

Influence of Strategic Technological Capabilities on Performance of Manufacturing Firms in Kenya

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Abstract

The study aimed at establishing the influence of strategic technological capabilities on performance of manufacturing firms in Kenya. This study used descriptive survey design to establish the relationship between strategic technological capabilities and performance of manufacturing firms in Kenya. The target population consisted of 513 manufacturing firms. The study used a sample size of 225 respondents. Stratified random sampling technique was used to select the sample within the target population. Regression results revealed that strategic technological capabilities had a positive and significant effect on performance of manufacturing firms in Kenya. This means that an increase in strategic technological capabilities led to an improvement performance of manufacturing firms. The study recommended that firms should adopt new technologies for cultivation of organizational capabilities. In addition, the study recommends adoption of technology for the development of new services, new functions, and formation of new alliances

Keywords: Strategic technological capabilities, performance, manufacturing firms

1. Introduction

Employment of organizational capabilities effectively could lead to organizational performance. In the present day business environment that is characterized by a high degree of uncertainty, organizational managers face increasingly dynamic, complex and unpredictable environment, where technology, globalization, knowledge and changing competitive approaches impact on overall performance of the firm. Thus as Stopford (2011) point out, due to this complex and changing environment, managers in both small and large firms are ever in the process of seeking new ways of conducting business to create wealth and increase the shareholder value. Thus a key concern to any present day shareholder of a firm is the need of the management to develop systems and frameworks that not only deliver performance, but also the ability to control these systems against top level targets (Chau & Witcher, 2008). As a result, they note that more and more firms are turning to strategic approaches and internal resources that are valuable, scarce, inimitable and irreplaceable.

Viewed from a worldwide perspective, the Toyota Motor Corporation, for instance has become a leading auto manufacturer in the world. Toyota sells its vehicles in more than 170 countries and regions worldwide (Hong,

2007). Among key Toyota's Key core competencies include the Toyota production system that has helped accelerate the "lean thinking" revolution that is finally sweeping all manufacturing operations today (Thakore, 2010). Since the 1980s, Toyota has set the standard for quality and cycle time in developing new models (Hass, 2006). They have been leaders in the market as a result of their popularly priced cars, such as the Camry, and premium brands such as the Lexus (Hass, 2006).

Toyota also continually invests for the future, and reported that 4% of the Toyota sales dollar was invested in research and development in 2004 (Hass, 2006). The innovation effectiveness at Toyota is a benchmark for competitors, yet Toyota is only the third-highest spender in the auto industry (Hong, 2007). Thus, Toyota has found ways to stretch the research and development expenditures across fewer models. For example, Toyota's Lexus was designed totally for U.S. consumers, from dealership to accessories, and is not sold in Japan (Hass, 2006). According to Wearable Robots (2007), Toyota is the most ambitious researcher of bionic technology in order to boost productivity by factory workers through products like high-tech prosthetic devices. The Toyota's strategic centre (or central firm) also plays a critical role as a creator of value

1.2 Statement of the Problem

Organizational capabilities has been said to affect performance. However Kenya has been experiencing

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turbulent times with regard to its organizational practices and this has resulted in declining profits in the manufacturing sector of the economy (Mutindi, Namusonge & Obwogi, 2013). Statistics from World Bank show that large scale manufacturers operating in Kenya registered stagnation and declining profits for the last five years due to a turbulent organization capabilities (WB, 2014). It is estimated that large manufacturing firms have lost 70 per cent of their market share in East Africa largely attributed to contingencies (RoK, 2014). Further statistics from Kenya Association of Manufacturers have shown that some firms announced plans to shut down their plants and shift operations to Egypt due to negative influences of management inabilities (KAM, 2014). In 2014, manufacturing sector in Kenya contributed barely 10% to the GDP which represented 3.4 per cent growth to Sh.537.3 Billion indicating a decline from the previous year 2013 where it had reported a 5.6 per cent growth mainly due to a challenging organizational capabilities (KNBS, 2014)

A review of literature on strategic organizational capabilities has focused on non-manufacturing firms; Aduloju (2014) investigated managerial capabilities in insurance companies in Nigeria, Kearney *et al*, (2013) focused on Irish hospitality industry, Karanja *et al* (2014) on mobile service provider intermediary organizations in Kenya and Chengecha (2016) sought knowledge capability in relation to competitiveness of firms in the banking industry in Kenya. Majority of these studies have focused on service industry. However, there has been attributes to complexities experienced in studying service industry as service outputs are considered unclear in nature making it difficult to identify and measure their improvement or change. Further McDermott (2012) stated that services are more immediately perishable, inseparable (production and consumption occur at the same time) and tend to be more heterogeneous than manufactured products. The current study therefore sought to determine the influence of influence of strategic technological capabilities on performance of manufacturing firms in Kenya.

2. Literature review

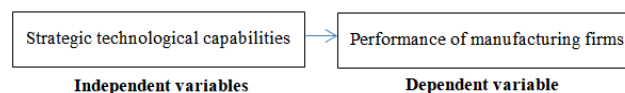
2.1 Adaptive Structuration Theory

Adaptive structuration theory is based on Giddens (1984) structuration theory. This theory is formulated as the production and reproduction of the social systems through members’ use of rules and resources in interaction. Poole (2009) adapted Giddens (1984) theory to study the interaction of groups and organizations with information technology, and called it adaptive structuration theory (AST). AST criticizes the techno centric view of technology use and emphasizes the social aspects. Groups and organizations using information technology for their work dynamically create perceptions about the role and utility of the technology, and how it

can be applied to their activities. These perceptions influence the way technology is used and hence mediate its impact on group outcomes.

This theory is concerned with the behavior of humans as they use technology (such as computers) in a bank. On the other hand the behavioral school implies the way human beings react to the environment, for instance how people behave determines how knowledge is managed. The theory also refers to the nature of group-computer interaction since organizations, such as those in the banking industry, now rely heavily on the use of advanced information technology for the purposes of communication and relaying information. Over-reliance on IT has led many organizations and individuals to believe that knowledge is IT, yet Adaptive structuration theory focuses on communication using information technology, thus highlighting the concepts of appropriation and structuration (Sedera & Zakaria, 2008). Dewan and Ren (2011) posits that the AST draws some links between individuals and organizational learning due to the key concepts that address aspects of group interaction with technology. Organizational learning is regarded as a continuous phenomenon emerging from the social interactions and practices of individual. The behavioral school is a kind of community of practice model where there is continuous learning and informal exchange which is enhanced by the availability of knowledge retained and accessible from within as well as outside the organization. With the advent of interactive communication technologies such as wikis, blogs, Facebook and Twitter, to name but a few, individuals are exposed to new information and knowledge (Taylor & Todd, 2011; Skyrme & Amidon, 2013).

While AST criticizes the techno centric view of technology use, it places emphasis on social aspects. Technologies such as computers enable the transfer, sharing and, most importantly, the retention of knowledge for preservation and re-use. Employees extensively interacted with technology which is likely to change individuals’ behaviors. As such the theory is applied as knowledge retention strategies (Skyrme & Amidon, 2013).



Source (Author 2017)

Figure 1: Conceptual Framework

3. Methodology

This study used descriptive survey design to establish the relationship between strategic technological capabilities and performance of manufacturing firms in Kenya. The target population consisted of 513 manufacturing firms. The study used a sample size of 225 respondents. This research incorporated two sampling techniques, simple

random sampling and stratified sampling. Stratified random sampling was accepted since the population is heterogeneous; hence the population was divided into homogenous strata in order to enable sampling to be conducted separately in each stratum. The study used structured questionnaires to collect data. The selection of questionnaires was based on the nature of the data to be collected. The questionnaire had both open ended questions and closed questions. Open ended questions for detailed information and closed ended questions on facts about variables.

4. Research findings and discussions

4.1 Response Rate

Table 1: Response Rate

| Response | Frequency | Percentage |
|--------------|------------|-------------|
| Returned | 170 | 75.56% |
| Unreturned | 55 | 24.44% |
| Total | 225 | 100% |

The number of questionnaires that were administered to employees of manufacturing firms in Nairobi, Kenya was 225. A total of 170 were properly filled and returned. This represented an overall successful response rate of 75.56% as shown on Table 4.1.

4.2 Demographic Information

4.2.1 Duration of Employment

The respondents were asked to indicate the duration they had worked on the manufacturing firm.

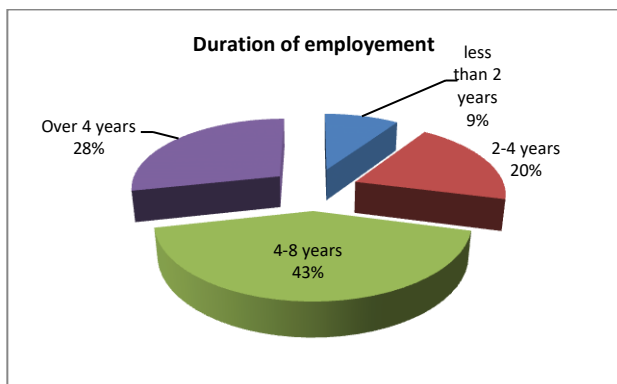


Figure 2: Duration of Employment

The results in figure 2 revealed that 43% of the respondents had worked in the manufacturing firm for 4 – 8 years, while (28%) of the respondents had worked in the manufacturing firm for more than 4 years. The results also showed that 20% of the respondents had worked in the manufacturing firms for 2-4 years while only 9% had worked in the manufacturing firms for less than 2 years. This implies that most employees had worked in the

manufacturing firms for a good number of years and therefore they had the relevant skills to improve the performance of the firm.

4.2.2 Level of Education

The respondents were asked to indicate their level of education. The results are shown in figure 3.

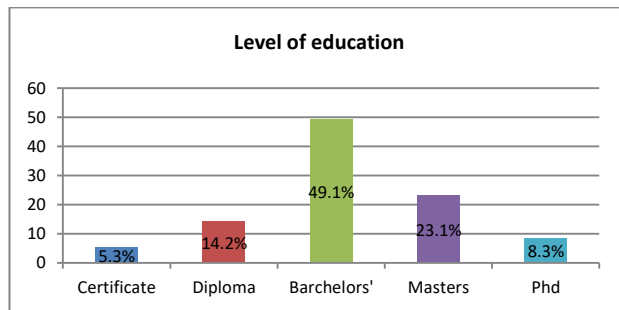


Figure 3: Level of Education

The result in Figure 3 revealed that majority of the respondents (49.1%) had a bachelor’s degree, (14.2%) were at post graduate with a master’s degree, (8.3%) had a PhD degree while (5.3%) of the respondent indicated that they had certificate qualifications. This implies that most employees in manufacturing firms are educated and thus has the capacity it boost the organizational performance.

4.3 Descriptive statistics

4.3.1 Strategic Technological Capabilities and Firm Performance

The results in Table 2 revealed that majority of the respondents (77.52%) agreed with the statement that adoption of technology has cultivated organizational capabilities that enable their firm to outperform its competitors. The results further showed that majority of the respondents (78.70%) agreed with the statement that adoption of technology has led to the development of new services, new functions, and formation of new alliances. The results also showed that (75.74%) of the respondents agreed with the statement that employees in their organization have high technological skills.

The results also revealed that majority of the respondents (78.10%) agreed with the statement that their organization is able to develop new products and processes without struggle. The results further revealed that majority of the respondents (78.11%) agreed with the statement that their organization is able to employ and develop a high technology for its product. The results also revealed that majority of the respondents (80.48%) agreed with the statement that their organization is able to lead and maintain technological change in the industry.

Table 2: Strategic Technological Capabilities

| Statement | Strongly disagree | Disagree | Neutral | Agree | Strongly agree | Mean | Std.Dev |
|---|-------------------|----------|---------|--------|----------------|-------------|-------------|
| Adoption of technology has cultivated organizational capabilities that enable our firm to outperform its competitors | 7.10% | 7.10% | 8.30% | 43.20% | 34.30% | 3.91 | 1.16 |
| Adoption of technology has led to the development of new services, new functions, formation of new alliances | 4.70% | 7.70% | 8.90% | 44.40% | 34.30% | 3.96 | 1.08 |
| Employees in our organization has high technological skills | 6.50% | 8.90% | 8.90% | 42.00% | 33.70% | 3.88 | 1.17 |
| Our organization is able to develop new products and processes without struggle. | 6.50% | 6.50% | 8.90% | 39.60% | 38.50% | 3.97 | 1.15 |
| Our organization is able to employ and develop a high technology for its product | 8.90% | 5.90% | 7.10% | 44.40% | 33.70% | 3.88 | 1.2 |
| Our organization is able to lead and maintain technological change in the industry | 5.90% | 6.50% | 7.10% | 47.30% | 33.10% | 3.95 | 1.1 |
| Our organization is able to use technology to efficiently produce more products than its competitors and at the lowest cost | 7.70% | 7.10% | 10.70% | 44.40% | 30.20% | 3.82 | 1.17 |
| Our organization uses distribution technology to increase its sales | 7.10% | 7.10% | 11.20% | 44.40% | 30.20% | 3.83 | 1.15 |
| Collaboration technologies enables the organization to outshine its competitors | 8.30% | 7.10% | 9.50% | 46.70% | 28.40% | 3.8 | 1.17 |
| Average | | | | | | 3.89 | 1.15 |

These findings were also in agreement with that of Porter (1985) who argues that the ability of an organization to be able to lead and maintain technological change in the industry eventually give such organization a justifiable competitive advantage over others, which gives an organization the ability to perform. The results revealed that majority of the respondents (74.56%) agreed with the statement that their organization is able to use technology to efficiently produce products than its competitors and at the lowest cost. The results also revealed that majority of the respondents (74.56%) agreed with the statement that their organization uses distribution technology to increase its sales. In addition, the results revealed that majority of the respondents (75.15%) agreed with the statement that collaboration technologies enable their organization to outshine its competitors. These findings were in agreement with that of Tornatzky and Fleischer (2010) whose findings stated that adoption of information technology is able to increase the organization’s productivity and thus considered competitive compared to its competitors who partially or do not adopt information technology at all. On a five point scale, the average mean of the responses was 3.89 which mean that majority of the respondents agreed with the statement; however the answers were varied as shown by a standard deviation of 1.15.

4.4 Correlation Analysis

4.4.1 Correlation Analysis between Technological Capabilities and Performance

Table 3: Correlation Analysis between Technological Capabilities and Performance

| | | Perform-ance | Strategic Technological Capabilities |
|--------------------------------------|---------------------|--------------|--------------------------------------|
| Performance | Pearson Correlation | 1 | |
| | Sig. (2-tailed) | | |
| Strategic Technological capabilities | Pearson Correlation | .642** | 1 |
| | Sig. (2-tailed) | 0.000 | |

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

The results in table 3 revealed that there was a positive and significant association between strategic technological capabilities and performance (r = 0.642, p = 0.000).

4.5 Regression Analysis

4.5.1 Regression Analysis for Strategic Technological Capabilities

Table 4: Model of Fitness for Strategic Technological Capabilities

| Model | R | R Square | Adjusted R Square | Std. Error of the Estimate |
|-------|------|----------|-------------------|----------------------------|
| 1 | .642 | 0.412 | 0.408 | 0.2593 |

The results in table 4 presented the fitness of model of regression model used in explaining the study phenomena. Strategic technological capabilities were found to be satisfactory in firm performance. This was supported by coefficient of determination i.e. the R square of 41.2%. This shows that technological capabilities explain 41.2% of the firm performance. The results meant that the model applied to link the relationship.

Table 5: ANOVA for Strategic Technological Capabilities

| | Sum of Squares | df | Mean Square | F | Sig. |
|------------|----------------|-----|-------------|---------|-------|
| Regression | 7.865 | 1 | 7.865 | 116.941 | 0.000 |
| Residual | 11.232 | 168 | 0.067 | | |
| Total | 19.098 | 169 | | | |

Table 5 provided the results on the analysis of the variance (ANOVA). The results indicated that the model was statistically significant. Further, the results implied that a technological capability is a good predictor of firm’s performance. This was supported by an F statistic of 116.941 and the reported p value (0.000) which was less than the conventional probability of 0.05 significance level.

Table 6: Regression of coefficients for Strategic Technological Capabilities

| | B | Std. Error | t | Sig. |
|--------------------------------------|-------|------------|--------|-------|
| (Constant) | 1.538 | 0.217 | 7.07 | 0 |
| Strategic technological capabilities | 0.613 | 0.057 | 10.814 | 0.000 |

Regression of coefficients results in table 6 revealed that technological capabilities and organization performance are positively and significantly related (B=0.613, p=0.000).

5. Recommendations and conclusions

5.1 Recommendations

The study recommends that firms should adopt new technologies for cultivation of organizational capabilities. In addition, the study recommends adoption of technology for the development of new services, new functions, and formation of new alliances. The study further recommends an organization to employ and develop a high technology for its product goes a long in order to determine strategic position to adopt the differentiation position or the cost leadership position. The organization is recommended to lead and maintain technological change in the industry and to use technology to efficiently produce products than its competitors and at the lowest cost and hence outshine its competitors. This will help them to outperform their competitors.

5.2 Conclusions

The study concluded that adoption of technology enables a firm to outperform its competitors. Furthermore, it concluded that adoption of technology leads to the development of new services, new functions, and formation of new alliances which in turn helps the organization to develop new products and processes without struggle and to employ as well as develop a high technology for its product. The study further concluded that the ability of an organization to employ and develop a high technology for its product goes a long way in determining the strategic position to adopt whether it is that of the differentiation position or the cost leadership position. The study also concluded that the organization is able to lead and maintain technological change in the industry and is able to use technology to efficiently produce products than its competitors and at the lowest cost and hence outshine its competitors

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