The Role of Technology in Strategy Implementation and Performance of Manufacturing Small and Medium Firms in Thika, Kenya

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Abstract

This study examined the relationships among technology, strategy implementation, and performance of manufacturing small and Medium (SME) firms in Thika, Kenya. The study is underpinned in the Dynamic Capabilities View of the firm (DCV), an offshoot of the Resource Based View of the firm (RBV), where technology is recognized as one of the key dynamic capabilities required by the firms in maintaining a superior performance and a competitive edge among the rival firms in the industry. A self administered questionnaire was used to collect data from a sample of 115 firms out of a population of 165 manufacturing SME's from two key industrial subsectors in Thika Sub-County in Kenya. Guided by the philosophy of logical positivism, which argue that the statement is only true if it can be proven to be right or wrong, the study adopted a mixed research design which incorporated the, qualitative and quantitative designs. Pearson's correlation's Rho (r) was used to indicate the nature of the relationship between the dependent and independent variables while OLS linear regression analysis was used to test hypotheses proposed in this study. The study findings indicated that there is a strong positive and significant relationship between attention to technological requirements during strategy implementation process and the performance of SME manufacturing firms. The literature of strategic management has identified three main drivers in strategy implementation that is leadership styles, structure, and human resources. This study investigated whether technology can be regarded as major driver influencing strategy implementation and performance of manufacturing SME firms in a developing county's set up like Kenya. The study found statistical evidence that alongside the three major drivers of strategy implementation, technology had the highest influence on the manufacturing SME firm's performance. Secondly, this study confirmed that technology is indeed a vital dynamic capability required by all manufacturing firms to attain superior performance and a strong competitive advantage among the rivals. This study therefore concluded that technology is, indeed, the fourth most important drivers influencing performance in the manufacturing SME's in Kenya. Since there is a strong positive and significant relationship between technology and performance of an SME, manufacturing firms interested in enhancing their performance and staying ahead of competition should always endeavor to maintain a fair balance between strategy implementations and the technological requirements needed to support that strategy.

Keywords: Strategy Implementation, Technology, Dynamic Capability, Performance, SME.

1. Introduction

Technology refers to knowledge, products, processes, instruments, procedures, and systems used by organizations, as platforms for value creation and delivery, to create value in form of goods and services. An organization's technological capability allows them to implement technology strategies that best fit their goals. The experience gained from implementing technology strategy feeds back into the technological capabilities which then enable firms to improve and build their core competencies to help them maintain their competitive advantage [1]. In a dynamic environment that characterizes organizations in the 21st Century, development of technological capabilities becomes very vital in order to cope with the ever changing demands in the society.
New and innovative technological competencies are needed for survival in a highly competitive environment [1].

One of the key areas of technology is the information technology which has become a key business function for almost every organization and most have great expectations of their investment in information technology for future benefits to the business expectations that will enable the business to reduce cost, enhance productivity, implement new business strategies, and gain competitive advantage. A study by Chung, Hsu, Tsai, Huang and Tsai [2] underscored the importance of information technology in implementing Customer Relationship Management (CRM) strategy and concluded that there is a positive relationship between information technology and implementation of CRM strategy. Proper alignment of technology and business strategy should be a focus of organizations aiming at achieving competitive advantage. Therefore, the current study investigated whether attention to technological requirements during strategy implementation is a major driver explaining superior performance and competitive advantage in the SME firms operating in the manufacturing sector in Kenya.

2. Objective of the study

The main aim of this study was to establish the relationship between attention to technological requirements during strategy implementation and the performance of SME manufacturing firms in Thika, Kenya

3. Hypothesis of the study

This study was guided by the following hypothesis;

H_1. A significant relationship exists between attention to technological requirements during strategy implementation and performance of SME manufacturing firms in Thika, Kenya

4. Literature Review

The resource based view (RBV) of the firm considers technology as one of the essential capabilities in the organization's bundle of resources that are used by the firm to develop, manufacture and deliver products and services to its customers [3], [4]. However, in line with frequent changes taking place in the firm's industry, the dynamic capability framework [5] views technology as a strong dynamic capability that is embedded in firm's practices and is essential in determining the competitiveness and performance of a firm in a dynamic and turbulent environment. Firms with strong dynamic capabilities exhibit technological and market agility, are able to create new technologies, differentiate and maintain superior processes and modify their structures and business models in a way that ensures they stay ahead of the competition [6]. Building technological capacity within a firm requires a change where new knowledge, skills and experience are developed and injected to drive the existing systems and to generate the required technical change [7], [8]. Lall [7] views technological capability as a continuous process of interacting with the environment to create, accumulate, and absorb technological knowledge and skills required by the firm. According to Kumar, Kumar, and Madanmohan [9], a firm achieves technological capability through process learning. The ability to create and manage changes in technologies in production is necessary if a firm has to achieve success in terms of superior performance [8], [10], [11].

Since technological capability is often associated with the knowledge of the firm [12], then it is incremental in nature [13] and there is a limit to which a firm can accumulate new knowledge. Therefore, many firms in developing countries go through a learning process after importing new technology which eventually enables them to develop their own technologies. They need to learn how to use the new technology and to them technological capacity means generation of new knowledge and skills [12]. In a dynamic environment, creation of technological capacity requires not only new knowledge but also innovative ideas [6]. Innovation allows the alteration of the firm's production function and processes and gives the firm a chance to build its distinctive technological competence.

At the firm level, innovation is viewed as the application of new ideas that lead to development of new products [14], [15]. Employees in organizations apply technology on a daily basis to carry out their duties and responsibilities. Since it is embedded in almost all organizations activities and practices from production to marketing of goods and services, from the structure, culture, systems, organization to leadership, then technology becomes an important factor that determines the success and competitiveness of a firm. Urich and Wayne [16] concluded that human resources in a firm regularly apply technology in many ways in order to improve their efficiency and their effectiveness. This in turn influences the firm's performance. From a system's thinking, a traditional question many researchers have asked is the relationship between innovation, the structure of a firm (formalization, centralization, and specialization) and the industrial environment.

From a traditional perspective, it is supposed that differences in firm's innovative activities are basically explained by industry and organizational structural characteristics [17], [18], [19], [20] and [21]. In developing countries where the economies are driven by SMEs in terms of growth and employment, technology adoption is a growing area of interest [22]. Due to their flexibility and robust growth, innovation adoption in SMEs enables them to survive in tight competition, global economic crisis and compete against larger organizations. SMEs structural flexibility and their ability to adapt themselves better enable them to innovate, adopt, develop and implement new ideas [23]. Through this, they are able to offer customers new products. SMEs are also increasingly using information technology to leverage on their competitive position and improve their productivity [24]. Although the rate of IT adoption in developing countries is still low [25], IT tools can significantly assist SMEs by creating the necessary infrastructure for providing appropriate types of information at the right time. IT can also provide SMEs with competitiveness through integration between supply chain partners and inter-organizational functions, as well as by providing critical information [26].

Past studies have tried to link technology and better performance in organizations [27]. According to Becheikh, Landry, and Amara [28], technological innovation is a key factor in firm competitiveness and it is unavoidable for firms which want to develop and maintain superior performance in the current or new markets. Manimala and Vijay [29] maintains that technology adoption is crucial for growth of business in the private sector and Mubaraki and Aruna [22] observed that technology adoption behaviour significantly improves organizational performance in terms of profit, growth and market share. Lumiste, Lumiste and Kilvits [30] found that SMEs were engaged in developing their products together with processes. However, Becheikh *et al*. [28] recommended that more research is required in both product and process innovations in SMEs because it is limited in literature. Artz, Norman, Hatfield and Cardinal [31] found that product innovation had a significant impact on firm performance, Therrien, Doloreux and Chamberlin [15] found out that for firms success in the market depended on early entrance, innovation and introduction of new and novelty products, Atalay, Anafarta and Savan [32] explored the effect of product, process, marketing and organizational innovation and found out that both product and process innovation has a significant effect on firms performance.

5. Conceptual Framework

The conceptualized framework that guided this study is depicted in figure 1 below:

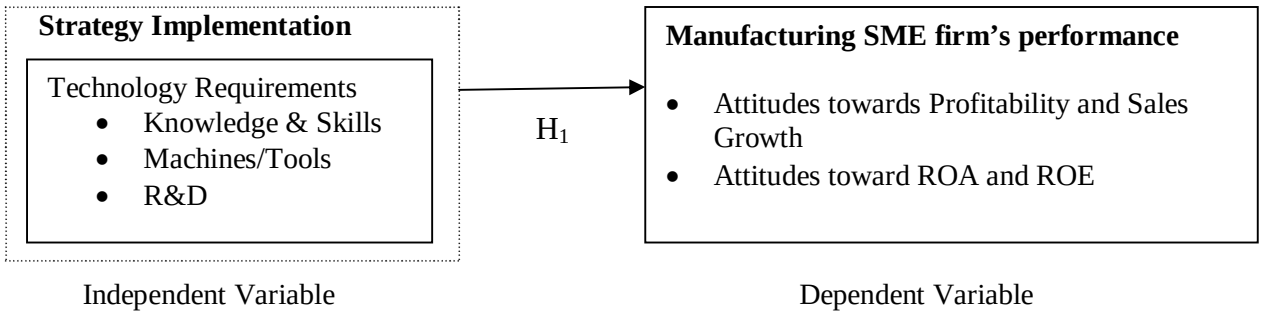

Fig 1.0: The Relationship between Technology and manufacturing SME's Performance

6. Theoretical Framework

The Dynamic Capability View of the Firm

The Dynamic Capabilities View of a firm (DCV) launched by David Teece in early 1990s is based on the works of Barney [3], Rumelt [33] and Wernerfelt [4]. The framework is an advancement of the Resource-Based View (RBV) of the firm which views resources as the key to superior organization performance. The dynamic capability framework [34] is based on the concept that organizations will always attempt to renew their resources in a way that suits the changes taking place in a dynamic environment. According to Teece, Pisano, and Shuen [35], the dynamic capability view examines how firms are able to integrate, build, and reconfigure their specific competencies (internal or external) into new competencies that match changes taking place in a turbulent environment [36]. The theory is based on the assumption that firms with greater dynamic capabilities will always outperform those with smaller dynamic capabilities. Therefore, operations in a dynamic environment call for firms to continuously renew re-engineer and regenerate their internal and external firm's specific capabilities in order to remain competitive [6]. The dynamic capabilities are hard to develop and difficult to transfer because they are tacit and are embedded in a unique set of relationships and histories of a firm. Ordinary capabilities, according to RBV, are about doing things right whereas dynamic capabilities are about doing right things at the right time based on unique processes, organizational culture, and prescient assessments of the business environment and technological opportunities surrounding a firm [6]. Strong dynamic capabilities include processes, business models, technology, and leadership skills needed to effectuate high performance sensing, seizing, and transforming an organization.

7. Research Methodology

To test the relationship between attention to technology requirements during strategy implementation and performance of small and medium manufacturing firms, the study, guided by logical positivism philosophy [37], adopted a mixed research design involving the, quantitative and qualitative research designs. The data was collected once over a period of eight months from a sample of 115 firms drawn using simple random procedure from a population of 165 manufacturing SME firms in Thika town and within 15 km radius. Data was collected using a self administered questionnaire where the owner manager/CEO or lead manager was interviewed and further issued with a questionnaire containing both open and close ended questions. Pearson's correlation analysis was used to show the correlation between technology and the performance of the SME manufacturing firm. The Pearson's Rho (r) ranges between 0 and 1. The closer the value is to 1, the stronger the relationship and the opposite is true for weak relationships. The corresponding p-value gives the significance of the relationship at 95% level of confidence. If the corresponding p-value is <0.05 then the relationship is significant at 95% level of confidence and opposite is also true for insignificant relationships. The univariate linear regression analysis was then used to test the hypothesis proposed in this study and to show the direction and significance of the relationship between technology and the manufacturing SME performance. The beta and p-values were used for this purpose. The F-Statistics in the ANOVA output in the regression analysis indicated the model validity while R-Squared (R^2) in the model summary output was used to show the proposed model's goodness of fit.

7.1 The Reliability Test

The psychometric constructs in this study were tested for internal consistency. Cronbach's alpha was then used to test reliability of these constructs. The dependent variable (performance) obtained an alpha of 0.815 while the independent variable (technological requirements) returned an alpha of 0.854. The acceptable level of alpha, as a measure of reliability of instrument, lies in between 0.70 – 1.0 [38]. The results obtained from these tests indicated that the constructs in this study were reliable and valid.

8. Measurement of Variables

a. Firm's Performance

The performance of a firm was measured by the degree of satisfaction on the levels of profitability, Return on Assets (ROA), Return on Equity (ROE) and sales turnover. Due to the sensitivity of obtaining information related to financial performance where owners of a firm were not willing to cooperate or information was not available, A 5 point Likert scale psychometric instrument [39] was developed to capture performance information using indirect financial measures.

The scale ranged from (1= Strongly Disagree, 2= Disagree 3= Not Sure, 4=Agree, 5= Strongly Agree). The mean score was then calculated as an average of the 5 items examined on the enterprises' perceived performance. A mean score above 3.4 on a 1-5 Likert scale indicated that the respondents generally agreed with a give statement while a mean score below 3.4 indicated that the respondents disagreed with the statement. A composite mean was then calculated based on all the statements on firm's performance. The higher the score obtained, the better the firm's perceived performance and the opposite is also true to poor perceived performance.

b. The Level of Technology

The level of technology in a manufacturing SME firm was measured by the extent to which the firm matches her tools, machines, and equipments to the requirements of the new strategy and changes in technology in the market. It was also measured by the extent to which the firms funds and conducts R&D, availability of efficient ICT infrastructure, and technology spread across departments. In order to measure the level of technology available during strategy implementation process, a 5-items Likert scale was used [39] which ranged from (1= Strongly Disagree, 2= Disagree 3= Not Sure, 4=Agree, 5= Strongly Agree). A mean score above 3.4 on a 1-5 Likert scale indicated that the respondents generally agreed with a give statement while a mean score below 3.4 indicated that the respondents disagreed with the statement. A composite mean was then calculated based on all the statements on firm's level of technology. The higher the score obtained, the better the firm's perceived technological match with the strategy being implemented and the opposite is also true to poor perceived technological match.

9. Research Findings and Discussions

Performance Construct	N	Mean	Std. Dev
Our Total Profits (Total sales – Costs) have been increasing yearly	115	4.139	.475
The volume of sales has been increasing ever yearly	115	4.078	.664
The number of employees has been rising every year	115	3.183	1.064
The geographical market size of our products has been expanding	115	3.635	.921
We are highly satisfied by the returns from assets invested (ROA)	115	3.374	1.013
We are highly satisfied by the returns from borrowed money (ROE)	115	3.504	.921
Number of customers satisfied by our products has been rising each year	115	3.913	.695
The size of our organization has been expanding for the last five years	114	3.895	.643
The quality of our products has improved considerably	114	3.851	.755
Efficiency of our internal work processes has improved tremendously	115	3.965	.576
Valid N (list wise)	113		

Note: Reliability α – Performance = 0.815

Ranked on a scale where 1=Strongly Disagree, 2= Disagree, 3=Not Sure, 4=Agree, 5=Strongly Agree

Table 1.0: Descriptive Statistics on the SME Performance

The study results in Table 1.0 shows that the respondents agreed with most of the Likert-based performance constructs apart from the following two statements; we are highly satisfied by the returns from assets (ROA) invested (mean score, 3.37) and that the number of employees has been rising every year (mean score, 3.18).

Technology Construct	N	Mean	Std. Dev
We use the current technology in the market to produce good/services	115	3.783	.935
The level of technology in place has greatly assisted us to implement strategies	115	4.017	.649
We have adequate tools, machines and equipments enable employees work well	113	3.982	.719
We have a budget for research and development and money is always available	114	2.798	1.006
We conduct researches in order to develop our products	115	2.904	1.043
We have efficient Information Communication Technology	115	3.348	1.060
Our technology level is higher than that of our immediate competitors	115	3.461	.830
Employees make suggestions of the type and kind of technology required	114	3.649	.787
Our organization is keen to ensure that technology required is availed	113	3.699	.812
All departments are well equipped with appropriate technology	115	3.548	.920
Our organization is quick to respond to the changes in technology	115	3.513	.940
Our organization updates and improves our ICT systems	115	3.261	1.069
We have a technology audit committee that reviews the technology	115	2.878	1.061
Valid N (listwise)	111		

Note: Reliability α – Attention to Technology Requirements = 0.854

Table 2.0: the level of Technology of the SME Firm

The study findings in Table 2.0 shows that the respondents agreed with the following statements regarding the level of technology in strategy implementation process: That the level of technology in place has greatly assisted the organization to implement strategies (mean score, 4.02), adequate tools, machines and equipments enable employees to their jobs better and faster (mean score, 3.98), the organization uses the current technology in the market to produce good/services (3.78), the organization is keen to ensure that technology required is availed (mean score, 3.70), employees are encouraged to make suggestions of the type and kind of technology required (mean score, 3.65), all departments are well equipped with appropriate technology (mean score, 3.55), the SME organization is quick to respond to the changes in technology (mean score, 3.51), the level of technology is higher than that of our immediate competitors (mean score, 3.46). The respondents however disagreed with the following statements: the organization have efficient Information Communication Technology (mean score, 3.35), the organization updates and improves our ICT systems to ensure they are efficient (mean score, 3.26), the organization conduct researches in order to develop her products (mean score, 2.90), the organization has a technology audit committee that reviews the technology (mean score, 2.88) and the organization has a budget for R&D (mean score, 2.80).

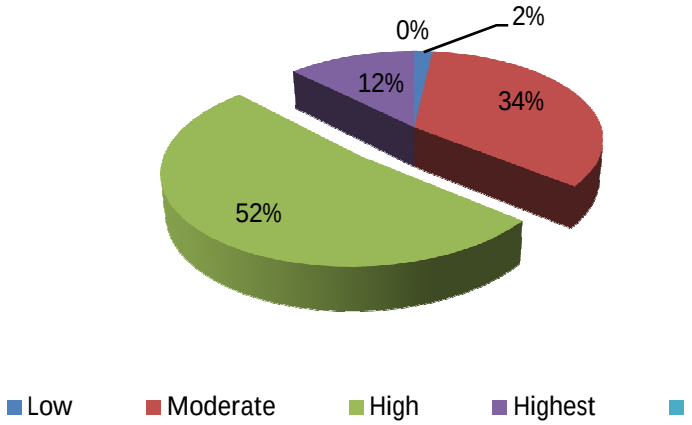

Figure 2.0: Firm's Ability to Adapt to Technological Changes

The study findings in Figure 2.0 shows what the respondents felt about their firm's ability to adapt to the technological changes in relation to dynamics in the environment. Majority of the firms (52%) responds highly to the changes in technology as a result of changes in the market while 34% of the firms moderately respond to these changes. Two percent (2%) of the firms have a low response while only 12% of all the manufacturing SME firms are able to respond very fast to the technological changes in the market.

		Y	X_1
Performance (Y)	Pearson Correlation	1	
	Sig. (2-tailed)		
	N	115	
Technology (X_1)	Pearson Correlation	.482**	1
	Sig. (2-tailed)	.000	
	N	115	115

**. Correlation is significant at the 0.01 level (2-tailed).

Table 3.0: Bivariate Linear Correlation: Technology & SME Performance

The bivariate linear correlation analysis in Table 3.0 indicated that there is a positive and significant relationship between the level of technology existing in the manufacturing SME firm during strategy implementation and its performance ($r = .482^{**}$, $P<0.001$). This finding implies that the owners, CEOs or the SME leaders who adapts to technological changes in line with changes in the environment and provides the required technological support during strategy implementation help their organizations to achieve better results. These finding were subjected to further analysis using univariate linear regression model $Y = \beta_0 + \beta_1 X_1 + \varepsilon$ to determine whether the technological adaptations of a manufacturing small and medium enterprise during strategy implementation positively affects the

performance. The model containing the explanatory variable (X_1) representing the level of technology of the SME firm was found to be valid ($F_{(1, 113)} = 34.106$, $P<.001$) meaning that the level of technology in a firm is a good predictor of performance in the manufacturing SME firms.

Model		Sum of Squares	df	Mean Square	F	Sig.
	Regression	6.156	1	6.156	34.106	.000[b]
	Residual	20.397	113	.181		
	Total	26.553	114			

a. Dependent Variable: Performance

b. Predictors: (Constant), Technology (X_1)

Table 4.0: Technology and SME Performance: ANOVA

The study results in Table 4.0 further revealed that attention the level of technology during strategy implementation explains 23.2% of the total variations in the manufacturing SME firm's performance ($R^2 = .232$). These results showed that the level of technology in the will always exist at a certain minimum as shown by the constant ($\beta_0 = 3.753$, $P < 0.001$). The level of technology in the firm during strategy implementation process was found to be positively and significantly related to the performance of the SME manufacturing firm ($\beta_1 = .417$, $P < .001$) meaning that as the SME's employ additional and better technology during strategy implementation process, the performance of the firm will also improve.

Model		Unstandardized Coefficients		Standardized Coefficients	R^2	t	Sig.
		B	Std. Error	Beta			
	Constant	3.753	.040			94.729	.000
	X_1	.417	.071	.482	.232	5.840	.000

a. Dependent Variable: Performance

Table 4.1: Technology and SME Performance: Regression Weights

The univariate model in Table 4.1 was found to be significant and therefore, supports the study objective that attention to technological requirements in the small and medium manufacturing firm during strategy implementation has a significant and positive influence on the firm's performance.

9.1 Test of Hypothesis

H_1. A significant relationship exists between attention to technological requirements during strategy implementation and performance of manufacturing SME firms in Thika Sub-County, Kenya.

This hypothesis intended to test whether adjustments to technological requirements during strategy implementation significantly influence the performance of the manufacturing SME firm's performance or not. The hypothesis $H_{01:}\ \beta_1 = 0$ versus $H_1: \beta_1 \neq 0$ was tested. The findings from the bivariate correlation in Table 3.0 showed a significant and positive relationship between the level of technology and SME firms performance ($r = .482^{**}$, $P < .001$). On the other hand, the univariate linear regression results in Table 4.1 showed a positive and significant relationship between technological adaptations in the manufacturing SME firm and its performance ($\beta_1 = .417$, $P < .001$). This led to the rejection of the null hypothesis (H_{01}) and the conclusion that a significant positive relationship exists between attention to technological requirements during strategy implementation and the performance of manufacturing SME firms in Thika Sub-County in Kenya.

10. Discussion of Findings

Zollo and winter [5] views technology as a dynamic capability that is embedded in firm's practices and is essential in determining the competitiveness and performance of a firm in a dynamic environment. The bivariate correlation ($r = .482^{**}$, $P <0.001$) in Table 3.0, the univariate regression results ($\beta_1 = .417$, $P < 0.001$) in Table 4.1 showed that the relationship between technological adaptations during strategy implementation in manufacturing SME firms is significant and positively related to the firm's performance. Teece [6] noted that those firms with strong dynamic capabilities exhibit strong technological agility are able to create new technologies, differentiate and maintain superior processes and modify their structures and business models in a way that ensures they stay ahead of the competition. This finding is in line with earlier scholars who did studies aimed at linking technology to superior performance in organizations [8], [10], [27], [40].

Becheikh *et al.* [28] observed that technological innovation is a key factor in firm competitiveness and it is unavoidable for those firms that want to develop and maintain superior performance in the current or new markets. Manimala and Vijay [29] maintained that technology adoption is crucial for growth of business in the private sector and Mubaraki and Aruna [22] noted that technology adoption behaviour significantly improves organizational performance in terms of profit, growth and market share. Lumiste *et al.*, [30] found that SMEs were engaged in developing their products together with processes. However, Becheikh *et al.*, [28] recommended that more research is required in both product and process innovations in SMEs because it is limited in literature. This study aimed at filling this gap and found that among all the major variables influencing strategy implementation like leadership styles, structure, human resources, technology had the highest positive and significant correlation with the manufacturing SME's performance (see Table 4.2 in the appendix 1.

The findings of this study are also in line with the arguments advanced by the proponents of the Dynamic Capability View of the firm [6] who argues that technology is one of the key dynamic capability required by firms to achieve better results and attain a competitive edge among rivals. This study found statistical evidence that, in deed, technological adaptations during strategy implementation process positively and significantly influences performance of the firm. These findings further supports and validate the arguments advanced by the Dynamic Capabilities View of the firm in relation to strategy implementation in organizations.

11. Summary and Conclusions

This study found statistical evidence that a positive and significant relationship exists between attention to technological requirements during strategy implementation and performance of manufacturing SME's firms. This implies that technology is a strong and an important variable influencing firm's performance. It is an important dynamic capability that is usually embedded in the firm's processes and configurations. The level of technology in an organization need to be adjusted and matched to the current demands of the society and to the strategy the firm is implementing. Based on the findings of this study it can be concluded that the CEOs and the owners of manufacturing SME firms who are keen to ensure that their new strategies are matched to the technological requirements and environmental changes enable their organization to perform better and also to maintain a superior competitive edge. Since technological capacities are embedded in various firms' processes and practices, then managers should always stay focused on the technological requirements and challenges posed by the new strategy. They must also continuously scan the environment for crucial leads regarding to the changes in technology brought about by the environmental dynamism. Finally, this study concluded that, in the contemporary world in the 21st Century where almost everything is driven by computers, machines and ICT, technology is a dynamic capability as postulated by the DCV framework and a major driver in strategy implementation influencing SME firm's performance positively and significantly.

12. References

Burgelman, R. A., & Rosen bloom, R. S. (1989). Technology Strategy: An evolutionary Process Perspective. Research on Technological Innovation. Management of Technology J. 4(1989) 1-23

Chung, Y. C., Hsu, Y. W., Tsai, S. c., Huang, H. L. & Tsai, C. H. (2012). The correlation between Business Strategy, Information technology, Organizational Culture, Implementation of CRM and Business Performance in a high tech Industry. South African Journal of Industrial Engineer. 23 (2)

Barney, J. B. (1991). Firm Resources and Sustained Competitive Advantage. Journal of Management, Vol. 17, pp. 99–120.

Wernerfelt, B. (1984). A Resource-Based View of the firm, Strategic Management Journal, 5, pp. 171-180.

Zollo, M. & Winter, S. G. (2002). Deliberate learning and the evolution of dynamic capabilities, Organization Science, 13, pp. 339-351.

Teece, D.J. (2014). A dynamic capabilities-based entrepreneurial theory of multinational enterprise. Journal of International Business Studies 45, 8-37

Lall, S. (1992). Technological capabilities and industrialization. World Development, 20 (2) 165-186

Bell, M., & Pavitt, K., (1995). The development of technological capabilities. Trade, Technology and International Competitiveness. Economic Development Institute of the World Bank 69-100

Kumar, U., Kumar, V., & Madanmohan, T. R. (2004). Import-led technological capability: a comparative analysis of Indian and Indonesian manufacturing firms. Technovation, 24, 979-993. DOI: 10.1016/S0166-4972(03)00030-0

Trez, J., Steffanello, M., Reichert, F., DeRossi, G., & Pufal, N. (2012). Footwear Industry Innovation Capability: Southern Brazilian Evidence: Academy of Management Meeting, Boston. 1-32.

Zawislak, P.A., Alves, A. C.,Tello-Gamarra, J., Barbieux, D., & Reichert, F. M. (2012). Innovation capability: From technology development to transaction capability. Journal of Technology Management and Innovation. 7 (2) 14-27

Jin, J., & Von Zedtwitz, M. (2008). Technological capability development in China mobile phone industry. Technovation, 28, 327-334

Pavitt, K. (1998). Technologies, products and organization in the innovating firm: what Adam Smith tells us and Joseph Schumpeter doesn't. Industrial and Corporate Change, 7 (3) 433-452

Rubera, G. & Kirca, A. H. (2012). Firm innovativeness and its performance outcomes: A meta-analytic review and theoretical integration, Journal of Marketing, 76(3), pp. 130-147: doi: http://dx.doi.org/10.1509/jm.10.0494

Therrien, P., Doloreux, D. & Chamberlin, T., (2011). Innovation novelty and (commercial) performance in the service sector: A Canadian firm level analysis, Technovation, (31), 655-665

Urich, D., & Wayne, B. (2005). HRM value of proposition, Boston, Harvard Business Press

Daft R. L., (1992). 'Organization Theory and Design', West St. Paul, MN

Damanpour, F. (1991). 'Organizational Innovation: a meta-analysis of effects of determinants and moderators', Academy of Management Journal, 34, 555-590. doi: 10.2307/256406

Duncan, R.B., (1976). 'The ambidextrous organization: Designing dual structures for innovation in R. H. Kilmann, L.R. Pondy & D.P. Slevin (Eds.), The management of organization: Strategy and implementation, 1, 167-188, New York: North-Holland.

Kimberly J., & Evanisko M., (1981). 'Organizational Innovation: the influence of individual, organizational and contextual factors on hospital adoption of technical and administrative innovations', Academy of Management Journal, 24, 689-713

Wolfe, R. A. (1994). 'Organizational Innovation: Review, critique and suggested research directions, Journal of Management Studies, 31, 405-431

Mubaraki, H., & Aruna, M. (2013). Technology Innovation for SME Growth: A Perception for the Emerging Economies. Journal of Economics and Sustainable Development. 4 (3) 156-162

Harrison, N. J., & Watson, T. (1998). The Focus for Innovation in Small and Medium Service Enterprises. Conference Proceedings of the 7th Annual Meeting of the Western Decision Sciences Institute, 7–11 April, Reno, NV, USA.

Premkumar, G., 2003. A meta-analysis of research on information technology implementation in small businesses. Journal of Organizational Computing and Electronic Commerce, 13 (2), 91–121.

McGregor, R. C & Vrazalic, L., (2005). A basic model of electronic commerce adoption barriers: a study of regional business in Sweden and Australia. Journal of small business and enterprise development. 12 (4) 510-527

Bhagwat, R. & Sharma, M. K. (2007). Performance measurement of supply chain management using the analytical hierarchy process, computers in industry. 18 (8) 666-680

Nohria, N., & Gulati, R. (1996). Is slack good or bad for innovation? Academy of Management Journal, 39 (5), 1245-1264.

Becheikh, N., Landry, R. & Amara, N. (2006). Lessons from Innovation Empirical Studies in the Manufacturing Sector: A Systematic Review of the Literature from 1993–2003. Technovation, 26 (5/6) 644–64.

Manimala, M. J., & Vijay, D. (2012). Technology Business Incubators (TBIs): A Perspective for the Emerging Economies. IIM Bangalore Research Paper No. 358. Available online: http://dx.doi.org/10.2139/ssrn.2117720

Lumiste, R., Lumiste, R. (jun) & Kilvits, K. (2004). Estonian Manufacturing SMEs Innovation Strategies and Development of Innovation Networks. Paper presented at the 13th Nordic Conference on Small Business Research, 10–12 June, Tromsø, Norway.

Artz, K. W., Norman, P. M., Hatfield, D. E., & Cardinal, L. B. (2010). A longitudinal study of the impact of R&D, patents, and product innovation on firm performance. Journal of Product Innovation Management, 27 (5) 725-740

Atalay, M., Anafarta, N., & Savan, F. (2013). The relationship between innovation and firm performance: An empirical evidence from Turkish Automobile Supplier Industry. Procedia-Social and behavioural Sciences 75, 226-235. doi: 10.1016/j.sbspro. 2013.04.026

Rumelt, R. P. (1984). 'Towards a strategic theory of the firm'. In R. Lamb (ed.) Competitive Strategic Management. Prentice-Hall, Englewood Cliffs, NJ, pp. 556-570.

Eisenhardt, K.M., & Martin, J. A. (2000). Dynamic capabilities: what are they? Strategic Management Journal, 21, 1105-1121.

Teece, D. J., Pisano, G., & Shuen, A. (1997). Dynamic capabilities and strategic management. Strategic Management Journal, 18 (7): 537–533.

Helfat, C. E, Finkelstein, S., Mitchell, W., Peteraf, M., Singh, H., Teece, D., & Winter, S. (2007). Dynamic capabilities and organizational processes in Dynamic Capabilities: Understanding Strategic Change in Organizations, pp. 30-45 Blackwell, London.

Scotland, J. (2012). Exploring the philosophical underpinnings of research: Relating ontology and epistemology to the methodology and methods of the scientific, interpretive, and critical research paradigms. English Language Teaching, 5 (9) 9-16. doi:10.5539/elt.v5n9p9, URL: http://dx.doi.org/10.5539/elt.v5n9p9

Cronbach L J. Coefficient alpha and the internal structure of tests. Psychometric. 1951; 22 (3): 297-334.

Boone, H. N., & Boone, A. D (2012). Analysing Likert data. Journal of Extension. 50 (2). Available online: http://www.joe.org/joe/2012april/pdf/JOE_v50_2tt2.pdf

Reichert, F. M., & Zawislak, P. A., (2014). Technology capability and firm performance. Journal of Technology Management & Innovation 9 (4) 20-35

13. Appendix 1

Table 4.2: Bivariate Correlation Results: All Study Variables

		Y	X_1	X_2	X_3	X_4	X_5
Performance (Y)	Pearson Correlation	1					
	Sig. (2-tailed)						
	N	115					
Leadership Styles (X_1)	Pearson Correlation	.259**	1				
	Sig. (2-tailed)	.005					
	N	114	114				
Structural Adaptations (X_2)	Pearson Correlation	.442**	.386**	1			
	Sig. (2-tailed)	.000	.000				
	N	115	114	115			
Human Resources (X_3)	Pearson Correlation	.408**	.337**	.526**	1		
	Sig. (2-tailed)	.000	.000	.000			
	N	115	114	115	115		
Technology (X_4)	Pearson Correlation	.482**	.337**	.468**	.525**	1	
	Sig. (2-tailed)	.000	.000	.000	.000		
	N	115	114	115	115	115	
Strategic Direction (X_5)	Pearson Correlation	.137	.527**	.225*	.447**	.358**	1
	Sig. (2-tailed)	.143	.000	.016	.000	.000	
	N	115	114	115	115	115	115

**. Correlation is significant at the 0.01 level (2-tailed).

*. Correlation is significant at the 0.05 level (2-tailed).