

**THE IMPACT OF E-BUSINESS APPLICATIONS ON THE OPERATIONAL
PERFORMANCE OF BUSINESSES IN THE LIMPOPO PROVINCE**

by

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DECLARATION

I declare that **THE IMPACT OF E-BUSINESS APPLICATIONS ON THE OPERATIONAL PERFORMANCE OF BUSINESSES IN THE LIMPOPO PROVINCE** is my own work and that all the sources that I have used or quoted have been indicated and acknowledged by means of complete references and that this work has not been submitted before for any other degree at any other institution.

Ledwaba Nape Frances

14 September 2018



Signature

.....

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ABSTRACT

The purpose of this study was to investigate the efficiency and effectiveness of e-business applications when used for the creation and delivering of value propositions that the target markets that businesses desire to achieve in the Limpopo Province. The study had three objectives. (1) To identify the e-business applications that can be used in the development of new value propositions for businesses (2) To identify the benefits that the use of e-business applications offers to businesses (3) To determine the relationship between the use of e-business applications and the operational performance of the value propositions. The study was quantitative in nature. Exploratory and descriptive research were utilised to the use of e-business applications by businesses. A sample size of 330 businesses was used. The questionnaire was based on a thorough theoretical basis and a pilot study was conducted to improve the validity. The Cronbach alpha test was conducted to ascertain the reliability of the research instrument. Data was collected through the use of self-administered questionnaires in a survey. SPSS was used for data analysis. The results indicate the e-business applications, the benefits of e-business and the relationship between the e-business applications and operational performance of value propositions. Recommendations to businesses utilise e-business applications so that they are able to create and deliver value propositions in an efficient and effective manner are made.

Key words: E-business; e-business applications; benefits of e-business; operational performance measures; Value propositions; Polokwane Local Municipality.

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CHAPTER ONE

INTRODUCTION TO THE STUDY

1.1 INTRODUCTION AND BACKGROUND TO THE PROBLEM

Internet technologies are changing the global economy by producing changes in traditional ways of doing business. The changes occurring in the global economy also present changes in the markets for the firm's value propositions (Kumar and Kumar, 2014: 349). Products and services that are produced using e-business applications lead to an increase in Gross Domestic Product (GDP), (Goldstuck, 2015: 39). There is also a growing number of internet users worldwide (Shahriari, Shahriari and Gheiji ,2015: 51).

E-business is the use of online facilities that are utilised to create value propositions with the intention of meeting the needs of the society at large and also generating profit for the business (Mudholkar *et al.* 2013: 513).

In developing countries, it was found that the utilisation of e-business demonstrated economic improvements and it is regarded as a necessity to overcome problems and improve participation in the world economy (Abou-Shouk, Lim and Megicks, 2016: 327). E-business is considered crucial in the economy of a country, so developing countries must try to keep pace with the current and emerging e-business technologies in order to experience improving economics (Mudholkar, Shanker and Maitra, 2013: 512).

Alyoubi (2015:480-481) found that in South Africa, Egypt, Morocco and Tunisia (developing countries from Africa), the slow dissemination of e-business can be attributed to numerous economic issues. However, some African countries (Morocco, Tunisia, Senegal and Ivory Coast) made progress in their e-business links by connecting themselves with the global connect road-map (Alyoubi, 2015: 480-481). The global connect road map is defined as the initiative of bringing sustainable development (Global connect initiative network, 2016: 2).

South Africa is a developing country that progressed quickly in internet adoption. The majority of the country is already a "networked society" and currently the country's focus is to encourage e-business skills in its provinces to achieve economic improvement through e-business benefits (Mbatha, 2013: 10).

According to Rodrigues, Pigosso and McAlloone (2016: 417), product development constitutes a composite coupling among needs of markets and technologies. According to Li, Wang, Huang and Bai (2013: 2420), new business development is the development of new products/services, new markets and new technologies. New business development is also defined as innovation in the business model of a business (Heikkilä, Bouwman, Heikkilä and Janssen, 2016: 337). Product development results from the development of a new value proposition that serves as a source of competitive edge in the business environment. A value proposition is the products and services which businesses produce and offer to their customers at a certain price, in order for them to make a profit. The development of new value propositions is therefore part of the concept of new business development (Beattie and Smith, 2013: 244).

The business's organisational and financial architecture for a specific value proposition can be presented by a business model. A business model is defined as the firm's operational logic which is applied in order to create and supply value to its stakeholders (Heikkilä *et al.* 2016: 338). The business model provides the business with a guideline how to enter into a market and outlines the revenue, costs and profit associated with a specific value proposition (Alexa and Alexa, 2015: 873). There is no study could be found that attempted to prove that the value propositions when implemented, resulted in improved operational performances.

This study will investigate the use of e-business by organisations in the development of value propositions.

1.2 PROBLEM STATEMENT

The problem is that the level of e-business utilisation in the Limpopo Province and how the utilisation affects operational performance of businesses are unknown.

Today businesses need to have the ability to continuously provide new value propositions to the market to be successful (Abou-Shouk *et al.* 2016: 327). E-business makes it possible for firms to produce goods and services for consumption by consumers using the internet. Beattie and Smith (2013: 244) affirm that businesses create or develop new value proposition through the utilisation of interactive e-business applications. This requires an

investigation into the identification of e-business applications and the benefits derived from their use when developing value propositions.

Delimitation of the study

This research is not conducted to deal or to indicate the challenges of using e-business, how consumers perceive e-business use or how e-business impacts on the purchasing decision process made by consumers. Neither does it try to explain why users accept new technologies. This paper is specifically based on e-business and operational performance, investigating the effect of e-business on the operational performance. This paper is conducted to outline the effect of e-business use on the operational performance of well-established businesses. The research will only focus on businesses that operate within the borders of Polokwane Local Municipality.

1.3 SIGNIFICANCE OF THE STUDY

This study is crucial, because it intends to fill a gap in the literature and will help businesses to know the important role that e-business plays in an organisation and at the same time to consider e-business when trying to come up with new business developments. This study will influence businesses to take e-business into consideration as a key strategy in their development procedures to achieve sustainability. This study will hopefully lead to increasing the number of competitive businesses.

1.4 AIM OF THE STUDY

The aim of this study is to investigate efficiency and effectiveness of e-business applications when used for the creation and delivering of value propositions. The results will help businesses to have successful new business developments and also ensure that the businesses remain competitive.

1.5 OBJECTIVES OF THE STUDY

In order to achieve the aim of this study, the following objectives for this study have been set:

- To identify the e-business applications that can be used in the development of new value propositions for businesses.
- To identify the benefits that the use of e-business applications offers to businesses.
- To determine the relationship between the use of e-business applications and the operational performance of the value propositions.

1.6 RESEARCH QUESTIONS

- What are the e-business applications that e-businesses can use in the development of new value propositions for businesses?
- What are the benefits that e-business applications offer to businesses?
- What is the relationship between the use of e-business applications and the operational performance of the value propositions?

1.7 DEFINITION OF TERMS

1.7.1 E-business

E-business is defined as any use of internet technologies to transform the key operational processes of a business (Chaffey, 2011: 12). E-business is further portrayed as the integration of the business processes based on information and communications technology (ICT) to improve the creation and the delivering of service to its customers and partners (Srivastava and Singh, 2013: 1). According to Mudholkar *et al.* (2013: 513), e-business is the available online facilities that are used to produce and sell, for profit, with the intention of meeting the needs of the society at large.

1.7.2 Value proposition

According to Davis and Davis (2010: 100), Bocken, Short, Rana and Evans (2013: 485), Value proposition is defined as an offer which is made from a mix of quality, features, service and price which businesses produce from scarce resources by businesses or firms, in order to sell them to their targeted customers. Murphy and Narkiewicz (2010: 100) further define value proposition as products or services with benefits that are offered by the business to its targeted customers at a certain price.

1.7.3 E-business applications

E-business applications are defined as components of e-business such as e-commerce, e-marketing and others, which enable firms to perform their day-to-day activities with their partners and target market over the internet. They further define these applications as measures of developing and delivering value proposition to a firm's customers (Zott, Amit and Massa, 2011: 6).

1.7.4 Benefits of e-business

Abid, Rahim and Scheepers (2011: 1) convey that businesses that adopted e-business in their business operations experience major benefits such as increase in sales, reduction of transactions costs and increase flexibility in communication among the business and its partners. They further outline that benefits of E-business are regarded as rewards that businesses earn from the adoption and utilisation of e-business in a business's operational performance.

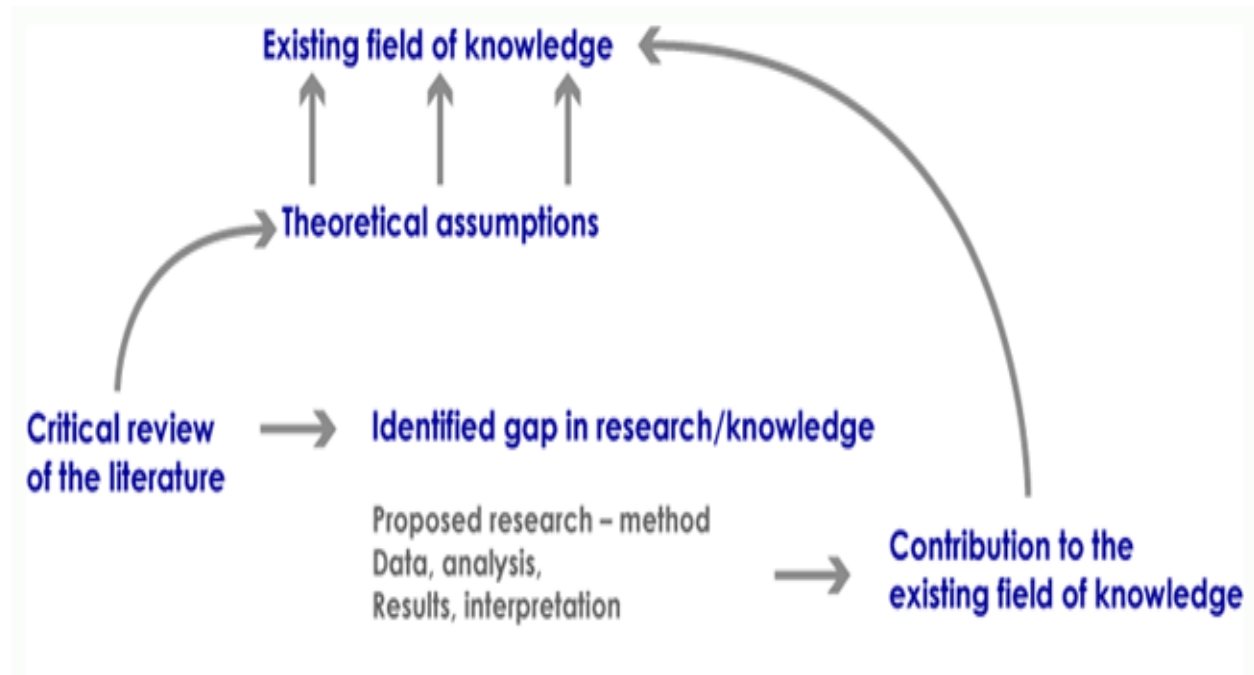
1.7.5 Operational performance measures

Slack, Chambers and Johnston (2010: 606) define performance as the level to which five performance objectives are fulfilled by an operation at a point in time, when satisfying the needs of customers. They define operational performance measures as the five generic operational performance objectives namely; cost, speed, dependability, quality and flexibility. They propose that these measures are derived from strategic objectives and when they are broken down they become more detailed measures that provide a complete picture of what's currently taking place and what should take place in a business (Slack *et al.* 2010: 607).

1.8 LITERATURE REVIEW

Several theoretical models have been adopted and utilised to investigate the benefits, opportunities and challenges of adopting e-business. For this study, a generic framework is adopted to investigate the efficiency and effectiveness of e-business applications when used for the creation and delivering of value propositions. Figure 1.1 below outlines the generic framework adopted.

Figure 1.1: Generic framework of the study



Source: (Miles and Huberman, 1994)

The theory of value creation outlines that the occurring technological developments are viewed as non-continuous change and disequilibrium ensuring from innovation (Schumpeter in Amit and Zott, 2001: 496). According to Amit and Zott (2001: 497), value creation takes place when acquisitions, schemes and procedures develop new products and services with high functionality.

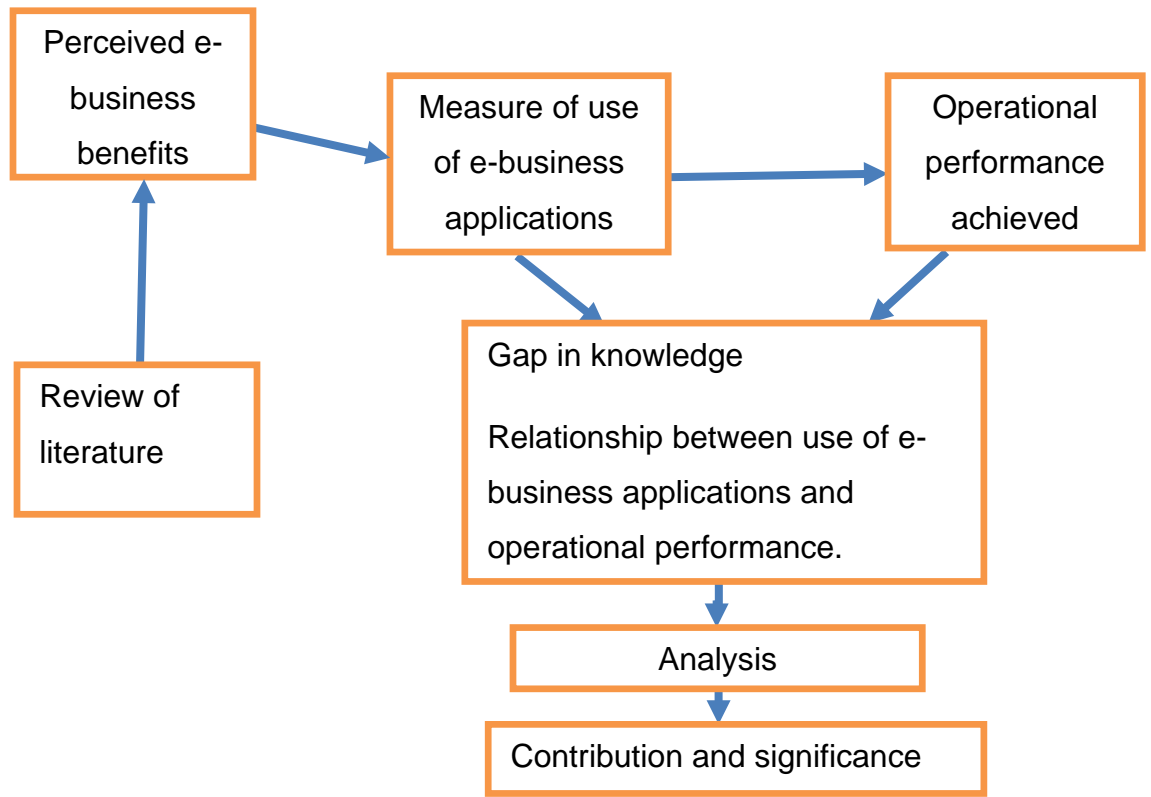
According to Schumpeter's theory, value creation is sourced by innovation, because the importance of technology and new mixture of resources are considered in innovation as the base of novel products (value proposition) and production ways (Amit and Zott, 2001: 494). Value proposition is used to define products and services that are provided through e-technologies to add value by rendering novelty, increased efficiencies, complementarities (accessory products and services), lock-in of consumers (Amit and Zott, 2001: 504; Bocken *et al.* 2013: 485).

It is important, useful and frequently required, to formulate a business model to simulate how value is to be added and to outline where exactly within the organisation the creation

of value occur. Value creation consists of the presentation of innovative ways of producing products and services, novel goods and services, novel markets, novel sources of supply and organisational restructuring (Zott *et al.* 2011: 7).

To provide answers to the research questions of this study, a detailed conceptual model is adopted. Figure 1.2 below outlines how answers was specifically derived by the author.

Figure 1.2: Conceptual model of the study



Source: (Author’s own conception)

1.9 RESEARCH METHODOLOGY

The research methodology applied for this study in order to close the gap identified will be outlined below:

The population studied was the companies that make use of e-business in their everyday business operation around Polokwane Local Municipality in the Limpopo province of South Africa.

A survey was done using a quantitative research methodology to collect and analyse data. A self-administered questionnaire was the research instrument utilised to collect primary data, and it was send to businesses that appeared on the list of businesses obtained from Polokwane Local Municipality. Secondary data was collected from journals, dissertations, theses and books.

A Descriptive statistical method was utilised in order to sum up and understand collected data. The Statistical Package for Social Science (SPSS) was used to tabulate and analyse data collected. The Cronbach alpha test method was used to ensure reliability in this study. A statistical expert was consulted to assess the research tool for conceptual clarity to better validity and the research questionnaire was developed based on accepted theoretical principles.

1.10 CONCLUSION

This chapter outlined the gap in the literature together with the theory related to this study. The chapter also outlined the measures undertaken to fill the identified gap, the next chapter will focus on the literature review of the empirical study.

CHAPTER TWO

LITERATURE REVIEW

2.1 INTRODUCTION

In this chapter the literature on the applications of e-business that can be utilised in the development of a new value proposition, the benefits of utilising e-business applications as well as the relationship between the utilisation of e-business applications and the operational performance of the businesses will be reviewed.

2.2 THE E-BUSINESS APPLICATIONS FOR THE DEVELOPMENT OF VALUE PROPOSITIONS FOR BUSINESSES

A business model is useful and often necessary to be developed in order to outline the way in which an organisation adds value to its operations and to outline in detail where value creation takes place in the organisation. Business models explain how the organisation creates value. Zott and Amit (2009: 5) affirm that value creation in a firm takes place with the business's activity system when skills, systems and procedures of a firm produce new products and services that constitute high quality functionality.

The value proposition concept defines offerings (products and services) that the firm produces and delivers, by using e-technologies, to its stakeholders at a certain price (Frow, McColl-Kennedy, Hilton, Davidson, Payne and Brozovic, 2014: 329).

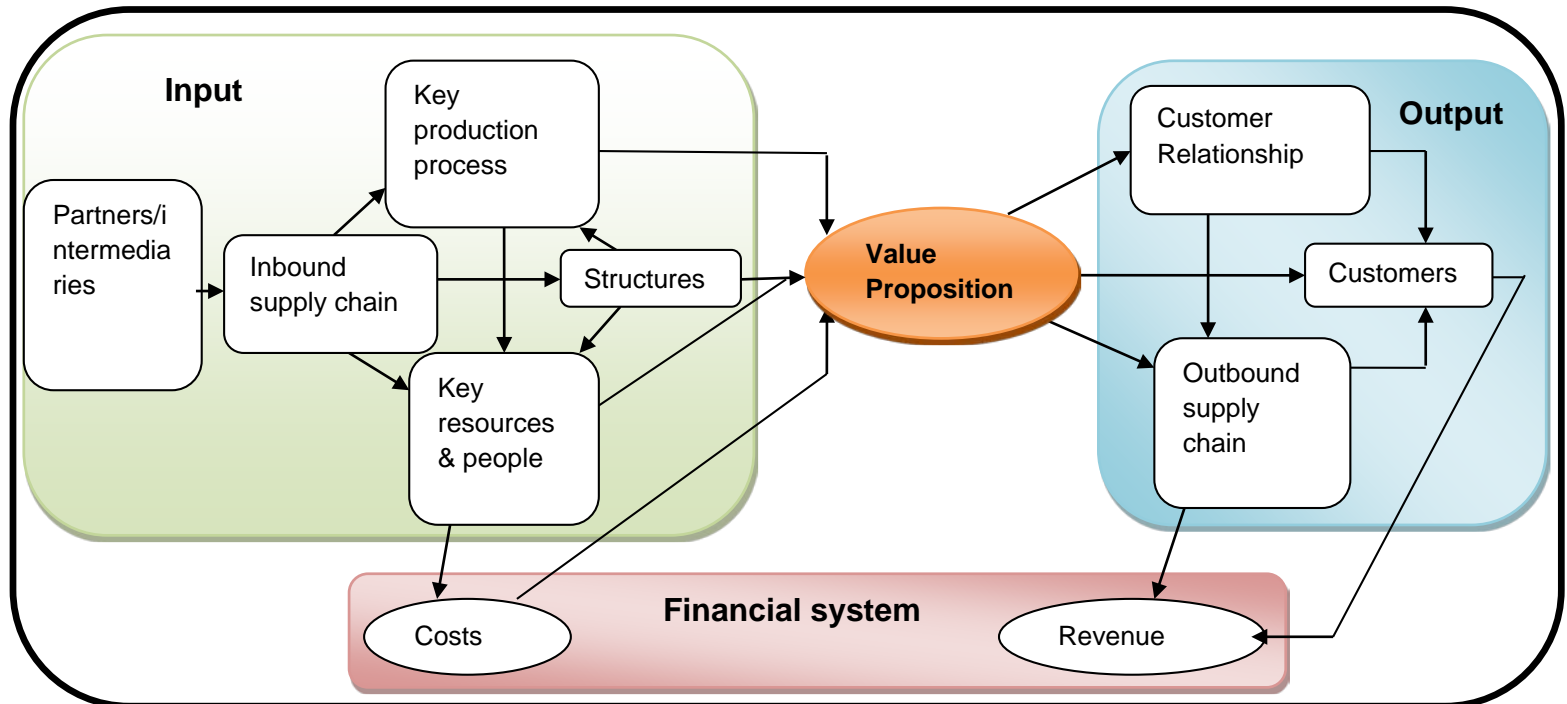
The concept value proposition is the beneficial products and services that are produced and distributed by firms to their customers with the intention of earning revenue, through the deployment of e-technologies in that value creation processes (Skålén, Gummerus, Von Koskull and Magnusson, 2015: 138).

According to Afuah and Tucci in Zott *et al.* (2011: 12), a business model explains ways in which firms build and make use of their scarce resources to produce as well as to provide its targeted customers with high quality value propositions and simultaneously make a profit. A business model is a set of detailed systematic processes of how a firm produces and delivers value proposition to its stakeholders through the employment of activity systems and e-technologies (Spieth, Schneckenberg and Ricart, 2014: 239).

Da Silva and Trkman (2013: 1) articulated that a broader conceptualisation of value proposition is a business model.

The occurrence of interaction among a firm and its elements, markets, resources, and capabilities to use and what incentives to employ, is outlined in this broader conceptualisation as shown in Figure 2.1 below.

Figure 2.1 Business Model



Source adopted from Achtenhagen, Melin and Naldi (2013: 14)

2.2.1 E-business applications for the development of value propositions

According to Boons and Lüdeke-Freud (2013: 14), business models through the utilisation of e-business applications outline the economic exchange relationship between a firm and its stakeholders and further enable a firm to dig into and understand the economic system of production and consumption logic taking place in the execution of particular necessities.

Breivold and Crnkovic (2014: 29) articulate that novel advancements in internet technology, offer new methods that firms can deploy when creating and distributing value propositions. In order for businesses to benefit from using e-business applications and also to remain

competitive in their market environment, they (firms) must adopt e-business applications as improvements as internet technology enables them (firms) to do so.

Wiengarten, Bhakoo and Gimenez (2015: 4963) posit that e-business applications alter firms to increase better integration of their operational processes in order to become efficient and effective in value proposition. E-business applications provide firms with the ability execute their daily functions with their stakeholders and customers through internet and these applications are business models' portions (Wiengarten *et al.* 2015: 4963).

The most widely used e-business applications are set out below:

- E-procurement

According to Baladhanadyutham and Venkatesh (2014: 26), e-procurement is defined as an application of e-business that consist of all procurement activities (including authorisation, purchase requests, orders, distribution and payments between the firm and its stakeholders) of a firm, which are electronically incorporated and managed. E-procurement is the collaboration between stakeholders that takes part in a firm's supply chain (Tai, Ho and Wu, 2012: 5397).

- E-supply chain

Hafeez, Koey, Zairi, Hanneman and Koh (2010: 525) posit that e-supply chain is one of the e-business applications that is utilised when creating value propositions, and define e-supply chain as the enabler of firms to become more flexible in the distribution of various products and result in lower time of marketing various products. Wu (2012: 325) further outlines e-supply chain as an application of e-business, and explains it as a facilitator for all business processes such as business-to-business processes and business-to-customer processes; for improvement in speed, control of real-time and customer gratification.

- E-marketing

E-marketing is an application of e-business. Rahimnia and Hassanzadeh (2013: 242) describe e-marketing as the use of digital instruments to interact directly or indirectly with the stakeholders of the firm by circulating information related to the firm and its value propositions.

E-marketing is an application of e-business that can be employed in the creation of value proposition to be offered to a firm's customers. E-marketing focuses on ways of communication in order to share information about their business, products and brands with their stakeholders through the employment of numerous channels of distributing messages or information (Taylor and Strutton, 2010: 950).

- E-logistics

According to Skitsko (2016: 9), e-logistics is a composite scheme that includes producers, resellers, customers and logistics midpoints which occurs over the internet to interchange data. It is an application of e-business that alleviates cross-functional efforts of supply chain consolidation. E-logistics aids firms in altering smooth incorporation of supply chain procedures through customer relationship planning (Hertwig, 2012: 254).

- E-services

E-services are an application of e-business and is defined as services which are carried out by firms to provide value to customers through the mediation of information technology (Shambour and Lu, 2011: 815). E-services are further portrayed as website based initiatives that are adopted in order to bring an increase in efficiency of providing services to customers (Axelsson, Melin and Lindgren, 2013: 10).

- Electronic Data Interchange (EDI)

According to Field (2016: 24), EDI is an application of e-business that is utilised in value propositions, and it is further outlined as a record keeper and distributor of all information in the consignment system. Nicolau, Ibrahim and Van Heck (2013: 986) outlined EDI as an application that eases cooperation in the execution of supply chain activities.

- E-selling

E-selling can be deployed in the development of value proposition and it is described as selling of products and services which is carried out through the internet with the intention of enhancing value proposition by assuring a common benefit from business interchange (Parvienan, Oinas-Kukkonen and Kaptein, 2015: 214). According to Sohaib and Kong (2014: 1), e-selling is a process of offering value propositions by firms to consumers with

the intention of creating a business exchange that is beneficial or profitable through the utilisation of digital interaction.

- E-collaboration

According to Rittgen (2010: 24), e-collaboration is described as coactions between various individuals and firms through the utilisation of digital technologies to attain a mutual goal. Chen, Chen and Capistrano (2013: 913) outlined e-collaboration as an enabler that improves information consolidation and co-operation in decision-making and resource partaking. They further portrayed e-collaboration as an e-business application that can be employed in the creation of value proposition wherever competitors may co-operate.

- E-payment

Gholami, Ogun, Kon and Lim (2010: 51) describes e-payment as online money or payment made online by firms and customers when purchasing goods and services in order to receive mutual benefits.

Kabir, Saidin and Ahmi (2015: 112) outlined e-payment as a system of purchasing goods and services, this purchasing system takes place among firms and their stakeholders through the utilisation of internet technologies. E-payment is further portrayed as an e-business application.

- Social commerce

Zhou, Zhang and Zimmermann (2013: 61) outlined social commerce as a class of commerce that includes the utilisation of internet-based media such as social media to enable firms and its stakeholders to make transactions among themselves.

- E-networks

Al-Washah, Al-Hyari, Abu-Elsamen and Al-Nsour (2013: 142) portrayed e-networks as an application of e-business that can be employed in the creation of value proposition by a firm. They define e-networks as an inter-organisational information scheme that enables more than one buyer, seller and other stakeholders to engage and make transactions over the internet.

2.3 BENEFITS OF E-BUSINESS

All businesses that adopted e-business in their day-to-day operations tend to experience significant, broad ranging and relevant benefits in their businesses (Abou-Shouk *et al.* 2012: 491). According to Jahanshahi, Zhang and Brem (2013: 850), e-business is accompanied by many opportunities and benefits that firms only realise or receive when e-business is adopted and utilised in their operational processes.

This study made use of the value chain of the operations of businesses to categorise the benefits of e-business as shown in table 2.1 below.

The last column shows the generic operational performance measures according to Slack *et al.* (2010: 608). The measures of operational performance for value proposition benefits are discussed below:

E-business ensures that businesses are at all times flexible and available. In order to measure the benefits that e-business present to businesses, performance yardsticks are employed. Benefits of value proposition effects can be measured in operational performance improvements.

Table 2.1 Categorisation system of e-business benefits

Supply side suppliers, wholesalers, business	Primary core value chain functions	Sell-side partners such as exchanges wholesalers, distributors	Support side partners such as finance human resources and admin	Operational Performance measures
Help firms to serve better the needs as well as the expectations of their consumers (Dube, Chitura and Runyowa, 2010: 5).	Higher quality productivity (Dube <i>et al.</i> 2010: 5).	Provide high quality services (Olatokun and Kebonye, 2010: 44).	Improved efficiency in the workplace (Dube <i>et al.</i> 2010: 5).	Quality
Enable firms to execute data transactions along activities of value chain (Dube <i>et al.</i> 2010: 5).	Fulfilments of orders and cycle time (Alshomrani and Qamar, 2013: 15).	Accessible anywhere, at any time (Dube <i>et al.</i> 2010: 5).	Quicker in rendering services (Alshomrani and Qamar, 2013: 15).	Dependability
Flexibility in offerings (such as variety of product or services) (Abid <i>et al.</i> 2011: 1)	Enable re-engineering business processes (Alshomrani and Qamar, 2013: 15)	Enable access to worldwide markets (Abid <i>et al.</i> 2011: 3).	Enable firms to communicate with its employees and other stakeholders at the same time (Abid <i>et al.</i> 2011: 1).	Flexibility
Increasing speed with which goods can be dispatched (Olatokun and Kebonye, 2010: 43).	Improve efficiency in sharing of information (Shorkovy, 2015: 44).	Enable quicker retailing response (Olatokun and Kebonye, 2010: 43).	Enable an employer to communicate with many employees at the same time (Shorkovy, 2015: 44).	Speed
Lower marketing costs (Fauska, Kryvinska and Strauss, 2013:41)	Lower transaction costs (Fauska <i>et al.</i> 2013:41)	Overhead costs are minimised (Fauska <i>et al.</i> 2013:41).	Lead to lower costs of communication and administration (Shorkovy, 2015: 44-45).	Cost

2.4 MEASUREMENT OF OPERATIONAL PERFORMANCE

In order for a firm to maintain its competitive edge and continue to grow, it must ensure that it has a clear understanding of high quality service delivery and customer satisfaction

because both are of the most important concepts in a firm's operational processes (Angelova and Zekiri, 2011: 232).

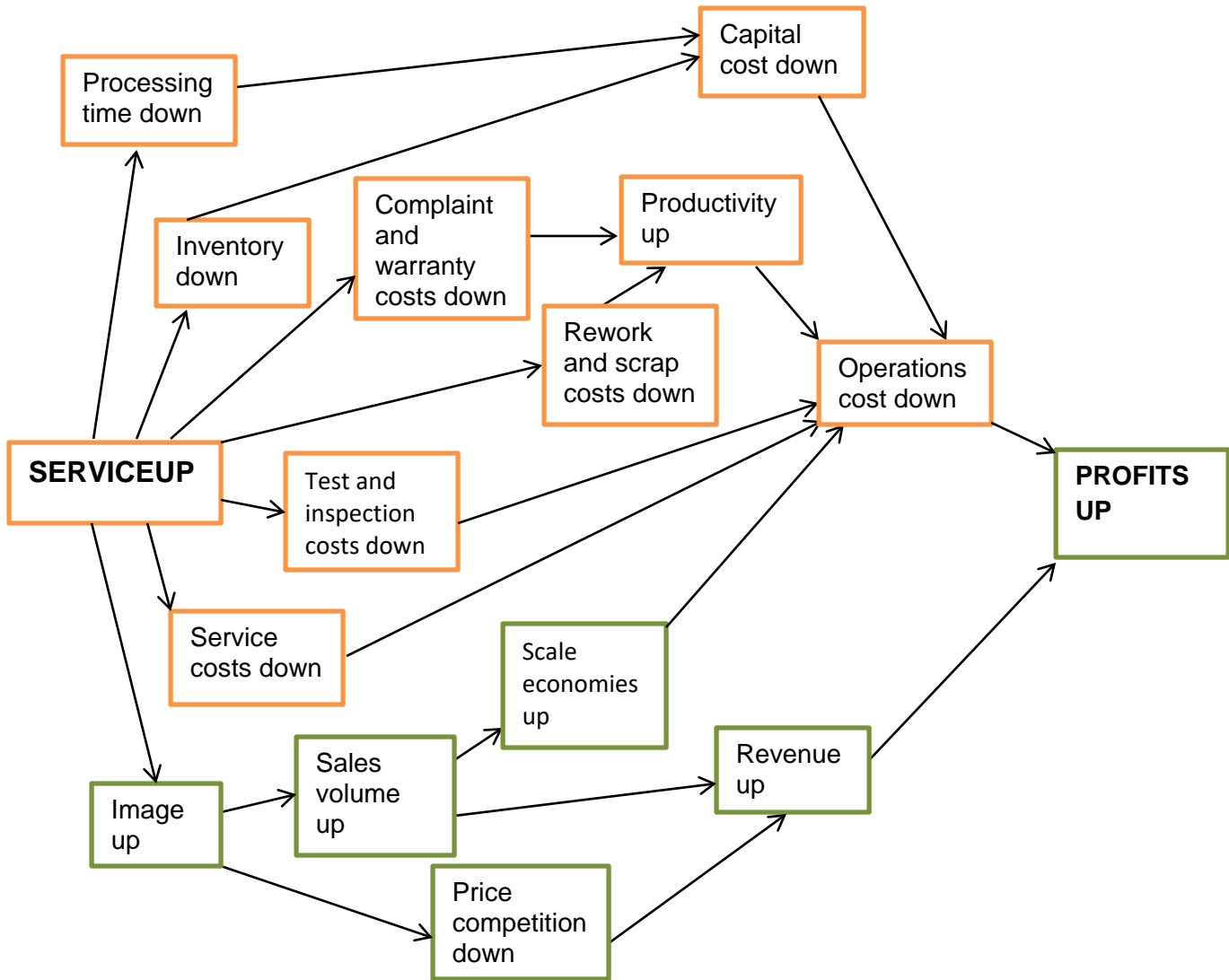
Slack *et al.* (2010: 606) explains performance as the degree to which performance parameters are met by an operation at a point in time, while satisfying customer needs. Davis, Aquilano and Chase (2003: 152), and Slack *et al.* (2010: 606) outline performance measurement as a process of assessing the day-to-day process of a business, by comparing itself with competitors that outdo other businesses within the global environment and also to indicate if they reached their goals or standards regarding service delivery.

Service delivery is outlined as a firm's way of replying to customers' demand of service through effective and efficient delivering of what is needed by customers (Ravichandran, Mani, Kumar and Prabhakaran, 2010: 118). According to Sun, Lim and Straub (2012: 1195), service delivery is defined as nonphysical products provided by the supplier to customers in order to consume the value added in the supplied products or services.

According to Bitner, Zeithaml and Gremler (2010: 198), service delivery is perceived as the difference between customers' expectations concerning a product or service and the customers' perceptions concerning the product or service. This difference is the gap that provides the measurement of service delivery.

Figure 2.2 illustrates the different ways in which service delivery improvements can affect other facets of operations performance. To ensure that a firm provides high quality service delivery to its internal and external customers it must make service delivery the central task of the operations function (Kumar, Kee and Charles, 2010: 351).

Figure 2.2: High quality service delivery has beneficial effects on operation performance



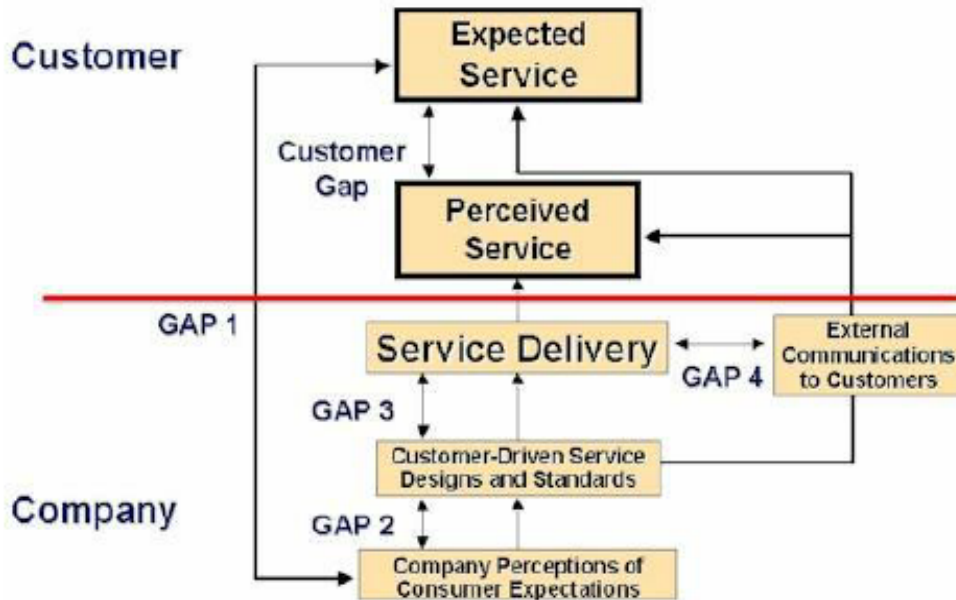
Source adapted from Slack, Chambers and Johnston (2007: 539)

Service up is a key concern for almost all organisations. Organisations through high service can attain a considerable competitive advantage. Service up lead to a reduction in rework costs, waste, complaints, returns, and most crucially, attains satisfied customers. Service up results in a decrease in operation costs through improved efficiencies, productivity and the capital use. At the same time, revenue can go up because of increased prices of services in the market and enhanced sales (Slack *et al.* 2010: 539).

Quality of service delivery depends on two variables: expected service and perceived service, due to the fact that there is a positive relationship between service and customer

satisfaction. Figure 2.3 outlines the gap between expectations and perceptions in service delivery. The gap between expectations and perceptions is known as the customer gap (Bitner *et al.* 2010: 198).

Figure 2.3: Gap model of service quality



Source adapted from Bitner *et al.* (2010: 199).

Singular attributes (intangibility, perishability, heterogeneity and inseparability) of service make it complex for one to measure. The SERVQUAL model is a tool that enables the researcher to measure service quality. This yardstick consists of both expectations and perceptions and it aims at a five-dimensional concept of perceived quality of service delivery (Munusamy, Chelliah and Mun, 2010: 399; Vaz and Mansori, 2013: 165).

The five dimensions of the SERVQUAL model are as follows:

- Tangibility- touchable facilities, equipment and personnel appearance.
- Reliability- ability to provide the assured service accurately and constantly.
- Responsiveness- disposition to assist customers and provide immediate service.
- Assurance- cognition and good manners of employees and their ability to intensify trust and sureness.
- Empathy- care and one-on-one attention that the firm render to customers.

2.4.1 Benchmarking

Slack *et al.* (2010: 611) posit that benchmarking is the process of studying the operational performance of other organisations and comparing the performance of your business with those of competitors in order to influence new ideas that might add value to performance improvement. Benchmarking can be classified into:

- Internal benchmarking: a comparison among procedure or functions of procedures that are inside the same business.
- External benchmarking: a comparison among procedures or functions of procedures that are components of dissimilar business.
- Non-competitive benchmarking: is to compare external businesses that compete indirectly in similar markets.
- Competitive benchmarking: is to compare external businesses that compete directly in similar markets.
- Performance benchmarking: is a comparison among the degrees of attained performance in various operations.
- Practice benchmarking: is a comparison among a business's operations processes, or day-to-day activities and those employed by another procedure (Slack *et al.* 2010: 611).

2.4.2 Generic performance measures

Performance measurement is an action quantitating process, whereas measurement entails quantification procedure and the activities taken by its management influence the performance of the operation (Muchiri, Pintelon, Gelders and Martin, 2010: 2).

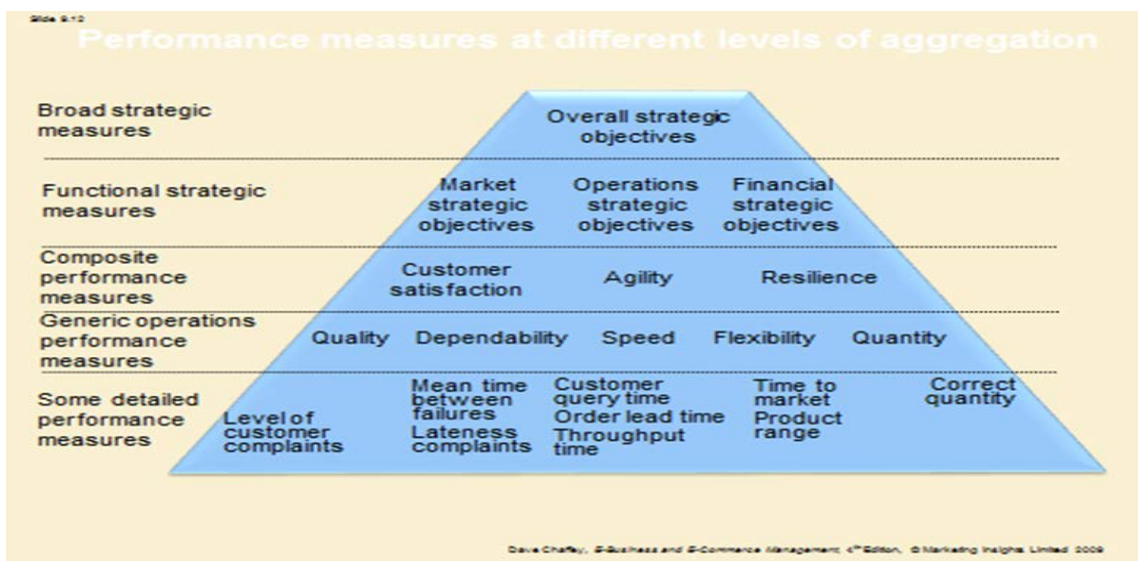
The level to which an operation meets the five performance objectives at a certain point in time to achieve customer satisfaction is known as performance. Performance measurement is used to exercise any control over an operation on an on-going basis. Five performance objectives are considered as the attributes of total performance that provide customers with satisfaction (Slack and Lewis, 2011: 41).

The five operational performance measures of Slack are preferred due to the fact that the problem is considered from the company's operations point of view. Figure 2.3 above outline the gap that is to be measured as gap 3. This gap occurs between service quality specification and service delivery. Gap 3 addresses the variation between service quality specifications and actual service delivered, for example, the service execution gap. (Shahin and Samea, 2010: 2).

Slack *et al.* (2010: 608) articulate five objectives of operations performance as: quality, quantity, speed, flexibility and dependability. Cost is one of these objectives because it is the measure of a business' power to deliver products or services of their own at minimum cost. Figure 2.4 illustrates the aggregation.

The five generic performance objectives can be broken down into measures that are more detailed, or they can be aggregated from high strategic relevance and high diagnostic power and frequency of measurement, such as broad strategic measures, functional strategic measures, composite performance measures and generic performance measures (Pycraft, Singh, Phihlela, Slack, Chambers and Johnston, 2010: 544-545).

Figure 2.4 Performance measures at different levels of aggregation.



Source: Slack *et al.* (2010:607)

Performance measures have great strategic relevance as they outline the greater picture of total performance of the business (functional and strategic objectives in Figure 2.4). This ensures that there is connectivity between the operations overall strategy, the crucial performance indicators that manifest strategic objectives and the collection of detailed measures that are utilised to measure each key performance indicator is regarded as comparison (Pycraft *et al.* 2010: 545).

Below is a discussion of the generic operations performance objectives:

i) Quality

Krajewski and Ritzman (2005: 63) stated quality as a service or product dimension that is well explained by both external and internal consumers. Greasley (2008: 18), and Slack *et al.* (2010: 608) further outline quality as a service or products' closeness to reaching the specifications required. Slack *et al.* (2010: 608) stated that final products are distributed through the process in terms of products and services specifications. Empathy is accepted when dealing with service distribution to consumers. Examples of performance measures for quality are, number of faults per unit, customer complaints degree, scrap degree, warranty claims, mean time between failure and customer satisfaction score (Vaz and Mansori, 2013: 165).

ii) Speed

E-business processes lead to acceleration in a firm's products and service distribution, further enabling easily attainable information that can also be swiftly obtained (Slack *et al.* 2010: 608). Krajewski and Ritzman (2005: 64), and Slack *et al.* (2010: 608) outlined that speed is how fast a firm can produce and deliver products or service to customers. Speed is the time it took a firm to deliver products or services that the customer requested or ordered. According to Davis *et al.* (2003: 34), and Slack *et al.* (2010: 608), speed is the ability of a firm to provide consumers with consistent and quick distribution of products or services. Examples of performance measures for speed are, fast response to customers, delivery frequency, cycle time and theoretical against actual throughput time (Slack *et al.* 2010: 608).

iii) Dependability

Business ability to meet promised distribution time of products and services to consumers in a consistent manner (Greasley 2009: 19; Slack *et al.* 2010: 608). The power of a business to distribute products and services as proposed to customers. The degree to which the operation scheme can carry out demanded functions is called reliability. Availability is adverted to as the time in which the utilisation of the system can be easily approachable and available. Examples of performance measures for dependability, orders average lateness, in stock proportion of products, mean deviation from proposed arrival and adherence schedule (Slack *et al.* 2010: 608).

iv) Flexibility

A business's power to deviate from the operation's final products. Modifiability is a business power to constitute changes into the system's end products (Davis *et al.* 2003: 1155; Slack *et al.* 2010: 608). Examples of performance measures for flexibility are, time required to develop new products or services, products or service range, machine change-over time, average batch size, time to improve activity rate, average capacity and time to change schedules (Slack *et al.* 2010: 608).

v) Quantity

According to Slack *et al.* (2010: 608), quantity is providing the needed final products. Reach is the power to get in connection with potential and existing customers, or to bring forth new business in old and new markets and at the same time publicise products. Example of performance measures for quantity, number of products or services produced, number of orders received, number of orders delivered, and number of failed order deliveries.

vi) Cost:

Slack and Lewis (2011: 51) articulated cost as a measuring tool of the power to distribute products and services at lower cost. Costs can also be regarded as direct and indirect costs, start-up investments and financial and non-financial costs. Examples of performance measures for costs are, discrepancy versus budget value added, efficiency, use versus resources, cost per hour in an operation and labour productiveness (Slack and Lewis, 2011: 51).

2.5. THE RELATIONSHIP BETWEEN THE USE OF E-BUSINESS APPLICATIONS AND THE OPERATIONAL PERFORMANCE OF THE BUSINESS

A relationship exists between e-business applications and operational performance, due to the fact that e-business applications help businesses to resolve issues that are critical in nature, such as global competition increase and continuously altering market environments. (Allahawiah, Altarawneh and Alamro, 2010: 85).

E-business applications enable firms to quickly detect and disseminate information within their organisation sharing with consumers and external organisations; to affirm the existence of the relationship that exists between e-business applications and a firms' operational performance (Al-Washah *et al.* 2013: 142).

E-business applications when adopted and utilised in firms' day-to-day processes, help businesses to keep up in new markets and transact opportunities by increasing their revenue through more than one channel, reducing trading cost and raising communication flexibility (Jabeur, Mohiuddin and Karurang, 2014: 1).

George and Kumar (2013: 627) state e-business is the relationship between e-business applications and operational performance within a firm, because e-business applications enable firms to deliver their produced products and services to consumers anywhere at any required or ordered time.

Adzroe and Ingirige (2013: 1) portrayed that there is a state of connectedness between businesses operational performance and e-business applications due to the fact that e-business and its applications are accelerators for important alterations in a firm's operations processes. E-business and its applications are most widely utilised when re-engineering business processes and when developing novel business models for improved performance of a business (Wiengarten, Humphreys, Mekittrick and Fynes, 2013: 26).

In broader sense, E-business applications therefore change the general form of the supply chain, relationships between firms and stakeholders and also change the degree of risks in operational performance, illustrating that there is a relationship between e-business

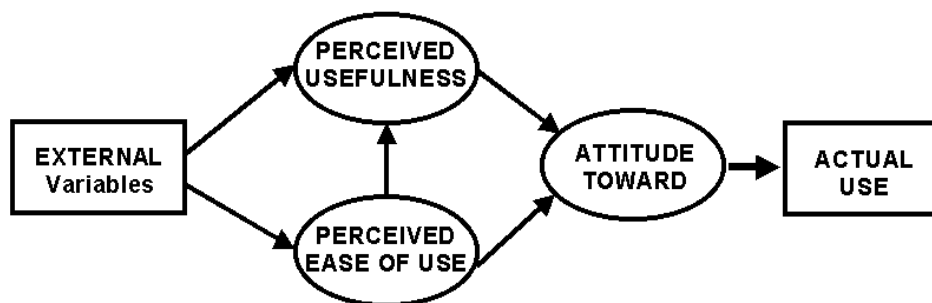
applications and operational performance of businesses (Caldwell, Harland, Powel and Zheng 2013: 692).

2.6 THEORETICAL FRAMEWORK FOR ANALYSIS

2.6.1 Technology Acceptance Model (TAM)

TAM is one of the theoretical models that is utilised to look into the determinate of acceptance and use of new technologies. TAM is believed to be the most widely utilised by Information Technology (IT) researchers and it is more predicative, parsimonious, robust, predicative and consequent, than other theoretical models (Sternad and Bobek 2013: 34).

Figure 2.5: Technology Acceptance Model



Source adopted from Cheung and Vogel (2013: 165).

The more users accept new systems, the more they are willing to make changes in their practices and use their time and effort to actually start utilising the system, is known as the model's basic premise (Escobar-Rodríguez and Bartual-Sopena, 2015: 128).

TAM outlines two crucial dimensions of analysing the acceptance or rejection of IT:

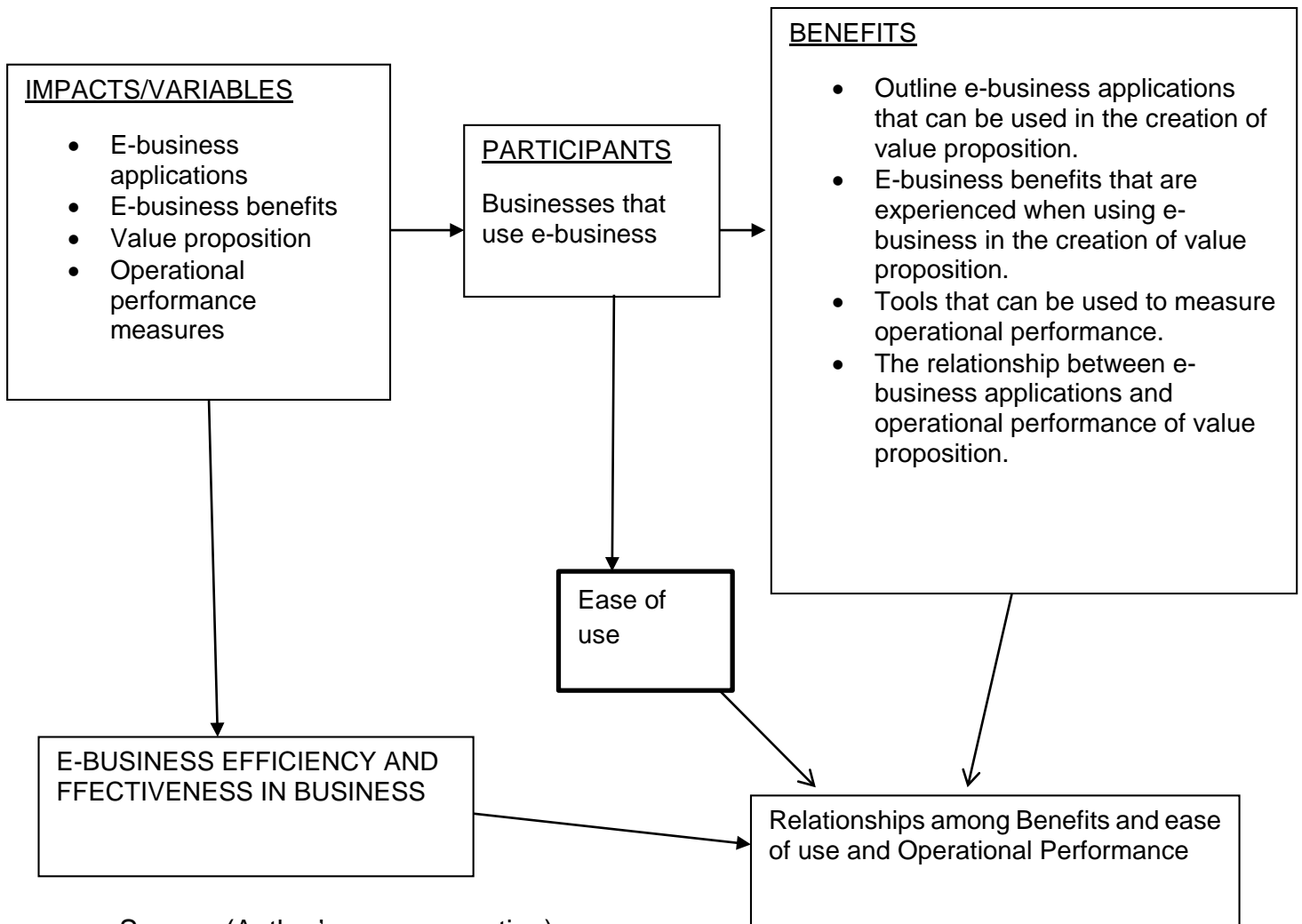
- Perceived usefulness- is the level to which an individual believes that utilising a particular system will increase his or her job performance.
- Perceived ease of use- is the level to which an individual believes that utilising a system would be effort free.

TAM deals with how businesses accept and utilise technology issue, and it further affirms the causal relationships among systems features design, perceived usefulness, perceived

ease of use (Padilla-Meléndez, Del Aguila-Obra and Garrido-Moreno, 2013: 308). Figure 2.5 above clearly illustrates the relationship.

According to Rauniar, Rawski, Yang and Johnson (2013: 8), TAM is used by organisations to improve the effectiveness and efficiency of their operations process and the model makes use of perceived usefulness and perceived ease of use as the two initial forecasters of effective acceptance and utilisation.

Figure 2.6: Theoretical analysis model



Source: (Author's own conception)

2.7 SUMMARY

This chapter reviewed literature on the e-business applications. The conclusion is that there are theoretical concepts that can be used in the development of new value propositions for

businesses and the benefits that e-business offers to businesses. The chapter also reviewed the literature on the relationship between the use of e-business applications and the operational performance of the business. The next chapter will focus on the research methodology that will be used for the empirical study.

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 INTRODUCTION

The intention of this chapter is to discuss the research methodology followed in the empirical part of the study. The research methodology applied for this study will abide by the business research process.

3.2 THE BUSINESS RESEARCH PROCESS

The research process consists of respective consecutive processes comprising of distinctly defined various steps (Cooper and Schindler, 2011: 80).

Figure 3.1 below outlines the steps that were taken to investigate efficiency and effectiveness of e-business applications when used for the creation and delivering of value propositions:

The model indicates that the literature was reviewed, followed by a brief design and methodology of the study. Next the perceived e-business benefits were outlined and categorised and measures of the use of e-business applications were identified. The operational performance achieved by organisations were articulated. The gap in knowledge is the relationship between use of e-business applications and operational performance. The collection of data and analysis of data to fill the gap followed next. After the analysis, the results were presented as well as the contributions of this study to illustrate how the gap in knowledge was filled. The last stage also includes recommendations.

Figure 3.1 Framework for analysis

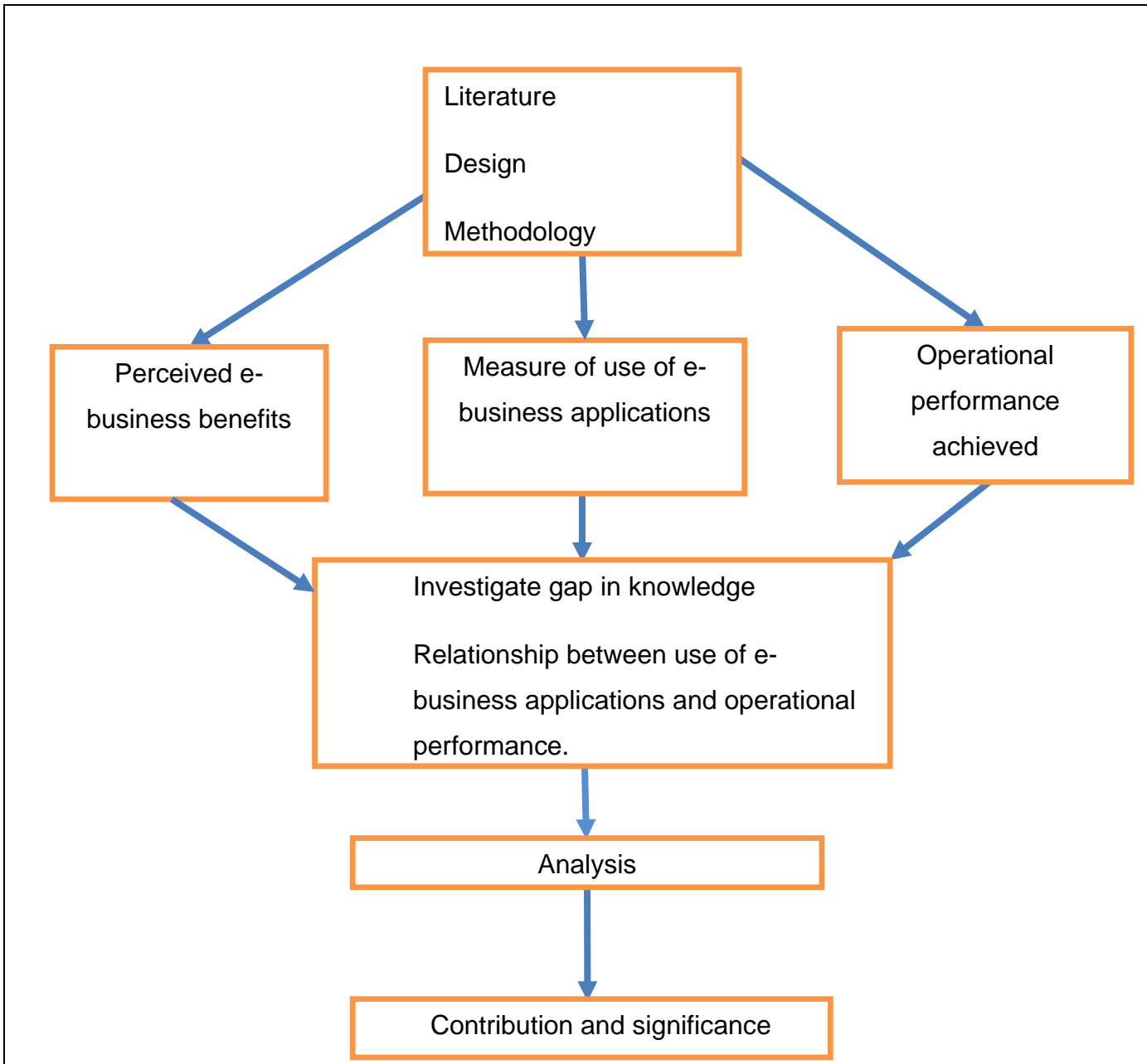
Source: (Author's own conception)

3.3 RESEARCH OBJECTIVES

The research objectives were stated as:

- To identify the e-business applications that can be used in the development of new value propositions for businesses.

- To identify the benefits that the use of e-business applications offers to businesses.



- To determine the relationship between the use of e-business applications and the operational performance.

3.4 RESEARCH DESIGN

Research design is a pattern that is employed in this study to provide response or elucidate research questions, so that improper composition of research questions can be avoided

(Ghuri and Grønhaug, 2010: 54). This study utilised an exploratory and descriptive research design. The research approach is quantitative in nature as Likert scales were used to quantify the responses. (Grix, 2010: 124). Quantitative research enabled the research to use statistical tests to analyse the data (Bryman, Bell, Hirschsohn, Dos Santos, Du Toit, Masenge, Van Aardt and Wagner, 2011: 30).

3.4.1 Exploratory research

According to Bless, Higson-Smith and Sithole (2013: 60) exploratory research is defined as research that is executed where fixed cognition or data about a particular subject exists, and the research purpose is to acquire broader apprehension of a phenomenon. Exploratory research has five types, namely, secondary data analysis, pilot studies, exploratory factor analysis, case studies and experience survey (Bless, Higson-Smith and Sithole, 2013: 60)

The researcher used exploratory research for the following purposes:

- To discover what was done by other studies that were related to the research problem;
- To discover whether significant gaps exist;
- To define the research problem and questions;
- To formulate and improve the questionnaire; and
- To collect information about the conducting the research.

3.4.2 Descriptive research

According to Ghauri and Grønhaug (2010:56) descriptive research is describing and not explaining the researched phenomena. Grix (2010:393) state that descriptive research has two ways in which a researcher can conduct it, namely, cross-sectional/ one-shot or longitudinal. This research study was cross-sectional/ one-shot due to the fact that the collection of data took place only once.

The researcher used descriptive research for the following reasons:

- Descriptive research was utilised to describe the e-business applications that can be used in the development of new value propositions for businesses.
- Descriptive research was used to describe the benefits that e-business applications offer to businesses.

- Descriptive statistics like mean, tables, charts were used during analysis of data.

3.5 RESEARCH METHODOLOGY

3.5.1 Population

Hanlon and Larget (2011: 7) define population as the entire group of individuals or units of concern. The population studied was businesses that operate within Polokwane Municipality. A list of these businesses was obtained from the Polokwane Local Municipality. The population size was one thousand, nine hundred (1900) businesses after medical doctors were removed from the list.

3.5.2 Sampling size and sample selection

Blumberg, Cooper and Schindler (2011: 171-172) define sample as the research's group of elements that will be observed, surveyed or studied to make a collection of needed information for the study. Murthy and Bhojanna (2010: 146) outline sample as a portion that is selected from the overall targeted population, to correspond to the overall population.

Sampling is the selection of the group of constituents or human beings by the researcher, to enable the researcher to make conclusions regarding their overall population (Bryman and Bell, 2011: 175-176). A random sampling was utilised in order to allow each unit of the population to have an equal probability of inclusion. The random sample was obtained from the list supplied by the CDM and random number generator was used to select the intended respondents.

Sample size calculation:

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

$$n = \frac{1900}{1 + 1900(0.05)^2}$$

$$n = \frac{1900}{1 + 1900(0.0025)}$$

$$n = \frac{1900}{1 + 4.75}$$

$$n = \frac{1900}{5.75}$$

$$n = 330$$

Where N = Population size = 1900

E = precision = 0.05

And n = sample size = 330

Yamane's (1967: 886) formula was utilised to calculate the sample size of this study. The sample size calculated was 330 businesses.

3.5.3 Collection, analysis and presentation of data

In this section, the different methods of data collection utilised as well as the questionnaire design will be discussed.

3.5.3.1 The research instruments

The collection of primary data for this survey followed a positivistic approach to enable the researcher to evaluate the cause relationship between variables (Bryman and Bell, 2011: 271; Zikmund, Babin, Carr and Griffin, 2013: 254).

A survey is a measuring process that asks questions of respondents who will provide answers to the questions. This study used a self-administered survey, since a higher response rate of self-administered surveys have been found when compared with other techniques of collecting data (Cooper and Schindler, 2011: 242-243).

This study's questionnaire consists of close-ended questions. Close-ended questions make it easier for the researcher to process answers from the questionnaires and is also easy for respondents to answer because respondents don't write but tick or cross their answers. Close-ended questionnaires were used in this study because they are better suited for computer analysis to determine the relationships and therefore simple to analyse (Murthy and Bhojanna, 2010: 106).

3.5.3.2 Gathering the data

This section describes the actual process of data collection. Three hundred and thirty questionnaires were distributed to businesses in Polokwane Local Municipality via e-mail. The researcher made a follow up through e-mail to ensure that the respondents answer and return the questionnaires and a response rate of .

3.5.3.3 Data analysis

The objective of this section is to outline how the researcher analysed the collected data.

After the completion of the data collection process, the questionnaires were edited. During the editing process, the researcher scanned each questionnaire by looking for skipped questions, incomplete information and incorrect marking or ticks. After this process, data collected had to be coded and captured into a computer data file. Numbers were assigned to the responses of questions, which enabled statistical data analyses (Bryman *et al.* 2011: 302-303).

Each variable was given a unique identity number, which was then captured in SPSS at the beginning of the recording. Data was also being checked and cleaned to ensure that it was well coded and captured.

Descriptive statistical methods were used to analyse data as the data could be rigorously analysed (Bless, Higson-Smith and Sithole, 2013: 245). The fact that descriptive statistical methods use frequency distributions and tables to present data is another reason that made the researcher to adopt these methods in analysing and presenting data (Bless *et al.* 2013: 245-246).

The different variables of this study were categorised into nominal and ordinal variables. Nominal variables consist of categories that cannot be grade ordered (Bryman *et al.* 2011: 313). Bibliographical information and benefits e-applications are categories that cannot be rank ordered as shown in section A and B of the questionnaire. Frequency of using E-applications, operation performance measures and ease of implementation contain categories that can be rank ordered. They were grouped into categories and the categories were grade ordered by using a Likert scale to assess their frequency of use, performance measures and ease use as shown in section C, D and E of the questionnaire (Bryman *et al.* 2011: 313).

Correlation and regression analyses were utilised to determine the relationship between e-business applications and the operational performance of value propositions. Regression analysis was used as a practical method of figuring a grade or observation in operational performance based on a grade or observation in e-business application (Burns and Burns, 2008: 368). Correlation is the test that was used to locate or discover a connection between e-business application and the operational performance of value proposition (Bryman *et al.* 2011: 313).

Frequency tables and diagrams were used to analyse data and present the results provided by data analyses. SPSS was also being used to tabulate and analyse the coded data. Two summary descriptive measures were used to describe data, namely a central tendency measure (mean, median and mode) and a variance measure (standard deviation) (Warner, 2013: 231).

The Cronbach Alpha test was utilised to investigate the reliability of the language test results, because it is a useful and flexible instrument that furnishes a judge of internal consistency of the test (Bless *et al.* 2012: 229).

3.5.3.4 Data presentation

In the last stages of the report the report's findings were presented, conclusions drawn, and recommendations made. The results of this research were presented through graphs and tables. The results of this study will be presented in the next chapter (Zikmund *et al.* 2013: 68).

3.5.4 Reliability and Validity

3.5.4.1 Reliability

Bryman *et al.* (2011: 41) define reliability as the consistency of the measuring tool. This articulates that a tool delivers the same results after measuring the same variable or factor that was measure before. This kind of instrument will present an exact measurement.

Zikmund *et al.* (2013: 301) outline that reliability is the ability of a yardstick to regurgitate the same output of a study. To ensure reliability in this study, a Cronbach alpha test and a pilot study were utilised. Cronbach alpha of above 0.7 was used to assess if there is internal

consistency among the questions to measure the different constructs. A pilot study using ten respondents was employed to help improve reliability. Changes to the questionnaire were then based on the problems incurred in the pilot study (Arain, Campbell, Cooper and Lancaster, 2010: 1).

3.5.4.2 Validity

Zikmund *et al.* (2013: 303) describe validity as the degree to which the research results are a true reflection of what is taking place in the situation. Cooper and Schindler (2011: 280) portray that validity identifies whether the instrument measures what it is intended to measure and outlines the literal meaning of the results.

A statistical expert was consulted to evaluate the research instrument for conceptual clarity to better validity. The questionnaire was also developed based on the theory that was discussed in chapter two. As this theory is generally accepted, the questionnaire should have an acceptable level of validity.

A self-administered questionnaire improves validity, because of its ability to represent all aspects of a given concept and is characterised by having a high response rate as compared to other methods (Bryman and Bell, 2014:192).

3.6 ETHICAL CONSIDERATIONS

The researcher obtained ethical approval from the University of Limpopo Turfloop Research Ethics Committee by submitting the research proposal accompanied by Faculty approval letter and the questionnaire. The approval was granted before data collection. The participants were informed about the purpose of the investigation. Ethical considerations are briefly outlined below.

- **Voluntary participation:** The participants were asked to volunteer their participation to ensure that they are not forced in any way to participate in the study.

- **Confidentiality of information and anonymity of participants:** The researcher protected the identities of all participants who took part in the research. The confidentiality of the information shared was also observed.

3.6 CONCLUSION

This chapter examined the aspects of the research methodology for this study and in this research methodology, the researcher outlined and followed the steps of a business research process. The following chapter will present the results of this study.

CHAPTER FOUR

PRESENTATION AND DISCUSSIONS OF THE RESULTS

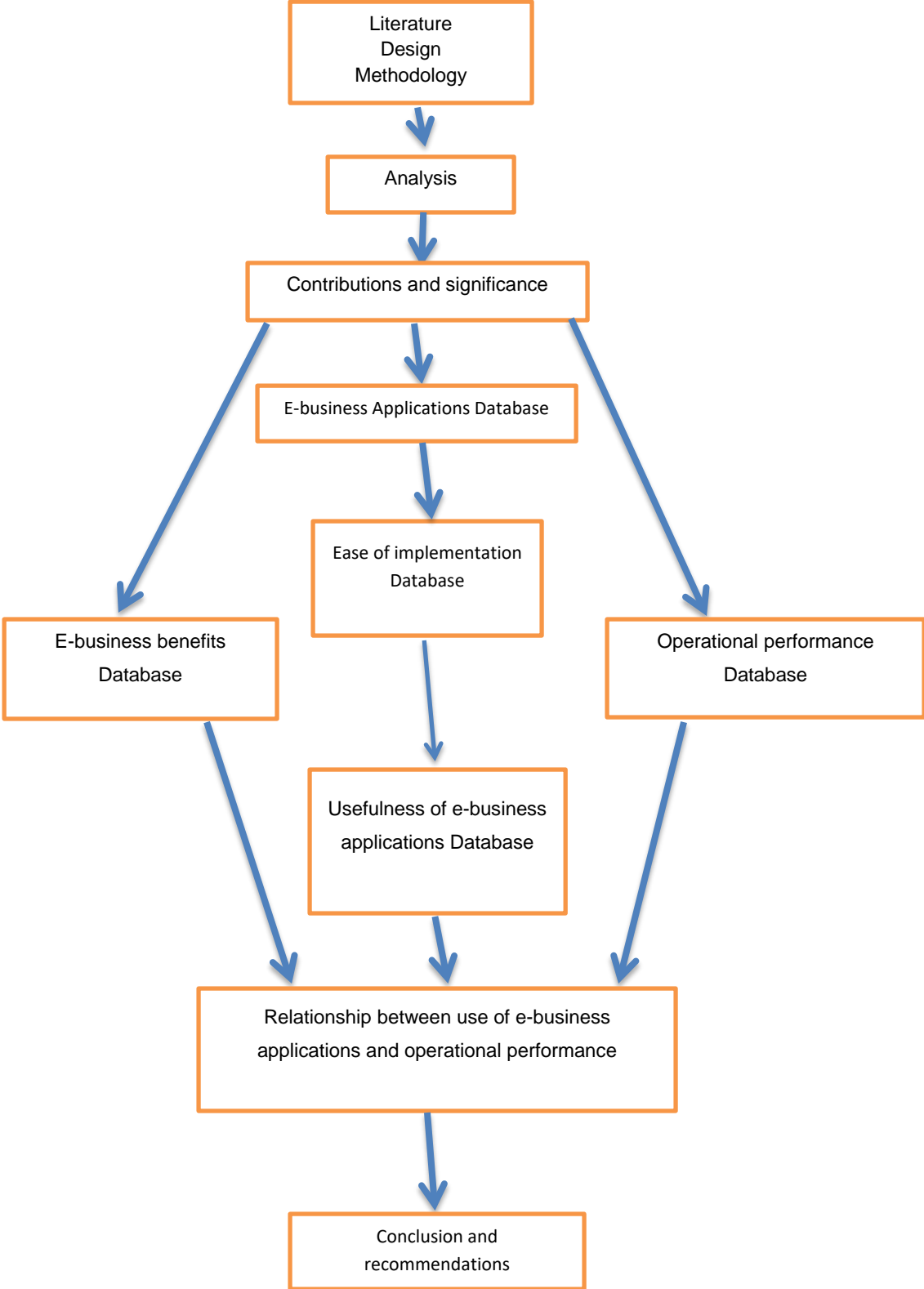
4.1 INTRODUCTION

The purpose of this chapter is to present and interpret the empirical findings of this research. The empirical findings will be presented in tables and graphs. To systematically present the findings and also to interpret the findings of this research study are the objectives of this chapter.

4.2 FRAMEWORK FOR ANALYSIS

The model below outlines the processes followed in this study and further outlines how this chapter will present and interpret the empirical findings of this research study. The first two stages on the model were presented in the previous chapter of the study. This chapter will represent the contributions and significance of this study, through presenting and interpreting the empirical findings to answer the research questions and to fill the gap in knowledge. The last phase in the model will be thoroughly dealt with in the next chapter of the research study.

Figure 4.1: Analysis framework



Source: (Author's own conception)

4.3 ANALYSES OF THE RESPONSE DATA

The analysis of the response data is outlined below. The analysis is represented by the contributions and significance section in the framework of analysis above. The analysis framework is Figure 4.1 above; this is the third stage on the framework for analysis. The analyses will firstly indicate and discuss the response rate below and followed by other analyses in relation to the variables.

4.3.1 Response rate

This is the rate of businesses that participated in this study area. It forms part of the contributions and significance section outlined in the analysis framework above. The response rate is discussed below.

Table 4.1: Response rate

Respondents	No. sent out	No. returned	Percentage
Businesses	330	147	44.5

Table 4.1 depicts the response rate of the survey. Three hundred and thirty questionnaires were distributed and 147 were returned. The response rate was 44.5%. As can be seen from Table 4.2 below the business sectors were well spread out and the response rate was therefore deemed acceptable.

4.3.2 Biographical data

The biographical variable forms part of the contributions and significance section in the analysis framework (Figure 4.1) above. The biographical variables for which data was collected and information obtained consist of business sector, age (How long have your business been running), and the number of employees within the business. Tables and figures below present the visual distributions of biographical variables.

Table 4.2 depicts categorisation of business sectors. Out of 147 businesses that participated, were 19 business sectors that are categorised into 5 sectors. These sectors are categorised into main sectors that fit all the presented businesses.

4.3.2.1. Business sector

Table 4.2: Categorisation of business sectors

Business sectors	Categories
Academic	Academics
Local government	Government
National government	
Parastatal	
Provincial government	
Restaurant	Hospitality
Hospitality	
Motor Industry	Manufacturing
Manufacturing	
Telecommunication	Service Provider
Banking	
Energy Efficiency	
Pest Control Hygiene and Cleaning	
Logistics services	
Audio visual	
Retail	
Service provider	
Telecommunication	
Wholesale	

Table 4.2 depicts categorisation of business sectors. Out of 147 businesses that participated, were 19 business sectors that are categorised into 5 main sectors. These sectors are categorised into main sectors that fit all the presented businesses.

In the following tables the results are expressed in percentages and in the graphs the actual numbers are portrayed.

Table 4.3: Main business sectors of the respondents

Business Sector	Percent
Service Provider	61.9
Manufacturing	14.3
Hospitality	11.6
Government	9.5
Academic	2.7
Total	100.0

Table 4.3 depicts the business sectors. The table above was utilised to develop Figure 4.2 below. The table outline the frequencies of business sectors.

Figure 4.2: Number per Business sector

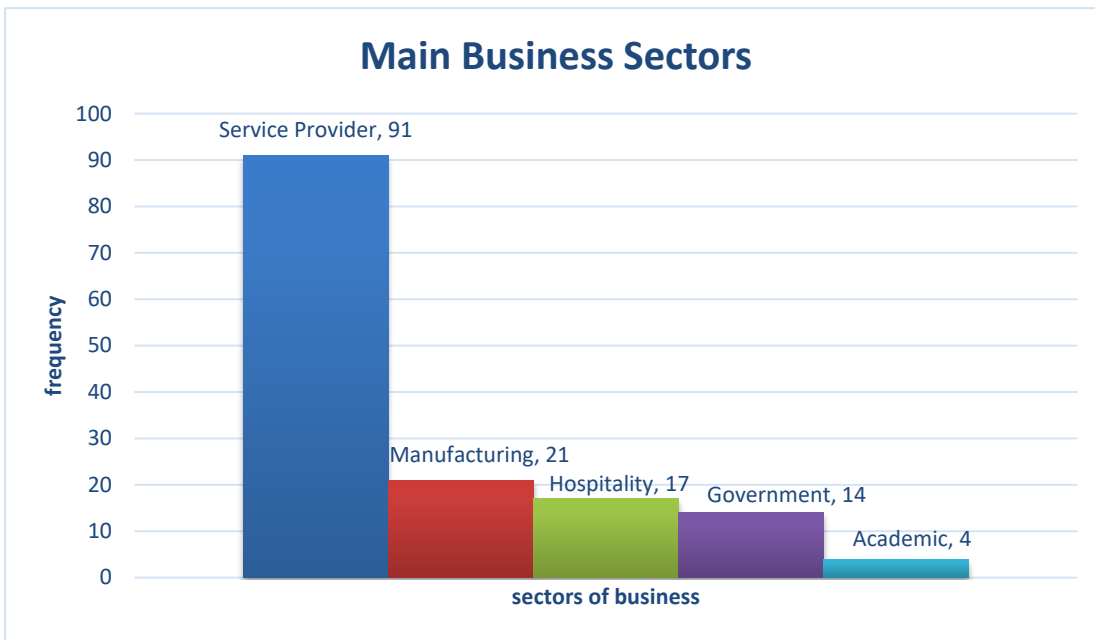


Figure 4.2 indicate that, out of 147 businesses that participated in the survey, 91 (61.9%) are Service Providers, 21 (14.3%) are Manufacturing, 17 (11.6%) are Hospitality, 14 (9.5%) are Government and 4 (2.7%) are Academic. The results indicate that the majority of businesses in the study area are service providers that make use of e-business applications in the development of value propositions, while the minority of them are academics making use of e-business applications in the operational performance to create value proposition. These results articulate that many businesses in the study area that make use of e-business applications in the operational performances of developing value propositions are service providers. This is in line with the population as the Polokwane Local Municipality has many regional branches with headquarters and manufacturing units in the Gauteng area.

4.3.2.2 Age of business operation

Table 4.4: Age of business operation

Years in business	Percent
10-14 years	12.9
15-19 years	17.0
0-4 years	19.0
5-9 years	21.8
20 years & above	29.3
Total	100

Table 4.4 indicate age of business operation. The Table above outline the frequency of businesses years in business. The table was utilised to develop Figure 4.3 below.

Figure 4.3: Age of business operation

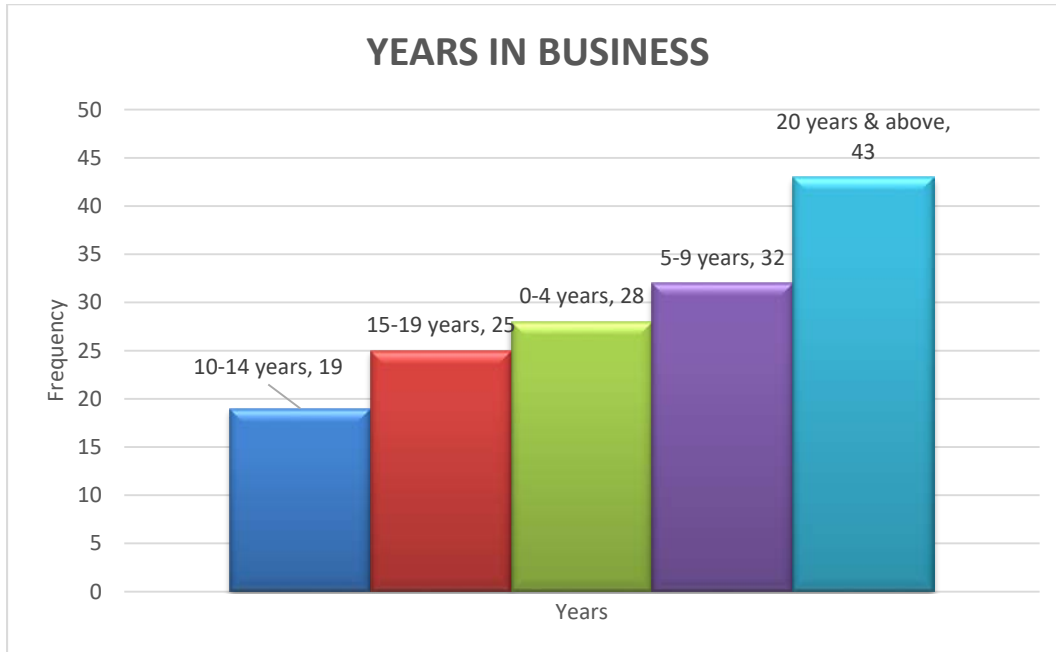


Figure 4.3 illustrates the age of business's operation. The results outline that out of 147 businesses participating in the survey, 28 (19%) businesses have been operating for 0-4 years, 32 (21.8%) businesses have been operating for 5-9 years, 19 (12.9%) businesses have been operating for 10-14 years, 25 (17%) businesses have been operating for 15-19 years and 43 (29.3%) businesses have been operation for 20 years and above. The results show that the majority of businesses have been operating for 20 years and above, while the minority of businesses have been operating for 10-14 years.

This implies that most of the businesses within the study area that utilise e-business applications in their operation performances of value propositions have been operating for 20 years and above, while the majority of those that make use of e-business applications within the study area have been operating for 10-14 years.

- Assessing the association between age of business operation e-business applications

The correlation test is indicated by Table 4.5 below. It outlines if there is a relationship between the years in operation and e-business applications that can be used in the operational performances in the development of value propositions. Years in operation is a variable, since a Likert scale was used when collecting data. This enable the correlation test between years in business and e-business applications to be done as indicated in Table 4.5 below. The Pearson product-moment correlation does not take into consideration whether a variable has been classified as a dependent or independent variable. It treats all variables equally, therefore no distinction between dependent and independent variables were made.

Table 4.5: Correlation between age of business operation and e-business applications

		ELECTRONIC DATA INTERCHANGE	E-OPERATIONS	E-SERVICES	E-SUPPLY CHAIN	E-LOGISTICS	E-PROCUREMENT	SOCIAL NETWORKS	E-PAYMENT	E-DESIGN	E-CATALOGUES
Years in business	Correlation	0.325	0.128	0.301	0.075	0.069	0.083	-0.204	0.154	0.003	0.021
	Sig. (2-tailed)	0.000	0.123	0.000	0.364	0.407	0.316	0.013	0.063	0.967	0.804
	N	147	147	147	147	147	147	147	147	147	147

Table 4.5 indicates the correlation between age of business operation and e-business applications. Table 4.5 above was utilised to develop Table 4.6 below.

Table 4.6 below indicate the strength of association between years in business and e-business applications. The table above shows that there is a low association between years in business and e-business applications (e-operations, social networks and e-payment). The table indicate that there is a medium association between years in business and e-business applications (electronic data interchange and e-services), while there is no association between years in business and e-business applications (e-supply chain, e-logistics, e-procurement, e-design and e-catalogues).

Table 4.6: Strength of association between years in business and e-business applications

		EDI	E-OPERATIONS	E-SERVICES	E-SUPPLY CHAIN	E-LOGISTICS	E-PROCUREMENT	SOCIAL NETWORKS	E-PAYMENT	E-DESIGN	E-CATALOGUES
Years in business	Significant	Yes	Yes	Yes	No	No	No	Yes	Yes	No	No
	Strength of association	Medium	Low	Medium				Low	Low		

It is therefore concluded that there is a low association between years in business and e-business applications. It is concluded that there is no association between years in business and (e-supply chain, e-logistics, e-procurement, e-design and e-catalogues) applications.

4.3.2.3 Employees

Table 4.7: Number of employees

Number of Employees	Percentage
41-100	12.9
101 & above	17.0
21-40	32.0
0-10	19.0
11-20	19.0
Total	100.0

Table 4.7 depicts the number of employees in businesses. The table above indicate the frequencies of number of employees in businesses. The table was further utilised to develop Figure 4.4 below.

Figure 4.4: Number of employees

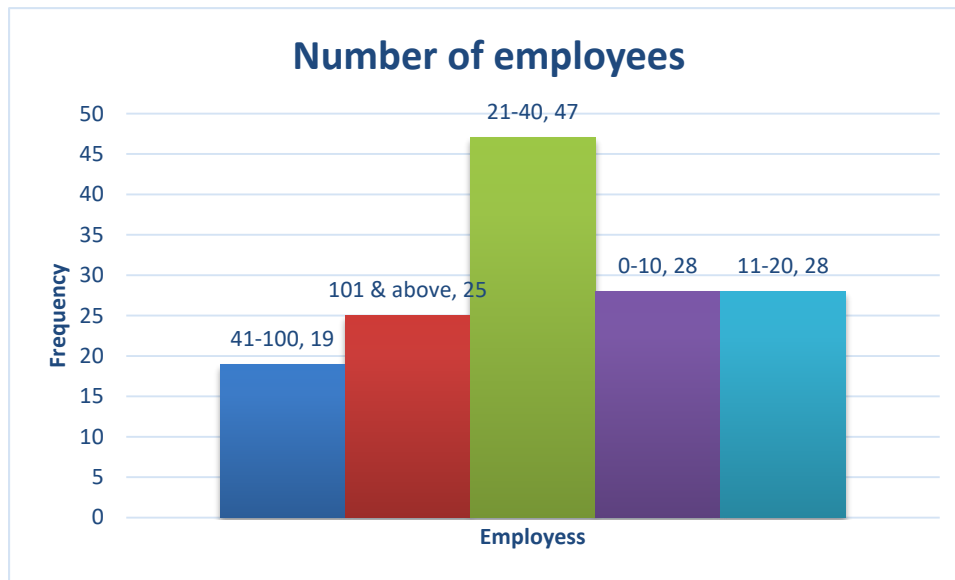


Figure 4.4 indicate that, out of 147 businesses that took part in the survey, 28 (19%) businesses have 0-10 employees, 28 (19%) businesses have 11-20 employees, 47 (32%) businesses have 21-40 employees, 19 (12.9%) businesses have 41-100 employees and 25 (17%) businesses have 101 employees and above. The results illustrate that majority of the businesses in the study area have 21-40 employees, while the minority of the businesses in the study have 41-100 employees. This articulates that many businesses within the study area that utilise e-business applications in their operations performances of creating value propositions have 21-40 employees, while the minority have 41-100 employees.

- Assessing the association between ease of implementation and e-business applications

The correlation test is shown in Table 4.8 below, to identify and outline if there is a relationship between number of employees in business and e-business applications that are used in the development of value propositions. Number of employees is a variable, since a Likert scale was used when collecting data. The frequency of use of e-business applications is shown in table 4.12. This enabled the correlation test between number of employees and e-business applications to be done as indicated in Table 4.8 below.

Table 4.8: Correlation between number of employees and e-business applications

		EDI	E-OPERATIONS	E-SERVICES	E-SUPPLY CHAIN	E-LOGISTICS	E-PROCUREMENT	SOCIAL NETWORKS	E-PAYMENT	E-DESIGN	E-CATALOGUES
NUMBER OF EMPLOYEES	Pearson Correlation	0.292	0.220	0.338	0.265	0.130	0.201	-0.062	0.121	0.044	0.185
	Sig. (2-tailed)	0.000	0.007	0.000	0.001	0.117	0.015	0.457	0.146	0.600	0.025
	N	147	147	147	147	147	147	147	147	147	147

Table 4.8 above, indicates the correlation between number of employees and the use of e-business applications. The table above was utilised to develop Table 4.9 below.

Table 4.9: Strength of association between number of employees and e-business applications

		EDI	E-OPERATIONS	E-SERVICES	E-SUPPLY CHAIN	E-LOGISTICS	E-PROCUREMENT	SOCIAL NETWORKS	E-PAYMENT	E-DESIGN	E-CATALOGUES
Number of employees	Significant	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes	No	Yes
	Strength of association	Low	Low	Medium	Low	Low	Low		Low		Low

Table 4.9 indicate the strength of association between number of employees and e-business applications. The table shows that there is a low association between number of employees and e-business applications (electronic data interchange, e-operations, e-supply chain, e-logistics, e-procurement and e-payment). There is a medium association between number of employees and e-business application (e-services), while there is no association between number of employees and e-business applications (social networks, e-design and e-catalogues).

It is assumed that larger numbers of employees indicate larger businesses size which can be assumed to indicate more use of formal systems and backup systems for new technology. It is assumed that there is a low association between number of employees and the use of e-business applications. It is concluded that there is a relationship between number of employees and the use of e-business applications.

4.4 E-BUSINESS APPLICATIONS

The e-business applications that can be used in the development of value propositions and their measure of use are indicated and discussed below. The e-business applications are represented by e-business applications database in the framework for analyses (Figure 4.1) above. The e-business applications database is in the fourth stage on the framework for analysis. The e-business applications database is the data that was collected from the businesses that operate within the study area (Limpopo province). The measure of use indicates how often the businesses use e-business applications when developing value propositions.

Firstly, the tests of fitness of the data in the data base e-business applications will be done.

4.4.1 Internal consistency

Table 4.10: Cronbach's Alpha test

	Mean if Item Deleted	Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
ELECTRONIC DATA INTERCHANGE	31.71	41.469	0.404	0.696
E-OPERATIONS	31.12	44.204	0.385	0.699
E-SERVICES	31.41	44.614	0.338	0.706
E-SUPPLY CHAIN	31.78	41.901	0.490	0.682
E-LOGISTICS	32.11	41.468	0.436	0.690
E-PROCUREMENT	31.53	43.908	0.334	0.707
SOCIAL NETWORKS	31.65	44.803	0.247	0.722
E-PAYMENT	31.11	46.207	0.211	0.725
E-DESIGN	32.90	40.731	0.426	0.692
E-CATALOGUES	31.88	41.231	0.569	0.671

Table 4.10 indicates the Cronbach's alpha test for e-business applications. The Cronbach's alpha test result for the 10 items is suggesting that there is relatively high internal consistency of the questions. Some of the e-business applications (such electronic data interchange, e-operations, e-supply chain, e-logistics, e-design and e-catalogues) have a Cronbach's Alpha test value that is below 0.7 and are accepted because the study is investigating the research questions, not testing hypotheses. Bless *et al.* (2012: 229) opine that reliability coefficient of 0.7 or higher is conceived acceptable because it indicates satisfactory internal-consistency reliability between all the variables used in the study.

4.4.2 Normality analysis for e-business applications

E-business applications database in the framework is tested for normality below. The normality analysis for e-business applications will be presented and interpreted in Figures below. The Figures below are constructed through the sums of the data of the e-business applications database.

Figure 4.5: Histogram with normal curve for e-business applications

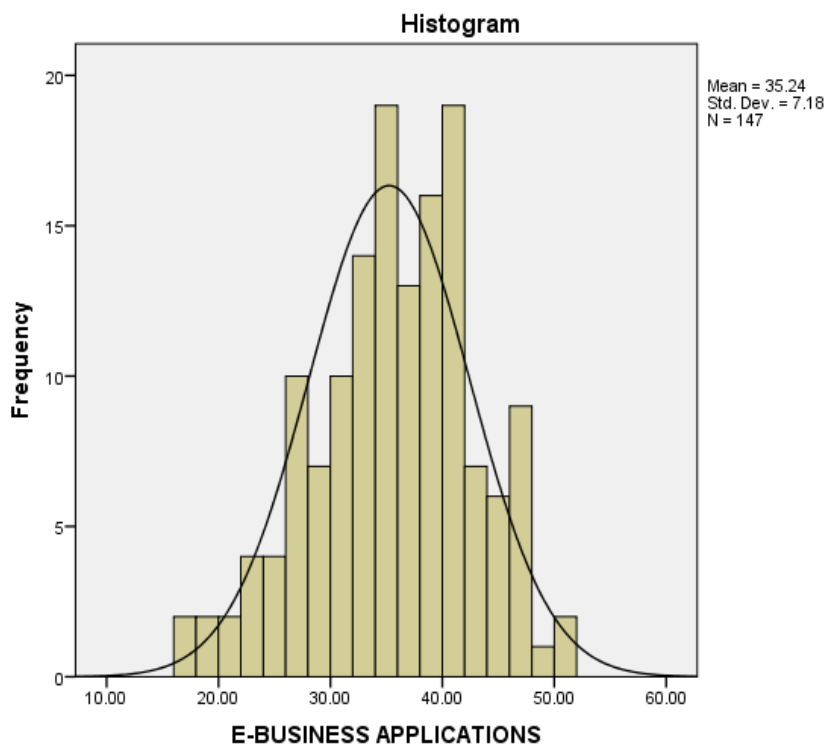


Figure 4.5: depicts histogram and normal distribution curve. The Figure illustrates that data for e-business applications and measure of using e-business applications is normal. The normal distribution curve on the histogram clearly outlines the

normality of data.

Figure 4.6: Normal Q-Q Plot for e-business applications

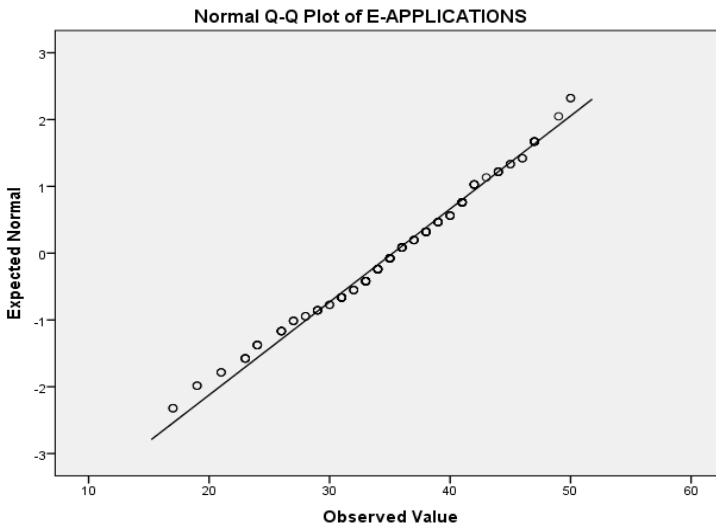


Figure 4.6 illustrates the normal Q-Q Plot. The figure depicts that data for e-business applications and measure of using e-business applications is normally distributed, because the data points are close to the diagonal line. The figure further outlines that e-business applications data points roam around the line in a

linear fashion.

Figure 4.7: Box plot for e-business applications

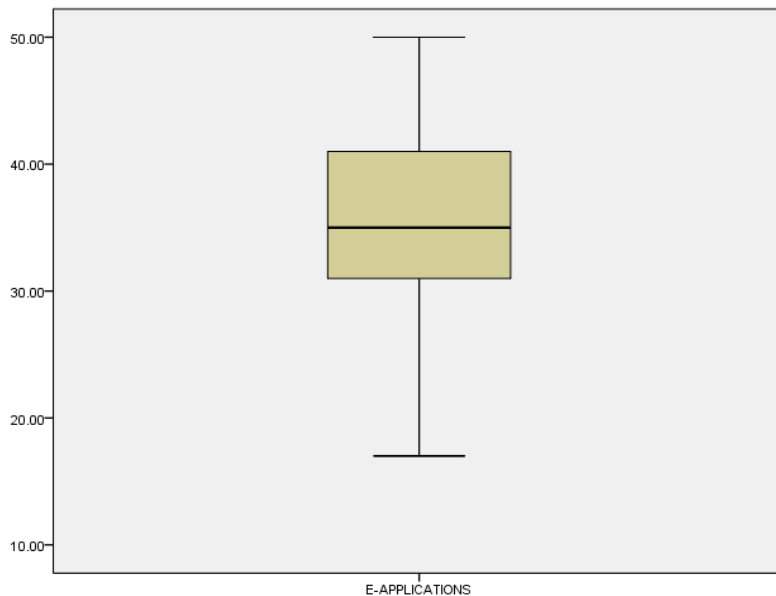


Figure 4.7 depicts the overall pattern of responses for businesses. The results of the figure outline that businesses hold different opinions about the e-business applications and measures of using e-business applications. The results further indicate that few businesses in the study area have similar views on the e-

business applications, while on some e-business applications they have various views. The indication of the results is influenced by the fact that the data is skewed to the left.

4.4.3 Frequencies of use of e-business applications

The analysis of the e-business applications is presented in table 4.11 that indicates the frequency and percentage of each e-business application.

Table 4.11: E-business applications used by businesses

	EDI		E-OPERATIONS		E-SERVICES		E-SUPPLY CHAIN		E-LOGISTICS		E-PROCUREMENT		SOCIAL NETWORKS		E-PAYMENT		E-DESIGN		E-CATALOGUES	
	Frequency	Percent	Frequency	Percent	Frequency	Percent	Frequency	Percent	Frequency	Percent	Frequency	Percent	Frequency	Percent	Frequency	Percent	Frequency	Percent	Frequency	Percent
Never	27	18.4	7	4.8	12	8.2	17	11.7	35	23.8	17	11.6	24	16.3	14	9.5	74	50.3	11	7.5
Yearly	10	6.8	8	5.4	6	4.1	14	9.5	6	4.1	7	4.8	8	5.4	5	3.4	12	8.2	24	16.3
Monthly	23	15.6	26	17.7	32	21.8	33	22.4	40	27.2	33	22.4	23	15.6	13	8.8	20	13.6	45	30.6
Weekly	31	21.1	25	17	42	28.6	49	33.3	36	24.5	34	23.1	41	27.9	30	20.4	19	12.9	34	23.1
Daily	56	38.1	81	55.1	55	37.4	34	23.1	30	20.4	56	28.1	51	34.7	85	57.8	22	15	33	22.4
Total	147	100	147	100	147	100	147	100	147	100	147	100	147	100	147	100	147	100	147	100

Table 4.11 illustrates the e-business applications that are used by businesses in the development of value propositions. The results depict that businesses use e-business applications such as electronic data interchange, e-operations, e-services, e-supply chain, e-logistics, e-procurement, social networks, e-payment, e-design (customisation) and e-catalogues in their operations performance. These results are consistent with the findings of Baladhanadyutham and Venkatesh (2014: 26), Hafeez (2010: 525-526), Axelsson, Melin and Lindgren (2013: 10-11) and Nicolaou, Ibrahim and van Heck (2013: 986), because they found that businesses use e-business applications like electronic data interchange, e-operations, e-services, e-supply chain, e-logistics, e-procurement, social networks, e-payment, e-design (customisation) and e-catalogues in their operations performance.

4.4.4 The number of users of e-business applications

Figures of e-business applications below are developed with the percentages of each e-business applications presented in Table 4.11 above.

Figure 4.8: The use of electronic data interchange

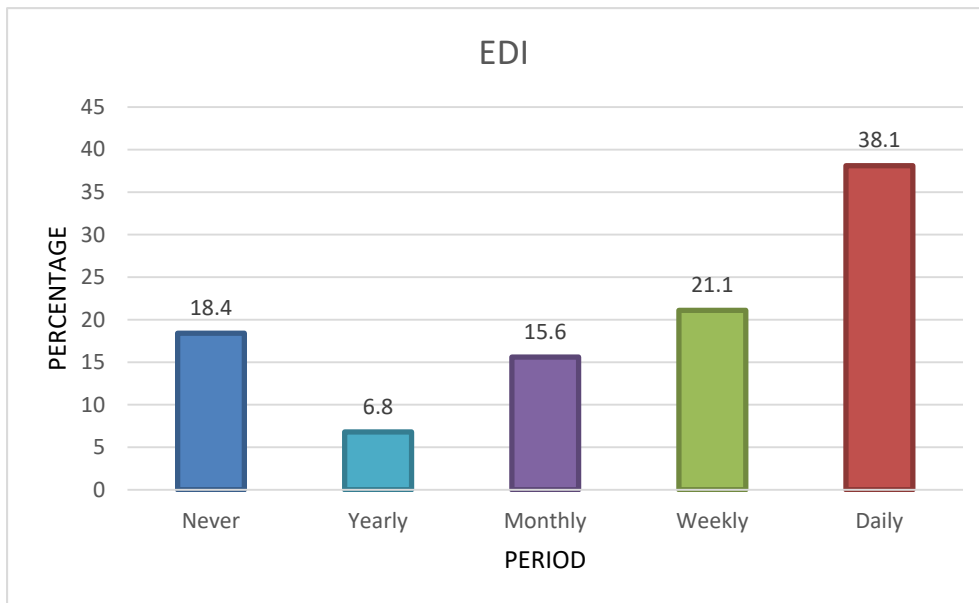


Figure 4.8 (derived from table 4.11) indicate that out of 147 businesses, 56 (38.1%) of them use electronic data interchange on a daily basis, 31 (21.1%) businesses use electronic data interchange weekly, 23 (15.6%) businesses use electronic data interchange monthly, 10 (6.8%) business use electronic data interchange yearly and 27 (18.4%) businesses don't use it. It is therefore concluded that the majority of businesses make use of electronic data interchange daily, while minority make use of electronic data interchange yearly.

Figure 4.9: The use of e-operations

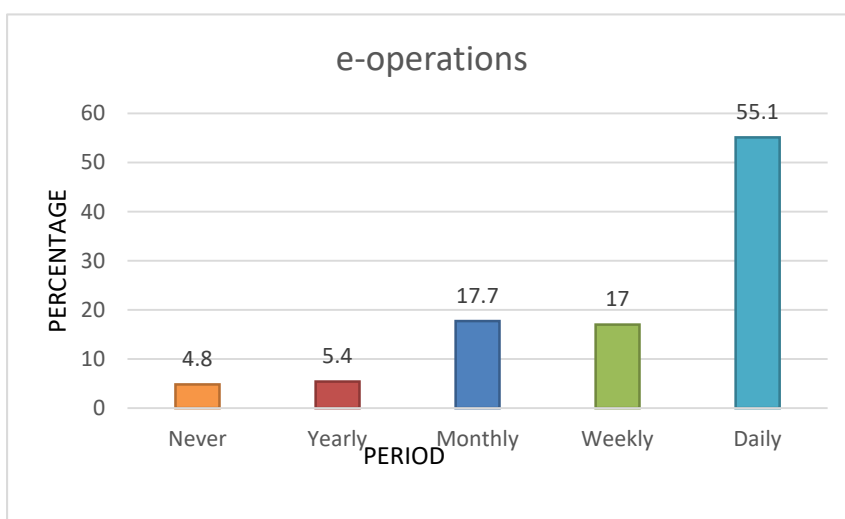


Figure 4.9 (derived from table 4.11) indicate that out of 147 businesses, 81 (55.1%) businesses use e-operations on their daily basis, 25 (17%) businesses use e-operations weekly, 26 (17.9%) businesses use e-operations monthly, 8 (5.4%) businesses use e-operations yearly and 7 (4.8%) businesses don't make use of e-operations. It is therefore concluded that the majority of businesses utilise e-operations daily, while minority of businesses never use e-operations.

Figure 4.10: The use of e-services

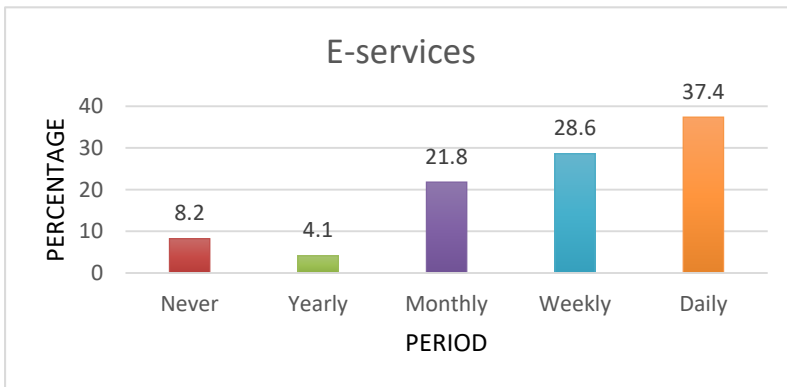
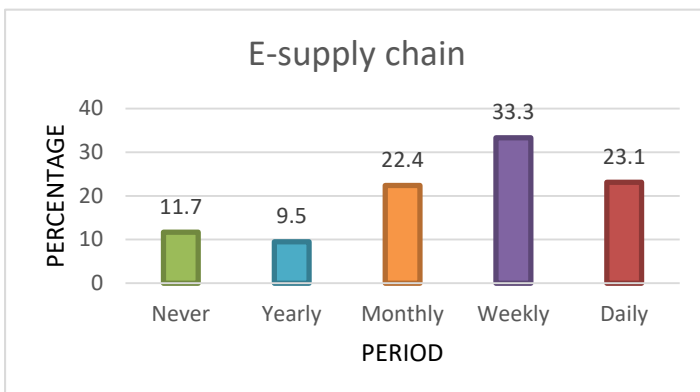


Figure 4.10 (derived from table 4.11) above indicate that out of 147 businesses, 55 (37.4%) businesses use e-services daily, 42 (28.6%) business use e-services weekly, 32 (21.8%) businesses use e-services monthly, 6 (4.1%) businesses use e-services yearly and 12 (8.2%) businesses don't use e-services. It is therefore concluded that the majority of businesses make use of e-services on daily basis, while minority of businesses use e-services yearly.

Figure 4.11: The use of e-supply chain



The results from Figure 4.11(derived from table 4.11) illustrate that out of 147 businesses that participated in the survey, 34 (23.1%) businesses utilise e-supply chain daily, 49 (33.3%) businesses use e-supply chain weekly, 33 (22.4%) businesses use e-supply chain monthly, 14 (9.5%) businesses use e-supply chain yearly and 17 (11.6%) businesses don't use e-supply chain. It is therefore concluded that the majority of businesses make use of e-supply chain on weekly basis, while minority of businesses use e-supply chain yearly.

Figure 4.12: The use of e-logistics

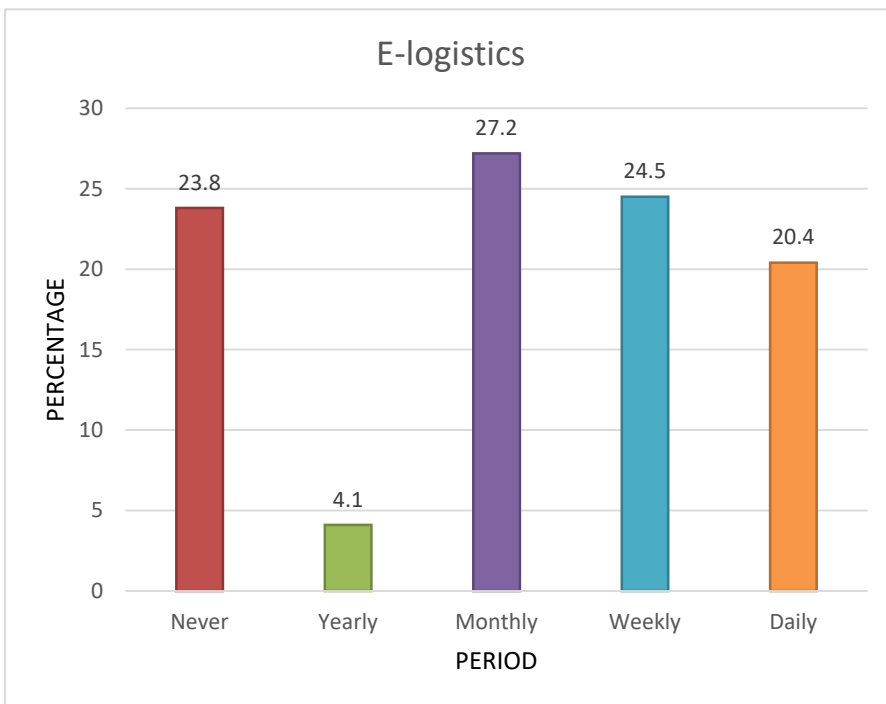


Figure 4.12 (derived from table 4.11) indicate that 30 (20.4%) business out of 147 that participated in the survey use e-logistics daily, 36 (24.5%) businesses use e-logistics weekly, 40 (27.2%) businesses use e-logistics monthly, 6 (4.1%) businesses use e-logistics yearly and 35 (23.8%) businesses don't use e-logistics. It is therefore concluded that the majority of businesses use e-logistics monthly, while minority of businesses use e-logistics yearly.

Figure 4.13: The use of e-procurement

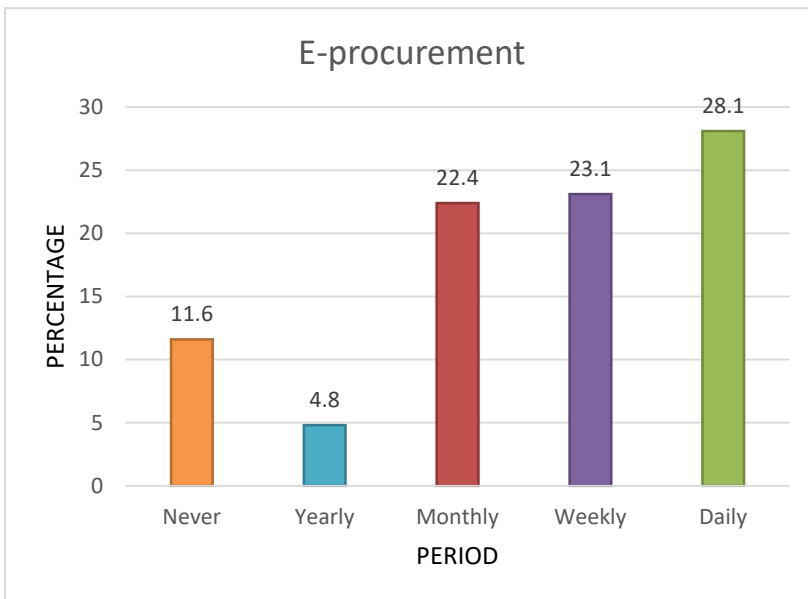
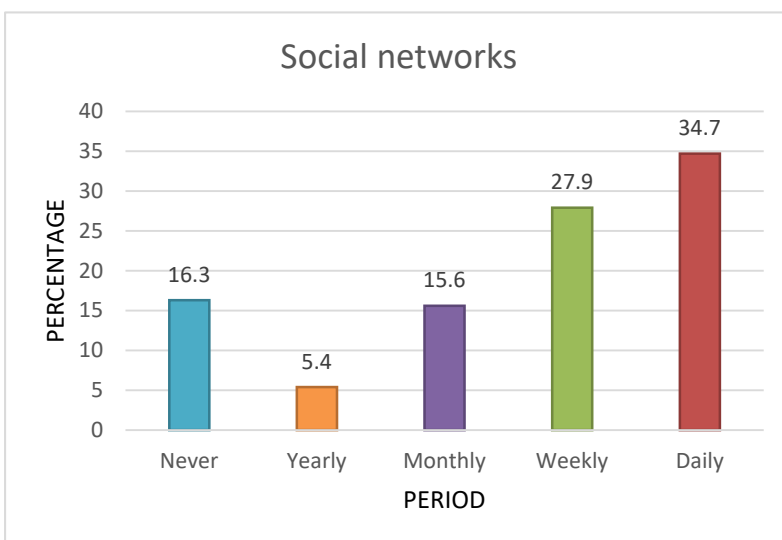


Figure 4.13 (derived from table 4.11) indicate that out of 147 businesses that took part in the survey, 56 (38.1%) businesses use e-procurement daily, 34 (23.1%) businesses use e-procurement weekly, 33 (22.4%) businesses use e-procurement monthly, 7 (4.8%) businesses use e-procurement yearly and 17 (11.6%) businesses don't use e-procurement. It is therefore concluded that the businesses use e-procurement daily, while minority of businesses use e-procurement yearly.

Figure 4.14: (derived from table 4.11) The use of Social networks



The results from Figure 4.14 indicate that from 147 businesses that participated, 51 (34.7%) businesses use social networks daily, 41 (27.9%) businesses use social networks weekly, 23 (15.6%) businesses use social networks monthly, 8 (5.4%) businesses use social networks yearly and 24 (16.3%) businesses don't make use of social networks.

It is therefore concluded that the businesses use social networks daily, while minority of businesses use social networks yearly.

Figure 4.15: The use of e-payment

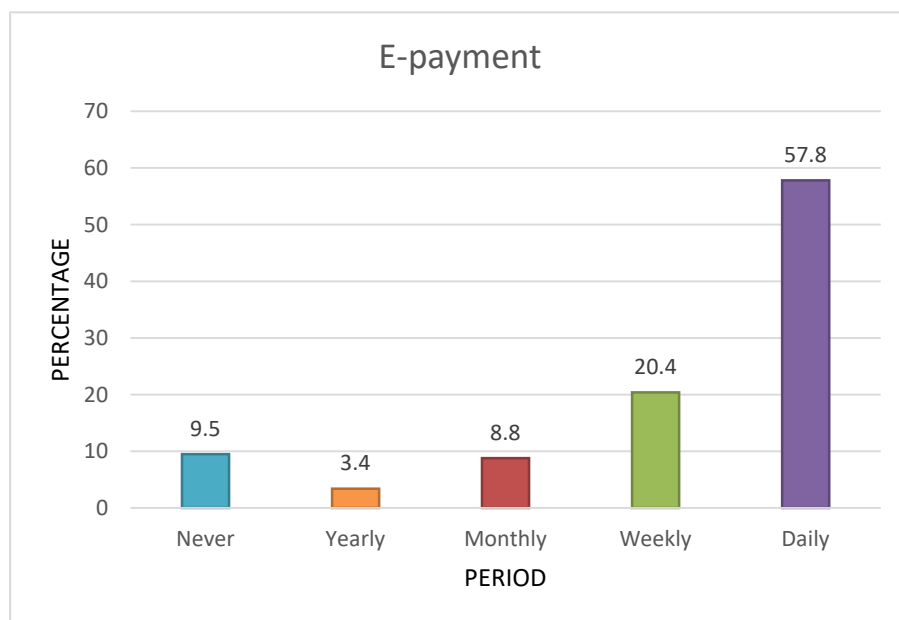
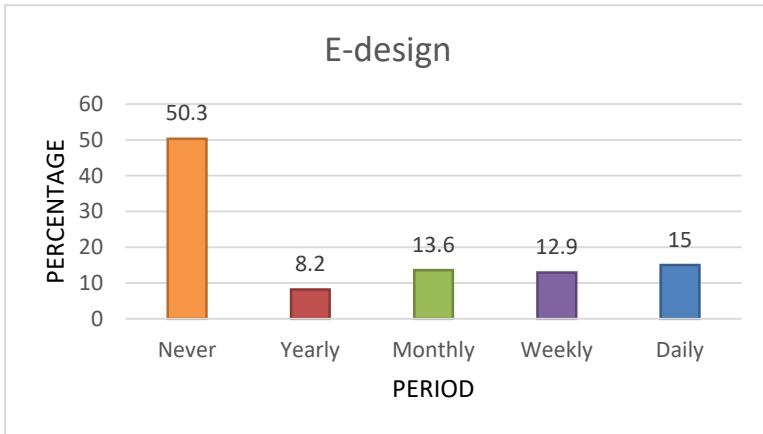


Figure 4.15 (derived from table 4.11) indicate that out of 147 businesses, 85 (57.8%) businesses make use of e-payment daily, 30 (20.4%) businesses use e-payment weekly, 13 (8.8%) businesses use e-payment monthly, 5 (3.4%) businesses use e-payment yearly and 14 (9.5%) businesses don't use e-payment.

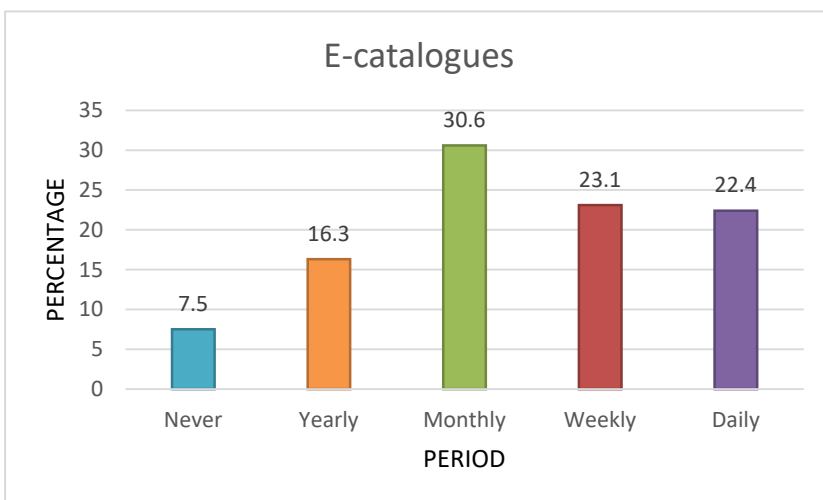
It is therefore concluded that the majority of businesses in the study area make use of e-payment on daily basis, while minority of the businesses in the study area make use of e-payment yearly.

Figure 4.16: The use of e-design



Results from Figure 4.16 (derived from table 4.11) above indicate that from 147 businesses that took part in the survey, 22 (15%) businesses utilise e-design (customisation) daily, 19 (12.9%) businesses utilise e-design weekly, 20 (13.6%) businesses utilise e-design monthly, 12 (8.2%) businesses utilise e-design yearly and 74 (50.3%) businesses don't use e-design. It is therefore concluded that the majority of businesses in the study area don't use e-design, while minority of the businesses in the study area make use of e-design yearly.

Figure 4.17: The use of e-catalogues



The results form Table 4.17 (derived from table 4.11) indicate that out of 147 businesses that participated in the survey, 33 (22.4%) businesses use e-catalogues daily, 34 (23.1%) businesses use e-catalogues weekly, 45 (30.6%) businesses use e-catalogues monthly, 24

(16.3%) use businesses use e-catalogues yearly and 11 (7.5%) businesses don't use e-catalogues. It is therefore concluded that the majority of businesses in the study area use e-catalogues monthly, while minority of the businesses in the study area don't use e-catalogues.

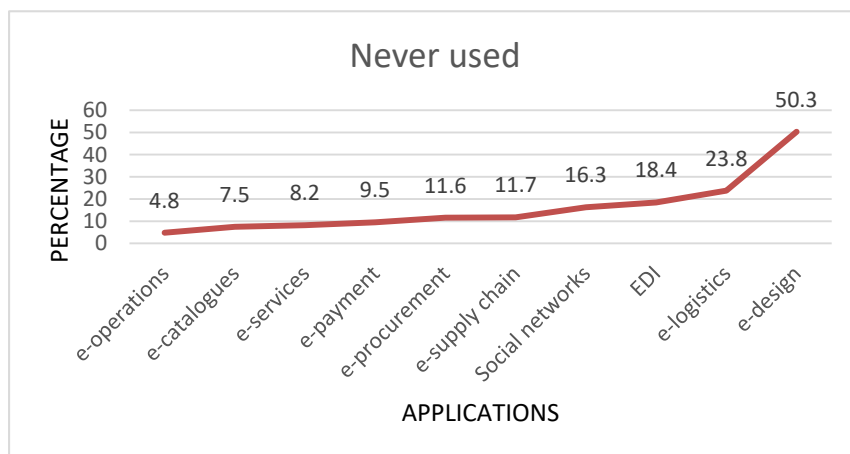
It is concluded that the majority of businesses in the study area make use of e-business applications (such as electronic data interchange, e-services, e-operations, e-supply chain, e-procurement, e-payment and social networks) daily, while the minority of businesses utilise e-business applications yearly.

It is concluded that the majority of businesses also don't make use of e-design, while minority of businesses use it weekly. This is because majority of businesses are subdivisions of large businesses. The results accord with Baladhanadyutham and Venkatesh (2014: 26), Hafeez (2010: 525-526), Rahimnia and Hassanzadeh (2013: 242), and Skitsko (2016:9) on the fact that businesses utilise e-design in the operational processes to develop value proposition.

4.4.5 Percentage per Period use of e-business applications

The figures below indicate the use of e-business applications. The figures below are developed out of the percentages that are shown in Table 4.11 above.

Figure 4.18: Percentage of businesses that do not use specific e-business applications



(i) Applications with the lowest percentage use

Figure 4.18 indicates that only 4.8 % of businesses do not use e-operations, 7.5% of businesses don't use e-catalogues, 8.2% of businesses don't use e-services and 9.5% of business never use e-payment.

(ii) Applications with medium percentage use

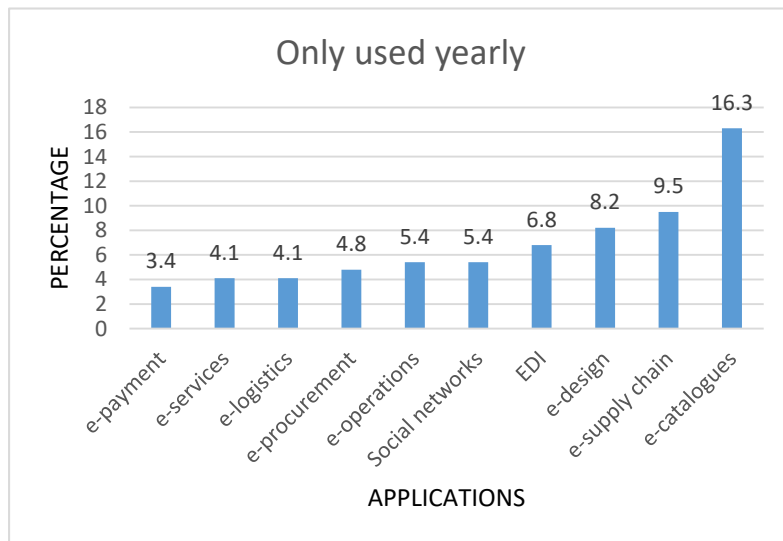
It is also clear that 11. 6% of businesses do not use e-procurement, 11.7% of businesses do not use e-supply chain, 16.3% of businesses don't use social networks and 18.4% of businesses don't use electronic data interchange.

(iii) Applications with the highest percentage use

It is also indicated that 23.8% of businesses do not use e-logistics and 50.3% of businesses do not use e-design.

It is concluded that the majority of businesses in the study area do not use e-design, while the minority of the businesses in the study area do not use e-operations.

Figure 4.19: E-business applications used yearly



(i) Applications with the lowest percentage use

Figure 4.19 indicate that out of 147 business that took part in the survey, 3.4% of businesses use e-payment yearly, 4.1% of businesses use e-services yearly, 4.1% of businesses use e-logistics yearly and 4.8% of businesses use e-procurement yearly.

(ii) Applications with medium percentage use

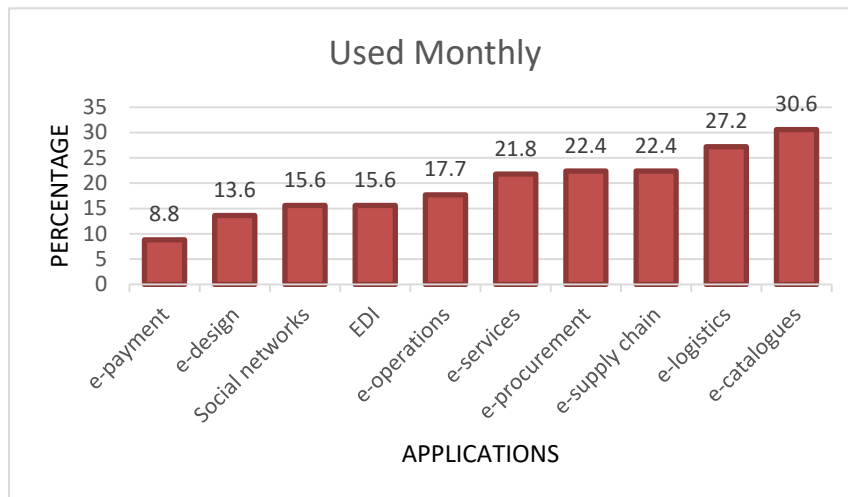
It is shown that 5.4% of businesses utilise e-operations yearly, 5.4% of business use social networks yearly, 6.8% of businesses use electronic data interchange yearly, 8.2% of businesses use e-design yearly and 9.5% of businesses use e-supply chain yearly

(iii) Applications with highest percentage use

It is shown that 16.3% of businesses use e-catalogues yearly.

It is therefore concluded that the majority of businesses in the study area use e-catalogues yearly, while minority of businesses in the study area use e-payment yearly.

Figure 4.20: E-business applications used Monthly



(i) Applications with the lowest percentage use

Figure 4.20 above indicate that out of 147 businesses that participated in this survey, 8.8% of businesses use e-payments monthly, 13.6% of businesses use e-design monthly, 15.6% of businesses use social networks monthly, 15.6% of businesses use electronic data interchange monthly,

(ii) Applications with medium percentage use

It is shown that 17.7% of businesses use e-operations monthly, 21.8% of businesses use e-services monthly, 22.4% of businesses use e-procurement monthly and 22.4% of businesses use e-supply chain monthly.

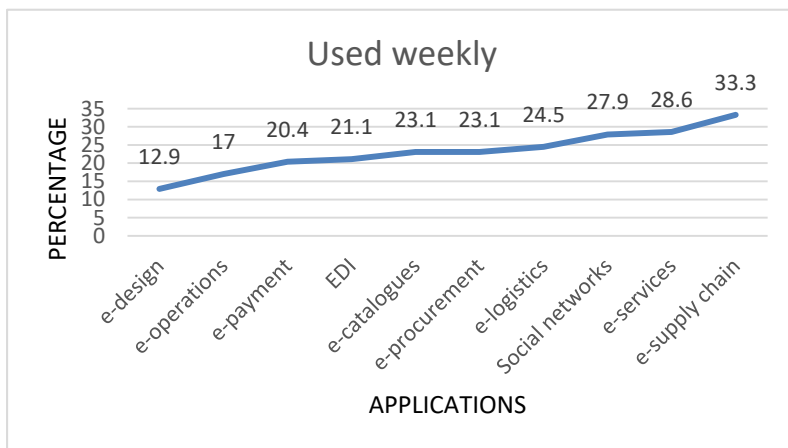
(iii) Applications with highest percentage use

It is shown that 27.2% of businesses use e-logistics monthly and 30.2% of businesses use e-catalogues monthly.

It is therefore concluded that the majority of businesses in the study area make use of e-catalogues on monthly basis, while minority of the businesses in the study area make use of e-payment monthly.

It is therefore concluded that the majority of businesses make use of e-catalogues on monthly basis, while minority of the businesses in the study area make use of e-payment monthly.

Figure 4.21: E-business applications used weekly



(i) Applications with the lowest percentage use

Figure 4.21 above indicate that out of 147 businesses that took part in the survey, 12.9% of the businesses use e-design weekly and 17% of businesses use e-operations weekly.

(i) Applications with medium percentage use

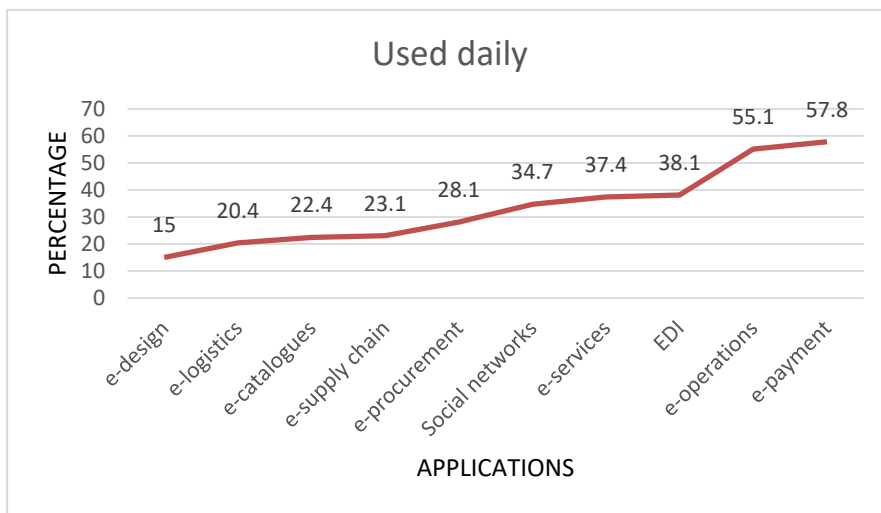
It is shown that 20.4% of businesses use e-payment weekly, 21.1% of businesses use electronic data interchange weekly, 23.1% of businesses use e-catalogues weekly, 23.1% of businesses use e-procurement weekly and 24.5% of businesses use e-logistics weekly.

(i) Applications with highest percentage use

It is shown that 27.9% of businesses use social networks weekly, 28.6% of businesses use e-services weekly and 33.3% of businesses use e-supply chain weekly.

It is therefore concluded that the majority of businesses in the study area use e-supply chain weekly, while minority of businesses in the study area use e-design weekly.

Figure 4.22: E-business applications used daily



(i) Applications with the lowest percentage use

Figure 4.22 indicate that out of 147 businesses that took part in the survey, 15% of businesses use e-design daily, 20.4% of businesses use e-logistics daily, 22.4% of businesses use e-catalogues daily and 23.1% of businesses utilise e-supply chain daily.

(i) Applications with medium percentage use

It is shown that 28.1% of businesses use e-procurement daily, 34.7% of businesses use social networks daily, 37.4% of business use e-services daily and 38.1% of businesses use electronic data interchange daily.

(i) Applications with highest percentage use

It is shown that 55.1% of businesses use e-operations daily and 57.8% of businesses use e-payment daily.

It is therefore concluded that the majority of businesses in the study area make use of e-payment daily, while minority of businesses in the study area make use of e-design on daily basis.

Table 4.12: classification of the use of e-business applications

Low	Medium	High
E-DESIGN	E-CATALOGUES E-LOGISTICS E-SUPPLY CHAIN	ELECTRONIC DATA INTERCHANGE E-OPERATIONS E-SERVICES E-PAYMENT SOCIAL NETWORKS E-PROCUREMENT

Table 4.12 indicate the categorisation of the use of e-business application. The businesses in the study area highly use electronic data interchange, e-operations, e-services, e-operations, e-payment, social networks and e-procurement. The businesses in the study area mediumly use e-catalogues, e-logistics and e-supply chain. The businesses in the study area lowly utilise e-design.

It is concluded that a high percentage of businesses use electronic data interchange, e-operations, services, e-operations, e-payment, social networks and e-procurement because

businesses use them to carry out their day-to-day activities. It is concluded that a medium percentage of businesses use e-catalogues, e-logistics and e-supply chain because businesses utilise them to carry out their monthly activities like monthly promotions and monthly planning of e-operations. It is concluded that a low percentage of businesses in the study area utilise e-design.

4.4.6 Summarised conclusions for the use of e-applications

It is concluded that businesses highly use electronic data interchange, e-operations, services, e-operations, e-payment, social networks and e-procurement because businesses use them to carry out their day-to-day activities. It is concluded that businesses in the study area monthly use e-catalogues, e-logistics and e-supply chain because businesses utilise them to carry out their monthly activities like monthly promotions. It is concluded that businesses in the study area utilise e-design lowly because they are the subdivisions of large businesses that are in Gauteng. The secondary data also confirms the use of e-business applications by businesses in their operational performances of developing value propositions (Wiengarten *et al.* 2015: 4963, and Breivold and Crnkovic, 2014: 29).

4.5 E-BUSINESS BENEFITS

The e-business benefits that businesses experience when utilising e-business applications in the development of value propositions are indicated and discussed below. The e-business benefits are represented by e-business benefits database in framework for analyses (Figure 4.1) above. The e-business benefits database is the fifth stage on the framework for analysis. The e-business benefits database is the data that was collected from the businesses that operate within the study area (Limpopo Province). The analyses of the e-business benefits are presented in tables.

4.5.1 Allows businesses to advertise many products at the same time

Table 4.13 below demonstrates that 35 (23.8%) of 147 businesses that took part in the survey, state that e-business does not allow the business to advertise many products at the same time, while 112 (76.2%) businesses outline that e-business when used allows businesses to advertise many products at the same time.

Table 4.13: Allows business to advertise many products at the same time

Allows firms to advertise many products at the same time	Frequency	Percentage
NO	35	23.8
YES	112	76.2
Total	147	100

The results imply that e-business when used allows businesses to advertise many products at the same time. The results concur with the study of Fauska, Kryvinska and Strauss (2013:41) on the fact that e-business allows a firm to advertise many products at the same time.

4.5.2 Access to South African markets

Table 4.14 below demonstrates that 39 (26.5%) of 147 businesses that took part in the survey, outline that when they use e-business it does not allow them to access South African markets, while 108 (73.5%) businesses agree that the use of e-business allows access to South African markets.

Table 4.14: Access to South African markets

Allows access to South African markets	Frequency	Percentage
NO	39	26.5
YES	108	73.5
Total	147	100

The results depict that when businesses use e-business, it allows them to access worldwide markets. According to Abid, Rahim and Scheepers (2011: 3), the use of e-business enables businesses to access worldwide markets.

4.5.3 Quicker decision making

According to Table 4.15 below, 60 (40.8%) of 147 businesses that participated in the survey state that the use of e-business doesn't enable business to make quicker decisions, while 87 (59.2%) of them state that when using e-business it allows business to make quicker decisions.

Table 4.15: Quicker decision making

Allows firms to make quicker decisions	Frequency	Percentage
NO	60	40.8
YES	87	59.2
Total	147	100

The results show that the use of e-business allows firms to make quicker decisions. The results concur with Olatokun and Kebonye (2010: 43) on the fact that e-business enables businesses to make quicker decisions.

4.5.4 Production of digital goods

Table 4.16 below illustrates that 97 (66%) of 147 business that participated in the survey state that when using e-business it does not enable a business to produce digital goods, while 50 (34%) of 147 businesses agree that e-business when utilised enables a business to produce digital goods.

Table 4.16: Production of digital goods

Enables a firm to produce digital goods	Frequency	Percentage
NO	97	66
YES	50	34
Total	147	100

The results indicate that the use of e-business does not enable businesses to produce digital good(s). The result further disaccord with the study of Jahanshahi, Zhang and Brem (2013: 850-851) on the fact that e-business enables firms to produce digital goods.

4.5.5 Add extra services to a product at little cost

Table 4.17 below depicts that 31 (21.1%) of 147 businesses that participated in the survey state that when utilising e-business it does not allow a business to add extra services to a product at little cost, while 116 (78.9%) businesses portray that when using e-business it allows a business to add extra services to a product at little cost.

Table 4.17: Allows a firm to add extra services to a product at little cost

Allows a firm to add extra services to a product at little cost	Frequency	Percentage
NO	31	21.1
YES	116	78.9
Total	147	100

The results indicate that the use of e-business allow businesses to add extra services to a product at little cost. The results further accord with Fauska *et al.* (2013:41) on the fact that e-business when utilised allows a firm to add extra services to a product at little cost.

4.5.6 Unique products and services

Table 4.18 below indicates that 54 (36.7%) of 147 businesses portray that they do not consider that a benefit of the use of applications is unique products and services while (63.3%) of those 147 businesses outline that when utilising e-business it allows a business to have unique products and services.

Table 4.18: Unique products and services

Allow firms to have unique products and services	Frequency	Percentage
NO	54	36.7
YES	93	63.3
Total	147	100

The results further concur with Abid, Rahim and Scheepers (2011: 1) on the fact that e-business enable businesses to have unique products and services.

4.5.7 Direct communication between business and its stakeholders

According to table 4.19 below, 133 (90.5%) of 147 business that participated in the survey depict that when using e-business it ensures direct communication between the business and its stakeholders, while 14 (9.5%) of them state that when utilising e-business it does not ensure direct communication between the business and its stakeholders.

Table 4.19: Direct communication between the business and its stakeholders

Ensures direct communication between the business and its stakeholders	Frequency	Percentage
NO	14	9.5
YES	133	90.5
Total	147	100

The results entail that when using e-business it ensures direct communication between the business and its stakeholders. The results further accord with Abid, Rahim and Scheepers (2011: 1) on the fact that e-business when utilised ensures direct communication between the business and its stakeholders.

4.5.8 Business have online store

Table 4.20 below indicates that 83 (56.5%) of 147 businesses portray that when using e-business it does not enable a business to have an online store, while 64 (43.5%) of the businesses that participated in the survey outline that when using e-business it enables a business to have an online store.

Table 4.20: Business have an online store

Enables a business to have an online store	Frequency	Percentage
NO	83	56.5
YES	64	43.5
Total	147	100

Results imply that when using e-business it does not enable a business to have an online store. The results also disaccord with Dube, Chitura and Runyowa (2010: 5) on the fact that e-business enables a business to have an online store.

4.5.9 Business to retain customers

According to table 4.21, 40 (27.2%) of businesses that participated in this survey depict that when using e-business it does not allow a business to retain customers, while 107 (72.8%) of those businesses state that e-business when utilised allows a business to retain customers.

Table 4.21: Business retain customers

Allows a business to retain customers	Frequency	Percentage
NO	40	27.2
YES	107	72.8
Total	147	100

Results entail that when using e-business it allows businesses to retain customers. The results further accord with Alshomrani and Qamar (2013: 15) on the fact that e-business when used, allows a business to retain customers.

4.5.10 Assessing the association between ease of implementation and e-business applications

The correlation test as indicated by Table 4.22 below is utilised to identify and outline if there is a relationship between the e-business applications and the benefits that businesses experience when utilising e-business applications in the operational performances in the development of value proposition.

Table 4.22: Correlation between e-business applications and benefits

		EDI	E-OPERATIONS	E-SERVICES	E-SUPPLY CHAIN	E-LOGISTICS	E-PROCUREMENT	SOCIAL NETWORKS	E-PAYMENT	E-DESIGN	E-CATALOGUES
Allows business to advertise many products at the same time	Pearson Correlation	-.190 [*]	0.023	-.344 ^{**}	0.045	.215 ^{**}	-0.084	-.154 [*]	-0.109	0.135	-0.091
	Sig. (1-tailed)	0.011	0.389	0.000	0.294	0.004	0.155	0.031	0.094	0.051	0.137
Allows access to South African markets	Pearson Correlation	-.236 ^{**}	-.208 ^{**}	-.170 [*]	-0.040	-.187 [*]	0.002	-.207 ^{**}	-0.088	-.332 ^{**}	-.285 ^{**}
	Sig. (1-tailed)	0.002	0.006	0.020	0.314	0.012	0.492	0.006	0.145	0.000	0.000
Allows firms to make quicker decisions	Pearson Correlation	0.007	0.055	-0.135	0.020	-0.060	-0.134	-0.131	-0.099	0.059	0.034
	Sig. (1-tailed)	0.467	0.253	0.051	0.404	0.236	0.052	0.056	0.116	0.239	0.342
Enables a firm to produce digital goods	Pearson Correlation	-0.078	-.294 ^{**}	-0.006	-.165 [*]	-.324 ^{**}	-0.079	-0.095	-0.025	-.372 ^{**}	-.234 ^{**}
	Sig. (1-tailed)	0.174	0.000	0.471	0.023	0.000	0.171	0.126	0.384	0.000	0.002
Allows a firm to add extra services to a product at little cost	Pearson Correlation	0.059	0.060	-.148 [*]	0.098	-0.096	-0.065	0.031	-0.003	.188 [*]	0.105
	Sig. (1-tailed)	0.237	0.235	0.037	0.118	0.124	0.218	0.354	0.486	0.011	0.102
Allows firms to have unique products and services	Pearson Correlation	0.066	-0.068	-0.068	-0.015	0.056	-.145 [*]	-.158 [*]	-0.015	-0.012	0.060
	Sig. (1-tailed)	0.215	0.207	0.207	0.428	0.251	0.040	0.028	0.429	0.440	0.234
Ensures direct communication between the business and its stakeholders	Pearson Correlation	-.178 [*]	-0.074	-.146 [*]	-0.029	0.099	-0.070	-0.102	0.020	0.049	-.156 [*]
	Sig. (1-tailed)	0.015	0.187	0.039	0.364	0.116	0.200	0.109	0.406	0.280	0.029
Enables a business to have an online store	Pearson Correlation	-0.106	-.355 ^{**}	-.294 ^{**}	-.141 [*]	-.272 ^{**}	-.252 ^{**}	-0.049	-.153 [*]	-.233 ^{**}	-.233 ^{**}
	Sig. (1-tailed)	0.100	0.000	0.000	0.045	0.000	0.001	0.276	0.032	0.002	0.002
Allows a business to retain customers	Pearson Correlation	-0.066	-0.012	0.010	0.063	0.027	0.028	-0.007	-0.029	0.024	-.186 [*]
	Sig. (1-tailed)	0.213	0.444	0.451	0.223	0.371	0.368	0.465	0.363	0.388	0.012
N		147	147	147	147	147	147	147	147	147	147

Table 4.22 illustrates the correlation between e-business benefits and e-business applications. The asterisks outline the level of association between variables. If a number has one asterisk indicates alpha at 055, two asterisks indicates alpha's at.01.

These asterisks indicate that there is an association correlation when you used a one-sided test. One-tail test was used because it is assumed that there is a linear correlation. The table was used to develop Table 4.23 below.

Table 4.23: Strength of association between e-business applications and e-business benefits

		EDI	E-OPERATIONS	E-SERVICES	E-SUPPLY CHAIN	E-LOGISTICS	E-PROCUREMENT	SOCIAL NETWORKS	E-PAYMENT	E-DESIGN	E-CATALOGUES
Allows business to advertise many products at the same time	Significant	Yes	No	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes
	Strength of association	Low		Medium		Low	Low	Low	Low	Low	Low
Allows access to South African markets	Significant	Yes	Yes	Yes	No	Yes	No	Yes	Yes	Yes	Yes
	Strength of association	Low	Low	Low		Low		Low	Low	Low	low
Allows firms to make quicker decisions	Significant	No	No	Yes	No	No	Yes	Yes	Yes	No	No
	Strength of association			Low			Low	Low	Low		
Enables a firm to produce digital goods	Significant	No	Yes	No	Yes	Yes	No	Yes	No	Yes	Yes
	Strength of association		Low		Low	Low		Low		Low	Low
Allows a firm to add extra services to a product at little cost	Significant	No	No	Yes	Yes	Yes	No	No	No	Yes	Yes
	Strength of association			Low	Low	Low				Low	Low
Allows firms to have unique products and services	Significant	No	No	No	No	No	Yes	Yes	No	No	No
	Strength of association						Low	Low			
Ensures direct communication between the business and its stakeholders	Significant	Yes	No	Yes	No	Yes	No	Yes	No	No	Yes
	Strength of association	Low		Low		Low		Low			Low
Enables a business to have an online store	Significant	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes
	Strength of association	Low	Medium	Low	Low	Low	Low		Low	Low	Low
Allows a business to retain customers	Significant	No	No	No	No	No	No	No	No	No	Yes
	Strength of association										Low

Table 4.23 indicate the strength of association between e-business applications and e-business benefits. The table above shows that there is a low association between allow

business to advertise many products at the same time and e-business applications (electronic data interchange, e-logistics, e-procurement, social networks, e-payment, e-design and e-catalogues). There is a medium association between allow business to advertise many products at the same time and e-business application (e-services), while there is no association between allow business to advertise many products at the same time and e-business applications (e-operations and e-supply chain).

There is a low association between allow access to South African markets and e-business applications (electronic data interchange, e-operations, e-services, e-logistics, social networks, e-payment, e-design and e-catalogues), while there is no association between allow access to South African markets and e-business applications (e-supply chain and e-procurement).

There is a low association between allow firm to make quicker decisions and e-business applications (e-services, e-procurement, social networks and e-payment), while there is no association between allow firm to make quicker decisions and e-business applications (electronic data interchange, e-operations, e-supply chain, e-logistics, e-design and e-catalogues).

The table above indicate that there is low association between enables business to produce digital goods and e-business applications (e-operations, e-supply chain, e-logistics, social networks, e-design and e-catalogues), while there is no association between enables business to produce digital goods and e-business applications (electronic data interchange, e-services, e-procurement and e-payment).

There is a low association between allow a firm to add extra services to a product at little cost and e-business applications (e-services, e-supply chain, e-logistics, e-design and e-catalogues), while there is no association between allow a firm to add extra services to a product at little cost and e-business applications (electronic data interchange, e-operations, e-procurement, social networks and e-payment).

There is a low association between allow firms to unique products, services and e-business applications (e-procurement and social networks), while there is no association between

allow firms to unique products, services and e-business applications (electronic data interchange, e-operations, e-services, e-supply chain, e-logistics, e-design, e-catalogues and e-payment).

There is a low association between e-business benefit (ensure direct communication between the business and its stakeholders) and e-business applications (electronic data interchange, e-services, e-logistics, social networks and e-catalogues), while there is no association between e-business benefit (ensure direct communication between the business and its stakeholders) and e-business applications (e-operations, e-supply chain, e-procurement, e-payment and e-design).

There is a low association between e-business benefit (enable a business to have an online store) and e-business applications (electronic data interchange, e-services, e-supply chain, e-logistics, e-procurement, e-payment, e-design and e-catalogues). There is a medium association between e-business benefit (enable a business to have an online store) and e-business application (e-operations), while there is no association between e-business benefit (enable a business to have an online store) and e-business application (social networks).

There is a low association between e-business benefit (allows a business to retain customers) and e-business application (e-catalogues), while there is no association between e-business benefit (allows a business to retain customers) and e-business applications (electronic data interchange, e-operations, e-services, e-supply chain, e-procurement, e-logistics, e-payment, social networks and e-design).

It is concluded that there is a low association between e-business applications and e-business benefits. Other researchers have different findings in relation to the benefits that the use of e-business applications offer. It is low and medium concluded that there is a relationship between e-business applications and e-business benefits. The results accord with the findings of Dube *et al.* (2010: 5), Abid *at al.* (2011: 3) and Shorkovy (2015: 44). According Dube *et al.* (2010: 5), Abid *at al.* (2011: 3) and Shorkovy (2015: 44) there is a state of connectness between e-business applications and the benefits of e-business.

4.6 OPERATIONAL PERFORMANCE

The operational performance measures of developing value propositions are indicated and discussed below. The operational performance measures are represented by operational performance database in the framework for analyses (Figure 4.1) above. In the Operational Performance database in the sixth stage on the framework for analysis. The operational performance database is the data that was collected from the businesses that operate within the study area. The operational performance measures indicate the impact of e-business applications on operational performance in the development of value propositions.

Firstly, the tests of fitness of the data in the data base operational performance will be done

4.6.1 Internal consistency

Table 4.24: Cronbach's Alpha test

	Mean if Item Deleted	Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
Consistency in the production of high quality	25.09	28.835	0.594	0.788
Enhance productivity	24.82	28.644	0.659	0.780
Fast and easy interaction among a firm and customers	24.86	30.927	0.586	0.793
Minimum cost of producing	25.07	31.434	0.469	0.806
Present opportunities for interactive design of products	25.68	27.767	0.576	0.792
Quick product and service delivery	24.89	30.906	0.583	0.793
Dynamic and flexible digital catalogue	24.89	32.139	0.342	0.824
More attention to customer queries and problems	25.18	28.667	0.536	0.798

Table 4.24 above shows the Cronbach's alpha test for operations performance measures. The Cronbach's alpha coefficient for 8 items is 0.818, suggesting that the items have a relatively high degree of internal consistency.

4.6.2 Normality test for operational performance

Operational performance database in the framework is tested for normality as shown in the Figures below. The normality analyses for operational performance will be presented and interpreted below.

The Figures below are constructed through the sums of the data represented by the operational performance database in the framework for analysis above.

Figure 4.23: Histogram with normal curve for operational performance measures

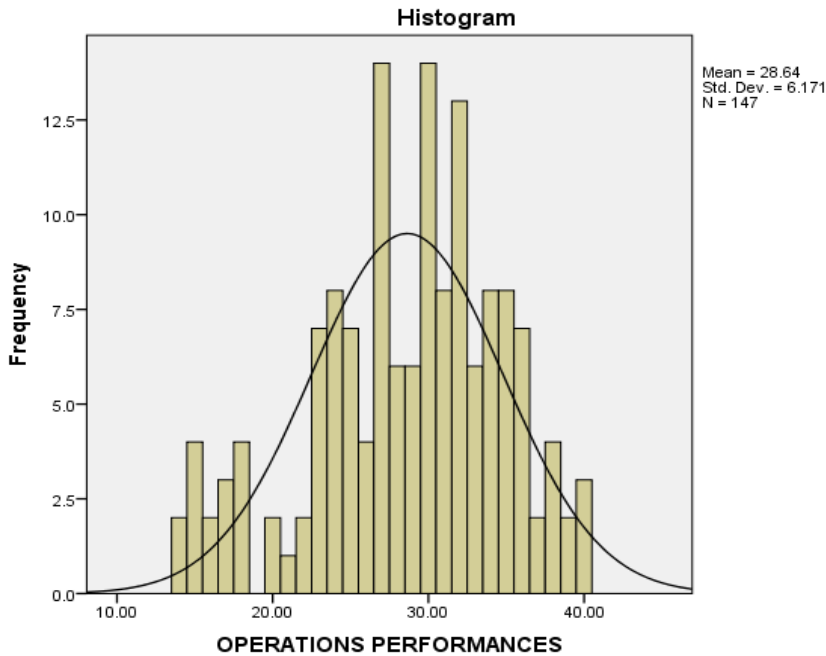


Figure 4.23 depicts a histogram and normal distribution curve. The figure illustrates that data for measures of operations performance is normal. The normal distribution curve on the histogram clearly outlines the normality of

measures of operations performance data.

Figure 4.24: Normal Q-Q Plot for operational performance measures

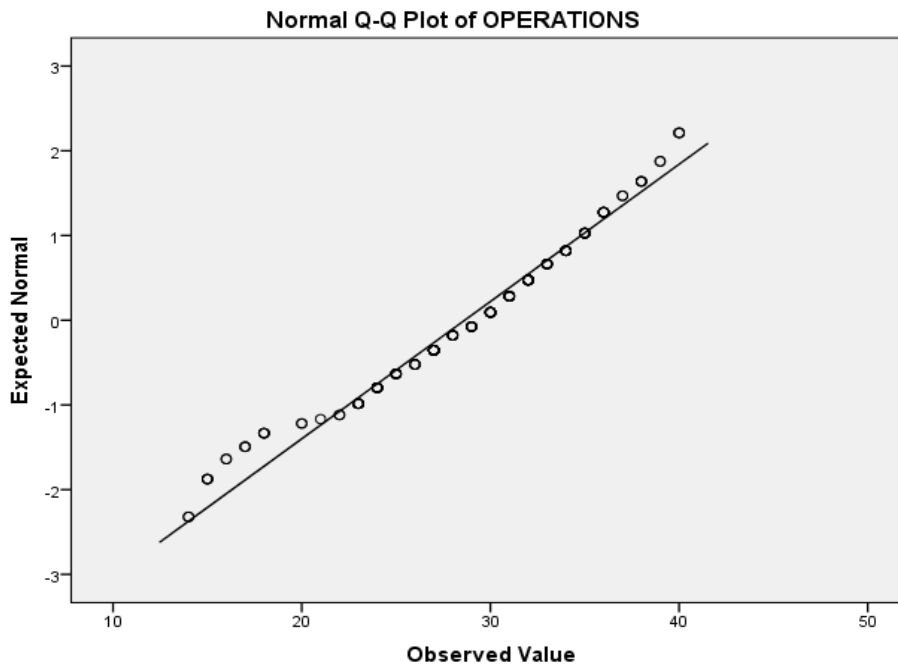


Figure 4.24 illustrates the normal Q-Q Plot. The figure depicts that measures of operations performances data is normally distributed, because the data points are close to the diagonal line. The figure further outlines that

measures of operations performances data points roam around the line in a linear fashion.

Figure 4.25: Box Plot for operational performance measures

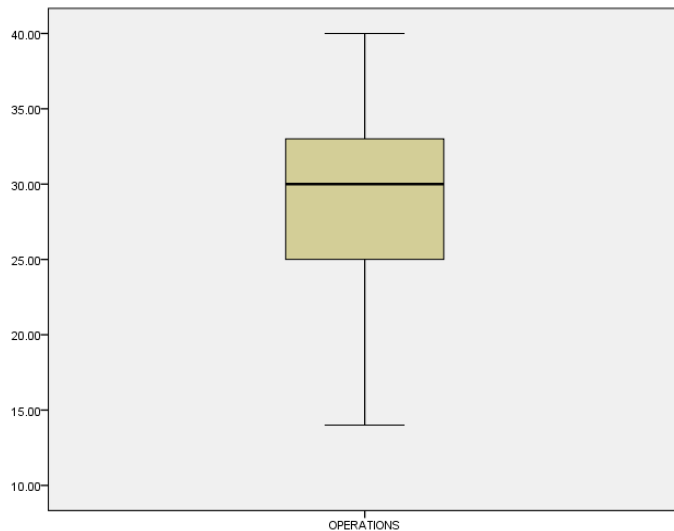


Figure 4.25 depicts the overall pattern of responses for businesses. The results of the figure outline that businesses hold different opinions about the operational performance measures of using e-business applications. The results further indicate that few businesses in the study area have diverse views on the operational performance measure,

while on some e-business applications they have similar views. The indication of the results is influenced by the fact that the data is skewed to the right.

4.6.3 Frequencies of operational performance

The analyses of the operational performance measures are presented in Table 4.25 that indicates the frequency and percentage of the impact.

Table 4.25: Operational performance measures

	Consistency in the production of high quality		Enhance productivity		Fast and easy interaction among a firm and customers		Minimum cost of producing		Present opportunities for interactive design of products		Quick product and service delivery		Dynamic and flexible digital catalogue		More attention to customer queries and problems	
	Frequency	Percent	Frequency	Percent	Frequency	Percent	Frequency	percent	Frequency	Percent	Frequency	Percent	Frequency	Percent	frequency	Percent
No impact	14	9.5	8	5.4	2	1.4	6	4.1	35	23.8	2	1.4	9	6.1	16	10.9
Minimal impact	13	8.8	12	8.2	17	11.6	18	12.2	16	10.9	14	9.5	14	9.5	21	14.3
Medium impact	33	22.4	28	19.0	24	16.3	36	24.5	38	25.9	37	25.2	28	19.0	31	21.1
High impact	52	35.4	49	33.3	73	49.7	60	40.8	36	24.5	60	40.8	50	34.0	37	25.2
Exceed all expectations	35	23.8	50	34.0	31	21.1	27	18.4	22	15.0	34	23.1	46	31.3	42	28.6
Total	147	100	147	100	147	100	147	100	147	100	147	100	147	100	147	100

Table 4.25 outlines the operational performance measures. The table above indicate the frequencies and percentages of operational performance.

4.6.4 Percentage of operational performance measure

Figures below are developed with the percentages of operational performance measures presented in Table 4.25 above

4.6.4.1 Consistency of producing high quality products

Figure 4.26: Consistency in production

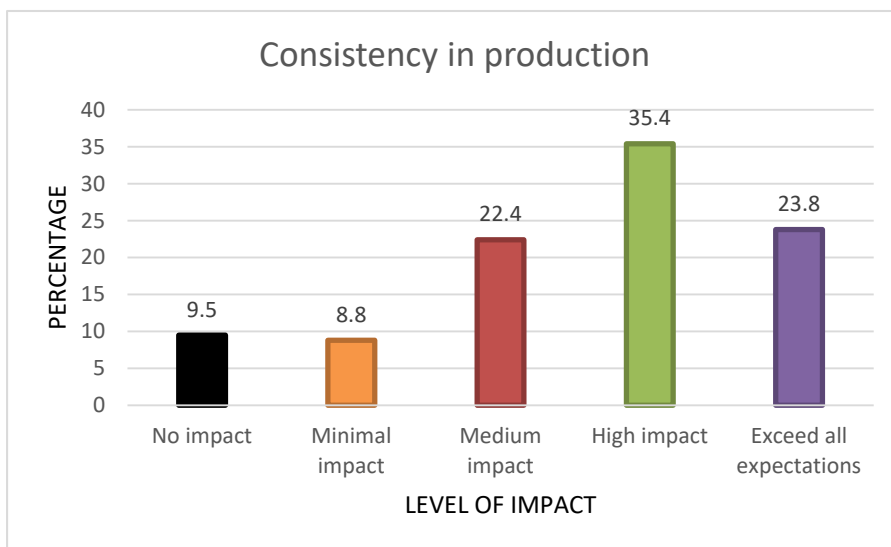


Figure 4.26 indicates that, out of 147 businesses that took part in the survey, 9.5% of businesses don't experience impact in the consistency of producing high quality products using e-business, 8.8% of businesses experience minimal impact in the consistency of producing high quality products, 22.4% of businesses experience medium impact in the consistency of producing high quality products, 35.4% of businesses experience high impact in the consistency of producing high quality products and 23.8% businesses experience impact that exceeds all expectations in the consistency of producing high quality products using e-business.

It is therefore concluded that the majority of businesses in the study area experience high impact in the consistency of producing high quality products when using e-business, while

minority of businesses experience minimal impact in the consistency of producing high quality products when using e-business.

4.6.4.2 Enhance productivity

Figure 4.27: Enhancement of productivity

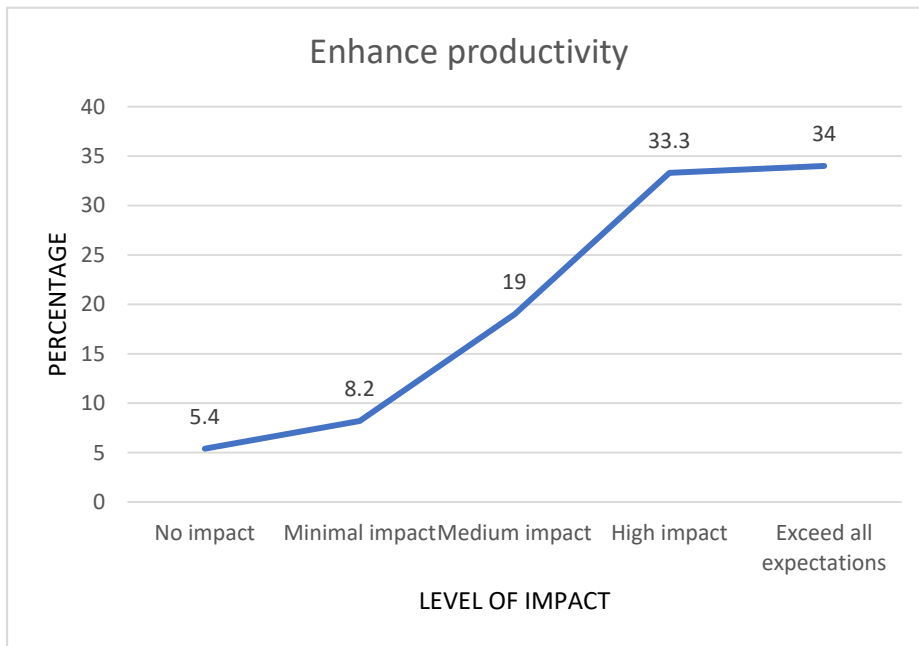


Figure 4.27 illustrate that out of 147 businesses, 5.4% of businesses don't experience the enhancement of productivity when using e-business, 8.2% of businesses experience minimal enhancement of productivity, 19% of businesses experience medium enhancement of productivity, 33.3% of businesses experience high enhancement of productivity and 34% of businesses experience that the enhancement of productivity exceeds all expectations.

It is therefore concluded that majority of businesses in the study area experience impact that exceeds all expectations on the enhancement of productivity when using e-business, while minority of businesses in the study area don't experience impact on the enhancement of productivity when using e-business.

4.6.4.3 Interaction among a firm and its customers

Figure 4.28: Interaction among a firm and its customers

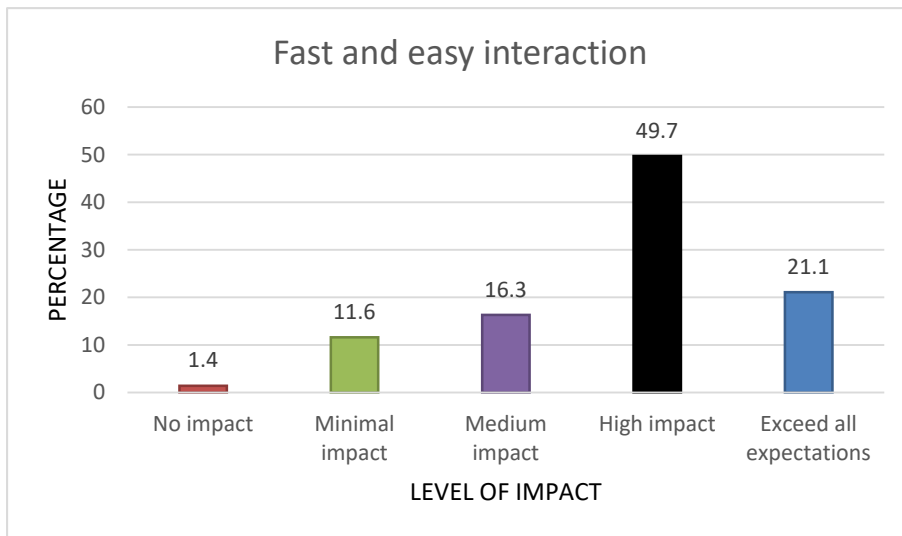


Figure 4.28 shows that, from 147 businesses that participated in the study, 1.4% of businesses receive no impact on fast and easy interaction among a firm and its customers when using e-business, 11.6% of businesses receive minimal impact on fast and easy interaction among a firm and customers, 16.3% of businesses receive medium impact on fast and easy interaction among a firm and customers, 49.7% of businesses receive high impact on fast and easy interaction among a firm and customers, and 21.1% of businesses receive impact that exceeds in the operations performances.

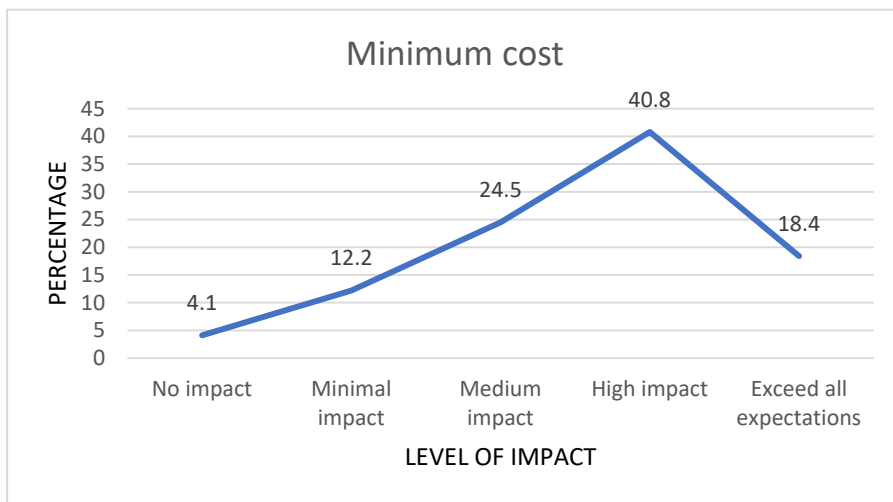
It is therefore concluded that the majority of businesses in the study area experience high impact on fast and easy interaction among a firm and customers when using e-business, while minority of businesses in the study area don't experience on fast and easy interaction among a firm and customers when using e-business.

Figure 4.29 below indicates that 4.1% of businesses from 147 businesses don't experience an impact when using e-business to ensure minimum cost of producing, while 12.2% of businesses experience minimal impact when using e-business to ensure minimum cost of producing, 24.5% of businesses experience medium impact when using e-business to ensure minimum cost of producing, 40.8% of businesses experience high impact when using e-business to ensure minimum cost of producing and 18.4% of businesses experience

impact that exceeds all expectations when using e-business to ensure minimum cost of producing.

4.6.4.4 Ensure minimum cost of production

Figure 4.29: Minimum cost of producing

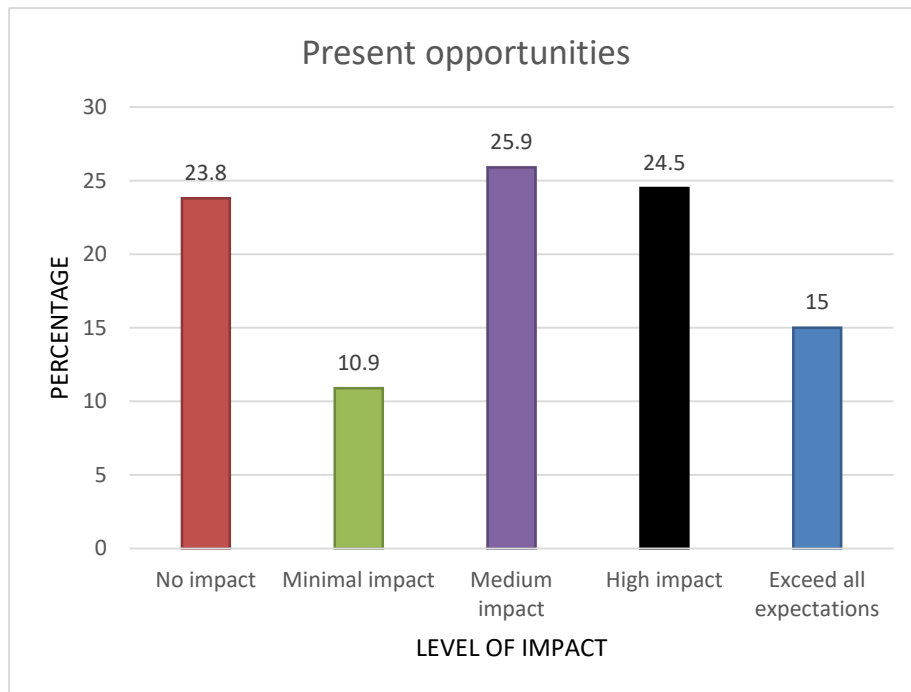


It is therefore concluded that majority of businesses in the study area experience high impact when using e-business to ensure minimum cost of producing, while minority of businesses in the study area don't experience an impact when using e-business to ensure minimum cost of producing.

4.6.4.5 Interactive design of products

Results from the Figure 4.30 indicate that 23.8% of businesses from 147 businesses don't experience no impact when using e-business for interactive design of products, while 10.9% of businesses receive minimal impact when using e-business to present opportunities for interactive design of products, 25.9% of businesses receive medium impact when using e-business to present opportunities for interactive design of products, 24.5% of businesses receive high impact when using e-business to present opportunities for interactive design of products and 15% of businesses receive impact that exceeds all expectations when using e-business to present opportunities for interactive design of products.

Figure 4.30: Interactive design of products

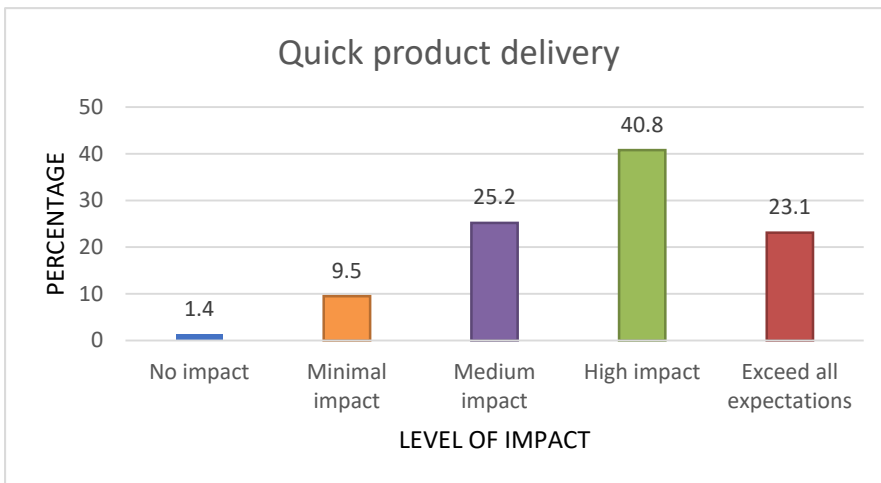


It is therefore concluded that the majority of businesses in the study area experience little impact when using e-business to present opportunities for interactive design of products, while minority of business experience minimal impact when using e-business to present opportunities for interactive design of products.

4.6.4.6 Product and service delivery

Figure 4.31 below shows that 1.4% of businesses from 147 businesses don't receive impact when using e-business to enable quick product and service delivery, while 9.5% of businesses receive minimal impact when using e-business to enable quick product and service delivery, 25.2% of businesses receive medium impact when using e-business to enable quick product and service delivery, 40.8% of businesses receive high impact when using e-business to enable quick product and service delivery and 23.1% of businesses receive impact that exceeds all expectations when using e-business to enable quick product and service delivery.

Figure 4.31: Quick product and service delivery



It is therefore concluded that majority of businesses in the study area experience a very high impact when using e-business to enable quick product and service delivery, while minority of businesses in the study area don't experience when using e-business to enable quick product and service deliver.

4.6.4.7 Digital catalogues

Figure 4.32: Ensure dynamic and flexible digital catalogue

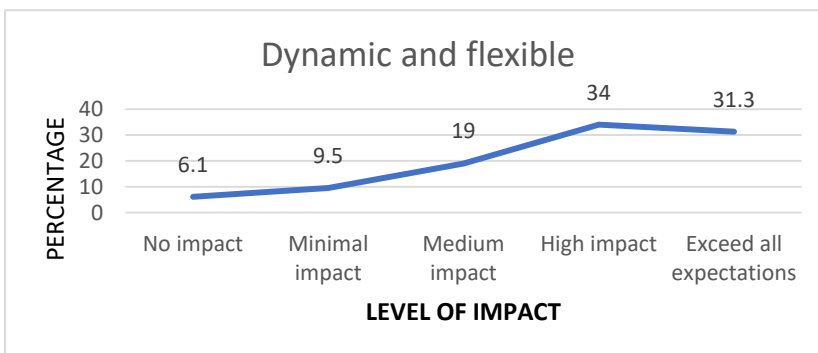


Figure 4.32 illustrate that 6.1% of businesses from 147 businesses don't receive impact when using e-business to ensure dynamic and flexible digital catalogue, while 9.5% of businesses receive minimal impact when using e-business to ensure dynamic and flexible digital catalogue, 19% of businesses receive medium impact when using e-business to ensure dynamic and flexible digital catalogue, 34% of businesses receive high impact when

using e-business to ensure dynamic and flexible digital catalogue and 31.3% of businesses receive impact that exceeds all expectations when using e-business to ensure dynamic and flexible digital catalogue.

It is therefore concluded that the majority of businesses in the study area experience high impact when using e-business to ensure dynamic and flexible digital catalogue, while minority of businesses in the study area don't experience impact when using e-business to ensure dynamic and flexible digital catalogue.

4.6.4.8 Customer queries

Figure 4.33: More attention to customers

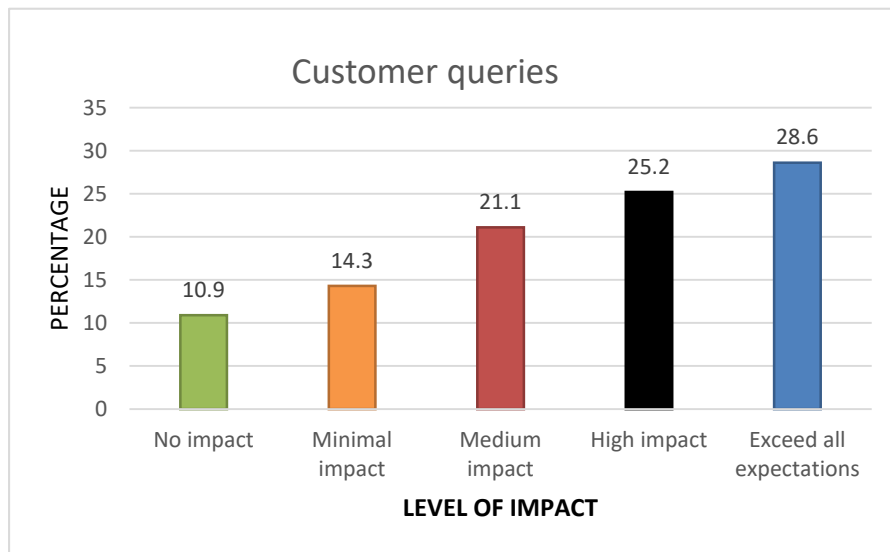


Figure 4.33 indicate that 10.9% of businesses from 147 businesses don't receive impact when using e-business to enable more attention to customer queries, while 14.3% of businesses receive minimal impact when using e-business to enable more attention to customer queries, 21.1% of businesses receive medium impact when using e-business to enable more attention to customer queries, 25.2% of businesses receive high impact when using e-business to enable more attention to customer queries and 28.6% of businesses receive impact that exceeds all expectations when using e-business to enable more attention to customer queries and problems.

It is therefore concluded that majority of businesses in the study area experience impact that exceeds all expectations when using e-business to enable more attention to customer queries and problems, while minority of businesses in the study area don't experience impact when using e-business to enable more attention to customer queries.

It is concluded that majority of businesses in the study area experience high impact on operations performance (such as consistency in the production of high quality, enhance productivity, fast and easy interaction among a firm and customers, Minimum cost of producing, present opportunities for interactive design of products, quick product and service delivery, dynamic and flexible digital catalogue) when utilising e-business, while some minority of businesses experience no impact and others experience minimum impact on operational performance when using e-business. It is therefore concluded that businesses experience high impact on operational performance when utilising e-business. The results concur with Caldwell *et al.* (2013: 692) on the fact that e-business have an impact on the operational performances of the business.

4.7 EASE OF IMPLEMENTING E-BUSINESS APPLICATIONS

The ease of implementing e-business applications is indicated and discussed below. The ease of implementing e-business applications is represented by ease of implementation database in framework for analysis (Figure 4.1) above. The ease of implementing database is in the seventh stage on the framework for analysis. The ease of implementing e-business applications database is the data that was collected from the businesses that operate within the study area.

Firstly, the tests of fitness of the data in the data base ease of use will be done.

4.7.1 Internal consistency

Table 4.26: Cronbach's alpha test

	Mean if Item Deleted	Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
Easy implementation of e-business applications	11.17	6.402	0.456	0.715
Quick to train staff	10.90	5.750	0.656	0.585
Ease of integration of e-business applications	10.95	7.120	0.521	0.675
Increase the use of e-applications in the next 3 years	11.15	6.950	0.475	0.697

Table 4.26 indicates the Cronbach's alpha test for ease of implementation. The Cronbach's alpha test for 4 items is 0.731, suggesting that there is relatively high internal consistency of the questions. Some of the ease of implementation of e-business applications (such as quick to train staff, ease of integration of e-business applications and increase the use of e-business of applications) have a Cronbach's Alpha test value that is below 0.7 and is accepted because the study is investigating the research questions, not testing the hypotheses.

4.7.2 Normality test for ease of implementation

Ease of implementation database in the framework is tested for normality through the Figures below. The normality analyses for ease of implementation will be presented and interpreted below. The Figures below are constructed through the sums of the data represented by ease of implementation database in the framework for analysis above.

Figure 4.34: Histogram with normal curve for ease of implementation

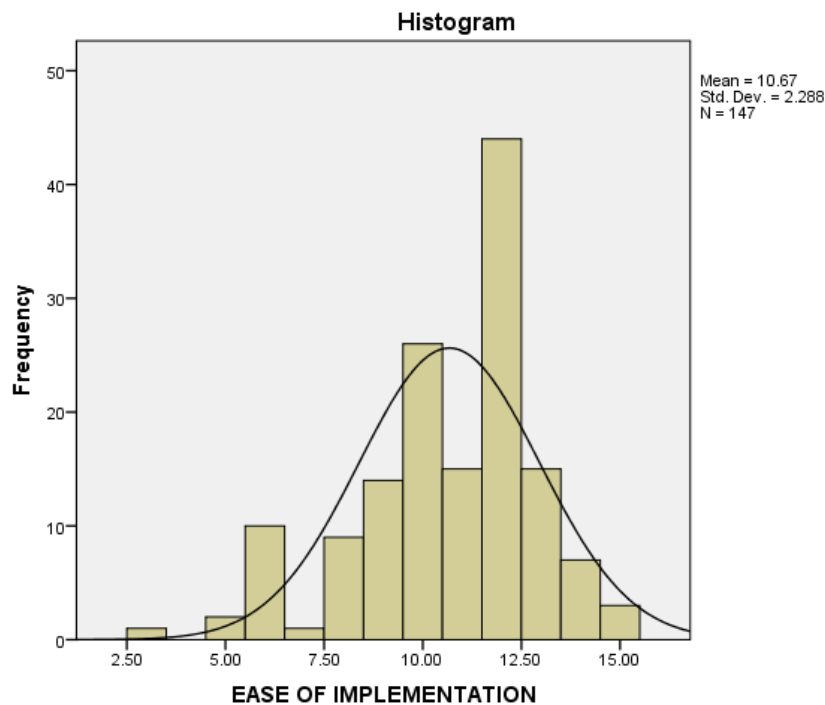


Figure 4.34 depicts a histogram and normal distribution curve. The Figure illustrates that data for ease of implementing e-business applications is normal. The normal distribution curve on the histogram clearly outlines the normality of ease of

implementation of e-business applications data.

Figure 4.35: Normal Q-Q Plot for ease of implementation

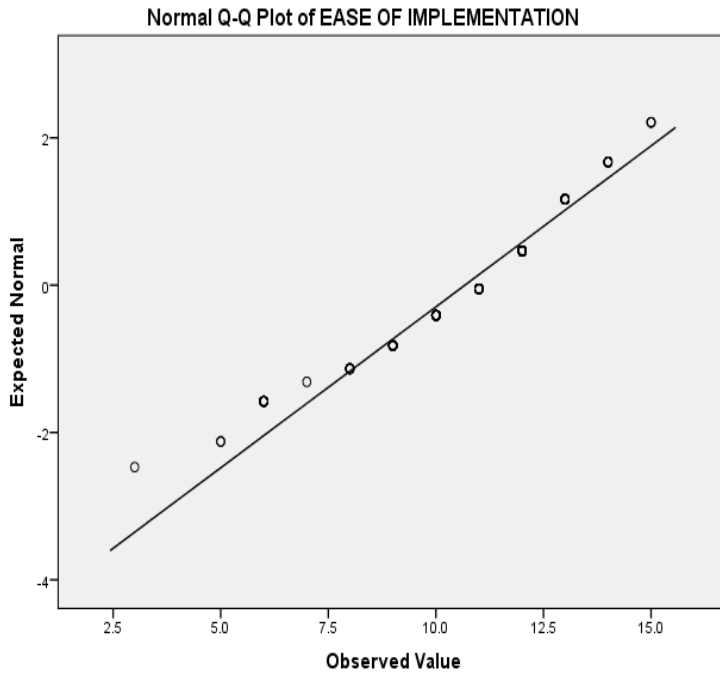


Figure 4.35 illustrates the normal Q-Q Plot. The figure depicts that ease of implementing e-business applications data is normally distributed, because the data points are close to the diagonal line. The figure further outlines that ease of implementing e-business applications data points roam around the line in a linear fashion.

Figure 4.36: Box Plot for ease of implementation

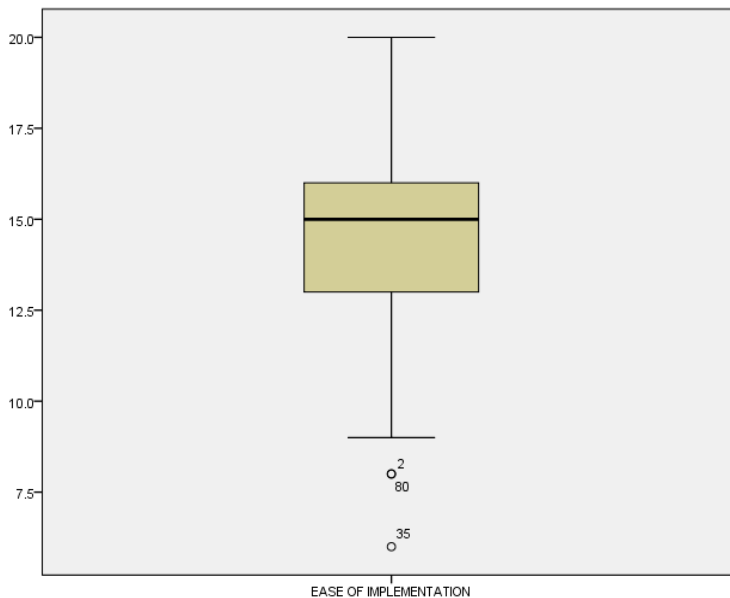


Figure 4.36 depicts the overall pattern of responses for businesses. The results of the figure outline that businesses hold different opinions about ease of implementing the e-business applications. The results further indicate that few businesses in the study area have diverse views on the ease of implementing e-business applications, while on some e-business applications they have similar views. The indication of the results is influenced by the fact that the data is skewed to the right.

4.7.3 Frequencies of ease of use

The analyses of ease of implementing e-business applications are presented in table 4.27 that indicates the frequency and percentage of the ease of use.

Table 4.27: Ease of implementation

	Easy implementation of e-business applications		Quick to train staff		Ease integration of e-business applications		Increase the use of e-applications in the next 3 years	
	Frequency	Percent	Frequency	Percent	Frequency	Percent	Frequency	Percent
Strongly Disagree	7	4.8	13	8.8	4	2.7	0	0
Disagree	7	4.8	21	14.3	10	6.8	7	4.8
Neutral	21	14.3	30	20.4	60	40.8	35	23.8
Agree	84	57.1	60	40.8	60	40.8	63	42.9
Strongly Agree	28	19.0	23	15.6	13	8.8	42	28.6
Total	147	100	147	100	147	100	147	100

Table 4.27 identifies the ease of implementing e-business applications. The table indicate the frequency and percentages of ease of implementing e-business applications. The percentages from the table above are used to develop the figures below.

4.7.4 Percentage of ease of use

Figure 4.37: Ease of implementing e-business applications

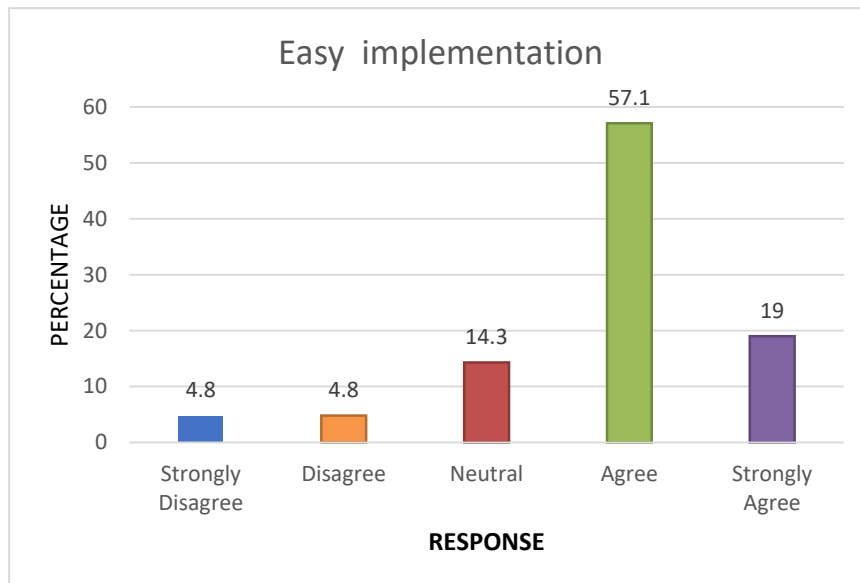
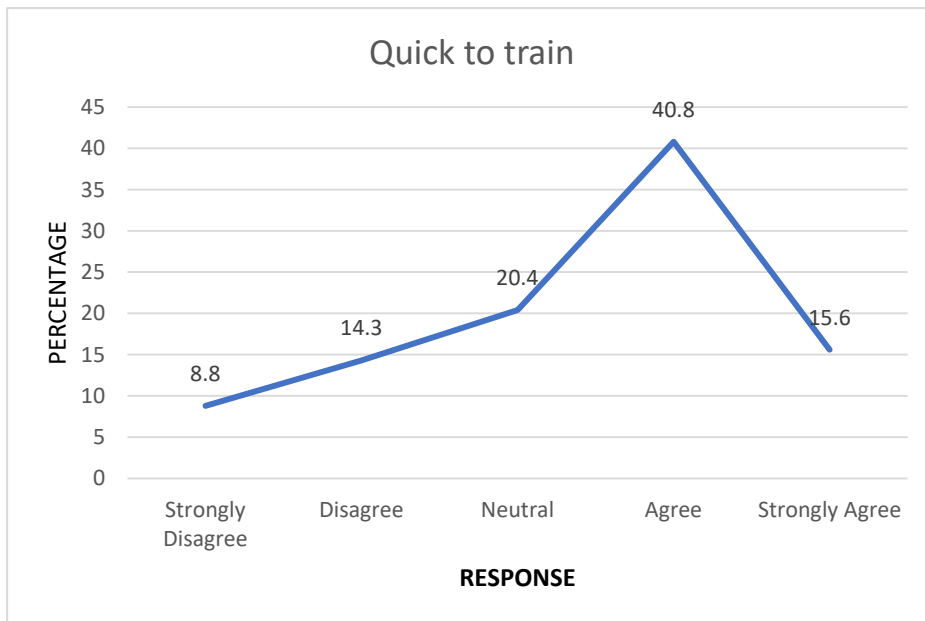


Figure 4.37 indicate the ease of implementing e-business applications. Figure 4.34 shows that 4.8% of businesses from 147 that participated strongly disagree on the fact that it is easy to implement e-business applications, 4.8 of businesses disagree on the fact that it is easy to implement e-business applications, 14.3% of businesses are neutral on the that it is easy to implement e-business applications, 57.1% of businesses agree that it is easy to implement e-business applications and 19% of businesses strongly agree that it is easy to implement e-business applications.

It is therefore concluded that the majority of businesses in the study area agree that it is easy to implement e-business applications, while minority of the businesses in the study area strongly disagree and that it is easy to implement e-business applications.

Figure 4.38: It is quick to train staff to use e-business applications



Results from Figure 4.38 also depict that 8.8% of businesses from 147 that participated strongly disagree on the fact that it is quick to train staff to use e-business applications, 14.3% of businesses disagree that it is quick to train staff to use e-business applications, 20.4% of businesses are neutral on the fact that it is quick to train staff to use e-business applications, 40.8% of businesses agree that it is quick to train staff to use e-business

applications and 15.6% of businesses strongly agree that it is quick to train staff to use e-business applications.

It is therefore concluded that the majority of businesses in the study area agree that it is quick to train staff to use e-business applications, while minority of businesses strongly disagree that it is quick to train staff to use e-business applications.

Figure 4.39: Ease integration of e-business applications

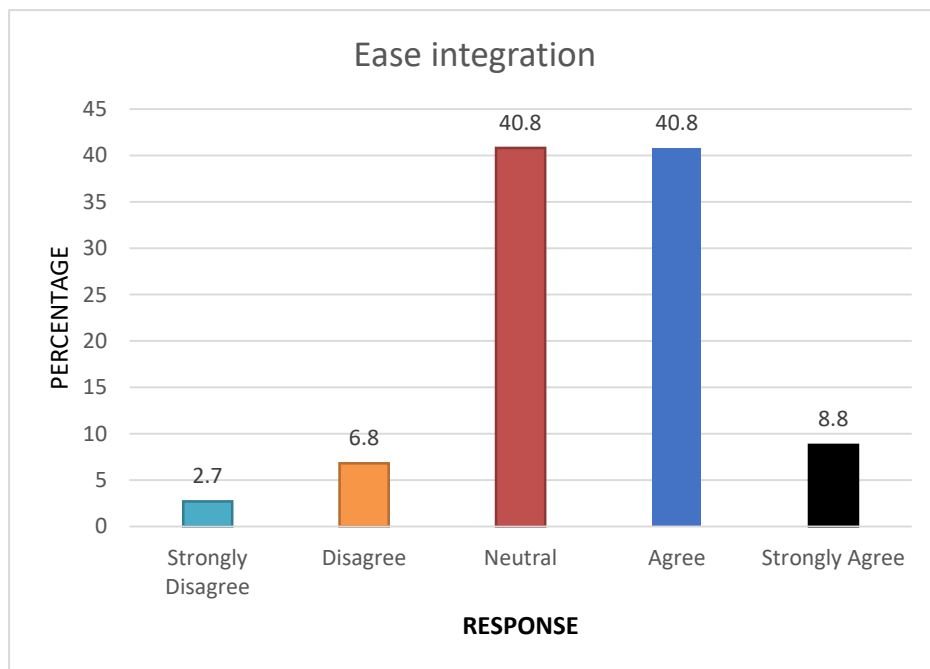


Figure 4.39 indicate that, out of 147 businesses that participated in the survey, 2.7% of businesses strongly disagree that it is easy to integrate e-business applications in a business, 6.8% of businesses disagree that it is easy to integrate e-business applications in a business, 40.8% businesses are neutral on the fact that it is easy to integrate e-business applications in a business, 40.8% of businesses agree that it is easy to integrate e-business applications in a business and 13 (8.8%) businesses strongly agree that it is easy to integrate e-business applications in a business.

It is therefore concluded that the majority of businesses agree that it is easy to integrate e-business applications in a business, while minority of businesses in the study area strongly disagree that it is easy to integrate e-business applications in a business.

Figure 4.40: Increase the use of e-business applications

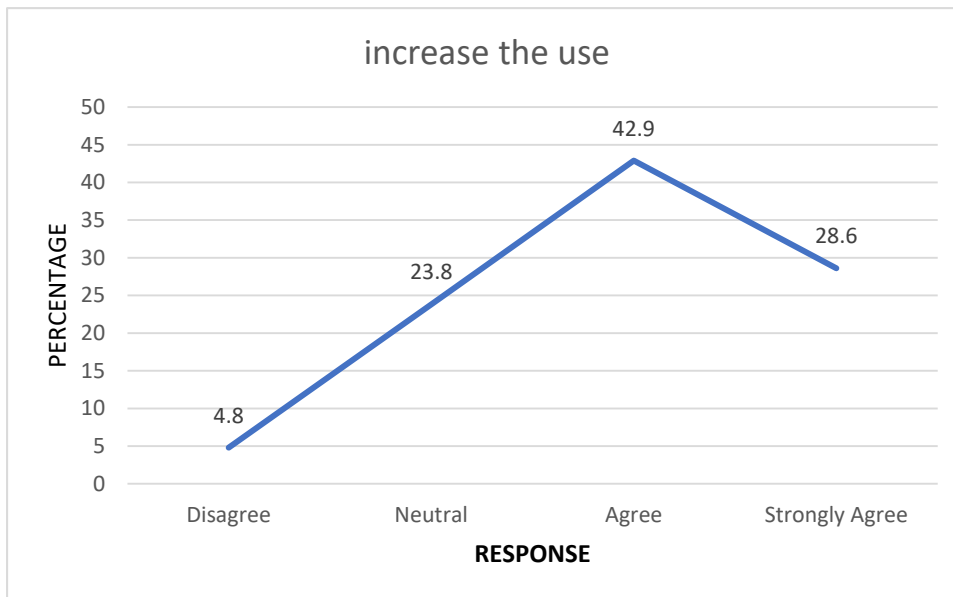


Figure 4.40 indicate as well that 4.8% of businesses from 147 businesses disagree to increase the use of e-business applications, 23.8% of businesses are neutral on increasing the use of e-business applications, 42.9% of businesses agree to increase the use of e-business applications while 28.6% of businesses strongly agree to increase the use of e-business applications.

It is therefore concluded that the majority of businesses in the study area agree to increase the use of e-business applications, while minority disagree to increase the use of e-business applications.

It is assumed that majority of businesses in the study agree with the fact that it is easy to implement e-business applications in the development of value proposition, while the minority of businesses strongly disagree. It is concluded that it is easy to implement the e-business applications in the business's operational performances of developing value propositions.

4.7.5 Assessing the association between ease of implementation and e-business applications

The correlation test is indicated by the table below and is utilised to outline if there is a relationship between the ease of implementation and the e-business applications that businesses utilise in the operational performances of developing value propositions.

Table 4.28: Correlation between ease of implementation and e-business applications

		EDI	E-OPERATIONS	E-SERVICES	E-SUPPLY CHAIN	E-LOGISTICS	E-PROCUREMENT	SOCIAL NETWORKS	E-PAYMENT	E-DESIGN	E-CATALOGUES
Easy implementation of e-business applications	Pearson Correlation	.261**	.167*	.184*	.366**	0.029	.241**	.153*	.393**	0.035	0.078
	Sig. (1-tailed)	0.001	0.021	0.013	0.000	0.364	0.002	0.032	0.000	0.339	0.173
Quick to train staff	Pearson Correlation	.141*	-0.086	0.019	.204**	0.126	0.030	0.111	.213**	.180*	0.035
	Sig. (1-tailed)	0.045	0.150	0.408	0.007	0.064	0.359	0.091	0.005	0.014	0.336
Ease integration of e-business applications	Pearson Correlation	0.130	0.080	0.123	.310**	.262**	.171*	0.077	0.011	0.134	.159*
	Sig. (1-tailed)	0.058	0.168	0.069	0.000	0.001	0.019	0.176	0.448	0.053	0.027
Increase the use of e-applications in the next 3 years	Pearson Correlation	0.004	0.041	0.079	0.040	-0.040	0.049	0.080	0.075	-0.061	-0.050
	Sig. (1-tailed)	0.480	0.313	0.171	0.315	0.316	0.279	0.167	0.183	0.233	0.275
N		147	147	147	147	147	147	147	147	147	147

Table 4.28 above illustrates the correlation between ease of implementation and e-business applications. The asterisks outline the level of association between variables. If a number has one asterisk indicates alpha at 0.05, two asterisks indicates alpha's at 0.01. These asterisks indicate that there is an association correlation when you used a one-sided test. One-tail test was used because it is assumed that there is a linear correlation. Table above is utilised to develop Table 4.29 below.

Table 4.29: Strength of association between ease of implementation and e-business applications

		EDI	E-OPERATIONS	E-SERVICES	E-SUPPLY CHAIN	E-LOGISTICS	E-PROCUREMENT	SOCIAL NETWORKS	E-PAYMENT	E-DESIGN	E-CATALOGUES
Easy implementation	Significant	Yes	No	Yes	Yes	No	Yes	Yes	Yes	No	No
	Strength of association	Low		Low	Medium		Low	Low	Medium		
Quick to train staff	Significant	Yes	Yes	No	Yes	Yes	No	Yes	Yes	Yes	No
	Strength of association	Low	Low		Low	Low		Low	Low	Low	
Ease integration	Significant	Yes	No	Yes	Yes	Yes	No	Yes	Yes	Yes	No
	Strength of association	Low		Low	Medium	Low		Low	Low	Low	
Increase the use of e-applications	Significant	No	No	No	No	No	No	No	No	No	No
	Strength of association										

Table 4.29 indicate the strength of association between ease of implementation and e-business applications. Table above shows that there a low association between ease of implementation and e-business applications (electronic data interchange, e-services, e-procurement and social networks). The table also indicate that there is a medium association between ease of implementation and e-business applications (e-supply chain and e-payment), while there is no association between ease of implementation and e-business applications (e-operations, e-logistics, e-design and e-catalogues).

The table shows that there is a low association between quick to train staff and e-business applications (electronic data interchange, e-operations, e-supply chain, e-logistics, social networks, e-payment and e-design). The table also indicate that there is no association between quick to train staff and e-business applications (e-services, e-procurement and e-catalogues).

The table as well indicate that there is a low association between ease integration and e-business applications (electronic data interchange, e-services, e-logistics, social networks,

e-payment and e-design). The table shows that there is a medium association between ease of integration and e-business application (e-supply chain), while there is no association between ease of integration and e-businesses applications (e-operation, e-procurement and e-catalogues).

It is concluded that there is a low association between ease of implementation of e-business applications and e-business applications that are used in the operational performances of developing value propositions. It is therefore concluded that there is a relationship between ease of implementation of e-business applications and some of the e-business applications. The study concurs with the findings of George and Kumar (2013: 627-628) and Jabeur *et al.* (2014: 1-2). According to George and Kumar (2013: 627-628) and Jabeur *et al.* (2014: 1-2) the ease of implementation of e-business applications has a positive relationship with the e-business applications.

4.8 USEFULNESS OF E-BUSINESS APPLICATIONS

The usefulness of e-business applications is indicated and discussed below. The usefulness of e-business applications is represented by the usefulness of e-business database in the framework for analysis (Figure 4.1) above. The usefulness of e-business applications database is the eighth stage on the framework for analysis. The usefulness of e-business applications database is the data that was collected from the businesses that operate within the study area (Limpopo Province).

Firstly, the tests of fitness of the data in the data base usefulness of implementing will be done.

4.8.1 Internal consistency

Table 4.30: Cronbach's Alpha test

	Mean if Item Deleted	Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
E-business applications are useful in a business	7.24	4.279	0.391	0.744
It's useful to have staff that can use e-business applications	7.52	2.525	0.584	0.539
Integrate e-applications in a business is useful	7.21	3.579	0.628	0.491

Table 4.30 indicates the Cronbach's alpha test for usefulness of implementing e-business applications. The Cronbach's alpha test for 3 items is 0.699, suggesting that there is relatively high internal consistency of the questions. Some of the usefulness of implementing e-business applications (such as its useful to have staff that can use e-business applications and integrate e-business of applications in a business is useful) have a Cronbach's Alpha test value that is below 0.7 and is accepted because the study is investigating the research questions, not testing the hypotheses.

4.8.2 Normality test for usefulness of implementation

Usefulness of implementing e-business applications database in the framework is tested for normality through the Figures below. The normality analyses for usefulness of implementing e-business applications will be presented and interpreted below. The Figures below are constructed from the sums of the data represented by usefulness of implementing e-business applications database in the framework for analysis above.

Figure 4.41: Histogram with normal curve for usefulness of implementation

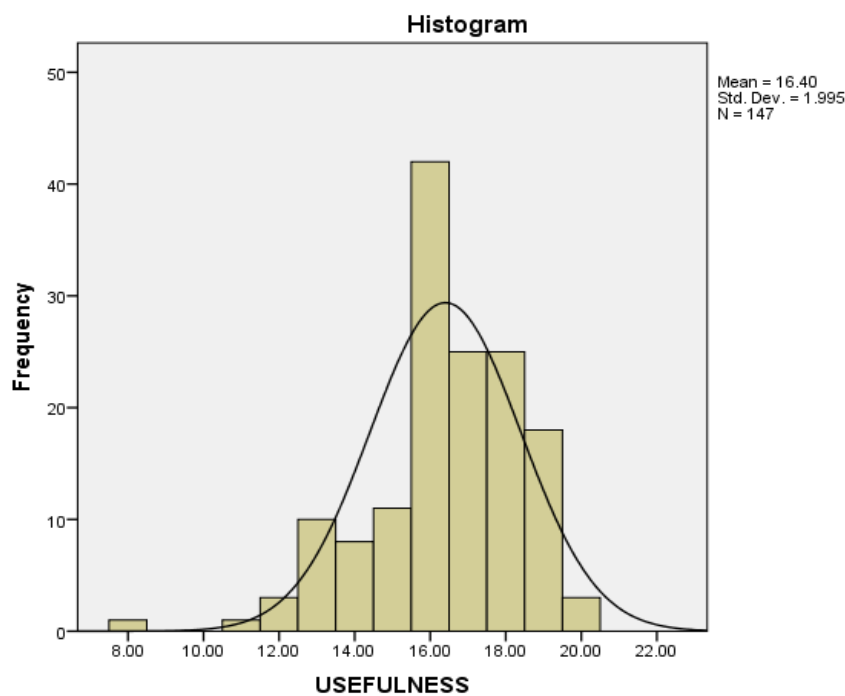
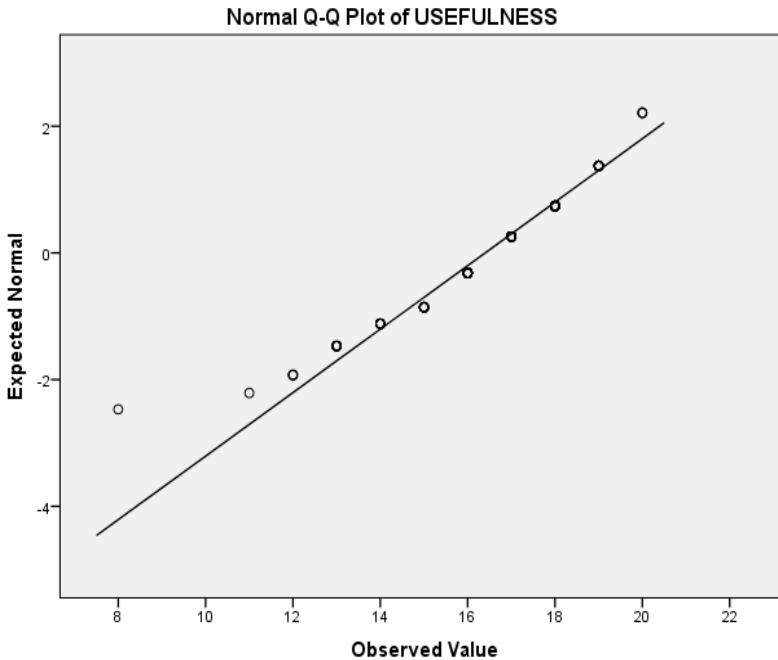


Figure 4.41 depicts a histogram and normal distribution curve. The figure illustrates that data for usefulness of implementing e-business applications is normal. The normal distribution curve on the histogram clearly outlines the normality of usefulness of implementing e-

business applications data.

Figure 4.42 below illustrates the normal Q-Q Plot. The figure depicts that usefulness of implementing e-business applications data is normally distributed, because the data points are close to the diagonal line.

Figure 4.42 Normal Q-Q Plot for usefulness of implementation



The figure further outlines that usefulness of implementing e-business applications data points roam around the line in a linear fashion.

Figure 4.43: Box Plot for usefulness of implementation

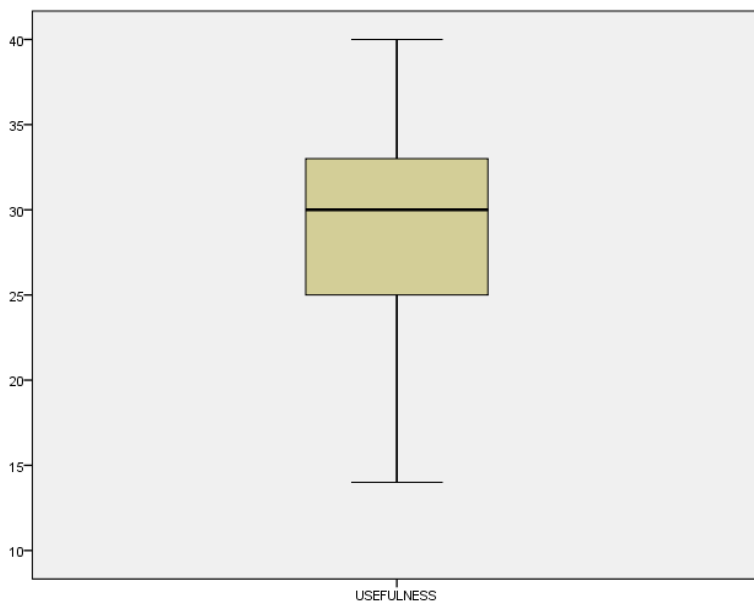


Figure 4.43 depicts the overall pattern of responses for businesses. The results of the figure outline that businesses hold different opinions about the usefulness of using e-business applications. The results further indicate that few businesses in the study area have diverse views on the usefulness of e-business applications, while on some e-

business applications they have similar views. The indication of the results is influenced by the fact that the data is skewed to the right.

4.8.3 Frequencies of usefulness of implementing e-business applications

The analyses of usefulness of e-business applications are presented in Table 4.31 that indicates the frequency and percentage of the usefulness.

Table 4.31: Usefulness of implementing e-business applications

	E-business applications are useful in a business		It's useful to have staff that can use e-applications		Integrate e-applications in a business is useful	
	Frequency	Percent	Frequency	Percent	Frequency	Percent
Disagree			2	1.4		
Neutral	19	12.9	12	8.2	28	19.0
Agree	87	59.2	86	58.5	70	47.6
Strongly Agree	41	27.9	47	32.0	49	33.3
Total	147	100	147	100	147	100

Table 4.31 identifies the usefulness of implementing e-business applications. The table indicate the frequency and percentages of all the usefulness of implementing e-business applications. The percentages from the table above are used to develop the figures below.

4.8.4 Percentage of usefulness of implementation

Figure 4.44: E-business applications are useful

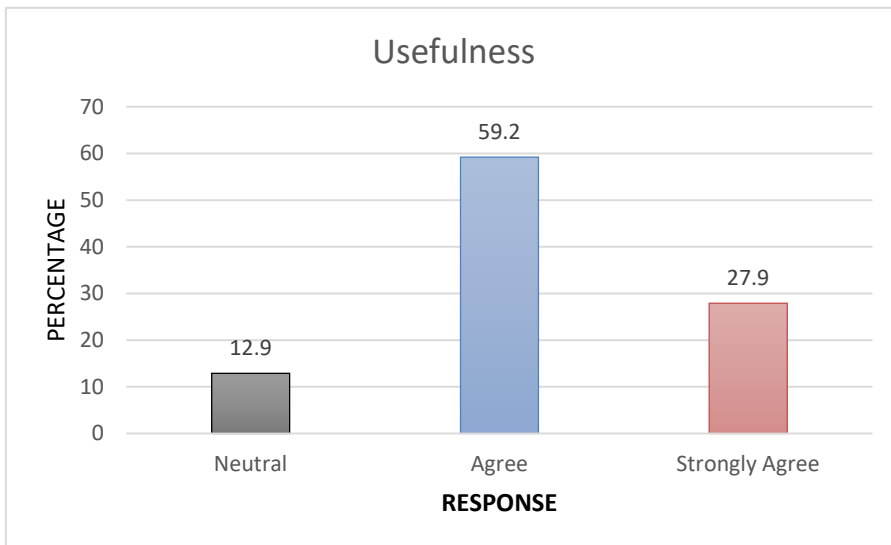
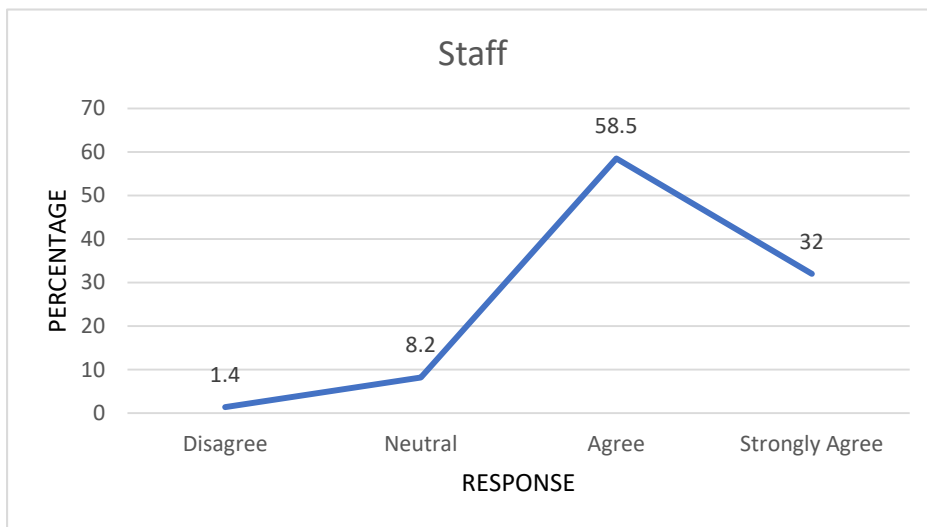


Figure 4.44 shows that 12.9% of businesses from 147 businesses are neutral on the fact that it is useful to implement e-business applications, 59.2% of businesses agree that it is useful to implement e-business applications and 27.9% of businesses strongly agree that it is useful to implement e-business applications in a business.

It is therefore concluded that the majority of the businesses in the study area agree that it is useful to implement e-business applications in a business, while minority of businesses in the study area are neutral on the fact that it is useful to implement e-business applications.

Figure 4.45: Staff that can use e-business applications



The results from Figure 4.45 shows that 1.4% of businesses from 147 that participated disagree on that it is useful to have staff that can use e-business applications, 8.2% of businesses are neutral on the fact that it is useful to have staff that can use e-business applications, 58.5% of businesses agree that it is useful to have staff that can use e-business applications and 32% of businesses strongly agree that it is useful to have staff that can use e-business applications.

It is therefore concluded that the majority of businesses in the study area agree that it is useful to have staff that can use e-business applications, while minority of businesses in the study area are neutral on the fact that it is useful to have e-business applications.

Figure 4.46: Integrate e-business applications

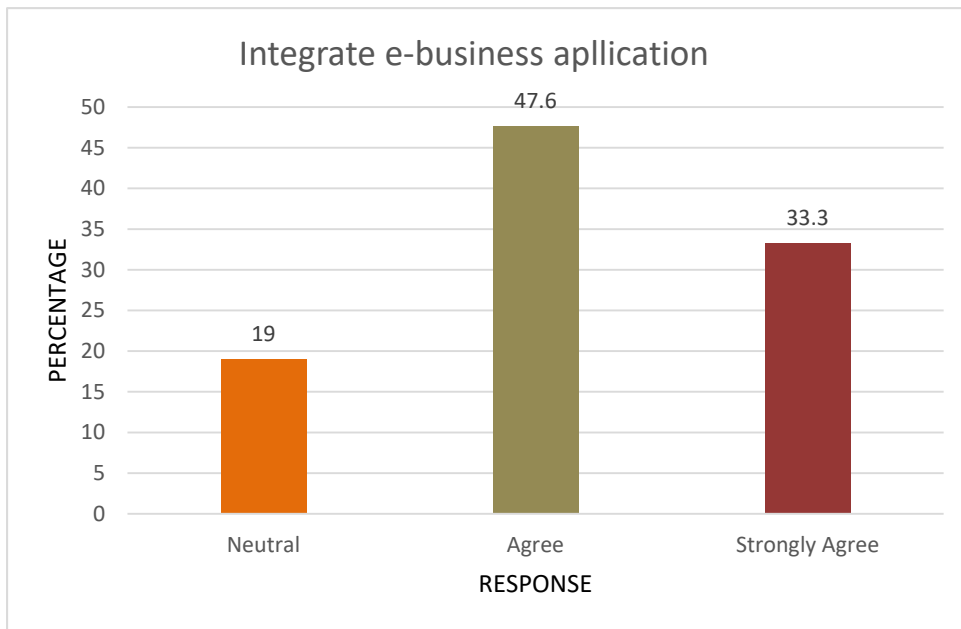


Figure 4.46 below indicate that 19% of businesses from 147 businesses that participated are neutral on the fact that it is useful to integrate e-business applications in a business, 47.6% of businesses agree that it is useful to integrate e-business applications in a business and 33.3% of businesses strongly agree that it is useful to integrate e-business applications in a business.

It is therefore concluded that the majority of businesses in the study area agree that it is useful to integrate e-business applications in a business, while minority of businesses are neutral on the fact that it is useful to integrate e-business applications in a business.

It is assumed that majority of businesses agree that it is useful to utilise e-business applications in a business, minority of businesses are neutral on the fact that it is useful to utilise e-business applications. It is therefore concluded that the utilisation of e-business applications is useful in a business's operations performances.

4.8.5 Assessing the association between usefulness of implementation and e-business applications

The correlation test is indicated by Table 4.32 below which outlines if there is a relationship between the usefulness of e-business applications and the benefits that businesses experience when utilising e-business applications and e-business applications that can be used in the operational performances of developing value propositions.

Table 4.32 indicates the correlation between the usefulness of implementation and e-business applications.

Table 4.32: Correlation between usefulness of implementation and e-business applications.

		EDI	E-OPERATIONS	E-SERVICES	E-SUPPLY CHAIN	E-LOGISTICS	E-PROCUREMENT	SOCIAL NETWORKS	E-PAYMENT	E-DESIGN	E-CATALOGUES
E-business applications are useful in a business	Pearson Correlation	.219**	0.058	0.104	.247**	.178*	0.136	-0.025	0.109	.281**	0.078
	Sig. (1-tailed)	0.004	0.243	0.107	0.001	0.016	0.051	0.384	0.096	0.000	0.176
It's useful to have staff that can use e-business applications	Pearson Correlation	0.123	-0.089	.160*	-0.047	-0.039	-0.081	-0.025	-0.126	.154*	-0.091
	Sig. (1-tailed)	0.069	0.142	0.026	0.288	0.320	0.164	0.382	0.064	0.031	0.136
Integrate e-applications in a business is useful	Pearson Correlation	.203**	0.127	.298**	.297**	.243**	.145*	0.011	.181*	.291**	.296**
	Sig. (1-tailed)	0.007	0.063	0.000	0.000	0.002	0.040	0.449	0.014	0.000	0.000
	N	147	147	147	147	147	147	147	147	147	147

The asterisks outline the level of association between variables. If a number has one asterisk indicates alpha at 0.05, two asterisks indicates alpha's at 0.01. These asterisks indicate that there is an association correlation when you used a one-sided test. One-tail test was used because it is assumed that there is a linear correlation. Table 4.32 above was utilised to construct table 4.33 below.

Table 4.33: Strength of association between usefulness of implementation and e-business applications

		EDI	E-OPERATIONS	E-SERVICES	E-SUPPLY CHAIN	E-LOGISTICS	E-PROCUREMENT	SOCIAL NETWORKS	E-PAYMENT	E-DESIGN	E-CATALOGUES
E-business applications are useful	Significant	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes	No
	Strength of association	Low	Low	Low	Low	Low	Low		Low	Low	
Useful to have staff	Significant	Yes	Yes	Yes	No	No	Yes	Yes	Yes	Yes	Yes
	Strength of association	Low	Low	Low			Low	Low	Low	Low	Low
Integrate e-applications	Significant	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes
	Strength of association	Low	Low	Low	Low	Low	Low		Low	Low	Low

Table 4.33 indicate the strength of association between usefulness of implementation and e-business applications. The table shows that there is low association between the usefulness of implementing e-applications and e-business applications (electronic data interchange, e-operations, e-services, e-supply chain, e-logistics, e-procurement, e-payment and e-design), while there is no association between usefulness of implementing e-applications and e-business applications (social networks and e-catalogues).

The table as well indicate that there is a low association between usefulness of having staff that can use e-applications and e-business applications (electronic data interchange, e-operations, e-services, e-procurement, social networks, e-payment, e-design and e-catalogues), while there is no association between usefulness of having staff that can use e-applications and e-business application (e-supply chain and e-logistics).

The table above further shows that there is a low association between integrate e-business application in a business and e-business applications (electronic data interchange, e-operations, e-services, e-procurement, e-supply chain, e-logistics, e-payment, e-design and

e-catalogues), while there is no association between integration of e-business applications in a business and e-business application (social network).

It is assumed that there is a low association between the usefulness of implementing e-business applications and e-business applications. It is therefore concluded that there is a relationship between the usefulness of implementing e-business applications and some of the e-business applications. The results concur with the findings of Wiengarten et al (2013: 25-26) and Caldwell *et al.* (2013: 691-692). According to Wiengarten *et al.* (2013: 25-26) and Caldwell *et al.* (2013: 691-692) there is a positive state of connectedness between the e-business applications and the usefulness of implementing e-business applications.

4.9. THE RELATIONSHIP BETWEEN THE USE OF E-BUSINESS APPLICATIONS AND THE OPERATIONAL PERFORMANCE OF THE VALUE PROPOSITIONS

The relationship between the use of e-business applications and the operational performance of the value propositions is indicated and discussed below. The relationship between the use of e-business applications and the operational performance of the value propositions is represented by the relationship between the use of e-business applications and the operational performance of the value propositions in the framework for analysis (Figure 4.1) above. The relationship between the use of e-business applications and the operational performance of the value propositions is the ninth stage on the framework for analysis. The relationship between the use of e-business applications and the operational performance of the value propositions is the gap between e-business applications and operational performance. The analyses of the relationship are presented in Table 4.34.

4.9.1. Assessing the association e-business applications and operational performance

The correlation test is indicated by Table 4.34 below outlines if there is a relationship between the e-business applications and operational performances of developing value propositions.

Table 4.34: Relationship between e-applications and operational performance

		EDI	E-OPERATIONS	E-SERVICES	E-SUPPLY CHAIN	E-LOGISTICS	E-PROCUREMENT	SOCIAL NETWORKS	E-PAYMENT	E-DESIGN	E-CATALOGUES
Consistency in the production of high quality products and services	Pearson Correlation	.275**	0.125	.185*	.173*	.267**	.343**	.205**	.276**	.397**	.359**
	Sig. (1-tailed)	0.000	0.065	0.013	0.018	0.001	0.000	0.006	0.000	0.000	0.000
Enhance productivity	Pearson Correlation	.368**	.377**	.258**	.315**	0.119	.361**	.264**	.174*	.283**	.401**
	Sig. (1-tailed)	0.000	0.000	0.001	0.000	0.076	0.000	0.001	0.018	0.000	0.000
Fast and easy interaction among a firm and its potential and current customers	Pearson Correlation	.398**	.478**	.174*	.404**	.303**	.165*	0.103	.298**	.153*	.385**
	Sig. (1-tailed)	0.000	0.000	0.018	0.000	0.000	0.023	0.107	0.000	0.032	0.000
Minimum cost of producing and delivering products and services	Pearson Correlation	.228**	.354**	.243**	.147*	.257**	.142*	0.097	0.069	0.107	.366**
	Sig. (1-tailed)	0.003	0.000	0.002	0.038	0.001	0.043	0.121	0.204	0.099	0.000
Present opportunities for interactive design of products	Pearson Correlation	.339**	.274**	.326**	.351**	.494**	.172*	.231**	0.096	.536**	.659**
	Sig. (1-tailed)	0.000	0.000	0.000	0.000	0.000	0.018	0.002	0.125	0.000	0.000
Quick products and service delivery	Pearson Correlation	.344**	.410**	.250**	.316**	.179*	.328**	0.059	0.116	.168*	.285**
	Sig. (1-tailed)	0.000	0.000	0.001	0.000	0.015	0.000	0.238	0.080	0.021	0.000
Ensure dynamic and flexible digital catalogue	Pearson Correlation	.189*	0.117	.205**	0.134	.224**	0.068	0.073	.236**	.224**	.537**
	Sig. (1-tailed)	0.011	0.079	0.006	0.053	0.003	0.208	0.190	0.002	0.003	0.000
More attention to customer queries and problems	Pearson Correlation	.272**	.373**	0.134	.410**	.208**	.199**	.226**	0.071	0.129	.298**
	Sig. (1-tailed)	0.000	0.000	0.053	0.000	0.006	0.008	0.003	0.196	0.060	0.000
	N	147	147	147	147	147	147	147	147	147	147

Table 4.34 illustrates the relationship between the use of e-business applications and the operational performances of value propositions. The asterisks outline the level of association between variables. If a number has one asterisk indicates alpha at 0.05, two asterisks indicates alpha at 0.01. These asterisks indicate that there is an association correlation when you used a one-sided test. One tail test was used because it is assumed that there is a linear correlation. The table above was utilised to develop Table 4.35 below.

Table 4.35: Strength of association between usefulness of e-applications and operational performances

		EDI	E-OPERATIONS	E-SERVICES	E-SUPPLY CHAIN	E-LOGISTICS	E-PROCUREMENT	SOCIAL NETWORKS	E-PAYMENT	E-DESIGN	E-CATALOGUES
Consistency in the production of high quality products and services	Significant	Yes	Yes	Yes	Yes	Yes	YES	Yes	YES	Yes	Yes
	Strength of association	Low	Low	Low	Low	Low	Medium	Low	Low	Medium	Medium
Enhance productivity	Significant	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
	Strength of association	Medium	Medium	Low	Medium	Low	Medium	Low	Low	Low	Medium
Fast and easy interaction among a firm and its potential and current customers	Significant	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
	Strength of association	Medium	Medium	Low	Medium	Medium	Low	Low	Low	Low	Medium
Minimum cost of producing and delivering products and services	Significant	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
	Strength of association	Low	Medium	Low	Low	Low	Low	Low	Low	Low	Medium
Present opportunities for interactive design of products	Significant	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
	Strength of association	Medium	Low	Medium	Medium	Medium	Low	Low	Low	Large	Large
Quick products and service delivery	Significant	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes
	Strength of association	Medium	Medium	Low	Medium	Low	Medium		Low	Low	Low
Ensure dynamic and flexible digital catalogue	Significant	Yes	Yes	Yes	Yes	Yes	No	No	Yes	Yes	Yes
	Strength of association	Low	Low	Low	Low	Low			Low	Low	Large
More attention to customer queries and problems	Significant	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes
	Strength of association	Low	Medium	Low	Medium	Low	Low	Low		Low	Low

Table 4.35 indicate the strength of association between e-business applications and operational performances. The table indicate that there is a low association between consistency in production and e-business applications (electronic data interchange, e-operations, e-services, e-supply chain, e-logistics, Social networks and Payment), while there is a medium association between consistency in production and e-business applications (e-procurement, e-design and e-catalogues).

The table of results shows that there is a low association between enhance productivity and e-business applications (e-services, e-logistics, Social networks, e-Payment and e-design), while there is a medium association between enhance productivity and e-business applications (electronic data interchange, e-operations, e-supply chain, e-procurement and e-catalogues).

Table 4.35 shows that there is a low association between fast, easy interaction among a firm with its customers and e-business applications (e-services, e-procurement, e-payment, e-design and social networks), while there is a medium association between fast, easy interaction among a firm with its customers and e-business applications electronic data interchange, e-operations, e-supply chain, e-logistics and e-catalogues).

The table of results indicate that there is a low association between minimum cost of producing, delivering products and e-business applications (electronic data interchange, e-services, e-supply chain, e-logistics, e-procurement, social networks, e-payment and e-design), while there is a medium association between minimum cost of producing, delivering products and e-business applications (e-operations and e-catalogues).

The results also show that there is a low association between present opportunities for interactive design and e-business applications (e-operations, e-procurement, social networks and e-payment). There is a medium association between present opportunities for interactive design and e-business applications (electronic data interchange, e-services, e-supply chain and e-logistics). There also a large association between present opportunities for interactive design and e-business applications (e-design and e-catalogues).

Results indicate that there is a low association between quick product delivery and e-business applications (e-services, e-logistics, e-payment, e-design and e-catalogues). There is medium association between quick product delivery and e-business applications (electronic data interchange, e-operations, e-supply chain and e-procurement), while there is no association between quick product delivery and e-business application (social network).

There is a low association between ensure dynamic, flexible digital catalogue and e-business applications (electronic data interchange, e-operations, e-services, e-supply chain, e-logistics, e-payment and e-design). There is a large association between ensure dynamic, flexible digital catalogue and e-business application (e-catalogues), while there is no association between ensure dynamic, flexible digital catalogue and e-business applications (e-procurement and social network).

The table above further indicate that there is a low association between more attention to customer problems and e-business applications (electronic data interchange, e-services, e-logistics, e-procurement, social networks, e-design and e-catalogues). There is a medium association between more attention to customer problems and e-business applications (e-operations and e-supply chain), while there is no association between more attention to customer problems and e-business application (e-payment).

It is assumed that there is a low association between the use e-business applications and the operational performance of developing value propositions. It is therefore concluded that there is a relationship between the use of e-business applications and the operational performances of value propositions. The results of the study further concur with Wiengarten *et al.* (2013: 26), Caldwell *et al.* (2013: 692), Adzroe and Ingirige (2013: 1-2), George and Kumar (2013: 627-628), Jabeur *et al.* (2014: 1-2), Al-Washah *et al.* (2013: 142-143), and Allahawiah *et al.* (2010: 85) on the fact that there is a relationship between the use of e-business applications and the operational performance of value propositions. According to Wiengarten *et al.* (2013: 26), Caldwell *et al.* (2013: 692), Adzroe and Ingirige (2013: 1-2), George and Kumar (2013: 627-628), Jabeur *et al.* (2014: 1-2), Al-Washah *et al.* (2013:

142-143), and Allahawiah *et al.* (2010: 85) the use of e-business applications results in an improved business operational performance of value propositions.

4.10. SUMMARY

This chapter revealed that businesses make use of e-business applications such as electronic data interchange, e-services, e-supply chain, e-procurement, e-logistics, e-operations, social networks, e-design and e-payment. The chapter revealed the measure of using e-business applications. The chapter also reveals that businesses experience several benefits when utilising e-business in their operational processes of developing value propositions. In addition, this chapter also indicate that e-business applications when used in a business have a high impact on a business's operational performance of developing value propositions. The chapter further reveal that e-business applications are easy and useful to implement in a business. Lastly the chapter indicated that there is a relationship between the use of e-business applications and the operational performance of the value propositions. The final state of the framework (Figure 4.1) will be discussed in the next chapter.

CHAPTER FIVE

SUMMARY OF KEY FINDINGS, CONCLUSIONS AND RECOMMENDATIONS

5.1 INTRODUCTION

This chapter concludes the study that was undertaken to investigate the efficiency and effectiveness of e-business applications when used for the creation and delivering of value propositions at the operational level of the organisation. In this chapter, the conclusions and recommendations will be discussed. In conclusion, the lessons learnt and the areas for further research are also discussed.

5.2. E-BUSINESS APPLICATIONS THAT CAN BE USED IN THE DEVELOPMENT OF NEW VALUE PROPOSITIONS

5.2.1. Summary of key findings

The results of this study indicate that:

Businesses make use of e-business application in the development of new value propositions.

Electronic data interchange, e-services, e-supply chain, e-operations, social networks, e-catalogues, e-logistics and e-procurement are the e-business applications that are regularly utilised by businesses within the study area when developing new value propositions.

Businesses experience several benefits when utilising e-business in their operational processes of developing value propositions.

Business applications have a high impact on the operational performance of value propositions.

E-business applications are easy and useful to implement in a business.

There is a relationship between the use of e-business applications and the operational performance of the value propositions.

5.2.2 Conclusions

Businesses in the study area make use of e-business applications in their operational performance of creating and delivering value propositions. The following e-business applications are mostly used by the majority of businesses: electronic data interchange, e-operations, e-services, e-supply chain, e-logistics, social networks, e-procurement and e-catalogues. The results further illustrate that the majority of businesses that operate in the study area do not make use of e-design(customisation) in the operational performance of developing and delivering value propositions, because businesses in the study area are subdivisions of large businesses. Businesses in the study mostly utilise e-business applications as indicated in the previous chapter.

In conclusion, the study clearly outlined the e-business applications that businesses utilise in the development of new value propositions. Businesses use various e-business applications to formulate and deliver new value propositions and this answers the research question and achieves the objectives.

5.2.3. Recommendations

Businesses need to utilise e-business applications such as electronic data interchange, e-services, e-operation, e-procurement, e-logistics, social networks, customisation, e-supply chain, e-payment and e-catalogue to create and deliver value propositions. All kinds of business need to use e-business applications in the operations performance of value propositions in order to be able to survive in the ever-changing operation environment. Businesses need to utilise e-design, because it will enable them to be able to produce novel value propositions to their customers.

Since it was concluded that business applications have a high impact on the operational performance of value propositions, the use of e-business applications in the development of new value propositions may assist that the process is efficient and effective. Businesses need to take into consideration the use of e-business applications in their operational processes of developing value propositions to improve their competitiveness as compared to their existing competitors.

Businesses need to consider the use of e-business applications (like e-service, e-operations and e-procurement) to develop new value propositions that will be of high quality and achieve customers' expectations. Businesses must use e-business applications in order to improve their operational performances in order to perform better in their environment of operations. Businesses must utilise the e-business applications, so that they are able to offer various quality products and services.

5.3 BENEFITS THAT THE USE OF E-BUSINESS APPLICATIONS OFFER TO BUSINESSES

5.3.2 Summary of key findings

Businesses within the study area experience various benefits when utilising e-business applications that are outlined above in their operations process of developing value proposition. The results outline that businesses experience benefits such as, high quality services, quick in rendering services, enable access to worldwide markets, enable quicker retailing response, lower marketing costs and enable re-engineering business processes.

5.3.2 Conclusions

Businesses when making use of e-business applications, they allow them (businesses) to advertise many products at the same time. Businesses experience numerous benefits like, allowing businesses to make quicker decisions, allowing businesses to add extra services to a product at little cost, allowing businesses to have unique products and services, ensuring direct communication between the business and its stakeholders, enabling businesses to have online stores and enabling businesses to retain customers.

In conclusion, businesses that use e-business applications are provided with many benefits that also make the businesses to improve their operational processes. The use of e-business applications brings benefits that enable growth and development in businesses' every day-to-day operation. These benefits that the use of e-business applications offer to businesses are determinants to answer the research question and achieve the objectives.

5.3.3 Recommendations

Businesses need to consider e-business applications so that they can experience benefits that can enable them to change their way of doing business. Businesses need to utilise e-business applications so that they are able to access worldwide markets to grow their market shares.

Businesses must really consider the utilisation of e-business applications so that they can allow them to add extra services to a product at a little cost, so that they can offer products that will provide and exceed customers' expectations. Businesses need to utilise e-business applications in their operational processes so that they can enable themselves to have unique products when compared to those of their competitors. Customers are crucial for a business, so businesses must make sure that they use e-business applications to smooth interaction between the business and its customers. The government and businesses must utilise e-business applications so that they can enable them to be accessible at all times.

Businesses need to adopt e-business applications in order to experience the benefit of minimum cost of production, so that they are able to produce value propositions that they offer to their customers. Businesses must make sure that they use e-business applications so that they are able to retain their customers in order for them to keep on earning revenue.

5.4 THE RELATIONSHIP BETWEEN USE OF E-BUSINESS APPLICATIONS AND THE OPERATIONAL PERFORMANCES OF VALUE PROPOSITIONS

5.4.1 Summary of key findings

The results outline that there is a low association between the use e-business applications and the operational performance of developing value propositions. The results articulate that the is a relationship between the utilisation of e-business applications with operational performances of value propositions.

5.4.2 Conclusion

In conclusion, there is a relationship between the use of e-business applications and operational performances of value propositions. According to the results, the use of e-business applications has a relationship with operational performances of value

propositions. The relationship was determined to answer the research question and achieve the objectives.

5.4.2 Recommendations

Business's survival and success in their environment of operation depend on its operational performances. Businesses need to consider the utilisation of e-business applications in their operational performances because the existing relationship between e-business applications and operations performance of value proposition will benefit their business. Businesses need to use e-business applications due to the fact that the relationship between these e-business applications and operational performances of value propositions show that e-business applications are crucial in the improvement of business operations. Businesses need to make use of e-business applications in the operational performance of value propositions because the relationship that exists between e-business applications and operational performances demonstrate that the use of e-business applications lead to improvement of the efficient and effectiveness of operational performance of value propositions.

5.5. INTEGRATED CONCLUSION AND RECOMMENDATIONS ON THE IMPACT OF E-BUSINESS APPLICATIONS ON THE OPERATIONAL PERFORMANCE OF BUSINESSES IN THE LIMPOPO PROVINCE

In conclusion, businesses need to improve their operational performance in order to keep-up with changes and challenges they encounter in their business environment. To do so, they need to make use of e-business applications in the operational performances of value propositions. Those e-business applications are clearly outlined in chapter four of this research study. The use of these e-business applications provides a number of benefits that improve or develop the operational performance of the organisation as it is portrayed in chapter 4.

It is advisable for all businesses to use e-business applications so that they can better their efficiency and effectiveness of creating and delivering value propositions. This will lead to growth and development in the country's (South Africa) economy.

5.6 AREAS FOR FURTHER STUDY

This study that can be expanded for research by examining the efficiency and effectiveness of e-business applications in producing digital products. Another study can investigate the usefulness of e-design. A third study can examine if the use of e-business applications leads to increase in revenue.

5.7 CONCLUSION

This study was conducted to investigate efficiency and effectiveness of e-business applications when used for the creation and delivering of value propositions. This was done through identifying e-business applications that businesses can use in the development of new value propositions, benefits that the use of e-business applications offer to businesses, and determining the relationship between use of e-business applications and the operational performances of value propositions. The study achieved its objective, because it was able to outline the e-business applications, the benefits and the relationship between the use of e-business applications and operational performances of value propositions. The research study also provided the necessary recommendations to the businesses in the business world.

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APPENDIX

APPENDIX A: Questionnaire

My name is Nape Frances Ledwaba, a student from the University of Limpopo. I am conducting a business research project on the effect of E-business on the operational performance of businesses. This questionnaire is for academic purposes only and confidentiality will be highly maintained. As a respondent, you are not duty-bound to disclose your name. We are humbly requesting you to assist us by answering the following set of questions which will take only 5 minutes of your time.

Please answer by marking (X) in the correct box.

Questionnaire

Section A: Biographical information

1. In which sector is your business? (e.g. Retail, service, Manufacturing, Local-, Provincial government, etc)

Answer

2. How long has your business been running?

0-4 years	5-9 years	10-14 years	15-19 years	20years & above
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3. What is the number of employees in the business?

0-10	11-20	21-40	41-100	101 & above
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Section B: Benefits of using E-business applications

On sections (B) answer YES or NO. Use X to answer.

No	When using E-business applications my firm has benefitted as the applications	YES	NO
1.	Allow firms to advertise many products at the same time.		
2.	Allow access to South African markets.		
3.	Allow firms to make quicker decisions.		
4.	Enable a firm to produce digital goods.		
5.	Allow a firm to add extra services to a product at little cost		
6.	Allow firms to have unique products and services		
7.	Ensured direct communication between the business and its stakeholders		
8.	Enable firm to have an online store		
9.	Allow firm to retain customers		

Section C: Measuring the frequency of using E-business applications

On section (C) answer by making an X on a scale of 1 to 5 as indicated below

No.	State how often does your firm use the following applications	Never	Yearly	Monthly	Weekly	Daily
1.	Electronic data interchange (EDI) to transfer massive amounts of information					
2.	Operations management software programmes to manage the processes of fulfilling customer needs					
3.	Services management software programmes to offer online range of services					
4.	Supply chain software programmes to integrate the operations of the firm and those of its main partners					
5.	Logistics software programmes to provide efficient transport and storage of products					
6.	Procurement software programmes to enable the process of providing products and services					
7.	Social networks such as Facebook to promote products and services offered					
8.	Payment software programmes to enable financial exchange that occur online					
9.	Customisation software programmes to enable custom-made products with low units' costs associated with mass production					
10.	Computerised catalogues to advertise my products and services					

Section D: Operational performance measures

On section (D) answer by making an X on a scale of 1 to 5 as indicated below

	Statement	No impact	Minimal impact	Medium impact	High impact	Exceed all expectations
No.	The use of e-business applications in my business:	1	2	3	4	5
1.	Provided consistency in the production of high quality products and services.					
2.	Enhance productivity					
3.	Enable fast and easy interaction among a firm and its potential and current customers.					
4.	Ensure minimum cost of producing and delivering products and services.					
5.	Present opportunities for interactive design of products					
6.	Enable acceleration in products and service delivery by a firm					
7.	Ensure dynamic and flexible digital catalogue					
8.	More attention to customers queries and problems					

Section E: Ease of Implementation

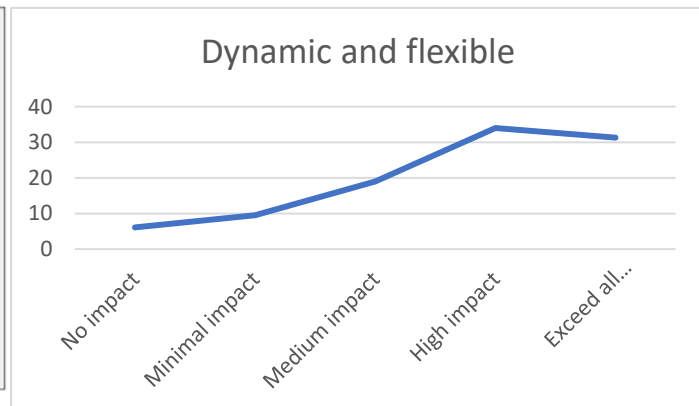
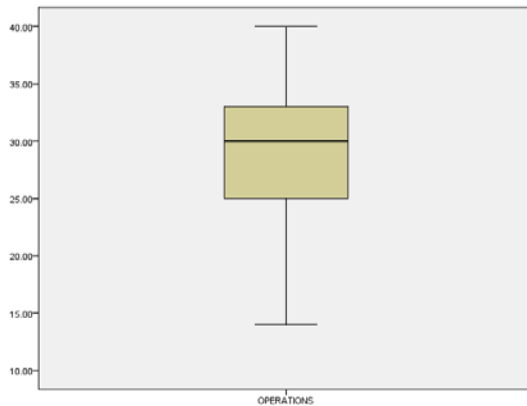
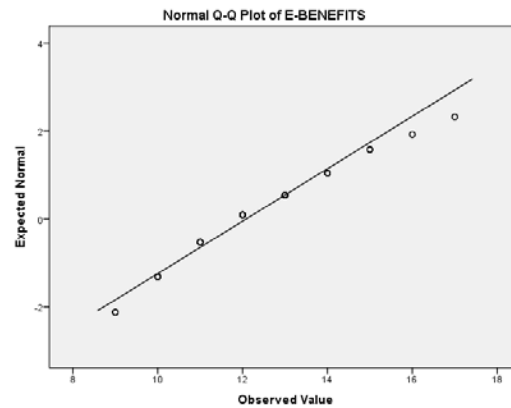
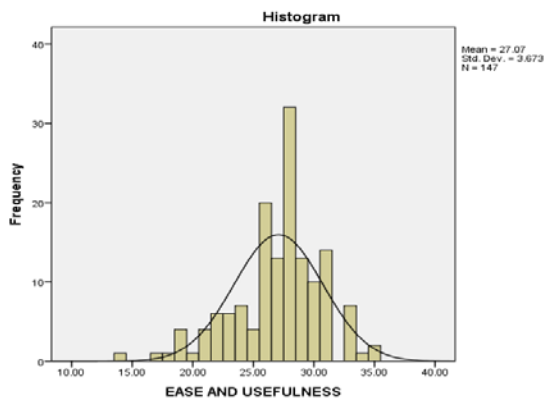
On section (E) answer by making an X on a scale of 1 to 5 as indicated below

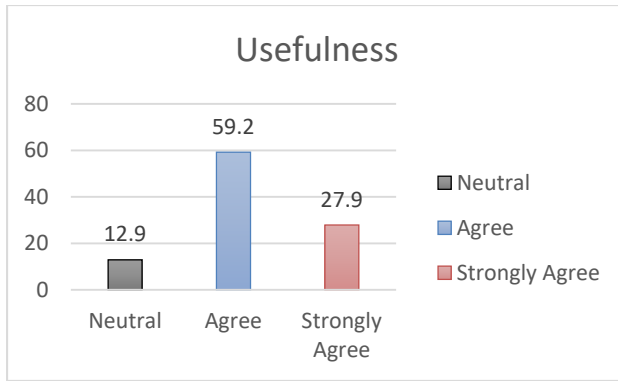
	statement	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
1.	E –technology applications can be easily implemented in my business					
2.	It will be quick to train my staff to use e-applications					
3.	It is easy to integrate e-applications in my business					
4.	I intend to increase the use of e-applications in my business in the next 3 years					
5.	E –technology applications are useful in my business					
6.	It is useful to have staff that can utilise e-applications					
7.	To Integrate e-applications in a business is useful.					

.....**THANK YOU**.....

APPENDIX B: Outputs from SPSS

BUSINESS SECTOR			
		Frequency	Percent
Valid	Service Provider	91	61.9
	Manufacturing	21	14.3
	Hospitality	17	11.6
	Government	14	9.5
	Academic	4	2.7
	Total	147	100.0





	Mean if Item Deleted	Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
Easy implementation of e-business applications	11.17	6.402	0.456	0.715
Quick to train staff	10.90	5.750	0.656	0.585
Ease of integration of e-business applications	10.95	7.120	0.521	0.675
Increase the use of e-applications in the next 3 years	11.15	6.950	0.475	0.697

		EDI	E-OPERATIONS	E-SERVICES	E-SUPPLY CHAIN	E-LOGISTICS	E-PROCUREMENT	SOCIAL NETWORKS	E-PAYMENT	E-DESIGN	E-CATALOGUES
Years in business	Significant	Yes	Yes	Yes	No	No	No	Yes	Yes	No	No
	Strength of association	Medium	Low	Medium				Low	Low		

		EDI	E-OPERATIONS	E-SERVICES	E-SUPPLY CHAIN	E-LOGISTICS	E-PROCUREMENT	SOCIAL NETWORKS	E-PAYMENT	E-DESIGN	E-CATALOGUES
Years in business	Correlation	0.325	0.128	0.301	0.075	0.069	0.083	-0.204	0.154	0.003	0.021
	Sig. (2-tailed)	0.000	0.123	0.000	0.364	0.407	0.316	0.013	0.063	0.967	0.804
	N	147	147	147	147	147	147	147	147	147	147

N J Nel
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CERTIFICATE

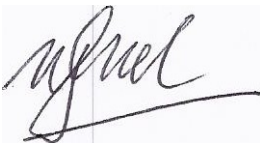
This serves to certify that I have language edited the Dissertation of

Mr. Nape Frances Ledwaba,

Student number: **201217507**

entitled:

***“THE IMPACT OF E-BUSINESS APPLICATIONS ON THE OPERATIONAL
PERFORMANCE OF BUSINESSES IN THE LIMPOPO PROVINCE”***

A handwritten signature in black ink, appearing to read 'NJ Nel', is placed over a light grey rectangular background.

N J Nel

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Tshwane University of Technology
(Retired)

4 / 12/ 2017