A CONCEPTUAL FRAMEWORK FOR THE SOUTH AFRICAN FINTECH ECOSYSTEM

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ABSTRACT

The term ‘ecosystem’ is synonymous with multi-company dynamic teamwork and a new way of organised economic activities. It is thus important to understand the modes of interaction among the heterogeneous actors in the ecosystem.

Financial Technology (FinTech) became prominent after the financial crisis when the financial industry's role in economic growth became a global concern. Many FinTech companies were established by bankers who found themselves unemployed after the financial crisis and found creative ways to use their skills in financial services. The purpose of FinTech companies in the economy became pre-eminent due to their ability to reduce economic risks and costs through innovation. It also became clear that FinTech would benefit the financial system due to its efficiency in addressing transaction costs, information asymmetry and in addressing issues of taxation. No market player can afford to operate in a silo in the digital age, as collaboration and partnerships are more critical than ever. According to the IMF website (2020), South Africa is a dual economy and has one of the highest inequality levels worldwide.

According to a Business Technology article published in 2019, there is still an untapped consumer opportunity, as there are nearly 1.2 billion people globally who do not have bank accounts. South Africa has a large unbanked or underbanked population, estimated to be about 11 million people. A healthy FinTech ecosystem will develop in South Africa if there is an improvement on barriers to entry and a better understanding of the consumer.

The study aimed to establish whether the existing FinTech ecosystem models are suitable for the South African context and identify any discrepancies and similarities between developed and developing world FinTech ecosystem models.

Qualitative research in the form of semi-structured interviews was conducted. The sample included 12 executives from South Africa who represented entrepreneurs and start-ups, policymakers and financial institutions. The sampling technique was purposive in nature, and it was chosen because of its convenience.

The study found that an additional function of funding must be explicitly specified as a government role in the South African context. In addition, the study revealed that in the South African sense, customers must be segmented further to include the unbanked and underbanked market. There is no existing FinTech ecosystem model for South Africa, and this study has developed a model that suits developing countries, specifically South Africa. Finally, the study

uncovered that incubation and mentorship are essential components of the FinTech ecosystem in South Africa.

The study will assist policymakers and other FinTech ecosystem players to gain a better understanding of their roles and how they can contribute and collaborate to make the FinTech ecosystem a success. The study will also aid policymakers and FinTech companies to focus on consumers and help policymakers consider some of the frustrations that participants have raised about policies. It will further assist them in FinTech policy formulation and amendment of the existing or the creation of new policies and legislation.

Key words: Financial technology, FinTech ecosystems, FinTech ecosystem models, FinTech stakeholders, developed and developing world, incubation, segmentation of customers, funding and coordination.

DECLARATION

I, Vuyelwa Masangwana, declare that this research report is my own work except as indicated in the references and acknowledgements. It is submitted in partial fulfilment of the requirements for the degree of Master of Management in the field of Digital Business at the University of the Witwatersrand, Johannesburg. It has not been submitted before for any degree or examination at this or any other university.

Name: Vuyelwa Masangwana

Signature:

Place: Signed at Wits Business School

Date: On the 25th day of April 2021

DEDICATION

Grace Masangwana, my late grandmother, your love for me and what is best for me is immeasurable. Thank you for instilling in me a passion for learning. To my mother in law Victoria Liamiso Kahla, I know you would be super proud of this achievement.

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LIST OF ACRONYMS AND ABBREVIATIONS

ACRONYM	DESCRIPTION
API	Application Programming Interface
ATM	Automated Teller Machines
CIPC	Companies and Intellectual Property Commission
CGAP	Consultative Group to Assist the Poor
DLTs	Distributed Ledger Technologies
FinTech	Financial Technology
GCC	Gulf Co-operation Countries
ICT	Information Communication Technology
IPO	Initial Public Offering
IT	Information Technology
KYC	Know Your Customer
KYC-AML	Know Your Customer – Anti Money Laundering
LSM	Living Standards Measure
MENA	Middle East and North Africa
MNO	Mobile Network Operators
SA	South Africa
SARB	South African Reserve Bank
SME	Small- to Medium-sized Enterprise
VAT	Value Added Tax
VC	Venture Capital

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CHAPTER 1: INTRODUCTION

1.1 PURPOSE OF STUDY

The purpose of the research was to examine the suitability of the existing financial technology (FinTech) ecosystem models in the South African context and the differences between the FinTech ecosystem models in the developed and developing world.

1.2 CONTEXT OF STUDY

FinTech is defined as an industry of financial technology-based businesses that collaborate with technology experts, governments, industry leaders, and research institutions (Tan et al., 2017). After the financial crisis of 2008, there was a surge in FinTech companies as many people in the financial services sector who were retrenched, identified gaps in the industry. Many FinTech companies were driven by bankers who had found themselves unemployed post the financial crisis and found creative ways to use their financial services skills (Hornuf, 2016).

Following the financial crisis, the financial industry's role in economic growth became a global concern (Olanrewaju, 2016). The purpose of FinTech companies in the economy became very prominent due to their ability to reduce economic risks and costs through innovation. It also became clear that FinTech would benefit the financial system due to its efficiency in addressing transaction costs, information asymmetry and in addressing issues of taxation (Alt & Puschmann, 2012). Millennials, in particular, have contributed to the growth of FinTech as they demand convenient access and cost-efficiency in the way they manage their finances.

Partnerships are created through an interdependent ecosystem, which draws on experience, expertise and technology. For a FinTech ecosystem to be thriving, all its participants or players need to engage, share ideas and connect across various areas to identify business opportunities and convert them into a business. In the digital age, no market player can afford to operate in a silo, as collaboration and partnerships are more critical than ever (Alt & Puschmann, 2012).

Therefore, it was also necessary to highlight which players in the FinTech ecosystem promote and which areas constrain the FinTech ecosystem. The research used the Lee and Shin (2018) FinTech ecosystem to look at the five role players in the ecosystem and their responsibilities. It is vital to examine each country’s ecosystem to understand FinTech’s ecosystems in developing and developed countries (Lee & Shin, 2018). According to Lee and Shin (2018), the FinTech ecosystem comprises five key players: government, a FinTech start-up, traditional banks, financial customers, and technology developers. Lee and Shin (2018) define FinTech as

including innovative companies that operate in payments, insurance, financial management, loans and capital markets, which have low operating costs and provide more personalised services than those offered by traditional financial institutions. They argued that the government has a significant role to play in establishing a FinTech ecosystem since it is the regulator of the sectors in which FinTech start-ups operate (Lee & Shin, 2018). This study, however, focused on the FinTech ecosystem and the proposed adoption of the conceptual framework for the South African context.

The Lee and Shin (2018) ecosystem lists the various role players and what they are responsible for in the FinTech ecosystem. Lee and Shin (2018) highlight two types of financial customer, the individual and the organisational customer; they also highlight different funders, such as a venture capitalist, private equity and banks. This area was examined specifically in South Africa, as it appears from the research conducted that there is funding available, but information asymmetry is created by the legacy of South Africa (Haddad & Hornuf, 2019).

1.3 RESEARCH PROBLEM

According to Skan et al. (2016), the global investment value of FinTech grew by approximately 75% to nearly US$ 22.3 billion in 2015. Skan et al. (2016) stated that FinTech start-ups increase because of understanding customer needs, experienced and skilled teams, and less rigid bureaucratic processes. Piscini et al. (2017) considered the increase and continued presence of investment for FinTech as a sign of the maturity of the ecosystem. The relationship between start-ups and investors starts when the business is created, and venture capitalists invest in the industry. FinTech has taken off worldwide due to many factors, such as sufficient capital and financial markets that create alternative opportunities for players.

Even with this, research regarding FinTechs and their ideal ecosystem are limited (Gimpel et al., 2018). There is a younger population in emerging economies that is digitally enabled and primarily possesses essential mobile devices. The younger population prefers convenience over trust (Alt & Puschmann, 2012).

There is also an untapped market opportunity, as approximately 1.2 billion individuals internationally do not possess bank accounts (Statista, 2019). The developed countries include many technologies and many engineering graduates, which readily form an essential part of the FinTech workforce (Pearson, 2020). According to a Business Tech article Writer (2019), the author comments that South Africa has a sizable unbanked or underbanked population, estimated to be about 11 million people; if there are no barriers to entry, a healthy FinTech

environment can exist in this environment in South Africa. This is because banks are structured in terms of their requirements; for example, they want to see regular income into the account, they require a payslip, proof of address that many South Africans do not possess as they live in shacks or rural areas (Coetzee & Coetzee, 2019).

The current FinTech ecosystem does not cater to an informal customer; therefore, the 'informal' customer cannot benefit from being part of the ecosystem. Additionally, funding is a barrier to entry into the FinTech market, which could stifle further market growth.

1.4 RESEARCH QUESTIONS

The primary question for this research was: How does the existing FinTech ecosystem model apply to the South African context?

The sub-questions for the study were:

1. Which components of the FinTech ecosystem models are fundamental to the South African context?
2. What is the existing FinTech ecosystem model for the developed and developing world?
3. What differences exists between the FinTech ecosystem models in the developing and developed world?

1.5 SIGNIFICANCE OF THE STUDY

While FinTech ecosystems literature is still developing, a significant increase in literature has been noted since 2014; because the relationship between technology and finance started some time ago (Ilyina & Samaniego, 2008). According to Arner et al. (2018), there are three significant trends creating shadow banks, namely, Fintech is reshaping the industry environment, changing financial intermediation and financial stability stemming from the FinTech outlook impact financial services, FinTech start-ups, and developing countries.

There is currently limited research looking at the FinTech ecosystems in the developing world, specifically South Africa. This study adds to the body of knowledge locally.

Some studies have been conducted that looked at what FinTech is and the business models associated with FinTech (Breidbach & Maglio, 2020). Further studies have defined who the FinTech ecosystem players or stakeholders are (Lee and Shin (2018); Zalan and Toufaily (2017). A study conducted by Zalan and Toufaily (2017) aimed to look at how participants in the financial services industry view the effects of digital disruption and what strategies

incumbents are employing in the face of possible disruption from FinTech contenders. They conducted an exploratory study with stakeholders from the Middle East and North Africa (MENA) financial ecosystem, and they found that the FinTech market is still in its infancy but that it is poised to disrupt existing products and segment the consumer. They further found that FinTech adoption is hampered by several legislative, structural, and cultural barriers (Zalan & Toufaily, 2017).

Other studies have compared what has made FinTech thrive, looking at the role of the identified players in the ecosystem in Vietnam and Singapore (Anh et al., 2018).

Some scholars have looked at frameworks that enable investors to invest in FinTech (Imerman & Fabozzi, 2020), while others have looked at how to contribute to the common understanding of investment dynamics in the Turkish FinTech ecosystem (Fayda et al., 2020).

The existing literature examined the FinTech ecosystems, roles played by the players in the FinTech ecosystem, the business models in the ecosystem and which factors assist a country to create a thriving FinTech, looking at the specific roles played by government, customers, entrepreneurs, developers and financial institutions (Fayda et al., 2020; Lee and Shin (2018); Anh et al. (2018). However, no study has looked at the FinTech ecosystem from a South African perspective regarding the existing FinTech ecosystem's role and suitability.

Therefore, this study is critical. It will assist policy makers, and FinTech ecosystem players understand their roles and how they can contribute and collaborate to create a conducive environment for FinTech to thrive. When it comes to a broader significance, this study contributes to the debate on this subject and provides insight into how FinTech can thrive.

The study further provides best practice examples that could be leveraged and better coordinated to enhance the FinTech ecosystem in South Africa. It uses this understanding to inform how government policy can be shaped and identifies the critical success factors for FinTech to flourish.

The academic context enhances and contributes towards the body of knowledge in the FinTech ecosystem in South Africa because it provides insights on whether the Lee and Shin (2018) ecosystem conceptual framework is suitable for SA. If it is not appropriate, it highlights the additional roles and perhaps other FinTech ecosystem players. The researcher believes that the study also provides insights into the FinTech industry; it demonstrates and highlights the role played by the FinTech ecosystem players and how the functions can be expanded. The study's

practical implications contribute to FinTech policy formulation and assist the policy makers in using a different lens when formulating policy and amending existing policies and legislation.

1.5.1 Theoretical contributions

- There is currently limited research looking at the FinTech ecosystems in the developing world, specifically South Africa. Therefore, this study will potentially enhance the body of knowledge in South Africa.
- This is the first time the FinTech ecosystem framework has been examined to determine the suitability of the existing financial technology (FinTech) ecosystem models in the South African context and also to juxtapose between the FinTech ecosystem models in the developed and developing world and deduce the fundamental differences.

1.6 DELIMITATION OF STUDY

The delimitations have been identified to enable the researcher to conduct an effective and appropriate study. This research includes the delimitation of the focus of the study in SA.

This research is delimited to the developing countries as examples of the FinTech ecosystem in diverse emerging economies. Some developing and developed countries such as China, India, and Singapore are leading in FinTech. It is essential to assess what in those countries contributes to a thriving FinTech ecosystem.

The study looked at various countries in the developing world as examples of a thriving FinTech ecosystem. It looked at Singapore as an example of a FinTech ecosystem performing well in the developed world. Successes in the FinTech ecosystem of Singapore provide an excellent example of what is required: this could be limiting in terms of best practice in other developed countries.

The focus of the study was mainly on FinTech with a focus on payment systems, excluding insurance, wealth management.

1.7 DEFINITION OF TERMS

Table 1.1 Definition of terms

TERM	DEFINITION
FinTech	Lee and Shin (2018) define FinTech as innovative companies operating in payments, insurance, financial management, loans and capital markets, which have low operating costs and provide services that are more personalised than those offered by traditional financial houses.
FinTech ecosystem	The FinTech ecosystem comprises five key players: entrepreneur/FinTech start-up, government, financial customer, technology developers, and traditional banking houses (Lee & Shin, 2018).
Ecosystem	Moore (2006) defines an ecosystem as an economic culture sponsored by a foundation of communicating organisations and individuals – the business world's organisms. This economic culture creates valuable products and services for consumers who are also ecosystem members. Suppliers, lead manufacturers, rivals, and other stakeholders are among the member species. They evolve their skills and responsibilities over time, and they appear to follow the course set by one or more central companies.
The informal economy	The informal economy is particularly fragile because it is handled very differently regarding access to finance than the formal economy. Financial institutions typically exclude the informal economy because of its existence and how it works (Alcock, 2015).
The formal economy	According to Mukherjee (2016), the formal economy is characterised as all economic activities that operate within the country's legal frameworks, pay taxes, and are regulated by governments. They work in the private sector, the government, or non-governmental organisations and have a daily salary, set working hours, and a stable job.

1.8 PROPOSED STUDY OUTLINE

The table below highlights what will be unpacked in each chapter of the study.

Table 1.2: Study outline

INTRODUCTION AND ORIENTATION	
Chapter 1: Introduction	Chapter 1 outlines the purpose of the study, the context of the study, research problem, research objectives, research questions and significance of the study.
Chapter 2: Literature Review	Chapter 2 is the literature review of the study, and this chapter provides comprehensive definitions of FinTech, FinTech ecosystem, FinTech business model as per available literature. This chapter also provides summaries of prior studies in FinTech ecosystem frameworks in developing and developed countries.
Chapter 3 The Methodology of the Study	Chapter 3 outlines the methodology used in the study, and it covers the research design, research method, population and sampling, credibility and dependability, data collection, limitations and ethical considerations.
Chapter 4: Presentation of Results	Chapter 4 presents the results obtained from the data analysis of the interviews.
Chapter 5: Findings and Recommendations	Chapter 5 provides a discussion of the results and findings, draws conclusions and provides recommendations.
Chapter 6: Summary, Conclusions and Recommendations	Chapter 6 presents a summary of the recommendations and conclusions.

CHAPTER 2: LITERATURE REVIEW

2.1 INTRODUCTION

In this chapter, the researcher presents the relevant studies that different researchers in this field have conducted. The FinTech ecosystem in various developed and developing countries was explored through multiple FinTech ecosystem framework studies.

In this chapter, the researcher reviewed the existing theoretical and empirical literature on the FinTech ecosystem in developed and developing countries and their institutional frameworks, strengths and weaknesses. How these ecosystems differ across countries and regions is considered, and the adaptability of the framework in the SA context is examined.

2.2 BACKGROUND DISCUSSION

2.2.1 FinTech

According to Arnér and Meyerson (2000), 'financial technology' or 'FinTech' is defined as using technology to provide a financial product or solution. Financial Technology originated in the early 1990s and was referred to as the 'Financial Services Technology Consortium'. It was a project started by Citigroup to assist and enable cooperative efforts in technology. It is a term that is now deeply entrenched in this significant and huge market that has carried anything between US$12 billion and US$197 billion in investment since 2014; it does not matter whether one looks at it from traditional financial institutions or start-ups (Boyle, 2016).

Lee and Kim (2015) define FinTech as a new type of financial service based on IT companies' broad kinds of users, combined with IT technology and other financial services such as remittance, payment, asset management, among others. FinTech includes all the technical processes from upgrading financial software to programming a new type of financial software that can affect a finance service.

FinTech describes financial technologies for use in technology to provide a business solution, and it explains technology-enabled financial services (Vijai, 2019). In general, it aims to provide appropriate financial services and products to all sections of society at an affordable cost. Mainstream institutional players use FinTech to offer necessary financial services and products to all parts of society at an affordable price. Another definition of FinTech by (Zavolokina et al., 2016) is a 'marriage of finance and technology'. FinTech is a combination of innovation in financial services as it develops new processes, products, services and new companies (Frame et al., 2009). Lerner and Tufano (2011) suggest that it advances and creates

bank-FinTech partnerships, which is desirable and unavoidable. According to Zavolokina et al. (2016), FinTech enables transformation that influences products and services that empower customers, providing them with opportunities to access affordable, convenient products.

According to the Financial Stability Board (2017), FinTech is defined as Technology-enabled financial services innovation that can lead in new business models, applications, procedures, or products with a material impact on financial services provision. While the broad term "FinTech" can be used to describe a wide variety of technologies, more detail is needed for each one. Gimpel et al. (2018) suggest that FinTech should be defined as how digital technologies such as the internet, mobile computing, and data analytics are being used to help, innovate, or disrupt financial services.

2.2.2 FinTech Business model

Zott et al. (2011) discovered that academic discourse is heterogeneous concerning a business model. They found a generalisation in terms of a business model seen as building blocks; thus, there is an apparent lack of a standard definition of a business model. Nevertheless, Zott et al. (2011) found that existing literature on business models can be divided into three generic themes. The first theme deals with e-business models and relates to the use of information technology. The second theme relates to strategic issues, which deals directly with value creation, company performance, and competitive advantage. The third theme deals with how innovation and technology are managed (Zott et al., 2011). Zavolokina et al. (2016) in their study, focus on e-business models that suited their taxonomic development of FinTech business models. They found that FinTech business models have six elements or dimensions, and each part consists of different characteristics (Varshney et al., 2013).

Breidbach and Maglio (2020), in their research, unpack the hybrid business models. They state that digital financial service systems are cyber-physical systems. Fernandez-Viagas et al. (2020) state that there is an inclination to signify the need to move beyond the personal computing view where humans conceive and direct machines to control outcomes. The current state is such that humans define the norms and rules of engagement concerning FinTech systems. This will change shortly, and the various levels of connectivity among actors, as well as the standards and laws of their interactions, will probably be controlled and managed by machines, which in turn, will lead to a realisation of unexpected and new value propositions (Breidbach & Maglio, 2020). This will result in FinTech enabling the emergence of new value

propositions through elastic reconfigurations of existing resources' financial service systems (Fernandez-Viagas et al., 2020). In turn, this will result in new business models used by traditional market incumbents and used by FinTech start-ups to enhance existing products or create new financial services markets. An example that they provide is that traditional banks performed mainly in offering loans, savings accounts or mortgages, creating a business model where transaction costs charged are a significant contributor to their revenue. The study recommends that future research should be conducted to explore new business models that are less reliant on transaction costs because it is unlikely that these will continue to reside within the domain of financial service firms in the future. The study also identified a new socially-oriented business model that will enable emerging technologies to be used as tools for inclusion in the financial service. Accordingly, this will then, provide an opportunity to transform service research. Disruptors also construct business models that are very different from those of incumbents, according to (Christensen et al., 2016).

Finally, the study recommend, as in previous research on internet-based e-commerce business models in the early 2000s, for example, by Mahadevan and Sivalingam (2000), that the researchers recommend further studies in the area of emerging business models concerning FinTech.

2.2.3 Fintech ecosystem

According to Moore (2006), an ecosystem is an economic society built on a base of interconnected organizations and individuals – the business world's species. This economic culture creates valuable products and services for consumers who are also ecosystem members. Suppliers, lead manufacturers, rivals, and other stakeholders are among the member species. They evolve their skills and responsibilities over time, and they appear to follow the course set by one or more central companies.

The first dimension demonstrates the value proposition and innovation in the ecosystem, producing a 'coherent, customer-facing solution' (Adner & Zemsky, 2006). The second dimension amplifies the platform (technological) through which the service providers and sponsors create and provide value to the customers (Gawer, 2014). However, these two dimensions offer a limited concept of an ecosystem compared to Moore (2006) definition that encompasses 'an economic community of interacting organisations is likely to offer more than one coherent solution to customers and may feature more than one platform'. Thus, if one applies one of the alternative conceptualisations to these plausible scenarios, this would split

the economic community (the ecosystem), in Moore (2006) terms, into several smaller ecosystems.

The degree of sustained collaboration required among governments, financial institutions, and entrepreneurs makes establishing and nurturing a FinTech ecosystem difficult. For a FinTech ecosystem to work, each participant must understand their position and the benefits they stand to gain from participating (Diemers et al., 2015).

Different scholars agree that ecosystems are distinguished by complementary production, using products by the various players in the ecosystem that are coordinated without any hierarchy in governance (Jacobides et al., 2018). Jacobides et al. (2018) further assert that ecosystem players continue to show interdependence with such complementarities, although a contractual agreement does not necessarily bind them. As a result, the ecosystem players' health and viability depend on the entire ecosystem rather than individual players in the ecosystem (Drasch et al., 2018).

The power of the FinTech ecosystem is increased by the continuous development of the players in the ecosystem. The significance of the ecosystem is demonstrated or becomes evident when emerging technologies create new solutions. The interdependent players directly influence technology development and competency and develop opportunities for new business models to emerge.

Palmié et al. (2020) support the increasing number of academics that believe that disruptive innovations are created, developed and commercialised in and by the ecosystems instead of by individual players in the ecosystem (Talmar et al., 2018). Lee and Shin (2018) assert that the FinTech ecosystem players have substantially increased due to increased investment in recent years.

Fenwick et al. (2016) further assert that the FinTech ecosystem's value creates significant disruptions in the value chain that was so strong and untouchable in the past. They firmly contend that it is about the customers and how the customers receive benefits from the ecosystem. The term ‘ecosystem’ is synonymous with multi-company dynamic teamwork and a new way of organising economic activities (Adner and Zemsky, 2006; Jacobides et al., 2018).

In general, building a FinTech ecosystem has three stages of evolution, as argued by (Palmié et al., 2020). In the first stage, firms operating in mature industries start cooperating with potential incumbents. In the FinTech industry, this cooperation involves implementing electronic payments: established banks collaborate with technology developers. The second stage is symbiosis, in which more technology disruptions take place in the form of, for example, cryptocurrencies and blockchain. The third stage centres on industrial resilience and transformations assisted by various technologies, such as artificial intelligence. This stage includes a high degree of automation and efficiency. Furthermore, at this stage, the market will be confined to a few players that can survive. These survivors will ostensibly be the fittest, as argued by evolutionary theory reference.

2.3 FINTECH EVOLUTION

According to Merton and Bodie (1992), the main reason for a financial institution system is to ease the classification and awarding of financial resources across time and geographical space, especially in uncertain conditions. It entails a settlement system with a medium of exchange, which shifts funds from savers to borrowers, for example, thus smoothing out the steps involved in consumption. It entails an ecosystem with various players, financial intermediaries, brokers, banks and skills. De Leo and Levin (1997) highlight the importance of finance as a promoter of consumption and productivity venture. Thus, improved performance in the financial service sector has a beneficial impact on the overall economy.

The last few years and possibly the last three decades have been filled with innovation in the financial service industry. It started in the 1970s with automated teller machines (ATMs) that rapidly spread globally in the 1980s. The evolution then moved to debit cards and bundled ATMs, which enabled one to make a payment to a bank account from an ATM. Remote bank access swiftly moved from the telephone to computer access through an increase in internet banking in early 2000. The rapid penetration of the World Wide Web in developing economies, though it began in the developed world, paved the way for FinTech-based innovations which diffuse transactions without many barriers. It has led to the replacement of more traditional financial architecture towards new internet-based versions (Alt & Puschmann, 2012; Lee & Shin, 2018).

This trend expanded to almost all financial transactions, eliminating physical contact with financial institutions. These transactions include, but are not limited to, banking, insurance,

wealth management, crowdfunding, stock trading and the procuring of information on the latest financial products and services (Lee & Shin, 2018).

FinTech initiatives, therefore, come to the forefront of this technology-based development process. Accordingly, scholars such as Sathye (1999) refer to the reduction in operational costs of financial institutions, shorter turn-around time for transactions, real-time information management (for both institutions and customers), effective inter- and intra-departmental communication in organisations and smoother communication with the present, as well as prospective, clients and customers. They also note convenience and multi-channel accessibility. The emergence of FinTech innovations was exceptionally rapid following the 2008 financial global crisis and the recent revolution of big data. Furthermore, King (2016) notes that the normal function of credit creation by the traditional commercial banks has weakened in the last years. Coetzee and Coetzee (2019) argue that SA banks have to ensure on the one hand, that they adopt a measured approach, considering the socio-economic landscape of the economy, and, on the other hand, they must bear in mind the tight regulatory and legislative requirements inherent to the industry.

2.4 THEORETICAL FOUNDATION

2.4.1 Stakeholders of the ecosystem framework

The FinTech ecosystem has various stakeholders: start-ups, governments, customer, developers, and financial institutions. These players contribute differently to the functioning of the FinTech ecosystem. According to Diemers et al. (2015), the Gulf Cooperation Countries (GCC) possess the four main key elements needed for FinTech ecosystems. These key stakeholders include a competitive environment/market access, government/regulatory support, capital access, and financial expertise. Zalan and Toufaily (2017) suggested a hybrid model; this is highlighted below and includes innovation culture, incubators and investor, talent and academic institutions and government.

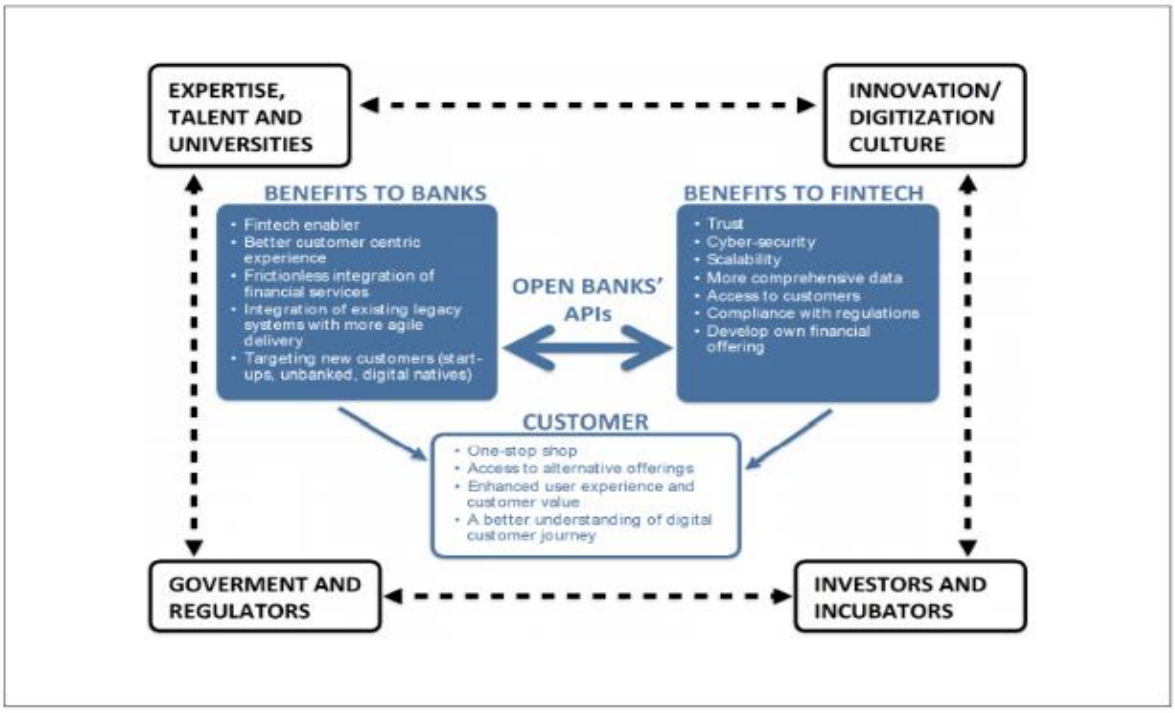

Figure 2:1 A hybrid platform

Hybrid FinTech ecosystem model (Zalan & Toufaily, 2017)

The diagram below highlights the Lee and Shin (2018) FinTech ecosystem model.

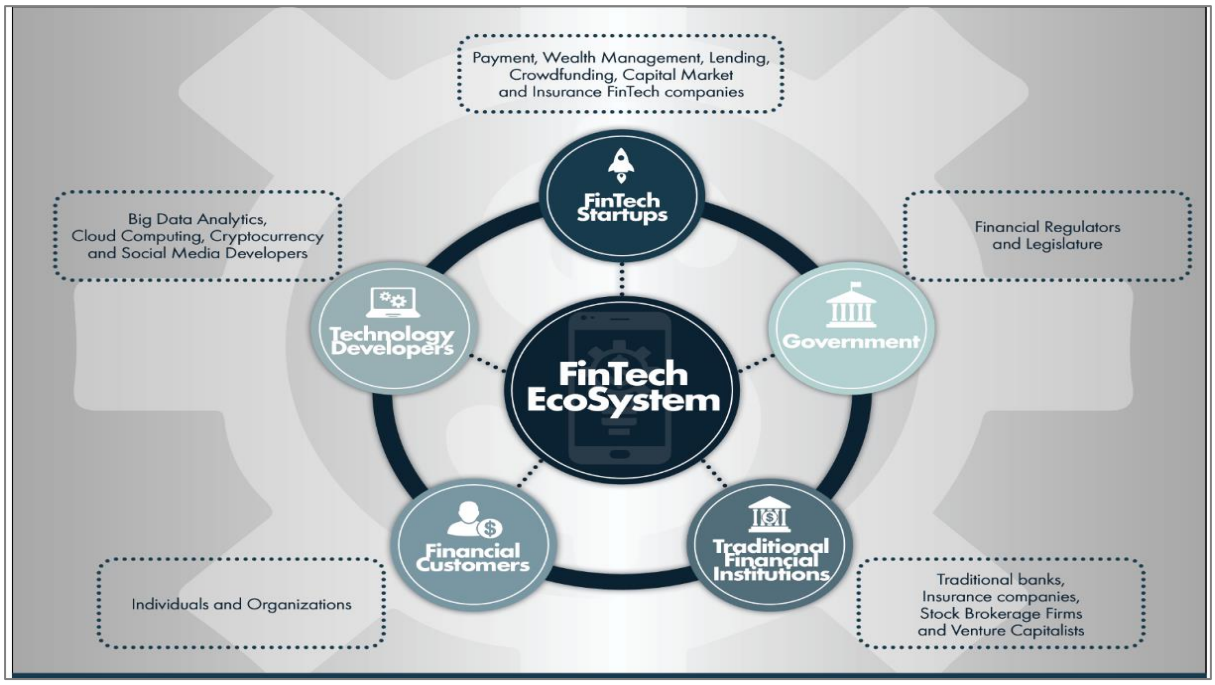

Figure 2:2 Lee and Shin (2018) ecosystem model

The sections below highlight the roles played by the different players in the FinTech ecosystem and how they collaborate and contribute to the ecosystem.

2.4.2 FinTech start-ups

The first players, who are at the heart of the ecosystem, are the FinTech start-ups. These are the entrepreneurs with creative innovations in the various segments of financial services, such as wealth management, payment solutions and insurance (Lee & Shin, 2018). Entrepreneurs contribute to the FinTech community with creative and sometimes disruptive technology solutions. Entrepreneurs gain expanded access to funding and industry experience, as well as a responsive market, in exchange. The degree of integration and synergies among the players is also a factor (Diemers et al., 2015). Their primary role is to develop new technological ideas in financial services and to build businesses. (Walchek, 2015) states that they are at the forefront of driving the financial services industry unbundling process, which has been disruptive for the industry. He further alludes to the fact that this creates options for consumers to choose from various players instead of relying on the traditional banks to meet their needs. According to Gimpel et al. (2018), the main areas where FinTech start-ups have an advantage are in savings, crowdfunding, asset management, crowd investing, peer-to-peer loans, money transfers and investments. However, Alt and Zimmermann (2001) provide a thematic view of the FinTech solutions and classify them into loans, financing, payment services and insurance. Entrepreneurs or start-ups are ‘companies that are creating innovation for integrating distributed digital banking, mobile solutions and delivery platforms, micro-finance, payment solutions, peer-to-peer lending and crowd-funding’ (Digital Finance Institute, 2015; (Drasch et al., 2018).

According to Mundy and Verger (2015), the average lending to SMEs in the Gulf Co-operation Council (GCC) is just 2%, which is among the lowest in the world, and a lack of credit is a significant barrier to business expansion. P2P lending is still in its infancy in the MENA's highly regulated setting, but it is steadily gaining traction.

Galvin et al. (2018) found that most financial institutions are in partnerships or collaborate with FinTechs in various contracts, either supporting their ideas, investors, or acquiring the start-ups. They further stated that some banks developed innovative laboratories to incubate the start-ups; this places them in a better competitive position. Regulatory authorities and central banks can help with restructuring, but entrepreneurs must find ways to show real value to

consumers through collaborations and by providing creative services (Hally, 2016). They will have better solutions than banks because they have the technology (Zalan & Toufaily, 2017).

Lustig et al. (2019) describe a change in the relationship between traditional financial institutions and FinTechs as the relationships have evolved from a competitive relationship to some collaboration. This positive move will increase benefits and profitability for both the FinTechs and the traditional financial institutions. Ninety-five per cent of small businesses said they welcome mobile money in return for goods and services and to pay their employees (Gikenye, 2011). Mobile money has also paved the way for hundreds of new start-up companies to sell services ranging from micro health and life insurance to farming products and digitised tuition payments, all based entirely on the mobile money platform (Kendall et al., 2011).

Many researchers state that mobile money and the agent banking model relied on to meet customers' liquidity needs could only succeed in markets with some degree of financial and economic growth already in place (Heyer & Mas, 2011). Many academics concluded that countries lacking this basic level of financial stability would not be receptive to mobile money (Mas & Radcliffe, 2011).

MNOs have an advantage over conventional banks in providing digital financial services to the poor because they have found viable ways to provide services even to poor people in remote areas (Gutierrez & Singh, 2013). Instead, they take a ‘market-led approach, allowing entrepreneurs to figure out the best ways to sell mobile money products with the least amount of regulatory interference possible” (Burns, 2018).

2.4.3 Technology developers

The second players are the technology developers. They are essential because they enable start-up entrepreneurs to present solutions that they develop by combining various skills and technologies, such as creating multiple platforms for analytics, artificial intelligence, and cloud computing (Zavolokina et al., 2016). They create a competitive advantage for entrepreneurs while generating an income from these entrepreneurs. According to Diemers et al. (2015), this is a mutually beneficial relationship. Lee and Shin (2018) comment that the relationship between the ecosystem and the developers is vital because it enables start-ups to operate in a friendly environment that ensures revenue for all ecosystem players.

FinTech scaling is being hampered by a lack of access to funding, as venture capital-backed entrepreneurship is still relatively new in the GCC countries, and venture capital investors are wary of investing in such innovations due to a lack of exit options (Zalan & Toufaily, 2017). Another problem is the availability of qualified and professional IT teams since outsourced expertise might not meet the demands of tomorrow's technological world, where customer collaboration is needed (Zalan & Toufaily, 2017).

2.4.4 Government

According to Treleaven (2015), governments are vital in creating a conducive and enabling environment for FinTech. Based on a country's plans, national priorities and economic policies, different governments furnish regulations that may support FinTech (Diemers et al. (2015); Lee and Shin (2018).

Financial inclusion (defined as increasing the proportion of a country's population with access to formal financial services) is critical in assisting individuals and nations to escape poverty (Burns, 2018).

The most promising examples of inclusive financial growth have come from countries that have taken a bottom-up, 'market-led approach, allowing private companies and entrepreneurs to develop novel ways to reach out to the disadvantaged' (Demirguc-Kunt et al., 2018).

The relatively low rate of financial inclusion in sub-Saharan Africa, combined with near-universal cellular penetration, has created a fertile environment for mobile money to fill the latent demand for reliable banking services (Maloumby-Baka & Kingombe, 2016).

According to Diemers et al. (2015), governments must pass policies and create a regulatory climate that will promote the growth of the FinTech ecosystem., which supports entrepreneurship and recruiting of financial services and technology companies. It also enhances the country's overall competitiveness.

The most crucial factor is whether governments are successful in creating an enabling regulatory environment. Policymakers should lower entry barriers and scale back repressive regulations, such as 'know your customer' and anti-money laundering (KYC-AML) laws, and minimum capital and liquidity requirements, allowing entrepreneurs to enter the market (Burns, 2018).

This move could be through tax incentives, relaxed requirements for capital or even enabling an 'easier' application process for licences, which allows the start-up entrepreneurs to participate in the economy and acts as a catalyst for global competitiveness (Puschmann, 2017). It is important to understand regulations in a sector where FinTech start-ups are operating. As well as the flexibility levels to adopt new unprecedented business models that might require the rules to be modified for the business (Gomber et al., 2017).

According to Berkmen et al. (2019), Mexico and Brazil have fostered positive change in their regulatory frameworks. Brazil has ensured that FinTech is appropriately integrated into its legal and regulatory framework, whereas Mexico has created broad legislation for FinTech.

Much of the scholarly debate in recent years has centred on what role governments should play in fostering inclusive financial development (Demirguc-Kunt et al., 2018). Fagerstrøm et al. (2017) cite M-Pesa as an outstanding success that shows the regulators' role in increasing financial inclusion. M-Pesa is a very successful FinTech start-up. The success of M-Pesa can be attributed partially to the Central Bank of Kenya, which enabled the company to grow and scale without creating restrictions.

Regulators, who were listed by bankers and entrepreneurs alike multiple times in the study by Zalan and Toufaily (2017), tend to be the most significant ecosystem player constraining FinTech expansion.

According to Zalan and Toufaily (2017), the majority of participants agreed that existing financial sector legislation is impeding FinTech innovation and that regulation is lagging behind innovation. 'Innovation comes first, followed by regulations,' as one respondent put it. A new regulatory structure is required to encourage innovation.

Increased financial services sector regulation in developed markets has, on average, decreased systemic risk while leaving some other problems, such as uncertainty and opaqueness, unresolved (Philippon, 2016). Disruption and technological financial solutions exist, and they are in a stronger position than banks because they are less limited by regulations.

2.4.5 Financial customers

According to Gimpel et al. (2018), one of the essential roles of FinTech start-ups is their ability to identify and meet customer needs; none of the above can be done or is possible without customers. They are critical for opening up the market for FinTech companies. It has been found that most FinTech companies rely on individual customers and small businesses for

revenue; they are the cornerstone of any economy and also very important for the growth of the ecosystem (Lee & Shin, 2018). Ryu (2018) states that FinTech must know who its customers are and provide relevant solutions that meet customer expectations. As the banks struggle with recreating themselves and the value add, the FinTech start-ups are developing new technology-driven opportunities to meet customer demands and needs or providing alternatives for customer needs. FinTechs are seen as agile, quick in leveraging opportunities through technology-driven solutions and customer-centred approaches compared to traditional financial institutions (Christensen et al., 2016; Drasch et al., 2018). Technology advances and transformation allow service providers to meet customer needs quickly, which enhances the position of FinTechs even more than banks (Drasch et al., 2018).

According to Buckley and Webster (2016), a survey they conducted found that mostly wealthier and younger customers use FinTech. Gimpel et al. (2018) further state that services that add value to customers and are of superior quality attract customers. On the other hand, disruptive technologies come from low-end or emerging markets (that is, non-consumption) and have 'good enough' solutions. It is important to provide solutions that are easier, less expensive, more flexible, and have less disadvantages and difficulty that are perceived as second-rate by mainstream consumers who are less demanding, for example. At the same time new customers are being offered efficiency improvements, while existing customers are being offered efficiency improvements (lowering costs and making the same goods less expensive tend to benefit the same markets).

Once these consumers embrace the technology in large numbers and tolerate lower rates, disruptors will be well on their way to displacing incumbents. Since incumbents' organisational capacities, capital distribution mechanisms, and compensation schemes are oriented toward promoting maintaining technologies, disruptions paralyse market leaders (Christensen et al., 2016).

Millennials, small businesses, and the underbanked, according to Olanrewaju (2016), are the customer segments most vulnerable to disruption: these three categories are especially sensitive to price and the improved consumer experience offered by digital delivery and distribution.

The participants in Zalan and Toufaily (2017) research frequently listed the potential to encourage financial inclusion for the region's under- or unbanked population. MENA's FinTech entrepreneurs could have a major social impact, helped by high mobile penetration rates and low penetration rates of conventional banking and credit cards.

According to Drasch et al. (2018), digital transformation drives the change in how customers act and think and creates increased customer demands. The banking industry affects strategy, business processes, business models and the IT department. Drasch et al. (2018) assert that banks need to reshape how they create value and interact with customers. When the Kenyan M-Pesa pilot was successful, a test-and-learn approach was used, allowing it to continue even without a completely fleshed-out regulatory structure and ‘navigated the required risk' as it emerged (Burns, 2018). Through the Commercial Bank of Kenya's M-Shwari application alone, ten million Kenyans have acquired financial access (Cook & McKay, 2015).

2.4.6 Traditional financial institutions

Traditional banks are also a significant force in the ecosystem, and initially, the conventional institutions perceived FinTech as a threat (Lee & Shin, 2018). However, as time progressed, they realised that they could collaborate with the start-ups, either through funding or incubating them (Bladier, 2016). Thus, the traditional banks are learning from the start-ups, enabling them to remain competitive to stay ahead (Yang, 2015); they mainly offer bundled products (Lee & Shin, 2018). Diemers et al. (2015) assert that financial institutions are vital to the ecosystem. According to Alt et al. (2018), many people are no longer loyal to traditional institutions, as the clients prefer to interact with multiple financial institutions. Diemers et al. (2015) state that FinTech start-ups and financial institutions' relationships can invigorate innovation and develop their competitive advantage.

A notable hindrance to the development of FinTech in developing countries, especially in SA, is the inadequacy of credit availability (Haddad & Hornuf, 2019). Hornuf and Schwienbacher (2016), examined the venture capital mode of investment in the FinTech industry. They attributed the VC deals to the differential enforcement of institutional rules of financial institutions before and after the 2008 financial crisis. Venture capital accumulation calls for better institutional quality, including infrastructure, the rule of law, good governance, and low crime rates. A hybrid platform may also allow financial institutions to reach new consumer segments historically underserved by banks (for example, start-ups, the unbanked, digital natives) in addition to providing a better customer-centric experience to existing customers (Schwab & Guibaud, 2016).

In a theoretical study conducted by Lee and Shin (2018), their findings relate to the fact that there are six FinTech business models: save, borrow, invest, move, spend, and protect money. Another finding in this study relates to the challenges facing the FinTech sector. It looks at the

area of customer management, the ability to identify a niche market. There is also a regulatory challenge related to the ability to identify the potential impact on FinTechs. They identified technology integration challenges, which refers to the difficulty of integrating new technologies into old technology due to legacy issues. They further identify a security and privacy issue that concerns the fact that consumers can easily file complaints related to data security and privacy breaches to the regulatory agencies, and the protection of consumer data is an important area. Finally, they identified the risk management challenge. The FinTechs must broadly focus on risk management and the importance of understating the liquidity risk and the interest rate risk to which FinTechs are exposed. FinTech needs to understand the current lending environment and its impact on them (Lee & Shin, 2018).

Following the literature review above, the researcher conducted interviews to answer the following research question: Which components of the FinTech ecosystem models are fundamental to the SA context?

2.5 DEVELOPED WORLD FINTECH ECOSYSTEMS

A study conducted in Finland by Palmié et al. (2020) aimed to develop the concept of the disruptive innovation ecosystem by integrating recent insights on disruptive innovation with the literature on ecosystems. They were also interested in the emergence of the ecosystem around FinTech and examined its impact on the financial services sector to explain how ecosystems around a disruptive innovation emerge and affect established industries. Finally, Palmié et al. suggested an agenda on disruptive innovation for future research. This study used exploratory qualitative and secondary data since the knowledge of the topic of FinTech is currently limited. Their findings suggest that they should propose an agenda for future research on ecosystems and disruptive innovations.

Palmié et al.'s study found that focus should be placed on the enablers contributing to the ecosystem's transformation. They found that the disruption of FinTech comes from the growth of the players in the ecosystem. The FinTech ecosystem's significance is visible when there is a collaboration between the players in the ecosystem. They found that ecosystems need to be further explored in future studies.

Many aspects of the environment can be influenced by governments, including relaxing business regulations (such as copyright, product registration, and IPO requirements) and

keeping retaining fees and taxes modest. The extent of the government's intervention, on the other hand, will vary. The private industry controls the provider landscape in relatively mature FinTech ecosystems such as the United Kingdom and the United States (Diemers et al., 2015).

Fayda, Sencan, Aksoy and Yazici (2020) conducted a study in Turkey. The purpose of their research was to help investors in their decision-making process in funding (FinTech) start-ups through developing a framework of key performance indicators for effective financial resource allocation. They conducted a qualitative study, which found that shareholders and investors struggle to make decisions about FinTech. The study recommended a framework to enable investors to make their decisions and empowers FinTechs start-ups to understand and appreciate what the investors seek. The study contributed to the collective knowledge of investment dynamics in the Turkish FinTech ecosystem, and this was expected to have a significant role in the FinTech industry.

Imerman and Fabozzi (2020) conducted a theoretical study to assess the use of a FinTech ecosystem, highlighting the diverse areas of possible value for investors who are considering venturing into the space as alternative investments. The study also created a conceptual framework that allows investors to assess new technologies from an investor perspective. However, they further highlight the risk between reward and risks in FinTech.

According to Pearson (2020), Europe has created an amicable regulatory environment that allows FinTech to thrive. There are many entrepreneurs and start-ups; there is a lot of funding available through either venture capital, private equity or investments from other countries. There is also plenty of skills and talent available to support the FinTech ecosystem.

Regulators around the world, such as the Singapore Monetary Authority, who see FinTech as a key enabler of banking innovation, suggest that the two sides work together and they are designing policies to promote the use of Application Programming Interface (APIs) that would support alternative financial services providers (Chhahira, 2016).

Table 2.1 highlights the key areas that are important for an ecosystem to thrive in the developed world. The wording is slightly different from the wording in the FinTech ecosystem as demonstrated by Lee and Shin (2018), but it touches on the same elements. The key and most important stakeholder of the ecosystem is the government that should foster supportive policies, provide strategy and investments as demonstrated in Lithuania and Singapore. Incubators, regulators, funders and support hubs also play a critical role in creating a thriving FinTech ecosystem.

Table 2.1 Developed country ecosystem

COUNTRY	TALENT	POLICY	INVESTMENTS	ENTRE-PRENEURS	CUSTOMERS
Lithuania	Talent exists	One of the most distinguishing characteristics is a well-thought-out approach for each stage of the FinTech ecosystem. It has a business-friendly atmosphere, including low corporate taxes, which makes it suitable for start-ups.	The Bank of Lithuania is vital to the country's rapid growth because it focuses on increasing competition and creating an atmosphere conducive to innovation, enabling FinTech products to join the market in a clear and orderly manner.	Well supported in the ecosystem	Available
Singapore	Talent exists	Government is supportive.	The Singapore Government is spending a large amount of money on FinTech ventures, with an expected cumulative investment of $735 million in 2019.	Over 20 FinTech accelerators.	Available
United Kingdom	Lots of talent exists	FinTech providers in the UK can be relied on due to strict policy and efficient tax deductions.	In 2019, the UK's gross domestic product (GDP) more than doubled to £1.9 billion.	A total of over 20 FinTech accelerators	Available

COUNTRY	TALENT	POLICY	INVESTMENTS	ENTRE-PRENEURS	CUSTOMERS
Switzerland	A talent pool able to develop novel solutions Switzerland focuses on recruiting young creative businesses and experts, as they understand the importance of the rapidly evolving FinTech industry better than anyone else.	FinTech is enabled by the policy.	The Swiss financial market and the country's FinTech ecosystem offer an ideal blend of dense and diverse characteristics.	The most creative country in the world.	Available

The literature above highlights the FinTech ecosystems in the developed countries, and the research question to be answered is, What are the existing FinTech ecosystem models for the developed world?

2.6 THE FINTECH ECOSYSTEM OF DEVELOPING COUNTRIES

A study conducted by Mundy and Verger (2015) found that approximately 55% of the developing countries' population does not have a bank account due to the high transaction costs and not having the appropriate documents: thus, they remain unbanked. Demirguc-Kunt et al. (2018) confirm the (Mundy & Verger, 2015) finding that around 1.7 billion adults do not have access to financial institutions and do not possess bank accounts. However, they found that adults in developed countries have a bank account: all the unbanked adults are in the developing world (Demirguc-Kunt et al., 2018).

The study found that developed countries, such as the United States, United Kingdom, have created lending platforms online that support SME lending rates, thereby increasing financial inclusion (Berkmen et al., 2019).

(D'Albuquerque, 2019)) examined the FinTech ecosystem in Brazil through the lens of service innovations and socio-technical theory: the findings are assessed with the particular focus of

the society and explained from the observation of theory. As in any country, FinTech start-ups act as the central figure in the ecosystem.

According to the Global Index Report from the World Bank (2017), Brazil has four major banks. Approximately 70% of Brazilian adults have an account with an established banking institution. In countries with established banking institutions, the banks have a significant input in policy, and they tend to protect their interests: this has similarly been observed in SA. The remaining 30% of the population (50 million people) do not possess a bank account. They, therefore, belong to the informal economy; however, they have cell phones.

Furthermore, Brazil's bank charges or finance costs are high, prohibiting poor people from accessing their services, which creates a big gap and an opportunity for FinTech. According to Felisberto (2017), FinTech is expected to generate approximately €20 billion by 2030.

There is, therefore, a massive gap between the formal and the informal economy. Typically, start-ups that can update their technologies and provide new products and services to these customers have a higher survival probability. In the Brazilian FinTech industry, the close relationship between big financial institutions and start-ups has acted as a catalyst in developing this industry and the related innovations. In April 2018, the Brazilian government relaxed the regulations on FinTech start-ups, allowing them to advance credit for their clients without intermediating traditional financial institutions. Subsequently, in May 2019, they established the Financial and Technological Innovation Laboratory in partnership with other stakeholders, including knowledge generation entities (D'Albuquerque, 2019). It is clear from this that a FinTech ecosystem in Brazil exists, whether formalised or not. The researcher further unpacks the ecosystem of Brazil through this research in Chapter 5.

Inflexible tax regulations stigmatise the Russian market: diplomatic risk, low investor confidence and a population with little spending power (Kumar et al., 2020). This factor dramatically influences its FinTech ecosystem. Until recently, for these reasons and the influence of traditional financial institutions, the FinTech industry in Russia was developing slowly. With the increasing penetration of smartphones with 3G/4G networks, there has been a replacement of traditional branch-based banking activities (Chen & Sergi, 2018). Furthermore, Russia has a comparative advantage, along with some other developing countries, due to its skilled workforce in IT and IT-enabled services (technology development). As Chen and Sergi (2018) argue, at present, investment by the private sector and government in the

industry is disrupting the whole FinTech ecosystem. This is due to certain lending clubs, whose function is to lend at a lower interest rate than the traditional financial institutions.

Sergi et al. (2019) describe the FinTech ecosystem in Russia in terms of the qualitative transformation of socio-economic relations due to a lack of alternatives and inconsistency in global dynamics. Technology elements, including artificial intelligence, blockchain technology and the Internet of Things (IoT), contribute to production, investment and innovation in a sustainable manner. Currently, it is estimated that by 2035, more than 96% of the transactions will be done through innovative services designed for payment and transfers. One-third of the investment from the government will be allocated towards the FinTech industry and related creative activities.

Essential aspects of Russian FinTech to be noted are the increased penetration of financial services through digitalisation, the loss of monopoly of the payment services in traditional ways, acquisition of financial institutions by non-financial organisations, and the partnership of banks with new FinTech start-ups.

India's FinTech ecosystem has expanded dramatically. With the inception of BankBazaar, which is serving the informal markets, in 2015 alone, India's investments in FinTech technologies accounted for more than $1 billion. India can also attract a considerable amount of foreign investment, primarily because of the availability of a skilled workforce in IT.[1] Furthermore, since 2015, India's digitalisation landscape shows a steady improvement in terms of the number of internet users in the population. In India, along with promoting financial innovations, the FinTech industry mainly focuses on financial inclusion providing access to financial products and services. Moreover, other sectors such as food and transport are being significantly transformed through the implementation of FinTech: this is relevant from the cities to the rural areas that produce food and its transportation to cities, with widely connected deliveries and cab facilities at affordable rates.

The government and Reserve Bank of India are essential drivers in the building and success of the FinTech ecosystem. The easing of regulations by the reserve bank to connect all elements in the system, including financial institutions, domestic and foreign technology developers, start-ups and other entrepreneurs, incubators, and innovators, have promoted this industry's growth.

[1] For instance, the Fin Tech Innovation Lab run by Accenture.

In terms of the development of the sector, an issue of concern is that the development of FinTech is taking place in cities. Therefore, cities are the primary beneficiaries of FinTech, excluding rural areas, even though financial inclusion is one of the most important agendas. MasterCard's recent survey shows that seven Indian cities are among the top 65 financial centres in the developing world.

It is noted that banking penetration, especially in the rural areas in India, is remarkably low. The poor and lower-middle-income classes are hugely dependent on indigenous money lenders for credit; charging exorbitant interest rates, they form a part of the informal economy, as highlighted earlier. Apart from simplifying the banking activities, the possibilities of FinTech are still under-utilised, as a more significant digital divide characterises the societies. For instance, almost 90% of India's transactions are still cash-based (Jutla & Sundararajan, 2016).

China has experienced the highest annual average growth rate over the past three decades, with remarkable technology upgrades in all sectors. At present, China is the second-largest economy in terms of GDP (following the United States of America), with a well-developed financial sector. They have 18 banks in the top 100 banks worldwide and the most significant number of people using financial technologies. The government's direct active intervention to foster the FinTech industry starts from the domestic payment system (reforms). [2] Scholars, including Shim and Shin (2016) and Gorjón Rivas (2018), found that, at the time of changes, the Chinese economy was inherently characterised by lower sophistication levels, absence of efficiency and a high degree of government intervention, especially in the financial sector. The cornerstone of far-reaching modernisation in the last two decades is precisely these new technologies, which aligns with the required restructuring of the financial institutions as part of reforms.

The reforms followed by creating a FinTech ecosystem in China have facilitated access to essential stakeholders. This is because the traditional funding sources hampered them in the earlier period, which meant they had no funding access. Among the start-ups, SMEs have become the backbone of the Chinese FinTech ecosystem. Some of them are global multinationals and critical players in the Taobao experiment. The Taobao experiment identified an opportunity to improve commerce by linking Chinese customers and sellers online, thanks to an increasing middle class and increased Internet connectivity. Taobao started by identifying confidence and constructing the infrastructure that is lacking in China. It came up with new

[2] See https://www.business-standard.com/article/economy-policy/india-must-have-at-least-six-banks-in-top-100-global-list-economic-survey-120020100028_1.html

value propositions for both buyers and sellers. Alibaba, which began its operation as an e-commerce company, is now one of the world's biggest FinTech companies, increasing its reach beyond borders (Kumar et al., 2020). Alipay, which was introduced later, was an integral part of Alibaba's success, which connected businesses, customers, technology developers, and other network actors. Shim and Shin (2016) have applied the Actor-Network Theory (ANT) directly to this to analyse heterogeneous actors' roles in the Chinese FinTech ecosystem.

Apart from the government's role as a facilitator, the main local actors in the Chinese FinTech ecosystem are companies such as Alibaba and Transcend, which were small start-ups two decades ago, and the traditional payment firms, such as UnionPay. In 1995, the Chinese Ministry of Electronics implanted the 'Golden Card Project', which aimed to create a nationwide credit card system to encourage e-payments and e-commerce platforms (La & Kandampully, 2002). Since China's IT infrastructure was not well-developed, much of the software-related investments were brought from abroad. China started with foreign investments. The country could catch up in terms of technology development, which could happen through effective collaboration between the government and the FinTech industry, dominated mainly by domestic players.

According to Mukherjee (2016), the formal economy is defined as all the economy's activities working in the country's legal structures, paying taxes, and being monitored by governments. The formal economy comprises people employed by the private sector, government, non-governmental organisations who have a regular income, working hours, and their work is secure. Whereas the informal economy consists of different types of 'informal employment' and includes employment that is not legally recognised and regulated, as well as unregistered informal businesses. Companies and people in this informal economy do not directly pay taxes; however, they pay VAT.

The informal economy is defined by Alcock (2015) as a representation of work done by individuals or businesses that, in practice or by law, are not adequately provided for through formal processes. These actors are seen as informal because they are not registered, and they transact using cash and, therefore, do not pay direct tax. The informal economy is typically not considered when policies are formulated as there is little information about the market.

Until recently, the SA financial industry followed a conservative and conventional commercial banking system (Coetzee & Coetzee, 2019). Following the disruptions in digital innovations and the reshaping of financial services (of all kinds) at a rapid pace and to cope with the

evolving expectations of both existing and prospective customers, major banks in SA started adopting innovation strategies in collaboration with global and local technology developers.

This occurred mainly after the global financial crisis of 2008[3]. A survey conducted by Ernst and Young, 2020 revealed that SA's consumer FinTech adoption rate was 82% in 2019, and it is expected to rise in the coming years[4]. Coetzee and Coetzee (2019) argue that African banks have to ensure they adopt a measured approach, considering the socio-economic landscape of the economy, on the one hand, and the tight regulatory and legislative requirements inherent to the industry, on the other.

It is possible to characterise the FinTech ecosystem in SA with different actors and their interactions using the framework adopted. In this framework, start-ups in payment services, online trading, wealth management, and insurance occupy the ecosystem's central part. The financial technology Programme, started by the SA Reserve Bank (SARB) to conduct a strategic assessment of the emergence and growth of FinTech innovations, is a crucial step from the government acting as a regulator (Gąsiorkiewicz & Monkiewicz). Furthermore, the SARB's initiative towards Distributed Ledger Technologies (DLTs) aims to formulate and review policies regarding the regulation of cryptocurrencies and the same tax treatment of these currencies (Mittal, 2019). Moreover, the SA Government's effective control of the FinTech ecosystem, which is mainly aimed at preventing money laundering and other financial fraud, is the non-allowance of non-face-to-face Know Your Customer (KYC) implementation[5]. This is an example of legislation that can be perceived as not supporting the financial institutions in being innovative and therefore drive FinTech implementation in SA.

Coetzee and Coetzee (2019) conducted a study in SA. The study aimed to assess if the technology offers SA banks an opportunity to address inherent socio-economic imbalances in the economy and further explore if the potential systemic risk posed threatens to aggravate the situation if it is not adequately regulated. This paper used a non-positivist, qualitative research design following a case study approach. The Coetzee and Coetzee (2019) study found that structurally, the SA economy is severely challenged with legacy socio-economic issues that can be addressed through technology. They further found that most of the population lacks technological literacy and cannot access the internet due to their remote rural location.

[3] See https://www.itnewsafrica.com/2019/09/FinTech-ecosystem-in-south-africa-accelerating-the-digital-transformation-of-banking-financial-services/
[4] See https://www.ey.com/en_in/ey-global-FinTech-adoption-index
[5] See https://www.fic.gov.za/Documents/130328%20GUIDANCE%20NOTE%203A.pdf

However, the study notes that the younger generation is not as concerned with physical human interaction in banks as the older generations.

Concerning the SA banks, the study established that banks are risk-averse and burdened by the legacy systems, which are not agile. In contrast, FinTech is responsive and customer-centric in approach, and they are risk-takers. Finally, they found that the government will address the technology literacy issues in the education system, as articulated by Minister Pandor in 2019 (Coetzee & Coetzee, 2019).

Due to the increasing demand for digitally enabled financial services, in 2017, SA's investment in the FinTech industry reached $170 million. For the first time in Africa, with the objective to source scalable and affordable technology solutions in financial servicing, the start-up boot camp launched its programme in Cape Town (Mittal, 2019). Innovative collaborations of large banks, including Barclays and Standard Bank, with start-ups promote the ecosystem, allowing for better partnerships. As seen in the case of India and Russia, SA does not possess a large talent pool, with little practical technical skill in FinTech-related disciplines such as data science, machine learning and cloud computing (Coetzee & Coetzee, 2019). An improved and structured university-industry interaction in the ecosystem would help the country match demand and supply, prevent the brain drain and attract foreign talent.

Palmié et al. (2020) state that the knowledge of how ecosystems emerge around disruptive innovations and how technology diffusion occurs and creates disruptions in other industries is limited in SA. Failure to understand these dynamics will be self-defeating.

The literature review above highlights the FinTech ecosystem model in the developing world, and the researcher explored the question, what is the existing FinTech ecosystem model for the developing world? Interviews were conducted with selected participants to answer this question.

2.7 DEVELOPED AND DEVELOPING WORLD ECOSYSTEMS

Thus far, a limited number of studies have been conducted to gain a better appreciation and understanding of the FinTech ecosystem framework. These studies were conducted by various scholars between 2018 and 2020. The authors of the papers are included Anh et al. (2018), Arner et al. (2018), Castro et al. (2020), Coetzee and Coetzee (2019), Fayda et al. (2020), Imerman and Fabozzi (2020), Lee and Shin (2018) and Palmié et al. (2020), they have conducted research specifically in the areas of the FinTech ecosystem frameworks.

Anh et al. (2018) conducted a study in Vietnam. The study's objective was to review via the lens of players in the FinTech ecosystem what the status of the FinTech ecosystem in Vietnam was and compare it with Singapore. The study further wanted to establish which actors are important for setting up an ecosystem and maintaining a healthy ecosystem. The purpose of the research was to develop and assess the role of each actor and to highlight the relationship amongst and between the ecosystem players. Finally, the study wanted to know how Vietnam's ecosystem was developing and how it could further be strengthened. They conducted a qualitative study. They found that when looking at Singapore's FinTech ecosystem as a benchmark for Vietnam, there is a considerable gap in the talent pool. Therefore, a lack of skills weakened the FinTech ecosystem in Vietnam. They further found that while the government encouraged all players in Singapore's FinTech ecosystem, the government's support concerning Vietnam's policy was limited. The Vietnam market has players in the ecosystem to create a FinTech ecosystem; however, concerning the ecosystem, they found that some banks are incorporating FinTech in their operations. There is no real collaboration outside of banks taking over FinTech to enhance their capabilities.

They also found that FinTech entrepreneurs in Vietnam have potential; however, they require expertise, knowledge and innovation. They found that contributions from academic resources are limited in Vietnam compared to Singapore. They also found that funding is minimal in Vietnam, whereas FinTech in Singapore has access to different financing types. They found that enhanced collaboration between FinTech companies and banks is beneficial to Singapore's ecosystem; however, that was lacking in Vietnam. Finally, they found that government policy is theoretical rather than practical in Vietnam.

Another study was conducted in countries including China, Mexico, India, Bangladesh (Arner et al., 2018). Its purpose was to develop guidelines for management to use when formulating digital strategies. They followed a case study approach. They found a role for government to play to support the four pillars below, which they identified. The first pillar is about digital ID and keys to simplify the process for opening bank accounts. The second pillar concerns the opportunity for electronic payment systems, building a system that enables a suitable regulatory and policy environment to ensure the digital flow of funds from traditional financial intermediaries and FinTech. The third pillar deals with the opening of account initiatives and electronic provision of government services. The study found that alignment between these allows for access. The fourth pillar entails the design of digital financial market infrastructure and systems.

Further, the research found that this promotes inclusion in the financial services industry. The study found that the four pillars enhance financial inclusion and support digital economic development.

Further to these studies, another study was conducted by Lee and Shin (2018), using a theoretical approach. The purpose of the research was to introduce a historical view of FinTech and present the FinTech ecosystem. They also looked at various business models and investment types. Finally, they identified and addressed six technical and managerial challenges for FinTech start-ups and traditional financial institutions: investment management, customer management, regulation, technology integration, security and privacy, and risk management. Through their study, they made three findings. The first finding, demonstrated through the study, identified five key elements of the FinTech ecosystem: FinTech start-ups, technology developers, government, financial customers, and traditional financial institutions. The capacity of FinTech to generate value is highly dependent on the availability, growth, and creation of critical ecosystem components such as legislation, utilities, customers, and technology suppliers (Adner & Kapoor, 2016). The cash-based economy and a lack of confidence in the financial system remain major roadblocks for the growth of the regional FinTech ecosystem (Zalan & Toufaily, 2017). Payments, financial inclusion (for example, targeting the underbanked), and financial applications are among the technology companies' top strategic priorities in financial services, according to their new initiative (Financial Innovation Now, 2016; Zalan & Toufaily, 2017).

According to Diemers et al. (2015), the GCC countries have not developed especially deep FinTech ecosystems, even though the main aspects already exist. Indeed, some market analysts agree that FinTech's disruptive effect will be especially significant in emerging economies such as the MENA area (the Middle East and North Africa) (Diemers et al., 2015; World Bank, 2015). A large portion of the population (around 85%) is financially excluded and access to finance for SMEs is among the lowest in the world (Diemers et al., 2015; World Bank, 2015).

The FinTech ecosystem is crucial as it encourages and promotes innovation, acts as a catalyst for increased collaboration and partnerships, and encourages industry competition. In turn, this creates value for the customer through added value, reduced costs and suitable solutions. In the next section, the researcher expands on the roles of the different role players in the ecosystem (Lee & Shin, 2018). Ecosystems are intentional communities of economic actors whose individual business activities contribute to the community's fate in some way (Moore, 2006).

Collaboration among ecosystem partners and complementary, hard-to-acquire assets and capabilities are frequently cited as a source of competitive advantage (Teece, 1986). Dey (2016) goes so far as to conclude that a bank-FinTech partnership is not only desirable but also unavoidable, with investments in creative start-ups, incubators, accelerators, hackathons, and corporate venturing likely to be the outcome.

Individual developments are often embedded in larger systems (Adner & Kapoor, 2010) and technology advances in ecosystems (Evans, 2016). Both existing and revolutionary technologies depend on complementary technologies, services, standards, and regulations (Adner & Kapoor, 2016).

Both ecosystem partners must find ways to match their strategic interests such that investments in innovation and operational processes are mutually beneficial and reinforcing (Moore, 2006).

The literature in this section highlighted the fundamentals concerning the FinTech ecosystems in the developed versus the developing world through various country studies. The research question that was asked in this study was: What difference exists between the FinTech ecosystem models in the developing and developed world?

2.8 CONCLUSION

Tan et al. (2017) state that FinTech includes the delivery and design of services and financial products via technology. They highlight that FinTech impacts various players, customers, merchants, financial institutions and regulators. The technologies are challenging the core of the financial services sector, which is highly regulated, creating new peer-to-peer money exchanges and severe and increased currency turbulence in the markets. They found that technology enhances the inclusion of the excluded people in the financial markets. FinTech is defined as an industry of financial technology-based businesses that collaborate with technology experts, governments, industry leaders, and research institutions (Gai et al., 2018). Partnerships are created through an interdependent ecosystem, which draws on experience, expertise and technology. For a FinTech ecosystem to be thriving, all its participants or players need to engage, share ideas and connect across various areas to identify business opportunities and convert them into a business. No market player can afford to operate in a silo in the digital age, as collaboration and partnerships are more critical than ever (Puschmann, 2017).

In a study, Wójcik (2020) introduced the concept of business sustainability in the ecosystem framework to enable innovation. They highlight the idea of systems thinking in business, thus

suggesting that business should be operated similarly to a living organism. They emphasise that in the ecosystem framework, the environment impacts the business, and likewise, the business also impacts the environment in a dynamic, interdependent and flexible manner. They further found that the systems thinking approach contradicts the linear way, which is generally employed in various disciplines, including in business, that attempts to explain the causes of action and reaction; however, it does not consider feedback effects concerning the activities and the purpose of the action. The researchers try to find solutions that would guide business leaders, including looking at different business models to create sustainability.

The Consultative Group to Assist the Poor (CGAP) report published in May 2019 showed initial results that FinTech can affect financial inclusion; however, their findings were not conclusive. According to Cook and McKay (2015), the CGAP will work with policy makers, the development sector and influence investors to increase financial inclusion by creating a shared understanding of trends and business models in FinTech.

The literature currently available on FinTech ecosystems is focused on developed countries, and very little research has been conducted in developing countries. The limited research tends to look at who the FinTech players are and what role they play. The preliminary literature review provides evidence that there is a shortage of scientific studies on the FinTech ecosystem frameworks. The primary objective of this research was to investigate if the existing FinTech ecosystem frameworks are suitable for the SA context. How does the current FinTech ecosystem model apply to the SA context?

The research questions of the study are to establish the following:

- Which components of the FinTech ecosystem models are fundamental to the SA context?
- What is the existing FinTech ecosystem model for the developed world?
- What is the existing FinTech ecosystem model for the developing world? This question was however consolidated to read, what are the existing FinTech ecosystem model for the developed and developing world?
- What differences exists between the FinTech ecosystem models in the developing and developed world?

CHAPTER 3: RESEARCH METHODOLOGY

3.1 RESEARCH DESIGN

According to Bhattacherjee (2012), the research design is a comprehensive plan for data collections in a research project. Mouton (2011) further states that the research design section is where the overall approach to testing the research question or statement is discussed. The topology of the research design can be classified into two categories: empirical studies and non-empirical studies (Mouton, 2011). Empirical studies derive new knowledge from data, whereas non-empirical studies use the literature review, modelling and philosophical and conceptual analysis to develop further understanding. An exploratory research study was suitable for this research problem because there is a lack of literature in the given context, as outlined by the research problem (Saunders & Lewis, 2012).

There was the possibility of integrating a deductive approach from the FinTech ecosystem literature review, as it was expected that an adapted ecosystem model framework, such as the Lee and Shin (2018) model, could form the basis for adapting the model to the SA context. This would also help formulate the research questions, thus stimulating an adaptation of the FinTech ecosystem. In the identified sector, the financial services industry, the researcher had access to a wide variety of participants in the FinTech ecosystem, which enriched the research findings. A semi-structured interview is a data collection process in which predetermined questions are posed in a systematic order covering various themes (Saunders & Lewis, 2012). This technique was appropriate because the data allowed for purposeful theme building, and it complemented the qualitative exploratory nature of the research.

3.2 RESEARCH METHOD

Bhattacherjee (2012) suggests that research studies can use a quantitative research method, a qualitative research method or a mixed research method that is both quantitative and qualitative. The qualitative research method usually has no measurements or statistics but uses words, descriptions and quotes to explore meaning, and the quantitative method usually contains numbers, proportions and statistics (Williams, 2007). For this study, the empirical qualitative technique was adopted because the researcher sought to get a more in-depth insight into the phenomenon.

According to Nancy and Grove (2001), an exploratory study aims to gain new insights into phenomena, raise questions, and evaluate phenomena in a different light. It is conducted when

few or a few studies are conducted on the subject or topic. Its aims and objectives are to traverse ideas and develop a theory or framework (Collis & Hussey, 2014). Exploratory research evaluates whether existing concepts of methods apply to a phenomenon and assess if there is a need to develop a new framework or methodology. This type of study will not provide conclusive answers to the problems, but and it gives ideas from which future research could be conducted, providing guidance or direction (Collis & Hussey, 2014). This research was conducted in an exploratory way due to the FinTech ecosystem being relatively new, and there is limited information about the topic. Reliance was placed on the desktop review, together with participants who are experts in FinTech.

3.3 POPULATION AND SAMPLING

3.3.1 Population

Mantzoukas (2009) refers to the population as an aggregate or totality of all the objects, subjects or members that conform to a set of specifications. In this study, the researcher used organisations in SA (financial services, FinTech entrepreneurs, customers and government institutions) as the population sample. Furthermore, since SA is a developing economy, it is an ideal location for researching FinTech ecosystems as a model for bringing about social and economic change. Even though it faces nearly insurmountable social and economic challenges, these challenges are not unique to SA (Akinboade et al., 2014). The theory-building process of this research study could potentially create an adapted FinTech ecosystem model design that could be transferable to other socio-economic contexts. However, the researcher is aware that the qualitative analysis approach severely limits the transferability of the research results, which should be supplemented by additional research.

3.3.2 Sampling

Scott and Morrison (2006) refer to sampling as selecting a subset of persons or things from a larger population, also known as a sampling frame. In this study, the sample included a chief executive officer, a founder of FinTechs and senior government official SA; the sample size was 12 participants. The study participants consisted of various players in the FinTech ecosystem in the SA context. They have a thorough understanding of FinTech ecosystem dynamics and were, therefore, well-placed to understand the challenges, enablers, and critical elements of creating a thriving FinTech ecosystem.

The sampling methods were convenient sampling (the researcher started collecting data from the participants with whom the researcher has working relationships), purposive sampling and snowball sampling (the researcher asked for recommendations from initial participants).

Given the potential for several new codes to be generated from semi-structured questions, it was necessary to choose a relatively homogeneous sample group, and although 14 participants were intentionally chosen as participants, data saturation was reached after 12 interviews (Guest et al., 2006). As a result, the study group generated enough data in the theoretical constraints of the measurement instrument, bolstering the research method's validity.

3.4 DATA COLLECTION METHODS AND PROCEDURES

In the context of COVID 19, it was anticipated that virtual interviews would be held with the participants even though face-to-face interactions would have been the preferred method. The interviews took approximately 45 minutes to an hour. The researcher conducted the interviews in a semi-structured format, which assisted in illustrating the level of insights and opinions each participant had on the issues. The study used open-ended interviews, and information was collected from the targeted participants who referred additional participants through the snowballing technique. The approval was emailed to the targeted participants, and an appointment was booked via their offices for the interview session.

The process was as follows:

(i) The researcher called the identified participants to introduce them to the study and outline the purpose of the study.
(ii) The researcher asked the identified participants to participate in the study in the form of an interview.
(iii) The researcher then set up interviews with participants who agreed to be part of the study.
(iv) The participants were sent the interview questions before the interview to ensure they were familiar with the questions and comfortable answering them.
(v) The interviews were set for 60 minutes, and after the interview, the participant was asked by the researcher to recommend another participant for the study.
(vi) The recommended participants were approached by the researcher, starting the data collection process again.

3.5 THE RESEARCH INSTRUMENT

The research instrument was developed, and the researcher used the interview guide to conduct the interviews. The questions were based on the following questions as specified in Chapter 2.

Main question: How does the existing FinTech ecosystem model apply to the SA context?

The sub-questions for the study are:

1. Which components of the FinTech ecosystem models are fundamental to the SA context?
2. What are the existing FinTech ecosystem model for the developed and developing world?
3. What differences exists between the FinTech ecosystem models in the developing and developed world?

Semi-structured virtual interviews were conducted using an interview instrument (Annexure A), which was used as the research instrument for this analysis. The interviews were semi-structured in the sense that a list of questions was prepared ahead of time to allow for additional input or clarification on the answers given. The questions were sent to the participants before the interview to manage their expectations. This procedure also helped to guide the participants' responses, as they could contextualise their responses based on the questions received.

3.6 DATA ANALYSIS

The researcher explored a three-stage process, as recommended by (Miles, 1994). This consists of writing the interviews, summarising them and coding the answers based on keywords repeated by the interview participants and keywords that either contradict or affirm the conceptual framework. However, the researcher felt that this approach would be limited.

The researcher in this study used thematic coding of document sources, and open-ended interviews were used. According to (Braun & Clarke, 2012; Clarke et al., 2015)), there are six steps to thematic analysis.

(i) The researcher read and understood the content and data in the literature and made notes, becoming familiar with the data required and reading and rereading the interview transcripts and notes. Once an appreciation of the content was developed, the work was analysed by interrogating the thematic areas.

(ii) The second step was to code using the research question that looked at the FinTech ecosystem framework and organising the data in a systematic and meaningful way.
(iii) The theme patterns captured something significant or interesting about the data; therefore, the third step was to assess the themes.
(iv) The fourth step was to review the themes identified, modified and developed further to check the themes that might emerge for SA.
(v) The fifth step was to name and define the themes in the context of SA: this was the final refinement of themes.
(vi) The sixth step was to write the dissertation.

Once the data had been collected, the interviews were transcribed and analysed to classify the interviews. They were coded using descriptive coding. Coding was a mechanism used to analyse qualitative data (Saldaña, 2021).

3.7 TRUSTWORTHINESS

3.7.1 Credibility

Nancy and Grove (2001) define credibility as a measure of truth or falsity of the data obtained by using the research instrument; it is classified as the internal and external validity of the measuring instrument. The study was conducted with one senior executive or chief executive office in each organisation, and the credibility was verified with the supervisor before the full-scale research was conducted.

Credibility refers to the alignment between the research instrument and what the research design intends to measure (Saunders & Lewis, 2012). The research instrument was informed by the research questions introduced in Chapter 1 and the literature reviewed in Chapter 2. It could be concluded that the research instrument yielded rich data from all four research questions and was highly relevant to the participants in the study, thereby validating the alignment between the research instrument and the research questions.

Presenting the interview schedule to participants in the interview process strengthened the validity of the research instrument and clarified the frame for the thought processes of all participants during the interviews.

3.7.2 Dependability

Mantzoukas (2009) states that dependability is the degree of consistency that an instrument uses to measure quality. In this study, to ensure dependability, the questions for the interviews were standardised, and the data was analysed using the thematic methodology. An expert was engaged for ongoing coaching and mentoring to improve dependability

3.7.3 Trustworthiness

Bryman (2016) defines transferability as the ability of findings from a study in a particular setting to be transferable to others or enable the generalisation of results. Bryman (2016) defines trustworthiness as a mechanism for evaluating the quality of a study, and it has four areas, transferability, credibility, confirmability and dependability.

- The data collection process was homogenous throughout the study, and the use of an interview guide ensured consistency in the data collection method.
- The reliability was ensured by maintaining a systematic process of data analysis, which can be applied by subsequent researchers who attempt to recreate this study.

3.8 LIMITATIONS

The analysis attempted to mitigate researcher bias by providing justifications for different research methods and rational explanations by providing a diverse collection of data. As mentioned in the previous sections, several reliability and validity techniques were used. However, the shortcomings of the research report may be supplemented by further quantitative research studies that will assess the study's validity. The method of interviewing experts from in the study community often improves the findings' transferability to other contexts, such as developing countries, and could be validated further through analysis. This study had four limitations, as outlined below (but these were mitigated as explained previously).

(i) The study had a limited sample size due to the time available to finalise the study.
(ii) The qualitative nature of the study means there is an inherent limitation due to the time allocated to this study.
(iii) The researcher had anticipated challenges with the availability of the senior founders and chief executive officers to participate in the study; however, this challenge did not materialise.
(iv) Further limitations are because interviews were conducted on MS Teams or Zoom due to the restrictions imposed on face-to-face meetings resulting from COVID-19.

Therefore, the researcher was not able to identify non-verbal cues or read people's body languages. Finally, there were dropped calls or/and pauses during the interview session that could have annoyed the participants due to network issues.

3.9 ETHICAL CONSIDERATIONS

According to Nancy and Grove (2001), ethics relates to the appropriateness of the researcher's conduct of the study and the research participants. Abernethy et al. (2014) emphasise that ethics should be maintained throughout all the phases of the research. They further state that it is vital for the researcher to place themselves in the participant's place regarding how they would like to be treated. Collis and Hussey (2014) highlight the importance of ethical guidelines for researchers concerning consent, anonymity, privacy and misrepresentation of the participants. Due to this, ethical approval was obtained, and an email was sent to all the interviewees to obtain their consent.

The first step in conducting an ethical research study was to seek ethical clearance from the University of Witwatersrand's Ethics Committee (Appendix D). As a result, the data collection process was carried out in full accordance with the ethical clearance agreement's terms and conditions. In addition, to further deal with the issue of ethics and confidentiality, pseudo names have been used to protect the confidentiality of participants.

Before the interview, the researcher explained to the participants that they could withdraw from the study at any point and that they may choose not to answer all the questions. They were further informed that their privacy would be maintained and respected at all times. The confidentiality of the participants was upheld throughout the study, and they remain anonymous. The participants were informed that the interviews are recorded, and a transcript could be provided to them for approval before analysis of the data and to avoid misrepresentation. The researcher signed the plagiarism declaration form, stating that the researcher has acknowledged other researchers where necessary.

CHAPTER 4: PRESENTATION OF RESULTS

4.1 INTRODUCTION

In this chapter, the findings from the research conducted are presented. This section is split into three sub-sections. The chapter starts with a presentation of the participants' background, followed by the emerging themes from the participants' insights, and then the conclusion. The analysis was conducted using the thematic qualitative approach discussed in Section 3.7 of this report. The findings are outlined using this analysis method relative to the questions presented in Chapter 2.

4.2 DEMOGRAPHICS

This section presents background information on the participants and their respective institutions. All the interviews were conducted via Zoom and MS teams. Because of the agreed confidentiality about the participants and their organisation, the participants' identities are referred to as P1, P2, P3, going forward.

The table below is a high-level overview of the participants, including gender, race, period of service in the financial services industry, and job level

Table 4.1 Overview of the participants' information

CODE	GENDER	RACE	TENURE (IN YEARS)	JOB LEVEL
P1	Male	Colored	10	Strategic change
P2	Female	Black	16	CEO
P3	Male	Indian	11	Founder
P4	Female	Black	4	Executive
P5	Male	Black	6	Executive
P6	Male	Black	20	CIO
P7	Male	Indian	22	Head of FinTech
P8	Male	White	20	Head of corporate strategy
P9	Male	Black	17	Head of listed investment
P10	Female	Black	10	Country manager
P11	Female	Black	15	Chief director
P12	Male	Black	15	Chief director

4.2.1 Gender and race

This section breaks down the gender and age profile of the participants. It can be noted that male incumbents dominate the participants' representation, but this does not impact the study results. From a race perspective, the participants are predominantly spread between the African and Indian race. Thirty-three per cent of the participants were black females; 33% were black males; 20% were Indian males; 7% white male, and 7% coloured male.

4.2.2 The number of years in financial services and qualification

The researcher shows information on the participants' number of years in financial services and their qualifications. It can be seen that all the participants are at senior executive and managing executive level and that they have been exposed to FinTech in their respective institutions. The information is further broken down between education level for both males and females, with most males showing more years of experience and higher levels of postgraduate education level for both males and females, with the majority of males showing more years of experience higher postgraduate education levels.

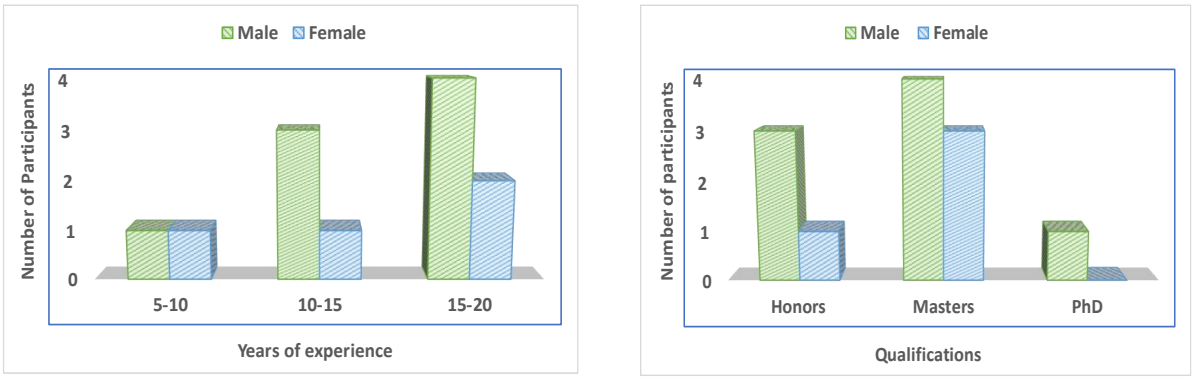

Figure 4:1 Number of years in financial institution and qualifications of the participants

4.3 DATA ANALYSIS

Semi-structured interviews were employed to generate the required data to realise the aims of the study. The main aim of data analysis and interpretation is to organise the data into categories and identify patterns in these categories through a deductive process, which gives meaning to the analysed information and determines its significance and implications.

The analysis was conducted using the thematic analysis process as depicted by various authors, as stated in Chapter 3 (Braun & Clarke, 2012; Clarke et al., 2015).

Data was translated into text format to allow for the analysis to be conducted. After that, initial impressions of the data were captured based on the research questions, and they are summarised below. Throughout the data analysis process, a constant and deliberate effort was made not to allow personal prejudice, assumptions, or presuppositions to contaminate the participants' meanings and opinions.

4.3.1 Generation of initial codes

The process of coding was applied, meaning that some of the codes were identified. The codes were formed by going through the transcripts to determine the emerging themes. This process was done with the research questions and objectives in mind; therefore, the approach followed is deductive. All codes about the research questions have been grouped into one table for ease of analysis. Seventy-three codes were identified, which were then grouped into eleven categories, explored in detail in the following sections.

There were seventy-three open codes derived from the coding process, which included several repetitions and similarities. The identified codes were organised into 11 categories: key stakeholders, stakeholders' role, the importance of stakeholders, Lee and Shin, PWC, another model, developed world versus the developing world, constraints, promote, formal and informal understanding, formal and informal benefits in the ecosystem.

4.3.2 Identification of themes

After identifying and generating the initial codes, similar codes were grouped into categories and, in some instances, sub-categories based on patterns emerged. The identified themes were linked back to the three main research questions of the study. There were seven themes identified.

The following themes are presented:

- Key FinTech ecosystem stakeholders;
- Key role players in the FinTech ecosystem;
- Components of the FinTech ecosystem that are relevant for the SA context;
- Difference between developed and developing world;
- Factors that impact the FinTech ecosystem;
- Understanding the formal and informal sector; and
- Collaboration between FinTech ecosystem players.

4.3.3 Reviewing and finalisation of themes

The 11 categories were refined further into seven themes and mapped to the research questions.

4.4 KEY FINTECH ECOSYSTEM STAKEHOLDERS

The subthemes that emerged during the data analysis for Research Question 1 are summarised below. Each theme yielded several subthemes that are discussed in more detail. Research Question 1 was explored through four questions during the interview. This sub-section presents the findings on the understanding of the FinTech ecosystem by the participants.

The participants unanimously identified the following players, government (regulator), customers, financial institutions, developers, entrepreneurs/ start-ups, academic institutions and mentors and incubators as the key players of the FinTech ecosystem as defined by the participants in the study. The majority of the participants identified the FinTech ecosystem as defined in Lee and Shin (2018) ecosystem framework, with a few participants adding the component of incubators and mentors.

> *'...there's a customer because otherwise, you don't have the need. You've got the entrepreneur that's trying to build the business, you've got funders, you've got financial institutions, you've got regulators, and to some extent, you also have, I don't know if the right term is mentors or experienced individuals who can support the business'.'–* ***P3***
>
> *And*
>
> *'For me, that's how I see it; the FinTech players out there, are key. We've got the enablers of the FinTech players; for example, we've got the funders, and we've got venture capitalists and private equity guys that enable those FinTech guys to get off the ground. Those are also key because, without them, there'll be no ecosystem. Then you've got government from a policy-making perspective, very key. Of course, you've got the regulators, and then you've got academic institutions like Wits Business School; they're also key in terms of helping us with the body of knowledge. We've [also] got some incubators that assist the FinTechs. Of course the customers, it can't just be supplier side because remember the FinTechs are there to solve the pain points of the customers, so absolutely.'* ***– P 11***

Some of the participants stated the roles of the FinTech ecosystem players before the question was presented.

'So, banks, mobile network operators, regulators, entrepreneurs, and then distribution networks. The stakeholders are regulators, banks, mobile network operators, processors, distribution networks as well as the customers; the obvious one is the customers. – ***P10***

4.5 KEY ROLES OF THE FINTECH STAKEHOLDER IN THE SOUTH AFRICAN CONTEXT

When responding to the ecosystem stakeholders' role, some of the participants were very clear about what the ecosystem system needs and the importance of the role players. The aim of this was to establish if there was a general understanding of the various players' roles in the ecosystem. All the participants had a similar understanding of the roles of the players in the ecosystem, with 50% of the participants adding additional roles such as incubation and mentorship that the ecosystem players can play. The key roles played by the FinTech ecosystem and raised by all the participants were the following. They are under the relevant subthemes.

4.5.1 Role of government

The majority of the participants stated that the role of government was to create legislation and supporting policy; however, some participants included additional roles for government to play, such as opening doors for FinTechs, while other participants believed that the government also had an important role to play over and above regulation: the government needs to provide funding to the FinTech start-ups. There was a minority view that the government should not provide funding, expressed by two out of the 12 participants.

'I think the government plays a very big role, of course. They are the ones that set the regulations and the legislations and the policies that govern how your FinTech ecosystem is.' – ***P2***

'For the government, it's much more of a policing and governing role. We look to the government for the right laws to moderate and ensure that there's good trade between FinTechs and there are the right protocols and laws that protect both the state and the businesses, as well as the people.' – ***P 4***

'I think there is a role government play in terms of ensuring that they create the opportunities for FinTechs to thrive, giving them a role in terms of some of the services that government needs to provide and ensuring that FinTechs are playing a big part in providing some of those services, over and above just the legislation and the regulation,

I think that they can open doors for FinTechs in terms of putting certain opportunities in place to just give them an opportunity to grow.' – ***P2***

4.5.2 Role of financial institutions

The participants were unanimous in what they believed the role of the financial institutions to be. Out of the 12 participants, two believed that financial institutions should also provide mentorship and incubation to the FinTechs as mentioned by Participant 3 – *'Mentors, it's the role of mentors and experienced individuals that help you maybe grow in the market commercially or bring industry or functional expertise that you may be lacking.'*

Here is a flavour of what the participants believe is the role of financial institutions shared by Participants 2, 7 and 8:

'Then you've got your traditional financial institutions, which are your banks. I'd say our banks play a significant role in that they obviously have to create funding and they have to provide different mechanisms for the FinTechs to start-up and to thrive.' ***– P2***

'There's the funders in the capital markets; those are two different things. The funders of FinTechs are typically venture capitalists and private equity companies. Last, but not least, certainly is consumers and businesses to customers of the banks whose requirements from these financial institutions need to be met.' ***– P7***

'The second one that I think would be quite key is still the financial institutions because somewhere along the line, irrespective of what service you are providing, you have to still connect to a financial institution, whether it's keeping your funds there as an equity crowdfunding platform or whatever it might be, you still need to connect to the financial institutions' ***– P8***

4.5.3 Role of the entrepreneur/start-ups

Most of the participants stated that the role of the entrepreneur or the FinTech start-up is to create relevant solutions for the customers; they were unanimous that FinTech brings solutions for the customers and financial institutions.

'Firstly, you need the FinTech start-ups; they are the guys that create the magic. I think the government plays a very big role, of course. Then you've got your traditional financial institutions, which are your banks. Obviously, customers are critical; there is

no ecosystem if there aren't any customers…The reason FinTechs are able to work is because of developers of platforms…' **– *P2***

*'If I think of FinTech entrepreneurs, the innovators and the FinTech firms, the role that they play is to almost produce what I would call disruptive innovation or supportive innovation, and it's quite fundamental.'***– *P8***

'…but I think that if the government is very serious about the development of FinTechs and in their provision of employment for others through that, then it would be simply a no brainer to allocate funds to the exploration of some of these ideas that FinTechs come up with, creating those sandboxes, creating the mentorship programmes for them to thrive from a business perspective and to give them an opportunity to grow.' **– *P2***

4.5.4 Role of customer/s

All the participants believed that there is no ecosystem without the customers, as there will be no clients for the solutions. They stated, as quoted below that the customer is at the centre of the ecosystem.

'The customer is obviously the heart of the matter, in the sense that they define where is there a gap in terms of current services, current products that might allow an appetite for something to be developed that will serve their needs, entrepreneurial obviously the ideation and implementation of a potential solution.' – ***P3***

'Obviously, customers are critical; there is no ecosystem if there aren't any customers as you've got to be developing something for someone's need.'– ***P2***

'The first part of that would be the customers, who would either be the beneficiaries of an efficient service or they would be the beneficiaries of a cost-effective service…I think the second set of people right at the top would then be the technology developers, the people who develop the technology, the programmers, and the people who provide the computing power behind these technologies. We also have, thirdly, the government through their regulatory processes to ensure that the systems are fair to the customers, but also they don't violate the rules of the country. We also have financial institutions, which are basically the people who need the technology to be able to deliver the service.' **– *P6***

4.5.5 Role of developers

The participants were unanimous that the role of the developers is to support either the entrepreneur or the financial institutions in providing the relevant solutions for the customers. The quotations below reflect what the participants shared concerning the developers.

> *'The reason FinTechs are able to work is because of developers of platforms, the guys that provide digital platforms through which those FinTechs are essentially able to provide their services to those customers by using lots of different technologies, so your developers of those digital platforms are also quite critical.'* ***– P2***

> *'A processor or a technology player would provide the actual platform where then all these services would be layered on.'* ***– P10***

In summary, the participants were unanimous in highlighting the following as the key roles of the FinTech ecosystem stakeholders:

- Transacting
- Setting regulations
- Providing funding
- Satisfying customer needs
- Providing technologies
- Accelerating innovation

4.6 CRITICAL COMPONENTS OF THE FINTECH ECOSYSTEM IN THE SOUTH AFRICAN CONTEXT

Approximately 11 of 12 participants articulated the roles of the different players as follows:

- Government and Regulator – should provide an environment that will enable the FinTechs to thrive;
- Financial institutions and entrepreneurs – should provide different funding models;
- Developers and entrepreneurs – should provide the technology platform to engage with customers and provide relevant products to the customers. Customers and entrepreneurs – should understand the customers' needs and provide the solutions; the customers are at the centre of the ecosystem because, without customers, there is no ecosystem; and
- Incubators – should provide support to the entrepreneurs.

The participants did not have a unified opinion in terms of which players are critical for the ecosystem. However, there was a general sentiment that the entrepreneurs, customers, and developers were important. The participants felt that the developers are essential because there are very few developers in the developing world. The funding institutions were also important in supporting the FinTech ecosystem with funding and mentorship. The regulators and government were seen as the least important as they are perceived as stifling innovation in the FinTech ecosystem. Below are highlights that reflect the sentiments expressed by Participants 4 and 9. The disconnects are further exacerbated by using different terminology concerning the FinTech ecosystem, the context of which does not seem to be clearly articulated. This is also evidenced by the varying descriptions associated with the roles of the stakeholders in the FinTech ecosystem.

> *'For South Africa, I'd say critical is the developers. I think they are still few, and currently, the FinTech players that I know of develop most of their technology themselves. I would say definitely there's a critical focus for the technology owners or the technology developers. Another critical player is the start-ups because they actually provide the solution and they identify the gap in the market, and the consumer is also critical I'd say if I'm scaling it, then government and banks would be in my last bottom two.'* ***– P4***

> *'For me, it's definitely the user first and then the government second.'* ***– P9***

Around half of the participants were familiar with the Lee and Shin (2018) ecosystems, while only a few were familiar with other FinTech ecosystem models. However, the other half of the participants who were unfamiliar with both of the FinTech ecosystems preferred the Lee and Shin (2018) model because it involves the consumer and is more reflective of the SA background. All the participants echoed the sentiment that customers are core in the FinTech ecosystem.

Participants 2 and 7 shared strong views in this area, and their views are highlighted below. P7 indicated that they had explored and created a framework, whereas Participant 2 felt strongly about the Lee and Shin (2018) model because of its relevance to the SA context.

> *'We came up with a framework in about 2016, and the intention wasn't to define the FinTech ecosystem in absolute completeness, but there is a framework that we came up with there, and you could probably see it in a report by a body called the FinTech*

Issues Group or the FIG. I think we called it something like, 'Issues that merit supervisor's attention in FinTech' or something like that, but you'll see it, there's a framework that we came up with there, and you can critique that framework as well.' ***– P7***

'The Lee-Shin FinTech ecosystem model is one that I've found particularly interesting because I think also it speaks a little closer to home...' ***– P2***

4.6.1 Customer segmentation

The participants' responses were unanimous in that the Lee and Shin (2018) model is the appropriate model because it includes the customer, and explanations were provided that SA is unique because it has parallel economies.

'I believe for the developing world and South Africa definitely the one by Lee and Shin, and these are your core role players, but in the developing world the entrepreneur is one of the most prominent roles.' ***– P1***

'I guess for me the Lee, and Shin model definitely could work in terms of identifying and understanding the South African context, but the segmentation of that consumer and how well our ecosystem then solves for that becomes very important.' ***– P2***

'Lee and Shin has that also includes the customer. For the developing countries or the South African context, we have a varied base for customer. I'd say that that's the one model that could even suit our case.' – ***P4***

'South Africa is an interesting case because we have parallel economies in a way. It's a developed market in one sense, but we also have in parallel to that, a very developing economy and some very rural and peri-urban conditions.' ***– P10***

'Obviously, the Lee and Shin model. Remember in the beginning where you spoke about an inclusive economy? I think for the FinTech ecosystem to say it has succeeded, the area of financial inclusion really needs to be addressed. Just to your question to say do we need to segment these customers? Of course.' ***– P12***

Due to the numerous challenges we face as a nation, such as infrastructure, literacy levels, legacy problems, and the pace of technology adoption, 60%–70% of participants indicated that

we cannot compare ourselves to the developed world. Over 50% of the participants agreed with the Lee and Shin (2018) model and expressed a need for a new model that is more inclusive and cognisant of our social ills, focusing more on the customer and addressing the context in the developing world. Approximately ten out of the 12 participants felt very strongly that developing nations could not compare themselves with developed levels for many reasons, but key were the infrastructure, literacy, technology adoption levels. The participants felt that a new model that is inclusive of all LSMs should be considered for inclusivity.

> *'I think there's a few. One is when you think of the differences between solutions in the developing world versus developed; there is a surplus in the developed world, surplus of funding, surplus of expertise, and customers tend to be often higher LSM, higher socio-economic brackets, more attuned to formal market mechanisms…Whereas [in] developing markets, at least in our experience at X, it's been a little bit more tricky in the sense that you're dealing with a market that's often more informal, it's hard to get a pulse sense of what the customer needs exactly and one often iterates to figure that out, there's often limited funding in the sense that everybody says that they're willing to fund pre-revenue businesses, but actually it's not really the case. It's quite an environment that is risk-averse, and often FinTechs in the South African environment have to, for example, seek funding internationally.'* **– *P3***

> Patient capital has no set meaning, but it usually applies to long-term investments that are willing to wait a long time to see a return on their investment. In general, "a significant period of time" means at least five years.

> *'Another critical player is investors and venture capital. I spoke about resources, and one resource is capital and enabling distribution of capital to FinTech innovators is essential in order for scalability, but we need patient capital when it comes to financial inclusion and inclusivity. We [also] need more venture capital that has a higher appetite for risk and invests in innovation rather than a proven model because the nature of innovation is trial and error… Another resource is talent. Another area that is really needed is FinTech talent, people that either have experience in financial technology or the affinity to learn financial technology, so we also need talent in the space and knowledge transfer.'* **– *P10***

4.7 THEME 4: DIFFERENCES BETWEEN DEVELOPING AND DEVELOPED WORLD FINTECH ECOSYSTEM MODELS

This sub-section presents the findings on whether there is a noteworthy difference between the FinTech ecosystem models in the developing and developed worlds that the participants could identify. This research question was broken down into five questions in the research instrument. The interview question identifying this category and the themes are presented in this section. Views expressed by the participants on these themes are also quoted.

The initial codes, together with the categories, were used to identify patterns in the data. The themes were reviewed in line with the research question and were classified into subthemes: available funding models, approaches to regulation, and customer needs.

4.7.1 Available funding models

The participants felt very strongly that developing nations, and specifically, SA, do not provide access to funding to entrepreneurs. Eighty per cent of the participants felt that there could be an additional role for government to play, such as funding the entrepreneurs and also creating an enabling environment for incubation, again supporting the entrepreneurs to thrive. They also felt that government could play a more supportive role in bringing financial inclusion through a closer partnership with entrepreneurs and the ecosystem instead of being 'big brother'.

The participants felt that both the financial institutions and government funding institutions are risk-averse and do not understand the technology business model as cited below by Participant 3, by sharing their business experience and where they ultimately received funding.

> *'I think there's a few. One is when you think of the differences between solutions in the developing world versus developed; there is a surplus in the developed world, surplus of funding, surplus of expertise, and customers tend to be often higher LSM, higher socio-economic brackets, more attuned to formal market mechanisms and working with what already exists often. Whereas as developing markets, at least in our experience at X, it's been a little bit more tricky in the sense that you're dealing with a market that's often more informal, it's hard to get a pulse sense of what the customer needs exactly and one often iterates to figure that out; there's often limited funding in the sense that everybody says that they're willing to fund pre-revenue businesses, but actually it's not really the case. It's quite an environment that is risk-averse, and often FinTechs in the South African environment have to, for example, seek funding internationally. Just as an example, X has been funded by investors not*

in South Africa but through our international networks of angels through Dutch impact investment entities and through a UK entity. There is a bit of a supply deficit of appropriate funders for FinTech locally, and the issue of expertise can be an issue in the sense that it's quite scarce to have the technical skills and the commercial skills to get these things grown.'– P3

Under the heading 'understanding the FinTech ecosystem's role', 70% of the participants highlighted that the government had an additional role to play in funding the FinTech ecosystem. Approximately 80% of the participants expressed their views on the distinctions are that exist in the developed and developing world. The participants have highlighted funding as one of the key missing ingredients for a thriving FinTech ecosystem, and the poor access to funding is viewed as a significant constraint for innovation. Sixty per cent of the participants provided examples such as the United States, China and Singapore as places where capital exists and FinTech and innovation is thriving.

Participants 3, 10 and 12 echoed the same sentiments as Participant 2 concerning wealth levels and further expressed his frustration with what the standard narrative is concerning funding; however, he expressed that in his experience, their business could not access funding in SA, as the institutions are risk-averse**.** Below highlights frustration and the sentiment shared by Participant 3 on where their funders are:

'I think there's a few. One is when you think of the differences between solutions in the developing world versus developed; there is a surplus in the developed world, surplus of funding, surplus of expertise, and customers tend to be often higher LSM, higher socio-economic brackets, more attuned to formal market mechanisms…Whereas as developing markets, at least in our experience at X, it's been a little bit more tricky in the sense that you're dealing with a market that's often more informal, it's hard to get a pulse sense of what the customer needs exactly, and one often iterates to figure that out, there's often limited funding in the sense that everybody says that they're willing to fund pre-revenue businesses, but actually it's not really the case. It's quite an environment that is risk-averse, and often FinTechs in the South African environment have to, for example, seek funding internationally.' ***– P3***

'One of the issues is not coupling the funding with the non-finance support. They give you a loan, and you're on your own to figure things out for yourself, and I think that's

where you start to question the effectiveness of agencies such as SEDA because, for example, SEFA and SEDA should be working closely together. If SEFA gives you one hundred Rands, immediately there should be somebody at SEDA waiting to support you in terms of what you need in your business, what are the skills, what are the gaps, what support they can give you, and I don't get the sense that there's that synergy between the two.' – ***P12***

'At the beginning, I started with the incentives, right? I think government-funded projects to provide the incentives for firstly people to create those solutions, so I do think incentives would drive that agenda so if you incentivise corporates, for instance, to partner with start-ups as an example, if you incentivise entrepreneurs to build solutions and models and to test models, and incentives could be grant capital to test solutions for the underserved, but also providing incentives for informal businesses to actually get formalised. They need an incentive, and the incentive shouldn't be that they pay tax, that's not incentive for them, that's a government incentive, there has to be a clear incentive for them to become formalised' – ***P10***

Some of the participants (about 20%) felt that there was no noteworthy difference between the FinTech ecosystem models in the developing world and the developed world because a model is a model; however, 80% of the participants felt that there was a noteworthy difference, due to issues of access to infrastructure, access to data, and literacy levels that are very different in a developed world versus the developing world. Approximately 80% of the participants highlighted that funding is a real issue in a developing country such as SA, whereas there is surplus funding in the developed world in the form of financial institutions, venture capitalists and private equity.

'We know that in certain emerging countries, the levels of literacy are low partly because of the history. The issue of understanding the local culture, understanding the levels of literacy and the level of wealth. Affordability and literacy, so adaptation in the area of affordability, in the area of literacy but also the area of culture because there are certain things that are acceptable in a South African culture that may not be acceptable in a foreign culture, and understanding how we communicate, those types of things might make a difference in terms of adopting a FinTech platform from a developed world to the developing world.' – ***P6***

'South Africa is an interesting case because we have parallel economies in a way. It's a developed market in one sense, but we also have, in parallel to that, a very developing economy and some very rural and peri-urban conditions. The challenge in South Africa is that you have a very formal financial infrastructure. We have a very developed financial infrastructure that is working and working really well, and our financial services is working and working really well. The challenge is that it is, however, not affordable, not accessible and not appropriate for the South Africans and the underserved communities. In South Africa, however, you've got the financial infrastructure, but it's not affordable, accessible or appropriate for everybody in South Africa, therefore we need inclusive FinTech models, we need more models and financial technology that is actually accessible, affordable, and appropriate.' **– P10**

4.7.2 Customer segmentation

The participants were unanimous in their views of segmenting the customers because we have many unbanked people who are not bankable due to regulations that exist. The majority of the participants believe that it is essential to segment the customer further for the SA context to bring inclusion of the underbanked and unbanked customers. The researcher highlights the views expressed by Participants 4 and 12.

'I think there is opportunity for growth more than constraint because the opportunity for FinTechs in South Africa is that they can slice up any part of banking and focus on it and double down on it. There's opportunity for FinTechs to win in the South African case because the incumbent banks have not been able to get through to the unbanked, the current banks are too expensive, or there is access issues, or the solutions that they provide do not work for the customers. It's a hanging fruit, I don't even want to say the lower hanging fruit, but it's a hanging fruit and a real opportunity for us because no one is doing anything for that market or can shift their product in order for it to really work for the market, and that's because within the incumbent banks there is heritage systems or the traditional systems that are expensive to run.' ***– P4***

'I think to some extent a lot of the innovation is oriented around the informal or underserved part of our economy because that's where the gap is, so if you look at innovations in Africa in particular, many of them have scaled because of that gap. X is one example I can maybe think of, they are also in the positive space, and they may have less requirements in terms of what they require of informal traders and they not

only play in [South] Africa, but outside of South Africa as well in terms of getting informal trader buy-in to some of their devices so they can accept payments.' – ***P12***

All the participants interviewed understood the formal and informal sector similarly. They all understood the informal sector as an institution not recognised by the government, not paying tax, with no access to credit and a cash-driven sector. In contrast, the participants understood the formal sector to be registered with the Companies and Intellectual Property Commission (CIPC), paying tax, and they have easy access to credit.

Participants 5 and 6 describe what it means to be in the informal sector, where people are included and excluded concerning capital.

'Firstly, it's that not enough research is being pumped into the informal sector. In South Africa, for example, a huge majority of the wealth is distributed amongst the minority. I think that's one, is that the levels of inequality are just too drastic, which results in the focus being skewed towards one part of the pie and very little research is being done also to understand the needs of the informal sector, so it's quite difficult to understand the needs of informal sector because they're not conventional so not much is being done to understand their needs. I think those are the two main factors.' – ***P5***

'Access to resources are probably better in the formal area of the market, and they will probably be almost non-existent in the informal market. If you think about access to capital at banks, you don't have financial statements, and you don't have proof that you've been trading well as a sidewalk entrepreneur you're not going to be able to access (to) *capital there, so the access to capital would be one of the major constraints for the informal sector.' –* ***P6***

Participant 4 defines the formal sector versus the informal sector.

'Formal sector would be the formalised trade where it goes through the banks, goes all the way to SARS and gets taxed, and it's operations that are registered, and the informal trade is cash basis. It's the stand on the side of the road, or someone who's thriving or beginning who doesn't have a registered entity, so their money sometimes doesn't go to banks or even get taxed.' – ***P4***

Participant 10 shares the understanding of the formal and informal sector and highlights that the International Finance Corporation (IFC) defines the informal sector as unseen.

'The formal sector in South Africa I'd say it's the employed workers and the services that they are offered, that's how I would define it, and I would also define it as capital cities, and the rest I'd actually say is informal market. I think in South Africa, that informal market is bigger than we see, as IFC defines it as the unseen economy because it's also largely unregistered businesses. It's a shadow economy because it's businesses that don't pay tax, so it's far bigger than we all know because it's unregistered businesses and unregistered transaction flows as well.' ***– P10***

4.7.3 Customer needs

Approximately ten out 12 participants felt that FinTech enables entrepreneurs to provide cost-effective solutions, thus bringing in inclusivity; however, they noted that the banks are partnering with FinTechs to provide solutions to their clients and trying to bring in solutions for the underbanked segment. The participants felt that it is important to understand the customer, and therefore, further segmentation of the customer is crucial to provide the right policies, solutions and innovations for the customer needs.

The majority of the participants believed that the Lee and Shin (2018) model is the most suitable for the SA context. However, the model needs to take cognisance of the customer segmentation in line with the challenges or context of SA. The participants felt that we do not have the same type of customer. Some customers do not have bank accounts because they do not have a home address, no consistent payslips, and are continuously being excluded for reasons beyond their control. The banks are not innovative enough to cater for these customers; thus, FinTech solutions would better serve these customers if they are appropriately catered for.

According to about half of the participants, customers in the developing world have a higher LSM than customers in countries such as SA. The majority of the participants highlighted the importance of developing an appreciation of a local understanding, culture, and literacy levels within the model. The majority of the participants also highlighted a robust infrastructure and interoperability in the developed world versus the developing world. The majority of the participants highlighted that the developed world has a mature regulatory framework, whereas the regulatory frameworks are not mature in some countries. They further highlighted that the developing world is risk-averse in terms of how funding is allocated to start-ups and entrepreneurs, whereas in the developed world, there are various funding models available to

entrepreneurs. Participants 1, 2 and 12 clearly articulated the difference in the infrastructure in the developed and developing worlds.

> *'…in the developed markets, there are very mature regulatory frameworks, and in the developing markets, the frameworks are in the process of maturing, and I think it will remain that way for some time…these things are very emergent, and we are currently experiencing a pandemic. It means that many of these regulatory frameworks and models are being tested as they've never been tested before and many things may change after the test.'* **– *P1***

> *'In my mind, developed countries or developed economies have got legislation that is supportive to FinTech development. An example would be the United States. They've got an entire Silicon Valley where the billionaires play, and technology is the name of the game, and they've got mature funding models. Their FinTechs are a critical part of the economy because they enable the country and the economy to be global players at a much bigger scale than what they could have before. There's a proper coexistence, a proper partnership if I can put it that way, between FinTechs and your banks or your financial institutions.'* **– *P2***

> *'If you look at the rural market and the low-income market, we have to resolve the issue of access to digital infrastructure, reason being, if the FinTechs can come up with all these innovations, they can come up with hundred innovations if they want to, but if people don't have access to digital infrastructure to access then these solutions that are being provided by these FinTechs, then we are wasting our time.'* **– *P12***

4.7.4 Approaches to regulations

The regulator's job, according to ten of the twelve participants, is to establish regulations that support the FinTech ecosystem and allow it to thrive. Approximately 80% of the participants felt that the SA regulator is reactive and not proactive, thus stifling the FinTech ecosystem.

Ninety per cent of participants agreed that the regulatory climate in SA does not help but instead stifles innovation. The participants felt that the regulation is that of the first world; however, SA is a developing world.

> *'…in the developed markets, there are very mature regulatory frameworks, and in the developing markets, the frameworks are in the process of maturing, and I think it will remain that way for some time…these things are very emergent, and we are currently*

experiencing a pandemic. It means that many of these regulatory frameworks and models are being tested as they've never been tested before and many things may change after the test.' **– *P1***

Most participants perceived the regulator or government as a hindrance to the FinTech ecosystem instead of unlocking value. About 90% also stressed the need to focus on the underserved or underbanked segment when regulations, solutions and innovations are being created.

Below are highlighted some of the respondent's answers to this question and how they articulated what was glaring for them. Participant 1 highlighted the maturity of the regulatory frameworks in the developed world.

'…in the developed markets, there are very mature regulatory frameworks, and in the developing markets, the frameworks are in the process of maturing, and I think it will remain that way for some time…these things are very emergent, and we are currently experiencing a pandemic. It means that many of these regulatory frameworks and models are being tested as they've never been tested before and many things may change after the test.' **– *P1***

'You've got these big, strong companies, big techs that have emerged out of the US, and I was reading somewhere where it says that the fluidity of their legislation and then the light touch of their legislation and regulation has enabled that kind of ecosystem in the US for these big techs to grow and dominate. You've got these companies like Alibaba and Ant Group emanating out of China, which has got a slightly different ecosystem from the US, but it works for that environment.' – ***P11***

4.8 THEME 5: FACTORS THAT IMPACT FINTECH ECOSYSTEM

In this question, 16 codes were identified and classified under the themes in factors that impact FinTech ecosystems.

The majority of the participants felt that there are constraints, but they also present an opportunity. The distinctions highlighted earlier are displayed further in Table 5.3 in chapter 5. Our demographics and being an unequal society feature prominently across most responses. The participants felt that SA is very slow in the digital journey for many reasons, but mainly, it is the quality of our education. The entrepreneurs in the study felt that it is complicated to secure funding in SA and that there is limited availability of skills sets with the competencies

in FinTech. The majority of the participants felt that some fundamentals need to be in place for FinTech to thrive; however, they believed that, despite the constraints, there is an opportunity for FinTechs to create cost-effective solutions that address the needs of the unbanked and underserved markets.

Participants 1, 2, 4 and 8 were very passionate about the regulator's or government's role in creating a conducive environment for FinTech to thrive.

> *'I would like to say that there's a good chance of arguing some relaxation on the regulations to enable FinTechs to thrive in the economy. Definitely, it has been proven that a more relaxed regulatory framework is something which enables FinTechs to thrive.'* ***– P1***

> *'There are foundational things that need to be in place before different FinTechs can then access those because, as I said earlier, we've got a very unequal population. Education, access and such become very important as foundational blocks for FinTechs or for start-ups. Where do we get a hold of the information, what does the information mean, where can I get help, how can I get help, so in my mind, if we can't get those foundational blocks in place, then the efforts that the government tries to make might be futile because they don't then solve for a wider range of FinTechs in my opinion.'* ***– P2***

Participant 4 was very vocal about the opportunities presented for FinTechs to win as the banks were not able to focus adequately on the unbanked customers

> *'I think there is opportunity for growth more than constraint because the opportunity for FinTechs in South Africa is that they can slice up any part of banking and focus on it and double down on it. There's opportunity for FinTechs to win in the South African case because the incumbent banks have not been able to get through to the unbanked. The current banks are too expensive, or there is access issues, or the solutions that they provide do not work for the customers. It's a hanging fruit, I don't even want to say the lower hanging fruit, but it's a hanging fruit and a real opportunity for us because no one is doing anything for that market or can shift their product in order for it to really work for the market, and that's because in the incumbent banks there is heritage systems or the traditional systems that are expensive to run.'* ***– P4***

Participant 8 expressed frustration that we will not be able to innovate at the rate of the United Kingdom or Singapore because we are not agile and do not have access to the infrastructure.

> *'I would think that if we don't have access to these infrastructures or tools or any of the other things that we talked about, assets, we will not see the kind of innovation that we're looking for, the rapidness of it, et cetera, we will not see that happen. If we contrast ourselves to the UK or Singapore, we will be able to see that there are innovations that are happening there. I'm just going to use a quick example. In China, there are five thousand peer-to-peer lending platforms, five thousand! But you can count them on your fingertips in South Africa, so that's the contrast.' –* ***P8***.

Infrastructure, literacy, and technology adoption levels were mentioned by approximately 80% of the participants. The participants felt that a low level of adoption and innovation led to a slow digital transformation due to the constraints highlighted above.

> *'Remember the developed is developed, so I'm not sure if we can really compare ourselves to them, and adoption of technologies are much easier in the developed world than in our world. I was in China two years ago now because now we are in 2021, and the adoption of digital technology in China is unbelievable. Everybody has a smartphone, you go to the train station, and everybody pulls up their phone for that QR Code to pay for the train fare, and that's it, and I'm thinking these people are way too advanced and us as South Africa it will take us years and years to get there.' –* ***P12***

As highlighted above, the themes that emerged concerned the slow adoption rate and government and regulatory challenge and funding.

Our digital adoption journey is extremely slow relative to other countries, according to approximately 70% of participants, due to the quality of our education and the fact that we have an unequal society. The issue of access to infrastructure and data costs was referred to frequently. The participants also raised the issue of literacy several times, which contributes to the skills gap and knowledge gap.

> *'There are foundational things that need to be in place before different FinTechs can then access those because, as I said earlier, we've got a very unequal population. Education, access and such become very important as foundational blocks in order for FinTechs or for start-ups. Where do we get a hold of the information, what does the information mean, where can I get help, how can I get help, so in my mind, if we can't*

get those foundational blocks in place, then the efforts that the government tries to make might be futile because they don't then solve for a wider range of FinTechs in my opinion.' ***– P2***

4.9 THEME 6: UNDERSTANDING THE FORMAL AND INFORMAL SECTOR

The participants' views varied on this: some participants felt that due to the multiplier effect, both the formal and informal sectors benefit from the FinTech ecosystem. However, when they thought about the 'how' part of the question, they would quickly retract and state that the formal sector benefits more than the informal sector benefits in the FinTech ecosystem.

'I believe they benefit; they definitely benefit. If we look at something called the multiplier effect, as the informal sector is transacting, funds are passing from the informal sector back into the formal sector. The more transactions are taking place in the informal sector; the more funds will flow from the informal sector into the formal sector.' ***– P1***

The majority of the participants (approximately 90%) felt that the informal sector was not benefiting from the FinTech ecosystem because they use cash mostly and do not have access to credit. Because of our country's historical legacy problems, 90% of the participants believe the environment is geared for the formal economy.

The quotation below highlights the views expressed by one of the participants. It is clear from this response that the informal sector is not benefiting from the FinTech ecosystem, and there are numerous reasons for the lack of benefit.

'Short answer is no. Short answer is, as I said previously, our South African system is geared for the formal economy and geared for the developed economy. The financial services system has been developed for developed markets in a developed economy historically, and because it's historic, the systems are geared that way, the policies are geared that way, and the infrastructure is geared that way. Is it geared for the informal market? No. Is that changing? Yes. I do think there is a transition happening. However, do they have a voice at the table? I don't know. Th(en) I'd rather say, I don't know.' ***– P7***

'*They don't have a seat, and there might be a whole set of the informal sector that we simply have not thought of. I remember the Governor* (of the Reserve Bank) *saying to us at one stage, he goes out whenever he does the monetary policy and every single*

time he goes out to a new community that is in the informal sector to talk to them about the impacts of monetary policy in simple English like what happens when he reduces the interest rates, and he says because if we don't do that, we are only serving one sector who would listen to me and then know exactly what this means or pretend to know what it means, but what about the people on the ground? Do they understand if I increase the interest rates what that means for them, that your credit has become more costly? Maybe you don't even have access to a bond; maybe it's just the credit for the 'Mashonisas' that's going to be increased without you even knowing. I think you are right; I don't think that sector is thought through structurally enough in terms of bringing them in.' – ***P7***

4.10 THEME 7: COLLABORATION BETWEEN THE FINTECH ECOSYSTEM PLAYERS

Eleven of the 12 participants emphasised the importance of the relationship, and they agreed that it was critical for collaborations and cooperation. The participants felt that all the players were vital to the ecosystem as they all need each other; in other words, they are interdependent. The participants were clear about the importance of the ecosystem's relationship, as highlighted below by Participants 3 and 9.

*'I think the role between the customer and entrepreneur is always there but it can be a little bit far removed if you're not careful. The best entrepreneurs try to keep some sort of pulse on clients as much as they can…The closest relationships are probably entrepreneur to funders, and then secondarily to mentors and experienced individuals and then probably financial institutions later in their life cycle…Regulators, I found are a little bit less so because they tend to be more of a hindrance than an unlocker of value.'***– P3***

'It's important for government to have a proper oversight role and facilitate market growth and movement, but the underpinning thing with any sort of financial relationship is trust. A guy needs to know that if I'm going to remit money through your platform, it will get there, [that's'] number one. Number two, you're not going to surprise me with any charges and number three, I'm not going to have undue or unnecessary issues when I try and get my money out of your ecosystem, so those things are quite important, and I need to make sure that if I'm not taking it out of your ecosystem, I'm able to transact with another person.' **– P9**

The participants were very vocal and passionate about how the ecosystem needs to collaborate and build a partnership. As shown by Participant 9 – reliability is key in ensuring the ecosystem is functional.

4.11 CHALLENGES OBSERVED WITHIN ECOSYSTEM

The majority of the participants highlighted that the FinTech ecosystem model as designed by Lee and Shin (2018) is representative of the SA ecosystem with a few challenges on the model itself. The challenges stem from the historical disadvantages of SA. The sentiment expressed by the participants was that the economy is designed for the privileged few in SA and not for everyone, and this is a systemic issue. The systemic issues continue to plague SA, even with the FinTech ecosystem, as the underbanked and underserved are not benefiting, nor are they catered for in the ecosystem: inclusion is a major challenge. Participant 8, who is part of the regulatory environment, stated that they have various associations representing various stakeholders, but they had never factored in the informal sector to enable them to speak for themselves, and Participant 8's response was:

> *'In the informal sector, my gut tells me that we have not accommodated them enough in the ecosystem. For example, you're making me think now why is it that we do not have as a key stakeholder an association of spaza shops? Why haven't we brought their voice into this?' –* ***P8***

Various challenges have been highlighted through the discussions that relate to the following areas.

Infrastructure: The infrastructure in rural areas, townships and shacks in SA is very limited; it is therefore difficult for the people in those communities to have access to data and connectivity.

Participant 2 expressed her frustration on the disparities in the developing world and highlighted issues such as infrastructure, literacy and wealth levels.

> *'Developing countries don't necessarily have the infrastructure in place to enable all of what I've just mentioned, and there might be some heavyweights that are bigger players than others in the ecosystem that get to dictate how certain regulation*(s) *or certain access is created to FinTechs. Also, in terms of the literacy of the people, the wealth of the people, the access that people have to technology, all of those things have to be in place in order for a proper FinTech ecosystem to thrive.' –* ***P2***

Literacy: The education in those areas is also inferior, and thus there is an even greater divide when it comes to technology-related solutions due to access to knowledge and the internet.

> *Also, in terms of the literacy of the people, the wealth of the people, the access that people have to technology, all of those things have to be in place in order for a proper FinTech ecosystem to thrive.' –* ***P2***

Inclusion: The SA economy is designed for the formal economy; due to the structural design of the economy, the majority of the citizens are excluded. The majority of the population does not have a home or work address no regular income, which automatically excludes people from the ecosystem. This links back to infrastructure and connectivity, where most people do not have data.

Participant 8 shared the sentiment by Participant 3 when he spoke of his frustration about the legacy systems that do not allow for innovation, as referred to below.

> *'…the legacy systems just do not allow for fresh innovation to be happening, and I could use a very practical example. We've had a faster payment system since 2004, but we built it using very old technology. If you look at some countries that leapfrogged us, although we started in 2004, Sweden only implemented their faster payment system I think it was 2014 or 2015, including China with Alipay and Tencent and so on in 2012…' –* ***P8***

4.12 CONCLUSIONS ON THE FINDINGS

Concerning Research Question (RQ1), it became evident that most of the participants felt that government is a fundamental component of the ecosystem in SA through providing funding and creating a conducive environment. The participants also felt the customer is very important; however, they felt that for the SA context, segmentation was critical to understanding the customer needs. The participants also highlighted the importance of the financial institutions to support the entrepreneurs and government by mentoring the entrepreneurs and providing incubation hubs. There was consensus on who the FinTech ecosystem players are; however, there were additional players recommended for the FinTech ecosystem in the developing world, specifically SA, and the roles were as follows:

- funding from the government;
- mentorship, and
- incubation – extremely important.

In terms of the roles played by the FinTech ecosystem, the participants were unanimous in what role each of the FinTech ecosystem representatives plays. Most of the participants felt that government could be proactive in its regulatory role rather than being reactive. The participants felt that government should create a conducive environment to enable the FinTech ecosystem to thrive by providing a friendlier regulatory environment and funding.

The majority of the participants felt that it is essential for the customers to be segmented due to the historical challenges. The majority of the participants felt that the developed world is adequately equipped with developers; however, the developing world does not have enough developers. They need to source solutions from the developed world, which creates misalignment. The participants acknowledge the skills gap that a developing world has due to a shortage of developers.

Concerning Research Question RQ2, most participants felt that the Lee and Shin (2018) model was most suitable for the developing world, specifically for SA, because of the customer focus. They felt that it is important for the customers to be further segmented in light of the demographics in the country.

When responding to RQ3, most participants believed that the emerging and developed world FinTech environments are fundamentally different. In comparison to the developing world, the participants proposed that the developed world has better infrastructure. They also suggested that developing countries have funding available. The participants also said that SA has many underbanked and underserved people, while developed countries have a higher LSM. Finally, the developed world has easier data access than the developing world.

CHAPTER 5: DISCUSSION AND FINDINGS

5.1 INTRODUCTION

This chapter analyses the research results presented in Chapter 4, considering the literature review highlighted in Chapter 2.

The study sought to establish if there was a common understanding of the FinTech ecosystem and if the stakeholders' roles in the FinTech ecosystem were understood and appreciated consistently by the various players in the ecosystem. It further sought to understand if the FinTech ecosystem, as demonstrated by Lee and Shin (2018), was appropriate for a developing country, specifically South Africa. Furthermore, the intention was to validate whether additional roles could be added to the ecosystem in South Africa.

The participants' average tenure is 14 years indicating excellent institutional knowledge and experience. All the participants possess a postgraduate degree, which further displays the calibre of participants who participated in this study.

Out of the research, various themes were identified; however, the researcher felt that the six themes that were the most relevant to the research question are:

- Key FinTech ecosystem stakeholders;
- Key role players in the FinTech ecosystem;
- Components of the FinTech ecosystem that are relevant in the South African context;
- Difference between developed and developing worlds;
- Factors that impact the FinTech ecosystem;
- Understanding the formal and informal sector; and
- Collaboration between FinTech ecosystem players.

These themes are explored further in line with the ecosystem model and the implications for the FinTech ecosystem, specifically in the South African context.

Table 5.1 reflects the themes that were formulated relative to the research questions from the analysis conducted.

Table 5.1 Research objectives and themes

RESEARCH OBJECTIVES	PROPOSITIONS	QUESTIONS	THEMES
1. To establish the key players of the South African FinTech ecosystem framework	There are five key players, namely start-ups/ entrepreneur, developers, government, financial institutions, customers, and the FinTech ecosystem relevant to the South African context.	RQ1: Which components of the FinTech ecosystem models are fundamental to the South African context?	1.Key players in the FinTech ecosystem 2.Key roles FinTech ecosystem stakeholders (i) government (ii) customer (iii) financial institutions (iv) entrepreneur (v) developer
2. To identify the different types of FinTech ecosystem models in the developing and developed world	There are different existing FinTech ecosystems models; we focus on two, namely Lee and Shin Model (2018) and the PWC Diemer's model (2015) in the a) developed and b) developing world.	RQ2: What are the existing FinTech ecosystem model for the developed and developing world?	3 .Components of the FinTech ecosystem that are critical for SA's context **Sub-theme** Customer segmentation
3. To examine the difference between the FinTech ecosystem models in the developing and developed world	There are noteworthy differences, namely, the types of customer that exist, infrastructure, literacy, adoption of technology, access to data availability of funding that is both positive and negative between the developed and developing worlds.	RQ3:What differences exists between the FinTech ecosystem models in the developing and developed world?	4.Difference between the developed and developing world Subthemes 4.1Customer segmentation/needs 4.2 Available funding models 4.3 Approaches to regulations 5.Factors that impact the FinTech ecosystem 6.Understanding the formal and informal 7. Collaboration between FinTech ecosystem players

Following the themes presented in Chapter 4, the results are presented below and align with the research questions in Table 5.1.

5.2 KEY PLAYERS IN THE FINTECH ECOSYSTEM

This section was divided into subcomponents looking at the FinTech ecosystem stakeholders that are most critical in the South African context. The study participants were asked various questions to ascertain who the key and most relevant players are in the FinTech ecosystem, including the South African context. Although there was consensus on who the FinTech ecosystem players are, additional role players in the developing world were suggested. This finding extends the ecosystem in terms of statements by Lee and Shin (2018).

According to Lee and Shin (2018), there are five FinTech ecosystem players: governments, entrepreneurs, developers, traditional financial institutions, and customers. Lee and Shin (2018) adapted the framework to include customers that were not part of the PWE Dimers model (2015). The participants in this study were unanimous on whom the FinTech ecosystem stakeholders are, with a few participants adding mobile phone operators, incubators and mentors to the ecosystem. The language used by the participants was inconsistent, as some participants included processors, distribution networks and mobile operators, while others included telecommunication operators.

The majority of the participants believed that the customers should be further segmented in the South African context to factor in rural areas. Furthermore, the participants suggested that the levels of affordability of various people in different parts of the country should be considered to give them access to appropriate financial services solutions. This aligns with the Zavolokina et al. (2016) research that found that FinTech assists in developing services and products that empower customers and enable the customer to have access to affordable, convenient and relevant financial products.

Zavolokina et al.'s study found that most participants agreed on who the FinTech ecosystem players are; however, some participants believed that there should be additional customer segmentation to reflect the South African context. A few participants highlighted incubation and mentorship as an essential aspect of the FinTech ecosystem in South Africa. In other words, the participants suggested an adaptation of the FinTech stakeholders for the developing world. The research instrument did not test explicitly for the FinTech ecosystem players' definition but for an understanding of who and what role the ecosystem players play, including their

importance. An important finding has emerged from the received responses, which indicates that a FinTech model representing the South African context does not exist.

5.3 KEY ROLES FOR FINTECH ECOSYSTEM STAKEHOLDERS

All of the participants seemed to have a common understanding of the functions of the ecosystem players, with 50% of them adding additional roles that ecosystem players should perform. They also highlighted the difficulties of switching costs for FinTechs and included mobile networks in providing infrastructure as a potential role. The participants also highlighted the role of innovation and reducing transaction costs. It was observed that the participants were unified in their view of who the role players are; however, it was noted that disparate views exist among the ecosystem players on the roles of the FinTech ecosystem players. Therefore, the findings of this study partially support the Lee and Shin (2018) research, as the findings suggest that there are additional role players in the ecosystem. Furthermore, there are additional roles that can be played by the FinTech ecosystem players over and above those alluded to in the PWC Diemers et al. (2015) model and Lee and Shin (2018) model.

This concept is explored in more detail through the following subthemes.

5.3.1 Role of government

The majority of participants believed that government should be constructive rather than reactive in its regulatory position. The participants agreed that government should foster a favourable atmosphere for the FinTech ecosystem to prosper by supporting it. In a study conducted by Diemers et al. (2015), it was found that to promote investment in small businesses, the government may provide initial financial support to venture capital or private equity funds, banks, and incubators; this is in line with the findings of the study. According to Diemers et al. (2015), the government's role is to create an enabling environment for FinTech to thrive. The participants in this study were frustrated by government regulations and the limited capital available for start-ups.

There have been numerous academic debates about the role of governments in ensuring financial inclusion (World Bank, 2008; Demirguc-Kunt et al., 2018). Most participants believed that the government should provide funding and provide a conducive atmosphere for the ecosystem to thrive. There were different views on whether the government should fund start-ups or not, with most participants suggesting that government should provide funding for start-ups. This finding is supported by literature that indicates that the FinTech ecosystem

thrives when funding is accessible to FinTech. M-Pesa was cited by Burns (2018) as a great success that demonstrates the role of regulators in financial inclusion. Regulators, who were mentioned by bankers and entrepreneurs multiple times in the Zalan and Toufaily (2017) study, are by far the most significant ecosystem player limiting FinTech expansion. The literature supports the findings of this study and the various views expressed by the participants.

5.3.2 Role of customers

Most participants believed that it was important for customers to be further segmented due to historical challenges in South Africa. All the participants agreed that without the customers, there would be no FinTech ecosystem. This is in line with the literature as highlighted by Gimpel et al. (2018). They indicated that one of the most important functions of FinTech start-ups is to recognise and satisfy consumer needs; without consumers, none of the above can be achieved or is feasible. Customers are essential for FinTech companies to gain access to the market. There was an overwhelming number of participants who supported the notion of a thriving environment and the importance of customer service. The participants agreed that the consumer is critical; moreover, the segmentation and knowing the customers' needs were more important in the South African context.

Olanrewaju (2016) highlights that the customer groups most susceptible to disruption are millennials, small businesses, and the underbanked. These three categories are susceptible to prices and the enhanced consumer experience provided by digital delivery and distribution. According to Burns (2018), financial inclusion is seen as the increasing number of people accessing financial services in a population, which is critical in helping people and countries to alleviate poverty. The participants in this study shared the same sentiments as expressed in the existing literature. The participants believed that FinTech allows entrepreneurs to provide cost-effective solutions, thus promoting inclusivity. However, they also noted that banks are working with FinTechs to provide solutions to their customers and attempting to introduce solutions for the underbanked.

5.3.3 Role of financial institutions

A few participants believed it was difficult for banks to help FinTechs since they regard them as competition. In contrast, most participants believed that financial institutions have a responsibility to provide support through funding, mentorship and incubation for the FinTech ecosystem; this is in agreement with the findings of a study conducted by Diemers et al. (2015) that found that four significant funding sources traditionally support finTech ecosystems.

Governments can contribute to the FinTech hub's development by providing seed money, interest-free loans, or even subsidised office and co-working space, which can be achieved by creating consortia and providing access to funding through different streams. In terms of the FinTech ecosystem's functions, all participants agreed on the position each FinTech ecosystem member holds. The majority of participants thought banks were part of the formal economy rather than the informal economy. According to the participants, financial institutions could play a critical role in incubating and mentoring FinTech start-ups. There is alignment in terms of the literature and the findings of this study concerning financial institutions incubating and collaborating with start-ups as this view is also supported in a study conducted by Bladier (2016), that found that the role of traditional financial institutions is also to incubate, fund, or collaborate with start-ups.

5.3.4 Role of entrepreneurs

The findings of this study are in line with the literature review conducted. The majority of the participants were in agreement that start-ups should create solutions that meet customer needs. The majority of the participants agreed that it was important for entrepreneurs to provide low-cost solutions that primarily target disadvantaged and underbanked markets.

According to Lee and Shin (2018), the primary role of the start-up is to create new technological ideas in the financial services industry and create new businesses. Gimpel et al. (2018) also stated that an essential aspect of FinTech start-ups is their ability to identify and create solutions that meet the customer needs.

5.3.5 Role of developers

Zavolokina et al. (2016) found that technology developers are important as they enable the entrepreneur to create solutions through the integrations of various skills. The majority of participants believed that the developed world has sufficient developer resources, unlike the developing world, where this is lacking. As a result, they would depend on developed world solutions, causing misalignment. The participants consider the skills gap in the developing world due to developer shortages as a disadvantage to the developing world. These findings are in line with the study conducted by Coetzee and Coetzee (2019), which revealed that South Africa, unlike India and Russia, lacks a significant talent pool in FinTech-related disciplines like data science, machine learning, and cloud computing. A more organised and strengthened

university-industry relationship in the ecosystem will assist the country in balancing demand and supply, as well as preventing the brain drain.

5.4 COMPONENTS OF THE FINTECH ECOSYSTEM THAT ARE CRITICAL FOR SA'S CONTEXT

In terms of which players are critical for the ecosystem, the participants did not have a unified opinion. However, there was consensus that the importance of entrepreneurs, consumers, and developers could not be overlooked. Since there are so few developers in the developing world, the participants believed that developers are crucial. The role of funding institutions in supporting the FinTech ecosystem was also critical. Regulators and the government were classified as the least significant because they are thought to stifle competition in the FinTech ecosystem. The disconnects are compounded by using various terms concerning the FinTech community, which do not seem to have a specific context; this is also demonstrated by the various explanations of the roles played by the FinTech ecosystem's stakeholders.

5.4.1 Customer segmentation

The participants were unanimous that the Lee and Shin (2018) model is suitable for the developing world, specifically South Africa. The participants believed that this model would need to be modified to allow for the segmentation of customers because of the large population that is unbanked or underbanked. They believed that literacy, infrastructure and access to data affect customers differently in the urban and rural areas. Participants agreed that it is important to understand the customer and that further segmentation of the customer is necessary to have the appropriate strategies, solutions, and technologies to meet the customer's needs.

The finding of this study is supported by Gutierrez and Singh (2013), who found that MNOs can provide relevant financial products to the poor. Gimpel et al. (2018) also highlighted that the customer is critical; the study further stressed that the start-ups must respond to customer’s need to be relevant. D'Albuquerque (2019) shared the sentiments that customers are important to the ecosystem. The participants in this study stated that banking in rural South Africa is poor. It appears from the literature and the sentiments expressed by Jutla and Sundararajan (2016) that banking in rural India is also low: the poor have limited to no access to financial institutions, and because of expensive interest rates, they are excluded because they are not part of the formal economy.

5.5 DIFFERENCE BETWEEN THE DEVELOPED AND DEVELOPING WORLD

This section aimed to address what FinTech ecosystem models exist in the developed and developing worlds and look at the differences between FinTech ecosystems. Research Question 2 was explored through three questions in the research instrument. The participants were unanimous that the Lee and Shin (2018) model best represents the South African context.

Some participants (about 20%) believed there was no discernible difference between FinTech ecosystem models in the developing and developed worlds since a model is a model; nevertheless, 80% of participants believed there was a discernible difference due to issues of technology, data access, and literacy levels that are very different in the developing and developed worlds. According to over half of the participants, customers in the developed world have a higher LSM than customers in countries like South Africa. Within the model, most participants emphasised the importance of cultivating an awareness of local understanding, history, and literacy levels.

Table 5.2 below highlights what the participants highlighted as the fundamental differences between the developing and developed world.

Table 5.2 Difference in FinTech models: Developed and developing world

WHAT DISTINCTIONS EXIST BETWEEN THE FINTECH MODELS IN DEVELOPED AND DEVELOPING WORLDS?	
DEVELOPED WORLD	**DEVELOPING WORLD**
• Matured regulatory framework • Mature funding models • Proper partnerships • Established infrastructure • Literate people	• Risk-averse • International funding • Local culture • Legacy systems • Lack of interoperability

The participants in this study mentioned the literacy issue even though they did not specifically refer to technology literacy. The findings are in line with the study conducted by Coetzee and Coetzee (2019), which revealed that most of the population could not access the internet because they are based in rural areas, and they are without the required infrastructure. They further found that they are technologically illiterate.

Mahadevan and Sivalingam (2000) suggested that a new business model would allow new technologies to bring tools that allow for inclusion in the financial services industry. They recommended that this area be further explored. According to Christensen et al. (2016), disruptors often build business models that are very different from those of incumbents. It is

vital to understand the regulations in a sector where FinTech start-ups operate and the degree of flexibility required to implement new, previously unheard-of business models that can necessitate rule changes (Gimpel et al., 2018). This area is further broken down into subthemes that delve into the analysis of the findings.

5.5.1 Customer segmentation/needs

Financial inclusion (described as increasing the percentage of a nation's population with access to financial services) is crucial in helping people and countries rise out of poverty (Burns, 2018). According to a World Bank survey, approximately 55% of developing countries lack a bank account due to high transaction costs and a lack of adequate documentation, resulting in them remaining unbanked. The World Bank's finding that about 1.7 billion adults lack access to financial institutions and do not hold a bank account is supported by the Global Findex Database (2017). Participants agreed that it is important to understand the customer and that further segmentation of the customer is necessary to have the appropriate strategies, solutions, and technologies to meet their needs.

Adults in developed countries have a bank account, while all unbanked adults live in developing countries (Demirguc-Kunt et al., 2018). It was discovered that developed countries such as the United States and the United Kingdom have built online lending platforms that have improved SME lending rates and increased financial inclusion (Berkmen et al., 2019).

According to Olanrewaju (2016), the customer groups most susceptible to disruption are millennials, small businesses, and the underbanked. These three categories are particularly sensitive to prices and the enhanced consumer experience provided by digital delivery and distribution. According to their latest initiative, Financial Innovation Now, payments, financial inclusion (targeting the underbanked), and financial applications are among the technology companies' top strategic priorities in financial services (Zalan & Toufaily, 2017). This view is in line with the findings that the underbanked segment presents an opportunity for the FinTech ecosystem. According to Light Castle Analytics Wing (2019), there is a lack of institutional financial services in Asia for nearly 90% of the 180 million poor households. Most formal financial institutions refuse to serve those poorest people due to perceived high risks. Small transactions are commonly associated with high prices, and the poor cannot afford marketable collateral for loans. As a result, Monetary Financial Institutions can be viewed as the primary means of bringing such people into the financial mainstream. FinTech, according to the participants, helps developers offer cost-effective solutions, encouraging inclusivity;

moreover, banks are collaborating with FinTechs to provide solutions to their clients and attempt to develop solutions for the underbanked.

In the Zalan and Toufaily (2017) study, participants frequently stated the ability to promote financial inclusion for the region's under- or unbanked population as an area where MENA's FinTech entrepreneurs could have a significant social impact aided by high mobile penetration rates. The findings in Chapter 4 described the areas highlighted above, and thus these findings are in line with the literature findings.

5.5.2 Available funding models

This sub-theme emerged from the combined views expressed concerning creating a supportive environment and is supported by the overall finding in the studies conducted in Vietnam, Singapore and Brazil. Taiar (2018) and Sagoenie (2019) found that the Brazilian government has, with effect from April 2018, created an enabling regulatory environment for FinTech; in May 2019, they established a FinTech innovation hub. Similarly, Sergi et al. (2019) stated that in India, the government and the reserve bank are critical players in ensuring the FinTech ecosystem's success.

In the study, most participants believed that government should play an additional role in funding the entrepreneurs. The participants were adamant that developing countries, especially South Africa, do not provide access to capital for entrepreneurs. Eighty per cent of the participants thought the government should play a more active role, such as financing entrepreneurs and providing a favourable climate for incubation, which would help entrepreneurs succeed. They also believed that, rather than being the regulator, the government should play a more constructive role in bringing financial inclusion by forming stronger partnerships with entrepreneurs and the ecosystem.

This view is supported by the study conducted in the South African context by Haddad and Hornuf (2019), which found that a stumbling block in developing countries is the lack of funding or access to credit. However, a study conducted by Haffajee (2019) found that the government's stance is highly supportive of building and supporting SMEs in the country, with the SME fund devoting around 1.4 billion to the Venture Capital Fund, which is contrary to the findings of this study. In a study that was conducted by Anh et al. (2018), it was found that there is limited funding available in Vietnam, which has affected FinTech. In contrast,

Singapore has various funding models available to entrepreneurs, leading to a thriving FinTech ecosystem. Pearson (2020) found that in Europe, funding streams are available to the ecosystem in the form of venture capital, private equity, and investment from other countries. He further stated that in 2019 the Singapore government had invested 735 million dollars in various FinTech initiatives.

Similarly, in the United Kingdom, it appeared there were approximately 1.9 billion pounds available to FinTechs. The participants were adamant that developing countries, especially South Africa, do not provide access to capital for entrepreneurs. Eighty per cent of the participants thought the government should play a more active role, such as financing entrepreneurs and providing a favourable climate for incubation, which would help entrepreneurs succeed. They also believed that, rather than being the regulator, the government should play a more constructive role in bringing financial inclusion by forming stronger partnerships with entrepreneurs and the ecosystem.

According to Galvin et al. (2018), most financial institutions have formed alliances or collaborated with FinTechs in different contracts, such as funding their innovations, investing in them, or purchasing them. Some banks have created creative laboratories where they incubate start-ups, giving them a competitive advantage over other players.

Different views in the literature exist currently; for example, a study conducted by Burns (2018) in Kenya found that across sub-Saharan Africa, the nations that have seen the best results have not always been those that have devoted the most state resources to increasing financial inclusion. Instead, the greatest success stories have occurred in countries where the government has limited itself to merely creating an 'enabling environment' for entrepreneurs and then effectively staying out of the way. The researcher found that different countries approach the issue of funding differently; thus, there is no one-size-fits-all approach. However, if governments support the FinTech ecosystem by making funding readily available, or creating a conducive environment for investors, whether, from the private or public sectors, the ecosystem can thrive.

5.5.3 Approaches to regulation

Yermack (2018) observed that regulating FinTech organisations has been a problem in most countries, even those with highly developed institutions. In many cases, the technology was

designed to bypass existing regulatory frameworks. To add value to the ecosystem, the government must relax regulation and bureaucracy during small businesses' registration processes. They must simplify the process for a start-up to gain access to markets. Policy stability, lower interest rates, education and training, promotion of start-ups in public services, flexible wages, and business information are critical aspects in which the central government can help start-up growth. The local government should focus on safety and security, building infrastructure, local ethical officials, public transport, local officials' improved attitude, and investment support (Luiz, 2002).

Instead of unlocking value, most participants saw the regulator or government as a hindrance to the FinTech ecosystem. Around 90% of the participants also stressed the importance of focusing on the underserved or underbanked segment while developing legislation, solutions, and innovations.

The government's position in the GCC countries is limited to policy-making, regulation, and property growth. The government should be active in the entire FinTech ecosystem in less developed FinTech environments, such as Jordan and Saudi Arabia (Diemers et al., 2015). Government policy and regulation are other significant hindrances, as is the slow rate of adopting and implementing financial policies in the country. A study focused on crowdfunding in South Africa alluded to a lack of explicit regulations governing new and upcoming financial platform solutions (Dunne et al., 2019). The author indicated that it takes time for regulators to understand different funding solutions; some types find themselves already regulated through existing legislation while others have yet to be accounted for. Ten of the twelve participants agreed that the regulator's role is to create regulations that help the FinTech ecosystem to thrive. Around 80% of the participants thought the South African regulator was reactive rather than constructive, suffocating the FinTech ecosystem.

The participants in this study agreed that instead of unlocking value, the regulator or government hinders the FinTech ecosystem. Around 90% of participants also stressed the importance of concentrating on the underserved or underbanked segment while designing laws, solutions, and innovations. Policymakers need to be intentional in developing a conducive regulatory climate that promotes innovation activities. Barriers to entry into the FinTech ecosystem should be minimised, and repressive regulations such as KYC-AML rules, minimum capital, and liquidity criteria should be reduced.

According to Zalan and Toufaily (2017), most participants in their study agreed that current financial sector legislation impedes FinTech innovation and that regulation is lagging behind innovation. As one respondent put it, 'innovation comes first, followed by regulations; a new regulatory framework is needed to promote innovation'. This is also in line with what the participants in the study highlighted as the main stumbling block for FinTech in South Africa. According to Berkmen et al. (2019), Mexico and Brazil have fostered positive reform in their regulatory structures. Brazil has ensured that FinTech is fully incorporated into its legal and regulatory system, while Mexico has adopted robust FinTech legislation.

M-Pesa was cited by Soriano (2017) as an exemplary achievement that demonstrates the role of regulators in financial inclusion. M-Pesa is a successful FinTech start-up, whose success can be attributed in part to Kenya's Central Bank, which enabled the company to develop and scale without restrictions.

5.6 FACTORS THAT IMPACT FINTECH ECOSYSTEM

Our digital adoption journey is extremely slow relative to other countries, according to suggestions in the findings in Chapter 4, due to the quality of our education and the fact that we have an unequal society. The problem of infrastructure connectivity and data costs was brought up many times. The topic of literacy was also highlighted many times by the participants, speaking to the skills and knowledge gaps in South Africa.

The table below highlights the various responses to this question.

Table 5.3 Reasons of for constraining and promoting FinTech

CONSTRAINING FINTECH GROWTH IN SA		PROMOTE FINTECH GROWTH IN SA
Challenging regulatory frameworks	FinTech does not thrive in the economy	Expensive existing banks
Unequal population	Access to education	Unbanked market
Funding is hard and monopolistic players	Survivalist perspectives	Segmentation of customers
Slow digital transformation	Slow uptake of technology	Custom-made products
No skill set or competencies in FinTech technology	Slow adoption rate	
Lack of infrastructure	Stifled innovation	

This finding is in line with the study conducted by Diemers et al. (2015), which found that technology clusters (or hubs) are groups of entrepreneurs who share common business goals and collaborate to achieve them. These groups ensure that qualified labour and expertise are accessible (such as banking analysts, IT developers, sales force, and management staff). A vibrant technology start-up community works on cutting-edge digital technologies ‘tailored’ to the Middle East (Arabic needs, culture, and language).

Due to its cosmopolitan existence, both in terms of the talent pool and international companies' involvement, the Middle East has a vibrant technology start-up community. Ultimately, infrastructure efficiency is highly significant, including the state of the physical infrastructure (for example, roads and ports), the ecosystem's connections (for example, distance from established business hubs and ease of access), services (for example, electricity, water, and telecommunications), and the overall performance of property investment and infrastructure for their inventions.

Infrastructure, literacy, and technology adoption levels were mentioned by approximately 80% of the participants. Due to the constraints highlighted in the table, the participants believed that low levels of adoption and innovation resulted in sluggish digital transitions, which aligns with the findings of this study. While most participants believed that certain fundamentals must be in place for FinTech to succeed, they also believed that, despite the constraints, FinTechs can provide cost-effective solutions that address the needs of the unbanked and underserved markets.

5.7 UNDERSTANDING THE FORMAL AND INFORMAL ECONOMIES

Alcock (2015) defines the informal economy as "work performed by individuals or firms that are not properly paid for by structured processes in practice or by statute". Since they are not licenced and currency traders, these actors are considered informal and do not pay direct taxes. According to Mukherjee (2016), the formal economy is characterised as all economic activities that operate within the country's legal frameworks, pay taxes, and are regulated by governments. They work in the private sector, the government, or non-governmental organisations and have a daily salary, set working hours, and a stable job.

The formal and informal industries were viewed similarly by all participants. They saw the informal sector as a government-unrecognised entity that did not pay taxes, did not have access to credit, and relied on cash. At the same time, the formal sector was seen as being registered with the CIPC, paying taxes, and having easy access to credit, according to the participants.

The informal economy is particularly fragile because it is handled very differently from the formal economy regarding access to finance. Financial institutions typically exclude the informal economy because of its existence and how it works (Alcock, 2015).

The following table highlights the views expressed by the participants.

Table 5.4 Benefits for FinTech in the formal and informal sector

INFORMAL SECTOR	FORMAL SECTOR
• **Multiplier effect** – More funds pass from informal sector to formal sector • **Advanced solutions potential** • **Emerging Consumer**	• **Cheap debt** – there is so much established already • **Recognised easily** – Tax exemptions • **Increased profits and sustainable**

Some participants believed that both the formal and informal sectors benefit from the FinTech ecosystem due to the multiplier impact. This finding is supported by the case study by Alcock (2015) conducted on the informal economy when they found that they obtain supplies from the formal economy. Parmalat's partnership with spaza shops across the country to supply the shops with individually wrapped cheese illustrates this. The result was a R1 billion revenue line item for Parmalat, reflecting the interdependence of the two economies; this is in line with the participant's views in this study.

Alcock (2015) found that financial institutions typically exclude the informal economy because of its nature and how it works. Since they do not have consistent profits, are not licenced companies, have no credit history, and thus no leverage, they have little or no access to loans or financial assistance. The findings of this study are similar as the majority of the participants (roughly 90%) stated that the informal economy still uses cash and does not have access to credit. They believed that the informal sector was not benefiting from the FinTech ecosystem, and because of our country's historical legacy problems, the participants believe the environment is geared towards the formal economy.

5.8 COLLABORATION BETWEEN FINTECH ECOSYSTEM PLAYERS

Approximately 90% of the participants felt that the relationship is important as one player cannot survive without the other players in the ecosystem; thus, an interdependent relationship exists between the various stakeholders in the FinTech ecosystem. The participants felt that the ecosystem player's relationship is significant as one cannot survive without the others. This agrees with the findings in a study conducted by Jacobides et al. (2018), who found a continued

interdependence and complementarity that unites the ecosystem, even though it is not contractual. Drasch et al. (2018) also found that the FinTech ecosystem's strength is enhanced by the interdependence of the FinTech ecosystem players on each other. The theoretical framework further highlights this in a study by Hennion and Muecke (2016), where it was found that the player's interconnectivity in an ecosystem is enhanced by collaboration. Collaboration among ecosystem partners and complementary, difficult-to-acquire assets and capabilities are frequently mentioned as sources of competitive advantage (Teece, 1986). With investments in innovative start-ups, incubators, accelerators, hackathons, and corporate venturing, Dey (2016) concludes that bank-FinTech partnership is desirable and unavoidable.

Establishing and nurturing a FinTech ecosystem is difficult due to the level of sustained collaboration needed among governments, financial institutions, and entrepreneurs. Each participant in a FinTech ecosystem must understand their role and the benefits they stand to gain from participating in the ecosystem (Diemers et al., 2015).

5.9 THE ADAPTED LEE AND SHIN FRAMEWORK

In Chapters 1 and 2, the Lee and Shin (2018) ecosystem was introduced. It encompasses the following stakeholders in the FinTech ecosystem. The government's role is to regulate the sector and provide regulations that either support or weaken the FinTech ecosystem. Customers are at the core of the ecosystem because without the customer, there is no one to offer the solutions to and, therefore, no business. Entrepreneurs offer solutions to customers that are relevant, convenient and cost-effective. Developers provide the skills to the entrepreneurs to develop relevant solutions. Financial institutions offer funding to entrepreneurs and also provide solutions for customers.

5.9.1 The role of government

The researcher found that the regulators listed by all the participants alike multiple times are the most significant ecosystem actor constraining FinTech expansion. The KYC criterion has remained largely unchanged, and many participants cited it as a challenge to innovation. The majority of the participants agreed that existing financial sector regulations impede FinTech progress and that regulation is lagging behind innovation.

The South African Reserve Bank is trying to make the process simpler for start-ups, but once they are legalised, it is easier to partner with existing banks and other financial institutions. It

should be remembered that regulatory issues are not limited to the banking and FinTech sectors in South Africa, as indicated in the literature.

Policy makers are another important ecosystem partner; they must be constructive in promoting their commitment to transformative results that advance the welfare of the FinTech ecosystem. Since South Africa's economy is led by the government, the government should be well-positioned to coordinate, if not lead, the development of a vibrant FinTech ecosystem. However, the South African Government is known for its lack of coordination, capacity constraints and poor leadership. The research recommends that the government perhaps look at the functioning institutions under the national treasury entrusted with financial services to take a more active role in coordination. The key result of this ecosystem response is that there is the inclusivity of customers, and they are appropriately segmented. The issue of funding by the government is assessed closely, and the incubation and mentorship roles are highlighted as part of the FinTech ecosystem.

Based on the research questions and the findings of this study, the adapted framework is shown below. As a result of the research findings, a sensible strategic approach to a FinTech ecosystem for the South African context is an adapted FinTech ecosystem embedded in a broader ecosystem that includes providing financial services to consumers who are segmented differently. It also includes a relook at funding, as the entrepreneurs interviewed by the researcher had not received funding from South Africa but from international investors, which begs the question of who has access to the capital that is available. Is it possible that the previously disadvantaged do not have access as they do not have the right networks or connections, or is it that the information, awareness and accessibility of the institutions is a serious challenge?

5.9.2 The role of the customer

All the participants (12 out of 12) agreed that there would be no ecosystem without consumers and there would be no one to offer a solution to; this finding is supported by the literature. One of the most important functions of FinTech start-ups, according to Gimpel et al. (2018), is to recognise and satisfy consumer needs; none of the above can be achieved or is feasible without customers. In addition to providing a better customer-centric experience to existing customers, a hybrid platform may allow financial institutions to reach new consumer segments that banks have previously underserved: start-ups, unbanked and digital natives, for example (Schwab & Guibaud, 2016).

A few of the participants believed that the banks could also incubate and provide mentorship to the entrepreneurs, thus strengthening the collaboration of both entities and creating a win-win situation for the customer, the entrepreneur, the banks and the government by enhancing or improving financial inclusion. Based on these findings, the researcher recommends an adapted FinTech ecosystem model that could also allow financial institutions to reach new customer segments that have historically been underserved by banks, in addition to offering a better customer experience to existing customers.

5.9.3 The role of developers

The majority of participants (nine out of 12) identified another problem: the availability of qualified and professional IT teams since outsourced expertise might not be up to the demands of tomorrow's technological world where customer collaboration is needed. The participants agreed that the developers' job is to assist entrepreneurs or financial institutions in providing appropriate solutions to customers. This finding is supported by previous literature that found that developers are important because they enable start-up entrepreneurs to present solutions that they have created by integrating different skills and technologies, such as creating multiple channels for analytics, artificial intelligence, and cloud computing (Zavolokina et al., 2016).

5.9.4 The role of financial institutions

Most participants (ten out 12) expressed a view that financial companies do not seem to have the requisite internal experience and expertise to execute a ‘what do our customers want?’ strategy. Thus, understanding the customer's needs more broadly than those of the formal economy in the South African context is essential. According to Ryu (2018), FinTech companies must understand their customers and provide relevant solutions to meet their needs. FinTech start-ups are exploring new technology-driven opportunities to meet consumer expectations and desires or provide solutions for customer needs as banks struggle to reinvent themselves and their value add. There is alignment between what the literature states and the findings of this study.

The participants stated that several barriers are impeding the growth of the FinTech ecosystem, with the cash-based economy and a lack of confidence in the financial system being the most important. FinTech scaling is being hampered by the lack of access to funding, as venture capital-backed entrepreneurship is still relatively new, making investors uncomfortable with the idea of investing in these FinTechs.

5.9.5 Entrepreneurs

Most (eight out 12) of the participants believed that FinTechs would benefit from banks' complementary strengths and capabilities, such as confidence, scalability, customer access, and regulatory enforcement. The banks can benefit from the trust that consumers have in FinTech's ability to provide cost-effective and relevant solutions. The literature also states that most financial institutions collaborate or cooperate with FinTechs in different contracts, either as supporters of their innovations, as investors or by purchasing the start-ups (Galvin et al., 2018). FinTechs and banks should recognise that true collaboration means sharing the economic value generated, which usually requires a change in attitude and culture toward more accountability and transparency.

5.9.6 Additional roles

Participants shared their view that educational institutions, investors, and incubators all have a part to play in cultivating and fostering human talent and assisting FinTech start-ups in scaling up. The participants also echoed the sentiment that educational institutions should play a more prominent role in developing skills for the FinTech ecosystem. The finding in this study is further supported by Zalan and Toufaily's (2017) research: investors and incubators all play a role in fostering skills development and assisting FinTech start-ups in scaling up. The collaboration advances and establishes the bank-FinTech relationship, according to Lerner and Tufano (2011), which is not only beneficial but also inevitable. This sentiment is shared in a study that found that the health and sustainability of ecosystem players are determined by the ecosystem as a whole rather than by individual players (Drasch et al., 2018).

There is a best practice that can be adopted for the South African context used by some part of the developed and developing world. Additionally, the concept of mentorship and incubation has to be dealt with by the players in the FinTech ecosystem. Perhaps several hubs in strategic locations should be established, not just in the Western Cape currently.

The proposed adapted FinTech ecosystem framework for the South African context is illustrated in Figure 5.1.

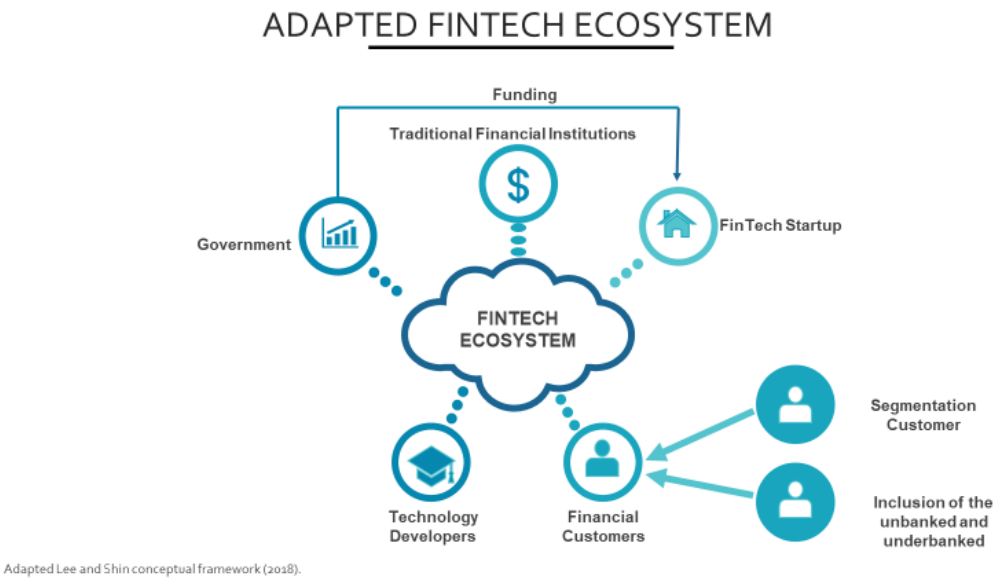

Figure 5:1 Adapted FinTech ecosystem framework

5.10 CONCLUSION

The findings of this study have highlighted the key ecosystem players and the roles played by the FinTech ecosystem players. The study has also demonstrated the fundamental similarities and differences between the FinTech ecosystems of the developing and developed worlds. It is evident from the findings of this study that an adapted FinTech ecosystem for the developing world would serve South Africa better than using the existing FinTech ecosystem model of Lee and Shin (2018). The difference with the proposed adaptation to the ecosystem is that it aims to create a collaborative ecosystem whose core function is to see the development and growth of FinTechs in South Africa and support their positive contribution to improving the economy and financial inclusion.

Most of the findings in this study are aligned with the literature, as demonstrated above. Some areas were highlighted by the participants in this study, such as incubation and mentorship that are very important for the South African context. Another important area highlighted by the participants in this study is the enhancement of developers and skills in FinTech.

Concerning the FinTech ecosystem players, most participants believed that funding could be added as a role for government to play. Alternatively, the government could create a conducive environment for investors. The participants also stated that it would be necessary for customers to be segmented for the South African context, as SA has an unequal society.

Another interesting finding was that financial institutions should provide mentorship and incubation to FinTech entrepreneurs.

The following issues came up in the study, although they were not the primary focus of the study.

- The lack of coordination or limited coordination between the FinTech ecosystem players;
- The importance of integration between ecosystem players; and
- Patient capital is required for start-ups in South Africa.

CHAPTER 6: SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

6.1 INTRODUCTION

Based on the research questions introduced in Chapter 1, this chapter presents describes the conclusions found in this study. Recommendations have been made, including proposals for future studies. The focus of this study was designed to validate the FinTech ecosystem in the South African context. The study also explored whether the FinTech environment, as shown by Lee and Shin (2018), was suitable for a developing country such as South Africa. Another goal was to see if additional roles could be added to the ecosystem, especially in South Africa. Furthermore, the study investigated whether there was a shared understanding of the FinTech ecosystem and if the various stakeholders' positions were understood and consistently appreciated by the various players.

6.2 OVERVIEW OF THE STUDY

This study aimed to investigate if the existing FinTech ecosystem frameworks are suitable for the South African context. There was a common understanding of who the leading FinTech ecosystem players are in South Africa, as well as whether there was a clear understanding of the role of players and whether additional players and roles could be introduced. By examining numerous FinTech ecosystem models from developed and developing countries and attempting to determine what has made the FinTech ecosystem efficient and what has led to its failures, this was accomplished. In the report, the following research questions were answered.

i. Research Question 1: Which components of the South African FinTech ecosystem framework are key?

ii. Research Question 2: What are the existing FinTech ecosystem model for the developed and developing world?

iii. Research Question 3: What difference exists between the FinTech ecosystem models in the developing and developed world?

6.3 CONCLUSIONS REGARDING EACH RESEARCH QUESTION

6.3.1 Conclusions regarding Research Question 1

Concerning Research Question1, the study found that the government, customers, developers and financial institutions are key to the South African context.

Governments are charged with overseeing the FinTech industry and enacting legislation that either improves or undermines the ecosystem. Customers are at the heart of the ecosystem, and without them, there would be no one to sell solutions to, and very few companies would exist. Entrepreneurs provide consumers with solutions that are appropriate, simple, and cost-effective. Developers help entrepreneurs develop relevant solutions by supplying them with the requisite skills. Financial institutions offer support to developers as well as consumer solutions.

The FinTech ecosystem's stakeholders are uniform and consistent across the world. What matters most is the local context in which they work, such as community, educational quality, and the number of people who are underbanked or unbanked. This study found that ,to a particular extent there is a common understanding of the key players in the FinTech ecosystem. However, there are additional players that are important for the South African context, such as the further segmentation of customers to include the unbanked and underbanked. The findings of the study found that there is no one-size-fits-all solution when it comes to the role played by the government, as it can be seen that in some countries, there is a combination of funding and a friendly regulatory environment while in other countries, there is a friendly regulatory environment only as shown by the M-Pesa case study in Kenya.

The study recommends that funding for the FinTech ecosystem should be explored further as the literature is not consistent. There are various contradictory findings in this study and in previous studies that indicate that when patient capital is readily available in a country, the FinTech ecosystem thrives. Nevertheless, other factors need to be considered. The study recommends that in the South African FinTech ecosystem context, it should be explicitly stated that the role that government plays includes funding.

Customers

The research conducted found that the customers in the South African context should be further segmented to bring in financial inclusion and represent the country's demographics. The FinTechs were seen as an opportunity to serve the underbanked and unbanked population. The study suggests that the FinTech ecosystem in South African should be adapted to include the

different segmentation of customers to ensure inclusion in the financial sector. It is apparent from the literature that FinTech can improve financial inclusion as it reduces costs and convenience.

Financial institutions

The findings in this study indicate that financial institutions have an important role in the FinTech ecosystem, such as providing funding to entrepreneurs and ensuring financial inclusion. The literature review confirms that the financial institutions support the ecosystem. The literature conducted by Zalan and Toufaily (2017) also found that investors and incubators all have a role to play in promoting skills growth and assisting FinTech start-ups in scaling up. The findings of this study also suggest incubation and mentorship for South African start-ups.

The study recommends that the financial institutions should play a critical role in mentoring and incubating the FinTech start-ups in South Africa. There is also potential for collaboration between FinTech start-ups and financial institutions.

Developers

One of the main concerns stated by the participants in this study was the lack of developer skills in South Africa, which resulted in solutions for the South African environment being created in developed countries, ignoring local issues.

The study found that there is a role for institutions of higher learning to play in this area to ensure an increase in developer skills in the country. The study recommends collaboration and more effort to coordinate within FinTech ecosystems to ensure that SA has a thriving FinTech environment. The FinTech ecosystem players can consider mutual assistance programmes, where there can be resource sharing, knowledge sharing through partnerships.

6.3.2 Conclusions regarding Research Question 2

The study discovered that there are various FinTech ecosystem models in existence. The Lee and Shin (2018) models were investigated for the South African context, and it was determined that the Lee and Shin (2018) models are the most relevant to the South African context since they involve the consumer. However, the study revealed that consumers could be segmented to suit the demographics of the South African population.

It was also found that a favourable regulatory environment supports the FinTech ecosystem. An environment with infrastructure, access to data and various funding options (venture

capital, angel investors, and strong private equity) is also critical as it enables the entrepreneurs to develop solutions. One of the fundamental differentiators in the developed world is the skills and expertise in those countries, unlike in South Africa, where there is a shortage of the relevant skills in the FinTech ecosystem. The availability of resources or a favourable climate for investors came next. The developed and developing countries making significant progress in FinTech have a country policy that is not only discussed but also implemented, as well as hosting FinTech summits and inviting other countries to participate. This research question reinforces the findings under RQ 1in terms of what is key for the South African FinTech ecosystem. According to the research conducted, the South African Reserve Bank established a FinTech plan for South Africa, which was approved in late 2020. The SARB is in charge of coordinating a body called the Working FinTech Group, made up of various FinTech ecosystem players. However, it was unclear how the players were chosen and who was eligible to join this working group.

6.3.3 Conclusions regarding Research Question 3

According to this report, a thriving regulatory climate, consumer needs and segmentation, and funding mechanisms to help the FinTech ecosystem are all critical areas, and they indicate some of the fundamental differentiators between the developing and the developed world. These topics have been discussed in previous literature, but they are particularly relevant in South Africa due to our historical challenges. According to the literature, a flourishing FinTech ecosystem climate is built in countries with a country strategy to address the FinTech ecosystem that works with financial institutions, regulators and understands consumer needs.

The issue of infrastructure connectivity and data costs was raised several times by the participants in this study. They also brought up the subject of literacy many times, emphasising the skills and awareness gaps in South Africa.

The participants assumed that the informal economy primarily uses cash and does not have access to credit. The FinTech ecosystem is not helping the informal sector, and the market was optimised towards the formal economy because of our country's historical legacy problems. The literature confirms this finding in other developing countries, for example, Vietnam and China.

The participants in the study believed that the relationship is critical because one player cannot survive without the other players in the ecosystem; therefore, the various stakeholders in the FinTech ecosystem are interdependent. According to the participants, the players' relationships

are extremely important because one cannot survive without the others: this relates to cooperation. However, there would be no collaboration if successful teamwork is not in place. For the FinTech ecosystem in South Africa to succeed, there must be successful and efficient collaboration. The study recommends collaboration and more effort to coordinate the FinTech ecosystem to ensure that SA has a thriving FinTech environment. The FinTech ecosystem players could consider mutual assistance programmes, where there could be resource and knowledge sharing through partnerships.

6.4 LIMITATIONS

This exploratory analysis has some of the drawbacks associated with qualitative studies, such as difficulty generalising outside the immediate context and small sample size, due to the time available to conduct this study. The study did, however, generalise as much as possible to the current literature.

Quite significantly, a broader range of feedback from the financial sector, especially FinTech founders, venture capitalists, and other investors, would have been beneficial. At this point in the research, this was not possible because, as previously stated, the FinTech ecosystem in the country is underdeveloped, and new entrants are limited and restricted in terms of resources, mainly due to a shortage of managerial expertise. Nonetheless, the researcher believes that this research yielded several valuable findings that will be of interest to scholars, practitioners, and policymakers.

6.5 SUGGESTIONS FOR FURTHER RESEARCH

Further research is recommended in the following areas:

1. The researcher recommends that the topic of patient capital should be further explored. The issue of funding and who has access to the funding in South Africa also requires further investigation.

2. It would be useful to find a study that explores the models of collaboration to be explored for the FinTech ecosystem.

3. A broader study could be conducted into different operating models resulting in leverage on the existing ecosystem for mutual benefit.

4. The way mutual assistance programmes could be used to enhance the FinTech ecosystem could be explored.

5. Broader research could be conducted into different business models that result in the successful implementation of FinTech, coupled with effective coordination of the FinTech ecosystem.

6.6 RECOMMENDATIONS

Financial expertise is needed to coordinate the ownership of a FinTech ecosystem, provide advisory services to entrepreneurs from the early stages of concept creation through to commercialisation, and, finally, give legal and regulatory advice to ensure compliance with local legislation and tax laws.

Educational institutions, investors, and incubators all play a role in developing and nurturing human talent and assisting FinTech start-ups in scaling up. Another important ecosystem partner is policymakers, who must be proactive in fostering their dedication to transformative outcomes that support the FinTech ecosystem.

As a result of the research findings, a sensible strategic approach to a FinTech ecosystem for the South African context is an adapted FinTech ecosystem embedded in a broader ecosystem that includes providing financial services to consumers that are segmented differently. It also includes a relook at funding, as the entrepreneurs interviewed by the researcher had not received funding from South Africa but from international investors, which begs the question of who has access to the capital that is available. Is it possible that the previously disadvantaged do not have access as they do not have the right networks or connections, or is it that the information, awareness and accessibility of the institutions is a serious challenge?

Another consideration to find mechanisms that, instead of pressuring customers to do business with the current banks' offering with no other choices, banks could position themselves as FinTech enablers via an open API architecture, thus working closely with FinTechs. Banks can also incubate and provide mentorship to the entrepreneurs, strengthening the collaboration of both entities and creating a win-win environment for the customer, the entrepreneur, the banks and the government by enhancing or improving financial inclusion.

A clear understanding and definition of customer segmentation would also allow financial institutions to reach new customer segments that have been historically underserved, in

addition to offering a better customer experience to existing customers. It would also offer solutions to marginalised people and start the process of being inclusive.

On the other hand, FinTechs would benefit from the banks' complementary strengths and capabilities, such as confidence, scalability, customer access, and regulatory enforcement. The banks could benefit from the trust that consumers have in FinTechs' ability to provide cost-effective and relevant solutions.

FinTechs and banks should recognise that true collaboration means sharing the economic value generated, which usually requires a change in attitude and culture toward more accountability and transparency.

Since South Africa's economy is led by the government, the government should be well-positioned to coordinate, if not lead, the development of a vibrant FinTech ecosystem. However, the South African Government is known for its lack of coordination, capacity constraints and poor leadership. The research recommends that the government looks at the functioning institutions under the national treasury that are entrusted with financial services to take a more active role in coordination. The key result of this ecosystem response is that there is inclusivity of customers, and they are appropriately segmented. Funding by the government is assessed closely, and the incubation and mentorships roles are highlighted as part of the FinTech ecosystem.

6.7 CONCLUSION

The objective of the study was to establish how the existing FinTech ecosystem model applies to the SA context. The study demonstrated that the existing FinTech ecosystem models explored partially cover the South African context, but they are not adequate for the South African environment. The Lee and Shin (2018) model is the closest fit for South Africa, but it needs to be adapted to include the unbanked and underbanked customers. South Africa has approximately 11 million underbanked and unbanked consumers. The South African FinTech ecosystem has to factor these customers in and segment them appropriately.

The Lee and Shin (2018) framework highlights the role of government as a regulator overall, that is in line with the role of government in South Africa; however, the study found that it is important to explicitly add the role of funding to support the FinTech ecosystem in the South African context.

The study found that in South Africa, we do not have sufficient developers. According to the Lee and Shin (2018) model, developers are critical for the FinTech ecosystem: they develop convenient and cost-effective solutions for entrepreneurs, customers and financial institutions. The study recommends that institutions of higher learning should be more involved in producing developer skills for the South African context that can develop relevant solutions for South Africa. Lee and Shin (2018) did not mention incubation and mentorship. This study found that incubation and mentorship are critical in the South African context. The study thus recommends looking at the Zalan and Toufaily (2017) model, as it incorporates incubation and mentorship. The findings showed that incubation and mentorship should feature strongly in the South African FinTech ecosystem.

It is clear from the research conducted that South Africa has a FinTech ecosystem that was started implementation a few years ago. It became evident from this research that there are a few gaps that need to be closed in the South African FinTech ecosystem, especially the role of coordination to ensure that the ecosystem players play their roles and enhance the FinTech ecosystem through better legislation and access to funding. That means they can solve problems by tapping into external ecosystems because outside every company, there will always be more creative people than within. As a result, they need dedicated mechanisms for engaging with these external networks and accepting procurement ideas from a wide variety of providers.

Finally, the customers must be appropriately segmented to ensure that previously disadvantaged people are included through FinTech solutions and are part of the broader FinTech ecosystem.

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APPENDIX A: THE RESEARCH INSTRUMENT

SECTION 1: PARTICIPANT BACKGROUND INFORMATION

Age and Gender

Years Range	20–25	25–30	30–40	40–50	60–65	65+
Age Range						
Gender						
Male						
Female						

Qualification and Experience

Qualification	**Field of Study**
Below Matric	
Matric	
Certificate	
Diploma	
Bachelor Degree	
Honours Degree	
Master's Degree	
Doctoral Degree	
Experience	**Total Years**
Current Position	
Current Company	
Industry Experience	

Research Questions

RESEARCH QUESTIONS	QUESTION
	Topic: General/Introduction Purpose: Making the participant at ease and to provide context if needed. Notes: Getting approval for the recording of the interview. Assessing the knowledge of the interviewee, years of experience, experience in FinTech etc. Giving a summary of the themes which are covered in the interview. Explaining the study and research topics.
Which components of the FinTech ecosystem models are fundamental to the South African Context?	1. Who are the key stakeholders in the FinTech ecosystem? 2. Explain in detail what role/s do they each play? 3. Among the stakeholders that were mentioned, could you explain to me what is the importance of this relationship in the SA ecosystem?
What are the existing FinTech ecosystem models for the developing and developed world?	4. Which FinTech Ecosystems models are you familiar with? 5. Which FinTech model do you think is more suitable for the developing world? 6. Which Fintech model do you think is more suitable for the developed world? For South Africa?
What differences exists between the FinTech ecosystem models in the developing and developed world?	7. What distinctions exist between the FinTech models in developed and developing worlds? 8. How do the indicated distinctions constrain or promote Fintech growth in SA? 9. What is your understanding of formal and informal sector? Customers segments? 10. In your opinion, do they benefit from the ecosystem, why? 11. Do you believe that both sector (formal and informal) are catered for in the ecosystem and if yes, how?

APPENDIX B: INTERVIEW CONSENT FORM

A conceptual framework for the South African FinTech ecosystem

Researcher: Vuyelwa Masangwana, Masters in Digital Business student at Wits Business School (WBS)

I am conducting research on **a conceptual framework for the South African FinTech ecosystem**. I am trying to find out more about the FinTech ecosystem and whether it is adequate for the South African context. Thus, I will look at the FinTech ecosystem in terms of the roles of the players in the ecosystem. Thereafter I will look at whether the FinTech ecosystem is appropriate for the South African context.

The focus of my study is on senior leadership in institutions with a direct reporting line to C-Suite leadership.

The interview is expected to last about an hour: your participation is voluntary, and you can withdraw at any time without penalty. The interview will be conducted online, via Zoom and audio recorded for my benefit to ensure that I do not lose any key points. The recording is also voluntary, and you may choose not to be recorded. All data will be kept confidential, and any references used will be kept anonymous. The name of the institution will not be used.

If you have any concerns, please contact my supervisor or myself. Our details are provided below:

Vuyelwa Masangwana	Tebogo Sethibe
0318891w@students.wits.ac.za.	tebogo.sethibe@wits.ac.za
082 339 2131	076 510 7529

Participant's Name: _____

Signature: _____

Date:

Researcher's Name: Vuyelwa Masangwana

Signature:

Date: 10 January 2021

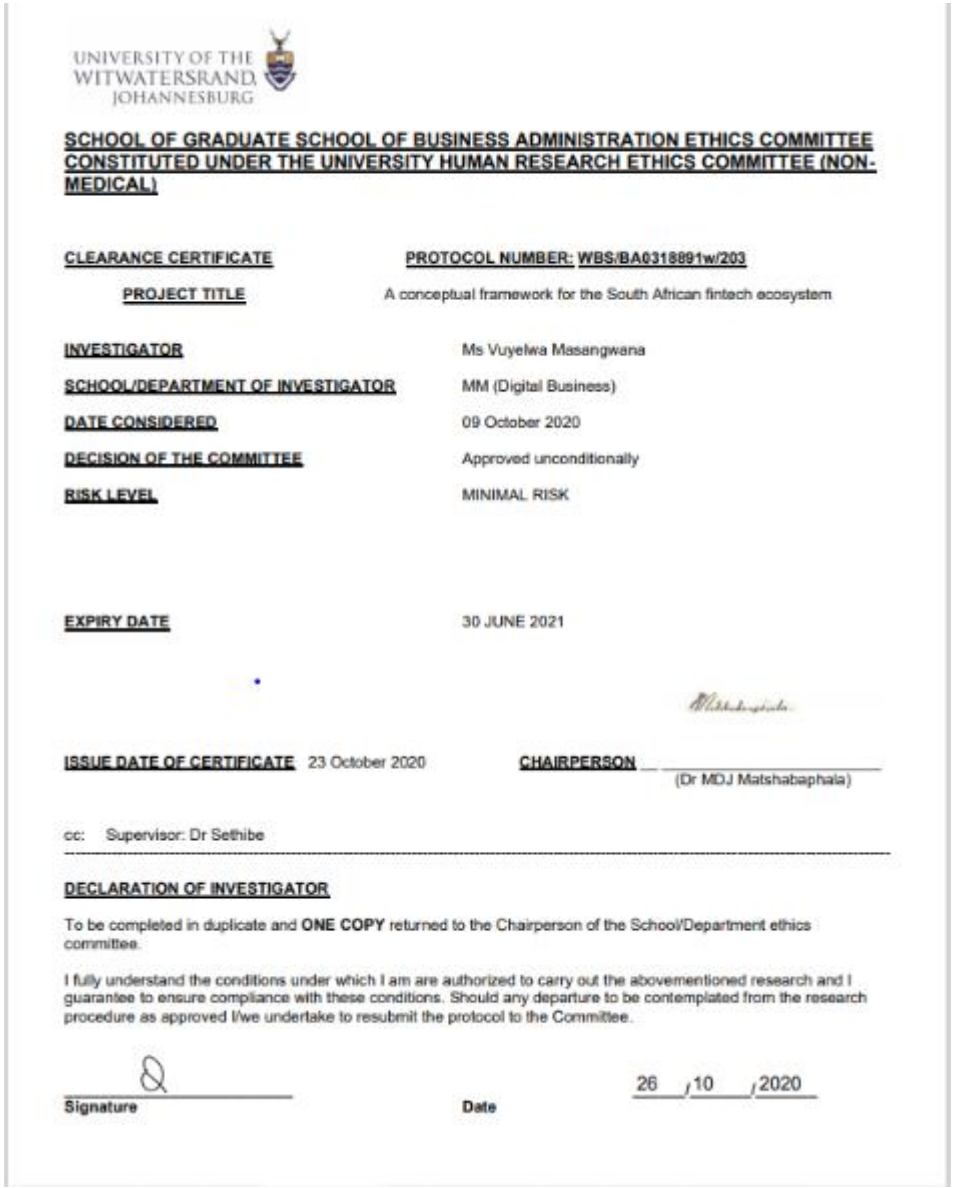
APPENDIX C: CONSISTENCY MATRIX–QUALITATIVE

Research Title: A conceptual framework for the South African FinTech ecosystem
Problem statement: The current FinTech ecosystem does not cater to an informal customer; therefore, the informal customer cannot benefit from being part of the ecosystem. Additionally; funding is a barrier to entry in the FinTech market, which could stifle further growth of the FinTech market.
Main objective: To investigate if the existing FinTech Ecosystem Frameworks are suitable for the South African context.

SUB-OBJECTIVES	LITERATURE REVIEW	PROPOSITIONS	RESEARCH QUESTIONS	PHENOMENON/ KEYWORDS	SOURCE OF DATA	TYPE OF DATA	ANALYSIS
To establish the key players of the South African FinTech ecosystem context	Johan Coetzee (2019) Lee and Shin (2018)	P1: Start-ups/ Entrepreneur, developers, government, financial institutions, customers are the key players in the FinTech ecosystem that are relevant to the South African context	RQ1: Which components of the FinTech ecosystem models are fundamental to the South African context?	Key players of FinTech ecosystem in South Africa	Interviews Q1 to Q4	Nominal	Thematic Analytic
To identify the different types of FinTech	Lee and Shin (2018)	P1: There two different types of	RQ2: What are the existing FinTech	FinTech ecosystem models	Interviews Q5 TO Q8	Nominal	Thematic Analysis

SUB-OBJECTIVES	LITERATURE REVIEW	PROPOSITIONS	RESEARCH QUESTIONS	PHENOMENON/ KEYWORDS	SOURCE OF DATA	TYPE OF DATA	ANALYSIS
ecosystem models in the developing and developed world	Diemers, Lamaa, Salama & Steffens (2015)	FinTech ecosystems models that exist are: a) Developed and Developing world – Lee and Shin model, Diemer's model, Toufaly Hybrid models.	ecosystem models for the developing and developed world?				
To examine the difference between the FinTech ecosystem models in the developing and developed world	Zavolokina, Dolata and Schwabe, 2016 Johan Coetzee (2019)	P3:The differences on the FinTech ecosystem of developed and developing models include the types of customers that exist, infrastructure, literacy, adaption of technology, access to data availability of funding	RQ3:What difference exists between the FinTech ecosystem models in the developing and developed world?	Developed and developing world FinTech ecosystem models differences	Interviews Q8 to Q12	Nominal	Thematic Analysis

APPENDIX D: ETHICS CLEARANCE LETTER



UNIVERSITY OF THE WITWATERSRAND, JOHANNESBURG

SCHOOL OF GRADUATE SCHOOL OF BUSINESS ADMINISTRATION ETHICS COMMITTEE CONSTITUTED UNDER THE UNIVERSITY HUMAN RESEARCH ETHICS COMMITTEE (NON-MEDICAL)

CLEARANCE CERTIFICATE **PROTOCOL NUMBER: WBS/BA0318891w/203**

PROJECT TITLE A conceptual framework for the South African fintech ecosystem

INVESTIGATOR Ms Vuyelwa Masangwana

SCHOOL/DEPARTMENT OF INVESTIGATOR MM (Digital Business)

DATE CONSIDERED 09 October 2020

DECISION OF THE COMMITTEE Approved unconditionally

RISK LEVEL MINIMAL RISK

EXPIRY DATE 30 JUNE 2021

ISSUE DATE OF CERTIFICATE 23 October 2020 **CHAIRPERSON** _____
(Dr MDJ Matshabaphala)

cc: Supervisor: Dr Sethibe

DECLARATION OF INVESTIGATOR

To be completed in duplicate and **ONE COPY** returned to the Chairperson of the School/Department ethics committee.

I fully understand the conditions under which I am are authorized to carry out the abovementioned research and I guarantee to ensure compliance with these conditions. Should any departure to be contemplated from the research procedure as approved I/we undertake to resubmit the protocol to the Committee.

_____ 26 / 10 / 2020
Signature **Date**