KNOWLEDGE MANAGEMENT CAPABILITIES AND COMPETITIVE ADVANTAGE IN THE NIGERIAN FOOD, BEVERAGE AND TOBACCO INDUSTRY

A Thesis Submitted to the School of Post Graduate Studies, University Of Lagos, in Partial Fulfillment of the Requirements for the Award of Doctor of Philosophy (Ph.D.) in Management

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CERTIFICATION

This is to certify that the Thesis:

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Submitted to the
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For the award of the degree of
DOCTOR OF PHILOSOPHY (Ph.D.)
is a record of original research carried out

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DEDICATION

This Thesis is dedicated to God Almighty, the author and finisher of my faith, without whom it would have been difficult to achieve this feat.

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ALANEME, Gloria Chinyere
April, 2017.

DECLARATION

I declare that this dissertation submitted for the degree of Doctor of Philosophy in Management is my original work and has not been previously submitted to any University or institution for any academic award. I further declare that all sources cited or quoted have been acknowledged and referenced to the best of my knowledge.

ALANEME, Gloria Chinyere
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Abstract

In today's environment with rapid and unpredictable changes, research shows that tangible resources have become easily accessible, imitable, and substitutable, thereby shifting competitiveness to an emphasis on knowledge, and knowledge-based resources. This study examined the effect of knowledge management capabilities on competitive advantage of the food, beverage and tobacco (FOBTOB) firms in Nigeria. To achieve the objectives of this study, a survey research design was employed, with a structured and self-reporting questionnaire as tool for data collection. Multi-stage sampling technique was used in the determination of three hundred and sixty (360) sample respondents, from a population of one thousand, seven hundred and eighteen (1,718) management staff of the FOBTOB firms under study. Two hundred and thirty four (234) copies of the questionnaire were returned and found usable, hence, formed the actual sample size for this study. Data obtained were analyzed using tables, frequencies and percentages for descriptive, while t-test, simple and multiple regressions, and Pearson Product moment correlation analyses were used as inferential statistics for testing of hypotheses. The findings of this study show that knowledge management infrastructure capabilities positively and significantly affect competitive advantage having an R^2 of .477, F= 34.437, and $p<0.05$; and more influence from leadership support and human resource. Similarly, knowledge management process capabilities also positively and significantly affect competitive advantage with R^2 = .299; F=24.397; $p<0.05$ while more effect was seen from protection and application. A strong relationship exists between KMIC & KMPC with an R =.739; $p<0.01$. Both KMIC and KMPC significantly influence CA with R^2 =.246; F=37.646; $p<0.05$, though KMPC had more effect on CA. Additionally, structure, knowledge protection and acquisition are found to affect innovation the most, while culture, knowledge application and protection processes are very crucial to predicting market share. It is recommended that firms should give more attention to the infrastructure and process capabilities significantly and directly affecting competitive advantage and its sub-variables, while not neglecting the insignificant ones as they all combine to achieve the desired outcome.

Keywords: knowledge management, competitive advantage, infrastructure capabilities, process capabilities.

CHAPTER ONE
INTRODUCTION

1.1 Background to the Study

The success and survival of any organization depends to a large extent on the ability to adapt to the ever changing business environment. The major focus of business organizations therefore is the attainment of position of competitive advantage that may enhance firm performance relative to that of competitors'. Companies engage in never-ending effort to distinguish themselves from unrelenting competitors even as the pressure for organizations' to remain productive and competitive rages over the years (Daghfous, 2003). This led to the search for strategic and efficient techniques that may enable organizations meet their general and competitive objectives. Hence, several tools, techniques and interventions are employed by organizations to remain relevant and effective; and these include but not limited to Management by Objectives (MBO), Six Sigma, Total Quality Management (TQM), Decision Support System (DSS), Lean processes, Management Information System (MIS), Business Process Re-engineering, Strategic Management, Risk Management (Alabi & Alabi, 2012).

Competitive advantage (CA) emerged from studies on strategy which posits that some firms consistently outperform others. Achieving position of CA which enhances firm's performance relative to that of competitors' becomes the major focus of business organizations. Hence, businesses locally and globally strive not only to attain competitive advantage but also to sustain and persevere in the long run. Therefore, understanding CA and the sources of Sustained Competitive Advantage (SCA) for firms remain a major research focus in strategic management. Acquiring SCA depends on a range of factors which include a firm's relative capability development (Johannessen & Olsen, 2003); or blend of traits that allows it to do better than its competitors like access to natural resources or access to highly trained and

skilled human resources (Wang, Lin, & Chu, 2011). These traditional sources of CA according to Jacome, Lisboa and Yasin (2002) have been eroded by the globalization of business activity.

Early studies tied competitive strategy around leadership and foresight, and that only managers who are smart enough to make the commitments required are likely to outperform those that do not. These earlier works suggest that firms obtain SCA by implementing strategies which exploit their internal strengths, through response to environmental opportunities, while neutralizing external threats and avoiding internal weaknesses. Porter (1980) turned this initial paradigm of leaders determining CA, by shifting the focus of strategy towards the analysis of the firm's microeconomic environment through the five forces structural framework underlying the economics of an industry, which shows how competitors, new entrants, substitutes, buyers and suppliers bargaining power exert pressure on the margins of a firm in a particular industry.

Wernerfelt (1984) suggests that the criticism in Porter's position enhanced the emergence of the Resource Based View (RBV) of the firm. According to the RBV, the resources with tangible and intangible attributes possessed by a firm that are valuable, uncommon, poorly imitable and non substitutable form the core competency for attaining and sustaining CA. The RBV acknowledges 'knowledge' as one of the strategic resources that enable SCA; and this triggered off another school of thought the 'Knowledge Based View' (KBV).

The KBV of the firm considers knowledge as the most strategic of firm's resources, and identifies knowledge and the managing of knowledge-based resources as a vital tool for sustaining CA and superior performance. The knowledge based resources are assumed to be socially complex and difficult to imitate being the most strategically significant resource considering firms heterogeneity; and largely because knowledge is centered on the human element.

Given that the environment of business is not constant and so is the resources and capabilities of a firm, the dynamic capabilities view (DCV) developed by Teece *et al* (1997) avers that firms must exploit their existing external and internal firm-specific resources and assets in such manner as to address changing environments. For the DCV, managing knowledge is considered the greatest dynamic capability of the firm and prime driver of all other competencies and capabilities since it is strongly related to processes and paths, just as RBV is to resources. These theories form the foundation of this study.

From the foregoing, the foundation for organizational competitiveness is shifting to an emphasis on knowledge, and as Wong (2005) reflects, organizations are becoming more knowledge intensive and hiring more "*minds*" rather than "*hands*". Emphasis is on the role of knowledge management (KM) in creating SCA for organizations (Ho 2008; Zheng, Yang & McLean 2010) though empirical and theoretical work in the area is largely underdeveloped (Chuang 2004).

KM being an emerging organizational strategic discipline focuses on creating, gathering, organizing and disseminating knowledge. There are several definitions of KM as there are many authors. However, what is common is that KM has to do with the ability of an organization to create, share and use the collective knowledge of its products, processes and people. It involves the process of acquiring, organizing and communicating both tacit and explicit knowledge of employees in order to improve productivity (Sodiya, Onashoga, Dansu, & Adeleye, 2006).

Initially, KM was placed generally in the sphere of information technology and the emphasis was on knowledge-based systems, tools and techniques (Egbu, 2004); but critiques opine that IT-based KM systems were basically limited to handling data rather than knowledge. Constant

improvement in the field of KM however, led to the identification of a number of significant factors in the literature including organizational culture, leadership, information technology, processes and activities, and human resources management which could enable effective knowledge management. These factors are referred to as enablers, or capabilities or the critical success factors (CSFs) of KM (Zheng *et al,* 2010).

Capabilities or CSFs are defined as the managerial and organizational factors which require serious attention in order for KM implementation to be successful. This implies that the CSFs can also be a barrier if not well articulated. Several capabilities (firms' resources) which serve as preconditions for effective KM have been proposed by scholars but the Gold, Malhotra, and Segars (2001) model appears to be the most widely referred to in the literature. This model presents knowledge management capabilities as multidimensional concepts that incorporate – an "infrastructure" perspective which focuses on "knowledge management infrastructure capabilities" and a "process" perspective which focuses on a set of activities termed "knowledge management process capabilities".

These capabilities in turn are composed of multiple dimensions. "Knowledge infrastructural capabilities" comprise technology, organizational culture and organizational structure while "knowledge process capabilities" consists of knowledge acquisition, knowledge conversion, knowledge application and knowledge protection. These capabilities have been adapted by several researchers in their studies.

1.2 Statement of the problem

Extant literature sources have shown that the trend in competitive advantage is fast moving away from the traditional sources to knowledge based sources. Knowledge is assumed to be toppling the age old lever of strategy and competition; and the foundation of industrialized economics has shifted from natural resources to intellectual assets. The impression is based on

the recent prominence and clear reliance on adding competitive value to products and services through the application of direct or entrenched human expertise – knowledge, other than relying on natural resources or operational efficiency as was previously the case.

Earlier concerns by firms on competitive advantage were on the industry environment and how to overcome competitive forces of competitors, new entrants, substitutes, buyers and suppliers. This was followed by an era of how to make the most with limited resources as they pursued product leadership, operational excellence, and customer intimacy. In essence, having CA meant ensuring good positioning in the industry, leading in operational excellence, product leadership, and customer intimacy, among others; while tangible assets like land, labour, capital and other commodities were regarded as the main production factors or sources of CA. These tangible assets no doubt are still sources of CA, but the emphasis has shifted from physical resources and external positioning in the industry through lowering of cost, or differentiating product, to the era of intangible resource like managing knowledge and knowledge based resources within the organization as a result of increased competition.

The increase in competition rendered physical resources inadequate in providing distinct CA due to the fact that they can be imitated and acquired by anyone on an equal basis. The focus of research became how to manage knowledge, factors influencing the management of knowledge, and the processes involved. Hence, management thinkers declare the “knowledge society”

Organizations may have similar resources, operate within same environment, but differ in their capabilities and resources usage efficiency. The fact is that the characteristics of the environment in which businesses operate is important, but not the sole determinant of organizations performance in the present day shift from economic focus to knowledge focuses. Studies show that managing knowledge for CA requires the use of distinct capabilities and

competences embedded in the organization in order to create, share, use and protect knowledge in order to improve and sustain competitiveness. Since organizations are heterogeneous in their resources, strategic capabilities or competences as well as arrangement, it implies that each organization will need to identify these capabilities and be able to apply them effectively.

However, there is a belief that many firms are only vaguely aware of the important KM capabilities and competencies that they have or lack, and or even the value of their competencies to achieve CA.

Some organizations have tried with mixed success to leverage knowledge assets by investing heavily in information technology (IT), centralizing knowledge management (KM) functions, or otherwise. Like other new business or management phenomenon, this is expected as there may be confusion as to the right practices and combination of organizational capabilities and resources that would earn CA. The issue here is not whether to manage knowledge, but how to manage it effectively through the right combination of organizational resources and practices that would earn competitive advantage.

Gold *et al.* (2001) proposed organizational KM capabilities which are divided into infrastructure capabilities (culture, structure, and IT) and process capabilities (acquisition, conversion, application and protection). Several other KM enablers or infrastructure capabilities like leadership support, organizational strategy, people, managerial influence, environmental influence, transformational leadership, collaborative experience; know how, size, among others have also been advocated in literature. This implies that organizations must be able to identify and apply the capabilities that are likely to achieve competitive advantage giving the dynamic business environment.

Prior research suggests that KM should be linked to business strategy; others advocate the importance of top management and leadership support in KM especially as it concerns knowledge seeking and acceptance. Further review show that organizational strategy has been under-studied in the KM research and that very few attempt were made to examine it from the strategic orientation of business enterprise (STROBE) view which is considered to be a more holistic approach. Rather, previous studies on strategy dealt more on generic strategies of differentiation, low cost and focus, as well as typologies; while most studies on leadership, investigated leadership style of transformation or transaction, or both, and few on leadership support which is adduced to be critical for effective organizational KM practice.

Additionally, literature shows that human resource is a very crucial infrastructure capability for KM; because employing human resource with T-shaped skill aids sharing and usage of knowledge; while supportive leaders encourage initiatives for creating, sharing, using and protection of knowledge. Only few studies have attempted to integrate all of these factors as infrastructure capabilities in one study rather they are usually studied in bits. This study attempts to close this gap as it adopted Gold *et al's* (2001) process capabilities as well as infrastructure capabilities with the addition of strategy (viewed from the angle of STROBE), leadership support, and human resource.

Empirical studies show varied results of the relationship between KM capabilities (Infrastructure and Process) on an outcome. The relative importance of the relationship between various infrastructure capabilities and the process capabilities has witnessed little research. Moreover, most studies investigate the relationship between KM capabilities and organizational performance (Matin & Sabagh, 2015), and only very few studies investigated KM capabilities on competitive advantage (CA). Greater per cent of these studies were in the context of developed Western countries, or newly industrialized Asian countries. In Nigeria

only very few studies to the best of the researcher's knowledge have been carried out to determine any of these outcomes (performance or CA); and essentially on the food, beverage and tobacco firms. Studies centre more on the financial institutions, service industry, and few on manufacturing industry, hence this study.

The Nigeria Strategy Support Programme (NSSP) report No. 002 on KM and development targets in Nigeria affirm that the issue of managing knowledge has not been given its right of place. The report advocates that nations and organizations should give attention to KM through having the right organizational mechanisms, practices, principles, and guidelines in place to aid successful KM programmes. It is not certain if the FOBTOB firms have these mechanisms and practices in place.

Given the following, this study set to establish the KM mechanisms and practices in place in the Nigerian FOBTOB firms and the combination of important capabilities necessary for CA. It extended the KM capabilities model of Gold *et al* (2001) to include organizational strategy, human resource and leadership support as infrastructure capabilities while retaining the model's four knowledge processes. Organizational strategy was investigated using STROBE. This study identified relationships between the KM capabilities and competitive advantage; and relationships between the KM capabilities (infrastructure and process) themselves.

1.3 Aim and Objectives of the study

The major aim of this study was to establish through empirical examination, the relationship between knowledge management capabilities (KMC) and competitive advantage (CA) in the food, beverage and tobacco firms in Nigeria. The specific objectives were to:

i. examine the influence of KM infrastructure capabilities (culture, structure, strategy, leadership support, human resource, and information technology) on competitive advantage.

ii. investigate the effect of KM process capabilities (acquisition, conversion, application, and protection) on competitive advantage.
iii. determine the relationship between knowledge management infrastructure capabilities and knowledge management process capabilities.
iv. appraise the combined effect of knowledge management infrastructure capabilities and knowledge management process capabilities on competitive advantage.

1.4 Research Questions

In order to accomplish the above research objectives, the following research questions were made to guide this study.

i. What is the influence of KM infrastructure capabilities on competitive advantage?
ii. What is the relationship between KM process capabilities and competitive advantage?
iii. What is the relationship between KM infrastructure capabilities and KM process capabilities?
iv. To what extent do KM infrastructure capabilities and KM process capabilities influence competitive advantage?

1.5 Research Hypotheses

The following hypotheses were formulated to guide the study.

Ho_i There is no significant effect of KM infrastructure capabilities (culture, structure, strategy, leadership support, human resource and IT) on competitive advantage.

Ho_{ii} KM process capabilities (acquisition, conversion, application and protection) do not significantly influence competitive advantage.

Ho_{iii} There is no significant relationship between KM Infrastructure and KM process capabilities.

Ho_{iv} KM infrastructure and KM process capabilities combined have no significant effect on competitive advantage.

1.6 Significance of the Study

This study is significant in a number of ways. From the literatures reviewed, most studies and models on knowledge management were developed and empirically tested in the context of the advanced western countries such as the USA, Australia, Canada; or newly industrialized Asian countries like Taiwan, Hong Kong, and Korea. Very few studies have been conducted in developing countries and essentially Nigeria.

Secondly, the reality of the world being a global village left us with no choice but to assess if KM mechanisms and practices that can enhance competition and survival are existent in the Nigerian FOBTOB manufacturing firms since it was reported that KM have not been given its right of place in Nigeria and is still in its early stages in developing economies. The outcome of this study may affirm or disproof this, and further show the availability or otherwise of resources and processes, and the readiness of Nigerian firms to embrace CA through KM. Hence, the policy makers and especially the International Food Policy Research Institute (IFPRI) will benefit from this study.

The study is of benefit to the manufacturing industry in the sense that its outcome will strengthen their position on the relationship between managing knowledge and attaining competitive advantage for their firms. They also will appreciate the relationship of the infrastructures and processes as established in this study and the combination of capabilities that may give the required competitive outcome.

The study will also add to the existing literature on knowledge management and competitive advantage, and serve as reference materials for future researchers.

1.7 Scope and delimitation of the study

This study covered the Food, Beverage and Tobacco (FOBTOB) manufacturing sector in Nigeria through the six selected firms operating within Lagos, Nigeria. These are Flour mills Nig. Plc., Cadbury Nig. Plc, Nigerian Bottling Company, Nestle Nigeria Plc, Honeywell flour mills, and Seven-up Bottling Company with management staff as well as cognate departments of R&D, sales, customer care etc. The Food Beverage and Tobacco manufacturing industry was chosen because it dominates the manufacturing sector and contributes the highest percentage to the nation's GDP (National Bureau of Statistics, 2014).

In terms of subject matter, this study is limited to determining the knowledge management capabilities (Infrastructures and processes) which will directly or indirectly enable competitive advantage in organizations using the selected staff of the FOBTOB. Other manufacturing sectors were not examined. This study was carried out between November 2014 and February 2017.

1.8 Operational Definition of Terms

This section provides working definitions of important terms used in this study to add clarity.

Competitive advantage: The edge a firm has over its rivals in attracting customers, innovating and defending against competitive forces.

Explicit Knowledge: The aspect of knowledge that can be articulated, easily accessed, communicated to others, distributed, and stored in certain media for onward use.

Knowledge: The understanding gained through experience or study combined with information.

Knowledge Management (KM): The systematic process of planning and organizing information and knowledge related activities so as to enable acquisition or creation, conversion

or transfer, application or use and protection in such manner as to create value for the organization.

Knowledge Management Capabilities (KMC): Organizational mechanisms (tangible and intangible assets or resources, factors, processes, routines) which enhance generation, sharing, usage and protection of knowledge continuously to attain competitive advantage.

Knowledge Management Infrastructure Capabilities (KMIC): Internal organizational enabling factors like culture, information technology, structure which supports constant and intentional creation and sharing of knowledge within an organization.

Knowledge Management Process Capabilities (KMPC): The basic operations of knowledge through sets of structured and related activities like creation, sharing, storage and usage for managing knowledge effectively.

Tacit Knowledge: An unwritten, unspoken and hidden depot of knowledge held by people, which may be difficult to transfer to other people except through extensive personal contact, regular interaction and trust.

CHAPTER TWO
LITERATURE REVIEW

2.1. Preamble

Competitive advantage (CA) as a strategic management term is traceable through different schools of thought. These schools at the various point in time had their relevance, but one criticism or the other leads to the emergence of another.

The earlier schools of CA include the design school, the positioning school and the resource based view (Nguyen, 2010). Each of these schools of thought evolved as a result of gap in the earlier schools. For instance, the design school was predicated on historical analyses and careful qualitative research. This school is based on the chief executive selecting the most appropriate strategy via the SWOT analysis to determine products and services to be provided as well as the assets and competences required to achieve CA and long term performance. This school attracted some criticisms including how feasible it was for a leader or manager to succeed alone without other actors in the organization. This paved way for the Positioning school model by Porter (1980).

The positioning school focused on the assessment of competitive forces, opportunities and threats present in the external environment (Barney, 1991), and largely provides external explanation for a firm's CA on the basis of a firm taking advantage of the relative imperfections of the industry in which it operates and competes (Lopez, 2005). The model allows for managers to assess the attractiveness of the market/industry and to identify the most competitive position within that industry (Robbins, Bergman, Stagg & Coulter, 2000). The perceived imbalance in Porter's positioning school (Browne, 1994) given globalization, paved way for the Resource Based View (RBV).

2.2 Theoretical Framework

The theories guiding this study are the resource based view of the firm (RBV), knowledge based view (KBV) and dynamic capability view (DCV).

2.2.1 The Resource Based View (RBV)

The RBV emphasizes firm-specific resources or assets (tangible and intangible, human and nonhuman) possessed or controlled by the firm which permits it to devise and apply value-enhancing strategies (Barney, 1991). The approach suggests that firms gain and sustain competitive advantage by deploying valuable resources (Barney, 1991; Grant, 1996a). These resources and capabilities that are valuable, uncommon, poorly imitable and non-substitutable constitute firm's unique or core competencies (Halawi, Aronson & McCarthy, 2005). Evolving developments in the RBV suggests that capabilities are crucial contributors to organizational performance (Teece, *et al.,* 1997). In RBV, knowledge is seen as a strategic asset or capability with the potential to be a source of sustainable competitive advantage (SCA) for an organization (Teece, 1998).

As Hitt, Bierman, Shimizu & Kochhar (2001), puts it, intangible firm-specific resources like knowledge permit firms to add up value to incoming factors of production, thereby generating competitive advantage. It therefore promotes a knowledge-based perspective, which postulates that competitive advantage (CA) is built upon those privately developed resources, tacit and explicit, inside the firm that are less likely to be imitated easily (Collis & Montgomery, 1995; Curado, 2006). These unique resources and capabilities are discussed under different names like distinctive competences, core competences, invisible assets, core capabilities, internal capabilities, embedded knowledge, corporate culture, and unique combinations of business experience (Von Krogh & Roos, 1995).

Barney (1991) developed the VRIO platform for assessing kinds of resources that would present sustainable competitive advantage. They are: value creation for the customers, rarity compared to competition, inimitability, and organization. Priem and Butler in Halawi, Aronson and McCarthy (2005) summarized the RBV statements mathematically thus:

- Prob (CA) $=f^{+}(v \cap r)$ ……..…….. (2.1)
- Prob (S) $= f^{+}(CA \cap i_n \cap s_n \cap t_n)$ …… (2.2)

Where Prob = probability

CA = competitive advantage

f^{+} = function

v = value

$\cap$= combination or joint

r = rarity

S = sustainability

i_n = non-imitability

s_n = non-substitutability

t_n = non-transferability

Hence, from the first expression, the probability of achieving competitive advantage (CA) is a positive function of the joint occurrence of resource value and rarity; while the second equation shows that the probability of sustainability is a positive function of the joint occurrence of competitive advantage, non-imitability, non-substitutability and non-transferability.

2.2.2 The Knowledge Based View

A knowledge-based perspective of the firm builds upon and extends the resource-based theory of the firm initially promoted by Penrose (1959) and expanded by others (Barney 1991; Wernerfelt, 1984 as cited in Alavi & Leidner, 2001). The KBV presents 'knowledge' as the most valuable resource of the firm (Curado, 2006; Spender, 1996). The knowledge resident in

human capital allows firms to improve distinctive competencies and discern innovation opportunities (Hansen *et al.*, 1999; Wright *et al*., 2001; Takeuchi, 2013). When firms engage on improvement of their management processes and develop new products, they require the ability of human capital to produce creative ideas, develop innovative approaches, and exert new opportunities (Scarbrough, 2003). The KBV of the firm therefore holds that the firm's capability to create and utilize knowledge is the most important source of a firm's SCA (Prahalad & Hamel, 1990; Grant, 1996a). In the current economy, where the only certainty is uncertainty, the one sure source of lasting competitive advantage is knowledge (Nonaka, 1991). As Sher & Lee (2004) puts it knowledge is gradually becoming the most important factor of production, next to labour, land and capital.

2.2.3. Dynamic Capability View (DCV)

The dynamic capabilities view (DCV) pioneered by Teece, Pisano, and Shuen (1997) is another component of the efficiency-based approach which identifies the dimensions of firm-specific capabilities that can be sources of advantage, and explains how combinations of competences and resources can be developed, deployed, and protected. It stresses existing internal and external firm-specific competences to address changing environments (Teece, 2007). DCV emphasizes the development of management capabilities, and difficult-to-imitate combinations of organizational, functional and technological skills sets to assist in the understanding of how and why certain firms build competitive advantage in regimes of rapid change.

DCV endeavours to analyze the sources of wealth creation and capture by firms, recognizing that strategic theory is replete with analyses of firm-level strategies for sustaining and safeguarding extant competitive advantage, but less with respect to assisting in the understanding of how and why certain firms build competitive advantage in regimes of rapid

change. The approach explains firm-level success and failure, and is interested in building better theory both in terms of firm performance as well as informing managerial practice. It stresses existing internal and external firm-specific competences to address changing environments. It integrates and draws upon research in such areas as the management of R&D, product and process development, technology transfer, intellectual property, manufacturing, human resources, and organizational learning. These fields are often viewed as outside of the traditional boundaries of strategy, hence not incorporated into existing economic approaches to strategy issues. DCA is promising both in terms of future research potential and as an aid to management endeavoring to gain competitive advantage in increasingly demanding environments.

2.3 Empirical Studies

There are many studies on knowledge management just as there are many researchers of knowledge management. However, the scope of the many researches focused on three major factors for managing knowledge and these are capabilities (enablers), processes and organizational performance (Demarest, 1997; O'Dell & Grayson, 1999; Becerra-Fernandez & Sabherwal, 2001). Knowledge management enablers or capabilities or facilitators are devices used by organizations to always foster knowledge (Ichijo, Krogh, & Nonaka, 1998).

These devices or factors can kindle the creation, sharing and protection of knowledge within an organization (Stonehouse & Pemberton, 1999). Knowledge Processes on the other hand referred to as the activities of knowledge management proper can be seen as a structured coordination for managing knowledge effectively (Gold *et al*, 2001). Knowledge processes include activities like creation, sharing, storage and usage (Alavi & Leidner, 2001; Beckman, 1999), while knowledge processes represent the basic operations of knowledge (Spek &

Spijkervet, 1997), enablers provide the infrastructure necessary for the organization to increase the efficiency of knowledge processes (Sarvary, 1999).

The previous studies which investigated relationships among knowledge management factors can be classified into four according to Lee and Choi, (2003). These are: (1) relationship between enablers (2) relationship between enablers and processes (3) relationship between processes and performance, and (4) relationship among knowledge enablers, knowledge processes and organizational performance. One study focusing on relationship between organizational factors (enablers) and knowledge management is the work of Bennett and Gabriel (1999) which analyzed a number of knowledge management methods in view of organizational structure, culture, size and environment. Others examined the relationships between enablers and processes with central proposition that knowledge enablers (e.g. industry characteristics or knowledge characteristics) should influence knowledge processes (e.g. transfer).

Prominent in these studies are Zander and Kogut (1995) with their study that the transfer of organizational capabilities be related to the characteristics of social knowledge and analyzed the effects of the ease of codifying manufacturing capabilities on its transfer time. Appleyard (1996) explored knowledge transfer patterns among various nations and industries while Szulanski (1996) investigated the relationship between four origins of stickiness (characteristics of the knowledge transferred, the source, the recipient, and the context in which the transfer takes place) and knowledge transfer. Hansen (1999) employed the notion of complex knowledge to explain the role of weak ties in transferring knowledge in a multiunit organization.

Another category of researchers examined the relationships between knowledge enablers and organizational performance. The essence of these studies was to sharpen the understanding of

the effects of knowledge enablers (e.g. knowledge management strategy) on organizational performance (e.g. return on assets [ROA] or return on sales [ROS]). For instance Bierly and Chakrabarti (1996) in a bid to identify how knowledge management strategies affect organizational performance, analyzed knowledge strategies of 21 U.S pharmaceutical companies that had been categorized into explorers, exploiters, loners, and innovators. Simonin (1997) tested the relationships among collaborative experience, know-how, and achievement of organizational performance, and proposed that the experience of a firm has to be transformed into know-how before it could improve organizational performance.

The fourth category emphasized the relationships among knowledge enablers, knowledge processes, and organizational performance with the primary focus to identify and assess knowledge enablers (e.g. task or infrastructure capabilities) and processes (e.g., creation, sharing) for improving organizational performance (e.g. knowledge satisfaction or organizational effectiveness). Becerra-Fernandez and Sabherwal (2001) proposed a contingency framework including two attributes of the organizational subunit's tasks (process or content orientation, and focused or broad domain) and linked them to Nonaka and Takeuchi (1995) knowledge creation process; they also investigated the relationship between knowledge creation process and knowledge satisfaction. Gold *et al* (2001) analyzed two relationships – one between infrastructure capabilities and organizational effectiveness, and the other between process capabilities and organizational effectiveness (Fig 2.1).

On the other hand, a study was conducted in Jamaica by Mills and Smith (2011) to examine the relationship between knowledge management capability and organizational performance. They found that knowledge acquisition, knowledge application, and knowledge protection are positively related to organizational performance, but not knowledge conversion. They argued that the relationship between knowledge management and performance is a complex one, and

that each knowledge management process may not necessarily be directly linked to performance even they are found to be correlated to performance from a combined model. Their study showed that in summary, knowledge infrastructure capabilities and knowledge process capabilities affect organizational performance positively.

A study by Rasoulinezhad (2011) looked at the role of knowledge management processes and performance in commercial banks of Iran. The measure of knowledge management process includes acquisition, distribution (conversion/transfer), utilization (application), creation, and storage. Whereas, performance includes three perspectives – organizational financial performance (OFP), organizational market performance (OMP) and the organizational employee performance (OEP). The result showed a significant relationship between knowledge management processes and performance of the organizations.

Interestingly, of the three measures for performance, organizational market performance (market share) had the highest correlation (0.717) with the knowledge management processes whereas the OFP and the OEP had 0.628 and 0.516 respectively. On an individual basis, knowledge utilization (application) showed a correlation of 0.58, whereas knowledge acquisition and knowledge distribution (conversion) showed a very weak correlation. Knowledge creation and storage indicated a negative correlation with performance.

According to Hodge (2010), there is a correlation between knowledge management processes and knowledge management capabilities. Knowledge management efforts typically focus on organizational objectives such as improved performance, competitive advantage, innovation, the sharing of lessons learned, integration and continuous improvement of the organization (Banes 2011).

2.3.1 Synthesis of previous studies

Modifying the work of Gold, Malhotra and Segars (2001) and Lee and Choi (2003), Chuang (2004) developed a model as shown in Figure 2.2. This model is one of a limited number of studies which employed the RBV of KM to develop theoretical links and empirically examine the relationship between a firm's KM capability and CA. The model examines the four elements of KM resources of a firm in isolation (namely structure, culture, and people as the social perspective, and information technology as the technical perspective) which is inconsistent with extensive discussions found in the literature of the interwoven nature among the organizational factors (Zheng, 2005).

Chuang's model did not take into account the KM process capabilities associated with a firm's CA and thus, ignores the relationship between KM infrastructure and process capabilities. Despite the fact that KM infrastructure is supported by and possibly stimulate critical KM processes, the capability of KM infrastructure cannot be fully exercised without the presence of KM process capability (Gold *et al.* 2001; Lee & Choi 2003). The combination of knowledge infrastructure elements and knowledge oriented processes is critical to reaching the intended KM objectives (Khalifa & Liu 2003). In addition, KM processes are considered to be the foundation of organizational advantage (Nahapiet & Ghoshal 1998) and, therefore, may influence a firm's CA (Chakravarthy *et al.* 2005).

The absence of KM process capability may restrict a valuable integrated contribution of the two major components of KM capability, namely infrastructure and process to the organizational CA. However, Chuang found that KM capabilities had a direct effect on competitive advantage. Zheng *et al* (2010) study tried to link culture, structure and strategy to organizational effectiveness using knowledge management as a mediating factor but did not

examine the relationship between these factors and knowledge management process capabilities.

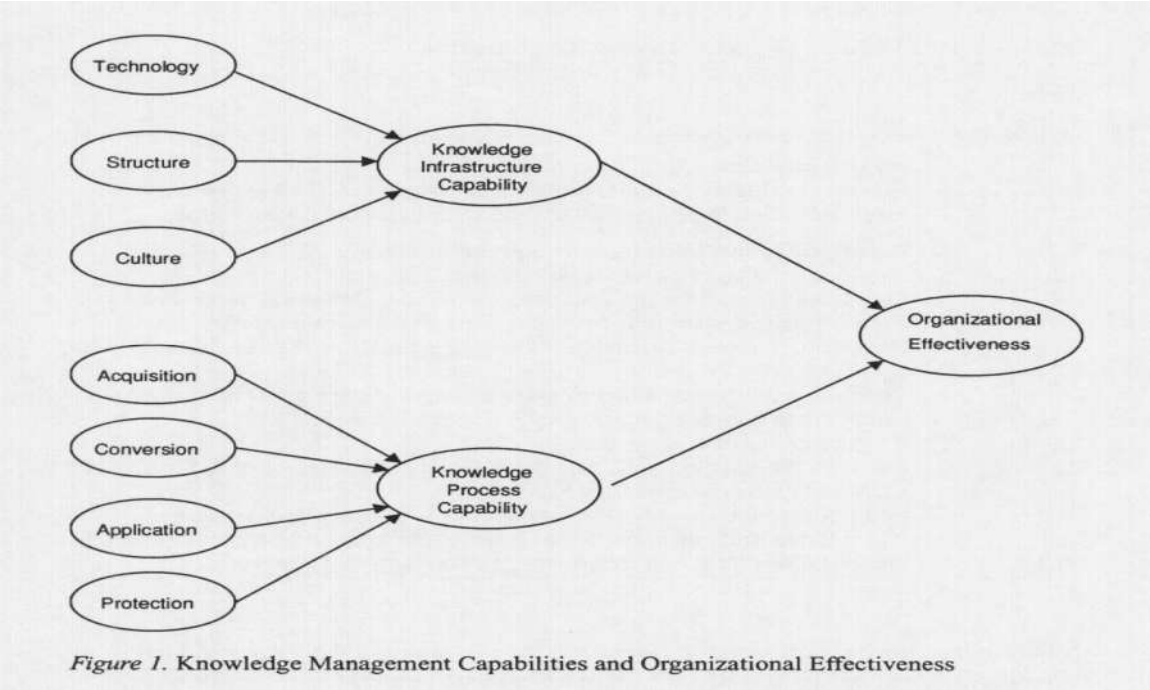

Figure 1. Knowledge Management Capabilities and Organizational Effectiveness

Fig. 2.1: KM capabilities and organizational effectiveness
Source: Gold *et al*. (2001)

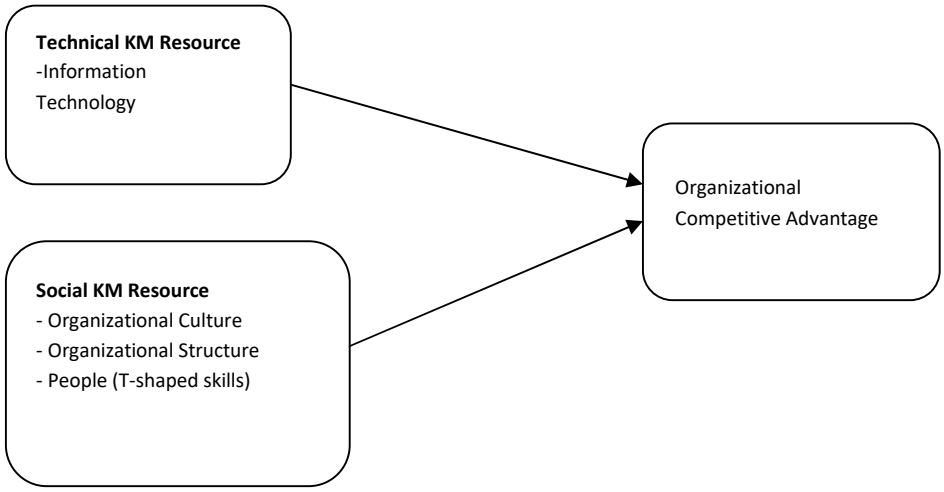

Fig. 2.2: Model of Technical and Social KM Resources on CA
Source: Chuang (2004)

In another study, Chang and Chuang (2011) examined the impact of infrastructure capabilities (knowledge culture, structure, technology and human resources) and business strategy (low

cost, differentiation and focus) while using the knowledge management processes (knowledge choice, access, storage, and sharing) as mediating variables to affect the performance of an organization. Applying Porter's generic strategies in their study, Chang & Chuang, (2011), discovers that focus strategy is one important task, and with corporate business strategy supporting knowledge management processes, company's performance efficiency can be enhanced. In this case, the study did not consider if a direct or indirect relationship exists between the infrastructure capabilities and firm performance.

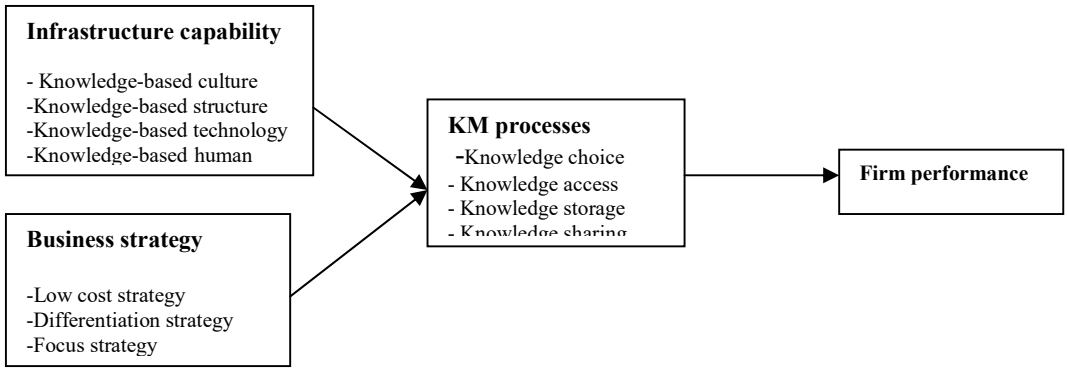

Fig. 2.3: Model on Infrastructure capability and business strategy
Source: Chang & Chuang (2011)

Theriou *et al* (2011) in their study examined knowledge management enabler factors and firm performance. They tried to identify and discuss critical success factors or enablers of knowledge management effectiveness which in turn influences the total performance of the firm. Based on existing frameworks and models, the study outlines the five most important factors that are believed to be critical for an effective KM implementation. These are culture, leadership support, technology, strategy, and people. They discovered that the most critical success factor was culture, followed by leadership support. People, strategy and technology, although important, did not show a significant relationship with the two measures of firm performance. However, the combined effect of the factors which yielded knowledge management effectiveness was seen to be significantly related with firm performance. The

study left out the aspect of knowledge processes in achieving organizational effectiveness and also did not include structure.

Zheng *et al* (2010) in their study using Venkatraman's STROBE discovered that strategy was positively related to knowledge management, as well as culture; while structure had a negative association with knowledge management. Previous research suggests a positive association between organizational strategy (STROBE) and knowledge management. For instance, Pedler *et al* (1991) underline the importance of analytical approach to strategy that contributes to learning; Senge (1990) stresses the ability to envision the future that is crucial to the learning organization. Watkins and Marsick (1996) highlight a proactive approach to new learning and new markets in establishing a learning organization. The knowledge-based view envisions the firm as a set of knowledge assets and the role of the firm as creating and deploying these assets to create value (Grant, 1996). Organizational strategy can then be perceived as the organization's plan of creating and deploying knowledge assets.

Largely, most studies have investigated the relationship between knowledge management and or knowledge management capabilities and organizational performance (Matin & Sabagh, 2015). Most of these researches concluded that there is a positive and significant correlation between these two variables. Gold *et al* (2001) found that there is a positive relationship between enablers and knowledge management processes and organizational effectiveness. Lee and Choi (2003) concluded that knowledge management enablers have a positive and significant effect on knowledge management processes and knowledge management processes increase organizational creativity and performance.

Nguyen and Neck (2009) found that knowledge management processes have significant effect on each other and knowledge protection and application have the highest effect on competitiveness. Mills and Smith (2011) showed that knowledge infrastructure capabilities and

knowledge process capabilities affect organizational performance positively. Chuang (2004) found that knowledge management capabilities have a direct effect on competitive advantage. Lee and Lee (2007) found that knowledge management capabilities including culture, structure, people and technology influence the knowledge management processes directly and these processes affects organizational performance, customer and financial performance, directly too. Migdadi (2005) showed in his research that there is a significant and positive relationship between the knowledge management capabilities, knowledge management processes and organizational performance.

The dependent variables of most of these studies are performance and even those that predicted competitive advantage did not have a direct measure of innovation and market share. This however, could be inferred from their non financial performance measures which in some cases included innovation and market position (Theriou *et al*., 2011) of the organizations. There is no known study by the researcher that has measured a direct effect of the six infrastructure capabilities and four process capabilities variables of this study on innovation and market share. The measure has been with competitive advantage which market share and innovation are a subset of.

However, this study set the pace for such measure of relationship. Stacey (2003), affirm that the ability to implant cost leadership, differentiation, or focus strategy (which are different strategies for achieving CA) is dependent on a firm's ability to develop a specific set of competitive methods; this becomes the basis for the firm to be able to achieve above average (higher innovation and market share) in its industry.

On the Nigerian environment, there have been some studies as well. Adebisi and Idolor (2015) appraised knowledge management as a determinant of performance in selected Nigerian Banks, using organizational creativity as a mediator. The study looked at the knowledge

creation process; and found that knowledge creation process affects organizational performance through its effect on creative organizational learning, while knowledge enablers of culture, structure, people and IT positively influence knowledge creation process and organizational performance. Sodiya, Onoshaga, Dansu, and Adeleye (2006) examined the KM capabilities of the twenty five existing Nigerian banks looking at policies, IT, and relationships within the organization. They found that these banks possess both organizational and operational environment for KM; but KM as a term is not in widespread use within the banks because it is not yet recognized as a strategic issue for effectiveness and development.

Another study by Umoh and Amah (2013) assessed the relationship between Knowledge Management and Organizational resilience in manufacturing organizations within Rivers State, Nigeria. The study consists of one hundred and twenty eight (128) employees of the thirty four manufacturing companies registered with the manufacturers Association of Nigeria, Rivers State Council. Knowledge processes of acquisition, storage, sharing and utilization were tested against organizational resilience measured using adaptability, resourcefulness, and learning. Their finding revealed a positive and significant relationship between knowledge management and organizational resilience. Specifically, knowledge acquisition, knowledge storage, knowledge sharing and knowledge utilization were revealed to have a positive and significant influence on organizational resilience. Although their study while measuring resilience looked at the resourcefulness of leadership, ability to learn, and the adaptive capacity of the organizations following changes in the environment. However, the study is not exhaustive as it did not look at their ability to compete effectively and having edge over others. More so, the study is domiciled in Rivers State and not Lagos.

Agbim, Oriarewo, and Owutuamor (2013) studied KM capabilities which excluded the process aspect and organizational performance of service sectors within Makurdi, Benue State;

Sarkindaji, Hashim and Abdullateef (2014) reviewed the concepts of KM and organizational performance and proposed a model for mobile service firms in Nigeria. Ugwu and Ezema (2010) examined competencies for successful knowledge management applications in Nigerian academic libraries; Ofoegbu (2014) examined the role of knowledge management on knowledge management performance of some Nigerian Banks within Oyo state.

2.3.2 Identified Gaps in Literature

An integrative model has been established in the context of advanced and developed countries e.g. (Lee & Choi 2003; Migdadi 2005; Nguyen, 2009). These studies investigated the relationships among enablers (infrastructure capabilities), processes, and organizational performance or competitive advantage. However, the integration included different enablers and the knowledge creation process alone in achieving competitive advantage, none examined the whole processes of knowledge creation or acquisition, conversion, application and protection as it relates to competitive advantage. Nguyen (2010) did something close to studying the whole process but did not incorporate the effect of leadership and organizational strategy; hence, the need for the current study.

The review of literature indicated that the dependent variables of most of the reviewed studies were performance based, and even those that predicted competitive advantage did not have a direct measure of innovation and market share. Though this can be inferred from their non financial performance measures which in some cases included innovation and market position of the organizations; but there is need to find out if there exists a relationship between knowledge management capabilities and these variables.

Literature review has revealed the importance of integrating KM strategy into organizational business strategy (Zack, 1999) since a clear and well-planned strategy is considered important

for the success of KM (Liebowitz in Theriou *et al,* 2011). Therefore, this study has chosen to examine business strategy as an enabler of KM.

From the literature review, majority of the studies are empirically tested and directed toward the context of developed Western countries, or newly industrialized Asian countries such as USA (Gold, Malhotra & Segars 2001; Smith 2006; Zheng 2005; Zheng, Yang & McLean 2010), Australia (Migdadi 2005), Canada (Manovas 2004), Taiwan (Chuang 2004), Hong Kong (Khalifa, Lam & Lee 2001; Khalifa & Liu 2003); and Korea (Choi & Lee 2000; 2003; Lee & Choi 2003; Lee & Lee 2007). The possibility that such models might be applicable or need to be customized to fit the specificities of emerging African countries has received little attention to date (Gimenez & Rincon 2003). In addition, the recognition that there exists a difference between the realities of firms in developing country and assumptions of western enterprise models (Boateng, 2011), leaves us with no choice than to test such models to ascertain if it fits a developing economy like Nigeria. To the best of the researcher's knowledge, only very few studies have been conducted on Nigerian firms (public or private, service or manufacturing, small, medium or large enterprises) relating to KM issues.

Consequently, this study attempts to fill the identified gaps by employing the RBV of the firm blended with the KBV and DCV to extend the existing model of Gold *et al* (2001) by adding Human resources (T-shaped skills), Strategy (using strategic orientation of business enterprise (STROBE) and Leadership support as part of KM infrastructure capabilities.

2.4 Conceptual Framework

2.4.1 Knowledge

In the traditional or classical economy, knowledge was seen as external and unrelated to the economic process (Uit-Beijerse in Wong and Aspinwall, 2006). Tangible assets like land, labour, capital, and other commodities were regarded as the main production factors. As

competition increased, physical resources became inadequate in providing distinct competitive advantage due to the fact that they can be imitated and acquired by anyone on an equal basis. The real value of organizations then rests on their knowledge base and the ideas and insights that reside in the heads of the employees (Wong and Aspinwall, 2006).

Knowledge as a concept has systematically developed over the years (Nonaka & Takeuchi, 1995). Bennet and Bennet (2001) argue that organizations have always used knowledge, but the new intense focus on knowledge in organizations rose out of the organizations' need to manage their own growing complexity and yet remain competitive.

The philosophies of "knowledge" are complex and incomprehensible (Nguyen, 2010) as Knowledge is disorganized and difficult to manage, multifaceted and complex, situated and abstract, implicit and explicit, distributed and individual, physical and mental, developing and static, verbal and encoded (Blackler, 1995). Defining knowledge is an issue which has occupied the minds of philosophers from the classical Greek era and has led to many epistemological debates (Alavi & Leidner, 2001). Different writers (Nonaka & Takeuchi, 1995, Davenport & Prusak, 1998; Beckman, 1999 among others) have described "knowledge" in diverse ways. One thing however seem to be common in all the definitions – that knowledge is related to a process, which involves human action (Nguyen, 2009). Knowledge has two very distinct aspects; the easily communicated and recorded or explicit knowledge and the one embedded in the minds of individual and not so easily documented or tacit knowledge (Nonaka & Takeuchi, 1995).

Knowledge is a dynamic combination of experience, expert insight, values and contextual information (Warner, 2013). It can be intangible, personal, elusive, and immeasurable (Gorelick, 2005). Knowledge constitutes a foundation for evaluating new experiences and information and is continually shaped through new experiences (Davenport & Prusak, 1998). Knowledge is defined by Awad and Ghazin (2004) as an understanding gained through

experience or study. Wang and Noe (2010) define knowledge as information processed by individuals including ideas, facts, expertise, and judgment, relevant for individual, team, and organizational performance.

Some researchers like Nonaka and Takeuchi (1995) and Wiig (1999a) prefer a more complete perspective, which describes knowledge as basically different from data and information; and seen as a dynamic human process of justifying personal belief toward the truth created by the flow of information anchored in the belief and commitments of its holders. Knowledge has its active and subjective nature represented by terms like "commitment and belief" which are deeply rooted in individuals, hence proving that knowledge is related to human actions. Knowledge may be viewed from five categories or perspectives as (1) a state of mind, (2) an object, (3) a process, (4) a condition of having access to information, or (5) a capability (Alavi & Leidner 2001).

Knowledge is recognized as a "core competency" of an organization which as a result can impact organizational structure, processes, service/product delivery (Ellis, 2005; Salisbury, 2003). Hence, the idea that organizations and individuals within them would be more effective and efficient if they "knew what they know" was muted by Nonaka and Takeuchi (1995). The value of knowledge lies in the fact that it is not easily reproduced by competitors and so provides a source of a unique competitive advantage to an organization (Lim & Klobas, 2000).

Knowledge has been viewed as an organizational asset (intangible). The importance is on the distinction between personal and organizational knowledge. Aptly expressed by Tsoukas and Vladimirou (2001), organizational knowledge is knowledge organized in a company context. Their argument is that though propositional knowledge otherwise known as codified procedures accounts for the larger proportion of organizational knowledge, the less appreciated aspect of organizational knowledge which is heuristic knowledge is more difficult to manage

because it contains “soft” information which needs to be captured via socialization and not just digitalization. They opine that heuristic knowledge is generated as employees do their job and becomes more enhanced when employees are encouraged to invent and use their intuitive skills and personal experience.

In Tsoukas (1996) opinion, there will always be uncertainty which will create the need for human judgment, therefore breaking the explicit rules of the firm. In the same vein, other scholars like Nonaka, (1994), Nahapiet and Ghoshal, (1998) argue that knowledge has a socially constructed nature; and knowledge becomes organizational only when employees are motivated through company culture to share experiences and use collective knowledge. Following this argument, for productivity to increase in a company, knowledge will have to be dealt with at a strategic level as it relates to culture (Tzortzaki & Mihiotis, 2014).

Knowledge and learning theories are very broad with roots in philosophy, cognition, psychology, and organizational theory (Nguyen, 2009). Knowledge has usually been differentiated from data and information (Becerra-Fernandez, Gonzalez & Sabherwal 2004). Fahey and Prusak (1998) assume that if knowledge is not something distinct from data or information, then there is nothing novel or fascinating about knowledge management. One commonly held view even though with minor variance is that data is raw numbers and facts; information is processed data, while knowledge is authenticated information (Dreske 1981; Machlup 1983; Vance 1997).

Brooking (1996) advances academic insight as she defined knowledge as information based upon which action is taken. Accordingly, she defines data as given and information as data in context. In the opinion of Alavi and Leidner (2001), what is key to effectively differentiate between information and knowledge may not be found in the content, structure, accuracy, or utility of the supposed information or knowledge, but knowledge is information possessed in

the mind of individuals: it is personalized information (which may or may not be new, unique, useful, or accurate) related to facts, procedures, concepts, interpretations, ideas, observations, and judgments.

Table 2.1 Definitions of Knowledge

Source	Definition
Bhatt (2001)	Knowledge is an organized combination of data assimilated with a set of rules, procedures, and operations learnt through experiences and practices
Nonaka and Takeuchi (1995)	Knowledge is "justified true belief". It is a dynamic human process of justifying personal belief toward the "truth"
Wiig (1999a)	Knowledge consists of truth and beliefs, perspectives, concepts, judgments, expectations, methodologies and "know-how".
Beckman (1999)	Knowledge is reasoning about information and data to actively enable performance, problem solving, decision making, learning and teaching
Davenport & Prusak (1998)	Knowledge is a fluid mix of framed experiences, values, contextual information, and expert insights that provide a framework for evaluating and incorporating new experiences and information. It originates and is applied by the middle of knowers. In organizations, it often becomes embedded not only in documents or repositories but also in organizational routines, processes, practices and norms.
Probst, Raub & Romhardt (2000)	Knowledge is the whole body of cognitions and skills which individuals use to solve problems. It includes both theories and practical, everyday rules and instructions for action. Knowledge is based on data and information, but unlike these, it is always bound to person. It is constructed by individuals, and represents their beliefs about causal relationships.
Sowa (1984)	Knowledge encompasses the implicit and explicit restrictions placed upon objects (entities), operations, relationships, general and specific heuristic as well as inference procedures involved in the model.
Awad and Ghaziri (2004)	Knowledge as "understanding gained through experience or study"
Davenport, De Long, & Beers (1998)	Knowledge is information combined with experience, context, interpretation and reflection

Source: Developed for the study (2016)

2.4.1a Distinguishing Knowledge, Data, Information and Wisdom

Some schools of thought consider knowledge to be at the highest level in a hierarchy with information at the valuable middle level and data to be at the lowest level (Davenport & Prusak 1998; Earl 2001; Tiwana 2002). Going by this view, knowledge is inherently similar to information and data, even though it is the richest and deepest of the three, and consequently, the most important (Nguyen, 2010). On the other hand, knowledge can be represented in a

circular model because of the iterative nature of knowledge development (Jones 2001). Other researchers (Bollinger & Smith 2001; Wu 2000) incorporate an additional layer, wisdom, while some (Shankar *et al*. 2003) investigate the concept of a knowledge value chain. To distinguish between these concepts, Shankar *et al* (2003) knowledge value chain is used in this study (see Fig. 2.4).

Data are defined as crude or unprocessed non-analyzed facts that are measures or attributes of phenomena, which are out of context and have no relation with other facts (Loshin 2001; Robbins *et al*. 2000; Zikmund, 2000). Data are objective in nature (James 2005; Tiwana 2002). Butcher (2007) defines data as a collection of facts and quantitative measures which exist outside of any context from which people can draw conclusions; By itself data have relatively little value (Butcher, 2007).

Information is a processed and analyzed data which form a body of objective facts in a format proper for decision making; or which are viewed in a context that defines the relationships between two or more pieces of data and possibly other information (Loshin 2001; Robbins *et al.* 2000; Zikmund 2000). Like data, information as well is objective in a given context (James, 2005). Information is data that people interpret and place in a meaningful context, highlighting patterns, causes or relationships in data; for example, reports or strategic planning documents (Butcher, 2007). Information is conceptualized as data invested with meaning (Davidson and Voss, 2002). A five 'C' filter for converting data to information which comprises contextualization, categorization, calculation, correction and condensation were proposed by Davenport & Prusak as cited in Tiwana (2002).

Bollinger and Smith (2001); Davenport and Prusak (1998); Pemberton and Stonehouse (2000); and Robbins *et al.* (2000), aver that knowledge at a higher level, is an awareness, understanding or familiarity gained from a blending of information, experience, skills,

principles, rules, value, insight, study, investigation and observation. Knowledge is usually subjective since it is a mixture of many things (James 2005). Knowledge is the understanding people develop as they react to and use information, either individually or as an organization (Butcher, 2007). Knowledge allows for making predictions, causal associations, or predictive decisions about what to do, unlike information which simply gives the facts (Tiwana, 2002).In essence, knowledge is information with a purpose (Davidson & Voss 2002). Whereas wisdom, as the top layer of the hierarchy or value chain, is the judicious application of accumulated knowledge and experience integrated into people, organizations, and society, indicating the ability to see through complexity and discover the fundamental nature of issues or problems (Vance, 1997).

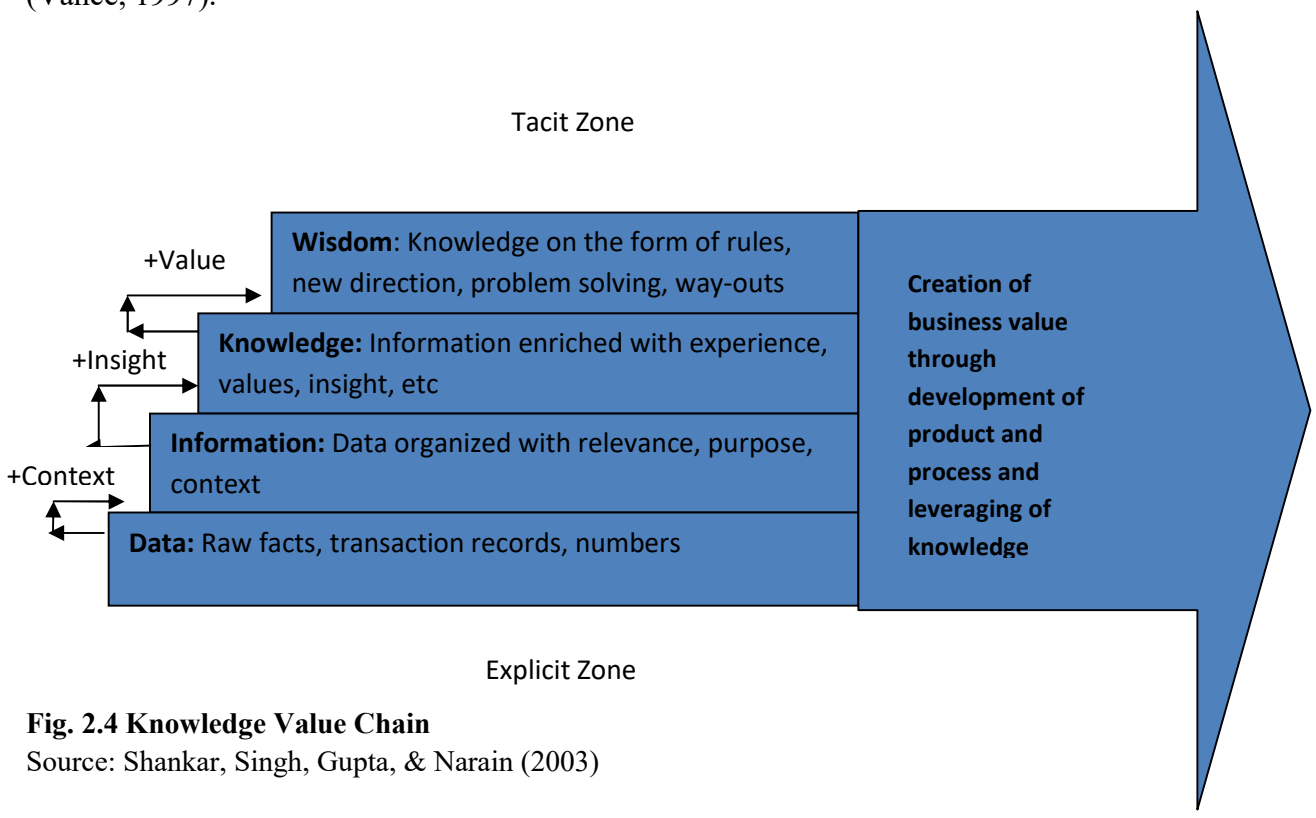

Fig. 2.4 Knowledge Value Chain
Source: Shankar, Singh, Gupta, & Narain (2003)

2.4.1b Knowledge Taxonomies/Classifications

Knowledge has been classified in various ways. Traditional epistemology identifies three distinct kinds of knowledge: knowledge of things and objects, knowledge of how to do things, and knowledge of statements or propositions (Musgrave, 1993). Following the work of Polanyi

(1962, 1967), Nonaka (1994) expounded two types of knowledge in organizations. These are tacit knowledge and explicit knowledge (Sodiya *et al,* 2006). Explicit knowledge is the knowledge that is collected, stored, distributed and shared primarily as electronic or paper documents. It is simply the knowledge acquired through training and education. Tacit knowledge involves special productive knowledge and skills possessed by individual. It also includes cognitive skills such as belief, images, intuition and mental models as well as technical skills. Knowledge from all indication seems the fundamental basis of competition presently (Zack, 1999; Grant, 1996). The tacit dimension rooted in action, experience, and involvement in a specific context, comprise of both cognitive and technical elements (Nonaka 1994). The cognitive element refers to an individual's mental models consisting of mental maps, beliefs, paradigms, and viewpoints. The technical component consists of concrete know-how, crafts, and skills that apply to a specific context. An example of tacit knowledge is knowledge of the best means of approaching a particular customer using flattery, using a hard sell, using a no-nonsense approach; while the explicit aspect of knowledge is articulated, codified, and communicated in symbolic form and/or natural language; An example is an owner's manual accompanying the purchase of an electronic product. The manual contains knowledge on the appropriate operation of the product (Alavi & Leidener, 2001).

Tacit knowledge entails information that is difficult to express, formalize, or share. It stands in contrast to explicit knowledge, which is conscious and can be put into words. An individual experiences tacit knowledge as intuition, rather than as a body of facts or instruction sets he is conscious of having and can explain to others. Tacit knowledge is “knowing how” while explicit knowledge is “knowing that.” The mere act of possessing knowledge itself does not guarantee strategic advantage (Zack 2002 in Emadzade *et al* 2012); rather, knowledge has to be managed. For instance, though some aspects of intellectual capital are transferable, internal knowledge may not be easily copied (Agbim *et al,* 2013). This implies that knowledge

deposited in employees' minds get lost the moment they leave the organization. It therefore becomes an objective of management to transform individual knowledge into organizational knowledge (Kovacic *et al.,* 2006; Rasula *et al.,* 2012).

Alavi and Leidner (2001) expresses the need to understand the concept of knowledge and knowledge taxonomies as being crucial since theoretical developments in knowledge management are determined by the different types of knowledge. More so, the knowledge taxonomies can enlighten the design of knowledge management systems as it calls attention to the importance of support for the different types of knowledge and the flows among these different types, even up to the IT base. This is summarized in table 2.2.

Table 2.2 Knowledge Taxonomies and Illustrations

Knowledge Types	Definitions	Examples
Tacit	Knowledge is rooted in actions, experience, and involvement in specific context	Best means of dealing with specific customer
Cognitive Tacit:	Mental models	Individual's belief on cause-effect relationships
Technical Tacit:	Know-how applicable to specific work	Surgery skills
Explicit	Articulated, generalized knowledge	Knowledge of major customers in a region
Individual	Created by and inherent in the individual	Insights gained from completed project
Social	Created by and inherent in collective actions of a group	Norms for inter-group communication
Declarative	Know-about	What drug is appropriate for an illness
Procedural	Know-how	How to administer a particular drug
Causal	Know-why	Understanding why the drug works
Conditional	Know-when	Understanding when to prescribe the drug
Relational	Know-with	Understanding how the drug interacts with other drugs
Pragmatic	Useful knowledge for an organization	Best practices, business frameworks, project experiences, engineering drawings, market reports

Source: Alavi and Leidner (2001).

The Blumentritt & Johnston framework in (Nguyen, 2010), specifies four categories of knowledge: codified knowledge, common knowledge, social knowledge, and embodied knowledge (see table 2.3). The categories are arranged according to the degree of difficulty involved in transferring knowledge from one individual to another or from an individual to an organization. As shown in table 2.3 the difficulty increases from left to right.

Table 2.3 Framework for Categories of Knowledge

Codified Knowledge Effective information of all kinds – facts and figures	**Common Knowledge** Knowledge that is accepted as standard without being made formally codified	**Social Knowledge** Knowledge of social links and shared values	**Embodied Knowledge** Knowledge that is rooted in experience, background and skill of a person, strongly related to the person that holds it
Explicit knowledge (Polanyi 1966; Nonaka & Takeuchi 1995) Knowledge of things and objects Knowledge of statements & propositions (Musgrave 1993) Symbolic knowledge (Collins 1993) Encoded knowledge (Blackler 1995) Know what (Catalogue knowledge) Know why (Explanatory knowledge) (Lundvall 1996) Catalogue knowledge (Millar, Demaid & Quintas 1997)	Embrained knowledge (Collins 1993 Embedded knowledge Embrained knowledge (Blackler 1995) Experiential knowledge (Millar, Demaid & Quintas 1997) Informal knowledge Meta knowledge (Fleck 1997)	Encultured knowledge (Collins 1993) Encultured knowledge (Blackler 1995) Know who (Social knowledge) (Lundvall 1996) Social knowledge (Millar, Demaid & Quintas 1997	Tacit knowledge (Polanyi 1966; Nonaka & Takeuchi 1995; Williams 2006) Embodied knowledge (Collins 1993) Embodied knowledge (Blackler 1995) Know how (Process knowledge) (Lundvall 1996) Tacit knowledge Instrumentalities (Fleck 1997)
Explanatory knowledge (Millar, Demaid & Quintas 1997) Formal knowledge Contingent knowledge (Fleck 1997) Object knowledge (Sveiby 1997, 2001; Hsu & Shen 2005)	Knowledge of how to do things (Musgrave 1993) Process knowledge – Know how content (Millar, Demaid & Quintas 1997) Process knowledge (Sveiby 2001; Hsu & Shen 2005)		These concepts might contribute to either process knowledge or embodied knowledge depending on their

Source: Nguyen (2010)

2.4.2 Knowledge Management

The conceptualization of the word "knowledge management" (KM) in the 1980s and the spotlight on explicit knowledge was indeed expected and a natural development even though it was a gradual occurrence that was often met with management uncertainty (Wiig, 1999b). In Tzortzaki and Mihiotis (2014) overview of the stages in the development of KM, the 1980s and the 1990s witnessed a variety of methodology improvement on business and the emergence of concepts such as business re-engineering, benchmarking, downsizing and outsourcing, management information systems, customer satisfaction and organizational learning; and was also an era of heavy industrialization of the economies, while researchers' focused on new disciplines such as marketing, organizational behaviour, and management of information technology.

KM has been described as a multidisciplinary and complex concept (Theriou, Maditinos & Theriou, 2011), which came about as a convergence of several factors and remained implicit and fundamentally based on the apprentice-journeyman-master model (Wiig, 1999b). There seem to be as many definitions of it as there are many researchers, depending on the various disciplines and interests. O'Dell and Jackson (1998) define KM as a strategy that can be developed within a firm to ensure that knowledge reaches the right people at the right time; and these people should share and use information to improve organizational functions. KM is the process of acquiring, organizing and communicating both tacit and explicit knowledge of employees so as to improve productivity (Sodiya *et al*, 2006). KM is also viewed as an organizational capability which identifies, locates, creates or acquires, transfers, converts and distributes knowledge for competitive advantage (Walters, 2002). KM refers to "the tools, techniques, and strategies to retain, analyze, organize, and share business expertise"(Groff and Jones, 2003). KM relates to the "strategies and processes of identifying, capturing and

leveraging knowledge to help the firm to compete in a turbulent business environment" (American Productivity and Quality Center (APQC), 1997).

Following the belief that there are different brands of KM, Wiig (1999b) gave a broad definition of KM "as the systematic and explicit management of knowledge-related activities, practices, programs, and policies within the enterprise. Wiig assumed that the firm's viability depends directly on (i) the competitive quality of its knowledge assets; and (ii) the successful application of these assets in all its business activities having realized the importance of the knowledge assets. Nonaka (1994); Spender and Grant (1996), opine that effective management of organizational knowledge is believed to be related to competitive advantage and is considered critical to the success of an organization. Additionally, Beckman in Islam, Mahtab and Ahmad (2008) refers to KM as "formalization of and access to, experience, knowledge and expertise that create new capabilities, enable superior performance, encourage innovation and enhance customer value". Newman in Islam *et al* (2008) rates intellectual assets as the valuable knowledge available for organizations to be used for exploitation, and must be nurtured, preserved and used to the largest extent possible by both individuals and organizations. The term 'knowledge management' refers to the planned organization of knowledge and information so it can be accessed, shared, transferred, applied and created in a way that generates value for an organization (Migdadi, 2005).

It is observed that there is no generally accepted definition of KM (Grossman, 2006; Lloria, 2008). However, what is supported in most of the definitions is that it comprises of processes or set of actions for creating and using knowledge to achieve or enhance various outcomes like organizational performance, goals, competitive advantage, or overall success. See table 2.4 for some of the definitions. A review of the literature opens wide a broad range of factors or knowledge management infrastructure capabilities or enablers that possibly influence the

success of knowledge management initiatives. They include culture, leadership, technology, organizational adjustments, evaluation of knowledge management activities and/or knowledge resources, governing/administering knowledge activities and/or knowledge resources, employee motivation and external factors (Holshapple & Joshi, 2000). This suggests that the success of a KM program depends on several factors; like Hasanali (2002) opines some within firm's control, and some not. Hasanali categorized the critical success factors into five thus, leadership, culture, structure (roles and responsibilities), information technology infrastructure, and measurement.

In like manner, Desouza (2004) resonates the attractiveness of a KM initiative for organizations to undertake which requires developing a robust system with certain key issues like (i) how to organize or structure a knowledge repository (a layout problem), (ii) the best mechanism for knowledge transfer from an employee to another, and from a system to an employee (a transportation or logistics problem), (iii) maintaining a KM system (a maintenance problem), and (iv) making a KM system user friendly (a human factor or problem). A number of frameworks for KM implementation have been advanced in literature mostly by practitioners such as Gupta and Govindarajan (2000) that proposed a set of practice notes on the use of strategy and organizational culture in achieving KM success. Others are the model developed by Leonard-Barton (1995) that identified four dimensions of core capabilities (skills and knowledge, physical system, managerial system, values and norms) necessary to succeed in KM initiatives. Skills and knowledge implies both the techniques specific to the firm as well as the scientific understanding. The skills can be public, industry-specific, or firm-specific. Firm specific skills are generally tacit, hence less codifiable and imitated by competitors. The skills are specific to the firm and people who own them. Physical systems are systems that a company builds overtime, such as software programs, databases, machinery, where skills and knowledge are embedded. Such physical systems, skills, and knowledge is referred to dynamic

knowledge reservoirs by Tiwana (2002). Managerial systems are defined as the organized routines that guide resource accumulation and deployment such as systems of innovation, rewards, and improvement (Leonard-Barton, 1995). Values and norms depicts the model of behaviour and obsessive beliefs which define the level of acceptance of new initiatives and techniques, hence acting as screening mechanisms that filter out anything unfamiliar to the existing culture (Davenport *et al*, 1998). These norms have their foundations from personal values of the founders of the firm and basic assumptions about human nature. Arthur Andersen and the APQC (1997) set forth the major institutional enablers of various KM processes viz – Strategy and Leadership, organizational culture, technology, and measurement.

Table 2.4 Definitions of Knowledge management

Author(s)	Definition
APQC (1998)	"the management discipline concerned with the systematic acquisition, creation, sharing and use of knowledge in organizations, aiming to improve a firm's competitiveness via continuous, rapid innovation"
O'Dell and Jackson (1998)	"Strategy that can be developed within a firm to ensure that knowledge reaches the right people at the right time; and these people should share and use information to improve organizational functions".
Davenport and Prusak (1998)	Knowledge management draws from existing resources which organizations already have in place in terms of sound IS management, organizational change management, and human resources management practices
Wiig (1999)	The objectives of KM are "(a) to make the enterprise as intelligently as possible to secure its viability and overall success and (b) to realize the best value of its knowledge assets"
Walters (2002)	"the organizational capability which identifies, locates (creates or acquires), transfers, converts and distributes knowledge into competitive advantage"
Becerra-Fernandez, Gonzalez and Sabherwal (2004)	"performing the activities involved in discovering, capturing, sharing, and applying knowledge so as to enhance, in a cost effective manner the impact of knowledge on the unit's goal achievement"
Migdadi (2005)	" the planned organization of knowledge and information so it can be accessed, shared, transferred, applied and created in a way that generates value for an organization"
Debowski (2006)	"the process of identifying, capturing, organizing and disseminating the intellectual assets that are critical to the organization's long-term performance"
Lloria (2008)	"information and knowledge-creating systems, as well as strategic management and innovation."
Theriou, Maditinos, and Theriou (2011)	"a process that facilitates organizations to capture, select, organize, distribute, and transfer significant information, knowledge, and expertise so as to gain business advantage.

Source: Developed for the study (2016)

2.4.3 Knowledge Management Systems

Knowledge management systems (KMS) refer to "a class of information systems applied to managing organizational knowledge. That is, they are IT-based systems developed to support and enhance the organizational processes of knowledge creation, storage/retrieval, transfer, and application" (Alavi & Leidner, 2001). Despite the fact that not all KM initiatives entail an implementation of IT, and even the caution against emphasizing on IT at the expense of the social and cultural facets of KM (Davenport and Prusak 1998; Malhotra 1999; O'Dell and Grayson 1998), many KM initiatives rely on IT as an important facilitator.

Though IT does not apply to all of the issues of knowledge management, it does support KM in a variety of ways (Alavi & Leidner, 2001). For instance, finding an expert or a recorded source of knowledge through online directories and searching databases; sharing knowledge and working together in virtual teams; access to information on past projects; and learning about customer needs and behaviour by analyzing transaction data (KPMG 1998), among others. Certainly, there is no one single role of IT in knowledge management just as there is no one single technology comprising KMS (Alavi & Leidner, 2001).

Table 2.5 Knowledge Perspectives and their implications

Perspectives		**Implications for Knowledge Management (KM)**	**Implications for Knowledge Management Systems (KMS)**
Knowledge vis-à-vis data and information	Data is facts, raw numbers. Information is processed/interpreted data. Knowledge is personalized information	KM focuses on exposing individuals to potentially useful information and facilitating assimilation of information.	KMS will not appear radically different from existing IS, but were extended toward helping in user assimilation of information
State of mind	Knowledge is the state of knowing and understanding	KM involves enhancing individual's learning and understanding through provision of information	Role of IT is to provide access to sources of knowledge rather than knowledge itself.
Object	Knowledge is an object to be stored and manipulated	Key KM issue is building and managing knowledge stocks	Role of IT involves gathering, storing, and transferring knowledge

Process	Knowledge is a process of applying expertise	KM focus is on knowledge flows and the process of creation, sharing, and distributing knowledge	Role of IT is to provide link among sources of knowledge to create wider breadth and depth of knowledge flows
Access to information	Knowledge is a condition of access to information	KM focus is organized access to and retrieval of content	Role of IT is to provide effective search and retrieval mechanisms for locating relevant information
Capability	Knowledge is the potential to influence action	KM is about building core competencies and understanding strategic know-how	Role of IT is to enhance intellectual capital by supporting development of individual and organizational competencies

Source: Alavi and Leidner (2001)

2.4.4 Knowledge Management Capabilities

For an organization to compete effectively, it must leverage its existing knowledge and create new knowledge that will favourably position it in the preferred market. That is to say, that organizations need to develop the ability to use former knowledge to identify the value of new information, absorb it, and apply it to create new knowledge and capabilities (Cohen & Levinthal, 1990). Several researchers have proposed organizational capabilities and competences influencing knowledge management as preconditions or organizational resources for effective knowledge management (Gold *et al*., 2001; Holsapple & Joshi, 2000; Ichijo *et al*., 1998; Lee & Choi, 2003; Leonard-Barton, 1995; Zack, 1999). Organizational capabilities interchangeably used as competency include all firm-specific assets, knowledge assets, skills, processes, and resources. Knowledge assets are "grounded in the experience and expertise of individuals", i.e., tacit knowledge, and others stored as knowledge objects that exist on their own, i.e., explicit knowledge (Fahey & Prusak, 1998; Teece, 1998). Resources are the assets that organizations have or can call upon, otherwise termed the "what we have"; while competences are the ways assets are used or deployed effectively or "what we do well". This explains the reason some organizations may have the resources but may not have the competences required to put into good use the resources, even though managers and scholars

claim that internal, knowledge based resources or competencies may be the most critical sources of CA (Barney, 1995).

Lot more researchers have highlighted three major factors for knowledge management: capabilities, processes, and organizational performance (Beckman, 1999; Demarest, 1997; O'Dell & Grayson, 1999). The notion of "KM capabilities" is consistent with how capabilities are perceived in the strategic management literature. Capabilities refer to an organization's ability to assemble, integrate and deploy valued resources (Amit & Schoemaker, 1993). It is viewed in terms of processes and infrastructures that an organization uses to convert its inputs into desired outputs (Amit & Schoemaker, 1993; Dutta *et al*., 2005). Capabilities are rooted in processes and business routines.

KM capabilities have been recognized as key factor for gaining and sustaining CA (Corsoa *et al*, 2006). KM capabilities are seen as organizational mechanisms which can be used for generating knowledge continuously (Ichijo, Krogh, & Nonaka, 1998), and these mechanisms can encourage acquiring knowledge, protecting knowledge, and facilitating knowledge sharing in an organization (Stonehouse & Pemberton, 1999). Extending the traditional notion of organizational resource based capability to a firm's KM function, a firm's KM capability is defined as "its ability to mobilize and deploy KM-based resources in combination with other resources and capabilities", leading to SCA (Chuang 2004). In this study, KM capabilities refer to organizational infrastructures (factors, routines) and processes which enable an organization to manage its knowledge efficiently and effectively in order to attain competitive advantage.

A review of literature shows the different kinds of KM related resources or capabilities. The KM capability of a firm generally is described in line with "KM Infrastructure" or what some authors would call "Enablers" and "KM Processes" (Gold *et al*, 2001). In other to make this more appreciable, Table 2.6 summarizes previous empirical studies conducted by some authors

using different dimensions of KM capability like KM infrastructure or enablers and knowledge processes and the related outcomes of organizational effectiveness, or performance or competitive advantage or knowledge management effectiveness. A cursory look at the table indicates that Gold *et al* (2001) were among the first researchers in the field of KM to give an all-inclusive model of KM capability dimensions from the organizational capabilities view. Following this model, the KM capability of a firm includes two key divisions: KM infrastructure and KM process capabilities.

Table 2.6 Empirical Studies on KM Capabilities (Infrastructure/Enablers, and Processes)

Author(s)	**KM Enablers/Infrastructure Capabilities**	**KM Process/Process capabilities**	**Purpose**
Zander and Kogut (1995)	Characteristics of societal knowledge	Transfer (time to transfer)	To test empirically knowledge and the speed of transfer using object-perspective measures like times to transfer etc.
Appleyard (1996)	Industry and national characteristics	Transfer (number of times the respondents provided and received knowledge in a given period)	To explore knowledge transfer patterns among various nations and industries using Japan and US
Bierly and Chakrabarti (1996)	KM Strategy	N/A	To examine how KM strategies affects organizational performance using generic strategies of innovators, explorers, exploiters and loners.
Szulanski (1996)	Characteristics of the knowledge transferred, source, recipient and context	Transfer (Four stage transfer processes)	To investigate the relationship between four origins of stickiness and knowledge transfer
Simonin (1997)	Collaborative experience, Know-how	N/A	To test the relationships between collaborative experience, know-how and organizational performance.
Bennet and Gabriel (1999)	Structure, Culture, Size, Environment, and KM method	N/A	To examine the effect of change-friendly culture on the number of KM methods employed
Hansen (1999)	Weak ties, Knowledge Characteristics	Transfer (percentage of a project's total knowledge that comes from other division)	To explain the roles of weak ties and knowledge characteristics on knowledge transfer in multiunit organizations
Holsapple and Joshi (2000)	Managerial influence (Leadership, coordination, control and measurement), Resource influence (Human resource and culture), and environmental influence (Technology and competition)	Knowledge Sharing process	To determine factors that influences the success of knowledge management initiatives in organization
Becerra-Fernandez and Sabherwal	Process oriented tasks, Content oriented tasks, Focused domain	Knowledge creation process (socialization,	To investigate the influence of task context on the suitability of

(2001)	tasks, and Broad domain tasks.	externalization, combination and internalization)	knowledge management processes which affects knowledge satisfaction.
Gold, Malhotra and Segars (2001)	Infrastructure Capability (Technology, Structure, and Culture)	Process Capability (Acquisition, Conversion, Application and Protection)	To ascertain the contribution of infrastructure and process capabilities on the achievement of organizational effectiveness
Khalifa, Lam and Lee (2001)	KM Strategy, Technology fit, Culture, and Leadership	N/A	To test empirically the adequacy of the main elements of KM structures and their effect on KM effectiveness.
Lee and Choi (2003)	Structure, Culture, People, IT	Knowledge creation process (Socialization, Externalization, Combination, Internalization)	To empirically examine the relationships existing between KM factors (enablers) and the knowledge creation process and organizational performance with organizational creativity mediating.
Chuang (2004)	Technical KM resource (IT) and Social KM Resource (Structure, Culture, and Human resource	N/A	To examine the association between KM capabilities and competitive advantage using the resource-based view approach
Migdadi (2005)	Culture, Structure, People, IT, and Transformational leadership	Knowledge creation process (Socialization, Externalization, Combination, and Internalization)	To combine KM enablers and knowledge creation processes from both a social and technological perspectives in relation to organizational performance using organizational creativity as a mediator.
Smith (2006)	Technology, Structure, and Culture, and Business Strategy	Acquisition, Conversion, Application, and Protection	To identify the KM capabilities that are linked to business strategy for organizational effectiveness.
Lee and Lee (2007)	Culture (Learning organization), People (T-shaped skills), Structure (centralization) and Information Technology (IT support)	KM Processes (Generating, Accessing, Facilitating, Representing, Embedding, Using, Transferring, and Measuring)	To examine structural relationships among the capabilities, processes, and performance of KM, and suggest strategic directions for successful implementation of KM.
Wu and Lin (2009)	KM Strategy (Copier, Skill acquirer, Continuous improver, and innovator)	KM Implementation approach (Codification, Personalization, and Integration)	To develop a complete process-based model that describes the relationships among four components: competitive strategy, KM strategy, implementation approach, and firm performance.
Zheng, Yang and McLean (2010)	Organizational culture, structure and strategy	Knowledge generation, knowledge sharing and knowledge utilization	To examine the possible mediating role of KM on the relationship between organizational culture, structure, strategy and organizational effectiveness.
Theriou, Maditinos and Theriou, (2011)	Leadership, Culture, Technology, KM Strategy and People	N/A	To identify critical success factors or enablers which determine KM effectiveness within an organization and in turn influences organizational performance
Emadzade, Mashayekhi and Abdar (2012)	Knowledge infrastructure capability (technology, organizational structure, and organizational culture)	Knowledge process capability (knowledge acquisition, knowledge conversion, knowledge application, and knowledge protection).	To examine the impact of specific knowledge management capabilities/resources on organizational performance.

Source: Developed for the study

Essentially, KM infrastructure capability consists of technology, structure, and culture which form "a definitional basis for the theoretical framework of social capital" (Nguyen, 2010), while KM process capability is comprised of acquisition, conversion, application and protection processes which form "an operational perspective for the framework of knowledge combination and exchange that underlies the theory of knowledge integration" (Gold *et al*, 2001). In the section below, an explanation of infrastructures and processes related with KM capabilities are given.

2.4.4.1 Knowledge Management Infrastructure Capabilities

Krogh *et al*. (2001) define knowledge management infrastructure as "organizational mechanism to create knowledge constantly and intentionally in organization," and presented five factors of knowledge management infrastructure such as (a) the will to generate knowledge, (b) conversation between employees, (c) organizational structure, (d) relationships between employees, and (e) human resources. Quinn *et al.* (1996) posits that actions such as appropriate employee's staffing, employee's ability and technology development, systematic organizational structure development, construction of compensation system about employee's performance should be promoted to use knowledge asset effectively.

An empirically effective knowledge management model from the perspective of organizational capabilities was examined by Gold *et al.* (2001). This perspective suggests that a knowledge infrastructure consisting of technology, structure, and culture along with knowledge process architecture of acquisition, conversion, application, and protection are essential organizational capabilities or preconditions for effective knowledge management. Lee and Choi (2003) emphasized that knowledge management consists of processes to manage knowledge and enablers (or capabilities) to support these processes. They highlighted organizational culture, structure, people, and information technology support as knowledge management enablers.

These infrastructure capabilities of culture, structure, people (human resources) and technology are incorporated into this study in addition to strategy and leadership.

2.4.4.1a Organizational Strategy

The purpose of business or organizational strategy is to create competitive advantages in an industry where a firm operates. Strategy as a concept is viewed as "the determination of the basic long term goals and objectives of an enterprise and the adoption of courses of actions and the allocation of resources necessary for carrying out these goals" (Chandler, 1962). Business strategy represents the way in which a firm arrives at a decision (Porter, 1985). Organizational strategy refers to "a plan for interacting with the competitive environments to achieve organizational goals" (Daft, 1995).

Since strategy is viewed as a pattern of decisions (Mintzberg, 1978), it becomes visible in the behaviour of organizations (Mintzbrg & Waters, 1982). The study of Theriou *et al*., (2011) indicated an insignificant relationship between strategy and knowledge management effectiveness. Although they believe, that strategy plays one of the most important roles in the creation and sustaining of competitive advantage, many organizations do not understand the importance of developing strategic models that can integrate KM process to business strategy.

Some generic business strategies were highlighted by Porter (1985) which are low cost, differentiation, and focus and these have actively been addressed in the strategic management studies (Rivard, Raymond, & Verreault, 2006; Spanos & Lioukas, 2001). In order for a firm's performance to increase, Zack (1999) opines that information technology needs be applied in knowledge management as well as corporate business strategy and both be used intangibly. Hansen, Nohria, and Tierney (1999) in a bid to promote the understanding of KM approaches, defined two different strategies that organizations adopt in practice. These are codification and personalization. Codification refers to the approach in which knowledge is extracted from

people, codified and captured in repositories so that it can be accessed and reused. In other words the strategy is one way of withdrawing knowledge from the person who possesses it, so that it remains within the organization. On the other hand, personalization centers on knowledge sharing via person-to-person contact and dialogues. Here knowledge remains in the mind of a person and human interaction is adopted to acquire it. Furthermore, business strategy should be effectively used as a unique knowledge resource so that the relationship between knowledge and strategy becomes mutual. Davenport and Prusak (1998) submit that knowledge management should combine internal infrastructure capability and competitive advantages; hence business strategy should be translated into knowledge management strategy so as to support corporate goals and achieve the missions and secure the status of competition (Gronhaug & Nordhaug, 1992). Chang & Chuang (2011) opines that organizational knowledge is considered a highly valuable strategic asset which includes tangible and intangible assets, therefore, knowledge management should be a reflection of the business strategy in order to create customer value, earn profit and be able to manage employees. This implies that business strategy will directly influence knowledge management process.

To measure strategy as a construct that reflects a "pattern in a stream of decision" (Mintzberg, 1978), so as to make it consistent with the behaviour of the organization (Mintzberg and Waters, 1982), requires multidimensional scales. Given this, the strategic orientation concept will provide appropriate measurement to the strategy construct (Anggraeni, 2009). Howbeit, strategic orientation is at the heart of the strategic management discipline (Venkatraman, 1989; Hitt *et al* in Anggraeni, 2009). Several strategic orientations have been proposed by different authors. Indications from the literature show that strategic orientation of firms are grouped into three – the narrative, the classificatory, and the comparative approach (Manu and Sriram, 1996). The first and the second approaches are used for qualitative research of case studies which seeks to verbally describe a firm's unique strategy as a whole, as well as categorizing or

grouping firms' strategies into typologies or taxonomies respectively (Ginsberg & Venkatraman, 1985; Morgan & Strong, 2003; Miles *et al,* 1978; Porter, 1980). Hence, both are not suitable for theory testing in quantitative research as the first approach may not measure variables to assess and compare strategies (Meskendahl, 2010), while the second approach is limited to intergroup comparison which does not allow for group internal assessments (Speed, 1993).

The classificatory approach is popular and has several widely accepted classifications like the generic strategies of cost efficiency, differentiation and focus (Porter 1980); prospector, analyzer, defender and reactor strategies (Miles & Snow 1978); operational excellence, product leadership and customer intimacy strategies (Treacy & Wiersema 1993); exploitation and exploration strategies (March 1991); and, first mover and follower strategies (Lieberman and Montgomery 1991). Irrespective of their prominence and attractiveness, these approaches do not include all the important dimensions of a strategy required to explain behaviours (Morgan & Strong, 2003). The comparative approach on the other hand can decompose the variances observed across different strategy classifications with distinct traits (Venkatraman, 1989). That is, strategy is considered in terms of the relative emphasis put by firms on each strategic trait (Morgan & Strong 2003). Therefore, the comparative approach to strategy assessment evaluates a firm's strategy along a number of traits and dimensions which are common to all firms (Morgan & Strong, 2003), and strategy can be made comparable and measurable in terms of emphasis along different strategic dimensions. This study adopts the strategic orientation of business (STROBE) approach of Venkatraman (1989), which was later adapted by Morgan & Strong (2003). This approach is adopted over typologies because it depicts the intensity of the characteristics of strategy rather than putting them into categories.

Venkatraman (1989) proposed a comparative framework which captures the general strategic mindset of a firm and is therefore different from ideas centering on one or selected functional orientations like market orientation (e.g. Jaworski & Kohli; Narver & Slater, in Meskendahl, 2010) or technology orientation (e.g. Gatignon & Xuereb; Voss & Voss, in Meskendahl, 2010). This framework includes six strategic orientation dimensions of aggressiveness, analysis, defensiveness, futurity, proactiveness, and riskiness and exhibits a broad overlap with the attributes of entrepreneurial orientation (Rauch *et al*., 2009; Talke, 2007). However, the six dimensions are collapsed into three (analytical, risk-taking and aggressiveness) following the findings of related studies which grouped proactiveness as one item in the aggressive posture (Antoncic & Hisrich, 2001; Knight, 1997; Talke & Hultink, 2010), while due to discriminant validity, futurity is covered by the analytical posture (Venkatraman, 1989), whereas defensiveness as the opposite of aggressive posture is omitted. These three considered dimensions of strategic orientation are adapted in this paper as part of knowledge infrastructural capability which aid competitive advantage. Fazli and Alishahi (2012) study established a direct relationship between business strategy and performance using STROBE.

2.4.4.1ai Analytic Strategy

Morgan & Strong (2003) refers to analytic position of a firm as its abilities to systematically generate information and build knowledge to secure competitive advantage. Firms with analytic strategy are able to interpret a wide range of information and make substantial management implication out of it. Analytic activities like data gathering and interpretation are crucial for skillful decision making and for firm performance when applied systematically (e.g. Goll and Rasheed, 1997). Analytic strategy involves systematically analyzing environmental factors like new technologies, market developments etc in line with its strategic competence (Meskandahl, 2010). As a knowledge management capability, firms with analytic strategy are likely to have more competitive advantage over their competitors.

2.3.4.1aii Aggressive Strategy

An organizations aggressive posture characterizes its behaviour toward external opportunities or threats (Covin & Covin, 1990), and ranges between offensiveness and defensiveness. This is seen as essential for firms in unstable and competitive environments (Venkatraman, 1989). The intensity of a firm's effort to capitalize on new technologies or serve new market needs in order to secure or increase its competitive advantage is determined by its aggressive position (Fombrun & Ginsberg, 1990; Lumpkin and Dess, 2001). That is, the whole essence of the aggressive position is to be able to apply and introduce innovation when compared with its competitors.

2.4.4.1aiii Risk-taking Strategy

The risk-taking posture enables organizations to enter new markets, follow trends, and develop or apply new technologies (Miller & Friesen, 1978). Risk-taking explains the way in which decisions are made and actions taken regarding most possible result (Talke, 2007). What is important here is the eagerness to take chances concerning new technologies and major project decisions (Meskandahl, 2010).

2.4.4.1b Leadership

Leadership as a concept appears likely the most widely researched social processes known to behavioural science; it is believed that leadership plays a crucial role in organizations, and has a direct influence on group process and outcomes (Nguyen, 2009). Leaders are the key people to whom others turn to for advice and guidance (Kuye, 2004). Behavioural thinkers (academics and practitioners) agree to the fact that leadership plays a significant role in the acquisition, use and management of knowledge in the organization in addition to other good number of organizational mechanisms (Singh, 2008). These other factors naturally fit in for as long as there are good leadership practices in operation. Hence, the competitive advantage of a firm through knowledge management is largely dependent on its style of leadership (Singh, 2008).

As is common with all constructs in social science, the definition of leadership may be arbitrary and very subjective. Some definitions may appear more useful than the others but there is no "correct" definition (Yukl, 2006). In research, the operational definition of leadership will depend to a large extent on the purpose of the researcher (Karmel, 1978). Part of the purpose of this study, is to examine the relationship existing between leadership support as a knowledge infrastructure capability (enabler) on competitive advantage of a firm, the two definitions below fit into the study and are adopted.

Leadership is defined as "the nature of the influencing process and its resultant outcomes, that occurs between a leader and followers and how this influencing process is explained by the leader's dispositional characteristics and behaviours, follower perceptions and attributions of the leader, and the context in which the influencing process occurs" (Antonakis, Cianciolo, and Sternberg, 2004). From this definition, it is pretty obvious from the submission of Rosenbach and Taylor (1993) that the past decade witnessed a shift in emphasis toward the participation of followers in leadership, to the extent that leadership is often now defined as the process of leaders and followers in a mutual influence on each other. This is what managing knowledge in an organization entails, since some aspect of knowledge (tacit) resides in the people, and will require a mutual influence to make this part of knowledge an organizational resource.

Yukl and Van Fleet (1992) defined leadership as a "process that includes influencing the task objectives and strategies of a group or organization, influencing people in the organization to implement the strategies and achieve the objectives, influencing group maintenance and identification, and influencing the culture of the organization". Examining this definition, leadership includes motivating people, shaping organizational objectives, maintaining the group and organizational culture. That is, leadership cuts across individual, group and organizational level; and the focus is not on what the leader "is", but on what the leader "does". So the emphasis here is on leader behaviour and value. As much as virile leaders are needed to

formulate policies and see to the daily operation of an organization, there is need to have leaders with vision for the future, who can challenge the status quo where necessary, and inspire followers in order to achieve the vision.

Leadership can be distinguished from management viewing it from the "new" perspective (transformational and charismatic leadership theories) because it is purpose driven, resulting in change premised on values, ideals, vision, symbols, and emotional exchanges while management is objectives driven, resulting in stability based on rationality, bureaucratic means, and the fulfillment of contractual obligations (Antonakis *et al,* 2004).

The role of leadership in managing knowledge in organization was clearly highlighted by Cleveland in his book, "The Knowledge Executive" (Singh, 2008). The book stressed the need for use of teams, communities of people, and other such networks as the role of leaders in managing information and knowledge. This is accomplished evidently through technology and social networks. A study by Andersen and APQC concluded that organization's failure to leverage knowledge is due to the lack of commitment of top leadership in sharing organizational knowledge" (Hiebeler in Theriou, Maditinos & Theriou, 2011). Given that the idea of knowledge management program may pose an organizational change (Davenport *et al*, 1998) the responsibility of leaders lies in their ability to draw up methods of how the organization should deal with knowledge management processes and practices and be critically involved in it. This is to ensure that knowledge management infuse all levels of the organization starting from the top otherwise knowledge management program is not likely to be effective in such an organization (DeTienne *et al*, 2004)

Gone were the days when it was assumed that organizations needed only one knowledge leader. Like Hubbard was quoted in Singh (2008), "effective organizations rely on leadership not leaders". What is important is the knowledge leadership offered at every level to provide

strategic visions, motivate others, communicate effectively, act as a change agent, coach others around, model good practices, and carry out the knowledge agenda (Debowski, 2006). Such knowledge leadership will painstakingly explain the aim of knowledge management to the people concerned to enable them identify their roles in achieving the organizational goals, and also guide on the priorities needed to reach the goals and any change that may likely take place in the processes (Debowski, 2006).

Storey and Barnett (2000), resonate that leadership should provide an environment supportive of the creation and transfer of knowledge, thereby making people feel free to make contributions, and such contributions should be recognized by leaders to encourage more contributions from the people. Leaders should be willing to also share and offer their knowledge to other organizational members, be willing to learn and seek new ideas and knowledge constantly. From their research findings the support of top level management in KM is crucial but the role of leaders in middle management positions is equally as important. That is, knowledge leadership should not be the business of the top echelon only, there should be a spread.

In addition, Beckman (1999) states that top managers need motivate employees, measuring and rewarding their performance, behaviour, attitude that is considered necessary for effective knowledge management as well as providing equal opportunities and development for them. However, top managers must understand the importance of knowledge management in order to support and play an active role (Greengard, 1998). Furthermore, leadership is expected to assist employees overcome conflict of interest situation in knowledge management practices which are likely to occur sometimes (Berlade & Harman, 2000). The review on leadership and its role in knowledge management programs gives a thorough evidence of the importance of leadership to the knowledge management process and competitive advantage of the firm.

Leadership has been suggested to be an important factor affecting innovation. Some studies have also shown that transformational leadership positively influences organizational innovation (e.g., Jung *et al*., 2003). It is therefore hypothesized that leadership is significantly related to KM process capabilities and competitive advantage of an organization.

2.4.4.1c Organizational Culture

Arnold (2005) describes organizational culture as the distinctive norms, beliefs, principles and behaviour which combine to give each organization its distinct character. Culture creates a unifying force that increases organizational performance and positively affects employee behaviour (Mazur, 2010). For a successful implementation of knowledge management, organizational culture is considered very important (Davenport & Prusak, 1998; Demarest, 1997; Gold *et al.,* 2001; Lee & Lee, 2007). There is need for organizations to establish an appropriate culture that encourages people to create and share knowledge within the organization (Lee & Lee, 2007), as interaction between individuals is essential in the innovation process (Leonard & Sensiper, 1998). Shaping culture is central in a firm's ability to manage its knowledge more effectively (Leonard, 1995). Culture defines not only what knowledge is valued, but also what knowledge must be kept inside the organization for sustained innovative advantage (Long, 1997). In various studies, culture is divided into a number of traits, and each trait has a different effect on performance indicators (Yilmaz & Ergun, 2008). For instance in the Denison model, culture elements include involvement, consistency, adaptability and mission (Denison, 1984). This study adopts the Lee and Choi (2003) model of culture which focuses on collaboration, trust, and learning.

2.4.4.1ci Collaboration

This is defined as the degree to which people in an organization support and helps each other actively in their work (Gupta & Govindarajan, 2000). According to Hansen *et al*, (1999), a

culture of collaboration is necessary for effective knowledge management, while Hedlund (1994) avers that collaborative interactions such as joint activity, social interaction and open discussion can help to create organizational knowledge. Exchanging knowledge amongst people is a condition for successful knowledge creation; and this type of exchange can be fostered by shared interactions to reduce fear and increase openness to other members. Collaboration between organizational members also loosens individual differences. Some studies have shown the significance of collaborative interactions for successful knowledge creation (Zucker *et al.* 1996; Lee & Choi, 2003; Migdadi, 2005), while many scholars considered collaboration a key enabler for knowledge creation (Hansen *et al*., 1999; Graham & Pizzo, 1996).

2.4.4.1cii Trust

Trust can be defined as keeping mutual faith in each other in terms of intention and behaviours (Hurley & Hult, 1998). Trust can facilitate open, substantive, and persuasive information exchange (Iansiti, 1993; Hansen *et al*., 1999). People become more willing to exchange knowledge and participate in social interactions when trust is relatively high (Hedlund, 1994). Institutionalizing trust among employees can be a breakthrough in knowledge transfer (Iansiti, 1993), as it is well believed that employees look for advice from trusted colleagues to increase their understanding of problems. In his study, Szulanski (1996) found that the lack of trust among employees is one of the key barriers to knowledge exchange. Whereas increase in knowledge exchange as a result of reciprocal trust results in encouraging a climate conducive for better knowledge creation and alleviates the fear of risk (Lee & Choi, 2003). Trust is also vital in an inter-organizational or cross-functional team given the fact that withholding information because of lack of trust can be particularly detrimental to knowledge creation.

2.4.4.1ciii Learning

A considerable body of prior scholarly work has defined learning as a systematic change in behaviour or knowledge informed by experience according to Miner in Migdadi (2005). Learning is the acquisition of new knowledge by people who are able and willing to apply that knowledge in making decisions or influencing others (Miller, 1996). That is, organizations can assist people to play a more active role in learning and identifying new things and possible solution to organizational problems through learning and development. The emphasis on learning infuses organizations with new knowledge (Damanpour, 1991). Learning can also be defined as the degree to which it is encouraged in organizations (Hurley & Hult, 1998). In essence, an organization may be a less learning institution if it does not support and encourage learning and development of its employees.

Kanevsky and Housel (1998) affirm that the amount of time spent on learning is positively related with the amount of knowledge created in an organization; we opine that it may also be related to the amount of knowledge usage or application. Scholars like Krogh (1998) proposed training programs as means of knowledge creation, while Swap *et al*., (2001) highlighted mentoring as a key means in organizational creation of knowledge. Therefore, the capacity of knowledge creation, usage and transfer can be increased through various learning means like education, training, and mentoring. Learning must be comprehensive enough and cut across all the organizational hierarchy. Employees should be encouraged to ask questions, challenge and learn. For instance, Madhavan and Grover (1998) states that pioneer industrial companies such as Nucor, acclaimed to be the most innovative steel company in the US have adopted a pattern of continuous and multifunctional training programs for all staff from top to the bottom of the hierarchy in order to preserve their competitive advantage in the industry. Essentially, for organizations to be successful in knowledge creation, application and transfer, traditional

training and development activities may no longer be enough; they need to nurture an environment with continuous and persistent learning (Lubit, 2001).

2.4.4.1d Human Resources

For every organization, the human resources (Employees/people) are at the centre of organizational knowledge creation (Eppler & Sukowski, 2001). According to Scott (1998), an adage has it that knowledge management is 10 per cent technology and 90 per cent people. People are considered a key enabler or infrastructure because knowledge resides in the heads of people (tacit); therefore they need to be encouraged to share their knowledge with others to make their knowledge explicit. To stay competitive, companies need to capitalize on their intellectual assets especially on the intellectual capacity of their workers rather than their technological infrastructure (Hung, 1998).

There are many factors which are related to people such as personality, cognitive style, self-efficacy, and skills. Knowledge and competence can be acquired by employing new people with desirable skills (Stonehouse & Pemberton, 1999). When it comes to skills, many researchers refer to the T-shaped skill e.g. Leonard, (1995). T-shaped skills refers to being both deep (stem of the "T") and yet broad enough (the cross of the "T") to enable their possessors to explore the interfaces between their particular knowledge domain and various applications of that knowledge in particular product (Leonard, 1995). T-shaped skills embodied in employees are often associated with core capability (Iansiti, 1993; Leonard-Baton, 1995). T-shaped skills may enable individual specialists to have synergistic conversations with one another (Madhavan and Grover, 1998). People with T-shaped skills can expand their competencies across several practical areas, and thus create new knowledge since they know how their branch of knowledge interacts with other branches. In this study, the T-shaped skill is also employed.

2.4.4.1e Technology

The technology context is looking at the information technology (IT) infrastructure and capabilities already on ground which supports knowledge management architecture (Zander & Kogut, 1995). Information Technology support is a crucial enabler and foundational element of a KM plan (Omotayo, 2015). Many researchers found that IT is an important element for efficient knowledge processes (Davenport & Prusak, 1998; Gold *et al*., 2001). For instance, IT is widely employed to connect people with reusable codified knowledge, facilitates conversations to create new knowledge, and allow an organization to create, share and store and use knowledge (Raven & Prasser, 1996). An aspect of technology infrastructure is the knowledge-oriented tools such as Lotus Notes and World Wide Web-based intranet. Another aspect of technology infrastructure is a common, pervasive set of technologies for desktop computing and communication (Lee & Choi, 2000). That is, a capable, networked PC on every desk or in every briefcase, with standardized personal productivity tools that people can exchange documents (Davenport *et al*., 1998).

According to Reed and DeFillipi (1990), the combining of different technologies creates causal ambiguity which increases the sustainability of competitive advantage. Knowledge projects are likely to succeed if these tools are already in place and this makes information technology an important factor for knowledge management (Lee & Choi, 2000). Information technology is important for initiating and carrying out knowledge management. However, many theorists leading knowledge management have warned about the attitude towards strong investments in information technology at the detriment of investment in human capital. This is against the backdrop of postulations from scholars like Davenport *et al,* (1998) that knowledge projects are more likely to succeed when broader technology infrastructure is adopted. Khalifa and Liu (2003) aver that IT on its own has no direct effect on a firm's CA, rather, firms use technology to support and enhance their KM processes in other to promote organizational performance.

Information Technology is the least important factor in KM effectiveness, and should not be seen as a sole driver of knowledge management for CA since it is only a tool (Wong & Aspinwall, 2005; Theriou *et al*, 2011). Teece *et al*. (1997) posits that the absence of a direct relationship between technology and firm performance could be because technology (e.g. IS resources) is easily copied, making it a fragile source of competitive advantage. This study focuses on IT support.

2.4.4.1f Organizational Structure

An organization's structure may support or stall knowledge management (Gold *et al*., 2001; Hedlund, 1994; Nonaka & Takeuchi, 1995). Kanten, Kanten, and Gurlek (2015) define organizational structure as a mechanism which links and coordinates individuals within the framework of their roles, authority and power. Organizational structure has been listed by numerous authors as an important element in the implementation of KM (Singh & Kant, 2008; Wu *et al,* 2010; Tan, 2011). The structure of the organization plays an important role in influencing how power is distributed, how decisions are made, the degree of "freedom" in the company, and the barriers between different groups and individuals. Organizational structure strongly determines the ability and willingness of people and communities to share and create knowledge, and directs how the KM programme is actually managed (Frost, 2014). In other word, organizational structure is a set of method through which the organization, divided into distinct tasks, create a harmony between different duties (Mintzberg, 1979).

Many researchers have recommended that organizational structure be designed flexible enough to encourage creating and sharing knowledge and also allow for effective knowledge management (Nejatian, Nejati, Zarei & Soltani, 2013; Menon & Varadarajan, 1992). The most important components of organizational structure as adjudged by Zheng *et al*, 2010; Ferrell & Skinner in Nejatian *et al*., 2013, include Formalization, Centralization, and Control. However, Centralization and Formalization has been recognized as key variables underlying organization

structure and both have strong effect on knowledge management (Grant, 1991; Lee & Choi, 2003; Johannenssen *et al*., 1999). In this study, formalization and centralization are included because they are the most common components of organizational structure (Migdadi, 2005).

Formalization measures the extent to which an organization uses rules and procedures to prescribe behaviour (Liao *et al* in Fazli and Alishahi, 2012). Formalization is associated with the degree to which the workers are provided with rules and procedures that either deprive or encourage creative, autonomous work and learning. An organization with high formalization will have explicit rules which are likely to impede the spontaneity and flexibility needed for internal innovation (Chen & Huang, 2007).

Centralization refers to "the degree to which the right to make decision and evaluate activities is concentrated" (Wang, 2001). It emphasizes the locus of decision authority and control within an organization (Walker & Ruckert, 1987). The locus of decision making is the extent to which decisions are made higher versus lower in the organizational hierarchy (Nahm *et al*, 2003). In essence, it states the hierarchical level that has authority to make decision. If decisions are delegated to lower levels the organization is decentralized and if decision making power authority is kept at the top level it is centralized (Ferrell & Skinner, 1988). Walton in Nahm *et al* (2003), states that firms operating under a "control" management model, emphasize management prerogatives and positional authority, as well as allocate status symbols to reinforce the hierarchy. However firms operating in an uncertain environment should delegate decisions to the level where workers may quickly adjust to the changing situations and provide value to the customers (Migdadi, 2005). Centralization also creates a non participatory environment that reduces communication, commitment, and involvement with tasks among participants (Chen & Huang, 2007). In essence, centralization hinders interactions among organizational members, reduces the opportunity for individual growth and advancement, and

prevents imaginative solutions to problems. Zheng *et al* (2010) pointed that a decentralized structure will facilitate the success of KM.

2.4.4.2 Knowledge Management Process Capabilities

Knowledge management processes can be thought of as a structured harmonization for managing knowledge effectively (Gold *et al*., 2001). These are interconnected or intertwined sets of activities (Migdadi, 2005) such as creation, sharing, storage/retrieval and usage (Alavi & Leidner, 2001; Beckman, 1999). Knowledge processes represent the basic operations of knowledge whereas knowledge enablers provide the infrastructure necessary for the organization to increase the efficiency of knowledge processes (Lee & Choi, 2003). Knowledge process capabilities required for storing, transforming and transporting of knowledge throughout the organization are needed for leveraging the infrastructure capability, and four broad dimensions of knowledge process capability were identified by Gold *et al* (2001). These are knowledge acquisition, knowledge conversion, knowledge application and knowledge protection.

Knowledge Acquisition: This refers to the extent to which the firm generates or creates knowledge resources across functional boundaries. It involves the process of acquiring knowledge from either inside or outside of the organizations (Cho & Korte, 2014). This is facilitated by the activities of interaction, feedback, innovation, brainstorming, and benchmarking. Knowledge acquisition can be viewed as a "potential capacity" which reflects a firm's ability to use its knowledge to create advantage, but does not guarantee that knowledge was used effectively (Cohen & Levinthal, 1990). In part, knowledge acquisition is a subset of a firm's absorptive capacity. Literature reviews reveal studies which outcomes suggest positive relationship between knowledge acquisition and performance measures. For instance, the study of Song (2008) showed that knowledge creation activities were significantly related to

organizational improvement. Knowledge acquisition is expected to have a significant influence on organizational performance (Ha, Lo, & Wang, 2016). In like manner, Lee and Choi (2003) studies also showed very significant relationship between knowledge creation and organizational creativity leading to organizational performance. In the same vein, Gold *et al* (2001) found that a significant relationship exists between process capabilities of which acquisition is one of them and organizational effectiveness. Also the work of Nguyen, Neck and Nguyen (2008) show a relationship between knowledge creation and organizational competitive advantage.

Knowledge Conversion: This is achievable through the processes and activities of integration, coordination, synthesis, distribution, combination, refinement, and restructuring of knowledge. Knowledge conversion is the ability of an organization to share and distribute knowledge resources across functional boundaries in order to effect improvement or fundamental change in business processes. The sharing of knowledge resources not only facilitates cross-functional interaction but also allows the sharing of knowledge repositories among process participants, thereby allowing greater collaboration and understanding of the entire process rather than having fragmented parts of the process.

Effective usage of knowledge in business requires the conversion of acquired knowledge from internal and external resources to organizational knowledge. Knowledge conversion requires shared contexts and common representation. This is facilitated by group problem solving and decision-making. Information technologies like email, intranet portal, teleconferencing, repositories, and activities of mentoring, collaboration and training play very important role in transferring knowledge. Activities like training, communities of practice provide a platform for the transfer of knowledge. It is therefore expected that the knowledge conversion process influence performance. Gold *et al* (2001) studies support a significant relationship between conversion process and organizational effectiveness.

Knowledge Application: The process is oriented toward the actual use of knowledge (Gold *et al*, 2001). It refers to the degree to which the firm applies the knowledge resources that are shared across functional boundaries (Emadzade, Mashayekhi & Abdar, 2012). Effective knowledge application and its outcomes have greatly being under discussed as most studies imply or assume it instead of precisely discussing it (Gold *et al*. 2001). For instance, Nonaka and Takeuchi (1995) discussed the ability of an organization to create knowledge and were silent about its application. They assumed that once knowledge is created it were effectively applied. Within the literature, some process characteristics that have been associated with application include storage, retrieval, application, contribution and sharing (Appleyard, 1996). The mechanisms for storing and retrieving effectively enable the organization to quickly access knowledge. To remain competitive, organizations must create, capture and locate organizational knowledge; and organizational knowledge and expertise in addition must be shared (Johannessen *et al*, 1999; Kogut & Zander, 1992). In essence, knowledge application allows the firm to reap returns on its knowledge resource. The capability to utilize a related knowledge base in decision making and problem solving allows the firm to respond more effectively to environmental changes. Knowledge is used in a context in which users can learn and also produce new knowledge. Through knowledge utilization, acquired knowledge can be transformed from being a potential capability into a realized and dynamic capability that impacts competitive advantage or performance (Cohen & Levinthal, 1990).

Knowledge Protection: These are security oriented processes designed to protect knowledge in an organization from inappropriate or illegal use or misuse or theft (Gold *et al*, 2001). The competitive advantage of a firm can be maintained if it has mechanisms in place to protect its knowledge (Liebskind, 1996). The protection oriented process just like application process has received little attention as many feel that protection can come in form of patent, trademarks, copyright laws etc. However, not all knowledge can be defined or explained in terms of

property laws and property rights (Liebskind, 1996). Given that protecting knowledge may be inherently difficult, it should not be abandoned or marginalized. Some steps can be taken to protect knowledge; for instance, incentive reward or alignment, employee conduct rules, and job design etc. On the other hand, a technology that restricts or tracks access to vital knowledge can be developed by the organization to forestall illegal use. Knowledge protection is a process that is important in an organization not minding the difficulty or challenges of doing that. For an asset to be a source of competitive advantage, it has to be rare and inimitable (Barney, 1991). Without security oriented processes, knowledge losses these important characteristics. Knowledge protection is necessary for effective functioning and control within organizations.

2.4.4.3 Competitive Advantage

For any business organization, strategy is concerned about deciding where you want your business to go, and how to get there. Crafting an organizational strategy includes determining whether to pursue a competitive advantage based on low cost or product superiority or unique organizational capabilities (Thompson & Strickland, 2001). Firms basically engage the use of competitive strategy with the sole aim of gaining competitive advantage (Oghojafor, 1998).

Competitive advantage is defined as the edge a firm has over rivals in attracting customers and defending against competitive forces (Thompson and Strickland, 2001). In the opinion of Civi (2000); Gupta, Iyer and Aronson (2000), the only competitive advantage that organizations will have in the 21st century is what they know and how they use it. Ma, (2000) aver that competitive advantage appears to be the most widely used term in strategic management even though it remains poorly defined and operationalized.

While CA can result either from implementing a value-creating strategy not being employed by current or prospective competitors or through the superior execution of a strategy which is

also being employed by competitors (Bharadwaj, Varadarajan & Fahy 1993), it is sustained when other firms are unable to duplicate the benefits of this strategy (Barney 1991). Porter in Thompson & Strickland (2001) sums it all by saying that "Competitive strategy is about being different. It means deliberately choosing to perform activities than rivals to deliver a unique mix of value".

Nguyen (2010) opines that the concept of competitive advantage (CA) can be traced back to Chamberlin (1933), while Selznick (1957) could be attributed with linking advantage to competency. Cockburn, Hendersen and Stern (2000) opines that the origins of competitive advantage may appear fundamental to strategy researchers, yet there is lack of a clear answer to it; what is certain however, is that there is a believe that some firms consistently outperform others, and there are some supports constant with this idea. Cockburn *et al,* (2000) suggests that CA had its root firmly in historical analyses and careful qualitative research and is a complex phenomenon which depended essentially on the active presence of superior leadership. Subsequently, through the 1960s and 1970s the study of strategy became the study of what leaders or general managers should do, which if done, would make a difference. It then follows that firms with better leaders would make better choices and would ultimately do better than their competitors.

Porter (1980) turned the initial paradigm of leaders determining competitive advantage, by shifting the focus of strategy research outward towards the analysis of the firm's microeconomic environment. His approach defined tools for understanding why some firms are more likely to be profitable than the others. He developed a five forces structural framework underlying the economics of an industry which shows how competitors, entrants, substitutes and vertical (buyers and suppliers) bargaining power exert pressure on the margins of a firm in a particular industry. The basic understanding of how these five competitive forces

influence a firm's profitability and performance in the industry will assist a firm to design adequate strategy to win in a competitive business environment (Oghojafor, Olayemi & Oluwatula, 2012).

Following criticism on Porter's competitive forces, the resource based view (RBV) of the firm emerged (Wernerfelt, 1984; Barney, 1991; Peteraf, 1993). The RBV emphasized the idea that for instance, technological or market positions reflect internal organizational capabilities, such as the ability to develop new products rapidly, to understand customer needs profoundly, or take advantage of new technologies cheaply. Proponents of the RBV suggested that strategic investments directed towards these "internal" activities might be of equal (or even greater) importance in generating supernormal returns. According to Cockburn *et. al* (2000) the RBV is often positioned as an "alternative" to the environmental perspective and in their view such positioning is a significant misconception as both (RBV and environmental) are complementary in many respects, and both proposes models on why firms may sustain superior performance, and are not mutually exclusive in terms of empirical predictions. The environmental view specifies attention on external industry structure while the RBV directs attention to the fact that internal capabilities and investments provide the instruments and tools to shape the external environment.

From the RBV, enterprises are potential creators of value-added capabilities and the underlying organizational competences involve viewing the assets and resources of the firm from a knowledge-based perspective (Prahalad & Hamel, 1990; Conner & Prahalad, 1996). A firm's resources consist of all assets both tangible and intangible, human and non-human that are possessed or controlled by the firm which permits it to devise and apply value-enhancing strategies (Barney, 1991; Wernerfelt, 1984). Firm's resources and capabilities come under different names like distinctive competences, core competences, invisible assets, core

capabilities, internal capabilities, embedded knowledge, corporate culture, and unique combinations of business experience (von Krogh & Roos, 1995). Only resources and capabilities that are valuable, uncommon, poorly imitable and non substitutable (Barney, 1991) qualify as the firm's unique or core competencies (Prahalad & Hamel, 1990) which brings about lasting competitive advantage. Intangible resources are more likely than tangible resources to generate competitive advantage (Hitt, Bierman, Shimizu & Kochhar, 2001). Specifically, intangible firm-specific resources such as knowledge permit firms to add up value to incoming factors of production (Hitt *et al*., 2001) and this represents competitive advantage for a firm (Prahalad & Hamel, 1990; Collis & Montgomery,1995; Post,1997; Markides, 1997; Bogner, Thomas & McGee,1999). Such advantage is developed over time and cannot easily be imitated. What then is a sustained CA?

There is no formal conceptual definition offered as far as "SCA" is concerned even though the term "SCA" emerged in 1985 when Porter discussed the basic types of competitive strategies firms could employ to achieve SCA. Based on Barney (1991) work, Hoffman (2000) defines SCA as "the prolonged benefit of implementing some unique value-creating strategy not simultaneously being implemented by any current or potential competitors along with the inability to duplicate the benefits of this strategy". What is fundamental to the long-term success of a firm is the achievement and maintenance of a SCA (Hoffman 2000). The rapidity at which companies develop or acquire new knowledge is such that having special knowledge is no longer a criterion for sustainable competitive advantage; rather, to achieve sustained competitive advantage, a firm requires knowledge that is hard for competitors to replicate in addition to the ability to rapidly develop new knowledge (Lubit, 2001).

To become the basis for a sustainable competitive advantage, knowledge must be easily spread within the firm that has it, but not readily spread to other firms. Any knowledge that cannot be spread within a firm remains the property of a few people, rather than of the firm and will have

limited impact on the rm's ability to create value. Conversely, knowledge that can spread within a company can generally also spread across its boundaries to other firms thereby becoming industry best practice, rather than the basis for a sustainable competitive advantage (Lubit, 2001).

The two ways by which companies can create sustained competitive advantage via knowledge is to spread internal knowledge that other companies will find very difficult to imitate and that is "tacit knowledge"; while the second thing is for companies to endeavor to create superior knowledge management capabilities which can foster ongoing innovation (Lubit, 2001) and create increased market share.

2.4.4.3a Innovation

Being innovative has become one decisive factor in the success or survival of many organizations (Van de Ven, 1986; Nonaka & Takeuchi, 1995; Quinn, 2000). According to Ahmed (1998), many organizations emphasize the importance of innovations, try to innovate, but only a few succeed. Innovation in reality frightens organizations because it is linked to risk; only those organizations which can deal constructively with risk will become innovative. Innovation is the development of ideas for the advancement of new products and services and the improvement of existing products and services (Aalbers, 2012).

Organizational innovativeness according to Lumpkin and Dess (1996) refers to an organization's willingness, tendency and ability to engage in and support new ideas, novelties, experimentation and creative processes that may result in innovations. Innovation refers to the creation or adoption of an idea or behaviour new to the organization (Damanpour 1996). It is a term primarily linked to research and development (R&D) associated with creating new products or services. Several studies on innovation reveal that increased R&D activities lead to innovative products which enable companies to achieve competitive advantages and to gain

market shares (Freeman & Soete, 1997). Organizational innovativeness is linked to the objective of an organization toward being more successful, as ideas are transformed into new or improved products, services or processes. This suggests that the foundation of innovation is ideas, and it is the people that ultimately develop, carry, and modify ideas (Van de Ven, 1986). In addition, knowledge of what enables and strengthens the innovativeness of organizational members is critical (Ellonen, Blomqvist & Puumalainen, 2008).

Studies have suggested that elements such as autonomy, empowerment, purposefulness, open communication, collaboration, diversity, continuous learning, trust, competitiveness, conflict handling, and leadership commitment are important factors that can promote organizational innovativeness (e.g. Martins & Terblance, 2003; Bassett-Jones, 2005; Ellonen *et al*, 2008; Miller & Triana, 2009). Innovative processes demand people who are able to collaborate and integrate their expertise (Van de Ven, 1986), and individual creativity is fundamental to an organization and is the starting point for innovativeness. In essence, organizations need to be flexible in their approach as against being rigid and some measure of freedom instead of control is stressed in the literature as promoting innovations (Martins & Terblance, 2003).

For Ologbo & Nor (2015) sustainable competitive advantage is an outcome of innovation while innovation itself could be derived from the four processes of knowledge management. They identified four major processes namely: knowledge discovery, knowledge capture, knowledge sharing, and knowledge application as the processes of knowledge management that could spark firm's innovation capabilities. There are various forms of innovation such as product or process innovation, radical or incremental innovation, administrative or technological innovation, etc. (Utterback, 1994; Cooper, 1998). Some authors emphasize the importance of different dimensions. For instance, Schumpeter (1934) suggests a variety of possible innovative alternatives, like developing new products or services, developing new methods of

production, identifying new markets, discovering new sources of supply, and developing new organizational forms. Miller and Friesen (1983) focus on four dimensions: new product or service innovation, methods of production or rendering of services, risk taking by key executives, and seeking unusual and novel solutions.

2.4.4.3b Market Share

Top management of organizations have used the term “Market share” as an expression of the market targets. (Brahmane, 2014). This dimension is of utmost importance to managers (Clark, 2000); since, by definition, changes in market share represent improving or declining performance relative to competitors, and inherently reflects the attainment or loss of competitive advantage (Brahmane, 2014). Effectiveness dimension of performance for Walker and Ruekert (1987) is an operationalization of the "success of business' products and programs in relation to those of its competitors in the market, measured by such items as sales growth in comparison with that of competitors or changes in market share".

Market share is one way of measuring competitive advantage of a firm. It can be defined as the percentage of a market accounted for by a specific entity and it is an advantageous way of measuring business competitiveness since it is less dependent upon macro environmental variables such as the state of the economy or changes in tax policy (Gregory, 2005). Ma (1999) argue that CA arises from the differential among firms along any dimension of firm’s attributes and characteristics that allows one firm to better create customer value than others do. Rose, Abdullah, and Ismad (2010) submit that generic sources of competitive advantage include ownership of assets or position; access to distribution and supply; as well as proficiency – knowledge, competence, and capability – in business operations.

The concept of market share which stems from competitor oriented objectives (Armstrong & Green, 2007) is considered an important generic aspect of competitive advantage since it

demonstrates the ability of a firm to have a market position or share of the market different from its competitors. In fact, market share is said to be a key indicator of market competitiveness; that is, how well a firm is doing against competitors.

Armstrong & Green (2007) aver that research has shown that market share is a most wanted asset among competing firms. However, experts discourage making market share an aim and standard on which economic policies are based. The use of market share as a measure for testing the performance of competing firms has promoted a system in which firms make decisions with regard to their operation with careful consideration of the effect of each decision on the market share of their competitors. Market share is the assumed percentage of an industry or market's total sales occupied by a particular company over a specified time period. A high or leading market share is measured in terms of either value or volume. The leading firms in a market usually enjoy a significant proportion of the available revenues or customer demand, unless the market is highly fragmented. Market share is calculated by taking the company's sales over the period and dividing it by the total sales of the industry over the same period. This metric is used to give a general idea of the size of a company to its market and its competitors.

According to Thompson, Strickland, Gamble, and Jain (2006), firms with high relative market shares normally have greater competitive strength than those with lower shares. Market share is a key indicator of firm competitiveness in that it shows how well a firm is doing against its competitors. It helps managers evaluate both primary and selective demand in their market. It enables them to judge not only total market growth or decline, but also trends in customers' selections among competitors. This suggests that more market share means more control of customers' preference. This also implies more sales revenue, which in turn will increase profit. Szymanski, Bharadwaj, & Varadarajan (1993) report that market share is positively correlated to profit. In a meta-analysis of their research, 48 studies reported 276 elasticities from

econometric models. The elasticities ranged from -0.16 to 0.84 with the unweighted mean elasticity equal to 0.20. However, Armstrong and Green (2007) opine that the relationship between market share and profitability does not follow logically that seeking higher market share will improve profit; rather it is showing that firms with better offerings tend to achieve higher market shares. In this study, market share is not seen as an end in itself but a means to measuring competitive advantage. Market share can be decomposed into three components, namely: penetration share, share of customer, and usage index. These three underlying metrics can then be used to help the brand identify market share growth opportunities.

Measuring market share entails determining in percentage the market size occupied or accounted for by a particular entity with regards to the total market size; usually in unit or revenue terms. This is to enable determination of the top, middle and "minnows" player of the market place based on the volume of business conducted. This involves some calculation of some sort. For instance to determine the unit market share, requires the units sold by a particular company as a percentage of total market sales, measured in the same units. That is, Unit market share (%) = 100*unit sales (#)/Total Market unit sales (#) (Faris *et al*., (2010). However, the non-financial measure was used to determine market share in this study. Specifically, the several decisions made by firms with regard to their operations bearing in mind the effect of such decisions on the competitors' share of the market.

Below is the conceptual framework showing the proposed relationships of organizational resources and practices as dynamic capabilities to achieving competitive advantage.

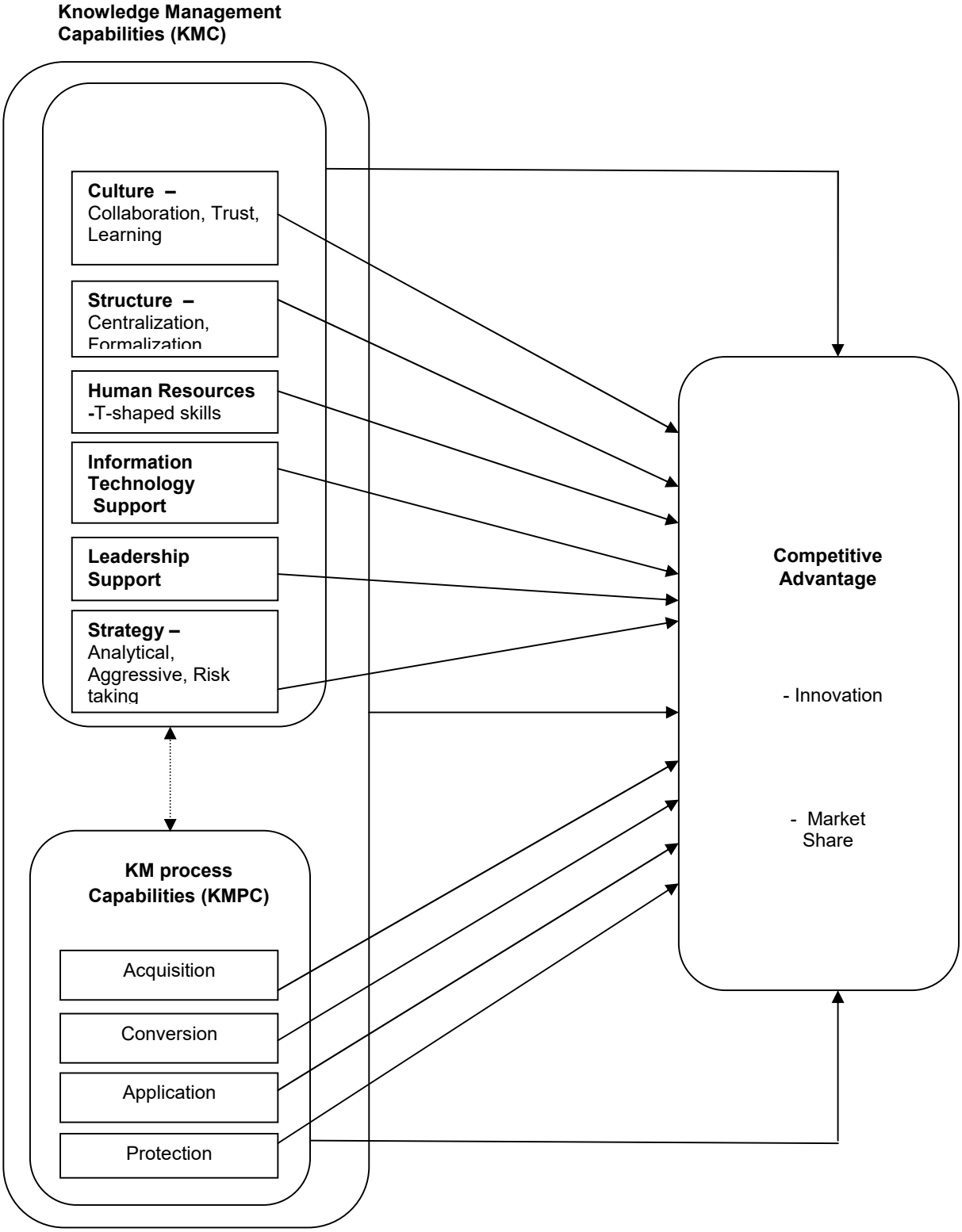

Fig. 2.5: Conceptual framework showing the relationship between Knowledge Management Capabilities and Competitive Advantage of Selected FOBTOB Firms
Source: Researcher, 2016

This model specifies that KM Capabilities consist of Infrastructure and Process capabilities. Both are independent variables which may unilaterally or combined, affect competitive

advantage of an organization being the dependent variable. KM Infrastructure capabilities include Culture, Structure, Strategy, Human Resources, Leadership support, and Information Technology while KM Process Capabilities comprise Acquisition, Conversion, Application and Protection; and Competitive Advantage consists of Innovation and Market share.

CHAPTER THREE

METHODOLOGY

3.1 Preamble

This chapter discusses the research method adopted in the study. It identified the philosophical foundations upon which it is based, described the study area, population of the study, sample size and sampling techniques, data collection methods, research instrument, measures of variables, pilot study, reliability and validity test, as well as the technique for data analysis.

3.2 Research Design

Every research is based on assumptions about how the world is perceived and how it can best be understood. Gray (2004) and Trochim (2006) states that there are many paradigms (set of basic beliefs or framework) for social sciences such as Positivism (classical approach), Realism, Post-positivism (interpretive approach), Critical theory, Feminism, Relativism, Constructivism, Subjectivism etc. However, the two most popular philosophical schools of thought that are essentially important perspectives for contemporary social research are Positivism and Post-Positivism (Trochim, 2006). The positivism paradigm assumes that reality is driven by universal laws and truth; and research adopting this paradigm is assumed to be objective and independent. It is argued that positivist paradigm relates to business studies to a greater extent compared to other disciplines. This is because business relationships are justly perceived as aggregation of relationships between individuals, within and between firms; and positivism is one of the most suitable approaches to the study of the nature of relationships where variables can be identified and relationships measured. This research can best be described as following the positivism paradigm since it is empirical and studies what can be observed and measured. It is based on testable hypotheses and deductive reasoning. On the other hand, it adopts the post-positivism paradigm with the assumption that all observations are fallible and has error, and all theory is also revisable. That is, it is difficult to know reality with

certainty; therefore science should aim at steadfastly holding on to the goal of getting it right about reality, though reality may never be achieved. Epistemologically, the study adopts a quantitative research methodology where the researcher is detached and unbiased with the objects of study while being objective.

The study attempts to establish relationships between knowledge management capabilities and organizational competitive advantage. It adopts a cross-sectional survey research design using quantitative approach which involves the formulation of hypotheses and is subject to empirical testing (Neuman, 2006). It is cross sectional because it involves the analysis of data collected through survey from a population at one specific point in time which gives no indication of the sequence of events before, during or after the outcome. More so, Manning (2006) admits that one of the most popular research techniques in quantitative business research is the survey. Surveys focus on facts, opinions, attitudes, behaviour and perceptions of people and help to determine the incidence, distribution and interrelationships amongst phenomena. Furthermore, surveys provide a quick, efficient, and accurate means of assessing information about a population, and are more appropriate where there is lack of secondary data (Zikmund, 2003) which applies in this case. Additionally, a review of empirical studies on knowledge management capabilities shows that survey has been the most popularly used method of measuring the concepts.

3.3 Area of Study

The study area is Lagos State, Nigeria. Lagos was the former Federal Capital and undisputedly the industrial/commercial hub of Nigeria. It is seen as the most economically important state of the country and the nation's largest urban area as most commercial activities takes place in it (Eze, 2008). Furthermore, the Manufacturers Association of Nigeria (2016) website show that Lagos has two branches (Ikeja and Apapa) out of the fifteen branches of the manufacturers association spread across the country. This suggests that there is a much larger concentration of

the manufacturing firms in Lagos. More so, the focus or study population which is the food beverage and tobacco (FOBTOB) manufacturing companies, also have about 50% concentration in Lagos with 19 out of the 38 registered firms of the FOBTOB association resident in Lagos according to the information from their website and as confirmed by the Executive Secretary at the Lagos Secretariat of the association.

3.4 Population of the Study

A research population is the complete group of the specific population elements relevant to the research project (Zikmund, 2003). Being a social science research, the target population involves everyone that can provide relevant information. The target population for this study comprises of the management staff of the firms in the FOBTOB manufacturing industry.

The manufacturing industry was chosen because it is one of the fastest growing sector in the economy, recording about 15 percent real growth in the first three quarters of 2014 (National Bureau of Statistics, 2014). Furthermore, we cannot overemphasize the importance of the manufacturing productive sector of any economy to the growth and survival of that economy and the Nigerian economy will not be an exception.

Data from the MAN (2016) website shows there are 1072 registered manufacturing firms spread across fifteen branches of the country and classified under eleven sectors thus: Food, Beverages and Tobacco, Chemical and Pharmaceuticals Sectoral Group, Basic Metal, Iron and Steel and Fabricated Metal Products Sectoral Group, Domestic and Industrial Plastic, Rubber and Foam Sectoral Group, Pulp, Paper and Paper Products, Printing and Publishing Sectoral Group, Electrical and Electronics Sectoral Group, Textile, Wearing Apparel, Carpet, Leather/Leather Footwear Sectoral Group, Wood and Wood Products Including Furniture Sectoral Group, Non-Metalic Mineral Products Sectoral Group, Motor Vehicle and

Miscellaneous Assembly Sectoral Group, and Man Export Group (http://www.manufacturersnigeria.org/directory.php?page=2&cat=ASC).

According to the NBS (2014) data, the Food, Beverages and Tobacco (FOBTOB) sector dominated the activity of the manufacturing sector as it had the largest output of all; with the greatest number of classes of goods captured. It was by far the greatest contributor at N3,814.50 billion or 52.74%, followed by Textiles Apparel and Footwear at N1,303.68 billion or 18.02% of the manufacturing sector total contribution. It also contributed the highest percentage to the nation's GDP (NBS, 2014). These informed the choice of the food, beverage, and tobacco sub sector as the population for this study. There are 38 registered firms with the FOBTOB association as gathered from their website (http://fobtob.org/about-us/our-branches/) and confirmed from the association's secretariat.

3.5 Sampling Techniques and Sample Size

It is practically impossible most times to study the entire population of a research; Hence, the need for sampling. There are two major methods of sampling – probability sampling and non-probability sampling (Zikmund 2003). In a probability sampling, the elements in the population have some known chances or probability of being selected as sample subjects, whereas in non-probability sampling the elements do not have a known or predetermined chance of being selected as subjects.

From the range of probability sampling methods which consist of simple random, stratified random, systematic, and cluster, multi-stage sampling technique was chosen for this study. Multi-stage procedure involves the use of different sampling techniques at different stages of sample element determination which is the reason for its preference over others in this study.

Given that the FOBTOB firms have spread across other states of the Nigerian federation and even more in Lagos, the first step to applying the multi-stage sampling design involved the

grouping of the companies into two clusters of Lagos, and the others. Using a simple random sampling technique, the Lagos cluster was selected.

The next stage involved the use of simple random sampling technique to select number of firms considered adequate for representation and generalization from the study population. According to De Vaus (1996), at least 10% of any population forms a good sample representation of that population for a study. However, this study sets to have at least a 30% representation; and since there are 38 member firms registered with the FOBTOB association, and 19 domiciled in Lagos, six (6) out of the nineteen (19) Lagos firms were selected. The six organizations chosen represent about 31.57% per cent of the population which is more than a good representation going by De Vaus (1996) position.

The selected firms are Cadbury Nig. Plc, Nestle Nig. Plc, Nigerian Bottling Company; Flour Mills Nig. Plc, Honeywell Flour Mills and Seven-up Bottling Company Plc. These firms are quoted in the Nigerian stock exchange. In addition, the Business Day special report of Tuesday, 16 December, 2014 includes these firms as part of the top 100 most respected companies of 2014 in Nigeria. Additionally, these organizations ranked very well (manufacturing industry wide as well as specific industry ranking) in a special publication of Business World Newspaper of December 2014 which analyzed top 100 companies in Nigeria using their assets base, revenue base, profit base, shareholders' funds and market capitalization.

The stratification of the managerial staff of the firms into top, middle and lower management cutting across various departments such as customer service, human resources, marketing and sales, operations and production, research and development, technical, and finance followed next. The choice of the three strata of management was informed by Nonaka and Takeuchi (1995) proposition that top management provides the vision, the frontline or lower level

management looks at reality, while middle management closes the gap between dream and reality. The selected respondents are classified as key informants, and the use of key informants from organizations for data collection has been a popular and effective approach in a wide range of research contexts (Huber & Power 1985). This stems from the fact that they are of senior ranks within the organization and are knowledgeable about the operations and practices of the organization.

The organizations under study were unable to release the population of their management staff (top, middle and lower), and so the study considered ways of getting a representative sampling frame for the study. Against this background, the total workforce of the organizations were sought from their annual reports, and a ratio of 1:10 (one manager to ten staff) drawn. Literature shows that there are different ratio of manager/supervisor to staff that can be used in an organization depending on the kind of organization (Cleaveland, 2012); however the most popular appears to be ratio 1:10 (one manager to ten staff). Hence, the calculated number of management staff for the six organizations upon which the sample size was drawn was one thousand seven hundred and eighteen (1,718) as shown in table 3.1 below.

Table 3.1: Sample Frame

Organization	**Total Workforce**	**Managements ratio to staff (1:10)**
Flour Mills Nigeria Plc	4828	483
Nigerian Bottling Co.	4800	480
Cadbury Nigeria Plc	800	80
Honeywell Flour Mills	850	85
Seven-Up Bottling Co.	3606	361
Nestle Plc	2294	229
Total	**17178**	**1718**

Source: Annual Reports of FMN, Cadbury, 7Up, Nestle (2014/2015) and Websites of NBC and Honeywell (2016)

The next was the determination of the sample size. The issue of how large a sample size should be according to Hair et al. (2006) was yet to be entirely resolved and depends on the statistical methods used. Dillman (2000) asserts that a sample size of one hundred and above is

representative enough and adequate to achieve acceptable research findings. To achieve sufficient sample size and generalizability of the result, Yamane (1967) formula was used. This gave a sample size of three hundred and twenty four (324) respondents to be administered questionnaire. However, the number was increased to three hundred and sixty (360) so as to fill possible void in the estimation of ratio of managers to staff. More so, it is better to increase the sample size above the minimum size determined so as to reduce sampling error as posited by Saunder *et al* (2009). Therefore, the sample size was considered adequate going by Dillman (2000) position.

$$n = \frac{N}{1+N(e)^2} \quad \text{..... (3.1)}$$

Where **n** is the sample size, **N** is the number of target population (generated from the sampling frame) and **e** is the maximum acceptable error margin. The maximum error margin for this study is five per cent. The result of the calculated sample size is as shown below.

$$n = \frac{1718}{1+1718(0.05)^2}$$

$$n = \frac{1718}{5.295} = 324$$

Table 3.2: Calculated sample size

No	Organization	Management staff	Sample size per institution
1.	Flour Mills Nigeria Plc	483	100
2.	Nigerian Bottling Co.	480	100
3.	Cadbury Nigeria Plc	80	20
4.	Honeywell Flour Mills	85	20
5.	Seven-Up Bottling Co.	361	70
6.	Nestle Plc	229	50
	Total	**1718**	**360**

Source: Field survey, 2016

3.6 Research Instrument

The nature of data necessary for this study is primary; hence a structured self-administered questionnaire was used as a means of collecting data. This involved the researcher and or aids

going to respondent's offices to hand the instrument one on one so that questions and clarifications are given where necessary (Trochim, 2006). This is expected to increase the percentage of people willing to respond. Furthermore, a hand delivered questionnaire was chosen above a mail survey for data collection due to its reliability in getting to the right respondents even though it is more expensive due to the spread of respondents and cost of transportation. In addition, telephone contacts were used to overcome the possibility of low response rates and slow speed of return which are the major weaknesses of the survey method. The instrument (questionnaire) was broadly divided into two parts. Part one was structured to elicit responses to answer the research questions and covered issues relating to the knowledge infrastructure capabilities constructs (culture, structure, leadership, strategy, human resource (t-shaped skills) and information technology), knowledge process capabilities (acquisition, conversion, application and protection) as well as competitive advantage (innovation and market share). These constructs were adapted from earlier studies as indicated in the measurement of variables below. A total of 96 items were generated (see Appendix 1). All were based on a 7-point Likert rating scale of responses ranging from 1 = strongly disagree (SD) to 7 = strongly agree (SA) (1 = strongly disagree, 2 = disagree, 3 = slightly disagree, 4 = neutral, 5 = slightly agree, 6 = agree, and 7 = strongly agree). A neutral response, 'neither disagree nor agree', was adopted to reduce uninformed response, since it assures respondents that they are not compelled to answer every questionnaire item (Wilcox, 1994). The second part of the questionnaire contained the relevant personal data of the respondents. The questionnaire was distributed and retrieved by the researcher between February and May, 2016.

3.7 Measurement of Constructs

The constructs in the questionnaire were measured as follows:

3.7.1 KM Infrastructure Capabilities (KMIC)

The items used in measuring Culture, Structure, People, and IT were adapted from Lee & Choi (2003). The samples of their study were collected from various middle managers of the firms under study. Thirty six items measured the components of knowledge enablers in that study. Cronbach's alpha was used to examine the reliability of the instruments. They considered higher cut-off value of 0.7 as usable given that these instruments have been adopted previously (Nunnally, 1978). All their constructs had higher than 0.7 cut off alpha value which ranged from 0.8309 to 0.9203. For convergent validity, items having item-to-total correlation scores lower than 0.4 were dropped from further analysis.

Item measures for Strategy were adapted from Venkatraman (1989) Strategic Orientation of Business Enterprise (STROBE). The reason for using Venkatraman's STROBE instead of typologies is because it depicts the intensity of characteristics of strategy rather than putting them into categories. STROBE measures to what extent the respondents perceive their organization's strategy as displaying six characteristics of aggressiveness, analysis, defensiveness, futurity, proactiveness, and riskiness. Venkatraman's list was evaluated by some researchers engaged in strategy at a University. The purpose was to ensure adequate coverage of the domain of each of the six dimensions. The list of statements was administered to 39 executives who were participants in a management development program. This was to ensure that the statements were understood without ambiguity. The result indicated the statements were unambiguously worded. The data for their study was collected in two stages. First, what may be termed a pilot study with preliminary reliability tests carried out and items believed to be outliers eliminated; then the second being the actual study. Confirmatory analysis approach was used to provide a strong test for the theoretically specified dimensionality using Lisrel Framework (Joreskog and Sorbom, 1978). The unidimensionality and convergent validity were tested, and the reliability assessment was done using Cronbach's alpha (0.05) coefficient.

Leadership items were adapted from Theriou *et al* (2011). Theriou *et al's* instrument used a five-point likert scale measure comprising of multiple items taken from Mathi, 2004; Wong and Aspinwall, 2005 to measure KM enablers of which leadership was one. They pre-tested their instrument to establish content validity through in-depth discussions with academics and professionals, even though the items had been used in previous studies. Given that these items of measure were gotten from many researchers, they used exploratory factor analysis to redefine the theoretical constructs. Questions with loadings below 0.5 were dropped. Loadings for each of the leadership items were above 0.7, while the Cronbach's Alpha for reliability was 0.716.

3.7.2 Measurement for KM Process Capabilities (KMPC)

The KMPC of Acquisition, Conversion, Application, and Protection were adapted from Gold *et al* (2001). Gold *et al* used key organizational informants as they visualize the approach to be effective. Senior Management or Vice Presidents or above was used in their study. Reason being because, they have knowledge of the organization and its strategy. They aver that key informants could be anyone in the organization provided such have access to knowledge about the organization. Their instrument was pretested among the senior executives to ensure that the respondents understood the questions and could provide responses. Data were collected through formal survey of 1000 senior executives. Lisrel 8.1 was used as their analytical tool for testing statistical assumptions and estimation of the measurement and structural equation models. They tested for the univariate normality among variables which gain even though not a guarantee of multivariate normality (Hair *et al,* 1992). This is because multivariate normality is usually a bit difficult, but the result of the univariate can at least lead to an assumption about the multivariate normality. Among the variables of their study, analysis of the statistics did not suggest any serious departure in the univariate normality. Model identification was obtained using series of diagnostics with LISREL, and in all cases, solution converged at the same point

and were identical. Items that demonstrate poor reliability or crossload were dropped and the model re-estimated. The normed and non-normed fit indices were very high suggesting good model fit, and the estimated correlation between all construct pairs was below the suggested cut-off of 0.90 implying distinctiveness in construct content or discriminate validity of the model. This study intends to build constructs around the work of Gold *et al* (2001).

3.7.3 Measurement for Competitive Advantage

Competitive Advantage was measured looking at innovativeness which includes product and process innovativeness, and Market position. The items of measure were adapted from Wang & Ahmed (2004) 29 item instrument. Wang and Ahmed sampled 1500 companies (with no less than 50 employees and a primary trading address within England, Wales, and Scotland) randomly selected from the FAME Database. A total of 231 completed the questionnaire representing a 15.4% response rate while the usable response was 14.2%. The instrument was subjected to confirmatory factor analysis. A-three level confirmatory factor analysis was carried out using AMOS 4.0. The Maximum Likelihood (ML) estimation method was employed following the required assumptions for ML to be used in order to check for validity of the model, and the multivariate normality. The initial estimates based on all 29 items showed that some items had poor square multiple correlations as well as low regression weights, these items were deleted. In all a 20-item factor validated were usable for their study. Non-financial measures were used to determine market share; specifically, the several decisions made by firms with regard to their operations bearing in mind the effect of such decisions on the competitors' share of the market. This self reported items for measuring market share (non financial measure) is selected owing to the fact that they do represent broad measures of performance or competitive advantage which are commonly tracked, and they are used to compare business units and industries (Drew, 1997).

3.8 Pilot Study

The adapted instrument for measuring the constructs was subjected to a pilot study in order to pretest the questionnaire. This is to detect and remedy any possible error prior to administering the main survey (Cavana, Delahaye & Sekaran, 2001; Malhotra 2004). For the purpose of the pilot study, thirty copies of the questionnaire were administered to some food, beverage, and tobacco companies other than the firms used for the main study and twenty copies were completed, returned and usable. The rule for the internal consistency test conducted using Cronbach's alpha coefficient to ascertain the constancy level, is to accept a higher cutoff value of 0.7 and above since the instruments were already validated as stated earlier (Nunnally, 1978).

3.9 Reliability and Validity

Carmines and Zeller (1979) opine that reliability is the tendency toward consistency found in repeated measurements. Reliability is the extent to which an assessment or test measurement tool produces consistent results. Cronbach's alpha is a measure of reliability; hence, Cronbach's alpha coefficient was used as a measure of internal consistency-reliability. It provides a measure of internal reliability for multi-item summated rating scales, ranging between 0 and 1; the higher the score, the more reliable the scale.

The reliability statistics in this study shows that the aggregate dimensions of the dependent and independent variables had Cronbach's alpha of ≥ 0.7 (0.965) which is acceptable as a reliable measure (Nunnally, 1978) and in fact considered excellent by George and Mallery (2003). However, only one construct – 'organizational structure' had an alpha of 0.686 which if approximated may be taken for 0.7; but Robinson *et al*., (1991); Nunnally and Bernstein, (1994), justifies that an alpha of 0.60 or higher is normally recommended; and if lower than 0.6, provided the average inter-item correlation is ≥ 0.3 (Pallant, 2007; deVaus, 2004; Clark

and Watson, 1995), then it has displayed an acceptable level of reliability and the scale is sufficient for use in multiple item statistical analysis.

Validity refers to how well a test measures what it is intended to measure. A content validity test of the research instrument was done. This validity requires that recognized subject matter experts evaluates if the test items assess defined content. The research instrument was validated through a review by my supervisors and some experts within the field, who are familiar with the constructs and made necessary corrections.

Table 3.3: Reliability Statistics

Cronbach's Alpha	No of Items
.965	96

Table 3.4: Reliability statistics for individual construct

Construct	Cronbach's Alpha	Number of Items
Organizational culture	.870	16
Organizational Structure	.686	10
Human Resource	.757	5
Organizational Strategy	.833	14
Leadership support	.967	4
Information Technology	.904	5
Acquisition	.956	7
Conversion	.952	7
Application	.946	7
Protection	.898	7
Competitive Advantage	.919	14

Source: Field Survey 2016

3.10 Data Analysis Methods

In this study, data collected were analyzed using both descriptive and inferential statistics. The SPSS software version 20 was used to aid analysis of the data collected. The descriptive analysis was done using tables, frequencies, percentages, and mean item scores. To ascertain the validity or otherwise of the mean item scores, a t-test statistic was run to further strengthen the result and interpretation of the constructs. For relationships and effect between the variables, Pearson product moment correlations, as well as simple and multiple regressions

analysis were used to test the hypotheses generated. Correlation was used to test for relationships between the independent and dependent variables; while regressions were used to test for significant effect or influence of each of the predictor variables on the outcome variables. That is, the six dimensions of infrastructure capabilities were regressed on competitive advantage as well as the four dimensions of process capabilities on competitive advantage. An examination of the influence of the predictor variables (KMIC and KMPC) on the sub variables of innovation and market share were also done. This is to enable the understanding of the contribution of each independent variable on the dependent variables.

CHAPTER FOUR

DATA PRESENTATION AND ANALYSES

4.1 Preamble

This chapter presents the analyses and interpretation of data collected from the field survey. Three hundred and sixty (360) copies of the questionnaire were distributed, two hundred and sixty seven (267) were returned. Of the returned copies, two hundred and thirty four (234) were found usable representing a 65% response rate. The profiles of the respondents are indicated in Table 4.1.

4.2 Descriptive Demographic Profile of Respondents

Table 4.1: Socio demographic profile of respondents

Variables		Frequency	Percent
Gender	Male	138	58.9
	Female	96	41.1
Age	Under 35 years	54	23.1
	35<45 years	85	36.4
	45<55 years	90	38.4
	55 years and above	5	2.2
Highest qualification	WAEC/O'LEVEL/NCE/OND	46	19.8
	HND/B.Sc/BA	128	54.7
	M.Sc/PGD/Ph.D	57	24.3
	Others	3	1.3
Current position	Chairman/MD/CEO/GM	14	5.8
	Sales/Marketing/Finance/ Accounting/HRManagers	80	34.1
	R&D/IT/OP/Production Managers	69	29.6
	Others	71	30.5
Length of service	Less than 5 years	36	15.5
	5 – 10 years	96	40.9
	11 – 15 years	66	28.0
	16 – 20 years and above	36	15.5

Source: Field Survey 2016

Table 4.1 shows that the male gender dominated the response rate with 58.9%; while 74.8% of respondents' lie in the age bracket of 35 to 55 years. 54.7% of the respondents' have first degree/higher national diplomas as highest level of qualification; even as 5.8% of the respondents represent the top management cadre. For length of service, the predominant years lie within 5 to 15 years with 68.9%. In summary, the table shows that respondents are from diverse background, have basic qualification, and enough experience to enable them

understand the practice of the organization, and are therefore considered qualified to serve as respondents in this study.

4.3: Descriptive Statistics of Variables

The descriptive analysis for the study was done using percentages, mean score, and standard deviation. A one sample t-test was run to confirm the difference in mean of the various variables using the threshold '4'; while the scale ranged from 1= Strongly Disagree, 2 = Disagree, 3 = Slightly Disagree, 4 = Neutral, 5= Slightly Agree, 6= Agree and 7= Strongly Agree. Mean scores below '4' implies a Strongly Disagree, Disagree or Slightly disagree response, while any mean score above '4' implies a Slightly Agree, Agree or Strongly Agree response. Thereafter, the presentation and analysis were done following the objectives, research questions and stated hypotheses.

Table 4.2: Organizational Culture (Collaboration, Trust, Learning)

	Scale Level								
Collaboration	1	2	3	4	5	6	7	Mean	Std. Dev
Members satisfied by the degree of collaboration	.4	2.2	9.7	22.6	31.0	23.9	10.2	4.9381	1.23852
Members supportive	0.0	1.3	4.3	12.0	23.9	31.2	27.4	5.6154	1.19976
Members helpful	0.0	1.3	5.6	10.7	27.4	33.8	21.4	5.5085	1.17646
Willingness to collaborate across organizational units	0.0	1.3	9.0	8.6	29.6	36.5	15.0	5.3605	1.18488
Willingness to accept responsibility for failure	3.0	9.5	10.0	17.3	20.3	31.6	8.2	4.7013	1.57479
Trust									
Members generally trustworthy	.9	.9	9.5	15.5	27.3	24.5	21.4	5.2636	1.34251
Faith in other members' intentions and behaviour	1.7	.9	9.5	17.3	27.7	18.6	24.2	5.2121	1.42433
Reciprocal faith in others' ability	.9	1.3	7.8	18.6	21.6	37.7	12.1	5.2035	1.25704
Reciprocal faith in others' behaviour to work toward organizational goals	.4	1.7	5.2	18.0	21.9	27.9	24.9	5.4249	1.30803
Reciprocal faith in others' decision toward organizational interests than individual interests	.4	1.7	9.1	16.5	22.6	31.7	17.8	5.2565	1.31479
Relationships based on mutual trust	1.8	1.8	6.6	12.7	28.1	32.0	17.1	5.2807	1.32750
Learning									
Formal training programs for performance of duties provided	1.7	3.0	7.3	12.1	20.3	46.1	9.5	5.2241	1.32630
Opportunities for informal other than formal training for individual development.	3.4	3.4	8.6	7.3	21.9	32.2	23.2	5.3004	1.56328
People encouraged to attend seminars, symposia	3.0	3.5	7.8	12.1	15.6	32.0	26.0	5.3377	1.57654
Provides various programs such as clubs and community gatherings	2.6	7.4	11.3	17.8	25.2	20.0	15.7	4.7826	1.58201
Members satisfied by contents of job training or self-development programs	3.9	3.9	8.2	13.0	23.4	39.4	8.2	4.9913	1.47144

Source: Field survey, 2016

From the table 4.2 above, the percentages and mean scores for all items under the culture variable is above '4' which is the stipulated benchmark for acceptance or rejection of the statement. This suggests that most respondents 'agree' with the statements on collaboration practices put in place; have mutual trust in one another; have reciprocal faith in other members' behaviour and intentions toward work and achievement of organizational goals; have opportunities for learning through various formal and informal training and development programs; and satisfied by the contents of job training and or self-development programs in their various organizations.

Table 4.3: One-Sample Test

	Test Value = 4									
									95% confidence Interval of the Difference	
	N	Mean	Std. Deviation	Std. Error Mean	T	df	Sig. (2-tailed)	Mean Difference	Lower	Upper
Collaboration	234	5.2312	.98746	.06455	19.073	233	.000	1.23120	1.1040	1.3584
Trust	234	5.2757	1.10626	.07232	17.640	233	.000	1.27571	1.1332	1.4182
Learning	234	5.1105	1.21793	.07962	13.947	233	.000	1.11047	.9536	1.2673
Organizational Culture	234	5.2058	.96878	.06333	19.040	233	.000	1.20579	1.0810	1.3306

Source: Field survey, 2016

A further confirmation of the assumption that most respondents agree to the statements, is the result of the one sample t-test statistic in Table 4.3 which shows a statistically significant difference in the mean of all the sub-variable means and organizational culture (5.2058) with 't' value = 19.040 and p value less than 0.05 in a 2-tail level test of significance; an indication that the Nigerian firms practice a culture of collaboration, trust, and learning; and that organizational culture fits as part of the measure for KM infrastructure capabilities (KMIC).

Table 4.4: Organizational Structure (Centralization, Formalization)

	Scale Level								
Centralization	1	2	3	4	5	6	7	Mean	Std. Dev
Can take action without supervisor (R)	13.5	4.4	13.1	13.5	21.4	19.2	14.8	4.4192	1.91915
Encouraged to make their own decisions (R)	3.0	17.8	10.0	12.2	23.0	25.7	8.3	4.4435	1.70379
Do not need to refer to someone else (R)	3.9	22.0	14.7	14.2	25.0	12.9	7.3	4.0259	1.67725
Do not need to ask supervisor before action (R)	15.0	17.6	18.0	11.6	22.3	8.6	6.9	3.6180	1.81351
Can make decisions without approval (R)	29.2	15.5	11.6	8.6	13.3	15.5	6.4	3.3348	2.06561
Formalization									
Many activities not covered by formal procedures (R)	6.9	10.3	24.9	18.9	18.5	13.3	7.3	4.0086	1.63209
Contacts with company on formal/planned basis	0.0	.9	4.3	16.7	21.9	32.2	24.0	5.5236	1.19648
Rules and procedures typically written	0.0	1.3	6.9	8.2	19.0	29.4	35.1	5.7359	1.28010
Rules can be ignored to reach informal agreements to handle some situations (R)	23.8	15.6	5.2	17.7	19.9	15.2	2.6	3.5022	1.90394
Members make their own rules on the job (R)	30.7	20.3	9.5	7.4	16.9	9.5	5.6	3.1039	1.98637

Source: Field survey, 2016

Table 4.4 shows that items 'four' and 'five' of centralization had means (3.6180 and 3.3348) below the benchmark of '4', as well as item 'four' and 'five' of formalization (3.5022 and 3.1039). The mean of item 'three' of centralization (4.0259) and item 'one' of formalization (4.0086) were barely on the border line. This implies that most of the organizations run a largely centralized and formalized structure which does not give flexibility for decision making. Supervisors consent must be sort before action is taken; rules must be followed to reach an agreement whether formal or informal; staff cannot make their own rule on the job, and most activities are covered by formal procedures in the organizations.

Table 4.5: One-Sample T-Test

	Test Value = 4									
									95% confidence Interval of the Difference	
	N	Mean	Std. Deviation	Std. Error Mean	t	Df	Sig. (2-tailed)	Mean Difference	Lower	Upper
Centralization	234	3.9519	1.59075	.10399	-.462	233	.644	-.04808	-.2530	.1568
Formalization	234	4.3553	.92406	.06041	5.882	233	.000	.35534	.2363	.4744
Organizational Structure	234	4.1353	1.13850	.07443	1.817	233	.070	.13526	-.0114	.2819

Source: Field Survey 2016

Table 4.5 gives further credence to the observation from the mean item scores that most respondents disagree to the statements especially concerning centralization of structure. This is

evident by the mean score for centralization of 3.9519, a negative calculated‘t’ of -.462 and p-value greater than 0.05. Additionally, the mean of organizational structure (4.1353), calculated ‘t’ (1.817), mean difference (0.13526) and p-value (.070) greater than 0.05 implies a statistically insignificant difference in the mean of the sub variables; and an indication that most of the organizations structure is centralized and substantially formalized.

Table 4.6: Human Resource (People with T-shaped skill)

	Scale Level								
T-shaped skill	1	2	3	4	5	6	7	Mean	Std. Dev
Understand not only their own tasks but also others’ tasks	.9	3.0	9.4	10.7	36.5	19.3	20.2	5.1760	1.36739
Can make suggestion about others’ task	.9	4.3	7.7	12.4	39.5	18.5	16.7	5.0773	1.34647
Can communicate well not only with their department members but also with other department members	.4	3.4	6.4	9.9	27.0	23.2	29.6	5.4764	1.38980
Are specialists in their own part	1.3	1.7	1.7	11.7	16.9	35.9	30.7	5.7186	1.27639
Can perform their own task effectively without regard to environmental changes	3.4	3.0	7.3	23.6	20.2	17.6	24.9	5.0644	1.58934

Source: Field Survey, 2016

Examination of table 4.6 indicates that mean scores for all five items exceeded the ‘4’ point of reference. This suggests that respondents agree to the fact that most employees or members of their organizations are experts in their own field; and who not only understand their job but that of others too. They could therefore be termed to have the t-shaped skill.

Table 4.7: One-Sample Test

	Test Value = 4									
									95% confidence Interval of the Difference	
	N	Mean	Std. Deviation	Std. Error Mean	T	Df	Sig. (2-tailed)	Mean Difference	Lower	Upper
Human Resource	234	5.2808	1.13432	.07415	17.272	233	.000	1.28077	1.1347	1.4269

Source: Field survey 2016

Table 4.7 is the test statistic strengthening the result of table 4.6 further and shows the calculated *t* as 17.272 and p-value of .000 which is less than 0.05 significant level. Hence, Human resource as a knowledge infrastructure capability has an acceptable fit, and a statistically significant difference in mean from the population mean.

Table 4.8: Organizational Strategy (Analytical, Aggressive, Risk taking)

	Scale Level								
Analytical	1	2	3	4	5	6	7	Mean	Std. Dev
Emphasize effective coordination among different functional areas	.9	1.7	4.7	12.9	18.5	41.2	20.2	5.5064	1.25643
Require great deal of factual information to support day-to-day decision making	.9	.9	5.6	8.2	16.7	45.9	21.9	5.6438	1.20243
Usually try to develop thorough analysis when confronted with major decision	1.3	0.0	7.3	11.6	11.2	35.8	32.8	5.6983	1.34338
Use several planning techniques	.4	5.2	8.2	16.3	0.0	38.6	31.3	5.8155	1.14294
Use the outputs of management information and control systems	0.0	.4	3.9	12.0	22.3	36.9	24.5	5.6438	1.13227
Commonly use manpower planning and performance appraisal of senior managers	1.8	.5	2.7	21.7	15.4	41.2	16.7	5.3891	1.26227
Aggressive									
Often sacrifice profitability for market share	1.3	5.6	6.4	27.5	17.2	36.5	5.6	4.8541	1.34715
Often cut prices to increase market share	.4	6.5	10.3	21.1	19.4	34.9	7.3	4.8664	1.38148
Often set prices below competition	3.0	9.9	15.0	16.3	16.3	30.0	9.4	4.6094	1.63404
Often seek market share position at the expense of cash flow and profitability	.4	8.8	13.2	23.7	14.0	27.6	12.3	4.7412	1.52762
Risk Taking									
General mode of operations riskier than competitors'	2.6	15.5	3.4	23.3	18.5	18.5	18.1	4.6767	1.73174
Adopt a rather conservative view when making major decisions	1.3	5.2	5.6	16.9	23.4	19.9	27.7	5.2641	1.52214
Business operations generally follow 'tried and true' paths	1.3	7.8	5.2	19.8	17.2	21.1	27.6	5.1767	1.61400
Tend to be risk-averse	1.3	2.6	10.9	21.8	22.3	22.3	18.8	5.0306	1.44305

Source: Field Survey, 2016

As shown by the frequencies and means in Table 4.8, the mean scores for all 14 items measuring 'strategy' through the sub-variables are above the stipulated benchmark of '4' showing that more respondents agree to the statements. Interpreting this means that they require a great deal of factual information and thorough analysis to support their decision making, as well as use several planning techniques. They cut prices to increase market share and sacrifice profitability to gain market share. They adopt a conservative view when making decisions, follow tried and true paths in their business operations and risk averse.

Table 4.9: One-Sample Test

	Test Value = 4									
									95% confidence Interval of the Difference	
	N	Mean	Std. Deviation	Std. Error Mean	T	Df	Sig. (2-tailed)	Mean Difference	Lower	Upper
Analytical	234	5.5984	1.02961	.06731	23.748	233	.000	1.59843	1.4658	1.7310
Aggressive	234	4.7411	1.27768	.08352	8.873	233	.000	.74110	.5765	.9057
Risk Taking	234	5.0110	1.31627	.08605	11.750	233	.000	1.01104	.8415	1.1806
Organizational Strategy	234	5.1169	.95520	.06244	17.886	233	.000	1.11686	.9938	1.2399

Source: Field survey, 2016

Table 4.9 shows a statistically significant difference between the sample mean and population mean as organizational strategy indicates a *t* value of 17.886 and 0.000 p-value less than 0.05 level of significance. This is a further confirmation of the descriptive assumption as shown in table 4.8.

Table 4.10: Leadership Support

	Scale Level								
Leadership support	1	2	3	4	5	6	7	Mean	Std. Dev
Leaders encourage knowledge creation, sharing and use	.9	1.3	3.0	11.2	22.0	39.2	22.4	5.5948	1.19507
Management recognizes knowledge management as important to business success	1.3	.9	4.8	13.0	16.1	39.6	24.3	5.5783	1.28493
Management demonstrates support for knowledge management	.4	1.3	3.9	14.3	24.2	32.5	23.4	5.5152	1.21887
Management establishes the necessary conditions for knowledge management	2.2	1.3	5.2	11.3	17.7	38.5	23.8	5.5195	1.36360

Source: Field Survey, 2016

An observation of table 4.10 indicates that the mean scores for all four items measuring leadership support exceed the '4' standard. This implies that greater respondents affirm that their leaders encourage the creation, sharing and use of knowledge as well as recognize the importance of knowledge management to business success and supports it.

Table 4.11: One-Sample Test

	Test Value = 4									
									95% confidence Interval of the Difference	
	N	Mean	Std. Deviation	Std. Error Mean	T	Df	Sig. (2-tailed)	Mean Difference	Lower	Upper
Leadership Support	234	5.5548	1.08832	.07115	21.854	233	.000	1.55484	1.4147	1.6950

Source: Field Survey, 2016

The table 4.11 further explains the authenticity of the table 4.10 response as the t-test statistic shows 21.854 calculated and a p-value of 0.000 less than α 0.05 two tailed significant level. This is an indication that 'leadership support' has a good fit as one of the knowledge infrastructure capabilities.

Table 4.12: Information Technology (IT Support)

	Scale Level								
Information Technology (IT) Support	1	2	3	4	5	6	7	Mean	Std. Dev
IT support for collaborative works regardless of time and place	0.0	0.0	3.5	10.0	23.4	40.7	22.5	5.6883	1.03747
For communication among organization members	0.0	.9	3.5	8.7	18.6	38.5	29.9	5.8009	1.11675
For searching and accessing necessary information	0.0	1.3	4.8	12.1	14.7	42.0	25.1	5.6667	1.18932
For simulation and prediction	.4	3.9	5.2	10.4	19.5	45.5	15.2	5.4156	1.27536
For systematic storing	0.0	.4	3.9	13.5	21.7	37.8	22.6	5.6043	1.11949

Source: Field Survey, 2016

Table 4.12 indicates that the five items measuring IT support for competitive advantage all have mean scores of above '4' index. Of particular note is the fact that there is provision of IT support for communication among organization members, for collaborative works regardless of time and place and for searching and accessing necessary information. This implies that greater per cent of respondents agree on the items measuring information technology support as a knowledge infrastructure capability.

Table 4.13: One-Sample Test

	Test Value = 4									
									95% confidence Interval of the Difference	
	N	Mean	Std. Deviation	Std. Error Mean	t	Df	Sig. (2-tailed)	Mean Difference	Lower	Upper
Information Technology	234	5.5624	1.12755	.07371	21.196	233	.000	1.56239	1.4172	1.7076

Source: Field survey, 2016

In addition, the t-test calculated in Table 4.13 reveals that information technology mean is significantly different at 0.000 p-value, and 21.196 calculated t with degree of freedom 233.

Table 4.14: Acquisition Process

Acquisition process	Scale Level 1	2	3	4	5	6	7	Mean	Std. Dev
Getting information about our customers	0.0	0.0	4.8	10.4	18.2	38.1	28.6	5.7532	1.12082
Generating new knowledge from existing knowledge	.4	.4	4.8	13.4	16.0	39.8	25.1	5.6407	1.19633
Acquiring knowledge about our suppliers	0.0	.4	6.6	11.8	16.6	46.7	17.9	5.5633	1.13619
Distributing knowledge throughout the organization	.9	.9	5.7	9.6	27.5	34.9	20.5	5.4891	1.21616
Determining knowledge about new products/services within our industry	.4	0.0	6.1	12.6	14.8	44.3	21.7	5.6130	1.17574
Exchanging knowledge between people	0.0	0.0	3.9	13.5	24.8	44.8	13.0	5.4957	1.00977
Inquiring about our competitors and their activities	.4	0.0	4.4	15.7	22.7	40.2	16.6	5.4716	1.11816

Source: Field Survey, 2016

Evidence from the frequencies and mean scores in Table 4.14 indicates that most respondents agree to all seven statements of the 'acquisition process' as each mean was above the threshold '4'. Notable among this agreed statements is the fact that the organizations has process for getting information about their customers, generating new knowledge from existing knowledge, determining knowledge about new products/services within the industry.

Table 4.15: One-Sample Test

	Test Value = 4									
									95% confidence Interval of the Difference	
	N	Mean	Std. Deviation	Std. Error Mean	T	Df	Sig. (2-tailed)	Mean Difference	Lower	Upper
Acquisition process	234	5.5068	1.09909	.07185	20.972	233	.000	1.50682	1.3653	1.6484

Source: Field survey, 2016

In addition, Table 4.15 shows a statistically significant difference between the population and sample means as the calculated t-test is 20.972 with a p-value < 0.05 level of significance.

Table 4.16: Conversion Process

Conversion process	Scale Level 1	2	3	4	5	6	7	Mean	Std. Dev
Absorbing knowledge from individuals into the organization	1.3	2.2	5.2	17.0	21.8	36.7	15.7	5.2882	1.30616
Filtering knowledge	.9	4.8	6.1	14.3	23.9	47.0	3.0	5.0870	1.24378
Transferring organizational knowledge to individuals	0.0	1.3	11.3	12.2	18.3	37.4	19.6	5.3783	1.30851
Replacing outdated knowledge	0.0	4.3	10.4	10.9	19.6	40.0	14.8	5.2478	1.36211
Integrating different sources and types of knowledge	0.0	0.0	6.1	12.2	25.3	44.5	11.8	5.4367	1.04783
Organizing (Storing/filing) knowledge	0.0	2.7	8.4	10.2	19.9	47.3	11.5	5.3540	1.22144
Converting competitive intelligence into plans of action	.4	0.0	6.1	14.4	14.8	47.2	17.0	5.5284	1.15672

Source: Field Survey, 2016

A look at the table 4.16 tells us that greater number of respondents agree to all the items measuring conversion process as each mean was above the '4' criteria for rejection or acceptance. This implies that the organizations has processes for absorbing knowledge from individuals to the organization as well as transferring knowledge from organization to individuals and converting competitive intelligence into plans of action.

Table 4.17: One-Sample Test

	Test Value = 4									
									95% confidence Interval of the Difference	
	N	Mean	Std. Deviation	Std. Error Mean	t	Df	Sig. (2-tailed)	Mean Difference	Lower	Upper
Conversion Process	234	5.2372	1.16639	.07625	16.226	233	.000	1.23720	1.0870	1.3874

Source: Field Survey, 2016

Furthermore, Table 4.17 strengthens the result of the mean item scores as the calculated t-test is 16.226 with a p-value (0.000) lower than 0.05 level of significance, implying a statistically significant difference between the means.

Table 4.18: Application Process

Application process	Scale Level 1	2	3	4	5	6	7	Mean	Std. Dev
Using knowledge to solve new problems	0.0	.4	4.8	13.4	17.7	32.9	30.7	5.7013	1.19853
Using knowledge to develop new products and services	0.0	1.3	4.3	13.9	13.4	32.5	34.6	5.7532	1.25618
Using knowledge to improve efficiency	.4	1.3	4.3	9.1	21.6	34.6	28.6	5.6840	1.21571
Locating and applying knowledge to changing competitive conditions	0.0	.9	4.8	9.5	26.8	30.7	27.3	5.6364	1.16741
Applying knowledge learned from mistakes	.4	.9	6.5	10.8	16.5	39.8	25.1	5.6190	1.24145
Applying knowledge learned from experiences	.4		3.5	10.0	24.2	30.7	31.2	5.7446	1.14575
Matching sources of knowledge to problems and challenges	.4	.4	4.3	13.0	20.0	36.5	25.2	5.6217	1.18596

Source: Field Survey, 2016

It is obvious from the Table 4.18 above that majority of the respondents' support the seven statements measuring 'application' as a knowledge process capability for attaining competitive advantage. Interesting is the fact that organizations use knowledge to develop new products and services, apply knowledge learned from experiences, use knowledge to solve new problems and improve efficiency. This is visible from the frequencies and the mean scores which were all above the average of '4'.

Table 4.19: One-Sample Test

	Test Value = 4									
									95% confidence Interval of the Difference	
	N	Mean	Std. Deviation	Std. Error Mean	t	Df	Sig. (2-tailed)	Mean Difference	Lower	Upper
Application Process	234	5.6077	1.20346	.07867	20.435	233	.000	1.60765	1.4527	1.7627

Source: Field Survey, 2016

A further proof of the statistically significant difference of the sample mean from the population mean is seen from the result of the one sample test statistic in Table 4.19 with an 'application process' mean of 5.6077, a calculated 't' of 20.435 and p-value of 0.000 signaling the good fit of the construct.

Table 4.20: Protection Process

Protection	Scale Level 1	2	3	4	5	6	7	Mean	Std. Dev
Protect knowledge from theft from within the organization	2.2	3.5	3.5	12.6	20.3	43.7	14.3	5.3377	1.35078
Protect knowledge from theft from outside the organization	.9	2.2	3.9	14.3	14.7	45.9	18.2	5.5022	1.25412
Protect knowledge from inappropriate use inside the organization	.4	3.9	10.8	20.8	20.8	24.2	19.0	5.0649	1.43864
Protect knowledge from improper use outside the organization	.4	2.2	7.4	18.2	16.9	33.3	21.6	5.3550	1.34954
Values and protects knowledge embedded in individuals	2.6	3.0	6.1	11.3	23.4	33.3	20.3	5.3117	1.44998
Clearly communicates the importance of knowledge protection	.4	1.3	6.1	18.6	20.3	35.9	17.3	5.3420	1.24758
Protects trade secrets through extensive policies and procedures	.9	0.0	7.4	11.3	16.5	39.8	24.2	5.5887	1.25444

Source: Field Survey, 2016

Table 4.20 above shows that a good number of respondents agree to all the seven items measuring the protection process as is seen from the frequencies and mean item scores which are greater than the measure of '4'. Remarkable is the fact that knowledge is protected from theft from outside the organization, and trade secrets are protected through extensive policies and procedures, as well as improper use outside the organization.

Table 4.21: One-Sample Test

	Test Value = 4									
									95% confidence Interval of the Difference	
	N	Mean	Std. Deviation	Std. Error Mean	t	Df	Sig. (2-tailed)	Mean Difference	Lower	Upper
Protection Process	234	5.3431	1.07591	.07033	19.096	233	.000	1.34310	1.2045	1.4817

Source: Field survey, 2016

Table 4.21 displays the result of the one sample test statistic and gives the 'protection process' mean as 5.3431, a calculated 't' of 19.096 and p-value of 0.000 signaling a statistically significant difference of the sample mean from the population mean and also a display of the good fit of the construct. It is a further confirmation of the result in table 4.20.

Table 4.22: Competitive Advantage (Innovation and Market Share)

	Scale Level								
Innovation	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**Mean**	**Std. Dev**
In new product and service introductions, our company is often first-to market	1.7	3.1	6.1	27.1	14.4	39.3	8.3	5.0044	1.34261
Our new products and services are often perceived very novel by customers	.9	1.3	3.8	28.6	13.7	36.3	15.4	5.2350	1.27382
New products and services in our company often take us up against new competitors.	0.0	8.6	4.7	15.9	21.5	32.2	17.2	5.1545	1.45394
In comparison with our competitors, our company has introduced more innovative products and services during the past five years.	.9	3.0	9.0	23.1	24.4	18.8	20.9	5.0726	1.42293
In comparison with our competitors, our company has a lower success rate in new products and services launch. (R)	10.3	14.6	5.2	27.9	19.3	12.4	10.3	4.0987	1.78443
We are constantly improving our business processes.	.4	1.3	3.4	10.8	17.7	44.8	21.6	5.6466	1.15286
In new product and service introductions, our company is often at the cutting edge of technology.	0.0	2.1	4.3	26.5	18.4	37.6	11.1	5.1838	1.19207
Our Company changes production methods at a great speed in comparison with our competitors.	1.3	.9	5.6	27.4	22.6	34.6	7.7	5.0385	1.19845
Rivals usually find it difficult and expensive to duplicate our products and services	.9	2.1	7.3	25.3	24.9	28.8	10.7	5.0043	1.26456
Market share									
Compared to competitors our organization enjoy greater percentage of the market share	0.0	1.7	4.3	13.7	19.7	40.2	20.5	5.5385	1.18313
We differentiate our products and lower prices in order to draw more customers	2.1	2.1	13.7	15.0	20.9	28.2	17.9	5.0684	1.49521
My organization has a very broad demographic appeal, and can reach all its customers	1.3	1.7	4.7	12.8	18.8	33.8	26.9	5.5513	1.33921
Compared to competitors, our marketing and advertising method draws more customers to us.	.4	1.3	3.0	13.2	23.1	35.0	23.9	5.5812	1.18821
Our market position creates strong barriers for entry for other firms	2.6	4.3	1.7	14.1	21.8	32.9	22.6	5.3761	1.45151

Source: Field Survey, 2016

As shown by the frequencies and means in Table 4.22 the mean scores for all 14 items under the innovation and market share variables measuring competitive advantage are all above the stipulated benchmark of '4'. Though, the mean score of item '5' under the innovation sub-variable is just a little above the threshold (4.0998) signifying that most respondents were either neutral or slightly agree on whether they had a lower success rate in new product and service launch as against competitors. Notable is the fact that they are constantly improving in their business process, their products and services are perceived as novel by customers, and the

organizations are often at the cutting edge of technology in new product and service introductions. Further, most of the organizations has very broad demographic appeal and can reach all their customers; they also have marketing and advertising methods which draws more customers to them.

Table 4.23: One-Sample Test

	Test Value = 4									
									95% confidence Interval of the Difference	
	N	Mean	Std. Deviation	Std. Error Mean	t	Df	Sig. (2-tailed)	Mean Difference	Lower	Upper
Innovation	234	5.0491	.87146	.05697	18.414	233	.000	1.04906	.9368	1.1613
Market Share	234	5.4231	1.00042	.06540	21.760	233	.000	1.42308	1.2942	1.5519
Competitive Advantage	234	5.2361	.77089	.05039	24.528	233	.000	1.23607	1.1368	1.3354

Source: Field survey, 2016

Table 4.23 confirms a statistically significant difference of the sample mean from the population mean. The t-test shows a 'competitive advantage' mean of 5.2361, a calculated t of 24.528 and p-value of 0.000 less than 0.05 significant level. This is an indication of the construct's good fit.

4.4 Results of relationships at a glance

TABLE 4.24: Summary of Pearson's Correlation Matrix for the variables

Knowledge Management Capabilities(KMC)	Innovation	Market Share	Competitive Advantage
Organizational Culture	.393**	.585**	.602**
Organizational Structure	.448**	**.074**	.301**
Human Resource	.426**	.531**	.585**
Organizational Strategy	.377**	.522**	.552**
Leadership Support	.376**	.553**	.572**
Information Technology	.317**	.340**	.400**
Acquisition process	.398**	.383**	.473**
Conversion Process	**.287****	.402**	.423**
Application Process	.333**	.478**	.498**
Protection Process	.398**	.394**	.481**
Knowledge Infrastructure Capabilities	.333**	.407**	.453**
Knowledge Process Capabilities	.357**	.414**	.471**

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

*. Correlation is significant at the 0.05 level (2-tailed). N = 234

Table 4.24 shows at a glance the association of all the predictor variables with the criterion and sub criterion variable. From this table, under degree of freedom 232 there is a moderate

positive correlation existing between organizational culture and innovation ($r = .393$, $p < .01$); and with market share ($r = .585$, $p < .01$). Similarly there is a moderate positive correlation between organizational structure and innovation ($r = .448$, $p < .01$); but not with market share. A further look shows a moderate positive relationship existing between human resource and innovation ($r = .426$, $p < .01$); as well as with market share ($r = .531$, $p < .01$). Strategy is also moderately correlated with innovation ($r = .377$, $p < .01$) and market share ($r = .522$, $p < .01$). Furthermore, Leadership support correlates moderately positively with innovation ($r = .376$, $p < .01$); and market share ($r = .553$, $p < .01$). Information technology has a moderate positive correlation with innovation ($r = .317$, $p < .01$) and market share ($r = .340$, $p < .01$). All the knowledge process capabilities except conversion (which had a weak relationship with innovation) were all moderately correlated with competitive advantage, innovation and market share.

In summary, all predictor variables were moderately but positively correlated with competitive advantage. Same goes with their association with the sub criterion variables: innovation and market share except for 'knowledge conversion' which has a positive but weak (.287) correlation with innovation, while structure was not significantly (.074) correlated with market share. The issue of structure and market share simply implies that the structure of an organization alone may not actually determine a firm's position in the market, unless combined with other factors.

4.5 Test of Hypotheses

Ho1: KM infrastructure capabilities (culture, structure, strategy, leadership support, human resource, and IT) will not significantly predict competitive advantage.

Multiple regression analysis was conducted to test this hypothesis. Regression analysis is a linear model for summarizing the relationship between one or more predictor variables and a criterion variable (Field (2013). The linear model is given by:

$Yi = (Bo + B_1X_1 + B_2X_2 + \ldots + B_6X_6) + \epsilon i$ ……..…..(4.1)

where, Yi = competitive advantage; X_1 = Culture, X_2 = Structure, X_3 = Strategy, X_4 = leadership support, X_5 = human resource, X_6 = information technology; Bo = Intercept, B_1 = Coefficient of culture, B_2 = Coefficient of Structure, B_3 = Coefficient of Strategy, B_4 = Coefficient of leadership support, B_5 = Coefficient of human resource, B_6 = Coefficient of information technology, and ϵi = error.

Table 4.25: KM infrastructure capabilities (culture, structure, strategy, leadership support, human resource, and IT) and competitive advantage

MODEL 1	B	Beta (β)	t-value	P-value	R	R^2	F-value	F-sig.
Constant	1.860		7.397	.000	.690[a]	.477	34.437	.000[a]
Organizational Culture	.133	.168	2.043	0.042				
Organizational Structure	.076	.112	2.182	0.030				
Human Resource	.146	.214	2.954	0.003				
Organizational Strategy	.096	.119	1.686	0.093				
Leadership Support	.155	.218	3.071	0.002				
Information Technology	.045	.065	1.121	0.263				

a. Predictors: (Constant), Information Technology, Organizational Structure, Human Resource, Leadership Support, Organizational Strategy, Organizational Culture
b. Dependent Variable: Competitive Advantage. Significant at 0.05 level
Source: Field Survey, 2016

Table 4.25 is a multiple regression analysis with an R of 0.690, R^2 of 0.477 which shows that a combination of KM infrastructure capabilities of culture, structure, strategy, leadership support, human resource, and information technology effects accounted for 47.7% of the total variance in competitive advantage. The fitness of the regression model to significantly predict competitive advantage is indicated at degree of freedom (6,227) with an f-value = 34.437, $p < 0.05$). The result demonstrates a statistically significant effect of KMIC on competitive advantage. The standardized coefficients or b-values indicate the individual contribution of each predictor to the general regression model. Given the results presented on the above table and their associated p-values, only organizational strategy and IT support made positive but insignificant contribution to the model with $p > .05$. This is an indication that it is not just

about how analytical, aggressive or risk taking strategy stance of an organization that can earn it CA. Neither is it just the information technology (IT) support facilities it has that will enable CA. These capabilities require the input of other factors to yield CA. In essence these capabilities are indirect contributors to CA. Deriving our model from the general regression model of $Yi = b_1X_1 + b_2X_2 + b_3X_3 + b_4X_4 + b_5X_5 + b_6X_6$, we then have:

$CA = b1Cul + b_2Stru + b_3Stra + b_4Ls + b_5HR + b_6IT + \epsilon i$ …… (4.12)

Thus the model is fitted as:

$CA = .168(Cul) + .112(Stru) + .119(Stra) + .218(Ls) + .214(HR) + .065(IT) + \epsilon i$ ……. (4.13)

We therefore reject the null hypotheses and conclude that KMIC of culture, structure, strategy, leadership support, human resources and information technology do significantly affect CA.

Ho2: KM processes (acquisition, conversion, application, and protection) will not significantly influence competitive advantage

Multiple regression analysis was conducted to ascertain the effect of KM process capabilities on competitive advantage. The linear model is given by:

$Yi = Bo + B_1X_1 + B_2X_2 + \ldots + B_4X_4 + \epsilon i$ ……. (4.2)

Where Yi= competitive advantage; Xi = acquisition, X_2 = conversion, X_3 = application, and X_4 = protection, Bo = Intercept, B_1 = Coefficient of acquisition, B_2 = Coefficient of conversion, B_3 = Coefficient of application, B_4 = Coefficient of protection and ϵi = error.

Table 4.26: KM process capabilities of acquisition, conversion, application, and protection on competitive advantage

Model 1	B	Beta (β)	t-value	P-value	R	R^2	F-value	F-sig.
Constant	2.948		12.191	.000	.547[a]	.299	24.397	.000[a]
Acquisition process	.078	.112	.908	.365				
Conversion Process	-.024	-.036	-.363	.717				
Application Process	.165	.258	2.135	.034				
Protection Process	.197	.275	3.781	.000				

a. Predictors: (Constant), Protection Process, Acquisition process, Conversion Process, Application Process
b. Dependent Variable: Competitive Advantage. Significant at 0.05 level.
Source: Field survey, 2016

Table 4.26 shows a multiple regression analysis of KM process capabilities of acquisition, conversion, application, and protection on CA. The result demonstrates a statistically significant effect with an R of 0.547 and R^2 of .299. The model is fitted under degree of freedom (4,229) with an f-ratio (F= 24.397, $p < 0.05$). A look at the individual coefficients show that the application and protection processes make positive and significant contribution to achieving competitive advantage, while acquisition has a positive but insignificant ($p > .05$) input into the model, and the conversion process had an inverse (-0.036) and insignificant ($p > .05$) contribution to the mode. This implies that the less transfer or conversion of knowledge to people, the more the competitive advantage a firm will have. This may be true of our Nigerian environment and simply indicates that most employee especially those who may not have immediate use of such knowledge within the organization if conferred the privilege of such knowledge, may likely abuse it, perhaps through divulging such information to other competitors for some kick backs. Once the other competitors grab it, it becomes common and less valuable, and therefore not a capability anymore. Basing our model from the general regression model of $Yi = b_1X_1 + b_2X_2 + b_3X_3 + b_4X_4$, we then have: $CA = b_1AC + b_2CV + b_3Ap + b_4PT$. Thus the model is specified as:

$CA = .112(AC) + (-.036CV) + .258(AP) + .275(PT) + \epsilon i$ ……..... (4.2.1)

Against this background it is obvious that a combination of the predictors: acquisition, conversion, application and protection do influence competitive advantage. We therefore reject the null hypotheses that acquisition, conversion, application, and protection will not significantly affect CA.

Ho3: KM Infrastructure capabilities (KMIC) will not be significantly related with KM process capabilities (KMPC)

The Pearson product moment correlation was used to determine the strength of the association among each of the variables making up the KMIC and KMPC. The correlation coefficient is

between -1.0 and +1.0. Coefficients close to 1 or -1 represent a strong relationship. Significant correlations are flagged with asterisks. A significant correlation indicates a reliable relationship and not necessarily a strong one. Correlations greater than .7 are considered strong, correlations less than .3 are considered weak while correlations between .3 and .7 are considered moderate (Cronk, 2002). This was followed by a combined correlation matrix for KMIC and KMPC.

TABLE 4.27: Pearson correlation Matrix for KMIC and KMPC sub-variables

Variables	Sub Variables	CUL	STRU	STRA	HR	IT	LEA	AC	CV	AP	PT
KMIC	CUL	1	.								
	STRU	.239**	1								
	STRA	.630**	.314**	1							
	HR	.672**	318**	.664**	1						
	IT	.543**	.160*	.370**	.350**	1					
	LEA	.703**	.151*	.577**	.552**	.488**	1				
	AC	.546**	.138*	.434**	.391**	.847**	.484**	1			
	CV	.558**	**.124**	.431**	.435**	.798**	.508**	.803**	1		
KMPC	AP	.616**	**.051**	.449**	.455**	.832**	.525**	.873**	.787**	1	
	PT	.565**	197**	.389**	.418**	.581**	.456**	.600**	.603**	.621**	1

**. Correlation is significant at the 0.01 level (2-tailed).
*. Correlation is significant at the 0.05 level (2-tailed). N = 234
CUL= culture, STRU= Structure, STRA= Strategy, HR= Human Resource, IT= Information technology, LEA= Leadership support, AC= Acquisition, CV= Conversion, AP= Application, and PT= Protection processes
Source: Field survey, 2016

Table 4.27 presents the correlation coefficients for each of the predictor variables constituting KMIC and KMPC. A critical look indicates that relationship from strong to weak exists among these variables. Very outstanding is a strong positive correlation between knowledge acquisition process and information technology support ($r = .847$, $p < .01$); Knowledge conversion process and information technology ($r = .798$, $p < .01$); knowledge application process and information technology ($r = .832$, $p < .01$); also, between culture and leadership ($r = .703$, $p < .01$); acquisition and application ($r = .873$, $p < .01$); acquisition and conversion ($r = .803$, $p < .01$); application and conversion ($r = .787$, $p < .01$). This implies a significant linear relationship between the variables. A further observation shows a moderate but positive

relationship existing between culture and strategy (.630); culture and human resource (.672); culture and IT support (.543), all at 232 degree of freedom and $p < .01$ significance level. Also moderately and positively correlated is culture and acquisition process ($r = .546$, $p < .01$), culture and conversion process ($r = .558$, $p < .01$), culture and application process ($r = .616$, $p < .01$), culture and protection process ($r = .565$, $p < .01$). Furthermore, strategy is positively but moderately correlated with acquisition process ($r = .434$, $p < .01$), conversion process ($r = .431$, $p < .01$), application process ($r = .449$, $p < .01$), and protection process ($r = .389$, $p < .01$). In the same vein human resource is positively and moderately correlated with acquisition process ($r = .391$, $p < .01$), conversion process ($r = .435$, $p < .01$), application process ($r = .455$, $p < .01$), and protection process ($r = .418$, $p < .01$). Leadership support is moderately and positively correlated with acquisition process ($r = .484$, $p < .01$), conversion process ($r = .508$, $p < .01$), application process ($r = .525$, $p < .01$), and protection process ($r = .456$, $p < .01$). In addition there is moderate and positive correlation between strategy and human resource (.664); IT support and strategy (.370), leadership and strategy (.577) as well as IT and human resource (.350), IT and leadership (.488), strategy and structure (.314) and human resource and structure (.318); all at 232 degree of freedom and $p < .01$ significance level. Of particular note is the weak but positive correlation existing between structure and acquisition process ($r = .138$, $p < .05$), structure and protection process ($r = .197$, $p < .01$), IT and structure (.160) and leadership and structure (.151) both at $p < .05$ significance level. However, there is no significant correlation between structure and conversion process; and between structure and application process. Given the results on table 4.27, it is evident going by Pallant (2013) assumption that there is no multi-collinearity issue since none of the variables had up to 0.9 and above correlation with the other. This suggests that the relative contribution of each of the variables can be evaluated. Also important is the positive but moderate relationship existing among the infrastructure capabilities variable; as well as the process capabilities variables.

Table 4.28: Pearson correlation matrix for KMIC and KMPC

VARIABLES	KMIC	KMPC
KMIC	1	.739**
KMPC	.739**	1

**. Correlation is significant at the 0.01 level (2-tailed). N= 234

Source: Field survey, 2016

Table 4.28 summarizes the association and the result suggests a very strong positive correlation between KM infrastructure capabilities (KMIC) and KM process capabilities (KMPC) at ($r = .793$, $p < .01$). Given the results of the tables 4.26 and 4.27, the relevance of IT to knowledge creation, use, transfer and protection cannot be overemphasized. In like manner all other infrastructure capabilities are significantly correlated with the process capabilities except for structure and conversion, and structure and application that are not significant. Therefore the null hypothesis that KM Infrastructure capabilities (KMIC) will not be significantly related with KM process capabilities (KMPC) is rejected.

Ho4: KM infrastructure capabilities (KMIC) and KM process capabilities (KMPC) combined have no significant effect on competitive advantage.

A multiple regression was conducted to ascertain the effect of KM infrastructure capabilities and KM process capabilities on competitive advantage. That is:

$Yi = Bo + B_1X_1 + B_2X_2$……..……. (4.3)

Where Yi= competitive advantage; $X_{1,}$ = KMIC, X_2 = KMPC, Bo = intercept, B_1 = Coefficient of KMIC, and B_2 = Coefficient of KMPC.

Table 4.29: KMIC and KMPC on competitive advantage

Model 1	B	Beta (β)	t-value	P-value	R	R^2	F-value	F-sig.
Constant	3.275		14.218	.000	.496[a]	.246	37.646	.000[a]
KM Infrastructure capabilities	.168	.232	2.732	.007				
KM Process Capabilities	.206	.299	3.532	.000				

a. Predictors: (Constant), Knowledge Process Capabilities, Knowledge Infrastructure Capabilities
b. Dependent Variable: Competitive Advantage

Source: Field Survey, 2016

The result in Table 4.29 shows that KMIC and KMPC are significant predictors of CA as implied by the R^2 (.246) showing that the variation in CA is caused by 24.6% infrastructure and process capabilities; F-value of 37.646, and $p < 0.05$ indicates the fitness of the regression model to predict competitive advantage. The b-values or coefficients specify the individual contribution of each predictor to the model. Given the result of table 4.28, it is seen that KM process capabilities influenced CA more with a standardized coefficient of 0.299 and p value < 0.05; while both of them combined, predict CA. With regards to our general regression model of $Yi = b_1X_1 + b_2X_2$, we then have: $CA = b_1KMIC + b_2KMPC$. Thus the model is specified as:

CA = .232(KMIC) + .299(KMPC) …….. (4.3.1)

This result implies that as much as both the KMIC and KMPC collectively affect competitive advantage, the KMPC have greater influence meaning that a firm is likely to increase in competitive advantage with the required increase or decrease in the various measures of knowledge acquisition, knowledge application, knowledge protection and knowledge conversion. We therefore reject the null hypotheses that there will not be any significant combined effect of KM infrastructure capabilities and KM process capabilities on CA.

Table 4.30: Summary of Hypotheses Testing Result

Hypotheses Tested	Outcome
Ho1	Reject null hypothesis
Ho2	Reject null hypothesis
Ho3	Reject null hypothesis
Ho4	Reject null hypothesis

Source: Results of Hypotheses 1 – 4 Tested

4.6 Other Results (Post Hoc)

The effect of each of the knowledge infrastructure capabilities and process capabilities variables were tested on the sub variables (innovation and market share) of competitive advantage. This was done using a simple regression analysis as a further test to identifying the strength of the influence of

the independent and sub-dependent variables aside from what the Pearson correlation showed. Additionally, the combined effect of these predictor variables was tested on the sub-criterion variables.

4.6.1 Effect of organizational culture on innovation and market share

Table 4.31: Models summary of regression analysis of Culture on Innovation and Market share

Model	R	R Square	Unstandardized coefficients		Standardized coefficients	F	Sig.	T	Sig.
			B	Std.Error	Beta				
(1)	.393[a]	.155	3.207	.287		42.466	.000[b]	11.155	.000
			.354	.054	.393			6.517	.000
(2)	.585[a]	.343	2.276	.291		120.932	.000[b]	7.821	.000
			.604	.055	.585			10.997	.000

a. Predictors: (Constant), Organizational Culture

b. Dependent Variables: Model (1) Innovation, (2) Market Share

Source: Field survey, 2016

Table 4.31 shows a linear regression of organizational culture on innovation as well as on market share. The correlation coefficient of 0.393 in model 1 indicates a positive relationship between culture and innovation. The R-Squared statistic with value .155 implies that about 15.5% of the total variation in the measure of the innovation is explained by the variations in organizational culture. Also the F-value of 42.466, p-value (0.000) < 0.05 level significance (2-tailed), indicate that there is a statistically significant relationship between organizational culture and innovation at the 95.0% confidence level. In essence, innovation predicted is equal to 3.207 + .393(culture). That is, innovation will increase .393 for each improvement in culture through collaboration, trust or learning. Similarly, linear regression calculated to predict market share from culture demonstrated significant fits as ($F = 120.932$, $p < 0.05$), with a coefficient of .585 and R^2 of .343. This implies that about 34.3% of the variation in market share is explained by the variations in culture. That is, market share predicted is equal to 2.276 + .585 (Culture). That is, market share will increase .585 for improvement in trust,

collaboration and learning which makes up culture. Hence, a relationship exists between culture and innovation; and market share.

4.6.2 Effect of organizational structure on innovation and market share.

Table 4.32: Models summary of regression analysis of Structure on Innovation and Market share

Model	R	R Square	Unstandardized coefficients		Standardized coefficients	F	Sig.	T	Sig.
			B	Std.Error	Beta				
(1)	.448[a]	.200	3.632	.193		58.164	.000[b]	18.847	.000
			.343	.045	.448			7.627	.000
(2)	.074[a]	.006	5.153	.247		1.285	.258[b]	20.887	.000
			.065	.058	.074			1.133	.258

a. Predictors: (Constant), Organizational Structure

b. Dependent Variables: (1) Innovation (2) Market Share

Source: Field survey, 2016

Table 4.32 shows a single linear regression of organizational structure on innovation as well as on market share. The correlation coefficient of 0.448 in model 1 shows a positive effect of structure on innovation. The R-Squared statistic with value .200 implies that about 20% of the total variation in the measure of innovation is explained by the variations in organizational structure, while the F-value of 58.164 with p (0.000) < 0.05 level of significance (2-tailed) indicate that the model is well fitted to predict innovation. In essence, innovation predicted is equal to 3.632 + .0.448(structure). That is, innovation will increase .448 for more flexibility in organizational structure. In the same vein, linear regression calculated to predict market share from structure did not demonstrate a significant relationship as (F = 1.285, p (.258) > 0.05), with a coefficient of .074 and R^2 of .006. This result further reiterates the correlation result presented earlier, as it is visible that structure does not actually command so much influence on market share. Hence, a significant relationship exists between innovation and structure but not with market share.

4.6.3 Effect of organizational strategy on innovation and market share

Table 4.33: Models summary of organizational strategy on innovation and market share

Model	R	R Square	Unstandardized coefficients		Standardized coefficients	F	Sig.	T	Sig.
			B	Std. Error	Beta				
(1)	.377[a]	.142	3.287	.289		38.543	.000[b]	11.386	.000
			.344	.055	.377			6.208	.000
(2)	.522[a]	.272	2.627	.305		86.816	.000[b]	8.603	.000
			.547	.059	.522			9.318	.000

a. Predictors: (Constant), Organizational Strategy

b. Dependent Variables: (1) Innovation (2) Market Share

Source: Field survey, 2016

Table 4.33 shows the effect of organizational strategy on innovation as well as market share. The correlation coefficient of 0.377 in model 1 indicates a positive relationship between strategy and innovation. The R-Squared statistic with value .142 implies that about 14.2% of the total variation in the measure of the innovation is explained by the variations in organizational strategy. Also the p-value of (0.000) which is less than the level of significance at the 0.05 level (2-tailed), and F-value of 38.543 indicate that there is a statistically significant relationship between organizational strategy and innovation at the 95.0% confidence level. In essence, innovation predicted is equal to 3.287 + .377(strategy). That is, innovation will increase .377 for each improvement in strategy through analytical, aggressive or risk taking measures. In the same vein, linear regression calculated to predict market share from strategy demonstrated a significant positive fit at a degree of freedom (1, 232) as seen in model 2 ($F= 86.816$, $p < 0.05$), with an R of .522 and R^2 of .272. This implies that about 27.2% of the variation in market share is explained by the variations in organizational strategy. That is, market share can be predicted 2.627 + .522(strategy). This suggests that market share may increase .522 for each improvement in strategic orientations. Hence, organizational strategy exerts a significant effect on innovation and market share.

4.6.4 Effect of leadership support on innovation and market share

Table 4.34: Models summary of leadership support on innovation and market share

Model	R	R Square	Unstandardized coefficients		Standardized coefficients	F	Sig.	T	Sig.
			B	Std.Error	Beta				
(1)	.376[a]	.142	3.375	.276		38.294	.000[b]	12.242	.000
			.301	.049	.376			6.188	.000
(2)	.553[a]	.306	2.599	.285		102.200	.000[b]	9.133	.000
			.508	.050	.553			10.109	.000

a. Predictors: (Constant), Leadership support

b. Dependent Variables: (1) Innovation (2) Market Share

Source: Field survey, 2016

Table 4.34 indicates the effect of leadership support on innovation and on market share. The correlation coefficient of 0.376 in model (1) indicates a positive relationship between leadership support and innovation. The R-Squared statistic with value .142 implies that about 14.2% of the total variation in the measure of the innovation is explained by the variations in leadership support. Also the p-value of (0.000) which is less than the level of significance at 0.05 level (2-tailed), and F-value of 38.294 indicate that there is a statistically significant relationship between leadership support and innovation at the 95.0% confidence level. In essence, innovation predicted is equal to 3.375 + .376(leadership support). That is, innovation will increase .376 for each improvement in leadership support. Similarly, linear regression calculated to predict market share from leadership support demonstrated a significant positive fits as seen in model 2 with ($F = 102.200$, $p < 0.05$), with an R of .553 and R^2 of .306. This implies that about 30.6% of the variation in market share is explained by the variations in leadership support. That is, market share can be predicted 2.599 + .553(leadership support). This suggests that market share will increase .553 for improvement in leadership support. Hence, a relationship exists between innovation and market share with leadership support.

4.6.5 Human resource (T-shaped skill) effect on innovation and market share

Table 4.35: Models summary of Human resource on innovation and market share

Model	R	R Square	Unstandardized coefficients		Standardized coefficients	F	Sig.	T	Sig.
			B	Std. Error	Beta				
(1)	.426[a]	.181	3.323	.247		51.294	.000[b]	13.479	.000
			.327	.046	.426			7.162	.000
(2)	.531[a]	.281	2.952	.265		90.891	.000[b]	11.137	.000
			.468	.049	.531			9.534	.000

a. Predictors: (Constant), Human Resource

b. Dependent Variables: (1) Innovation (2) Market Share

Source: Field survey, 2016

Table 4.35 indicates the effect of human resource t-shaped skill on innovation, and on market share. The correlation coefficient of 0.426 in model 1 indicates a positive relationship between human resource and innovation. The R-Squared statistic with value .181 implies that about 18.1% of the total variation in the measure of innovation is explained by the variations in human resource. Also the p-value of (0.000) which is less than the level of significance at the 0.05 level (2-tailed), and F-value of 51.294 indicate that there is a statistically significant relationship between human resource and innovation at the 95.0% confidence level. In essence, innovation predicted is equal to 3.3723+ .426(human resource). That is, innovation will increase .426 (42.6%) for each inch of employing human resource with T-shaped skill. Similarly, linear regression calculated to predict market share from human resource demonstrated a significant positive fits as model 2 depicts ($F = 90.891$, $p < 0.05$), with an R of .531 and R^2 of .281. This implies that about 28.1% of the variation in market share is explained by the variations in human resource. That is, market share can be predicted by human resource 2.952 + .531(human resource). This suggests that market share will increase .531 for each improvement of t-shaped skill human resource. Hence, a relationship exists between innovation and market share with Human Resource.

4.6.6 IT Support effect on innovation and market share

Table 4.36: Models summary of IT support on innovation and market share

Model	R	R Square	Unstandardized coefficients		Standardized coefficients	F	Sig.	T	Sig.
			B	Std. Error	Beta				
(1)	.317[a]	.101	3.684	.273		25.999	.000[b]	13.492	.000
			.245	.048	.317			5.099	.000
(2)	.340[a]	.115	3.747	.311		30.234	.000[b]	12.052	.000
			.301	.055	.340			5.499	.000

a. Predictors: (Constant), IT support

b. Dependent Variables: (1) Innovation (2) Market Share

Source: Field survey, 2016

Table 4.36 shows the effect of IT support on innovation and market share. The correlation coefficient of 0.317 in model 1 indicates a positive effect of IT support on innovation. The R-Squared statistic with value .101 implies that about 10.1% of the total variation in the measure of innovation is explained by the variations in IT support. Also the p-value of (0.000) which is less than the level of significance at the 0.05 level (2-tailed), and F-value of 25.999 indicate that there is a statistically significant relationship between IT support and innovation at the 95.0% confidence level. In essence, innovation predicted is equal to 3.684 + .317(IT supports). That is, innovation will increase .317 for each inch of improvement in IT support. Similarly, linear regression calculated to predict market share from IT support demonstrated a significant positive fits as can be seen in model 2 with ($F(1, 232) = 30.234$, $p < 0.05$), and an R of .340 and R^2 of .115. This implies that about 11.5% of the variation in market share is explained by the variations in human resource. That is, market share can be predicted by human resource 3.747 + .340(IT support). This suggests that market share will increase .340 for each improvement in IT support. Hence, a relationship exists between innovation and market share with IT support.

Conclusion: All six variables individually show statistically significant relationship with innovation; while all but structure was not statistically significant with market share.

4.6.7 Joint influence of culture, structure, strategy, leadership support, human resource, and information technology on innovation

Multiple regression analysis was used to test this relationship.

Table 4.37: Influence of Culture, structure, strategy, leadership support, human resource, and IT on innovation

MODEL 1	B	Beta (β)	t-value	P-value	R	R^2	F-value	F-sig.
Constant	1.949		6.070	.000	.577[a]	.333	18.850	.000
Organizational Culture	.017	.019	.203	.839				
Organizational Structure	.263	.343	5.908	.000				
Human Resource	.130	.170	2.071	.039				
Organizational Strategy	.013	.015	.183	.855				
Leadership Support	.124	.155	1.927	.055				
Information Technology	.087	.112	1.701	.090				

a. Predictors: (Constant), Information Technology, Organizational Structure, Human Resource, Leadership Support, Organizational Strategy, Organizational Culture
b. Dependent Variable: Innovation. Significant at 0.05 level

Source: Field Survey, 2016

From table 4.37, the result of the multiple regression to predict innovation (INN) based on culture, structure, human resource, strategy, leadership support and information technology support showed a significant regression equation with a degree of freedom (6, 227) F = 18.850, $p < .05$) with an R^2 of .333. Examining the individual coefficients which ascertain the contribution of each factor to the model shows that only organizational structure with .343 coefficient and human resource with .170 coefficient significantly and positively influenced innovation. All others had positive coefficients but were insignificant in their contribution. This implies that for any organization that wishing to be innovative, it must pay more special attention to its organizational structure and human resource than any other of the factors. The positive coefficient of structure is an indication that the more decentralized the structure is, the more innovation that will occur in the organization. Therefore, innovation predicted:

INN = 1.949 + .343(Stru) + .170 (HR) + .155 (Ls) + .112 (ITs) + ϵi …….. (4.1).

This implies that INN increases by .343 for decentralized and less formalized structure, increase 0.170 of improved t-shaped skill employed, increases .155 of additional leadership support, and .112 of IT support.

In summary, the joint effect of the six variables showed they are significant predictors of innovation. However, the influence of the factors on one another reduced the effect of culture, strategy, leadership support, and IT support, as they all have p-values greater than 0.05 level of significance.

4.6.8 Joint effect of Culture, structure, strategy, leadership support, human resource, and information technology on market share.

A multiple regression was conducted to ascertain the joint effect of culture, structure, strategy, leadership support, human resource, and information technology on market share (MS).

Table 4.38: Influence of Culture, structure, strategy, leadership support, human resource, and IT on Market Share

MODEL 1	B	Beta (β)	t-value	P-value	R	R^2	F-value	F-sig.
Constant	1.772		5.205	.000	.656[a]	.431	28.609	.000
Organizational Culture	.250	.242	2.828	.005				
Organizational Structure	-.111	-.126	-2.347	.020				
Human Resource	.161	.182	2.411	.017				
Organizational Strategy	.178	.170	2.319	.021				
Leadership Support	.185	.202	2.720	.007				
Information Technology	.003	.003	.052	.958				

a. Predictors: (Constant), Information Technology, Organizational Structure, Human Resource, Leadership support, Organizational Strategy, Organizational Culture
b. Dependent Variable: Market share. Significant at 0.05 level
Source: Field survey, 2016

Table 4.38 shows a multiple regression calculated to predict Market share (MS) based on culture, structure, human resource, strategy, leadership support and information technology support. The result demonstrates a statistically significant effect with an R of 0.547 and R^2 of .299. The model is fitted at degree of freedom (4,229) with an F-ratio = 24.397, $p < 0.05$). Looking at the individual coefficients it is obvious that organizational culture which includes collaboration, trust, and learning made more positive and significant contribution (0.242, $p < 0.05$) to attaining market share; while structure had an inverse but significant effect (-.126, $p <$

0.05) on the model. This is a further proof that the less of centralized and formalized structure, in addition to other contributing factors, the more market share an organization is likely to secure. Information technology support on the other hand had a positive but insignificant effect (0.003, p > 0.05) on market share. The interpretation then, is that information technology is important in gaining market share, but become insignificant when joined with other factors. This is arguable more so as the world is going e-commerce. Predicted Market share will be:

MS = 1.772+.242 (Cul)+.202(LS) .182(HR) +.170(Stra) + (-.126)Stru+.003(ITs)+ϵi..... (4.2)

This implies that MS increases by .242 for improved culture, decreases (.126) for increased centralized and formalized structure, increases .182 of improved t-shaped skill employed, increases .170 of improved strategy, increases .202 of additional leadership support, and .003 of IT support.

Summarily, the six variables combined show they are significant predictors of Market share. However, information technology with the influence of other factors was found to be insignificant with p value (.958) > .05 level of significance; while structure has a negative slope (-.218) though still significant. This implies that though information technology is important in gaining market share, but has less effect when joined with other factors. The result on structure implies an inverse significant relationship with market share. That is, the more centralized and formalized a firm's structure is, the less market share it is likely to acquire.

4.6.9 Effect of knowledge acquisition process on innovation and market share

Table 4.39: Models summary of acquisition process on innovation and market share

Model	R	R Square	Unstandardized coefficients		Standardized coefficients	F	Sig.	T	Sig.
			B	Std. Error	Beta				
(1)	.398[a]	.158	3.311	.268		43.666	.000[b]	12.349	.000
			.316	.048	.398			6.608	.000
(2)	.383[a]	.147	3.504	.310		39.848	.000[b]	11.304	.000
			.348	.055	.383			6.312	.000

a. Predictors: (Constant), Knowledge acquisition process

b. Dependent Variables: (1) Innovation (2) Market Share

Source: Field survey, 2016

Table 4.39 presents the effect of acquisition process on innovation as well as on market share. A linear regression calculated to predict innovation from the acquisition process demonstrated a significant positive relationship as can be seen in model (1) with degree of freedom (1, 232) F= 43.666, $p < 0.05$), and an R of .398 and R^2 of .158. This implies that about 15.8% of the variation in innovation is explained by the variations in the acquisition process. That is, innovation can be predicted by acquisition process 3.311 + .398(acquisition process). This suggests that innovation will increase .398 for each improvement in the acquisition process. On the other hand, the correlation coefficient of 0.383 in model (2) indicates a significant positive fit between acquisition process and market share. The R-Squared statistic with value .147 implies that about 14.7% of the total variation in the measure of the market share is explained by the variations in acquisition process. Also the p-value of (0.000) which is less than the level of significance at the 0.05 level (2-tailed), and F-value of 39.848 indicate that there is a statistically significant relationship between acquisition process and market share at the 95.0% confidence level. In essence, market share predicted is equal to 3.504 + .383(acquisition process). That is, market share will increase .383 for each improvement in the acquisition process. Hence, a significant relationship exists between application process and market share.

4.6.10 Effect of knowledge conversion process on innovation and market share.

Table 4.40: Models summary of conversion process on innovation and market share

Model	R	R Square	Unstandardized coefficients		Standardized coefficients	F	Sig.	T	Sig.
			B	Std. Error	Beta				
(1)	.287[a]	.082	3.927	.252		20.801	.000[b]	15.575	.000
			.214	.047	.287			4.561	.000
(2)	.402[a]	.162	3.617	.277		44.720	.000[b]	13.077	.000
			.345	.052	.402			6.687	.000

a. Predictors: (Constant), Knowledge conversion process

b. Dependent Variables: (1) Innovation (2) Market Share

Source: Field survey, 2016

Table 4.40 presents the effect of conversion process on innovation as well as on market share. A linear regression calculated to predict innovation from the conversion process demonstrated a significant positive fits as can be seen in model (1) with degree of freedom (1, 232) F= 20.801, $p < 0.05$), an R of .287 and R^2 of .082. This implies that about 8.2% of the variation in innovation is explained by the variations in the conversion process. That is, innovation can be predicted by 3.927 + .287(conversion process). This suggests that innovation will increase .287 for each improvement in the conversion process. On the other hand, the correlation coefficient of 0.402 in model (2) indicates a significantly positive relationship between conversion process and market share. The R-Squared statistic with value .162 implies that about 16.2% of the total variation in the measure of the market share is explained by the conversion process. Also the p-value of (0.000) which is less than the level of significance at the 0.05 level (2-tailed), and F-value of 44.720 indicate that there is a statistically significant model fit between conversion process and market share at the 95.0% confidence level. In essence, market share predicted is equal to 3.617 + .402(conversion process). That is, market share will increase .402 for each inch of conversion process. Hence, a relationship exists between innovation and market share with the process of conversion.

4.6.11 Influence of application process on innovation and market share.

Table 4.41: Summary of application process on innovation and market share

Model	R	R Square	Unstandardized coefficients		Standardized coefficients	F	Sig.	T	Sig.
			B	Std. Error	Beta				
(1)	.333[a]	.111	3.697	.257		28.950	.000[b]	14.379	.000
			.241	.045	.333			5.381	.000
(2)	.478[a]	.228	3.195	.275		68.681	.000[b]	11.622	.000
			.397	.048	.478			8.287	.000

a. Predictors: (Constant), Knowledge application process

b. Dependent Variables: (1) Innovation (2) Market Share

Source: Field survey, 2016

Table 4.41 presents the effect of application process on innovation as well as market share. A linear regression calculated to predict innovation from the application process demonstrated a

significant positive fits as can be seen in model (1), ($F(1, 232) = 28.950$, $p < 0.05$), with an R of .333 and R^2 of .111. This implies that about 11.1% of the variation in innovation is explained by the variations in the application process. That is, innovation can be predicted by 3.697 + .333(application process). This suggests that innovation will increase .333 for each improvement in the application process. On the other hand, the R-Squared statistic with value .228 in model (2) implies that about 22.8% of the total variation in the measure of the market share is explained by the variations in application process. The correlation coefficient of 0.478, F-value of 68.681, and p-value (0.000) which is less than the level of significance at the 0.05 level (2-tailed), points to a positive statistically significant model fit for application process and market share at the 95.0% confidence level. In essence, market share predicted is equal to 3.195 + .478(application process). That is, market share will increase .478 for each improvement in the knowledge application process. Hence, a relationship exists between innovation and market share with the application process.

4.6.12 Effect of knowledge protection process on innovation and market share.

Table 4.42: Models summary of Protection process on innovation and market share

Model	R	R Square	Unstandardized coefficients		Standardized coefficients	F	Sig.	T	Sig.
			B	Std. Error	Beta				
(1)	.398[a]	.159	3.325	.266		43.774	.000[b]	12.508	.000
			.323	.049	.398			6.616	.000
(2)	.394[a]	.156	3.464	.306		42.741	.000[b]	11.329	.000
			.367	.056	.394			6.538	.000

a. Predictors: (Constant), Knowledge protection process

b. Dependent Variables: (1) Innovation (2) Market Share

Source: Field survey, 2016

Table 4.42 shows the effect of knowledge protection process on innovation, and on market share. A linear regression calculated to predict innovation from the protection process demonstrated a significant positive fits as can be seen in model (1) with ($F = 43.774$, $p < 0.05$), with an R of .398 and R^2 of .159. This implies that about 15.9% of the variation in innovation is explained by the variations in the protection process. That is, innovation can be predicted by

3.325 + .398(protection process). This suggests that innovation will increase .398 for each improvement in the protection process. On the other hand, the correlation coefficient of 0.394 in model (2) indicates a significant positive relationship between protection process and market share. The R-Squared statistic with value .156 implies that about 15.6% of the total variation in the measure of the market share is explained by the variations in protection process. Also the p-value of (0.000) which is less than the level of significance at the 0.05 level (2-tailed), and F-value of 42.741 indicate that there is a statistically significant model fit between protection process and market share. In essence, market share predicted is equal to 3.464 + .394(protection process). That is, market share will increase .394 for each improvement in protection process. Hence, the protection process can predict both innovation and market share.

In summary, all the knowledge management process variables individually showed statistically significant positive relationship with innovation, as well as market share.

4.6.13 Combined effect of acquisition, conversion, application, and protection on innovation

A multiple regression analysis was conducted to ascertain the joint effect of acquisition, conversion, application, and protection processes on innovation.

Table 4.43: Joint effect of acquisition, conversion, application, and protection on innovation

Model 1	B	Beta (β)	t-value	P-value	R	R^2	F-value	F-sig.
Constant	2.898		10.010	.000	.462[a]	.213	15.519	.000[a]
Acquisition process	.363	.457	3.508	.001				
Conversion Process	-.123	-.165	-1.567	.118				
Application Process	-.089	-.123	-.958	.339				
Protection Process	.242	.299	3.878	.000				

a. Predictors: (Constant), Protection Process, Acquisition process, Conversion Process, Application Process
b. Dependent Variable: Innovation. Significant at 0.05 level.

Source: Field survey, 2016

Table 4.43 represents a multiple regression calculated to predict innovation (INN) based on acquisition, conversion, application, and protection process. The result show a positive and statistically significant joint effect of the process variables on innovation with an $F(4, 229) = 15.519$, $p < .05$) and an R^2 of .213. This means that 21.3% of variation in innovation is jointly caused by these variables. The individual coefficients illustrating the input of each individual variable indicate that the acquisition process (0.457, $p < 0.05$) and protection process (0.299, $p < 0.05$) had more influence in predicting innovation. The conversion and application process however, had negative coefficients and insignificant contribution to the model. The implication of this result is that what is most important in innovation in an organization is acquiring the knowledge first and learning how to protect the knowledge from theft and misuse. Again, the less transfer of the knowledge to people who may not have use to it so as to prevent divulging it to competitors the more innovation is likely to take place. In addition, negative application of knowledge reduces innovation. Hence, innovation predicted:

INN = 2.898 + .457(AC) + (-.165)CV + (-.123)AP + .299(PT) + ϵi…….... (4.3).

This implies that INN may increase by .457 of knowledge acquisition process and by .242 of knowledge protection process. On the other hand, innovation will be inversely affected by -.165 of knowledge conversion process and -.123 of knowledge application process.

In précis, the combination of the four variables shows they are significant predictors of innovation (INN). However, the conversion and application process influenced by other factors have inverse and insignificant contribution to the model.

4.6.14 Effect of acquisition, conversion, application, and the protection process on market share.

Using a multiple regression analysis the effect of acquisition, conversion, application, and protection processes on Market share was ascertained.

Table 4.44: Joint effect of acquisition, conversion, application, and protection on market share

Model 1	B	Beta (β)	t-value	P-value	R	R^2	F-value	F-sig.
Constant	2.997		9.263	.000	.504[a]	.254	19.534	.000[a]
Acquisition process	-.206	-.226	-1.782	.076				
Conversion Process	.075	.088	.861	.390				
Application Process	.419	.504	4.049	.000				
Protection Process	.152	.164	2.180	.030				

a. Predictors: (Constant), Protection Process, Acquisition process, Conversion Process, Application Process
b. Dependent Variable: Market share. Significant at 0.05 level.

Source: Field survey, 2016

Table 4.44 presents a multiple linear regression calculated to predict market share (MS) based on acquisition, conversion, application, and protection process. A significant regression equation at degree of freedom (4,229) gives an F = 19.534, $p < .05$ with an R^2 of .254. Therefore, market share predicted:

MS = 2.997 + (-.226)(AC) + .088(CV) + .504(AP) + .164(PT) + ϵi……..... (4.5).

This implies that MS may decrease by .226 of knowledge acquisition process, increase by .088 of knowledge conversion process, increase by .504 of knowledge application process and .164 of knowledge protection process. From the individual coefficient, it is obvious that more contribution to the model came from the knowledge application process with 0.504, $p < 0.05$. This explains the fact that the ability to gain market share lies in applying the acquired knowledge to fill identified gaps which can be used to satisfy, draw and establish customers' loyalty. Also very important to the model is the knowledge protection process. This is understandable because an unprotected knowledge becomes everybody's knowledge and will no longer serve any competitive advantage; and in the case of gaining market share, if everyone (all competing organizations) is offering the same service for instance, there is nothing distinguishing about it anymore, and no organization can lay claim to being the market leader for that particular knowledge. In addition, the knowledge acquisition process has an

inverse relationship with market share. This can be explained given the fact that acquiring less of unimportant or unuseful knowledge will increase gaining market share or vice versa.

In essence, the four variables jointly are significant predictors of market share (MS). However, the acquisition and conversion process influenced by other factors are not significant predictors of MS with their p values > .05.

4.7 Discussion of Findings

From the descriptive statistics using mean, standard deviation and one sample t-test run on the dependent and independent variables, the following findings were discussed.

Majority of the respondents affirm to the practice of a culture of collaboration, trust, and learning which from literature (theoretical and empirical) is a veritable factor for KM effectiveness in an organization. This implies that the right culture is existent within these Nigerian organizations and they are change ready if management introduces KM initiatives. Because as the saying goes, when the level of trust in an organization nose dive, the speed of change also nose dive with it, and the costs of the change becomes high. The importance of this finding lies in the fact that the elements in an organization cannot achieve the overall corporate objectives unless there is trust, willingness to collaborate, and avenue for learning new things. As is evident, the organizations studied are rated amongst the 100 best firms in Nigeria. Their existing culture may have been part of the explanation for their good performance. This is so because tacit knowledge which resides within individuals in an organization is only likely to be shared in an environment where trust, collaboration, and opportunity for learning is existent. This supports the work of Adebisi & Idolor (2015); Lee & Choi (2003); Smith (2001); and Szuslanki, (1996). In essence, the organizational culture of the studied Nigerian firms are set for knowledge management effectiveness which will likely yield CA; hence, supporting extant literatures that culture is a KM infrastructure capability (KMIC).

Similarly, the structure in place as revealed by the study is that of centralization and formalization. This shows the extent of bureaucratic bottlenecks existent within the Nigerian firms. With this finding, it means that most of the organizations do not have flexible structure as to allow employees take decision without recourse to the supervisor which is what effective KM for CA requires. Having to get permission for every issue may play down creative and innovative abilities of employee. Literature review and empirical evidences suggest that a decentralized and flexible structure is likely to support KM effectiveness (Lee & Choi, 2003). This result lends credence to the very important role of organizational structure as a KM infrastructure capability.

Furthermore, the human resources (employees) of most of the organizations as evidenced by the mean and one sample t-test shows they are experts in their own field, and not only understood their job but also that of others, and therefore could be termed as possessing the t-shaped skill which is what effective KM requires (Leonard-Barton, 1995). This finding suggests that these Nigerian firms are not caught up with the popular slogan of god-fatherism in hiring of employees and offering of employment to those they know or relations; rather they go for the best of hands, employ the qualified and right people. Therefore in terms of employee skills, the firms are good to go on a KM initiative for CA. This supports Human resource as another KMIC.

In like manner respondents also confirm that they adopt business strategies which are analytical as they require a great deal of factual information and thorough analysis to support their decision making, as well as use several planning techniques. They are aggressive as they are ready to cut prices to increase market share and sacrifice profitability to gain market share. They are risk averse as they adopt a conservative view when making decisions, follow tried and true paths in their business operations. Extant literature and studies suggests an integration of KM strategy and business strategy (Hansen *et al*., 1999; Eisenhardt & Santos 2002).

Therefore, an organization with analytic, aggressive, and risk taking business strategy has adopted that as their plan for interacting with the competitive environments in order to achieve organizational goals. When this is fused with knowledge management initiatives, it will lead to a more robust knowledge management strategy which will be all inclusive and can yield CA. That is, involving both the personalization and codification strategies. This is because analysis may require both human and IT input, aggressive as a posture requires more of human resource with tacit knowledge to take meaningful and positive decision, while risk taking also involves both. This implies that the Food, Beverage and Tobacco firms in Nigeria represented by the studied organizations have the requisite business strategy which could be integrated with KM strategy. This supports business strategy as another KM enabler.

Furthermore, most of the firms affirm that their leaders support and encourage the creation, sharing, and use of knowledge, as they recognize the importance of these processes to business success. Extant literatures show that supportive leaders and a work environment that nurtures knowledge management are essential to success. When leaders recognize and reward people for understanding the entire knowledge process and for using their creativity and intuition at work, efforts to discover, use and share professional intellect will be more effective (Smith, 2001). The finding with the studied firms is an indication that leadership support is already in existence in the organizations and a good facilitator of KM for CA.

On the provision of IT support for communication among organization members, collaborative works regardless of time and place and for searching and accessing necessary information, majority of the respondents agree that there is provision for that. Literature and empirical studies suggest that IT support allows employees in multiple locations to learn as a group from a single or multiple sources at a single or multiple points in time (Nguyen, 2010; Lee & Choi,

2003). The study response implies the affirmation by firms that information technology support is another KMIC.

Greater percentage of the respondents agree that they have established process for getting information about their customers, generating new knowledge from existing knowledge, determining knowledge about new products/services within the industry; an indication that acquisition process is already in place in most of the responding organizations and the importance of acquisition process as one of the KM process capabilities (KMPC). This supports extant literature (Gold *et al*., 2001, Nguyen, 2010) which identified acquisition process as a KM capability.

The processes for absorbing knowledge from individuals to the organization, transferring knowledge from organization to individuals and converting competitive intelligence into plans of action are existent in most of the organizations given their response. This supports literature review and studies (Szuslanski, 1996; Gold *et al*., 2001) which identified knowledge conversion or transfer ability of an organization as very vital for KM effectiveness. This implies the acceptance of conversion process as a KMPC.

The organizations' response show that majority of them use knowledge to develop new products and services, apply knowledge learned from experiences and mistakes, use knowledge to solve new problems and improve efficiency. This is in line with the findings of empirical studies and literature review (Nguyen, 2010); Emadzade *et al*., 2012) which suggests that knowledge application process or usage is important for KM effectiveness and therefore seen as a KMPC.

From the responses, most of the firms indicate that knowledge is protected from theft from outside of the organizations, protected from improper use inside and outside of the

organization, and trade secrets are protected through extensive policies and procedures. Literature reveals the importance of protecting knowledge from inappropriate use or theft through using variety of policies, rules, procedures, incentives and technology (Gold *et al.*, 2001; Smith, 2006; Nguyen 2010). This makes the knowledge protection process an important capability.

The innovative practices of the firms were confirmed though they were unable to establish whether they had lower success rate in new product and service launch as against competitors. They constantly improve in their business processes, affirm that their products and services are perceived as novel by their customers, and the organizations are often at the cutting edge of technology in new product and service introductions. Further, most of the organizations have very broad demographic appeal and can reach all their customers; they also have marketing and advertising methods which draws more customers to them. Extant literature supports that sustainable competitive advantage is an outcome of innovation while innovation itself could be derived from the four processes of knowledge management (Ologbo & Nor, 2015). On the other hand continuous organizational innovativeness is an indication of CA (Shan & Zhang, 2009) and that good KM practices give rise to innovation in organization which in turn affects performance (Alrubaiee, Alzubi, Hanandeh, & Ali, 2015). In like manner, studies support that market share is positively related to profitability of an organization (Szymanski *et al.*,1993); If that is the case it implies that sustained market share is a good measure of CA for an organization. Notwithstanding the assumption, Armstrong & Green (2007) aver that market share stems from competitor oriented objectives and is considered an important generic aspect of competitive advantage since it demonstrates the ability of a firm to have a market position or share of the market different from its competitors. The firms under study therefore have demonstrated possession of innovation and market share abilities which is used to measure CA.

4.7.1 KM Infrastructure Capabilities and Competitive Advantage

The result from the test of hypothesis one using multiple regression, indicate that KM infrastructure capabilities (culture, structure, strategy, leadership support, human resource and information technology) significantly predict competitive advantage. This supports the work of Matin and Sabagh (2015); Adebisi & Idolor (2015); Theriou *et al*., (2011); Mills & Smith (2011); Nguyen & Neck (2009), Chuang (2004); Lee & Choi (2003); Gold *et al* (2001); Szuslanki (1996) but is contrary to the findings of Chiu and Chen (2016) which failed to establish a relationship between knowledge infrastructure capabilities and organizational effectiveness; as well as Nguyen (2010) which submits that social knowledge management infrastructure capability comprising culture, structure, people did not significantly and directly predict CA. Nguyen suggests that the elements of social knowledge infrastructure capability acting alone may seem significant predictors of CA, but when moderated by other factors, the effect is watered down.

An examination of the individual coefficients of the factors indicates that organizational strategy and information technology did not significantly predict competitive advantage; while all others (culture, structure, leadership, human resource) did. Nguyen's position may be used to explain the insignificant effect of strategy and IT in the multiple regressions even though the independent simple regressions and correlation results show significant relationship of both to CA. That is to say, the interaction effect of the other factors reduced the significance of strategy and IT. This finding on strategy tend to align with that of Theriou *et al*., (2011) which indicated an insignificant relationship between strategy and knowledge management effectiveness when other infrastructure resources are combined; but on the other hand, also supports Fazli and Alishahi (2012) study which established a direct relationship between business strategy and performance in a simple regression.

Given the outcome of this study from the Nigerian environment supporting previous studies, the possible reason for the insignificant effect of strategy and technology could be the fact that organizational strategy may have been subsumed in the culture of the organizations since as Needle (2004) puts it, organizational culture which includes the organization's vision, values, norms, systems, symbols, language, assumptions, beliefs, and habits is a product of factors like history, product, market, technology, strategy, type of employees, management style, and national culture; culture.

On the insignificance of IT, the findings of this study is in alignment with Khalifa & Liu, (2003), which posits that IT on its own has no direct effect on a firm's CA, rather, firms use technology to support and enhance their KM processes in other to promote organizational performance. It also agrees with Wong and Aspinwall (2005); Theriou *et al*, (2011), which states that IT is the least important factor in KM effectiveness, and should not be seen as a sole driver of knowledge management for CA since it is only a tool.

In essence, the study findings indicate that the infrastructures for effective KM that can yield and sustain CA are existent in the sampled organizations. It shows that the internal environment of these Nigerian firms in terms of cultural practice, t-shaped human resource skill, supportive leadership, strategic orientation, and IT support are good enough to enable competitive advantage through knowledge management. However, the organizational structures for most of the firms are largely centralized and formalized indicating the existence of bureaucratic principles which are ordinarily evident in the public sector and now in the private sector. Since this does not reflect flexibility in decision making, which is what KM for effectiveness requires, it is likely to stifle the knowledge processes. The importance of flexible structure is confirmed in line with the studies of Eppler & Sukowski (2000); Gold *et al*. (2001); and Nguyen (2010).

A culture of collaboration, trust and learning is existent within the Nigerian business environment as reflected by the response of these firms. This explains the fact that the elements in an organization cannot achieve the overall corporate objectives which include attaining and sustaining CA unless there is ability to trust and collaborate with one another, and readiness to learn new things. This finding is in line with the views of Adebisi & Idolor (2015); Lee & Choi (2003); Szuslanki (1996) that the aforementioned cultural practices are a veritable tool for KM effectiveness in organization.

In the same vein, the essentiality of human resource has been shown in this study in tandem with the views of Leonard-Barton (1995). This study has also shown how crucial organizational strategy of analyzing, aggressiveness and risk taking is to KM effectiveness and supports the study of Zheng *et al* (2010); Eisenhardt and Santos (2002). The study affirms the position of Singh (2008); Yukl & Van Fleet (1992) on the vital nature of leadership support in KM. The role of IT support was evidenced in this study in line with Nguyen (2010); Lee & Choi (2003); Khalifa & Liu (2003); Teece *et al.* (1997).

4.7.2 KM process capabilities and competitive advantage

Hypothesis two results show that the four variables (acquisition, conversion, application, and protection) measuring KM process capabilities combined show significant prediction of competitive advantage. This is in line with the studies of Chiu and Chen (2016) which found a significant positive effect of knowledge process capabilities on organizational effectiveness. It also supports the findings of Emadzade *et al* (2012), Nguyen (2010), Seleim and Khalil (2007), Gold *et al* (2001), and Grant (1996a).

The individual standardized beta coefficients however show that the conversion process was negatively and insignificantly related with CA since the p-value > 0.05; while the acquisition process was positively insignificant. This inverse relationship of conversion on CA is an indication that increasing the conversion process may decrease competitive advantage. This

may be looked at from the point of view that when too many people supposedly are aware of something it becomes an open-secret which may no longer be an advantage to the organization since some are bound to sell out this knowledge. Further, the inability of the acquisition process to significantly predict competitive advantage with the interaction from other variables shows that it is not necessarily the ability to generate or acquire knowledge that matters in CA.

Linking the insignificant effect of the conversion process to CA in Nigeria can be explained by the fact that most times transfer of knowledge through formal training in organizations are made for the "preferred employees" and not necessarily the "deserving employees". This implies that knowledge is being transferred to the wrong people that may be unable to use it. This negates the effect of the conversion process as an advantage to the organization. Similarly, the positive but insignificant effect of the acquisition process when related to Nigerian organizations whether public or private indicates that when it comes to searching for useful information or knowledge to solve problems, Nigerians are good at it, but after which the information is shelved and hardly used. Having more knowledge than the competitor should be an advantage, but the significance on CA will be on how it is applied.

On the other hand, the application and protection processes appeared the most crucial processes. This affirmed the studies of Cohen and Levinthal (1990), Seleim and Khalil (2007) which found that through knowledge utilization, acquired knowledge transforms from potential capability to dynamic capability which yields organizational performance. That is, a direct impact on CA will be felt when acquired knowledge that has been shared to the right people is put into use or applied. The view of Barney (1991), Smith (2006), and Gold *et al.* (2001) on the importance of protection of knowledge from inappropriate use or theft through using variety of policies, rules, procedures, incentives and technology was confirmed. This indicates a direct effect on CA and the need for an organization to secure its knowledge resource from misuse

and theft especially in an environment like Nigeria where people look out to steal others idea and patent at the slightest opportunity.

The study indicates that the processes for effective KM that can yield and sustain CA in terms of their knowledge acquisition, conversion of acquired knowledge, application or use of knowledge acquired, and protection of organizational knowledge from theft and incorrect use are available in the Nigerian organizations studied. The findings of this study provide a strong support for the knowledge based view of the firm which posits that the major source of competitive advantage rests in the ability to apply integrated knowledge resources and not in the ability to generate new knowledge or convert new knowledge as such (Grant 1996a).

The implication of the findings suggests that while the four main processes combine to determine the KM process capabilities, more emphasis and highlight should be placed on the application process so as to exploit different types and sources of knowledge to achieve organizational objectives. In addition, there is need to protect the valuable, rare and imitable resources acquired, converted and applied from being stolen in order to maintain CA (Barney, 1991; 1995).

4.7.3 Relationship between KM Infrastructure capabilities (KMIC) and KM process capabilities (KMPC)

The study findings of hypothesis three are contrary to the null assumption that KMIC will not be significantly associated with KMPC. A strong positive correlation was found between KMIC and KMPC. This relationship is in line with the findings of Nguyen (2010) which though divided the infrastructure capability into technical and social capabilities but found both associated with KMPC.

A cursory look at the correlations among the components of KM infrastructure capabilities supports and strengthens the view of the interrelationships consistent with extensive discussion in the literature of their interwoven nature (Lee & Lee 2007; Nonaka & Takeuchi 1995; Zheng

2005); while the correlations among the components of KM process capabilities aligns with the view of their interrelationships that is consistent with results of previous studies (Gold et al, 2001; Lee & Choi (2003); Smith, 2006). A further examination of their association may lead to an argument that one process leads to the other, and therefore they support each other. For instance, new knowledge acquired should be made useful through a conversion process, and then applied to achieve organizational objectives. Then, there is need to protect this new knowledge from illegal or inappropriate use or theft in order for it to remain as a CA.

On KM infrastructure capabilities components association for instance, if there is no supportive culture to stress the importance of the application of a particular technology in an organization, no matter what technology base is established, the rate of adoption may remain very low. In addition, technology will assist in overcoming space and time barriers for group interactions, enable knowledge workers to share their expertise and improve collaboration and communication among employees at all levels, all locations, irrespective of structural boundaries and across organisations.

However, lack of correlation was found between structure and conversion, and structure and application. This is expected since centralization and formalization as organizational structure creates a non participatory environment that reduces communication, commitment, and involvement with tasks among participants supporting Chen and Huang (2007) position. In essence, centralization hinders interactions among organizational members, prevents imaginative solutions to problems and innovation.

Of note is the strong and significant positive relationship between the four knowledge processes and information technology support. This is in accord with Emadzade *et al* (2012) which states that although information technology may not contribute directly to organizational performance; it is an essential infrastructure or enabler of other knowledge resources like acquisition, application which in themselves may enhance organizational performance. Followed by this is the relationship between culture and leadership; culture and human

resources; and between human resource and strategy. This again supports the findings of Theriou *et al* (2011) whose study indicated that of all the enablers of culture, strategy, leadership, people, and information technology, only culture and leadership are statistically significant. This brings to fore the important dynamic capability theory which implies a flexible culture coupled with people with flexible skills (T-shaped), in addition to a believing and supportive leadership which will craft a strategy leading to an internal environment where knowledge capture, creation, sharing, and transfer of knowledge could flourish (Theriou *et al,* 2011). It implies that the ability to manage knowledge very well depends on how well cultural values are translated into value for the organization (Zheng *et al*, 2010; Smith 2006). This is due to the belief that culture is a determinant of basic beliefs, values, and norms regarding the why and how of knowledge generation, sharing and utilization in organization (Zheng *et al,* 2010).

Moreover, the culture of an organization for KM effectiveness is determined to a large extent by the support of leadership or top management of the organization. The level of flexible interaction or relationship existing among these (culture, employees and leaders) will lead to a dynamic or decentralized structure which facilitates a knowledge-friendly environment (Zheng, *et al.,* 2010) and may for instance reflect the kind of organizational structure talked about by Nonaka and Takeuchi (1995) which is intricately tied to the knowledge culture of the organization.

A further look at the interrelationship between the variables of KMIC and that of KMPC show that except for structure and conversion; and structure and application, all other infrastructure and process capabilities are significantly correlated. The result also shows that all the infrastructure capabilities variables on their own are significantly correlated; so also all the process capabilities are significantly correlated. The findings support the theoretical suggestion

by Khalifa & Liu (2003) for more researches to be carried out on the relative importance of the various KMIC in relation to KMPC.

4.7.4 KM infrastructure and KM process capabilities on competitive advantage.

The multiple regression analysis shows that jointly KMIC and KMPC significantly predicted competitive advantage even though greater per cent of the influence was from the KMPC. The findings support the studies of Zaied, Hussein & Hassan (2012), Gold *et al*. (2001) which showed that both knowledge infrastructure capability and knowledge process capability have a significant and positive effect on organizational effectiveness. It aligns with the study of Zack *et al.* (2009) which found that knowledge management practices are related to measures of organizational performance. This study partially affirms Nguyen (2010) study which established that KM process capability is a significant positive predictor of CA, whereas Technical KM and Social KM infrastructures both have insignificant direct effect on CA. This study is in line with Lee & Sukoco (2007), which observed that knowledge management capabilities affect innovation and organizational effectiveness, while Gosh & Scott (2007) argue that knowledge infrastructural capabilities such as technology, organizational culture and organizational structure, need to correspond with knowledge process capabilities (e.g. actual flow and use of knowledge) in order to achieve significant improvements in effectiveness. This work supports their findings. Again the finding that the greater prediction or variance on CA comes from the KM process capabilities is in consonance with Nguyen (2010). The implication of this is that as much as the infrastructures are important in determining CA, the actual practice or processes of acquiring, converting, applying and protecting organizational knowledge is more crucial.m

4.7.5 Discussion of Other Results (Post Hoc)

The single and combined effect of each of culture, structure, strategy, leadership support, human resource, and information technology on innovation and market share was determined through simple and multiple regression analysis. A significant relationship existed between all the six variables and innovation, while for market share only organizational structure was not significantly related. Results from correlation analysis also indicate significant association of each of the six variables with innovation and all except structure with market share.

Similarly, the single and combined effect of acquisition, conversion, application, and protection processes on innovation and market share was examined through simple and multiple regression analysis respectively. The result showed individual significant relationship of the four variables with innovation and market share. The multiple regression analysis showed that the four variables are significant predictors of innovation and market share. However, the conversion and acquisition process influenced by other factors did not significantly predict innovation with their p values > .05; while the acquisition and conversion process influenced by other factors also did not significantly predict market share with p values > .05. The result of the correlation analysis further confirms the significant relationship between the four variables with innovation and market share.

4.7.5.1 KM Infrastructure Variables and Innovation

The finding on innovation and human resource is in agreement with the theoretical arguments of Leonard & Sensiper (1998) that the social interaction between individuals is essential in the innovation process; along with Vieites and Carlo (2011) empirical study which finds that human resources positively influence research and development (R&D) activities which in turn have a positive effect on innovation. That is to say, if organizations employ people with t-shaped skills, it is likely that their knowledge which cuts across will affect positively their research and development ability which in turn affects the ability to innovate at the end of the

day. Furthermore their findings also support that technological support and organizational resources affect innovation, even as innovation has a positive effect on firm's performance.

On innovation and structure, the result is in line with the studies of Jensen *et al*., (2007) which affirms the relationship between innovation and structure but however opine that classical organizational configurations may not be appropriate for companies seeking superior product and process innovative performance. That more flexible and agile structures are required, structures that allow interaction and communication between employees, without rigidly defined functional areas, but with functional integration instead. Perhaps, "adhocratic" or organic structure would permit the development of knowledge based on practical experience and interaction, and consequently leveraging the organization's innovative capacity. Zarifian in Marotti de Mello (2008) support that such organizational configurations would be better for a dynamic environment such as the innovative environment which deal with unforeseen and chance occurrences; thereby buttressing the dynamic capabilities view that even though resources remain the same, the environment of business does not and so application of such resources will have to be dynamic.

On the relationship with culture, the result of this work agrees with that of March-Chorda and Moser (2008) which found that different characteristics associated with different cultural dimensions were correlated with innovation. However, it contradicts the findings of Yesil and Kaya (2012) which empirically studied culture along four dimensions of clan, adhocracy, market oriented and hierarchy; and established a relationship only between adhocracy culture and innovation, even though they do not claim that other cultural dimensions are not related to innovation but calls for further studies on them. The finding on leadership and innovation aligns with the study of Theriou *et al*. (2011) which proved a strong positive relationship between leadership support and knowledge management effectiveness; and KM effectiveness according to Gold *et al.* (2001) enables a firm to become innovative, harmonize its efforts

better, commercialize new products quickly, foresee surprises, and become more responsive to market change. Similarly, Jung *et al.,* (2003) reported a positive influence of transformational leadership on organizational innovation. The important thing here is that irrespective of the type of leadership style, their support to knowledge management initiatives which enable innovation and in turn CA is what matters.

In terms of organizational strategy and innovation using STROBE, this study's findings is in agreement with the findings of Zheng *et al.,(*2010), which established a relationship between strategy and organizational effectiveness, and part of the measure for organizational effectiveness includes market share, profitability and innovativeness of the organization in comparison with key competitors. It also supports the work of Talke (2007), which found that a pronounced analytical, aggressive, yet risk averse strategic posture toward market and technology was positively related to new product performance.

Results from the multiple regressions show that combined, the KM infrastructure variables are significant predictors of innovation. However, the influence of the factors on one another reduced the effect of culture, strategy, leadership support, and IT support with p-values greater than the level of significance, as can be seen from their individual coefficients. This supports the work of Theriou *et al*., (2011) which proved a positive relationship between KM Enabler factors and knowledge management effectiveness; and KM effectiveness according to Gold *et al.,*(2001) enables a firm to become innovative, harmonize its efforts better, commercialize new products quickly, foresee surprises, and become more responsive to market change.

4.7.5.2 KM Infrastructure Capabilities Variables and Market Share

There appear to be a dearth of direct studies to support the findings of each of the six factors on market share. However, the study of Sin & Tse (2000) found that organizational cultural values were significantly associated with marketing effectiveness; while on structure and market

share, the findings is contrary to Zaied, Hussein, & Hassan (2012) that found a high positive correlation between structure and market share. Autrey, Bova, & Soberman (2014) in their study found that decentralization leads a firm to make aggressive production decisions, which leads to lower prices and higher market share for the firm unlike centralization. This shows that there is a relationship between structure and market share but the significance or otherwise may be determined by the design. This can explain the insignificant relationship found in this study between structure (measured by centralization and formalization) and market share, though there may be other reasons which further study can explore.

DeTienne, Dyer, Hoopes, and Harris (2004); Theriou *et al*., (2011) found a strong positive relationship between knowledge management effectiveness (measured through leadership support, culture, strategy, people, and information technology) and firm performance (measured using market share and profitability). Their study indicates that the combined effect of all the infrastructures showed significant relationship with market share (firm performance); but the interaction of the factors reduced the effect of strategy, people, and information technology as they were not significantly related with market share, independently. This study supports their finding as information technology was not significant with market share when the factors interact, supports also the findings of Zaied, Hussein, & Hassan (2012) which found a strong relationship between IT and market share. However, structure had an inverse significant effect with market share as could be seen by the negative slope in the joint effect. This is a deviation from the simple regression analysis between structure and market share earlier reported which demonstrated an insignificant relationship; implying that the interaction effect with other infrastructures brought about this change. This study also aligns with the study of Zheng *et al.,* (2010) which found a negative significant relationship of structure and market share in their measure of relationship between organizational effectiveness (measured through market share, profitability, innovativeness), and strategy, structure, and culture.

A look at the correlation result in this study showed that there was no significant relationship between centralization, formalization (part of measures for structure) and market share. Literature revealed that centralized structure hinders communication flow and the ease of interaction or sharing of ideas due to time-consuming communication channels; it also causes distortion and discontinuing of ideas (Stonehouse & Pemberton, 1999). A decentralized organizational structure on the other hand has been found to facilitate an environment where employees participate in the knowledge building process more spontaneously. Knowledge processes require flexibility and less emphasis on work rules (Ichijo *et al.,* 1998). Therefore, an increased flexibility in organizational structure can result in activated knowledge management activities.

In summary, the interaction of the six variables showed that combined, they are significant predictors of market share. However, information technology with the interaction of other factors was found to be insignificant; while structure had an inverse significant effect.

4.7.5.3 KM Process Capabilities Variables and Innovation

The findings show that each of the variables of acquisition, conversion, application and protection processes was significantly positively related to innovation. This supports partially the work of Emadzade *et al.* (2012) and Matin & Sabagh (2015) which found that knowledge acquisition, knowledge application and knowledge protection impacted organizational performance, but not knowledge conversion. It confirms also the work of Shu-Hsien, Chi-Chuan, Da-Chian & Guang-An (2009) which identified a statistically significant positive relationship between knowledge acquisition and firm's innovation capability; as well as the findings of Gold *et al*., (2001) which established a positive relationship between the knowledge processes of acquisition, conversion, application, protection and organizational effectiveness of which innovation was part of the measures. In this study, the effect of interaction between the

variables reduced the effect of conversion and application processes to being insignificant on innovation.

4.7.5.4 KM Process Capabilities Variables and Market share

The findings show that each of the variables of acquisition, conversion, application and protection processes was significantly positively related to market share. This result supports partially the findings of Rasoulinezhad (2011) which looked at the role of knowledge management processes on organizational performance in commercial banks of Iran. Their measure of performance includes three perspectives of organizational financial performance (OFP), organizational market performance (OMP) and organizational employee performance (OEP). The result showed a significant relationship between knowledge management processes and performance of the organizations. Interestingly, of the three measures, organizational market performance (Market share) had the highest correlation. On an individual basis, knowledge utilization (application) showed a moderate correlation (of 0.58), whereas knowledge acquisition and knowledge distribution (conversion) showed a very weak correlation. Knowledge creation and storage indicated a negative correlation with performance.

The multiple regressions indicated that combined, the variables had a significant positive relationship with market share. However, the interaction effect of the four processes reduced the influence of acquisition to negative insignificance and conversion to positive insignificance.

CHAPTER FIVE
SUMMARY OF FINDINGS, CONCLUSIONS, RECOMMENDATIONS, CONTRIBUTIONS TO KNOWLEDGE, AND SUGGESTIONS FOR FURTHER STUDIES

5.1 Preamble

This study set out to identify and confirm the KM capabilities that could aid competitive advantage within the Nigerian firms since Nigerian businesses like others in the world are heterogeneous and also inundated with the issue of the knowledge era and competitive advantage. This is against the background that the age old lever of competition is fast changing from the traditional sources to knowledge sources; implying that the management of organizational knowledge is the in thing. To this effect, some factors were identified and tested in some environments as KM infrastructure capabilities and others as KM process capabilities which either in isolation or combined, affect competitive advantage. It was necessary to establish if the Nigerian firms through the analysis of the responses will affirm and confirm same factors as capable of influencing CA in the Nigerian environment; and to also establish which factors in particular has the most effect. The interrelationship between KM capabilities was explored so as to highlight their valuable integrated contribution to the organizational outcome.

A notable difference from previous studies of KM capabilities is the addition of human resource, strategy, and leadership support as part of KM infrastructure capabilities. In concrete terms, the study confirms that KM infrastructure capabilities (KMIC) and KM process capabilities (KMPC) are two distinct but related components which constitute the overall KM capabilities (KMC) of the firm. The model viewed the different KMIC elements in isolation as well as in their interwoven nature. This makes possible, an estimate of the impact of each infrastructure capability on CA as well as their collective outcome. Similarly, the different KM

process capabilities elements were viewed as well as their interwoven nature, in order to estimate the effect of each process capability and collective effect on CA. Finally, the interrelationships between KM capabilities were investigated to emphasize their valuable integrated contribution to the organizational CA.

5.2 Summary of Findings

From the analyzed data, the empirical findings of this study can be summarized as follows:

a) KM infrastructure capabilities comprising culture, structure, IT, as well as leadership support, human resource (t-shaped skill) and business strategy significantly predict CA. This is evidenced from the findings which indicate an R^2 of .477, F = 34.437, and $p < 0.05$, showing a good model fit of the variables, though more influence came from leadership support and human resources.

b) KM Process capabilities comprising acquisition, conversion, application, and protection significantly and positively affect competitive advantage as shown by $R^2 = .299$; F = 24.397; $p<0.05$ even as their independent coefficients show more influence from the protection and application processes.

c) Both KM infrastructure and process capabilities are strongly correlated as can be seen from the coefficient of correlation ($r =.739$; $p<0.01$); while different levels of association from strong to weak exists between the individual variables, even as structure and conversion; structure and application were not associated.

d) KM infrastructure and KM process capabilities combined predict competitive advantage with an $R^2 =.246$; F=37.646; $p<0.05$; even as the individual coefficients show that KMPC had more effect on CA.

e) The infrastructure capabilities independently predict innovation significantly; combined, they also significantly predict innovation ($R^2 = 0.333$, F = 18.850, $p < 0.05$) but more influence from structure (0.343, $p < 0.05$) and human resource (0.170, $p <$

0.05) even as the effect of culture, strategy, leadership support and IT support, were reduced as their coefficients showed p-values > 0.05 level of significance.

f) All infrastructure capabilities except structure independently predict market share significantly. Combined also, they predict market share but with more influence from culture while the effect of IT was reduced (.958 >.05) and structure had an inverse significant relationship (-.126, $p < .05$) with market share.

g) Evidence from the results show that KM process capabilities independently and combined significantly affect innovation. Combined, it was shown that there was more influence from the acquisition process (0.457, $p < 0.05$) and protection process (0.299, $p < 0.05$), while the conversion and application processes were rendered insignificant with p-values > 0.05.

h) The KM process capabilities independently and combined significantly affect market share as implied by the results of data analyzed. The application (0.504, $p < 0.05$) and protection (0.164, $p < 0.05$) processes made more contribution to the combined effect, while acquisition had an inverse insignificant effect and conversion process insignificant with p-values > 0.05.

Summary of findings from the descriptive analyses indicate that:

i. Majority of the studied FOBTOB firms in Nigeria affirm to the practice of a culture of collaboration, trust, and learning, given the results of the mean, t-test and p-values (Mean = 5.2058; t = 19.040; $p < 0.05$) respectively. Thus supporting organizational culture as one of the KM infrastructure capabilities.

ii. Most of the firms agree that the structure in place is centralized and substantially formalized as shown by the result (Mean = 4.1351; t = 1.817; $p > 0.05$) even though literature posits that a decentralized or flexible structure impacts better on competitive advantage of a firm.

iii. Evidence from the study show that most of the organizations hire and retain people (Human resource) with T-shaped skill as indicated by the result (Mean = 5.2808; t = 17.272; $p < 0.05$) since knowledge resides with the individuals and the wealth of their knowledge within the departments and across is likely to yield success for the organization.

iv. Majority of the firms agree to adopting business strategies that are analytical, aggressive, and risk averse as shown by the results of the descriptive analyses (Mean = 5.1169; t = 17.886; $p < 0.05$). Analytical as they require a great deal of factual information and thorough analysis to support their decision making, as well as use several planning techniques; aggressive as they are ready to cut prices to increase market share and sacrifice profitability to gain market share; and risk averse as they adopt conservative view when making decisions, follow tried and true paths in their business operations.

v. The analyses show that the firms under study affirm that their Leaders support and encourage creation, sharing, and use of knowledge, as they recognize the importance of these processes to business success. This is obvious from the descriptive analyses result which showed Leadership support variable with Mean = 5.5548; t = 21.854, $p < 0.05$.

vi. Majority of the organizations provide IT support for communication among members, collaborative works regardless of time and place and for searching and accessing necessary information as posited by the results of descriptive data analyses showing Mean = 5.5624; t = 21.196; $p < 0.05$.

vii. Most respondents affirm that their organizations have processes for getting information about their customers, generating new knowledge from existing knowledge, determining knowledge about new products/services within the industry, as suggested by the result which shows Mean = 5.5068; t = 20.972, $p < 0.05$.

viii. The descriptive results of Mean = 5.2372; t = 16.226, $p < 0.05$ is a suggestion that the process for absorbing knowledge from individuals to the organization as well as transferring knowledge from organization to individuals and converting competitive intelligence into plans of action is existent in the organizations.

ix. The descriptive results of Mean = 5.6077; t = 20.435 $p < 0.05$ is an indication that the majority of the organizations apply acquired knowledge to develop new products and services, apply knowledge learned from mistakes and experiences and also use knowledge to solve new problems and improve efficiency.

x. The organizations affirm to the existence of mechanisms which protect their knowledge from theft and improper use outside and within the organization, and protect trade secrets through extensive policies and procedures as implied by the results of the descriptive analyses with Mean = 5.3431; t = 19.096; $p < 0.05$.

xi. Organizations agree that they have innovative practices and constantly improve on their business processes, have very broad demographic appeal and can reach all their customers; and have marketing and advertising methods which draws more customers to them. This is shown in the result of the descriptive analyses with Mean = 5.2361; t = 24.528; $p < 0.05$.

5.3 Conclusions

Given the summary of findings, the study concludes that:

i. KM infrastructure capabilities significantly affect competitive advantage (CA) with more influence from leadership support and human resources.

ii. KM Process capabilities significantly influence CA with greater influence from the protection and application processes.

iii. There is a significant positive relationship between KM Infrastructure Capabilities (KMIC) and Knowledge Management Process Capabilities (KMPC).

iv. KMIC and KMPC combined have significant influence on competitive advantage, but with more effect from the KMPC.

v. KM infrastructure capabilities independently and combined significantly affect innovation but with more influence from structure and human resource.

vi. Among the KM infrastructure capabilities only structure does not independently affect market share but combined, they all significantly affect market share and with more influence from culture, leadership support and human resource.

vii. KM process capabilities independently and combined affect innovation significantly and positively with greater influence from acquisition and protection processes.

viii. KM process capabilities independently and combined significantly and positively affect market share with the application and protection processes making more contribution to the model.

ix. Majority of the studied firms in Nigeria affirm to the practice of a culture of collaboration, trust, and learning

x. Most of the firms agree that the structure in place is centralized and substantially formalized.

xi. Majority of the organizations human resources are experts in their own field, not only understood their job but also that of others, and could be termed as people with t-shaped skill.

xii. Majority of the firms adopt business strategies that are analytical, aggressive, and risk averse.

xiii. Leaders of the studied firms support and encourage creation, sharing, use and protection of knowledge.

xiv. The firms have IT support for communication among members and collaborative works regardless of time and place, and for searching and accessing necessary information.

xv. Most of the organizations have processes for acquiring or generating knowledge, converting or transferring knowledge, applying or utilizing knowledge, and protecting or securing organizational knowledge from theft and improper use.

xvi. Most of the organizations engage in innovative practices, have broad demographic appeal to reaching their customers, as well as marketing and advertising methods which expands their market share.

5.4 Recommendations

Based on the findings and conclusion, the study recommends as follows:

1. That organizational managers and knowledge management implementation members should incorporate leadership support, human resource (t-shaped skill) and business strategy as part of KM infrastructure capabilities in addition to culture, structure, and information technology proposed by Gold *et al* (2001) in order to make their KM infrastructure capabilities more robust; and great attention should be paid to leadership support and human resource with t-shaped skill because of their direct and strong influence on CA. However, irrespective of the various KM infrastructure capabilities stand alone contributions to CA, their combination or interaction effect is stronger and will yield better results in predicting firms' CA.
2. Leadership support is a critical success factor and a major hindrance to knowledge management initiative. Every organization willing to succeed or achieve competitive advantage via knowledge management must take seriously the leadership support infrastructure. This is very imperative because if the leaders do not believe in the KM initiatives and support it wholeheartedly through creating a motivating, encouraging and appreciative environment that will enable acquiring, creating, sharing, and transfer of knowledge, such KM projects might hit the rock. Leadership should have faith in the programme first, understand it and help in pushing all other infrastructures that will enable

KM create CA for the organization. Leadership participation also sends out positive signals of the desirability and benefits of the KM initiative to its employees.

3. The importance of human resources cannot be overemphasized as literature reveals that tacit knowledge resides in the heads of people, especially people with t-shaped skills. The t-shaped skilled people have very versed and deep knowledge which span across other functional areas and a requirement for KM programmes. Such people whether existing in the organization already or newly hired should be motivated and encouraged to give their best especially in terms of willingness to share and apply knowledge. Organizations should do all to retain them as their exit also implies loss of a CA.

4. Organizational culture that encourages collaboration, trust and learning is very crucial and a critical success factor in the management of knowledge within an organization. An organizational setting which does not allow for continuous learning to improve its human resource, employees are unwilling to work together, and lack trust in one another for whatever reason, cannot amount to achieving CA. Managers and leaders must create and encourage collaboration, lay foundation for trust, and ensure learning opportunities are created for their employees. This again supports the reason leadership support has the most influence on CA.

5. Organization's strategy should incorporate KM strategy. This is because organizational strategy is very crucial and involves plans for interacting with the competitive environments so as to achieve the missions, goals, and secure the status of competition ((Daft, 1995; Gronhaug & Nordhaug, 1992). The result of the correlation between organizational strategy and CA allude to this even though the effect is insignificant in the multiple regressions. Moreover, all the strategic steps (Analytic, aggressive, and risk taking), revolve around knowledge generation or acquisition, conversion or transfer,

application or use, and storage/protection; and require all of organizational capabilities (culture, structure, leadership, people, information technology etc) for support. For instance after analysis, the knowledge strategy to be used for the organization becomes obvious; whether it is codification (extract knowledge from people, codify and capture in repositories so that it can be accessed and reused), or personalization (sharing via person-to-person contact and dialogues) or both? This is the role of integrating organizational and knowledge strategies.

6. Since the KM Process capabilities combined predicts CA, it is recommended that all four processes be paid attention to. However, great attention should be paid to KM protection and application processes giving their very strong correlation and significance with CA. If a firm's resources which are valuable, rare, imitable and organized must remain a sustained source of CA to the organization, then it needs to adopt a security oriented process to ensure that the resources are protected. Further, the application process is very important in transforming a firm's potential capability to a realized and dynamic capability that will earn CA; but whatever knowledge has to be applied must have been acquired and converted. Though the acquisition and conversion processes were not statistically significant with CA, they are correlated however, and should be taken as important just like the application and protection process in order to achieve CA. This is because if there is no process of acquiring and converting knowledge, then there will be no knowledge to apply to influence an organizational CA.

7. KM Infrastructure Capabilities (KMIC) and KM Process Capabilities are correlated; and together they predict CA. Hence, organizations wishing to embark on knowledge management initiatives should not concentrate efforts on the infrastructure capabilities or process capabilities alone as this will alter the interwoven nature of the factors going by the very strong and positive correlations observed among them. For instance, the importance of

IT infrastructure on the four KM process capabilities was very evident in the correlation results as shown in table 4.27. Therefore, the interaction of the KMIC and KMPC at any point in time will bring about CA.

8. The study recommends that for organizations wishing to be more innovative, they should work more on their structure first, followed by their HR and leadership support, then culture, and followed by others. In addition they need to prioritize their KM processes in this order; first intensify their protection process, increase acquisition or creation process, followed by the use or application process, before the conversion process.

9. Companies wishing to increase their market share needs mostly to work on their cultural practices, examine critically their leadership support, human resource, strategy, and followed by structure, then IT. They in addition needs to prioritize their knowledge processes by giving attention to the application process first, followed by the protection process, then acquisition process and finally conversion process.

10. This study recommends that appropriate investment in KM initiatives can enhance competitive advantage, though not all the capabilities are direct contributors. However, firms cannot afford to neglect the indirect contributors as they work in combination with and support other capabilities which contribute directly to organizational competitive advantage.

5.5 Contributions To Knowledge

i. This study has successfully extended the Gold *et al.* (2001) model with the inclusion of leadership support, human resource, and organizational strategy constructs as part of KM infrastructure capabilities; of which human resource and leadership support top the list of factors influencing competitive advantage.

ii. This study has added to the current body of knowledge in CA and KM by combining the RBV blended with KBV and DCV to develop an all inclusive model of KM capabilities and CA for firms.

iii. Using innovation and market share as measures for competitive advantage this study has been able to establish that for effective innovative practices, a flexible and decentralized structure, t-shaped human resource, and leadership support are very crucial infrastructure capabilities as well as the processes of knowledge protection and acquisition. However, increase in market share requires a culture of trust, collaboration and learning, leadership support, human resource as well as application and protection processes.

iv. Applying the strategic orientation of business enterprise (STROBE) approach other than the regularly used approaches, this study established that organizational strategy as a capability is more correlated with market share than innovation. However, it is observed that acting alone in a regression, organizational strategy had a significant effect on CA but acting jointly with other constructs, the effect becomes insignificant.

v. This study identified and established KM infrastructure and process capabilities which have direct and indirect effect on CA. The indirect contributors however should not be ignored as they support other capabilities which contribute directly to CA.

vi. The study has further increased the information base of managers of the FOBTOB and indeed other managers of manufacturing firms on the relative importance of firm specific resources and capabilities useful in managing knowledge for CA in today's changing business environment.

vii. Integrative studies of KM capabilities and CA earlier conducted in some developed and developing nations have also been accomplished in Nigeria through this study using the food, beverage and tobacco firms.

5.6 Suggestions for Further Studies

This study can be taken further by other researchers thus:

a. Extend the work to other manufacturing and service industries.
b. Empirically ascertain and compare the extent to which KM initiatives for CA are pursued within the manufacturing or service industry.
c. Examine if KM process capabilities could act as mediators or moderators between KM infrastructure capabilities and CA.
d. Subjective measure was used for market share in competitive advantage; future study can consider objective measures for market share.
e. Empirically ascertain the possibility of integrating KM strategy into organizational or business level strategy to achieve KM effectiveness.

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APPENDIX 1

Dept of Business Administration
University of Lagos, Akoka, Yaba, Lagos

Questionnaire

Dear Respondent,

I am a Ph.D. student conducting a study on my final thesis. Kindly provide appropriate answers to the statements below. Please note that your responses remain confidential and will be used solely for the purposes of research. Thank you.

Alaneme, Gloria C. (Mrs.)

Please indicate by ticking in the appropriate box (√) the extent to which you agree or disagree with each of the statements as it applies to your organizational practice of managing knowledge. The following scale is applied for all statements:

SD = 1	D = 2	SID = 3	N = 4	SIA = 5	A = 6	SA = 7
Strongly Disagree	**Disagree**	**Slightly disagree**	**Neutral**	**Slightly Agree**	**Agree**	**Strongly Agree**

1. Organizational Culture (Collaboration, Trust, Learning)

SN	**Collaboration**	SD	D	SID	N	SIA	A	SA
	In our organization…							
Col1	Members are satisfied by the degree of collaboration							
Col2	Members are supportive							
Col3	Members are helpful							
Col4	There is a willingness to collaborate across organizational units within our organization							
Col5	There is a willingness to accept responsibility for failure							
SN	**Trust**							
	Our company members…							
Tru1	Are generally trustworthy							
Tru2	Have reciprocal faith in other members' intentions and behaviours							
Tru3	Have reciprocal faith in others' ability							
Tru4	Have reciprocal faith in others' behaviours to work toward organizational goals							
Tru5	Have reciprocal faith in others' decision toward organizational interests than individual interests							
Tru6	Have relationships based on mutual trust							
SN	**Learning**							
	Our company…							
Lea1	Provides various formal training programs for performance of duties							
Lea2	Provides opportunities for informal individual development other than formal training such as work assignments and job rotation							
Lea3	Encourages people to attend seminars, symposia, and so on							
Lea4	Provides various programs such as clubs and community gatherings							
Lea5	Members are satisfied by the contents of job training or self-development programs							

2. Organizational Structure (Centralization, Formalization)

SN	Centralization	SD	D	SID	N	SIA	A	SA
	Our organization members...							
Cen1	Can take action without a supervisor (R)							
Cen2	Are encouraged to make their own decisions (R)							
Cen3	Do not need to refer to someone else (R)							
Cen4	Do not need to ask their supervisor before action (R)							
Cen5	Can make decisions without approval (R)							
SN	**Formalization**							
	In our company…							
For1	There are many activities that are not covered by some formal procedures(R)							
For2	Contacts with our company are on a formal or planned basis							
For3	Rules and procedures are typically written							
For4	Members can ignore the rules and reach informal agreements to handle some situations (R)							
For5	Members make their own rules on the job (R)							

3. Human Resource (People with T-Shaped Skills)

SN	T-Shaped Skills	SD	D	SlD	N	SIA	A	SA
	Our company members …							
Tss1	Understand not only their own tasks but also others' tasks							
Tss2	Can make suggestion about others' task							
Tss3	Can communicate well not only with their department members but also with other department members							
Tss4	Are specialists in their own part							
Tss5	Can perform their own task effectively without regard to environmental changes							

4. Organizational Strategy (Analytical, Aggressive, Risk Taking)

SN	Analytical	SD	D	SlD	N	SIA	A	SA
	In our organization…							
Ana1	We emphasize effective coordination among different functional areas							
Ana2	We require a great deal of factual information to support our day-to-day decision making							
Ana3	We usually try to develop thorough analysis when confronted with a major decision							
Ana4	We use several planning techniques							
Ana5	We use the outputs of management information and control systems							
Ana6	We commonly use manpower planning and performance appraisal of senior managers							
SN	**Aggressive**	SD	D	SlD	N	SIA	A	SA
	In our organization…							
Agg1	We often sacrifice profitability to gain market share							
Agg2	We often cut prices to increase market share							
Agg3	We often set prices below competition							
Agg4	We often seek market share position at the expense of cash flow and profitability							
SN	**Risk Taking**							
	Our company…							
RT1	In general, our mode of operations is riskier than our							

	competitors'							
RT2	We adopt a rather conservative view when making major decisions							
RT3	Our business operations generally follow 'tried and true' paths							
RT4	We tend to be risk-averse							

5. Leadership Support

SN	Leadership Support	SD	D	SlD	N	SIA	A	SA
	In our organization…							
LS1	Leaders encourage knowledge creation,sharing and use							
LS2	Management recognizes knowledge management as important to business success							
LS3	Management demonstrates support for knowledge management							
LS4	Management establishes the necessary conditions for knowledge management							

6. Information Technology (IT) Support

SN	Information Technology (IT) Support	SD	D	SlD	N	SIA	A	SA
	Our organization provides IT support…							
ITS1	For collaborative works regardless of time and place							
ITS2	For communication among organization members							
ITS3	For searching and accessing necessary information							
ITS4	For simulation and prediction							
ITS5	For systematic storing							

7. Acquisition process

SN	Acquisition process	SD	D	SlD	N	SIA	A	SA
	My organization has processes for …							
AC1	Getting information about our customers							
AC2	Generating new knowledge from existing knowledge							
AC3	Acquiring knowledge about our suppliers							
AC4	Distributing knowledge throughout the organization							
AC5	Determining knowledge about new products/services within our industry							
AC6	Exchanging knowledge between people							
AC7	Inquiring about our competitors and their activities							

8. Conversion Process

SN	Conversion Process	SD	D	SlD	N	SIA	A	SA
	My organization has processes for …							
CV1	Absorbing knowledge from individuals into the organization							
CV2	Filtering knowledge							
CV3	Transferring organizational knowledge to individuals							
CV4	Replacing outdated knowledge							
CV5	Integrating different sources and types of knowledge							
CV6	Organizing (Storing/filing) knowledge							
CV7	Converting competitive intelligence into plans of action							

9. Application Process

SN	Application Process	SD	D	SlD	N	SIA	A	SA
	My organization has processes for …							

AP1	Using knowledge to solve new problems							
AP2	Using knowledge to develop new products and services							
AP3	Using knowledge to improve efficiency							
AP4	Locating and applying knowledge to changing competitive conditions							
AP5	Applying knowledge learned from mistakes							
AP6	Applying knowledge learned from experiences							
AP7	Matching sources of knowledge to problems and challenges							

10. Protection Process

SN	**Protection**	SD	D	SlD	N	SIA	A	SA
	My organization has processes that …							
PP1	Protect knowledge from theft from within the organization							
PP2	Protect knowledge from theft from outside the organization							
PP3	Protect knowledge from inappropriate use inside the organization							
PP4	Protect knowledge from improper use outside the organization							
PP5	Values and protects knowledge embedded in individuals							
PP6	Clearly communicates the importance of knowledge protection							
PP7	Protects trade secrets through extensive policies and procedures							

11. Competitive Advantage (Innovation and Market Share)

SN	**Innovation**	SD	D	SlD	N	SIA	A	SA
Inn1	In new product and service introductions, our company is often first-to market							
Inn2	Our new products and services are often perceived very novel by customers							
Inn3	New products and services in our company often take us up against new competitors.							
Inn4	In comparison with our competitors, our company has introduced more innovative products and services during the past five years.							
Inn5	In comparison with our competitors, our company has a lower success rate in new products and services launch. (R)							
Inn6	We are constantly improving our business processes.							
Inn7	In new product and service introductions, our company is often at the cutting edge of technology.							
Inn8	Our Company changes production methods at a great speed in comparison with our competitors.							
Inn9	Rivals usually find it difficult and expensive to duplicate our products and services							
S/N	**Market Share**							
MS1	Compared to competitors our organization enjoy greater percentage of the market share							
MS2	We differentiate our products and lower prices in order to draw more customers							
MS3	My organization has a very broad demographic appeal, and can reach all its customers							
MS4	Compared to competitors, our marketing and advertising method draws more customers to us.							
MS5	Our market position creates strong barriers for entry for other firms							

BACKGROUND INFORMATION

1. **Name of your organization**:…….....
2. **Gender:** (1) Male (2) Female
3. **Age:** (1) Under 35 years (2) 35 < 45 (3) 45 < 55 (4) 55 and above
4. **Highest level of qualification:** (1) WAEC/O'level (2) NCE/OND (3) HND/BSc/BA (4)Masters Degree/PGD (5) Doctorate (6) Others
5. **Current position in the organization:** (1) President/Chairman (2) Managing Director/CEO (3) General Manager (4) Sales/Marketing Manager (5) Finance/Accounting Manager (6) Human Resource Manager (7) R & D Manager (8) Information Technology Manager (9) Operations/Production Manager (10) Others (please specify) ……
6. **Length of service:** (1) Less than 5 years (2) 5 – 10 years (3) 11 – 15 years (4) 16 – 20 years (5) More than 20 years

Thank you for finding time to complete this questionnaire.

APPENDIX 2

SIMPLE LINEAR REGRESSION ON COMPETITIVE ADVANTAGE

CA regressed on Organizational culture

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.602[a]	.363	.360	.61678

a. Predictors: (Constant), Organizational Culture

ANOVA[b]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	50.207	1	50.207	131.978	.000[a]
	Residual	88.257	232	.380		
	Total	138.464	233			

a. Predictors: (Constant), Organizational Culture

b. Dependent Variable: Competitive Advantage

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	2.742	.221		12.415	.000
	Organizational Culture	.479	.042	.602	11.488	.000

a. Dependent Variable: Competitive Advantage

CA regressed on Organizational Structure

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.301[a]	.091	.087	.73666

a. Predictors: (Constant), Organizational Structure

ANOVA[b]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	12.563	1	12.563	23.151	.000[a]
	Residual	125.900	232	.543		
	Total	138.464	233			

a. Predictors: (Constant), Organizational Structure

b. Dependent Variable: Competitive Advantage

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	4.393	.182		24.164	.000
	Organizational Structure	.204	.042	.301	4.812	.000

a. Dependent Variable: Competitive Advantage

CA regressed on Organizational Strategy

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.552[a]	.305	.302	.64421

a. Predictors: (Constant), Organisational Strategy

ANOVA[b]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	42.183	1	42.183	101.644	.000[a]
	Residual	96.281	232	.415		
	Total	138.464	233			

a. Predictors: (Constant), Organisational Strategy

b. Dependent Variable: Competitive Advantage

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	2.957	.230		12.857	.000
	Organisational Strategy	.445	.044	.552	10.082	.000

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.552[a]	.305	.302	.64421

a. Dependent Variable: Competitive Advantage

CA regressed on Leadership Support

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.572[a]	.327	.324	.63391

a. Predictors: (Constant), Leadership Support

ANOVA[b]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	45.237	1	45.237	112.573	.000[a]
	Residual	93.227	232	.402		
	Total	138.464	233			

a. Predictors: (Constant), Leadership Support

b. Dependent Variable: Competitive Advantage

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	2.987	.216		13.831	.000
	Leadership Support	.405	.038	.572	10.610	.000

a. Dependent Variable: Competitive Advantage

CA regressed on Human Resources

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.585[a]	.342	.339	.62668

a. Predictors: (Constant), Human Resource

ANOVA[b]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	47.350	1	47.350	120.567	.000[a]
	Residual	91.113	232	.393		
	Total	138.464	233			

a. Predictors: (Constant), Human Resource

b. Dependent Variable: Competitive Advantage

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	3.137	.195		16.050	.000
	Human Resource	.397	.036	.585	10.980	.000

a. Dependent Variable: Competitive Advantage

CA regressed on Information Technology

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.400[a]	.160	.156	.70813

a. Predictors: (Constant), Information Technology

ANOVA[b]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	22.127	1	22.127	44.127	.000[a]
	Residual	116.336	232	.501		
	Total	138.464	233			

a. Predictors: (Constant), Information Technology

b. Dependent Variable: Competitive Advantage

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	3.716	.233		15.914	.000
	Information Technology	.273	.041	.400	6.643	.000

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	3.716	.233		15.914	.000
	Information Technology	.273	.041	.400	6.643	.000

a. Dependent Variable: Competitive Advantage

CA regressed on Acquisition

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.473[a]	.224	.221	.68050

a. Predictors: (Constant), Acquisition process

ANOVA[b]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	31.029	1	31.029	67.007	.000[a]
	Residual	107.434	232	.463		
	Total	138.464	233			

a. Predictors: (Constant), Acquisition process

b. Dependent Variable: Competitive Advantage

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	3.408	.228		14.962	.000
	Acquisition process	.332	.041	.473	8.186	.000

a. Dependent Variable: Competitive Advantage

CA regressed on Conversion

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.423[a]	.179	.175	.70003

a. Predictors: (Constant), Conversion Process

ANOVA[b]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	24.774	1	24.774	50.555	.000[a]
	Residual	113.690	232	.490		
	Total	138.464	233			

a. Predictors: (Constant), Conversion Process

b. Dependent Variable: Competitive Advantage

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	3.772	.211		17.881	.000
	Conversion Process	.280	.039	.423	7.110	.000

a. Dependent Variable: Competitive Advantage

CA regressed on Application

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.498[a]	.248	.245	.66976

a. Predictors: (Constant), Application Process

ANOVA[b]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	34.393	1	34.393	76.671	.000[a]
	Residual	104.071	232	.449		
	Total	138.464	233			

a. Predictors: (Constant), Application Process

b. Dependent Variable: Competitive Advantage

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	3.446	.209		16.480	.000
	Application Process	.319	.036	.498	8.756	.000

a. Dependent Variable: Competitive Advantage

CA regressed on Protection

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.481[a]	.231	.228	.67725

a. Predictors: (Constant), Protection Process

ANOVA[b]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	32.052	1	32.052	69.880	.000[a]
	Residual	106.412	232	.459		
	Total	138.464	233			

a. Predictors: (Constant), Protection Process

b. Dependent Variable: Competitive Advantage

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	3.394	.225		15.103	.000
	Protection Process	.345	.041	.481	8.359	.000

a. Dependent Variable: Competitive Advantage

APPENDIX 3

MULTIPLE REGRESSION ANALYSIS ON CA

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.690[a]	.477	.463	.56508

a. Predictors: (Constant), Information Technology, Organizational Structure, Human Resource, Leadership Support, Organisational Strategy, Organizational Culture

ANOVA[a]

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	65.978	6	10.996	34.437	.000[b]
	Residual	72.486	227	.319		
	Total	138.464	233			

a. Dependent Variable: Competitive Advantage

b. Predictors: (Constant), Information Technology, Organizational Structure, Human Resource, Leadership Support, Organisational Strategy, Organizational Culture

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	1.860	.252		7.397	.000
	Organizational Culture	.133	.065	.168	2.043	.042
	Organizational Structure	.076	.035	.112	2.182	.030
	Human Resource	.146	.049	.214	2.954	.003
	Organisational Strategy	.096	.057	.119	1.686	.093
	Leadership Support	.155	.050	.218	3.071	.002
	Information Technology	.045	.040	.065	1.121	.263

a. Dependent Variable: Competitive Advantage

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.453[a]	.205	.202	.68878

a. Predictors: (Constant), Knowledge Infrastructure Capabilities

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	28.399	1	28.399	59.860	.000[b]
	Residual	110.065	232	.474		
	Total	138.464	233			

a. Dependent Variable: Competitive Advantage

b. Predictors: (Constant), Knowledge Infrastructure Capabilities

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	3.573	.220		16.267	.000
	Knowledge Infrastructure Capabilities	.329	.043	.453	7.737	.000

a. Dependent Variable: Competitive Advantage

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.547[a]	.299	.287	.65113

a. Predictors: (Constant), Protection Process, Acquisition process, Conversion Process, Application Process

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	41.374	4	10.344	24.397	.000[b]
	Residual	97.090	229	.424		
	Total	138.464	233			

a. Dependent Variable: Competitive Advantage

b. Predictors: (Constant), Protection Process, Acquisition process, Conversion Process, Application Process

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	2.948	.242		12.191	.000
	Acquisition process	.078	.086	.112	.908	.365
	Conversion Process	-.024	.065	-.036	-.363	.717
	Application Process	.165	.077	.258	2.135	.034
	Protection Process	.197	.052	.275	3.781	.000

a. Dependent Variable: Competitive Advantage

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.471[a]	.221	.218	.68166

a. Predictors: (Constant), Knowledge Process Capabilities

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	30.664	1	30.664	65.993	.000[b]
	Residual	107.800	232	.465		
	Total	138.464	233			

a. Dependent Variable: Competitive Advantage

b. Predictors: (Constant), Knowledge Process Capabilities

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	3.492	.219		15.919	.000
	Process Capabilities	.324	.040	.471	8.124	.000

a. Dependent Variable: Competitive Advantage

APPENDIX 4

Hypothesis 1
General Linear Model

Multivariate Tests[a]

Effect		Value	F	Hypothesis df	Error df	Sig.
Intercept	Pillai's Trace	.410	80.216[b]	2.000	231.000	.000
	Wilks' Lambda	.590	80.216[b]	2.000	231.000	.000
	Hotelling's Trace	.695	80.216[b]	2.000	231.000	.000
	Roy's Largest Root	.695	80.216[b]	2.000	231.000	.000
CUL	Pillai's Trace	.382	71.489[b]	2.000	231.000	.000
	Wilks' Lambda	.618	71.489[b]	2.000	231.000	.000
	Hotelling's Trace	.619	71.489[b]	2.000	231.000	.000
	Roy's Largest Root	.619	71.489[b]	2.000	231.000	.000

a. Design: Intercept + CUL

b. Exact statistic

Tests of Between-Subjects Effects

Source	Dependent Variable	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	Innovation	27.378[a]	1	27.378	42.466	.000
	Market Share	79.904[b]	1	79.904	120.932	.000
Intercept	Innovation	80.227	1	80.227	124.439	.000
	Market Share	40.416	1	40.416	61.169	.000
CUL	Innovation	27.378	1	27.378	42.466	.000
	Market Share	79.904	1	79.904	120.932	.000
Error	Innovation	149.573	232	.645		
	Market Share	153.291	232	.661		
Total	Innovation	6142.316	234			
	Market Share	7115.080	234			
Corrected Total	Innovation	176.951	233			
	Market Share	233.195	233			

a. R Squared = .155 (Adjusted R Squared = .151)

b. R Squared = .343 (Adjusted R Squared = .340)

Regression 1

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.393[a]	.155	.151	.80294

a. Predictors: (Constant), Organizational Culture

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	27.378	1	27.378	42.466	.000[b]
	Residual	149.573	232	.645		
	Total	176.951	233			

a. Dependent Variable: Innovation

b. Predictors: (Constant), Organizational Culture

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	3.207	.287		11.155	.000
	Organizational Culture	.354	.054	.393	6.517	.000

a. Dependent Variable: Innovation

Regression 2

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.585[a]	.343	.340	.81286

a. Predictors: (Constant), Organizational Culture

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	79.904	1	79.904	120.932	.000[b]
	Residual	153.291	232	.661		
	Total	233.195	233			

a. Dependent Variable: Market Share

b. Predictors: (Constant), Organizational Culture

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	2.276	.291		7.821	.000
	Organizational Culture	.604	.055	.585	10.997	.000

a. Dependent Variable: Market Share

Hypothesis 2
General Linear Model

Multivariate Tests[a]

Effect		Value	F	Hypothesis df	Error df	Sig.
Intercept	Pillai's Trace	.716	290.712[b]	2.000	231.000	.000
	Wilks' Lambda	.284	290.712[b]	2.000	231.000	.000
	Hotelling's Trace	2.517	290.712[b]	2.000	231.000	.000
	Roy's Largest Root	2.517	290.712[b]	2.000	231.000	.000
STRU	Pillai's Trace	.209	30.434[b]	2.000	231.000	.000
	Wilks' Lambda	.791	30.434[b]	2.000	231.000	.000
	Hotelling's Trace	.264	30.434[b]	2.000	231.000	.000
	Roy's Largest Root	.264	30.434[b]	2.000	231.000	.000

a. Design: Intercept + STRU

b. Exact statistic

Tests of Between-Subjects Effects

Source	Dependent Variable	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	Innovation	35.470[a]	1	35.470	58.164	.000
	Market Share	1.284[b]	1	1.284	1.285	.258
Intercept	Innovation	216.611	1	216.611	355.198	.000
	Market Share	436.120	1	436.120	436.287	.000
STRU	Innovation	35.470	1	35.470	58.164	.000
	Market Share	1.284	1	1.284	1.285	.258
Error	Innovation	141.481	232	.610		
	Market Share	231.911	232	1.000		
Total	Innovation	6142.316	234			
	Market Share	7115.080	234			
Corrected Total	Innovation	176.951	233			
	Market Share	233.195	233			

a. R Squared = .200 (Adjusted R Squared = .197)

b. R Squared = .006 (Adjusted R Squared = .001)

Regression 1

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.448[a]	.200	.197	.78092

a. Predictors: (Constant), Organizational Structure

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	35.470	1	35.470	58.164	.000[b]
	Residual	141.481	232	.610		
	Total	176.951	233			

a. Dependent Variable: Innovation

b. Predictors: (Constant), Organizational Structure

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	3.632	.193		18.847	.000
	Organizational Structure	.343	.045	.448	7.627	.000

a. Dependent Variable: Innovation

Regression 2

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.074[a]	.006	.001	.99981

a. Predictors: (Constant), Organizational Structure

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	1.284	1	1.284	1.285	.258[b]
	Residual	231.911	232	1.000		
	Total	233.195	233			

a. Dependent Variable: Market Share

b. Predictors: (Constant), Organizational Structure

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	5.153	.247		20.887	.000
	Organizational Structure	.065	.058	.074	1.133	.258

a. Dependent Variable: Market Share

Hypothesis 3

General Linear Model

Multivariate Tests[a]

Effect		Value	F	Hypothesis df	Error df	Sig.
Intercept	Pillai's Trace	.425	85.391[b]	2.000	231.000	.000
	Wilks' Lambda	.575	85.391[b]	2.000	231.000	.000
	Hotelling's Trace	.739	85.391[b]	2.000	231.000	.000
	Roy's Largest Root	.739	85.391[b]	2.000	231.000	.000
STRA	Pillai's Trace	.315	53.070[b]	2.000	231.000	.000
	Wilks' Lambda	.685	53.070[b]	2.000	231.000	.000
	Hotelling's Trace	.459	53.070[b]	2.000	231.000	.000
	Roy's Largest Root	.459	53.070[b]	2.000	231.000	.000

a. Design: Intercept + STRA

b. Exact statistic

Tests of Between-Subjects Effects

Source	Dependent Variable	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	Innovation	25.209[a]	1	25.209	38.543	.000
	Market Share	63.501[b]	1	63.501	86.816	.000
Intercept	Innovation	84.786	1	84.786	129.631	.000
	Market Share	54.135	1	54.135	74.012	.000
STRA	Innovation	25.209	1	25.209	38.543	.000
	Market Share	63.501	1	63.501	86.816	.000
Error	Innovation	151.742	232	.654		

	Market Share	169.694	232	.731		
Total	Innovation	6142.316	234			
	Market Share	7115.080	234			
Corrected Total	Innovation	176.951	233			
	Market Share	233.195	233			

a. R Squared = .142 (Adjusted R Squared = .139)

b. R Squared = .272 (Adjusted R Squared = .269)

Regression 1

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.377[a]	.142	.139	.80874

a. Predictors: (Constant), Organisational Strategy

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	25.209	1	25.209	38.543	.000[b]
	Residual	151.742	232	.654		
	Total	176.951	233			

a. Dependent Variable: Innovation

b. Predictors: (Constant), Organisational Strategy

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	3.287	.289		11.386	.000
	Organisational Strategy	.344	.055	.377	6.208	.000

a. Dependent Variable: Innovation

Regression 2

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.522[a]	.272	.269	.85524

a. Predictors: (Constant), Organisational Strategy

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	63.501	1	63.501	86.816	.000[b]
	Residual	169.694	232	.731		
	Total	233.195	233			

a. Dependent Variable: Market Share

b. Predictors: (Constant), Organisational Strategy

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	2.627	.305		8.603	.000
	Organisational Strategy	.547	.059	.522	9.318	.000

a. Dependent Variable: Market Share

Hypothesis 4

General Linear Model

Multivariate Tests[a]

Effect		Value	F	Hypothesis df	Error df	Sig.
Intercept	Pillai's Trace	.461	98.657[b]	2.000	231.000	.000
	Wilks' Lambda	.539	98.657[b]	2.000	231.000	.000
	Hotelling's Trace	.854	98.657[b]	2.000	231.000	.000
	Roy's Largest Root	.854	98.657[b]	2.000	231.000	.000
Ls	Pillai's Trace	.343	60.343[b]	2.000	231.000	.000
	Wilks' Lambda	.657	60.343[b]	2.000	231.000	.000
	Hotelling's Trace	.522	60.343[b]	2.000	231.000	.000
	Roy's Largest Root	.522	60.343[b]	2.000	231.000	.000

a. Design: Intercept + Ls

b. Exact statistic

Tests of Between-Subjects Effects

Source	Dependent Variable	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	Innovation	25.070[a]	1	25.070	38.294	.000
	Market Share	71.312[b]	1	71.312	102.200	.000
Intercept	Innovation	98.117	1	98.117	149.875	.000
	Market Share	58.208	1	58.208	83.419	.000
Ls	Innovation	25.070	1	25.070	38.294	.000
	Market Share	71.312	1	71.312	102.200	.000
Error	Innovation	151.881	232	.655		
	Market Share	161.883	232	.698		
Total	Innovation	6142.316	234			
	Market Share	7115.080	234			
Corrected Total	Innovation	176.951	233			
	Market Share	233.195	233			

a. R Squared = .142 (Adjusted R Squared = .138)

b. R Squared = .306 (Adjusted R Squared = .303)

Regression 1

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.376[a]	.142	.138	.80911

a. Predictors: (Constant), Leadership Support

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	25.070	1	25.070	38.294	.000[b]
	Residual	151.881	232	.655		
	Total	176.951	233			

a. Dependent Variable: Innovation

b. Predictors: (Constant), Leadership Support

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	3.375	.276		12.242	.000
	Leadership Support	.301	.049	.376	6.188	.000

a. Dependent Variable: Innovation

Regression 2

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.553[a]	.306	.303	.83533

a. Predictors: (Constant), Leadership Support

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	71.312	1	71.312	102.200	.000[b]
	Residual	161.883	232	.698		
	Total	233.195	233			

a. Dependent Variable: Market Share

b. Predictors: (Constant), Leadership Support

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	2.599	.285		9.133	.000
	Leadership Support	.508	.050	.553	10.109	.000

a. Dependent Variable: Market Share

Hypothesis 5

General Linear Model

Multivariate Tests[a]

Effect		Value	F	Hypothesis df	Error df	Sig.
Intercept	Pillai's Trace	.977	4495.623[b]	2.000	210.000	.000
	Wilks' Lambda	.023	4495.623[b]	2.000	210.000	.000
	Hotelling's Trace	42.815	4495.623[b]	2.000	210.000	.000
	Roy's Largest Root	42.815	4495.623[b]	2.000	210.000	.000
TSS	Pillai's Trace	.977	9.168	44.000	422.000	.000
	Wilks' Lambda	.251	9.509[b]	44.000	420.000	.000
	Hotelling's Trace	2.075	9.854	44.000	418.000	.000
	Roy's Largest Root	1.445	13.855[c]	22.000	211.000	.000

a. Design: Intercept + TSS

b. Exact statistic

c. The statistic is an upper bound on F that yields a lower bound on the significance level.

Tests of Between-Subjects Effects

Source	Dependent Variable	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	Innovation	83.583[a]	22	3.799	8.586	.000
	Market Share	132.398[b]	22	6.018	12.598	.000
Intercept	Innovation	2355.250	1	2355.250	5322.539	.000
	Market Share	2606.743	1	2606.743	5456.727	.000
TSS	Innovation	83.583	22	3.799	8.586	.000
	Market Share	132.398	22	6.018	12.598	.000
Error	Innovation	93.369	211	.443		
	Market Share	100.797	211	.478		
Total	Innovation	6142.316	234			
	Market Share	7115.080	234			
Corrected Total	Innovation	176.951	233			
	Market Share	233.195	233			

a. R Squared = .472 (Adjusted R Squared = .417)

b. R Squared = .568 (Adjusted R Squared = .523)

Regression 1

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.426[a]	.181	.178	.79033

a. Predictors: (Constant), Human Resource

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	32.039	1	32.039	51.294	.000[b]
	Residual	144.912	232	.625		
	Total	176.951	233			

a. Dependent Variable: Innovation

b. Predictors: (Constant), Human Resource

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	3.323	.247		13.479	.000
	Human Resource	.327	.046	.426	7.162	.000

a. Dependent Variable: Innovation

Regression 2

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.531[a]	.281	.278	.84983

a. Predictors: (Constant), Human Resource

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	65.643	1	65.643	90.891	.000[b]
	Residual	167.553	232	.722		
	Total	233.195	233			

a. Dependent Variable: Market Share

b. Predictors: (Constant), Human Resource

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	2.952	.265		11.137	.000
	Human Resource	.468	.049	.531	9.534	.000

a. Dependent Variable: Market Share

Hypothesis 6

General Linear Model

Multivariate Tests[a]

Effect		Value	F	Hypothesis df	Error df	Sig.
Intercept	Pillai's Trace	.976	4302.022[b]	2.000	213.000	.000
	Wilks' Lambda	.024	4302.022[b]	2.000	213.000	.000
	Hotelling's Trace	40.395	4302.022[b]	2.000	213.000	.000
	Roy's Largest Root	40.395	4302.022[b]	2.000	213.000	.000
Its	Pillai's Trace	.668	5.652	38.000	428.000	.000
	Wilks' Lambda	.438	5.733[b]	38.000	426.000	.000
	Hotelling's Trace	1.042	5.813	38.000	424.000	.000
	Roy's Largest Root	.692	7.793[c]	19.000	214.000	.000

a. Design: Intercept + Its

b. Exact statistic

c. The statistic is an upper bound on F that yields a lower bound on the significance level.

Tests of Between-Subjects Effects

Source	Dependent Variable	Type III Sum of Squares	Df	Mean Square	F	Sig.
Corrected Model	Innovation	60.830[a]	19	3.202	5.900	.000
	Market Share	87.681[b]	19	4.615	6.787	.000
Intercept	Innovation	3160.219	1	3160.219	5823.984	.000
	Market Share	3405.514	1	3405.514	5008.296	.000
Its	Innovation	60.830	19	3.202	5.900	.000
	Market Share	87.681	19	4.615	6.787	.000
Error	Innovation	116.121	214	.543		
	Market Share	145.515	214	.680		
Total	Innovation	6142.316	234			
	Market Share	7115.080	234			
Corrected Total	Innovation	176.951	233			
	Market Share	233.195	233			

a. R Squared = .344 (Adjusted R Squared = .286)

b. R Squared = .376 (Adjusted R Squared = .321)

Regression 1

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.317[a]	.101	.097	.82817

a. Predictors: (Constant), Information Technology

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	17.832	1	17.832	25.999	.000[b]
	Residual	159.119	232	.686		
	Total	176.951	233			

a. Dependent Variable: Innovation

b. Predictors: (Constant), Information Technology

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	3.684	.273		13.492	.000
	Information Technology	.245	.048	.317	5.099	.000

a. Dependent Variable: Innovation

Regression 2

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.340[a]	.115	.111	.94301

a. Predictors: (Constant), Information Technology

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	26.886	1	26.886	30.234	.000[b]
	Residual	206.310	232	.889		
	Total	233.195	233			

a. Dependent Variable: Market Share

b. Predictors: (Constant), Information Technology

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	3.747	.311		12.052	.000
	Information Technology	.301	.055	.340	5.499	.000

a. Dependent Variable: Market Share

Hypothesis 7

General Linear Model

Multivariate Tests[a]

Effect		Value	F	Hypothesis df	Error df	Sig.
Intercept	Pillai's Trace	.494	112.884[b]	2.000	231.000	.000
	Wilks' Lambda	.506	112.884[b]	2.000	231.000	.000
	Hotelling's Trace	.977	112.884[b]	2.000	231.000	.000
	Roy's Largest Root	.977	112.884[b]	2.000	231.000	.000
Ac	Pillai's Trace	.225	33.606[b]	2.000	231.000	.000
	Wilks' Lambda	.775	33.606[b]	2.000	231.000	.000
	Hotelling's Trace	.291	33.606[b]	2.000	231.000	.000
	Roy's Largest Root	.291	33.606[b]	2.000	231.000	.000

a. Design: Intercept + Ac

b. Exact statistic

Tests of Between-Subjects Effects

Source	Dependent Variable	Type III Sum of Squares	Df	Mean Square	F	Sig.
Corrected Model	Innovation	28.029[a]	1	28.029	43.666	.000
	Market Share	34.182[b]	1	34.182	39.848	.000
Intercept	Innovation	97.887	1	97.887	152.494	.000
	Market Share	109.614	1	109.614	127.783	.000
Ac	Innovation	28.029	1	28.029	43.666	.000
	Market Share	34.182	1	34.182	39.848	.000
Error	Innovation	148.922	232	.642		
	Market Share	199.013	232	.858		
Total	Innovation	6142.316	234			
	Market Share	7115.080	234			
Corrected Total	Innovation	176.951	233			
	Market Share	233.195	233			

a. R Squared = .158 (Adjusted R Squared = .155)

b. R Squared = .147 (Adjusted R Squared = .143)

Regression 1

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.398[a]	.158	.155	.80119

a. Predictors: (Constant), Acquisition process

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	28.029	1	28.029	43.666	.000[b]
	Residual	148.922	232	.642		
	Total	176.951	233			

a. Dependent Variable: Innovation

b. Predictors: (Constant), Acquisition process

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	3.311	.268		12.349	.000
	Acquisition process	.316	.048	.398	6.608	.000

a. Dependent Variable: Innovation

Regression 2

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.383[a]	.147	.143	.92618

a. Predictors: (Constant), Acquisition process

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	34.182	1	34.182	39.848	.000[b]
	Residual	199.013	232	.858		
	Total	233.195	233			

a. Dependent Variable: Market Share

b. Predictors: (Constant), Acquisition process

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	3.504	.310		11.304	.000
	Acquisition process	.348	.055	.383	6.312	.000

a. Dependent Variable: Market Share

Hypothesis 8

General Linear Model

Multivariate Tests[a]

Effect		Value	F	Hypothesis df	Error df	Sig.
Intercept	Pillai's Trace	.585	162.811[b]	2.000	231.000	.000
	Wilks' Lambda	.415	162.811[b]	2.000	231.000	.000
	Hotelling's Trace	1.410	162.811[b]	2.000	231.000	.000
	Roy's Largest Root	1.410	162.811[b]	2.000	231.000	.000
Cv	Pillai's Trace	.186	26.309[b]	2.000	231.000	.000
	Wilks' Lambda	.814	26.309[b]	2.000	231.000	.000
	Hotelling's Trace	.228	26.309[b]	2.000	231.000	.000
	Roy's Largest Root	.228	26.309[b]	2.000	231.000	.000

a. Design: Intercept + Cv

b. Exact statistic

Tests of Between-Subjects Effects

Source	Dependent Variable	Type III Sum of Squares	Df	Mean Square	F	Sig.
Corrected Model	Innovation	14.560[a]	1	14.560	20.801	.000
	Market Share	37.686[b]	1	37.686	44.720	.000
Intercept	Innovation	169.804	1	169.804	242.590	.000
	Market Share	144.102	1	144.102	170.998	.000
Cv	Innovation	14.560	1	14.560	20.801	.000
	Market Share	37.686	1	37.686	44.720	.000
Error	Innovation	162.391	232	.700		
	Market Share	195.509	232	.843		
Total	Innovation	6142.316	234			
	Market Share	7115.080	234			
Corrected Total	Innovation	176.951	233			
	Market Share	233.195	233			

a. R Squared = .082 (Adjusted R Squared = .078)

b. R Squared = .162 (Adjusted R Squared = .158)

Regression 1

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.287[a]	.082	.078	.83664

a. Predictors: (Constant), Conversion Process

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	14.560	1	14.560	20.801	.000[b]
	Residual	162.391	232	.700		
	Total	176.951	233			

a. Dependent Variable: Innovation

b. Predictors: (Constant), Conversion Process

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	3.927	.252		15.575	.000
	Conversion Process	.214	.047	.287	4.561	.000

a. Dependent Variable: Innovation

Regression 2

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.402[a]	.162	.158	.91799

a. Predictors: (Constant), Conversion Process

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	37.686	1	37.686	44.720	.000[b]
	Residual	195.509	232	.843		
	Total	233.195	233			

a. Dependent Variable: Market Share

b. Predictors: (Constant), Conversion Process

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	3.617	.277		13.077	.000
	Conversion Process	.345	.052	.402	6.687	.000

a. Dependent Variable: Market Share

Hypothesis 9

General Linear Model

Multivariate Tests[a]

Effect		Value	F	Hypothesis df	Error df	Sig.
Intercept	Pillai's Trace	.546	138.752[b]	2.000	231.000	.000
	Wilks' Lambda	.454	138.752[b]	2.000	231.000	.000
	Hotelling's Trace	1.201	138.752[b]	2.000	231.000	.000
	Roy's Largest Root	1.201	138.752[b]	2.000	231.000	.000
Ap	Pillai's Trace	.259	40.406[b]	2.000	231.000	.000
	Wilks' Lambda	.741	40.406[b]	2.000	231.000	.000
	Hotelling's Trace	.350	40.406[b]	2.000	231.000	.000
	Roy's Largest Root	.350	40.406[b]	2.000	231.000	.000

a. Design: Intercept + Ap

b. Exact statistic

Tests of Between-Subjects Effects

Source	Dependent Variable	Type III Sum of Squares	Df	Mean Square	F	Sig.
Corrected Model	Innovation	19.631[a]	1	19.631	28.950	.000
	Market Share	53.266[b]	1	53.266	68.681	.000
Intercept	Innovation	140.207	1	140.207	206.764	.000
	Market Share	104.754	1	104.754	135.069	.000
Ap	Innovation	19.631	1	19.631	28.950	.000
	Market Share	53.266	1	53.266	68.681	.000
Error	Innovation	157.320	232	.678		
	Market Share	179.929	232	.776		
Total	Innovation	6142.316	234			
	Market Share	7115.080	234			
Corrected Total	Innovation	176.951	233			
	Market Share	233.195	233			

a. R Squared = .111 (Adjusted R Squared = .107)

b. R Squared = .228 (Adjusted R Squared = .225)

Regression 1

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.333[a]	.111	.107	.82347

a. Predictors: (Constant), Application Process

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	19.631	1	19.631	28.950	.000[b]
	Residual	157.320	232	.678		
	Total	176.951	233			

a. Dependent Variable: Innovation

b. Predictors: (Constant), Application Process

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	3.697	.257		14.379	.000
	Application Process	.241	.045	.333	5.381	.000

a. Dependent Variable: Innovation

Regression 2

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.478[a]	.228	.225	.88066

a. Predictors: (Constant), Application Process

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	53.266	1	53.266	68.681	.000[b]
	Residual	179.929	232	.776		
	Total	233.195	233			

a. Dependent Variable: Market Share

b. Predictors: (Constant), Application Process

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	3.195	.275		11.622	.000
	Application Process	.397	.048	.478	8.287	.000

a. Dependent Variable: Market Share

Hypothesis 10

General Linear Model

Multivariate Tests[a]

Effect		Value	F	Hypothesis df	Error df	Sig.
Intercept	Pillai's Trace	.499	115.139[b]	2.000	231.000	.000
	Wilks' Lambda	.501	115.139[b]	2.000	231.000	.000
	Hotelling's Trace	.997	115.139[b]	2.000	231.000	.000
	Roy's Largest Root	.997	115.139[b]	2.000	231.000	.000
Pp	Pillai's Trace	.232	34.926[b]	2.000	231.000	.000
	Wilks' Lambda	.768	34.926[b]	2.000	231.000	.000
	Hotelling's Trace	.302	34.926[b]	2.000	231.000	.000
	Roy's Largest Root	.302	34.926[b]	2.000	231.000	.000

a. Design: Intercept + Pp

b. Exact statistic

Tests of Between-Subjects Effects

Source	Dependent Variable	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	Innovation	28.088[a]	1	28.088	43.774	.000
	Market Share	36.278[b]	1	36.278	42.741	.000
Intercept	Innovation	100.386	1	100.386	156.449	.000
	Market Share	108.935	1	108.935	128.343	.000
Pp	Innovation	28.088	1	28.088	43.774	.000
	Market Share	36.278	1	36.278	42.741	.000
Error	Innovation	148.864	232	.642		
	Market Share	196.917	232	.849		
Total	Innovation	6142.316	234			
	Market Share	7115.080	234			
Corrected Total	Innovation	176.951	233			
	Market Share	233.195	233			

a. R Squared = .159 (Adjusted R Squared = .155)

b. R Squared = .156 (Adjusted R Squared = .152)

Regression 1

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.398[a]	.159	.155	.80103

a. Predictors: (Constant), Protection Process

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	28.088	1	28.088	43.774	.000[b]
	Residual	148.864	232	.642		
	Total	176.951	233			

a. Dependent Variable: Innovation

b. Predictors: (Constant), Protection Process

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	3.325	.266		12.508	.000
	Protection Process	.323	.049	.398	6.616	.000

a. Dependent Variable: Innovation

Regression 2

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.394[a]	.156	.152	.92129

a. Predictors: (Constant), Protection Process

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	36.278	1	36.278	42.741	.000[b]
	Residual	196.917	232	.849		
	Total	233.195	233			

a. Dependent Variable: Market Share

b. Predictors: (Constant), Protection Process

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	3.464	.306		11.329	.000
	Protection Process	.367	.056	.394	6.538	.000

a. Dependent Variable: Market Share

Hypothesis 11

Regression

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.739[a]	.546	.544	.75729

a. Predictors: (Constant), Knowledge Infrastructure Capabilities

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	159.956	1	159.956	278.918	.000[b]
	Residual	133.049	232	.573		
	Total	293.005	233			

a. Dependent Variable: Process Capabilities

b. Predictors: (Constant), Knowledge Infrastructure Capabilities

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	1.445	.241		5.986	.000
	Knowledge Infrastructure Capabilities	.781	.047	.739	16.701	.000

a. Dependent Variable: Process Capabilities

Hypothesis 12

Regression

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.446[a]	.199	.195	.69147

a. Predictors: (Constant), Knowledge Management Capabilities

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	27.538	1	27.538	57.596	.000[b]
	Residual	110.925	232	.478		
	Total	138.464	233			

a. Dependent Variable: Competitive Advantage

b. Predictors: (Constant), Knowledge Management Capabilities

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	3.663	.212		17.271	.000
	Knowledge Management Capabilities	.305	.040	.446	7.589	.000

a. Dependent Variable: Competitive Advantage

APPENDIX 5

MULTIPLE REGRESSION ON INNOVATION AND MARKET SHARE

HYPOTHESIS ONE

Descriptive Statistics

	Mean	Std. Deviation	N
Innovation	5.0491	.87146	234
Organizational Culture	5.2058	.96878	234
Organizational Structure	4.1353	1.13850	234
Human Resource	5.2808	1.13432	234
Organisational Strategy	5.1169	.95520	234
Leadership Support	5.5548	1.08832	234
Information Technology	5.5624	1.12755	234

Correlations

		Innovation	Organizational Culture	Organizational Structure	Human Resource	Organisational Strategy	Leadership Support	Information Technology
Pearson Correlation	Innovation	1.000	.393	.448	.426	.377	.376	.317
	Organizational Culture	.393	1.000	.239	.672	.630	.703	.543
	Organizational Structure	.448	.239	1.000	.318	.314	.151	.160
	Human Resource	.426	.672	.318	1.000	.664	.552	.350
	Organisational Strategy	.377	.630	.314	.664	1.000	.577	.370
	Leadership Support	.376	.703	.151	.552	.577	1.000	.488
	Information Technology	.317	.543	.160	.350	.370	.488	1.000
Sig. (1-tailed)	Innovation	.	.000	.000	.000	.000	.000	.000
	Organizational Culture	.000	.	.000	.000	.000	.000	.000
	Organizational Structure	.000	.000	.	.000	.000	.010	.007
	Human Resource	.000	.000	.000	.	.000	.000	.000
	Organisational Strategy	.000	.000	.000	.000	.	.000	.000
	Leadership Support	.000	.000	.010	.000	.000	.	.000
	Information Technology	.000	.000	.007	.000	.000	.000	.
N	Innovation	234	234	234	234	234	234	234
	Organizational Culture	234	234	234	234	234	234	234
	Organizational Structure	234	234	234	234	234	234	234
	Human Resource	234	234	234	234	234	234	234
	Organisational Strategy	234	234	234	234	234	234	234
	Leadership Support	234	234	234	234	234	234	234
	Information Technology	234	234	234	234	234	234	234

Variables Entered/Removed[b]

Model	Variables Entered	Variables Removed	Method
1	Information Technology, Organizational Structure, Human Resource, Leadership Support, Organisational Strategy, Organizational Culture	.	Enter

a. All requested variables entered.

b. Dependent Variable: Innovation

Model Summary[b]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics					Durbin-Watson
					R Square Change	F Change	df1	df2	Sig. F Change	
1	.577[a]	.333	.315	.72131	.333	18.850	6	227	.000	1.576

a. Predictors: (Constant), Information Technology, Organizational Structure, Human Resource, Leadership Support, Organisational Strategy, Organizational Culture

b. Dependent Variable: Innovation

ANOVA[b]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	58.844	6	9.807	18.850	.000[a]
	Residual	118.107	227	.520		
	Total	176.951	233			

a. Predictors: (Constant), Information Technology, Organizational Structure, Human Resource, Leadership Support, Organisational Strategy, Organizational Culture

b. Dependent Variable: Innovation

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Correlations			Collinearity Statistics	
		B	Std. Error	Beta			Zero-order	Partial	Part	Tolerance	VIF
1	(Constant)	1.949	.321		6.070	.000					
	Organizational Culture	.017	.083	.019	.203	.839	.393	.013	.011	.342	2.924
	Organizational Structure	.263	.044	.343	5.908	.000	.448	.365	.320	.870	1.149
	Human Resource	.130	.063	.170	2.071	.039	.426	.136	.112	.439	2.280
	Organisational Strategy	.013	.072	.015	.183	.855	.377	.012	.010	.466	2.148
	Leadership Support	.124	.064	.155	1.927	.055	.376	.127	.104	.456	2.192
	Information Technology	.087	.051	.112	1.701	.090	.317	.112	.092	.679	1.473

a. Dependent Variable: Innovation

Collinearity Diagnostics[a]

Model	Dimension	Eigenvalue	Condition Index	Variance Proportions						
				(Constant)	Organizational Culture	Organizational Structure	Human Resource	Organisational Strategy	Leadership Support	Information Technology
1	1	6.855	1.000	.00	.00	.00	.00	.00	.00	.00
	2	.059	10.740	.00	.01	.84	.00	.00	.02	.02
	3	.030	15.093	.06	.00	.01	.21	.05	.00	.42
	4	.019	19.172	.80	.02	.09	.03	.03	.00	.26
	5	.016	20.988	.03	.01	.07	.29	.01	.64	.18
	6	.012	23.740	.12	.03	.00	.25	.91	.02	.04
	7	.009	27.847	.00	.92	.00	.21	.00	.32	.08

a. Dependent Variable: Innovation

Residuals Statistics[a]

	Minimum	Maximum	Mean	Std. Deviation	N
Predicted Value	2.9771	6.1162	5.0491	.50254	234
Residual	-1.97615	1.71878	.00000	.71197	234
Std. Predicted Value	-4.123	2.123	.000	1.000	234
Std. Residual	-2.740	2.383	.000	.987	234

a. Dependent Variable: Innovation

HYPOTHESIS TWO

Descriptive Statistics

	Mean	Std. Deviation	N
Market Share	5.4231	1.00042	234
Organizational Culture	5.2058	.96878	234
Organizational Structure	4.1353	1.13850	234
Human Resource	5.2808	1.13432	234
Organisational Strategy	5.1169	.95520	234
Leadership Support	5.5548	1.08832	234
Information Technology	5.5624	1.12755	234

Model Summary[b]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics					Durbin-Watson
					R Square Change	F Change	df1	df2	Sig. F Change	
1	.656[a]	.431	.416	.76482	.431	28.609	6	227	.000	1.682

a. Predictors: (Constant), Information Technology, Organizational Structure, Human Resource, Leadership Support, Organisational Strategy, Organizational Culture
b. Dependent Variable: Market Share

ANOVA[b]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	100.411	6	16.735	28.609	.000[a]
	Residual	132.785	227	.585		
	Total	233.195	233			

a. Predictors: (Constant), Information Technology, Organizational Structure, Human Resource, Leadership Support, Organisational Strategy, Organizational Culture
b. Dependent Variable: Market Share

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients			Correlations			Collinearity Statistics	
		B	Std. Error	Beta	T	Sig.	Zero-order	Partial	Part	Tolerance	VIF
1	(Constant)	1.772	.340		5.205	.000					
	Organizational Culture	.250	.088	.242	2.828	.005	.585	.184	.142	.342	2.924
	Organizational Structure	-.111	.047	-.126	-2.347	.020	.074	-.154	-.118	.870	1.149
	Human Resource	.161	.067	.182	2.411	.017	.531	.158	.121	.439	2.280
	Organisational Strategy	.178	.077	.170	2.319	.021	.522	.152	.116	.466	2.148
	Leadership Support	.185	.068	.202	2.720	.007	.553	.178	.136	.456	2.192
	Information Technology	.003	.054	.003	.052	.958	.340	.003	.003	.679	1.473

ANOVA[b]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	100.411	6	16.735	28.609	.000[a]
	Residual	132.785	227	.585		
	Total	233.195	233			

a. Dependent Variable: Market Share

Collinearity Diagnostics[a]

Model	Dimension	Eigenvalue	Condition Index	Variance Proportions						
				(Constant)	Organizational Culture	Organizational Structure	Human Resource	Organisational Strategy	Leadership Support	Information Technology
1	1	6.855	1.000	.00	.00	.00	.00	.00	.00	.00
	2	.059	10.740	.00	.01	.84	.00	.00	.02	.02
	3	.030	15.093	.06	.00	.01	.21	.05	.00	.42
	4	.019	19.172	.80	.02	.09	.03	.03	.00	.26
	5	.016	20.988	.03	.01	.07	.29	.01	.64	.18
	6	.012	23.740	.12	.03	.00	.25	.91	.02	.04
	7	.009	27.847	.00	.92	.00	.21	.00	.32	.08

a. Dependent Variable: Market Share

Casewise Diagnostics[a]

Case Number	Std. Residual	Market Share	Predicted Value	Residual
14	-2.194	3.40	5.0779	-1.67790
16	-2.065	2.00	3.5792	-1.57923
18	-2.316	3.40	5.1710	-1.77096
36	-3.425	3.00	5.6194	-2.61937
97	-2.197	3.40	5.0807	-1.68069
99	2.146	6.00	4.3586	1.64138
106	-3.415	2.80	5.4120	-2.61195
109	2.630	6.20	4.1888	2.01123
111	2.759	7.00	4.8899	2.11006
117	2.039	6.60	5.0403	1.55967
119	-2.327	3.40	5.1795	-1.77950
134	-2.410	3.40	5.2433	-1.84328
136	2.077	6.00	4.4118	1.58817
146	2.630	6.20	4.1888	2.01123
203	-3.489	2.00	4.6688	-2.66881
208	2.237	6.00	4.2894	1.71056

a. Dependent Variable: Market Share

Residuals Statistics[a]

	Minimum	Maximum	Mean	Std. Deviation	N
Predicted Value	3.5792	6.5754	5.4231	.65647	234
Residual	-2.66881	2.11006	.00000	.75491	234
Std. Predicted Value	-2.809	1.755	.000	1.000	234
Std. Residual	-3.489	2.759	.000	.987	234

a. Dependent Variable: Market Share

HYPOTHESIS THREE

Descriptive Statistics

	Mean	Std. Deviation	N
Innovation	5.0491	.87146	234
Acquisition process	5.5068	1.09909	234
Conversion Process	5.2372	1.16639	234
Application Process	5.6077	1.20346	234
Protection Process	5.3431	1.07591	234

Model Summary[b]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics					Durbin-Watson
					R Square Change	F Change	df1	df2	Sig. F Change	
1	.462[a]	.213	.200	.77969	.213	15.519	4	229	.000	1.498

a. Predictors: (Constant), Protection Process, Acquisition process, Conversion Process, Application Process
b. Dependent Variable: Innovation

ANOVA[b]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	37.738	4	9.435	15.519	.000[a]
	Residual	139.213	229	.608		
	Total	176.951	233			

a. Predictors: (Constant), Protection Process, Acquisition process, Conversion Process, Application Process
b. Dependent Variable: Innovation

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients			Correlations			Collinearity Statistics	
		B	Std. Error	Beta	t	Sig.	Zero-order	Partial	Part	Tolerance	VIF
1	(Constant)	2.898	.290		10.010	.000					
	Acquisition process	.363	.103	.457	3.508	.001	.398	.226	.206	.202	4.949
	Conversion Process	-.123	.078	-.165	-1.567	.118	.287	-.103	-.092	.312	3.207
	Application Process	-.089	.093	-.123	-.958	.339	.333	-.063	-.056	.210	4.766
	Protection Process	.242	.063	.299	3.878	.000	.398	.248	.227	.577	1.733

a. Dependent Variable: Innovation

Casewise Diagnostics[a]

Case Number	Std. Residual	Innovation	Predicted Value	Residual
13	-2.459	3.11	5.0285	-1.91735
63	3.836	5.89	2.8981	2.99076
77	2.281	5.89	4.1101	1.77878
123	-2.444	3.11	5.0164	-1.90531
152	2.538	6.22	4.2436	1.97866
160	2.121	5.78	4.1242	1.65358
174	2.545	6.33	4.3492	1.98418
187	2.624	6.22	4.1763	2.04596

a. Dependent Variable: Innovation

Residuals Statistics[a]

	Minimum	Maximum	Mean	Std. Deviation	N
Predicted Value	2.8981	5.9602	5.0491	.40245	234
Residual	-1.91735	2.99076	.00000	.77297	234
Std. Predicted Value	-5.345	2.264	.000	1.000	234
Std. Residual	-2.459	3.836	.000	.991	234

a. Dependent Variable: Innovation

HYPOTHESIS FOUR

Descriptive Statistics

	Mean	Std. Deviation	N
Market Share	5.4231	1.00042	234
Acquisition process	5.5068	1.09909	234
Conversion Process	5.2372	1.16639	234
Application Process	5.6077	1.20346	234
Protection Process	5.3431	1.07591	234

Model Summary[b]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics					Durbin-Watson
					R Square Change	F Change	df1	df2	Sig. F Change	
1	.504[a]	.254	.241	.87135	.254	19.534	4	229	.000	1.466

a. Predictors: (Constant), Protection Process, Acquisition process, Conversion Process, Application Process
b. Dependent Variable: Market Share

ANOVA[b]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	59.325	4	14.831	19.534	.000[a]
	Residual	173.870	229	.759		
	Total	233.195	233			

a. Predictors: (Constant), Protection Process, Acquisition process, Conversion Process, Application Process
b. Dependent Variable: Market Share

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Correlations			Collinearity Statistics	
		B	Std. Error	Beta			Zero-order	Partial	Part	Tolerance	VIF
1	(Constant)	2.997	.324		9.263	.000					
	Acquisition process	-.206	.116	-.226	-1.782	.076	.383	-.117	-.102	.202	4.949
	Conversion Process	.075	.088	.088	.861	.390	.402	.057	.049	.312	3.207
	Application Process	.419	.104	.504	4.049	.000	.478	.258	.231	.210	4.766
	Protection Process	.152	.070	.164	2.180	.030	.394	.143	.124	.577	1.733

a. Dependent Variable: Market Share

Casewise Diagnostics[a]

Case Number	Std. Residual	Market Share	Predicted Value	Residual
14	-2.406	3.40	5.4963	-2.09628
16	-2.692	2.00	4.3453	-2.34534
18	-2.415	3.40	5.5043	-2.10430
36	-2.888	3.00	5.5164	-2.51640
63	3.446	6.00	2.9971	3.00294
77	2.573	6.00	3.7584	2.24158
98	2.098	6.40	4.5717	1.82829
100	-2.019	3.80	5.5592	-1.75922
106	-2.539	2.80	5.0126	-2.21259
135	2.098	6.40	4.5717	1.82829
137	-2.019	3.80	5.5592	-1.75922
203	-3.351	2.00	4.9198	-2.91977

a. Dependent Variable: Market Share

Residuals Statistics[a]

	Minimum	Maximum	Mean	Std. Deviation	N
Predicted Value	2.9971	6.1660	5.4231	.50459	234
Residual	-2.91977	3.00294	.00000	.86384	234
Std. Predicted Value	-4.808	1.472	.000	1.000	234
Std. Residual	-3.351	3.446	.000	.991	234

a. Dependent Variable: Market Share