DETERMINANTS OF MOBILE TECHNOLOGY ADOPTION FOR THE IMPROVEMENT OF SUPPLY CHAINS OF SMALL AND MEDIUM ENTERPRISES

by

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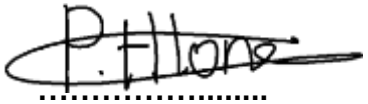
DECLARATION

I declare that the DETERMINANTS OF MOBILE TECHNOLOGY ADOPTION FOR THE IMPROVEMENT OF SUPPLY CHAINS OF SMALL AND MEDIUM ENTERPRISES hereby submitted to the University of Limpopo, for the degree of Master of Commerce in Business Management has not previously been submitted by me for a degree at this or any other university; that it is my work in design and in execution, and that all material contained herein has been duly acknowledged.

Hlongwane Paseka (Ms) 31 MARCH 2022

Signature



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ABSTRACT

The purpose of this study is to investigate the factors influencing the use of mobile technology in SMEs for the improvement of the supply chain**.** The study uses the Technology Acceptance Model (TAM) and Technology Readiness Index (TRI) as theories. This study has four objectives: (1) To identify the determinants of the use of mobile technology in supply chains of SMEs, (2) To determine the level of adoption of mobile technology in the supply chain of SMEs, (3)To determine the relationships between determinants of the use of mobile technology and the adoption of mobile technology in the supply chain of SMEs, and (4) To determine the relationship between mobile technology adoption and supply chain performance.

The study uses a quantitative approach. Exploratory and correlation research is used to determine the determinants of adoption of mobile technology. The study population are SMEs in Polokwane Local Municipality. A sample of 122 is used and a self-administered questionnaire is used to collect primary data. Data analysis is carried out utilising SPSS version 27. A Cronbach alpha test is carried out to measure the internal reliability of the research instrument. The results show that there are positive relationships between determinants of the use of mobile technology and the adoption of mobile technology in the supply chain of SMEs and that there is a positive relationship between mobile technology adoption and supply chain performance. It is recommended to businesses to take into consideration the determinants of mobile technology adoptionin attempting to improve their supply chain performance and to adopt the mobile technology to enhance productivity and the processes of supply chain for those who have not adopted it. The research contributes to the knowledge about the factors influencing the use of mobile technology in SMEs for the improvement of supply chains

Key words: Mobile technology; mobile SCM; supply chain; supply chain performance; TAM; TRI; perceived usefulness; perceived ease of use; technology readiness; environmental factors; organisational factors; Polokwane local municipality.

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CHAPTER ONE

INTRODUCTION TO THE STUDY

1.1. INTRODUCTION AND BACKGROUND

Supply Chain Management (SCM) is the management of connecting the processes and tasks of the business into a “high-performing business model” in the organisation. Supply chain management is “the management of upstream and downstream relationships with suppliers and customers in order to deliver superior customer value at less cost to the supply chain as a whole” (Martin, 2011:3). SCM is about relationship building between the seller and the buyer (Anca, 2019). It includes ‘manufacturer, suppliers, transporters, warehouses, wholesalers, retailers, other intermediaries and customers (Felea & Albăstroiu, 2013).

SCM therefore includes the effective coordination of material, product, delivery, payment, and information flows between enterprises and trading partners (Zanela, Gomes da Marques & Rafael, 2014). This coordination requires communication between the various constituents of the supply chain (Avittathur & Jayaram, 2016). One of the communication tools is the use of mobile devices. Mobile technology use in SCM enterprises is the application of mobile and wireless technologies in organisational processes. It encompasses services in terms of technology, connectivity, and context awareness services (Zanela *et al.,* 2014).

E-business is also known as e-commerce refers to how business partners interact with each other via the use of the internet. Furthermore, it entails how existing businesses transform their supply chain processes into the effective one. Information technology (IT) initiated e-business (Wagner & Sweeney, 2011). The use of e-business in the firm allows businesses to exchange information and to have electronic transactions with their stakeholders, this done through the internet (Wagner & Sweeney, 2011). The adoption of e-business measures how internet technologies affect the activities and processes of supply chains. This means that facilitating “customer-facing activities, including product or service sales, distribution, aftersales support, product testing, and market research” (Hafeeza, Keoy, Zairi, Hanneman & Koh, 2010).

Mobile technologies have a significant role in the economy of the country (Car, Pilepić& Šimunić, 2014) and organisations need to take into consideration the role of mobile technologies in the supply chain (Anca, 2019). Mobile Supply Chain Management (MSCM) has the advantages of increasing the efficiency of information flows, little variation in decision making, dynamic supply chain optimisation and control of supply chain properties/resources as well as activities (Schoenherr, 2016). Mobile technologies have played a vital role in SCM (Chana & Chong, 2013).

The use of mobile technology has become common in some supply chains of the Small Medium Enterprises (SMEs) (Krotov, Junglas & Steel, 2015). The mobile technologies in the organisation are utilised to improve the communication between the buyer and the seller in terms of business transactions, but there are some of the businesses that do not use mobile technology (Zanela *et al.,* 2014). The initial use of mobile devices in the supply chain started during the late 1990s as "stand alone" devices (Kalem, Kurt, Vayvay & Kalender, 2016).

The usage of mobile technology in SCM is still in its infancy and it is labelled as mobile supply chain management (Chana & Chong, 2013; Schoenherr, 2016). Mobile SCM is a combination of "software and mobile devices" that it is used to engage with stakeholders in the business for supply chain purposes (Schoenherr, 2016). In this manner, quick decisions can be made, and communication improved using this mobile technology (Schoenherr, 2016).

Mobile devices are utilised by managers in the supply chain. Mobile technology is utilised to track the movement of goods within the warehouse and the mobile devices are fast replacing bulky scanners in the supply chain. Mobile devices are being utilised by delivery teams, logistics teams, warehouse management teams and other teams involved in supply chain management (Mngomezulu, 2019).

Mobile technologies include devices such as "Radio Frequency Identification (RFID), Wi-Fi, Global Position System (GPS), Wireless Sensors, Personal Digital Assistants (PDA), and Geographic Information Systems (GIS)". These devices give the supplier and the buyer an unbroken communication of information between them at any specific period of time (Chana & Chong, 2013). These tools are utilised in networks of "Internet of things" as an interconnection via the internet of computing devicesembedded in everyday objects, enabling them to send and receive data. An "Internet

of things" permits its uses to track their products or orders around the world (Chana & Chong, 2013).

In addition, Mobile technology is rapidly adopted in the business. With mobile devices, one can easily do tasks that are usually done by using personal computers back in the days (Callum, 2011). However, mobile technology has changed the way of conducting supply chains.

For a better performance of the supply chain, it is a necessity for SMEs to manage activities that are involved in supply chain (Chen, Baihaqi & Arifin, 2014). In some countries, the use of technology is genuine, and it is mainly focusing on the growth of a useful SCM scheme. Nevertheless, the responsibility of technology is to develop the business's capabilities in SCM in order to have an advantage when it comes to unpredictable markets. Hence, some organisations make means of achieving economical gain because of new technologies in their supply chain (Asrol, Marimin & Machfud, 2017).

The performance of supply chain is better in the businesses when there is a greater impact on the activities or plans on how to control the supply chain performance. However, performance in the business is not extensively controlled by decision-making but by all actions of all stakeholders in the supply chain (Marwah, Thakar & Gupta, 2014).

Mobile technology is likely to increase the performance of supply chain in SMEs. Since mobile technology has the potential to increase the performance of supply chain, the usage of this technology is vital to almost all SMEs in South Africa.

Most researchers have studied supply chain management and information technology but there is a gap in the use of mobile technology in supply chain management for SMEs. Therefore, the study determines factors affecting the use of mobile technology for the improvement of supply chain performance.

1.2. PROBLEM STATEMENT

Mobile technology is also known as digital technology, where users use their mobile smartphones and Personal Computers (PC) to communicate and to use software systems for their personal lives and for the purpose of the business (Elsobeihi & Abu-Naser, 2017).

The use of mobile technology in SCM gives organisations the opportunity to quickly recognise and connect with potential customers, by way of improving the operational efficiency and the processes (Zanela *et al.,* 2014). There are factors influencing the use of mobile technology in a supply chain. These factors are environmental factors (internal and external), conditions of the firms as well as the national and international involvement (Hafeeza *et al.,* 2010). The problem is that the relationships between the factors and the use of mobile technology have not been established for supply chain management in SMEs. The researcher, therefore, explores the factors influencing/ affecting the use of mobile technology in supply chains, the adoption of mobile SCM in SMEs and evaluates the effectiveness of mobile supply chain management in SMEs.

This research concentrates on the determinants of mobile technology adoption for the improvement of the performance in supply chains of small businesses. Furthermore, the level of adoption of mobile technology in the supply chain of SMEs is investigated. This study focuses only on small businesses that operate within Polokwane Municipality.

1.3. SIGNIFICANCE OF THE STUDY

Most of the previous studies have examined the use of Information Communication Technology (ICT) in supply chains but there is a gap in the use of mobile technology in supply chain management for SMEs. Therefore, this study assists in closing the gap by identifying the determinants of mobile technology adoption in supply chains. The use of mobile technology in supply chains results in costs reduction and better communication between the organisation and its suppliers and their customers. This study can assist in providing information about improving the use of mobile technology usage in supply chains of SMEs by identifying the determinants of mobile use improvements to supply chain performance. It is also useful to those who wish to start their businesses in order to know which technology they can use for their businesses.

1.4. AIM OF THE STUDY

The aim of the study is to identify the determinants of mobile technology adoption for the improvement of the performance in supply chains of SMEs.

1.5. OBJECTIVES OF THE STUDY

The objectives of this study are as follows:

- To identify the determinants of the use of mobile technology in supply chains of SMEs.
- To determine the level of adoption of mobile technology in the supply chains of SMEs.
- To determine the relationships between determinants of the use of mobile technology and the adoption of mobile technology in the supply chains of SMEs.
- To determine the relationship between mobile technology adoption and supply chain performance.

1.6. RESEARCH HYPOTHESES

Ho1: There is no relationship between perceived usefulness of mobile technology and adoption of it in SMEs.

Ha1: There is a positive relationship between perceived usefulness of mobile technology and adoption of it in SMEs.

Ho2: There is no relationship between perceived ease of use of mobile technology and adoption of mobile technology in SMEs.

Ha2: There is a positive relationship between perceived ease of use of mobile technology and adoption of mobile technology in SMEs.

Ho3: There is no relationship between technology readiness for mobile technology and adoption of mobile technology in SMEs.

Ha3: There is a positive relationship between technology readiness for mobile technology and adoption of mobile technology in SMEs.

Ha4: There is a positive relationship between environmental factors of mobile technology and adoption of mobile technology in SMEs.

Ho4: There is no relationship between environmental factors of mobile technology and adoption of mobile technology in SMEs.

Ha5: There is a positive relationship between organisational factors of mobile technology and adoption of mobile technology in SMEs.

Ho5: There is no relationship between organisational factors of mobile technology and adoption of mobile technology in SMEs.

Ho6: There is no relationship between adoption of mobile technology and improvement in supply chain performance in SMEs.

Ha6: There is a positive relationship between adoption of mobile technology and improvement in supply chain performance in SMEs.

1.7. DEFINITION OF CONCEPTS

- **Mobile Technology**

Binbasioglu and Turk (2020) define mobile technology as a system that can be used everywhere by people or organisations in their related fields mostly in cellular communication. This study considers mobile smartphones or portable laptops as mobile technology to complete tasks in the supply chain of SMEs by using electronic software to communicate between suppliers and customers.

- **Perceived Usefulness**

Perceived usefulness of technology is the process of using a technology system in expectation that the work will improve due to the use of the system (Leon, 2018; Karamchandani, Srivastava & Srivastava, 2019). In the context of this research, perceived usefulness of technology is the usefulness of mobile technology devices to improve the performance of supply chain in SMEs.

- **Perceived Ease of Use**

Perceived ease of use is a characteristic of a technology in which individuals expect no harm either physical or mental when using the system or technology (Leon, 2018). When users continue to use a system or technology, it implies that its features are easy to use or they are willing to adopt the system and develop some training to use it (Hamid, Razak, Bakar & Abdullah, 2016). For this study, the perceived ease of use is considered as a belief that their businesses will continue to use mobile technology in supply chains of the SMEs if it is easy to use and is harmless to them.

- **Technology Readiness**

Technology readiness describes people's goals to embrace and use technology, which are dependent on their perspective rather than their skills with the acknowledgment that advanced abilities may affect the perspective (Parasuraman & Colby, 2015). In this context, technology readiness will be the perception of users of their skills to use mobile technology and devices to communicate in the supply chain.

- **Environmental Factors**

Environmental factors are the external factors that affect the ongoing of the business. These factors can be visible or non-visible (Bush, 2016). Environmental factors are also known as ecological factors. In this study, environmental factors will be used as external factors that influence the use of mobile technology in the supply chain.

- **Organisational Factors**

Organisational factors are factors that affect the scope, the size, and the structure of the business (Feibert & Jacobsen, 2019). Organisational factors refer to "the conditions such as readiness to provide support by managers and are used to indicate whether or not firms have the technical and financial resources for technical investments" (Wong, Leong, Hew, Tan & Ooi, 2020:683). In this context, organisational factors are internal factors that influence the use of mobile technology in the supply chain.

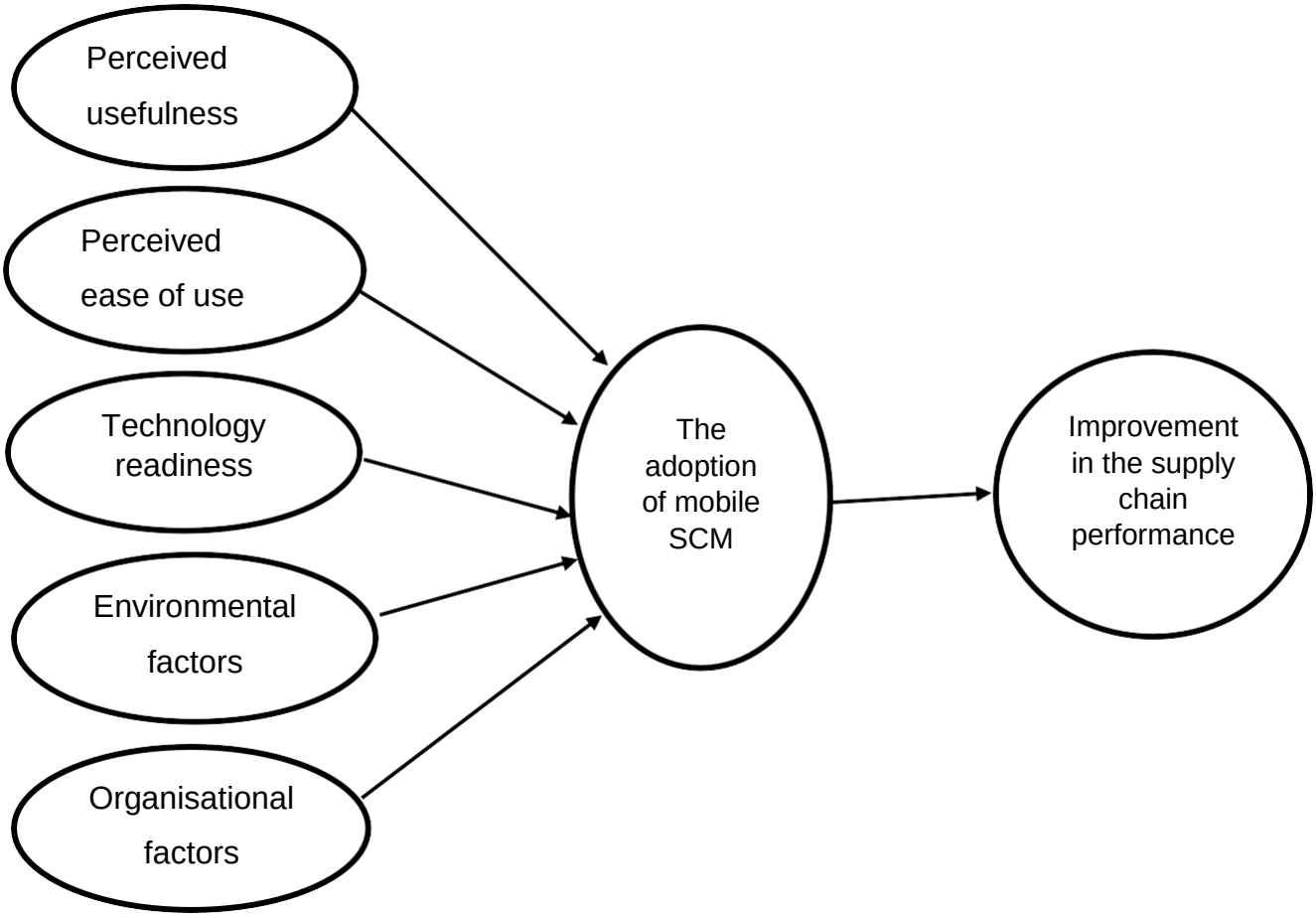
1.8. LITERATURE REVIEW

The literature review is discussed in detail in chapter two

The study adopts the theory of the Technology Acceptance model (TAM) and Technology Readiness Index (TRI). The TAM is adopted to examine the use and the adoption of technology, while TRI is adopted to explore how individuals perceive the use of new technology and the readiness for adoption of technology. TAM is a theory that explains the use and the adoption of technology. This theory is utilised to examine the acceptance behaviour of different technologies (Schoenherr, 2016). TRI theory is about how individuals perceive the use of new technology and how their minds are ready for adoption of technology (Sohaib, Hussain, Asif & Ahmad, 2020). In the past, TRI and TAM were combined to forecast the adoption of technology (Kamble, Gunasekaran & Arha, 2019).

The Conceptual model for this study (figure 1.1), it is adopted to make assumptions about the hypotheses. The use of mobile technology in supply chains of SMEs is determined by perceived usefulness, perceived ease of use, technology readiness, environmental factors, and organisational factors. These determinants influence the adoption of mobile SCM, which results in the improvement in the supply chain performance. Below is the conceptual model of the study, which shows how the hypotheses were developed.

Figure 1.1: **Determinants of adoption of Mobile technology in the supply chain**



Source: Author's own conception.

The relationship between variables is evaluated. The relationship between perceived usefulness of mobile technology and the adoption of mobile SCM; the relationship between perceived ease of use of mobile technology and the adoption of mobile SCM; the relationship between technology readiness and the adoption of mobile SCM. Also, the relationship between environmental factors and the adoption of mobile SCM, the

relationship between organisational factors and adoption of mobile SCM; and improvement in supply chain performance.

1.9. RESEARCH METHODOLOGY

The research methodology is discussed in detail in chapter three. This study uses the research methodology outlined below:

This study uses a quantitative research design. The researcher determines the determinants of adoption of mobile technology and analyses the relationships as postulated in the research hypotheses using quantitative design. The research study population is small business owners who use mobile technology for the improvement of the performance in supply chain within the area of Polokwane Local Municipality in the Limpopo province of South Africa. From a list of all registered SMEs in Polokwane municipality a sample of 122 is drawn. The researcher with a self-administered questionnaire (survey) collected primary data. The researcher supplied the survey to the participants (SMEs), and it was collected immediately afterwards. The questionnaire consists of closed questions.

The research uses the statistical Package for Social Sciences (SPSS27) for the analysis of the collected data. The study uses descriptive statistics to summarise the primary data obtained from the participants. The inferential statistics are utilised to test the hypotheses and the relationships among the independent and dependent variables.

1.10. CONCLUSION

This chapter provides an outline of the research study. The chapter outlines the introduction of the study and the problem statement, the delimitation and the significance of the study.

In chapter 2, the theoretical framework is discussed, and a detail of the empirical study is provided. Chapter 3 outlines the research methodology used by the researcher to collect the primary data. In chapter 4, the findings and conclusions are discussed. Lastly, in chapter 5 the recommendations are discussed.

CHAPTER TWO

LITERATURE REVIEW

2.1. INTRODUCTION

The previous chapter outlined the context of the research, and this chapter outlines the literature review. The purpose of literature review is to help the researcherto prepare a road map or framework towards achieving the objectives of the study. Therefore, this chapter will present the theoretical concepts that relates to the study, the use and adoption of mobile technology in supply chains of SMEs and theimprovement in supply chains.

2.2. THEORETICAL LITERATURE REVIEW

A variety of theories and models have been developed to investigate the adoption of technology in SMEs, including the Diffusion Of Innovation (DOI), Theory of Reasoned action (TRA), Technology Organisation Environment (TOE), Theory of Planned Behavior (TPB), Unified Theory of Acceptance and Use of Technology (UTAUT). Nevertheless, this study only focuses on the theory of Technology Acceptance Model (TAM) and Technology Readiness Index (TRI).

2.2.1. The Technology Acceptance Model

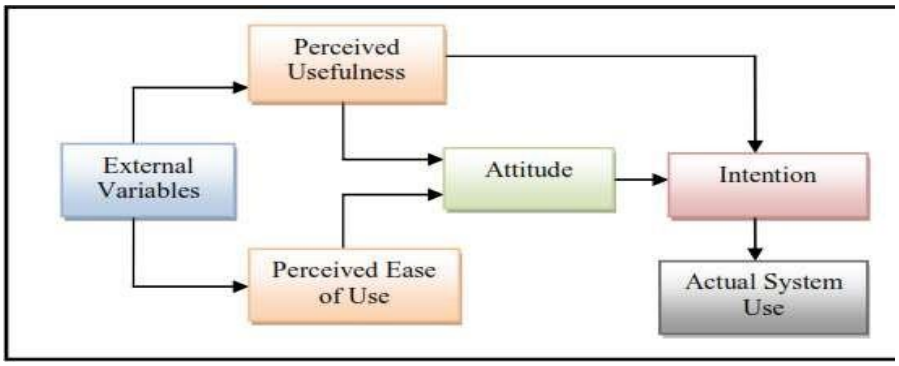
TAM is a theory that explains the use and the adoption of technology. This theory is utilised to examine the acceptance behaviour of different technologies. Fishbein and Ajzen developed it in 1975 (Schoenherr, 2016). The TAM model emphasises two aspects, which are the environment of adoption and the type of innovation. Nonetheless, the purpose of establishing TAM is for technology adoption. The technology acceptance largely depends on how individuals observe the usefulness of technology, the convenience of technology, the resource quality, and the perceived ease of use (MacCallum, 2011).

TAM is a well-known tool for estimating the use of technology in the firms and for describing the procedures of technology adoption and the views of different people on its value and simplicity of use (Kamble *et al.,* 2019). The acceptance of these technologies is measured by “perceived usefulness and perceived ease of use”, and

it influences the use of technology (Lin & Lin, 2014). The essential element of TAM is the power it has to predicting the use of technology (Kamble *et al.,* 2019).

Technology adoption in any environment is determined by the attitude of individuals (MacCallum, 2011). Attitude toward a system is an element of whether the system could be used or rejected (Mathu & Tlare, 2017). A positive attitude of individuals will have a great result towards the use of technology. This attitude used to influence the perceived usefulness and perceived ease of use of technology in the earlier version of TAM model, but in the latest model the attitude was removed (MacCallum, 2011). The figure below is a TAM model, which shows the relationship between perceived usefulness, perceived ease of use and the behavioural intention to use.

Figure 2.1: Technology Acceptance Model.



Source: adopted from Ajibade (2018:5).

The TAM model shows the relationship between the perceived usefulness and perceived ease of use that results in the behavioural intentions to use the actual system. The model entails how systems usage as used as a response to describe the link, which is directly influenced by the perceived usefulness and the perceived ease of use considering the features and capabilities of the actual systems (Mathu & Tlare, 2017).

Literature shows that the TAM model has some criticism by other researchers, who claims that when it comes to the results, the model is not reliable because there is no consistency, and it is not conclusive. MacCallum (2011) conducted a study to discourse the criticism of other authors about the TAM model, of which the results show that TAM is a good model for influencing technology adoption (MacCallum, 2011).

2.2.2. The Technology Readiness Index

According to Ariani, Napitupulu, Jati, Kadar & Syafrullah (2018), there is not enough collected work or information on how to measure technology readiness in SMEs. However, some researchers have studied the technology readiness in SMEs with different approaches.

Nonetheless, the Technology Readiness Index is a theory that is utilised to measure the organisation's readiness in terms of technology (Parasuraman & Colby, 2015). A theory that is used to measure individuals' beliefs and thoughts about technology and to determine whether an individual has used technology or not. In addition, TRI can group users of technology based on their beliefs and thoughts, which can be positive or negative (Santosa, Larasati & Widyawan, 2017).

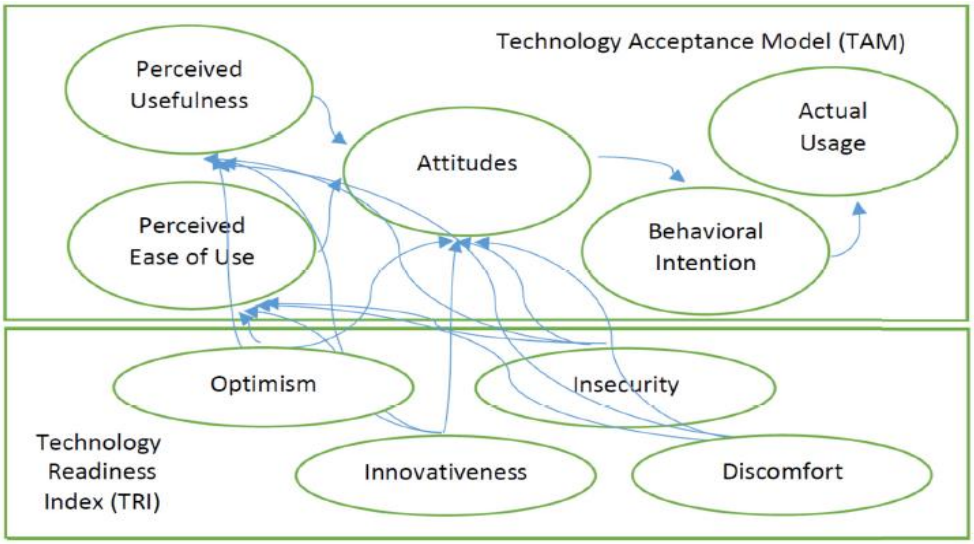
TRI is about how individuals perceive the use of new technology and how their minds are ready for adoption of technology. The level of readiness in adoption of new technology is primarily on positive or negative appraisals of technology (Yeo, Al-Ashwal, Handayani & Lee, 2017). A full acceptance of technology indicates the positive attitudes towards the service or product while consumers with a negative attitude towards the technology are resisting the adoption of technology (Sohaib *et al.,* 2020). The Technology readiness index is a theory that considers individuals' differences (Lai & Lee, 2020).

Sohaib, Hussain, Asif & Ahmad (2020) point out that technology readiness is divided into four dimensions, namely innovativeness, optimism, discomfort, and insecurity. The study of Hallikainen, Alamäki & Laukkanen (2019) reveals that optimism and innovativeness could drive the utilisation of business mobile and discomfort and insecurity can have a negative impact on the phenomenon of the theory of technology readiness.

In the past years, there was a combination of the technology readiness index and the technology acceptance model. The combination was utilised to forecast the level of technology adoption in business sectors (Kamble *et al*., 2019). Furthermore, the combination is spontaneous even though the measures of TAM are precise on a certain technology. On the other hand, the measures of TRI focus on the individual's beliefs towards the products and services of technology (Ferreira, Rocha & Ferreira

da Silva, 2014). However, the measures of TAM directly affect the measures of TRI (Lai & Lee, 2020).

Figure 2.2: Integrative model of TAM and TRI.

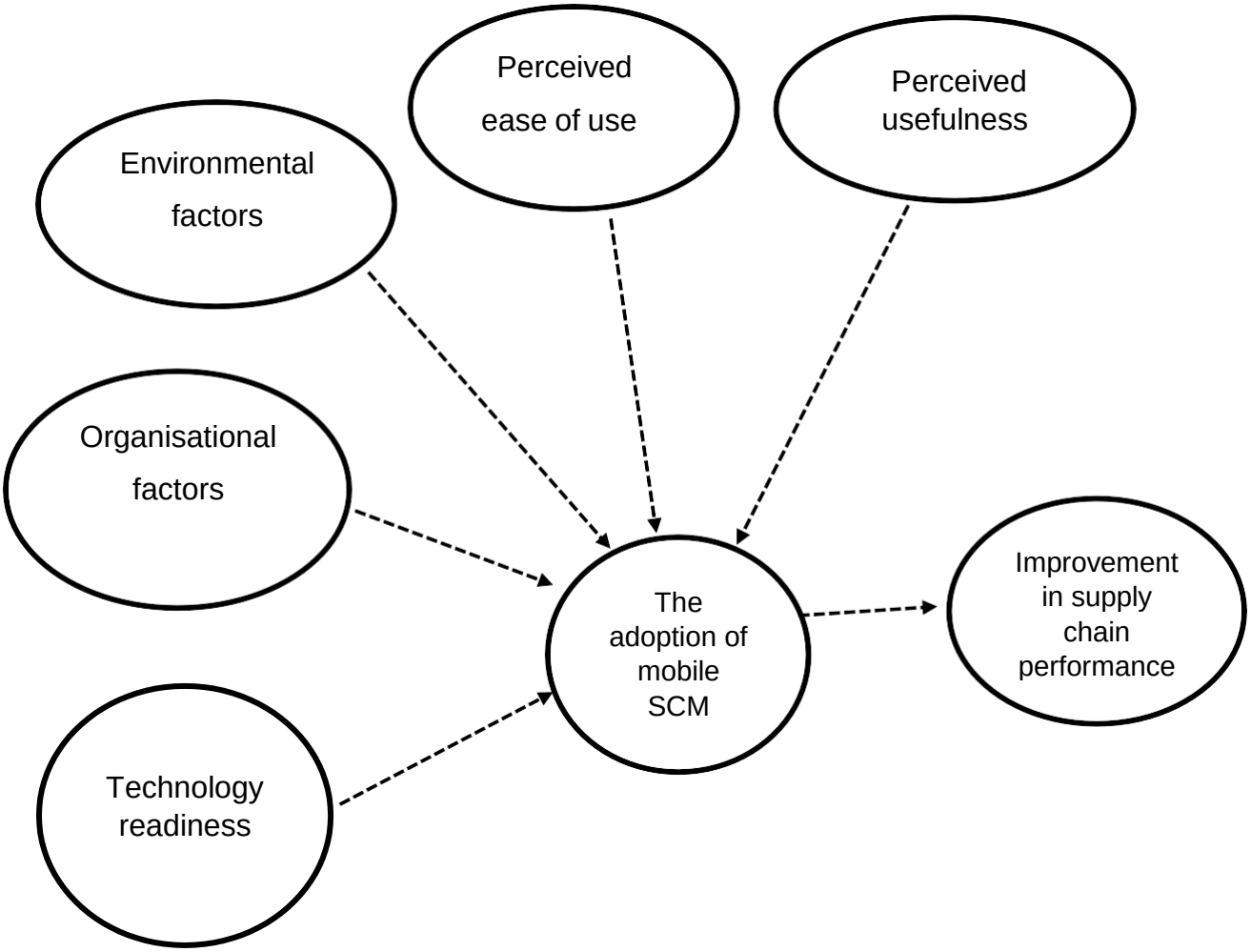


Source: adopted from Lai & Lee (2020).

Lai & Lee (2020) indicate, “The growth of highly sophisticated technological products has resulted in fundamental transformations in the interaction with users whichindicate attention to the readiness of people is needed“. TRI has the possibility of affecting individuals’ cognitive views that are related to technology adoption. For instance, the excitement, anxiety, frustration, and confusion that an individual faces during and after the adoption of technology. However, it has played a vital part in the convention of new technology. Hence, it is vital for users to master and understand how to utilise the system of technology (Ferreiraa *et al.,* 2014).

There are factors affecting the adoption of mobile SCM in supply chain management (Barata & Cunha, 2016). This means that there are factors contributing to the transition of mobile SCM from traditional SCM (Badenhorst-Weiss, Van Biljon & Ambe, 2017). Barata and Cuhna (2016) suggest that supply chain managers must support mobile technologies in order to gain trust among supply partners and to be committed to their activities. They further state that the adoption of mobile technology has some contradictions. The mobile technology usage at organisations contains mobile devices and applications. There are many factors or drivers persuading the mobile technology usage in supply chains. This study focuses on three factors and two moderating factors of perceived ease of us end perceived usefulness as shown below.

Figure 2.3: Determinants of adoption of Mobile technology in the supply chain



Source: Author's own conception.

2.2.3. Conceptual Framework

The conceptual framework refers to theories that explain the patterns and connections of the study, which help the researcher to understand the findings of the study. It is about transaction of "confusion to certainty" (Fisher, 2010). The study uses the researcher's own conception guided by objectives of this study and consistent literature review.

2.3. EMPIRICAL LITERATURE REVIEW

Technology is continuously improving the way of running a business and affects several units in the firm. Zainal, Fontana & Wijanto (2016) state that the success of technology adoption depends on how consistently the business is in terms of using the particular technology, which enhances a business to gain competitive advantage and better performance. Mobile SCM has drastically changed the way supply chain mangers conduct their activities (Badenhorst-Weiss *et al.,* 2017). Mobile SCM in SMEs is a method which aids the business to operate in a responsive way by incorporating activities of the stakeholders that have effective cost reduction (Khan, Liang & Shahzad, 2014).

Barata and Cuhna (2016) state that the adoption of mobile SCM has some drawbacks. Supply chain managers first need to familiarise themselves with this mobile SCM activity. The adoption differs in terms of the aim to use technology, certain situations in the organisation and the organisational culture (Leon, 2018).

Work practices are changing due to the use of mobile technology in entities such as SMEs. The mobile technology is it not introduced to SMEs to enhance work practices but to attain better performance in SCM (Magotra, Sharma & Sharma, 2018). However, it is essential for SMEs to know the relationship among technology, work practices and planning if they need better work practices and improved performance using technology. These three variables need a proper plan in order to have a better performance in SMEs (Muhanguzi & Kyobe, 2014).

In some countries like Indonesia, SMEs were obligated to adopt the electronic business or the online business in order to survive in the economy or competitive world. This also occurred in South Africa because most customers of SMEs prefer using online systems rather than the traditional (Mathu & Tlare, 2017).

2.3.1. The determinants of the use of mobile technology in the supply chains of SMES.

Supply chains are no longer limited in the use of mobile technology**.** Supply chains use smartphones to manage the business's daily activities and to have easy and quick communication between suppliers and customers; they also encourage employees to use their own mobile devices (Badenhorst-Weiss *et al.,* 2017). The use of mobile SCM

in SMEs, allows businesses to exchange information and to have electronic transactions with their stakeholders (Wagner & Sweeney, 2011). Chuang (2019) point out that mobile technology usage in supply chains could enhance a system that is more responsive in terms of controlling the chains of the business.

The use of mobile technology in supply chains of SMEs could determine perceived usefulness, perceived ease of use, technology readiness, environmental factors, and organisational factors.

2.3.1.1. Perceived Usefulness

Perceived usefulness is utilised as a vital element in influencing the adoption of mobile SCM in SME (Singh & Sinha, 2020). In any community, for any technology to be accepted, individuals and business owners must be certain that there are benefits in using it (Blut & Wang, 2020). Perceived usefulness of technology its using a technology system in expectation that work will improve due to the use of the system (Leon, 2018; Karamchandani, Srivastava & Srivastava, 2019). In addition, perceived usefulness refers to how useful technology can be in enhancing a better performance in tasks (Ma, Gam & Banning, 2017). The perceived usefulness can affect individuals towards greater use of the technology system (Leon, 2018). It is utilising the system as an important element in outlining consumer behaviour intentions in terms of adopting technology, which improves the relations between technology readiness and technology usage (Blut & Wang, 2020).

In perceived usefulness, businesses believe that implementing a new technology such as computer systems will enhance performance (Hamida *et al.,* 2016). Individuals who are innovative and optimistic are likely to discover the benefits of using technology during their experimentation and exploration, which results in the greater perceived usefulness of technology. While individuals who are insecure and have discomfort discover technology less useful and tend to not enjoy the benefits of it (Singh & Sinha, 2020).

2.3.1.2. Perceived Ease of Use

When individuals believe that using a particular technology or system is free and it is easy to use it, it refers to perceived ease of use (Ma *et al.,* 2017). Leon (2018) defines perceived ease of use as the ability of new technology in which individuals expect no harm either physical or mental when using the system or technology. When users

continue to use a system or technology, it implies that its features are easy to use, or they are willing to adopt the system and develop some training to use it (Hamida et al., 2016).

The perceived ease of use is a precursor of perceived usefulness, and it influences the minds of users towards a system or technology. The adoption of technology becomes high if individuals perceive it as easy to use. The perceived ease of use is a vital element in determining the use of interactive systems (Leon, 2018). If technology is complex, the chances of being utilised decreases and it might be an obstacle for individuals to understand the technology and to utilise it. When technology is perceived by users to be easy to use, it is likely to be adopted (Blut & Wang, 2020).

When individuals learn about new technology, they tend to discover that it is easy to use, so it is important for business owners to learn more about any new technology for better understanding of it. When someone lacks confidence in new technology, they will find it difficult to use, so the ease of use of new technology depends on how individuals perceive it (Singh & Sinha, 2020). The term ease-of-use relates to critical success factors for implementation of new systems such as organisational culture, data accuracy, training level and education, and software vendor support (Hwang & Min, 2015).

2.3.1.3. Technology Readiness

Technology readiness is defined as “people’s propensity to embrace and use new technologies for accomplishing goals in home life and at work” (Nugroho, Susilo, Fajar, & Rahmawati, 2017; Smit, Roberts-Lombard & Mpinganjira, 2018; Blut & Wang, 2020). The technology readiness is affected by cognitive and affective assessments of new technologies (Roy, 2017). People's goals to embrace and use technology is dependent on their perspective rather than their skills with the acknowledgment that advanced abilities may affect the perspective (Parasuraman & Colby, 2015). Nugroho, Susilo, Fajar & Rahmawati (2017) outline technology readiness as a measurement scale to measure individuals’ perspective about technology and not as a scale to measure the technology capabilities and capacity. In addition, as the level of readiness increases it enhances quality usage of technology and the ability to enter new technology (Nugroho *et al.,* 2017).

2.3.1.3.1 Levels of technology users

Technology readiness represents how informed and psychologically adapted an individual is in terms of new technology, from which derives the person's tendency to use new technology (Kurt, Kalem, Vayvay & Kalender, 2016). Technology readiness is utilised to scale the individual's overall myths about technology and to distinguish between a person that uses a technology and a person who does not (Sohaib *et al.,* 2020).

Below are five segments of technology users:

- Explorers are people who are always the first to adopt any new technology and they are extremely inspired (Bessadok, Lassaad & Almotairi, 2018). Since they are always the first people to try any new technology, they have the uppermost score in the contributors and the lowest score in the inhibitors of technology readiness (Nugroho *et al.,* 2017).
- Pioneers are likely to explore new technology. They are also optimistic and innovative like explorers, but they stop using the technology if they are not getting the results as expected. They normally stop trying if there is no comfort and security (Nugroho *et al.,* 2017) because they are expecting that something can go wrong (Bessadok *et al.,* 2018).
- The sceptics are low driven to explore new technology. They tend to believe in technology usage when they are inspired and encouraged that certain technology will benefit them. They tend to have smaller inhibiting level of lacking confidence in the use of technology, so it is important for them to be influenced in advance about the advantages of technology usage (Nugroho *et al.,* 2017; Bessadok *et al.,* 2018).
- Paranoids perceive technology as fascinating but risky. Even though it is interesting, they always think about risk factors that they may encounter (Nugroho *et al.,* 2017). They self-doubt; it is shown by a great degree of discomfort and insecurity (Bessadok *et al.,* 2018).
- Laggards have the uppermost score as inhibitors and the lowest score in the contributors of technology readiness (Nugroho *et al.,* 2017). They are opposed to technology usage (Bessadok *et al.,* 2018).

2.3.1.3.2 Factors affecting technology readiness

People's beliefs can be categorised as positive or negative towards new technology (Ahi, Searcy & Jaber, 2016). Optimism and innovativeness are positive contributors,

while discomfort and insecurity are negative inhibitors. The combination of these four elements has an impact on general technology readiness (Hallikainen *et al.,* 2019). Optimism and innovativeness are contributors that persuade one to adopt new technology and discomfort and insecurity are inhibitors against adoption of new technology (Smit *et al.,* 2018). Optimism and innovativeness can increase the level of technology usage, while discomfort and insecurity can decrease the level of technology usage (Nugroho *et al.,* 2017).

Therefore, when someone is “optimistic and innovative”, they will tend to experience lesser “discomfort and insecurity” when they adopt new technology (Larasati & Santosa, 2017; Yeo *et al.,* 2017). Hence, Sophonthummapharn and Tesar (2017) state that any of these two aspects, negative or positive will influence each other towards the technology. A high score on these measurements augments the technology readiness and a low score can reduce technology readiness. The four measurements are independent, thus an individual could have both contributor and inhibitor feelings towards technology (Bessadok *et al.,* 2018).

- *Optimism*

It is a factor used to scale the good aspects of technology based on how individuals perceived it (Hallikainen *et al.,* 2019). Optimism outline as a positive assessment of technology and opinions of individuals based on the advantages of using technology as a belief that there is a work efficiency and flexibility in the work environment (Blut & Wang, 2020).

Optimistic individuals measure the use of technology as result of being confident about technology and have found technology being useful (Hallikainen *et al.,* 2019). In other words, when someone perceives technology use as a positive, they tend to have faith that technology will help them to enhance flexibility and efficiency in their daily lives (Sophonthummapharn & Tesar, 2017). According to Nugroho, Susilo, Fajar & Rahmawati (2017), when an optimist is satisfied with the overall technology usage, they tend not to worry about negative aspects of the technology but focus on the convenience the technology brings (Blut & Wang, 2020).

Optimism as a factor always views the positive side of technology, for instance, optimism is associated with hours of trading, control over the business, efficiency in the business and the work environment (Smit *et al.,* 2018).

- *Innovativeness*

Innovativeness explains how much individuals like to explore different avenues regarding technology and to be at the cutting edge of evaluating the most recent technology-based items (products & services) (Nugroho *et al.,* 2017). Innovativeness refers to an inclination to be an innovation pioneer and thought pioneer. Research based on customer innovativeness has discovered that innovative individuals are associated with deep-seated curiosity chasing and creativity behaviours, for example, the adoption of new technology. Consequently, with respect to technology adoption, it is anticipated that people with a basic level of inborn creativity (receptiveness to new things) show natural interest in challenging new technologies (Blut & Wang, 2020). Innovativeness does not focus on how to understand how new technology operates but rather focuses on how to get that technology and use it. Innovative people are always the first individuals to associate themselves with the new technology and use it for the purpose of the business or their daily lives (Smit *et al.,* 2018).

The innovativeness scale is a measurement scale that is used to check whether people are willing to try the products or services of new technology, which is recommended by others who are opinion leaders on those technology products or services (Parasuraman & Colby, 2015; Sophonthummapharn & Tesar, 2017).

- *Discomfort*

Discomfort is a factor where individuals have less sureness and comprehensive knowledge in utilising the modern technology. The scope of discomfort shows the inconvenience to technology in general (Nugroho *et al.,* 2017). The use of technology is characterised by people's technology anxiety. When people have a feeling that certain technology is not for them. This happens when they have no control over that technology (Parasuraman & Colby, 2015; Sophonthummapharn & Tesar, 2017). In discomfort, such individuals have negative feelings about new technology or the use of technology. Blut & Wang (2020) observe discomfort as feeling excessively powerless and deficient with new technology. Individuals with a high level of discomfort view utilising technology as unfriendly and devastating and as a result they attempt to dodge it at all costs (Blut & Wang, 2020). Some individuals believe that technology is not for ordinary individuals because is moreover complex and requires comprehensive knowledge and skills to utilise it, due to the feeling of discomfort. Discomforted people are biased when it comes to technology usage (Smit *et al.,* 2018).

- *Insecurity*

Insecurity is referred to as a vital component that contributes to the gradual adoption of e-commerce (Liljander, Gillberg, Gummerus & Riel, 2016). Blut & Wang (2020) allude that insecurity is a “distrust of technology, stemming from scepticism about its ability to work properly and concerns about potential harmful consequences”. Individuals also have a negative feeling about technology; when they have a negative feeling or lack of trust in whether the technology will work properly (Sophonthummapharn & Tesar, 2017). Insecurity focuses on trust of technological relations. For instance, the fear of sharing personal information such as credit information. They are sceptics (Blut & Wang, 2020; Smit *et al.,* 2018).

2.3.1.4. Environmental factors

The study of Awiagah, Kang & Lim (2016) indicates that environmental factors could block or boost adoption in an organisation. Environmental factors can restrict the SMEs’ owners in adopting technology (Kabanda & Brown, 2017). The external environment influences the adoption of mobile technology. Environmental factors such as pressure from supply chain partners, customers and or competitors influence technology adoption (Duan, Deng & Corbitt, 2012). Kabanda and Brown (2017) point out that some SMEs’ owners see these factors as difficulties while others see them as an opportunity. SMEs’ owners need to demonstrate to the market preparedness for the utilisation of mobile technology for transaction purposes irrespective of the level of maturity for e-commerce adoption in the SME (Kabanda and Brown, 2017). This study only focuses on competitive & customer pressure and government support (government policies & regulation).

2.3.1.4.1 Competitive & customer pressure

Wong, Leong, Hew, Tan & Ooi (2020) point out that competitive pressure is a pressure that is within the market industry, which makes SMEs’ owners to have a desire to be competitive against its competitors. Whilst on customer pressure, customers prefer to shop online using smartphones (Laudon & Laudon, 2018). Almatarneh & Farooqui (2017) state that it is difficulty for business owners to persuade and fulfil needs of customers of these days because most of them prefer a globalised shopping experience and at the same time businesses need to endeavour to provide quality of the products or services.

This pressure makes organisations to embrace technology even though the owner is confronting pressure from upstream and downstream parts in the supply chain as well as pressures from new improvements in plans of action and industry guidelines. The pressure from both the competitors and customers affects the supply chain performance (George & Pillai, 2019). Pressure from trading partners force organisations to adopt m-commerce, current prices from competitors, inflation, and interest rates (Laudon & Laudon, 2018).

2.3.1.4.2 Government support

There are many unresolved issues related to government policies & regulations, which affect the operation of technology systems that need crucial growth in the market environment especially in supply chains. Government policies & regulations are regulated laws that guide business owners on how to operate the business. It focuses on the facility's infrastructure, how to coordinate the business and it plays a vital role in promoting adoption of technologies in the SMEs (Ahmad, Zahri, Alghaili, Zainudin, Shahril & Zaili, 2020).

Additionally, when there is a full support from government, the adoption is likely to be rapid (Wong, Leong, Hew, Tan & Ooi, 2020) and governments' participation tends to improve the economy of the country by empowering infrastructure for online business to flourish (Awiagah, Kang & Lim, 2016). However, the government intervention can happen as an inspiration, which can emphasise the knowledge of business, the mobilisation and organisational readiness based on e-commerce adoption (Awiagah, Kang, & Lim, 2016).

2.3.1.4.3 Globalisation

Globalisation in supply chain management is a factor that empowers access of mobile technologies such as cell phones, tablets, and applications. Different mobile networks can empower methods for correspondence particularly in far off areas with absence of fixed landlines (Kurt, Kalem, Vayvay & Kalender, 2016).

Mobile technologies advances have surpassed the landline regarding mobile communication and geographic coverage. It implies that business and individuals are presently tending to communicate with other organisations through mobile communication frameworks (Badenhorst-Weiss *et al.,* 2017). Mobility is logical and

valuable between various nations compared to 15-20 years ago when it was strange to do global calls. In this manner, mobile communication can improve business activities and exchanges worldwide with firms in the supply chains (Kurt, Kalem, Vayvay & Kalender, 2016).

2.3.1.4.4 Mobile Information Sharing

The information flow in supply chain management is based on the accuracy and the speediness; it is an important element because it helps the organisation to avoid amplification of the order information. Mobile information improves the way of communicating the supply chains (Badenhorst-Weiss *et al.,* 2017).

The speed of communication can enhance the mobile applications. Mobile applications are slowly getting rid of paper-based work, for example, there is no need to sign documents manually as this is done electronically with the use of electronic signatures (Kurt, Kalem, Vayvay & Kalender, 2016). By using mobile devices, organisations can arrange the information of delivery times and quantities, which will result in supply chains being more effective with organised data. Mobile information sharing connects various individuals to be aware of the crucial situations that need their attention. The delivery process becomes shorter and there are faster replies from management (Kmetec, Rosi & Kač, 2019).

2.3.1.5. Organisational factors

Mobile SCM has drastically changed the way supply chain mangers conduct their activities (Badenhorst-Weiss *et al.,* 2017). Technology adoption affects the organisational culture (Leon, 2018). Awiagah, Kang & Lim (2016) state that organisational traits are the most important and it needs focus mostly in SMEs.

2.3.1.5.1 Firm characteristics

The internal characteristics of a firm can also influence the adoption of m-commerce (Chiu, Chen & Chen, 2017). The level in which a firm has invested in IT systems indicates the firm's technology readiness. Organisational factors such as size of the organisation owners' demographic characteristics also determines m-commerce adoption. A rising trend in social media usage by women entrepreneurs across the

globe to unlock their potentials for business success has become commonplace (Ukpere, Slabbert & Ukpere, 2014).

2.3.1.5.2 Financial resources

A problem for SMEs is a slow growth due to lack of capital (Mustafa, Yusof & Iranmanesh, 2016). Many studies reveal that money is the most important factor in adopting technology. Financial resources significantly affect the intention of adopting mobile technology, higher cost usually limits the new technology systems and technology adoption amongst businesses (Wong *et al.,* 2020).

Kurt, Kalem, Vayvay & Kalender (2016) state that cost reduction is the most important aspect in mobile supply chain management and its main objective is to reduce the operational expenditures by looking at which new methods can be utilised in order to obtain its objectives. Likewise, mobile technologies (devices and applications) can be utilised to simplify the difficulties in supply chain in the process of ordering to cash.

2.3.1.5.3 Management support

The ICT has constituted so many challenges for top management in any business, and the availability they have for adapting those changes significantly affects technology adoption processes (García-Moreno, García-Moreno, Nájera-Sánchez & De Pables-Heredeo, 2016). Moreover, Dahnil, Marzuki, Langgat & Fabeil, (2014) and Almatarneh & Farooqui (2017) view technology adoption in SMEs as directly affected by top management.

During technological implementation, the managerial problems tend to be an obstacle when it comes to taking a decision about an adoption of new technology. On the other hand, they try by all means to enthusiastically engage in attaining the objectives of the business (Wong *et al.,* 2020), which implies that a higher level of interest and commitment by management will subsequently result a stronger participation in adopting new technology in the business (Chatzoglou & Chatzoudes, 2016).

The success of an adoption of e-commerce technologies in SMEs will largely depend on the knowledge, the attitude, the willingness of risk taking and entrepreneurial skills of the manager. Managerial support is needed in any electronic supply chain because is a crucial part in the business (Almatarneh & Farooqui, 2017). Without the support

from managerial staff, the adoption is likely to be unsuccessful because their support can be utilised to conquer any resistance to change in the business. The willingness of the managerial staff to accept change and to adopt new technologies in the firm, the firm is likely to adopt technology (García-Moreno *et al.,* 2016).

2.3.1.5.4 Organisational size

Organisational size has a huge impact on the adoption of technology (Chatzoglou & Chatzoudes, 2016). The smaller the size of the organisation the more challenges for the business because resources are not enough to embrace new technology, while bigger business are more likely to be successful because of more resources in the business, which allows the business to embrace new developments in technology (Ahmad *et al.,* 2020).

Additionally, bigger businesses are/can tolerate future risk failures compared to small enterprises. Moreover, smaller enterprise compared to bigger enterprises have little bargaining power over their suppliers, which results in failure when it comes to adoption of new technologies. Once, they fail to control their suppliers and customers, the adoption tends to be useless. Consequently, there is no effective cooperation (Chatzoglou & Chatzoudes, 2016).

According to Dahnil, Marzuki, Langgat & Fabeil (2014), small organisations that adopt mobile technology tend to become larger. Environmental competitiveness information is influencing adopters and non-adopters of technology. Hence, Chatzoglou & Chatzoudes (2016) hypothesise that bigger businesses are more likely to adopt e-commerce than small businesses.

2.3.1.5.5 Integration

The integration is divided into internal integration and external integration. The adoption of mobile technology leads to internal and external integration in supply chain (Kmetec *et al.,* 2019). Communication services such as voice calls and connectivity to the internet are improving the internal integration and give accessibility to the organisation's data at any time. On the other hand, external integration is improving through mobile applications usage by giving access to potential customers, retailers, and logistics with relevant information (Kurt, Kalem, Vayvay & Kalender, 2016). For instance, an individual can track the transactions online, and location of the physical

goods with Global Positioning System (GPS) (Kurt, Kalem, Vayvay & Kalender, 2016). Customers or organisations can track their shipments or products. The GPS enables delivery people to reach the destination on time, which promotes efficiency in supply chains (Mngomezulu, 2019). Furthermore, the location tracking needs location-based systems such as Geographic Information System (GIS) and General Packet Radio Service (GPRS) in order to achieve tracking in the supply chain (Lee, Lv, Ng, Ho & Choy, 2018).

2.3.1.5.6 Replacement of Unused Systems

In the past, it was not possible to send videos, images, and audios via mobile phones. The changes in mobile technology influence organisations and individuals to replace or swap some of the unused systems in order to remain competitive in the market and to be in trendy with the new technologies (Kurt, Kalem, Vayvay & Kalender, 2016).

2.3.2. The adoption of mobile SCM in SMEs.

The adoption of e-business is measured by how internet technologies are used in terms of activities and processes of supply chains. This means facilitating "customer-facing activities, including product or service sales, distribution, aftersales support, product testing, and market research" (Hafeeza *et al.,* 2010).

2.3.2.1. Attitudes towards the adoption of mobile SCM in SMEs

The success of technology adoption is dependent on the user's attitude. Attitude refers to undesirable or confident feelings of individuals in achieving a target behaviour, in this case adopting mobile SCM in SMEs. Moreover, attitude is the precursor of behavioural intentions (Chakiso, 2019), the stronger the intentions the probability of positive attitude towards technology adoption (Musa, Li, Abas & Mohamad, 2016). According to Mutisya & Kiai (2016), the attitude towards the adoption influenced by perceived ease of use of any system, hence, they conclude that there is a significant relationship between attitude and perceived ease of use.

2.3.2.2. Intention to adopt Mobile SCM

The intention to use technology depends on the level of usefulness. This implies that the higher the level of usefulness, the greater the intentions to use the technology (Singh & Sinha, 2020).

Any technology adoption is influenced by behavioural intentions to adopt, which result from the individual's attitudes and opinions (Lai, 2017; Smit *et al.,* 2018). Fatoki (2020) points out that the intentions to adopt m-commerce can be affected by technological factors, namely perceived benefits, perceived costs, perceived compatibility, perceived security risk and perceived complexity (Alkhaldi & Kharma, 2018). The intention to use and the intention to adoption are correlated; an individual's intentions to use technology will subsequently result in adoption and use of any technology (Koenaite, Chuchu & Venter de Villiers, 2019).

2.3.2.3. Actual adoption

Chatzoglou & Chatzoudes (2016) state that the growth of the economy is largely dependent on the adoption of e-business in the SMEs because most SMEs have invested their business in the digital world mainly by creating websites development and using mobile technology for their daily services. Ahmad, Zahri, Alghaili, Zainudin, Shahril & Zaili (2020) also state that mobile technology adoption brings significant values to the present and future growth developments of the SMEs because it is an enabler for any administration to be competitive and effective.

Technology adoption can be viewed in three different phases, namely, pre-adoption, adoption, and post adoption. At the pre-adoption phase, individuals investigate the benefits of adopting new technology and analyse if there is an exact need to adopt new technology, thereafter, consider adopting the technology. While at adoption phase, their intentions are to adopt the technology and at the post-adoption phase, technology is either abandoned or continued to be used by individuals depending on how they found it, useful and easy to use (Pillay, 2016).

2.3.3. Improvement in supply chain performance.

The success of the business depends on the firm's performance, hence it is categorised as a significant indicator in the success of the business (Sethibe & Steyn, 2016). The performance of the supply chain in the SMEs is affected by the relationship between the buyers and suppliers (Ahi, Searcy & Jaber, 2016). According to Sethibe & Steyn (2016), firms' performance is partially influenced by innovation and technology. Performance measures have become an important factor in the supply chain of SMEs. There are various measures or metrics for measuring a firm's performance, these measures can be grouped into two key variables, explicitly

financial and non-financial performance measures (Ahmad & Zabri, 2016; Ramasobana, 2017).

According to Sutia, Riadi & Fahlevi (2020), supply chain performance measures are a vital component in the firm because it helps the manager to set out the business objectives, the evaluation of the activities and to make future recommendations about a business strategy. It has enhanced the growth and profitability of the firm (Far, Akbari & Clarke, 2017; Rostamzadeh, Esmaeili & Nia, 2017).

2.3.3.1. Performance measures for the Firm

According to Mofokeng & Chinomona (2019), 75% of South African SMEs have indicated that supply chain performance is important for the improvement of the business, but an obstacle is to remain and/or become competitive in the supply chains. Therefore, they suggest that South African SMEs are failing to be competitive in the supply chain (Mofokeng & Chinomona, 2019). Yet, Alaswad, Salman, AlHashmi, AlMarzooqi & AlHammadi (2019) state that many of the businesses are enduring in the competitive supply chain by liaising with their competitors and adopting the drastic changes in the market world (Alaswad *et al.,* 2019).

There is a rapid increase in the use of SCM for their daily operations in various organisations (Marwah *et al.,* 2014). Maulina & Natakusumah (2020) reveal that it is important for an organisation to be dedicated and focused on SCM performance since it has played an essential role in the performance of the business. Nonetheless, some organisations do not have the same vision as others who see SCM as a vital element in the organisation. This is because they do not have reasons why it is important to develop effective performance as an aim of achieving combined SCM (Sethibe & Steyn, 2016). In order to measure the performance of supply chain, organisations need to clearly identify if their major goals are being achieved (Ahi *et al.,* 2016). The measurement results in transparency and the innovation of supply chains. The transparency in supply chains helps organisations to increase the probability of the overall performance improvement of the firm (Beske-Janssen, Johnson & Schaltegger, 2015; Ahi *et al.,* 2016).

2.3.3.1.1 Financial performance

Financial performance is one of the most widely utilised factors in accomplishment of financial objectives of the firm (Sethibe & Steyn, 2016). The financial performance plays a big role in the efficiency of supply productivity which shows the growth and failure of the business, basically it focuses on the past (Benedict & Matsoso, 2016). There are two measures that can be used to assess financial performance, namely accounting-based measures, and market-based measures. In every business the main objective is to make profit and to expand value for shareholders (Sethibe & Steyn, 2016).

2.3.3.1.2 Other performance measurement systems/ Non-financial

In order to get an overall firm's performance, the non-financial measures must also be evaluated, mainly because the areas of strategic business are not monetary in nature and to assess the goals and expectations of those who are involved in the business (Sethibe & Steyn, 2016). Non-financial performance can be used for decision- making because it provides appropriate internal information that one needs at the time of deciding. Likewise, it is proficient to give signs to improve critical exercises in a firm to become better indicators of financial performance (Ahmad and Zabri, 2016).

Non-financial performance measures can be grouped into 9 categories namely, Function-Based Measurement Systems (FBMS), Dimension-Based Measurement Systems (DBMS), Hierarchical-Based Measurement Systems (HBMS), Interface-Based Measurement Systems (IBMS), Perspective-Based Measurement Systems (PBMS), Efficiency-Based Measurement Systems (EBMS), Supply Chain Balanced Scorecard (SCBS), Supply Chain Operations Reference (SCOR), and Generic Performance Measurement Systems (GPMS) (Agami, Saleh & Mohamed Rasmy, 2012). This study will only focus on two of the measurement system, namely Supply chain Balanced Scorecard and Supply Chain Operations Reference. Table 2.1 below shows a summary of the non-financial performance measurement systems.

Table 2.1: The summary of other/non-financial performance measure

Type of Measurement System	Criteria of Measurement
1. Function-based Systems **(FBMS)**	Performance measures of ***functions*** within each process of the supply chain.
2. Dimension-based Systems **(DBMS)**	Performance evaluation of pre-determined ***key dimensions*** across the supply chain.
3. Hierarchical-based Systems **(HBMS)**	Performance measures identified on ***three levels of management*:** Strategic, Tactical and Operational.
4. Interface-based Systems **(IBMS)**	Performance measures defined between supply chain ***linkages***, i.e. stages.
5. Perspective-based Systems **(PBMS)**	Performance measures on ***six perspectives*** of the supply chain: Operations Research, System Dynamics, Logistics, Marketing, Organization and Strategy.
6. Efficiency-based Systems **(EBMS)**	Performance measures to evaluate the supply chain ***efficiency***.
7. SC Operations Reference Model **(SCOR)**	Performance measures along the ***five main supply chain processes*:** Plan, Source, Make, Deliver and Return.
8. SC Balanced Scorecard **(SCBS)**	Performances measures across ***four supply chain perspectives*:** Financial, Customer, Internal Business Processes and Innovation and Learning.
9. Generic Systems **(GPMS)**	Performance measures are ***strategy*** aligned

(Agami, Saleh & Mohamed Rasmy, 2012).

It is vital for performance measurement systems to be well checked to improve the supply chain. All members who are associated with the supply chain should pursue a shared objective and team up to address the issues of the clients/customers and accomplish competitiveness in the market (Far *et al.,* 2017). Sutia, Riadi & Fahlevi (2020) notice that improved performance is not accomplished through a mechanised machine but instead those who are part of the supply chain should work harder with the point of treasuring the advantages toward the end. Therefore, it is important for organisations to have a "balanced approach" and to have a clear knowledge of the SC in order to improve performance (Marwah *et al.,* 2014). It is important for managers to know different variables that may impact the performance of the business in order to achieve them effectively.

2.3.3.2. Definition of supply chain performance

Sutia, Riadi & Fahlevi (2020) define performance as an achievement of assigned tasks, which can be done in accordance with one's ability. Supply Chain Performance (SCP) refers to general activities of supply chains such as making products available and delivering on time to the customers and using all equipment that is needed to

deliver performance in a friendly way (Baroroh, Ariana & Dinariyana, 2020; Marwah, Thakar & Gupta, 2014). Mofokeng & Chinomona (2019) outline SCP as “the ability of a supply chain to cost-effectively carry out its activities while minimising costs, for the main purpose of meeting the ultimate customer’s needs”. Supply Chain Performance involves “basic materials, components, procurement, manufacturing, distribution, marketing & sales, and research & development” (Marwah *et al.,* 2014). It is measured by level of accuracy, how the organisations approach their customers, how quickly do they deliver their products and continuously improve their supply chain activities. However, there is another element that measures the supply chain performance which is efficiency (Rana, Osman, Bahari & Solaiman, 2014). “To improve the efficiency of the performance of the supply chain, organisations are required to learn to better forecast, flexibly manage inventory and effectively plan and schedule all operational activities of all resources” (Althaqafi, 2021).

2.3.3.3. Features of supply chain performance

Sutia, Riadi & Fahlevi (2020) indicate that a firm’s performance is influenced by internal and external factors. They indicate that external factors greatly influence the culture of the business, while internal factors are improving the supply chain performance. The supply chain performance is affected by the growth of supply chainswhich results in profit for the organisation (Ahmad & Zabri, 2016).

It is important for an organisation to advance the system of measurement of performance in order to improve their supply chain (Ahmad & Zabri, 2016). Mofokeng & Chinomona (2019) argue that improvement in supply chain performance generates value. The value in supply chain can only be generated if there is an increase in supply chain performance, which can be done through coordination.

Four steps for effective performance:

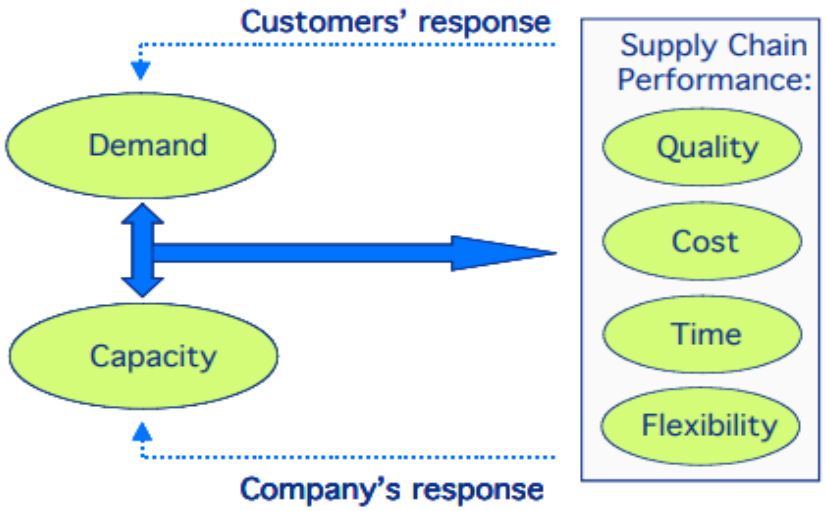
- *Step 1: Designing of the measures:* This step requires to know exactly whatyou want to measure.
- *Step 2: Planning and building:* The most important step in the process, wherethe communication amongst members is essential.
- *Step 3: Implementing and operating:* This step is about executing the plan in action.

- *Step 4: Refresh:* The last stage in the process is about managers redefining measures to check relevance and if it is useful (Benedict & Matsoso, 2016).

Figure 2.4 illustrates the features used to measure the process of supply chain performance and business performance in general. There must be teamwork between members of the supply chain and better communication (Mulwa, 2015). When market demand reaches highest supply capacity, the more the supply chain performance will suffer, which will result in time being extended, the coststo increase, and quality to decrease and further flexibility to be reduced. A negative response will be there from customers by placing fewer orders and the firm will expandits capacity in reaction (Akkermans & Bezemer, 2014).

In figure, 2.4 below the generic operational performance measures are discussed. At the operational level, five generic performance objectives can be distinguished. Achievement in these objectives will lead to competitiveness of the firm (Slack, Chambers & Johnston, 2013). These generic performance measures are broken down into specific unique measures for the operational level for each function of a specific organisation or intended research area. In this research the measures developed will, therefore, be applicable to supply chains in general.

Figure 2.4: Features of supply chain performance



Source adopted from Akkermans & Bezemer (2014).

2.3.3.4. Metrics used to monitor supply chain performance.

2.3.3.4.1. Quality

Regularly, quality is considered to quantify how well an item adjusts to specific particulars. The measures of quality products are, how attractive the products are, the reliability, the durability, how well it plays out its proposed capacity and, how much the clients trust in its worth (LaMarco, 2019).

2.3.3.4.2. Cost

The cost is among the elemental fundamentals in the competitive market, and so it plays a vital role in the performance of the business. The lower the cost of the product; often the lower price will lure potential customers (Coach, 2020).

2.3.3.4.3. Time/speed

Time refers to the speed that could take a firm to deliver the product to the potential customers. Consumers' purchase decision depends on how quickly they can receive the product. Speed at which an organisation can address a client's issues can expand sales (Coach, 2020; LaMarco, 2019). Speed is the capacity of a firm to supply customers with steady and fast distribution of items (LaMarco, 2019).

2.3.3.4.4. Flexibility

In a business environment flexibility implies the capacity to adjust activities in light of changes. That could mean expanding production to satisfy an ascent in need or introducing a new service to meet moving preferences of potential customers (Coach, 2020). Adaptable tasks are activities that can arrange the product offerings to manage different necessities and to likewise change these product offerings rapidly to new prerequisites.

2.3.3.4.5. Dependability

Dependability is divided into two variables, namely the external and internal. External dependability measures how customers can depend on the products and/or the services rendered by the business (Slack, Chambers & Johnston, 2010). The organisation, by ensuring that customers depend on them should always try by all

means to delivery in time and with the right quality (simply by not making the product/services cheap), fast, and innovative (Coach, 2020). Internal dependability measures the operation of the business. It helps the businesses to save costs, time, and effort as it reduces useless usage of time and resources (Slack, Chambers & Johnston, 2013).

2.3.3 4.6 Functional Operational performance

Other criteria used to measure the supply chain performance are:

- Customer relationship and service management,
- Manufacturing and demand management,
- Product development,
- Return management,
- Order fulfilment,
- Supply chain structure,
- Inventory control policy,
- Information sharing,
- Customer demand,
- Forecasting method,
- Lead time and
- Review period length.

2.3.3.5. Conclusion

Recently there are much improvement in supply chain performance. Mobile SCM has gained recognition as an important element in cost reduction and supply chain improvement (Chana & Chong, 2013). Agami, Saleh & Rasmy (2012) point out that there are many issues that prohibits the longest-standing performance of supply chains. Many businesses are struggling to gain competitive advantage hence it is difficult for them to improve supply chain performance (Muhanguzi & Kyobe, 2014). However, the supply measurements have played a vital role in the growth and improvement of supply chains' performance (Agami *et al*., 2012). There are various ways that can be used to improve the supply chains' performance.

2.3.4. The relationships between the determinants of the use ofmobile technology in the supply chains of SMEs.

2.3.4.1. Correlation between perceived usefulness of mobiletechnology and the adoption of mobile SCM.

The performance of the supply chain in SMEs is affected by the adoption of the perceived usefulness of mobile technology and mobile SCM. Leon (2018) concludes that perceived usefulness has a positive relationship with pursuing new technology. According to Singh and Sinha (2016), there is a significant effect between perceived usefulness and the intentions to use a technology. Technology adoption correlates with perceived usefulness, because the decision to accept mobile technology is influenced by how individuals perceive the usefulness of technology (Naicker & Merwe, 2018). Performance expectancy is one of the element in determining the user adoption of mobile technology and is relatively close to the perceived usefulness of TAM. This implies that users have a level of mentality and believe that the performance of certain things will depend on the adoption of new technology (Lee, Lee & Rha, 2019). In this case it can be assumed that the adoption of mobile technology in the business can enhance performance. As indicated that performance expectancy as a factor of user adoption is relatively close to perceived usefulness, it is concluded that it also measures the same thing as perceived usefulness.

2.3.4.2. The relationship between perceived ease of use of mobile technology and the adoption of mobile SCM.

Perceived ease of use has a significant effect on the adoption of technology (Liébana-Cabanillas, Singh & Sinha, 2020). Perceived ease of use has a positive influence on adoption of mobile SCM that is, adoption of mobile technology is dependent on how individuals perceive the usefulness of the new technology (Ma *et al.,* 2017). Ignorance about adopting new technology leads to dissatisfaction with regard to new technology adoption (Liébana-Cabanillas *et al.,* 2020). The adoption of mobile SCM is measured by how internet technologies are conducted in the activities and processes of supply chains (Magotra *et al.,* 2018). Lau, Lam & Cheung (2020) argue that there is a negative relationship between perceived ease of use of mobile technology and the adoption of mobile SCM because some users believe that using new technology is not easy but difficult and that the benefit of usage is outweighed by the effort of using or learning

the technology. According to the study of Naicker & Merwe (2018), adoption of mobile technology is influenced by perceived ease of use. They state that effort expectancy in user adoption of mobile technology relates to the perceived ease of TAM. In addition, it measures how individuals perceive the use of technology in the expectation that it will be easy (Lee *et al.,* 2019).

2.3.4.3. The relationship between technology readiness and the adoption of mobile SCM.

The degree of measuring the belief that certain systems can be used systemically in the utilisation of new technology refers to a system of facilitating conditions as a factor in determining user adoption of mobile technology. It is seen as a factor that affects an individual's beliefs that they will support the utilisation of new technology systems (Lee *et al.,* 2019). "The positive enablers of technology readiness inspire users to adopt emerging technological products and services. Inhibitors make users disinclined to adopt new technologies or services" (Chen, Liu & Lin, 2013). The adoption of new technology largely depends on the perception of individuals and the context around them. There is little empirical evidence that there is a relationship between technology readiness of mobile technology and the adoption of mobile SCM.

2.3.4.4. The relationship between environmental factors and the adoption of mobile SCM.

According to Fatoki (2020), competition significantly affects the adoption of e-commerce in the business environment. He further states that six environmental factors namely, regulatory environment, customer pressure, government pressure, support industry pressure, social pressure, and competitor pressure have positive significant effects on the mobile commerce adoption. In addition, customer pressure and top management significantly affects the intentions to adopt m-commerce positively (Fatoki, 2020; García-Moreno *et al.,* 2016).

Wang, Li, Li & Zhang (2016) point out that production and operations improvement are the most important factors in adoption. These factors positively correlate with adoption. In addition, the "business partner influence" as an environmental factor is positively relating with adoption of supply chain management. Competitive pressure is a significant adoption discriminator, when investigating firms' adopt electronic supply chain management systems (Wang *et al.,* 2016).

2.3.4.5. The relationship between organisational factors and the adoption of mobile SCM.

The adoption of mobile technology can be affected by numerous features such as management and organisational structures, the willingness of the organisation, innovativeness, and employees' technical knowledge and skills (Lai, Sun & Ren, 2018).

The decision and the implementation of new technology is affected by managerial obstacles. The cost or money is an obstacle to the adoption of new technology in organisations because it determines the aims and willingness of the organisation has in terms of adopting new technology (Wong *et al.,* 2020). Lai, Sun & Ren (2018) point out that the intentions to adopt technology can be positively affected by the organisational structure of the firm. There are some of organisational factors such as "top management support and absorptive capacity" which are the significant factors of discriminators on adoption of supply chain management systems in the organisation. The firm size and top management support have a positive relationship with adoption, when studying businesses' adoption of e-procurement systems (Wang *et al.,* 2016).

2.3.4.6. The relationship between adoption of mobile SCM and improvement in supply chain performance.

There is a positive relationship between the adoption of mobile SCM and improvement in supply chain performance because the development of mobile SCM increases the performance of the businesses and the activities particularly through the use of mobile devices like smartphones (Car *et al.,* 2014). Many businesses are integrating mobile SCM into their supply chain systems to remain competitive and to make sure that they have a better accountability and visibility (Vella, 2012). The growth of mobile SCM in supply chains aids the businesses to develop fully (the integrated entire process) (Tadepalli, 2018).

The output of operations processes can be improved in six operations dimensions as follows: cost, quantity, quality, speed, dependability, and flexibility (Slack, Chambers & Johnston, 2010). E-technology enables operations to produce a variety at speed and to create flexibility and availability at all hours. Therefore, these output measures can be used to determine if the adoption of e-technology leads to higher performance

in the following areas: global reach, interactivity, information density and higher quality of information (Ledwaba, 2018).

2.4 FRAMEWORK FOR THE RESEARCH

2.4.1 Theoretical framework

This study follows a generic framework developed by Miles and Huberman. A generic framework it is a flow diagram that summarises what the researcher intends to do in the study. It is critical for the success of research study because it provide the research processes, and allow the researcher to locate constructs and the relationship between research problem, empirical evidence, methodology and the findings of the study. which allows a critical analysis of the phenomenon under study (Miles and Huberman, 1994). Hence, a generic framework is adopted in this study to identify the determinants of mobile technology adoption for the improvement of the performance in supply chains of SMEs.

2.4.2 Framework of this research

The figure on the next page illustrates the framework for analysis of this study. The framework shows the adoption of mobile SCM by SMEs in trying to improve the supply chain performance. This framework emphasises that SMEs must familiarise themselves with the adoption of mobile technology before they can adopt any technology in their business in order to improve supply chain performance and to gain competitive advantage.

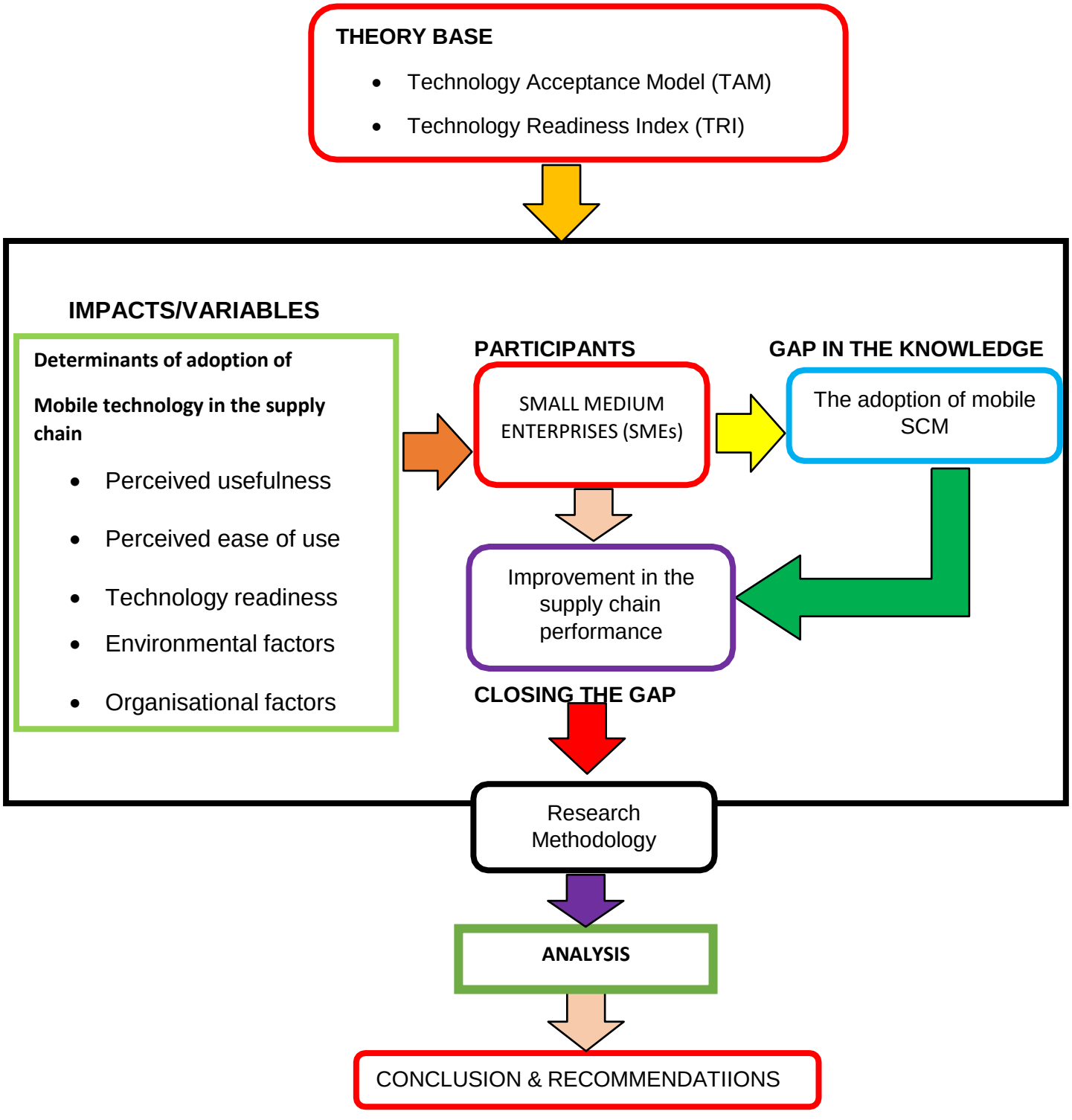
Firstly, the theoretical basis for the intended research namely the Technology Acceptance model (TAM) and the Technology Readiness Index (TRI) are discussed. The framework then shows the variables that impact the adoption of mobile technology in the supply chain of SMES. Variables are identified as perceived usefulness, perceived ease of use, technology readiness and environmental factors and organisational factors and their relationships with each other and supply chain performance are set out. The gap in the knowledge is then closed by the results of the analysis.

2.5 CONCLUSION

This chapter reviewed the literature on the determinants of use of mobile technology and the adoption of mobile technology in supply chains of SMEs, and the improvement in supply chains. In addition, the chapter reviewed the relationship between the

adoption of mobile SCM and improvement in supply chain performance.

Figure 2.5 Framework for this research



(Researcher's own conception)

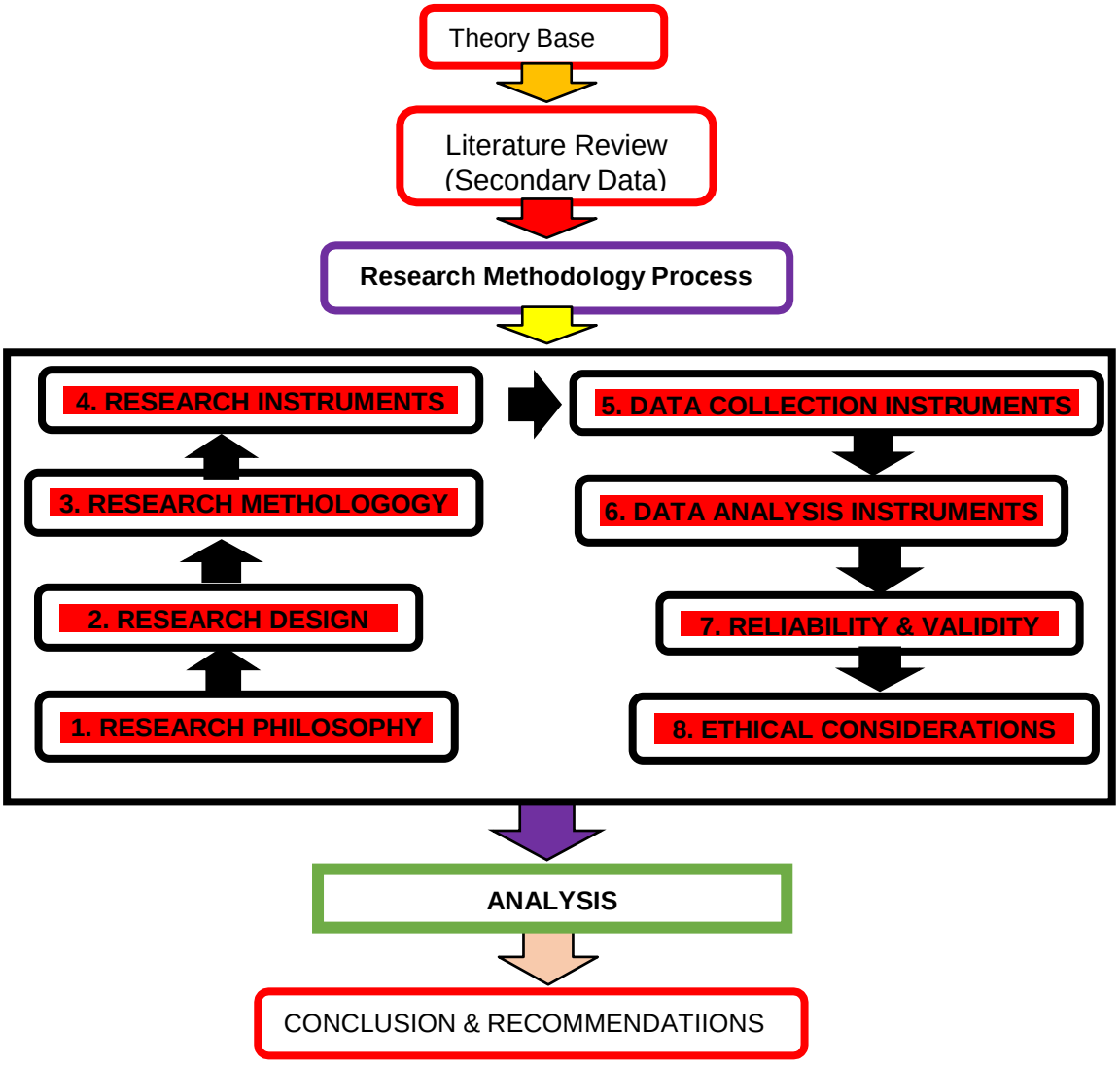
CHAPTER THREE

RESEARCH METHODOLOGY

3.1. INTRODUCTION

This chapter recaps how the use of mobile technology adoption has improved the performance of supply chains in SMEs. The chapter outlines the techniques used, the primary data collection and analysis. This chapter follows the framework for research methodology designed by the researcher, in order to accomplish the objectives of this study. The figure 3.1 below is the framework for research methodology which illustrates the layout of the chapter.

Figure 3.1. Framework for research methodology



Researcher's own conception

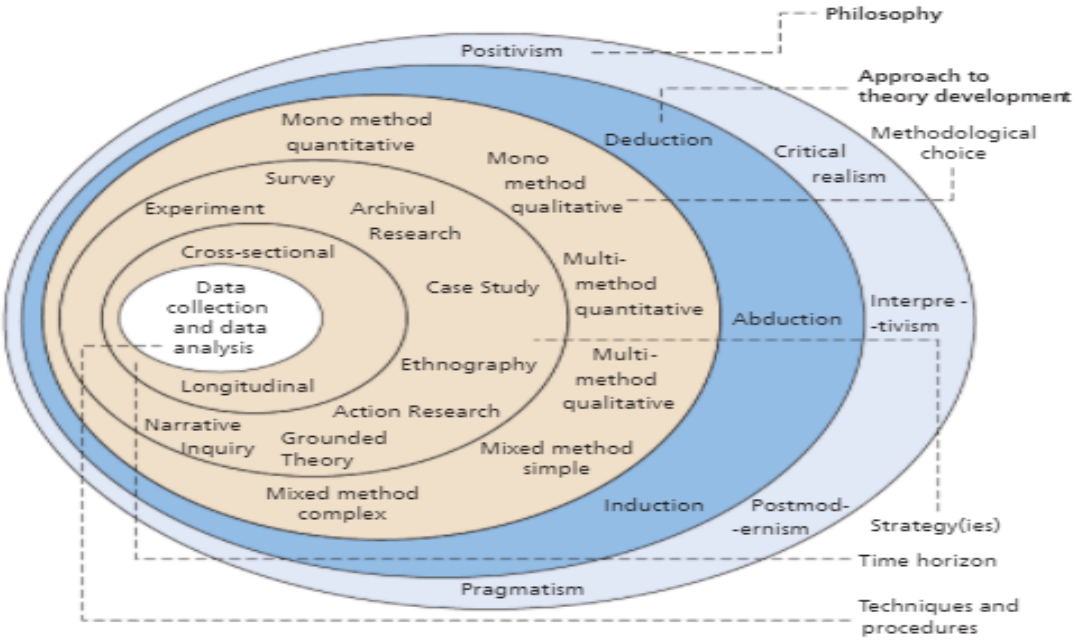
3.2. RESEARCH PHILOSOPHY

The concept of research philosophy refers to “a system of beliefs and assumptions about the development of knowledge” (Saunders, Lewis & Thornhill, 2019). This allowed the researcher to find suitable techniques to be used in approaching the problem statement of the study. Research philosophy can be grouped into four variables, namely pragmatism, positivism, realism and interpretivism (Dudovskiy, 2018).

Conversely, the study used epistemology assumptions because the assumptions are based on human knowledge, and it used a positivistic approach because the study is quantitative in nature. The researcher uses deductive reasoning because the study postulated hypotheses to investigate the problem and then collect the data to test the hypotheses.

The research onion (figure 3.2) is used to provide the researcher with a clear direction of the study. Melnikovas (2018) states that the model is primarily designed for business studies. Of therefore, the diagram was used to choose techniques/methods to be used when collecting data, of which it belongs to the centre of the research onion. Additionally, the figure illustrates the data analysis procedures.

Figure 3.2. Research Onion



Source adopted from Saunders, Lewis & Thornhill (2019).

3.3. RESEARCH DESIGN

Research design refers to the way the researcher chooses to design the study. The research design is a plan of how the researcher tackles research methodology and data analysis of the study (Bryman, Bell, Hirschsohn, Dos Santos, Du Toit, Masenge, Van Aardt & Wager, 2011). Vos, Strydom, Fouche & Delport (2011) define research design as the processes involved in achieving the end results/product.

3.3.1. Types of research design

There are two well-known research designs, namely the quantitative and qualitative research, and the researcher can decide which approach to use based on the objectives and problem statement. Alternatively, the researcher can combine and use both approaches, which is known as the mixed methods approach.

3.3.1.1. Qualitative research

According to Vos, Strydom, Fouche & Delport (2011), qualitative research is holistic in nature, it focuses on identifying and understanding the respondent's opinions, beliefs and experiences rather than predicting respondent's behaviour. In qualitative research, the non-statistical methods and/or non-probability methods are often used, and the sample size is often small.

3.3.1.2. Quantitative research

Quantitative research emphasises describing, explaining and predicting the relationship between the two variables. In quantitative research, the researcher asks research questions and/or formulate hypotheses, which are built on the theories,and then draws logical conclusions based on the findings.

This study adopted a quantitative research design as it presents a logical basis for carrying out data collection, processing, and analysis (Islamia, 2016). This research used a quantitative approach to determine the determinants of adoption of the mobile technology and to analyse and generalise the relationships as postulated in the research hypotheses. The quantitative research methodology is used when the researcher is collecting structured data using a questionnaire. Structured data collection tools such as the questionnaire allows the researcher to perform statistical data analysis that includes correlation and regression analysis. There are two types of quantitative research designs, namely experimental designs and non-experimental

designs. This study adopted non- experimental design namely exploratory and correlational research, for the reason of making an informed and suitable research design for achieving the research objectives.

3.3.2. Descriptive Research

This research made use of descriptive research design to explain the characteristics of an existing phenomenon such as the determinants of the use of mobile technology in the supply chains of SMES (Stangor, 2011:124). Descriptive research is a suitable design when the research involves the use of a survey (Dudovskiy, 2016).

3.3.3. Correlational Research

According to Bordens and Abbott (2016), correlational research refers to discovering andthen measuring the two or more variables in determining the existing correlation between those variables by not manipulating the other variable in a statistical manner. In correlational research it does not matter whether the relationship is positive or negative, they are all vital, and it is suggested that it is a relationship (Hofstee, 2018).

The researcher uses correlational research for following purposes:

- Correlational research is used to determine the relationship between the variables that were hypothesised during exploratory stage.
- Correlational research is used to determine the relationships between determinants of adoption and the adoption of mobile technology.
- Correlational research is used to determine the relationship between mobile technology adoption and supply chain performance.

3.4. RESEARCH METHODOLOGY

According to Sileyew (2019), research methodology is defined as a path which the researchers need to take in order to conduct their research. Research methodology is the specific methods/techniques that can be used by the researcher to accumulate and examine data (McMillan & Schumacher, 2010). In addressing the research objectives, this researchuses quantitative methods in order to observe or measure the primary data. The study area, population of study and sampling methods are outlined below.

3.4.1. Study area

Selecting the study area is an important part in conducting a research study (Dudovskiy, 2016). The researcher conducts this study in Polokwane municipality. Polokwane is the capital city of Limpopo province of South Africa. This region provided the researcher with a variety in the population of SMEs as it contains both town and rural SMEs and there is a variety of infrastructure. It was necessary for the researcher to conduct the study in town and rural areas because SMEs in Limpopo are based in both of those areas. It enables the researcher to make recommendations for both town andrural businesses.

3.4.2. Population of study

Banerjee & Chaudhury (2010) describe population as anything that can help a researcher to discover certain information that is vital to the study. In addition, population can be a group of people who has the same qualities such as occupation, religion, and ethnic group (Kovaz, 2017; Singh, 2018). The research population depends on the scope of the study. Hence, the research population for this study consists of all the Small Medium Enterprises (SMEs) in Polokwane local municipality area and the data were collected from this region. A sampling frame was obtained from the Polokwane local municipality. The population is 175 small businesses.

3.4.3. Sample and sampling methods

In a quantitative study, a sample is known as a group of people, objects or items from the population who are selected to participate in the study in a form of survey (Kovaz, 2017). All measures taken by a researcher to select a sample is known as sampling (Singh, 2018)**.** Sampling is the process of identifying a group of people or a category of the population to make statistical interpretations (Bhat, 2018; Dudovskiy, 2016). Sampling is one of the most important elements in research because it determines how accurate the findings will be (Singh, 2018). As a researcher, it is important to ensure that the sample is representative because a wrong sample directly affects the findings of the research**.** There are many types of sampling that can be used in gathering the sample; it depends on the need and situation (Dudovskiy, 2016).

3.4.3.1. Probability sampling

This study uses probability sampling because the research is quantitative in nature. Probability Sampling is a sampling method which uses randomisation to ensure that every participant from the population has an equal opportunity to be chosen from the selected sample (Singh, 2018). Probability sampling makes the sample to be representative of the population. Hence, the inferences in Polokwane were made to be objective and accurate and could be extended to similar regions in South Africa.

Methods of probability sampling consists of simple, stratified, systematic, multistage, and cluster sampling methods (Dudovskiy, 2016). For this study, the researcher applied simple random sampling since the study used a quantitative approach.

3.4.3.2. Simple random sampling

A simple random sampling is utilised when the researcher does not have any previous information about the targeted group of the population. In simple random sampling, each participant has an equal opportunity to be chosen to be part of the sample or as a subject (Singh, 2018). “In order to select a simple random sample from a population, it is first necessary to identify all individuals from whom the selection will be made” (Banerjee & Chaudhury, 2010). The study, therefore, uses simple random sampling because the study is quantitative in nature. Bryman and Cramer (2012) state that it would be prudent and advisable for a quantitative study to follow either simple, stratified, systematic, multistage, or cluster sampling methods.

3.4.3.3 Sample size

The study uses a sample size determined by the Raosoft online sample size calculator. The calculator takes into account 95% confidence level, population size and 50% response distribution to calculate the minimum recommended sample size. The sample size calculated is shown below.

Sample size calculation:

$$n = \frac{N}{1 + N(e)^2}$$

Where n = is the sample size,

N = is the population size,

And e = level of precision.

Therefore, the sample size for this study is calculated as follows:

$$n = \frac{175}{1 + 175(0.05)^2}$$

$$n = \frac{175}{1 + 175(0.0025)}$$

$$n = \frac{175}{1 + 0.4375}$$

$$n = \frac{175}{1.4375}$$

$$n = 122$$

3.5. DATA COLLECTION INSTRUMENT

There are many ways or instruments a researcher can use in gathering the data. Dudovskiy (2016) outlines that data collection is the process of gathering the primary data by the researcher from all essentials sources in order to get answers to the identified research problem, and also to test the hypotheses assumed by the researcher and finally to evaluate the results. Quantitative research method is based on figures and estimations. This study uses a quantitative method, therefore, a survey was used. Data collection portrays a vital part in statistics analysis. This comprises of primary data and secondary data and therefore this study uses primary data to gather information. Primary data are also called raw data and is the information which is gathered by the research for the first time from his/her informants pertaining to the research study (Surbhi, 2017). The primary data can be used to outline the research problem and finding some aspects desirable for the study. Collecting of primary data is expensive as it requires many resources (Nedha, 2011).

Methods such as surveys, observations, physical testing, interviews, focus groups and case studies, etc. can be used to collect primary data (Surbhi, 2017). However, this study uses a survey method to collect the data.

3.5.1. Survey

A survey is a method which the researcher can use in answering questions and problems relating to the study and it gives a researcher to be analytical about the trends of what already exists in the context (Glasow, 2013). The researcher used a survey method for getting the feedback from the participants because the study requires hypotheses to be tested and it is lessexpensive, less time consuming when compared to other methods and the data are ofhigh accuracy. Using other methods could have not given the researcher high data accuracy because hypothesis testing (quantitative approach) requires the study to usethe surveys instead of interviews.

The researcher used a self-administered questionnaire for this study because of an advantage of efficiency, where the researcher distributed the self-administered questionnaires to a largepopulation. The researcher used the closed questions format for the questionnaires, and it was developed from the theoretical review. The questionnaires were distributed to the businesses' owners/managers in Polokwane local municipality in the Limpopo Province. The reason for using this type of questions was to gather as much information for the analyses of the hypotheses as possible. The researcher used Likertscales as the questions included in the questionnaire request the respondents to ratetheir answers based on a scale from one to five representing strongly agree, agree, neutral, disagree, strongly disagree categories. The table below illustrates how the questions in the questionnaire were constructed from the secondary data (literature review).

TABLE 3.1: Development of the questionnaire

SECTION B: DETERMINANTS OF SUPPLY ADOPTION OF MOBILE TECHNOLOGY FOR SUPPLY CHAIN

No.	Question	Source
	Perceived usefulness In my business, I and the workers use mobile technology (cell phones) we believe that:	
1.	A cell phone and other mobile devices helps me to find new customers.	Badenhorst-Weiss, Van Biljon& Ambe, 2017
2.	A cell phone and other mobile devices improves the speed with which I can deal with customers.	Wagner & Sweeney, 2011
3.	Whether I use technology depends on the level of usefulness.	Leon, 2018
4.	A cell phone and other mobile devices create flexibility between me and my customers and suppliers.	Barata and Cuhna 2016
5.	A cell phone and other mobile devices help me to be available at all hours for my business.	Muhanguzi & Kyobe, 2014
	Perceived ease of use:	

1.	I use cell phones and other mobile devices because it is easy to use.	Ma, Gam & Banning, 2017
2.	When I believe it is easy to use new technology, I will use it.	Hamida, Razak, Bakarc, & Abdullah, 2016
3.	I use the cell phone and other mobile devices to interact with my customers because it is easier to use.	Ma, Gam & Banning, 2017
4	Using a cell phone is easy to gather data.	Hwang & Min, 2015
5.	I train myself and my workers to use mobile devices because it is easy to use.	Singh & Sinha, 2020
6.	Mobile technology is easy to use as suppliers supports me with mobile software.	Hwang & Min, 2015
No.	Technology Readiness in my business:	
1.	Being open to the use of new technologies helps me to use mobile devices in my business.	Sophonthummapharn & Tesar, 2017
2.	I am always ready to use new technology.	Parasuraman & Colby, 2015
3.	I prefer to employ people that use new technology rather than a person who does not.	Blut & Wang, 2020
4.	People that are optimistic prefer to use new technology.	Blut & Wang, 2020
5.	People that are insecure are not ready to adopt new technology.	Liljander, Gillberg, Gummerus, Riel, 2016
6.	If people are uncomfortable with new technology they will not use it.	Nugroho, Susilo, Fajar, & Rahmawati , 2017
No.	Environmental factors in my business:	
1.	Competitive pressure has influenced me to adopt mobile technology.	Laudon *& Laudon,* 2018
2.	Government policies/regulations is affecting how I run my supply chain's activities.	Ahmad, Zahri, Alghaili, Zainudin, Shahril, Zaili, 2020
3.	Mobile communication sharing has improved my supply chain activities.	Badenhorst-Weiss, Van Biljon& Ambe, 2017
4.	Accuracy and speed in information flow in supply chain influence my adopting.	Badenhorst-Weiss, Van Biljon & Ambe, 2017
5.	Mobile communication has improved my supply chain activities.	Kmetec, Rosi & Kač, 2019
No.	Organisational factors in my business:	
1.	Lack of capital/resources results in slow growth in me adopting mobile technology.	Mustafa, Yusof & Iranmanesh, 2016
2.	Higher amount of costs limits me in the adoption of new technology.	Wong, Leong, Hew, Tan, & Ooi, 2020
3.	Managerial problems are an obstacle for adopting new technology in my business.	Wong, Leong, Hew, Tan, & Ooi, 2020
4.	Mobile technology has replaced some of the old systems in my business.	Kurt, Kalem, Vayvay & Kalender, 2016
5.	Little bargaining power over suppliers' results in me not adopting new technology.	Chatzoglou & Chatzoudes, 2016
6.	Large businesses are more likely to adopt mobile technology than small businesses.	Chatzoglou & Chatzoudes,2016
7.	Challenges faced by SMEs limit them to embrace new technologies.	Ahmad, Zahri, Alghaili, Zainudin, Shahril, Zaili, 2020

SECTION C: THE ADOPTION OF MOBILE SCM

No	Question	**Source**
	The adoption of mobile supply chain management(SCM) in my business:	
1.	Has changed the way I conducted my supply chain activities.	Magotra, Sharma & Sharma, 2018
2.	Mobile SCM adoption has changed the activities and processes of supply chains.	Badenhorst-Weiss, Van Biljon & Ambe, 2017
3.	The adoption of mobile technology is changed by the aim for using the technology.	Leon, 2018
4.	The success of mobile supply chain adoption is dependent on my attitude.	Chakiso, 2019
5.	The attitude towards the adoption is influenced by ease of use.	Mutisya & Kiai, 2016
6.	The intentions to use mobile technology depends on the level of usefulness.	Mutisya & Kiai, 2016
7.	Mobile technology adoption is influenced by behavioural intentions to adopt.	Lai, 2017;Smit, Roberts-Lombard & Mpinganjira, 2018
8.	The adoption of mobile technology supply chain was affected by the benefits and costs.	Alkhaldi & Kharma, 2018; Fatoki, 2020
9.	The adoption of mobile technology supply chain was affected by the compatibility, and complexity.	Alkhaldi & Kharma, 2018; Fatoki, 2020
10.	The adoption of mobile technology supply chain was affected by the security risk.	Alkhaldi & Kharma, 2018; Fatoki, 2020

SECTION D: IMPROVEMENT IN SUPPLY CHAIN PERFORMANCE

No	Question	Source
	The use of mobile technology has improved my supply chain performance:	
1.	Enhanced productivity and cost reduction.	Chana & Chong, 2013
2.	The performance is affected by the relationship between my suppliers and buyers.	Ahi, Searcy, Jaber, 2016
3.	The performance is measured by identifying my major goals if they are being achieved.	Ahi, Searcy, Jaber, 2016
4.	Level of performance in my supply chain is measured by transparency and innovation.	Beske-Janssen, Johnson & Schaltegger, 2015
5.	Gaining competitive advantage has improved my supply chain performance.	Mofokeng & Chinomona, 2019
6.	Knowledge of different variables of the supply chain has helped to improve my supply chain performance effectively.	Marwah, Thakar & Gupta, 2014
7.	The supply chain performance is affected by the growth of supply chains.	Ahmad & Zbri,2016
8.	I use quality, cost, time, flexibility and dependability to monitor my supply chain performance.	Coach, 2020; LaMarco, 2019
9.	The financial performance has played a big role in the efficiency of supply productivity.	Benedict & Matsoso, 2016
10	Helps to operate in a responsive way to my customers.	Yet, Alaswad, Salman, AlHashmi, AlMarzooqi & AlHammadi ,2019

3.6. DATA COLLECTION

This section of the study outlines how researcher gathered the collected data. All questionnaires were distributed to the sample of 122 of SMEs in Polokwane, along with a motivational letter explaining why the research was conducted, and a letter of ethical clearance from the Turfloop Research Ethics Committee (TREC). The questionnaires were collected immediately after completion by the researcher. In this study, 122 questionnaires were distributed and 110 were returned for analysis. The response rate was therefore 90per cent. A high response rate was obtained by the nature of the data collection employed.

3.7. DATA ANALYSIS METHODS

The main aim of data analysis is to describe how the researcher analysed and presented the primary data that were collected. The statistical Package for Social Sciences (SPSS27) was used to do the analysis and graphs and tables were used to present the findings of the study. The questionnaires that were collected by the researcher were edited. Throughout the process of editing, the researcher checked every questionnaire to see if there were no questions that were skipped and whether they used a correct tick and to check half-finished information (Ledwaba, 2018). After all of these, the researcher coded and captured the collected primary datainto Microsoft Excel and then transferred it to SPSS27.

This study used descriptive statistics to summarise the primary data obtained from the

participants. Descriptive statistics is used by the researcher to symbolise and describing the collected data. Descriptive statistics such as mean and standard deviation were used to describe the data. Primary data were portrayed in tabular form, figures, and graphic form. The study utilised frequency diagrams, and tables to present demographic information.

The data were tested for normality using the Kolmogorov-Smirnov test before conducting furthers tests. Inferential statistics such as regression analysis and Pearson correlation and ANOVA (Analysis of Variance) were used to test the hypotheses and the relationships between the independent and dependent variables.

Inferential statistics is the statistics used to decide on the null hypotheses. Regression analysis was used to determine the degree of correlation between two elements based on underlying theory. Pearson correlation coefficient was utilised to measure association since the data had an interval scale. ANOVA was utilised to analyse the variance of the data as more than two groups of variables were used to produce the variation of the data (Bordens & Abbott, 2016).

3.8. RELIABILITY AND VALIDITY

This study used validity and reliability as a measure of quality in a quantitative analysis, in order to meet the requirements of scientific research since the measurements' accuracy are essential (Tritama & Tarigan, 2016).

3.8.1. Reliability

Reliability measures the consistence that the results will have (Heale & Twycross, 2015). The results of the study should have high levels of reliability when any researcher conducts the test again using the same instruments (Dudovskiy, 2016). The Cronbach Alpha was used to determine if there is internal consistency among the questions that constitute the measurement of each research variable. Values of the Cronbach Alpha at or above 0, 7 are desirable, but values above 0, 9 are not desirable (Mathu & Tlare, 2017).

3.8.2. Validity

Validity measures the philosophy and the findings of the test by ensuring that all scales are measured (Mathu & Tlare, 2017). Tritama & Tarigan (2016) outline that validity measures accurateness of the questionnaire when it describes and explains the

variables in the study. In order to measure validity of the research, a researcher need to state the appropriate time scale, choosing a suitable methodology for the study, identifying sample method and the respondents (Dudovskiy, 2016) and by using common-sense by requesting an assistant from professionals (Tritama & Tarigan, 2016).

Hence, in this study the researcher consulted a statistical expert to assess which methods of research measure a better validity. A pilot test was run to test the content and construct validity of this study. For content validity the researcher also ensured that the questions were aligned to the research objectives. The construct validity was also ensured as the questionnaire was based on assumptions that were based on the conceptual framework. For face validity, the questionnaire was sent for evaluation and proofreading by the research committee for approval. The pilot study was carried out to check the time used to complete the questionnaire, to detect errors in the questionnaire, and correct grammatical mistakes. The instrument was adjusted after obtaining feedback.

3.9. ETHICAL CONSIDERATIONS

This study considered research ethics policy and procedures of the University of Limpopo. A permission letter, which is known as ethical clearance letter, was obtained to conduct the research. This letter of approval was obtained from Turfloop Research Ethics Committee (TREC) as well as the organisations where the researcher conducted the study before any data collection began. Before commencing with data collection, the researcher applied for ethical clearance from the Turfloop Research and the researcher has adhered to all the COVID 19 government restrictions and regulations, this was done during face to face interaction with the exchange of surveys.

The following research ethics were ensured by the researcher:

- **Informed consent**

When the data collection starts, the participants are given a written background and the purpose of the study. They are also presented with a consent form which gives them a chance to decide whether they will participate or not. Written informed consent are also obtained from all the participants before starting the interviews and before administering the questionnaires.

- **Voluntary participation**

Participation in the study was voluntary as stated in the introductory letter.

- **Anonymity**

The researcher assured the participants that their names would not appear in any part of the research and that the information provided was treated as confidential.

- **Confidentiality**

The researcher ensured that information is kept strictly private and confidential. Information provided by participants, especially personal information is not shared with anyone. The researcher ensured this by coding response sequentially instead of using the names of the respondents. The researcher also assured the participants that their names are not to appear in any part of the research.

- **Privacy**

Privacy is maintained throughout the research process. Any individuals' contribution in this study were on a voluntary basis and the researcher ensured that information is kept strictly private.

- **Respect**

Every participant was treated with respect and dignity. The researcher respected the cultural and other sensitivities of the participants.

- **Honesty**

All research activities are carried out with honesty and with regard to the requirements of scientific research and the data are protected.

3.10. CONCLUSION

This chapter outlined the research methodology used in this study. It outlined the process of data collection, research design, the analysis of the data and how ethical considerations were ensured by the researcher during the process of gathering data. In the next chapter the findings from the data collection are discussed.

CHAPTER FOUR

PRESENTATION AND DISCUSSIONS OF THE RESULTS

4.1. INTRODUCTION

This chapter outlines the research data analysis and findings (results) from 110 questionnaires completed by manager/owners of SMEs in the Polokwane local municipality. The participants in the study area were both owners and managers of small businesses. The Polokwane local municipality database was utilised for sourcing participants. Essentially, all the small business owners and managers in the database constituted the population.

This chapter mainly focuses on presenting the results of the findings. The SPSS Version 27 was used to construct the descriptive statistics tests and excel was used to design graphs. These results are utilised to either accept or reject the hypotheses of this study.

4.2. FRAMEWORK FOR ANALYSIS

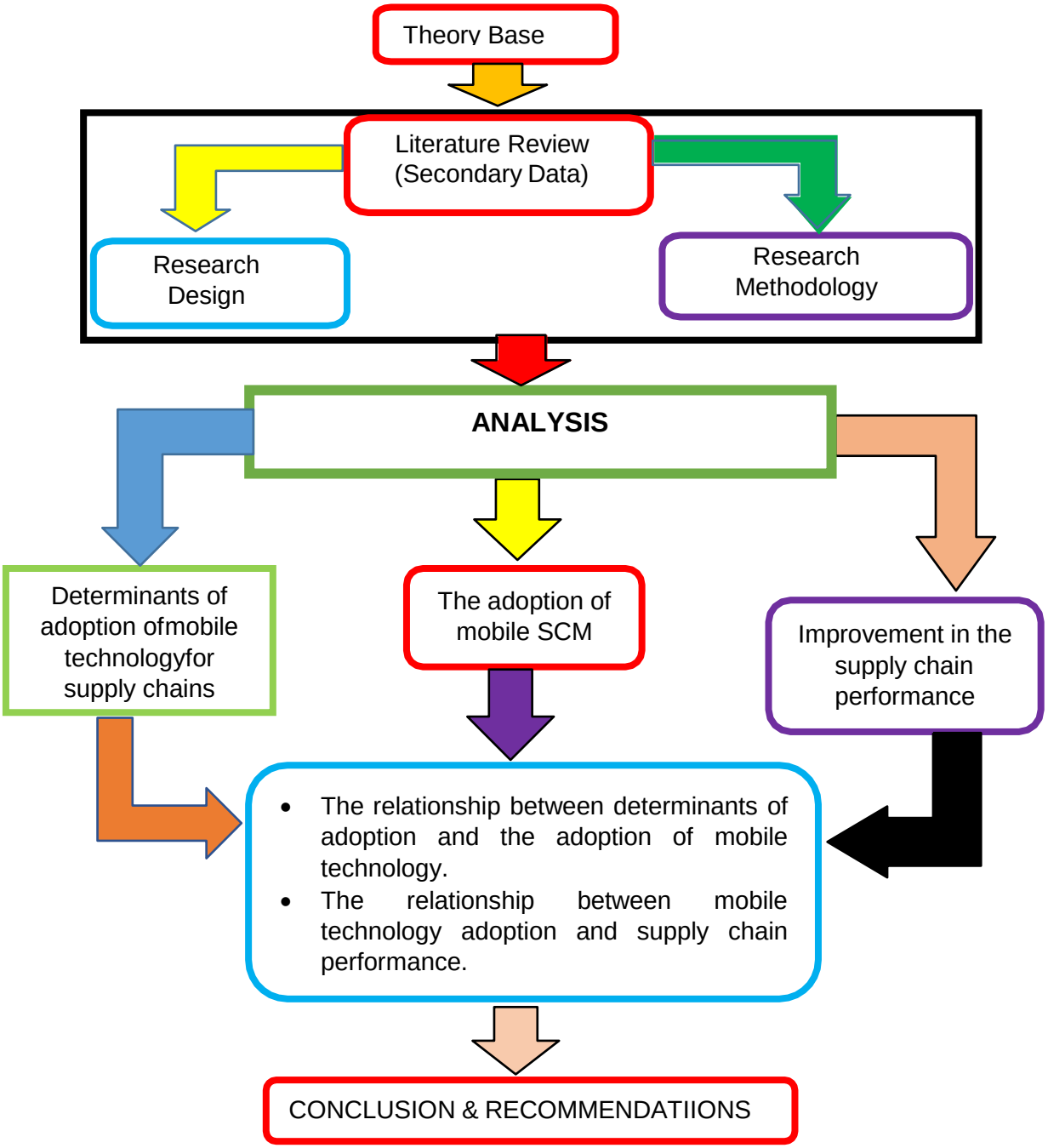
The model below is the framework analysis of this study. The model outlines the manner in which the researcher has presented and interpreted the findings of this study. The model is the continuation of figure 2.5 in chapter two and a combination of model 3.1 in chapter three, respectively.

The results are outlined conferring to the sections of the questionnaire. The sections of the questionnaire are as follows:

- Section A: Demographic data
- Section B: Determinants of supply adoption of mobile technology for supply chains
- Section C: The adoption of mobile SCM
- Section D: Improvement in supply chain performance

Figure 4.1. Framework Analysis

To clearly show how the analysis that leads to the conclusions and recommendations, the following framework was constructed.



Researcher's own conception

The analysis includes measuring determinants of adoption, the adoption and the improvement thereafter as well as the relationships among determinants of adoption, the adoption of mobile technology and supply chain performance.

4.3. ANALYSES OF THE RESPONSE DATA

The table below is the analysis of the response data and the internal consistency. The analyses outline the response rate of the businesses that have participated in the study, the Cronbach's alpha tests for the variables of this study, follows by other analyses in relation to the variables.

4.3.1. Response rate

Table 4.1: Response rate

Respondents	No. sent out	No. returned	Percentage
Businesses	122	110	90.16

The table 4.1 above depicts the rate of businesses that participated in this study. A total of one hundred and twenty-two questionnaires were distributed to the SMEs in the Polokwane local municipality and one hundred and ten were returned. The response rate is 90.16%.

4.3.2. Internal consistency of variables

This section mainly focuses on determining the internal consistency of variables by the using Cronbach's alpha tests. The test was used to measure if there is internal consistency and reliability of each one of the nominal and ordinal scales used in the study (Cilliers, Chinyamurindi & Viljoen, 2017).

Table 4.2: Cronbach's Alpha test for the variables of the study

Reliability Statistics	
Cronbach's Alpha	No. of Items
.963	57

The above table 4.2 shows the Cronbach's alpha test for the variables of the study. The Cronbach's alpha coefficient for 57 items is 0.963 and it is acceptable because it shows the excellent reliability and the satisfactory of internal consistency in between all the variables that are utilised in this research study.

4.3.3. Demographic data

Table 4.3: Level of qualifications

Qualifications	Frequency	Percent
Matric	48	43.6
Diploma	58	52.7
Degree/Honours	4	3.6
Masters	0	0
Other	0	0
Total	**110**	**100**

Table 4.3 shows the level of education of businesses in the study area. The above table illustrates the frequency of the ethnicity. The table is used to derive figure 4.2 below.

Figure 4.2: Level of education

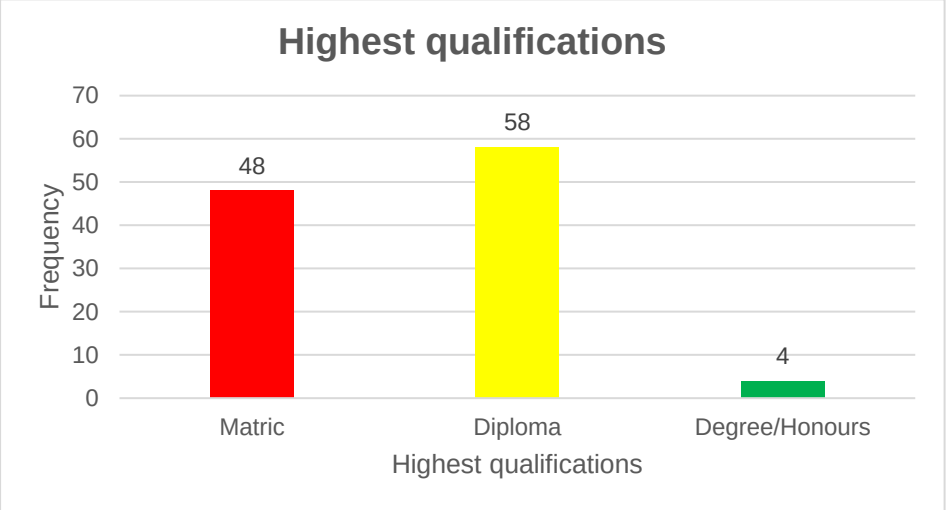


Figure 4.2 illustrates the highest education qualification of businesses that participated in the study area. The figure indicates that 48(43.6%) of the participants have matric. 58(52.7%) have diploma, 4(3.6%) have a degree or honours, and for masters and other there was no indication which results 0%. The results show that the majority have a diploma as their highest qualifications, while the minority have a degree or honours as their highest qualifications.

Table 4.4: Ethnicity

Ethnicity	Frequency	Percent
African	110	100
Indian/Asian	0	0
White	0	0
Coloured	0	0
Other	0	0
Total	**110**	**100**

Table 4.4 shows the ethnicity of businesses in the study area. The above table illustrates the frequency of the ethnicity. The table is used to derive figure 4.3 below.

Figure 4.3 Ethnicity

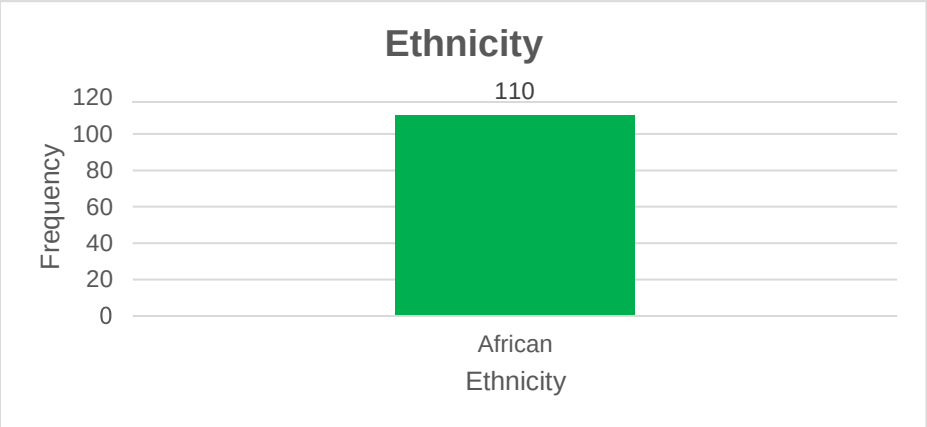


Figure 4.3 shows the ethnicity in the study area. The results indicate that out of 110 businesses participating, 110 (100%) are Africans. This entails that there are no other ethnicity businesses, only African businesses.

Table 4.5: Occupation

Occupation	Frequency	Percent
Business Owner	101	91.8
Manager	9	8.2
Total	**110**	**100**

Table 4.4 shows the occupation of the participants in the study area. The above table outlines the frequency of the occupation of the participants. The table is used to derive figure 4.4 below.

Figure 4.4: Occupation of participants

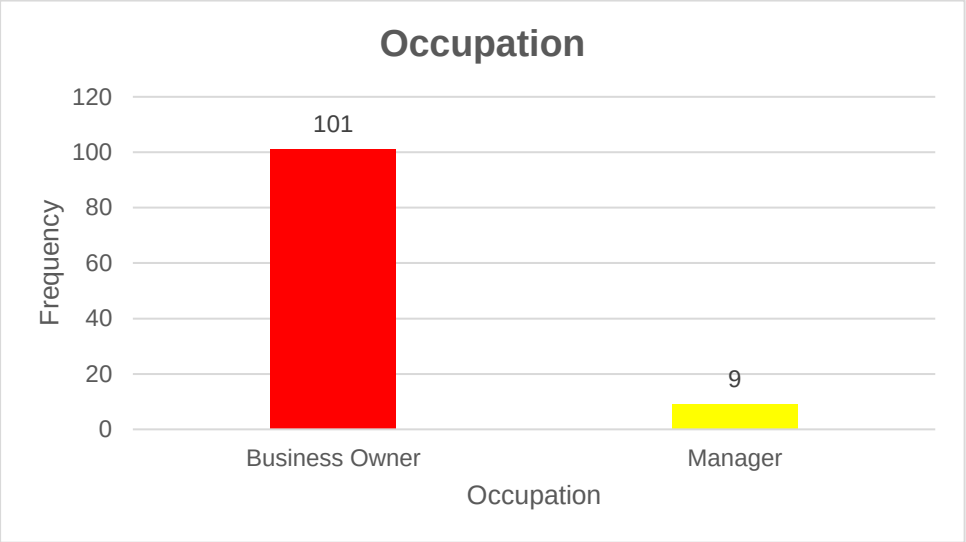


Figure 4.4 shows the occupation of the participants. The results indicate that out of 110 businesses participating, 101 (91.8%) are business owners and 9 (8.2%) are managers. This entails that most respondents of businesses in the study area are business owners.

Table 4.6: Work experience

Work experience	Frequency	Percent
Less than 1 year	17	15.5
Between 1 to 5 years	87	79.1
Between 5 to 10 years	6	5.5
Between 10 to 15 years	0	0
15 years and above	0	0
Total	**110**	**100**

Table 4.6 shows the work experience in the business. The Table outlines the frequency of work experience in the business. The table is used to derive figure 4.5 below.

Figure 4.5: Work experience in the business

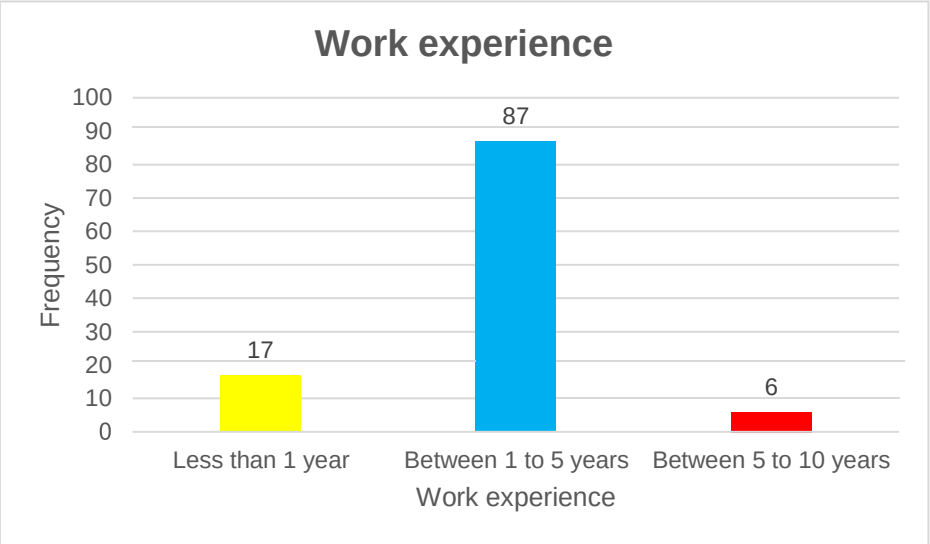


Figure 4.5 shows the work experience in the business. The results indicate that out of 110 businesses (individual) participating, 17 (15.5%) have been working in the business for less than 1 year, 87 (79.1%) have the work experience of between 1 to 5 years, 6 (5.5%) businesses have the work experience of between been 10 to 14 years, between 10 to 15 years and 15 years and above there was no indication, which results 0%. The results show that the majority have the work experience in the business, while the minority have work experience of between 5 to 10 years.

4.4. DETERMINANTS OF SUPPLY ADOPTION OF MOBILE TECHNOLOGY FOR SUPPLY CHAINS

4.4.1. Perceived Usefulness

4.4.1.1. Cronbach's Alpha test for Perceived Usefulness

Table 4.7: Cronbach's Alpha test for perceived usefulness

Reliability Statistics	
Cronbach's Alpha	No. of Items
.930	5

The above table 4.7 shows the Cronbach's alpha test for the perceived usefulness as a determinant of supply adoption of mobile technology for supply chains. The Cronbach's alpha coefficient for 5 items is 0.930, which is acceptable for hypotheses testing.

4.4.1.2. Internal consistency for Perceived Usefulness

Table 4.8: Internal consistency for perceived usefulness

	Mean if Item Deleted	Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
Find new customers	8.81	15.672	.886	.899
Improve the speed	8.66	15.835	.910	.895
Depends on the level of usefulness	9.07	20.443	.526	.960
Create flexibility	8.63	15.787	.896	.897
To be available at all hours for my business	8.72	15.978	.864	.904

Table 4.8 shows the internal consistency of perceived usefulness. The Cronbach's alpha test result for the 5 items suggests that there is a relatively high internal consistency of the questions. This means that the Cronbach's Alpha test value for the perceived usefulness as a determinant of supply adoption of mobile technology for supply chains is acceptable because all of them are above 0.7 which indicates the internal consistency reliability between the items.

4.4.1.3. Normality test for Perceived Usefulness

The normality test and analyses for perceived usefulness are presented below. The figures below are constructed through the sums of the data of the perceived usefulness as a determinant of adoption of mobile technology for supply chains.

Figure 4.6: Histogram with normal curve for perceived usefulness

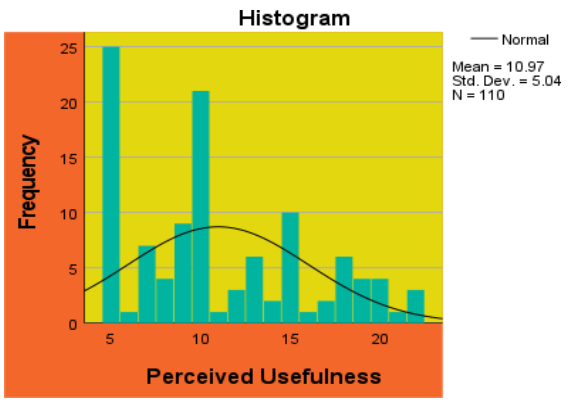


Figure 4.6: illustrates the histogram and normal distribution curve. The figure illustrates that data for perceived usefulness are normal. The normal distribution curve on the histogram clearly outlines the normality of the data.

Figure 4.7: Normal Q-Q Plot for perceived usefulness

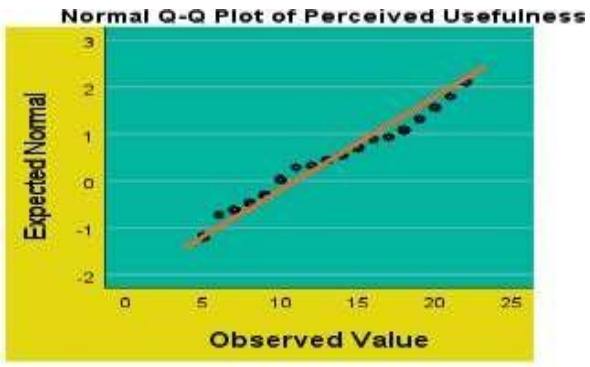
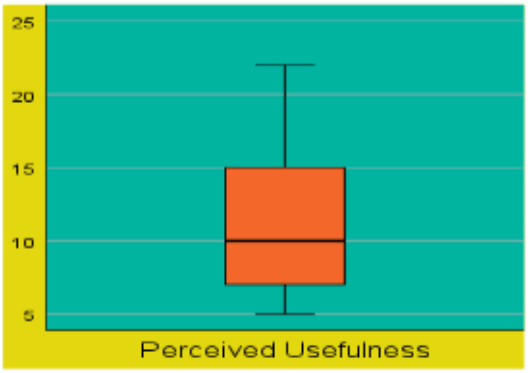


Figure 4.7 illustrates the normal QQ Plot. The figure depicts that perceived usefulness data are normally distributed because the data points are close to the diagonal line.

Figure 4.8: Box plot for perceived usefulness



The figure 4.8 outlines that the businesses have different views about the perceived usefulness as a determinant of mobile technology adoption in the supply chain. The indication of the results is influenced by the fact that the data are squid to the right.

4.4.1.4. Frequencies of Perceived Usefulness

The frequencies and percentages of the perceived usefulness are presented and analysed in the table and figures below.

Table 4.9: Frequencies for perceived usefulness

Perceived Usefulness										
	Customers		Speed		Usefulness		Flexibility		Availability	
	Frequency	Percent	Frequency	Percent	Frequency	Percent	Frequency	Percent	Frequency	Percent
Strongly agree	42	38.2	32	29.1	46	41.8	34	30.9	39	35.5
Agree	33	30.0	37	33.6	35	31.8	29	26.4	30	27.3
Neutral	12	10.9	18	16.4	23	20.9	26	23.6	19	17.3
Disagree	19	17.3	19	17.3	6	5.5	16	14.5	18	16.4
Strongly disagree	4	3.6	4	3.6	0	0	5	4.5	4	3.6
Total	**110**	**100**	**110**	**100**	**110**	**100**	**110**	**100**	**110**	**100**

Figure 4.9: A cell phone and other mobile devices help me to find new customers.

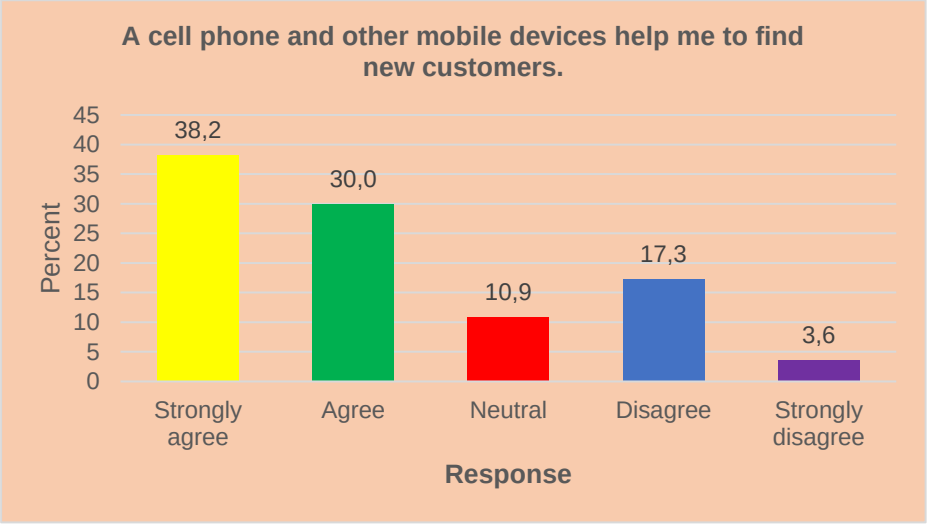


Figure 4.9 (derived from table 4.9) indicates that out of 110 businesses, 38.2% of them strongly agree that a cell phone and other mobile devices help them to find new customers, 30% of businesses agree that a cell phone and other mobile devices help them to find new customers, 10.9% of businesses are neutral, 17.3% of business disagree, and 3.6% of businesses indicate that they strongly disagree. Consequently, it is concluded that the majority of the businesses strongly agree that a cell and other mobile devices help them to find new customers, while the minority indicate that they strongly disagree that a cell and other mobile devices can help them to find new customers.

Figure 4.10: A cell phone and other mobile devices improve the speed with which I can deal with customers.

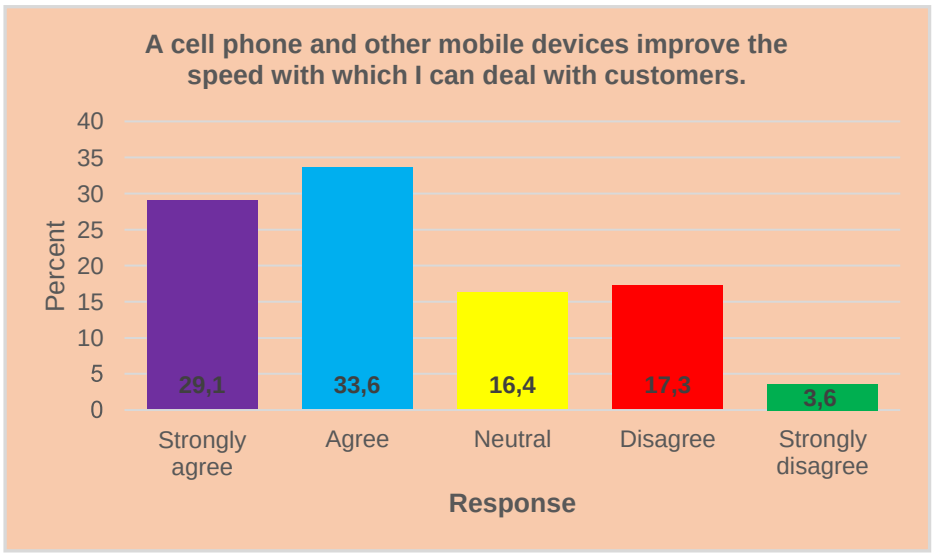


Figure 4.10 (derived from table 4.9) shows that 29.1% of businesses from 110 that participated strongly agree that a cell phone and other mobile devices improve the speed with which they can deal with their customers, 33.6% of businesses agree that a cell phone and other mobile devices are improving the speed with which they can deal with their customers, 16.4% of businesses are neutral on the fact that a cell phone and other mobile devices can improve the speed with which they can deal with their customers,17.3% disagree that a cell phone and other mobile devices improve the speed with which they can deal with their customers and 3.6% of businesses strongly disagree that the speed with which they deal with their customers is improving with the use of a cell phone and mobile devices.

Therefore, it is concluded that the majority of businesses in the study area agree that a cell phone and other mobile devices improve the speed with which they can deal with their customers, while the minority of businesses in the study area strongly disagree on the fact that a cell phone and other mobile devices improve the speed with which they can deal with their customers.

Figure 4.11: Whether I use technology depends on the level of usefulness.

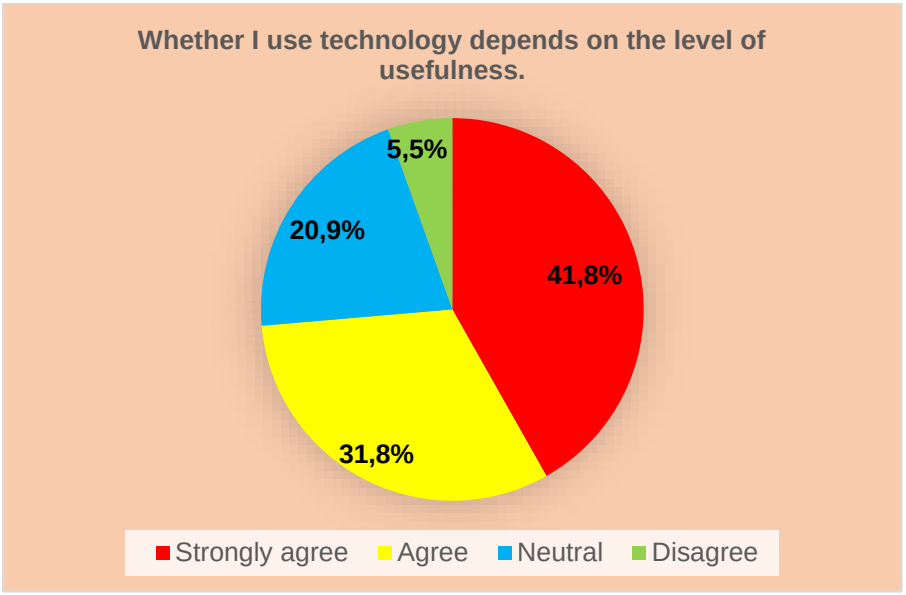


Figure 4.11 (derived from table 4.9) indicate that 41.8% of businesses from 110 businesses strongly agree that the use of technology depends on the level of usefulness, 31.8% of businesses agree that the level of usefulness determines the use of technology, 20.9% of businesses are neutral on whether the use of technology depends on the level of usefulness, 5.5% of businesses disagree on the fact that

technology usage depends on the level of usefulness, while strongly disagree is on 0 %. It is therefore concluded that the majority of businesses in the study area strongly agree that the use of technology depends on the level of usefulness, while the minority disagree that the use of technology depends on the level of usefulness.

Figure 4.12: A cell phone and other mobile devices create flexibility between me and my customers.

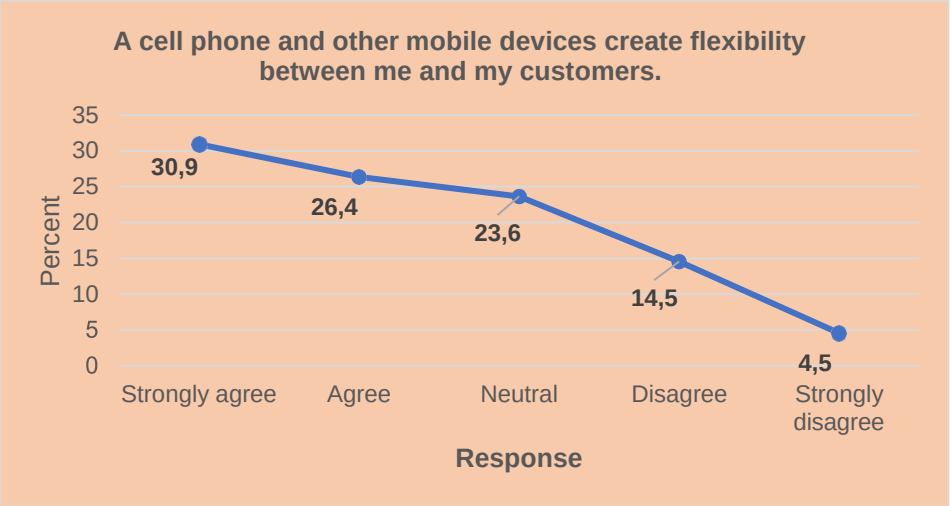


Figure 4.12 (derived from table 4.9) indicates that, out of 110 businesses that participated in the study, 30.9% of businesses strongly agree that a cell phone and other mobile devices are creating the flexibility between them and their customers, 26.4% of businesses agree that a cell phone and other mobile devices create the flexibility between them and their customer, 23.6% businesses are neutral on whether there is a flexibility between them and their customers because of the use of a cell phone and other mobile devices, 14.5% of businesses disagree that a cell phone and other mobile devices can create flexibility between them and their customers and 4.5% businesses strongly disagree that a cell phone and other mobile devices can create flexibility between them and their customers.

It is therefore concluded that the majority of businesses strongly agree that that a cell phone and other mobile devices can create flexibility between them and their customers, while the minority of businesses strongly disagree that a cell phone and other mobile devices can create flexibility between them and their customers.

Figure 4.13: A cell phone and other mobile devices help me to be available at all hours for my business.

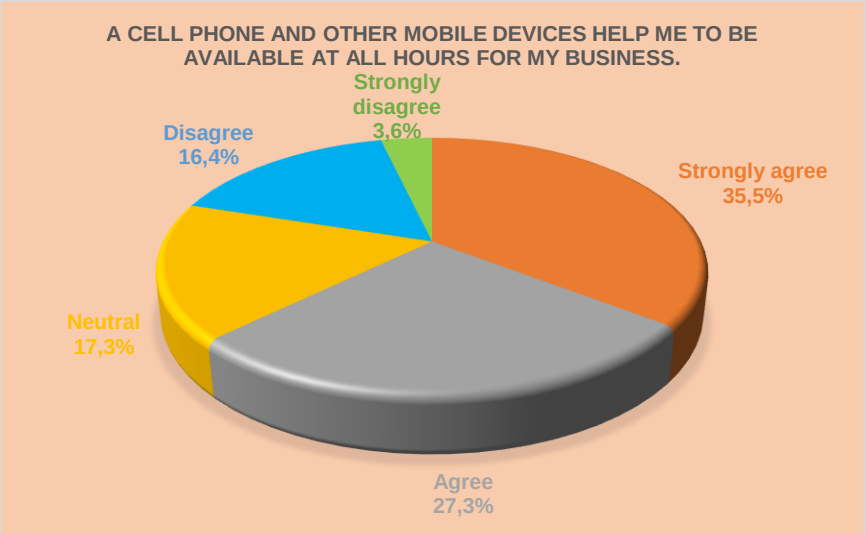


Figure 4.13 (derived from table 4.9) indicates that out of 110 businesses, 35.5% strongly agree that a cell phone and other mobile devices help them to be available at all hours for their business, 27.3% of businesses agree that a cell phone and other mobile devices help them to be available at all hours for their business, 17.3% of businesses are neutral on whether a cell phone and other mobile devices help them to be available at all hours for their business , 16.4% of business disagree that a cell phone and other mobile devices help them to be available at all hours for their business, and 3% of businesses indicated that they strongly disagree that a cell phone and other mobile devices help them to be available at all hours for their business.

Consequently, it is concluded that the majority of the businesses indicate that a cell phone and other mobile devices help them to be available at all hours for their business, while the minority indicate that they strongly disagree that a cell phone and other mobile devices help them to be available at all hours for their business.

4.4.1.5. Summary of findings of perceived usefulness as a determinant of supply adoption of mobile technology for supply chains

It is concluded that a cell phone and other mobile devices can help businesses find new customers and that it can improve the speed with which the business can deal with their customers. Consequently, the use of technology in the businesses depends on the level of usefulness. The businesses in the study area believe that a cell phone and other mobile devices can create flexibility between them and their customers and help them to be available at all hours for their business.

4.4.2. Perceived Ease of Use

4.4.2.1. Cronbach's Alpha test for Perceived Ease of Use

Table 4.10: Cronbach's Alpha test for Perceived ease of use

Reliability Statistics	
Cronbach's Alpha	No. of Items
.894	6

The table 4.10 shows the Cronbach's alpha test for the perceived ease of use as a determinant of supply adoption of mobile technology for supply chains. The Cronbach's alpha coefficient for 6 items is 0.894, which is acceptable for hypotheses testing.

4.4.2.2. Internal consistency for Perceived Ease of Use

Table 4.11: Internal consistency for perceived ease of use

	Mean if Item Deleted	Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
Easy to use	12.32	22.054	.697	.879
If it is easy to use new technology, I will use it	12.45	23.883	.566	.896
Interact with my customers	12.12	20.968	.713	.875
Easy to gather data	11.38	18.146	.808	.861
I train myself and my workers to use mobile devices	11.48	19.958	.738	.872
Suppliers supports me with mobile software	11.52	19.169	.801	.861

Table 4.11 presents the internal consistency for perceived ease of use. The Cronbach's alpha test result for the 6 items suggests that there is relatively high internal consistency of the questions. This means that the Cronbach's Alpha test value for the perceived ease of use as a determinant of supply adoption of mobile technology for supply chains is acceptable because is above 0.7 which indicates the internal consistency reliability between the items.

4.4.2.3. Normality test for Perceived Ease of Use

The normality test and analyses for perceived ease of use are presented below. The figures below are constructed through the sums of the data of the perceived usefulness as a determinant of supply adoption of mobile technology for supply chains.

Figure 4.14: Histogram with normal curve for perceived ease of use

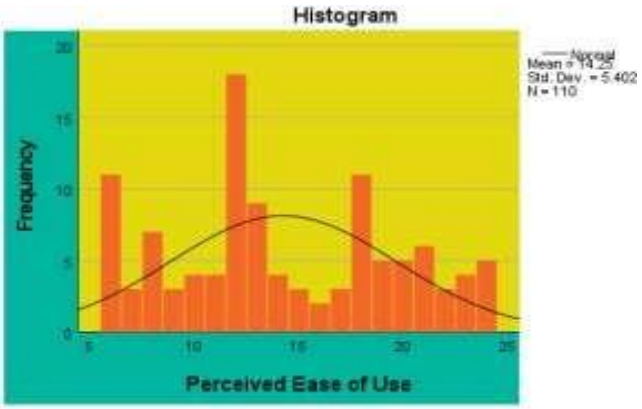


Figure 4.14: illustrates a histogram and normal distribution curve. The figure illustrates that data for perceived ease of use are normal. The normal distribution curve on the histogram clearly outlines the normality of data.

Figure 4.15: Normal Q-Q Plot for perceived ease of use

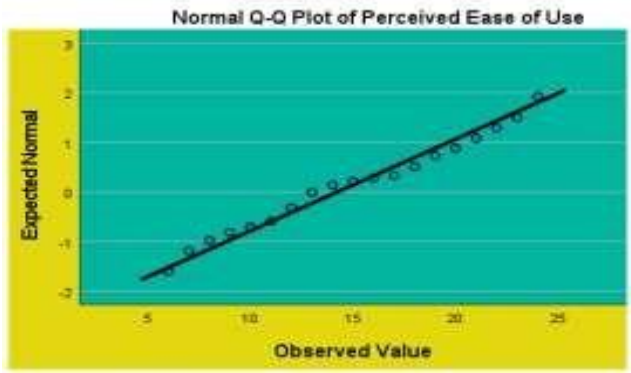
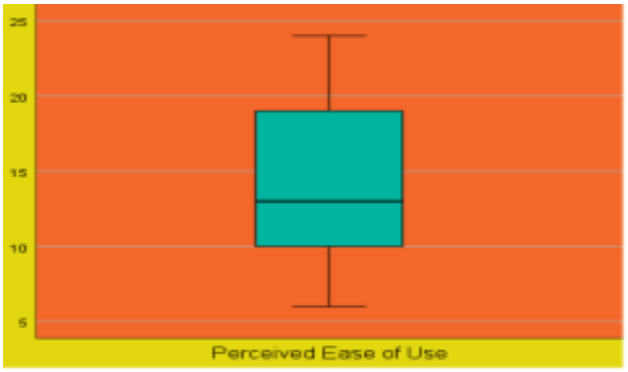


Figure 4.15 illustrates the normal QQ Plot. The figure depicts that perceived ease of use data is normallydistributed because the data pointsare close to the diagonal line.

Figure 4.16: Box plot for perceived ease of use



The figure 4.16 outlines the Box plot for perceived ease of use. The figure depicts that the businesses have different views about the perceived ease of use as a determinant of mobile technology adoption in the supply chain. The indication of the results is influenced by the fact that the data is squid to the right.

4.4.2.4. Frequencies of Perceived Ease of Use

The frequencies and percentages of the perceived ease of use are presented and analysed in the table and figures below.

Table 4.12: Frequencies for perceived ease of use

Perceived Ease of Use												
	Easy to use		Easiness		Interact		Gather data		Training		Suppliers	
	Frequency	Percent	Frequency	Percent	Frequency	Percent	Frequency	Percent	Frequency	Percent	Frequency	Percent
Strongly agree	44	40.0	47	42.7	38	34.5	21	19.1	18	16.4	21	19.1
Agree	38	34.5	42	38.2	37	33.6	29	26.4	32	29.1	30	27.3
Neutral	19	17.3	17	15.5	18	16.4	17	15.5	23	20.9	22	20.0
Disagree	9	8.2	4	3.6	16	14.5	29	26.4	31	28.2	31	28.2
Strongly disagree	0	0	0	0	1	.9	14	12.7	6	5.5	6	5.5
Total	**110**	**100**	**110**	**100**	**110**	**100**	**110**	**100**	**110**	**100**	**110**	**100**

Figure 4.17: I use a cell phone and other mobile devices because it is easy to use.

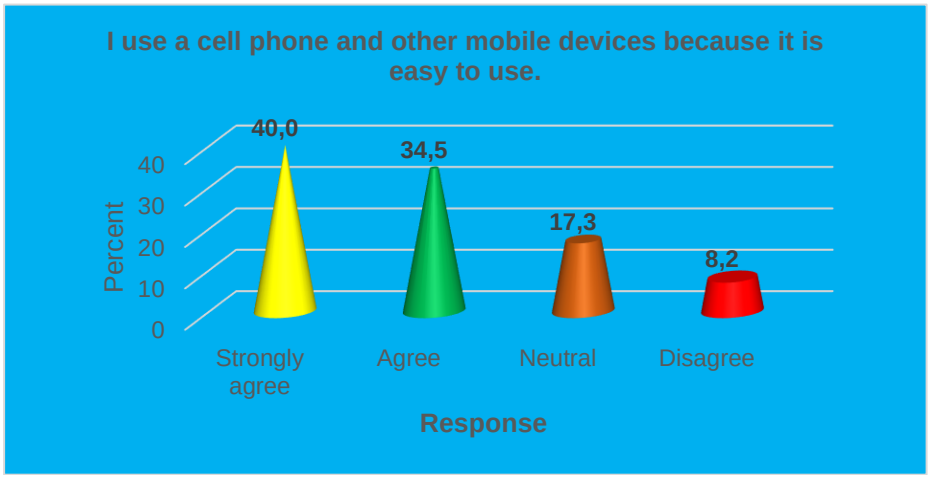


Figure 4.17 (derived from table 4.12) indicates that, out of 110 businesses that participated in the study, 40% of businesses strongly agree that they use a cell phone and other mobile devices because it is easy to use, 34.5% of businesses agree that they use a cell phone and other mobile devices because it is easy to use, 17.3% businesses are neutral on whether they use a cell phone and other mobile devices because it is easy to use, 8.2% of businesses disagree that they use a cell phone and other mobile devices because it is easy to use and strongly disagree is 0%. It is therefore concluded that the majority of businesses strongly agree that they use a cell

phone and other mobile devices because it is easy to use, while the minority of businesses disagree that they use a cell phone and other mobile devices because it is easy to use.

Figure 4.18: When I believe it is easy to use new technology, I will use it.

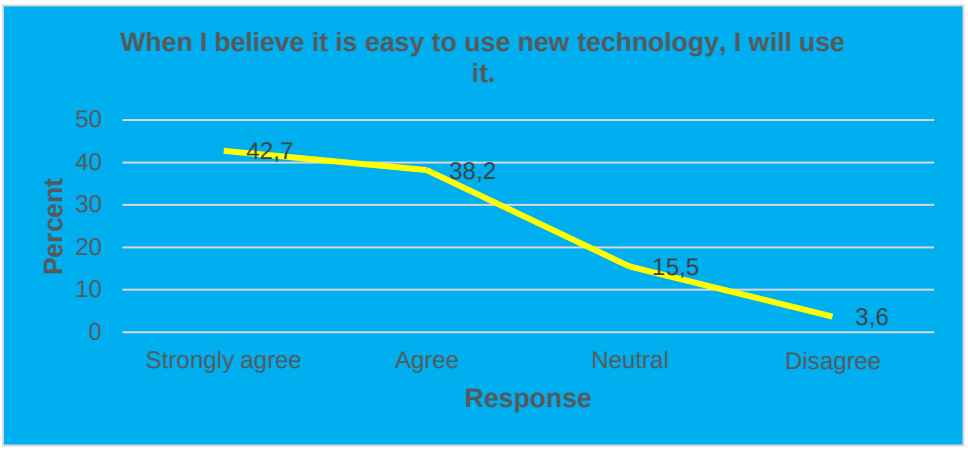


Figure 4.18 (derived from table 4.12) indicates that 42.8% of businesses from 110 businesses strongly agree that if it is easy to use new technology they will use it, 38.2% of businesses agree that if it is easy to use new technology they will use it, 15.5% of businesses are neutral on the fact that if new technology is easy to use they will use it, 3.6% of businesses disagree that if it is easy to use new technology they will use it, while strongly disagree is on 0 %. It is therefore concluded that the majority of businesses in the study area strongly agree that if new technology is easy to use they will use it, while the minority disagree that even if the new technology is easy to use they will use it.

Figure 4.19: I use the cell phone and other mobile devices to interact with my customers because it is easier to use.

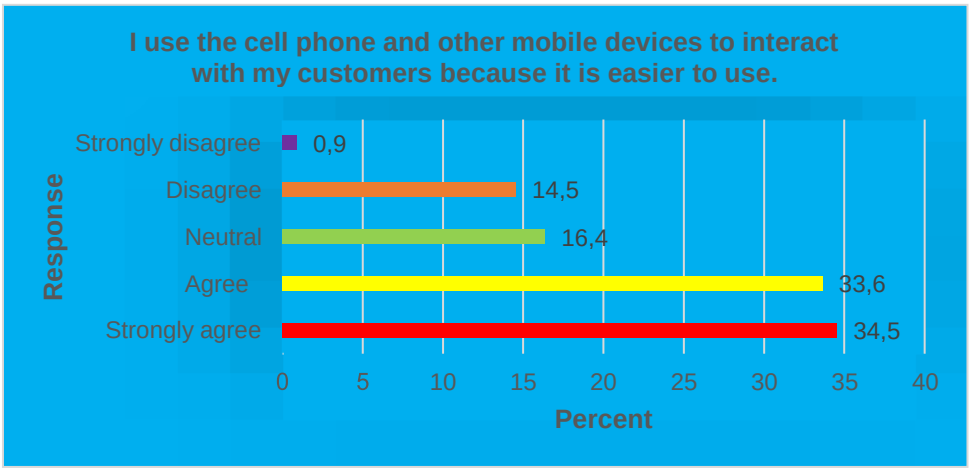


Figure 4.19 (derived from table 4.12) shows that 34.5% of businesses from 110 that participated strongly agree that they use a cell phone and other mobile devices to interact with their customers because it is easier to use, 33.6% of businesses agree that they use a cell phone and other mobile devices to interact with their customers, 16.4% of businesses are neutral on the fact that they use a cell phone and other mobile devices to interact with their customers because it is easier to use,14.5% disagree that they use a cell phone and other mobile devices is to interact with their customers and 0.9% of businesses strongly disagree to using a cell phone and mobile devices to interact with their customers.

Therefore, it is concluded that the majority of businesses in the study area strongly agree that they use a cell phone and other mobile devices to interact with their customers because it is easier to use, while the minority of businesses in the study area strongly disagree on the fact that they use a cell phone and other mobile devices to interact with their customers.

Figure 4.20: Using a cell phone it is easy to gather data.

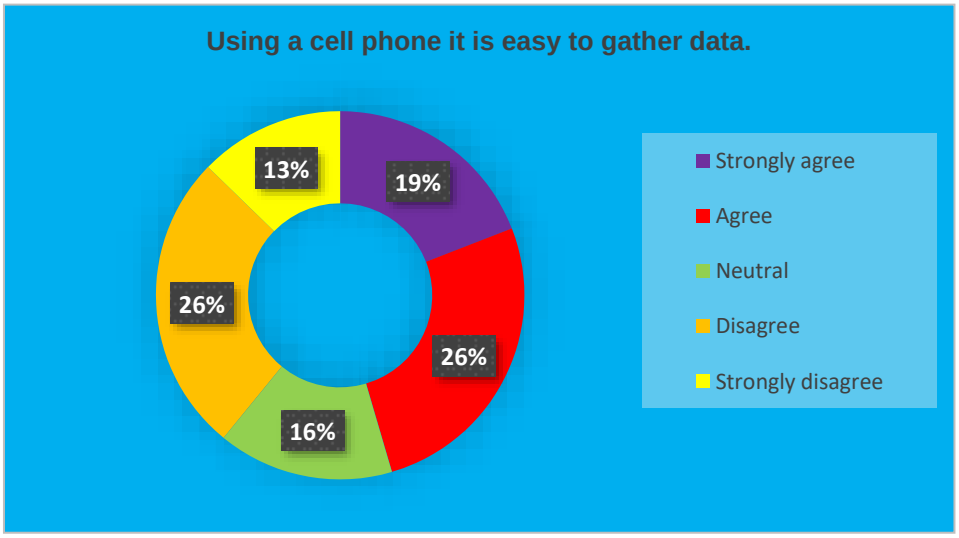


Figure 4.20 (derived from table 4.12) indicates that out of 110 businesses, 19% strongly agree that gathering data is easy by using a cell phone, 26% of businesses agree that using a cell phone is easy to gather data, 16% of businesses are neutral on whether using a cell phone is easy to gather data , 26% of business disagree that using a cell phone is easy to gather data, and 13% of businesses indicated that they strongly disagree that using a cell phone is easy to gather data. Consequently, it is concluded that the majority of the businesses indicated strongly agree and agree that

using a cell phone is easy to gather data, while the minority indicate that they strongly disagree that using a cell phone is easy to gather data.

Figure 4.21: I train myself and my workers to use mobile devices because it is easy to use.

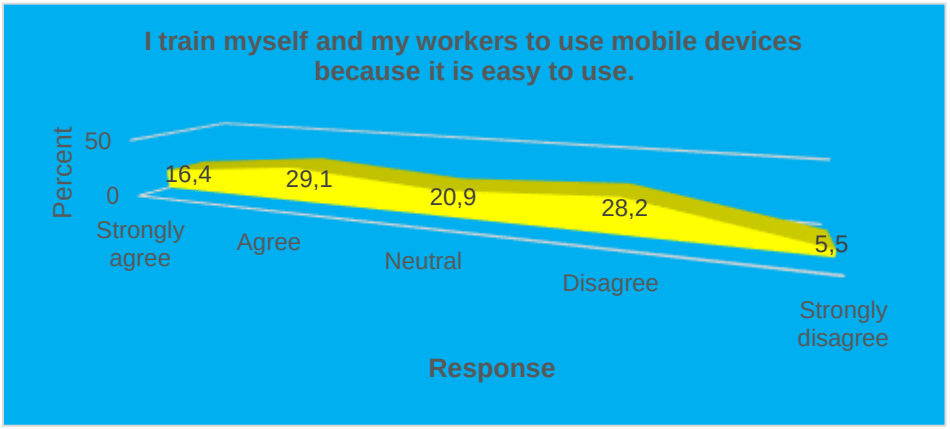


Figure 4.21 (derived from table 4.12) shows that 16.4% of businesses from 110 that participated strongly agree that they train themselves and their workers to use mobile devices because it is easy to use, 29.1% of businesses agree that they train themselves and their workers to use mobile devices because it is easy to use, 20.9% of businesses are neutral on the fact that they train themselves and their workers to use mobile devices, 28.2% disagree that they train themselves and their workers to use mobile devices and 5.5% of businesses strongly disagree that they train themselves and their workers to use mobile devices.

Therefore, it is concluded that the majority of businesses in the study area agree that they train themselves and their workers to use mobile devices because it is easy to use, while the minority of businesses in the study area strongly disagree on the fact that they train themselves and their workers to use mobile devices because it is easy to use.

Figure 4.22: Mobile technology is easy to use as suppliers support me with mobile software.

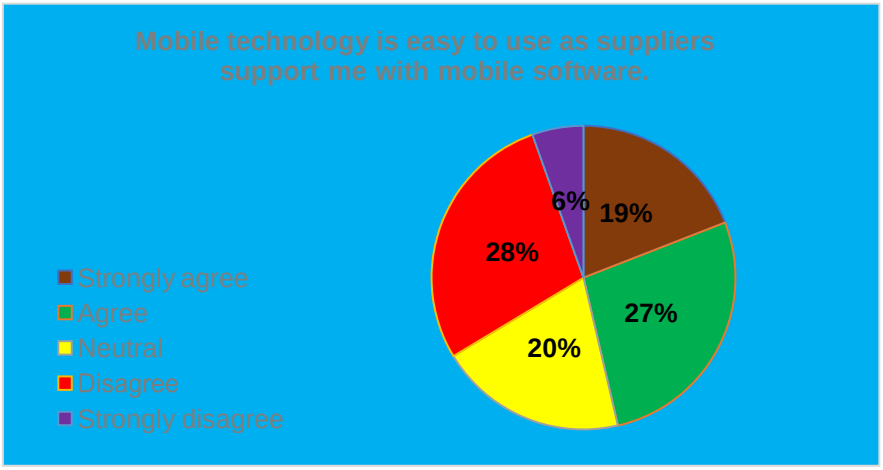


Figure 4.22 (derived from table 4.12) indicates that, out of 110 businesses that participated in the study, 19% of businesses strongly agree that mobile technology is easy to use as suppliers support them with mobile software, 27% of businesses agree that mobile technology is easy to use as suppliers support them with mobile software, 20% businesses are neutral on the fact that mobile technology is easy to use as suppliers support them with mobile software, 28% of businesses disagree that mobile technology is easy to use as suppliers support them with mobile software and 6% businesses strongly disagree that mobile technology is easy to use as suppliers support them with mobile software. It is therefore concluded that the majority of businesses disagree that mobile technology is easy to use because suppliers do not support them with mobile software, while the minority of businesses strongly disagree that mobile technology is easy to use as suppliers support them with mobile software.

4.4.2.5. Summary of findings of perceived ease of use as a determinant of supply adoption of mobile technology for supply chains

It is concluded that the businesses in the study area believe that they use a cell phone and other mobile devices because it is easy to use and that the use of new technology in the businesses depends on the level of easiness. It is therefore assumed that a cell phone and other mobile devices in businesses are used to interact with customers because it is easy to use, and it is easy to gather data. Also, it is concluded that businesses in the study area train themselves and their workers to use mobile devices, but suppliers do not support them with mobile software.

4.4.3. Technology Readiness

4.4.3.1. Cronbach's Alpha test for Technology Readiness

Table 4.13: Cronbach's Alpha test for technology readiness

Reliability Statistics	
Cronbach's Alpha	No. of Items
.886	6

The table 4.13 shows the Cronbach's alpha test for technology readiness as a determinant of supply adoption of mobile technology for supply chains. The Cronbach's alpha coefficient for 6 items is 0.886, which is acceptable for hypotheses testing.

4.4.3.2. Internal Consistency for Technology Readiness

Table 4.14: Internal consistency for technology readiness

	Mean if Item Deleted	Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
Innovativeness	10.89	19.841	.530	.890
Readiness	11.30	18.047	.714	.864
Technology uses rather than who does not	11.02	16.917	.780	.852
Optimism	11.37	18.108	.708	.864
Insecurity	11.20	17.079	.693	.868
Discomfort	11.31	17.408	.778	.853

Table 4.14 presents the internal consistency for technology readiness. The Cronbach's alpha test result for the 6 items suggests that there is relatively high internal consistency of the questions. This means that the Cronbach's Alpha test value for technology readiness as a determinant of supply adoption of mobile technology for supply chains is acceptable because is above 0.7 which indicates the internal consistency reliability between the items.

4.4.3.3. Normality test for Technology Readiness

The normality test and analyses for technology readiness are presented below. The figures below are constructed through the sums of the data of technology readiness as a determinant of supply adoption of mobile technology for supply chains.

Figure 4.23: Histogram with normal curve for technology readiness

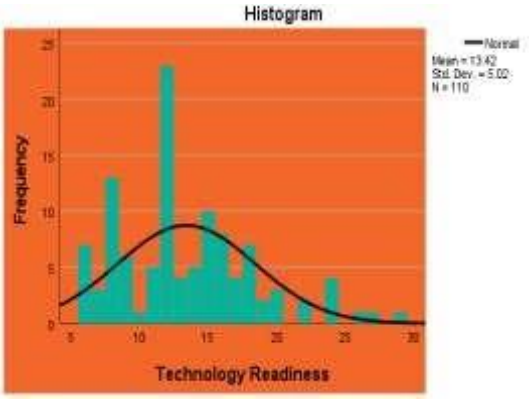
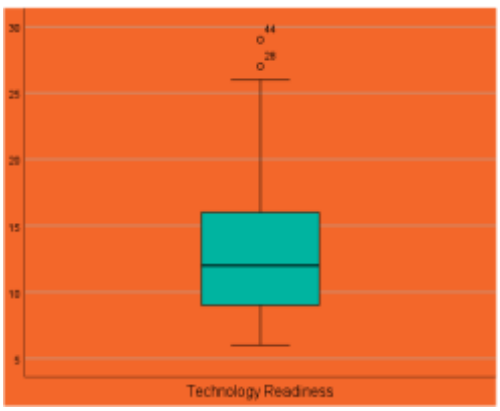


Figure 4.23: illustrates a histogram and normal distribution curve. The figure illustrates that data for technology readiness are normal. The normal distribution curve on the histogram clearly outlines the normality of data.

Figure 4.24: Normal Q-Q Plot for technology readiness

Figure 4.24 depicts the normal QQ Plot. The figure illustrates that technology readiness data are normally distributed because the data points are close to the diagonal line.

Figure 4.25: Box plot for technology readiness



The figure 4.25 outlines the Box plot for technology readiness. The figure depicts that the businesses have different views about the technology readiness as a determinant of mobile technology adoption in the supply chain. The indication of the results is influenced by the fact that the data are squid to the right.

4.4.3.4. Frequencies of Technology Readiness

The frequencies and percentages of technology readiness are presented and analysed in the table and figures below.

Table 4.15 Frequencies for Technology readiness

Technology readiness												
	Innovativeness		Readiness		Technology uses		Optimism		Insecurity		Discomfort	
	Frequency	Percent	Frequency	Percent	Frequency	Percent	Frequency	Percent	Frequency	Percent	Frequency	Percent
Strongly agree	16	14.5	34	30.9	28	25.5	34	30.9	33	30.0	32	29.1
Agree	38	34.5	42	38.2	31	28.2	51	46.4	45	40.9	51	46.4
Neutral	39	35.5	24	21.8	34	30.9	16	14.5	15	13.6	14	12.7
Disagree	16	14.5	7	6.4	13	11.8	4	3.6	9	8.2	9	8.2
Strongly disagree	1	0.9	3	2.7	4	3.6	5	4.5	8	7.3	4	3.6
Total	**110**	**100**	**110**	**100**	**110**	**100**	**110**	**100**	**110**	**100**	**110**	**100**

Figure 4.26: Being open to the use of new technologies helps me to use mobile devices in my business.

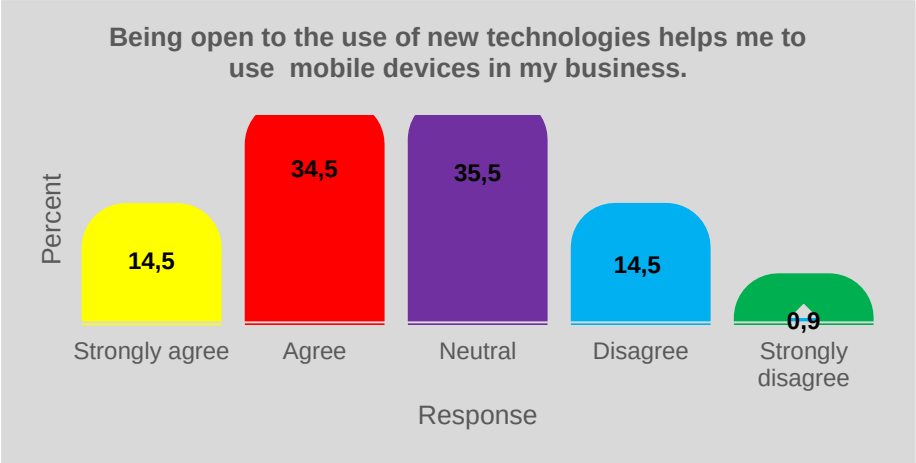


Figure 4.26 (derived from table 4.15) indicates that, out of 110 businesses that participated in the study, 14.5% of businesses strongly agree that being open to the use of new technologies helps them to use mobile devices, 34.5% of businesses agree that being open to the use of new technologies helps them to use mobile devices, 35.5% businesses are neutral on the fact that being open to the use of new technologies helps them to use mobile devices, 14.5% of businesses disagree that

being open to the use of new technologies helps them to use mobile devices and 0.9% businesses strongly disagree that being open to the use of new technologies helps them to use mobile devices.

It is therefore concluded that the majority of businesses are neutral on the fact that being open to the use of new technologies helps them to use mobile devices, while the minority of businesses strongly disagree on the fact that being open to the use of new technologies helps them to use mobile devices.

Figure 4.27: I am always ready to use new technology.

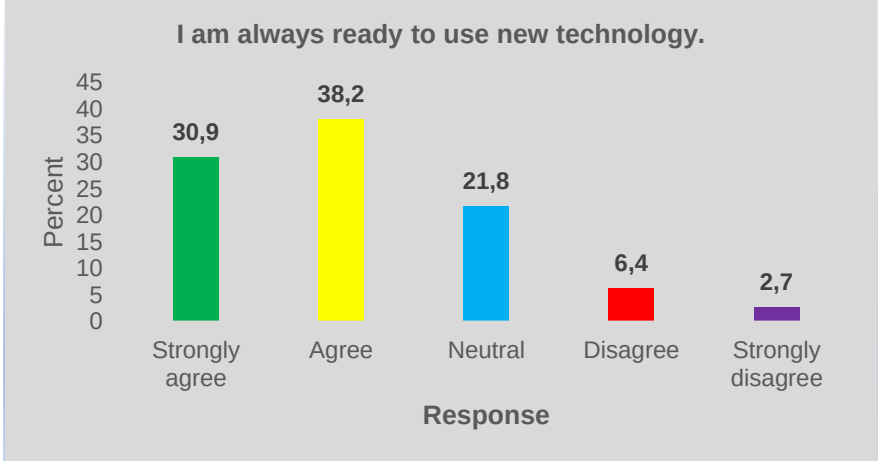


Figure 4.27 (derived from table 4.15) shows that 30.9% of businesses from 110 that participated strongly agree that they are always ready to use new technology, 38.2% of businesses agree that they are always ready to use new technology, 21.8% of businesses are neutral that they are always ready to use new technology, 6.4% disagree that they are always ready to use new technology and 2.7% of businesses strongly disagree that they are always ready to use new technology. Therefore, it is concluded that the majority of businesses in the study area agree that they are always ready to use new technology, while the minority of businesses in the study area strongly disagree on the fact that they are always ready to use new technology.

Figure 4.28: I prefer to employ people that use new technology rather than a person who does not.

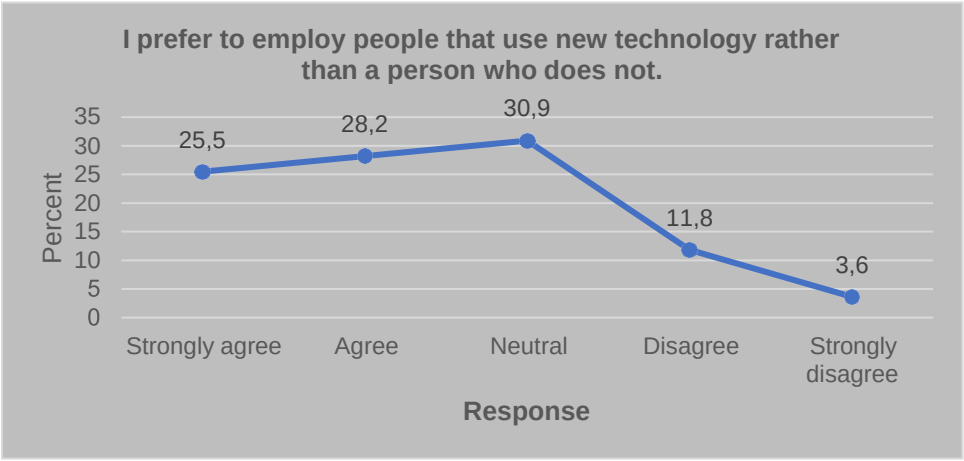


Figure 4.28 (derived from table 4.15) indicates that out of 110 businesses, 25.5% strongly agree that they prefer to employ people that use new technology rather than a person who does not, 28.2% of businesses agree they prefer to employ people that use new technology rather than a person who does not, 30.9% of businesses are neutral on whether to employ people that use new technology rather than a person who does not, 11.8% of business disagree on employing people that use technology rather than a person who does not, and 3.6% of businesses indicate that they strongly disagree on employing people that use technology rather than a person who does not.

Consequently, it is concluded that the majority of the businesses are neutral on the fact of employing people that use technology rather than a person who does not, while the minority indicated that they strongly disagree on employing people that use technology rather than a person who does not.

Figure 4.29: People that are optimistic prefer to use new technology.

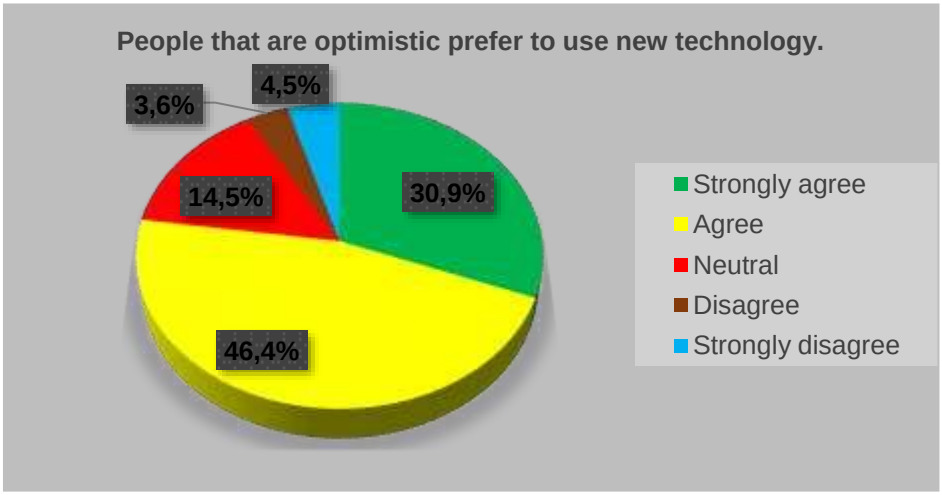


Figure 4.29 (derived from table 4.15) shows that 30.9% of businesses from 110 that participated strongly agree that people who are optimistic prefer to use new technology, 46.6% of businesses agree that people who are optimistic prefer to use new technology, 14.5% of businesses are neutral on the fact that people who are optimistic prefer to use new technology,3.6% disagree that people who are optimistic prefer to use new technology and 4.5% of businesses strongly disagree that people who are optimistic prefer to use new technology. Therefore, it is concluded that the majority of businesses in the study area agree that people who are optimistic prefer to use new technology, while the minority of businesses in the study area disagree on the fact that people who are optimistic prefer to use new technology.

Figure 4.30: People that are insecure are not ready to adopt new technology.

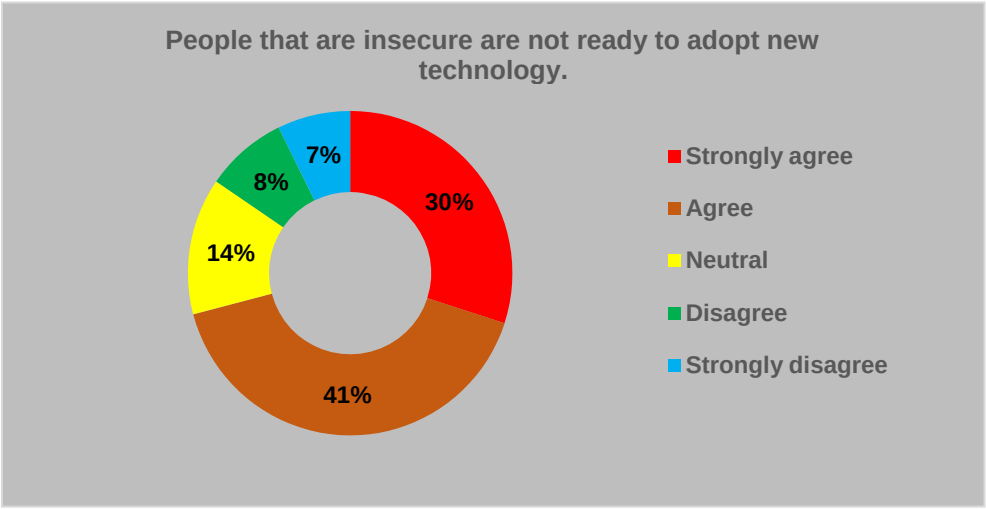


Figure 4.30 (derived from table 4.15) indicates that 30% of businesses from 110 businesses strongly agree that people who are insecure are not ready to adopt new technology, 41% of businesses agree that people who are insecure are not ready to adopt new technology, 14% of businesses are neutral on the fact that people who are insecure are not ready to adopt new technology, 8% of businesses disagree that people who are insecure are not ready to adopt new technology, while 7% of businesses strongly disagree that people who are insecure are not ready to adopt new technology. It is therefore concluded that the majority of businesses in the study area agree that people who are insecure are not ready to adopt new technology, while the minority disagree that people who are insecure are not ready to adopt new technology.

Figure 4.31: If people are uncomfortable with new technology they will not use it.

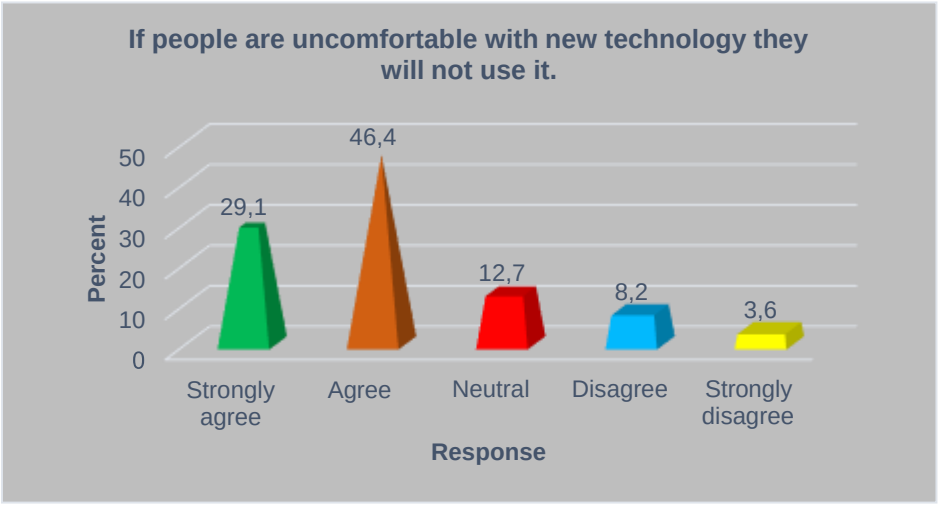


Figure 4.31 (derived from table 4.15) indicates that 29.1% of businesses from 110 businesses strongly agree that if people are uncomfortable with new technology they will not use it, 46.4% of businesses agree that if people are uncomfortable with new technology they will not use it, 12.7% of businesses are neutral on the fact that if people are uncomfortable with new technology they will not use it, 8.2% of businesses disagree that if people are uncomfortable with new technology they will not use it, and 3.6% of businesses strongly disagree if people are uncomfortable with new technology they will not use it. It is therefore concluded that the majority of businesses in the study area agree that if people are uncomfortable with new technology they will not use it, while the minority strongly disagree that if people are uncomfortable with new technology they will not use it.

4.4.3.5. Summary of findings of technology readiness as a determinant of supply adoption of mobile technology for supply chains

It is concluded that the businesses in the study area are unsure of whether being open to the use of new technology helps them to utilise mobile devices in their businesses, however they are always ready to use new technology. In addition, they are not sure if they prefer people that use new technology rather than those who do not. It is also concluded that businesses in the study area believe that people who are optimistic prefer to use new technology, and who are insecure are not ready to adopt new technology, and lastly if they are uncomfortable with new technology, they will not use it.

4.4.4. Environmental Factors

4.4.4.1. Cronbach's Alpha test for Environmental Factors

Table 4.16: Cronbach's Alpha test for environmental factors

Reliability Statistics	
Cronbach's Alpha	No. of Items
.881	5

The table 4.16 shows the Cronbach's alpha test for environmental factors as a determinant of supply adoption of mobile technology for supply chains. The Cronbach's alpha coefficient for 5 items is 0.881, which is acceptable for hypotheses testing.

4.4.4.2. Internal Consistency for Environmental Factors

Table 4.17: Internal consistency for environmental factors

	Mean if Item Deleted	**Variance if Item Deleted**	**Corrected Item-Total Correlation**	**Cronbach's Alpha if Item Deleted**
Competitive pressure	11.13	15.488	.503	.911
Government policies	11.37	14.896	.665	.867
Mobile communication sharing	10.95	13.915	.827	.828
Accuracy and speed in information flow	10.84	14.799	.809	.836
Mobile communication	10.95	14.456	.834	.829

Table 4.17 presents the internal consistency for environmental factors. The Cronbach's alpha test result for the 5 items suggests it that there is relatively high internal consistency of the questions. This means that the Cronbach's Alpha test value for environmental factors as a determinant of adoption of mobile technology for supply chains is acceptable because it is above 0.7 which indicates the internal consistency reliability between the items.

4.4.4.3. Normality test for Environmental Factors

The normality test and analyses for environmental factors are presented below. The figures below are constructed through the sums of the data of the environmental factors as a determinant of supply adoption of mobile technology for supply chains.

Figure 4.32: Histogram with normal curve for environmental factors

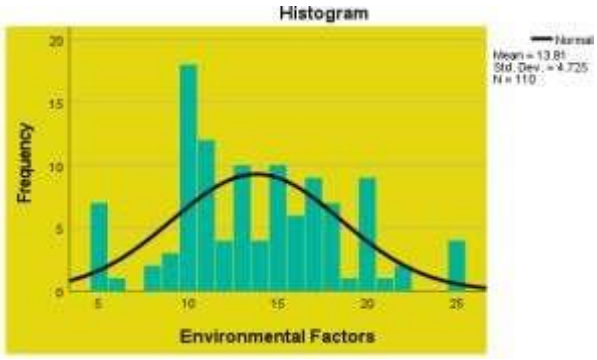


Figure 4.32: illustrates a histogram and normal distribution curve. The figure illustrates that data for environmental factors are normal. The normal distribution curve on the histogram clearly outlines the normality of data.

Figure 4.33: Normal Q-Q Plot for environmental factors

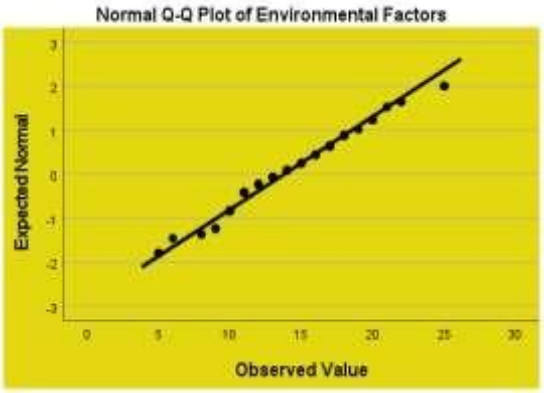
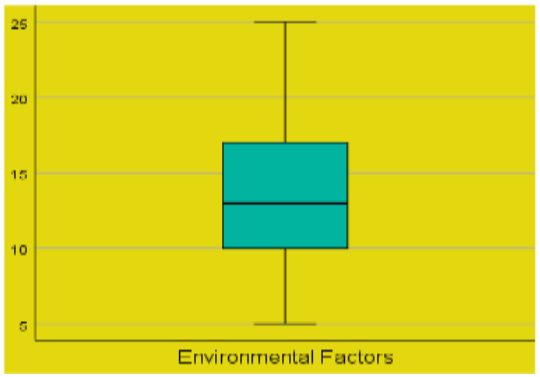


Figure 4.33 depicts the normal QQ Plot. The figure illustrates that environmental factors data are normally distributed because the data points are close to the diagonal line.

Figure 4.34: Box plot for environmental factors



The figure 4.34 outlines the Box plot for environmental factors. The figure depicts that the businesses have different views about the environmental factors as a determinant of mobile technology adoption in the supply chain. The indication of the results is influenced by the fact that the data are squid to the right.

4.4.4.4. Frequencies of Environmental Factors

The frequencies and percentages of the environmental factors are presented and analysed in the tables and figures below.

Table 4.18 Frequencies for environmental factors

Environmental factors										
	Competitive pressure		Government policies		Communication sharing		Information flow		Mobile communication	
	Frequency	Percent	Frequency	Percent	Frequency	Percent	Frequency	Percent	Frequency	Percent
Strongly agree	22	20.0	29	26.4	12	10.9	8	7.3	9	8.2
Agree	37	33.6	32	29.1	36	32.7	30	27.3	37	33.6
Neutral	17	15.5	26	23.6	27	24.5	35	31.8	30	27.3
Disagree	22	20.0	18	16.4	26	23.6	31	28.2	28	25.5
Strongly disagree	12	10.9	5	4.5	9	8.2	6	5.5	6	5.5
Total	**110**	**100**	**110**	**100**	**110**	**100**	**110**	**100**	**110**	**100**

Figure 4.35: Competitive pressure has influenced me to adopt mobile technology.

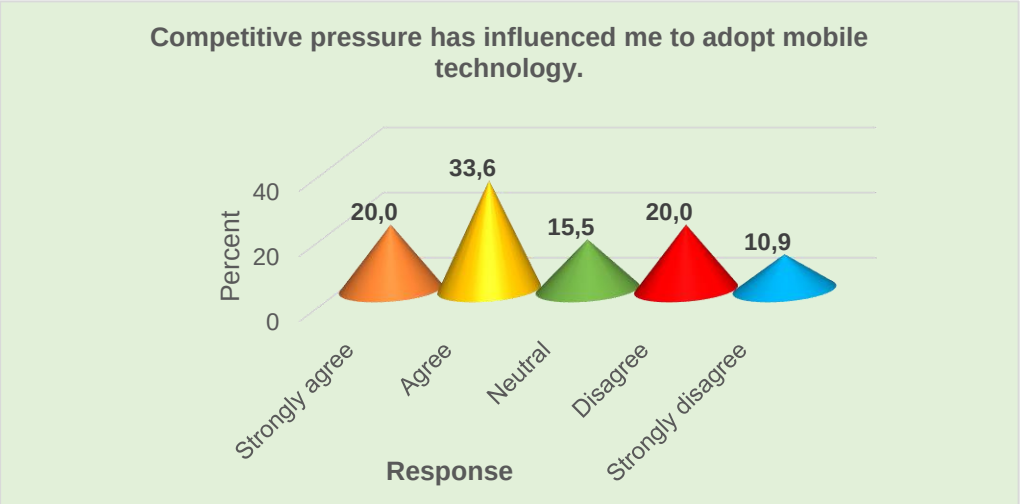


Figure 4.35 (derived from table 4.18) indicates that 20% of businesses from 110 businesses strongly agree that competitive pressure has influenced them to adopt mobile technology, 33.6% of businesses agree that competitive pressure has influenced them to adopt mobile technology, 15.5% of businesses are neutral on the fact that competitive pressure has influence them to adopt mobile technology, 20% of businesses disagree that competitive pressure has influenced them to adopt mobile

technology, and 10.9% of businesses strongly disagree that competitive pressure has influenced them to adopt mobile technology.

It is therefore concluded that the majority of businesses in the study area agree that competitive pressure has influenced them to adopt mobile technology, while the minority strongly disagree that competitive pressure has influenced them to adopt mobile technology.

Figure 4.36: Government policies/regulations are affecting how I run my supply chains activities.

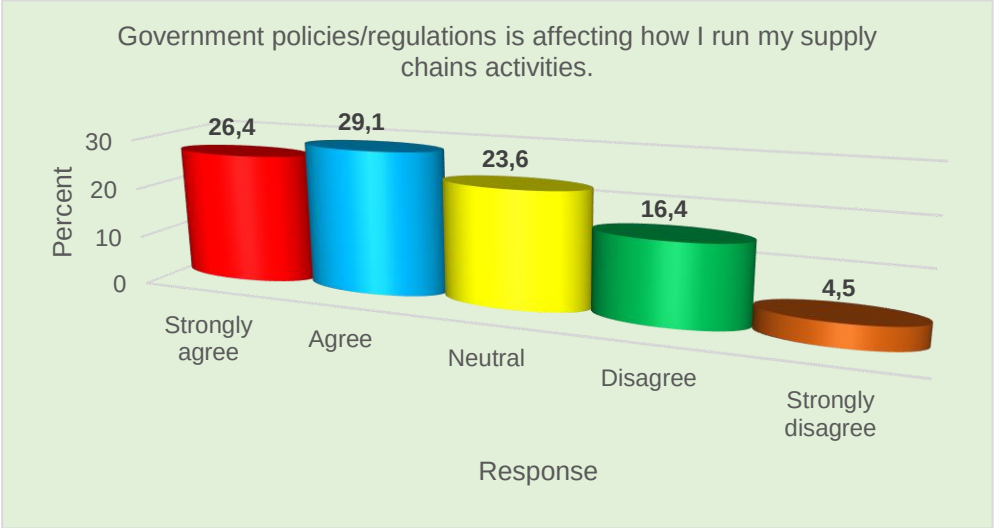


Figure 4.36 (derived from table 4.18) indicates that, out of 110 businesses that participated in the study, 26.4% of businesses strongly agree that government policies/regulations are affecting how they run their supply chains activities, 29.1% of businesses agree that government policies/regulations are affecting how they run their supply chains activities, 23.6% businesses are neutral on the fact that government policies/regulations are affecting how they run their supply chains activities, 6.4% of businesses disagree that their supply chains activities are affected by government policies and 4.5% businesses strongly disagree that their supply chains activities are affected by government policies.

It is therefore concluded that the majority of businesses agree that government policies/regulations are affecting how they run their supply chains activities, while minority of businesses strongly disagree that their supply chains activities are affected by government policies.

Figure 4.37: Mobile communication sharing has improved my supply chain activities.

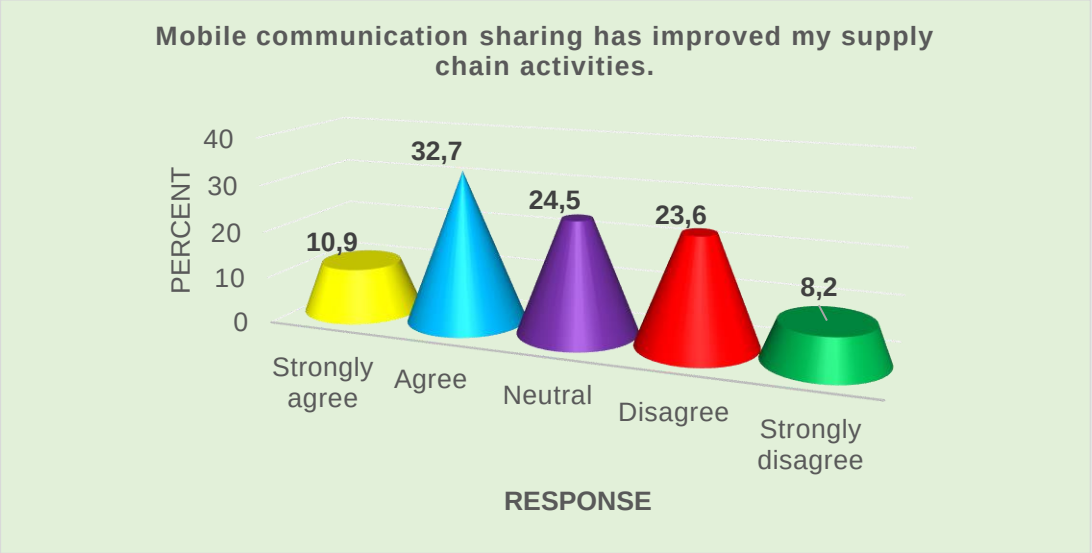


Figure 4.37 (derived from table 4.18) shows that 10.9% of businesses from 110 that participated strongly agree that mobile communication sharing has improved their supply chain activities, 32.7% of businesses agree mobile communication sharing has improved their supply chain activities, 24.5% of businesses are neutral on the fact that mobile communication sharing has improved their supply chain activities, 23.6% disagree that their supply chain activities have improved because of mobile communication sharing and 8.2% of businesses strongly disagree that their supply chain activities have improved because of mobile communication sharing.

Therefore, it is concluded that the majority of businesses in the study area agree that mobile communication sharing has improved their supply chain activities, while the minority of businesses in the study area strongly disagree that mobile communication sharing has improved their supply chain activities.

Figure 4.38: Accuracy and speed in information flow in supply chain influence my adopting.

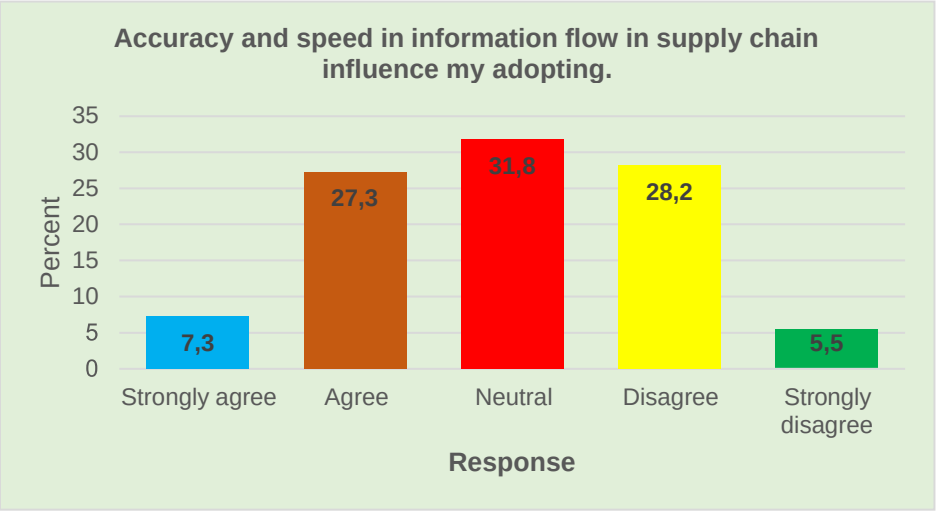


Figure 4.38 (derived from table 4.18) shows that 7.3% of businesses from 110 that participated strongly agree that accuracy and speed in information flow in supply chain influence them to adopt, 27.3% of businesses agree that accuracy and speed in information flow in supply chain influence them to adopt, 31.8% of businesses are neutral on the fact that accuracy and speed in information flow in supply chain influence them to adopt,28.2% disagree that accuracy and speed in information flow in supply chain influence them to adopt and 5.5% of businesses strongly disagree that accuracy and speed in information flow in supply chain influence them to adopt.

Therefore, it is concluded that the majority of businesses in the study area are neutral on the fact that accuracy and speed in information flow in supply chain influence them to adopt, while the minority of businesses in the study area strongly disagree that accuracy and speed in information flow in supply chain influence them to adopt.

Figure 4.39: Mobile communication has improved my supply chain activities.

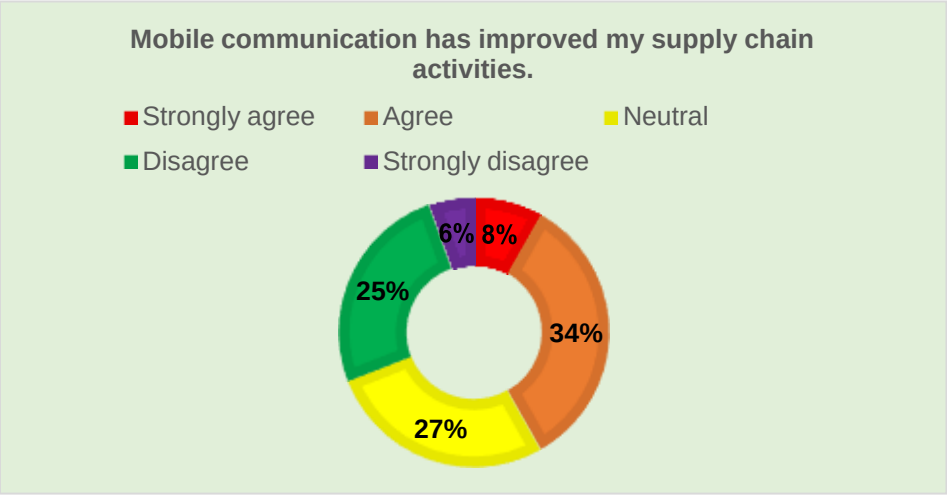


Figure 4.39 (derived from table 4.18) indicates that 8% of businesses from 110 businesses strongly agree that mobile communication has improved their supply chain activities, 34% of businesses agree that mobile communication has improved their supply chain activities, 27% of businesses are neutral on the fact that mobile communication has improved their supply chain activities, 25% of businesses disagree that mobile communication has improved their supply chain activities, and 6% of businesses strongly disagree that mobile communication has improved their supply chain activities.

It is therefore concluded that the majority of businesses in the study area agree that mobile communication has improved their supply chain activities, while the minority strongly disagree that mobile communication has improved their supply chain activities.

4.4.4.5. Summary of findings of environmental factors as a determinant of supply adoption of mobile technology for supply chains

It is concluded that competitive pressure can influence businesses to adopt mobile technology and that government policies affect the supply chain activities in the businesses, nevertheless, the supply chain activities have improved because of use of mobile communication sharing. They are unsure whether the accuracy and the speed in information flow in the supply chain have influenced them to adopt mobile technology.

4.4.5. Organisational Factors

4.4.5.1. Cronbach's Alpha test for Organisational Factors

Table 4.19: Cronbach's Alpha test for organisational factors

Reliability Statistics	
Cronbach's Alpha	No. of Items
.884	7

The table 4.19 shows the Cronbach's alpha test for organisational factors as a determinant of adoption of mobile technology for supply chains. The Cronbach's alpha coefficient for 7 items is 0.884, which is acceptable for hypotheses testing.

4.4.5.2. Internal consistency for Organisational Factors

Table 4.20: Internal consistency for organisational factors

	Mean if Item Deleted	Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
Lack of capital	14.25	28.279	.683	.866
Higher amount of costs	14.19	27.110	.781	.853
Managerial problems	13.37	26.768	.634	.875
Replacement some of the old systems	13.94	27.473	.783	.854
Little bargaining power over suppliers	13.62	27.339	.619	.876
Large businesses are more likely to adopt technology	14.36	30.123	.623	.874
Challenges limit to embrace new technologies	14.18	29.710	.642	.871

Table 4.20 presents the internal consistency for organisational factors. The Cronbach's alpha test result for the 5 items suggests that there is relatively high internal consistency of the questions. This means that the Cronbach's Alpha test value for organisational factors as a determinant of adoption of mobile technology for supply chains is acceptable because it is above 0.7 which indicates the internal consistency reliability between the items.

4.4.5.3. Normality test for Organisational Factors

The normality test and analyses for organisational factors are presented below. The figures below are constructed through the sums of the data of the organisational factors as a determinant of supply adoption of mobile technology for supply chains.

Figure 4.40: Histogram with normal curve for organisational factors

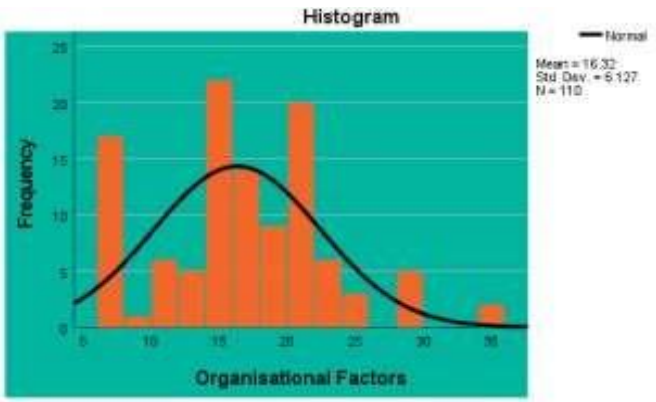
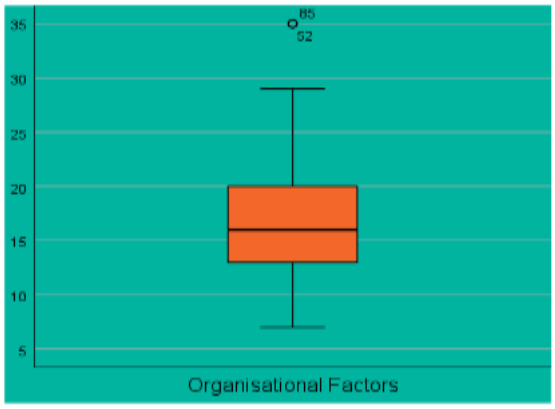


Figure 4.40: depicts a histogram and normal distribution curve. The figure illustrates that data for organisational factors are normal. The normal distribution curve on the histogram clearly outlines the normality of data.

Figure 4.41: Normal Q-Q Plot for organisational factors

Figure 4.41 depicts the normal QQ Plot. The figure illustrates that organisational factors data are normally distributed because the data points are close to the diagonal line.

Figure 4.42: Box plot for organisational factors



The figure 4.42 outlines the Box plot for organisational factors. The figure depicts that the businesses have different views about the organisational factors as a determinant of mobile technology adoption in the supply chain. The indication of the results is influenced by the fact that the data are squid to the right.

4.4.5.4. Frequencies of Organisational Factors

The frequencies and percentages of the organisational factors are presented and analysed in the table and figures below.

Table 4.21 Frequencies for organisational factors

Organisational Factors														
	Capital		Costs		Problems		Replacement		Bargaining		Businesses		Challenges	
	Frequency	Percent	Frequency	Percent	Frequency	Percent	Frequency	Percent	Frequency	Percent	Frequency	Percent	Frequency	Percent
Strongly agree	44	40.0	39	35.5	22	20.0	23	20.9	26	23.6	40	36.4	30	27.3
Agree	29	26.4	36	32.7	23	20.9	47	42.7	23	20.9	45	40.9	49	44.5
Neutral	26	23.6	23	20.9	19	17.3	18	16.4	33	30.0	17	15.5	19	17.3
Disagree	7	6.4	6	5.5	31	28.2	19	17.3	14	12.7	6	5.5	10	9.1
Strongly disagree	4	3.6	6	5.5	15	13.6	3	2.7	14	12.7	2	1.8	2	1.8
Total	110	100	110	100	110	100	110	100	110	100	110	100	110	100

Figure 4.43: Lack of capital /resources results in slow growth in my adopting mobile technology.

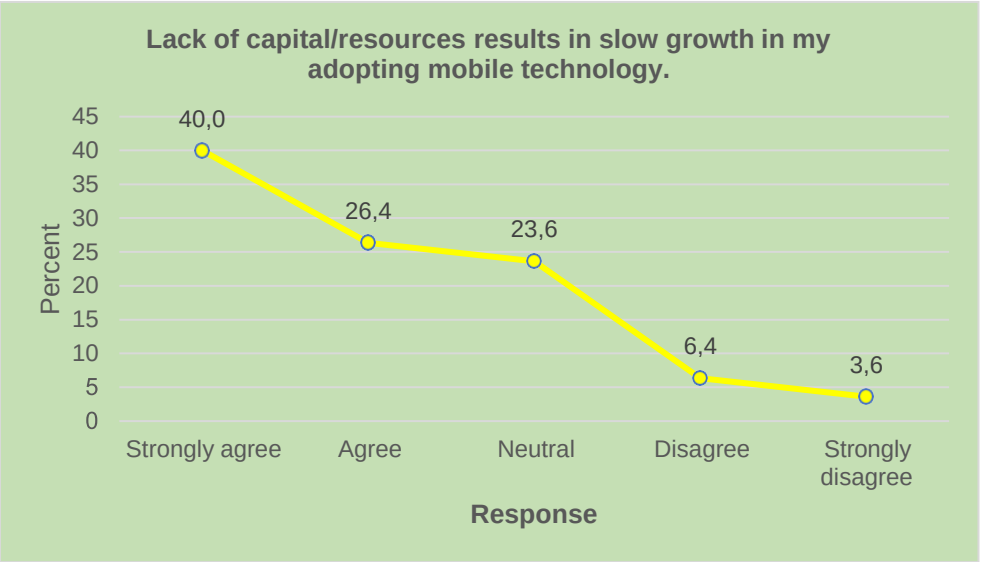


Figure 4.43 (derived from table 4.21) shows that 40% of businesses from 110 that participated strongly agree that lack of capital /resources results in slow growth for them to adopt mobile technology, 26.4% of businesses agree that lack of capital /resources results in slow growth for them to adopt mobile technology, 23.6% of businesses are neutral on the fact that lack of capital /resources results in slow growth for them to adopt mobile technology, 6.4% disagree that lack of capital /resources results in slow growth for them to adopt mobile technology and 3.6% of businesses strongly disagree that lack of capital /resources results in slow growth for them to adopt mobile technology.

Therefore, it is concluded that the majority of businesses in the study area strongly agree that lack of capital /resources results in slow growth for them to adopt mobile technology, while the minority of businesses in the study area strongly disagree that lack of capital /resources results in slow growth for them to adopt mobile technology.

Figure 4.44: Higher amount of costs limits me in the adoption of new technology.

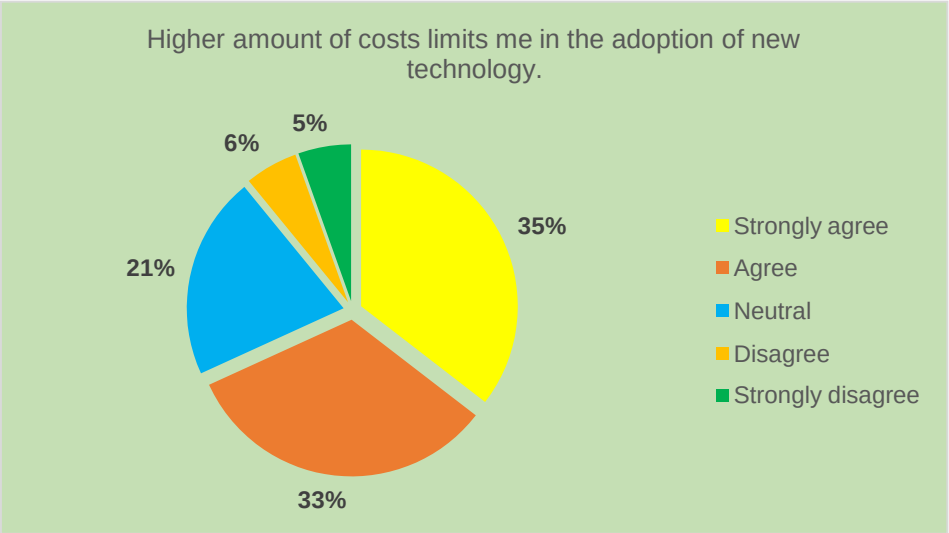


Figure 4.44 (derived from table 4.21) indicates that 35% of businesses from 110 businesses strongly agree that higher amount of costs limits them to adopt new technology, 33% of businesses agree that higher amount of costs limits them to adopt new technology, 21% of businesses are neutral on the fact that higher amount of costs limits them to adopt new technology, 6% of businesses disagree that higher amount of costs limits them to adopt new technology, and 5% of businesses strongly disagree that higher amount of costs limits them to adopt new technology.

It is therefore concluded that the majority of businesses in the study area strongly agree that higher amount of costs limits them to adopt new technology, while the minority strongly disagree that higher amount of costs limits them to adopt new technology.

Figure 4.45: Managerial problems are an obstacle for adopting new technology in the business.

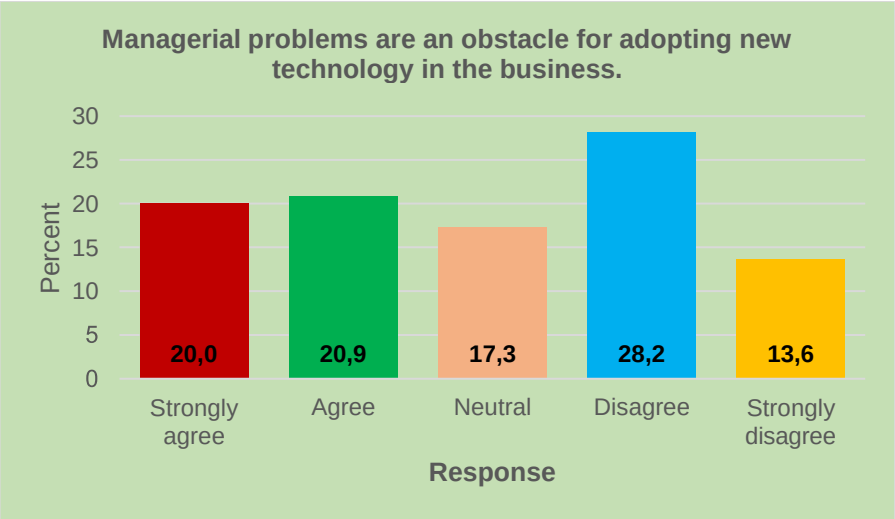


Figure 4.45 (derived from table 4.21) indicates that, out of 110 businesses that participated in the study, 20% of businesses strongly agree that managerial problems are an obstacle for adopting new technology, 20.9% of businesses agree that managerial problems are an obstacle for adopting new technology, 17.3% businesses are neutral on the fact that managerial problems are an obstacle for adopting new technology, 28.2% of businesses disagree that managerial problems are an obstacle for adopting new technology and 13.6% businesses strongly disagree that managerial problems are an obstacle for adopting new technology.

It is therefore concluded that the majority of businesses disagree that managerial problems are an obstacle for adopting new technology, while the minority of businesses are neutral that managerial problems are an obstacle for adopting new technology.

Figure 4.46: Mobile technology has replaced some of the old systems in my business.

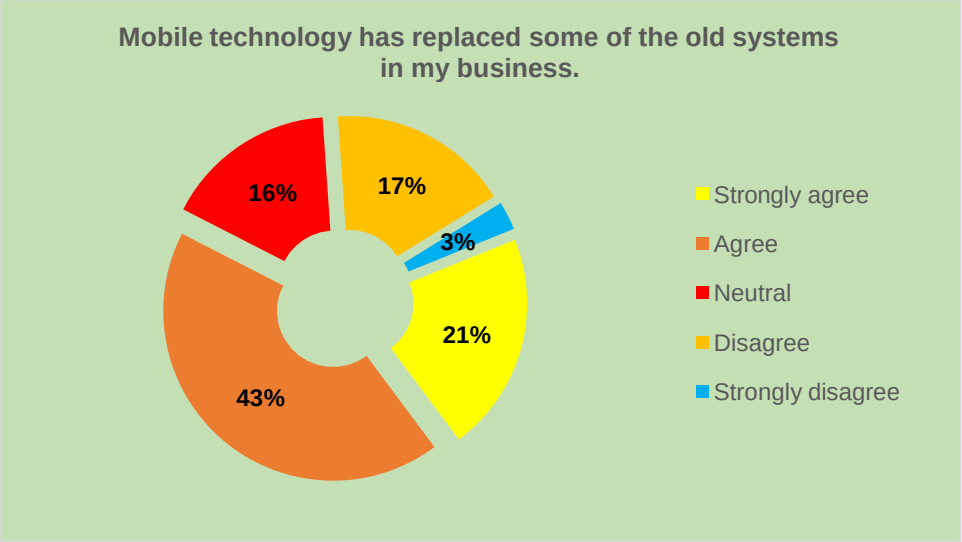


Figure 4.46 (derived from table 4.21) shows that 21% of businesses from 110 that participated strongly agree that mobile technology has replaced some of the old systems in their business, 43% of businesses agree that mobile technology has replaced some of the old systems in their business, 16% of businesses are neutral on the fact that mobile technology has replaced some of the old systems in their business,17% disagree that mobile technology has replaced some of the old systems in their business and 3% of businesses strongly disagree that mobile technology has replaced some of the old systems in their business.

Therefore, it is concluded that the majority of businesses in the study area agree that mobile technology has replaced some of the old systems in their business, while the minority of businesses in the study area strongly disagree that mobile technology has replaced some of the old systems in their business.

Figure 4.47: Little bargaining power over suppliers results in my not adopting new technology.

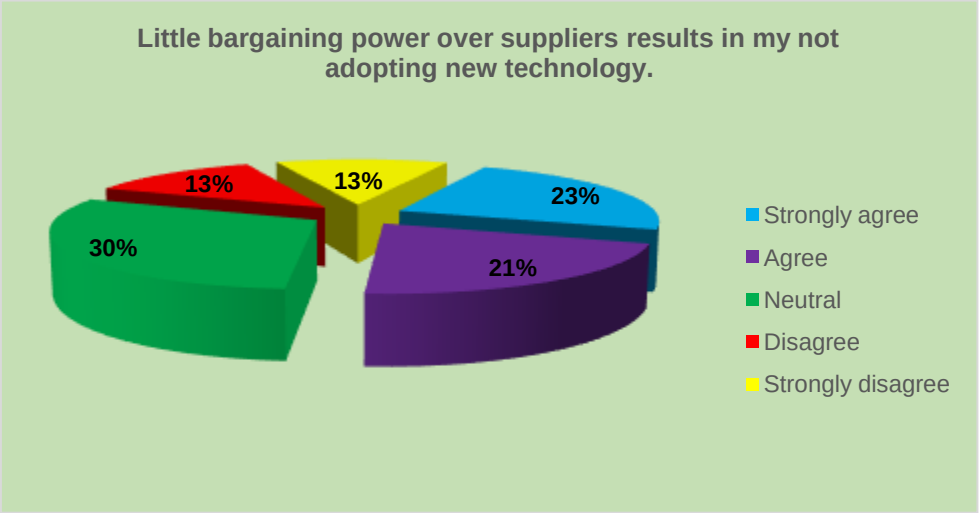


Figure 4.47 (derived from table 4.21) indicates that 23% of businesses from 110 businesses strongly agree that little bargaining power over suppliers results in their not adopting new technology, 21% of businesses agree that little bargaining power over suppliers results in their not adopting new technology, 30% of businesses are neutral on the fact that little bargaining power over suppliers results in their not adopting new technology, 13% of businesses disagree that little bargaining power over suppliers results in their not adopting new technology, and 13% of businesses strongly disagree that little bargaining power over suppliers results in their not adopting new technology.

It is therefore concluded that the majority of businesses in the study area are neutral on the fact that little bargaining power over suppliers results in their not adopting new technology, while the minority disagree and strongly disagree that little bargaining power over suppliers results in their not adopting new technology.

Figure 4.48: Large businesses are more likely to adopt mobile technology than small businesses.

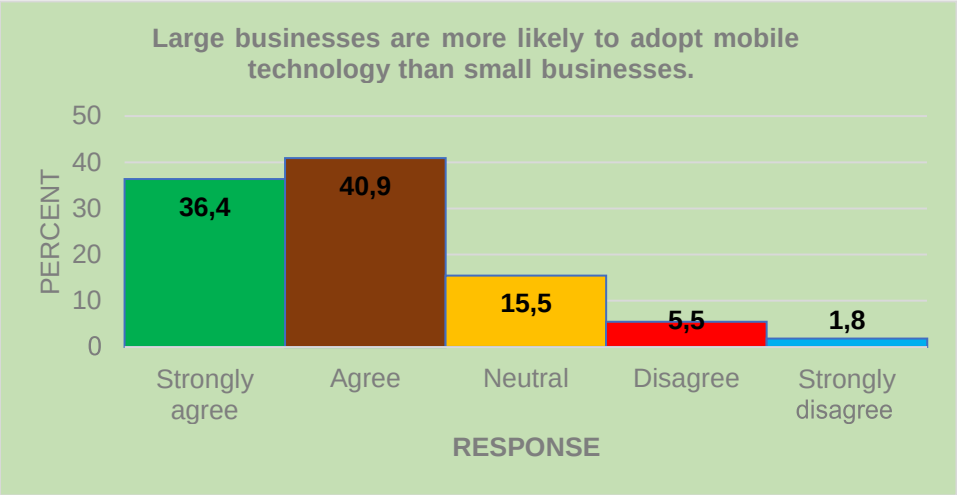


Figure 4.48 (derived from table 4.21) shows that 36.4% of businesses from 110 that participated strongly agree that large businesses are more likely to adopt mobile technology than small businesses, 40.9% of businesses agree that large businesses are more likely to adopt mobile technology than small businesses, 15.5% of businesses are neutral on the fact that large businesses are more likely to adopt mobile technology than small businesses, 5.6% disagree that large businesses are more likely to adopt mobile technology than small businesses and 1.8% of businesses strongly disagree that large businesses are more likely to adopt mobile technology than small businesses.

Therefore, it is concluded that the majority of businesses in the study area agree that large businesses are more likely to adopt mobile technology than small businesses, while the minority of businesses in the study area strongly disagree large businesses are more likely to adopt mobile technology than small businesses.

Figure 4.49: Challenges faced by SMEs limit them to embrace new technologies.

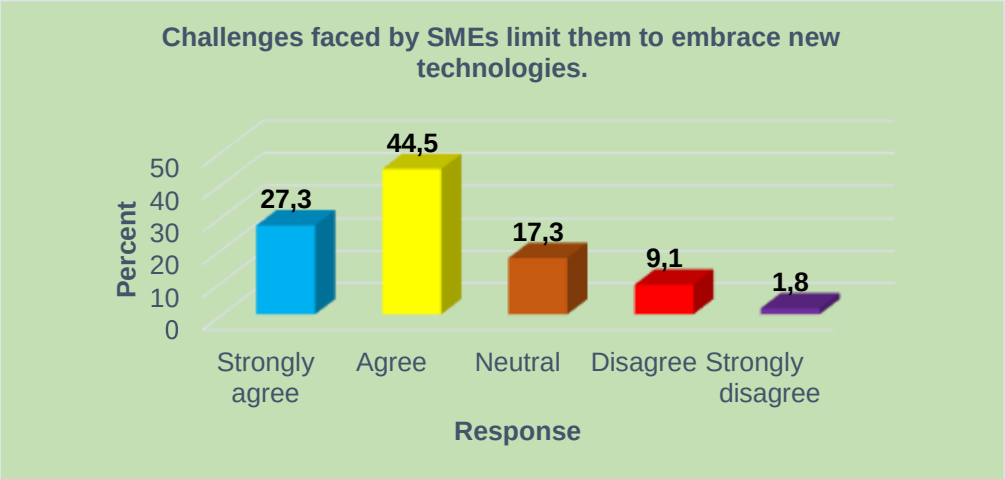


Figure 4.49 (derived from table 4.21) indicates that, out of 110 businesses that participated in the study, 27,3% of businesses strongly agree that challenges faced by SMEs limit them to embrace new technologies, 44.5% of businesses agree that challenges faced by SMEs limit them to embrace new technologies, 17.3% businesses are neutral on the fact that challenges faced by SMEs limit them to embrace new technologies, 9.1% of businesses disagree that challenges faced by SMEs limit them to embrace new technologies and 1.8% of businesses strongly disagree that challenges faced by SMEs limit them to embrace new technologies.

It is therefore concluded that the majority of businesses agree that challenges facing SMEs limit them to embrace new technologies, while the minority of businesses strongly disagree that challenges faced by SMEs limit them to embrace new technologies.

4.4.5.5. Summary of findings of organisational factors as a determinant of supply adoption of mobile technology for supply chains

It is assumed that lack of capital /resources results in slow growth in adopting mobile technology and the higher amount of costs limits businesses to adopt new technology. Managerial problems are not an obstacle for adopting new technology in the businesses and mobile technology has replaced some of the old systems in the businesses. Consequently, little bargaining power over suppliers results in businesses to not adopt new technology. Lastly but not least, large businesses are more likely to adopt mobile technology than small businesses and challenges in SMEs limit businesses to embrace new technologies.

4.5. THE ADOPTION OF MOBILE SCM

4.5.1. Cronbach's Alpha test for adoption of mobile SCM

Table 4.22: Cronbach's Alpha test for the adoption of mobile SCM

Reliability Statistics	
Cronbach's Alpha	No. of Items
.938	11

The above table 4.22 shows the Cronbach's alpha test for the perceived usefulness as a determinant of supply adoption of mobile technology for supply chains. The Cronbach's alpha coefficient for 5 items is 0.930, which is acceptable for hypotheses testing.

4.5.2. Internal consistency for adoption of mobile SCM

Table 4.23: Internal consistency for the adoption of mobile SCM

	Mean if Item Deleted	Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
The way I conducted my supply chain activities	26.17	72.664	.645	.936
Changed the activities and processes of supply chains	26.12	73.347	.660	.935
Changed by the aim for using the technology	26.18	73.799	.591	.938
The success is dependent on the attitude	26.60	70.206	.707	.933
Influenced by ease of use	26.87	68.131	.831	.928
The intentions to use depends on ease of use	26.85	67.608	.824	.928
Influenced by behavioural intentions	26.61	68.683	.740	.932
Affected by the benefits and costs	26.47	69.825	.803	.929
How it fits into my present way of doing things	26.44	69.378	.775	.930
By the how complex it was	26.53	70.770	.729	.932
By security risk	26.43	70.414	.780	.930

Table 4.23 presents the internal consistency for the adoption of mobile SCM. The Cronbach's alpha test result for the 11 items suggests that there is relatively high internal consistency of the questions. This means that the Cronbach's Alpha test value for the adoption of mobile SCM is acceptable because it is above 0.7 which indicates the internal consistency reliability between the items.

4.5.3. Normality test of adoption of mobile SCM

The normality test and analyses for adoption of mobile SCM are presented below. The figures below are constructed through the sums of the data of the adoption of mobile SCM.

4.50: Histogram with normal curve for adoption of mobile SCM

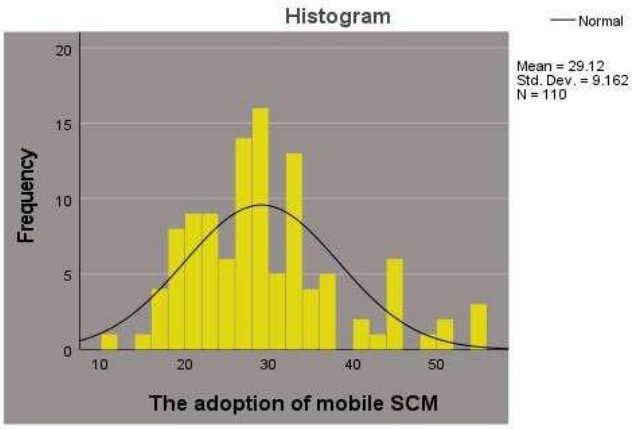


Figure 4.50: depicts a histogram and normal distribution curve. The figure illustrates that data for adoption of mobile SCM are normal. The normal distribution curve on the histogram clearly outlines the normality of data.

Figure 4.51: Normal Q-Q Plot for adoption of mobile SCM

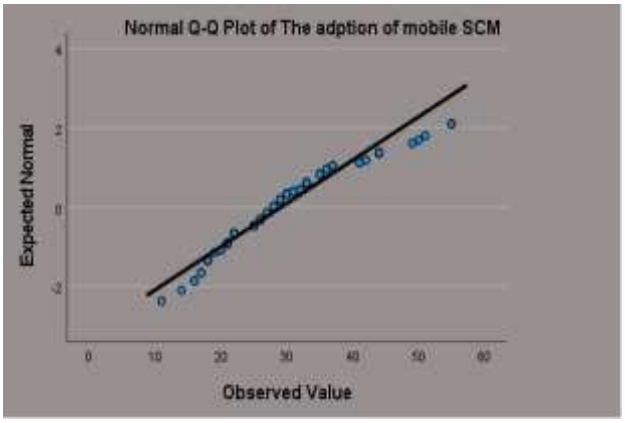
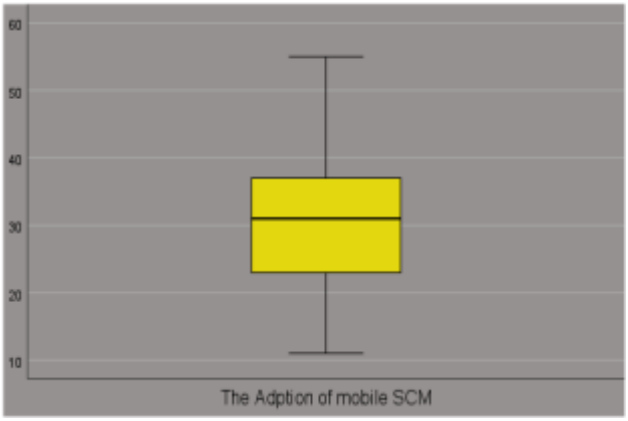


Figure 4.41 depicts the normal QQ Plot. The figure illustrates that adoption of mobile SCM data is normally distributed because the data some points are lying on, and some are close to the diagonal line.

Figure 4.52: Box plot for adoption of mobile SCM



The figure 4.42 outlines the Box plot for adoption of mobile SCM. The figure depicts that the businesses have different views about the adoption of mobile SCM. The indication of the results is influenced by the fact that the data are squid to the right.

4.5.4. Frequencies of adoption of mobile SCM

Table 4.24: Frequencies of adoption of mobile SCM

The adoption of mobile SCM																						
	Changed		MSCM		Aim		Success		Attitude		Intention		Mobile		Benefits		Presents		Complex		Security	
	Frequency	Percent	Frequency	Percent	Frequency	Percent	Frequency	Percent	Frequency	Percent	Frequency	Percent	Frequency	Percent	Frequency	Percent	Frequency	Percent	Frequency	Percent	Frequency	Percent
Strongly agree	8	7.3	3	2.7	5	4.5	19	17.3	29	26.4	32	29.1	21	19.1	13	11.9	14	12.7	16	14.5	12	10.9
Agree	27	24.5	32	29.1	34	30.9	44	40.0	47	42.7	40	36.4	45	40.9	37	33.9	38	34.5	37	33.6	36	32.7
Neutral	42	38.2	40	36.4	38	34.5	22	20.0	16	14.5	20	18.2	20	18.2	39	35.8	35	31.8	39	35.5	42	38.2
Disagree	27	24.5	30	27.3	27	24.5	20	18.2	13	11.8	12	10.9	15	13.6	14	12.8	15	13.6	12	10.9	14	12.7
Strongly disagree	6	5.5	5	4.5	6	5.5	5	4.5	5	4.5	6	5.5	9	8.2	6	5.5	8	7.3	6	5.5	6	5.5
Total	110	100	110	100	110	100	110	100	110	100	110	100	110	100	110	100	110	100	110	100	110	100

Figure 4.53: Has changed the way I conduct my supply chain activities.

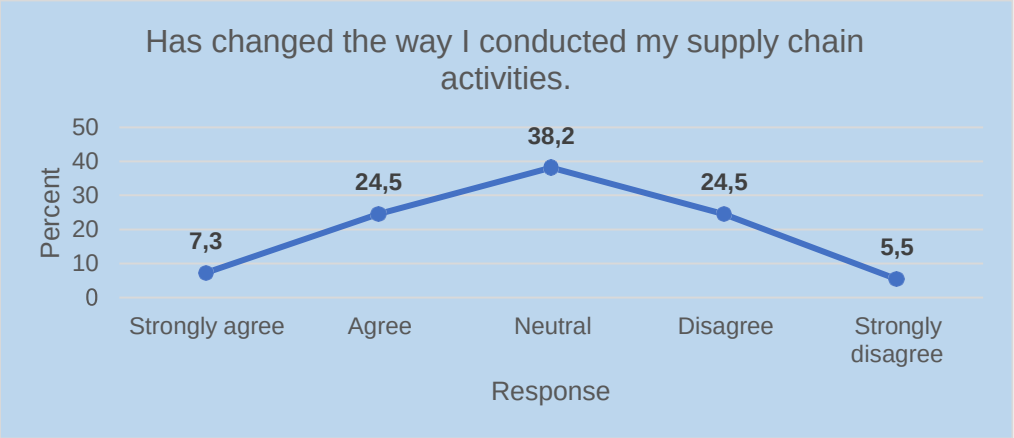


Figure 4.53 outlines that out of 110 of the businesses that participated, 7.3% strongly agree, 24.5% agree, 38.2% are neutral, 24.5% they disagree and 5.5% strongly disagree on the fact that mobile SCM has changed the way they conduct their supply chain activities. The figure indicates that most of the businesses are neutral on the fact that mobile SCM has changed the way they conduct their supply chain activities, while very few of them strongly disagree that mobile SCM has changed the way they conduct their supply chain activities.

Figure 4.54: Mobile SCM adoption has changed the activities and processes of supply chains.

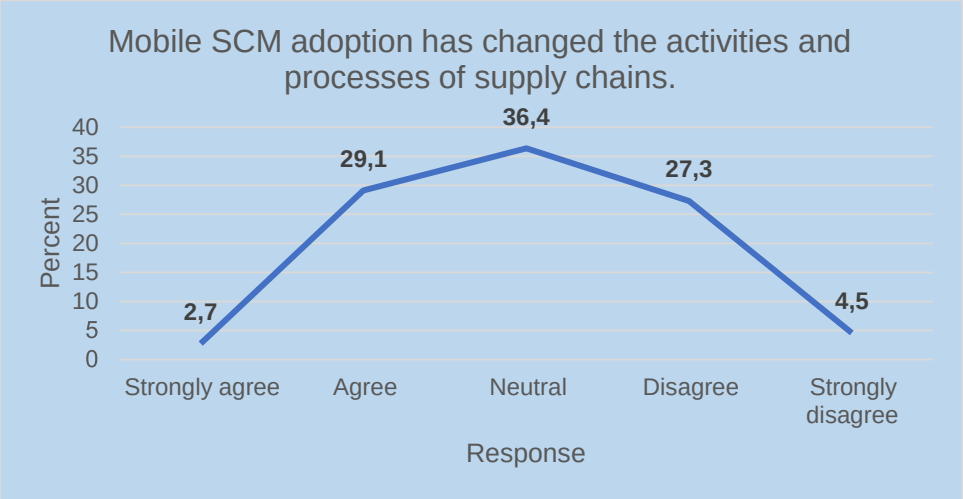


Figure 4.54 illustrates that out of 110 businesses that have participated in the study, 2.7% of them indicated that they strongly agree that mobile SCM adoption has changed the activities and processes of supply chains, 29.1% of businesses indicated that they agree, 36.4% of businesses indicated that they are neutral, 27.3% of business indicated that they disagree and 4.5% of businesses indicated strongly disagree. It is therefore concluded that the majority of businesses indicated that they are neutral on the fact that mobile SCM adoption has changed the activities and processes of their supply chains, while the minority of them strongly agree that mobile SCM adoption has changed the activities and processes of their supply chains.

Figure 4.55: The adoption of mobile technology is changed by the aim for using the technology.

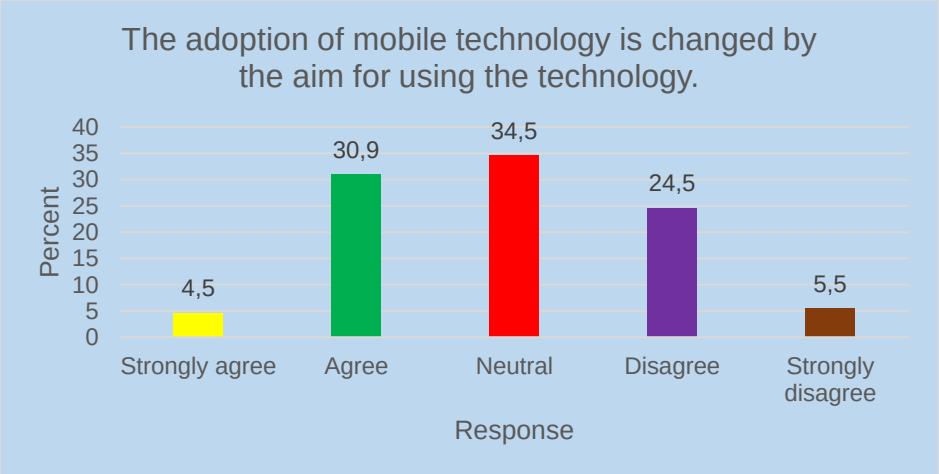


Figure 4.55 outlines that out of 110 businesses that have participated in the study, 4.5% of them indicated that they strongly agree that the adoption of mobile technology is changed by the aim for using the technology, 30.9% of businesses indicated that they agree, 34.6% of businesses indicated that they are neutral, 24.5% of business indicated that they disagree and 5.5% of businesses indicated strongly disagree. It is therefore concluded that the most of businesses indicated that they are neutral on the fact that the adoption of mobile technology is changed by the aim for using the technology, while few of them strongly agree that the adoption of mobile technology is changed by the aim for using the technology.

Figure 4.56: The success of mobile supply chain adoption is dependent on my attitude.

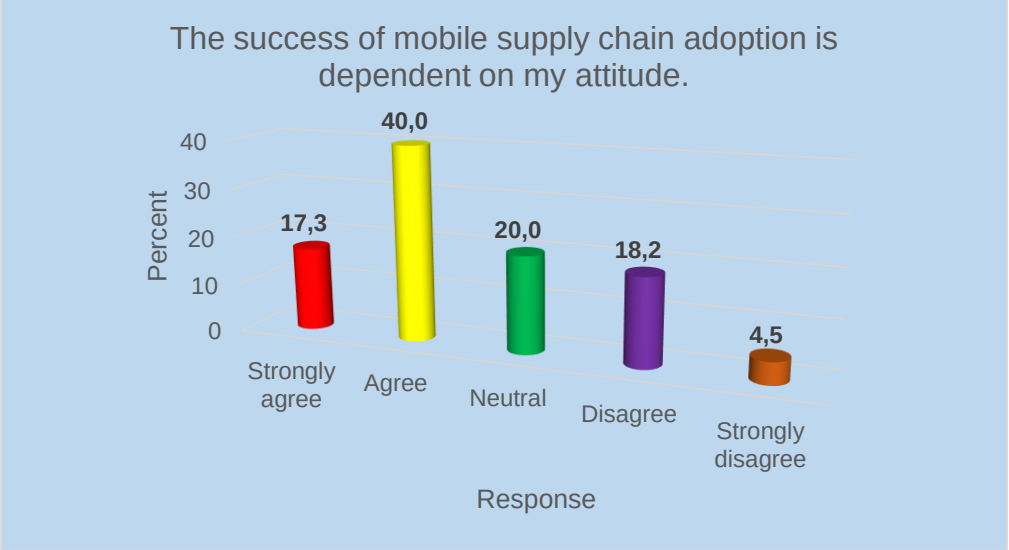


Figure 4.56 indicates that, out of 110 businesses, 17.3% of businesses strongly agree that the success of mobile supply chain adoption is dependent on their attitude, 40% of businesses agree, 20% of businesses are neutral, 18.2% of businesses disagree and 4.5% of businesses strongly disagree. It is therefore concluded that majority of businesses agree that the success of mobile supply chain adoption in their businesses is dependent on their attitude, while the minority of them strongly disagree that the success of mobile supply chain adoption is dependent on their attitude.

Figure 4.57: The attitude towards the adoption is influenced by ease of use.

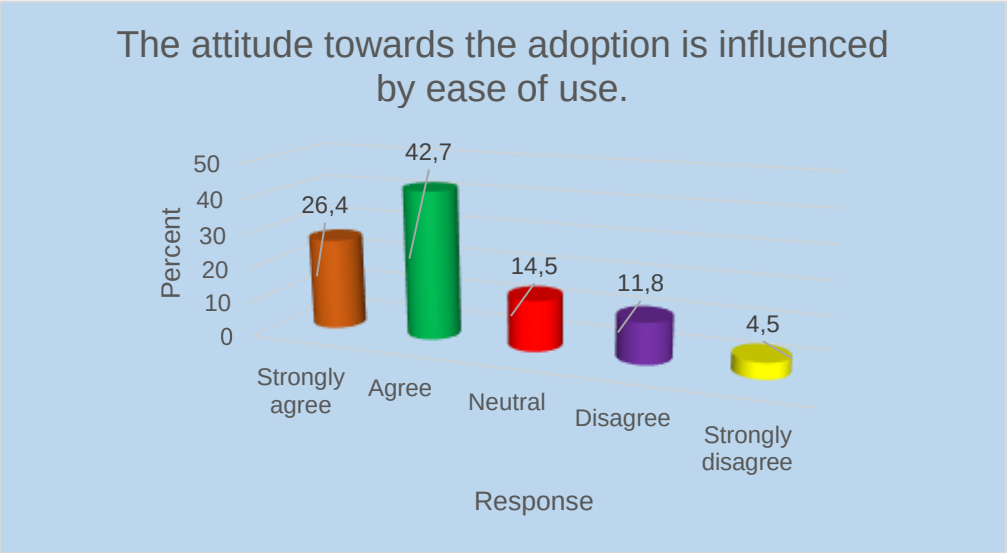


Figure 4.57 56 indicates that, out of 110 businesses, 26.4% of businesses strongly agree that the attitude towards the adoption is influenced by how easy it is to use it, 42.7% of businesses agree, 14.5% of businesses are neutral, 11.8% of businesses disagree and 4.5% of businesses strongly disagree. It is therefore concluded that most of businesses agree that the attitude towards the adoption is influenced by ease of use, while few of them strongly disagree that the attitude towards the adoption is influenced by ease of use.

Figure 4.58: The intentions to use mobile technology depend on the level of usefulness.

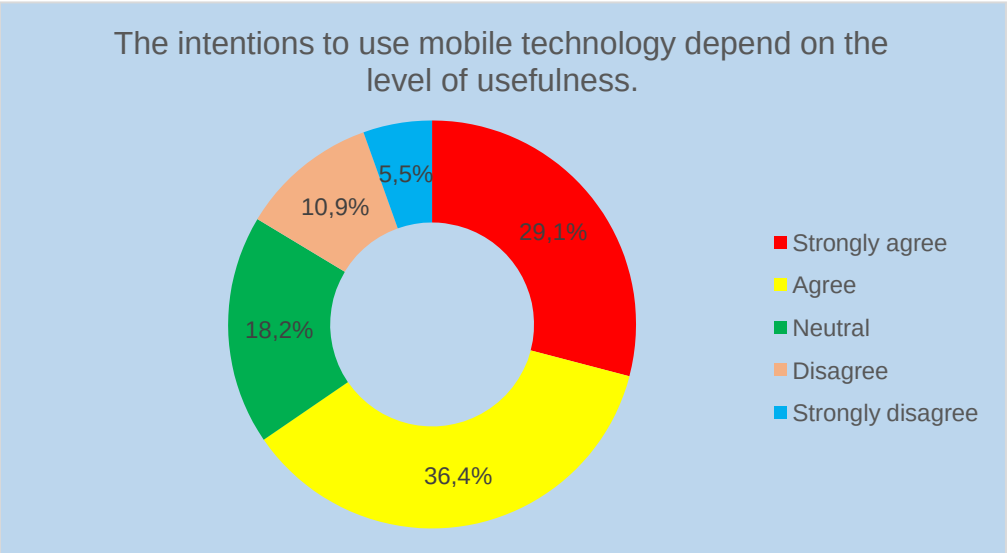


Figure 4.58 indicates that, out of 110 businesses in the study, 29.1% of businesses strongly agree that the intentions to use mobile technology depend on the level of

usefulness, 36.4% of businesses agree, 18.2% of businesses are neutral, 10.9% of businesses disagree and 5.5% of businesses strongly disagree. It is therefore concluded that most of businesses agree that the intentions to use mobile technology depend on the level of usefulness, while few of them strongly disagree that the intentions to use mobile technology depend on the level of usefulness.

Figure 4.59: Mobile technology adoption is influenced by behavioural intentions to adopt.

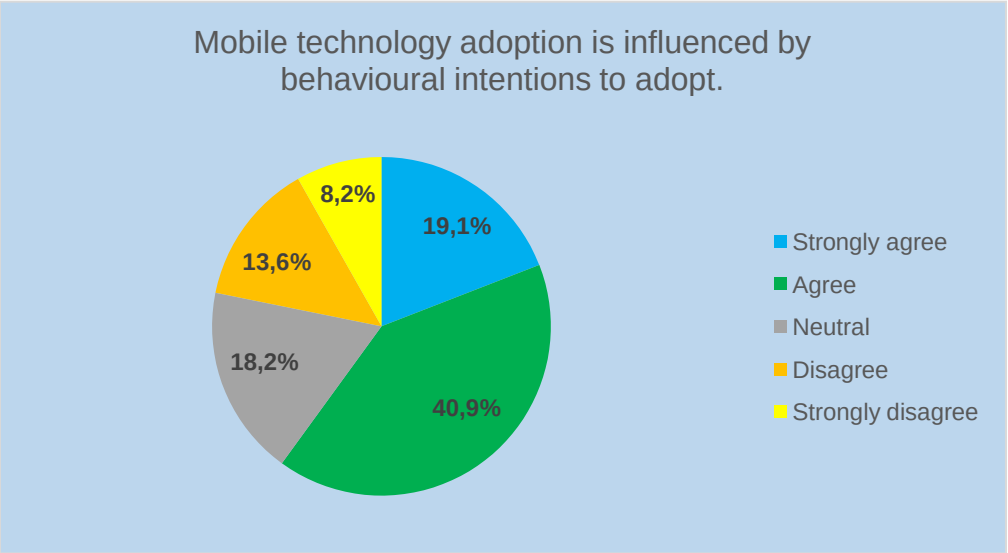


Figure 4.59 shows that, out of 110 businesses in the study, 19.1% of businesses strongly agree that the mobile technology adoption is influenced by behavioural intentions to adopt, 40.9% of businesses agree, 18.2% of businesses are neutral, 13.6% of businesses disagree and 8.2% of businesses strongly disagree. It is therefore concluded that most of businesses agree that the mobile technology adoption is influenced by behavioural intentions to adopt, while few of them strongly disagree that the mobile technology adoption is influenced by behavioural intentions to adopt.

Figure 4.60: The adoption of mobile technology supply chain was affected by the benefits and costs.

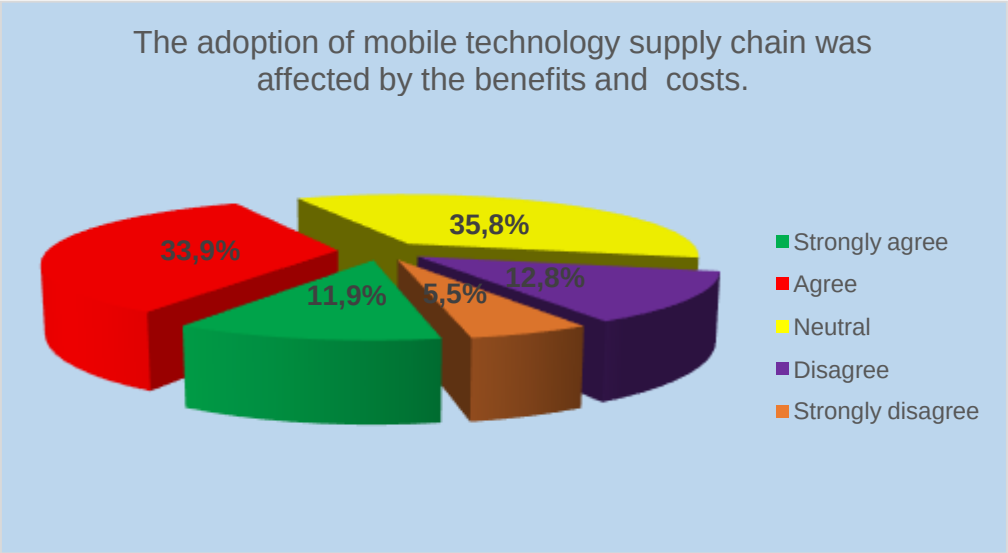


Figure 4.60 depicts that, out of 110 businesses in the study, 11.9% of businesses strongly agree that the adoption of mobile technology supply chain was affected by the benefits and costs in their business, 33.9% of businesses agree, 35.8% of businesses are neutral, 12.8% of businesses disagree and 5.5% of businesses strongly disagree. It is therefore concluded that most of businesses are neutral on the fact that the adoption of mobile technology supply chain was affected by the benefits and costs in their business, while few of them strongly disagree that the adoption of mobile technology supply chain was affected by the benefits and costs in their business.

Figure 4.61: The adoption of mobile technology supply chain was affected by how it fits into my present way of doing things.

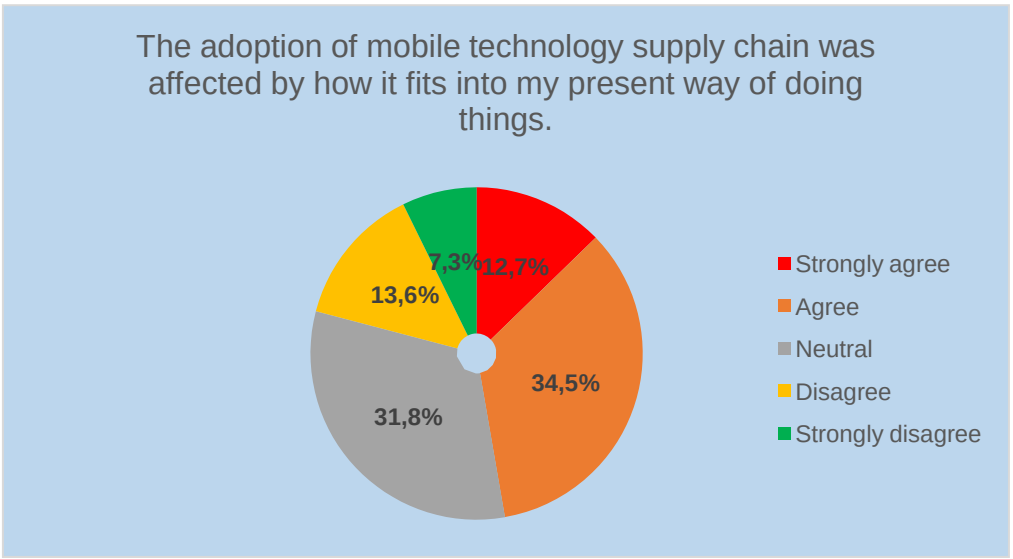


Figure 4.61 outlines that out of 110 of the businesses that participated, 12.7% strongly agree, 34.5% agree, 31.8% are neutral, 13.6% disagree and 7.3% strongly disagree on the fact that the adoption of mobile technology supply chain was affected by how it fits into their present way of doing things. It is therefore concluded that most of the businesses agree that the adoption of mobile technology supply chain was affected by how it fits into their present way of doing things, while very few of them strongly disagree that the adoption of mobile technology supply chain was affected by how it fits into their present way of doing things.

Figure 4.62: The adoption of mobile technology supply chain was affected by how complex it was.

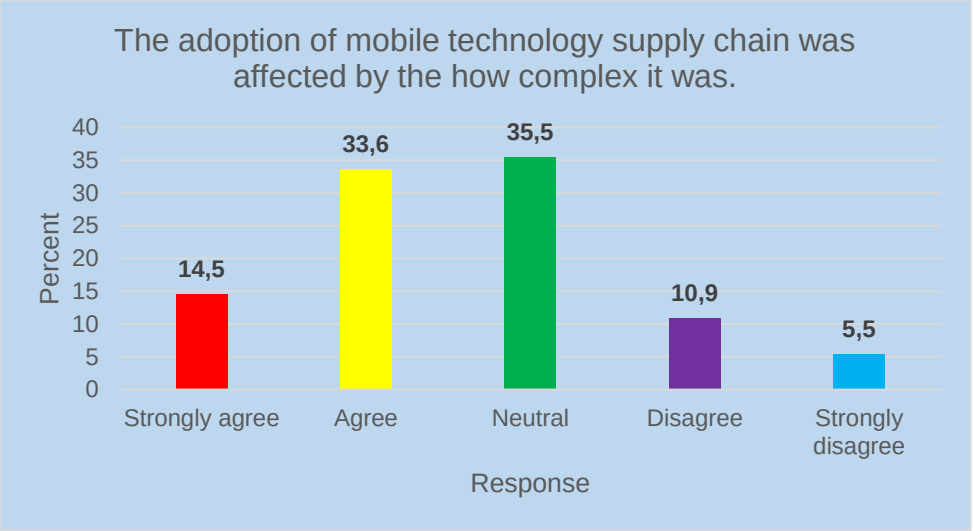


Figure 4.62 indicates that out of 110 businesses, 14.5% of them indicated that they strongly agree that the adoption of mobile technology supply chain was affected by how complex it was, 33.6% of businesses indicated that they agree, 35.5% of businesses indicated that they are neutral, 10.9% of business indicated that they disagree and 5.5% of businesses indicated they strongly disagree. It is therefore concluded that the majority of businesses indicated that they are neutral on the fact that the adoption of mobile technology supply chain was affected by how complex it was, while the minority of them indicated that they strongly disagree that the adoption of mobile technology supply chain was affected by how complex it was.

Figure 4.63: The adoption of mobile technology supply chain was affected by security risk.

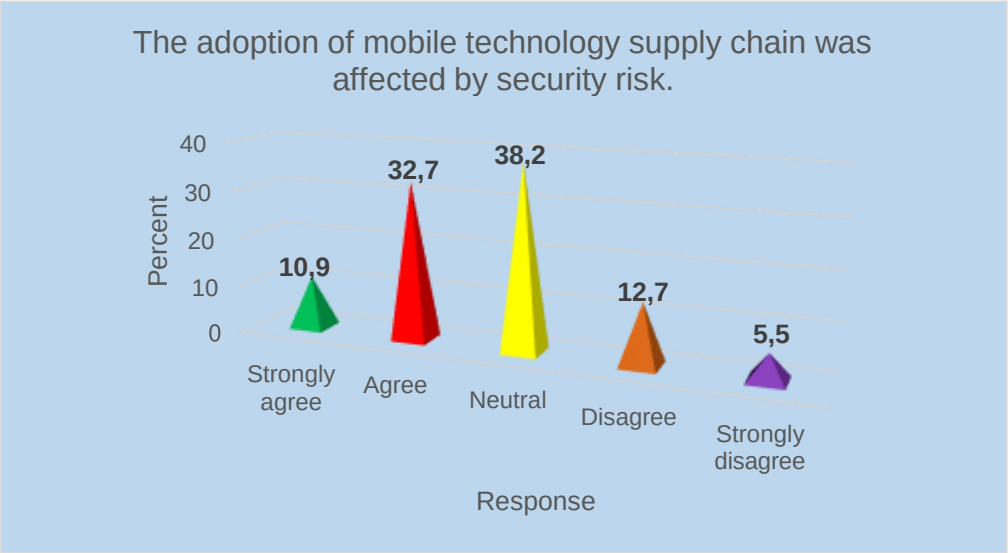


Figure 4.63 shows that out of 110 businesses, 10.9% of them indicated that they strongly agree that the adoption of mobile technology supply chain was affected by security risk, 32.7% of businesses indicated that they agree, 38.2% of businesses indicated that they are neutral, 12.7% of business indicated that they disagree and 5.5% of businesses indicated they strongly disagree. It is therefore concluded that the majority of businesses indicated that they are neutral to the fact that the adoption of mobile technology supply chain was affected by security risk, while the minority of them indicated that they strongly disagree that the adoption of mobile technology supply chain was affected by security risk.

4.5.5. Summary of findings of the adoption of mobile SCM

It is concluded that mobile SCM has changed the way businesses conduct their supply chains. It is neutral that mobile SCM adoption has changed the activities and processes of supply chains, also that the adoption of mobile technology is changed by the aim for using the technology. Nonetheless, the success of mobile supply chain adoption is dependent on the attitude of the business owners, and the attitude towards the adoption is influenced by ease of use. Additionally, the intentions to use mobile technology depend on the level of usefulness and it is influenced by behavioural intentions to adopt. The adoption of mobile technology supply chain in the study area was not affected by the benefits and costs, how complex it was and security risk but the adoption of mobile technology in the supply chain affects how it fits into their present way of doing things.

4.6. IMPROVEMENT IN SUPPLY CHAIN PERFORMANCE

4.6.1. Cronbach's Alpha test for improvement in supply chain performance

Table 4.25: Cronbach's Alpha test for improvement in supply chain performance

Reliability Statistics	
Cronbach's Alpha	No. of Items
.970	11

The above table 4.25 shows the Cronbach's alpha test for the improvement in supply chain performance. The Cronbach's alpha coefficient for 11 items is 0.970, which is acceptable for hypotheses testing.

4.6.2. Internal consistency for improvement in supply chain performance

Table 4.26: Internal consistency for improvement in supply chain performance

	Mean if Item Deleted	Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
Enhanced productivity and cost reduction	28.35	81.350	.821	.969
The performance has improved	28.35	81.570	.869	.967
The major goals are being better achieved	27.80	83.519	.751	.971
Transparency in the supply chain has improved	28.02	82.055	.863	.967
Gaining competitive advantage has improved SCP	28.04	82.567	.817	.969
Knowledge of different variables of the SCP	28.08	82.993	.792	.969
There is a growth in the supply chain	28.10	83.412	.836	.968
Performance objectives have improved	28.31	81.078	.922	.965
The financial performance has played a big role	28.31	81.078	.913	.966
To operate in a responsive way to my customers	28.17	82.309	.908	.966
Innovation in the supply chain has improved	28.19	82.064	.889	.966

Table 4.26 shows the internal consistency for the improvement in supply chain performance. The Cronbach's alpha test result for the 11 items suggests that there is relatively high internal consistency of the questions. This means that the Cronbach's Alpha test value for the improvement in supply chain performance is acceptable because it is above 0.7 which indicates the internal consistency reliability between the items.

4.6.3. Normality test of improvement in supply chain performance

The normality test and analyses for the improvement in supply chain performance are presented below. The figures below are constructed through the sums of the data of the improvement in supply chain performance.

Figure 4.64: Histogram with normal curve for improvement in supply chain performance

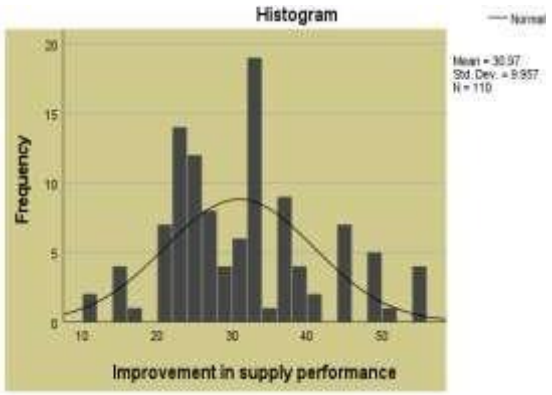


Figure 4.11: depicts a histogram and normal distribution curve. The Figure illustrates the data for improvement in supply chain performance. The normal distribution curve on the histogram clearly outlines the normality of data.

Figure 4.65: Normal Q-Q Plot for improvement in supply chain performance

Figure 4.12 illustrates the normal QQ Plot. The figure illustrates that improvement in supply chain performance data are normally distributed because the data at some points are lying on and some are close to the diagonal line.

Figure 4.66: Box plot for adoption improvement in supply chain performance

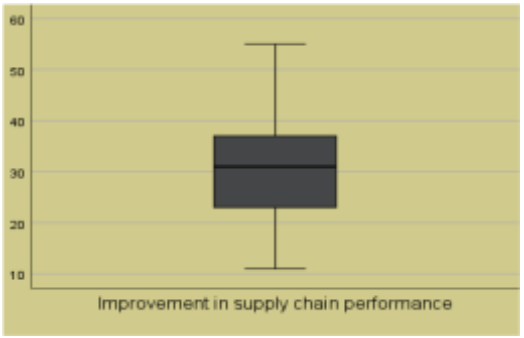


Figure 4.13 illustrates the box plot. The figure depicts the improvement in supply chain performance. The indication of the results is influenced by the fact that the data are skewed to the right.

4.6.4. Frequencies of improvement in supply chain performance

Table 4.27: improvement in supply chain performance

Improvement in supply chain performance																						
	Enhance		Performance		Goals		Transparency		Competitiveness		Knowledge		Growth		Flexibility		Productivity		Responsive		Innovationon	
	Frequency	Percent	Frequency	Percent	Frequency	Percent	Frequency	Percent	Frequency	Percent	Frequency	Percent	Frequency	Percent	Frequency	Percent	Frequency	Percent	Frequency	Percent	Frequency	Percent
Strongly agree	20	18.2	15	13.6	7	6.4	6	5.5	8	7.3	8	7.3	8	7.3	12	10.9	11	10.0	6	5.5	10	9.1
Agree	30	27.3	37	33.6	18	16.4	33	30.0	31	28.2	34	30.9	28	25.5	40	36.4	43	39.1	40	36.4	32	29.1
Neutral	39	35.5	40	36.4	48	43.6	40	36.4	39	35.5	38	34.5	51	46.4	37	33.6	35	31.8	40	36.4	47	42.7
Disagree	14	12.7	11	10.0	23	20.9	22	20.0	24	21.8	22	20.0	16	14.5	15	13.6	14	12.7	18	16.4	14	12.7
Strongly disagree	7	6.4	7	6.4	14	12.7	9	8.2	8	7.3	8	7.3	7	6.4	6	5.5	7	6.4	6	5.5	7	6.4
Total	110	100	110	100	110	100	110	100	110	100	110	100	110	100	110	100	110	100	110	100	110	100

Figure 4.67: Enhanced productivity and cost reduction.

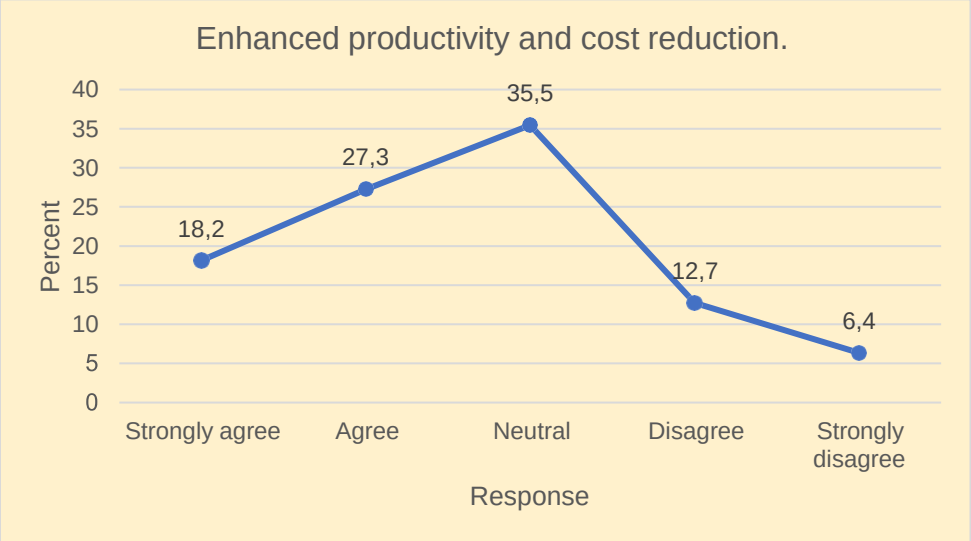


Figure 4.67 illustrates that out of 110 businesses that have participated, 18.2% of them indicated that the use of mobile technology in their businesses has enhanced productivity and cost reduction, 27.3% businesses indicated that they agree, 35.5% businesses indicated that they are neutral, 12.7% businesses indicated that they disagree, and 6.4% businesses indicated that they strongly disagree. Therefore, it is

concluded that the majority of businesses indicated that they are neutral on the fact that the use of mobile technology in their businesses has enhanced productivity and cost reduction, while the minority strongly disagree that mobile technology has enhanced productivity and cost reduction.

Figure 4.68: The performance of my suppliers and buyers has improved.

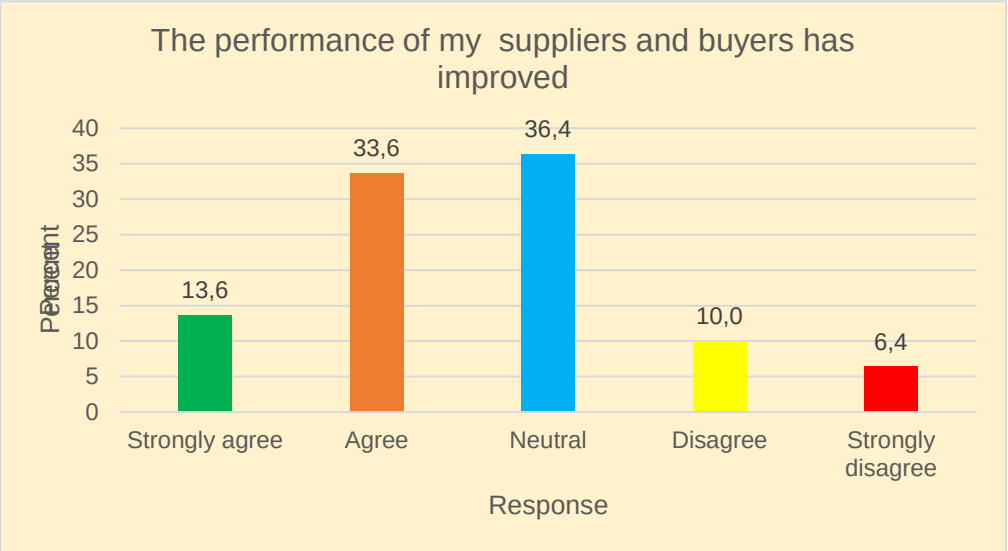
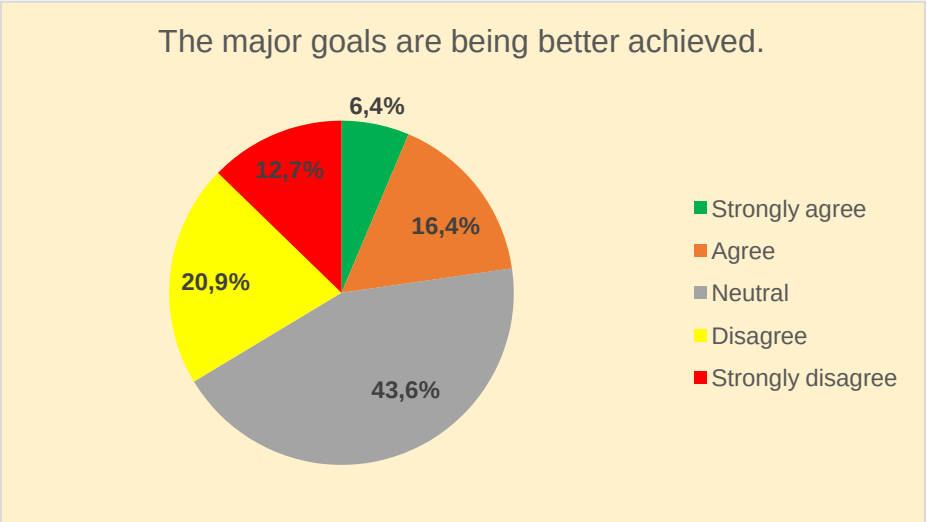


Figure 4.68 indicates that out of 110 businesses, 13.6% of them indicated that they strongly agree that the performance of their suppliers and buyers has improved due to the use of mobile technology in the business, 33.6% businesses indicated that they agree, 36.4% businesses indicated that they are neutral, 10% business indicated that they disagree, and 6.4% businesses indicated they strongly disagree. It is therefore concluded that the majority of businesses indicated that they are neutral on the fact that the performance of their suppliers and buyers has improved due to the use of mobile technology in their businesses, while the minority of them indicated that they strongly disagree that the performance of their suppliers and buyers has improved.

Figure 4.69: The major goals are being achieved.



Results from figure 4.69 shows that out of 110 businesses that participated in the study, 6.4% of them indicated that they strongly agree that the major goals are being better achieved because of the use of mobile technology in the business, 16.4% businesses indicated that they agree, 43.6% businesses indicated neutral, 20.9% businesses indicated disagree and 6.4% businesses indicated that they strongly disagree. Therefore, it is concluded that the majority of businesses in the study area are neutral on the fact that the major goals are being better achieved because of the use of mobile technology in the business, while the minority indicated they strongly agree that the major goals are being better achieved.

Figure 4.70: Transparency in the supply chain has improved.

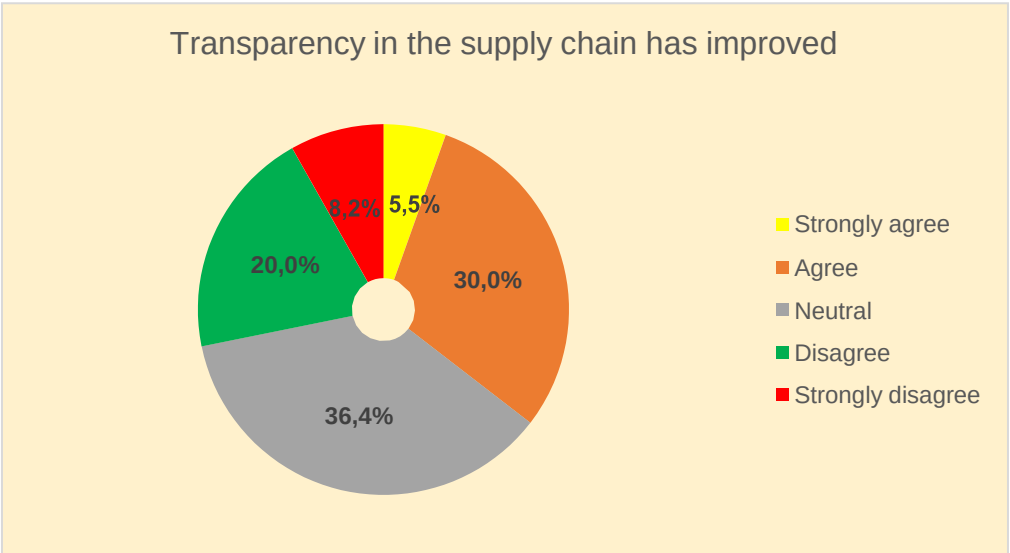


Figure 4.70 outlines that out of 110 businesses that participated in the study, 5.5% of them indicated that they strongly agree that transparency in the supply chain has improved because of the use of mobile technology, 30% businesses indicated that they agree, 36.4% businesses indicated that they are neutral, 20% business indicated that they disagree, and 8.2% businesses indicated that they strongly disagree. It is therefore concluded that the majority of businesses indicated that they are neutral on the fact the transparency in the supply chain has improved because of the use of mobile technology definitely, while the minority indicated that they strongly agree that transparency in the supply chain has improved.

Figure 4.71: Gaining competitive advantage has improved my supply chain performance.

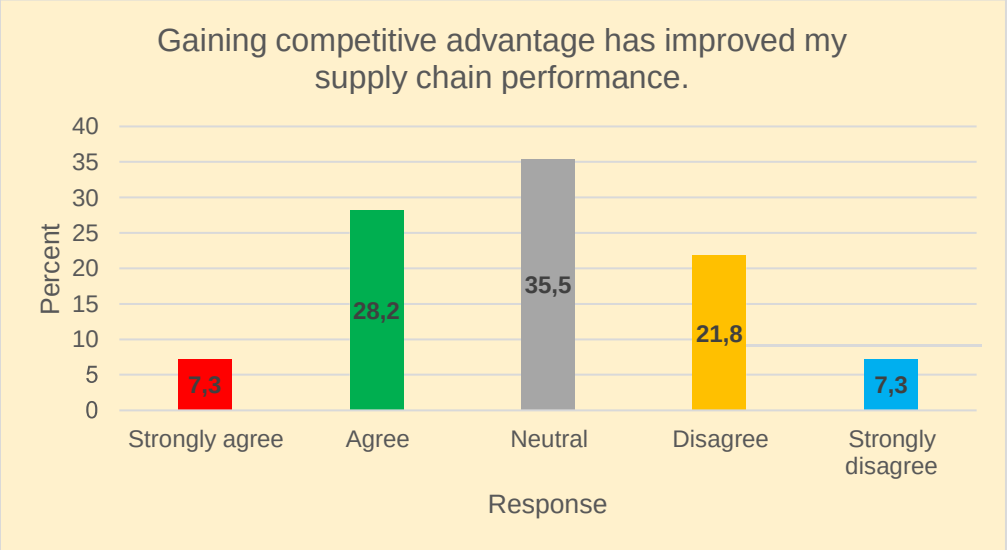


Figure 4.71 illustrates that out of 110 businesses that participated in the survey, 7.3% of them indicated that they strongly agree that gaining competitive advantage has improved their supply chain performance, 28.2% businesses indicated that that they agree, 35.5% businesses indicated that they are neutral, 21.8% business indicated that they disagree, and 7.3% businesses indicated that they strongly disagree. It is therefore concluded that the majority of businesses indicated that they are neutral on the fact that gaining competitive advantage has improved their supply chain performance, while the minority equally indicated strongly agree and strongly disagree.

Figure 4.72: Knowledge of different variables of the supply chain has helped to improve my supply chain performance.

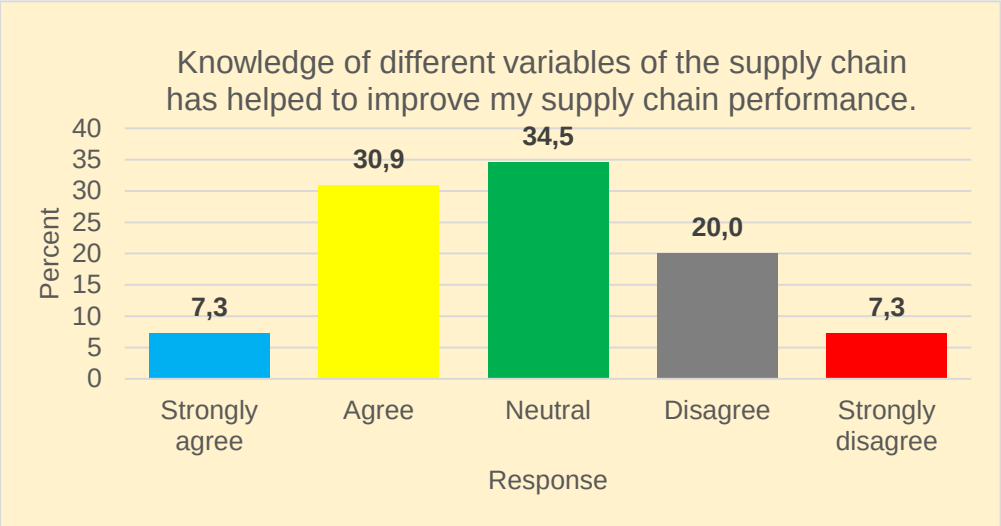
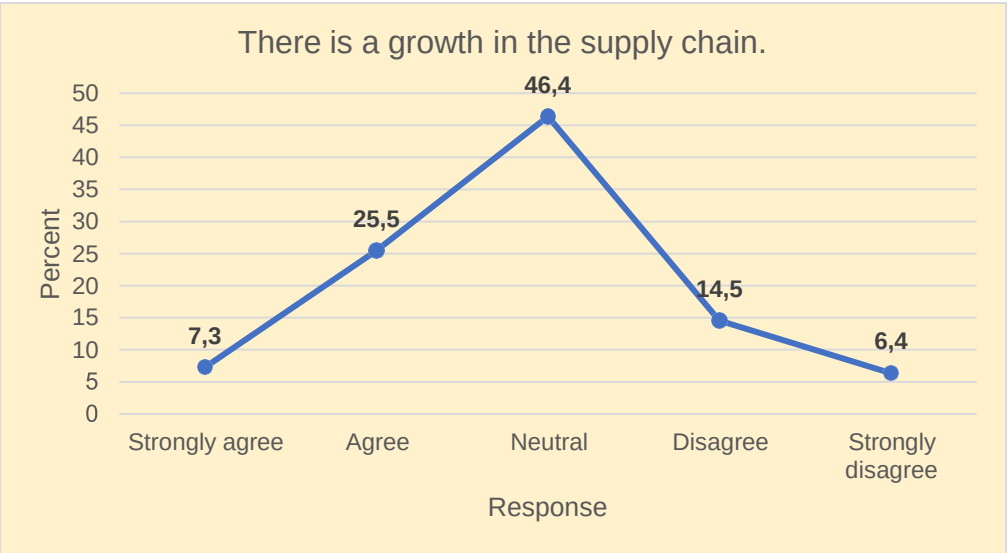


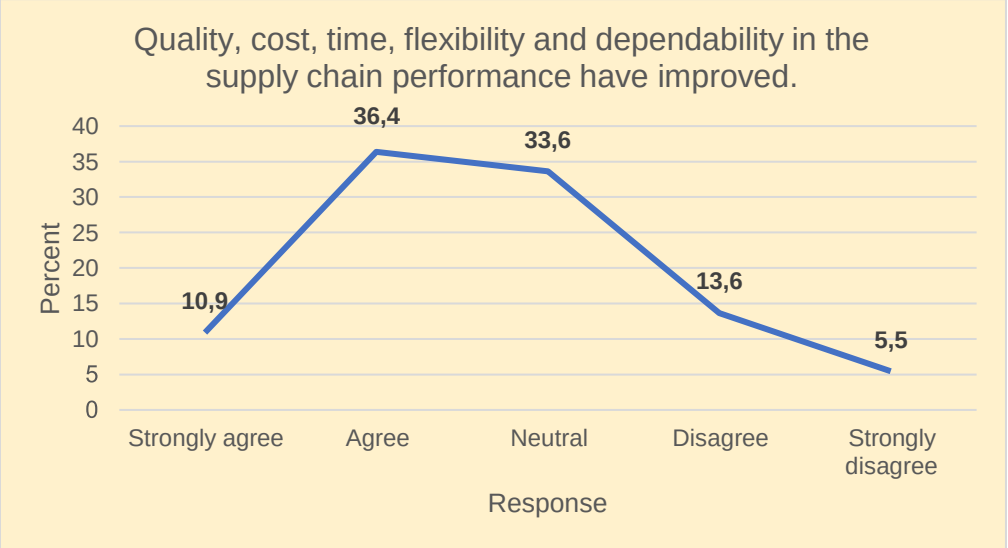
Figure 4.72 depicts that out of 110 businesses, 7.3% of them indicated that they strongly agree that knowledge of different variables of the supply chain has helped them to improve their supply chain performance, 30.9% businesses indicated that that they agree, 34.5% businesses indicated that they are neutral, 20% business indicated that they disagree, and 7.3% businesses indicated that they strongly disagree. It is therefore concluded that the majority of businesses indicated that they are neutral on the fact that of knowing whether the different variables of the supply chain has improved their supply chain performance, while the minority equally indicated strongly agree and strongly disagree.

Figure 4.73: There is a growth in the supply chain.



Results from figure 4.7 show that out of 110 businesses that participated in the study, 7.3% of them indicated that they strongly agree that there is a growth in the supply chain because of the use of mobile technology, 25.5% businesses indicated that they agree, 46.4% businesses indicated neutral, 14.5% business indicated disagree and 6.4% businesses indicated that they strongly disagree. Therefore, it is concluded that the majority of businesses in the study area are neutral on the fact that there is a growth in the supply chain due to the use of mobile technology, while the minority indicated they strongly disagree that there is a growth in the supply chain because of the use of mobile technology.

Figure 4.74: Quality, cost, time, flexibility and dependability in the supply chain performance have improved.



Results from figure 4.74 outlines that out of 110 businesses that participated in the study, 10.9% of them indicated that they strongly agree that quality, cost, time, flexibility and dependability in the supply chain performance have improved due to the use of mobile technology, 36.4% businesses indicated that they agree, 33.6% businesses indicated neutral, 13.6% businesses indicated disagree and 5.5% businesses indicated that they strongly disagree. Therefore, it is concluded that the majority of businesses indicated that they strongly agree that quality, cost, time, flexibility and dependability have improved their supply chain performance, while minority indicated they strongly disagree that quality, cost, time, flexibility and dependability have improved their supply chain performance.

Figure 4.75: The financial performance has played a big role in the efficiency of supply productivity.

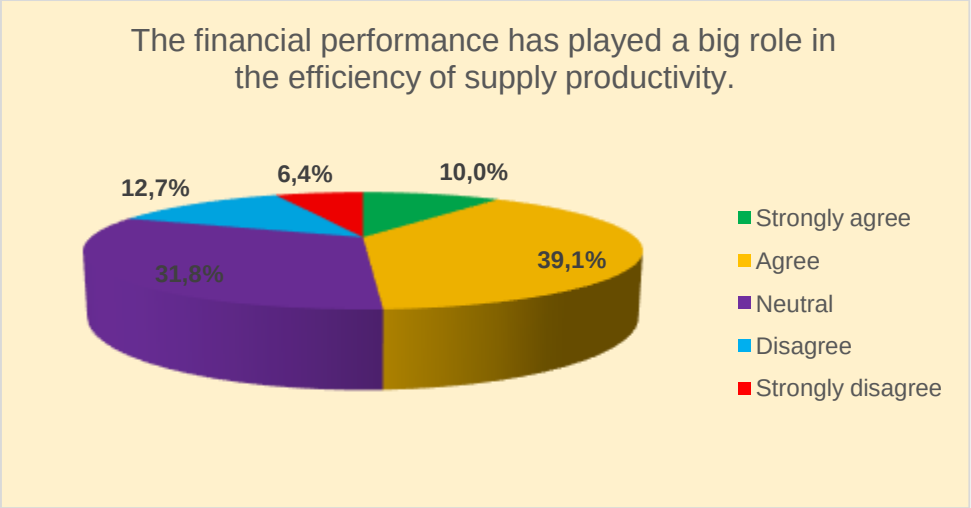


Figure 4.75 illustrates that out of 110 participants, 10% of businesses indicated that they strongly agree that the financial performance has played a bigger role in the efficiency of supply productivity, 39.1% businesses indicated that they strongly agree, 31.8% businesses indicated that they are neutral, 12.7% business indicated that they disagree, and 6.4% businesses indicated they strongly disagree. It is therefore concluded that the majority of businesses indicated that they agree that the financial performance has played a bigger role in the efficiency of supply productivity, while the minority strongly disagree that financial performance has played a bigger role in the efficiency of supply productivity.

Figure 4.76: Helps to operate in a responsive way to my customers.

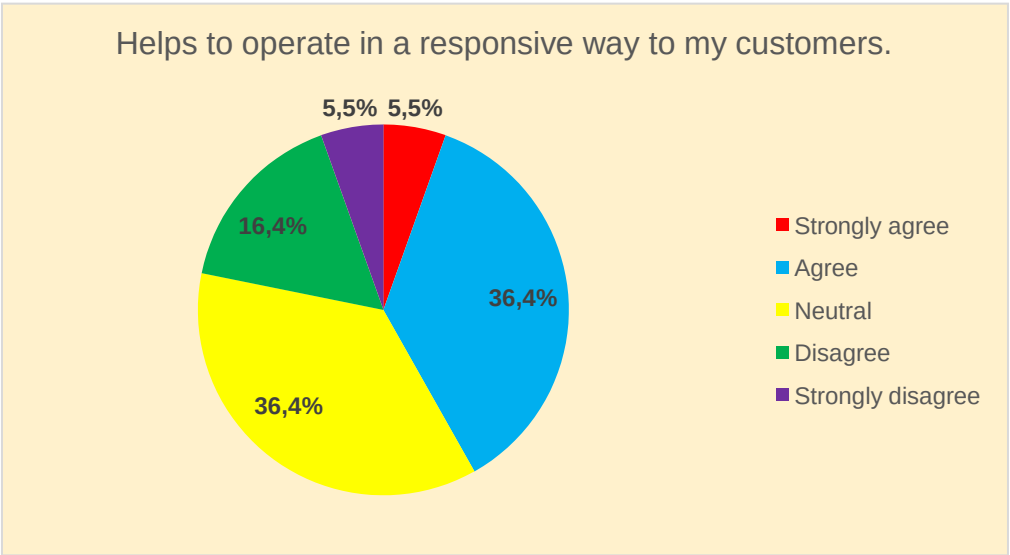


Figure 4.76 shows that out of 110 businesses, 5.5% of them indicated that they strongly agree that the use of mobile technology has helped them to operate in a responsive way to their customers, 36.4% businesses indicated that they agree, 36.4% businesses indicated that they are neutral, 16.4% business indicated that they disagree, and 5.5% businesses indicated that they strongly disagree. It is therefore concluded that the majority of businesses equally indicated that they agree, and they are neutral on the fact that the use of mobile technology has helped them to operate in a responsive way to their customers, while the minority of them equally indicated disagree and strongly disagree that the use of mobile technology has helped them to operate in a responsive way to their customers.

Figure 4.77: Innovation in the supply chain has improved.

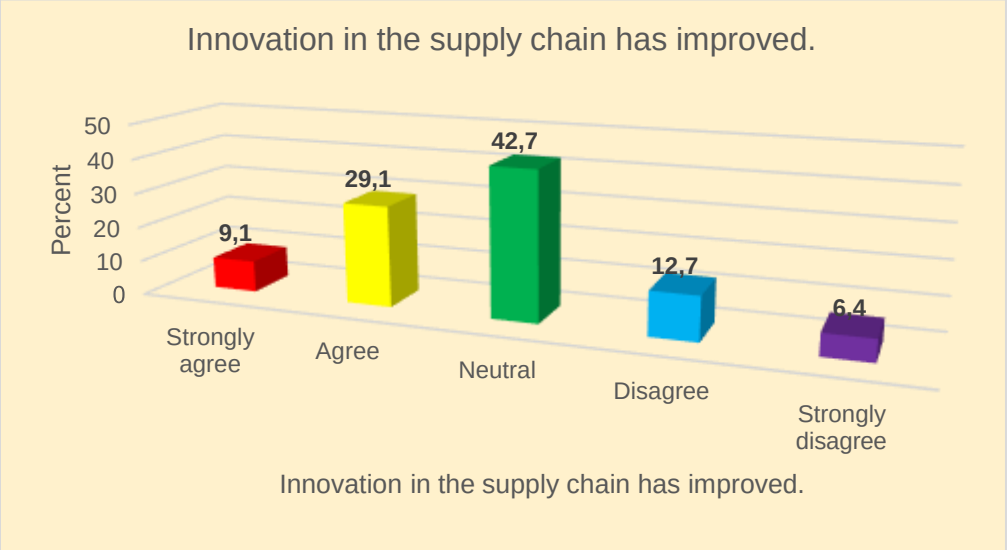


Figure 4.77 depicts that out of 110 businesses that participated in the survey, 9.1% of them indicated that they strongly agree that innovation in the supply chain has improved due to use of mobile technology, 29.1% businesses indicated that they agree, 42.7% businesses indicated that they are neutral, 12.7% business indicated that they disagree, and 6.4% businesses indicated that they strongly disagree. It is therefore concluded that the majority of businesses indicated that they are neutral on the fact that innovation in the supply chain has improved due to use of mobile technology, while the minority disagree.

4.6.5. Summary of findings of the improvement in supply chain performance

It is not clear that the use of mobile technology has enhanced productivity and cost reduction, the improved performance of suppliers and buyers, the major goals being achieved, and if transparency in the supply chain has improved. Additionally, it is not clear that gaining a competitive advantage has improved their supply chain performance, if there is a growth in the supply chain because of the use of mobile technology and if knowing the different variables of the supply chain has helped them to improve their supply chain.

It is concluded that quality, cost, time, flexibility and dependability in the supply chain performance have improved, the financial performance has played a big role in the efficiency of supply productivity, the use of mobile technology has helped to operate in a responsive way to their customers and innovation in the supply chain has improved.

4.7. ASSESSING THE STATISTICAL SIGNIFICANCE OF RELATIONSHIPS

Below are the hypotheses testing and its analyses. The analyses outline the relationships between determinants of adoption and the adoption of mobile technology, and the relationship between mobile technology adoption and supply chain performance.

4.7.1 The Hypotheses

The below are the research hypotheses:

Ho1: There is no relationship between perceived usefulness of mobile technology and adoption of it in SMEs.

Ha1: There is positive relationship between perceived usefulness of mobile technology and adoption of it in SMEs.

Ho2: There is no relationship between perceived ease of use of mobile technology and adoption of mobile technology in SMEs.

Ha2: There is a positive relationship between perceived ease of use of mobile technology and adoption of mobile technology in SMEs.

Ho3: There is no relationship between technology readiness for mobile technology and adoption of mobile technology in SMEs.

Ha3: There is a positive relationship between technology readiness for mobile technology and adoption of mobile technology in SMEs.

Ha4: There is a positive relationship between environmental factors of mobile technology and adoption of mobile technology in SMEs.

Ho4: There is no relationship between environmental factors of mobile technology and adoption of mobile technology in SMEs.

Ha5: There is a positive relationship between organisational factors of mobile technology and adoption of mobile technology in SMEs.

Ho5: There is no relationship between organisational factors of mobile technology and adoption of mobile technology in SMEs.

Ho6: There is no relationship between adoption of mobile technology and improvement in supply chain performance in SMEs.

Ha6: There is a positive relationship between adoption of mobile technology and improvement in supply chain performance in SMEs.

4.7.2 The relationships between determinants of adoption and the adoption of mobile technology.

Table 4.28: Hypothesis testing 1: Relationship between perceived usefulness of mobile technology and adoption of it in SMEs.

Correlations			
		Perceived Usefulness	Adoption of mobile technology
Perceived Usefulness	Pearson Correlation	1	.392
	Sig. (2-tailed)		.000
	N	110	110
Adoption of mobile technology	Pearson Correlation	.392	1
	Sig. (2-tailed)	.000	
	N	110	110

Table 4.28 depicts that there is a moderate positive relationship between the perceived usefulness and the adoption of mobile technology (r is 0.392) and it shows the two-

tailed p-value of 0.000. The p-value is less than 0.05; it means that the null hypothesis is rejected. Therefore, the correlation of 0.392 is significantly greater than zero. This implies that there is enough evidence to conclude that there is a positive correlation between the perceived usefulness and the adoption of mobile technology.

Table 4.29: Hypothesis Testing 2: Relationship between perceived ease of use of mobile technology and adoption of mobile technology.

Correlations			
		Perceived Ease of Use	Adoption of mobile technology
Perceived Ease of Use	Pearson Correlation	1	.429
	Sig. (2-tailed)		.000
	N	110	110
Adoption of mobile technology	Pearson Correlation	.429	1
	Sig. (2-tailed)	.000	
	N	110	110

Table 4.29 shows that there is a moderate positive relationship between the perceived ease of use and the adoption of mobile technology (r is 0.429) and it shows the two-tailed p-value of 0.000. The p-value is less than 0.05; it means that the null hypothesis is rejected. Therefore, the correlation of 0.429 is significantly greater than zero. This means that there is enough evidence to conclude that there is a positive correlation between the perceived ease of use and the adoption of mobile technology.

Table 4.30: Hypothesis testing 3: Relationship between technology readiness of mobile technology and adoption of mobile technology.

Correlations			
		Technology Readiness	Adoption of mobile technology
Technology Readiness	Pearson Correlation	1	.344
	Sig. (2-tailed)		.000
	N	110	110
Adoption of mobile technology	Pearson Correlation	.344	1
	Sig. (2-tailed)	.000	
	N	110	110

Table 4.30 shows that there is a moderate positive relationship between the technology readiness and the adoption of mobile technology (r is 0.344) and it shows the two-tailed p-value of 0.000. The p-value is less than 0.05; it means that the null hypothesis is rejected. Therefore, the correlation of 0.344 is significantly greater than zero. This means that there is enough evidence to conclude that there is a positive correlation between the technology readiness and the adoption of mobile technology.

Table 4.31: Hypothesis testing 4: Relationship between environmental factors of mobile technology and adoption of mobile technology.

Correlations			
		Environmental Factors	Adoption of mobile technology
Environmental Factors	Pearson Correlation	1	.440
	Sig. (2-tailed)		.000
	N	110	110
Adoption of mobile technology	Pearson Correlation	.440	1
	Sig. (2-tailed)	.000	
	N	110	110

Table 4.31 illustrates that there is a moderate positive relationship between the environmental factors and the adoption of mobile technology (r is 0.44) and it shows the two-tailed p-value of 0.000. The p-value is less than 0.05; it means that the null hypothesis is rejected. Therefore, the correlation of 0.440 is significantly greater than zero. This means that there is enough evidence to conclude that there is a positive correlation between the environmental factors and the adoption of mobile technology.

Table 4.32: Hypothesis testing 5: Relationship between organisational factors of mobile technology and adoption of mobile technology.

Correlations			
		Organisational Factors	Adoption of mobile technology
Organisational Factors	Pearson Correlation	1	.468
	Sig. (2-tailed)		.000
	N	110	110
Adoption of mobile technology	Pearson Correlation	.468	1
	Sig. (2-tailed)	.000	
	N	110	110

Table 4.32 shows that there is a moderate positive relationship between the organisational factors and the adoption of mobile technology (r is 0.468) and it shows the two-tailed p-value of 0.000. The p-value is less than 0.05; it means that the null hypothesis is rejected. Therefore, the correlation of 0.468 is significantly greater than zero. This means that there is enough evidence to conclude that there is a positive correlation between the organisational factors and the adoption of mobile technology.

4.7.3 The relationship between mobile technology adoption and supply chain performance

Table 4.33: Hypothesis testing 6: Relationship between adoption of mobile technology and improvement in supply chain performance in SMEs.

Correlations			
		Improvement	**Adoption of mobile technology**
Improvement	Pearson Correlation	1	.816
	Sig. (2-tailed)		.000
	N	110	110
Adoption of mobile technology	Pearson Correlation	.816	1
	Sig. (2-tailed)	.000	
	N	110	110

Table 4.33 illustrates that there is a strong positive relationship between the adoption of mobile technology and the improvement of supply chain performance (r is 0.816) and it shows the two-tailed p-value of 0.000. The p-value is less than 0.05; it means that the null hypothesis is rejected. Therefore, the correlation of 0.816 is significantly greater than zero. This means that there is enough evidence to conclude that there is a positive correlation between the adoption of mobile technology and the improvement of supply chain performance.

Table 4.34: The relationship between pairs of variables

Paired Samples Test									
			Paired Differences						Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference		T	Df	
					Lower	Upper			
Pair 1	Adoption & Usefulness	18.145	8.553	.815	19.762	16.529	22.251	109	.000
Pair 2	Adoption & Ease	14.864	8.405	.801	16.452	13.275	18.547	109	.000
Pair 3	Adoption & Readiness	15.700	8.804	.839	17.364	14.036	18.703	109	.000
Pair 4	Adoption& Environmental	15.309	8.258	.787	16.870	13.749	19.443	109	.000
Pair 5	Adoption & organisational	12.800	8.304	.792	14.369	11.231	16.167	109	.000
Pair 6	Improvement & Adoption	1.855	5.856	.558	.748	2.961	3.322	109	.001

This table was computed as an alternative way of testing hypotheses and to check the strength(negative/positive relationship). Table 4.34 used a two-tailed significancetest to assess the relationship between the pairs of variables. All pairs have positive t-values, meaning that the variables are positively correlated. All the pairs of variables are statistically significant because their p-values are greater than 0.05.

4.8. REGRESSION ANALYSIS

This section outlines the regression analysis by presenting and analysing the significance of the coefficient of multiple determination of independent variables (Saunders, Lewis & Thornhill, 2019).

4.8.1. Multiple Regression Analysis

Table 4.35: Model Summary for Multiple Regression Analysis

Model Summary [b]				
Model	**R**	**R Square**	**Adjusted R Square**	**Std. Error of the Estimate**
1	.828[a]	.686	.668	5.278

a. Predictors: (Constant), Perceived Usefulness, Perceived Ease of Use, Technology Readiness Environmental Factors, Organisational Factors , Improvement

b. Dependent Variable: Adoption of Mobile SCM

Table 4.35 shows the model summary of multiple regression between variables. The value of R represents the correlation coefficient, the R Square represents the square of R which provides “an index of the amount of variability in the dependent variable accounted for by the predictor variables” (Bordens & Abbott, 2016:473). The adjusted R square represents sampling error that may occur, and of which results in the R-square to tend to overestimate its variance and “the standard error gives an indication of how much variability is around the calculated regression line” (Bordens & Abbott, 2016:474).

The correlation coefficient is 0.828 and R-square is 0.686 meaning 68.6% of the variation in the dependent variable (the adoption of mobile SCM) can be explained by the predictors (perceived usefulness, perceived ease of use, technology readiness environmental factors, organisational factors and improvement in supply chain performance) in the regression model. The results show a significant regression analysis.

Table 4.36: ANOVA analysis for multiple regression

ANOVA [a]					
Model	**Sum of Squares**	**Df**	**Mean Square**	**F**	**Sig.**
Regression	6280.155	6	1046.693	37.573	.000[b]
Residual	2869.308	103	27.857		
Total	9149.464	109			

a. Dependent Variable: Adoption of Mobile SCM
b. Predictors: (Constant), Perceived Usefulness, Perceived Ease of Use, Technology Readiness Environmental Factors, Organisational Factors , Improvement

The F-value of 37.573 has a corresponding p-value of 0.000, which means that the probability of these or more extreme results occurring by chance was less than 0.001. This implies that there is a statistically significant between the variables.

Table 4.37: The coefficient of multiple regression analysis

Coefficients [a]											
		Unstandardised Coefficients		Standardised Coefficients			95,0% Confidence Interval for B		Correlations		
		B	Std. Error	Beta	T	Sig.	Lower Bound	Upper Bound	Zero-order	Partial	Part
1	(Constant)	3.460	1.999		1.731	.086	-.504	7.423			
	Usefulness	.026	.150	.015	.176	.860	-.270	.323	.392	.017	.010
	Ease	.004	.166	.002	.024	.981	-.325	.333	.429	.002	.001
	Readiness	.264	.126	.145	2.092	.039	.014	.514	.344	.202	.115
	Environmental	-.067	.178	-.034	-.374	.709	-.421	.287	.440	-.037	-.021
	Organisational	.028	.119	.019	.233	.816	-.208	.263	.468	.023	.013
	Improvement	.718	.063	.780	11.435	.000	.594	.843	.816	.748	.631
a. Dependent Variable: Adoption of mobile SCM											

Table 4: 37 shows the regression weights that was used to interpret the multiple regression of this study. The results show that the technology readiness and the improvement of the supply chain performance are statistically significantly related to the adoption of mobile SCM (both their p-values are smaller than 0.05) but perceived usefulness, perceived ease of use, environmental factors and organisational factors are not (their p-values are greater than 0.05).

The t-test results for perceived ease of use and environmental factors show that the probability of both of these from occurring by chance was less than 0.1, which means that the regression coefficients of the variables are considered significant if the study is exploratory.

Figure 4.78: The multiple regression scatterplot for the adoption of mobile SCM and the perceived usefulness, perceived ease of use, technology readiness, environmental factors, organisational factors and improvement of supply chain performances.

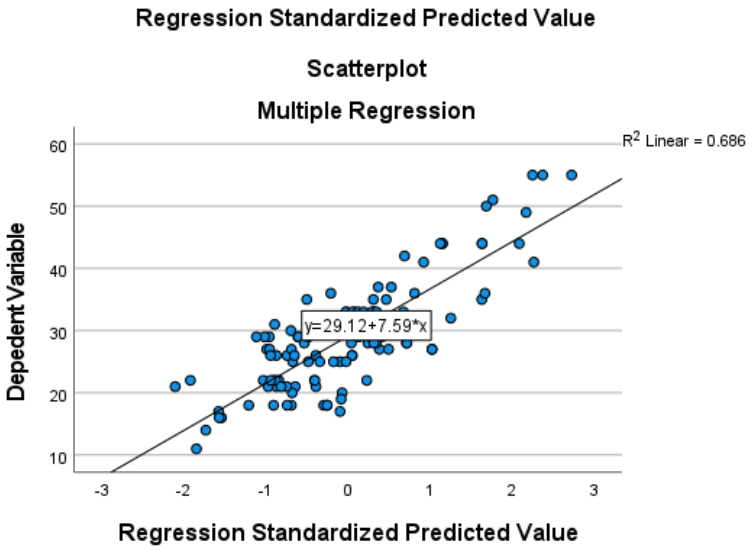


Figure 4.78 depicts the multiple regression scatterplot between the dependent variable (the adoption of mobile SCM) and the independent variables (perceived usefulness, perceived ease of use, technology readiness, environmental factors, organisational factors and improvement of supply chain performance). Line y=29.12+7.59*x indicates the relationship between dependent and independent variables (it is called linear).

4.8.2. Regression analysis for the intention to adopt with improvement in supply chain performance

Table 4.38: Model Summary for regression analysis for the intention to adopt with improvement in supply chain performance.

Model Summary [b]				
Model	**R**	**R Square**	**Adjusted R Square**	**Std. Error of the Estimate**
1	.816[a]	.665	.662	5.789
a. Predictors: (Constant), Intention to adopt b. Dependent Variable: Improvement in supply chain performance				

Table 4.38 shows the model summary of regression analysis between the intention to adopt and the improvement in the supply chain performance. The correlation coefficient is 0.816 and R-square is 0.665 meaning 66.5% of the variation in the dependent variable (improvement in supply chain performance) can be explained by

the predictors (intentions to adopt) in the regression model. The results show a significant regression analysis.

Table 4.39: ANOVA Analysis for intention to adopt with improvement in the supply chain performance.

ANOVA [a]					
Model	**Sum of Squares**	**Df**	**Mean Square**	**F**	**Sig.**
Regression	7187.485	1	7187.485	214.467	.000[b]
Residual	3619.433	108	33.513		
Total	10806.918	109			
a. Dependent Variable: Improvement in the supply chain performance b. Predictors: (Constant), Intention to adopt					

The F-value of 214.467 has a corresponding p-value of 0.000, which means that the probability of these or more extreme results occurring by chance was less than 0.001. This implies that there is a statistically significant between the variables.

Table 4.40: The coefficient for intention to adopt with improvement in supply chain performance

Coefficients [a]											
		Unstandardised Coefficients		**Standardised Coefficients**			**95,0% Confidence Interval for B**		**Correlations**		
		B	**Std. Error**	**Beta**	**T**	**Sig.**	**Lower Bound**	**Upper Bound**	**Zero-order**	**Partial**	**Part**
1	(Constant)	5.165	1.847		2.797	.006	1.504	8.825			
	Intention to adopt	.886	.061	.816	14.645	.000	.766	1.006	.816	.816	.816
a. Dependent Variable: Improvement in the supply chain performance											

Table 4:40 shows the regression analysis between the intention to adopt with improvement in the supply chain performance. For every increase in intention to adopt it is expected that the improvement in the supply chain performance to increase by 0.886(B). The p-value for the intention to adopt is 0.000 which is smaller than 0.05.this means that there is a significant relationship between the intention to adopt and the improvement in the supply chain performance.

Figure 4:79: The regression analysis scatterplot for the intention to adopt with improvement in supply chain performance.

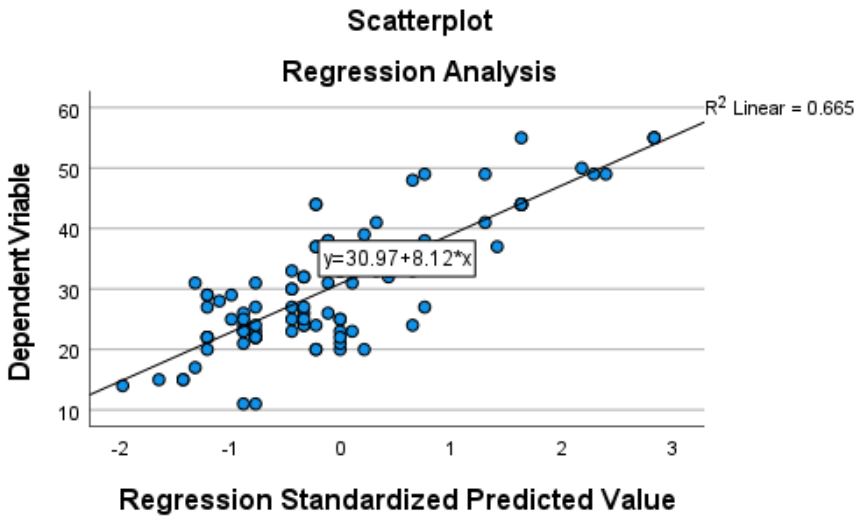


Figure 4.79 depicts the regression scatterplot between the intention to adopt and the improvement in the supply chain performance. The relationship between the intention to adopt and the improvement in the supply chain performance is linear (y=30.97+8.12*x) and thus a strong positive.

4.9. CONCLUSION

In this chapter, factors affecting the use of mobile technology in supply chains was determined, namely, perceived usefulness, perceived ease of use, technology readiness, environmental factors and organisational factors. The level of adoption of mobile technology in the supply chain of SMEs was determined as well as the level of effectiveness of mobile supply chain management in SMEs and the improvement of the supply chain performance. The relationships between determinants of the use of mobile technology and the adoption of mobile technology in the supply chain of SMEs and the relationship between mobile technology adoption and supply chain performance were determined. The next chapter is the final chapter, which outlines the summary of findings, recommendations and conclusions.

CHAPTER FIVE

SUMMARY OF FINDINGS, RECOMMENDATIONS AND CONCLUSIONS

5.1. INTRODUCTION

This chapter rounds off what the researcher started in chapter one (the introduction to this study). The chapter outlines what the researcher has found and concluded about the research problem of this study, which was to investigate the factors affecting the use of mobile technology in supply chains, the adoption of mobile SCM in SMEs and the effectiveness of mobile supply chain management in SMEs. In this chapter, the researcher utilises the results from chapter four to conclude, make recommendations and suggest the areas for future research.

5.2. FINDINGS AND CONCLUSIONS

5.2.1. DETERMINANTS OF SUPPLY ADOPTION OF MOBILE TECHNOLOGY FOR SUPPLY CHAINS

The summary of findings in chapter 4 are as follows:

5.2.1.1. Perceived Usefulness

The findings show that a cell phone and other mobile devices can help businesses find new customers and that it can improve the speed with which the business can deal with their customers. Consequently, the use of technology in the businesses depends on the level of usefulness. The businesses in the study area believe that a cell phone and other mobile devices can create flexibility between themselves and their customers and can help them to be available at all hours for their business.

Similar findings present that the supply chains are no longer limited in the use of mobile technology**.** Supply chains use smartphones to manage the business's daily activities and to have easy and quick communication between suppliers and customers (Badenhorst-Weiss *et al.,* 2017). The use of mobile SCM in SMEs, allows businesses to exchange information and to have electronic transactions with their stakeholders (Wagner & Sweeney, 2011). Chuang (2019) point out that mobile technology usage in supply chains could enhance a system that is more responsive in terms of controlling the chains of the business.

5.2.1.2. Perceived Ease of Use

The findings show that the businesses in the study area accept that using cell phones and other mobile devices because is easy to use and that the use of new technology in the businesses depends on the level of easiness. These findings therefore found that a cell phone and other mobile devices in businesses are used to interact with customers because it is easy to use, and it is easy to gather data. Also, the findings show that businesses in the study area train themselves and their workers to use mobile devices, but suppliers do not support them with mobile software.

Other findings present that the adoption of technology becomes high if individuals perceive it as easy to use (Leon, 2018) and when technology is perceived by users to be easy to use, it is likely to be adopted (Blut & Wang, 2020). Singh & Sinha (2020) note that when someone lacks confidence in new technology, they will find it difficult to use, so the ease of use of new technology depends on how individuals perceive it.

5.2.1.3. Technology Readiness

The findings also find that the businesses in the study area are unsure of whether being open to the use of new technology helps them to utilise mobile devices in their businesses, however they are always ready to use new technology. In addition, they are not sure if they prefer people that use new technology rather than those who do not. Findings also show that businesses in the study area believe that people who are insecure are not ready to adopt new technology and prefer to use new technology, and lastly if they are uncomfortable with new technology, they will not use it.

Similar findings allude that people who are insecure focuses on trust of technological relations. For instance, the fear of sharing personal information such as credit information (Blut & Wang, 2020; Smit *et al*., 2018). It is anticipated that people with a basic level of inborn creativity (receptiveness to new things) show natural interest in challenging new technologies (Blut & Wang, 2020). It is proven that the use of technology is characterised by people's technology anxiety. Individuals with a high level of discomfort view utilising technology as unfriendly and devastating and as a result they attempt to dodge it at all costs (Blut & Wang, 2020). Some individuals believe that technology is not for ordinary individuals because is moreover complex

and requires comprehensive knowledge and skills to utilise it, due to the feeling of discomfort. Discomforted people are biased when it comes to technology usage (Smit et al., 2018).

5.2.1.4. Environmental Factors

These findings show that competitive pressure can influence businesses to adopt mobile technology and that government policies affect the supply chain activities in the businesses. Similar findings conducted by Almatarneh & Farooqui (2017) present that competitive pressure makes organisations to embrace technology even though the owner is confronting pressure from upstream and downstream parts in the supply chain. Additionally, when there is a full support from government, the adoption is likely to be rapid (Wong, Leong, Hew, Tan & Ooi, 2020).

Nevertheless, the supply chain activities have improved because of use of mobile communication sharing. They are unsure that the accuracy and the speed of information flow in the supply chain has influenced them to adopt mobile technology. However, Badenhorst-Weiss, Van Biljon & Ambe (2017) contend in their study that the information flow in supply chain management is based on the accuracy and the speediness and mobile applications are slowly getting rid of paper-based work, for example, there is no need to sign documents manually as this is done electronically with the use of electronic signatures (Kurt, Kalem, Vayvay & Kalender, 2016).

5.2.1.5. Organisational Factors

The study conducted by Wong, Leong, Hew, Tan & Ooi (2020) present that capital is the most important factor in adopting technology and it significantly affect the intention of adopting mobile technology and higher cost usually limits the new technology systems and technology adoption amongst businesses. These findings indicate that lack of capital /resources results in slow growth in adopting mobile technology and the higher amount of costs limits businesses to adopt new technology. Managerial problems are not an obstacle for adopting new technology in the businesses and mobile technology has replaced some of the old systems in the businesses. Yet, the study conducted by Chatzoglou & Chatzoudes (2016) reveal that the managerial problems tend to be an obstacle when it comes to taking a decision about an adoption of new technology.

Consequently, little bargaining power over suppliers results in businesses to not adopt

new technology. Lastly but not least, large businesses are more likely to adopt mobile technology than small businesses and challenges in SMEs limit businesses to embrace new technologies. The study of Ahmad, Zahri, Alghaili, Zainudin, Shahril & Zaili (2020) presents similar findings, for example the smaller the size of the organisation the more challenges for the business because resources are not enough to embrace new technology, while bigger business are more likely to be successful because of more resources in the business, which allows the business to embrace new developments in technology. Moreover, smaller enterprise compared to bigger enterprises have little bargaining power over their suppliers, which results in failure when it comes to adoption of new technologies (Chatzoglou & Chatzoudes, 2016).

5.2.2. THE ADOPTION OF MOBILE SCM

The findings show that mobile SCM has changed the way businesses conduct their supply chains. It is neutral that mobile SCM adoption has changed the activities and processes of supply chains, also that the adoption of mobile technology is changed by the aim for using the technology. Nonetheless, the success of mobile supply chain adoption is dependent on the attitude of the business owners, and the attitude towards the adoption is influenced by ease of use. Additionally, the intentions to use mobile technology depends on the level of usefulness and it is influenced by behavioural intentions to adopt.

This is supported by the study conducted by Musa, Li, Abas & Mohamad (2016) that the success of technology adoption is dependent on the user's attitude and the stronger the intentions the probability of positive attitude towards technology adoption. Mutisya & Kiai (2016) point out that the attitude towards the adoption is influenced by ease of use of any system, hence, they conclude that there is a significant relationship between attitude and perceived ease of use. Moreover, the higher the level of usefulness, the greater the intentions to use the technology (Singh & Sinha, 2020).

The adoption of mobile technology supply chain in the study area is not affected by the benefits and costs, how complex it was and security risk but the adoption of mobile technology in the supply chain affects how it fits into their present way of doing things. Even though, Fatoki (2020) points out that the intentions to adopt m-commerce can be affected by benefits, costs, compatibility, security risk and complexity. The intention to use and the intention to adoption are correlated; an individual's intentions to use

technology will subsequently result in adoption and use of any technology (Koenaite, Chuchu & Venter de Villiers, 2019).

5.2.3. IMPROVEMENT IN SUPPLY CHAIN PERFORMANCE

It is not clear that the use of mobile technology has enhanced productivity and cost reduction, improved the performance of suppliers and buyers, improved the major goals achieved, and transparency in the supply chain. Additionally, it is not clear that gaining a competitive advantage has improves their supply chain performance, if there is a growth in the supply chain because of the use of mobile technology and if knowing the different variables of the supply chain has helped them to improve their supply chain.

Other findings present that mobile SCM has gained recognition as an important element in cost reduction and supply chain improvement (Chana & Chong, 2013). Agami, Saleh & Rasmy (2012) point out that there are many issues that prohibits the longest-standing performance of supply chains. Many businesses are struggling to gain competitive advantage hence it is difficult for them to improve supply chain performance (Muhanguzi & Kyobe, 2014). However, the supply measurements have played a vital role in the growth and improvement of supply chains' performance (Agami *et al*., 2012) and the use of mobile technology it has enhanced the growth and profitability of the firm (Far, Akbari & Clarke, 2017).

It is found that quality, cost, time, flexibility and dependability in the supply chain performance have improved, the financial performance has played a big role in the efficiency of supply productivity, the use of mobile technology has helped to operate in a responsive way to their customers and innovation in the supply chain has improved.

5.2.4. HYPOTHESIS TESTING

The first hypothesis states that the null hypothesis is rejected, because there is a positive relationship between the perceived usefulness and the adoption of mobile technology. This is indicated by the p-value of 0.000 which is less than 0.05.

The second hypothesis shows that there is a positive relationship between the perceived ease of use and the adoption of mobile technology, as the p-value of 0.000 is less than 0.05 which means the null hypothesis is rejected.

The third hypothesis states that there is a positive relationship between the technology readiness and the adoption of mobile technology, as the p-value is 0.000, which is less than 0.05. Therefore, the null hypothesis is rejected.

The fourth hypothesis shows that there is a positive relationship between the environmental factors and the adoption of mobile technology, as the p-value of 0.000 is less than 0.05 it means the null hypothesis is rejected.

The fifth hypothesis states that the null hypothesis is rejected, because there is a positive relationship between the organisational factors and the adoption of mobile technology. This is indicated by the p-value of 0.000 which is less than 0.05.

The sixth hypothesis shows that there is a positive relationship between the adoption of mobile technology and the improvement of supply chain performance, as the p-value of 0.000 is less than 0.05 which means the null hypothesis is rejected.

The next section will summarise the conclusions based on the findings

5.2.5 SUMMARY OF FINDINGS AND CONCLUSIONS

In this chapter, factors affecting the use of mobile technology in supply chains was determined, namely, perceived usefulness, perceived ease of use, technology readiness, environmental factors and organisational factors. The level of adoption of mobile technology in the supply chain of SMEs was determined as well as the level of effectiveness of mobile supply chain management in SMEs and the improvement of the supply chain performance. The relationships between determinants of the use of mobile technology and the adoption of mobile technology in the supply chain of SMEs and the relationship between mobile technology adoption and supply chain performance was determined to be positive. Overall, the results show that there is a positive relationship between the variables used in this research study.

5.3. RECOMMENDATIONS

5.3.1. DETERMINANTS OF SUPPLY ADOPTION OF MOBILE TECHNOLOGY FOR SUPPLY CHAINS

5.3.1.1. Perceived Usefulness

Businesses need to utilise a cell phone and other mobile devices as these devices will

help them to find new customers and it can also improve the speed with which they can deal with their customers. Also, the businesses need to use technology in their businesses as this is useful for running of the business and to be competitive in the business environment. All kinds of businesses need to use a cell phone and other mobile devices as this will create flexibility between them and their customers and to help them to be available at all hours for their business.

Since it is concluded that perceived usefulness is affecting the use of mobile technology in supply chains, it is important for the businesses to take into consideration the use of mobile technology which will help them improve their supply chain performance. The businesses need to utilise mobile technology since today business finds itself in an innovative world. There is a need to change the way of doing business to a modern world.

5.3.1.2. Perceived Ease of Use

Since it is concluded that the businesses believe that they use a cell phone and other mobile devices because it is easy to use, they should continue using those devices because it is indeed easy as supported the results. The use of new technology in the businesses should depend on the level of easiness because it is wasteful to utilise the technology that is not easy and friendly to use. This will end up costing the business more money instead of generating profit. The business will end up running at a loss.

In addition, a cell phone and other mobile devices in businesses are concluded to be used to interact with customers because it is easy to use, so the business must continue using these devices because it is easy to gather data. This implies that the businesses are able to capture all the transactions of the business electronically instead of using traditional ways.

Lastly, the suppliers need to support businesses with mobile software for better supply chains. Also, businesses need to employ people who are computer literate to avoid spending more money on organising training for employees on how to use technology; rather use the money to upgrade the technology which will generate more profit.

5.3.1.3. Technology Readiness

Businesses need to take into consideration that it is important for them to be open to the use of new technology because it will help them to utilise mobile devices in their businesses, however they should always be ready to the utilisation of such technology.

In addition, businesses need to employ people who use new technology rather than those who do not. It is important for the businesses to be optimistic at all times as this will enable them to remain competitive against its competitors. Optimistic business owners are open minded, and risk takers, which means that they are not insecure. They use what they think is best for their business and they are likely to succeed in their business. Lastly, businesses should be technology ready.

5.3.1.4. Environmental Factors

Since it is concluded that a competitive pressure can influence businesses to adopt mobile technology, businesses need to take into consideration the influence of competitive pressure on whether it is worth or not in their business. They should avoid unnecessary pressure from their competitors. Businesses need to take into consideration the government policies which may affect their supply chain activities in the businesses to avoid lawsuits or the closing of their businesses by the government. Nevertheless, the businesses need to share with their customers and suppliers about supply chain activities to ensure accuracy and the speed of information flow in the supply chain.

5.3.1.5. Organisational Factors

Businesses should take into consideration the issue of asking for donations to the large businesses in order to adopt mobile technology in their business, since it is concluded that lack of capital/resources results in slow growth in adopting mobile technology. Businesses need to adopt new technology that is affordable according totheir budget to avoid the issue of higher costs that limits them in adopting new technology.

Since it is concluded that managerial problems are not an obstacle for adopting new technology in the businesses, they should continue not to mix personal issues with business issues, as it does not portray a good image. Businesses that have not yet replaced some of the old systems with mobile technology need to do so because the results reveal that mobile technology has improved how the supply chain activities were conducted.

The bargaining power over suppliers must be promoted between the suppliers and the businesses in adoption of new technology. Businesses should not believe the myth of saying, “large businesses are more likely to adopt mobile technology than small businesses”. They should adopt mobile technology when it is suitable and affordable

for them to do so. They should not allow challenges in businesses to limit them to embrace new technologies.

5.3.2. THE ADOPTION OF MOBILE SCM

Businesses need to adopt mobile SCM in order to change the way of conducting the supply chain activities. They need to change from the traditional way of doing things to the modern way, since we live in the 4th industrial revolution. Businesses need to change their attitude towards the adoption of mobile SCM, since its success is dependent on the attitude of the business owners. Businesses need to change their intentions to use mobile technology because it influences the behavioural intentions to adopt. In adopting the mobile SCM, businesses need to know their budget or adjust their budget before the initial adoption because the mobile technology adoption is affected by the benefits and costs. It is also affected by how complex it is, the security risk and how it fits into the present way of doing things.

5.3.3. IMPROVEMENT IN SUPPLY CHAIN PERFORMANCE

Businesses need to use mobile technology to enhance the productivity and the cost reduction; to improve the performance of suppliers and buyers, to better achieve the major goals, and lastly, to improve the transparency in the supply chain. Businesses need to remain/gain competitive advantage in order to improve the supply chain performance. According to Althaqafi (2021), there are seven aspects that can improve supply chain performance. They are as follows:

- The ability to gain competitive advantage among competitors.
- Managing sustainability in supply chains.
- Encouraging supplier to establishing incentives.
- The willingness to adopt new technology that is suitable for your supply chains.
- Learning to better forecast.
- Be flexible to manage inventory.
- To effectively plan and schedule all operational activities of all resources.

5.4. INTEGRATED RECOMMENDATION

It is recommended that the businesses take into consideration the determinants of mobile technology adoption when tackling it to improve their supply chain performance

because there is a strong relationship between the two. To those who have not adopted mobile technology in their businesses, it is recommended that they adopt mobile technology to enhance productivity and the processes of supply chain for a better performance.

5.5. FURTHER RESEARCH RECOMMENDED

To get a holistic view of the determinants of mobile technology adoption for the improvement of the performance in supply chains of SMEs, a sample of all district municipalities in Limpopo province should be sampled to get more accurate and larger amounts of data. It is recommended that the sample size be increased to get meaningful results, because in this study, businesses were sampled only from the Polokwane local municipality. Additionally, research can examine the impact of mobile technology on mobile SCM usage in supply chain of SMEs.

5.6 CONCLUSION

This study was conducted to investigate the factors influencing the use of mobile technology in the SMEs for the improvement of the supply chain. This was done through identifying the determinants of the use of mobile technology in supply chains of SMEs, the level of adoption of mobile technology in the supply chains of SMEs and determining the relationships between determinants of adoption and the adoption of mobile technology and the relationship between mobile technology adoption and supply chain performance. This study has achieved its objective, because it was able to determine the determinants of the use of mobile technology in the supply chains, the level of adoption of mobile technology and the relationship between determinants of adoption and the adoption of mobile technology and the relationship between mobile technology adoption and supply chain performance. The necessary recommendations to the businesses in the business environment were made.

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ANNEXURE: A

I am Hlongwane Paseka, a Master of Commerce student from the University of Limpopo in the School of Management and Law. I am conducting a research on the topic: Determinants of mobile technology adoption for the improvement of the supply chains of SMEs. I request that you participate in my research by completing this questionnaire. Your privacy will be ensured since this questionnaire is for research purpose only. The information you provide will be kept confidential and no names will appear in any part of the research. If during the process of completion, you want to withdraw from the process, you are free to do so. All research activities will be carried out with honesty and with regard to the requirements of scientific research and the data will be protected.

Completing this questionnaire will take only 30 minutes of your time and I will appreciate your cooperation.

CONSENT FORM

Research title: Determinants of mobile technology adoption for the improvement of the supply chains of SMEs.

Researcher: **Hlongwane Paseka**

I, _____ hereby voluntarily agree to participate in the following project: …….

I understand that:

1. My responses will be treated with confidentiality and only be used for the purpose of the research.

2. No harm will be posed to me.

3. The research project aim has been explained to me.

4. I do not have to respond to any question that I do not wish to answer for any reason.

5. Access to the records that pertain to my participation in the study will be restricted to persons directly involved in the research.

6. Any questions that I may have regarding the research, or related matters, will be answered by the researcher.

7. Participation in this research is entirely voluntary and I can withdraw my participation at any stage.

8. I understand the information regarding my participation in the study and I agree to participate.

Signature of interviewee Signature of witness

_____ _____

Signature of interviewer

_____

Signed at_____on this_____day of_____20_____

Section A: Demographic Information

In this section, the researcher would like to find out a little more about yourself and the profile of your company. Please place a cross (x) in the appropriate block.

	Female	Male
1. Please state the number of employees in your business.		

	Matric	Diploma	Degree/ Honours	Master's	Other (specify)
2. Please state your highest qualifications.					

	African	Indian/Asian	White	Coloured	Other (specify)
3. Ethnicity.					

	Business owner	Manager
4. Please indicate your occupation.		

	Less than 1 year	Between 1 to 5 years	Between 5 to 10 years	Between 10 to 15 years	15 years and above
5. Work experience.					

SECTION B: DETERMINANTS OF SUPPLY ADOPTION OF MOBILE TECHNOLOGY FOR SUPPLY CHAINS

Please indicate your agreement with the following statements by choosing either, strongly agree, agree, neutral, disagree or strongly disagree.

		Strongly agree	Agree	Neutral	Disagree	Strongly disagree
No.	**Perceived usefulness** In my business, me and the workers use mobile technology (cell phones) we believe that:	**(1)**	**(2)**	**(3)**	**(4)**	**(5)**
1.	A cell phone and other mobile devices help me to find new customers.					
2.	A cell phone and other mobile devices improve the speed with which I can deal with customers.					
3.	Whether I use technology depends on the level of usefulness.					
4.	A cell phone and other mobile devices create flexibility between me and my customers and suppliers.					
5.	A cell phone and other mobile devices help me to be available at all hours for my business.					
No.	**Perceived ease of use:**					
1.	I use a cell phone and other mobile devices because it is easy to use.					
2.	When I believe it is easy to use new technology, I will use it.					
3.	I use the cell phone and other mobile devices to interact with my customers because it is easier to use.					
4	Using a cell phone is easy to gather data.					
5.	I train myself and my workers to use mobile devices because it is easy to use.					
6.	Mobile technology is easy to use as suppliers support me with mobile software.					
No.	**Technology Readiness in my business:**					
1.	Being open to the use of new technologies helps me to use mobile devices in my business.					
2.	I am always ready to use new technology.					
3.	I prefer to employ people that use new technology rather than a person who does not.					
4.	People that are optimistic prefer to use new technology.					
5.	People that are insecure are not ready to adopt new technology.					
6.	If people are uncomfortable with new technology they will not use it.					
No.	**Environmental factors in my business:**					
1.	Competitive pressure has influenced me to adopt mobile technology.					
2.	Government policies/regulations are affecting how I run my supply chains activities.					
3.	Mobile communication sharing has improved my supply chain activities.					
4.	Accuracy and speed in information flow in supply chain influenced my adopting.					
5.	Mobile communication has improved my supply chain activities.					
No.	**Organisational factors in my business:**					
1.	Lack of capital/resources results in slow growth in my adopting mobile technology.					
2.	Higher amount of costs limits me in the adoption of new technology.					
3.	Managerial problems is an obstacle for adopting new technology in my business.					
4.	Mobile technology has replaced some of the old systems in my business.					
5.	Little bargaining power over suppliers results in my not adopting new technology.					
6.	Large businesses are more likely to adopt mobile technology than small businesses.					
7.	Challenges faced by SMEs limit them to embrace new technologies.					

SECTION C: THE ADOPTION OF MOBILE SCM

Please indicate whether you agree with the statements by choosing either, strongly agree, agree, neutral, disagree or strongly disagree with the following statements.

		Strongly agree	Agree	Neutral	Disagree	Strongly disagree
No.	**The adoption of mobile supply chain management(SCM) in my business:**	**(1)**	**(2)**	**(3)**	**(4)**	**(5)**
1.	Has changed the way I conducted my supply chain activities.					
2.	Mobile SCM adoption has changed the activities and processes of supply chains.					
3.	The adoption of mobile technology is changed by the aim for using the technology.					
4.	The success of mobile supply chain adoption is dependent on my attitude.					
5.	The attitude towards the adoption is influenced by ease of use.					
6.	The intention to use mobile technology depends on the level of usefulness.					
7.	Mobile technology adoption is influenced by behavioural intentions to adopt.					
8.	The adoption of mobile technology supply chain was affected by the benefits and costs.					
9.	The adoption of mobile technology supply chain was affected by the how it fits into my present way of doing things.					
10	The adoption of mobile technology supply chain was affected by the how complex it was.					
11.	The adoption of mobile technology supply chain was affected by security risk.					

SECTION D: IMPROVEMENT IN SUPPLY CHAIN PERFORMANCE

Please indicate within the following statements by choosing either strongly agree, agree, neutral, disagree or strongly disagree.

		Strongly agree	Agree	Neutral	Disagree	Strongly disagree
No.	**The use of mobile technology has improved my supply chain performance:**	**(1)**	**(2)**	**(3)**	**(4)**	**(5)**
1.	Enhanced productivity and cost reduction.					
2.	The performance of my suppliers and buyers has improved					
3.	The major goals are being better achieved.					
4.	Transparency in the supply chain has improved					
5.	Gaining competitive advantage has improved my supply chain performance.					
6.	Knowledge of different variables of the supply chain has helped to improve my supply chain performance.					
7.	There is a growth in the supply chain.					
8.	Quality, cost, time, flexibility and dependability in the supply chain performance have improved.					
9.	The financial performance has played a big role in the efficiency of supply productivity.					
10.	Helps to operate in a responsive way to my customers.					
11.	Innovation in the supply chain has improved.					

Thank you for your time and cooperation.

ANNEXURE: B

University of Limpopo
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Private Bag X1106, Sovenga, 0727, South Africa
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TURFLOOP RESEARCH ETHICS COMMITTEE

ETHICS CLEARANCE CERTIFICATE

MEETING: 17 February 2021

PROJECT NUMBER: TREC/05/2021: PG

PROJECT:

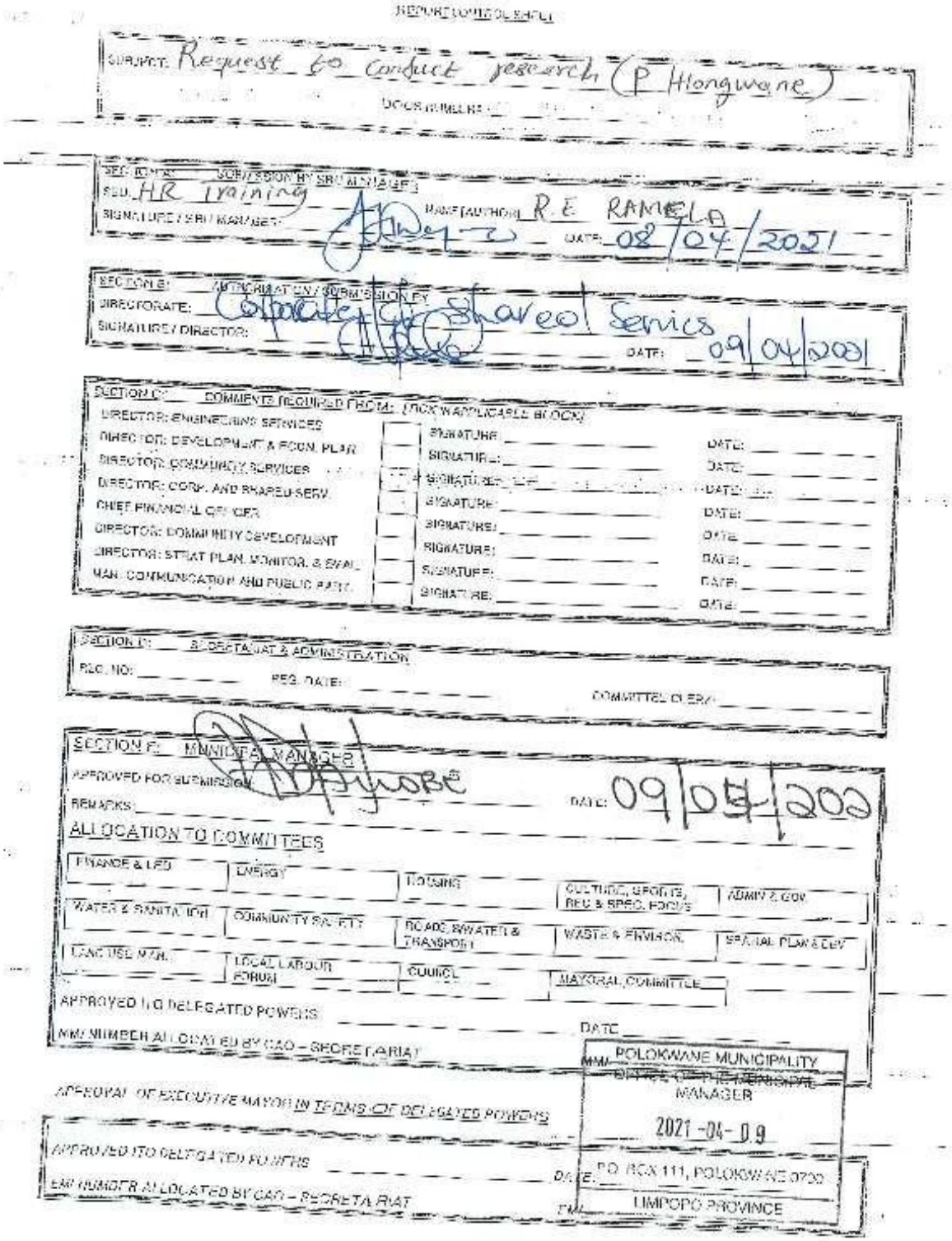
Title:	Determinants of mobile technology adoption for the improvement of supply chains of small and medium enterprises
Researcher:	P Hlongwane
Supervisor:	Prof GPJ Pelser
Co-Supervisor/s:	N/A
School:	School of Economic and Management
Degree:	Master of Commerce in Business Management

PROF P MASOKO
CHAIRPERSON: TURFLOOP RESEARCH ETHICS COMMITTEE
The Turfloop Research Ethics Committee (TREC) is registered with the National Health Research Ethics Council, Registration Number: **REC-0310111-031**

Note:
i) **This Ethics Clearance Certificate will be valid for one (1) year, as from the abovementioned date. Application for annual renewal (or annual review) need to be received by TREC one month before lapse of this period.**
ii) **Should any departure be contemplated from the research procedure as approved, the researcher(s) must re-submit the protocol to the committee, together with the Application for Amendment form.**
iii) **PLEASE QUOTE THE PROTOCOL NUMBER IN ALL ENQUIRIES.**

Finding solutions for Africa

ANNEXURE: C



REPORT TO COUNCIL

SUBJECT: Request to conduct research (P Hongwane)

DOCS NUMBER:

SEC: HUMAN SUBMISSION BY SBU MANAGER:

SBU: HR training

SIGNATURE SBU MANAGER:

NAME (AUTHOR): R E RAMELA

DATE: 08/04/2021

SECTION B: AUTHORISATION/SUBMISSION BY

DIRECTORATE: Corporate Gov Shared Servics

SIGNATURE/ DIRECTOR:

DATE: 09/04/2021

SECTION C: COMMENTS REQUIRED FROM: (TICK WHERE APPLICABLE BLOCK)

DIRECTOR: ENGINEERING SERVICES		SIGNATURE:	DATE:
DIRECTOR: DEVELOPMENT & ECON. PLAN		SIGNATURE:	DATE:
DIRECTOR: COMMUNITY SERVICES		SIGNATURE:	DATE:
DIRECTOR: CORP. AND SHARED SERV.		SIGNATURE:	DATE:
CHIEF FINANCIAL OFFICER		SIGNATURE:	DATE:
DIRECTOR: COMMUNITY DEVELOPMENT		SIGNATURE:	DATE:
DIRECTOR: STRAT PLAN, MONITOR. & EVAL.		SIGNATURE:	DATE:
MAN. COMMUNICATION AND PUBLIC PART.		SIGNATURE:	DATE:

SECTION D: SECRETARIAT & ADMINISTRATION

REC. NO: REC. DATE: COMMITTEE/S:

SECTION E: MUNICIPAL MANAGER

APPROVED FOR SUBMISSION DATE: 09/04/2021

REMARKS:

ALLOCATION TO COMMITTEES

FINANCE & LED	ENERGY	HOUSING	CULTURE, SPORTS, REC & SPEC. FOCUS	ADMIN & GOV	
WATER & SANITATION	COMMUNITY SAFETY	ROADS, STORMWATER & TRANSPORT	WASTE & ENVIRON.	SPATIAL PLAN & DEV	
EXECUTIVE MAN.	LOCAL LABOUR FORUM	COUNCIL	MAYORAL COMMITTEE		

APPROVED I/O DELEGATED POWERS DATE

MM NUMBER ALLOCATED BY CAO – SECRETARIAT

POLOKWANE MUNICIPALITY
OFFICE OF THE MUNICIPAL MANAGER
2021 -04- 09
P.O. BOX 111, POLOKWANE 0700
LIMPOPO PROVINCE

APPROVAL OF EXECUTIVE MAYOR IN TERMS OF DELEGATED POWERS

APPROVED I/O DELEGATED POWERS DATE

EM NUMBER ALLOCATED BY CAO – SECRETARIAT

515557
MS. R.E RAMELA (07/04/2021)

DIRECTORATE: CORPORATE AND SHARED SERVICES

ITEM:

FILE REF:

REQUEST TO GRANT P HLONGWANE CONDUCT RESEARCH WITHIN POLOKWANE MUNICIPALITY

Report of the Director: Corporate and Shared Services

Purpose of the Report

To request the Municipal Manager to grant P Hlongwane to conduct research at Polokwane Municipality.

Background and Discussion

P Hlongwane sent a letter requesting permission to conduct research at Polokwane Municipality. Research topic is title: Determinants of mobile technology adoption for the improvement of supply chains of small and medium enterprises

"A copy of the letter from University of Limpopo is attached for reference"

Financial Implication

There is no financial implication.

Recommend

1. That approval be granted to P Hlongwane to conduct research within Polokwane Municipality.
2. That the findings emanating from the research study be shared with the Municipality before they are published.

Mr. JL Manyama
HR Manager

Ms. MM Matshivha
Director: Shared & Corporate Services

Mr. DH Makobe
Municipal Manager

ANNEXURE: D

N J Nel
PO Box 365,
BENDOR PARK
0713

Tel: 0741849600

CERTIFICATE

This serves to certify that I have language edited the Master's Dissertation of

Ms PASEKA HLONGWANE
Student number: **201531078**

entitled:

"DETERMINANTS OF MOBILE TECHNOLOGY ADOPTION FOR THE IMPROVEMENT OF SUPPLY CHAINS OF SMALL AND MEDIUM ENTERPRISES."

N J Nel

Lecturer of English, Department Applied Languages
Tshwane University of Technology
(Retired)

4 July 2021

ANNEXURE:E

ORIGINALITY REPORT

11%	9%	8%	5%
SIMILARITY INDEX	INTERNET SOURCES	PUBLICATIONS	STUDENT PAPERS

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