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TECHNOLOGY CAPABILITY FOR ACHIEVEMENT OF COMPETITIVENESS AMONG SMALL AND MEDIUM MICRO ENTERPRISES

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Abstract

The study was focused on technology capability for achievement of competitiveness among small and medium enterprises. Explanatory research design was adopted and cluster sampling technique was used to obtain a sample size of 335 respondents. The research utilized primary data obtained through the use of questionnaires and analysis conducted using both descriptive and inferential statistical methods to draw conclusions from the data. Technology capability was found to have a positive and significant effect on competitiveness. Therefore technology adopters and users should focus on the capabilities of the technology in terms of upgrading and updating, flexibility, usability and ready accessibility in the market before adoption.

Keywords: Technology Capability, Competitiveness, Technology Acquisition Capacity, Technology Operating Capacity, Technology Upgrading Capacity, SMEs

INTRODUCTION

SMEs operate within a volatile business environment where competitiveness determines business survival. Rapid technological advancement that attract high operational costs, barriers to entry, intense competition and market rivalry in provision of goods and services, characterize

the modern business environment where SMEs thrive posing a greater challenge to the growth of the enterprises. SMEs operate in competitive markets for business development to offer services and to maximize shareholder wealth.

When an organization performs better compared to their competitors in the same industry, they have an edge in competitiveness. An organization attains competitiveness when it acquires and develops a means or a group of resources that permits them to perform better (Willems, Werelds, & Streukens, 2012). It is much evident that firms that have a higher level of competitiveness innovate continually, basing on new technologies and accentuate on skills and knowledge of their workers compared to resources such as plants and machinery.

Organizational level of aggressiveness consider a firm as a question of examination and think about internal components of a firm, both tangible and intangible assets of firm like innovation, ICT, marketing capacities, human asset, innovation abilities among others, as basic sources for enhancing the organization level competitiveness (Latruffe, 2010; Laurentiu, 2009). Competence approach emphasizes on the competencies, which are an outcome of firm's internal resources such as technology, ICT on raising competencies for building, maintaining and sustaining firm level competitiveness.

Innovation Diffusion Theory argues that potential client settle on choices to embrace or reject an innovation in view of convictions that they frame about the innovation and their capability to embrace the same. This paper is organized as follows; in the next section is the literature review, methodology, results and the paper conclusions. Technology capability was found to have an effect on competitiveness of SMES.

LITERATURE REVIEW

Technological capability (TC) is generally known as a key source of development and riches at the national and the firm levels (Monopoloulos *et al.,* 2009). It is the definitive factor in creating focused positions, competitive qualities, and managed developments (Ngoc Ca, 1999). The firm level TC has been viewed as a vital asset, empowering firms to accomplish competitiveness inside their industry. Those organizations with prevalent TC can secure more prominent productivity by spearheading process innovations and can accomplish higher differentiation (Tsai, 2004). Guifu and Hongfu (2009) have characterized firm-level TC into three particular levels: TAC, technological acquiring capacity which attributes to abilities to secure new information through formal, casual, internal and external channels, TOC technological operating capacity that alludes to capacities to work, utilize and maintain generation types of equipment and facilities. Going with the advancement, firms abbreviate the gaps with other driving organizations when they consistently present further developed product and process

advancement, and TUC technological upgrading capacity that concerns capacities which enhance significantly on products and procedures relying upon firm's own quality and on changing business sector needs. The upgrading results will enable the organizations to achieve higher TC level. Technological capability is a particular group of equipment, aptitudes, information, and states of mind that present the capacity of a firm to work, comprehend, change and make production procedures and product (Marcelle, 2004).

The headway in the level of specialized know-how and broad utilization of mechanical advancements bringing about high gainful ability and financial development isn't new in developed countries. For developing nations, fortifying such technological capacity and innovations are their interests (Adeoti & Adeoti, 2010). This is on the grounds that gaining advanced information and technologies have no value if the acquiring country doesn't have the important technological abilities that can enable them to seize such innovative opportunities (Morrisson, Pietrobelli, & Rabellotti, 2008; Hong, 2009).

Adeoti (2002) noted that building local technological ability in this manner is a fundamental condition for any country trying to grow technologically. (Monopoloulos, Dimitratos, Young & Lioukas, 2009) stated that TC is broadly viewed as a source of development and riches for the countries and the organizations. Two principle issues have been underlined in investigations into the function of technology on economic advancement. They focused on the developing business sector nations and adjusting the foreign made technologies that have turned into a definitive factor in their capacity to get up to speed and the business and nation phenomena, where the firm-level phenomena have very little emphasis (Caniels & Romijn, 2003; Archibugi & Coco, 2004).

Further, investigations on the link between TC of developing nations SMEs and their performance are needed to produce a better understanding (Figueiredo, 2002; Guifu & Hongjia, 2009). In the research we decomposed Technology capability into TAC, TAC and TUC.

Ho: Technology capability has no significant effect on competitiveness

METHODOLOGY

The study adopted an explanatory research design and was carried out in Uasi Gishu County in Kenya, which is a good representation of an emerging market in a developing nation where businesses survive within a highly competitive environment. Cluster sampling technique was used to obtain a sample of 335 SME owners or managers. Primary data was collected through the use of structured questionnaires. Reliability was test using Cronbach alpha coefficient while correlation and regression analysis was also conducted to establish the association and to test hypotheses respectively.

The overall regression equation is outlined as below:

$y = \alpha + \beta_1 x_1 + \varepsilon$ `

Where: y Represents Competitiveness among Small and Medium Enterprises

α Represents the value of *y* when other factors are held constant or when x_1 =0

β_1 Represents the level to which SME competitiveness is influenced as Technology capability varies by a unit.

x_1 Represents Technology capability

ε Refers to the error of prediction that represents all other factors which influence the dependent variable other than the independent variable in the study

RESULTS

Descriptive statistics sought to establish the views of the respondents regarding the technology capability. This enabled the rating of the views on a five-point likert scale so as to determine the level of SME competitiveness given their level of technology capability.

Table 1. Technology Capability

		Very poor	Poor	Average	Good	Excellent	M	Std	Skewness
We are able to access new enterprise knowledge	F	0	0	63	172	96	4.10	0.69	-0.13
	%	0	0	19	52	29			
Our employees enjoy operating the adopted technology	F	17	61	114	139	0	4.13	0.89	-0.70
	%	5.1	18.4	34.4	42	0			
Our relationship with customers is outstanding	F	9	8	45	269	0	4.73	0.64	-2.79
	%	2.7	2.4	13.6	81.3	0			
System upgrades and updates are conducted regularly	F	9	26	121	149	26	3.47	0.85	-0.58
	%	2.7	7.9	36.6	45	7.9			
We have more skillful technical workers and operational workers.	F	0	9	237	68	17	3.28	0.60	1.23
	%	0	2.7	71.6	20.5	5.1			
We experience less operational discontinuities.	F	9	26	35	174	87	3.92	0.96	-1.11
	%	2.7	7.9	10.6	52.6	26.3			
Our products and services meet customer tastes and preferences	F	0	0	17	61	253	4.71	0.56	-1.81
	%	0	0	5.1	18.4	76.4			
							4.05	**0.43**	**-0.21**

The findings in Table 1 show that 52% and 29% of the owners/managers of SMEs agreed and strongly agreed respectively that they are able to access new enterprise knowledge while 19% held a neutral view thus giving a mean response of (mean =4.10, sd = 0.69) that showed agreement by majority of the respondents. Furthermore, while 42% of the owners/ managers agreed that their employees enjoy operating the adopted technology, 34.4% held a neutral view while 5.1% and 18.4% strongly disagreed and disagreed respectively thus giving a mean response of (m= 4.13, sd = 0.89) that showed agreement by the majority. In addition, the findings show that 81.3% of the owners/ managers of SMEs agreed that their relationship with customers is outstanding while 13.6%, 2.4% and 2.7% held a neutral view, disagreed and strongly disagreed respectively thus giving a mean response of (m=4.73 , sd = 0.64) that showed strongly agreement by majority.

The findings also show that while 45% and 7.9% of the owners/ managers of SMEs agreed and strongly agreed respectively that system upgrades and updates are conducted regularly, 36.6%, 7.9% and 2.7% held a neutral view, disagreed and strongly disagreed respectively resulting in a mean response of (m=3.47, sd = -0.85) that showed neutrality by majority. In addition, while 20.5% and 5.1% of the owners/ managers agreed and strongly agreed respectively that they have more skillful technical workers and operational workers, 71.6% and 2.7% held a neutral view and disagreed respectively thus giving a mean response of (m=3.28, sd = 0.60) showing neutrality by majority of the respondents. Findings further revealed that 52.6% and 26.3% agreed and strongly agreed respectively that they experience less operational discontinuities while 10.6%, 7.9% and 2.7% held a neutral view, disagreed and strongly disagreed respectively. This resulted in a mean response of (m=3.9, sd = 0.96) showing agreement by majority of the respondents.

Finally, 18.4% and 76.4% of the owners/ managers agreed and strongly agreed respectively that their products and services meet customer tastes and preferences while 5.1% held a neutral view thus giving a mean response of (m=4.71, sd = 0.56) showing strongly agreement by majority of the respondents. The overall mean response for the level of technology capability by majority of the owners/ managers was (m=4.05, sd = 0.43) that showed overall agreement.

The results are consistent with those of Korir, Bonuke and Chepkwony (2017) whose output also shows that technology capability is positively related with firm performance, with a coefficient of r = 0.596 which is also significant at p< 0.01. similarly Archibugi, and Coco (2004) who concluded that technological capabilities are a fundamental component for achieving substantive goals such as a satisfactory quality of life or a higher income.

Correlation Results

A correlation analysis of Technology Capability and Competitiveness was carried out and the findings shows that there is a positive and significant relationship between technology capability and competitiveness, R = .611. This is an indication that there is a 61.1% chance that the level of competitiveness in the SMEs will increase with increase technology capability.

Table 2 Correlation Results

	Competitiveness	Technology capability
Competitiveness	1	
Technology Capability	.611	1

Regression Results

We also sought to test the hypothesis stating that technology capability has no significant effect on competitiveness among SMEs by conducting a regression analysis. The findings were presented in Table 3, 4 and 5 below.

Table 3 Model Summary

R	R Square	Adjusted R Square	Std. Error of the Estimate
.611[a]	.373	.372	.36839

The coefficient of determination (R^2) and correlation coefficient (R) shows the degree of association between technology capability and competitiveness in SMEs. The results of the linear regression In Table 3 indicate that R^2 =0. 373 and R = 0. 611. R value indicates that there is a strong linear relationship between technology capability and competitiveness in SMEs. The R^2 indicates that the explanatory power of the independent variables is 0.373 meaning 37.3% of the variation in competitiveness is explained by the regression model while 62.7 % is unexplained by the model.

Adjusted R^2 is a modified version of R^2 that has been adjusted for the number of predictors in the model by less than chance, the adjusted R^2 of 0.372 which is slightly lower than the R^2 value is an exact indicator of the relationship between the independent and the dependent variable because it is sensitive to the addition of irrelevant variables. The adjusted R^2 indicates that 37.2% of the changes in competitiveness is explained by the model while 62.8% is not explained by the model.

Table 4 Goodness of Fit

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	26.609	1	26.609	196.07	.000[b]
	Residual	44.649	329	.136		
	Total	71.257	330			

a. Dependent Variable: competitiveness

b. Predictors: (Constant), technology capability

From Table 4 above The F test provides an overall test of significance of the fitted regression model. The F value indicates that the overall regression model is significant. The F-statistics (F = 196.070) was significant at 0.05 significance level thus confirming the fitness of the model.

Table 5 Coefficients

Model		Unstandardized Coefficients		Standardized Coefficients	T	Sig.
		B	Std. Error	Beta		
1	(Constant)	1.448	.177		8.188	.000
	Technology capability	.613	.044	.611	14.002	.000

a. Dependent Variable: competitiveness

The Table 5 indicates there is a positive linear relationship between Technology capability and competitiveness which reveals that an increase in Technology capability increases competitiveness. Capability proved significant with p=0.000 thus the null hypothesis is rejected implying that Technology capability has an influence on competitiveness.

CONCLUSION

The study findings indicate that technology capability significantly affects SME competitiveness. These findings imply that technology capability i.e. Technology Acquiring capability, Technology Operating capability and Technology Upgrading Capabilities should be put into consideration before adopting any technology in a business enterprise so as to thrive in a polarized market. However, despite these findings, while majority of the SMEs were performing well in all other aspects relating to technology capability, there were gaps in terms of having system upgrades

and updates being carried out regularly and lack of skillful technical workers and operational workers so that SMEs outsourced the skills.

While our study focused on the internal environment, there are other factors that are external such as customer preference, economic-based factors such as inflation and government policies on business that are critical for many SMEs to stay afloat. So, getting a deeper understanding of how dynamic such factors are in a different context is important in establishing ways on how to develop sound policies and structures that can effectively cushion the SMEs thus preventing closing down of some of them.

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