

The Use and Benefits of E-Technology Business Applications

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Abstract: The paper investigates the use of and resultant benefits of e-business applications within the Capricorn District Municipality in the Limpopo Province. E-business applications are components of e-business such as e-commerce, and e-marketing which enable firms to perform their day-to-day activities with their partners and target market for developing and delivering value proposition to a firm's customers. The study uses the quantitative method to analyse the use and the benefits of e-business. Exploratory and descriptive research will be utilised to determine the use of e-business applications by businesses. A sample size of 330 businesses was used. The questionnaire was used for a pilot study conducted to improve the validity. The Cronbach alpha test was conducted to ascertain the reliability of the research instrument. Data were collected through the use of self-administered questionnaires in a survey. SPSS was used for data analysis. The results showed a clear exposition of the use of e-business applications, and the benefits that businesses experience when using e-business applications. 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 and provide relative inexpensive options for SME enterprises. Recommendations to businesses are to utilise e-business applications so that they are able to create and deliver value propositions in an efficient and effective manner.

Keywords: E-business, E-business applications, Benefits of e-business

1. Introduction

Internet technologies are changing the traditional ways of doing business (Kumar and Kumar, 2014:349). 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, Shanker & Maitra, 2013:513). 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 & Gheiji, 2015:51). In developing countries, it was found that the utilisation of e-business is regarded as a necessity to improve participation in the world economy (Abou-Shouk, Lim & Megicks, 2016:327). 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 (Alyoubi, 2015:480-481).

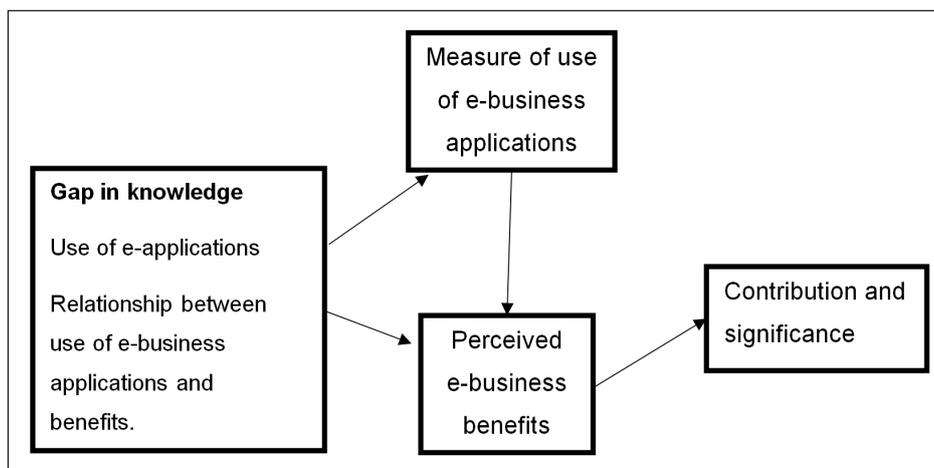
South Africa is a developing country that progressed quickly in internet adoption. The majority of the

country is already a "networked society" and currently the country's focus is to encourage e-business skills to achieve economic improvement through e-business benefits (Mbatha, 2013:10-11). E-business applications are defined as components of e-business such as e-commerce and e-marketing, which enable firms to perform their day-to-day activities. The applications enable the developing and delivering of value proposition to a firm's customers (Zott, Amit & Massa, 2011:6-7).

2. The Problem

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. 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. This requires an investigation into the use of e-business applications and the benefits derived. The research will only focus on businesses that operate within the borders of Polokwane municipality.

Figure 1: Framework for Analysis - The Effect of e-Business Applications on the Development of Value Propositions



Source: Author's own concept

3. Aim of the Study

The study investigated the efficiency and effectiveness of e-business applications when used for the creation and delivering of value propositions. This helps business to have successful new business developments and also ensure that the businesses remain competitive. The objectives set for this study were:

- 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.

4. Theoretical Basis for the Research

Zott and Amit (2013:5) state 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. Da Silva and Trkman (2013:1) state that a business model is a broad conceptualisation of a value proposition. The framework for analysis is outlined in Figure 1 above.

According to Boons and Lüdeke-Freud (2013:14), business models outline the economic exchange relationship between a firm and its stakeholders and further enable a firm to understand the economic basis of production and consumption logic when developing new products. Advancements in internet technology, offer new methods that firms can deploy when creating and distributing value propositions

(Breivold and Crnkovic, 2014:29). E-business applications allow firms to increase integration of their operational processes in order to become efficient and effective in value propositions (goods or services). The e-business applications used in this research are set out below:

E-Procurement

According to Baladhanadyutham and Venkatesh (2014:26), e-procurement is the application of e-business that consists 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-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 shorter lead times for marketing of various products.

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-Logistics

According to Skitsko (2016:9), e-logistics is a composite scheme that includes producers, resellers, customers and logistics midpoints which occur over the internet to interchange data. It is an application of e-business that alleviates cross-functional efforts of supply chain consolidation.

E-Services

E-services are an application of e-business and are defined as services which are carried out by firms to provide value to customers through the mediation of information technology (Shambour & Lu, 2011:815).

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) outline 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 & Kaptein, 2015:214).

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.

E-Payment

Kabir, Saidin and Ahmi (2015:112) describe 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.

Social Commerce

Zhou, Zhang and Zimmermann (2013:61) outline

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) is an inter-organisational information scheme that enables more than one buyer, seller and other stakeholders to engage and make transactions over the internet.

5. 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.*, 2016:491). According to Jahanshahi, Zhang and Brem (2013:850-851), 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 uses the value chain of the operations of businesses to categorise the benefits of e-business as shown in Table 1 on the following page. 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. 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.

6. Methods and Materials

The research followed a positivistic approach to enable the researcher to evaluate the relationship between variables (Bryman & Bell, 2011:271; Zikmund, Babin, Carr & Griffin, 2013:254). The population studied was businesses that operate within Polokwane Municipality (Hanlon & Larget, 2011:7). A list of these businesses was obtained from the Polokwane Local Municipality. The population size was one thousand, nine hundred (1 900) businesses. A random sampling method was utilised in order to allow each unit of the population to have an equal probability of inclusion (Bryman & Bell, 2011:175-176). The random sample was obtained from the list supplied by the Polokwane Municipality and a

Table 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	Generic 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 the 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

Source: Authors

Table 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	

Source: Authors

Table 3: 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

Source: Authors

random number generator was used to select the intended respondents. A self-administered survey was used since a higher response rate of self-administered surveys has been found when compared with other techniques of collecting data (Cooper & Schindler, 2011:242-243). Yamane's (1967:886) formula was utilised to calculate the sample size of this study. The sample size calculated was 330 businesses. 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 44,5% was achieved. As can be seen from Table 2 on the previous page the business sectors were well spread out and the response rate was therefore deemed acceptable.

This study's questionnaire consists of close-ended questions. 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 & Bhojanna, 2010:106). After the completion of the data collection process, the questionnaires were edited and data collected were coded and captured (Bryman *et al.*, 2011:302-303). Descriptive statistical methods were used to determine the frequencies of use for E-applications, operation performance measures and ease of implementation of the different e-applications. (Bless, Higson-Smith & Sithole, 2013:245). A Likert scale was used (Bryman & Bell, 2011:313; Burns & Burns, 2008:368). A pilot study using ten respondents was employed to help improve reliability. Changes to the questionnaire

were then made, based on the problems incurred in the pilot study (Arain, Campbell, Cooper & Lancaster, 2010:1). The Cronbach Alpha test was utilised to assess internal consistency of the question items (Bless *et al.*, 2013:229). Cronbach alphas of above 0.7 were used to ascertain if there was internal consistency among the questions measuring the different constructs.

Table 3 indicates the Cronbach's alpha test for e-business applications. The Cronbach alpha test result for four items suggests 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 near to 0,7 and they are accepted because the study is investigating the research questions, not testing hypotheses. A statistical expert was consulted to evaluate the research instrument for conceptual clarity to better validity. The questionnaire was developed based on the theory discussed above. As this theory is generally accepted, the questionnaire should have an acceptable level of validity.

7. Results and Discussion

7.1 Frequencies of Use of E-Business Applications

The analysis of the e-business applications is presented in Table 4 on the next page that indicates the frequency and percentage of each e-business application.

Table 4: 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

Source: Authors

7.2 Percentage per Period Use of E-Business Applications

The figures below indicate the use of e-business applications. The numbers below are developed out of the percentages that are shown in Table 4 above.

Figure 2 shows 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 at all.

Figure 3 indicates that the majority of businesses use e-catalogues yearly, while the minority of businesses in the study area use e-payment yearly.

Figure 4 shows that only 8.8 % of businesses do use e-payment. It is concluded that 30,6% businesses use e-catalogues.

Figure 5 indicates that 33.3% of businesses use e-supply chain weekly and the others are used even less. It is therefore concluded that the majority of businesses do not use e-applications on a weekly basis.

Figure 6 indicates that the majority of businesses use e-payment daily, while a minority of businesses in the study area make use of e-design on daily basis.

Table 5 indicates the categorisation of the use of e-business applications. The businesses in the study

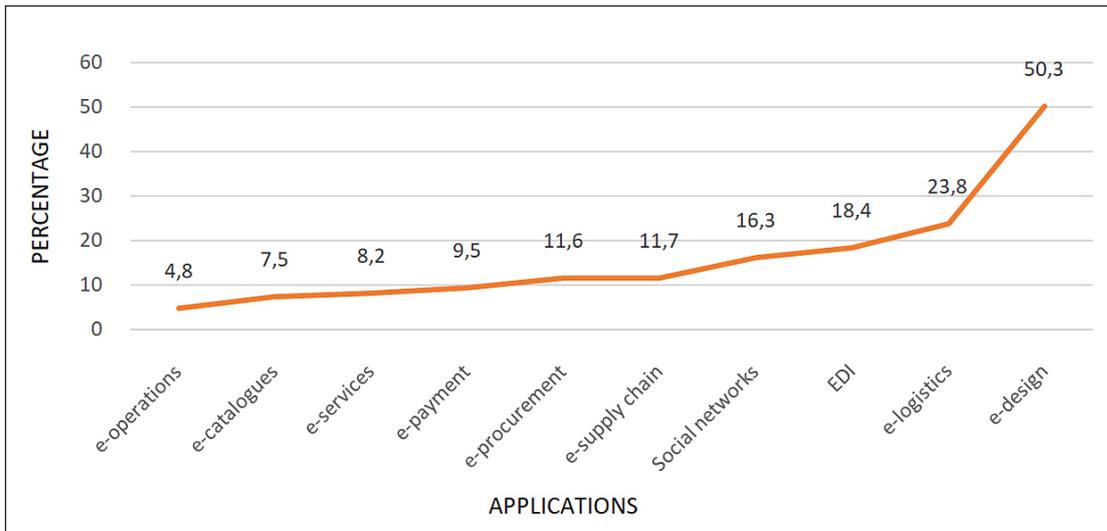
area have high use of electronic data interchange, e-operations, e-services, e-operations, e-payment, social networks and e-procurement. The businesses in the study area have medium use of e-catalogues, e-logistics and e-supply chain. The businesses in the study area have low use of e-design.

It is concluded that businesses have high use of 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; that businesses monthly use e-catalogues, e-logistics and e-supply chain for monthly promotions; that businesses in the study area utilise e-design at a low level because they are the subdivisions of large businesses that are in Gauteng. The secondary data also confirm the use of e-business applications by businesses in their operational performances of developing value propositions (Wiengarten *et al.*, 2015:4963; Breivold & Crnkovic, 2014:29).

7.3 E-Business Benefits

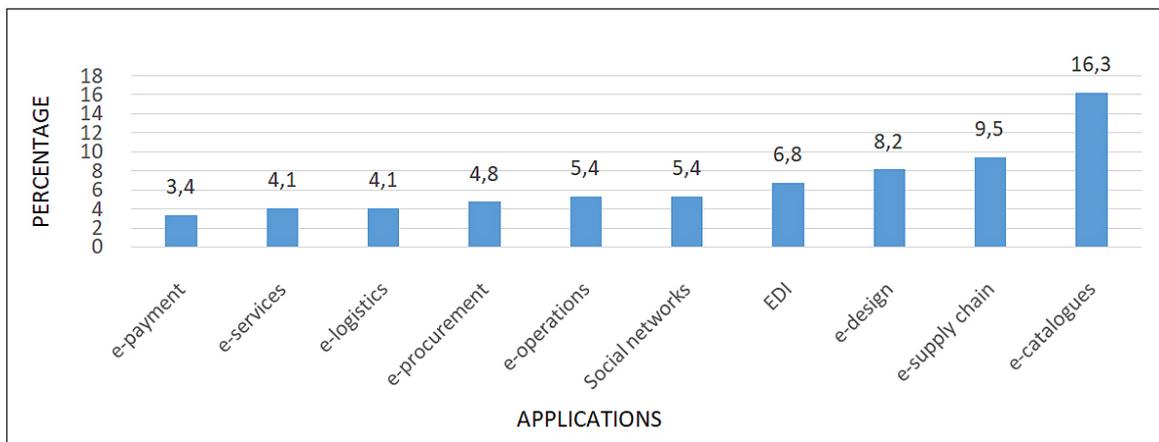
The e-business benefits that businesses experience when utilising e-business applications in the development of value propositions are indicated and discussed below. The e-business benefits are represented by e-business benefits database in framework for analyses (Figure 1). The e-business benefits database is the data that were collected from the businesses that operate within the study area (Limpopo Province).

Figure 2: Percentage of Businesses that Do Not Use Specific E-Business Applications



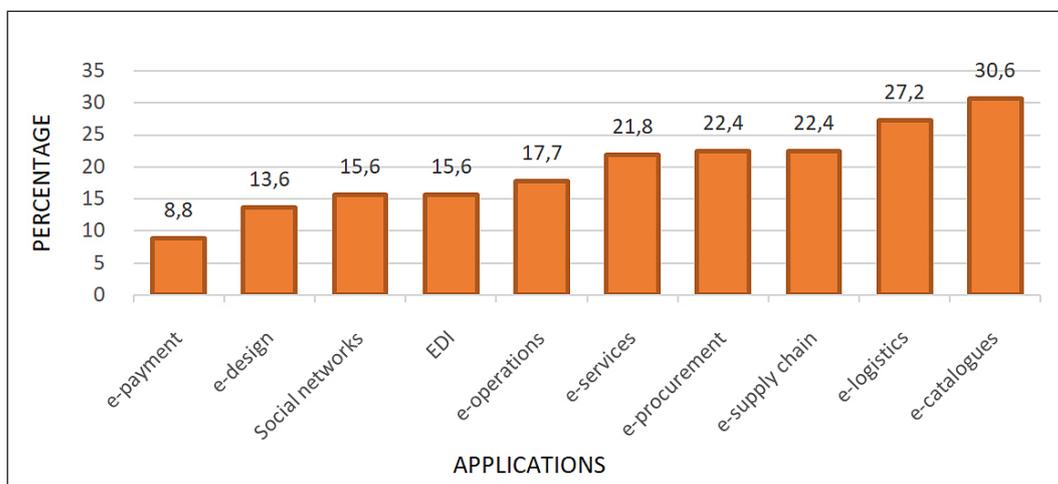
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Figure 3: E-Business Applications Used Yearly



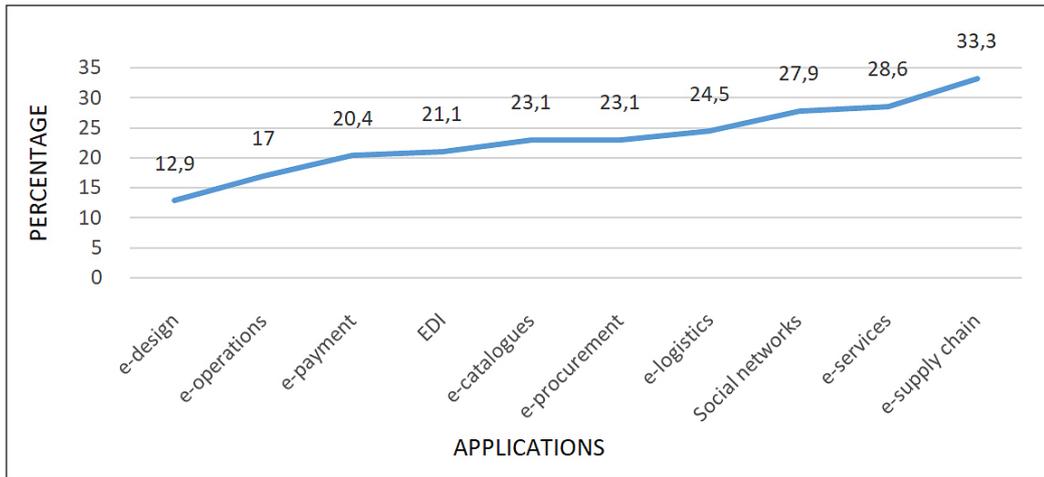
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Figure 4: E-Business Applications Used Monthly



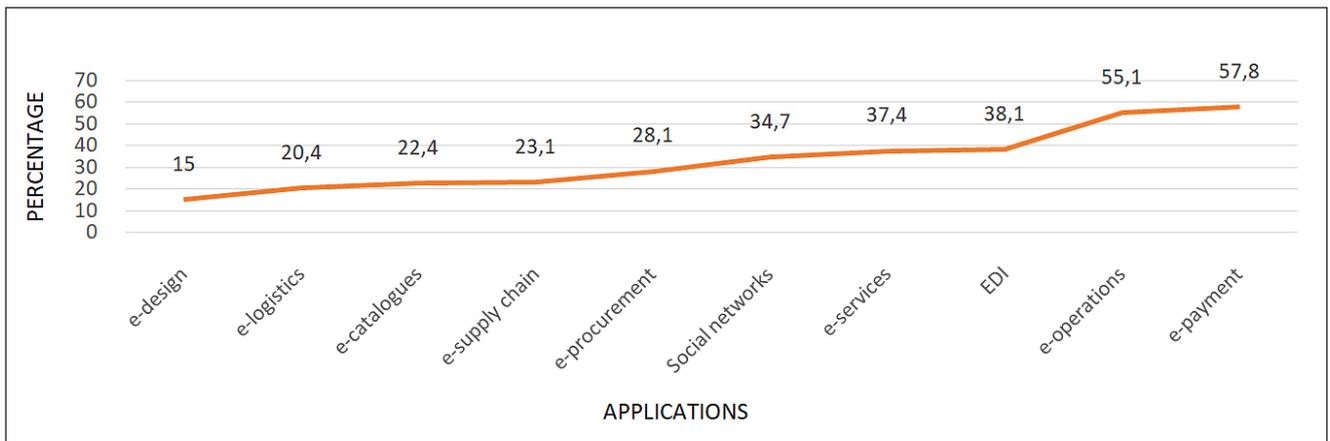
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Figure 5: E-Business Applications Used Weekly



Source: Authors

Figure 6: E-Business Applications Used Daily



Source: Authors

Table 5: 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

Source: Authors

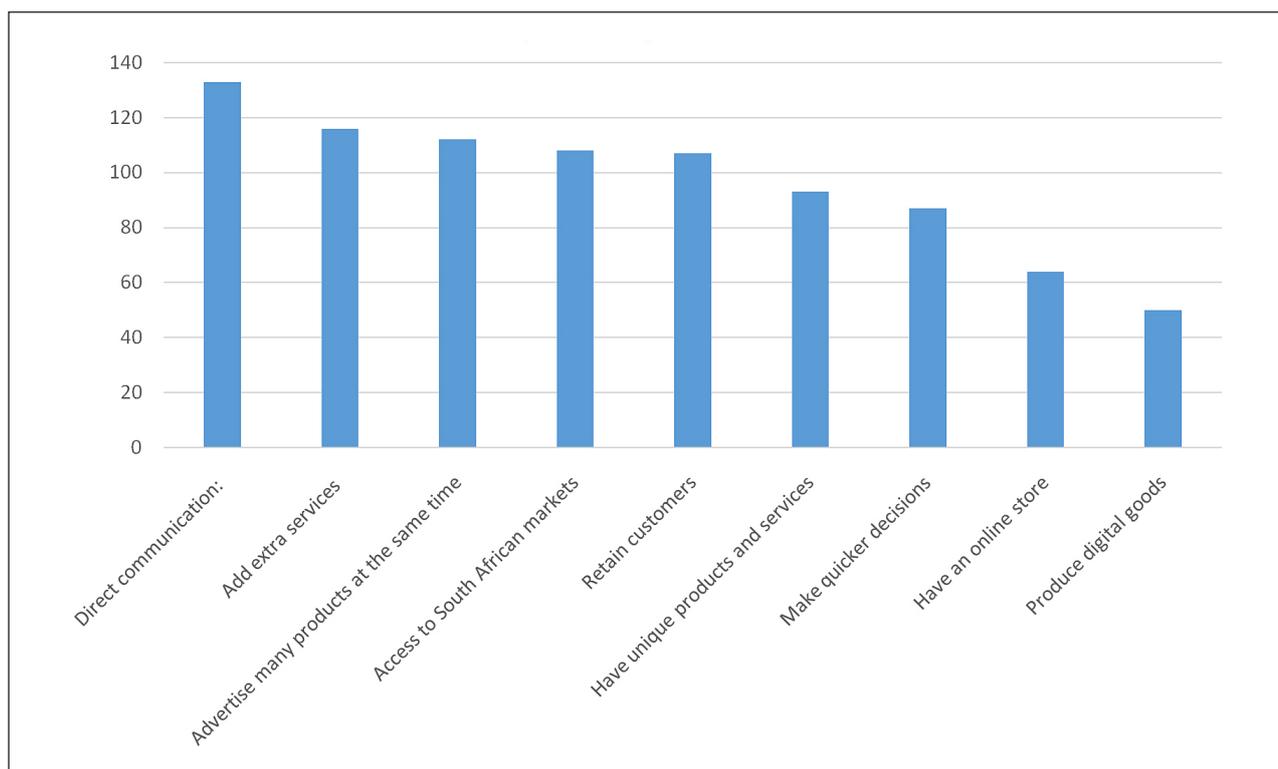
The figures below indicate the benefits of use of e-business.

E-business 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.

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

The use of e-business allows firms to make quicker decisions. The results concur with Olatokun and

Figure 7: Benefits of Use of E-Business



Source: Authors

Kebonye (2010:43) on the fact that e-business enables businesses to make quicker decisions.

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

The use of e-business allows businesses to add extra services to a product at little cost. The findings 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.

The utilisation of e-business allows businesses to have unique products and services. The results concur with Abid, Rahim and Scheepers (2011:1) on the fact that e-business when used enables businesses to have unique products and services.

E-business ensures direct communication between the business and its stakeholders. The results 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.

E-business does not enable a business to have an online store. The results contrast with Dube, Chitura and Runyowa (2010:5) on the fact that e-business enables a business to have an online store.

E-business allows businesses to retain customers. The findings accord with Alshomrani and Qamar (2013:15) on the fact that e-business when used, allows a business to retain customers.

7.4 Improvement in Operational Performance

The operational performance measures indicate the impact of e-business applications on operational performance in the development of value propositions.

Table 6 outlines the operational performance measures. The table above indicates the frequencies and percentages of operational performance.

The figures below are developed with the percentages of operational performance measures shown in Table 6.

7.5 Consistency of Producing Products

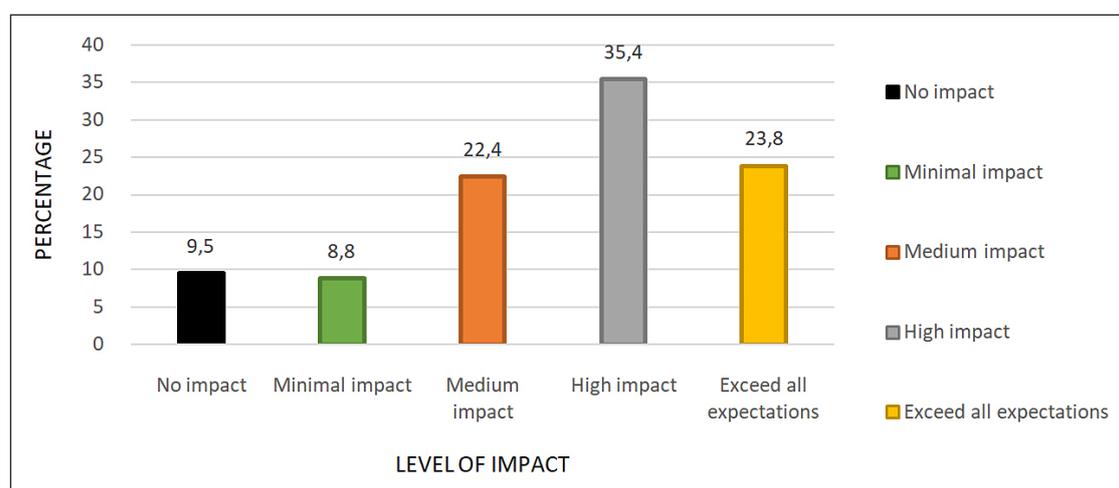
Figure 8 indicates that 35.4% of businesses experience high impact in the consistency of producing

Table 6: 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

Source: Authors

Figure 8: Consistency of High Quality Production



Source: Authors

high quality products and 23.8% businesses experience impact that exceeds all expectations in the consistency of producing high quality products using e-business.

7.6 Enhanced Productivity

Figure 9 illustrates that 33.3% of businesses experience high impact and 34% of businesses experience impact that exceeds all expectations on the enhancement of productivity. It is therefore concluded that the majority of businesses in the study area experience high impact while the minority of businesses in the study area don't experience impact on the enhancement of productivity when using e-business.

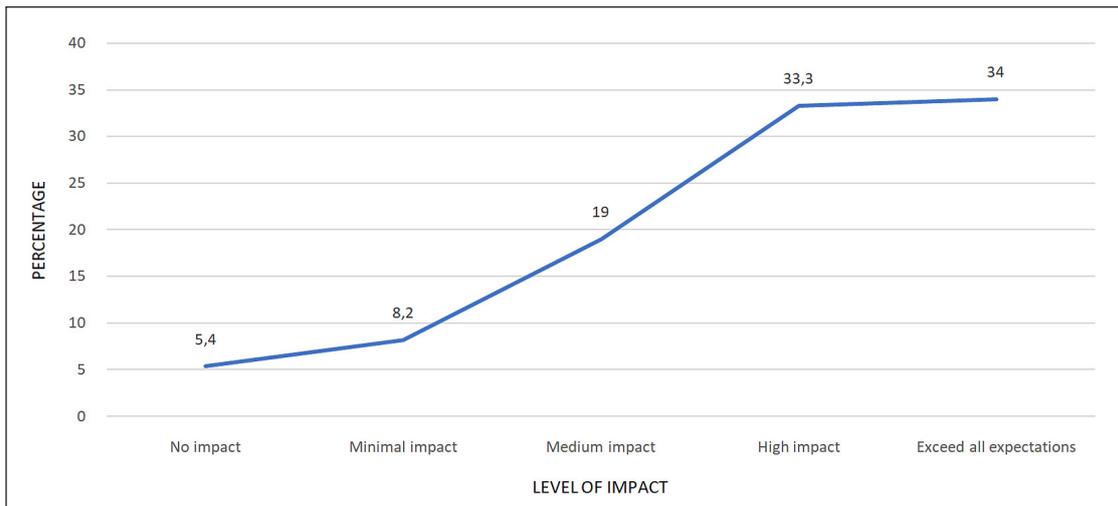
7.7 Interaction Between a Firm and Its Customers

Figure 10 shows that, 1.4% of businesses experience no impact on fast and easy interaction between a firm and its customers when using e-business, while 70.8% of businesses experience a high impact on fast and easy interaction between a firm and customers.

7.8 Ensure Minimum Cost of Production

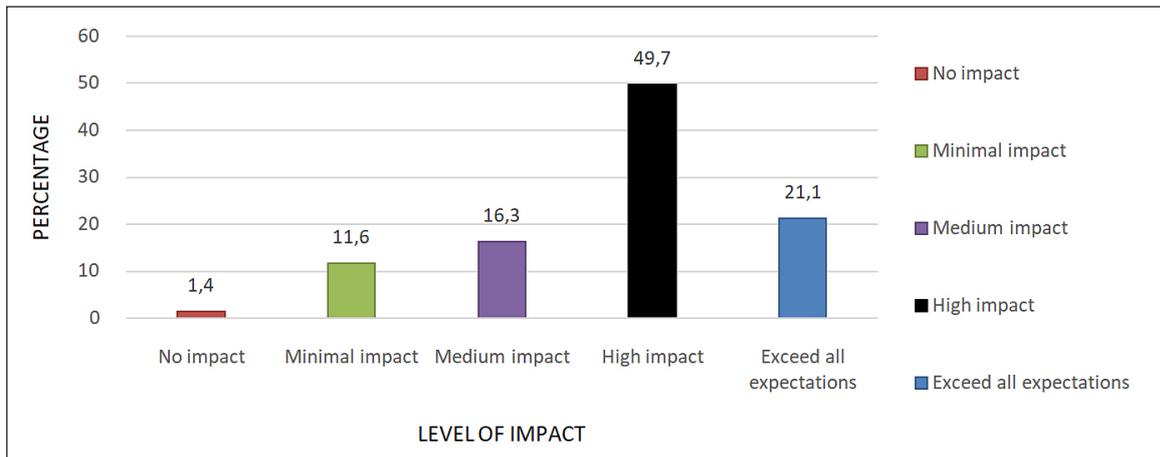
Figure 11 indicates that the majority of businesses in the study area experience high impact when using e-business to ensure minimum cost of producing, while the minority of businesses in the study area don't experience an impact.

Figure 9: Enhanced Productivity



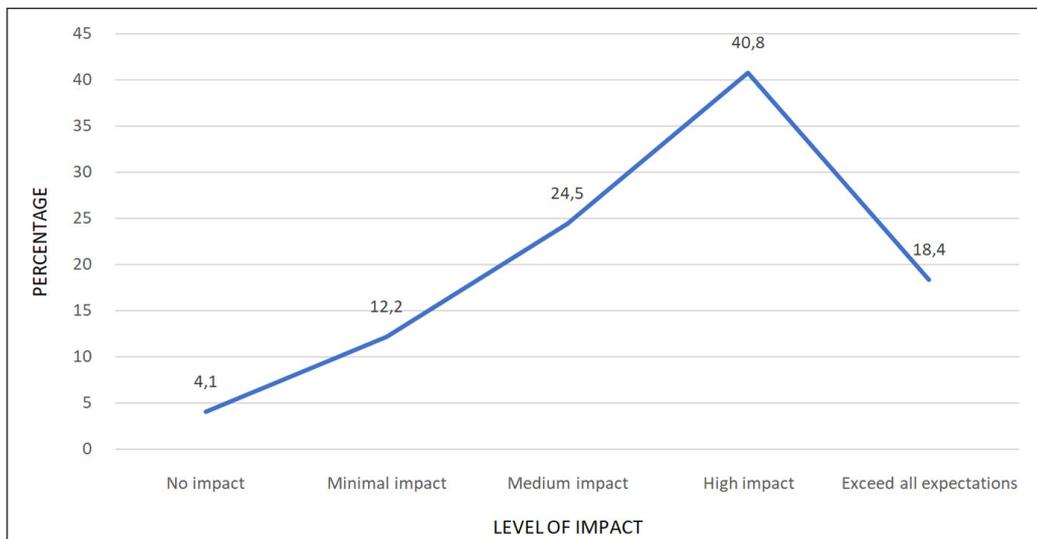
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Figure 10: Interaction Among a Firm and its Customers



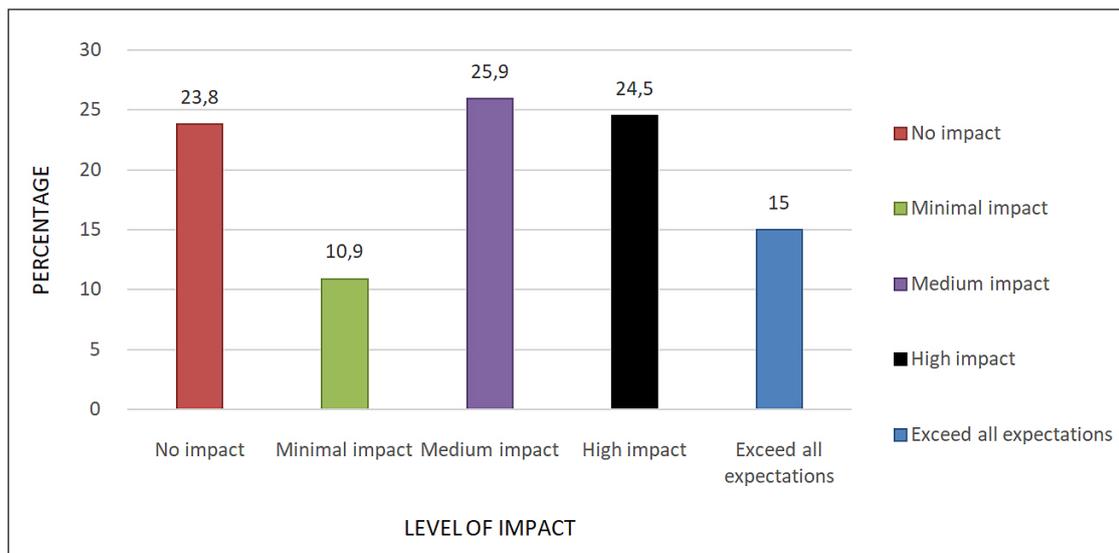
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Figure 11: Minimum Cost of Production



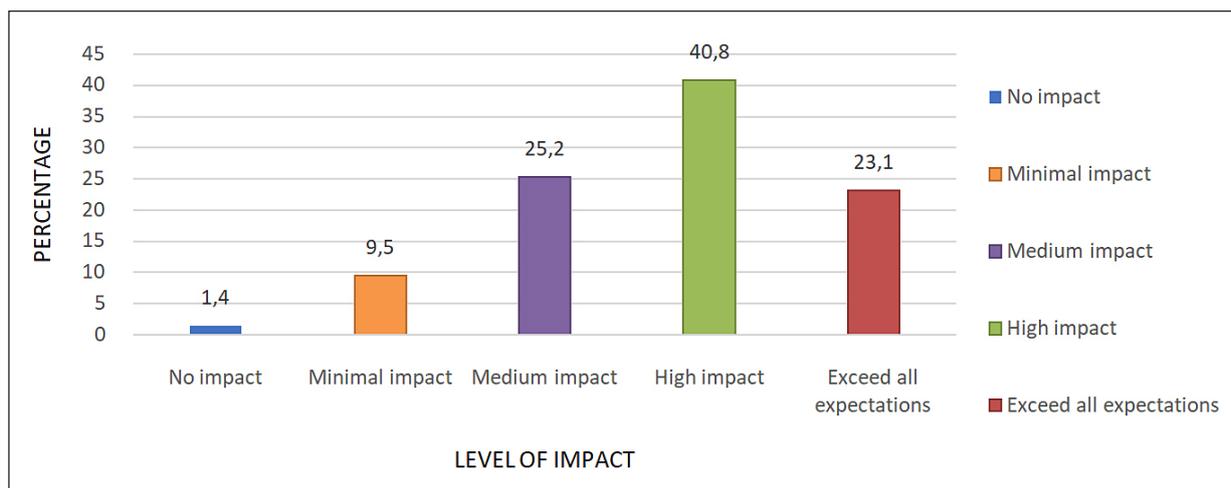
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Figure 12: Interactive Design of Products



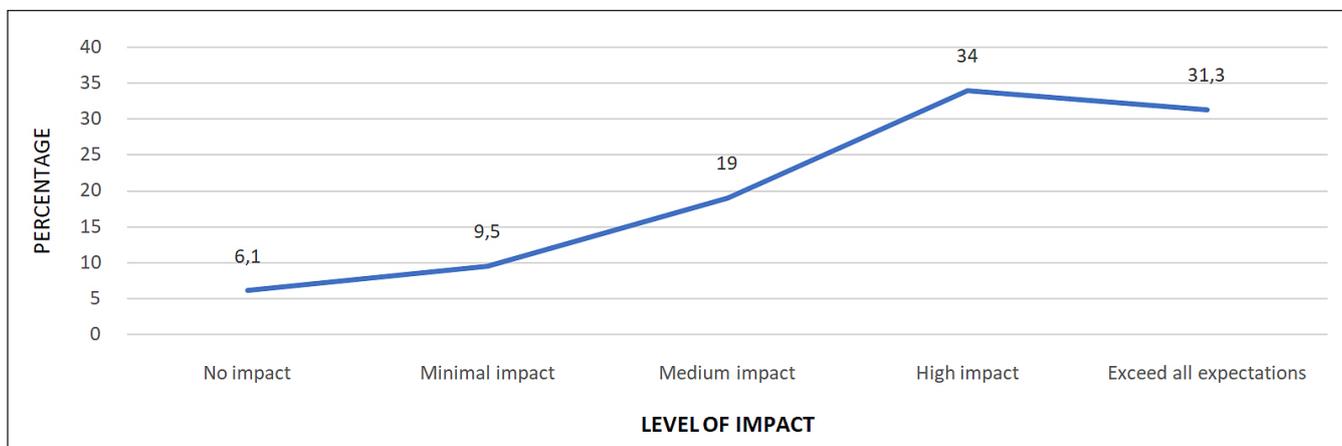
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Figure 13: Quick Product and Service Delivery



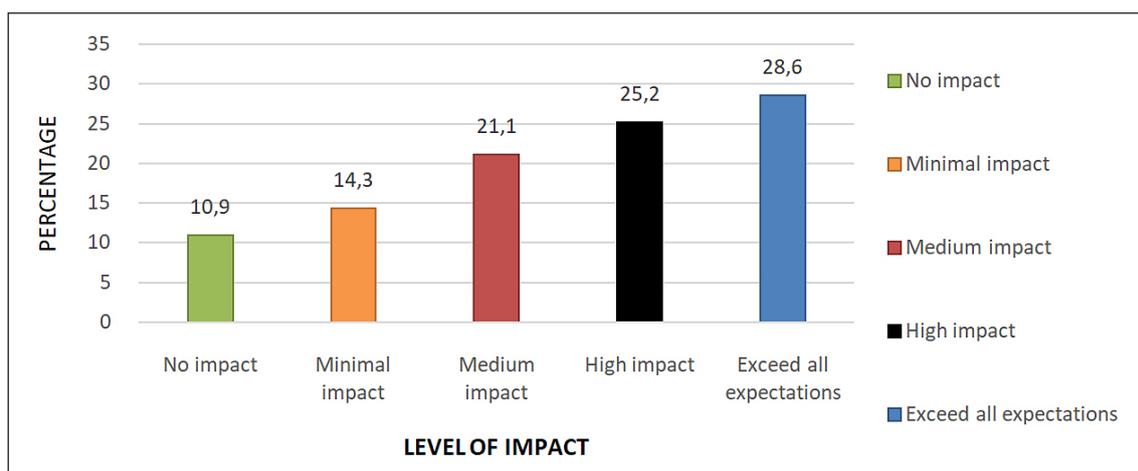
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Figure 14: Ensure Dynamic and Flexible Digital Catalogue



Source: Authors

Figure 15: Customer Queries



Source: Authors

7.9 Interactive Design of Products

Results from Figure 12 indicate that the majority of businesses in the study area experience an impact when using e-business for interactive design of products, while minority of business experience minimal impact when using e-business to present opportunities for interactive design of products.

7.10 Product and Service Delivery

Figure 13 shows that concluded that the majority of businesses in the study area experience a high impact when using e-business to enable quick product and service delivery.

7.11 Digital Catalogues

Figure 14 illustrates that the majority of businesses in the study area experience high impact when using e-business to ensure dynamic and flexible digital catalogue.

7.12 Customer Queries

Figure 15 indicates that 10.9% don't experience impact while 28.6% experience impact that exceeds all expectations when using e-business to enable more attention to customer queries and problems.

8. Conclusion and Recommendations

This study reaffirms that businesses make use of e-business applications in creating and delivering value propositions. The following e-business applications are mostly used by most of the businesses:

electronic data interchange, e-operations, e-services, e-supply chain, e-logistics, e-procurement, social networks, and e-catalogues. The results further illustrate that majority of businesses do not make use of e-design in the delivering of value of propositions, because businesses in the study area are subdivisions of large businesses. The study clearly outlined the e-business applications that businesses utilise in the development of new value propositions. This study will influence businesses to take e-business into consideration as a key strategy to achieve better performance. The study will help businesses to know the important role that e-business plays in an organisation.

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