ENHANCING SMALL BUSINESS THROUGH MOBILE APPS: A CASE STUDY FROM LAGOS, NIGERIA

By

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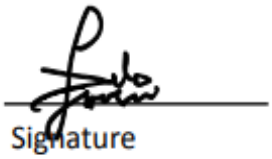
I declare that **"*Enhancing Small Business Through Mobile Apps: A Case Study from Lagos, Nigeria*"** is my own work and that all the sources that I have used, or quoted, have been indicated and acknowledged by means of complete references.

I further declare that I submitted the thesis to originality checking software. The resultant summary is attached (Appendix 12).

I further declare that I have not previously submitted this work, or part of it, for examination at UNISA for another qualification, or at any other higher education institution.



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Abstract

Enhancing Small Business through Mobile Apps: A Case Study from Lagos, Nigeria

by

Adebowale Owoseni

This thesis draws on the framework of dynamic capability (DC) in an effort to make sense of how small and medium scale enterprises (SMEs) use mobile apps in Lagos, Nigeria. There exists significant knowledge regarding the application of the DC framework in large firms but its application in smaller organisations has scarcely been researched. The knowledge of how SMEs use mobile apps is important at this time because it could help these SMEs compete favourably, despite unpredictable environments.

Based on pragmatic philosophy and a mixed-methods research approach, the research was conducted in two phases. The first phase of the research used qualitative methods to identify the absorptive, adaptive and innovative capabilities of SMEs in Lagos with a view to discover the extent to which mobile apps are used as enablers and/or drivers of these capabilities. The findings from 20 SMEs identified 15 DC constructs whose impact on SMEs could be enhanced using appropriated mobile apps. The SMEs manifest adaptive capabilities, mainly through customer feedback and referrals, and demonstrate absorptive capabilities through the repackaging and repricing of their goods and/or service offerings. The innovative capabilities of SMEs became evident through the imitation and adaptation of offerings.

The second phase of this research surveyed 1 162 SMEs in Lagos in an effort to validate the identified constructs through quantitative methods. Descriptive statistics of survey responses affirm the use of mobile apps by SMEs and it also indicated the underutilisation of mobile apps as a DC enabler. Further analysis, using covariance-based structural equation modelling (SEM) techniques and confirmatory factor analysis (CFA), explored the fitness of a conceptual SME model. The model assembled seven latent variables namely: mobile app usage, adaptive capability, absorptive capability, innovative capability, opportunity sensing ability, opportunity shaping ability and opportunity seizing ability. Subsequently, 15 hypotheses

aimed at understanding the relationships between the variables were developed. The findings from the quantitative analysis revealed that mobile app usage increases the adaptive, absorptive and innovative capabilities of SMEs. The results failed to establish a direct relationship between mobile app usage and opportunity sensing, shaping and seizing abilities. Furthermore, the use of the adaptive capability in taking advantage of opportunities could not be generalised in SMEs' context.

The research findings imply the existence of an untapped potential as far as the use of mobile apps by SMEs in Lagos is concerned. The findings suggest that SMEs in Lagos respond to opportunities by becoming innovative and they seldom exhibit innovation in order to create opportunities. Based on the heterogeneous nature of SMEs, it is difficult to suggest a clear-cut narrative as to how all SMEs should employ mobile apps to create and maximise opportunities. However, mobile apps could induce creativity when developed and applied to the contextual requirements of SMEs.

The outcome of this research reflects a multidisciplined research experience. The study contributed to IS through the creation of a model for investigating mobile app usage by organisations from a DC perspective. The conceptual model designed in this study could be adapted to investigate the way in which mobile app usage influences organisations in other contexts. The study contributed to the area of Information Systems by revealing the application of the DC framework to SMEs in contrast to the usual practice of researching DC with large organisations in mind. This research work suggests implicit ways of enhancing SMEs which could aid policy makers.

This study was limited in that it gathered data from SMEs in Lagos alone as Lagos represents the commercial centre of Nigeria. Considerations for future research include the comparison of DC of large and small organisations in Lagos to examine if similarities and/or contrasts exist. Furthermore, due to the evasive and heterogeneous nature of SMEs, it would be beneficial to delimit future research on SMEs along specific domains of interest.

Keywords: Small and Medium scale Enterprises (SMEs); Dynamic Capability (DC); Mobile app; Adaptive capability; Absorptive capability; Innovative capability; Structural Equation Model (SEM); Confirmatory Factor Analysis (CFA).

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Peer reviewed publications from this study

Journal papers

1. Owoseni, A. & Twinomurinzi, H. 2018. Mobile apps usage and dynamic capabilities: a structural equation model of SMEs in Lagos, Nigeria. *Telematics and Informatics*. https://doi.org/10.1016/J.TELE.2018.07.009
2. Owoseni, A. & Twinomurinzi, H. 2018. The dynamic capabilities of small and medium scale enterprises using mobile apps in Lagos, Nigeria. *E J Info Sys Dev Countries*. https://doi.org/10.1002/isd2.12061

Conference papers

1. Owoseni, A. & Twinomurinzi, H. 2018. Maximizing opportunities using mobile apps: an exploratory factor analysis of service sector micro and small enterprises in Nigeria. 11th Annual SIG Global Development. *AIS 2018 Pre-ICIS Workshop, at San Francisco, Califonia, United States of America.*
2. Owoseni, A. & Twinomurinzi, H. 2017. The use of mobile apps to enhance SMEs in conditions of uncertainty : A case study from Lagos. 10th Annual SIG Global Development. *AIS 2017 Pre-ICIS Workshop, at Seoul, Republic of Korea.*
3. Owoseni, A. et al., 2017. Evolving a New Community Through Tuckman Model and WhatsApp Messaging Platform. *IST-Africa 2017 Conference Proceedings*, *Windhoek* pp.1–8.
4. Owoseni, A. & Twinomurinzi, H. 2016. Mobile App Usage as a Dynamic Capability in Nigerian Start-ups. *IST Africa 2016 Conference Proceedings, Durban*, pp.1–9.

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Abbreviations

Term	Meaning
ABC	Absorptive Capability
ADC	Adaptive Capability
CFA	Confirmatory Factor Analysis
DC	Dynamic Capability
ICT	Information Communications Technology
INC	Innovative Capability
IT	Information Technology
IS	Information Systems
Offering	Product and/or service made/rendered by business entity.
SEM	Structural Equation Modelling
SME	Small and Medium scale Enterprises
SMEDAN	Small and Medium Enterprises Development Agency of Nigeria

CHAPTER 1

Introduction and project overview

1.1 Background and motivation

Small and medium enterprises (SMEs) form the economic backbone of many countries and this is especially true in the context of *developing* nations. SMEs contribute substantially to the development of Nigeria as they create jobs, trigger innovation and accelerate rural industrialisation (Ayanda & Adeyemi, 2011; Kale, 2015). Despite the existance of more than 17 284 671 SMEs in Nigeria (Tom et al., 2016), unemployment, crime and poverty is still on the increase. With 111.1 million Nigerians legally employable, the increase in the unemployment rate from 6.7% in 2015 to 18.8% in 2017 (NBS, 2017) is a great cause for concern. As SMEs employ over 80% of the total work force (Kale, 2015), the *decrease* in employement opportunities and corresponding *increase* in poverty, this despite the creation of more SMEs, signify that SMEs are experiencing serious challenges. Some of the problems experienced by SMEs in Nigeria include: inadequate funding, poor management skills, lack of action plan to deal with eventualities, lack of research and limited technical expertise (Apulu & Latham, 2011; Jelilov & Onder, 2016; Tom et al., 2016; Ilegbinosa & Jumbo, 2015; Eniola et al., 2015). With the advent and increased adoption of mobile technologies in Africa, SMEs are increasingly turning to these technologies in search of solutions to their problems (Kabanda & Brown, 2014; Owoseni & Twinomurinzi, 2016; Gazdecki, 2015). We know that SMEs widely use mobile apps, but the manner in which they do so is relatively obscure.

This research adopted the dynamic capability (DC) framework to investigate how SMEs in Lagos use mobile apps. The DC theory argues that organisations can compete favourably, despite unpredictable environments, through continuous reconfiguration of resources (Helfat et al., 2007; Kuria & Kitenga, 2014). Whereas the usefulness of DC frameworks in large firms has been extensively researched, limited research has been done regarding the relevance of this framework in smaller organisations, like SMEs. For example, Daniel and Wilson (2013) reseached how large firms use DC for e-business transaformations. Rajeev and Graeme (2011) studied the role of DC in creating business values from IS assets of large organisations.

Considering that SMEs constitute the foundation of national economies in developing countries, this study sought to investigate *how* SMEs could develop DC through mobile app usage. The mastering of DCs by SMEs could greatly assist in addressing the problems which plague them.

1.2 Problem statement

As recorded in March 2017, Nigeria has the eighth most internet users in the world with 93.59 million users (Internet Live Statistics, 2017; Statistics Portal, 2017). A significant number of these users may also access the internet from mobile devices (Ojo, 2012; Ojo, 2015) which indicates that a significant number of people use mobile apps for business purposes. Notwithstanding the perception that the deliberate use of apps by SMEs could enhance their business outcomes (Owoseni & Twinomurinzi, 2016), there have been no significant empirical studies as to *how* SMEs use mobile apps.

This research sought to address these gaps in the literature by investigating and formulating, through the use of the dynamic capability framework, how mobile apps are enhancing SMEs in Nigeria.

1.3 Research aim and objectives

The aim of this study is to examine the use of mobile apps by SMEs in Lagos, Nigeria. In particular, the study sought to achieve the following research objectives:

1. To identify those DCs which are important for SMEs in Lagos.
   This objective revealed the DC constructs in terms of three dimensions: adaptive, absorptive and innovative capabilities, as specific to SMEs in Lagos, which could possibly resonant with other SMEs in similar contexts in developing countries.
2. To determine how the use of mobile apps influences the three dimensions of DCs.
   This objective looked at how the use of mobile apps by SMEs, influences the identified DC constructs in terms of adaptive, absorptive and innovative capabilities.
3. To determine whether the three DC dimensions have an impact on SMEs' ability to sense, shape and seize business opportunities.
   This objective investigated how adaptive, absorptive and innovative capabilities influence SMEs' ability to sense, shape and seize opportunities.

4. To determine whether the use of mobile apps influences the way in which SMEs sense, shape and seize opportunities, or mitigate risks.

   This objective sought to determine if a direct relationship exists between mobile app usage by SMEs and the capability of SMEs to maximise opportunities.

1.4 Research questions

In particular, the research sought to answer the following primary research question:

How could the use of mobile apps enhance SMEs in Lagos, Nigeria?

The primary research question is supported by the following sub-research questions:

1. What are the dynamic capabilities of SMEs in Lagos?
2. How does mobile app usage influence dynamic capabilities (i.e. adaptive, absorptive and innovative capabilities)?
3. To what extent do the dynamic capabilities of SMEs impact on the SMEs' ability to sense, shape and seize opportunities?
4. How does the use of mobile apps influence SMEs' ability to sense, shape and seize opportunities?

1.5 Overview of methodological approach

This study is philosophically grounded in pragmatism. The research investigates contemporary issues as they impact upon SMEs in their real-life context, through case studies. The pragmatic approach is useful in situations where the unit of analysis cannot be clearly separated from its context (Seethamraju & Seethamraju, 2008; Yin, 2005; Lisle, 2011). The study was carried out in two phases and it focused on SMEs in the city of Lagos. Through the use of a mixed method research design, qualitative and quantitative data were collected from SMEs, all the while ensuring that the requirements for validity and credibility of study research data were satisfied.

The first phase of the research employed a qualitative research approach. This approach considers the influence of human thought and actions in social and organisational settings (Klein & Myers, 1999). A non-probability convenience sampling method was used to select 20 SME owners who were then interviewed in person. The responses from the interviewees

were transcribed and analysed using content analysis procedures on Atlas.ti©. This led to the identification of 15 constructs for evaluating the DCs of SMEs.

Subsequently, the second phase of the study used the same sampling method to survey 1 162 SMEs in Lagos. This was done to quantitatively validate the identified DC constructs and to thus make sense of *how* mobile app usage enhances SMEs. The survey was conducted through personal interviews. Questions were created on google forms and responses were directly recorded through smart handheld devices. In order to increase responses to the survey, 12 data collection field officers were hired, trained and fitted out with customised t-shirts and nametags. Three respondents voluntarily opted out of the research which reduced the sample size to 1 159. Using confirmatory factor analysis (CFA) and covariance based structural equation modelling (SEM) by AMOS (version 24), the study explored the fitness of a conceptual model for SMEs. SEM is a statistical analysis technique for examining structural relationships between measured variables and latent variable(s) in a given model. The conceptual model for SMEs assembled seven latent variables namely: mobile app usage, adaptive capability, absorptive capability, innovative capability, opportunity sensing ability, opportunity shaping ability and opportunity seizing ability. The outcome of SEM demonstrated the relationships between the latent variables. Understanding the relationship between the latent variables explained *how* SMEs in Lagos make use of mobile apps.

1.6 Scope and context

This study resides within the multidisciplinary field of Information Systems. The research work adopted the principles of DC, as present in strategic management, as the DC framework considers ICT an integral driver of DC (Sharma & Shanks, 2011; Xiao & Dasgupta, 2009). The DC framework therefore offered an appropriate lens through which SMEs could be studied to ascertain *how* they leverage mobile apps to create, develop and realign their internal competencies and resources towards addressing unpredictable business environments (Teece, 1997). Mobile technology has been one of the technologies that developing countries, especially in Africa, have embraced enthusiastically (Quade & Leimstoll, 2015; Degirmenci et al., 2013; Hafkin, 2009; Bouwman & de Reuver, 2013). This paper therefore sought to understand how mobile technology, specifically mobile apps, are used to support SMEs in the Nigerian context.

1.7 Ethical considerations

Research ethics ensure that moral standards are not violated while conducting research. This study was implemented in line with UNISA's policy on research ethics. The research was reviewed and approved by the ethical committee before the commencement of field activities. Informed consent, voluntary participation, confidentiality and anonymity are ethical principles which guided the conduct of this research. Ethical clearance for this research study can be viewed in Appendix 6.

1.8 Thesis structure

The remainder of this thesis is structured in the following way:

Chapter 2 presents the pragmatic philosophy as the worldview adopted for this research. This chapter further argues and justifies the selection of this pragmatic perspective.

Chapter 3 provides background information to Lagos, Nigeria as case study within the context of the research.

Chapter 4 reviews ICT, SMEs and DC literatures in order to create a theoretic foundation for this study. In addition, this chapter explains how the research questions and hypotheses were developed from the existing literature. It also explains the creation of the conceptual model for SMEs in Lagos as it relates to mobile app usage and DC.

Chapter 5 provides insight into the research as it defines and justifies the mixed-method research approach and also develops data collection instruments.

Chapter 6 presents the content analysis of the qualitative data collected from 20 SMEs. This analysis reveals 15 DC constructs inherent to SMEs in Lagos, Nigeria.

Chapter7 discusses the SEM of SMEs based on the conceptual model. In addition, the chapter explains the relationship between seven latent variables in the conceptual model and presents the outcome of 15 hypotheses, tested through SEM.

Chapter 8, as the concluding chapter, reflects on the conduct of the research. It presents a summary of the results and contribution of the research as well as recommendations, suggestions for further research and closing remarks.

CHAPTER 2

Philosophy

Chapter 1 presented the background of the research, highlighted the research problem and provided the motivation for investigating the problem.

This chapter will expound upon the place and value of philosophy in the scientific research process and, in addition, present pragmatism as the guiding philosophy in the conduct of this research.

2.1 Introduction

Philosophies are general orientations regarding the world and the nature of truth which are held by the researcher and, as such, constitute a basic set of beliefs which guide actions (Lincoln & Guba, 1995). Philosophy is a mindset which attempts to discover common ground between that which is *known* to be true and that which is *believed* to be true (Efinger et al., 2004; Lee, 2004; Creswell, 2008). Philosophies fundamentally influence the practice of research as it guides the researcher towards embracing, for example, a qualitative, quantitative or mixed methods approach to his/her research.

Philosophies should not be chosen arbitrarily and apart from research contexts. The application of philosophies within research contexts requires an in-depth understanding of the common beliefs and agreements shared by scholars regarding *how* problems should be understood and addressed (Sellars, 1963). In general, all research endeavours assume one of four broad philosophical orientations: Positivism, Interpretivism, Realism and Pragmatism (Lee, 2004).

A positivist stance seeks to discover those laws which govern outcomes (Lincoln & Guba, 1995). This orientation believes that abstract theory does not exist and that the process leading to an outcome must be known and verifiable experimentally through quantitative methods. Interpretivists seek to understand the social experience though humanistic interactions which are qualitative in nature. Interpretivists like to gain understanding by

answering the *Why?* question, whereas positivists want to ascertain *What?* transpired (Saunders et al., 2009).

Realism holds with the proposition that things are not always what they appear to be and that entities may thus possess objective realities that could be at variance with the human perception of what they are. Realists claim that every *thing* in existence has an objective purpose, or function (Lincoln & Guba, 1995), and that this purpose may differ from the subjective interpretation of the role-players which interact with it. This emphasises the need to test subjective understandings towards the deduction of objective meanings. Pragmatism presents a factual and practical approach to solving problems. Unlike realism, the pragmatic perception of reality holds true insofar as it is *workable* – reality is thus considered as that which works (Campbell, 2011).

This study adopted a pragmatic philosophy to guide the research process as the governing impetus is the need to understand *how* SMEs practically use mobile apps. The focus is thus not on how they *plan* to use, or how they *ought* to use mobile apps, but on their real-life interaction with said apps. The subsequent sections of this chapter will provide insights into the basic tenets of pragmatism and how these influenced the conduct of this research.

2.2 Pragmatism as a philosophy

Charles Saunders Peirce (1839 - 1914) introduced the concept of pragmatism as a philosophy and it was then further developed by notable scholars like William James (1842 - 1910), John Dewey (1859 - 1952), Herbert Mead (1863 - 1931) and a few others (Barton, 1994). According to Peirce, pragmatism believes that every concept has conceivable practical effects (Rylander, 2012). It opines that research propositions should be examined in terms of practical understanding rather than general perceptions, theories or ideals. This presents pragmatism as one of the driving forces behind practical, scientific approaches targeted at the continuous improvement of established opinions, points of view or truths.

Truth is that which works in practical situations and it yields satisfactory results when put into practice (James, 1910). For example, one could ascribe to a general perception, or theoretically certified hypothesis, that social media marketing is helping SMEs to penetrate new markets quicker and that its use is increasing sales and profits. This perception, however, remains within the realm of *speculation* if it fails to deliver the expected results when put into

practice. Thus, if SMEs traditionally rely on one-one-one marketing strategies to penetrate new markets, one-on-one marketing remains the truth until it can be practically established that social medial marketing has had the perceived effect.

2.3 Fundamentals of pragmatic philosophy

Scholars hold many different opinions and ascribe to many different viewpoints regarding philosophies. Despite these seemingly conflicting views, the fundamentals of pragmatic philosophy are based on *four* key components: practicability, usability, heterogeneity and changeability. These will be assessed in the subsequent sections of this chapter.

2.3.1 Practicability

Pragmatism aims to provide solutions to the practical problems of life. Hence it places a high premium on the value of interaction and observation (Kilpinen, 1987). Pragmatism supports the testing of every proposition by ascertaining its practical outcomes. If the outcomes are desirable, the proposition is accepted as truth and, if not, it is rejected. Pragmatists appreciate *doing* (activity) rather than *saying* (ideas) and they hold the view that ideas are born from activities and not vice-versa. Learning by doing is thus considered as one of the main tenets of pragmatism (Rylander, 2012).

Previous studies on mobile app usage by SMEs in Lagos revealed the perception that the use of mobile apps enhances business. For example, 19 start-ups in laundry business used mobile apps to increase customer-base, staffing and profits (Owoseni & Twinomurinzi, 2016). However, the way in which the mobile apps are used remained virtually undisclosed and limited empirically data supported this perception. This research set out to close the gap between *perception* and *reality* through knowledge regarding how SMEs use mobile apps and recommendations regarding how the use of these apps could enhance SMEs.

2.3.2 Usability

Pragmatism advocates that the reality of a principle resides in its usefulness. Not only does it thus expect a practical demonstration of ideas, but it also expects these ideas to be useful within their context (James, 1910). For example, SMEs tend to use various mobile apps (Dinner et al., 2015) but there are literature gaps in as far as explaining the usefulness of mobile apps to SMEs in the context of developing countries.

2.3.3 Heterogeneity

According to Campbell (2011), pragmatism is not committed to only one specific way of thinking. The pragmatic approach focuses on the outcomes and practical impacts of actions and pragmatists thus apply mixed methods of inquiry by which they are free to draw from quantitative *and* qualitative assumptions during research activities. Pragmatism, as a research baseline, opens the door to multiple methods, different worldviews and assumptions, as well as different forms of data collection and analyses (Campbell, 2011). This study is socially and practically inclined as it sought to understand how SMEs enhance business through the use of mobile apps and it therefore benefitted from the application of mixed research methods towards the realisation of the research objectives.

2.3.4 Changeability

The fact that a belief held true yesterday does not make it true today, neither does it guarantee its truthfulness tomorrow. Pragmatism believes that nothing is fixed and final and that everything is subjected to a process of flux (Goldkuhl, 2004). Truth thus evolves and changes over time because the human experience is evolving, and as such, subjected to change as well. Pragmatism is mindful of the outcome of the continuous interaction between man and his environment. Man adapts and moulds the environment according to his needs, purposes and desires as prescribed by his interaction with his environment (Hope & Hope, 2001; Rylander, 2012; Goldkuhl, 2004).

The Facebook mobile app can be used to illustrate this point. In 2015 this app did not possess a live video conferencing functionality. Today, however, subscribers spend three times longer watching live streams compared to uploaded videos which amount to, on average, 8 billion daily video views (Savage, 2016). Today the Facebook app possesses more functionalities than a few years ago and, consequently, it has opened up more opportunities to users who would prefer to develop video contents. SMEs in Lagos might have used mobile apps without tangible outcomes in the past, but an understanding of *how* they use them now will provide useful knowledge which, in turn, will light the way to maximised usage in the future.

2.4 Conclusion

The central theme of this research is to investigate the dynamic capabilities of SMEs when mobile apps are used to enhance business. It suggests that *that* which worked and *that* which

was deemed useful *yesterda*y may, in fact, be obsolete today. This study therefore embraced an exploratory approach to ascertain insights into how SMEs use mobile apps in reality. Pragmatism, as a philosophy, provides a suitable lens through which to explore this research landscape because it cruxes on practicality, usability, heterogeneity and changeability.

The next chapter will present background to Lagos, Nigeria as the research context.

CHAPTER 3

Research Context

Chapter 2 presented pragmatism as the philosophy which guided the conduct of this research.

In this chapter, a background information to Lagos, Nigeria is presented in order to further contextualise the research environment.

3.1 Historic significance of Lagos

Lagos state was the capital city of Nigeria for 77 years from 1914, following amalgamation, to 1991 when the capital city moved to Abuja. Lagos is located in the south-western region of Nigeria which is predominantly occupied by Yoruba tribe. In addition, it has a very high integration of other ethnicities (Hausa and Igbo) due to rural-urban migration of individuals in search of better opportunities.

Lagos is one of Nigeria's 36 states and covers only 0.39% of the country's total territorial land mass, thus making it the smallest state in the country geographically. Nonetheless, Lagos has the highest population density (21 million people in 3 577 km²) and a 3.2% growth rate (Ministry of Economic Planning & Budget, 2014). In addition, Lagos has the busiest seaport in West Africa, spanning a 100km stretch of coastline along the Atlantic Ocean. The city has evolved into three main districts: Lagos Island, Lagos Mainland and Sub-Urban Lagos. These districts have 20 local government areas (LGA) and 37 local council development areas (LCDA). Table 3.1 provides an overview of Lagos' estimated population. Unlike other major cities in Nigeria, Lagos can be described as *cosmopolitan.* The city is home to every culture found in Nigeria and living conditions range from poor slums to affluent developed communities.

Although Lagos has steadily evolved over the years, the most significant developments in terms of governance, infrastructure (health, education and transport), trade and industries have occurred within the last 15 years (2001 - 2016). The vision is that by 2025, Lagos would be considered Africa's Model Megacity, a global economic and financial hub that is safe, secure, functional and productive. This vision is believed to be achievable through the

systematic eradication of poverty and sustainable economic growth through infrastructural renewal and development (Lagos State Government, 2013).

Table 3.1 (1): Population distribution of Lagos state (from Lagos population, 2016)

S/No		**Name of Local Govt. Areas**	**Population**
1	Lagos Island	Amuwo-Odofin	772 120
2		Apapa	523 360
3		Eti-Osa	666 060
4		Lagos Island	499 220
5	Lagos Mainland	Ajeromi-Ifelodun	1 613 140
6		Lagos Mainland	766 780
7		Surulere	1 180 240
8	Suburban Lagos	Alimosho	3 097 060
9		Agege	1 083 720
10		Badagry	557 960
11		Epe	426 540
12		Ibeju/Lekki	276 460
13		Ifako-Ijaye	1 003 900
14		Ikeja	745 440
15		Ikorodu	1 239 040
16		Kosofe	1 602 480
17		Mushin	1 482 980
18		Ojo	1 429 740
19		Oshodi-Isolo	1 476 420
20		Shomolu	947 180
Estimated population from 20 Local Govt. Areas			21 389 840

3.2 Economic significance of Lagos

Lagos accounts for about 30% of Nigeria's economic activities (BudgetIT, 2016) which, in part, represents 60% of the nation's industrial and commercial activities (Mawuna, 2015). The economic diversification of Lagos contrasts with the larger Nigerian economy which is heavily reliant on profits from the oil and gas industry. Lagos is financially viable and generates the highest internal revenue of all states in Nigeria (Ministry of Economic Planning & Budget, 2014). Table 3.2 displays the contribution of Lagos to the overall economy of Nigeria.

Table 3.2 (2): The contribution of Lagos to Nigeria's economy (from Lagos State Government, 2013)

Strengths of Lagos Economy
Contribution of 35% to National GDP
Contribution of 62% to non-oil national GDP (2004)
60% of nation's value added manufacturing
Largest stock exchange in West Africa
Over 200 financial institutions (outlets)
Headquarters of many national and international corporations
Lagos' ports contribute 50% of national port revenue
45% of Nigeria's skilled labour force
Over 70% of international air traffic (50% local)
50% of national energy consumption

3.2 SMEs in Lagos

An SME in Nigeria is defined as a legitimate business entity with 1 to 49 employees and an annual turnover of less than 50 million Naira (158 000 USD) (SMEDAN & NBS, 2013). The contribution of SMEs in Lagos, as at 2016, is estimated to be in the region of 7.8 trillion Naira (48.2 billion USD). SMEs further assure the livelihood of approximately 5.7 million people employed by 3.4 million SMEs (Lawanson, 2010). This arguably represents over 70% of the working population of Lagos (Oni, 2016). SMEs exist in all sectors of the economy: as support service providers to big organisations, as smaller competitors empowered by technology or simply as active businesses aimed at sustaining a living (BudgetIT, 2016).

The primary challenges faced by the SMEs in Lagos are: poor resource management, a mainly unskilled workforce, poor access to finance, lacking infrastructure, inconsistencies in government policy and bureaucracy, unfair competition, multiple taxes and levies, inability to access modern technology, poor marketing strategies and non-availability of raw materials locally (Ngwu, 2005; Oni, 2016; BudgetIT, 2016). These challenges resonate with many other developing countries.

Lagos state government has been supporting SMEs with funding and training. In an effort to stimulate job and wealth creation, a 25 billion Naira Employment Trust Fund (ETF) for the funding and training of 100 000 emerging entrepreneurs, has also been initiated. Another

way in which the government of Lagos is seeking to enhance SMEs is through the creation of ICT incubation centres with the aid of private partnerships: Idea Nigeria and Co-Creation hubs are examples of these initiatives (Lagos State Government, 2013). The new generation of Nigerian digital entrepreneurs and SMEs are being encouraged to develop innovative solutions and business models that will lead to efficient businesses and trades and, in so doing, reduce poverty and unemployment.

3.3 Conclusion

The choice of Lagos as geographic location and case study for this research hinged mainly upon the concetration and high number of SMEs. In addition, the defination of SMEs in this study largely include small and micro enterprises which typicaly have less than 10 employees.

CHAPTER 4

Literature Review

Chapter 3 presented background information to Lagos, Nigeria in an effort to elucidate the chosen research environment. With a contextual understanding of the research environment in mind, Chapter 4 will present a review of the literature foundational to the study.

4.1 Mobile Apps as Information Communication Technology (ICT)

ICTs generally signify technologies that offer access to information, through telecommunications. Embedded telecommunication technologies include the Internet, wireless networks, cell phones and other communication mediums. Over the past few decades, ICTs have provided society with a vast array of new communication capabilities (Good & Qureshi, 2009; Didi-quvane & Twinomurinzi, 2013a; Eze et al., 2013; Ariyo & Mcgrath, 2010; Breytenbach et al., 2013). For example, people can communicate in real-time with others in different countries using technologies such as instant messaging, voice over IP (VoIP) and video messaging on social network platforms like Facebook, Twitter and Instagram. Modern ICTs have created a global village in which people interact with their contemporaries across the world, as if they were merely living next door. For this reason, ICT is often viewed within the context of how modern communication technologies affect society (Kamal & Qureshi, 2009; Sun & Chen, 2006). One way to gauge ICT's impact on society is to consider its influence on the way in which business is practised. In recent times, a business' ability to interact with its environment and to respond rapidly and appropriately to environmental challenges has become largely dependent on the use of ICT (Good & Qureshi, 2009; Michiel, 2013). Mobile apps stand out as the type of ICT which facilitates all stakeholders' (including customers, employers, suppliers, regulators, etc.) business interactions.

Mobile applications, also known as *mobile apps* or *apps*, are small programmes installed, or accessible, on smartphones. These programmes offer functionalities by interfacing with other hardware components of the smart device in order to collect, retrieve or store data locally on the smart device, or virtually in the cloud (Young, 2015; Yang et al., 2014). Mobile apps

primarily rely on internet connectivity and cloud technologies. Technically, based on their architectural design, apps can be broadly grouped as: native apps, web apps or hybrid apps (Nayebi et al., 2012). Native apps are platform-specific, developed for use on specific platforms (like android, iOS and windows) or devices. Apps natively developed for android will not run on iOS and vice-versa. Web apps are usually built around mobile browsers which means they are not installed on the mobile device but could be accessed via the browser on the device. Web apps are driven by web technologies like Hyper Text Mark-up Language (HTML), Cascading Style Sheets (CSS) and JavaScript. The main advantage of web apps is their ability to update content without being constrained by the platform app stores, while their main disadvantage is the limitation in interface with the mobile device hardware. Hybrid apps tend to aggregate the features of native and web apps. These apps are built on web technologies, like web apps, but they are wrapped in a native container which interfaces with the mobile device hardware (Dinner et al., 2015).

In terms of use, apps are employed by a wide variety of different ages, industries, cultures and religions. There are apps specifically designed for children and for adults, apps which facilitate learning, military activities, sales, advertisements and entertainment as well as apps written for Chinese, Dutch or African users, to name but a few. The wide use of apps probably justifies Gatner's projection that, by 2019, approximately 300 billion apps would have been downloaded worldwide (Findings, 2015). Statistics regarding the downloading of apps in Nigeria could not be ascertained. However, the increased rate of internet penetration from mobile devices in this country is an indication that mobile apps are being widely used. It is estimated that there are about 93.59 million internet users in Nigeria (Internet Stats, 2016; Internet Live Statistics, 2017; Statistics Portal, 2017) and that approximately 90% of internet access is from mobile devices (Ojo, 2012; Ojo, 2015).

It is therefore reasonable to state that SMEs in Nigeria form a significant part of the statistics concerning mobile apps use since most SMEs are micro businesses with less than 10 employees. However, *how* these SMEs make use of mobile apps remains unclear.

4.2 SMEs and mobile Apps

4.2.1 SMEs defined

There is no single definition for Small and Medium Enterprises (SMEs). Available definitions of SMEs are context based and largely reliant on the number of employees and annual turnover. In the Nigerian context, an SME refers to a legitimate business entity with 1 to 49 employees and with an annual revenue turnover of less than 50 million Naira (158 000 USD) (SMEDAN & NBS, 2013). Table 4.1 presents selected definitions of SMEs from across the world.

Table 4.1 (3): Definitions of the SME

Region or Country	No of Employees	Annual Revenue Turnover	Remarks	Reference
USA	<500	<25M USD	Varies by industry and upper limit was adopted	(Hammer et al., 2010)
European Union	<250	< 50M Euros	Employ fewer than 250 persons with an annual turnover not exceeding 50M Euros OR an annual balance sheet total not exceeding 43M Euros	(European Commission , 2015)
Canada	<100	<20M Canadian Dollars	Varies for service-based and non-service-based firms and upper limit was adopted	(Goverment of Canada, 2017)
China	<2 000	<1B Yuan	Varies by industry and upper limit was adopted	(Ward, 2016)
South Africa	<200	<51M Rand	Varies by industry and upper limit was adopted	(The Bank Association South Africa, 2016)
Nigeria	<50	<50M Naira	-	(SMEDAN & NBS, 2013)

As far back as 1956, Schumpeter indicated the possibilities of SMEs fuelling economic development and highlighted their innovative capabilities (Schumpeter, 1956). Recent studies also point to the significance of SMEs for national economic well-being. In the face of a multitude of challenges, small and medium enterprises have contributed significantly towards the reduction of unemployment and the alleviation of poverty in developing

countries, more so than any other sector (Wang & Shi, 2011; Ayanda & Adeyemi, 2011; Gronum et al., 2012).

4.2.2 Importance of SMEs

As they are relatively easy to create and manage, the primary purpose globally of encouraging SMEs is to create an economic balance (Kingdom & Taylor, 2015). SMEs create jobs, trigger innovation and help citizens achieve financial freedom and personal satisfaction (Kale, 2015; Islam et al., 2011; Tushabomwe-Kazooba, 2006; Ayanda & Adeyemi, 2011). These positive outputs are experienced across national economies, whether they be *developed* or *developing*.

In the United Kingdom, 5.2 million SMEs provide 15.7 million private sector employment opportunities. This represents about 60% of the total employed population and signifies a 1.8 trillion Pound annual turnover (White, 2016). These statistics are similar to that of the United States of America (USA) where SMEs account for the creation of 1.7 million jobs. The total employment of SMEs in the USA account for an excess of 56.8 million which translates to more than 48% of the private workforce in 2015 (Small Business Administration Office of Advocacy, 2015). In Nigeria, SMEs seem to have an even greater impact because they are responsible for the creation of over 60 million jobs, which represents 84.02% of the total labour force (SMEDAN & NBS, 2013).

SME entrepreneurs trigger innovation because they thrive on finding new ways of doing old things - they are creators, innovators and leaders who give back to society by positively changing the ways in which people live, work, learn and play (Moos, 2014). The motivational drive of these entrepreneurs resides in their passion to achieve financial freedom and personal satisfaction. Whether *this* motivation is indeed satisfied in the long-run is still an evolving research subject (Snider, 2015; Ajaiyi & Jegede, 2015).

4.2.3 Impact of mobile apps on SMEs

In today's evolving economy, the success of SME ventures requires good resource management skills. As digitalisation and globalisation are changing approaches to *how* businesses and firms compete for shares and advantages in the open, virtual and borderless markets (Islam et al., 2011), soft resources, in particular, need to be managed with care. This change has created a new economic paradigm known as the *knowledge economy* which

suggests that the most important asset in this emerging economy is, in fact, knowledge. Knowledge, in this context, can be defined as the correct application of information derived from analysed data. The strategic use of mobile apps, as ICT, could maximise the benefits of information (Didi-quvane & Twinomurinzi, 2013b). It has been proven that SME organisations, which recognise and employ the strategic use of information, tend to be more productive and profitable because they benefit from the increased efficiency offered by data driven technologies (Goldkuhl, 2004). Sourcing, analysing and interpreting information has been the main challenge of SMEs in the knowledge economy, especially in a developing nation like Nigeria (Osotimehin et al., 2012).

A study, conducted by Owoseni and Twinomurinzi (2016), noted that the use of a customised mobile app for SMEs in the laundry business led to an increase in both revenue and the number of employees after 6 months. These laundry businesses used mobile apps to streamline their business processes which included: job ordering, job delivery, customer relationship management and payments. In another study of 900 SMEs, done by Quade and LeimStoll (2015), the impact of mobile apps on SMEs were again established, especially when used to support business processes that involve a large variety of data (Quade & LeimStoll, 2015). Since ICT (mobile apps) affects lifestyles, its use consequently affects businesses as well (Good & Qureshi, 2009) as businesses are conducted *by* humans with feelings and emotions.

4.2.4 The mobile app as agent of technology disruption and creative destruction

Change is inherently disruptive, especially in business and economic environments. A number of factors could be regarded as causative agents of change in an economic environment including: new policy adoptions, consumers' lifestyles and globalisation (Ayanda & Adeyemi, 2011). However, it could be argued that these changes are linked to the emergence of *disruptive* technologies. A technology is termed *disruptive* when it changes frequently and unpredictably – all the while presenting new ways of doing things (Manyika et al., 2013). Arguably, mobile apps have become a leading disruptive technology in recent time.

Products based on disruptive technologies (mobile apps in this case) are usually cheaper, simpler and more convenient to use than the dominant technology (Santoso et al., 2013) and thus create a competitive advantage. Although the initial emergence of disruptive technology

may not displace the dominant technology, it gradually gains acceptance as an alternative commodity and then steadily improves performance, or requirements, as demanded by mainstream markets until it totally displaces the incumbent. The advent of chat platforms, like WhatsApp and Telegram, over conventional telecom's short-message-service (SMS) is a typical example.

Previous research presented creative destruction as an economic consequence of technology disruption. Creative destruction is thus viewed as an economic growth factor (Aghion et al., 2017). Entrepreneurs are arguably responsible for creative destruction because they introduce innovations to the market. Usually, these innovations ride on opportunities created by new technologies, like mobile apps. Entrepreneurs, who create SMEs, are self-motivated individuals who combine, or recombine, vital resources to serve emerging customer needs. Thereby they *creatively destroy* the pre-existing economic order by creating new industries and markets (Moos, 2014).

Emerging economies are increasingly engaging with science and businesses around the world to achieve greater efficiency in product and service differentiation. The use of appropriate technologies, like mobile apps, could lower entry barriers for emerging SMEs and thus allow favourable competition by creating online market places and tools which facilitate customer engagement and sales (Gierten & Spiezia, 2016). The strategic value of mobile apps, and their potential impact on business enhancement, make this a very relevant research topic.

The perception is that Nigerian SMEs use mobile apps. It is, however, insufficient to only use apps without an understanding of *how* to extract the maximum benefits from their use, especially in a dynamic economic environment. This study sought to understand *how* SMEs in Lagos, Nigeria use mobile apps to enhance their businesses in a dynamic economic environment. The theory of *dynamic capability* offered a means by which to understand *how* SMEs are using mobile apps to enhance their businesses in Lagos.

4.3 Dynamic capabilities framework

The dynamic capability (DC) framework offers an understanding of why different organisations, operating within the same economic conditions and with access to the same resources, often exhibit different business outcomes (Eze et al., 2013). The DC framework evolved from the resource-based view (RBV) concept in strategic business management

which suggests that business organisations develop, and sustain, competitive advantages through the uniqueness of their resources (Eisenhardt & Martin, 2000). These resources may be *intangible* (i.e. employee's skills and intellect) or *tangibl*e (i.e. machines, property and capital). The RBV directly associates organisational business outcomes with organisational resources. This direct association can be established in relatively stable and predictable environments. However, it has been argued that in dynamic and unpredictable economic environments, such competitiveness cannot be sustained (Alaghehband & Rivard, 2010). The reason for this being that RBV does not consider other inherent factors that could affect the intended application of resources. The development, combination and application of resources, towards attaining the intended business outcome/s, thus signifies the strength of the DC. The dynamic capabilities (DCs) can enable an SME to quickly re-align its resources to create, or maintain, the competitive advantage in a dynamic business environment.

Teece et al. (1997, p. 516) defines DC as "the firm's ability to integrate, build, and reconfigure internal and external competencies to address rapidly changing environments". Helfat et al. (2007, p. 1) define DC as "the capacity of an organization to purposefully extend, create, or modify its resource base". Wang et al. (2007, p. 10) describe a business' DC as a "behavioural orientation to constantly integrate, reconfigure, renew and recreate its resources and capabilities, and most importantly, upgrade and reconstruct its core capabilities in response to the changing environment to attain and sustain competitive advantage". The common thread in all three definitions is the capacity for *change* by aligning, adjusting, modifying, reconstructing, upgrading, streamlining or configuring resources in a volatile business environment towards business gains (Zahra et al., 2008). Table 4.2 presents definitions of DC found across literature.

Faizal et al. (2012) answered five fundamental questions in an effort to simplify DCs: (1) What is DC? (2) What purpose does it serve? (3) When do you use DC? (4) What changes when DC is applied? and (5) What is the result of DC?

DCs are *abilities* and their purpose is to develop new, or existing, *abilities* in a dynamic environment. The application of DCs result in a change in competencies, or resources, of which the ultimate goal is to create a "sustainable competitive advantage" (Faizal et al., 2012, p. 371).

The organisational capacity for change, within the DC context, is three dimensional as it can manifest as: adaptive capability, absorptive capability or innovative capability (Wang & Ahmed, 2007). However, each of these three capabilities depends on *micro-capabilities* to sense opportunities, shape opportunities and seize opportunities (Teece et al., 1997). Sensing, shaping and seizing opportunities are thus considered the *micro-foundations* of DC.

Table 4.2(4): Definitions of DC (from Gema et al., 2017)

S/N	**Author**	**Definition**
1	Teece and Pisano (1994)	Timely responsiveness and rapid and flexible product innovation, along with the management capability, to effectively coordinate and redeploy internal and external competences.
2	Teece et al. (1997)	The firm's ability to integrate, build and reconfigure internal and external competences to address rapidly changing environments.
3	Eisenhardt and Martin (2000)	The firm's processes that use resources - specifically the processes to integrate, reconfigure, gain and release resources to match, and even create, market change. Dynamic capabilities are thus the organisational and strategic routines by which firms achieve new resource configurations as markets emerge, collide, split, evolve and die.
4	Teece (2000)	The ability to sense and then seize opportunities quickly and proficiently.
5	Griffith and Harvey (2001)	Dynamic Capabilities is a combination of resources that are difficult to imitate. This includes effective coordination of inter-organisational relationships, on a global basis, that can provide a firm competitive advantage.
6	Zollo and Winter (2002)	A dynamic capability is a learned and stable pattern of collective activity through which the organisation systematically generates, and modifies, its operating routines in pursuit of improved effectiveness.
7	Lee, Lee and Rho (2002)	Dynamic capabilities are conceived as a source of sustainable advantage in Schumpeterian regimes of rapid change.
8	Adner and Helfat (2003)	The capabilities with which managers build, integrate and reconfigure organisational resources and competences.
9	Helfat and Peteraf (2003)	Dynamic capabilities do not directly affect the output of the firm in which they reside, but indirectly they contribute to the output of the firm through an impact on operational capabilities.
10	Winter (2003)	Those (capabilities) that operate to extend, modify, or create ordinary capabilities.
11	Zahra et al. (2006)	The abilities to reconfigure a firm's resources and routines in the manner envisioned and deemed appropriate by its principal decision-maker(s).
12	Helfat et al. (2009)	The ability to perform a task in the least minimally acceptable manner.
13	Teece (2007)	Dynamic capabilities can be disaggregated in the capacity to: (a) sense and shape opportunities and threats, (b) seize opportunities and (c) maintain competitiveness through enhancing, combining, protecting and, when

		necessary, reconfiguring the business enterprise's intangible and tangible assets.
14	Pavlou and El Sawy (2011)	Dynamic capabilities have been proposed as a means for addressing turbulent environments by helping managers extend, modify and reconfigure existing operational capabilities into new ones which better match the environment.
15	Helfat and Martin (2015)	The capabilities with which managers create, extend and modify the ways in which firms make a living. This helps to explain the relationship between the quality of managerial decisions, strategic change and organisational performance.

4.3.1 Absorptive capabilities

An absorptive capability creates knowledge through strategic alliances in that it combines new *external* knowledge with existing *internal* knowledge towards business gains (William et al., 2013). Based on the acquisition of new information, SMEs with rich absorptive capabilities work smarter and thus avoid mistakes being made by their competitors.

The requirements for examining absorptive capabilities seem to have differing constructs, based on the research or business context. For example, absorptive capability refers to the application of the latest biochemical compounds in pharmaceutical organisations (Biedenbach & Muller, 2012). In the entertainment industry, however, absorptive capability is the rate at which a business creates valuable networks with its peers (Wang & Shi, 2011). This infers that the absorptive capabilities of SMEs in Lagos, Nigeria differ and are unique to their context.

RQ1: How do SMEs in Lagos manifest absorptive capabilities and to what extent are mobile apps used as part of the capability?

According to Reilly and Scott (2010), knowledge acquisition, assimilation, transformation and exploitation are underlying requirements for developing DCs (Reilly & Scott, 2010). ICT has the capacity to help SMEs acquire and transform, assimilate and exploit knowledge (Good & Qureshi, 2009). Based on the foregoing, it could be hypothesised that the use of mobile apps as ICT by SMEs in Lagos could increase absorptive capability.

$H1_a$: The use of mobile apps increases the absorptive capability of SMEs in Lagos.

4.3.2 Adaptive capabilities

The ability to exploit evolving market opportunities illustrates a firm's adaptive capability (Wang & Ahmed, 2007). Adaptive capabilities could be incorrectly perceived as a measure of a firm's resilience while navigating difficult economic realities. Adaptive capabilities do not only show resilience, they also exhibit a firm's capacity to identify these external opportunities and then change their practices, in a timeous manner, to adapt to environmental changes (Saeedi, 2014; Biedenbach & Müller, 2012). In this way *internal resources* are aligned with *external demand* which is reflected through changes in business processes, or procedures, and investment in new markets through strategic flexibility. This adaptive capability projects what SMEs do with the information acquired, with the emphasis being on response speed.

The constructs of adaptive capabilities vary in accordance with the context of study. For example, the pharmaceutical industry measures adaptive capability by the rate of "re-patenting to prolong patent protection" (Biedenbach & Muller, 2012, p. 627) while the measure of "how firms' information systems allow customers to change outdated information" is an indication of the adaptive capability of other industries (Wang & Ahmed, 2007). The ease at which customers update outdated information relates to adaptive capability because new customer information will provide new insight to the firm. It therefore means that SMEs in Lagos have different constructs for measuring adaptive capability. The constructs for measuring adaptive capability should be determined in light of the Nigerian context as this will allow for the correct measurement and/or evaluation of this capability. Enquiring from SME owners *how* new business is stimulated will prompt measurable variables that connotes SME's adaptive capability. Since literature have suggests that SMEs in Lagos use mobile apps, understanding *how* they use apps for adaptive capability will unveil its impacts on dynamic capability.

RQ2: How do SMEs in Lagos manifest the adaptive capability and to what extent are mobile apps used as part of the capability?

The use of mobile apps, by SMEs in the laundry sector, witnessed a marginal increase in revenue (Owoseni & Twinomurinzi, 2016). This could suggest that the use of mobile apps could positively drive the adaptive capabilities of SMEs.

H1$_b$: The use of mobile apps increases the adaptive capability of SMEs in Lagos.

4.3.3 Innovative capabilities

Innovative capabilities can be likened to a creative force. According to William et al. (2013), this capability is demonstrated by the way in which SMEs push at conventional business boundaries through the creation of new products, services, markets or business models (Grimaldi et al., 2013). The Innovative capability is crucial to business survival and can be measured through the identification of clear goals which propel ideas (Biedenbach & Muller, 2012). It is also a measured by the rate at which organisations develop new products, services or business models.

It has been proven that absorptive and adaptive capabilities have differing measuring constructs based on the relevant research context. Thus, it is beneficial to elicit the construct for measuring the innovative capability of SMEs in Lagos, although previous research studies indicate a similar measuring unit as creative ability (Camisón & Monfort-Mir, 2012; Parida & Örtqvist, 2015; Miles, 2008).

RQ3: How do SMEs in Lagos manifest the innovative capability, and to what extent are mobile apps used as part of the capability?

In recent times, the flexibility, wide acceptance and coverage offered by apps single them out as *innovative enhancement tools.* A significant number of people today interact with smart devices through mobile apps. Consider the innovative advertising capabilities of a single tweet in terms of the potential number of people reached by such a tweet, its low cost and ease of use. Moreover, the high rate of smart device adoption also highlights the possibility of mobile app usage as an innovative capability used by SMEs. ICT incubation centres in Lagos are releasing new business models and innovations which are reliant on mobile apps. An example of this trend is *FarmCrowdy*, a platform which allows its users to purchase farm land, cultivate and harvest crops as well as effect sales via a smartphone.

H1$_c$: Mobile app usage increases the innovative capability of SMEs in Lagos.

4.4. Micro-foundations of dynamic capability: sensing, shaping and seizing opportunities

At the foundation of DCs are cognitive abilities: the ability to *sense* opportunities, the ability to *shape* opportunities and the ability to *seize* opportunities or mitigate threats (Teece et al., 1997). SMEs thus develop DCs when they practice the act of continuously sensing, shaping and seizing opportunities (Wagner & Wagner, 2013; Haas, 2015); This unveils the acquisition of DCs as a skill which is not instantaneously achieved, but rather developed and mastered over time.

SMEs' sensing capabilities relate to their ability to *identify* prospects. The capability to shape opportunities help an SME to interpret and decide whether or not a prospect should be explored. Opportunity seizing and/or risk mitigation capabilities, however, drive the execution of actions towards maximising the benefits of a selected opportunity or prospect. The repetition of these sequential actions can be termed *dynamic capability mastery* – the act of building DC expertise by continuously sensing, shaping and seizing opportunities or mitigating threats.

For clarity's sake, Figure 4.1 explains the DCs framework in terms of a process model. For example, an SME may decide to explore DCs from an adaptive, absorptive or innovative perspective. Irrespective of this decision, the goal is to be sensitive to opportunities that exist within the business environment (Sharma & Shanks, 2011). Sensed opportunities are evaluated based on the available facts. Opportunities that have passed evaluation are considered *shaped* and are fit to be explored. Subsequently, shaped opportunities are acted upon. The seizing of opportunities primarily translates as the capacity of a business to quickly formulate actions and allocate resources towards attaining an identified business objective. The impact of seized opportunities are measured against the business outcome in order to determine the amount of *shift*. The shift in business outlook and the desire to remain competitive, in turn, trigger the need to sense opportunities and thus the dynamic capability mastery loop continues. This process leads to business transformation (Niehaves et al., 2011; Teece et al., 1997).

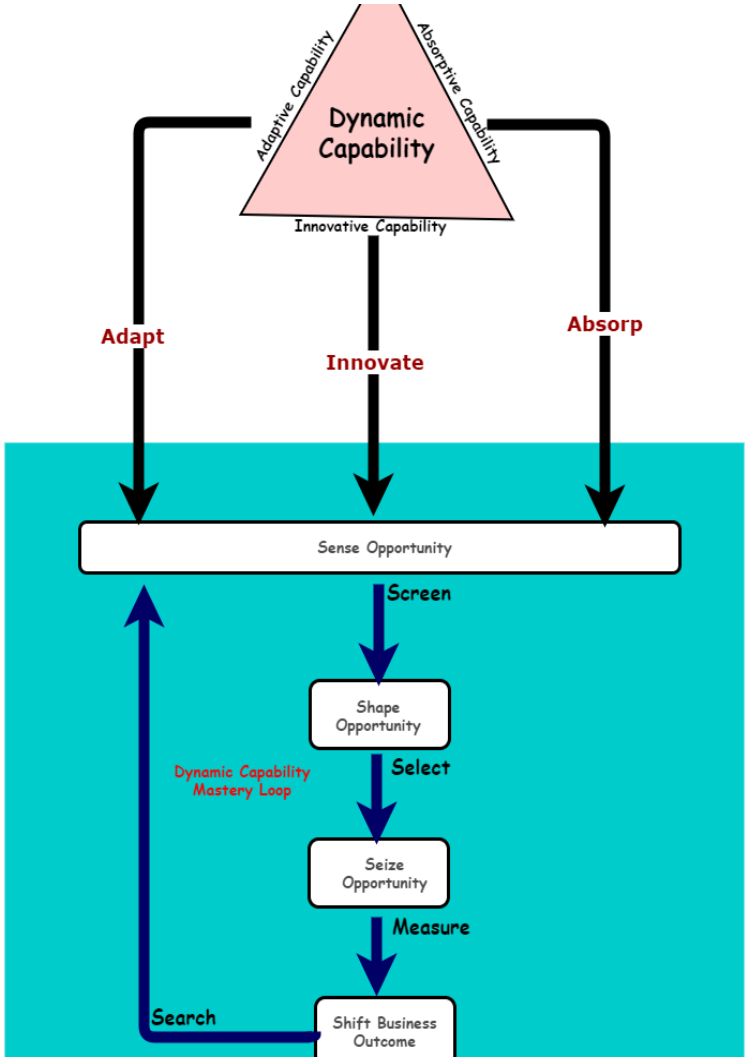


Figure 4.1 (1): DC process model

It is noteworthy to highlight that in this research the concepts of opportunity sensing, shaping and seizing were detached from DCs and treated as capabilities required by SMEs to gain a competitive advantage. The measure of opportunity maximisation by SME aims to provide an indications of the SME's growth and profitability as an SME with a strong competitive advantage usually experiences growth and profitability (Didi-quvane & Twinomurinzi, 2013a; Teece, 2007).

Drawing from literature and the context of this research, which sought to understand how SMEs in Lagos use mobile apps, the following hypotheses are investigated:

$H2_a$: The Absorptive capability increases SMEs' opportunity sensing ability in Lagos.

$H2_b$: The Absorptive capability increases SMEs' opportunity shaping ability in Lagos.

$H2_c$: The Absorptive capability increases SMEs' opportunity seizing ability in Lagos.

$H3_a$: The Adaptive capability increases SMEs' opportunity sensing ability in Lagos.
$H3_b$: The Adaptive capability increases SMEs' opportunity shaping ability in Lagos.
$H3_c$: The Adaptive capability increases SMEs' opportunity seizing ability in Lagos.

$H4_a$: The Innovative capability increases SMEs' opportunity sensing ability in Lagos.
$H4_b$: The Innovative capability increases SMEs' opportunity shaping ability in Lagos.
$H4_c$: The Innovative capability increases SMEs' opportunity seizing ability in Lagos.

Having established the possible relationships between the three perspectives of DCs and SMEs' opportunity sensing, shaping and seizing capabilities; it is valuable to consider whether mobile usage could directly influence SMEs' capabilities to sense, shape and seize opportunities.

$H5_a$: Mobile app usage increases SMEs' ability to sense opportunities in Lagos.
$H5_b$: Mobile app usage increases SMEs' ability to shape opportunities in Lagos.
$H5_c$: Mobile app usage increases SMEs' ability to seize opportunities in Lagos.

4.5. The conceptual model and research variables

The research questions and hypotheses developed in the previous section suggest 7 test items (which could be considered as latent variables). The relationships which govern these test items will elucidate the way in which SMEs in Lagos use mobile apps, and is illustrated by the conceptual model of SMEs and mobile app usage as per Figure 4.2.

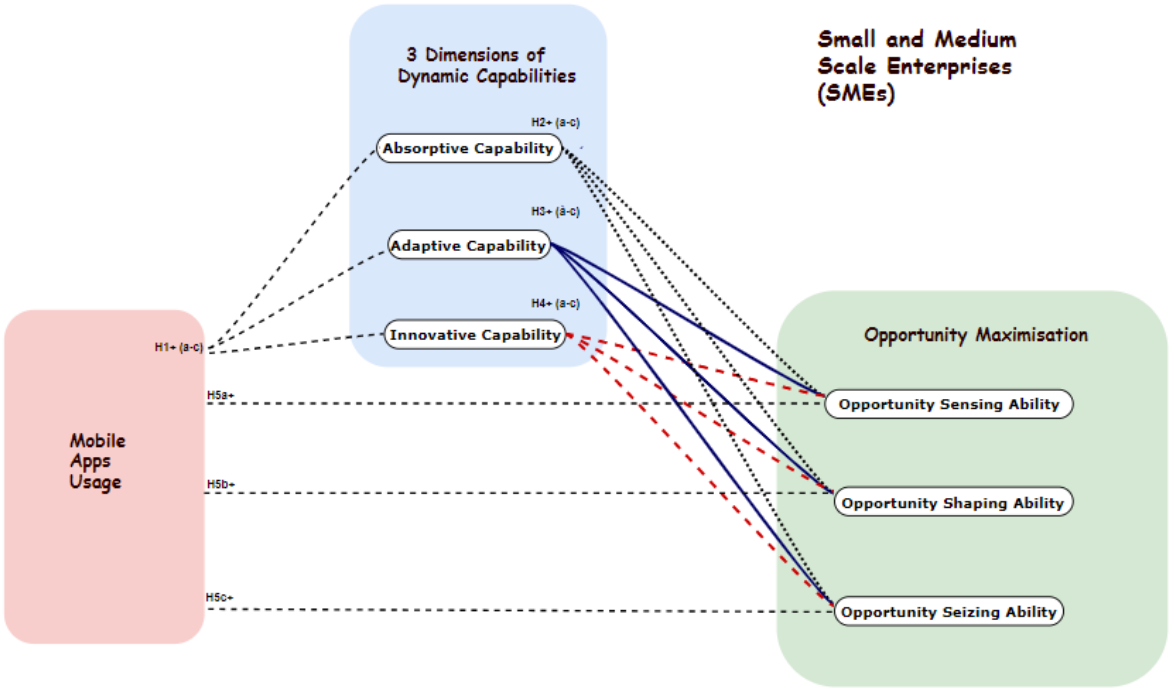


Figure 4.2 (2): Conceptual framework for investigating SMEs

The conceptual model suggests SMEs as the unit of analysis with latent variables itemised below:

1. Mobile app usage
2. Absorptive capability
3. Adaptive capability
4. Innovative capability
5. Opportunity sensing capability
6. Opportunity shaping capability
7. Opportunity seizing capability

4.6 Definition and association of constructs

Within the context of this research, which sought to gain an understanding of *how* SMEs in Lagos use mobile apps to develop DCs, 7 test items named in preceding section correspond to 7 theoretical constructs. We defined the constructs which make up the conceptual model as follows:

1. ***Mobile app usage*** refers to *how* SMEs in Lagos engage mobile apps while carrying out business activities.
2. ***Absorptive capability*** describes *how* SMEs in Lagos create knowledge through strategic alliances which combine new external knowledge with existing internal knowledge towards attaining business gains (William et al., 2013).
3. ***Adaptive capability*** illustrates *what* SMEs in Lagos do with the knowledge acquired. This reflects on changes in business processes, or procedures, and investment in new markets (Wang & Ahmed, 2007).
4. ***Innovative capability*** is demonstrated by the way in which SMEs in Lagos push at conventional business boundaries through the creation of new products, services, markets or business models (Grimaldi et al., 2013).
5. Lagos SMEs' opportunity ***sensing capability*** relates to their ability to identify prospects (Didi-quvane & Twinomurinzi, 2013).
6. The ***capability to shape opportunities*** helps SMEs in Lagos to interpret and decide whether a prospect, which had been identified earlier, should be explored (Haas, 2015).
7. ***Opportunity seizing (and/or risk mitigation) capability*** of SMEs in Lagos drives the execution of actions towards maximising the benefits of selected and/or shaped opportunities (Wagner & Wagner, 2013).

In light of the creation of the SME conceptual model, the identification of directional associations between constructs are important to avoid misspecifications. A measurement model is misspecified when it does not account for all construct interactions within the context in which the model was created (Freeze & Raschke, 2007). A measurement model could be reflective or formative in nature. When the observed indicators are influenced by latent variables, the resultant model is considered as reflective. In the case of the formative model, the latent variables are influenced by observed indicators (Freeze & Raschke, 2007; Bankole & Bankole, 2017). Reflective measures are expected to possess high inter-correlations while formative measures are not expected to correlate (Jarvis et al., 2003; Bagozzi, 2011).

The conceptual model of SMEs in Lagos is formative as the latent variables derive meaning from the measured variables. Additionally, DC consists of 3 measures: absorptive, adaptive

and innovative capabilities and an increase in one of these capabilities signals an increase in DC. Likewise, opportunity maximisation (or the micro-foundation of DC) consists of 3 measures: opportunity sensing, shaping and seizing capabilities and an increase in any of these capabilities would result in the increased capability of SMEs to maximise opportunities. The covariance based structural equation modelling (SEM) technique is considered appropriate for evaluating formative models in IS research (Cenfetelli et al., 2013; Cenfetelli & Bassellier, 2009).

4.7 DC and pragmatism

The DC theory emphasises continuous improvement of the manner in which business owners quickly align internal and external resources in order to remain relevant in a dynamic economic environment (Pavlou & El Sawy, 2011). This dynamic capability concept, in turn, aligns with the pragmatic principles of practicability, heterogeneity, usability and changeability, as discussed in Chapter 2.

- *Practicability* as it is better to study, in context, the way in which SMEs develop DCs through repeated manifestation of absorptive, adaptive and innovative capabilities (Kilpinen, 1987; Campbell, 2011). This focus suggests a practical approach to the investigation of mobile app usage by SMEs.
- *Heterogeneity* as the theme of this study connotes an investigation, which is exploratory in nature, and mixed research methods thus present the best approach in this context.
- *Usability* as one of the objectives of this study is to understand how useful mobile apps are to SMEs. This process exposes the *truth* in line with pragmatic tenets which regard only that which works as truth.
- *Changeability* as the assertion that the DC paradigm works best in a fast paced environment (Eisenhardt & Martin, 2000) attests to its changeability. It thus follows that a capability which had previously given rise to good business outcomes may not offer the same results when applied today.

In addition to the alignment of DC with pragmatism as argued, the choice of Dynamic Capability (DC) as the underlining framework is reasonable because the DC framework

considers information communication technology (ICT) as an integral driver of the DC capabilities unlike other theories Institutional theory and Choice framework (Sharma and Shanks 2011; Xiao and Dasgupta 2009).The framework of DC therefore offered an appropriate lens through which SMEs could be studied on how they leverage mobile apps to create, develop and realign their internal competencies and resources towards addressing unpredictable business environments (Teece 1997).

4.8 Conclusion

The literature review provided theoretic foundations within the context of SMEs' enhancement using mobile apps in Lagos. The literature suggested that:

1. SMEs in Lagos use ICT, in the form of mobile apps, and this impacts upon business outcomes, especially in a rapidly changing environment.
2. The purpose of SMEs in Lagos is primarily to create jobs and generate new ideas. These concepts are motivated by a need for financial freedom and a drive for personal satisfaction.
3. SMEs in Lagos have problems sourcing, analysing and interpreting information. SMEs also have to face and navigate poor access to finance, poor infrastructure, inconsistent government policies and inadequate training.
4. The DC framework provides an approach regarding *how* SMEs could create and realign their internal competencies and resources towards addressing rapidly changing business environments (Teece, 1997). This process would ultimately enable SMEs to remain profitable, despite the rapidly changing environment within which they operate.
5. DCs manifest as absorptive, adaptive and innovative capabilities. The representation of these capabilities differs within the context under investigation. However, mobile apps could enhance these capabilities of SMEs in Lagos.
6. Developing DCs is a learning process and, as such, not instantaneous. The sensing, shaping and seizing of opportunities, or mitigating of threats, rely on an SME's ability to source, analyse and interpret data. The speed at which this process occurs is also important for the enhancement of SMEs in Lagos.

7. At the foundation of DCs one finds cognitive abilities including: the ability to sense opportunities, the ability to shape opportunities, the ability to seize opportunities and/or the ability to mitigate threats (Teece et al., 1997). SMEs' develop DCs through continuously sensing, shaping and seizing opportunities (Wagner & Wagner, 2013; Haas, 2015).
8. The primary purpose of DCs is to create a competitive advantage.
9. It is suggested that SMEs, which sustain a competitive advantage, experience growth and profitability (Didi-quvane & Twinomurinzi, 2013a; Teece, 2007).
10. This research detached the capabilities of sensing, shaping and seizing opportunities from DCs and, in so doing, consider them as capabilities required by SMEs to create competitive advantage. This could serve as indirect measure of growth and profitability.

This chapter dealt with the creation of a conceptual model for investigating *how* SMEs use mobile apps to enhance business in Lagos, Nigeria. While there are theories pertaining to DC, empirical research into the DCs of SMEs in developing economies, like Nigeria, remains scant. Evaluating the conceptual model will provide useful and pragmatic insight into how SMEs in Lagos use mobile app to enhance business.

CHAPTER 5

Research Methodology

The preceding chapter presented the design of a conceptual model for investigating *how* SMEs in Lagos use mobile apps. This design was based on literature and the insights obtained from the dynamic capability framework. The conceptual model identifies the SME as a unit of analysis with 7 latent variables. In addition, 3 research questions and 15 hypotheses were also developed to explore the relationships between these variables. This chapter presents approaches adopted and methods employed toward meeting the research objectives.

5.1 The research design

Research design denotes the strategic plan and procedures employed toward attaining an effective research outcome (Witschel & Hans, 2015). This study adopted the research onion model, a research framework designed and developed by Saunders et al. (2007). The model presents the stages required in the execution of scientific research as a typical onion which is made up of multiple layers. If one wishes to access the *inner* layers of the onion, one must first remove the *outer* layers one by one in a systematic fashion. Likewise, Saunders et al's' research onion model (Saunders et al., 2009) advises a stepwise and systematic approach to strategic research design and execution.

Saunders' research onion model (Saunders et al., 2009) outlines 6 stages for conducting effective research:

Stage 1: *Adopt* a philosophy.

Stage 2: *Embrace* a research approach based on the goal of the research. For example, a research theme may move from theory to practice or from practice to theory.

Stage 3: *Select* a strategy that aligns with the chosen philosophy and research approach.

Stage 4: *Choose* a design which supports the philosophy, research approach and strategy.

Stage 5: *Define* the time horizon of the research.

Stage 6: Finally, *resolve* potential data collection conflicts by engaging appropriate data collection tools and procedures.

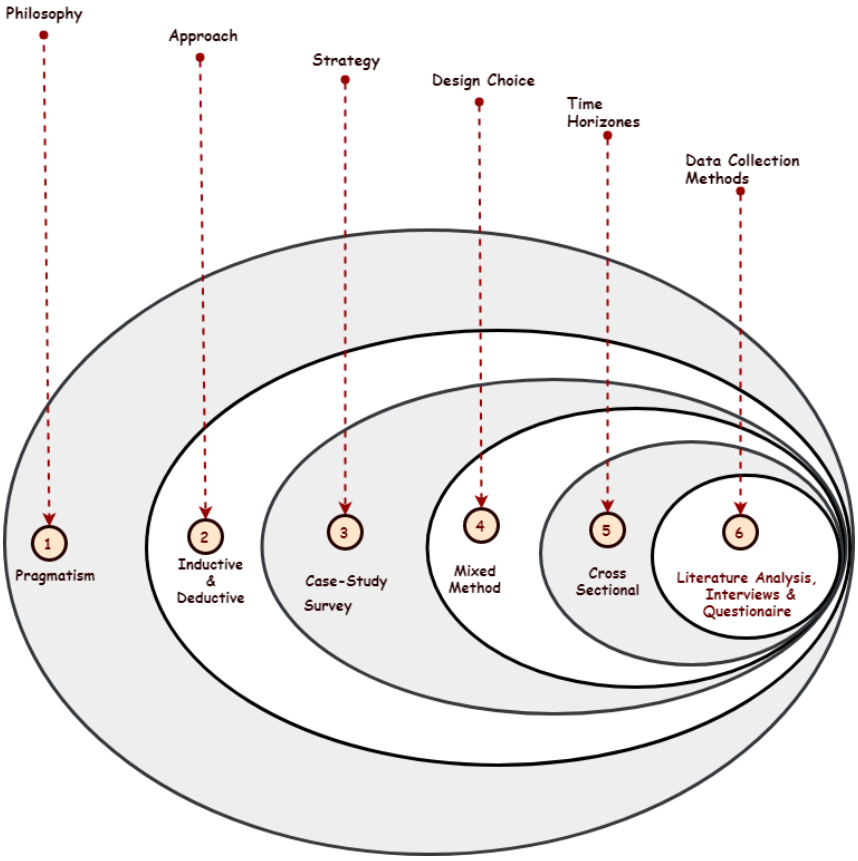


Figure 5.1 (3): Adapted from Saunders' Research Onion Model (from Saunders et al., 2009)

The primary focus of Saunders' research design approach is to ensure the clarity and trustworthiness of a research procedure. Subsequent sections of this chapter adapt the onion model to present the methodology of this research.

5.2 Research philosophy

This study adopted a pragmatic philosophy which believes in practice rather than theory. Pragmatism offers a factual and practical approach to solving problems (Rylander, 2012). The choice of philosophic stance is justified by the goal of the research which is to gain an understanding of *how* SMEs practically use mobile apps. Chapter 2 discussed the pragmatic philosophy, as it relates to this study, in detail.

5.3 Research approach

The research approach relates to the relevance of theory in a scientific study as whether, for example, the study should commence with a known theory and/or conclude with a newly discovered theory (Efinger et al., 2004). Saunders et al. (2009) support this view by identifying two pairs of approaches to scientific research, namely: the *inductive* and *deductive* research approach as well as the *qualitative* and *quantitative* research approach.

5.3.1 Inductive and deductive approaches

Studies which follow the *inductive research approach* usually start with observation. The inductive approach fosters: the making of observations, the collection and analysing of data, the identifying of patterns and the creation of theory (Saunders et al., 2009). Identified patterns in inductive research could, however, fit into existing theory (Bryman & Bell, 2011).

The *deductive research approach* is convergent in nature as it moves from the general understanding of a phenomenon to specific knowledge of that phenomenon in a given context (Kothari, 2004). A deductive approach demands that the researcher develops a hypothesis and then create a strategy to test said hypothesis, based on prevailing theory. The deductive research approach is suitable for use in situations where the goal of the research is to examine whether or not a given context fits the expectation, or demands, of the existing theory.

This research study used both the inductive *and* deductive approaches. The inductive approach helped in the understanding of the dynamic capabilities of SMEs in Lagos, which was an unknown construct. The deductive approach tested 15 hypotheses by relying on the generic understanding of the problem, as presented in conceptual model.

5.3.2 Qualitative and quantitative approaches

The *qualitative research approach* has its roots in the social sciences. It focuses on people and their environment and the ways in which they interpret their experiences while interacting with their natural environment. Qualitative research is context specific and the researchers must take into account that people's feelings, actions and experiences differ, based on a given context. Qualitative research is subjective because the values and experiences of the researcher can affect the general worldview of the study (Alan Bryman, 2016). Qualitative data are usually unstructured and collected via observation and/or interview/s. Thematic

and/or content comparative analyses are preferred in qualitative data analysis. The outcome of the qualitative study reveals new theories or facilitates a clearer understanding of existing theory.

In the *quantitative research approach* the goal is primarily to either affirm or negate existing theory through statistical analysis. The research process tends to remain objective with a distant relationship maintained between the data and the researcher. Data collection in quantitative research is standardised and leads to a structured dataset. The requirements of quantitative research demand that other researchers should obtain similar results when the research is repeated.

Table 5.1 presents a summary of characteristics specific to the qualitative and quantitative research approach, as per Alan Bryman (2016).

Table 5.1 (5): Summary of qualitative and quantitative research approaches (from Alan Bryman, 2016)

Perspectives	**Qualitative approach**	**Quantitative approach**
Aim	Explores participants' experiences in their natural environment. Generates new theory or provides better insight into existing theory.	Search for causal explanations. Test hypothesis. Aid prediction and control.
Approach	Broad focus. Process oriented. Context-bound. Getting close to data (participants).	Narrow focus. Product oriented. Context free. Often in artificial or laboratory setting.
Sample	Participants, informants. Sampling units such as place, time and concepts. Purposive and theoretical sampling. Flexible sampling that develops during research.	Respondents, participants. Randomised sampling. Sampling frame fixed before research.
Data collection	In-depth, non-standardised interviews. Participants' observation/fieldwork. Documents, photographs, videos.	Questionnaires, standardised interview. Tightly structured observation. Randomised control trials.
Analysis	Thematic, constant comparative analysis.	Statistical analysis.
Outcome	A story, an ethnography, a theory.	Measurable results.
Relationships	Direct involvement of researcher. Research relationship is close.	Limited involvement of researcher. Research relationship is distant.
Rigour	Trustworthiness, authenticity, typicality and transferability.	Internal/external validity, reliability and generalisability.

This study employed both the inductive *and* deductive approaches. The inductive approach was firstly used in applying the DC framework as a theoretical lens through which to observe SMEs in their context. The deductive approach then helped to formulate and test the hypotheses aimed at understanding how SMEs in Lagos, Nigeria enhance business through the use of mobile apps. These hypotheses are rooted in the offerings of the DC framework and quantitative research perspectives. The inductive segment of the study identified patterns from the analysed qualitative data in order to reveal DC constructs in line with the three dimensions of DC (i.e. absorptive, adaptive and innovative capabilities) within the context of SMEs in Lagos. It is noteworthy that the pragmatic philosophy provides freedom of approach, methods and instruments towards finding a solution to a practical problem. Every method, or approach, has its limitations but multiple approaches, methods and instruments can be used to complement one another (Rydenfelt, 2008).

5.4 Research strategy

Research strategy is the stepwise plan of action decided upon towards delivering quality research outcomes. This strategy helps the researcher stay focused on the research objectives while saving time and valuable resources. Saunders et al. (2009) identify eight basic research strategies namely: experiment, case study, survey research, action research, archival research, design research, grounded theory and ethnography.

Table 5.2 briefly describes these strategies and their applicability to this research context. Based on the pragmatic philosophy, this study investigated how SMEs in Lagos enhance SME through the use of mobile apps from dynamic capability perspective.

Table 5.2 (6): Research strategies and application within research context

Strategy	**Description/Goal**	**Applicable to research context?**
Experiment	Verification of facts in a controlled environment.	No
Case study	Studies the characteristic of a real-life instance.	Yes
Action research	Iteratively solves problems by practically involving role-players within the community of practice.	No
Design research	Develops an artefact.	No
Grounded theory	Systematically develops theory from analysed data.	No
Survey research	Social research that retrieves data from humans by asking questions.	Yes
Archival research	Finds and extracts evidence from original archival data.	No

Ethnography	Behavioural study of a group of people in their natural habitat over a prolonged period.	No

Based on the goals of the research strategies, as noted in Table 5.2, *case study* and *survey research* align with the objectives of this research.

5.4.1 Case study research

Case study provides empirical investigation into a contemporary problem in its real-life context, especially when the problem cannot be clearly separated from its context (Yin, 2005). This process acknowledges the mutual inclusiveness of a problem *and* a context, as well as the importance of investigating a problem *within* its context. Yin (2005) also noted that case study research is preferred when asking the *how?* and *why?* research questions. Although, the case study research strategy has drawbacks - including the researcher's bias, lack of rigour and difficulty with generalising data - the quality of case study research can be enriched by ensuring its validity and reliability (Gering, 2002; Wedawatta et al., 2011).

This research adopted a single case study which focused on how SMEs in Lagos use mobile apps to enhance business.

5.4.2 Survey research

Survey research presents various ways of investigating a phenomenon in its natural environment. This research approach is socially inclined as it elicits data regarding the actions and/or opinions of a selected group of people known as a *sampl*e (Alain & Kenneth, 2015; Pennsylvania State University, 2006). A sample is usually a fraction of the study population. This fraction is carefully selected and large enough to represent the population as a whole. Survey research uses the interview and questionnaire as instruments for data gathering. According to Alain and Kenneth (2015), survey research is appropriate when exploring a phenomenon by asking questions like: *what is happening?* and *how is it happening?* The drawback to survey research is the possibility of eliciting inappropriate data. This can, however, be addressed through testing survey instruments towards ensuring reliability and validity.

The provisions of *case study* and *survey research* align with the goal of this research which is to explore *how* SMEs in Lagos enhance their business through the use of mobile apps from a dynamic capability perspective. Selecting appropriate research strategies requires alignment

between the characteristics of the research approach and the research questions (Van der et al., 2005; Witschel & Hans, 2015). Case study and survey research also compliment the pragmatic philosophy, which suggests a practical approach to scientific investigation and which forms the foundation of this study. Case study allows for multiple methods of data collection which could be analysed from both the qualitative and quantitative perspective. Table 5.3 illustrates the various alignments between research question, research strategy and the characteristic of said strategy. Van der, A., Kotze, P. & Cronje, J.

Table 5.3 (7): Alignment of research question and adopted research strategies

Research question	**Research strategy**	**Characteristics of research strategy**
How could mobile apps enhance SMEs in Lagos Nigeria?	Case study research	Humanistic in nature because it permits participant and non-participant observations.
		Practical or pragmatic approach.
		Presents holistic view of research subject.
		Presents both qualitative and quantitative perspectives.
		Presents in-depth, detailed data derivable from wide data sources.
	Survey research	A social research method which retrieves data from people by asking questions.
		Often a target selected group of people delineated by clear boundaries.
		Permits qualitative and quantitative data analysis.
		Derives its objectives from a statement, a question or hypothesis.

5.4.3 Units of Analysis

In order to successfully clarify the research purpose, the unit/s of analysis within a research context must be identified. This process answers the question: *what thing/s do you want to say regarding something at the end of the study?* (Chipangura, 2016) as it considers the constructs being observed, or measured, as well as their interaction within the chosen research environment. For example, this study examines the ways in which SMEs in Lagos use mobile apps from a dynamic capability perspective. Thus, at the completion of this study, the researcher should have attained insight and knowledge regarding SMEs, mobile apps and dynamic capabilities in Lagos. In addition, the researcher is expected to demonstrate the relationships between the units of measure.

The conceptual framework, developed as an outcome of the literature review and presented in section 4.5 (Chapter 4), identifies SMEs as the unit of analysis in addition to 7 latent variables. Table 5.3 presents the variables, corresponding sources of data and the purpose of said data.

Evaluating the unit of analysis demands that the researcher sources data regarding the unit. The sources of data for this study were:

1. Literature on the dynamic capability theory and SMEs.
2. SME owners and/or SME business managers.

Table 5.4 (8): Units of measure, corresponding sources of data and purpose of data

Units of Measure	**Source of data**	**Data collection instruments**	**Purpose of data**
SMEs	SME owners and/or managers.	Interview	- Determine dependent variables like gender, age, academic qualifications and background of business owners or managers. - Determine how the SME uses mobile apps.
		Questionnaire	- Determine dependent variables like gender, age, academic qualifications and background of business owners or managers. - Determine business sector.
Mobile apps	SME owners and/or managers.	Questionnaire	- Determine types of mobile apps used by businesses.
Absorptive, adaptive and innovative capabilities	SME owners and/or managers.	Literature Interview	- Determine absorptive, adaptive and innovative capabilities construct of SME business.
		Questionnaire	- Determine how SMEs use mobile apps in terms of absorptive, adaptive and innovative capabilities.
Sensing, shaping and seizing capabilities	SME owners and/or managers.	Questionnaire	- Determine how SMEs use mobile apps in terms of sensing, shaping and seizing capabilities.

Based on the case study units of measure and sources of data, this research required *both* qualitative and quantitative data. In addition, it will require the use of *both* qualitative and quantitative research elements in a mixed method research approach.

5.5 Design Choice

The research onion model presents two main design choices, the *mono* and *mixed* method. Typically, the mono method demands the use of only one research approach to govern a research study whilst the mixed method permits the use of two, or more, methods. The mixed method research design thus combines qualitative and quantitative research doctrines in one single study. The goals of the mixed method research are complimentary in that one makes up for the deficiency of the other and vice versa (Johnson & Onwuegbuzie, 2012). This method provides an appropriate avenue for understanding the complexities and peculiarities of the role player within a certain social context (Lisle, 2011). The mixed method design approach can be either qualitatively or quantitatively driven but usually the choice resides with the method which takes the lead in the design approach (Rani, 2016).

This study combined both qualitative and quantitative research methods toward achieving its objective namely to gain an understanding as to *how* SMEs in Lagos use mobile apps to enhance business, based on the DC framework. The research objective required an exploratory and pragmatic approach as it sought to comprehend the behaviour of SMEs in their natural environment.

5.6 Time Horizon

The time horizon in a research design considers the time elements of a scientific study, thus whether the study aims to make comparisons at a single point in time or over a longer period (Saunders et al., 2009). The time horizon in scientific research could thus be considered as *cross-sectional* (a single point) or *longitudinal* (a time span). For example, a study that investigates the way in which sales in SMEs affect stocks is *cross sectional* when it examines the impact of sales on stocks at the beginning of the year. However, the impact of sales on stocks could also be *longitudinal* when examined over a period of 1 year. The former requires one dataset while the later requires at least two datasets collected over a period of time.

This research study can be considered as *cross sectional* as it sought to elicit a single set of data from SME owners in Lagos, the aim being to measure the impact of DCs on *how* SMEs maximise opportunities.

5.7 Data Collection

This study used interviews and questionnaires (in the form of a survey) as data collection instruments. The instruments used are in alignment with the mixed method research approach, as previously specified. The data collection process was actioned in two phases. In the *first phase* qualitative data were collected from SME owners and/or managers in order to understand peculiar constructs for measuring absorptive, adaptive and innovative capabilities of SMEs in Lagos. The *second phase* relied on the outcomes of the qualitative analysis, completed in phase one. Questionnaires were developed based on DC constructs identified in phase one and surveys conducted to obtain quantitative data. Data collections for first and second phases of the research occurred in September 2017 and November 2017 respectively. The schematic flow of the overall research design is presented in Figure 5.2.

5.7.1 Phase 1 – Qualitative data collection

This phase collected qualitative data from SMEs in order to satisfy sub-research question 1:

What are the DC constructs of SMEs in Lagos, grouped by adaptive, absorptive and innovative capabilities dimensions?

5.7.1.1 Sample frame

A *sample frame* describes the available source/s from which a sample is drawn. This phase of the research sourced data from SME owners and/or managers. The current number of SME owners in Lagos is unknown, however, the National Bureau of Statistics' (NBS) most recent statistics (as in 2013) state that there are 5 224 324 SMEs in Lagos (SMEDAN & NBS, 2013). This study targets the owners and/or managers of these SMEs. It must be noted that the NBS's statistics did not take into account the possibility that one individual could own more than one SME.

In order to select a sample frame for this research, the researcher had to consider the authenticity, availability and accessibility of a SME register in Lagos. The Small and Medium Enterprises Development Agency of Nigeria (SMEDAN) keeps a register of SMEs in Nigeria which is not frequently updated, given the difficulty of registering and starting SMEs in Nigeria (Eniola et al., 2015). However, there are online platforms which list businesses on directories at no extra cost to the SME. These directories increase the online visibility of the SME and acts as a valuable advertising conduit. Thus, most SMEs prefer to enrol on such a web platform. This study chose SMEs registered on businesslist.com.ng as a sample frame. Taking into account the qualitative nature of the interview, 20 SME owners were selected from the sample frame through a non-probability convenience sampling technique.

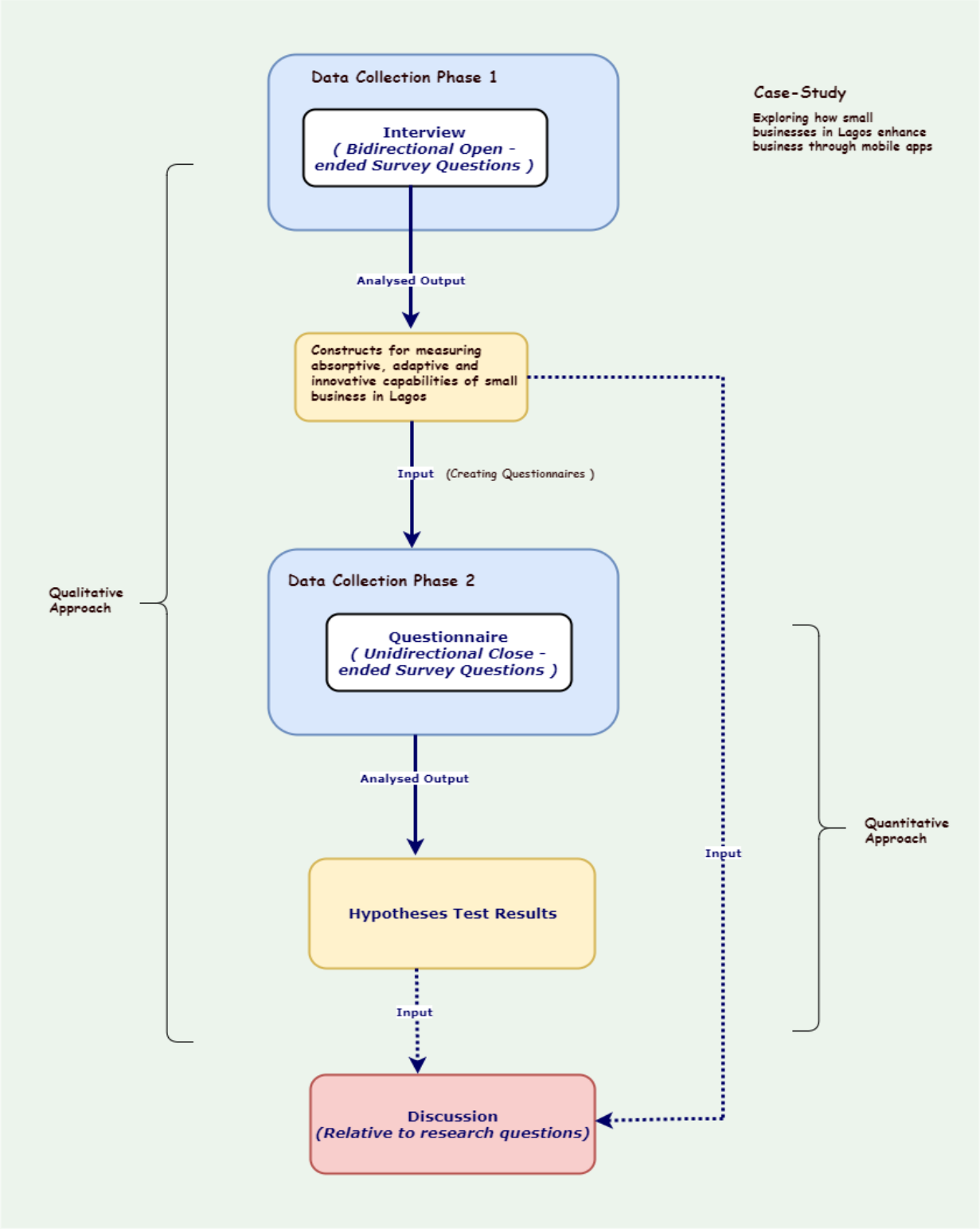


Figure 5.2 (4): High-level schematic research design

5.7.1.2 Interview instrument design

The interview questions were divided into four sections. The first section captured the background information of the SME while the remaining three sections dealt with the three

dimensions of DC namely their absorptive, adaptive and innovative capabilities. The questions were framed in easily understandable terms to maximise the interviewee's understanding thereof. In addition, the interview questions regarding DC aligned with the provisions of absorptive, adaptive and innovative capabilities, as previously discussed in the literature (see sections 4.3.1 to 4.3.3). The detailed interview outline is included Appendix 2.

Table 5.5 (9): Interview questions and corresponding research objectives

S/No	**Question**	**Objective**
1	Section 1 • What does your business do? • How many employees do you have? • How long have you been in business? • What mobile apps do you use?	Gain dependent variables that will provide a better understanding of the research context.
2	Section 2 • How do you get more business or identify business opportunities?	Elicit adaptive capability constructs of the SME.
3	Section 3 • How do you make use of new information?	Elicit absorptive capability constructs of the SME.
4	Section 4 • How do you create, or upgrade, your product/s or service/s?	Elicit innovative capability constructs of the SME.

5.7.1.3 Reliability and validity of qualitative data

The reliability and validity of the interview instrument is considered from a qualitative research perspective. According to Nahid Golafshani (2003), reliability and validity in qualitative research can be viewed as *research credibility*. Credibility is the need to ensure that the results of a research are believable.

Establishing credibility in qualitative research cuts across the entire research process as it addresses the personality of the researcher, his background biases as well as the coding and generalisations of research outcomes (Adu, 2013; Nahid Golafshani, 2003; Ford et al., 2014; Frels & Onwuegbuzie, 2013).

In ensuring the credibility of this study, the following were considered and will be discussed in the analysis of the research outcomes:

1. Background and bias of researcher.
2. Ensuring the development and administration of consistent interview protocol.
3. Evaluation of the existing theory on which the study is grounded.
4. Ensuring consistent coding and categorisation techniques during content analysis of interview data.

5.7.1.4 Interview administration

Prior to the interview session, the SME business managers and/or owners were contacted telephonically, and dates were scheduled for face-to-face interviews. To interview the managers and/or owners personally was advantageous as it afforded the researcher an opportunity to observe their body language and gauge their non-verbal communication. Additional information could be deduced from these tacit non-verbal communications. Notwithstanding the fact that face-to-face interviews are costly and time consuming, they were considered suitable for this research as they provided valuable opportunities for the researcher to interact with the interviewee/s in their natural environment.

In order to ensure consistency, the administration of the interview followed a predefined protocol. The interviewee was afforded the opportunity to read and sign the consent form (see Appendix 1) before the interview. The interviews were recorded with a voice recorder app on an android smartphone. Interview session with each respondent ranges from 5 minutes to 9 minutes. The audio file was properly tagged (saved) after each interview session and the conversation was subsequently transcribed into text.

5.7.1.5 Role of the researcher in qualitative research

Due to the subjective nature of qualitative analysis, it is important to understand the researcher's bias as it elucidates the perspectives which, in turn, inform research outcomes (Klein & Myers, 1999). The principal researcher in this study resides in Lagos and has 10 years' hands-on experience in software development, including that of mobile apps, as a programmer and business process analyst. He has interfaced with SMEs and big corporations to elicit software requirements aimed at automating business processes. He also volunteers at not-for-profit organisations that offer free training to entrepreneurs seeking to start, or expand, an SME.

The researcher's background and personal experience could impact his interpretation of qualitative data from the interview. For example, a respondent claim of "slow" mobile apps may suggest different meaning to a researcher with marketing background and a researcher with software programing background. A marketer could adjudge slowness to telecommunication network; while a programmer could think about the architecture of the mobile app.

5.7.2 Phase 2 – Quantitative data collection

The second phase of this study quantitatively validated the DC constructs revealed in phase 1. Specifically, it focused on answering three sub research questions (see section 1.4):

How do mobile apps usage influence the three dimensions of DC (i.e. adaptive, absorptive and innovative capabilities)?

To what extent do the three dimensions of DC impact on SMEs' ability to sense, shape and seize opportunities?

How do the use of mobile apps influence SMEs' ability to sense, shape and seize opportunities?

5.7.2.1 Sampling Strategy

The sampling strategy followed the same approach employed in the qualitative phase (i.e. target population, sample frame and nonprobability convenience sampling technique). The only difference was in the selection of the sample size. As questionnaires elicit quantitative data and quantitative statistical methods are used to test the hypothesis, it is important to ensure that the sample size is within acceptable statistical range. Based on Krejcie and Morgan (1970), 1 136 samples must be evaluated in a population of 5 224 324, if a 95.0% confidence level and 2.5% error margin are desired. Figure 5.3 explains the sampling strategy for the quantitative aspect of the study.

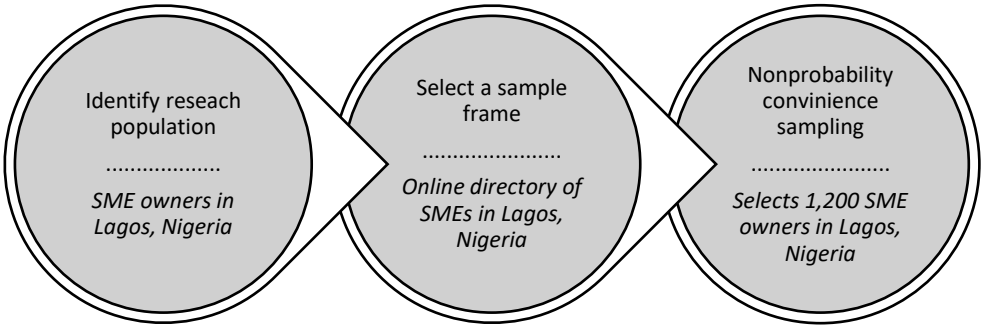


Figure 5.3 (5): Quantitative sampling strategy

5.7.2.2 Questionnaire instrument design

The survey questionnaire was divided into four sections that captured:

1. Background information.
2. Mobile apps usage by SME.
3. Dimensions of DC.
4. Micro foundations of DC.

The design of the questionnaires was in line with the seven latent variables, as revealed by the conceptual framework (see section 4.5). Table 5.6 depicts the layout of the questionnaires and how each section of the questionnaire maps to the latent variables.

Table 5.6 (10): Questionnaire and latent variable mapping

Questionnaire Section	**Latent variables (from conceptual framework)**
Background information	Not applicable
Mobile app usage	(1) Mobile app usage
Dimensions of DC	(2) Absorptive capability (3) Adaptive capability (4) Innovative Capability
Micro foundations of DC	(5) Opportunity sensing capability (6) Opportunity shaping capability (7) Opportunity seizing capability

The detailed questionnaire is available in Appendix 4.

Section 1: Background information

This section of the survey aimed to elicit demographic variables that would help in the understanding of the context of the research. For example, the way in which *older* business owners use mobile apps may differ from the way in which *younger* business owners engage with the apps. There may also be differences that can be ascribed to gender, business sector and educational qualifications which are considered important demographic details.

Table 5.7 (11): Questionnaire background information

Question	***Response Type***	***Objective***
What is your gender?	Direct response type. However, some responses are grouped together to simplify analysis.	To identify dependent demographic variables that will enrich the broad analysis of the data within the research context.
How old are you?		
What is your highest educational qualification?		
How old is the SME you are managing?		
To which sector does this business belong?		
In which part of Lagos is the business located?		
Are you the owner of the SME?		
How many people are currently employed in the SME?		
What type of employees do you have?		

Section 2: Mobile app usage

As SME owners and/or managers, respondents were presented with 15 tasks that SMEs could accomplish with mobile apps based on interactions with SMEs (Owoseni & Twinomurinzi, 2016). Respondent were allowed to select the applicable response from a 5 point Likert scale where responses vary from *always* to *never*.

Table 5.8 (12): Questionnaire design – mobile app usage

Scenario	***Response Type***	***Objective***
We use mobile apps to provide feedback to customers.	5 point Likert scale response. From “always” to “never”.	To retrieve data for Mobile app usage latent variable as identified in the conceptual model
We use mobile apps to get referrals.		
We use mobile apps to chat or text.		
We use mobile apps to store contacts, documents or recorded conversations.		
We use mobile apps for virtual meetings.		
We use mobile apps for advertising and marketing.		

We use mobile apps to organise and plan our schedules (reminders).		
We use mobile apps to search the internet and obtain desired information.		
We use mobile apps for analysing information.		
We use mobile apps for accounting and bookkeeping		
We use mobile apps to sell our products and services.		
We use mobile apps for payments and collections.		
We use mobile apps for learning.		
We use mobile apps for managing job orders.		
We use mobile apps to create online content like blogs/news/articles.		

Section 3: Dimensions of DC

Based on the outcomes of the qualitative analysis (phase 1), which revealed the constructs for measuring the three dimensions of DC (absorptive, adaptive and innovative capabilities), this section of the questionnaire sought to retrieve feedback from SMEs regarding the relevance of said constructs to business practices. The respondents were queried as to the importance of the constructs to their business and their responses were recorded in terms of a 5 point Likert scale, varying from *very important* to *not important*.

The same set of questions were modified to elicit respondents' perceptions as to *how* mobile apps have been helpful in enabling these dimensions of DC.

Table 5.9 (13): Questionnaire design – dimensions of DC

Scenario	**Response Type**	**Objective**
Adaptive Capabilities		
Feedback and referrals	5 point Likert scale response, ranging from "very important" to "not important" with provision for "not applicable" as well.	To retrieve data for adaptive capability variable, as identified in the conceptual model.
Social media and internet		
Customer interactions		
Needs and problem analysis		
Advertisement and networking		
Absorptive Capabilities		
Teamwork and collaboration	5 point Likert scale response, ranging from "very important" to "not important" with provision for "not applicable" as well.	To retrieve data for absorptive capability variable, as identified in the conceptual model.
Changing our packaging and prices		
Intelligent marketing of our products and services		
Analysing information		
Research and training		
Improving quality and speed		
Innovative Capabilities		

Adjusting the price and packaging of our product and services	5 point Likert scale response, ranging from "very important" to "not important" with provision for "not applicable" as well.	To retrieve data for innovative capability variable, as identified in the conceptual model.
Managing sales and procurement		
Developing new skills and talents		
Copying other businesses		
Improving quality		

Section 4: Micro foundations of DC

The goal of this section was to retrieve valid responses for those variables which represent the micro foundations of DC: i.e. sensing, shaping and seizing opportunities. Matching scenarios were created with these capabilities in mind. However, due to the high prevalence of respondent misunderstanding regarding the nature of the concepts, the questions were worded in easily understandable terms without the essence of the concept being lost. For example, *opportunity sensing* became "notice opportunity", *opportunity shaping* became "consider opportunity" and *opportunity seizing* became "take hold of opportunity".

Respondents were presented with a 5 point Likert scale according to which responses could vary between "always" and "never".

Table 5.10 (14): Questionnaire design – micro foundations of DC

Scenario	**Response Type**	**Objective**
Opportunities sensing capabilities: how do you notice opportunities?		
We foresee opportunities	5 point Likert scale responses, varying from "always" to "never"	To retrieve data for opportunity sensing capability, as identified in the conceptual model.
We identify opportunities		
We are conscious of opportunities		
We create opportunities		
We discover hidden opportunities		
Opportunities shaping capabilities: How do you consider opportunities or prevent loss?		
We separate profitable business opportunities from unprofitable ones	5 point Likert scale responses, varying from "always" to "never"	To retrieve data for opportunity shaping capability, as identified in the conceptual model.
We understand opportunities better in time		
We identify risks associated with opportunities		
We analyse opportunities		
We analyse threats		
Opportunities seizing capabilities: How do you take hold of opportunities or prevent loss?		
We speedily implement our ideas in order to seize opportunities	5 point Likert scale responses, varying from "always" to "never"	To retrieve data for opportunity seizing capability, as identified in the conceptual model.
We reduce some risks when we seize opportunities		

We block loop holes in business when we seize opportunities		
We always make good use of opportunities		
We prevent threats when we seize opportunities		

The same set of questions focussing on the micro foundations of DC were reconstructed to retrieve respondents' perceptions regarding the way in which mobile apps have been helpful in enabling opportunity sensing, shaping and seizing capabilities.

This research considers 5 Likert scale because of the peculiarity of the respondents. They are somewhat impatient and non-responsive. 7 Likert scale will arguable confuse respondent

5.7.2.3 Questionnaire: reliability and validity

The concepts of reliability and validity, resorting under the questionnaire as a data collection instrument, are considered from a quantitative research approach. *Validity* is the degree to which an instrument measures its intentions, whereas *reliability* is the extent to which measurement gives repeatable and consistent results within a given period of time (Sobh & Perry, 2006). In an effort to heighten the validity and reliability to the study, the researcher must ensure that every question contained in the data collection instruments is intended, peer reviewed and has a justifiable purpose.

The survey was tested for validity and suitability for intended purposes by eliciting responses from 50 target respondents. This *test* dataset's reliability was confirmed through Cronbach's alpha - a reliability measure designed by Lee Cronbach (1951). The test analysis thus confirms the suitability of the data collection instrument before the researcher embarks on full scale data collection.

5.7.2.4 Questionnaire administration

Experiences gained during the test survey revealed two factors that informed the manner in which the questionnaires were eventually administered:

1. The rate of response to the online survey was very slow. In some cases the respondents started answering the questions, but they lost interest along the way. Most of the survey responses were thus not useful because the survey had not been completed.

2. Respondents did not seem to understand some of the questions and they selected answers, at random, without really grasping the questions. This was discovered because the edit functionality of the online survey was activated and the responses of selected respondents were reviewed.

Based on the preceding, it was decided to administer the survey personally (face-to-face). In order to increase the response rate, 12 data collection field officers were hired, trained and kitted out with customised t-shirts and nametags. The survey was created on google forms and responses were inputted directly through smart handheld devices while the interview was in process. Field officers commenced with seeking the consent of the respondent and thereafter they assisted the respondent with the completion of the survey. The data collection exercise took four weeks and feedback was attained from 1 162 SMEs. Three respondents voluntarily opted out of the research and this reduced the sample size to 1 159.

It is important to note that the survey administration approach adopted in this research reflects the pragmatic nature of this study and thus called for practical interactions with respondents. Although online surveys are generally considered acceptable ways of collecting data they do, however, exhibit some limitations which make their use in certain situations unsuitable. For example, online surveys are limited to respondents who have internet access and apparent ICT skills. The reliability of data, collected via online surveys, may also be distorted as the questions may as the questions may be interpreted differently by different respondents.

Appendix 5 presents a cross section of field officers as well as some of their interactions with respondents in the field during the data collection process.

5.8 Ethical Consideration

In order to uphold moral principles and avoid legal consequences, the Unisa ethics committee reviewed and approved the data collection instruments (questionnaire and survey). The ethics certificate for this study can be viewed in Appendix 6.

5.9 Conclusion

This chapter presented the research design which was guided by Saunders' research onion model and which aligns with pragmatism as underling philosophy. The chapter further justified the choice of an inductive and deductive research approach as well as the use of the case study and survey as research strategies along with a mixture of qualitative and quantitative research approaches. The use of the longitudinal time horizon and the collection of data, through interviews and semi-structured survey instruments, were also explained. Data collection took place in two phases with the qualitative analysis of the data collected in phase one serving as input to phase two. The objectives of the questions, or scenarios, as contained in the data collection instruments, were shown to clearly align with the research objectives and research questions.

The next chapters will focus on the *analysis* of the data, collected via the interviews and survey instruments, as set out in this chapter.

CHAPTER 6

Qualitative analysis and discussions

The preceding chapter discussed the approaches and methods employed toward meeting the research objectives. In line with the mixed research methodology, the research activities were grouped into qualitative and quantitative phases. In the first phase the *interview* instrument was used to collect qualitative data while in the second phase the *survey* instrument was employed to collect quantitative data. The data collection instruments were designed to capture required data pivotal to the research objectives. This chapter describes the analysis of the data which were collected in the qualitative phase of the study. The data were analysed with Atlas.ti™, a qualitative analysis software. The outcome of the data analysis, and its implications for the study, will also be discussed.

6.1 Content analysis strategy

Content analysis uses coding techniques to summarise qualitative data without their significance being lost, or misplaced. Typically, qualitative analysis follows the four sequential stages of coding, categorisation, theming and theorising (Saldana, 2009). However, since the purpose of the qualitative phase of this research is to identify DC constructs, the first two stages (coding and categorisation) are applicable. This limits the content analysis to only two cycles – the *first* being coding and the *second* being categorisation.

For this study, the content analysis followed the following steps:

1. Identify and acknowledge the background and potential bias of the researcher.
2. Transcribe the recorded interview/s into text.
3. Adopt a suitable coding method.
4. Create anchor codes that make it easier to sort identified codes.
5. Complete the first cycle coding by identifying the relevant codes in line with the coding method.
6. Sort the main codes using the anchor codes.

7. Complete the second cycle coding by categorising the sorted codes.
8. Document the outcome of the second cycle coding as this represent the DC constructs.

6.2 Coding

Coding is the process of assigning labels to words, phrases or sentences. Coding captures the essence of the unstructured data which helps in the understanding of a phenomenon and the developing of constructs (Adu, 2013). There are many different coding methods (i.e. attribute coding, magnitude coding, structural coding, initial coding, in-vivo coding, emotion coding, dramaturgical coding, etc). However, this study adopted *process coding* as the purpose of coding in this research is to identify constructs.

Process coding techniques identify action statements, especially words that end in *-ing* as they usually illustrate actions in data. Process coding is useful when searching for ongoing *actions* or *interactions* taken in response to situations or problems (Saldana, 2009; Ford et al., 2014). The process coding technique was considered suitable in this case because it aligns with the interpretive nature of this study which sought to reveal the DC constructs of SMEs in Lagos. It specifically considers what SMEs are do "-ing" in order to develop DC.

After transcribing the recorded interview into text, anchor codes ADC, ABC and INC were created. These anchors respectively represent: adaptive capability, absorptive capability and innovative capability. The anchors helped with the grouping of codes which were subsequently identified. With the anchor codes acting as *prefixes* to the real codes, the researcher could read the transcribed text while assigning process codes to the relevant action statements. The process codes and corresponding frequencies were extracted and analysed.

In the second cycle of coding (or categorisation), the identified codes, along with the anchor codes, were examined and grouped together based on a common underlying meaning and relationships between the codes.

The semi-processed interview feedback that produced the DC constructs of SMEs in Lagos are presented in appendix 7.

6.3 Discussion of findings

6.3.1 Demographics

The SMEs in this study cut across 15 business sectors with 2 to 24 employees in each SME (see Table 6.1). Twelve SME owners noted that the number of employees fluctuated because they hire part-time staff when there are new projects. These SMEs have existed for periods ranging from 2 to 21 years. The mean age and employee count of SMEs in this study is 7.05 years and 7.75 employees, respectively.

Table 6.1 (15): Demographics of sample population (from qualitative fieldwork)

SMEs	**Business Type**	**Sector**	**No of Employees**	**Business Age (Yrs.)**
1	Real Estate Development	Housing	24	10
2	Crèche and Primary School	Education	18	10
3	Renewable Energy Consulting	Energy	12	10
4	Crop farming	Agriculture	12	2
5	Block production and cement sales	Manufacturing	11	8
6	Logistics and travels	Transport	8	8
7	Show-Biz	Entertainment	8	5
8	Nylon manufacturing	Manufacturing	7	2
9	Cleaning Services	General Services	7	8
10	Town Planning Consulting	Consulting	7	10
11	Credit Services	Financial Services	6	5
12	Catering Services	Food and Confectioneries	5	3
13	Renewable energy installation	Energy	5	10
14	Events management	Entertainment	5	21
15	IT services / e-Products development	Information Technology	4	3
16	Health management	Health and Wellness	4	4
17	Digital Marketing	Information Technology	3	7
18	Fashion	Fashion	2	2
19	Cakes making	Food and Confectioneries	2	4
20	Sales of Groceries	Retail Consumables	5	9

6.3.2 Conceptual mobile apps used by SMEs in Lagos

Twenty SMEs in this study use 27 different mobile apps; the frequency of usage of 27 mobile apps across 20 SMEs is 104. It suggests that each SME use average of 5 mobile apps. Categorizing the mobile apps used, results (see Table 6.2) showed that 40.5% use social media apps, 31.5% use productivity apps and 14.4% use mobile banking apps. 10.7% use travel/transport apps while the remaining 2.9 % use customized apps that is uniquely

developed for SMEs. The top 3 mobile apps used by SMEs are WhatsApp, MobileBankingApp (Same functionality but branded differently across Nigerian banks) and Gmail.

Table 6.2 (16): Mobile apps used by SMEs in Lagos (from qualitative fieldwork)

Mobile App	**Frequency**	**Percent**
Social Media Apps		
WhatsApp	15	14.4
Facebook	9	8.7
Instagram	6	5.8
Twitter	3	2.9
Skype	3	2.9
LinkedIn	2	1.9
YouTube	2	1.9
GoogleTalk	1	1.0
Snapchat	1	1.0
Sub-Total	***42***	***40.5***
Travel/Transport Apps		
Taxify	3	2.9
GoogleMap	2	1.9
Uber	2	1.9
Expedia	1	1.0
BookingApp	1	1.0
TripAdvisor	1	1.0
GoogleTrips	1	1.0
Sub-Total	**11**	**10.7**
Productivity Apps		
Gmail	13	12.5
GoogleDrive	6	5.8
GoogleContact	4	3.8
DropBox	3	2.9
Eventbrite	2	1.9
OneNote	1	1.0
YahooMail	1	1.0
Pixmix	1	1.0
GoogleCalendar	1	1.0
Soundcloud	1	1.0
Sub-Total	**33**	**31.5**
Tailor-made mobile apps		
CustomApp	3	2.9
Electronic Banking/Accounting apps		
MobileBanking	15	14.4
Grand-Total	**104**	**100.0**

Figure 6.1 (6): Scatter plots of mobile apps used by SMEs in Lagos, Nigeria (Source: Fieldwork 2018)

6.3.3 First cycle coding

A total of 48 unique codes were identified in the first cycle process coding. However, grouping the codes in accordance to their anchors and frequencies revealed 89 adaptive capabilities, 55 absorptive capabilities and 52 innovative capabilities.

Table 6.3 (17): Distribution of codes in first cycle coding (from fieldwork)

Anchor Code	**Type of DC**	**Unique Codes**	**Code Frequency**
ADC	Adaptive Capability	19	89
ABC	Absorptive Capability	17	56
INC	Innovative Capabilities	12	52
	Total	**48**	**197**

This outcome suggests that SME in Lagos demonstrate more adaptive than absorptive and innovative capabilities. The finding implies that SMEs in Lagos are primarily information seekers who are flexible in their business approach. This is a reflection of the uncertainty of their business environment and their survival strategies.

6.3.4 Second cycle coding (Categorisation)

6.3.4.1 Adaptive capability constructs

The adaptive capability illustrates *how* SMEs identify and develop new emerging market opportunities, all the while balancing *exploration* and *exploitation* strategies (Wang & Ahmed, 2007). A total of 19 unique codes were identified and their frequency suggests that SMEs in Lagos acquire new business through referrals. The identified codes were categorised based on underlying relationships and this resulted in 5 categories. The categorisation further revealed that SMEs in Lagos break new boundaries through *feedback and referrals*, closely followed by *social media and internet* use. Table 6.4 presents a summary of adaptive capability findings.

Table 6.4 (18): Adaptive capability of SMEs in Lagos (from fieldwork)

How do SMEs get more business or identify business opportunities?		
Adaptive Capability Categories	**Adaptive Capability Codes**	**Frequency**
ADC – Through Feedback and referrals (24)	ADC - Through feedback	11
	ADC - Through referrals	13
ADC – Through Social Media and Internet (21)	ADC - Through social media engagement	11
	ADC - Social media advertisements	3
	ADC - Through Internet based technologies	7
ADC – Through Customer Interactions (18)	ADC - Through freebies	2
	ADC - Through customer education	6
	ADC - Through market segmentation	1
	ADC - Word of mouth marketing	8
	ADC- Through branded souvenirs	1
ADC – Through Needs or Problems Analysis (16)	ADC - By spying on the competitors	2
	ADC - Looking out for new ideas in developed countries	4
	ADC- Through review of government policies	3
	ADC – Identifying problems	1
	ADC - Looking for needs	6
ADC – Through Networking and Advertisement (10)	ADC - Through print media advertisements	2
	ADC - Through family and friends	1
	ADC - Feedback from affiliates/parent organisations	1
	ADC - By networking with other professionals and customers	6
	Totals	89

Extracts from the interviews suggest that SMEs cultivate relationships with their customers, and in so doing they connect emotionally with the needs of their customers. See sample quotes below:

"We have a feel and a feed from customers"
(Male, Catering Services)

"The first thing is we try to create relationship and identify the opportunities"
(Male, Crop Farming)

"I try to engage people when I meet them; I do a lot of word of mouth"
(Female, Cakes and Bakes)

"We identify a problem and provide free service or solution; that draws them and we now monetize it based on feedback and referrals"
(Male, IT Services)

"We also use social media to acquire customers and then go one-on-one to create a relationship"
(Female, Tailoring/Fashion)

"Most of our new customers come through referrals; we also have a number of customers that come via social media"
(Male, Cleaning Services)

The relationship and feedback subsequently generate referrals which evolve into new businesses. This finding suggests that the SMEs' adaptive capability focuses on creating intimate and close relationships with customers which increase opportunities.

6.3.4.2 Absorptive Capabilities

SMEs' ability to identify new external information and then apply it towards business gains demonstrate absorptive capability. The analysed data presents 17 unique absorptive capability codes, grouped into 7 categories. The code frequency shows that SMEs in Lagos *evaluate* new external information and use this extracted knowledge to *develop offerings intelligently*. This process is achieved through *collaboration* and *re-packaging and/or re-pricing of offerings*, as shown by the following interview excerpts:

"In our kind of business; the entry and exit are high because we are into services; the economy also compels potential customers to look for cheaper services. So, when we have new information, we review it and sometime resize the service in order to catch customers' attention per time."
(Male, Blocks Production)

"We digest this information along the goal of the business. For example, because government is banning rice importation we now grow rice."
(Male, Crop Farming)

"We put every information into black and white; evaluate it and identify in detail all that is required to develop business from it."
(Female, Town Planning Consulting)

"The information makes us more efficient and positively affects the quality of output; it also triggers partnerships; pricing and packaging optimisation."
(**Male, Nylon Manufacturing)**

"Whenever we have new information; first we try to analyse it to see how it fits into our offerings; and when we notice an opportunity and we don't have hands-on on the technology, we go for training or we collaborate with partners and we see how we can apply the knowledge to get the business."
(Male, Renewable Energy)

Table 6.5 (19): Absorptive capability of SMEs in Lagos (from fieldwork)

How do SMEs make use of new external information?		
Absorptive Capability Categories	**Absorptive Capability Codes**	**Frequency**
ABC - Induces collaboration (14)	ABC - Runs idea by customers	6
	ABC - Initiates partnerships	4
	ABC - Creates Internet based products/services	2
	ABC - Shares idea with experts	2
ABC - Triggers packaging or pricing of offerings (11)	ABC - Adjusts packaging	5
	ABC - Adjusts pricing	6
ABC - Generates intelligent leads (9)	ABC - Intelligently develops products	7
	ABC- Stock or unstock inventories	1
	ABC - Mass Advertisement	1
ABC - Induces information analysis (8)	ABC - Identifies opportunity in new information	1
	ABC - Analyses new information	7
ABC - Induces research and training (6)	ABC - Learns new or upscale skills	3
	ABC - New Research	3
ABC – Induces quality and quicker delivery of offerings (5)	ABC - Ensures Faster Delivery	1
	ABC - Increases Quality	4
ABC - Adapt Offerings (4)	ABC - Adapts existing product from competitors	1
	ABC - Adapts existing product in developed countries	3
	Totals	**56**

SMEs tend to develop offerings for a ready market in an intelligent way. In gathering intelligence, the study indicates that SMEs collaborate with relevant parties that could

contribute objectively. These parties may include customers, suppliers, colleagues, local and foreign partners.

6.3.4.3 Innovative Capabilities

Innovation is about being creative. This study found that SMEs in Lagos demonstrate innovative capabilities by imitating and adapting offerings (goods and /or services). In addition, the SMEs adjust the packaging and pricing of offerings in an attempt to remain competitive. According to Shenkar (2010), imitation is a precursor to innovation and, as such, a primary source of innovative idea generation. Successful imitation is difficult as it requires intelligence and imagination. Imitation can be very important to business growth as applied imitation is not merely mindless repetition, it is an intelligent search for cause and effect within a given context (Shenkar, 2010). A few quotes from the interviews explain how SMEs in Lagos imitate and adapt:

"Well, with the global world we are in now, it is easy to see what happens around the world, so what we do is to adapt new ideas to our environment; at times it might just be the need in one or two children that will make us create something specially for them."
(Female, Crèche Services)

"So, when I see what others are doing which is new to me I try to adapt and replicate it until I can perfect it."
(Female, Fashion)

"We keep tabs on business that are ahead of us and try to imitate them; all-be-it rendering the services at a cheaper rate with considerable quality."
(Male, Travels and Logistics)

"There are new concepts overseas that won't get to Africa in 5 years. So, we imitate concepts and adapt it to our environment; and the output usually turns out better."
(Male, Events Management)

"We use internet and social media a lot to learn new stuff I can imitate and adapt."
(Male, Real Estate)

Existing concepts can be innovative when they are applied in a new context. For example, in major cities of the world cab owners rely on the *Uber* platform to provide transportation services. In Lagos, Nigeria, *Gommyway* uses the same concept to connect travellers with drivers who have spare seats to share, at a fee. *Gommyway* imitates *Uber* and thus creates a new and innovative concept which has been adapted to the Nigerian context.

Table 6.6 (20): Innovative capability of SMEs in Lagos (from fieldwork)

	How do you create or upgrade your products or services?	
Innovative Capability Categories	**Innovative Capability Codes**	**Frequency**
INC - Imitate and adapt offerings (31)	INC - By imitating competitors	6
	INC - Copy and adapt products	11
	INC - Customise to specific need	9
	INC - Develop specialisation	5
INC - Adjust packaging and pricing (14)	INC - Adjust packaging	4
	INC - Adjust pricing	4
	INC - Create demos	1
	INC - Create product bouquet	2
	INC - Improve quality	3
INC - Adjust procurement and sales strategy (7)	INC - By creating more brand visibility	1
	INC - Create varieties by changing suppliers	1
	INC - Cross sell new product to customers	5
	Total	**52**

This research outcome explains why SMEs in Lagos survive in a dynamic economic environment. These SMEs survive by maintaining close relationships with their customers and by imitating and adapting offerings to suit the customer. SMEs adapt offerings by adjusting packaging and pricing.

6.4 DC constructs for SMEs in Lagos

The first objective of this study, which sought to identify the DC constructs of SMEs in Lagos, is illustrated in Figure 6.2.

Based on the findings, the study reveals that SMEs mainly use social media and internet apps for their adaptive capability. This finding is significant because it provides insight into *how* SMEs in developing economies take advantage of mobile apps. The context of developing economy in Lagos is similar to that of many other developing countries' contexts. This new understanding can be used to create better-suited mobile apps for SMEs that share similar economic environments. It could also help government/s to develop appropriate policies that will enhance SMEs.

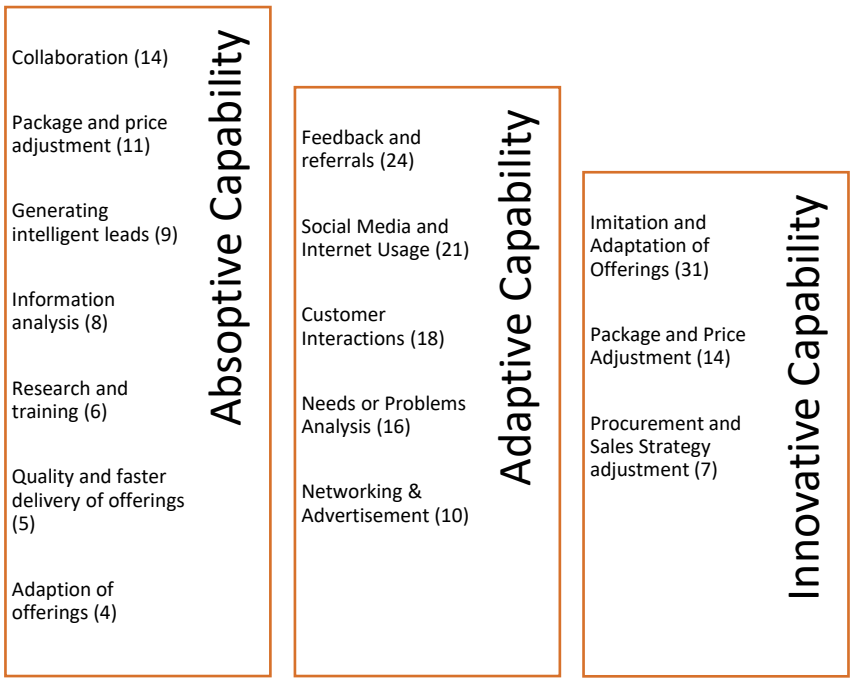


Figure 6.2 (7): Absorptive, adaptive and innovative capability constructs of SME in Lagos

The illustration in figure 6.2 partly answers research questions RQ1, RQ2 and RQ3 as it reveals the way in which SMEs manifest DC:

RQ1: ***How do SMEs in Lagos manifest the absorptive capability****, and to what extent are mobile apps used as part of the capability?*

RQ2: ***How do SMEs in Lagos manifest the adaptive capability****, and to what extent are mobile apps used as part of the capability?*

RQ3: ***How do SMEs in Lagos manifest the innovative capability****, and to what extent are mobile apps used as part of the capability?*

6.5 Summary

Absorptive capabilities emphasise the ability to combine new *external* knowledge with existing *internal* knowledge towards the discovery of new information that could be explored for business gains. SMEs with rich absorptive capabilities work smarter by avoiding those mistakes made by competitors based on new acquired information. SMEs in Lagos manifest absorptive capabilities through collaboration, package and price adjustment, intelligent business leads, information analysis, research and training.

Adaptive capabilities show SMEs' capacity to identify and quickly harness external opportunities by changing their practices in response to environmental changes. SMEs in Lagos manifest adaptive capabilities through feedback and referrals, social media and internet usage, customer interactions, needs and problems analysis, networking and advertisement.

SMEs' innovative capability is demonstrated by the creative way in which they break through new business frontiers to create new products, services, markets or business models. SMEs in Lagos manifest innovative capabilities through the imitation and adaptation of offerings as well as adjustments to the packaging and prices of offerings.

6.6 Conclusion

The objective of this research study was to investigate the dynamic capabilities of SMEs and the extent to which these SMEs use mobile apps to enhance their DC. The research approached the objectives by developing a conceptual model and thereafter identifying DC constructs within the Nigerian SME context.

Despite the dynamic economic situation in Lagos as discussed in chapter 3, SMEs typically survive by using their adaptive capabilities which hinges on customer feedback, referrals, collaboration, social media, internet, re-packaging and re-pricing of offerings. Importantly, they also innovate through the imitation and adaptation of offerings. This suggests that SMEs, in other cities throughout the world whose economies are developing, could survive through developing DC like the SMEs in Lagos. Considering the importance of SMEs to national economies, policy makers should look at effecting policies that will aid SMEs in their drive for survival and growth. These policies could: promote international collaboration, aid in the creation of new contextually appropriate apps and encourage the exchange of ideas and resources internationally. SMEs can also leverage on internet, social media and related technologies.

This study contributed to DC theory as it illustrated that SMEs in Lagos demonstrate more *adaptive* than *absorptive* and *innovative* capabilities. The research outcome implies that SMEs in Lagos primarily approach uncertain situations by seeking information. More importantly, the research outcome suggests that mobile apps, as ICT, could be used to enhance the DC of

SMEs. For example, contextual mobile apps could be developed towards customer feedback and referral management in SMEs.

The next chapter will present the formation of an empirical relationship between mobile app usage and the dynamic capabilities of SMEs through quantitative analysis.

CHAPTER 7

Quantitative analysis and discussions

Chapter 6 dealt with the qualitative aspect of the study. Fifteen constructs which represent the dynamic capabilities (DC) of SMEs in Lagos emerged through the use of qualitative research methods. A closer look at these constructs suggests that SME managers could use mobile apps to enhance their DC and, in so doing, improve the overall competences of SMEs in Lagos.

In this chapter the DCs are examined from a quantitative point of view. Firstly, the demographics of the 1 159 SME sample size which engaged in the quantitative study are presented followed by the descriptive statistics of mobile app usage, as DC enablers. In the concluding sections of the chapter, Confirmatory Factor Analysis (CFA) and the covariance-based Structural Equation Model (SEM) techniques are employed to explore the suitability of a): Conceptual framework for investigating SMEs.

7.1. Demographics

Valid responses from the managers of a total of 1 159 SMEs included 53.4% females and 46.6% males. Considering the educational background of respondents, 42%, 16.2% and 28.5% attained a secondary school certificate, diploma and bachelor's degrees, as highest qualifications, respectively. In terms of age, 46.7% of the respondents were younger than 30 years old and 35.7% were aged 30 to 39 years.

Focusing on the business, 88.5% of the SMEs in the sample had less than 11 employees, 9.9% employed between 11 and 20 people and 1.6% had more than 20 employees. In terms of the *business age* which answered the question *How long has the SME been in operation?* 60.3% of the SMEs indicated less than 6 years, 23.2% indicated between 11 and 15 years while 16.5% indicated 15 years and more. A total of 68.6% of the respondents indicated that they own the SME while the remaining 31.4% indicated that they were not the owner/s of the business. Hinged on the foregoing, the demographics depict a heterogeneous dataset.

Table 7.1 illustrates the demographic distribution of the sample size in accordance with the characteristics described previously.

Table 7.1 (20): Demographics of sample population (from quantitative fieldwork)

Characteristics	Options	Frequency	Percentage (%)
Gender of respondent	Male	619	53.4
	Female	540	46.6
Education of respondent	No formal education	43	3.7
	Secondary School Certificate	487	42.0
	Diploma	188	16.2
	Bachelor's degree	330	28.5
	Master's Degree	105	9.1
	Doctoral Degree	6	0.5
Age of respondent	20 years and less	130	11.2
	21 - 29 years	412	35.5
	30 - 39 years	414	35.7
	40 - 49 years	150	12.9
	50 - 59 years	45	3.9
	60 years and above	8	8 .7
Age of SME	5 years and less	698	60.3
	6 - 10 years	269	23.2
	11 - 15 years	107	9.2
	16 - 20 years	53	4.6
	21 - 25 years	16	1.4
	More than 25 years	14	1.2
Size of SME (in terms of number of employees)	1 - 10 employees	1026	88.5
	11 - 20 employees	115	9.9
	21 - 50 employees	18	1.6
Respondent's ownership of business	No, I am not the owner	364	31.4
	Yes, I am the owner or co-owner	795	68.6

7.2. Mobile app usage, dynamic capability and opportunity maximisation of SMEs

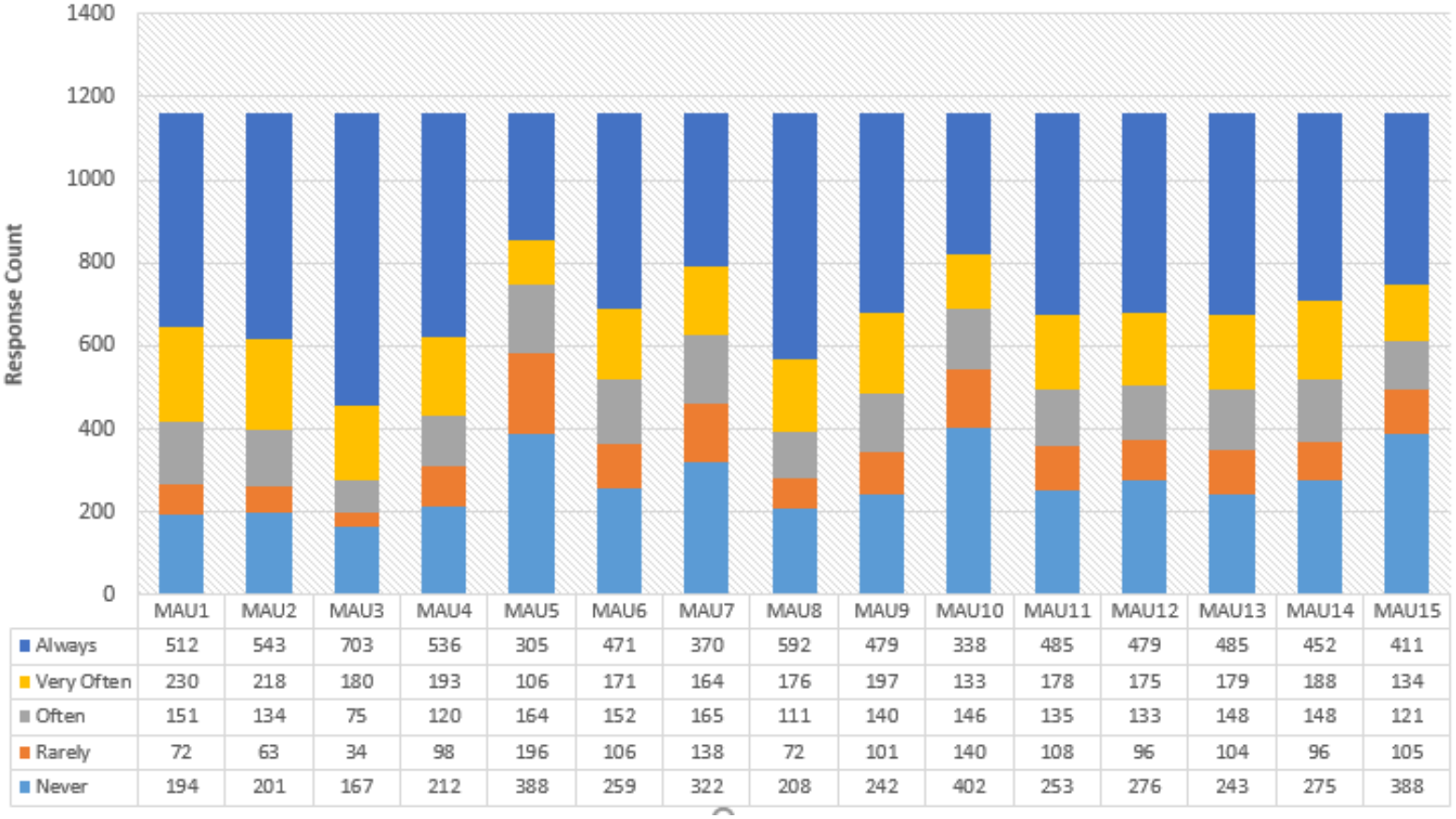
Mobile app usage, dynamic capabilities and opportunity maximisation variables are important components of the): Conceptual framework for investigating SMEs. This section considers descriptive statistics of quantitative data, captured to inform these variables. The goal is to appraise the quantitative feedback, garnered from 1 159 SMEs, in light of qualitative methods which revealed 15 DC constructs of SMEs in Lagos.

7.2.1 Mobile app usage by SMEs

Results yielded by the descriptive statistics affirmed that SMEs use apps to drive their businesses. SMEs in Lagos' substantial use of mobile apps is depicted in Table 7.2 with the mean percentage peaking at 81% and dipping at 55%. Figure 7.1 shows the frequency distribution of respondents feedback to mobile app usage.

Table 7.2 (21): Descriptive analysis of mobile app usage by SMEs (from fieldwork)

S/No	Mobile app usage	Variable	N	Mean	Mean %	SD	Kurtosis	Skewness	Never (1)	Rarely (2)	Often (3)	Very Often(4)	Always (5)
1.	We use mobile apps to provide feedback to customers.	MAU1	1159	3.69	73.80	1.49	-1.0	-0.77	194	72	151	230	512
2.	We use mobile apps to get referrals.	MAU2	1159	3.72	74.40	1.51	-1.0	-0.83	201	63	134	218	543
3.	We use mobile apps to chat or text.	MAU3	1159	4.05	81.00	1.44	0.1	-1.3	167	34	75	180	703
4.	We use mobile apps to store contacts, documents and/or recorded conversations.	MAU4	1159	3.64	72.80	1.56	-1.0	-0.69	212	98	120	193	536
5.	We use mobile apps for virtual meetings.	MAU5	1159	2.78	55.60	1.61	-2.0	0.26	388	196	164	106	305
6.	We use mobile apps for advertising and marketing.	MAU6	1159	3.42	68.40	1.61	-1.0	-0.44	259	106	152	171	471
7.	We use mobile apps to organise and plan our schedules (reminders).	MAU7	1159	3.11	62.20	1.62	-2.0	-0.11	322	138	165	164	370
8.	We use mobile apps to search the internet for desired information.	MAU8	1159	3.75	75.00	1.55	-1.0	-0.84	208	72	111	176	592
9.	We use mobile apps for analysing information.	MAU9	1159	3.49	69.80	1.58	-1.0	-0.53	242	101	140	197	479
10.	We use mobile apps for accounting and bookkeeping.	MAU10	1159	2.88	57.60	1.67	-2.0	0.11	402	140	146	133	338
11.	We use mobile app to sell our products and services.	MAU11	1159	3.46	69.20	1.61	-1.0	-0.48	253	108	135	178	485
12.	We use mobile apps for payments and collections.	MAU12	1159	3.42	68.40	1.63	-1.0	-0.45	276	96	133	175	479
13.	We use mobile apps for learning.	MAU13	1159	3.48	69.60	1.59	-1.0	-0.51	243	104	148	179	485
14.	We use mobile apps for managing job orders.	MAU14	1159	3.38	67.60	1.62	-1.0	-0.42	275	96	148	188	452
15.	We use mobile apps to create online content like blogs/news/articles.	MAU15	1159	3.06	61.20	1.72	-2.0	-0.08	388	105	121	134	411



	MAU1	MAU2	MAU3	MAU4	MAU5	MAU6	MAU7	MAU8	MAU9	MAU10	MAU11	MAU12	MAU13	MAU14	MAU15
Always	512	543	703	536	305	471	370	592	479	338	485	479	485	452	411
Very Often	230	218	180	193	106	171	164	176	197	133	178	175	179	188	134
Often	151	134	75	120	164	152	165	111	140	146	135	133	148	148	121
Rarely	72	63	34	98	196	106	138	72	101	140	108	96	104	96	105
Never	194	201	167	212	388	259	322	208	242	402	253	276	243	275	388

Figure 7.1 (8): Column chart of mobile app usage by SMEs (from fieldwork)

Chatting and *texting* activities received the highest mobile app usage score while *accounting/bookkeeping* and *virtual meeting* activities showed the least usage. These results support the perception that SMEs underutilised mobile apps (Wang & Shi, 2011). This underutilisation could stem from a knowledge gap, or the absence of contextually appropriate applications. For example, using the excel mobile app for bookkeeping could serve as a stop-gap, but it is not necessarily contextually appropriate.

The descriptive analysis conforms to statistical rules because *Kurtosis* and *Skewness* are within an acceptable range of -2 to +2 in order to prove normal univariate distribution (George & Mallery, 2010).

7.2.2 DC of SMEs and perceived usage of mobile apps as DC enabler

The DCs of the SMEs are manifested through 15 constructs, as identified in the preceding chapter. However, it is important to access these constructs based on the feedback from the bigger sample size of SMEs. This assessment was done in two phases, based on feedback from 1 159 SMEs. Through the use of descriptive statistics, the identified DCs were validated and, thereafter, measured the extent to which SMEs have been using mobile apps to enhance DC.

With a percentage mean of 84.65%, the results uphold the outcome of the qualitative phase of this research (see Figure 6.2). These results affirm the 15 DC constructs as true manifestations of the dynamic capabilities of SMEs in Lagos. The qualitative results suggest that SMEs mostly manifest *adaptive* capabilities, followed by *absorptive* capabilities and then *innovative* capabilities. The descriptive statistics show a similar trend with adaptive, absorptive and innovative capabilities scoring 86.36%, 84.25% and 83.48% respectively.

When one considers the extent to which SMEs are using mobile apps to enhance DC, one notices a decline in DC from 84.65% to 70.11%. This implies that, at this stage in time, SMEs in Lagos manifest DC at a high level, but when compared to situations where mobile apps are used as DC enablers, these manifestations dwindle.

Table 7.3 (22): Descriptive analysis of DC constructs (from fieldwork)

Dimension of DC	DC Constructs	Var	Background			DC manifestations without mobile apps					DC manifestations with mobile apps				
			N	*Min Score*	*Max Score*	*Mean*	*Mean %*	*SD*	*Kurtosis*	*Skewness*	*Mean*	*Mean %*	*SD*	*Kurtosis*	*Skewness*
Adaptive Capability	Feedback and referrals.	ADC1	1159	1	5	4.65	93.00	0.76	*7.52	*-2.65	3.58	71.60	1.48	-1.00	-0.62
	Social media and internet.	ADC2	1159	1	5	3.88	77.60	1.50	-0.51	-1.03	3.78	75.60	1.48	-0.65	-0.90
	Customer interactions.	ADC3	1159	1	5	4.62	92.40	0.79	*6.98	*-2.56	3.72	74.40	1.48	-0.80	-0.81
	Needs and problem analyses.	ADC4	1159	1	5	4.25	85.00	1.09	1.33	-1.47	3.52	70.40	1.49	-1.10	-0.58
	Advertisement and networking.	ADC5	1159	1	5	4.19	83.80	1.26	0.86	-1.46	3.58	71.60	1.51	-1.10	-0.62
		-	-	-	-	**4.32**	**86.36**	-	-	-	**3.64**	**72.72**	-	-	-
Absorptive Capability	Teamwork and collaboration.	ABC1	1159	1	5	4.27	85.40	1.16	1.64	-1.63	3.28	65.60	1.55	-1.40	-0.32
	Re-packaging and re-pricing.	ABC2	1159	1	5	4.14	82.80	1.25	0.87	-1.41	3.35	67.00	1.56	-1.37	-0.39
	Intelligent marketing.	ABC3	1159	1	5	4.24	84.80	1.15	1.51	-1.56	3.51	70.20	1.54	-1.22	-0.54
	Analyses Information.	ABC4	1159	1	5	4.19	83.80	1.12	1.14	-1.41	3.44	68.80	1.51	-1.20	-0.50
	Research and training	ABC5	1159	1	5	4.07	81.40	1.34	0.22	-1.27	3.43	68.60	1.57	-1.33	-0.47
	Improving quality and speed.	ABC6	1159	1	5	4.58	91.60	0.84	*5.52	-2.36	3.68	73.60	1.51	-0.94	-0.76
	Adaptation of offering.	ABC7	1159	1	5	4.00	80.00	1.47	-0.08	-1.23	3.56	71.20	1.53	-1.14	-0.60
		-	-	-	-	**4.21**	**84.26**	-	-	-	**3.46**	**69.29**	-	-	-
Innovative Capability	Adjusting the price and packaging of offerings.	INC1	1159	1	5	4.29	85.80	1.13	*2.01	-1.69	3.44	68.80	1.56	-1.33	-0.47
	Sales and procurement.	INC2	1159	1	5	4.07	81.40	1.21	0.60	-1.26	3.39	67.80	1.49	-1.25	-0.43
	Developing new skills and talents.	INC3	1159	1	5	4.17	83.40	1.22	0.93	-1.43	3.46	69.20	1.55	-1.30	-0.48
	Copying other businesses.	INC4	1159	1	5	3.68	73.60	1.54	-1.06	-0.72	3.33	66.60	1.6	-1.46	-0.35
	Improving quality.	INC5	1159	1	5	4.66	93.20	0.78	*8.59	*-2.83	3.55	71.00	1.55	-1.22	-0.57
		-	-	-	-	**4.17**	**83.48**	-	-	-	**3.43**	**68.68**	-	-	-
*** Kurtosis and Skewness out of -2.0 to +2.0 range**															

The results yielded a few abnormal kurtosis and skewness values if viewed in relation to statistical rules which set acceptable kurtosis and skewness values between -2 to +2 to prove normal univariate distribution (George & Mallery, 2010).

Skewness and *kurtosis* are asymmetrical measures of distribution. Skewness measures the direction and extent of digression from the normal distribution whilst kurtosis measures the extent of tail margin. Kurtosis primarily reflects the presence of *outliers* or the propensity for outliers in a distribution. Higher kurtosis values indicate a higher, or sharper, distribution peak while lower values indicate a lower, or less distinct, peak. In this study the Leptokurtic distribution (kurtosis >3) as observed in some DC constructs (i.e. feedback and referrals [7.52], customer interactions [6.98], improving delivery speed [5.52] and improving quality [8.59]) depicts extreme events. For example, during data gathering, we encountered a fruit-salad vendor who used WhatsApp as an e-commerce platform, this illustrates an extreme case of mobile apps adaptation. Extremities such as this, suggest that the effect of DC constructs on SMEs, and the implication for mobile app usage, requires deeper investigation (Shmueli & Koppius, 2010).

7.2.3 Maximisation of opportunities and the perceived use of mobile apps as enablers

Maximising opportunities involves the ability to sense, shape and seize opportunities. These capabilities form an important part of the*): Conceptual framework for investigating SMEs*In a bid to discover the extent to which SMEs maximise opportunities through their opportunity sensing, shaping and seizing capabilities, we present descriptive statistics of feedback garnered from 1 159 SMEs in Lagos. Firstly, the research sought to establish the degree to which these SMEs sense, shape and seize opportunities. This constituted a further step towards understanding the extent to which mobile app usage has helped SMEs in their drive to sense, shape and seize opportunities.

The outcome of the descriptive statistics suggests that SMEs' drive for opportunities peaks at *seizing capabilities* (85.04 %), declines at *shaping capabilities* (84.40 %) and reaches its lowest point at *sensing capabilities* (81.00%). These results imply that SMEs in Lagos could do better

to maximise opportunities as the *gateway* for maximisation is the ability to sense an opportunity. Only opportunities that have been *sensed* can then be *shaped* and *seized*.

When one considers the extent to which SMEs are using mobile apps to maximise opportunities, there is a decline from 83.48% to 70.25%. This implies that SMEs in Lagos are currently maximising opportunities considerably but, when compared to situations where mobile apps are used to enhance opportunity, we notice a decline.

Table 7.4 (23): Descriptive analysis of opportunity maximisation by SMEs

Dimensions of Opportunity Maximisation	Constructs for maximizing opportunities	Var	Background			Maximising opportunities without mobile apps					Maximising opportunities with mobile apps				
			N	*Min Score*	*Max Score*	*Mean*	*Mean %*	*SD*	*Kurtosis*	*Skewness*	*Mean*	*Mean %*	*SD*	*Kurtosis*	*Skewness*
Sense Opportunity	We foresee opportunities.	SN1	1159	1	5	4.20	84.00	1.01	0.91	-1.22	3.59	71.80	1.49	-1.00	-0.65
	We identify opportunities.	SN2	1159	1	5	4.33	86.60	0.94	1.66	-1.43	3.57	71.40	1.47	-0.95	-0.67
	We are conscious of opportunities.	SN3	1159	1	5	4.39	87.80	0.93	*2.13	-1.61	3.59	71.80	1.49	-1.01	-0.66
	We create opportunities.	SN4	1159	1	5	3.74	74.80	1.34	-0.75	-0.7	3.59	71.80	1.52	-1.06	-0.65
	We discover hidden opportunities.	SN5	1159	1	5	3.59	71.80	1.42	-1.03	-0.57	3.42	68.40	1.50	-1.25	-0.44
		-	-	-	-	**4.05**	**81.00**	-	-	-	**3.56**	**71.04**	-	-	-
Shape Opportunity	We separate profitable business opportunities from unprofitable ones	SH1	1159	1	5	4.33	86.60	1.03	1.96	-1.61	3.48	69.60	1.50	-1.15	-0.52
	We understand opportunities better after some time.	SH2	1159	1	5	4.31	86.20	0.95	1.98	-1.50	3.56	71.20	1.48	-0.98	-0.66
	We identify risks associated with opportunities.	SH3	1159	1	5	4.25	85.00	1.03	1.27	-1.38	3.50	70.00	1.48	-1.09	-0.56
	We analyse opportunities.	SH4	1159	1	5	4.15	83.00	1.01	0.93	-1.31	3.46	69.20	1.49	-1.15	-0.51
	We analyse threats.	SH5	1159	1	5	4.06	81.20	1.19	0.35	-1.16	3.39	67.80	1.52	-1.30	-0.40
		-	-	-	-	**4.22**	**84.4**	-	-	-	**3.48**	**69.56**	-	-	-
Seize Opportunity	We speedily implement our ideas in order to seize opportunities.	SZ1	1159	1	5	4.41	88.20	0.95	*2.88	-1.8	3.72	74.40	1.50	-0.82	-0.81
	We reduce risks when we seize opportunities.	SZ2	1159	1	5	4.15	83.00	1.06	0.59	-1.15	3.45	69.00	1.49	-1.17	-0.51
	We block loop holes in business when we seize opportunities.	SZ3	1159	1	5	4.11	82.20	1.11	0.64	-1.18	3.38	67.60	1.52	-1.26	-0.43
	We always make good use of opportunities.	SZ4	1159	1	5	4.41	88.20	0.96	*2.53	-1.73	3.56	71.20	1.51	-1.10	-0.61
	We prevent threats when we seize opportunities.	SZ5	1159	1	5	4.18	83.60	1.12	0.86	-1.31	3.43	68.60	1.53	-1.30	-0.43
		-	-	-	-	**4.25**	**85.04**	-	-	-	**3.51**	**70.16**	-	-	-
*** Kurtosis and Skewness out of -2.0 to +2.0 range**															

7.3. Covariance-based structural equation modelling of SME conceptual model

Covariance-based structural equation modelling (SEM) by AMOS (version 24) was used to evaluate the conceptual model. According to Garson (2016), covariance-based SEM is appropriate for testing hypotheses and exploring models in contrast to partial least square (PLS) SEM which is preferred in predictive model evaluation (Garson, 2016). Covariance SEM also yields better outcomes for large samples (Livote & Blunch, 2009). The use of covariance-based SEM in this study is justified because the model under investigation is exploratory in nature, it sought to test hypotheses using large samples.

Prior to conducting structural equation modelling, the data were screened for outliers and normality to meet the assumptions of the general linear model. To detect the outliers, the observations furthest from the centroid were identified using the Mahalanobis distance. No outlier was found and the Mahalanobis distance test indicated acceptable and progressive distances from the centroid (Byrne, 2010).

7.3.1 Normality Assessment

According to Field (2013), for large sample sizes, such as the one in this study, the central limit theorem stipulates that the assumption of normality has little effect on the analysis of data. While the central theorem caters for the issue of normality in this study, the skewness and kurtosis of each item in the model are within acceptable limits (see Appendix 8). Generally, a value for skewness and kurtosis of between -2 and +2 is considered acceptable to prove normal univariate distribution (George & Mallery, 2010). Although the variable AdC3 is above the acceptable range, Appendix 8 indicates that overall, the skewness and kurtosis values are satisfactory. This affirms that the assumption of normality has been met.

7.3.2 Reliability analysis, convergent and discriminant validity assessment

Cronbach's alpha was used to measure the reliability of each construct. Cronbach's alpha measures the internal consistency of the construct with a cut-off value of 0.7, although 0.6 is sometimes permissible (Field, 2013). As recommended by Hair et al. (2014), convergent validity was assessed using: factor loading (standardised estimates) which is expected to be above 0.5, Average Variance Extracted (AVE) which is expected to be above 0.5 and

Composite Reliability (CR) which is expected to be above 0.7, although 0.6 is sometimes permissible.

The overall result indicates acceptable reliability of all the scales involved in this study as Cronbach's alphas and the composite reliability coefficients were both above 0.6 (see Appendix 8 and Table 7.5). The results show that the factor loadings of all the constructs were above the recommended threshold of 0.5 (Field, 2013). The AVEs of all constructs were above the usual cut-off of 0.5 (Chin et al., 1997). CR ranges, from 0.6 to 0.954, largely met the recommended criterion of 0.6 (Bagozzi and Yi, 1988).

The preceding results confirm the convergent validity of all the constructs in the model. This means that all the items converged towards their respective constructs. The discriminant validity is assessed through the comparison between the Squared Root of the AVEs (indicated in blue) and the highest correlation.

Table 7.5 (24): Correlation and Square root of AVEs Matrix

	OSC	**AdC**	**MAU**	**AbC**	**OSeC**	**InC**	**OShC**
OSeC	**0.776**						
AdC	0.553	**0.659**					
MAU	0.377	0.454	**0.774**				
AbC	0.557	0.939	0.440	**0.694**			
OSeC	0.747	0.532	0.364	0.583	**0.789**		
InC	0.401	0.682	0.419	0.796	0.393	**0.775**	
OShC	0.799	0.621	0.331	0.656	0.876	0.448	**0.750**
	Notes: **OSC:** Opportunity Sensing Capability **AdC:** Adaptive Capability **MAU:** Mobile App Usage **AbC:** Absorptive Capability **OSeC:** Opportunity Seizing Capability **InC:** Innovative Capability **OShC:** Opportunity Shaping Capability						

According to Table 7.5, the discriminant validity is supported for many constructs. However, some discriminant validity concerns were also reported. These concerns are evident where the square roots of some constructs (indicated in blue) are greater than their respective highest correlation coefficients (indicated in red). For example, adaptive capability and absorptive capability were found to be highly correlated (0.939). The discriminant validity, in this case, should not be cause for concern as the relationship between the constructs is

theoretically supported since they both resort under dynamic capabilities. The same applies to innovative capability in relation to adaptive capability (0.682) and absorptive capability (0.796). Similar discriminant validity issues were also reported between *opportunity shaping capability* and *opportunity sensing capability* (0.799) and *opportunity seizing capability* (0.876). Given the pragmatic nature of study, it is important to note that IS research permits trade-offs between *model preconception* and *sampling variance* (Shmueli & Koppius, 2010). Gaining empirical understanding into the IS problem domain does not just *force* data to fit theory, it also explains what data are saying in a situation where model fitness is not achieved.

7.3.3 Measurement model using confirmatory factor analysis (CFA)

Confirmatory factor analysis (CFA) speaks to the understanding of the DC framework which underpins the relationship between the constructs and their observed indicators. The measurement model, through CFA, confirmed the structure of various constructs involved in a given model and thus accesses the convergent validity and reliability of the model. This study focused on the*): Conceptual framework for investigating* SMEs, as developed in Chapter 4.

The measurement model was constructed in the IBM SPSS package AMOS version 24. From the initial proposed model (see Figure 4.2 (*2*), the CFA results displayed unsatisfactory fit indices. A diagnosis of the modification indices and the standardised residual covariance matrix, as retrieved from the AMOS outputs, showed that some items (e.g. MAU4, AdC1, AdC2, etc.) had to be deleted from the analysis in order to improve the model fit. These items were removed because of the high-standardised residual covariance matrix (above 2.4) and cross loading issues (Hair et al., 2014). Deletion of items reduced the measurement error and increased the reliability amongst the remaining items (Ford et al., 1986). This, in turn, enhanced the model fit.

After some refinement, the final measurement model was designed. The refined model ($\chi 2$ = 2475.083; degree of freedom [df] = 28; p value = 0.000) presented satisfactory fit indices: $\chi 2/df$ = 4.688; GFI = 0.875; TLI = 0.921; CFI = 0.930; NFI = 0.913; RMSEA = 0.056, as presented in Figure 7.2. All items represented in the measurement model are presumed to be valid in the context of this study as they have been confirmed through the reliability and validity tests (as per Appendix 9).

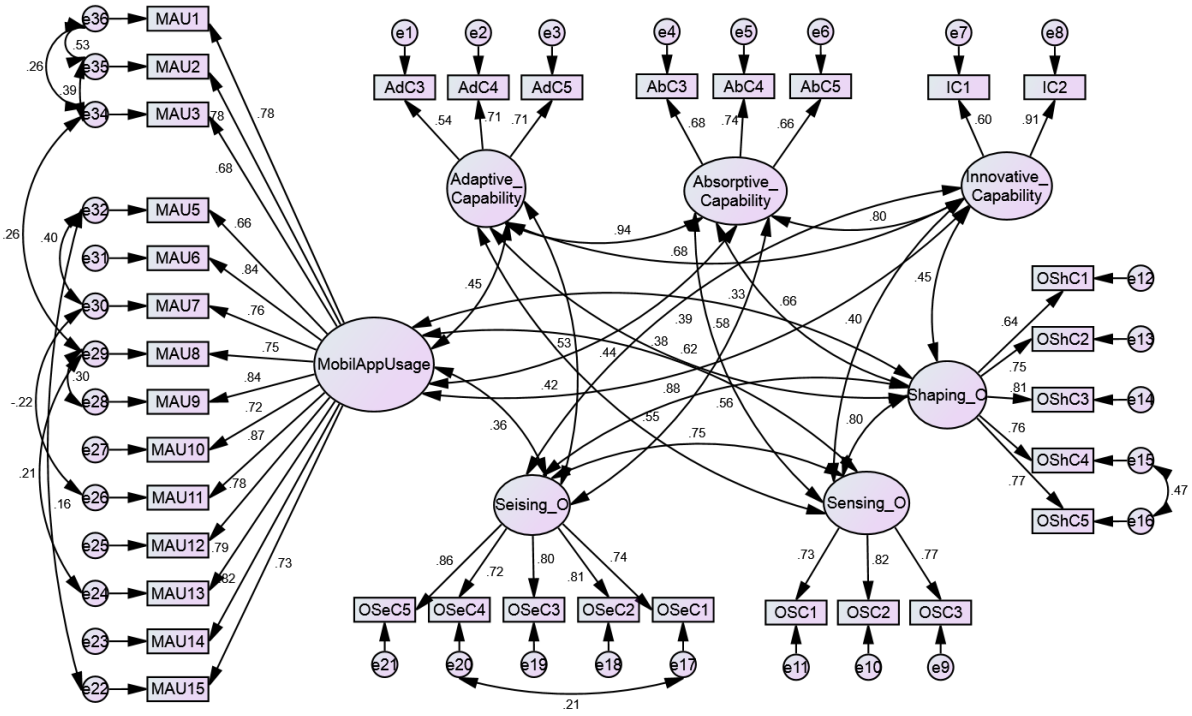


Figure 7.2 (9): Measurement model using CFA (from fieldwork)

7.3.4 Interpretation of the CFA measurement model

The bigger circles represent the latent variables, also called *constructs*. For example, in the measurement model (refer to Figure 7.2) we have seven constructs.

1. *MobilAppUsage* represents “Mobil App Usage”
2. *Adaptive_Capability* represents “Adaptive Capability”
3. *Absorptive_Capability* represents “Absorptive Capability”
4. *Innovative_Capability* represents “Innovative Capability”
5. *Shaping_O* represents “Shaping Opportunities”
6. *Sensing_O* represents “Sensing Opportunities”
7. *Seizing_O* represents “Seizing Opportunities”

Adaptive Capability originally contained five items but only three items were retained in the model because of validity concerns. All the items represented in the measurement model are presumed to be valid in the context of this study. Their validity was previously confirmed through the reliability and validity tests.

The contribution of each item to its construct is indicated by its factor loading. Any factor loading above 0.5 is acceptable, while anything below 0.5 indicates a poor measure. For example, the factor loading of item AdC3 is 0.54, meaning that item AdC3 measures Adaptive Capability at 54% (0.54 X 100). Since there is always a margin of error to contend with when measuring abstract constructs, an error term is associated with each item. In the case of Adaptive Capability for example, e1 is the error term of the item AdC3.

Overall, the relationships of the latent variables, as illustrated in the measurement model (Figure 7.2), fitted the data satisfactorily. All the instruments used in the measurement model were deemed reliable and valid in the context of this study. The satisfactory results provided by the CFA facilitated progression towards the creation of the structural model (Figure 7.3).

Whilst discussing the structural model, it is beneficial to note that the pragmatic nature of this research, which focused on understanding the realities of SMEs, called for a deeper assessment of the preceding measurement model (Figure 7.2). Although the adjusted model satisfied statistical requirements, after the removal of some items, these *removed items* weighed the heaviest when the constructs were elicited qualitatively (Owoseni & Twinomurinzi, 2017). For example, *collaboration* and *package and price adjustment of offering* carried the most weight as absorptive capability constructs of SMEs but they were removed in order to ensure the reliability and validity of the measurement model. Their removal could support the notion that SMEs are highly heterogeneous entities (Derham & Cragg, 2011) and further exposes their evasiveness in developing DCs homogeneously among SMEs. This is an important discovery which could necessitate further analysis of SMEs along different sectors or offerings. For example, although SMEs *collaborate*, the way in which they collaborate per sector could differ and, as such, be difficult to generalise. This explanation also applied to adaptive capability where the *feedback and referrals* and *social media and internet usage* items were removed from the final structural model.

7.3.5 Structural model

The structural model (as per Figure 7.3) was tested using the maximum likelihood performed with AMOS 24. The structural model results displayed satisfactory fit indices: $\chi 2/df = 5$; GFI = 0.861; TLI = 0.901; CFI = 0.910; NFI = 0.894, RMSEA = 0.064. Appendix 9 presents details of regression weights and correlation coefficients displayed on the structural model. The Chi-square ($\chi 2$) of the structural model is (as presented in Figure 7.3) is 2927.535, with 505

degrees of freedom and a p value of 0.000. This implied that the structural model fit the data satisfactorily. The structural model (Figure 7.3) could therefore be used with confidence to conclude on the research hypotheses. Note that a relationship is significant when the p value is less than 0.05; if the p value is above 0.05 the relationship is not significant (Appendix 9).

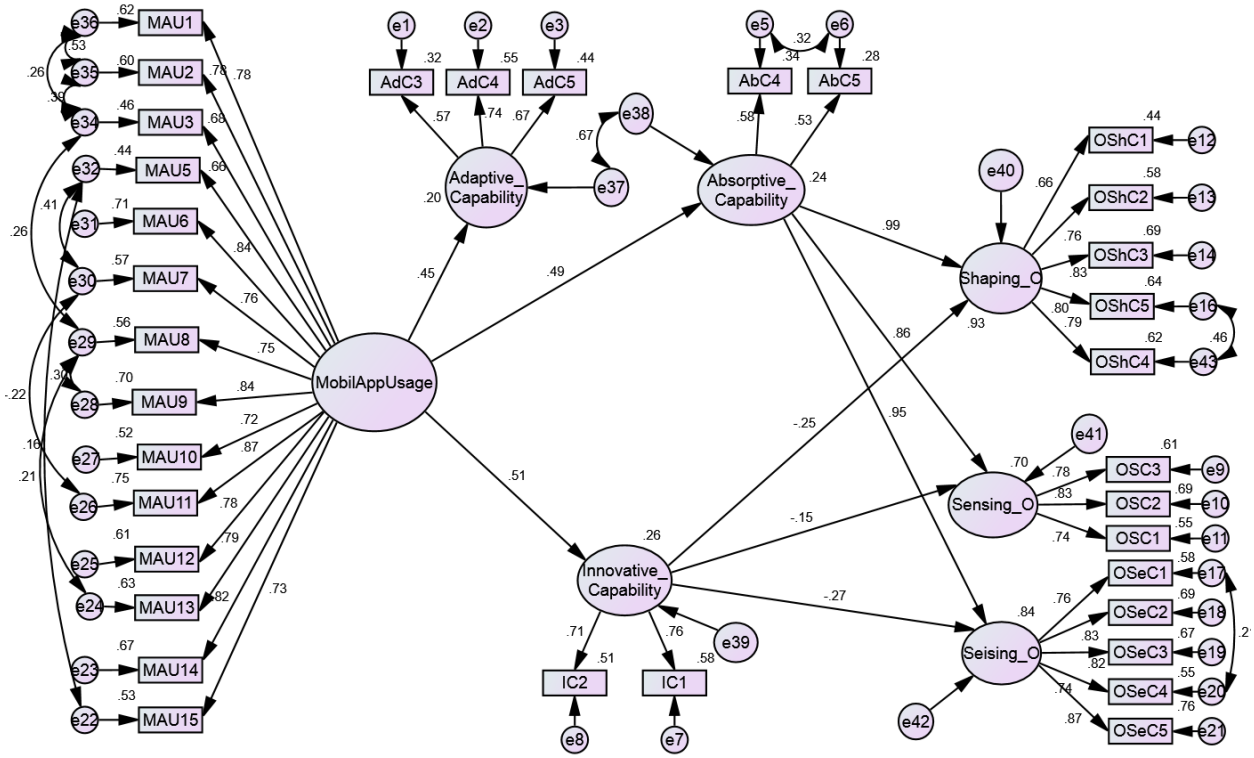


Figure 7.3 (10): Structural model

The fitted structural model, as presented in Figure 7.3, differs from the conceptual model, as per Figures 7.2 and 4.2. Six paths were deleted as they were deemed non-significant and negatively impacted upon the appropriateness of the structural model. The deleted paths connected mobile app usage and adaptive capability to opportunity sensing, shaping and seizing capabilities. According to the structural model (Figure 7.3), the deletion suggests that mobile app usage and adaptive capability have no impact on the SMEs' approach to sensing, shaping and seizing opportunities.

The regression weight analysis of structural model indicate that mobile app usage has a positive impact on the three dimensions of DCs. However, mobile app usage had the strongest effect on innovative capability as this path displays the highest beta value (0.51) compared to

the other two dimensions. The innovative capability had negative effects on the opportunity sensing, shaping and seizing abilities of SMEs. However, its strongest negative impact was reported for *seizing opportunity* (-.27), followed by *shaping* (-.25) and then *sensing* (-.15) of opportunities. This result connotes a wide gap in the innovative use of mobile apps by SMEs and the potential impact on DC could be huge. SMEs in Lagos innovate through imitation but contextual mobile apps, which can assist in this drive, barely exist (Owoseni & Twinomurinzi, 2017). SMEs reportedly adapt generic mobile apps to suit their needs. For example, contextual mobile apps will consider the culture and environment of target users in its design.

Unlike the innovative capability, the absorptive capability has a positive effect on sensing, shaping and seizing opportunities. However, it has the strongest impact on the shaping of opportunity (beta value = .99). It suggests that the absorptive capability which represents SMEs' ability to nurture knowledge, through strategic alliances, mostly helps in the shaping of opportunities.

Additionally, shaping opportunity was the most important dependent variable in the model as it displayed the highest variance explained (0.93). This means that the selected predictors explain up to 93% of the variance of shaping opportunities and this is rightly so because a *sensed* opportunity cannot be *adequately* seized if not *shaped*. Shaping opportunity is followed by seizing and sensing opportunities which respectively have 84% and 70% of the variance explained. Table 7.6 summarises the outcome of hypothesis aimed at satisfying the objectives of this study.

Table 7.6 (25): Summarised outcome of hypotheses tests

	Hypothesis	**Status**
$H1_a$	Mobile app usage increases the adaptive capability of SMEs in Lagos.	Confirmed
$H1_b$	Mobile app usage increases the absorptive capability of SMEs in Lagos.	Confirmed
$H1_c$	Mobile app usage increases the innovative capability of SMEs in Lagos.	Confirmed
$H2_a$	Absorptive capability increases SMEs' opportunity sensing ability in Lagos.	Confirmed
$H2_b$	Absorptive capability increases SMEs' opportunity shaping ability in Lagos.	Confirmed
$H2_c$	Absorptive capability increases SMEs' opportunity seizing ability in Lagos.	Confirmed
$H3_a$	Adaptive capability increases SMEs' opportunity sensing ability in Lagos.	**Not determined*
$H3_b$	Adaptive capability increases SMEs' opportunity shaping ability in Lagos.	**Not determined*
$H3_c$	Adaptive capability increases SMEs' opportunity seizing ability in Lagos.	**Not determined*
$H4_a$	Innovative capability increases SMEs' opportunity sensing ability in Lagos.	Rejected

$H4_b$	Innovative capability increases SMEs' opportunity shaping ability in Lagos.	Rejected
$H4_c$	Innovative capability increases SMEs' opportunity seizing ability in Lagos.	Rejected
$H5_a$	Mobile app usage increases SMEs' opportunity sensing ability in Lagos.	**Not determined*
$H5_b$	Mobile app usage increases SMEs' opportunity shaping ability in Lagos.	**Not determined*
$H5_c$	Mobile app usage increases SMEs' opportunity seizing ability in Lagos.	**Not determined*
***Not determined: Consist of missing path that negatively affect goodness of fit of the structural model**		

Taking into consideration the outcome of the hypotheses test as well as previous analyses, it can be affirmed that this research has indeed satisfied its aim and objectives which sought to understand *how* SMEs in Lagos use mobile apps and *how* the use of said mobile apps could enhance business.

7.4. Conclusion

The quantitative phase of this research sought to make sense of *how* SMEs in Lagos use mobile apps to enhance business through DC. This objective was approached by evaluating the feedback gained from 1 159 survey responses. The demographic information was evaluated and followed by respondents' perception towards 15 DC constructs, as extracted from the qualitative phase of this study. Subsequently, the conceptual model of SMEs with seven latent variables were assessed through CFA and SEM to explore the fitness of the model and the relationships between the variables. The latent variables include: mobile app usage, adaptive capability, absorptive capability, innovative capability, opportunity sensing ability, opportunity shaping ability and opportunity seizing ability.

The results uphold the outcome of qualitative phase of this research which reveals 15 DC constructs of SMEs in Lagos. The CFA also affirms the fitness of the conceptual model of SMEs. In testing the relationships between latent variables through SEM, the research outcome suggests that mobile app usage has a positive effect on the adaptive, absorptive and innovative capabilities of SMEs. However, only absorptive capabilities were proven to increase the opportunity sensing, shaping and seizing abilities of SMEs.

Based on the need to ensure the model's appropriate fit, the paths which express relationships between adaptive capability and opportunities sensing ability, adaptive

capability and opportunities shaping ability, as well as adaptive capability and opportunities seizing ability were removed. Similarly, three paths that associates mobile app usage and opportunities sensing ability, mobile app usage and opportunity shaping ability as well as mobile app usage and opportunity seizing ability were deleted. The fore going implies that SMEs' approach towards mobile app usage and DC is evasive.

These findings expose the need for the creation of mobile apps which meet the contextual requirements of SMEs. This need could be addressed by intelligent apps which are supported by Artificial Intelligence and Machine Learning. For example, SMEs in Lagos innovate through imitation, they grow their absorptive capabilities through collaboration and adapt though referrals (Owoseni & Twinomurinzi, 2017). Contextual mobile apps, which understand the requirements of each sub-sector and suggest ideas that enhance DCs, might help in these quests.

CHAPTER 8

Conclusion and recommendations

Chapter 7 presented the outcomes of the quantitative phase of this research. It validated the 15 DC constructs of SMEs in Lagos based on survey responses from 1 159 SMEs. The findings through CFA and SEM affirm the fitness of the *conceptual model for investigating SMEs*. The research outcome suggests that mobile app usage has a positive effect on the adaptive, absorptive and innovative capabilities of SMEs. However, only absorptive capabilities were proven to positively influence the opportunity sensing, shaping and seizing abilities of SMEs.

This concluding chapter reflects on the entire research. It highlights the contributions and limitations of study, while making recommendations and suggestions for future studies.

8.1 Research overview

This research, based on pragmatic philosophy and a mixed research approach, set out to understand *how* SMEs in Lagos use mobile apps to enhance business through DCs. The content analysis of data, retrieved from 20 SMEs through interviews, revealed 15 DC constructs. The constructs demonstrated how SMEs in Lagos manifest DC. Subsequently, a conceptual model of SMEs, containing seven latent variables, was evaluated. These variables included: (1) mobile app usage, (2) adaptive capability, (3) absorptive capability, (4) innovative capability, (5) opportunity sensing ability, (6) opportunity shaping ability and (7) opportunity seizing ability. Through responses gained from 1 159 SMEs, the study used a covariance-based SEM and CFA to explore the appropriateness of the conceptual model and the relationships between the variables, as demonstrated by the paths connecting the latent variables.

Based on the findings of the qualitative aspect of the research, the study revealed that SMEs mainly use *social media* and *internet apps* to support their adaptive capability - specifically for customer feedback and referrals. SMEs improve their absorptive capabilities through collaboration with stakeholders and they innovate through imitation, adaptation, re-packaging and re-pricing of products and/or services. This finding is noteworthy because it

provides a perspective to *how* SMEs in Lagos take advantage of mobile apps as well as highlighting the need for more contextually appropriate mobile apps. This new understanding can also be used towards creating better-suited mobile apps for SMEs that share similar environments.

Results gained from the quantitative aspects of the research indicated that mobile app usage has a positive effect on the adaptive, absorptive and innovative capabilities of SMEs in Lagos. However, only *absorptive capabilities* was proven to increase the opportunity sensing, shaping and seizing abilities of SMEs in Lagos. Based on the need to ensure the model's goodness of fit, the paths that express relationships between adaptive capability and opportunities sensing ability, adaptive capability and opportunities shaping ability, as well as adaptive capability and opportunities seizing ability were removed. This also applied to relationships between mobile app usage and opportunities sensing ability, mobile app usage and opportunity shaping ability as well as mobile app usage and opportunity seizing ability. This implied that SMEs' approach towards mobile app usage and DC is ambiguous. It further confirmed the heterogeneous nature of SMEs and, as such, recommended further sub-sector specific research when using SEM to evaluate diversified samples. For example, establishing the differences between service-sector SMEs and product-based SMEs, and whether these differences extend to the distinct sub-areas of each sector.

Before the conduct of this research, the perception was held that SMEs in Lagos use mobile apps for business. However, the way in which these SMEs use mobile apps for business was unknown. This research has provided valuable insight into this previously un-researched area.

8.2 Philosophy revisited

This study adopted a pragmatic stance because the research was motivated by the drive to understand *ho*w SMEs practically use mobile apps. Pragmatists believe that every concept has conceivable practical effects (Rylander, 2012). It suggests that research intentions should be examined from a practical perspective. Pragmatism influenced the interpretation of the research problem and the implementation of research design.

8.2.1 Interpretation of the research problem

The main aim/objective of this study was to understand *how* SMEs in Lagos use mobile apps. The review of the literature therefore focused on the contextual use of mobile apps by SMEs

in Lagos. Within the boundaries of DC framework, the literature gave rise to the creation of a unique and practicable conceptual model for investigating the problem domain (as per Figure 4.2 (*2*). The conventional DC framework emphasises the three dimensions of DCs (i.e. absorptive, adaptive and innovative capabilities) and the micro-foundations of DCs (i.e. sensing, shaping and seizing opportunities). The new conceptual model, however, added the perspective of *mobile app usage*. This presented a practical and realistic approach to demystifying the research problem.

8.2.2 Implementation of research design

This research chose the case study approach as it facilitated the realistic investigation of contemporary problems in their real-life context. This is especially relevant when the problem cannot be clearly separated from its context. The case study approach is appropriate when practical and in-depth knowledge of a particular phenomenon is being sought. Additionally, case studies permit the use of mixed research techniques which rely on both qualitative *and* quantitative data. This research focused on SMEs in Lagos, Nigeria as case study.

Data were collected through interviews and questionnaires which were administered face-to-face, thus in contrast to the conventional online surveys. Twelve data collection field officers were hired, trained and kitted out with customised t-shirts and nametags for the purpose of data collection (see Appendix 5). The survey was created on google forms and responses were directly recorded through smart handheld devices while the respondents were being interviewed. Importantly, the approach adopted in administering the surveys (practical interactions with respondents) manifested the pragmatic nature of the study. Although online surveys are fast becoming a generally acceptable way of collecting data, they do have some limitations which make them unsuitable for use in this study. For example, the navigation of online surveys is limited to respondents who have access to the internet and possess the relevant ICT skills.

The use of process coding techniques to interpret qualitative interview responses also speaks to the pragmatic nature of this research. Process coding is useful when searching for ongoing actions, and interactions, taken in response to situations or problems. Process coding techniques specifically consider what SMEs are do "-ing" with, or without, mobile apps in order to develop dynamic capabilities.

The quantitative aspect of this research used confirmatory factor analysis (CFA) and structural equation modelling (SEM) techniques to evaluate the conceptual model of SMEs created within the context of this research. In the analysis of the quantitative data, we remained cognisant of the stringent statistical rules governing data interpretation. However, we did not allow these rules, or theory, to make us lose sight of prevailing facts. Some discriminant validity concerns were reported in the quantitative analysis including the square roots of some constructs being greater than their respective highest correlation coefficients (refer to section 7.3.2). Typically, adaptive and absorptive capabilities were found to be highly correlated (0.939). Given the pragmatic nature of study, we sought to understand the reasons *behind* the discriminant validity in order to gain empirical insight into the problem domain. The discriminate validity issue could be traced to the evasiveness of SMEs.

8.3 Research objectives revisited

This thesis made use of the framework of dynamic capability (DC) to facilitate an understanding of how SMEs use mobile apps in Lagos, Nigeria. Substantial knowledge exists regarding the application of the DC framework in large firms, but similar knowledge of smaller organisations is limited.

The study sought to answer the primary research question:

How could mobile app usage enhance SMEs in Lagos, Nigeria?

The objectives included:

1. To identify those DCs that are important for SMEs in Lagos. These DCs are constructs, which align with the three dimensions of DC (i.e. adaptive, absorptive and innovative capabilities).
2. To determine how mobile app usage influences the three dimensions of DCs.
3. To determine whether the three dimensions of DCs have an impact on SMEs' ability to sense, shape and seize business opportunities.
4. To determine if mobile app usage influences *how* SMEs sense, shape and seize opportunities. This objective sought to determine if a direct relationship exists between mobile app usage and the capability to maximise opportunities.

8.3.1 First research objective: Identification of dynamic capabilities

The first research objective was to identify the dynamic capabilities (DCs) that are important for SMEs in Lagos. These DCs are constructs, which align with the adaptive, absorptive and innovative capabilities.

RQ1: How do SMEs in Lagos manifest the absorptive capability and to what extent are mobile apps used as part of the capability?

SMEs in Lagos manifest absorptive capabilities through: collaboration, package and price adjustment, intelligent business leads, information analysis, research and training. Absorptive capabilities emphasise the ability to combine new external knowledge with existing internal knowledge towards the discovery of new information that could be explored towards business gains. SMEs with rich absorptive capabilities work smarter by avoiding mistakes made by their competitors based on new information they acquire. When the extent to which SMEs are using mobile apps to enhance their absorptive capability were considered, a decline in absorptive capability was noticed, from 84.26% (*without* mobile apps) to 69.26% (*with* mobile apps).

SMEs in Lagos truly manifest absorptive capabilities but still tend to make the same mistakes over and over again. The essence of absorptive capability, on the other hand, is the creation of new knowledge that will prevent known mistakes. For example, the owner of one of the SMEs we interviewed explained how he managed his inventory and how he had repeatedly lost income as a result of incorrect inventory management decisions. The SME in question sells cement and the owner relies on exchange rate information to decide whether to increase, or reduce, stock. However, due to the unregulated nature of Nigerian foreign exchange, the exchange rate information available to him is often incorrect. The creation of an app, which could consolidate all available exchange rates and present accurate and timely information to the SME, would be of great assistance.

RQ2: How do SMEs in Lagos manifest the adaptive capability, and to what extent are mobile apps used as part of the capability?

SMEs in Lagos manifest adaptive capabilities through feedback and referrals, social media and internet usage, customer interactions, needs and problems analysis, networking and advertisement. Adaptive capabilities exhibit SMEs' capacity to quickly identify and use

external opportunities by adapting their practices in response to environmental changes. This research indicated a decline in adaptive capability from 86.36% (*without* mobile apps) to 72.72% (*with* mobile apps). This finding speaks to the rate at which SMEs adapt to new business realities. The hitherto untapped potential of mobile apps could help improve SMEs response time to business change.

For example, an SME that sells fresh farm produce almost went out of business because it did not timeously perceive that customers' preference for farm produce, in Lagos Island, differed on weekends. This change was due to an improved electricity supply to the neighbourhood over weekends which resulted in residents increasingly preparing meals in bulk over weekends, instead of multiple meals during the week. The SME in question embraced the challenge and quickly responded to new customer preferences through adapting its packaging, delivery and pricing of goods. SMEs, with enhanced DCs, require reliable feedback mechanisms which continually allow them to gauge customers' expectations. A contextual mobile app could be designed to facilitate constant customer feedback. Such apps would also plug into customers' social media space and so aid in the intelligent prediction of customer preferences.

RQ3: How do SMEs in Lagos manifest innovative capability, and to what extent are mobile apps used as part of the capability?

SMEs in Lagos manifest innovative capabilities through the imitation and adaptation of offerings as well as the adjustment of packaging and pricing. An SME's innovative capability is demonstrated by its creativity at navigating new business frontiers through the creation of new products, services, markets or business models.

When considering the extent of mobile app usage towards absorptive capability, a decline in absorptive capability from 83.48% (*without* mobile apps) to 68.68% (*with* mobile apps) is noticeable. Mobile apps could improve the approach to imitation and adaptation. The mobile app which allows the user to create different version of him/herself, through the application of different make-up, serves as case in point. The creation of an app that could help SMEs visualise different packaging for their products could be highly beneficial.

8.3.2 Second research objective: Mobile app usage and dynamic capabilities

The second research objective sought to determine *how* mobile app usage influences the three dimensions of dynamic capabilities (DC). To fulfil this objective, a conceptual model of SMEs was developed based on the literature review and research context. Mobile app usage as well as absorptive, adaptive and innovative capabilities formed the latent variables which underpin this model. The CFA and SEM of the conceptual model revealed the relationship between these variables.

Results showed that mobile app usage positively impacted upon the absorptive, adaptive and innovative capabilities of SMEs in Lagos with beta values of 0.49, 0.45 and 0.51, respectively. Innovative capability represented the highest impact compared to absorptive and adaptive capabilities. If one wishes to quickly and greatly enhance the DC of SMEs, then one should focus on using mobile apps for SME business innovation.

Business innovation, through the use of mobile apps, could be achieved through integrating multiple services and offerings onto a mobile enabled platform. The idea is to ensure convenience and security while serving the customer. For example, the mobile app, quickTeller^{TM} has brought about a payment innovation over the past 10 years for Nigerian SMEs in that it has greatly changed the way in which funds are collected and exchanged. A similar innovation, mCash, promotes fund transfers, payments and collection in the rural areas of Nigeria. Similar innovations could be deployed in other industrial sectors, apart from the financial space, such as agriculture, manufacturing, education and tourism.

8.3.3 Third research objective: Dynamic capabilities and opportunity maximisation

The third objective was to determine whether the three DC dimensions had impacted on SMEs' ability to sense, shape and seize business opportunities. We leveraged on the conceptual model of SMEs to fulfil the third research objective.

Using the CFA and SEM of the conceptual model we discovered that absorptive capability has a positive and significant effect on the opportunity sensing, shaping and seizing abilities of SMEs in Lagos. It suggested that SMEs in Lagos generally maximise opportunities by combining new *external* knowledge with existing *internal* knowledge.

Those paths representing the relationship/s between the adaptive capability and (1) opportunities sensing, (2) opportunities shaping and (3) opportunities seizing abilities of SMEs in Lagos were deleted in the course of the structural model's creation to ensure model fit. This implies that the relationship between the *adaptive capability* and the *opportunity maximisation* of SMEs in Lagos could not be generalised. The inability to generalise tendencies of SMEs calls for a *disintegrated approach* towards studying the impacts which would view these SMEs in terms of other common attributes like: business sector, business ownership, business size and/or product type.

Innovative capability had a significantly negative effect on SMEs' ability to sense, shape and seize opportunities. It transpires that SMEs did not innovate to maximise opportunities *but rather* maximise opportunities through innovation. The implication is that SMEs in Lagos demonstrate innovation when they need to maximise opportunities. SMEs respond to opportunities by becoming innovative. The SMEs would probably not innovate if the need to maximise opportunity does not arise.

8.3.4 Fourth research objective: Mobile app usage and opportunity maximisation

The fourth research objective sought to determine whether mobile app usage directly influenced the way in which SMEs sense, shape and seize opportunities. This objective scrutinised the direct relationship between mobile app usage and SMEs' capability to maximise opportunities.

The paths which represents the relationship between mobile app usage and SMEs' ability to sense, shape and seize opportunities were expunged during the creation of the structural model in order to ensure model fit. SMEs in Lagos, as an entity, thus demonstrated an indeterminate approach towards the use of mobile apps. Taking into account the heterogeneous nature of SMEs, it remains a difficult task to provide clear-cut narratives explaining the use of mobile apps to directly maximise opportunities. A more in-depth study of this domain is required during which the SME group, as a whole, would be split and diced into smaller categories of interest to facilitate a better understanding of the dynamics.

8.4 Contribution of study

A reflection on the outcomes of this research portrays a multi-disciplined research experience. The study primarily sought to answer the question: *How could mobile apps usage enhance SMEs in Lagos, Nigeria?* from an Information Systems (IS) viewpoint. The knowledge of *how* SMEs use mobile apps is important at this time as mobile app usage will arguable continue to grow and expand. Moreover, the combination of mobile apps and new technologies (like Blockchain), will arguably continue to challenge and eradicate conventional economic boundaries. This emerging marketplace holds great promise for SMEs. Researchers need to focus their efforts on unravelling what SMEs need to be doing to re-position themselves to take advantage of the potential disruptions occasioned by the unfolding trends in mobile technologies.

With its research into the problem area, this study contributed to the fields of: information systems (mobile app usage), strategic management (dynamic capability), small business management (SMEs) and philosophy (pragmatism).

8.4.1 Contribution to Information Systems

The outcome of this research did not only provide a solid basis for developing contextually viable mobile app solutions to address the specific needs of SMEs, it also advises specific areas of SME business which requires attention. The study created a model for investigating the mobile app usage of small organisations from a DC perspective. Using this newly created model, researchers can investigate how the use of mobile apps affect SMEs in other contexts. Moreover, each DC construct identified in this study could be re-examined to see how mobile app usage impacts SMEs.

8.4.2 Contribution to dynamic capability framework

This study revealed DC constructs peculiar to SMEs in Lagos, Nigeria and how these DCs influenced the capacity of SMEs to maximise opportunities. This can be viewed as a contribution to strategic management. The research presented a new perspective to the application of the dynamic capability (DC) framework to small organisations. Thus, the application of the DC framework to SMEs in this study was novel in that DCs are generally researched with large organisations in mind. The study provided insight into the DC framework as it applies to SMEs, especially in the context of a developing African economy.

8.4.3 Contribution to small and medium enterprises

This study emphasised the evasive nature of SMEs and the need to be cautious when selecting strategies for conducting research centred on SMEs. The study contributed to the area of strategic economic policy developments of SMEs as it provided implicit information on how SMEs could be enhanced. Policy makers could tap into this information to make decisions that would positively enhance the SME domain. For example, policies could be tailored to facilitate skills transfer between *developed* and *developing* economies in Africa since, as this study suggests, SMEs innovate through the imitation and adaptation of goods and/or services.

8.4.4 Contribution to pragmatism

The knowledge gained through this research, within the context of a developing country, implies that pragmatism induces the capacity to improvise. Pragmatic researchers therefore need to keep an open mind and should improvise their research approach, if and when the evolving situation demands it. For example, we initially set out to collect data through online surveys but, as the situation unfolded, we discovered that the reality of our target respondents required that we conduct a physical survey. We thus changed our approach to personal face-to-face surveys. However, we discovered that the target respondents were sceptical as they were unsure as to what the research represented. We once more adapted our approach by gaining the assistance of field officers kitted out with customised t-shirts and name tags. This greatly increased the number of participants and helped to decrease the time we could have spent on data collection.

8.5 Limitation of study

The study was limited to data gained from only one area in Nigeria. Samples were collected from SMEs in Lagos alone as this city represents the commercial centre of Nigeria. Although Lagos contains the highest number of SMEs in Nigeria (Kale, 2015), data from Lagos alone may not characterise the absolute experience of all SMEs in Nigeria. This can be considered a limitation to the study.

8.6 Recommendation and future research

This research recommends the contextual development of mobile apps in such a way that the specific needs of specific SMEs are meet in specific contexts. Moreover, governments and

policy makers should be mindful of the peculiar contributions of DC to SMEs and they should implement policies which keep this in mind.

An area for future research could include an exploration of the DC of large organisations in Lagos to examine whether and to which extent they are similar or contrasting to the DCs of smaller firms (SMEs). Furthermore, due to the evasive and heterogeneous nature of SMEs, it would be beneficial to delimit future research on SMEs along specific areas of interests. This is especially true when using SEM to evaluate diversified samples such as SMEs. For example, instead of studying SMEs as a whole, SMEs could be studied according to different sectors and sub-sectors.

References

Adu, P., 2013. Qualitative Analysis: Coding and Categorizing. *National Centre for Academic & Dessertation Excellence*, p. 21.

Aghion, Philippe, Antonin B, Timo B, Peter J. K, Huiyu L. 2017. "Missing Growth from Creative Destruction" Federal Reserve Bank of San Francisco Working Paper 2017-04. https://doi.org/10.24148/wp2017-04

Ajaiyi, A. & Jegede, C. 2015. An Appralsal of Small and Medium Scale Enterprises in Osogbo Metropolis of Osun State, Nigeria, 1(4), pp. 233–244.

Alaghehband, F. & Rivard, S. 2010. The Strategic Role of Information Technology Sourcing: A Dynamic Capabilities Perspective. *ICIS 2010 Proceedings*, Paper 107. Available at: http://aisel.aisnet.org/icis2010_submissions/107/

Alain, P. & Kenneth, K. 2015. Survey Research Methodology in Management Information Systems: An Assessment, *Journal of Management Information Systems*, 10:2, 75-105. Available at: DOI: 10.1080/07421222.1993.11518001

Alan, B. 2016. Introduction to Qualitative Research. In *Social Research Methods*. Oxford.

Apulu, I. & Latham, A. 2011. Drivers for Information and Communication Technology Adoption: A Case Study of Nigerian Small and Medium Sized Enterprises. *International Journal of Business and Management*, 6(5). Available at: http://www.ccsenet.org/journal/index.php/ijbm/article/view/10428

Ariyo, M. & Mcgrath, K. 2010. ICTs and Sustainable Development: A Capability Perspective. *AMCIS 2010 Proceedings*.

Aulet, B. & Murray, F. 2013. A Tale of Two Entrepreneurs: Understanding Differences in the Types of Entrepreneurship in the Economy. *Martin trust Center for MIT Entrepreneurship*, (May). Available at: http://www.kauffman.org/uploadedFiles/DownLoadableResources/a-tale-of-two-entrepreneurs.pdf

Ayanda, M. & Adeyemi, S. L. 2011. Small and Medium Scale Enterprises as A Survival Strategy for Employment Generation in Nigeria. *Journal of Sustainable Development*, 4(1), pp. 200–206.

Bagozzi, R.P., 2011. Measurement and Meaning in Information Systems and Organizational Research: Methodological and Philosophical Foundations. *MIS Quarterly*, 35(2), pp.261–292.

Bankole, F.O. & Bankole, O.O., 2017. The effects of cultural dimension on ICT innovation: Empirical analysis of mobile phone services. *Telematics and Informatics*, 34(2), pp.490–505. Available at: http://dx.doi.org/10.1016/j.tele.2016.08.004.

Barton, J. 1994. Pragmatism, Systems Thinking and System Dynamics. *System*, pp. 1–17. Available at: http://www.systemdynamics.org/conferences/1999/PAPERS/PLEN2.PDF

Biedenbach, T. & Muller, R. 2012. Absorptive, innovative and adaptive capabilities and their

impact on project and project portfolio performance. *International Journal of Project Management*, 30(5), pp. 621–635. Available at: http://dx.doi.org/10.1016/j.ijproman.2012.01.016

Bouwman, H. & de Reuver, M. 2013. Domestication of smartphones and mobile applications: a quantitative mixed-method study. *Mobile Media and Communication*, volume 4, issue 3. doi:10.1177/2050157916649989

Breytenbach, J., Sciences, M. & Africa, S. 2013. A critical review of ICT-enabled development influencing the quality and quantity of South African tertiary education students, PhD thesis, University of Pretoria.

Budget IT, 2016. *Lagos' Informal Sector : Taxation & Contribution to the Economy*, Available at: https://ng.boell.org/sites/default/files/uploads/2017/02/budgit_final_report_30.1.17.pdf

Camisón, C. & Monfort-Mir, V. M. 2012. Measuring innovation in tourism from the Schumpeterian and the dynamic-capabilities perspectives. *Tourism Management*, 33(4), pp. 776–789. Available at: http://dx.doi.org/10.1016/j.tourman.2011.08.012

Campbell, P. L. 2011. Peirce, Pragmatism, and the Right Way of Thinking, SANDIA Reports. Sandia National Laboratory. Available at : https://fas.org/sgp/eprint/peirce.pdf

Cenfetelli, R.T., Bassellier, G. & Posey, C., 2013. The Analysis of formative measurement in IS research : Choosing between component- and covariance-based techniques. *Data Base for Advances in Information Systems*, 44(4), pp.66–79.

Cenfetelli & Bassellier, 2009. Interpretation of Formative Measurement in Information Systems Research. *MIS Quarterly*, 33(4), p.689. Available at: http://www.jstor.org/stable/10.2307/20650323.

Chipangura, B. 2016. *A framework for providing mobile centric services to students at higher education institutions: the case of open distance learning.* University of South Africa.

Creswell, J. W. 2008. Three components involved in a design. *RESEARCH DESIGN: Qualitative, Quantitative, and Mixed Methods Approaches*, pp. 5–21. Available at: http://www.sagepub.com/upm-data/22780_Chapter_1.pdf

Daniel E.M & Wilson H.N., 2013. European Journal of Information Systems (12), p. 282–296. doi:10.1057/palgrave.ejis.3000478

Degirmenci, K., Guhr, N. & Breitner, M. H. 2013. Mobile Applications and Access to Personal Information: A Discussion of Users' Privacy Concerns. *Proceedings of the International Conference on Information Systems*, pp. 1–21.

Derham, R. & Cragg, P. 2011. Creating Value : An SME And Social Media. *Pacific Asia Conference on Information Systems (PACIS)*.

Didi-quvane, B. B. S. & Twinomurinzi, H. 2013a. Exploring the Role of ICT in the transition from a Small Business owner to an Entrepreneur: A Dynamic Capabilities Perspective in a Developing Context. *Proceedings of the Nineteenth Americas Conference on Information Systems, Chicago, Illinois, August 15-17,2013*, (1), pp. 1–8.

Didi-quvane, B. B. S. & Twinomurinzi, H. 2013b. Exploring the Role of ICT in the transition from a Small Business owner to an Entrepreneur: A Dynamic Capabilities Perspective in a Developing Context. In *Proceedings of the Nineteenth Americas Conference on Information Systems, Chicago, Illinois, August 15-17,2013*. pp. 1–8.

Dinner, I., Van Heerde, H. J. & Neslin, S. A. 2015. Creating Customer Engagement via Mobile Apps : How App Usage Drives Purchase Behavior. (October).

Efinger, J., Maldonado, N. & McArdle, G. 2004. PhD students' perceptions of the relationship between philosophy and research: A qualitative investigation. *The Qualitative Report*, 9(4), pp. 732–759. Available at: http://www.nova.edu/ssss/QR/QR9-4/efinger.pdf

Eisenhardt, K. M. & Martin, J. A. 2000. Dynamic capabilities: what are they? *Strategic Management Journal*, 21(10–11), pp.1105–1121. Available at: http://doi.wiley.com/10.1002/1097-0266(200010/11)21:10/11%3C1105::AID-SMJ133%3E3.0.CO;2-E

Eniola, A., Entebang, H. & Sakariyau, O. B. 2015. Small and medium scale business performance in Nigeria: Challenges faced from an intellectual capital perspective. *International Journal of Research Studies in Management*, 4(1). Available at: http://www.consortiacademia.org/index.php/ijrsm/article/view/964

European Commision. 2015. user guid to SME defination. Publication of the Europen Union. Available at : http://ec.europa.eu/regional_policy/sources/conferences/state-aid/sme/smedefinitionguide_en.pdf

Eze, S., Duan, Y. & Awa, H. O. 2013. Dynamic capabilities approach to information communication technology adoption in SMEs. *UK Academy for Information Systems Conference Proceedings 2013*. Available at: http://aisel.aisnet.org/ukais2013/8

Faizal, M., Zaidi, A. & Othman, S. N. 2012. Understanding the Concept of Dynamic Capabilities by Dismantling Teece, Pisano, and Shuen's Definition (1997). *International Journal of Academic Research in Business and Social Sciences*, 2(8), pp. 367–378. Available at: www.hrmars.com/journals.

Findings, K. 2015. *Gatner Predicts 2015: Mobile Apps and Development*, viewed on 10 January 2017, https://www.gartner.com/doc/3525665/predicts--mobile-apps-development

Ford, H., Analysis, A. Q. & Term, H. 2014. Qualitative codes and coding. Oxford Internet Institite. Avilable at : https://www.slideshare.net/hfordsa/qualitative-codes-and-coding [Accessed November 6, 2017]

Freeze, R.D. & Raschke, R.R.L., 2007. An assessment of formative and reflective constructs in IS research. *European Conference on Information Systems (ECIS)*, pp.1481–1492.

Frels, R. K. & Onwuegbuzie, A. J. 2013. Administering quantitative instruments with qualitative interviews: A mixed research approach. *Journal of Counseling and Development*, 91(2), pp. 184–194.

Garson, G. D. 2016. *Partial Least Squares: Regression & Structural Equation Models*, Statistical Associates Publishers, New York.

Gazdecki, A. 2015. 22 SMB Industries Cashing in on Mobile Marketing [INFOGRAPHIC] - Bizness Apps. Available at: https://www.biznessapps.com/blog/22-smb-industries-cashing-in-on-mobile-marketing-infographic/ [Accessed November 6, 2016].

Gerring, J. 2002. Techniques for Choosing Cases. *Case Study Research: Principles and Practices*, pp. 86–150.

Gierten, D. & Spiezia, V. 2016. New Forms of Work in the Digital Economy. *Oecd Digital Economy Papers*, (260), pp. 1–44.

Goldkuhl, G. 2004. Meanings of Pragmatism: Ways to conduct information systems research. *International Business*, pp. 17–18. Available at: http://www.vits.org/publikationer/dokument/457.pdf

Good, T. & Qureshi, S. 2009. Investigating the Effects of Micro-enterprise Access and Use of ICTs through a Capability Lens: Implications for Global Development. *Second Annual SIG GlobDev Workshop*, pp. 1–28.

Goverment of Canada, 2017. Home - Canadian Industry Statistics. Available at: https://www.ic.gc.ca/eic/site/cis-sic.nsf/eng/home

Gronum, S., Verreynne, M. L. & Kastelle, T. 2012. The Role of Networks in Small and Medium-Sized Enterprise Innovation and Firm Performance. *Journal of Small Business Management*, 50(2), pp. 257–282.

Haas, A. 2015. Micro-foundations of dynamic capabilities. The diverse roles of boundary spanners in sensing/shaping and seizing opportunities. *XXIVème conférence annuelle de l'Association Internationale de Management Stratégique*, pp. 1–24.

Hafkin, N. J. 2009. Electronic/Mobile Government in Africa: Building Capacity in Knowledge Management Through Partnership, (February). Available at: http://www.unpan.org/emgkr_africa%5CnAddis

Hammer, A. et al. 2010. Small and Medium-Sized Enterprises: Overview of Participation in U.S. Exports. *U.S. International Trade Commission*, (332), pp. 1–91. Available at: http://www.usitc.gov/publications/332/pub4125.pdf

Helfat, Finkelstein. S, Mitchell. W , Peteraf. M , Singh. H , Teece .D & Winter. S. 2007. *Dynamic Capabilities: Understanding Strategic Change in Organizations*, Wiley-Blackwell Publishing. ISBN: 978-1-405-13575-7

Hope, S. & Hope, S. 2001. Pragmatist Philosophy and Action Research : Readings and Conversation with Richard Rorty Peter Reason, pp. 1–16. Available at: http://peterreason.eu/Papers/Rorty.pdf

Ilegbinosa, I. A. & Jumbo, E. 2015. Small and Medium Scale Enterprises and Economic Growth in Nigeria: 1975-2012. *International Journal of Business and Management*, 10(3), pp. 203–216. Available at: http://www.ccsenet.org/journal/index.php/ijbm/article/view/43329

Internet Live Statistics, 2017. Internet Users by Country (2017). *Internet Users*, pp. 1–6. Available at: http://www.internetlivestats.com/internet-users-by-country/

Islam, M. A. et al. 2011. Effect of Entrepreneur and Firm Characteristics on the Business Success of Small and Medium Enterprises (SMEs) in Bangladesh. *International Journal of Business and Management*, 6(3), pp. 289–299.

James, W. 1910. Pragmatic Theory of Truth , pp. 1–15. Available at: http://philosophy.lander.edu/intro/articles/pragmatism-a.pdf

Jarvis, C.B., MacKenzie, S.B. & Podsakoff, P.M., 2003. A Critical Review of Construct Indicators and Measurement Model Misspecification in Marketing and Consumer Research. *Journal of Consumer Research*, 30(2), pp.199–218. Available at: https://academic.oup.com/jcr/article-lookup/doi/10.1086/376806.

Jelilov, G. & Onder, E. 2016. Entrepreneurship in Nigeria Realities on Ground, 2(3), pp. 6–9.

Johnson, R. B. & Onwuegbuzie, A. J. 2012. Mixed Methods Research: A Research Paradigm Whose Time Has Come, 33(7), pp. 14–26.

Kabanda, S. & Brown, I. 2014. Bring-Your-Own-Device (BYOD) practices in SMEs in Developing Countries – The Case of Tanzania.

Kale, Y. 2015. Micro, Small and Medium Enterprise National Survey 2013. *National Bureau of Statistics Nigeria*.

Kamal, M. & Qureshi, S. 2009. How can information and communication technology bring about development? An information architecture for guiding interventions in developing regions. *15th Americas Conference on Information Systems 2009, AMCIS 2009*, 3, pp. 1557–1566. Available at: http://www.scopus.com/inward/record.url?eid=2-s2.0-84870851016&partnerID=40&md5=e04297db15517523b3f9c21f58f3d6b8

Kebede, M. S. 2015. *Challenges and Prospects of Small Enterprises in Ethiopia: A Study of Enterpreneurs in Tigray Region*. University OF South Africa.

Kilpinen, E. 1987. Pragmatism as a philosophy of action, pp. 1–16. available at : http://www.helsinki.fi/peirce/MC/papers/Kilpinen%20-%20Pragmatism%20as%20a%20Philosophy%20of%20Action.pdf

Kingdom, U. & Taylor, P. 2015. The Importance of Information and Communication Technologies (ICTs): An Integration of the Extant Literature on ICT Adoption in Small and Medium Enterprices. *International Journal of Economics, Commerce and Management*, III(5), pp. 274–295.

Klein, H. H. K. & Myers, M. 1999. A set of principles for conducting and evaluating interpretive field studies in information systems. *MIS quarterly*, 23(1), pp. 67–93.

Krejcie, R. V. & Morgan, D. W. 1970. Determining Sample Size for Research Activities Robert. *Educational and Psychological Measurement*, 38(1), pp. 607–610.

Kuria, T. J. & Kitenga, G. M. 2014. Theoretical Underpinnings of Dynamic Capabilities. *European Journal of Business and Social Sciences P.P*, 3(9), pp. 181–190. Available at: http://www.ejbss.com/recent.aspx-/

Lagos State Government. 2013. *Lagos State Development Plan 2012-2025*. Available at :

https://www.scribd.com/document/271150413/lagos-state-development-plan-2012-2025

Lawanson, T. O. 2010. Poverty and Environmental Conditions in the Lagos Megacity: Consequences for Environmental Health, Enviromental Law Institute. Available at : http://www.elri-ng.org/Poverty%20And%20Environmental%20Degradation%20In%20The%20Lagos%20Metropolis.doc

7(2).

Lee, A. S. 2004. Thinking aboout Social Theory and Philosophy for Information Systems. *Social Theory and Philosophy for Information Systems*, pp. 1–26.

Lincoln, Y. S. & Guba, E. G. 1995. Paradigmatic Controversies / Contradictions / And Emerging Confluences. Newbury Park, Sage Publications.

Lisle, J. 2011. The Benefits and Challenges Of Mixing Methods and Methodologies: Lessons Learnt from Implementing Qualitatively Led Mixed Methods Research Designs in Trinidad and Tobago, *The Emergence of Mixed Methods Research*, 18, pp. 87–120.

Livote, E. & Blunch, N. J. 2009. Introduction to Structural Equation Modeling Using SPSS and AMOS. *Structural Equation Modeling: A Multidisciplinary Journal*, 16(3), pp. 556–560.

Maduegbuna, A. 2014. Creative – Destruction: The Essence of Entrepreneurial Studies. *IOSR Journal of Economics and Finance (IOSR-JEF)*, 5(3), pp. 61–65. Available at: http://www.iosrjournals.org/iosr-jef/papers/vol5-issue3/J0536165.pdf

Mahroum, S. 2016. *Black Swan Start-ups_ Understanding the Rise of Successful Technology*, Palgrave Macmillan. Available at: https://books.google.com.ng/books?id=P6IqDAAAQBAJ&printsec=frontcover&source=gbs_vpt_buy#v=onepage&q&f=false

Manyika, J. et al. 2013. Disruptive technologies: Advances that will transform life, business, and the global economy. *McKinsey Global Insitute*, (May), p. 163. Available at: http://www.mckinsey.com/insights/business_technology/disruptive_technologies

Mawuna, R. 2015. Lagos-2025: Governor Ambode & State Development Plan, p. 1.

Michiel, 2013. *Towards an understanding of the strategic use of mobile ICT in small and medium enterprises*. University of Pretoria.

Miles, I. 2008. Patterns of innovation in service industries. *IBM Systems Journal*, 47(1), pp. 115–128.

Ministry of Economic Planning & Budget, 2014. Overview of Lagos State, Nigeria.

Moos, M. N. 2014. *Evaluating the South African Small Business Policy To Determine the Need for and Nature of*. University of Pretoria.

Nahid, G. 2003. Understanding Reliability and Validity in Qualitative Research. *The Qualitative Report*, 8(4), pp. 597–607.

Nayebi, F., Desharnais, J. & Abran, A. 2012. The State of the Art of Mobile Application

Usability Evaluation. *IEEE Explore*, (November 2015).

NBS, 2017. *Labor Force Statistics Vol. 1: Nigeria Unemployment and Underemployment Report*. Available at: http://www.nigerianstat.gov.ng/elibrary?page=2&offset=10

Ngwu, B. A. 2005. *Small and medium enterprises (SMEs) in Nigeria: problems and prospects*. St. Clements University. Available at: http://stclements.edu/grad/gradonug.pdf

Niehaves, B., Plattfaut, R. & Sarker, S. 2011. Understanding dynamic is capabilities for effective process change: A theoretical framework and an empirical application. *Icis-Rp*, 5, pp. 3935–3945.

Ojo, P. B. 2015. *Emerging Technologies Issues for Consumer Online Protection in Nigeria.* Available at: http://www.itu.int/en/ITU-D/Regulatory-Market/Documents/Events2017/Benin/Presentations/Day 2/SESSION 8.3_Banji Ojo_E-commerce.pdf

Ojo, R. B. 2012. Using Mobile Technology to Support Government Service Delivery: A Case Study on the Pension System in South Africa.

Oni, T. 2016. Lagos and Its Potentials for Economic Growth. , pp. 1–11. Available at: https://ng.boell.org/2015/07/02/lagos-and-its-potentials-economic-growth [Accessed April 22, 2017].

Osotimehin, K., Jegede, C., Akinlabi, B., Olajide, O. 2012. An Evaluation of the Challenges and Prospects of Micro and Small Scale Enterprises Development in Nigeria. *American International Journal of Contemporary Research*, 2(4), pp. 174–185.

Owoseni, A. & Twinomurinzi, H. 2016. Mobile App Usage as a Dynamic Capability in Nigerian Start-ups. *IST Africa Conference, Durban*, pp. 1–9.

Owoseni, A. & Twinomurinzi, H. 2017. The use of mobile apps to enhance SMEs in conditions of uncertainty: A case study from Lagos. *10th Annual SIG Global Development. AIS 2017 Pre-ICIS Workshop, At Seoul, Republic of Korea*, (Dc), pp. 1–24.

Parida, V. & Örtqvist, D. 2015. Interactive Effects of Network Capability, ICT Capability, and Financial Slack on Technology-Based Small Firm Innovation Performance. *Journal of Small Business Management*, 53, pp. 278–298. Available at: http://doi.wiley.com/10.1111/jsbm.12191

Pavlou, P. & El Sawy, O. 2011. Understanding the Elusive Black Box of Dynamic Capabilities. *Decision Sciences*, 42(1), pp. 239–273.

Pennsylvania State University, 2006. *Using Surveys for Data Collection in Continuous Improvement*, Office of Planning and Institutional Assessment. Available at: http://www.virginia.edu/processsimplification/resources/PennState%20Surveys.pdf

Quade, M. H. & Leimstoll, U. 2015. Mobile business with smartphones and tablets: Effects of mobile devicesin SMEs. *28th Bled eConference: #eWellbeing - Proceedings*, pp.290–305.

Rajeev S. & Graeme S., 2011. The Role of Dynamic Capabilities in Creating Business Value from IS Assets . AMCIS 2011 Proceedings. Available at : http://aisel.aisnet.org/amcis2011_submissions/135

Rani, H. 2016. What Is the Difference Between multimethods and mixed methods? p. 100. Available at: https://www.researchgate.net/post/What_is_the_difference_between_multimethods_and_mixed_methods [Accessed March 24, 2017].

Reilly, M. & Scott, P. S. 2010. Dynamic capabilities, absorptive capacity and knowledge sharing: A research agenda into explicating the antecedent factors conducive to subsidiary bargaining. *Academy of International Business (UKI Chapter) Conference Paper, Trinity College Dublin*, pp. 1–26. Available at: http://arrow.dit.ie/buschmancon/7/

Rydenfelt, H. 2008. Meaning and Pragmatism - James on the practical consequences of belief, in Nordic Pragmatism Network, Available at: http://nordprag.org/papers/Rydenfelt%20-%20Meaning%20and%20Pragmatism.pdf

Rylander, A. 2012. Pragmatism and Design Research. *Ingår i Designfakultetens serie kunskapssammanställningar*, (April), p. 42. Available at: http://www.designfakulteten.kth.se/sites/default/files/designfpragdesignrapport_18.4.pdf

Saeedi, M. R. 2014. *Fostering Dynamic Capabilities of SMEs*, Msc Thesis, Linkoping Unniversity. Available at: http://www.diva-portal.org/smash/get/diva2:707586/fulltext01.pdf

Saldana, J. 2009. *The Coding Manual for Qualitative Researchers*, Sage. London.

Santoso, S. M. et al. 2013. Destroying by Creating: Exploring the Creative Destruction of 3D Printing Through Intellectual Property, pp. 1–17.

Saunders, M., Lewis, P. & Thornhill, A. 2009. Understanding research philosophies and approaches. In *Research methods for business students*. pp. 106–136.

Savage, J. 2016. Top 5 Facebook Video Statistics for 2016 [Infographic] | Social Media Today. Available at: http://www.socialmediatoday.com/marketing/top-5-facebook-video-statistics-2016-infographic [Accessed November 7, 2016].

Schneider, B. 2015. Creative Destruction in the British Industrial Revolution: Hand Spinning to Mechanization, c . 1750 – 1850 Theory and Case Study Overview, (March).

Seethamraju, R. & Seethamraju, J. 2008. Adoption of ERPs in a Medium-sized Enterprise - A Case Study. *Proceedings of the 19th Australasian Conference on Information Systems*, (January), pp. 887–896. Available at: http://www.bsec.canterbury.ac.nz/acis2008/Papers/acis-0187-2008.pdf

Sellars, W. 1963. Empiricism and the Philosophy of Mind. *Science, Perception and Reality*, pp. 127–196. Available at: http://selfpace.uconn.edu/class/percep/SellarsEmpPhilMind.pdf

Sharma, R. & Shanks, G. 2011. The role of dynamic capabilities in creating business value from IS assets. *17th Americas Conference on Information Systems 2011, AMCIS 2011*, 2, pp.1158–1164.

Shenkar, O. 2010. Defend your research: Imitation is more valuable than innovation.

Harvard Business Review, 88(4). Available at: https://hbr.org/2010/04/defend-your-research-imitation-is-more-valuable-than-innovation.

Shmueli, G. & Koppius, O. 2010. Forecasting the Future with Predictive Analytics. *Industry Week*, (July), pp. 47–49.

Small Business Administration Office of Advocacy, 2015. Small Business Market Update, June 2015, (June), p. 3.

SMEDAN & NBS, 2013. SMEDAN and National Bureau of Statistics Collaborative Survey : Selected Findings, pp. 1–50.

Snider, J. 2015. *Success Factors of Small Business Owners of Independent Financial Planning Firms*. Walden University. Available at: http://scholarworks.waldenu.edu/dissertations.

Sobh, R. & Perry, C. 2006. Research design and data analysis in realism research. *European Journal of Marketing*, 40(11/12), pp.1194–1209. Available at: http://www.emeraldinsight.com/doi/abs/10.1108/03090560610702777

Statistics Portal, 2017. Number of internet users in selected countries 2017 Statistic. *The Statistics Portal*. Available at: https://www.statista.com/statistics/262966/number-of-internet-users-in-selected-countries/ [Accessed June 12, 2017].

Sun, C. & Chen, R. 2006. A Study on the Strategic Alignment Process with Information Technology for New Ventures: From a Dynamic Capability Perspective. Available at: http://aisel.aisnet.org/ecis2006/202%5C.

Teece, D. J. 2007. Explicating dynamic capabilities: The nature and microfoundations of (sustainable) enterprise performance. *Strategic Management Journal*, 28(13), pp. 1319–1350.

Teece, D. J., Pisano, G. & Shuen, A. 1997. Dynamic Capabilities and Strategic Management. *Strategic Management Journal*, 18(7), pp. 509–533. Available at: http://links.jstor.org/sici?sici=0143-2095%28199708%2918%3A7%3C509%3ADCASM%3E2.0.CO%3B2-%23

The Bank Association South Africa, 2016. How Does the National Small Business Act Define SME. *he Bank Association South Africa*, p. 1. Available at: http://www.banking.org.za/what-we-do/sme/sme-definition.

Tom, E. Z., Glory, B. & Alfred, U. J. 2016. An Appraisal of Nigeria's Micro, Small and Medium Enterprises (MSMES): Growth, Chalenges and Prospect. *International Journal of Small Business and Entrepreneurship Research*, 4(4), pp. 1–15.

Tushabomwe-Kazooba, C. 2006. Causes of small business failure in Uganda: A case study from Bushenyi and Mbarara towns. *African Studies Quarterly*, 8(4), pp. 27–35.

Vaaler, P. & Mcknight, L. W. 2000. Creative Destruction in the Internet Economy: The Internet Impact on Enterprise Valuation. *Journal of Communications & Strategies*, 40(40), pp. 193–210.

Van der, A., Kotze, P. & Cronje, J. 2005. The Functionality of a requirements Elicitation Procedure Developed for process Modelling within the Higher Education Application

Domain. In *Alternation,* pp. 489–514.

Wagner, D. & Wagner, H. 2013. Online Communities and Dynamic Capabilities: A Cross-Case Examination of Sensing, Seizing, and Reconfiguration Research-in-Progress. *In Proceedings of Proceedingsof the 19th Americas conference on information systems Chicago, Illinois, USA,* (1), pp. 1–8.

Wang, C. L. & Ahmed, P. K. 2007. Dynamic Capabilities: A Review and Research Agenda. *The International Journal of Management reviews*, 9 (2007), pp. 31–51.

Wang, Y. & Shi, X. 2011. Thrive, not just survive: enhance dynamic capabilities of SMEs through IS competence. *Journal of Systems and Information Technology*, 13(2), pp. 200–222.

Ward, S. 2016. What Are SMEs_ Small to Medium Enterprise Definition. Viewed on 5th March 2017, https://www.thebalancesmb.com/sme-small-to-medium-enterprise-definition-2947962

Wedawatta, G., Ingirige, B. & Amaratunga, D. 2011. Case study as a research strategy: Investigating extreme weather resilience of construction SMEs in the. *7th Annual International Corference of International Institute for Infrastracture*, pp. 1–9.

White, S. 2016. *Business Population Estimates for the UK and Regions 2016*, Available at: https://www.gov.uk/government/statistics/business-population-estimates-2015.

William, J. W., Vinit, P. & Patel, P. C. 2013. Too much of a good thing? absorptive capacity, firm performance, and the moderating role of entrepreneurial orientation. *Strategic Management Journal*, January 2008), p. 12.

Witschel, K. H. & Hans, F. 2015. *How to Choose Research Methodology*, University of Applied Sciences Notherwestern Swizerland School of Business. Available at: http://knut.hinkelmann.ch/lectures/project2013/p1_5_how-to-choose-a-research-methodology.pdf

Xiao, L. & Dasgupta, S. 2009. Dynamic IT Capability : An Instrument Development Study Dynamic IT Capability : An Instrument Development Study. *Amcis 2009*.

Yang, C. et al. 2014. Personalized Mobile Application Discovery How to Find Apps. *Crowd Soft ACM*, pp. 49–54.

Yin, R. K. 2005. *Case Study Reseach: Design and Methods* Volume 5, Sage Publications. Available at: http://www.madeira-edu.pt/LinkClick.aspx?fileticket=Fgm4GJWVTRs%3D&tabid=3004

Young, D. A. 2015. *Improving the adoption of cloud computing by small and medium scale enterprices in Nigeria*. University of South Africa.

Zahra, S. A., Sapienza, H. J. & Davidsson, P. 2008. Entrepreneurship and dynamic capabilities: a review, model and research agenda. *Journal of Management Studies*, 43(June), pp. 4–43. Available at: http://eprints.qut.edu.au/5850/

Appendix 1

Interview Consent Form & Protocol

Title: Understanding varying adaptive, absorptive and innovative capabilities of small businesses in Lagos

Objective: To determine the construct(s) for measuring adaptive, absorptive and innovative capabilities of small businesses in Lagos

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Dear Participant,

You are invited to participate in a research study conducted by Adebowale Owoseni, a PHD student in the School of Computing at the University of South Africa. The results of this study will be included in Adebowale Owoseni's PhD thesis.

Terms

You were selected as a prospective participant in this study because you manage a small business in Lagos. Kindly read the information below, and ask questions about anything you do not understand, before deciding whether to participate.

1. Taking part in the interview is voluntary.
2. You have the right not to answer any question, and to stop the interview at any time or for any reason.
3. The interview will take about 10 minutes.
4. You will not be paid for this interview.
5. Your name will remain confidential in any discussions or publications resulting from the interview.
6. Your decision to take part in this research also means that the small business entity you represent approves to be part of this research.
7. All interview recordings or transcripts will be stored in a secure place until the thesis is completed in 2018 and the records will be destroyed.

Signoff:

If you agree to partake in this interview kindly, signify your consent below:

I understand the procedures described in this consent document; and my questions have been answered to my satisfaction. I agree to participate in this study and the small business entity I represent also approves this decision.

I have been given a copy of this form.

Name of Small Business manager _____ Sign/Date. _____

Appendix 2

SME Owner/Manager Interview

Interviewer Name: _____

Interviewee Name: _____

Date: _____ Time: _____

Audio Filename: _____

Title: Understanding varying adaptive, absorptive and innovative capabilities of small businesses in Lagos

Objective: To determine the construct(s) for measuring adaptive, absorptive and innovative capabilities of small businesses in Lagos

---

Section A: Introduction - Interviewer

I am Adebowale Owoseni, a PHD student at UNISA. I would like to thank you for accepting to participate in this interview having read and signed the consent form. The interview is expected to last for about 10 minutes.

Section B: Introduction - Small Business

- What does your business do?
- How many employees do you have?
- How long have you been in business?
- What mobile apps do you use?

Section C: Adaptive Capabilities

- How do you get more business or identify business opportunities?

Section D: Absorptive Capabilities

- How do make use of new information?

Section E: Innovative Capabilities

- How do create or upgrade your product(s) or service(s)?

Closing - Thank you for your time.

Appendix 3

Cover letter to an online anonymous web-based survey

Dear Prospective participant,

You are invited to participate in a survey conducted by Adebowale Owoseni under the supervision of Prof. Hossana Twinomurinzi, an associate Professor in the School of Computing towards a PhD at the University of South Africa.

This survey has been designed to study how small businesses in Lagos currently enhance business through the use of mobile apps. You were selected to participate in this survey because you manage a small business in Lagos and your business is listed in an online business directory (http://www.businesslist.com.ng). By completing this survey, you agree that the information you provide may be used for research purposes, including dissemination through peer-reviewed publications and conference proceedings. You also agree that the small business entity you represent approved to be part of this study.

It is anticipated that the information we gain from this survey will help us to understand how small businesses in Lagos currently enhance business through the use of mobile apps and also recommend how small businesses could gain maximum benefits from mobile apps usage based on scientifically proven theories. You are however, under no obligation to complete the survey; and you can withdraw from the study prior to clicking the submit button.

The survey is developed to be anonymous, meaning that we will have no way of connecting the information that you provide to you personally or to the business entity you represent. However, you will not be able to withdraw from the study once you have clicked the submit button based on the anonymous nature of the survey.

If you choose to participate in this survey it will take up about 15 minutes of your time. You will not benefit from your participation as an individual, however, it is envisioned that the findings of this study will help you maximise benefits of using mobile apps to enhance your small businesses.

We do not foresee any negative consequences as a result of completing the survey; however, the researcher(s) undertake to keep any information provided herein confidential, not to let it out of our possession and to report our findings from the perspective of the participating

group and not from the perspective of an individual. The records will be kept for five years for audit purposes where after it will be permanently destroyed by deleting from secured cloud environment.

Please note that you or the business you represent will not be reimbursed or receive any incentives for your participation in the survey.

The research was reviewed and approved by the Ethics The primary researcher, Adebowale Owoseni, can be contacted during office hours at +234 806 798 2450. The study leader Prof. Hossana Twinomurinzi, can be contacted during office hours on +27 11 670 9361 or email twinoh@unisa.ac.za. Should you have any questions regarding the ethical aspects of the study, you can contact the chairperson of the Ethic Committee by emailing SocEthics@unisa.ac.za. Alternatively, you can report any serious unethical behaviour at the University's Toll Free Hotline 0800 86 96 93.

You are making a decision whether or not to participate by continuing to the survey section. You are free to withdraw from the study at any time prior to clicking the final submit button.

Thank you

Adebowale Owoseni

Appendix 4

SME Owner/Manager Questionnaire

Section A: Background Information

1. What is your gender? Please select the applicable.

a) Male ☐ *b) Female* ☐

2. How old are you? Please enter your year of birth.

Year of birth _____

3. What is your highest educational qualification? Please select applicable educational qualification.

a) Secondary School Certificate	☐	*b) Diploma*	☐
c) Bachelor's degree	☐	*d) Master's Degree*	☐
e) Bachelor's degree	☐	*f) Master's Degree*	☐
g) Doctoral Degree	☐	*h) No formal education*	☐

4. How old is the small business you are managing? Please select year the business started.

Year Business Started _____

5. Which sector is the business? Please select applicable business sector, you may select more than one sector.

a) Construction	☐	*b) Imports/Exports*	☐	*c) Agriculture*	☐
d) Financial Services	☐	*e) Information Technology*	☐	*f) Retail*	☐
g) Beauty/Fashion	☐	*h) Education*	☐	*i) Consulting*	☐
j) Hospitality	☐	*k) Media*	☐	*l) Arts/Culture*	☐
m) Energy	☐	*n) Home Support*	☐	*o) Foods*	☐
p) Advertisement	☐	*q) Transport/Logistics*	☐	*r) Others*	☐

6. Which part of Lagos is the business located? Please select applicable location below

a) Lagos/Victoria Island	☐	*b) Lagos Mainland*	☐
c) Lagos Sub-hubs	☐	*c) Other Locations*	☐

7. Are you the owner of the small business? Please select the applicable

a) Yes ☐ *b) No* ☐

8. How many people are currently employed in the small business? Please select applicable

a) 1-10 employees	☐	*b) 11-20 employees*	☐
c) 21-50 employees	☐	*d) more than 50 employees*	☐

9. What type of employees do you have? Please select applicable employment type

a) Full-time employees only ☐
b) Part-time employees only ☐
c) Both full-time and part-time employees ☐

Section B: Dimensions of dynamic capabilities

10. How important is the following activities to your small business?

Adaptive Capabilities	**Very Important**	**Important**	**Moderately important**	**Slightly important**	**Not important**
Feedback and referrals					
Social media and internet					
Customer interactions					
Needs and problems analysis					
Advertisement and networking					
Absorptive Capabilities	**Very Important**	**Important**	**Moderately important**	**Slightly important**	**Not important**
Teamwork and collaboration					
Changing our packaging and prices					
Intelligent marketing of our products and services					
Analysing information					
Research and training					
Improving quality and speed					
Adapting our product and services to specific customer					
Innovative Capabilities	**Very Important**	**Important**	**Moderately important**	**Slightly important**	**Not important**
Adjusting the price and packaging of our product and services					
During sales and procurement					

Developing new skills and talents					
Copying other businesses					
Improving quality					

Section C: Micro-foundations of dynamic capability (sensing, shaping and seizing opportunities)

11. Please identify how you sense, shape and seize opportunities or prevent loss based on the statements listed below:

Opportunity sensing capabilities					
How do you notice opportunities?	**Always**	**Very often**	**Some times**	**Rarely**	**Never**
We foresee opportunities					
We identify opportunities					
We are conscious of opportunities					
We create opportunities					
We discover hidden opportunities					
Opportunity shaping capabilities					
How do you consider opportunities or prevent loss?	**Always**	**Very often**	**Some times**	**Rarely**	**Never**
We separate profitable business opportunities from unprofitable ones					
We understand opportunities better after sometime					
We identify risks associated with opportunities					
We analyse opportunities					
We analyse threats					
Opportunity seizing capabilities					
How do you take-hold of opportunities or prevent loss?	**Always**	**Very often**	**Some times**	**Rarely**	**Never**
We speedily implement our ideas in order to seize opportunities					
We some reduce risks when we seize opportunity					

We block loop holes in business when we seize opportunities					
We always make good use of opportunities					
We prevent threats when we seize opportunities					

Section D: Mobile apps usage by small businesses

12. How often do you use mobile apps for the following business tasks

Mobile App Usage	**Always**	**Very often**	**Some times**	**Rarely**	**Never**
We use mobile apps to provide feedback to customers.					
We use mobile apps to get referrals					
We use mobile apps to chat or text.					
We use mobile apps to store contacts, document or recorded conversation.					
We use mobile apps for virtual meetings.					
We use mobile apps for advertisement and marketing.					
We use mobile apps to organise and plan our schedules (reminders)					
We use mobile apps to search the internet for get desired information					
We use mobile apps for analysing information.					
We use mobile apps for accounting and book/keeping					
We use mobile app to sell our products and services.					
We use mobile apps for payments and collections					
We use mobile apps for learning					
We use mobile apps for managing job orders					
We use mobile apps to create online content like blogs/news/articles					

Section E: Mobile apps as absorptive, adaptive and innovative capabilities enabler

13. Small business tries many ways to attract customer and business deals; please select how the situation below apply to your small business

Adaptive capability					
Situation	**Always**	**Very often**	**Some times**	**Rarely**	**Never**
We get feedback and referrals through mobile apps					
Mobile apps give us access to social media and internet					
We interact with customers through mobile apps					
Mobile apps help us to identify business needs or problems					
We network with people and advertise through mobile apps					
Absorptive capability					
Situation	**Always**	**Very often**	**Some times**	**Rarely**	**Never**
We use mobile apps for teamwork (collaboration)					
Mobile apps help us to package and price our product and services					
Mobile apps help use to market our product and services intelligently					
We use mobile apps to analyse information					
Mobile apps help in research and training					
Mobile apps help us to meet customers' expectations faster					
Mobile apps help us to adapt our product and services					
Innovative Capability					
Situation	**Always**	**Very often**	**Some times**	**Rarely**	**Never**
We use mobile apps to adjust how we package or price our products					
Mobile apps help our sales and procurement					
Mobile apps help us to develop new skills and talents					

Mobile apps help us to copy other businesses and even do better.					
We improve the quality of our services and products through the use of mobile apps					

Section F: Mobile apps and micro-foundations of dynamic capabilities (sensing, shaping and seizing opportunities)

14. Please identify how you use mobile apps to sense, shape and seize opportunities or prevent loss based on the statements listed below:

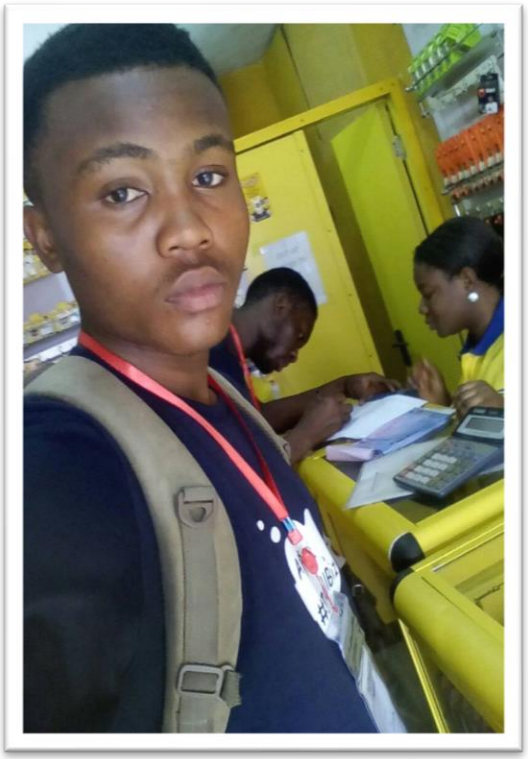
Mobile apps and opportunity sensing capabilities					
We notice opportunities through the following actions	**Always**	**Very often**	**Some times**	**Rarely**	**Never**
Through the use of mobile apps, we foresee opportunities					
Mobile apps help use to identify opportunities					
We become conscious of opportunities through mobile apps					
Using mobile apps opens doors to many business opportunities					
We discover hidden opportunities when we use mobile apps					
Mobile apps and opportunity shaping capabilities					
We take-hold of opportunities or prevent loss through the following actions	**Always**	**Very often**	**Some times**	**Rarely**	**Never**
Mobile apps help us to separate profitable business opportunities from unprofitable ones					
Through the use of mobile apps, we understand opportunities better					
Through the mobile apps, we identify risks associated with opportunities					
We analyse opportunities through while using mobile apps					
We analyse threats while using mobile apps					
Innovative and opportunity seizing capabilities					
We take-hold of opportunities or prevent loss through the following actions	**Always**	**Very often**	**Some times**	**Rarely**	**Never**
Mobile apps help use to speedily implement our ideas					
Mobile apps help use to reduce risks					

Mobile apps help us to block loop holes in business					
We seize opportunities through mobile apps usage					
We prevent threats through usage of mobile apps.					

Closing - Thank you for your time.

Appendix 5

Field Experience



Appendix 6

Ethics Approval

UNISA university of south africa

UNISA COLLEGE OF SCIENCE, ENGINEERING AND TECHNOLOGY'S (CSET) RESEARCH AND ETHICS COMMITTEE

4 September 2017

Ref #: **059/AOO/2017/CSET_SOC**
Name: Adebowale Oluropo Owoseni
Student #: 57264392

Dear Adebowale Oluropo Owoseni

Decision: Ethics Approval for three years (Humans involved)

Researcher: Adebowale Oluropo Owoseni
Block 6, Flat 12, Chief Anthony Enahoro Housing Estate, Ishaga,
Shogunro, Ogba Lagos
57264392@mylife.unisa.ac.za, +234 806 798 2450

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2017 -09- 13
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College of Science, Engineering and Technology

Supervisor (s): Prof H. Twinomurinzi
twinoh@unisa.ac.za, +27 11 670 9361

Proposal: Enhancing Small Businesses using Mobile Apps

Qualification: PhD in Computer Science

Thank you for the application for research ethics clearance by the Unisa College of Science, Engineering and Technology's (CSET) Research and Ethics Committee for the above mentioned research. Ethics approval is granted for a period of three years from 4 September 2017 to 4 September 2020.

1. The researcher will ensure that the research project adheres to the values and principles expressed in the UNISA Policy on Research Ethics.
2. Any adverse circumstance arising in the undertaking of the research project that is relevant to the ethicality of the study, as well as changes in the methodology, should be communicated in writing to the Unisa College of Science, Engineering and

University of South Africa
Preller Street, Muckleneuk Ridge, City of Tshwane
PO Box 392 UNISA 0003 South Africa
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Technology's (CSET) Research and Ethics Committee. An amended application could be requested if there are substantial changes from the existing proposal, especially if those changes affect any of the study-related risks for the research participants.

3. The researcher will ensure that the research project adheres to any applicable national legislation, professional codes of conduct, institutional guidelines and scientific standards relevant to the specific field of study.
4. Only de-identified research data may be used for secondary research purposes in future on condition that the research objectives are similar to those of the original research. Secondary use of identifiable human research data require additional ethics clearance.
5. Permission to conduct this research should be obtained from the participating small businesses owners in Lagos prior to commencing field work.

Note:

The reference number 059/AOO/2017/CSET_SOC should be clearly indicated on all forms of communication with the intended research participants, as well as with the Unisa College of Science, Engineering and Technology's (CSET) Research and Ethics Committee

Yours sincerely

Adèle da Veiga

Dr. A Da Veiga

Chair: Ethics Sub-Committee School of Computing, CSET

Prof I. Osunmakinde

Director: School of Computing, CSET

Prof B. Mamba

Executive Dean: College of Science, Engineering and Technology (CSET)

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Appendix 7

Semi-Processed Extracts of Content Analysis

Identified codes by SMEs	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**	**17**	**18**	**19**	**20**	**Total**
Innovative Capability: How do you create or upgrade your products or services?																					
INC - Adjust Packaging	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	4
INC - Adjust Pricing	0	0	0	1	0	1	0	0	1	0	0	0	0	0	0	0	1	0	0	0	4
INC - By creating more brand visibility	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1
INC - By imitating competitors	0	0	0	0	1	1	0	0	0	1	1	0	1	0	0	0	0	0	0	1	6
INC - Copy and adapt products	0	1	1	1	0	1	0	0	0	1	2	0	1	0	0	1	0	1	0	1	11
INC - Create Demos	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1
INC - Create product bouquet	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	2
INC - Create varieties by change suppliers	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1
INC - Cross sell new product to customers	1	0	0	0	0	0	0	1	1	0	0	1	0	0	0	0	0	1	0	0	5
INC - Customise to specific need	0	1	1	1	0	0	0	0	1	0	2	1	0	0	0	0	1	1	0	0	9
INC - Develop Speciality	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1	0	0	2	1	5
INC - Improve Quality	0	0	0	0	0	0	1	1	1	0	0	0	0	0	0	0	0	0	0	0	3
Sub Totals	**1**	**2**	**2**	**4**	**2**	**3**	**3**	**3**	**5**	**2**	**5**	**2**	**2**	**1**	**1**	**3**	**3**	**3**	**2**	**3**	**52**
Absorptive Capability: How do you make use of new information?																					
ABC - Ensure Faster Delivery	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1
ABC - Run idea through customers	1	1	0	0	0	1	1	0	1	0	1	0	0	0	0	0	0	0	0	0	6

ABC - Adapt existing product from competitors	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
ABC - Adapt existing product in developed countries	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	3
ABC - Adjust packaging	0	0	0	1	0	1	0	0	0	0	0	1	0	0	0	0	0	0	1	1	5
ABC - Adjust pricing	0	0	1	0	0	1	0	0	0	0	0	1	0	0	0	0	0	1	1	1	6
ABC - Analyse new information	0	0	0	0	0	0	0	0	1	0	0	1	0	1	1	1	1	1	0	0	7
ABC - Create Internet based products/services	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
ABC - Identify opportunity in new information	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1
ABC - Increase Quality	0	0	0	0	0	0	0	0	0	1	0	0	1	0	0	1	0	0	0	1	4
ABC - Initiate partnerships	0	0	0	0	0	0	1	0	0	0	0	0	1	0	1	0	0	0	0	1	4
ABC - Intelligently market product	0	0	0	1	0	1	0	0	0	1	1	0	0	1	0	0	0	1	0	0	6
ABC - Learn new or upscale skills	0	0	0	0	1	0	1	0	0	0	0	1	0	0	0	0	0	0	0	0	3
ABC - Mass Advertisement	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1
ABC - New Research	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0	0	1	0	3
ABC - Share idea with experts	1	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	2
ABC- stock or unstock inventories	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
Sub -Total	**2**	**2**	**1**	**3**	**3**	**4**	**3**	**1**	**3**	**2**	**2**	**4**	**4**	**4**	**2**	**4**	**1**	**3**	**3**	**4**	**55**
Adaptive Capability: How do you attract more businesses or identify business opportunities?																					
ADC - By Looking out for new ideas in developed countries	0	0	1	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1	4
ADC - By Networking with other professionals and customers	0	1	0	0	0	0	0	1	0	0	1	0	1	0	0	0	0	0	0	2	6
ADC - Through customer enlightment	0	0	0	1	0	0	0	0	0	0	1	0	0	1	0	0	1	1	0	1	6

ADC - Through Social Media Engagement	1	1	0	1	1	0	1	0	0	1	1	0	0	1	0	0	0	1	1	1	11
ADC - By spying the competitors	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
ADC - Feedback from affiliates/parent organizations	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1
ADC - Identify Problems	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1
ADC - Looking for needs	0	0	1	0	0	0	0	0	0	1	1	1	0	0	0	1	1	0	0	0	6
ADC - Print Media Advertisement	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	2
ADC - Social Media Advertisement	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1	1	0	3
ADC - Through Feedback	0	1	0	2	0	1	0	0	1	0	0	1	1	0	0	1	1	2	0	0	11
ADC - Through Referrers	1	1	0	1	1	1	1	1	1	1	0	1	0	1	0	1	0	0	1	0	13
ADC - Through Family and Friends	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1
ADC - Through freebies	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1	0	0	0	0	2
ADC - Through Internet based technologies	0	0	0	1	0	1	1	0	2	0	0	0	0	0	1	0	0	0	1	0	7
ADC - Through market segmentation	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1
ADC - Word of Mouth Marketing	0	0	0	0	0	0	0	0	1	0	0	1	0	1	1	0	0	2	1	1	8
ADC- Through review of government policies	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1	1	0	0	3
ADC- Through Souvenirs / Advertisements	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
Sub-Totals	**2**	**4**	**2**	**7**	**3**	**4**	**3**	**4**	**5**	**4**	**5**	**6**	**4**	**6**	**2**	**5**	**4**	**8**	**5**	**6**	**89**
Aggregate	**5**	**8**	**5**	**14**	**8**	**11**	**9**	**8**	**13**	**8**	**12**	**12**	**10**	**11**	**5**	**12**	**8**	**14**	**10**	**13**	**197**

Appendix 8

Normality Assessment

Observed Variables /Constructs	Mapping	skew	kurtosis
Mobile app usage			
We use mobile apps to provide feedback to customers.	MAU1	-.490	-1.359
We use mobile apps to get referrals	MAU2	-.559	-1.313
We use mobile apps to chat or text.	MAU3	-1.066	-.494
We use mobile apps to store contacts, document or recorded conversation.	MAU4	*Deleted	
We use mobile apps for virtual meetings.	MAU5	.542	-1.443
We use mobile apps for advertisement and marketing.	MAU6	-.195	-1.675
We use mobile apps to organise and plan our schedules (reminders)	MAU7	.151	-1.686
We use mobile apps to search the internet for get desired information	MAU8	-.609	-1.332
We use mobile apps for analysing information.	MAU9	-.282	-1.610
We use mobile apps for accounting and book/keeping	MAU10	.360	-1.619
We use mobile app to sell our products and services.	MAU11	-.249	-1.659
We use mobile apps for payments and collections	MAU12	-.219	-1.680
We use mobile apps for learning	MAU13	-.260	-1.636
We use mobile apps for managing job orders	MAU14	-.173	-1.670
We use mobile apps to create online content like blogs/news/articles	MAU15	.127	-1.773
Seizing Opportunity			
We prevent threats through usage of mobile apps.	OSeC5	-1.004	-.313
We deploy (position) resources through mobile apps usage	OSeC4	-1.424	.953
Using mobile apps helps us to block loop holes in business	OSeC3	-.856	-.507
Using mobile apps helps use to reduce risks	OSeC2	-.885	-.435
Using mobile apps helps use to speedily implement our ideas	OSeC1	-1.453	1.100
Shaping Opportunity			
We analyse threats while using mobile apps	OShC5	-.865	-.610
We analyse opportunities through while using mobile apps	OShC4	-1.014	-.163
Through the mobile apps, we identify risks associated with opportunities	OShC3	-1.072	-.037

Through the use of mobile apps, we understand opportunities better	OShC2	-1.165	.424
Mobile apps help us to separate profitable business opportunities from unprofitable ones	OShC1	-1.270	.402
Sensing Opportunity			
Through the use of mobile apps, we foresee opportunities	OSC1	-.932	-.276
Mobile apps help use to identify opportunities	OSC2	-1.151	.282
We become conscious of opportunities through mobile apps	OSC3	-1.359	.813
We create opportunities by using mobile apps	OSC4	*Deleted	
We discover hidden opportunities when we use mobile apps	OSC5	*Deleted	
Innovative Capability			
Mobile apps allow us to easily imitate and adapt offerings	IC3	*Deleted	
We use mobile apps to adjust how we package or price our products	IC2	-1.254	.595
Mobile apps help our sales and procurement	IC1	-1.687	1.997
Absorptive Capability			
Mobile apps help us to work /interact virtually with other people	AbC7	*Deleted	
We easily change the packaging and pricing of our offering with mobile apps	AbC6	*Deleted	
Through mobile apps usage, we identify sales opportunities	AbC5	-1.268	.213
Information become clearer when we use mobile apps	AbC4	-1.408	1.126
Mobile apps help in research and training	AbC3	-1.557	1.503
Mobile apps help us to meet customers' expectations faster	AbC2	*Deleted	
We use mobile apps to make our offering suitable to specific customer or situation	AbC1	*Deleted	
Adaptive Capability			
We network with people and advertise through mobile apps	AdC5	-1.454	.856
Mobile apps help us to identify business needs or problems	AdC4	-1.470	1.322
We interact with customers through mobile apps	AdC3	-2.555	6.950
Mobile apps help us maximise social media and Internet usage	AdC2	*Deleted	
We got feedback and referrals through mobile apps	AdC1	*Deleted	

*Items were deleted to improve model fits.

Appendix 9

Reliability and Validity Assessment

Constructs	Observed variables	Factor loading	P value	Cronbach α	CR	AVE	Final number of Items (and Initial)
Adaptive Capability	AdC3	.538	***	0.695	0.694	0.434	3 (5)
	AdC4	.713	***				
	AdC5	.710	***				
Absorbtive Capability	AbC3	.684	***	0.734	0.736	0.482	3 (7)
	AbC4	.736	***				
	AbC5	.660	***				
Innovative Capability	IC1	.605	***	0.712	0.743	0.601	2(3)
	IC2	.914	***				
Sensing Opportunities	OSC3	.771	***	0.817	0.819	0.602	3 (5)
	OSC2	.823	***				
	OSC1	.731	***				
Shaping Opportunities	OShC1	.642	***	0.872	0.865	0.563	5(5)
	OShC2	.746	***				
	OShC3	.813	***				
	OShC4	.765	***				
	OShC5	.775	***				
Seizing Opportunities	OSeC1	.745	***	0.894	0.892	0.623	5 (5)
	OSeC2	.812	***				
	OSeC3	.804	***				
	OSeC4	.723	***				
	OSeC5	.856	***				
Mobil App Usage	MAU11	.868	***	0.955	0.954	0.599	14(15)
	MAU10	.721	***				
	MAU9	.836	***				
	MAU8	.750	***				
	MAU7	.758	***				
	MAU6	.845	***				
	MAU5	.665	***				
	MAU1	.785	***				
	MAU2	.776	***				
	MAU3	.680	***				
	MAU15	.728	***				
	MAU14	.817	***				
	MAU13	.791	***				
	MAU12	.781	***				

Notes:
*****: significance at 0.01 level : CR= composite reliability; AVE: Average variance extracted**

Appendix 10

Regression Weights

Dependent variables		Independent Variables	Est.	P value	Hypothesis conclusion
Absorptive Capability	<---	Mobil App Usage	.489	***	Mobil App Usage has a positive and significant effect on Absorptive Capability as its P value (***) is lower than .05. Meaning when Mobil App Usage goes up by 1 standard deviation, Absorptive Capability also goes up by 0.489 of its own standard deviation.
Innovative Capability	<---	Mobil App Usage	.512	***	Mobil App Usage has a positive and significant effect on Innovative Capability as its P value (***) is lower than .05. Meaning when Mobil App Usage goes up by 1 standard deviation, Innovative Capability also goes up by 0.512 of its own standard deviation.
Adaptive Capability	<---	Mobil App Usage	.450	***	Mobil App Usage has a positive and significant effect on Adaptive Capability as its P value (***) is lower than .05. Meaning when Mobil App Usage goes up by 1 standard deviation, Adaptive Capability also goes up by 0.450 of its own standard deviation.
Shaping Opportunities	<---	Absorptive Capability	.994	***	Absorptive Capability has a positive and significant effect on Shaping Opportunities as its P value (***) is lower than .05. Meaning when Absorptive Capability goes up by 1 standard deviation, Shaping Opportunities also goes up by 0.994 of its own standard deviation.
Shaping Opportunities	<---	Innovative Capability	-.248	***	Innovative Capability has a negative and significant effect on Shaping Opportunities as its P value (***) is lower than .05. Meaning when Innovative Capability goes up by 1 standard deviation, Shaping

					Opportunities also goes down by 0.248 of its own standard deviation.
Sensing Opportunities	<---	Absorptive Capability	.859	***	Absorptive Capability has a positive and significant effect on Sensing Opportunities as its P value (***) is lower than .05. Meaning when Absorptive Capability goes up by 1 standard deviation, Sensing Opportunities also goes up by 0.859 of its own standard deviation.
Sensing Opportunities	<---	Innovative Capability	-.148	***	Innovative Capability has a negative and significant effect on Sensing Opportunities as its P value (***) is lower than .05. Meaning when Innovative Capability goes up by 1 standard deviation, Sensing Opportunities goes down by 0.148 of its own standard deviation.
Seizing Opportunities	<---	Absorptive Capability	.946	***	Absorptive Capability has a positive and significant effect on Seizing Opportunities as its P value (***) is lower than .05. Meaning when Absorptive Capability goes up by 1 standard deviation, Seizing Opportunities also goes up by 0.946 of its own standard deviation.
Seizing Opportunities	<---	Innovative Capability	-.267	***	Innovative Capability has a negative and significant effect on Seizing Opportunities as its P value (***) is lower than .05. Meaning when Innovative Capability goes up by 1 standard deviation, Seizing Opportunities goes down by 0.267 of its own standard deviation.

*** indicates significant relationship at the level 0.0001

Appendix 11

Certificate of Editing

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Certificate of Editing

To whom it may concern

This is to certify that the manuscript detailed below was edited by an English language academic editor.

Estee Wiese
estee.wiese@gmail.com

Date:	*07/05/2018*
Manuscript Title:	*Enhancing Small Business Through Mobile Apps: A Case Study from Lagos, Nigeria*
Manuscript Author:	*Adebowale Oluropo Owoseni*
Institution:	*University of South Africa* *Student number: 57264392*

Appendix 12

Turnitin Originality Report

Document Viewer

Turnitin Originality Report

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ENHANCING SMALL BUSINESS THROUGH MOBILE APPS:... By Adebowale Owoseni

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