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Influence of Intellectual Capital on Performance of Large Manufacturing Firms in Kenya

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Abstract

Intellectual capital has been gaining increased attention in competitive industries due to shortened product life cycles, globalization, rapid technological progress, deregulation and accelerated diffused rates for technology–based products. In addition, only 46 percent of the large manufacturing firms operate a full 8 hours while 47 percent of the businesses run between 6-8 hours a day. Majority of the firms use outdated technology; 83 percent are semi-automated while a measly 11 percent are fully automated. Therefore, this study sought to establish the effect of intellectual capital on performance among large manufacturing firms. This study was guided by positivism philosophy and used a deductive approach. The study adopted a descriptive survey. The population of interest comprised all the 124 large manufacturing firms in Kenya that are members of the Kenya Association of Manufacturer (KAM) as at December 2019. Data was gathered using a questionnaire. The questionnaire targeted CEO, director of human resources and finance. To test the stated hypothesis and correspondingly address this objective, the factor variable, intellectual capital was indicated by 3 sub-constructs, including human capital, structural capital and relational capital while the outcome variable. The study concluded that intellectual capital is a significant predictor of performance among large manufacturing firms in Kenya. By enhancing human capital, large manufacturing firms in the country benefit from a skillful, productive, effective and an efficient workforce which results in performance improvements through more efficient and innovative production processes and products. The study recommends that, for superior performance, large manufacturing firms in the country should invest in their intellectual capital by investing in employee training and development to build skills, expertise and capabilities; and enhancing human resource management systems and programs, improving their reward performance programs in relation to task and promote a supportive firm culture.

Keywords: *Human Capital, Structural Capital, Relational Capital, Intellectual Capital, Performance & Large Manufacturing Firms*

1.1 Introduction

The knowledge based economy postulates the significant of intellectual capital as a key resource in gaining and sustaining competitive advantage for firms through value creation. IC is gaining momentum due to its increased contribution to extraordinary profits and dominant competitive positions for firms (Harris, 2011; Lev, 2001; Bontis et al., 2017; Alonso 2019). The critical role of intellectual capital for firms in balancing the innovation and exploitation activities is further emphasized in the present fourth industrial revolution era (Mahmood & Mubark, 2020). Intellectual capital is viewed in different perspectives. Stewart (1997) perceives intellectual capital as concerned with accrual of employee competence that contributes to organizational performance. Bontis (2009) view intellectual capital as amalgamation of knowledge established in personnel, organizational practices and organizational network relationships. Intellectual capital in the words of Youndt et al. (2004) is 'the intangible assets and knowledge efficiency used in generating value and improving performance of the organization'. Intellectual capital comprises three kinds of intangible resources comprising human capital, structural capital as well as relational capital (Bontis, 1998; Stewart, 1997; Zeglat & Zigan, 2013).

Human capital symbolizes collective knowledge, education, talents, characteristics and abilities of staff to deal with task under consideration (Roos & Roos, 1997; Edvinsson & Malone, 1997). Structural capital connotes the supporting conditions and configurations and the intellectual capital residing within the firm and remains long after employees separate from the organization (Roos & Roos, 1997). Social capital involves sets and patterns of interactions and the value derived from relationships the organization has with stakeholders (Nahapiet & Ghoshal, 1998). Recently, researchers began to question the depiction of intellectual capital as tripartite variable considering its diverse nature (Kianto et al., 2014). Hence, additional dimensions comprising regeneration capital (Kianto, 2008), trust capital and entrepreneurial capital (Inkinen et al., 2014) have surfaced. Alrowwad, Abualoush and Masadeh (2020) proposed intellectual capital as displayed in the form of knowledge, creativity, expertise and valuable skills that organizational members have.

Intellectual capital has been gaining increased attention in competitive industries due to shortened product life cycles, globalization, rapid technological progress, deregulation and accelerated diffused rates for technology–based products. IC is considered as a viable solution towards improving efficiency and lowering costs of manufacturing firms, leading to competiveness (Bontis et al., 2012). A recent study by Alonso (2019) proved that successful adoption of IC is affected by both the internal environment and external factors which increase market share though innovativeness and product differentiation.

The manufacturing sector is fundamental for economic growth in Kenya through innovations and product differentiation in other sectors and offering expansion of export opportunities. It is one of the key pillars of the government towards achieving the 2030 vision. Manufacturing companies are classified on the basis of their net worth and asset base wherein LMFs with asset value exceeding KES 100 million (Haron & Chelakumar, 2012). Currently, the large manufacturing companies globally have revenues ranging between US$1177 to US$424,328 million. Although manufacturing sector is key to the economy, its slow growth is a key policy concern. The slow growth of the manufacturing sector affects the economy in many ways including suppressed job creation, reduced flow of foreign exchange and overreliance on extractive industries.

The declining performance of LMFs in Kenya could be partly attributed to numerous variables that affect efficiency and effectiveness in operations. To attain product uniqueness, timeliness in

production, quality products and quest to meet customer need. Intellectual capital and managing knowledge are key to performance owing to their documented role in creating competitive advantage. Kenya can change to be an exporting country by adopting KMS which empirically inform organizational success. Knowledge management and intellectual capital are intangible assets that are central to employment and human resource management practices. Unlike other resources such as physical facilities and finances can be acquired by competitors, the intellectual capital is unique to individual organizational employees and the strategies organizations use to manage tacit and explicit knowledge. Therefore, intellectual capital and knowledge management strategies serve as the armory from where competitive weapons like differentiation are unleashed to defend market positions and respond to competitive maneuvers by rival firms.

1.2 Research Problem

Studies have shown that there is a relationship between Intellectual Capital and Firm Performance. Empirical evidence has shown that IC can improve firm's competitive advantage, and is closely related to high –level firm performance. Ali (2021) examined the impact of IC components including human, structural and relational capital on firm performance and established a correlation between Malaysian manufacturing enterprises. A study by (Hamadan, 2018) conducted at 198 firms from two Gulf Cooperation Council Countries came up with evidence that support the relationship between intellectual capital and accounting-based performance. In a study of pharmaceuticals in Kenya (Ngari, 2019) established that human capital, structural capital and Relational Capital influence business performance of pharmaceuticals in Kenya and that the three components are dimensions of IC. In a study of banking institutions in Luxembourg and Belgium, Bontis (2013) indicates that Human Capital and contributes both directly and indirectly to business performance in the banking sector. Structural and relational capital are positively related to business performance, though results are not statistically significant. Previous studies have shown that for intellectual capital to influence firm performance, knowledge management strategies are very important in that relationship. KMS is the strategic application of integrated management strategy, which combines the explicit (IT) and tacit (people) knowledge with organizational process to create, store, share and apply knowledge assets from the different sources (internal and external) of knowledge to make the right decisions in order to gain strategic objectives. Bhalt (2001) defines Knowledge Management Strategies as the processes and procedures that govern the creation, dissemination and utilization of knowledge by merging organizational structures and people with technology in order to better leverage the resources within an organization. In progressive organizations Knowledge Management Strategy moderates the relationship between IC and FP. While IC focuses on renewing and maximizing the enterprise-wide value of intellectual assets, Knowledge Management Strategy supports intellectual capital management by focusing on detailed systematic, explicit processes and overlap and synergy between IC and KMS. Advanced enterprises pursue deliberate strategies to coordinate and exploit them.

Kianto et al., (2018) analyzed the complementary role of structural and relational capital (as the outcome of codification and personalization knowledge management strategies in renewal capital and innovation in high and low-tech companies of 180 Spanish companies. The study provides a conceptual analysis of the connection between Knowledge Management Strategies and Intellectual Capital. From extant literature Knowledge Management Strategies is an antecedent Intellectual Capital. The Intellectual Capital Components act to enhance the existence and significance of Knowledge Management Strategies. An examination on the impact of Knowledge Management Strategies on Strategic Performance in Chinese High Tech Firms Drawing on the resource based

view indicates a correlation exists. Results from moderated regression analysis show the Knowledge Management Strategies and performance connection is contingent on both performance driven strategies (including reward system and process innovation) and knowledge management based competencies, such as research and development from past projects, market intelligence, and intraorganizational knowledge sharing. The findings suggest that both performance driven strategies are knowledge management-based competencies should be considered in the implementation of knowledge management strategies in the Chinese high-tech firms.

Studies carried out in large manufacturing firms have shown that firm performance has been on a decline for a period of time. A study on manufacturing firms in Indonesia postulates the significance implement in performance after the introduction of Intellectual Capital components in the period 2014-2019 (Kusnandar et al, 2020). Similarly, in Kenya, the performance of Large Manufacturing Firms is on a steady decline as evidenced by several studies and threatening to wind up due to poor performance. Were (2016) established constraints in efficiency and productivity in Large Manufacturing Firms in Kenya in the period 2012-2016. The study postulates weaknesses in skill, management, infrastructure and investment climate. The study captures these elements in the collaboration of intellectual capital components of; human capital, structural capital and relational capital.

Extant literature on key challenges in the manufacturing sector in Kenya indicate the sector currently contributes less than 10 percent of the GDP. SYSPRO, a global technology company offering software solutions and industry expertise to manufacturers and distributors, and Strathmore Business School recently conducted a survey and found that most Large Manufacturing Firms do not run optimally. Only 46 percent of the Large Manufacturing Firms operate a full 8 hours while 47 percent of the businesses run between 6-8 hours a day. Majority of the firms use outdated technology; 83 percent are semi-automated while a measly 11 percent are fully automated. As per the research findings, most Large Manufacturing Firms operate sub-optimally due to diverse challenges such as: high energy costs, lack of automation, high cost of technology, shortage of skilled workforce and lack of market for goods. Hence, the study sought to answer the question: How does intellectual capital on performance of large manufacturing firms in Kenya?

1.3 Research Objective

To determine the influence of intellectual capital on performance of large manufacturing firms in Kenya

2.0 Literature Review

2.1 Theoretical Review: Human Capital Theory

The theory argues that people hold skills, knowledge and abilities that are instrumental for economic viability of the firm. Therefore, firm investments in people through human resources management increase intellectual capital and hence economic returns to the firm. Human capital manifests itself through collective tacit knowledge and human skills distinguished in a sequence of HRM functions including recruitment, deployment, and appraisal of employees (Hsu et al., 2012). Human capital is directly proportional to organizational productivity, such that the more human capital an organization has, the higher the its overall productivity and performance (Hussainey, 2010). HR scholars have made theoretical contributions to describe the main constituents of the HCT. Youndt (2004) posits that a firm's investment in human resource activities

depends on the level of human capital productivity and overall organizational performance. Zerenler (2009) explains that, when an organization attracts new personnel, it must pass through a period of dynamic cost adjustment before the best utilization of personnel can be discovered and mainstreamed to the needs of the organization.

Human Capital is arguably a crucial element of intellectual capital (Bontis et al., 2005) that brings economic value to the firm (Snell & Dean, 1992). Included in the human capital are attributes of managerial and entrepreneurial experience, formal education, vocational training, an individual's age. Literature argues that intellectual capital is industry specific (Bontis et al., 2012). Debate on HC arises on how to develop and compensate the various skills that people possess in organizations to increase individual performance and retention. Human Resource scholars argue that workers can have different levels of skills arising from inborn differences across individuals. Hence, heterogeneity in human capital is most likely whether individuals are exposed to similar opportunities and the same economic conditions. This calls for further theoretical and empirical investigations to examine the source of variations in human capital, particularly where it is associated with organizational performance.

2.2 Empirical review

Knowledge resources have for a long time been associated with organizational performance. Kim et al. (2011) observe that intellectual capital comprises non-financial assets that bring gains to the firm. Grant (1996) argues that variations in knowledge typologies create economic value and financial returns to companies. Empirical studies on intellectual capital have pointed out the combinations and interactions of different facets of intellectual capital influence performance of the organization (Jordon & Martos, 2012; Kim et al., 2012). Debate on the impact of different components of intellectual capital on performance has been ongoing without convergence of findings. While some researchers vouch that the different dimensions of intellectual capital are equally important (Reed, 2000) for performance outcomes, other studies (Bontis et al., 2003) suggest that the diverse elements of intellectual capital affect performance differently. A study by Bontis et al. (2000) assessed three elements of cognitive resource and concluded that human and relational capital were significant in operational performance. In addition, the study arrived at the conclusion that structural capital was positively linked to organizational performance.

Studies have yielded inconsistent findings with regards to the association between intellectual capital and performance. While majority of the studies have demonstrated positive impact of intellectual capital on performance, other studies have reported negative relationship. Moreover, some studies have reported that the link between cognitive capital and performance is not significant. Empirical studies (Rialhu-Belkaoui, 2003) have established a direct association between intellectual capital and financial performance. Youndt and Snell (2004) established significant positive influence between intellectual capital and performance. Other scholars believe that intellectual capital influence different dimensions of organizational performance. For example, Chahal and Bakshi (2016) established that intellectual capital influence organizational survival and value creation. On their part, Abualoush et al. (2018a) established that intellectual capital positively influences business performance. Pablos and Blacklers (2002) revealed that IC components enhanced performance of firms in Canada. Negative relationship has been reported by Tan (2007) who established that some components of IC and organizational performance were negatively associated. In addition, Ulrich et al. (2009) in their analysis of small firm efficiency in Malaysia reported negative effect of one IC component and positive effect of two IC components.

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2.3 Conceptual framework

The relationship of the variables under study is shown in Figure 1. IC and performance are the independent and dependent respectively. The conceptual framework is based on a theoretical framework wherein IC plays the role of predictor variable, and organizational performance is the predicted variable.

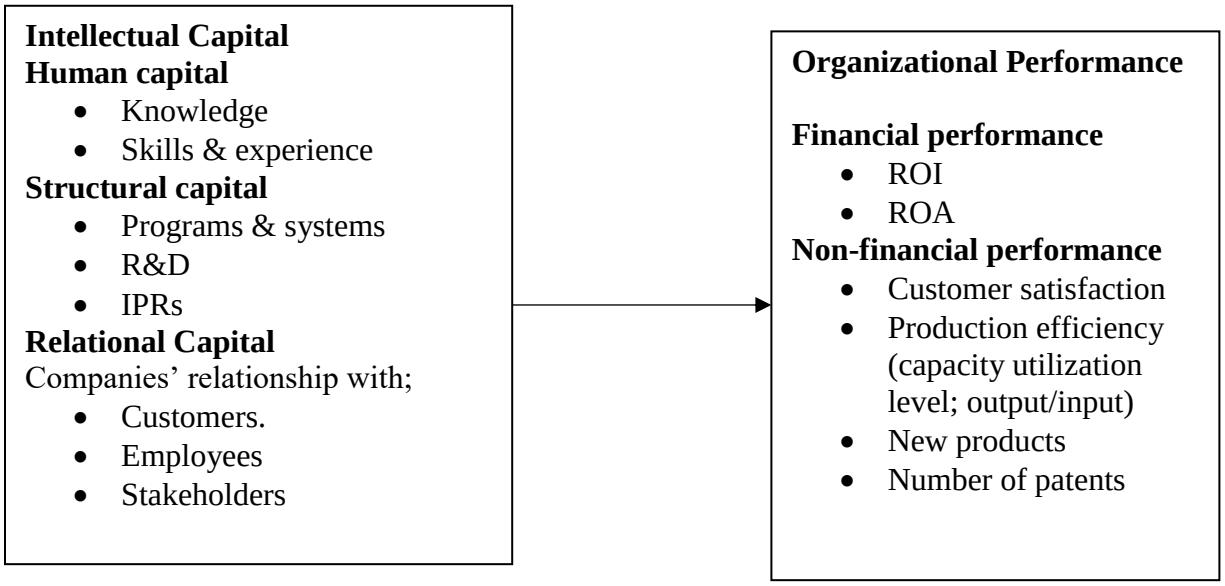

Figure 1: Conceptual Framework

2.4 Research Hypothesis

H0: Intellectual Capital has no significant influence on performance of Large Manufacturing Firms in Kenya

3.0 Research Methodology

This study was guided by positivism philosophy and used a deductive approach. Deductive approach aims at testing concepts and patterns drawn for theory using empirical data. The study was guided by theories and aims at testing hypothesized relationships. Positivism is the preferred philosophy for studies that involve hypotheses testing. The study adopted a descriptive survey where data is collected using cross-section design. Descriptive studies are useful where research involves description of a subject matter associated with a population (Cooper & Schindler, 2006). Descriptive studies determine nature of relationships between variables. The descriptive design describes relationships among the variables of the study.

The population of interest comprised all the 124 large manufacturing firms in Kenya that are members of the Kenya Association of Manufacturer (KAM) as at December 2019. The various sectors in the population of the study are classified under four market sectors as follows: Food sector, automobile assembly, cement and household goods. The LMFs were selected as ideal for the study owing to their being a fair reflection of the Kenyan economy in the context of the critical role that they play in the economy.

The research used data from primary sources on all LMFs in Kenya, Data on performance included internal business process, customer focus, learning and growth, societal and environmental factors. Original data was gathered using a questionnaire. The questionnaire targeted CEO, director of human resources and finance. The choice of informants was guided by the nature of their jobs that makes them custodians of information about IC, KMS, EC and firm performance. The questionnaire was administered through both the 'drop and pick' and mail questionnaire method. The simple regression analysis used was:

Performance = B_0+B_1Intellectual Capital + e_1

Where: B_0 = Regression constant B_1 = Regression coefficient e= Error term

4.1 Results and Findings

The total number of administered questionnaires was 124 large manufacturing firms in Kenya, targeting the senior management staff including CEOs, directors of human resources and finance directors. Five (5) of these manufacturing firms were excluded for the pilot study, leaving a targeting population of 119. From the 119 administered questionnaires, a total of 111 were dully filled and returned, bringing the total response rate to 93.3%.

4.2 Hypothesis Testing

The study stated the hypothesis as: intellectual capital has no significant influence on performance of large manufacturing firms in Kenya (H_0). To test Hypothesis H_0, the study performed a simple linear regression analysis, which produced regression coefficients, ANOVA and the model summary. Results of the hypothesis tests were interpreted based on the regression coefficients' statistical significance.

4.2.1 Hypothesis Testing for Intellectual Capital and Performance

The results for the relationship between intellectual capital and performance are as shown in Table 1.

Table 1: Model Summary for Intellectual Capital and Performance

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.738[a]	.545	.540	8.29201

a. Predictors: (Constant), Intellectual Capital

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	8965.191	1	8965.191	130.389	.000[b]
	Residual	7494.557	109	68.757		
	Total	16459.748	110			

a. Dependent Variable: Performance
b. Predictors: (Constant), Intellectual Capital

Model		Unstandardized Coefficients		Standardized Coefficients		
		B	Std. Error	Beta	t	Sig.
1	(Constant)	-11.344	8.256		-1.374	.172
	Intellectual Capital	.541	.047	.738	11.419	.000

a. Dependent Variable: Performance

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A correlation value (R) of .738 was revealed as shown in Table 1, which depicts that there is a strong, linear dependence between the variables, intellectual capital and performance. An R^2 value of .545 was further established indicating that intellectual capital explains 54.5% of the variations in performance, while 45.5% is expounded by factors not studied in the present regression model.

The ANOVA test results demonstrate that the model testing for the relationship between intellectual capital and performance was significant ($F = 130.389$, p-value < 0.05). Performed at 95% confidence level, the results further show that relative to total squares sum (16459.748), the regression sum of squares is 8965.191. This implies that the regression model explains about 54.5% of the variability in the data set while the residual sum of squares is 7494.557 implying that 45.5% of the variability in the dataset is left unexplained.

The results reveal that intellectual capital had a positive and significant influence on performance ($\beta = .738$, $t = 11.419$, $p < 0.05$). The results therefore imply that intellectual capital significantly influences performance, violating the null hypothesis (H_{01}) that intellectual capital has no significant influence on performance of large manufacturing firms in Kenya. The null hypothesis was therefore rejected.

A summary of test results for hypothesis 1 is presented in Table 3.

Table 3: Summary for Hypothesis

Objective	**Hypotheses**	**Results**	**Hypothesis Rejected/Failed to Reject**
To determine the influence of intellectual capital on performance of large manufacturing firms in Kenya	**H_0:** Intellectual capital has no significant influence on performance of large manufacturing firms in Kenya	R= .738, R^2=.545, F Statistic = 130.389, p<0.05, β= .738 (p<0.05)	Rejected

Source: Survey Data (2021)

The summary results in Table 3 reveal that intellectual capital has a statistically significant and positive effect on performance (β=.738; P<0.05), explaining 54.5% of the variance in performance. The results imply that for every 1% change in intellectual capital, there was a 73.8% change in performance.

The regression analysis can thus be rewritten as follows:

P = -11.344+ 738IC

Where: P = Performance; IC = Intellectual Capital

4.3 Discussion of Findings

The objective of the study was to establish the effect of intellectual capital on performance among large manufacturing firms. This paralleled the first study hypothesis stated as H_0: Intellectual

capital has no significant influence on performance of large manufacturing firms in Kenya. To test the stated hypothesis and correspondingly address this objective, the factor variable, intellectual capital was indicated by 3 sub-constructs, including human capital, structural capital and relational capital while the outcome variable.

The study tested hypothesis H_{01} using a simple linear regression, results of which showed that intellectual capital had a positive and significant effect on performance; performance ($\beta = .738$, $t = 11.419$, $p < 0.05$). This means that for every 1% variation in intellectual capital, there was a matching 73.8% change in performance across a majority of the firms surveyed. The study thus rejected hypothesis $H_{01,}$ concluding that intellectual capital significantly influences performance of large manufacturing firms in the country.

It is inferred from the finding, that intellectual capital is a significant predictor of performance among large manufacturing firms in Kenya. Intellectual capital, indexed by human capital, structural capital and relational capital, is thus a significant resource and contributor to value creation and economic success among large manufacturing firms. The manufacturing industry is particularly dynamic, competitive and highly volatile marked by more informed consumers and rapidly advancing technological innovations for efficiency improvement. The survival, and ultimately the performance of manufacturing companies in this context is thus dependent on their ability and willingness to adapt changes, making intellectual capital an imperceptible value driver. It is on this basis that these manufacturing companies are investing in their intellectual capital, through employee training, research and development, improving customer relations, and investment in various human resource management systems and programs, among others. Through intellectual capital, manufacturing firms are capable of remaining competitive in the markets by quickly adapting to the changes by innovating, creating other high value assets and wealth as well as enhancing efficiency in the production process leading to desirable performance.

5.1 Conclusion

The study concludes that intellectual capital is a significant predictor of performance among large manufacturing firms in Kenya. By enhancing human capital, large manufacturing firms in the country benefit from a skillful, productive, effective and an efficient workforce which results in performance improvements through more efficient and innovative production processes and products. Structural capital also aids employees in the value creation process by enabling efficiency of operations and by acting as a source of competitive advantage. This in turn boosts employee productivity, resulting in improved organizational performance among large manufacturing firms in the country. Further, by strengthening their relational capital, the manufacturing firms realize customer loyalty and a sustained, long-term business relationships with important stakeholders which results in sustainable business operations and revenues hence superior performance.

6.1 Recommendations

Performance of large manufacturing firms in the country is therefore particularly important to the country's socio-economic progression, through contribution to GDP, promoting innovation, the generation of foreign exchange by attracting foreign direct investment and job creation. It was established in this study, that intellectual capital significantly influences performance among large manufacturing firms in the country. As such, based on the foregoing study findings, it is recommended that an enabling policy environment be created to support the creation, utilization and protection of intellectual capital among large manufacturing firms in the country.

The study recommends that, for superior performance, large manufacturing firms in the country ought to invest in their intellectual capital by investing in employee training and development to build skills, expertise and capabilities; and enhancing human resource management systems and programs, improving their reward performance programs in relation to task, and promote a supportive firm culture. Large manufacturing firms in the country also ought to invest in research and development and adopt the latest scientific and technical development for efficiency in production processes; protect their intellectual property rights by formulating clear strategies and procedures for their management. Large manufacturing firms in the country are further implored to uphold meaningful and sustainable long-term business relationship with their customers, suppliers, employees among other stakeholders.

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