Technology, Innovation and Performance Perspectives of Small to Medium Enterprises in the Manufacturing Sector of Zimbabwe

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Abstract:- **The purpose of this study was to investigate the effect of innovation (technological, product and process) on the performance of small to medium enterprises in the manufacturing sector of Zimbabwe. The concept of innovation was quantified in terms of three variables, such as technological innovation, product innovation and process innovation. The survey design was used in this study. Therefore, a sample of 20 SMES in the greater Harare were chosen using the purposive sampling method. Only those SMEs that have been in operation for more than five years were chosen to participate in this study. The questionnaire approach was used to collect primary data which was subsequently analysed using the ANOVA and Pearson's correlation matrix. The results of the study showed that there is a positive relationship between innovation (technological, product and process) and the performance of SMEs in the manufacturing sector of Zimbabwe.**

Keywords: **Technology, product innovation, electronics sector, process innovation and Small to Medium Enterprises.**

I. BACKGROUND OF THE STUDY

Aqarwal and Ashwani (2008) argue that Small to Medium Enterprises (SMEs) constitute more than 80% of business enterprises globally. All economic and industrial development being registered in most of the countries today is supported by SMEs. According to Sharper (2002) and Aranoff et al (2010) SMEs are used by different countries to empower the citizens economically and to create the needed employment. SMEs are the tools for new product development, positive investment and export initiatives (Aranoff et al, 2010). Hategа (2007) points out that SMEs are the major firms in Sub-Saharan Africa and they employ the majority of the population in most African countries. SMEs are used to fight poverty, hunger and diseases in most African countries (Benzing and Chu, 2012). Kauffmann (2006) posits that SMEs provide the needed goods and services and are an important source of income and employment in most African countries.

Table 1: SMEs in Africa

Country	Contribution to GDP	Contribution to employment	Source
Ethiopia	3%	92%	Gebrehiwot (2006)
Ghana	72%	52%	Abor and Quartery (2010)
Kenya	53%	84%	Mwarari and Ngugi (2013)
Nigeria	52%	73%	Ariyo (2011)
Rwanda	22%	65%	Makumanyanga (2011)
South Africa	58%	67%	DTI, (2012) Willemse, (2010)
Tanzania	62%	22%	Ngasongwa (2002)
Uganda	20%	91%	Ministry of Trade Industry and Commerce (2015)
Zambia	10%	33%	Mbuta (2007)
Zimbabwe	42%	18%	Katua (2014) Zwinoira (2015)

Source: Muriithi (2017:38).

Most SMEs are found in the service sector where they employ more than 60% of the workforce in Africa. According to Katua (2014) and Bowen et al (2009) SMEs in Africa face a myriad of problems. Some of these problems are; lack of skilled manpower, lack of funds and lack of government support. Corruption in the civil service has also hampered the growth and development of most SMEs in Africa (Transparency International Corruption Perception Index, 2007). It has become a norm in Africa to pay government officials some money before a service can be rendered. Most African countries are experiencing political instability, economic stagnation and massive unemployment (Katua, 2014; Bowen et al, 2009). **Table 2,** shows some of the problems being experienced by SMEs in Africa:

TABLE 2: Problems being experienced by SMEs in Africa

Problem	Reference
1. Access to adequate electricity	World Bank Enterprises Survey (2010)
2. Poor funding	Fjose et al (2010) Shah et al (2013)
3. Incompetent leadership	Benzing and Chu (2012) Bowen et al (2009)
4. lack of skilled manpower	Muriithi (2015) Bouazza et al (2015) Aylin et al (2013)
5. Poor attitudes	Bowen et al (2009)
6. Lack of adequate information and	Kamunge et al (2014)

education	
7. Lack of government help	Kamunge et al (2014)
8. Unethical practices by public servants	Benzing and Chu (2012) Transparency International Corruption Perceptions Index (2007)

Source: Muriithi (2017:44).

Objectives of the Study

1. To determine the effect of technological innovation on SMEs performance.
2. To investigate the relationship between product innovation and SMEs performance.
3. To establish the effect of process innovation on SMEs performance.

Hypothesis

H_1 Technological innovation correlates positively with SMEs performance.

H_2 There is a positive relationship between product innovation and SMEs performance.

H_3 Process innovation is positively related to SMEs performance.

II. REVIEW OF RELATED LITERATURE

The concept of technology has been defined in many ways by many authors. According to Rousseau and Cooke (1984), the term technology refers to many factors such as labour skills, machines and the techniques exploited by the organisation to transform raw materials into the needed products and services. Robbins (1996) defines technology as the use of new ideas to convert inputs into outputs. Technological innovation is considered as the most important ingredient in the growth and development of SMEs in the manufacturing sector (Agarwal and Ashwani, 2008). Studies on SMEs development have shown that there is a positive relationship between technological innovation and SMEs growth and good performance (Agarwal and Ashwani, 2008). Studies conducted by Coad and Rao (2008) revealed that the application of technological innovation in manufacturing firms resulted in the increase of the total sales of the firm. Becheikh et al, (2006) argue that technological innovation is a key business model that enables SMEs to gain a bigger share of the market and to maintain profitable customers. The literature on SMEs demonstrates that SMEs can only grow and increase their profits by adopting technological innovation (Ruttan, 1977).

Product Innovation

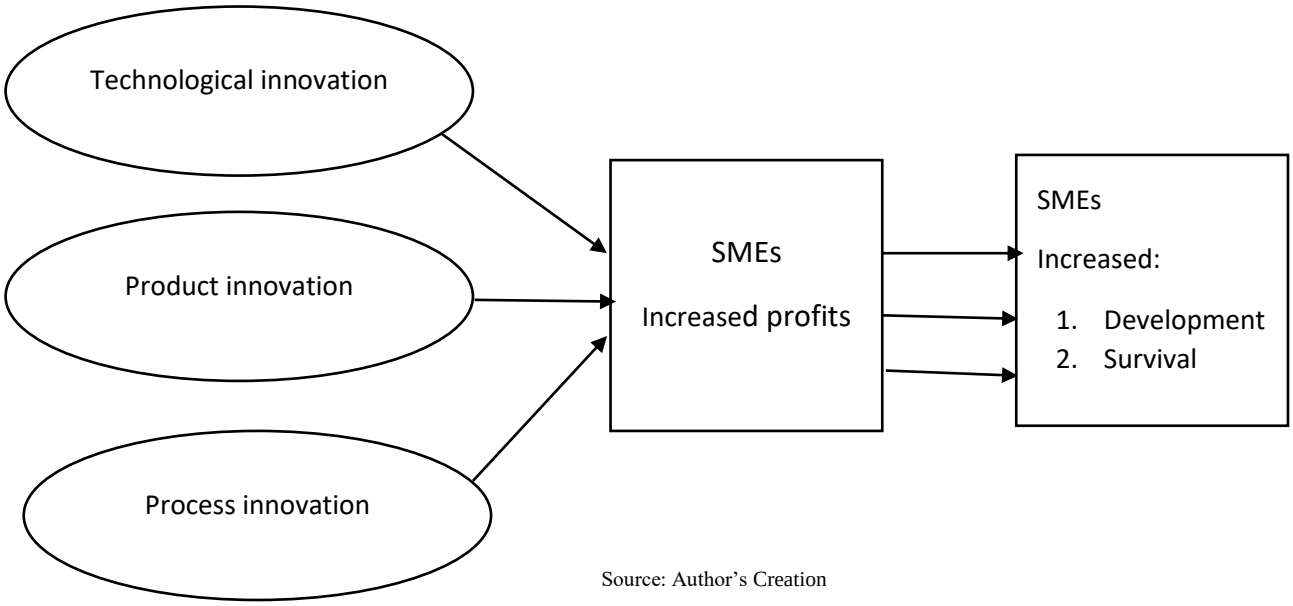
Product innovation is the process in which new products are introduced in the market (Schumpeter, 1934). Product innovation is the process in which the features of a product are altered (Mwangi and Namusonge, 2014). Product innovation may also refer to the process in which the function of the product is changed, (Susman et al, 2006). The main objective of product innovation is to enhance the performance of the product. SMEs are encouraged to embark on product innovation in order to attract more customers and to enhance a bigger market share, compared to other firms in the same industry. The literature on product development shows that most SMEs do not conduct product innovation initiatives frequently compared to large companies (Woodcock et al, 2000). Product innovation means competition. Firms are always engaging in meaningful research and development in order to create new products or in order to improve the features of the already existing products. Product innovation is the basis on which SMEs guarantee their development, growth and survival (Woodcock et al, 2000). Most of the products placed on the market today have undergone a product innovation process. This means that the new product was used to replace the old product on the company's product profile (Woodcock et al, 2000). According to Crawford et al (2003) product innovation ensures that the new product gives "a greater perceived value" compared to the old product (Crawford et al, 2003). Product innovation is used by researchers to identify the particular needs of customers and to add value to the new product (Woodcock et al, 2000).

Process Innovation

Process innovation refers to the creation of a completely new method of producing goods and services. In other words, process innovation refers to the novel procedure of manufacturing goods. (Schumpeter, 1934). Process innovation can also refer to the new procedures for handling some commodities commercially (Schumpeter, 1934). Any business in the manufacturing sector need process innovation in order to become effective and efficient. The main objective of process innovation is to reduce costs, to improve on time management, to enhance employee productivity and to eliminate duplication of tasks. Bowen et al, (2009) argues that SMEs are capable of implementing process innovation faster than larger firms due to their simple organisational structure. Furthermore, SMEs are able to manage process innovation more effectively and at lower switching costs compared to larger firms. (Bowen et al, 2009). Therefore, process innovation is a business model that enables SMEs to move from low productivity levels to higher productivity levels (Bowen et al, 2009). In other words, higher productivity levels translate into higher manufacturing platforms that enable SMEs to be competitive on the market (Bowen et al, 2009). Process innovation is used by bigger companies to "provide for human welfare and ensure environmental sustainability (Munani and Koman, 2009). In Zimbabwe, the aim of the government is to improve the competitive advantage of SMEs by introducing advanced manufacturing processes. This can be achieved by recruiting highly skilled technicians, utilising sophisticated equipment and using modern technologies such as Computer Aided Designs (CAN) and Information and Communication Technologies (ICT) (Ogembo and Mason, 2012). Experts in product development posit that process innovation is derived from activities such as Research and

Development (R and D), design production on the shop floor, quality control and marketing programmes (Oyelaram-Oyeyinks and McCornick, 2007).

Figure 1: Technological innovation, product innovation and process innovation in SMEs



Source: Author's Creation

III. METHODOLOGY

The survey design method was used in this study. Therefore, the concept of innovation was quantified in terms of three variables, such as technological innovation, product innovation and process innovation. The aim of the study was to explore the relationship between:

1. Technological innovation and SMEs performance.
2. The relationship between product innovation and SMEs performance, and
3. The relationship between process innovation and SMEs performance.

Therefore, a sample of 20 SMEs in Harare Metropolitan City were chosen using the purposive sampling technique. Only those SMEs that have been in operation for more than five years were selected to participate in the study. The questionnaire approach was used to collect primary data. Data were analysed using ANOVA and Statistical Package for Social Sciences (SPSS).

IV. DISCUSSION OF RESULTS

TABLE 1: REGRESSION ANALYSIS

Mode	R	R Square	Adjusted Square	Std Error of the estimate
	0.744[a]	0.544	0.526	2.66172

A Predictors (constant) Innovation

Table 2: Variable (ANOVA) Results

	Sum of squares	Df	Mean square	F	Significance
Regression	1468.544	4	388.481	76.326	0.000
Residual	1269.166	186	6.622		
Total	2686.633	199			

Table 3: Analysis of Coefficients

Model	Unstandardized coefficients		Standardised coefficients	t	Sig
	B	Std Error	Beta		
1 (constant)	4.228	.798		4.22	.000
Technological innovation	.322	.068	.344	3.238	.001
Product innovation	.366	.069	.433	4.899	.000
Process innovation	.089	.077	.222	1.466	.136

Table 4: Technological innovation to SMEs performance

	Technological innovation	SMEs Performance
Technological innovation		
Pearson Correlation	1	.666**
Sig (2-tailed)		.000
N	199	199

SMEs Performance		
Pearson Correlation	**666	1
Sig (2-tailed)	.000	
N	199	199

Table 5: Product innovation to SMEs Performance

	Depended variables: SMEs performance	
	Adjusted	Standard Coefficient
Product innovation	R^2	b
	0.544	0.736

Table 1, summarises the correlation between innovation (technological, product and process) and SMEs performance. The adjusted R Squared of 0.526 percent, technological innovation, product innovation and process innovation account for about 54 percent of the variations in SMEs performance. The F value of 76.326 shows that the entire regression approach is significant. This means that a positive relationship exists between innovation (technological, product and process) and SMEs performance.

Table 3 is about the outcome of coefficient analysis and the t-ratio. The constant shows a ratio of 4.22 and this is a sign that there are many other factors that influence the performance of SMEs and such factors have not been shown in this study. The constant is positively correlated to the performance of SMEs and this is a sign that other factors, not being shown here, have a positive impact on the performance of SMEs. **Table 3** has revealed that technological innovation, product innovation and process innovation have a positive influence on the financial performance of SMEs. Product innovation has the highest t-ratio of 4.89, followed by technological innovation with a t-ratio of 3.23 while process innovation, has a t-ratio of 1.46 and is therefore not significantly related. The literature reviewed has shown that technological innovation has a positive influence on SMEs growth (Agarwal and Ashwani, 2008). Studies conducted by Coad and Rao (2008) revealed that the application of technological innovation in manufacturing SMEs resulted in the increase of the total sales of the firm. Product innovation is used by researchers to identify the particular needs of customers and to enhance the value of the new product (Choi, 2005). Process innovation enables SMEs to move from low productivity levels (Bowen, 2009). In other words, high productivity levels translate into high value manufacturing platforms that enable SMEs to be highly competitive on the market (Bowen, 2009).

Table 4, made use of Pearson Correlation to show that there is a positive and linear relationship between technological innovation and SMEs performance. **In Table 5**, there is evidence to prove that product innovation influences positively the performance of SMEs (Adjusted R^2 = 0.544). These results seem to support the studies conducted by Choi (2005) and Crawford et al (2003) which concluded that production innovation is the basis on which SMEs can guarantee their development growth and survival in the long run.

V. CONCLUSION

Agarwal and Ashwaniu argue that SMEs are the backbone of all economic activities globally. SMEs are used by various national governments to fight poverty, hunger and disease. Kauffman (2006) posits that SMEs provide the needed goods and services and are an important source of income and employment in the majority of African countries. Experts on SMEs development argue strongly that SMEs performance is a function of technological innovation, product innovation and process innovation. Therefore, this study analysed the relationship between innovation (technological, product and process) and SMEs performance. Primary data were collected from SMEs in the manufacturing sector of Zimbabwe. The results of the study supported the hypothesis that innovation (technological, product and process) has a linear and positive relationship with SMEs performance. This study therefore recommends that national governments should make equitable organisational policies that encourage SMEs to undertake technological innovation, product innovation and process innovation. African governments should ensure that adequate financial resources are channelled to the SMEs sector to increase their innovative activities.

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