as a catalyst to enable the growth of all forms of electronic payments including mobile payments?
f. What has been/ What been the key contributing factors to the lack of adoption of your mobile deployment?