KNOWLEDGE STRATEGY, ORGANIZATIONAL CHARACTERISTICS, INNOVATION AND PERFORMANCE OF MANUFACTURING FIRMS IN KENYA

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A Thesis Submitted in Partial Fulfillment of the Requirements for the Award of the Degree of Doctor of Philosophy in Business Administration, School of Business, University of Nairobi

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DECLARATION

This thesis is my original work and has not been presented for a degree in any other University.

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DEDICATION

I dedicate this thesis to my Mother Priscah Moraa whose value for education has been a source of inspiration for me; and my Wife Mary Moraa who has always given me continuous support and encouragement during my doctoral studies.
ACKNOWLEDGEMENT

The completion of this thesis would not have been successful without the inspiration and support of a number of people. I would like to humbly acknowledge their encouragement and support. Firstly, I wish to express my deepest appreciation and gratitude to my supervisors, Professor Peter K’Obonyo and Professor Martin Ogutu. Their advice and generous guidance throughout the various stages of this research has been extremely helpful in making this research possible. Secondly, I would like to thank Faculty members at the University of Nairobi, School of Business and my friends, Dr. Patrick Ojera, Dr. Christopher Kodongo, Dr. Joseph Mose and Dr. Evans Sagwa for their advice and encouragement. Thirdly, my thanks are also to the managers of the manufacturing firms for their generosity in completing the questionnaire which formed an integral part of the thesis. Fourthly, I am indebted to my colleagues in the PhD programme, Dr. Adelaide Mbithi, Dr. Lucy Kiowi and Dr. Mary Osoro for their encouragement and support. Fifthly, I am grateful to my wife Mary Moraa and children: Lydia, Collins, Janvan and Hilary for their understanding and support during my doctoral studies. There are other people who assisted me in various ways; I am unable to mention all of them here, but I am sincerely grateful for the help and encouragement they offered to make the study a success.
ABSTRACT
Organizational knowledge is increasingly gaining attention in strategic management and related fields. Theoretically, there is consensus that knowledge strategy is related to organizational performance. However, few empirical studies have examined the relationship between knowledge strategy and organizational performance. Further, the few empirical studies examining the link between the variables have yielded inconsistent results. Whereas some studies have reported direct positive relationship, others found no direct relationship. This calls for research adopting a contingency approach to examine the interaction effect of situational factors on the relationship between knowledge strategy and performance. While organizational characteristics and innovation are critical factors for knowledge initiatives and performance, prior studies have not focussed on their role in the linkage between knowledge strategy and organizational performance. Manufacturing firms in Kenya are operating in a competitive environment as a result of liberalization of the economy. To enhance competitiveness and performance, the firms are managing organizational knowledge as a resource. However, past studies in Kenya have not examined the relationship between knowledge strategy and performance of the firms. The objectives of this study were to: determine the effect of knowledge strategy on performance; establish whether organizational innovation mediates the relationship between knowledge strategy and performance; determine the influence of organizational characteristics on the relationship between knowledge strategy and performance; and establish whether the joint effect of knowledge strategy, organizational characteristics, and innovation on performance is greater than the effect of knowledge strategy on performance. The study was based on the resource-based theory, knowledge based view, dynamic capabilities and contingency theory. The study adopted cross-sectional survey research design. The target population comprised 655 manufacturing firms in Kenya. A stratified sample of 266 firms representing twelve sub-sectors of the manufacturing sector was used. Primary data was collected from 184 firms using structured questionnaire administered to the managers of the firms. To describe profiles of the firms and research variables, means, standard deviations and coefficient of variation were used; and Pearson’s correlation was used to examine relationships between the variables. To test hypotheses, multiple regression and hierarchical regression were used. The results revealed significant positive relationship between knowledge strategy and performance. The results also showed that organizational innovation mediated the relationship; while organizational characteristics moderated the relationship between knowledge strategy and performance. Further, the results demonstrated that the joint effect of knowledge strategy, organizational characteristics, and innovation on organizational performance was greater than the effect of knowledge strategy alone. By empirically examining the integrated model interconnecting variables, this study provides new insights into the role of organizational characteristics as a moderating variable and organizational innovation as a mediating variable in the linkage between knowledge strategy and performance. The findings support the integrated model and demonstrate that the influence of knowledge strategy on performance is contingent on interaction of organizational characteristics and innovation; hence the need to align knowledge strategy with the situational factors to enhance performance. The researcher recommends replication of the study in different sectors and countries to enhance understanding of the relationship between knowledge strategy and organizational performance.
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<tbody>
<tr>
<td>DC</td>
<td>Dynamic Capabilities</td>
</tr>
<tr>
<td>GDP</td>
<td>Gross Domestic Product</td>
</tr>
<tr>
<td>KAM</td>
<td>Kenya Association of Manufacturers</td>
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<tr>
<td>KBV</td>
<td>Knowledge Based View of the firm</td>
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<tr>
<td>KM</td>
<td>Knowledge Management</td>
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<td>RBV</td>
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CHAPTER ONE
INTRODUCTION

1.1 Background of the Study
Strategic management as a field of study is primarily concerned with addressing the question of why firms differ in performance (Barney, 1991; Nag, Hambrick, & Chen, 2007; Rumelt, Zendel, & Teece, 1994). In an effort to identify sources of heterogeneous performance among firms, strategy scholars have developed various perspectives.

Industrial organization perspective (Porter, 1980; Herrmann, 2005) suggested that the industry environment in which a firm competes determines the strategic behaviour and hence performance of the firm. From the early 1980s, strategic management literature focused on firm resources and capabilities as the primary source of competitive advantage (Barney, 1991; Newbert, 2007). This perspective labelled as the resource-based view of the firm (RBV) holds that development and deployment of resources and capabilities to enhance effectiveness and efficiency in exploiting environmental opportunities determines the firm’s level of performance. Since the 1990s, the RBV became more focused on intangible resources, particularly knowledge, because it is unique and difficult to imitate, as a source of sustainable competitive advantage (Choo & Bontis, 2002; Newbert, 2007). This perspective, referred to as the knowledge-based view of the firm (KBV) (Choo & Bontis, 2002), holds that competitive advantage and performance differences among organizations are a result of their differing capabilities in creating and deploying knowledge.

Innovation outcomes of new products and processes are the basis of superior organizational performance (Damanpour, 1991; Eshlaghy & Maatofia, 2011). Innovation depends on knowledge, and increasing the amount and quality of knowledge within organizations creates new insights crucial to creating higher levels of innovation (Darroch & McNaughton, 2003). Consequently, firms are adopting various knowledge strategies to develop and utilize knowledge as a basis of enhancing innovation and performance. However, knowledge literature suggests that effective knowledge initiatives
require supportive organizational characteristics such as structure, culture and strategic leadership (Holsapple & Joshi, 2000).

Guided by the RBV, KBV, and dynamic capabilities perspective (DC), it was postulated in this study that creation and utilization of knowledge as a resource and development of dynamic competencies to respond to environmental changes determines the level of organizational innovation and performance. As advocated by the contingency theory, it was expected that situational factors of organizational characteristics and innovation would influence the relationship between knowledge strategy and organizational performance. As suggested by RBV, KBV, and DC it was expected that manufacturing firms practice knowledge Management (KM) to enhance innovation, hence competitive advantage and superior performance.

The environment in which Kenyan manufacturing firms are operating has changed as a result of the economic reforms initiated in the early 1990s. The reforms resulted to liberalization of trade, hence increased competition. This has exerted pressure on Kenyan manufacturing firms to initiate various approaches to enhance their competitiveness. In a study examining the relationship between KM strategy, organizational competence and competitiveness in Kenya’s Book Publishing Industry, Mwihia (2008) found that firms in the industry had processes of acquiring, storing, sharing, transferring and using knowledge to enhance their competences and competitiveness. In another study, Cheruiyot, Jagongo and Owino (2012) found that managers in manufacturing enterprises in Kenya are recognising and managing organizational knowledge as an asset to improve products and processes, and enhance organizational performance. Although these studies have provided understanding that manufacturing firms in Kenya are managing knowledge as a resource to improve performance, none of the studies examined the relationship between knowledge strategy and performance of the firms.

1.1.1 Knowledge Strategy
Knowledge strategy is a relatively new concept in knowledge literature. Knowledge strategy refers to the overall approach an organization intends to take regarding the focus of its resources on two knowledge domains: knowledge exploration and knowledge
exploitation (March, 1991). Thus knowledge strategy describes a firm's strategic choice on whether the firm focuses more of its resources on knowledge exploration, which deals with the creation, discovery or acquisition of new knowledge; or knowledge exploitation that is, incremental refinement or reuse of existing knowledge. Knowledge exploration is more innovation-oriented and knowledge exploitation aims at attaining efficiency (March, 1991; Levinthal & March, 1993; Bierly & Daly, 2007).

Knowledge exploration and exploitation are conceptualized as two distinct constructs, implying that they are not simply two extremes of a single continuum. Rather, they are two sets of strategic choices that involve trade-offs and require different organizational capabilities; and organizations may pursue one, both simultaneously, or neither of the two strategies (March, 1991; Levinthal & March, 1993). In practice, organizations choose a combination of the two strategies, and an organization needs to find a balance between knowledge exploration and exploitation strategies. Focusing solely on exploration can mean that the organization never gains from its investment in exploration of new knowledge, and focusing solely on exploitation may lead to knowledge obsolescence or even the destruction of the organization (March, 1991; Levinthal & March, 1993). Bierly and Daly (2007) found positive correlation between knowledge exploration and exploitation supporting the argument that the strategies are complementary in organizations. Organizational ambidexterity, joint pursuit of a well-balanced combination of knowledge exploration and exploitation is essential for a healthy organization (March, 1991). Tushman and O’Reilly (1996) posit that firms should try to simultaneously excel at knowledge exploration and exploitation; and being an ambidextrous organization, simultaneously excelling at knowledge exploration and exploitation, leads to higher profits.

The terms knowledge strategy, KM and KM strategy are sometimes used interchangeably however, the terms are different. Knowledge strategy is part of KM and refers to the overall approach an organization intends to take regarding the focus of its resources on knowledge exploration and exploitation (March, 1991, Bierly & Daly, 2007). In contrast, KM is defined as the process that creates, locates knowledge and manages the sharing, dissemination and use of knowledge within the organization (Darroch & McNaughton,
KM strategy is defined as a high-level plan that describes and outlines the processes, tools and infrastructures (organizational and technological) required to manage knowledge gaps or excesses, and to permit knowledge to flow effectively in an organization. KM strategy is viewed as the means by which the exact knowledge determined by a knowledge strategy can flow effectively in the organization (Zack, 1999). Studies on knowledge strategy adopt March’s (1991) conceptualization of knowledge strategy in terms of the strategic choice or approach an organization intends to take regarding knowledge exploration and knowledge exploitation. KM literature suggests that organizational characteristics influence a firm’s knowledge strategy.

1.1.2 Organizational Characteristics

An organization’s processes are affected by external factors and internal firm characteristics (Barney, 1991). Internal organizational context focuses on broad and relatively stable categories of organizational characteristics such as structure, culture, and strategic leadership (Zheng, Yang, & Mclean, 2010). These characteristics constitute an environment where organizational activities take place and make up critical sources for success (Barney, 1991). Zheng et al. (2010) observe that organizational characteristics play a potentially moderating role in the linkage between knowledge initiatives and organizational effectiveness. They argue that organizational characteristics have the potential of enhancing an organization’s innovation and competitive advantage.

Organizational structure is one of the constructs that is established to coordinate work in organizations. It refers to an organization’s internal pattern of relationships, authority and communication (Zheng et al., 2010). The constructs of organizational structure which have received more attention in management studies are formalization, centralization and complexity (Claver-Cortes, Pertusa-Ortega, & Molina-Azorin, 2012). Formalization refers to the degree to which job descriptions, rules, policies and procedures within the organization are standardized. Centralization is the degree to which decision making is concentrated at the top of the organizational hierarchy. Complexity is defined as the degree of differentiation that exists within the organization, that is differences among jobs and units in the organization (Zheng et al., 2010).
Culture comprises a set of values, beliefs, and assumptions shared by members of an organization (Schein, 1985). These underlying values influence the behaviour of organizational members and guide their behaviours towards organizational goals (Schein, 1985). Research based on the RBV has demonstrated that organizational culture is a source of competitive advantage for firms, since it is a firm-level resource which is valuable, rare and difficulty to imitate (Barney, 1991). In most organizational studies, culture is conceptualized in terms of involvement, consistency, adaptability and mission (Denison & Mishra, 1995), and trust and collaboration (Lee & Choi, 2003).

Involvement focuses on employees’ commitment and sense of ownership, involvement in decisions that affect them, and team orientation. Consistency refers to the existence of organizational systems and processes that promote alignment and efficiency over time. It also focuses on a common set of management principles, consensus regarding ways of doing things and coordination and integration across the organization. Adaptability is the organization’s capacity for internal change to external conditions. Mission refers to the degree to which an organization is clear on its purpose and direction, goals and objectives and a vision for the future (Denison & Mishra, 1995). Trust refers to when members of an organization believe in the integrity, character and ability of each other (Robbins, 1998). Collaboration can be described as the degree to which people in groups actively help one another in their tasks (Kreitner & Kinicki, 2004).

Strategic leadership refers to the executive work of the people at the top of organizations (Vera & Crossan, 2004). Besides focussing on the traditional relational activity between leaders and followers, strategic leaders play the symbolic activity of influencing strategic processes of the firm related to strategy and environment, and ability to establish and facilitate achievement of vision of the firm. Strategic leadership of the top management team is the primary agent that scans and interprets the organization’s environment, makes strategic choices and monitors the results of those choices (Bluedorn, Johnson, Cartwright, & Barringer, 1994). Strategic leadership styles widely cited in the literature are transformational and transactional leadership (Bass & Avolio, 1992; Jansen, Vera, & Crossan, 2009).
Transformational leadership encourages the achievement of challenging standards by inspiring and creating a sense of purpose and a common vision and mission. Transactional leadership involves negotiation, motivation of followers through specific benefits provided that they are capable of accomplishing the tasks assigned to them (Aslan, Diken, & Sendogdu, 2011; Bass & Avolio, 1992; Jansen et al., 2009).

Organizational structure, culture and strategic leadership are considered to be important influencers of knowledge activities in organizations. However, prior studies have not examined the influence of these organizational characteristics on the relationship between knowledge strategy and organizational performance.

1.1.3 Organizational Innovation
Innovation is viewed as one of the fundamental organizational activities in the market. Innovation is defined as a new idea, method or process of introducing something new (Sarros, Cooper, & Santora, 2008). Thus organizational innovation refers to the conception, development and introduction of new products, services and processes, or new ways of organization. Organizational innovation in terms of development of new products and processes is an important source of sustainable competitive advantage and superior performance (Damanpour, 1991; Eshlaghy & Maatofia, 2011; Sarros et al., 2008).

Innovation constitutes an indispensable component of corporate activities in that it enables a firm to apply new productive manufacturing processes, to respond to changing customer needs, attain positive reputation in customers’ perceptions and, as a result, gain sustainable competitive advantage and superior performance (Eshlaghy & Maatofia, 2011). Eshlaghy and Maatofia (2011) argue that through the development of organizational capabilities and aligning them to the dynamic environment, innovation strengthens an organization’s competitive advantage and enhances performance.

Studies by Darroch and McNaughton (2003), and Lopez-Nicolas and Merono-Cerdan (2011) suggest that through stocks of knowledge, a firm is able to innovate new products and processes which give it competitive advantage. This shows that organizational innovation is important in understanding the relationship between knowledge strategy
and performance. However, the influence of innovation on the relationship has been given scanty attention in past research work.

1.1.4 Organizational Performance
The purpose of every business enterprise is to consistently outperform competitors and deliver sustained superior returns to the owners while satisfying other stakeholders. Thus organizational performance is one of the most important constructs in management research and its improvement is a dominant theme in the field of strategic management (Richard, Devinney, Yip, & Johnson, 2009). Organizational performance construct is important in allowing researchers to evaluate firms over time and compare them to rivals (Richard et al., 2009). Strategy scholars and practitioners are concerned with the performance implications of management decisions and actions at firm level (Rumelt et al., 1994). Richard et al. observe that most studies in strategic management define performance as a dependent variable and seek to identify variables that produce variations in performance across organizations.

The concept of organizational performance is based upon the idea that an organization is the voluntary association of productive assets and those providing the assets expect to receive value in exchange (Barney, 1991). Hence value creation as defined by the resource provider is the essential overall performance evaluation criteria for any organization. Organizational performance is a multidimensional concept that encompasses aspects including financial performance and market performance (Richard et al., 2009).

1.1.5 Knowledge Strategy, Organizational Characteristics, Innovation and Performance
Knowledge management literature suggests that organizational knowledge is crucial in generating insights necessary for innovation in products and processes required to enhance customer satisfaction and creation of competitive advantage (Darroch & McNaughton, 2003; Lopez-Nicolas & Merono-Cerdan, 2011). This suggests that development and utilization of knowledge improves organizational performance.
Contingency theory researchers suggest that organizations align their internal aspects such as strategy, structure, leadership and culture, to achieve higher performance outcomes (Donaldson, 1987). Thus organizations which align their knowledge strategies and innovation activities with internal organizational characteristics, would improve innovative performance and firm performance (Donaldson, 1987; Venkatraman & Prescott, 1990).

Thus, as suggested in the literature, knowledge strategy results in organizational innovation which leads to creation of competitive advantage and superior performance. Further, the relationship between knowledge strategy, innovation and performance requires supportive contextual factors such as organizational structure, leadership and culture. Whereas literature suggests linkages among knowledge strategy, organizational characteristics, innovation and organizational performance, past empirical studies have not exhaustively considered the contingency perspective to develop an integrated model linking the variables.

1.1.6 Manufacturing Sector in Kenya

Manufacturing sector in Kenya comprises various sub-sectors mainly oriented towards the production of various consumer goods (Kimuyu, 1999; Kenya Association of Manufacturers (KAM), 2014). The sector is dominated by private firms with local and foreign companies. Over 80 per cent of the firms are based in Nairobi, while the rest are located in other major towns in Kenya (KAM, 2014). Manufacturing sector plays an important role in Kenyan economy. In the year 2014, the sector’s percentage contribution to Gross Domestic Product (GDP) was 10.0 percent. The sector also employed 287.5 thousand persons as at the time of the study in 2014, thus playing a significant role in creation of employment opportunities (Republic of Kenya, 2015).

Kenya's manufacturing sector which is important to the economy has been performing poorly in the recent past. The sector's share of GDP which on average was 10 percent in the 1960s and 1970s has been increasing marginally in the last two decades. For example, output of the sector grew by only 5.6 percent in 2013 and by 3.4 percent in 2014 (Republic
of Kenya, 2015). Hence, manufacturing firms in Kenya are under pressure to enhance effectiveness and efficiency for success in the competitive environment.

Given the fact that manufacturing firms in Kenya are operating in a competitive environment, it would be important for the firms to adopt the practice of KM to enhance innovation, hence competitive advantage and improvement in performance. Studies examining KM strategy and competitiveness of manufacturing firms in Kenya (Mwihia, 2008), and institutionalization of KM in manufacturing enterprises in Kenya (Cheruiyot et al., 2012) found that the firms were sourcing and using knowledge as a basis of improving effectiveness and efficiency, and hence competitiveness. However, the studies did not focus on the effect of knowledge exploration and exploitation on the performance of the firms. Thus, Kenyan manufacturing sector was considered a suitable context to examine the relationship between knowledge strategy and organizational performance.

1.2 Research Problem

Strategic management literature suggests that firms make strategic choices regarding the focus of their resources on knowledge exploration and knowledge exploitation. These knowledge strategies are key ingredients for superior organizational performance (March, 1991). Scholars (Tushman & O’Reilly, 1996; Bierly & Daly, 2007) argue that firms that simultaneously explore and exploit knowledge are likely to achieve higher levels of organizational innovation. Elsewhere, Eshlaghy and Maatofia (2011) observe that innovation is the basis for competitive advantage and superior performance; and innovation requires supportive organizational characteristics.

Despite the theoretical link between knowledge strategy and organizational performance, empirical studies testing the relationship are scanty. The few empirical studies examining the relationship between knowledge exploration and exploitation, and firm performance have yielded inconsistent results. Whereas some studies (He & Wong, 2004; Lubatkin, et al., 2006) reported direct positive relationship between knowledge strategy and organizational performance, other studies (Siren, Kohtamaki, & Kuckertz, 2012; Venkatraman, Lee, & Iyer, 2007) did not find a direct relationship between knowledge strategy and performance. Moreover, other studies (Bierly & Daly, 2007) found a linear
positive relationship between knowledge exploration and performance, and a concave relationship between exploitation and performance. Uotila, Maula, Keil and Zahra (2009) also found a curvilinear relationship between exploitation and financial performance. Further, a study by Bierly and Daly (2007) revealed that simultaneous pursuit of knowledge exploration and exploitation explained only 8 percent of variance in performance.

The inconsistent findings regarding the effect of knowledge exploration and exploitation on performance and the weak explanatory power of the effect of knowledge strategy on performance suggests that there may be other factors moderating or mediating the relationship. Li, Lee, Li and Liu (2010) recommended a contingency perspective when studying relationships between variables. This would involve examining the role of situational factors. Empirical studies that have tested the effect of situational factors on the relationship between knowledge strategy and organizational performance have examined the effects of competitive intensity (Auh & Menguc, 2005), competitive environment (Bierly & Daly, 2007) and strategic learning (Siren et al., 2012). The studies found that the variables moderated the relationship. While studies (Darroch & McNaughton, 2003; Holsapple & Joshi, 2000; Lee & Choi, 2003), have identified organizational characteristics and innovation as variables which are likely to influence the relationship between knowledge strategy and organizational performance, prior empirical studies have not focused on the role of these variables in the relationship. Further, although the individual influences of knowledge strategy, organizational characteristics and innovation on organizational performance have been studied, prior studies have not examined the joint effect of the variables on organizational performance.

Manufacturing sector in Kenya experienced a decline in its contribution to GDP from 5.6 percent in 2013 to 3.4 percent in 2014 (Republic of Kenya, 2015). Mwihia (2008) studied KM strategy and competitiveness, whilst Cheruiyot et al. (2012) focussed on institutionalization of KM, both of them on manufacturing firms in Kenya. A major drawback of these studies is that they did not address the effect of knowledge strategy on performance of the firms.
As discussed, theoretical literature suggests a linkage between knowledge strategy and organizational performance. However, empirical studies examining the relationship between knowledge strategy and organizational performance have reported inconsistent results. Further, whereas prior studies have shown that manufacturing firms in Kenya are recognizing and managing knowledge to enhance their competitiveness, the studies have not focussed on the effect of knowledge strategy on performance of the firms. The conflicting findings and the low explanatory power of knowledge strategy in organizational performance reported in the literature requires further studies. This is part of the reason for this study which sought to answer the question: What is the role of organizational characteristics and organizational innovation in the relationship between knowledge strategy and performance of manufacturing firms in Kenya?

1.3 Research Objectives
The overall objective of the study was to examine the role of organizational characteristics and organizational innovation on the relationship between knowledge strategy and performance of manufacturing firms in Kenya. The specific objectives of the study were to:

i. Determine the effect of knowledge strategy on organizational performance.
ii. Establish whether organizational innovation mediates the relationship between knowledge strategy and organizational performance.
iii. Determine the influence of organizational characteristics on the relationship between knowledge strategy and organizational performance.
iv. Establish whether the joint effect of knowledge strategy, organizational characteristics and organizational innovation on organizational performance is greater than the effect of knowledge strategy on organizational performance.

1.4 Value of the Study
This study will be useful to scholars. The findings of this study add to the existing literature in knowledge management, and contribute to RBV, KBV, DC and contingency theory. Such literature would be useful to scholars interested in understanding the relationship between knowledge strategy and organizational performance.
The findings of the study will also be useful to management practitioners. The findings would enhance managers’ understanding of how and under which circumstances knowledge strategy leads to superior performance. Thus the findings and recommendations would be useful to the practitioners in enhancing KM initiatives to create and sustain competitive advantage and superior performance for their organizations.

1.5 Organization of the Thesis

This thesis is divided into five chapters. Chapter One is the introduction and provides the background of the study and the research problem. The chapter also discusses the research objectives and value of the study.

Chapter Two is dedicated to review of literature related to the concepts and constructs incorporated in the study. The chapter presents discussion of theoretical perspective of the study and the linkages between the concepts of knowledge strategy, organizational characteristics, organizational innovation and organizational performance. The chapter also presents the conceptual framework and hypotheses of the study.

Chapter Three explains the methodology adopted in this study. The chapter describes the philosophical orientation, research design, population and sample design. The chapter also discusses the method and procedure of data collection, tests of reliability and validity of the measurement scales, tests of regression assumptions and statistical techniques used to summarize the data and test the research hypotheses.

Chapter Four presents data analysis, findings and discussion of results. Results of descriptive statistics of the profiles of the studied organizations and study variables are presented. The chapter also presents the results of tests of hypotheses and discussion of the results.

Chapter Five presents a summary of major findings of the study and conclusions of the study. The chapter also discusses implications of the study for management theory, and management policy and practice, limitations of the study and directions for further research.
1.6 Summary of the Chapter

This chapter discussed the background of the study, described the study variables and presented an overview of Kenyan Manufacturing Sector. The chapter also presented the research problem, objectives of the study, value of the study and the organization of the thesis. The next chapter presents literature review, conceptual framework and hypotheses of the study.
CHAPTER TWO
LITERATURE REVIEW

2.1 Introduction
This chapter examines literature related to the study. It discusses the theoretical perspective of the study and linkages between the study variables. The chapter concludes with a conceptual framework and hypotheses.

2.2 Theoretical Perspective
This study was based on four theoretical perspectives. These are the resource based view of the firm (RBV), knowledge-based view of the firm (KBV), dynamic capabilities perspective (DC) and contingency theory. These theoretical perspectives explain the determinants of organizational processes and outcomes.

2.2.1 Resource Based View
The resource based view of the firm is one of the most widely accepted theoretical perspectives in the field of strategic management in explaining organizational performance (Barney, 1991; Priem & Butler, 2001). The RBV assumes that firms can be conceptualized as bundles of resources and these resources are heterogeneously distributed across firms. The basic argument of RBV is that no two companies are alike because no two companies have had the same set of experiences, acquired the same assets and skills or developed the same organizational cultures. Based on these assumptions, scholars have theorized that when a firm has resources that are valuable, rare, inimitable and non-substitutable, it can achieve sustainable competitive advantage. Thus, the RBV focuses on how sustained competitive advantage is generated by the unique and idiosyncratic bundle of resources developed over time within specific firms. Fundamentally, RBV conceives unique resources and capabilities, and unique deployment patterns as the basis on which a firm’s competitive advantage is built and the primary determinant of superior performance (Barney, 1991).

There is consensus in the strategic management conversations on the role of firm resources and capabilities in explaining why firms differ in the creation and sustenance of competitive advantage (Barney, 1991; Newbert, 2007). However, strategy scholars
Barney, 1991; Choo & Bontis, 2002) argue that resources are not valuable in and of themselves, but because they allow firms to develop and implement value-creating strategies that create advantages in particular markets. Thus, resources and capabilities can be thought of as a platform from which the firm derives various products for various markets that enable the firm to develop competitive advantage.

The insights from RBV provide the framework for understanding and managing innovation (Siguaw, Simpson, & Enz, 2006; Newbert, 2007). Resource based view suggests that organizational resources and capabilities underlie and determine a firm’s capacity for innovation. Within this perspective, organizational knowledge resources are taken to provide the necessary inputs for the development and exploitation of a firm’s innovation activities to enable the firm adapt to the rapidly changing environment and create competitive advantage. Hence, this study adopted RBV because organizational knowledge is a resource and a pre-requisite for innovation and hence superior performance.

2.2.2 Knowledge Based View
Within the RBV, organizational knowledge is gaining increasing attention as a critical source of sustainable competitive advantage and superior performance. This perspective has led to the development of the KBV, which is an extension of the RBV (Choo & Bontis, 2002). Rather than seeing organizations as systems that integrate the use of all kinds of physical, financial and human resources, the KBV emphasizes the organization as a site for the development, dissemination and use of knowledge and other forms of intellectual resources to create competitive advantage. Thus, KBV holds that performance differences between organizations are a result of their differing capabilities in creating and utilizing knowledge.

Armistead and Meakins (2002) contend that the value of knowledge results from the way in which the firm combines its knowledge and capabilities in the production of products and services that deliver value to its market. They argue that a firm can gain advantage from using the capabilities that arise from the knowledge assets in ways which are difficult for others to imitate or replicate. The KBV postulates that since organizational
knowledge is unique and difficult to imitate, it is the only resource that provides sustainable competitive advantage, and therefore the firm’s attention and decision making should focus primarily on its knowledge and the competitive capabilities developed from it.

The dominant perspective in the knowledge literature is that innovation comes from a process of exchange and recombination of knowledge (Kaser & Miles, 2002); and creation and sharing of knowledge within organizations creates new insights crucial to innovation which is necessary in enhancing a firm’s competitive advantage and performance. KBV was relevant to this study in postulating a relationship between knowledge strategy and organizational performance.

2.2.3 Dynamic Capabilities

Dynamic capabilities perspective is closely associated with the RBV. Dynamic capabilities approach suggests that firms need to constantly integrate, reconfigure, upgrade and recreate their resources and capabilities in response to the rapidly changing environment to attain and sustain competitive advantage (Ambrosini & Bowman, 2009; Teece, Pisano, & Shuen, 1997). By addressing the question of how firms can cope with changing environments, DC has gained increasing attention in management literature in recent years. Dynamic capabilities approach complements the RBV; like the RBV, the focus of DC is on the development and use of competences to enhance competitive advantage and performance. However, in contrast with the RBV, DC’s emphasis is on dynamics, thus overcoming the criticisms levelled at the RBV as a static and equilibrium model (Ambrosini & Bowman, 2009; Teece et al., 1997).

The emergency of DC has enhanced the understanding of the linkage between knowledge strategy and innovation. Because it deals with a firm’s mechanisms for change, it suggests that firms build and reconfigure competences through organizational learning to increase stocks of knowledge which in turn enhances innovation and the firm’s ability to adapt to the changing environment (Ambrosini & Bowman, 2009).

This study adopted dynamic capabilities approach since it was expected that through integration, reconfiguration and renewal of resources, particularly organizational
knowledge, firms would enhance innovation in response to the changing environment to attain competitive advantage and superior performance.

### 2.2.4 Contingency Theory

According to the contingency perspective, an organization is conceived as an open system, seeking adaptation or match between the characteristics of the environment and those of the organization to survive and perform (Donaldson, 1987; Venkatraman & Prescott, 1990). Contingency theory suggests that congruency or fit among key organizational variables, such as strategy or processes, structure and context, is critical for obtaining optimal performance. The theory illustrates the importance of alignment or fit among different constructs related to organizations and explains how the relationship between strategy and performance can be moderated by various contextual factors.

Strategic management scholars are concerned with the relationship between key contingency variables such as organizational structures and processes and characteristics of the environment, and performance (Lumpkin & Dess, 1996). The scholars posit that for each strategic orientation, there exists a configuration of organizational characteristics that fits the strategy to yield superior performance. Strategy scholars adopt the contingency perspective based on the argument that a match between a chosen strategy and contextual variables should result to desired performance outcomes. Given the inconsistent and inconclusive results in the literature regarding the relationship between knowledge strategy and organizational performance, this study adopted contingency perspective to examine the influence of organizational characteristics and innovation on the relationship between knowledge strategy and organizational performance.

Given that this study sought to provide understanding of the linkage between knowledge strategy and organizational performance, KBV was the main theory that guided this study. However, RBV, DC and contingency theory played complementary roles in examining the influence of organizational characteristics and innovation on the relationship between knowledge strategy and organizational performance.
2.3 Knowledge Strategy and Organizational Performance

Knowledge can be considered the most strategic resource and the ability to acquire, integrate, share and apply it the most important capability for sustaining competitive advantage (Choo & Bontis, 2002). Knowledge literature suggests that organizations need to be ambidextrous, that is balance knowledge exploration and exploitation, to achieve superior performance. March (1991) argues that returns from knowledge exploitation strategy are more predictable and closer in time, while exploration is risky and uncertain but may promote the firm’s survival and success in the long run.

Prior research has reported direct and positive effects of joint pursuit of knowledge exploration and exploitation strategies on organizational performance. In a cross-sectional survey of 206 manufacturing firms in Singapore examining the effect of joint pursuit of knowledge exploration and exploitation on sales growth performance, He and Wong (2004) found that the interaction between knowledge exploration and exploitation strategies was positively related to sales growth. They also found that relative imbalance between explorative and exploitative strategy was negatively related to sales growth rate. The study provided insights regarding the relationship between knowledge exploration and exploitation on performance however, the study did not examine how the relationship may be contingent on situational factors or be mediated by innovation processes.

Auh and Menguc (2005) conducted a survey study of 260 Australian manufacturing firms to test the moderating role of competitive intensity on the relationship between knowledge exploration and exploitation, and firm performance; the results showed existence of different impacts of knowledge exploration and exploitation on firm performance, moderated by strategic type. Knowledge exploration had a greater effect than exploitation on firm performance for prospectors, while exploitation exerted a greater impact than exploration for defenders. Auh and Menguc’s study made a contribution in examining the moderating effect of strategic type on the relationship between knowledge strategy and performance however, the study did not consider the role of internal contextual factors on the relationship. This study seeks to bridge this knowledge gap by examining the influence of organizational characteristics and
innovation on the relationship between knowledge strategy and organizational performance.

Lubatkin et al. (2006) tested the effect of joint pursuit of knowledge exploration and exploitation on firm performance using cross-sectional survey data from 139 small and medium-sized firms in New England, USA. They found that the joint pursuit of an exploitative and exploratory orientation positively affects firm performance. Further, the study revealed that top management team’s behavioural integration influences successful pursuit of the knowledge strategies. The study by Lubatkin et al. however, did not consider the influence of organizational characteristics such as structure and culture, and innovation on the relationship between knowledge strategy and organizational performance.

Bierly and Daly (2007) conducted a survey examining the relationship between knowledge strategy (exploration or exploitation) and firm performance, and the possible moderating role of external environmental variables using a sample of small manufacturing firms in USA. The study found that knowledge exploration and exploitation are not significant predictors of firm performance. Using regression model, the results indicated that knowledge exploration and exploitation explained only 8% of the variance in performance. The study also found that the relationship between exploration and performance was positive but weaker than prior studies had suggested, and the relationship between exploitation and performance was concave. The findings revealed that knowledge exploration had a stronger influence on performance than knowledge exploitation; and exploitation was positively correlated with performance up to a point, after which they were negatively correlated. Using hierarchical regression models, Bierly and Daly further found that external environmental factors moderated the relationships between knowledge strategy and organizational performance. The study made contribution in examining the linkage between knowledge strategy and performance, and moderating influence of environmental factors. However, the study did not examine the moderating effect of organizational characteristics and mediating effect of organizational innovation on the relationship between knowledge strategy and organizational performance.
Saleim and Khalil (2007) conducted survey study to examine the relationship between knowledge management processes of knowledge acquisition, documentation, transfer, creation and application, and organizational performance in the Egyptian software firms. The results showed that only knowledge application, among the KM processes had a positive and significant effect on organizational performance. However, this study focuses on knowledge strategy in terms knowledge exploration and exploitation, and their effect on organizational performance.

Contrary to the studies which found positive links between knowledge exploration and exploitation, and firm performance, some scholars have reported that the strategies do not necessarily result in higher performance and contend that the relationships are more complex with various factors either mediating or moderating the linkages. Venkatraman et al. (2007) for example, tested the impact of joint pursuit of knowledge exploration and exploitation on performance by conducting a survey of 1,005 US software firms. Contrary to prior findings, their results did not reveal direct relationship between exploration and exploitation, and firm performance. The study however, did not consider the influence of organizational characteristics and innovation on the relationship.

In a later study examining the relationships between knowledge exploration, exploitation and financial performance of manufacturing firms in Finland, Uotila et al. (2009) found that there was a trade-off between exploration and exploitation that depends upon environmental conditions. They found an inverted U-shaped relationship between a firm’s relative exploration orientation and its financial performance; however, this relationship was found to be more pronounced in research and development intensive industries.

More recently, Siren et al. (2012) conducted a survey examining the role of strategic learning as mediating variable between knowledge exploration and exploitation, and profit performance of Finish software firms. The results revealed that exploration and exploitation do not directly affect profit performance, and that strategic learning process fully mediated the relationship. The study by Siren et al. (2012) made a contribution in examining the process through which knowledge exploration and exploitation influence
performance however, the study did not consider the influence of organizational characteristics and innovation on the relationship between knowledge strategy and organizational performance.

2.4 Knowledge Strategy, Organizational Innovation and Performance

Knowledge has been identified as a resource that greatly facilitates innovation and enhances performance of firms. Studies (Darroch & McNaughton, 2003; Lopez-Nicolas & Merono-Cerdan, 2011) which have examined the influence of innovation efforts on firm performance recognise the importance of knowledge for innovation management and performance results. The studies suggest that the development and application of knowledge is the basis for innovation. Knowledge sharing within organizations results in new insights crucial to creating increased levels of innovation. Because environments evolve, firms must adopt effective knowledge strategies to enhance innovations over time to achieve some sort of competitive advantage, and improved performance (Damanpour, 1991).

Knowledge literature suggests that knowledge strategy affects firm performance through their innovative performance. In a survey study of New Zealand firms, Darroch and McNaughton (2003) found that firms adopting more KM practices were more innovative and had superior financial performance. They noted that acquiring knowledge about the market for example, was essential for developing innovations that best suit customer needs. The results also revealed that different types of innovation profiles require different KM practices. Darroch and McNaughton however, focussed on KM in terms of knowledge acquisition, knowledge dissemination and responsiveness to knowledge. The study did not examine knowledge strategy in terms of knowledge exploration and exploitation.

In a study examining the effects of strategic KM strategies on innovation and performance of Spanish firms, Lopez-Nicolas and Merono-Cerdan (2011) found that strategic KM strategy impacts on organizational performance directly and indirectly through an increase on innovation capability. The study by Lopez-Nicolas and Merono-Cerdan (2011) made a contribution in understanding the role of innovation in the
relationship between strategic KM and organizational performance however, the study conceptualized strategic KM in terms of codification and personalization of knowledge. The study did not examine knowledge strategy in terms of knowledge exploration and exploitation and its effect on organizational performance.

The review of past studies on knowledge initiatives, organizational innovation and performance demonstrate the link between knowledge initiatives and innovation and its effect on performance outcomes. However, prior studies have not focussed on the role of organizational innovation on the relationship between knowledge strategy and organizational performance.

2.5 Knowledge Strategy, Organizational Characteristics and Performance

Contingency theorists illustrate the importance of alignment or fit among different constructs related to organizations, and explain how the relationship between measures of strategy and performance can be moderated by various contextual factors (Venkatraman & Prescott, 1990). Knowledge strategy scholars argue that even though there are challenges for firms to simultaneously pursue knowledge exploration and exploitation, there are organizational systems and human resource practices that support it. For example, team-based structures, organizational cultures that value and promote change, open communication channels, and human resource practices that promote creativity and innovation will help sustain both exploration and exploitation required to enhance organizational innovation and performance (Bierly & Daly, 2007).

In a survey of 58 Korean listed firms examining KM enablers, processes, and organizational performance, Lee and Choi (2003) found that organizational factors were important KM enablers. The study also revealed that cultural aspects of collaboration and trust were important for successful KM. The more employees trust each other, the greater the possibility that they would interact and share knowledge with others. Elsewhere, He and Wong (2004) also found that knowledge exploration and exploitation draw on different structures, processes and resources generating significantly different performance outcomes over time.
In a study examining knowledge process effectiveness, Chong and Chong (2009) found that leadership influences KM process effectiveness. This finding corroborated earlier findings (Vera & Crossan, 2004) that strategic leadership is one of the important factors for successful knowledge creation and sharing culture. Chong and Chong (2009) pointed out that one of the important roles of top management is providing the necessary direction of how to implement a firm’s knowledge strategy. This includes establishing a conducive knowledge sharing culture as well as incentives to which employees will be stimulated and motivated to create, organize and share knowledge.

Vera and Crossan (2004) argue that managing organizational learning requires top executives to practice both transformational and transactional leadership, but note that these leadership behaviours play different roles in the processes of knowledge exploration and exploitation. Elsewhere Elenkov and Manev (2005) argue that often top management’s actions regarding the allocation of resources and the establishment of certain customs ultimately shape and direct the organization’s learning process and determine the nature of the firm’s knowledge base. In a study examining the relationship between strategic leadership and organizational learning, Vera and Crossan (2004) found that creation of learning culture needed for knowledge creation depends on strategic leaders. Also, strategic leaders may directly determine their firms’ structure through decisions about its type and elements or they may do so indirectly through the way information is used and shared through informal networks and political activities.

Reviewed studies support the proposition that organizational characteristics are influencers of KM initiatives for improvement of organizational performance. However, none of the reviewed studies examined the influence of organizational characteristics on the relationship between knowledge strategy and organizational performance.

2.6 Knowledge Strategy, Organizational Characteristics, Innovation and Performance

As suggested by contingency theorists, different constructs related to organizations need to be aligned to achieve desired organizational outcomes. Thus for knowledge strategy to be successful, there is need to achieve a match or fit between knowledge strategy and
organizational characteristics to support innovative efforts critical to enhance organizational competiveness and performance. Knowledge exploration and exploitation draw on different structures, processes and resources generating significantly different performance outcomes over time (He & Wong, 2004).

Innovation which brings about superior organizational performance is an outcome of KM and various antecedent organizational factors or determinants, namely structure, leadership and culture (Liao, 2007; Sarros et al., 2008). Strategic leadership of organizations help define and shape work contexts that contribute to organizational innovation; and there is evidence that leadership style is an important determinant of innovation (Jung, Chow, & Wu, 2003; Sarros et al., 2008).

Past studies examining knowledge strategy, organizational characteristics and innovation have examined the influence of each variable on organizational performance singly. The study have not have not focussed on the combined effect of the variables on organizational performance. This study developed an integrated model to examine the combined effect of knowledge strategy, organizational characteristics and innovation on organizational performance to portray a more complete picture of the relationships among the variables.

2.7 Summary of Literature and Knowledge Gaps

Literature suggests that knowledge strategy is critical in determining organizational innovation and performance. Few empirical studies have been conducted to examine the relationship between knowledge strategy in terms of knowledge exploration and exploitation, and organizational performance. The results of the few studies that have been conducted to examine the relationship are clearly inconsistent. Some studies have reported direct positive relationships while others found no direct and significant relationship. A few empirical studies have considered contingency perspective to examine the importance of situational factors as either moderating or intervening variables in the relationship between knowledge strategy and organizational performance. However, reviewed studies have not examined the influence of organizational characteristics and innovation in the relationship. The review of literature also reveals
that the studies on knowledge strategy, organizational characteristics and innovation have examined the relationships between each variable and organizational performance in isolation rather than developing an integrated model that examines the effect of the combination on performance. Further, none of the studies examining the relationship between knowledge strategy and organizational performance was conducted in Kenya. To bridge these knowledge gaps, this study adopted the contingency perspective to develop an integrated model to examine the interaction effects between knowledge strategy, organizational characteristics, and innovation in explaining performance of manufacturing firms in Kenya. Table 2.1 helps delineate a summary of studies linking knowledge strategy and organizational performance.
<table>
<thead>
<tr>
<th>Study</th>
<th>Research Focus and Methodology</th>
<th>Key Findings</th>
<th>Knowledge Gaps</th>
<th>Focus of Current Study</th>
</tr>
</thead>
<tbody>
<tr>
<td>Siren et al. (2012)</td>
<td>Role of strategic learning as mediating variable between exploration and exploitation and profit performance of Finish software firms. Used survey data of 206 Finish software firms; and structural equation modelling.</td>
<td>Exploration and exploitation do not directly affect profit performance, and that strategic learning mediates the relationship.</td>
<td>Studied Finish Software firms. Did not examine the influence of moderating variables and intervening variables such organizational innovation; used financial measures of performance.</td>
<td>Studied manufacturing firms in Kenya. Examined moderating effect of organizational characteristics on the relationship between knowledge strategy and performance; and whether innovation mediates the effect of knowledge strategy on performance. Used financial and market measures of performance.</td>
</tr>
<tr>
<td>Uotila et al. (2009)</td>
<td>Relationship between firm exploration and exploitation, and financial performance of manufacturing firms in Finland. Used longitudinal panel data from 279 firms between the year 1989 to 2004; and GMM regression models.</td>
<td>Curvilinear relationship between exploitation and financial performance that depends on industry environment.</td>
<td>Studied manufacturing firms in Finland. Did not examine influence of other moderating variables such as organizational characteristics and intervening variables. Only considered financial measures of performance.</td>
<td>Examined moderating effect of organizational characteristics on the relationship between knowledge strategy and performance; and whether innovation mediates the effect of knowledge strategy on performance of manufacturing firms in Kenya; used financial and market measures of performance.</td>
</tr>
<tr>
<td>Bierly &amp; Daly (2007)</td>
<td>Effect of knowledge strategy and competitive environment on performance of small manufacturing firms in USA. Used survey data from small firms; and hierarchical regression analysis.</td>
<td>Positive relationship between knowledge exploration and firm performance; concave relationship between exploitation and performance. $R^2$ of 0.08; competitive intensity moderates the relationship.</td>
<td>Study focused on small manufacturing firms in USA. Did not examine the influence of other moderating variables such as organizational characteristics and mediating variables such as organizational innovation.</td>
<td>Examined influence of organizational characteristics on the relationship between knowledge strategy and performance; and whether innovation mediates the effect of knowledge strategy and performance of manufacturing firms in Kenya.</td>
</tr>
</tbody>
</table>
### Lubatkin et al. (2006)
- **Effect of joint pursuit of exploration and exploitation on performance of small and medium-sized (SMEs) firms in USA.**
- Used cross-sectional survey data from 139 SMEs. Used hierarchical regression and structural models.
- Joint pursuit of an exploitative and exploratory orientation positively affects performance.
- Studied small and medium sized firms in USA. Did not consider role of moderating and intervening variables.
- Studied small, medium and large firms and considered moderating effect of organizational characteristics on the relationship between knowledge strategy and performance; and whether innovation mediates the effect of knowledge strategy on performance.

### Auh & Menguc (2005)
- **Role of competitive intensity in the relationship between exploration and exploitation, and performance of manufacturing firms in Australia.**
- Used data from 260 firms; and hierarchical regression analysis.
- Existence of different impacts of exploration and exploitation on firm performance, moderated by strategic type and competitive intensity.
- Studied small manufacturing firms in Australia. Did not consider moderating effect of organizational characteristics and mediating effect of organizational innovation.
- Examined moderating effect of organizational characteristics on the relationship between knowledge strategy and performance; and whether innovation mediates the effect of knowledge strategy on performance.

### He & Wong (2004)
- **Joint influence of exploration and exploitation strategy on performance of manufacturing firms in Singapore.**
- Used data from 206 firms; and hierarchical regression analysis.
- Interaction between explorative and exploitative strategies is positively related to sales growth.
- Small manufacturing firms in Singapore. Did not consider influence of moderating and intervening variables.
- Examined moderating effect of organizational characteristics on the relationship between knowledge strategy and performance; and whether innovation mediates the effect of knowledge strategy on performance.

### 2.8 Conceptual Framework and Hypotheses

This section presents the conceptual framework discussing the variables of the study and their relationships. The section also discusses and presents conceptual hypotheses of the study.

#### 2.8.1 Conceptual Framework

This study integrated RBV, KBV, DC and contingency theory to develop the framework for the study. According to the RBV and KBV, resources especially intangible resources such as organizational knowledge determine organizational performance. Dynamic capabilities approach emphasizes that the development and use of competences in
response to the changing environment enhances performance. Contingency theory researchers stipulate that organizations must align the internal aspects of their organizations and processes such as knowledge strategy with situational factors such as organizational characteristics for higher innovation and improved performance (Venkatraman & Prescott, 1990). A conceptual model of the relationships among knowledge strategy, organizational characteristics, organizational innovation and performance proposed in this research is shown in Figure 2.1.

**Figure 2.1: Conceptual Model of the Relationship between Knowledge Strategy, Organizational Characteristics, Organizational Innovation and Organizational Performance.**
As shown in Figure 2.1, organizational performance is the dependent variable, knowledge strategy is the independent variable; organizational characteristics is the moderating variable and organizational innovation is the mediating variable. The following section discusses the expected relationships among the variables as shown in the conceptual model. The section also discusses the rationale for the expected relationships among the variables. From the expected relationships among the variables, hypotheses were proposed for empirical testing.

2.8.2 Conceptual Hypotheses

The conceptual model (Figure 2.1) indicates that knowledge strategy was expected to have an effect on organizational performance. Knowledge based view of the firm suggests that performance differences among firms can be explained by their differing stocks of knowledge and utilization patterns (Choo & Bontis, 2002). Knowledge enhances a firm’s effectiveness and efficiency which are crucial in improving performance. Teece (2000) argues that companies having superior knowledge are able to coordinate and combine their traditional resources and capabilities in new and distinctive ways, providing more value for their customers than their competitors. Knowledge also enhances a firm’s innovative capability in products and processes required to enhance customer satisfaction. Indeed, a firm that effectively uses its knowledge assets knows more about its customers, products, technologies, markets and their linkages. This enables a firm to create competitive advantage and improve its performance.

Knowledge management scholars argue that firms need to balance knowledge exploration and exploitation to achieve superior performance (Bierly & Daly, 2007; He & Wong, 2004; March, 1991; Utiola et al., 2009). March (1991) argued that knowledge exploitation is likely to maximize profits in the short-run and that exploration is more likely to maximize long term success. Past studies (Bierly & Daly, 2007; He & Wong, 2004) reported positive relationship between knowledge exploration and exploitation, and firm performance. In view of these arguments and empirical evidence, the following hypothesis was proposed:

H1: Knowledge strategy has a positive effect on organizational performance.
Organizational innovation was expected to mediate the relationship between knowledge strategy and organizational performance. Soo et al. (2002) point out that the impact of KM systems on performance relates primarily to the organization’s ability to innovate—either through improved processes or improved products and services. Dynamic capabilities approach suggests that firms use their stocks of knowledge to enhance innovation required to adapt to environmental changes and in turn achieve competitive advantage and improved performance (Ambrosini & Bowman, 2009; Teece et al., 1997).

Past research (Darroch & McNaughton, 2003; Lopez-Nicolás & Merono-Cerdan, 2011) shows that knowledge initiatives can improve corporate performance indirectly through higher organizational ability to innovate which in turn affects organizational performance. Thus, the following hypothesis was proposed:

**H2: The effect of knowledge strategy on organizational performance is mediated by organizational innovation.**

The relationship between knowledge strategy and organizational performance was also expected to be moderated by organizational characteristics. Knowledge management scholars (Holsapple & Joshi, 2000) posit that the effectiveness of KM initiatives depend on organizational characteristics such as structure, culture, and strategic leadership which facilitate knowledge exploration and exploitation. Knowledge exploration and exploitation typically occur in different parts of an organization and balancing exploration and exploitation requires organizational cultures, team based structures, human resource practices and communication networks that support knowledge exploration and exploitation (Bierly & Daly, 2007; Zack, 1999). In line with the contingency theory, it is expected that the influence of knowledge strategy on organizational performance is dependent on supportive organizational characteristics.

Empirical studies suggest that organizational characteristics such as culture of collaboration and trust are important enablers of KM initiatives which enhance achievement of KM outcomes (Lee & Choi, 2003). Other studies (Jung et al., 2003; Vera & Crossan, 2004) have found that strategic leadership is one of the important factors that support knowledge creation and sharing which are important requirements for innovation.
and performance outcomes. In view of these arguments and findings, the following hypothesis was proposed:

\( H3: \text{The effect of knowledge strategy on organizational performance is moderated by organizational characteristics.} \)

The variables of knowledge strategy, organizational characteristics, and organizational innovation were jointly expected to have a greater effect on organizational performance than the effect of knowledge strategy on organizational performance. Contingency theory suggests that the relationship between organizational processes and organizational performance depends on organizational conditions, also known as contingencies (Donaldson, 1987). Based on the contingency theory, it is expected that the relationship between knowledge strategy and organizational performance is influenced by contingencies of organizational characteristics and organizational innovation.

The contingency theory also suggests that organizational performance is enhanced when organizational processes are aligned to supportive organizational contingencies (Donaldson, 1987). Thus alignment of knowledge strategy with organizational characteristics and organizational innovation would achieve higher performance outcomes. Hence the following hypothesis was proposed:

\( H4: \text{The joint effect of knowledge strategy, organizational characteristics, and organizational innovation on organizational performance is greater than the effect of knowledge strategy on organizational performance.} \)

In summary, this study sought to test the following hypotheses:

H1: Knowledge strategy has a positive effect on organizational performance.

H2: The effect of knowledge strategy on organizational performance is mediated by organizational innovation.

H3: The effect of knowledge strategy on organizational performance is moderated by organizational characteristics.

H4: The joint effect of knowledge strategy, organizational characteristics, and organizational innovation on organizational performance is greater than the effect of knowledge strategy on organizational performance.
2.9 Summary of the Chapter

This chapter discussed the theoretical perspective of the study, and reviewed theoretical arguments and empirical studies on the linkages between the study variables: knowledge strategy, organizational characteristics, organizational innovation and organizational performance. The chapter also discussed the knowledge gaps and the focus of this study. Based on the literature, the chapter described the conceptual framework and hypotheses of the study. The next chapter describes the research methodology that was adopted for the study.
CHAPTER THREE
RESEARCH METHODOLOGY

3.1 Introduction
This chapter describes the methodology that was used in conducting the study. It explains the philosophical orientation, research design, population and sample of the study. It also describes data collection, operationalization of variables, tests of reliability, validity and regression assumptions, and statistical techniques used to summarize data and test hypotheses.

3.2 Philosophical Orientation
Two philosophical orientations guide researchers in conducting research. These are positivism and phenomenology. Social sciences scholars make a choice whether a study will adopt positivist or phenomenology orientation. Positivism involves theory testing and the key argument of positivist orientation is that the world exists externally, and that its properties should be measured through objective methods, rather than being inferred subjectively through sensation, reflection or intuition (Easterby-Smith, Thorpe & Jackson, 2011). Positivist orientation is related to the quantitative approach, a research strategy or general orientation to conduct research (Bryman & Bell, 2007). Quantitative approach is construed as a research strategy that emphasizes quantification in the collection and analysis of data; and entails a deductive approach in which a conceptual and theoretical structure is developed and then tested by empirical observation; thus particular instances are deducted from general inferences (Hussey & Hussey, 1997).

On the other hand, phenomenology orientation, sometimes referred to as interpretivist orientation involves theory development and assumes that experience of the world is subjective and best understood in terms of individual subjective meanings rather than objective definitions (Easterby-Smitt et al., 2011). Phenomenology orientation is related to qualitative research that emphasizes words rather than quantification in the collection and analysis of data (Bryman & Bell, 2007). Qualitative strategy entails an inductive approach in which theory is developed from the observation of empirical reality; thus general inferences are induced from particular instances (Hussey & Hussey, 1997).
This study adopted a positivist orientation because it was theory-driven and tested hypotheses. Theory and hypotheses are the cornerstones of the positivist philosophy (Easterby-Smitt et al., 2011). In addition, the study was anchored on RBV, KBV, DC and contingency theory all of which facilitated postulation of the relationships between knowledge strategy, organizational characteristics, organizational innovation and organizational performance. By adopting a positivist approach, it was assumed that the research concepts are phenomena with known properties or dimensions and can be measured with standard instruments. The study also adopted the quantitative approach which is objective in nature and concentrates on measuring phenomena (Bryman & Bell, 2007).

Guided by the RBV, KBV, DC and contingency theory, hypotheses were formulated, variables were measured using structured questionnaires and data analysis performed using appropriate statistical techniques to test the hypotheses.

3.3 Research Design

There are various research designs classified on the basis of various perspectives. The common perspectives on which research designs are classified include: purpose of the study (descriptive or causal), method of data collection (survey or experiment) and the time horizon of the study (cross-sectional or longitudinal) (Sekaran, 2003; Zikmund, 2000). The objectives of the study, the available data sources, the urgency of the decision and the cost of obtaining the data determine the design technique chosen (Zikmund, 2000).

This study adopted a cross-sectional survey research design. A cross-sectional survey design entails collection of data across many research units at one point in time predominantly by questionnaire (Bryman & Bell, 2007). In other words, data on the research variables were collected at a single point in time from sample units to examine potential relationships among the variables. Cross-sectional survey was considered appropriate because of the need to collect data from a cross-section of the population at one point in time and the results generalized to represent the entire population of the study.
3.4 Population of the Study

This study focussed on the influence of organizational characteristics and organizational innovation on the relationship between knowledge strategy and performance of manufacturing firms in Kenya. Data aggregation and analysis was done at firm level. Thus, the population of this study comprised manufacturing firms in Kenya. These are firms whose activities involve mechanical or chemical transformation of inorganic or organic substances into new products (Riddel, 1990). Manufacturing firms in Kenya which comprise the population of the study were identified using KAM Directory of Kenya Manufacturers and Exporters (KAM, 2014), because the researcher established that KAM maintains the most update coverage of manufacturing firms in Kenya. The firms in the population comprised small, medium and large firms.

There were a total of 655 manufacturing firms at the time of the study which were members of KAM (KAM, 2014). A complete list of these firms is attached as Appendix II. The firms are classified into 12 sub-sectors of manufacturing on the basis of the products they manufacture. The sub-sectors are: Food, Beverages and Tobacco; Metal and Allied; Leather and Footwear; Chemical and Allied; Textile and Apparels; Plastics and Rubber; Paper and Board; Timber, Wood and Furniture; Pharmaceutical and Medical Equipment; Motor Vehicle and Accessories; Energy, Electricals and Electronics; and Building, Mining and Construction Sector.

3.5 Sample Design

In conducting a study, the researcher has to make a decision whether to use the entire population or sample (Sekaran, 2003; Zikmund, 2000). Sometimes when the population is large it is extremely unlikely that the researcher will have the time and other resources to conduct a survey of all the elements of the population. Hence researchers usually use samples so that findings of sample studies are generalized to the population (Sekaran, 2003).

Given the large size of the population and resource constraints, a sample was used for this study. The sample units comprised manufacturing firms operating in Kenya. To determine the sample size, the statistical formula suggested by Mugenda and Mugenda
(2003) and Saunders et al. (2009) was used. They observe that sample size depends on how confident the researcher wants to be that the estimate is accurate (the level of confidence in the estimate), how accurate the estimate needs to be (the margin of error), and the proportion of responses expected to have some particular characteristic.

Hence sample size (Mugenda & Mugenda, 2003; Saunders et al., 2009) was computed as follows:

\[ n = \frac{z^2pq}{e^2} \]

Where:

- \( n \) is the minimum sample size required
- \( z \) is the standard normal deviate that is, 1.96 for 95% confidence level
- \( p \) is the proportion in the target population estimated to have the characteristic, recommended to be 50% if there is no estimate available of the proportion in the target population assumed to have the characteristic of interest.
- \( q \) is the proportion not having the characteristic (that is, 1 - \( p \))
- \( e \) is the level of significance or margin of error (set at 5% in this study).

Substituting the data in the formula gave a sample size of 384.

Saunders et al. (2009) suggest that where the population is less than 10,000, as is the case in this study, smaller sample size called adjusted minimum sample size can be used without affecting the accuracy of the study. This is calculated using the following formula (Mugenda & Mugenda, 2003; Saunders et al., 2009):

\[ n' = \frac{n}{1 + \frac{n}{N}} \]

Where:

- \( n' \) is the adjusted minimum sample size
- \( n \) is the minimum sample size, as calculated above, that is, 384
- \( N \) is the total population, that is, 655

Substituting these figures into the formula gave minimum sample size of 242.

Bryman and Bell (2007) advise that in sample size determination, the problem of nonresponse should be borne in mind. In this study, it was expected that there could be a 10
per cent rate of non-response. Thus, an additional 10 per cent of the desired sample, that is 24 firms were included in the study. Hence, the target sample size was 266 firms.

Once the sample size has been determined the researcher has to determine the particular population units that will constitute the sample. There are several alternative ways of selecting sample units; the methods are grouped into probability and non-probability sampling techniques. Probability sampling designs are preferred when the representativeness of the sample is of importance for wider generalization of the results of the study (Sekaran, 2003).

To select the 266 firms which constituted the sample units, a probability sampling method, that is disproportionate stratified random sampling method was used to ensure the sample was representative of the 12 sub-sectors of manufacturing to enhance generalizability of the results. Unlike proportionate stratified sampling where the number of units drawn from each stratum is proportionate to the stratum’s share of the total population, disproportionate stratified sampling involves taking units from each stratum disproportionate to the stratum’s share in the population. Disproportionate stratified sampling method is preferred when some stratum or strata are too small or too large (Sekaran, 2003; Mugenda & Mugenda, 2003), and thus ensures the inclusion into the sample the small strata in the population which otherwise would be omitted by other sampling methods. To select sample units from each of the manufacturing sub-sector strata, systematic sampling method was used. The sampling frame was constructed from the list of manufacturing firms in Kenya which were members of KAM at the time of the study. The population in each sub-sector of manufacturing and sample size are shown in Table 3.1.
Table 3.1: Population and Sample by Sector

<table>
<thead>
<tr>
<th>Manufacturing sub-sector</th>
<th>Population</th>
<th>Sample</th>
</tr>
</thead>
<tbody>
<tr>
<td>Building, Mining &amp; Construction</td>
<td>21</td>
<td>11</td>
</tr>
<tr>
<td>Chemical &amp; Allied</td>
<td>72</td>
<td>29</td>
</tr>
<tr>
<td>Energy, Electricals &amp; Electronics</td>
<td>39</td>
<td>15</td>
</tr>
<tr>
<td>Food, Beverages &amp; Tobacco</td>
<td>171</td>
<td>66</td>
</tr>
<tr>
<td>Leather &amp; Footwear</td>
<td>9</td>
<td>7</td>
</tr>
<tr>
<td>Metal &amp; Allied</td>
<td>71</td>
<td>29</td>
</tr>
<tr>
<td>Motor Vehicle &amp; Accessories</td>
<td>39</td>
<td>15</td>
</tr>
<tr>
<td>Paper &amp; Board</td>
<td>68</td>
<td>26</td>
</tr>
<tr>
<td>Pharmaceutical &amp; Medical Equipment</td>
<td>24</td>
<td>12</td>
</tr>
<tr>
<td>Plastics &amp; Rubber</td>
<td>64</td>
<td>24</td>
</tr>
<tr>
<td>Textile &amp; Apparels</td>
<td>60</td>
<td>23</td>
</tr>
<tr>
<td>Timber, Wood &amp; Furniture</td>
<td>17</td>
<td>9</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>655</strong></td>
<td><strong>266</strong></td>
</tr>
</tbody>
</table>

3.6 Data Collection

Research data can be obtained from primary or secondary sources (Sekaran, 2003). To achieve the objectives of this study, primary data was collected.

In gathering the data in this study, the questionnaire was used as the instrument for data collection. Questionnaires have the advantage of obtaining data more efficiently in terms of time, energy, and costs; hence, questionnaire is commonly used as an instrument to collect data from respondents (Sekaran, 2003).

The questionnaire for this study was developed to measure the respondents’ perceptions of the existence and magnitude of the research variables: knowledge strategy, organizational characteristics, organizational innovation and organizational performance in their organizations. Designing a sound questionnaire requires focus on three main issues. These include simple wording of questions, planning of how the variables will be categorized, scaled and coded, and general appearance of the questions (Sekaran, 2003). These issues were addressed to minimize bias in the study. In designing a questionnaire researchers make a decision whether the questions will be open-ended or closed-ended (Sekaran, 2003). This study used closed-ended questions mainly Likert-type scales because closed questions have the advantage of helping the respondents make quick decisions to choose among the set of alternatives. Closed questions also make it easier to code the information for subsequent analysis (Sekaran, 2003).
The questionnaire was arranged in four sections. Section I contained questions on the profile of the organizations. Section II contained questions about knowledge strategy. Section III contained questions regarding organizational characteristics; the section was divided into three parts covering dimensions of organizational characteristics, that is organizational structure, culture and strategic leadership. Section IV contained questions on organizational innovation. Finally, Section V contained questions on organizational performance. The complete set of the questionnaire is presented in Appendix I.

Hair, Black, Babin, Anderson and Tatham (2011) advise that before embarking on the final study, it is necessary to conduct a pilot study to determine the clarity, reliability and validity of the instrument. Thus, the questionnaire was pre-tested on five manufacturing firms which were randomly selected and were not part of the actual study sample, to test how the questionnaire was perceived. The respondents in the pilot study were asked to make comments and suggestions regarding the instructions and, clarity of questions asked. The pre-tests raised no concerns as managers had no problem understanding and answering the questions.

The unit of analysis in this study was the organization; hence one respondent was targeted in each firm. The respondents were the executive officers of the firms who included chief executive officers, production managers, human resource managers and administrators. These managers were chosen as the respondents because they are considered to be better informed about organizational characteristics and processes.

To improve response rate in this study, the questionnaires were self-administered and were either delivered personally by the researcher or research assistants; and in a few cases, sent by e-mail to the respondents. The questionnaires were attached with research permit from National Commission for Science, Technology and Innovation, and introductory letters from the University of Nairobi and the researcher outlining the research project and requesting respondents to facilitate the study with a promise of confidentiality. To increase the rate of return of the questionnaires, phone calls were used to make follow-ups. The survey took a total of four months from July to November 2014.
3.7 Operationalization of Variables
The survey contained a number of measures designed to elicit information about the research variables: knowledge strategy, organizational characteristics, organizational innovation and organizational performance. Zikmund (2000) posits that a concept must be made operational in order to render it measurable. This is done by looking at the dimensions, facets or properties denoted by the concept which are then translated into observable and measurable elements on which measurement scale is developed (Sekaran, 2003). The variables in this study were operationalized by borrowing from related past studies as discussed below.

The independent variable of this study, knowledge strategy was measured using the widely used dimensions of knowledge exploration and exploitation (Bierly & Daly, 2007; March, 1991; Miller et al., 2007). Informed by the literature, five-point Likert-type response scales (from 1 = strongly disagree to 5 = strongly agree) were constructed with items on knowledge exploration and exploitation. Respondents were asked to indicate how accurately each statement described their firms. A higher agreement with the statements in the scale was taken to mean the organization practiced knowledge exploration and exploitation to a great extent.

The moderating variable, organizational characteristics were conceptualized to include organizational structure, organizational culture and strategic leadership. To measure organizational structure, this study adopted the widely used typology which includes three dimensions of formalization, centralization and complexity. Items to measure these dimensions were borrowed from the works of Pugh et al. (1969) and Lee and Choi (2003). Culture was measured using the operationalization developed by Denison and Mishra (1995) that encompasses four dimensions: involvement, consistency, adaptability, and mission; and collaboration and trust (Lee & Choi, 2003). Questionnaire items were developed based on these dimensions of culture. Strategic leadership was operationalized using the widely used dimensions of transformational and transactional leadership styles. Multifactor leadership questionnaire developed by Bass and Avolio (1995) was used to measure the dimensions of the construct. Multi-item Likert-type scales (with a 5-point scale from 1 = strongly disagree to 5 = strongly agree) were developed based on the
dimensions of the variables. Respondents were asked to assess how accurately the statements described their firms. Higher agreement with the statements in the scale was taken to mean the organizations were characterized by the aspects of organizational characteristics.

The mediating variable, organizational innovation was measured in terms of introduction of new or improved products to the market, and new or improved processes. Items to measure innovation were borrowed from the works of Darroch and MacNaughton (2003) and Li, Liu, Wang, Li and Guo (2009). Five-point Likert-type scales (from 1 = strongly disagree to 5 = strongly agree) were developed with items to measure the dimensions of organizational innovation. Respondents were asked to indicate their level of agreement on how accurately the statements about innovation described their firms. Higher agreement with the statements in the scale was taken to mean the organization was innovative in products and processes.

Prior studies (Bontis, Crossan, & Hulland, 2002; Gopalakrishnan & Bierly, 2006) suggest that firm size can influence organizational processes and performance outcomes. However, conflicting findings exist concerning the impact of size on knowledge management activities. Some studies suggest that firm size is associated with a firm’s accumulated learning, enhanced knowledge systems and procedures, and greater resources to support innovation (Gopalakrishnan & Bierly, 2006). In contrast, other studies suggest inflexibility can increase with size, thus narrowing down the search for and adoption of new technologies and new knowledge (Bontis et al. 2002). Thus, size of the firms was controlled for in this study. Borrowing from the literature (Gopalakrishnan & Bierly, 2006), firm size was measured using number of employees. Number of employees was categorized into three categories including less than 50 employees, between 51 to 100 employees and more than 100 employees.

The dependent variable, organizational performance is viewed as a multidimensional concept (Auh & Menguc, 2005) and researchers have adopted different perspectives in measuring performance. Organizational performance encompasses three specific areas of firm outcomes: financial performance (profits, return on assets and return investment);
market performance (sales and market share); and shareholder return (total shareholder and economic value added) (Richard et al., 2009). In this study, organizational performance was measured using financial performance in terms of return on assets and return on equity, and market performance in terms of market share or sales growth. The measures were used because of their common usage in measuring organizational performance and simplicity to estimate.

The dimensions of organizational performance can be measured using objective or subjective self-reported measures. Although the use of objective measures would be preferred, obtaining accurate financial data is often a problem particularly in privately held firms. Scholars (Atalay, Anafarta, & Sarvan, 2013; Dess & Robinson, 1984) posit that where objective measures of performance are unavailable or difficult to gather especially for private firms due to confidentiality, a researcher might consider using subjective perceptual data. Dess and Robinson (1984) argue that self-evaluations could serve as reliable alternative indicators of performance; and evidence suggests that executive officers’ self-reports of performance significantly correlate with objective measures of firm performance. Since most of the manufacturing firms in Kenya are private firms and hence absence of publicly available objective data, this study used self-reported perceptual data on financial and market performance of the firms. Five-point Likert-type response scales (from 1 = lowest 20% to 5 = Top 20%) were developed with items on financial and market performance, and respondents were asked to compare their firms with key competitors on the items. Higher scores on the items in the scale were taken to mean the organization had higher performance. Table 3.2 presents a summary of indicators and items to measure each of the variables.
Table 3.2: Operationalization of Variables

<table>
<thead>
<tr>
<th>Variable</th>
<th>Indicators</th>
<th>Source</th>
<th>Measurement scale</th>
<th>Questionnaire items</th>
</tr>
</thead>
<tbody>
<tr>
<td>Knowledge strategy</td>
<td>- Knowledge exploration</td>
<td>Bierly &amp; Daly (2007); March (1991); Miller et al. (2007)</td>
<td>Five-point Likert-type scale</td>
<td>Section II (a)</td>
</tr>
<tr>
<td></td>
<td>- Knowledge exploitation</td>
<td></td>
<td></td>
<td>Section II (b)</td>
</tr>
<tr>
<td>Organizational</td>
<td>- Organizational structure</td>
<td>Pugh et al. (1969); Lee &amp; Choi (2003); Denison &amp; Mishra (1995); Bass &amp; Avolio (1992)</td>
<td>Five-point Likert-type scale</td>
<td>Section III (a)</td>
</tr>
<tr>
<td>characteristics</td>
<td>- Organizational culture</td>
<td></td>
<td></td>
<td>Section III (b)</td>
</tr>
<tr>
<td></td>
<td>- Strategic leadership</td>
<td></td>
<td></td>
<td>Section III (c)</td>
</tr>
<tr>
<td>Organizational</td>
<td>- Product innovation</td>
<td>Darroch &amp; MacNaughton (2003); Li et al. (2009)</td>
<td>Five-point Likert-type scale</td>
<td>Section IV</td>
</tr>
<tr>
<td>innovation</td>
<td>- Process innovation</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Organizational</td>
<td>- Financial performance</td>
<td>Lumpkin &amp; Dess (1996); Tan &amp; Litschert (1994)</td>
<td>Five-point Likert-type scale</td>
<td>Section V</td>
</tr>
<tr>
<td>performance</td>
<td>- Market performance</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

3.8 Reliability, Validity and Regression Assumptions

Reliability and validity are two essential characteristics of a good measurement tool (Zikmund, 2000). The measurement tools used to measure research variables must be reliable and valid to yield accurate results. Validity and reliability are related and reliability is a necessary but not sufficient condition for validity. In other words, a reliable instrument may not be valid, but for a test to be valid it has to be reliable (Zikmund, 2000). To draw conclusions based on a regression analysis of data, Hair et al. (2011) emphasize the importance of testing to identify any violations of the underlying assumptions in linear regression analysis. Tests of reliability, validity and regression assumptions are described in this section.

3.8.1 Test of Reliability

In assessing the reliability of research instruments, internal consistency reliability, which is the most commonly used test, was used. It is an indicator of how well the different items are homogeneous and capable of independently measuring the same concept so that the respondents attach the same overall meaning to each of the items (Sekaran, 2003).
This study used Cronbach’s alpha coefficient to measure internal consistency reliability of the measures of the constructs. Cronbach’s alpha coefficient was used because it is the most widely measure of internal consistency reliability (Sekaran, 2003; Hair et al., 2011). Cronbach’s alpha reliability coefficient normally ranges between 0 and 1; and higher alpha coefficient values are more reliable. The generally agreed lower limit is 0.7 (Nunnally & Bernstein, 1994) or 0.6 in exploratory research (Hair et al., 2011). A value greater than this lower limits indicates an acceptable level of reliability.

3.8.2 Test of Validity

To assess validity of the study instruments, this study examined two commonly used forms of validity tests: Face or content validity and construct validity. Construct validity is a combination of convergent and discriminant validity (Sekaran, 2003; Zikmund, 2000).

To establish face validity of the research instrument, this study used existing scales that have already been validated by other researchers. Further, the research instrument was subjected to critique by experts in strategic management at the University of Nairobi, School of Business, who assessed the instrument items and terminology to ensure it was clear and logical. The comments of the critique were used to revise the instrument to enhance face validity. Further, wording and format modifications were made to improve clarity of the questions and the general appearance of the questionnaire.

To test construct validity, the commonly used approach of factor analysis was conducted. Factor analysis can be achieved by either using exploratory factor analysis (EFA) or confirmatory factor analysis (CFA). In this study, EFA was used to analyse the items in the research constructs because of its common usage and simplicity. Exploratory factor analysis yielded factor loadings which were assessed to determine the extent to which each item in the scales contributed to the respective factor. Factor loadings of items that met the recommended cut-off of 0.4 (Hair et al., 2011) were considered sufficiently high and thus acceptable.
3.8.3 Test of Regression Assumptions
Regression analysis was used as the main analysis technique to test the research hypotheses. Hence it was imperative to ensure that the assumptions of regression analysis were fulfilled. The assumptions of linearity and homoscedasticity, normality and multicollinearity were tested when conducting regression analysis.

To test for linearity and homoscedasticity, a scatterplot of standardized residuals (ZRESID) against standardized predicted (ZPRED) values was used. The graph of ZRESID and ZPRED should look like a random array of dots evenly dispersed around zero. If there is any sort of curve in this graph then the chances are that the data have broken the assumption of linearity (Hair et al., 2011). If the graph funnels out, then chances are that there is heteroscedasticity, unequal variances in the data, one of the most common violations of homoscedasticity assumption. To assess normality, the normal probability plot, which compares the cumulative distribution of actual data values with the cumulative distribution of a normal distribution (Hair et al., 2011) was used. The normal distribution forms a straight diagonal line, and the plotted data values are compared with the diagonal. If a distribution is normal, the line representing the actual data distribution closely follows the diagonal (Hair et al., 2011). The assumption of multicollinearity of the predictor variables was tested using the diagnostics of tolerance and variance inflation factor (VIF). A tolerance of below 0.1 or a VIF of greater than 10 are considered to indicate a serious problem of multicollinearity (Hair et al., 2011).

3.9 Data Analysis
The data collected was edited and coded for analysis. Descriptive statistics were used to summarise the data and inferential statistics were used to test hypotheses. Descriptive statistics, specifically frequencies and percentages were used to describe the profiles of the organizations and respondents. Further, descriptive statistics: summary measures were used to describe the research variables. This study used the most widely used summary measure: the mean to describe knowledge strategy, organizational characteristics, innovation and performance of the firms. Easterby-Smith et al. (2012) posit that most samples of data will contain variability around a central value and how much spread there is around a measure of location is a valuable way of capturing the data
set as a whole. Three common measures of spread are the range, mid-range and the
standard deviation. The most widely used summary of spread is the standard deviation
(Easterby-Smith et al., 2012). To determine relative dispersion across the variables and
hence variability of the data, coefficient of variation, which expresses the standard
deviation as a proportion of the mean, is usually used. Hence, this study used the standard
deviation and coefficient of variation as measures of spread and relative variation in the
data; which were paired together with the mean.

Before testing the hypotheses, it was necessary to analyze how the variables of the study:
knowledge strategy, organizational innovation, organizational characteristics and
organizational performance were related. This was done using Pearson’s product-moment
correlation.

To test Hypothesis H1, which predicted that knowledge strategy has a positive effect on
organizational performance, multiple regression analysis was used. To do the analysis,
organizational performance was regressed on the dimensions of knowledge strategy, that
is knowledge exploration and knowledge exploitation. Composite scores of knowledge
exploration and knowledge exploitation, and organizational performance were used in the
analysis. The composite scores were computed by adding together scores of all the items
measuring the respective variables and dividing the total score by the total number of the
items (Pallant, 2005). The following multiple regression model (3.1) was used:
\[ Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \epsilon \] ...............................................................
...........................
(3.1)
Where:
Y is the dependent variable (organizational performance)
\( \beta_0 \) is the y intercept
\( \beta_1 \) and \( \beta_2 \) are the regression (beta) coefficients
\( X_1 \) is knowledge exploration
\( X_2 \) is knowledge exploitation
\( \epsilon \) is regression error term

Methods used to test mediation effect include Baron and Kenny’s (1986) approach and
structural equation modelling (Shaver, 2005). To test Hypothesis H2, which stated that
the effect of knowledge strategy on organizational performance is mediated by organizational innovation, the commonly used Baron and Kenny’s (1986) approach in testing mediation effect was used.

Following Baron and Kenny’s (1986) procedure, analysis to test mediation effect was done in four steps in which regression analyses were conducted to establish four conditions for mediation. Composite scores of knowledge strategy, organizational innovation and organizational performance were used in the analysis. The composite scores were computed by adding together scores from all the items measuring the respective variables and dividing the total score by the total number of the items (Pallant, 2005).

The first step was to show that there was a relationship between the independent variable and dependent variable which may be mediated. Hence, the dependent variable, organizational performance was regressed on the independent variable, knowledge strategy. Regression model (3.2) was used to test the first condition for mediation:

\[ Y = \alpha_0 + \beta_1 X_1 + \varepsilon_0 \]  

Where:

- \( Y \) is the dependent variable (organizational performance)
- \( \alpha_0 \) is the y intercept
- \( \beta_1 \) is the regression (beta) coefficient
- \( X_1 \) is the independent variable (knowledge strategy)
- \( \varepsilon_0 \) is the regression error term

The second step was to show that the independent variable was related to the potential mediator. Hence, the potential mediating variable, organizational innovation was regressed on the independent variable, knowledge strategy to assess the second condition for mediation. This is represented by regression model (3.3):

\[ M = \alpha_1 + \beta_2 X_1 + \varepsilon_1 \]  

Where:

- \( M \) is the mediating variable (organizational innovation)
- \( \alpha_1 \) is the y intercept
\( \beta_2 \) is the regression (beta) coefficient

\( X_1 \) is the independent variable (knowledge strategy)

\( \varepsilon_1 \) is the regression error term

The third step was to show that the potential mediator was related to the dependent variable. To assess this, the dependent variable, organizational performance was regressed on the mediating variable, organizational innovation. To make this assessment, regression model (3.4) was used:

\[
Y = \alpha_2 + \beta_3 M + \varepsilon_2 \\
\text{(3.4)}
\]

Where:

- \( Y \) is the dependent variable (organizational performance)
- \( \alpha_2 \) is the y intercept
- \( \beta_3 \) is the regression (beta) coefficient
- \( M \) is the mediating variable (organizational innovation)
- \( \varepsilon_2 \) is the regression error term

In the fourth and final step, the dependent variable was regressed on the independent variable and the potential mediator in blocks. This was to show that the strength of the relationship between the independent and the dependent variable is significantly reduced when the mediator is added to the model. If the variable is a complete mediator, the relationship between the independent variable and dependent variable would not be significant after the effect of the mediating variable is controlled for. To test this condition, the following model (3.5) was used:

\[
Y = \alpha_3 + \beta_4 X_1 + \beta_5 M + \varepsilon_3 \\
\text{(3.5)}
\]

Where:

- \( Y \) is the dependent variable (organizational performance)
- \( \alpha_3 \) is the y intercept
- \( \beta_4 \) and \( \beta_5 \) are regression (beta) coefficients
- \( X_1 \) is the independent variable (knowledge strategy)
- \( M \) is the mediating variable (organizational innovation)
- \( \varepsilon_3 \) is the regression error term
Hypothesis H3, which proposed that the effect of knowledge strategy on organizational performance is moderated by organizational characteristics, was tested using hierarchical regression analysis. Hierarchical regression analysis provides a method for testing contingency hypotheses in which interaction is implied by entering variables into a model sequentially in blocks to determine whether the addition of the potential moderator, interaction term increases the overall fit of the model (R Squared) significantly (Easterby-Smith et al., 2012). Hierarchical regression analysis was used in related studies (Bierly & Daly, 2007; He & Wong, 2004) to test moderating effect. Composite scores for knowledge strategy, organizational characteristics and organizational performance were used in the analysis. The composite scores were computed by adding together scores from all the items measuring the respective variables and dividing the total score by the total number of the items (Pallant, 2005). Dimensions of organizational characteristics that were considered in this study were organizational structure, organizational culture and strategic leadership. The dimensions were collapsed to form a composite score for organizational characteristics that was used in the analysis. Three regression models (3.6, 3.7 and 3.8) specified below were used to test the hypothesis:

\[
Y = a + b_1X + e \ldots (3.6)
\]

\[
Y = a + b_1X + b_2Z + e \ldots (3.7)
\]

\[
Y = a + b_1X + b_2Z + b_3XZ + e \ldots (3.8)
\]

Where:

- Y is the dependent variable (organizational performance)
- \( b_1 \) - \( b_3 \) are the regression (beta) coefficients
- X is the independent variable (knowledge strategy)
- Z is the moderating variable (organizational characteristics)
- XZ is the cross-product of the independent variable and moderator (interaction term)
- e is the regression error term

In the first equation (3.6), the dependent variable (organizational performance) was regressed on the independent variable, knowledge strategy; the second equation (3.7) had the dependent variable (organizational performance), the independent variable (knowledge strategy), and the moderator (organizational characteristics). Finally, in the last equation (3.8), the dependent variable was regressed on independent variable,
moderator, and the cross-product of the independent variable and moderator, that is the interaction term. The cross-product was to determine the effect of the interaction between the independent variable and moderator on the dependent variable. If the addition of the interaction term significantly increases the R Squared, the interaction or moderator effect can be said to exist.

To test Hypothesis H4, which predicted that the joint effect of knowledge strategy, organizational characteristics and organizational innovation on organizational performance is greater than the effect of knowledge strategy on organizational performance, regression equations were used. Composite scores of knowledge strategy, organizational characteristics, organizational innovation and organizational performance were used in the analysis.

In the first regression, organizational performance was regressed on knowledge strategy. The following simple regression model (3.9) was used:

\[ Y = i_0 + \beta_1 X_1 + u_0 \]

(3.9)

Where:

- \( Y \) is the dependent variable (organizational Performance)
- \( i_0 \) is the y intercept
- \( \beta_1 \) is the regression coefficient
- \( X_1 \) is the independent variable (knowledge strategy)
- \( u_0 \) is the regression error term

In the second regression, organizational performance was regressed on all the predictor variables: knowledge strategy, organizational characteristics and organizational innovation. The following multiple regression model (3.10) was used:

\[ Y = i_1 + \beta_2 X_1 + \beta_3 X_2 + \beta_4 X_3 + u_1 \]

(3.10)

Where:

- \( Y \) is the dependent variable (organizational Performance)
- \( i_1 \) is the y intercept
- \( \beta_2 - \beta_4 \) are regression coefficients
- \( X_1 \) is knowledge strategy
$X_2$ is organizational characteristics
$X_3$ is organizational innovation
$u_1$ is the error term.

The overall fit ($R$-squared) of the two models were compared. If $R$ Squared for joint effect model is greater than $R$ Squared for individual effect model, then the joint effect of knowledge strategy, organizational characteristics, and organizational innovation on performance is greater than the individual effect of knowledge strategy on organizational performance.

Table 3.3 presents a summary of the research objectives, hypotheses and inferential statistics to test hypotheses.
Table 3.3: Summary of Objectives, Hypotheses and Analysis Techniques

<table>
<thead>
<tr>
<th>Objective</th>
<th>Hypothesis</th>
<th>Analysis technique</th>
<th>Interpretation</th>
</tr>
</thead>
<tbody>
<tr>
<td>i. Determine the effect of knowledge strategy on organizational performance.</td>
<td>H1. Knowledge strategy has a positive effect on organizational performance.</td>
<td>Multiple regression: ( Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \epsilon )</td>
<td>Change in ( R^2 ) value; If ( \beta ) values for knowledge exploration and knowledge exploitation are positive and ( F, \beta ) and ( t ) are all significant ( (p &lt; 0.05) ), then knowledge strategy has positive and significant effect on performance.</td>
</tr>
<tr>
<td>ii. Establish whether organizational innovation mediates the relationship</td>
<td>H2. The effect of knowledge strategy on organizational performance is mediated by organizational innovation.</td>
<td>Regression equations: ( Y = \alpha_0 + \beta_1 X_1 + \epsilon_1 ) ( M = \alpha_1 + \beta_2 X_1 + \epsilon_1 ) ( Y = \alpha_2 + \beta_3 M + \epsilon_2 ) ( Y = \alpha_3 + \beta_4 M + \beta_5 + \epsilon_3 )</td>
<td>If relationship between knowledge strategy and organizational innovation is significant ( (\beta, t ) are significant, ( p &lt; 0.05) ); relationship between knowledge strategy and organizational innovation is significant ( (\beta, t ) are significant, ( p &lt; 0.05) ); and relationship between knowledge strategy and performance is no longer significant when the effect of organizational innovation is controlled for ( (\beta, t, \epsilon ) are not significant, ( p &gt; 0.05) ), then organizational innovation mediates the relationship.</td>
</tr>
<tr>
<td>iii. Determine the influence of organizational characteristics on the</td>
<td>H3. The effect of knowledge strategy on organizational performance is moderated by organizational characteristics.</td>
<td>Hierarchical regression: ( Y = a + b_1 X + e ) ( Y = a + b_2 X + b_3 Z + e ) ( Y = a + b_4 X + b_5 Z + b_6 XZ + e )</td>
<td>If change in ( R^2 ) after addition of interaction term (moderator) is significant ( (R^2 ) change, ( F ) change, ( \beta, t ) are significant, ( p &lt; 0.05) ), then organizational characteristics moderates the relationship.</td>
</tr>
<tr>
<td>relationship between knowledge strategy and organizational performance.</td>
<td></td>
<td>Where: ( Y = ) performance; ( X = ) knowledge strategy; ( Z = ) organizational characteristics; ( XZ = ) interaction term</td>
<td></td>
</tr>
<tr>
<td>iv. Establish whether the joint effect of knowledge strategy, organizational</td>
<td>H4. The joint effect of knowledge strategy, organizational characteristics, and organizational innovation on organizational performance is greater than the effect of knowledge strategy on organizational performance.</td>
<td>Regression equations: ( Y = \beta_0 + \beta_1 X_1 + u_0 ) ( Y = \beta_1 + \beta_2 X_1 + \beta_3 X_2 + \beta_4 X_3 + u_1 ) ( Y = ) performance; ( X_1 = ) knowledge strategy; ( X_2 = ) organizational characteristics; ( X_3 = ) organizational innovation</td>
<td>If change in ( R^2 ) Squared for joint effect model is greater than change in ( R^2 ) Squared for individual effect model, then the joint effect of knowledge strategy, organizational characteristics, and organizational innovation on performance is greater than the effect of knowledge strategy on performance.</td>
</tr>
</tbody>
</table>

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3.10 Summary of the Chapter

This chapter focussed on the methodology that was used to collect and analyse the data required to address the research objectives and hypotheses. It described the philosophical orientation, research design, population and sampling design. The chapter also discussed the operationalization of study variables, tests of reliability and validity of research instruments, and assumptions of regression analysis. Finally, the chapter discussed the descriptive techniques for summarising research data and inferential techniques for testing hypotheses. The next chapter presents and discusses the results of descriptive statistics and tests of hypotheses.
CHAPTER FOUR
DATA ANALYSIS, FINDINGS AND DISCUSSION

4.1 Introduction
This chapter presents data analysis, findings and discussion of the results of the study. The chapter starts with discussion of the response rate, assessment of research instruments and regression assumptions. Then the results of descriptive statistics of the profiles of respondents and organizations are presented. These are followed by results of descriptive statistics of the study variables, correlation analysis and tests of hypotheses. Finally, the chapter presents discussion of the results of the study.

4.2 Response Rate
The unit of analysis in this study was the organization as each organization has unique sets of knowledge strategy, organizational characteristics, organizational innovation and performance. Questionnaires were distributed to 266 companies. After follow-ups, questionnaires from 184 companies were completed and returned in a form usable for analysis, which constituted a response rate of 69 percent. This response rate was considered good as suggested by Bryman and Bell (2007), and Mugenda and Mugenda, (2003).

Inspection of the missing data patterns showed that the number of missing values on the study variables was small and random. Further, missing patterns in the few cases did not reveal systematic values on the items of the independent variables and the dependent variable. Since the missing values were small and randomly distributed, imputation of missing values was not considered necessary; and missing values were excluded pair-wise in the SPSS 20.0. This option removes cases that have a missing value on the variables being correlated or regressed only (Pallant, 2005).

4.3 Reliability, Validity and Regression Assumptions
The study sought to ensure that the research scales were reliable and valid, and the data met the regression assumptions. The following section discusses the results of tests of reliability, validity and assumptions of regression analysis.
4.3.1 Test of Internal Consistency Reliability

The research scales were examined to determine their reliability. To test the internal consistency of the scale items, Cronbach’s alpha coefficient was used. The results of the analysis are presented in Table 4.1.

Table 4.1: Reliability Statistics

<table>
<thead>
<tr>
<th>Overall Reliability Statistics</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cronbach's Alpha</td>
</tr>
<tr>
<td>0.935</td>
</tr>
</tbody>
</table>

Cronbach’s Alpha Coefficients for the Measurement Scales for the Constructs

<table>
<thead>
<tr>
<th>Variable</th>
<th>Dimension measured</th>
<th>Number of items</th>
<th>Alpha (α)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Knowledge strategy</td>
<td>Knowledge exploration</td>
<td>4</td>
<td>0.745</td>
</tr>
<tr>
<td></td>
<td>Knowledge exploitation</td>
<td>3</td>
<td>0.649</td>
</tr>
<tr>
<td>Organizational characteristics</td>
<td>Organizational structure</td>
<td>16</td>
<td>0.859</td>
</tr>
<tr>
<td></td>
<td>Organizational culture</td>
<td>18</td>
<td>0.903</td>
</tr>
<tr>
<td></td>
<td>Strategic leadership</td>
<td>18</td>
<td>0.802</td>
</tr>
<tr>
<td>Organizational innovation</td>
<td>Product innovation</td>
<td>3</td>
<td>0.750</td>
</tr>
<tr>
<td></td>
<td>Process innovation</td>
<td>2</td>
<td>0.702</td>
</tr>
<tr>
<td>Organizational performance</td>
<td>Financial performance</td>
<td>2</td>
<td>0.788</td>
</tr>
<tr>
<td></td>
<td>Market performance</td>
<td>2</td>
<td>0.757</td>
</tr>
</tbody>
</table>

As shown in Table 4.1, all the research constructs had alpha coefficients of above 0.7, except the coefficient for knowledge exploitation which was slightly low (0.649). The overall Cronbach's Alpha coefficient was 0.935. Overall, the instrument met the recommended threshold of 0.7 (Nunnally & Bernstein, 1994) and thus was considered reliable.

4.3.2 Test of Validity

To test construct validity in this study, factor analysis was conducted. Because of the large number of items involved, separate sets of factor analyses were conducted for the items in the research constructs. Factor analysis was used to check the extent to which each item in the scales contributed to the respective factor.

Before factor analysis was conducted, assumptions of factor analysis were tested. As a general rule regarding sample size, the minimum is to have at least five times as many observations as the number of variables to be analyzed; and the minimum absolute sample size should be 50 observations, but preferably, the sample size should be 100 or
larger (Hair et al., 2011). In this study, sample size requirement was met as 184 firms were studied. To validate the use of factor analysis, Kaiser Meyer-Olkin (KMO) measure of sampling adequacy (MSA) is commonly used. Kaiser Meyer-Olkin measure varies from 0 to 1.0 and values closer to 1 are better. A value of 0.5 is a suggested minimum to proceed with factor analysis (Hair et al., 2011). Another method of determining the appropriateness of factor analysis is by conducting the Bartlet test of sphericity, a statistical test for the presence of correlations among the variables. A statistically significant Bartlet’s test of sphericity indicates that sufficient correlations exist among the variables to proceed with factor analysis (Hair et al., 2011). In this study, Kaiser Meyer-Olkin measure and Bartlet’s test of sphericity were employed. Table 4.2 presents the results.

Table 4.2: KMO and Bartlett’s Test Results

<table>
<thead>
<tr>
<th></th>
<th>Kaiser-Meyer-Olkin Measure of Sampling Adequacy</th>
<th>Bartlett’s Test of Sphericity</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Approximate Chi-Square</td>
<td>Approximate Chi-Square</td>
</tr>
<tr>
<td>MSA</td>
<td>.828</td>
<td>.828</td>
</tr>
<tr>
<td>Df</td>
<td>2278</td>
<td>2278</td>
</tr>
<tr>
<td>Sig.</td>
<td>.000</td>
<td>.000</td>
</tr>
</tbody>
</table>

Table 4.2 shows that KMO measure (0.828) is above the threshold of 0.5; and Bartlet’s test of sphericity is statistically significant (sig. < 0.05). This indicates that the assumptions of factor analysis are satisfied.

In conducting EFA, the two most commonly used extraction methods are principal component analysis or principal axis factoring. The two methods generate similar results in most research situations (Gaur & Gaur 2011; Hair et al., 2011). This study used principal component analysis and varimax rotation because of their wide usage and simplicity.

4.3.2.1 Factor Analysis of Knowledge Strategy

Exploratory factor analysis for items in knowledge strategy scale was conducted. Principal component analysis extraction method with varimax rotation method was used; and validity was assessed by examining the factor loadings to see if the items in the scale loaded highly on the construct. Table 4.3 presents the results of the analysis.
Table 4.3: Rotated Component Matrix for Measures of Knowledge strategy

<table>
<thead>
<tr>
<th>Knowledge strategy items</th>
<th>Component 1</th>
</tr>
</thead>
<tbody>
<tr>
<td>At our firm employees frequently come up with creative ideas that challenge conventional ideas</td>
<td>.727</td>
</tr>
<tr>
<td>Our firm excels at refining existing technologies</td>
<td>.691</td>
</tr>
<tr>
<td>We are usually one of the first firms in our industry to use new breakthrough technologies</td>
<td>.689</td>
</tr>
<tr>
<td>We frequently experiment with radical new ideas</td>
<td>.685</td>
</tr>
<tr>
<td>Compared to our principal competitors, a high percentage of our firm's sales come from new products launched within the past 3 years</td>
<td>.674</td>
</tr>
<tr>
<td>At our firm a strong emphasis is placed on improving efficiency</td>
<td>.651</td>
</tr>
<tr>
<td>We frequently adjust our procedures, rules and policies to make things work better</td>
<td>.604</td>
</tr>
</tbody>
</table>

Extraction Method: Principal Component Analysis.

The rotated component matrix in Table 4.3 shows that all the factor loadings of knowledge strategy items range from 0.604 to 0.727. The loadings met the cut-off of 0.4 and were considered sufficiently high. The factors account for 45.604 of the variance in the construct (Appendix V, Table A1). Thus, all the factors were retained for analysis.

4.3.2.2 Factor Analysis of Organizational Characteristics

Exploratory factor analysis for items in organizational characteristics scale was conducted. Because organizational characteristics was conceptualized in terms of three dimensions, that is organizational structure, culture and strategic leadership, and each dimension had many factors, factor analyses were done separately for each dimension. Factor analysis of organizational structure scale was conducted using principal component analysis extraction method with varimax rotation method to check the extent to which each item in the scale contributed to the respective factors. Table 4.4 presents the results of the analysis.
Table 4.4: Rotated Component Matrix for Measures of Organizational Structure

<table>
<thead>
<tr>
<th>Organizational structure items</th>
<th>Component 1</th>
<th>Component 2</th>
<th>Component 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>This organization has many professional specialties</td>
<td>.785</td>
<td></td>
<td></td>
</tr>
<tr>
<td>This organization has high functional diversification</td>
<td>.774</td>
<td></td>
<td></td>
</tr>
<tr>
<td>This organization has a great variety in core processes</td>
<td>.769</td>
<td></td>
<td></td>
</tr>
<tr>
<td>This organization has high geographical dispersion of operating sites</td>
<td>.746</td>
<td></td>
<td></td>
</tr>
<tr>
<td>This organization has many hierarchical levels</td>
<td>.744</td>
<td></td>
<td></td>
</tr>
<tr>
<td>This organization has a high span of control</td>
<td>.685</td>
<td></td>
<td></td>
</tr>
<tr>
<td>In our organization employees are not encouraged to make their own decisions</td>
<td></td>
<td>.832</td>
<td></td>
</tr>
<tr>
<td>In our organization employees cannot take action without a supervisor</td>
<td>.793</td>
<td></td>
<td></td>
</tr>
<tr>
<td>In our organization employees need to refer to someone to make decisions</td>
<td>.775</td>
<td></td>
<td></td>
</tr>
<tr>
<td>In our organization only a few people at the upper levels are involved in making decisions</td>
<td>.717</td>
<td></td>
<td></td>
</tr>
<tr>
<td>In our organization employees cannot make decisions without approval</td>
<td>.576</td>
<td></td>
<td></td>
</tr>
<tr>
<td>In our organization employees cannot ignore the rules and reach informal agreements to handle some situations</td>
<td></td>
<td></td>
<td>.775</td>
</tr>
<tr>
<td>In our organization rules and procedures are typically written</td>
<td>.745</td>
<td></td>
<td></td>
</tr>
<tr>
<td>In our organization, contact with our organization is on a formal or planned basis</td>
<td>.714</td>
<td></td>
<td></td>
</tr>
<tr>
<td>In our organization, there are many activities that are covered by formal procedures</td>
<td>.672</td>
<td></td>
<td></td>
</tr>
<tr>
<td>In our organization employees cannot make their own rules on the job</td>
<td></td>
<td></td>
<td>.601</td>
</tr>
</tbody>
</table>

Extraction Method: Principal Component Analysis.
Rotation Method: Varimax with Kaiser Normalization.

The rotated component matrix in Table 4.4 shows that all the factor loadings of organizational structure items range from 0.576 to 0.832 which are above the loading cut-off of 0.4. Hence, the loadings were in the acceptable range. The factors account for 59.502 of the variance in the construct (Appendix V, Table A2). Thus, all the factors were retained for analysis.

Factor analysis of organizational culture scale was conducted using principal component analysis and varimax rotation method to check the extent to which each item in the scale contributed to the respective factors. Table 4.5 presents the results of the analysis.
Table 4.5: Rotated Component Matrix for Measures of Organizational Culture

<table>
<thead>
<tr>
<th>Organizational culture items</th>
<th>Component</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Our employees have trust in each other’s commitment to the organizational goals</td>
<td>.833</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Our employees have trust in each other’s ability</td>
<td>.801</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Our employees have relationships based on trust in each other</td>
<td>.739</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Our employees have trust in each other members’ intentions and behaviours</td>
<td>.718</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Our employees are generally trustworthy</td>
<td>.666</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Our employees have trust in each other’s commitment to the company as a whole</td>
<td>.660</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>There is willingness to collaborate across organizational units within our organization</td>
<td>.830</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>In our organization employees are highly willing to support each other</td>
<td>.731</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>In our organization, collaboration among employees is high</td>
<td>.710</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>There is willingness within our organization to accept responsibility for failure</td>
<td>.645</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Customers comments and recommendations often lead to changes in this organization</td>
<td>.853</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>This organization is very responsive and adapts to changes easily</td>
<td>.762</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>There is a high level of agreement about the way that we do things in this organization</td>
<td>.570</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Our approach to doing business is very consistent</td>
<td>.402</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>This organization has a long term purpose and direction</td>
<td>.803</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>There is a shared vision of what this organization will be like in future</td>
<td>.732</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cooperation and collaboration across functional roles is actively encouraged</td>
<td>.856</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Most people in this organization have input into the decisions affecting them</td>
<td>.775</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Extraction Method: Principal Component Analysis.
Rotation Method: Varimax with Kaiser Normalization.

As shown in Table 4.5, the rotated component matrix in the table indicates that all the factor loadings of organizational culture items ranged from 0.402 to 0.856. Although the loading of the item ‘Our approach to doing business is very consistent’ was low (.402), all the loadings met the cut-off of 0.4. The factors account for 69.026 percent of the variance of the construct (Appendix V, Table A3). Thus, all the factors were retained for analysis.

Factor analysis of strategic leadership scale was conducted with principal component analysis and varimax rotation to check the extent to which each item in the scale
contributed to the respective factors. The results of the analysis are presented in Table 4.6.

### Table 4.6: Rotated Component Matrix for Measures of Strategic Leadership

<table>
<thead>
<tr>
<th>Strategic leadership items</th>
<th>Component 1</th>
<th>Component 2</th>
<th>Component 3</th>
<th>Component 4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Inspires employees loyalty to leadership</td>
<td>.801</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Inspires employees</td>
<td>.801</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Inspires employees loyalty to the organization</td>
<td>.783</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Encourages employees to express their ideas and opinions</td>
<td>.739</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Is completely trusted by the employees</td>
<td>.655</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Makes everyone enthusiastic about assignments</td>
<td>.645</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Finds out what employees want and tries to help them get it</td>
<td></td>
<td>.777</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Expresses appreciation to employees when they do a good job</td>
<td></td>
<td>.755</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gives personal attention to members who seem neglected</td>
<td></td>
<td>.734</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Allows agreement between what employees are expected to put into the group effort and what they can get out of it</td>
<td></td>
<td>.688</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tells employees what to do if they want to be rewarded for their efforts</td>
<td></td>
<td>.680</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gets employees to rethink ideas that they had never questioned before</td>
<td></td>
<td></td>
<td>.787</td>
<td></td>
</tr>
<tr>
<td>Enables employees to think about old problems in new ways</td>
<td></td>
<td></td>
<td>.786</td>
<td></td>
</tr>
<tr>
<td>Provides employees with new ways of looking at things</td>
<td></td>
<td></td>
<td>.694</td>
<td></td>
</tr>
<tr>
<td>Allows negotiation with employees about what they can get from what they can accomplish</td>
<td></td>
<td></td>
<td></td>
<td>.479</td>
</tr>
<tr>
<td>Allows employees to take initiatives but does not encourage them to do so</td>
<td></td>
<td></td>
<td></td>
<td>.879</td>
</tr>
<tr>
<td>Asks employees no more of them than what is absolutely essential to get the work done</td>
<td></td>
<td></td>
<td></td>
<td>.850</td>
</tr>
<tr>
<td>Tells employees what they have to know to their job</td>
<td></td>
<td></td>
<td></td>
<td>.632</td>
</tr>
</tbody>
</table>

Extraction Method: Principal Component Analysis.
Rotation Method: Varimax with Kaiser Normalization.

The rotated component matrix in Table 4.6 shows that all the factor loadings of strategic leadership items ranged from 0.479 to 0.879. Hence, the loadings met the cut-off of 0.4. Except the loading for the item ‘Allows negotiation with employees about what they can get from what they can accomplish’ which is low (.479), the loadings for the items were sufficiently high. The factors account for 68.305 percent of the variance of the construct (Appendix V, Table A4). Thus, all the factors were retained for analysis.
4.3.2.3 Factor Analysis of Organizational Innovation

In conducting factor analysis for organizational innovation, principal component analysis and varimax rotation method was used to check the extent to which each item in the scale contributed to the respective factors. Table 4.7 presents the results of the analysis.

Table 4.7: Rotated Component Matrix for Measures of Organizational Innovation

<table>
<thead>
<tr>
<th>Organizational innovation items</th>
<th>Component 1</th>
</tr>
</thead>
<tbody>
<tr>
<td>Our firm introduces new products to the market before competitors</td>
<td>.859</td>
</tr>
<tr>
<td>Our firm often introduces new production processes and methods</td>
<td>.838</td>
</tr>
<tr>
<td>Our firm often improves existing products</td>
<td>.772</td>
</tr>
<tr>
<td>Our firm often improves production processes and methods</td>
<td>.730</td>
</tr>
<tr>
<td>Our firm often creates and commercializes products with totally new performance</td>
<td>.673</td>
</tr>
</tbody>
</table>

Extraction Method: Principal Component Analysis.

The rotated component matrix in Table 4.7 shows that all the factor loadings were above the cut-off of 0.4, and were in the acceptable range of .673 to .859. The factors account for 60.444 percent of the variance in the construct (Appendix V, Table A5). Hence, all the factors were retained for analysis.

4.3.2.4 Factor Analysis of Organizational Performance

In conducting factor analysis for organizational performance, principal component analysis and varimax rotation was used to check the extent to which each item in the scale contributed to the respective factors. The results of the analysis are presented in Table 4.8.

Table 4.8: Rotated Component Matrix for Measures of Organizational performance

<table>
<thead>
<tr>
<th>Organizational performance items</th>
<th>Component 1</th>
</tr>
</thead>
<tbody>
<tr>
<td>Return on equity</td>
<td>.831</td>
</tr>
<tr>
<td>Market share</td>
<td>.818</td>
</tr>
<tr>
<td>Return on assets</td>
<td>.754</td>
</tr>
<tr>
<td>Sales growth</td>
<td>.723</td>
</tr>
</tbody>
</table>

Extraction Method: Principal Component Analysis
The rotated component matrix in Table 4.8 shows that all the factor loadings were sufficiently high and met the threshold of 0.4. The factors account for 61.253 percent of the variance in the construct (Appendix V, Table A6). All the factors were retained for analysis.

4.3.3 Test for the Assumptions of Regression Analysis
Since regression analysis was used as the main analysis technique, the assumptions of linearity and homoscedasticity, normality and multicollinearity were tested. This section presents the results of the tests.

4.3.3.1 Linearity and Homoscedasticity
To test for linearity and homoscedasticity, a scatterplot of standardized residuals (ZRESID) against standardized predicted (ZPRED) values was used. Figure 4.1 shows the graph for the data.
Figure 4.1: Scatter plot of ZRESID against ZPRED

Figure 4.1 shows that data points are randomly and evenly dispersed around zero, the graph does not funnel out and there is no sort of curve in the graph. This pattern indicates that the assumptions of linearity and homoscedasticity were met.

4.3.3.2 Test for Normality
To test for normality, the normal probability plot was used; and the plotted data values were compared with the diagonal. Figure 4.2 shows the results of the test for normality.
As shown in Figure 4.2, the line representing the actual data distribution is a straight line following the diagonal indicating normal distribution of the data. Hence, the survey data met the normality assumption.

4.3.3.3 Test for Multicollinearity
To test for multicollinearity of the predictor variables in this study, the diagnostics of tolerance and variance inflation factor (VIF) were used. The results of the analysis are presented in Table 4.9.
Table 4.9: Results of the Test of Multicollinearity

<table>
<thead>
<tr>
<th>Model</th>
<th>Unstandardized Coefficients</th>
<th>Standardized Coefficients</th>
<th>T</th>
<th>Sig.</th>
<th>Collinearity Statistics</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>B</td>
<td>Std. Error</td>
<td>Beta</td>
<td></td>
<td>Tolerance</td>
</tr>
<tr>
<td>(Constant)</td>
<td>.404</td>
<td>.430</td>
<td>.939</td>
<td>.349</td>
<td></td>
</tr>
<tr>
<td>Knowledge strategy</td>
<td>.081</td>
<td>.105</td>
<td>.062</td>
<td>.774</td>
<td>.440</td>
</tr>
<tr>
<td>Organizational innovation</td>
<td>.589</td>
<td>.093</td>
<td>.504</td>
<td>6.306</td>
<td>.000</td>
</tr>
<tr>
<td>Organizational characteristics</td>
<td>.179</td>
<td>.149</td>
<td>.107</td>
<td>1.200</td>
<td>.232</td>
</tr>
</tbody>
</table>

a. Dependent Variable: Organizational performance

A tolerance of below 0.1 or a VIF of greater than 10 are considered to indicate a serious problem of multicollinearity. As shown in Table 4.9, none of tolerance values was below 0.1 and all the VIFs were below 10, hence indicating that multicollinearity was not a problem in this study.

4.4 Descriptive Statistics

This section presents and discusses results of descriptive statistics of the profile of respondents and organizations. It also presents descriptive analyses results of the study variables.

4.4.1 Profile of Respondents

The respondents in this study were managers of the organizations who were considered to be informed about organizational processes. Frequencies and percentages were used to examine the distribution of the respondents by position. The profile of the respondents of the studied organizations is shown in Table 4.10.

Table 4.10: Distribution of Respondents by Position

<table>
<thead>
<tr>
<th>Position</th>
<th>Frequency</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Human Resource Manager</td>
<td>107</td>
<td>58.2</td>
</tr>
<tr>
<td>Production Manager</td>
<td>19</td>
<td>10.3</td>
</tr>
<tr>
<td>Administrator</td>
<td>34</td>
<td>18.5</td>
</tr>
<tr>
<td>Accountant/Finance Manager</td>
<td>8</td>
<td>4.3</td>
</tr>
<tr>
<td>Sales/Marketing Manager</td>
<td>10</td>
<td>5.4</td>
</tr>
<tr>
<td>Other</td>
<td>6</td>
<td>3.3</td>
</tr>
<tr>
<td>Total</td>
<td>184</td>
<td>100.0</td>
</tr>
</tbody>
</table>
As shown in Table 4.10, among the respondents, the majority (58.2%) were human resource managers, 18.5% were administrators and 10.3% were production managers. Given the positions of the respondents, in can be concluded that the respondents were knowledgeable on organizational processes and their responses were considered informed.

### 4.4.2 Profile of Organizations

The 184 organizations that were studied cover a broad set of industries. Frequencies and percentages were used to examine the distribution of the firms across the manufacturing sub-sectors. Table 4.11 provides the distribution of the companies in the various sub-sectors of Kenyan manufacturing sector.

#### Table 4.11: Distribution of Firms by Sub-sector

<table>
<thead>
<tr>
<th>Sector</th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Building, Mining &amp; Construction</td>
<td>8</td>
<td>4.3</td>
</tr>
<tr>
<td>Chemical &amp; Allied</td>
<td>21</td>
<td>11.4</td>
</tr>
<tr>
<td>Energy, Electricals &amp; Electronics</td>
<td>11</td>
<td>6.0</td>
</tr>
<tr>
<td>Food, Beverages &amp; Tobacco</td>
<td>52</td>
<td>28.3</td>
</tr>
<tr>
<td>Leather &amp; Footwear</td>
<td>4</td>
<td>2.2</td>
</tr>
<tr>
<td>Metal &amp; Allied</td>
<td>17</td>
<td>9.2</td>
</tr>
<tr>
<td>Motor Vehicle &amp; Accessories</td>
<td>9</td>
<td>4.9</td>
</tr>
<tr>
<td>Paper &amp; Board</td>
<td>20</td>
<td>10.9</td>
</tr>
<tr>
<td>Pharmaceutical &amp; Medical Equipment</td>
<td>8</td>
<td>4.3</td>
</tr>
<tr>
<td>Plastics &amp; Rubber</td>
<td>17</td>
<td>9.2</td>
</tr>
<tr>
<td>Textile &amp; Apparels</td>
<td>13</td>
<td>7.1</td>
</tr>
<tr>
<td>Timber, Wood &amp; Furniture</td>
<td>4</td>
<td>2.2</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>184</strong></td>
<td><strong>100.0</strong></td>
</tr>
</tbody>
</table>

As shown in Table 4.11, majority of the firms studied, that is 28.3% were in food, beverages and tobacco sub-sector of manufacturing, 11.4% of the firms were in chemical and allied, and 10.9% were in paper and board. The rest of the firms were from other sub-sectors of manufacturing.

The study also sought to establish the distribution of ownership of the firms, number of years in operation, number of employees and markets served. Frequencies and percentages were used to establish the distribution. Table 4.12 presents the results of the analysis.
As shown in Table 4.12, majority of the firms (76.1%) are local firms while 23.9% are foreign owned firms. Most of the firms (57.6%) have been operating in Kenya for over 20 years and only 6.0% have operated in Kenya for less than 6 years. The fact that majority of the firms have operated in Kenya for over 6 years indicates that the firms have established their operations in Kenya and it can be assumed that the firms were pursuing knowledge strategies and innovation activities. The results also revealed that most of the firms (69.0%) served both domestic and foreign markets.

Regarding the number of employees in the firms, Table 4.12 shows that 23.9% of the firms employed less than 50 employees, 16.8% employed 51 to 100 employees, and 69.2% had more than 100 employees. Organizations can be classified as small, medium or large on the basis of the number of employees, sales turnover or capital (Coughlin & Ikiara, 1991; Kibera, 1996). Because information on sales turnover or capital employed is considered sensitive and confidential, and may therefore not be easily obtained, usually the number of employees is used as a measure of size (Coughlin & Ikiara, 1991; Kibera, 1996). In Kenya,
firms employing 10 or fewer workers are called micro-enterprises, those with 11 to 50 workers are labelled small, those employing between 51 and 100 workers are categorized as medium, and those employing more than 100 workers are regarded as large firms (Kibera, 1996). Using this perspective, the results of this study indicate that 23.9% of the firms studied were small firms, 16.8% were medium firms and 69.2% were large firms.

4.4.3 Knowledge Strategy

The study sought to describe knowledge strategy of the firms. Respondents were asked to indicate the extent to which they agreed that the statements on the items of dimensions of knowledge strategy described their firms. The dimensions of knowledge strategy were knowledge exploration and knowledge exploitation. Each item had a 5-point Likert-type scale, ranging from ‘strongly disagree’ (1) to ‘strongly agree’ (5). The responses were analyzed using mean scores, standard deviations and coefficient of variation. Higher mean scores indicated strong agreement on the item and lower mean score implied strong disagreement with the statements. Table 4.13 presents the results of the analysis.

Table 4.13: Mean, Standard Deviation and Coefficient of Variation for Measures of Knowledge Strategy

<table>
<thead>
<tr>
<th>Knowledge strategy items</th>
<th>N</th>
<th>Mean</th>
<th>Std. Deviation</th>
<th>CV (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Knowledge Exploration</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>We frequently experiment with radical new ideas</td>
<td>183</td>
<td>3.84</td>
<td>.82</td>
<td>21.5</td>
</tr>
<tr>
<td>At our firm employees frequently come up with creative ideas that challenge conventional ideas</td>
<td>183</td>
<td>3.79</td>
<td>.82</td>
<td>21.6</td>
</tr>
<tr>
<td>Compared to our principal competitors, a high percentage of our firm's sales come from new products launched within the past 3 years</td>
<td>181</td>
<td>3.84</td>
<td>.86</td>
<td>22.4</td>
</tr>
<tr>
<td>We are usually one of the first firms in our industry to use new breakthrough technologies</td>
<td>182</td>
<td>3.90</td>
<td>.84</td>
<td>21.5</td>
</tr>
<tr>
<td><strong>Knowledge Exploitation</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>At our firm a strong emphasis is placed on improving efficiency</td>
<td>182</td>
<td>4.11</td>
<td>.77</td>
<td>18.6</td>
</tr>
<tr>
<td>Our firm excels at refining existing technologies</td>
<td>184</td>
<td>4.07</td>
<td>.77</td>
<td>18.9</td>
</tr>
<tr>
<td>We frequently adjust our procedures, rules and policies to make things work better</td>
<td>184</td>
<td>4.10</td>
<td>.74</td>
<td>18.0</td>
</tr>
<tr>
<td><strong>Overall</strong></td>
<td></td>
<td>3.95</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
As shown in Table 4.13, the mean score for the knowledge exploration dimension was 3.84. The item with the highest score was ‘we are usually one of the first firms in our industry to use new breakthrough technologies’ \((M = 3.90, SD = 0.84)\); the item with the lowest score was ‘at our firm employees frequently come up with creative ideas that challenge conventional ideas’ \((M = 3.79, SD = 0.82)\). Further, the results show that data on items of knowledge exploration had low variability. Among the items, the item ‘compared to our principal competitors, a high percentage of our firm's sales come from new products launched within the past 3 years’ had the highest variability \((CV = 22.4\%)\); and the items ‘we frequently experiment with radical new ideas’ and ‘we are usually one of the first firms in our industry to use new breakthrough technologies’ had the lowest variability \((CV = 21.5\%)\).

The mean for knowledge exploitation dimension was 4.11. The item with the highest score was ‘at our firm a strong emphasis is placed on improving efficiency’ \((M = 4.14, SD = 0.77)\); the item with the lowest score was ‘our firm excels at refining existing technologies’ \((M = 4.07, SD = 0.77)\). The item with the highest variability was ‘our firm excels at refining existing technologies’ \((18.9\%)\) and the item with the lowest variability was ‘we frequently adjust our procedures, rules and policies to make things work better’ \((CV = 18.0\%)\).

The overall mean score for knowledge strategy was 3.95. These results indicate that the respondents strongly agreed with the statements regarding knowledge strategy in their organizations. These results were interpreted to mean that the firms practice knowledge strategy that is, both knowledge exploration and knowledge exploitation strategies to a great extent. However, the organizations exhibit slightly more of knowledge exploitation \((M = 4.11)\) than knowledge exploration \((M = 3.84)\).

The findings of this study support the findings of past studies (Bierly & Daly, 2007; March, 1991; Utiola et al., 2009) which found that the two knowledge strategies-knowledge exploration and exploitation are complementary and a firm can pursue both strategies simultaneously, supporting the ambidextrous view that firms need to balance between knowledge exploration and exploitation (March, 1991). The results are also
consistent with the findings of past studies in Kenya (Mwihia, 2008; Cheruyoit et al., 2012) which found that firms in Kenya were managing knowledge as a resource to enhance their effectiveness and efficiency. This study adds to these prior studies by providing understanding that manufacturing firms in Kenya practice knowledge exploration and knowledge exploitation strategies.

4.4.4 Organizational Characteristics
The study sought to describe organizational characteristics of the firms. The aspects of organizational characteristics included organizational structure, organizational culture and strategic leadership. This section presents the results of descriptive statistics of the aspects of organizational characteristics.

4.4.4.1 Organizational Structure
Regarding organizational structure, respondents were asked to indicate the extent to which they agreed that the statements on items of dimensions of organizational structure described their firms. The dimensions of organizational structure included formalization, centralization and complexity. Each item had a 5-point Likert-type scale, ranging from ‘strongly disagree’ (1) to ‘strongly agree’ (5). The responses were analyzed using mean scores, standard deviations and coefficient of variation. Higher mean scores indicated strong agreement on the item and lower mean score implied strong disagreement. Table 4.14 presents the results of the analysis.
Table 4.14: Mean, Standard Deviation and Coefficient of Variation for Measures of Organizational Structure

<table>
<thead>
<tr>
<th>Organizational structure items</th>
<th>N</th>
<th>Mean</th>
<th>Std. Deviation</th>
<th>CV (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Formalization</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>In our organization, there are many activities that are covered by formal procedures</td>
<td>184</td>
<td>4.07</td>
<td>.80</td>
<td>19.7</td>
</tr>
<tr>
<td>In our organization, contact with our organization is on a formal or planned basis</td>
<td>183</td>
<td>4.08</td>
<td>.80</td>
<td>19.6</td>
</tr>
<tr>
<td>In our organization rules and procedures are typically written</td>
<td>183</td>
<td>4.10</td>
<td>.90</td>
<td>22.0</td>
</tr>
<tr>
<td>In our organization employees cannot ignore the rules and reach informal agreements to handle some situations</td>
<td>182</td>
<td>4.03</td>
<td>.95</td>
<td>23.6</td>
</tr>
<tr>
<td>In our organization employees cannot make their own rules on the job</td>
<td>184</td>
<td>4.07</td>
<td>.88</td>
<td>21.6</td>
</tr>
<tr>
<td><strong>Centralization</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>In our organization only a few people at the upper levels are involved in making decisions</td>
<td>182</td>
<td>3.71</td>
<td>1.07</td>
<td>28.8</td>
</tr>
<tr>
<td>In our organization employees cannot make decisions without approval</td>
<td>183</td>
<td>4.02</td>
<td>.84</td>
<td>20.9</td>
</tr>
<tr>
<td>In our organization employees cannot take action without a supervisor</td>
<td>182</td>
<td>3.86</td>
<td>.94</td>
<td>24.4</td>
</tr>
<tr>
<td>In our organization employees are not encouraged to make their own decisions</td>
<td>183</td>
<td>3.55</td>
<td>1.22</td>
<td>34.4</td>
</tr>
<tr>
<td>In our organization employees need to refer to someone to make decisions</td>
<td>183</td>
<td>3.68</td>
<td>1.02</td>
<td>27.7</td>
</tr>
<tr>
<td><strong>Complexity</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>This organization has many professional specialities</td>
<td>183</td>
<td>3.93</td>
<td>.86</td>
<td>21.9</td>
</tr>
<tr>
<td>This organization has high functional diversification</td>
<td>184</td>
<td>4.05</td>
<td>.75</td>
<td>18.5</td>
</tr>
<tr>
<td>This organization has a great variety in core processes</td>
<td>184</td>
<td>4.01</td>
<td>.76</td>
<td>19.0</td>
</tr>
<tr>
<td>This organization has many hierarchical levels</td>
<td>183</td>
<td>3.87</td>
<td>.85</td>
<td>22.0</td>
</tr>
<tr>
<td>This organization has a high span of control</td>
<td>183</td>
<td>3.92</td>
<td>.74</td>
<td>18.9</td>
</tr>
<tr>
<td>This organization has high geographical dispersion of operating sites</td>
<td>183</td>
<td>3.80</td>
<td>1.01</td>
<td>26.6</td>
</tr>
</tbody>
</table>

**Overall Mean** | 3.92

Table 4.14 shows that the mean score for formalization dimension was 4.07. The item with the highest score was ‘in our organization rules and procedures are typically written’ ($M = 4.10, SD = 0.90$); the item with the lowest score was ‘in our organization employees cannot ignore the rules and reach informal agreements to handle some situations’ ($M = 4.03, SD = 0.95$). Among the items of formalization, the item with the greatest variability was ‘in our organization employees cannot ignore the rules and reach informal agreements to handle some situations’ ($CV = 23.6\%$) and the item with the lowest variability was ‘in our organization, contact with our organization is on a formal or planned basis’ ($CV = 19.6\%$).
The mean for the centralization dimension was 3.76. The item with the highest score was ‘in our organization employees cannot make decisions without approval’ \((M = 4.02, SD = 0.84)\); the item with the lowest score was ‘in our organization employees are not encouraged to make their own decisions’ \((M = 3.55, SD = 1.22)\). The item with the highest variability was ‘in our organization employees are not encouraged to make their own decisions’ \((CV = 34.4\%)\) and the item with the lowest variability was ‘in our organization employees cannot make decisions without approval’ \((CV = 20.9\%)\).

The mean score for complexity was 3.93. The item with the highest score was ‘this organization has high functional diversification’ \((M = 4.05, SD = 0.75)\); the item with the lowest score was ‘this organization has many hierarchical levels’ \((M = 3.87, SD = 0.85)\). The item ‘this organization has high geographical dispersion of operating sites’ had the highest variability \((CV = 26.6\%)\), and the item ‘this organization has high functional diversification’ had the lowest variability \((CV = 18.5\%)\).

The overall mean for organizational structure is 3.92. This score indicates that the respondents strongly agreed with the statements regarding the items of the dimensions of formalization, centralization and complexity. These results show that the structural designs of manufacturing firms in Kenya are characterised by formalization, centralization and complexity to a great extent. However, the mean score for the centralization dimension is relatively low (3.76), which is interpreted to mean that there is less centralization in the organizations compared to formalization and complexity.

4.4.4.2 Organizational Culture

Regarding organizational culture, respondents were asked to indicate the extent to which they agreed that the statements of aspects of organizational culture described their firms. Each item had a 5-point Likert-type scale, ranging from ‘strongly disagree’ (1) to ‘strongly agree’ (5). The responses were analyzed using mean scores, standard deviations and coefficient of variation. Higher mean scores indicated strong agreement on the item and lower mean score implied strong disagreement. Table 4.15 presents the results of the analysis.
Table 4.15: Mean, Standard Deviation and Coefficient of Variation for Measures of Organizational Culture

<table>
<thead>
<tr>
<th>Organization Culture items</th>
<th>N</th>
<th>Mean</th>
<th>Std. Deviation</th>
<th>CV (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Involvement</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Most people in this organization have input into the decisions affecting them</td>
<td>183</td>
<td>3.86</td>
<td>.73</td>
<td>18.9</td>
</tr>
<tr>
<td>Cooperation and collaboration across functional roles is actively encouraged</td>
<td>183</td>
<td>4.10</td>
<td>.67</td>
<td>16.3</td>
</tr>
<tr>
<td><strong>Consistency</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>There is a high level of agreement about the way that we do things in this organization</td>
<td>184</td>
<td>4.08</td>
<td>.77</td>
<td>18.9</td>
</tr>
<tr>
<td>Our approach to doing business is very consistent</td>
<td>184</td>
<td>4.10</td>
<td>.79</td>
<td>19.3</td>
</tr>
<tr>
<td><strong>Adaptability</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Customers comments and recommendations often lead to changes in this organization</td>
<td>184</td>
<td>4.14</td>
<td>.65</td>
<td>15.7</td>
</tr>
<tr>
<td>This organization is very responsive and adapts to changes easily</td>
<td>184</td>
<td>4.09</td>
<td>.72</td>
<td>17.6</td>
</tr>
<tr>
<td><strong>Mission</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>This organization has a long term purpose and direction</td>
<td>183</td>
<td>4.21</td>
<td>.65</td>
<td>15.4</td>
</tr>
<tr>
<td>There is a shared vision of what this organization will be like in future</td>
<td>184</td>
<td>4.15</td>
<td>.74</td>
<td>17.8</td>
</tr>
<tr>
<td><strong>Collaboration</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>In our organization, collaboration among employees is high</td>
<td>182</td>
<td>4.06</td>
<td>.72</td>
<td>17.7</td>
</tr>
<tr>
<td>In our organization employees are highly willing to support each other</td>
<td>184</td>
<td>4.05</td>
<td>.78</td>
<td>19.3</td>
</tr>
<tr>
<td>There is willingness to collaborate across organizational units within our organization</td>
<td>183</td>
<td>4.09</td>
<td>.73</td>
<td>17.8</td>
</tr>
<tr>
<td>There is willingness within our organization to accept responsibility for failure</td>
<td>184</td>
<td>3.93</td>
<td>.83</td>
<td>21.1</td>
</tr>
<tr>
<td><strong>Trust</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Our employees are generally trustworthy</td>
<td>184</td>
<td>3.98</td>
<td>.72</td>
<td>18.1</td>
</tr>
<tr>
<td>Our employees have trust in each other members intentions and behaviours</td>
<td>184</td>
<td>3.92</td>
<td>.78</td>
<td>19.9</td>
</tr>
<tr>
<td>Our employees have trust in each other's ability</td>
<td>181</td>
<td>3.97</td>
<td>.72</td>
<td>18.1</td>
</tr>
<tr>
<td>Our employees have trust in each other’s commitment to the organizational goals</td>
<td>184</td>
<td>4.05</td>
<td>.73</td>
<td>18.0</td>
</tr>
<tr>
<td>Our employees have trust in each other’s commitment to the company as a whole</td>
<td>183</td>
<td>4.01</td>
<td>.74</td>
<td>18.5</td>
</tr>
<tr>
<td>Our employees have relationships based on trust in each other</td>
<td>184</td>
<td>4.02</td>
<td>.66</td>
<td>16.4</td>
</tr>
<tr>
<td><strong>Overall Mean</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>4.05</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

As shown in Table 4.15 the mean score for involvement dimension was 3.98. The item ‘cooperation and collaboration across functional roles is actively encouraged’ had a higher mean score ($M = 4.10, SD = 0.67$) and the item ‘most people in this organization have input into the decisions affecting them’ had a slightly low mean score ($M = 3.86, SD = 0.73$).
Regarding variability of data, for the items of involvement, the item ‘most people in this organization have input into the decisions affecting them’ had a higher variability ($CV = 18.9\%$) than the item ‘cooperation and collaboration across functional roles is actively encouraged’ ($CV = 16.3\%$).

The mean score for consistency is 4.09. The item ‘our approach to doing business is very consistent’ had a higher mean score ($M = 4.10, SD = 0.79$) and the item ‘there is a high level of agreement about the way that we do things in this organization’ had a slightly low mean score ($M = 4.08, SD = 0.77$). The item ‘our approach to doing business is very consistent’ had a slightly higher variability ($CV = 19.3\%$) than the item ‘there is a high level of agreement about the way that we do things in this organization’ ($CV = 18.9\%$).

The mean score for adaptability is 4.12. The item ‘customers’ comments and recommendations often lead to changes in this organization’ had a higher mean score ($M = 4.14, SD = 0.65$) and the item ‘this organization is very responsive and adapts to changes easily’ had a slightly low mean score ($M = 4.09, SD = 0.72$). The item ‘this organization is very responsive and adapts to changes easily’ had a higher variability ($CV = 17.6\%$) than the item ‘customers’ comments and recommendations often lead to changes in this organization’ ($CV = 15.7\%$). The mean score for mission is 4.18. The item ‘this organization has a long term purpose and direction’ had a higher mean score ($M = 4.21, SD = 0.65$) and the item ‘there is a shared vision of what this organization will be like in future’ had a slightly low mean score ($M = 4.15, SD = 0.74$). The item ‘there is a shared vision of what this organization will be like in future’ had a higher variability ($CV = 17.8\%$) than the item ‘this organization has a long term purpose and direction’ ($CV = 15.4\%$).

The mean score for collaboration was 4.03. The item with the highest score was ‘there is willingness to collaborate across organizational units within our organization’ ($M = 4.09, SD = 0.73$); the item with the lowest score was ‘there is willingness within our organization to accept responsibility for failure’ ($M = 3.93, SD = 0.83$). Among the items of collaboration, the item ‘there is willingness within our organization to accept responsibility for failure’ had the highest variability ($CV = 21.1\%$), and the item ‘in our
organization, collaboration among employees is high’ had the lowest variability ($CV = 17.7\%$).

The mean score for trust is 3.99. The item with the highest score was ‘our employees have trust in each other’s commitment to the organizational goals’ ($M = 4.05$, $SD = 0.73$); the item with the lowest score was ‘our employees have trust in each other member’s intentions and behaviours’ ($M = 3.92$, $SD = 0.78$). Among the items of trust, the item ‘our employees have trust in each other members’ intentions and behaviours’ had the highest variability ($CV = 19.9\%$) and the item ‘our employees have relationships based on trust in each other’ had the lowest variability ($CV = 16.4\%$).

The overall mean score for organizational culture was 4.05. The results indicate that the respondents agreed with the statements regarding the dimensions of culture to a great extent. Thus, it can be concluded that to a great extent, the organizations are characterised by culture of involvement, consistency, adaptability, mission, collaboration and trust.

### 4.4.4.3 Strategic Leadership

Regarding strategic leadership, respondents were asked to indicate the extent to which they agreed that the statements of aspects of strategic leadership described their firms. Each item had a 5-point Likert-type scale, ranging from ‘strongly disagree’ (1) to ‘strongly agree’ (5). The responses were analyzed using mean scores, standard deviations and coefficient of variation. Higher mean scores indicated strong agreement on the item and lower mean score implied strong disagreement. Table 4.16 presents the results of the analysis.
### Table 4.16: Mean, Standard Deviation and Coefficient of Variation for Measures of Strategic Leadership

<table>
<thead>
<tr>
<th>Strategic Leadership</th>
<th>N</th>
<th>Mean</th>
<th>Std. Deviation</th>
<th>CV (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Transformational leadership</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Makes everyone enthusiastic about assignments</td>
<td>184</td>
<td>4.01</td>
<td>.78</td>
<td>19.5</td>
</tr>
<tr>
<td>Is completely trusted by the employees</td>
<td>184</td>
<td>3.95</td>
<td>.80</td>
<td>20.3</td>
</tr>
<tr>
<td>Encourages employees to express their ideas and opinions</td>
<td>184</td>
<td>4.28</td>
<td>.83</td>
<td>19.4</td>
</tr>
<tr>
<td>Inspires employees</td>
<td>184</td>
<td>3.93</td>
<td>.91</td>
<td>23.2</td>
</tr>
<tr>
<td>Inspires employees loyalty to leadership</td>
<td>184</td>
<td>3.97</td>
<td>.79</td>
<td>19.9</td>
</tr>
<tr>
<td>Inspires employees loyalty to the organization</td>
<td>184</td>
<td>3.99</td>
<td>.82</td>
<td>20.6</td>
</tr>
<tr>
<td>Gets employees to rethink ideas that they had never questioned before</td>
<td>183</td>
<td>3.75</td>
<td>.87</td>
<td>23.2</td>
</tr>
<tr>
<td>Enables employees to think about old problems in new ways</td>
<td>184</td>
<td>3.89</td>
<td>.75</td>
<td>19.3</td>
</tr>
<tr>
<td>Provides employees with new ways of looking at things</td>
<td>184</td>
<td>3.93</td>
<td>.75</td>
<td>19.1</td>
</tr>
<tr>
<td>Gives personal attention to members who seem neglected</td>
<td>183</td>
<td>3.87</td>
<td>.90</td>
<td>23.3</td>
</tr>
<tr>
<td>Finds out what employees want and tries to help them get it</td>
<td>184</td>
<td>4.03</td>
<td>.86</td>
<td>21.3</td>
</tr>
<tr>
<td>Expresses appreciation to employees when they do a good job</td>
<td>184</td>
<td>4.00</td>
<td>.82</td>
<td>20.5</td>
</tr>
<tr>
<td><strong>Transactional leadership</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tells employees what to do if they want to be rewarded for their efforts</td>
<td>183</td>
<td>3.82</td>
<td>.86</td>
<td>22.5</td>
</tr>
<tr>
<td>Allows agreement between what employees are expected to put into the group effort and what they can get out of it</td>
<td>184</td>
<td>3.92</td>
<td>.79</td>
<td>20.2</td>
</tr>
<tr>
<td>Allows negotiation with employees about what they can get from what they can accomplish</td>
<td>184</td>
<td>3.95</td>
<td>.90</td>
<td>22.8</td>
</tr>
<tr>
<td>Asks employees no more of them than what is absolutely essential to get the work done</td>
<td>184</td>
<td>3.70</td>
<td>.97</td>
<td>26.2</td>
</tr>
<tr>
<td>Allows employees to take initiatives but does not encourage them to do so</td>
<td>184</td>
<td>3.64</td>
<td>1.05</td>
<td>28.8</td>
</tr>
<tr>
<td>Tells employees what they have to know to do their job</td>
<td>184</td>
<td>3.93</td>
<td>.74</td>
<td>18.8</td>
</tr>
</tbody>
</table>

| Overall Mean                                                                       |    | 3.92 |                |        |

The results as indicated in Table 4.16 show that the mean score for the items of transformational leadership dimension is 3.97. The item with the highest score was ‘encourages employees to express their ideas and opinions’ ($M = 4.28$, $SD = 0.83$); the item with the lowest score was ‘gets employees to rethink ideas that they had never questioned before’ ($M = 3.75$, $SD = 0.87$). Among the items of transformational leadership, the item with the highest variability was ‘gives personal attention to members who seem neglected’ ($CV = 23.3\%$) and the variable with the lowest variability was ‘provides employees with new ways of looking at things’ ($CV = 19.1\%$).
The mean score for the items of transactional leadership is 3.83. The item with the highest score was ‘allows negotiation with employees about what they can get from what they can accomplish’ ($M = 3.95$, $SD = 0.90$); the item with the lowest score was ‘allows employees to take initiatives but does not encourage them to do so’ ($M = 3.64$, $SD = 1.05$). The item with the highest variability was ‘allows employees to take initiatives but does not encourage them to do so’ ($CV = 28.8\%$) and the item with the lowest variability was ‘tells employees what they have to know to do their job’ ($CV = 18.8\%$).

The overall mean for strategic leadership is 3.92. These results indicate that the respondents agreed that management in the organizations practice both transformational leadership and transactional leadership behaviours to a great extent.

### 4.4.5 Organizational Innovation

The study sought to describe innovation activities of the firms. Respondents were asked to indicate the extent to which they agreed that the statements of items of product and process innovation described their firms. Each item had a 5-point Likert-type scale, ranging from ‘strongly disagree’ (1) to ‘strongly agree’ (5). The respondents were analyzed using mean scores, standard deviations and coefficient of variation. Higher mean scores indicated strong agreement on the item and lower mean score implied strong disagreement. Table 4.17 presents the results of the analysis.

#### Table 4.17: Mean, Standard Deviation and Coefficient of Variation for Measures of Organizational Innovation

<table>
<thead>
<tr>
<th>Organizational Innovation</th>
<th>$N$</th>
<th>Mean</th>
<th>Std. Deviation</th>
<th>$CV$ (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Product innovation</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Our firm often creates and commercializes products with totally new performance</td>
<td>182</td>
<td>4.00</td>
<td>.80</td>
<td>20.0</td>
</tr>
<tr>
<td>Our firm introduces new products to the market before competitors</td>
<td>183</td>
<td>3.89</td>
<td>.82</td>
<td>21.1</td>
</tr>
<tr>
<td>Our firm often improves existing products</td>
<td>182</td>
<td>4.04</td>
<td>.80</td>
<td>19.8</td>
</tr>
<tr>
<td><strong>Process innovation</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Our firm often introduces new production processes and methods</td>
<td>182</td>
<td>4.05</td>
<td>.81</td>
<td>20.0</td>
</tr>
<tr>
<td>Our firm often improves production processes and methods</td>
<td>182</td>
<td>4.06</td>
<td>.69</td>
<td>17.0</td>
</tr>
<tr>
<td><strong>Overall Mean</strong></td>
<td></td>
<td>4.01</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
The results presented in Table 4.17 indicate that the mean for the items for product innovation was 3.98. The item with the highest mean score was ‘our firm often improves existing products’ ($M = 4.04, SD = 0.80$); the item with the lowest score was ‘our firm introduces new products to the market before competitors’ ($M = 3.89, SD = 0.82$). Regarding variability of data, the item with the highest variability was ‘our firm introduces new products to the market before competitors’ ($CV = 21.1\%$) and the item with the lowest variability was ‘our firm often improves existing products’ ($CV = 19.8\%$).

The mean for process innovation was 4.05. The item ‘our firm often improves production processes and methods’ had a higher mean score ($M = 4.06, SD = 0.69$) and the item ‘our firm often introduces new production processes and methods’ had a slightly low mean score ($M = 4.05, SD = 0.81$). The item ‘our firm often introduces new production processes and methods’ had higher variability ($CV = 20\%$) than the item ‘our firm often improves production processes and methods’ ($CV = 17\%$).

The overall mean for organizational innovation was 4.01. These scores indicate that the respondents agreed with the statements regarding aspects of innovation in their organizations to a great extent. On the overall, the results show that the firms practice both product and process innovation activities.

### 4.4.6 Organizational Performance

The study sought to describe the performance of manufacturing firms in Kenya. Respondents were asked to estimate how their firms’ performance ranked compared to other firms in their industries on each dimension of performance. Each item had a 5-point Likert-type scale, ranging from ‘lowest 20%’ (1) to ‘top 20%’ (5). The responses were analyzed using mean scores, standard deviations and coefficient of variation. Higher mean scores indicated strong agreement on the item and lower mean score implied strong disagreement. Table 4.18 presents the results of the analysis.
Table 4.18: Mean, Standard Deviation and Coefficient of Variation for Measures of Organizational Performance

<table>
<thead>
<tr>
<th>Organizational Performance</th>
<th>N</th>
<th>Mean</th>
<th>Std. Deviation</th>
<th>CV (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Financial performance</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Return on assets</td>
<td>181</td>
<td>3.82</td>
<td>3.83</td>
<td>0.87</td>
</tr>
<tr>
<td>Return on equity</td>
<td>181</td>
<td>3.81</td>
<td>0.95</td>
<td>24.9</td>
</tr>
<tr>
<td><strong>Market performance</strong></td>
<td></td>
<td>3.76</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Market share</td>
<td>184</td>
<td>3.77</td>
<td>0.91</td>
<td>24.1</td>
</tr>
<tr>
<td>Sales growth</td>
<td>184</td>
<td>3.76</td>
<td>0.91</td>
<td>24.2</td>
</tr>
<tr>
<td><strong>Overall Mean</strong></td>
<td></td>
<td>3.79</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

As shown in Table 4.18, the mean score for financial performance dimension was 3.82. The item ‘return on assets’ had a higher mean score ($M = 3.83, SD = 0.87$) and the item ‘return on equity’ had a slightly lower mean score ($M = 3.81, SD = 0.95$). Among the items of financial performance, the item ‘return on equity’ had a higher variability ($CV = 24.9\%$) than the item ‘return on assets’ ($CV = 22.7\%$).

The score for market performance dimension was 3.76. The means for the items were almost the same (‘market share’ had a mean score $M = 3.77, SD = 0.91$; and ‘sales growth’ had a mean score $M = 3.76, SD = 0.91$). The items also had almost the same variability (‘sales growth’ had a variability $CV = 24.2\%$; ‘market share’ had variability $CV = 24.1\%$).

The overall mean for organizational performance was 3.79. This mean score indicates that the respondents estimate the performance of their firms to rank in the top 40% in their respective industries.

### 4.5 Correlation Analysis

Before testing hypotheses, the study sought to examine how the variables of the study: knowledge strategy, organizational innovation, organizational characteristics and organizational performance were related. The analysis was done using Pearson product-moment correlation. The results of the analysis are presented in Table 4.19.
The correlation results in Table 4.19 show a significant positive relationship between knowledge strategy and organizational performance (Pearson’s $r = 0.363, p < 0.05$). The results also show that the relationship between organizational innovation and organizational performance is positive and significant ($r = 0.597, p < 0.05$). The correlation results also reveal that there is a significant positive relationship between organizational characteristics and organizational performance ($r = 0.448, p < 0.05$). Further, the results show a significant positive relationship between knowledge strategy and organizational innovation ($r = 0.466, p < 0.05$); and a significant positive relationship between knowledge strategy and organizational characteristics ($r = 0.610, p < 0.05$). These results are consistent with findings of past studies which found a positive relationship between knowledge strategy and organizational performance (He & Wong, 2004; Lubatkin et al., 2006). The findings also support the findings of Lee and Choi (2003) who found a relationship between KM initiatives and organizational culture of trust and collaboration.
4.6 Test of Hypotheses

This section presents analysis and results of the tests of hypotheses using inferential statistics. The section presents the results of statistical analyses and interpretations of the results in relation to the research hypotheses.

4.6.1 Knowledge Strategy and Organizational Performance

The study sought to examine the effect of knowledge strategy on organizational performance. It was hypothesized (Hypothesis H1) that knowledge strategy has a positive effect on organizational performance. The analysis was done using multiple regression. To remove any possible influence of firm size on the relationship between knowledge strategy and organizational performance, size was entered in the first model as a control variable, and knowledge exploration and exploitation were added in the second model as predictor variables. The results of the analysis are presented in Table 4.20.

Table 4.20: Multiple Regression Results for Effect of Knowledge Exploration and Knowledge Exploitation on Organizational Performance

<table>
<thead>
<tr>
<th>Model</th>
<th>R Square</th>
<th>Adjusted R Square</th>
<th>Std. Error of the Estimate</th>
<th>R Square Change</th>
<th>F Change</th>
<th>df1</th>
<th>df2</th>
<th>Sig. F Change</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>.154&lt;sup&gt;a&lt;/sup&gt;</td>
<td>.024</td>
<td>.018</td>
<td>.70708</td>
<td>.024</td>
<td>4.233</td>
<td>1</td>
<td>175</td>
</tr>
<tr>
<td>2</td>
<td>.381&lt;sup&gt;b&lt;/sup&gt;</td>
<td>.145</td>
<td>.131</td>
<td>.66533</td>
<td>.122</td>
<td>12.327</td>
<td>2</td>
<td>173</td>
</tr>
</tbody>
</table>

**ANOVA<sup>c</sup>**

<table>
<thead>
<tr>
<th>Model</th>
<th>Sum of Squares</th>
<th>df</th>
<th>Mean Square</th>
<th>F</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Regression</td>
<td>2.116</td>
<td>1</td>
<td>2.116</td>
<td>4.233</td>
</tr>
<tr>
<td></td>
<td>Residual</td>
<td>87.494</td>
<td>175</td>
<td>.500</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>89.610</td>
<td>176</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Regression</td>
<td>13.030</td>
<td>3</td>
<td>4.343</td>
<td>9.812</td>
</tr>
<tr>
<td></td>
<td>Residual</td>
<td>76.580</td>
<td>173</td>
<td>.443</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>89.610</td>
<td>176</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Coefficients<sup>c</sup>**

<table>
<thead>
<tr>
<th>Model</th>
<th>Unstandardized Coefficients</th>
<th>Standardized Coefficients</th>
<th>t</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>B</td>
<td>Std. Error</td>
<td>Beta</td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>(Constant)</td>
<td>3.506</td>
<td>.150</td>
<td>23.418</td>
</tr>
<tr>
<td></td>
<td>Size</td>
<td>.080</td>
<td>.039</td>
<td>.154</td>
</tr>
<tr>
<td></td>
<td>(Constant)</td>
<td>1.915</td>
<td>.387</td>
<td>4.948</td>
</tr>
<tr>
<td>2</td>
<td>Size</td>
<td>.047</td>
<td>.037</td>
<td>.091</td>
</tr>
<tr>
<td></td>
<td>Knowledge exploration</td>
<td>.346</td>
<td>.100</td>
<td>.305</td>
</tr>
<tr>
<td></td>
<td>Knowledge exploitation</td>
<td>.093</td>
<td>.067</td>
<td>.076</td>
</tr>
</tbody>
</table>

a. Predictors: (Constant), Size
b. Predictors: (Constant), Size, Knowledge exploitation, Knowledge exploration
c. Dependent Variable: Organizational performance

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As shown in Table 4.20, the R Squared for Model 1 is 0.024, indicating that 2.4% of the variation in organizational performance is explained by variation in the control variable (size). The ANOVA results indicate that the model is statistically significant ($F = 4.233$, $p < 0.05$). The standardized coefficients show that the effect of size on organizational performance is positive and significant ($\beta = 0.154$, $t = 2.057$, $p < 0.05$).

Model 2 shows that after knowledge exploration and exploitation were added to the model, R Squared increased to 0.145, which means that 14.5% of the variance in organizational performance is explained by the control variable (size), and knowledge exploration and exploitation. The model shows that R Squared change is 0.122. This shows that the two knowledge strategy dimensions (knowledge exploration and exploitation) explain an additional 12.2% of the variation in organizational performance. The results indicate that the change in R Squared is statically significant ($F$ change $= 12.327$, $p < 0.05$). The ANOVA results show that the effect of the control variable and the two dimensions of knowledge strategy on organizational performance is statistically significant ($F = 9.812$, $p < 0.05$).

The regression coefficients in Model 2 show that knowledge exploration has greater effect on organizational performance ($\beta = 0.305$) than knowledge exploitation ($\beta = 0.076$). The positive coefficients of knowledge exploration and knowledge exploitation show that the two knowledge strategies have a positive effect on organizational performance. Further, the results show that only knowledge exploration has a significant effect on organizational performance ($t = 3.465$, $p < 0.05$); and the effect of knowledge exploitation is not significant ($t = 0.878$, $p > 0.05$). The multiple regression model results support Hypothesis H1, that knowledge strategy has a positive effect on organizational performance. That is, higher levels of knowledge exploration and exploitation would result in higher organizational performance.

### 4.6.2 Knowledge Strategy, Organizational Innovation and Performance

Hypothesis H2 predicted that the effect of knowledge strategy on organizational performance is mediated by organizational innovation. The hypothesis was tested
following Baron and Kenny’s (1986) procedure. In this regard, four regression analyses were conducted to assess whether the conditions for mediation were met at each step.

In the first step, the dependent variable, organizational performance was regressed on the independent variable, knowledge strategy. This step was intended to establish if there was a relationship between knowledge strategy and organizational performance which may be mediated. To control for the effect of firm size on the relationship between knowledge strategy and organizational performance, size was entered in the model as a control variable. The results of the analysis are presented in Table 4.21.

**Table 4.21: Simple Regression Results for Effect of Knowledge Strategy on Organizational Performance**

<table>
<thead>
<tr>
<th>Model</th>
<th>R</th>
<th>R Square</th>
<th>Adjusted R Square</th>
<th>Std. Error of the Estimate</th>
<th>R Square Change</th>
<th>F Change</th>
<th>df1</th>
<th>df2</th>
<th>Sig. F Change</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>.154&lt;sup&gt;a&lt;/sup&gt;</td>
<td>.024</td>
<td>.018</td>
<td>70709</td>
<td>.024</td>
<td>4.209</td>
<td>1</td>
<td>174</td>
<td>.042</td>
</tr>
<tr>
<td>2</td>
<td>.376&lt;sup&gt;b&lt;/sup&gt;</td>
<td>.141</td>
<td>.132</td>
<td>66497</td>
<td>.118</td>
<td>23.740</td>
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</tbody>
</table>

**ANOVA**

<table>
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<th>df</th>
<th>Mean Square</th>
<th>F</th>
<th>Sig.</th>
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</thead>
<tbody>
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<td></td>
<td>Residual</td>
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</tr>
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<td></td>
<td>Total</td>
<td>89.101</td>
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<td></td>
</tr>
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<td>2</td>
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<tr>
<td></td>
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</tr>
<tr>
<td></td>
<td>Total</td>
<td>89.101</td>
<td>175</td>
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<td></td>
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</table>

**Coefficients**

<table>
<thead>
<tr>
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<th>Standardized Coefficients</th>
<th>t</th>
<th>Sig.</th>
</tr>
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<td>Std. Error</td>
<td>Coefficients</td>
<td>Beta</td>
</tr>
<tr>
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<td>.150</td>
<td>23.351</td>
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<tr>
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<td>Size</td>
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<td>.154</td>
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<td>(Constant)</td>
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<td>Size</td>
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<td>.101</td>
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<tr>
<td></td>
<td>Knowledge strategy</td>
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<td>.093</td>
<td>.347</td>
</tr>
</tbody>
</table>

<sup>a</sup> Predictors: (Constant), Size
<sup>b</sup> Predictors: (Constant), Size, Knowledge strategy
<sup>c</sup> Dependent Variable: Organizational performance

Model 1 in Table 4.21 shows the effect of size on organizational performance. The Model shows that R Squared is 0.024, which shows that 2.4% of the variation in organizational performance is explained by variation in size. The ANOVA results show that the model was significant (F = 4.209, p < 0.05). The standardized coefficients show that the effect
of size on organizational performance is positive and significant \( (\beta = 0.154, t = 2.052, p < 0.05) \).

Model 2 shows that after knowledge strategy was added to the model, R Squared increased to 0.141 which means that 14.1% of the variance in organizational performance is explained by size and knowledge strategy. Model 2 also shows that R Squared change is 0.118. This shows that knowledge strategy explained an additional 11.8% variation in organizational performance. The results show that the change in R Squared is statically significant \( (F \text{ change} = 23.740, p < 0.05) \). The ANOVA results show that the effect of size and knowledge strategy on organizational performance was statistically significant \( (F = 14.249, p < 0.05) \). The regression coefficients in Model 2 show a significant positive relationship between knowledge strategy and organizational performance \( (\beta = 0.347, t = 4.872, p < 0.05) \). This step established that the first condition for mediation was satisfied, that there was a relationship between the dependent variable (organizational performance) and independent variable (knowledge strategy) which may be mediated.

In the second step, the potential mediating variable, organizational innovation was regressed on the independent variable, knowledge strategy. The aim of this step was to show that knowledge strategy and organizational innovation were significantly related. Firm size was controlled for in the model. Table 4.22 shows the results of the second regression analysis.
Table 4.22: Simple Regression Results for Effect of Knowledge Strategy on Organizational Innovation

<table>
<thead>
<tr>
<th>Model Summary</th>
<th>Model</th>
<th>R Square</th>
<th>Adjusted R Square</th>
<th>Std. Error of Estimate</th>
<th>R Square Change</th>
<th>F Change df1 df2</th>
<th>Sig. F Change</th>
</tr>
</thead>
<tbody>
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<td></td>
<td>1</td>
<td>.095a</td>
<td>.009</td>
<td>.003</td>
<td>.60895</td>
<td>.009</td>
<td>1 175  .206</td>
</tr>
<tr>
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<td>2</td>
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<td>.218</td>
<td>.209</td>
<td>.54254</td>
<td>.209</td>
<td>46.463 1 174  .000</td>
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</tbody>
</table>

ANOVA:

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<th>df</th>
<th>Mean Square</th>
<th>F</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
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<td>.597</td>
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<td>Residual</td>
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<td></td>
<td>Total</td>
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<td></td>
</tr>
<tr>
<td>2</td>
<td>Regression</td>
<td>14.274</td>
<td>2</td>
<td>7.137</td>
<td>24.246</td>
</tr>
<tr>
<td></td>
<td>Residual</td>
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<td>.294</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>65.492</td>
<td>176</td>
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Coefficients:

<table>
<thead>
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<th>Unstandardized Coefficients</th>
<th>Standardized Coefficients</th>
<th>t</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
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<td>B</td>
<td>Std. Error</td>
<td></td>
<td>Beta</td>
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</tr>
<tr>
<td></td>
<td>Size</td>
<td>.043</td>
<td>.034</td>
<td>.095</td>
</tr>
<tr>
<td></td>
<td>(Constant)</td>
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<td>.305</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Size</td>
<td>.011</td>
<td>.030</td>
<td>.025</td>
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<tr>
<td></td>
<td>Knowledge strategy</td>
<td>.516</td>
<td>.076</td>
<td>.462</td>
</tr>
</tbody>
</table>

Model 1 in Table 4.22 shows that R Squared is 0.009, indicating that firm size explains 0.9% of the variance in organizational innovation. The ANOVA results indicate that the model is not significant (F = 1.610, p > 0.05). The standardized coefficients show that the effect of size on organizational innovation is positive but not significant (β = 0.095, t = 1.269, p > 0.05).

Model 2 shows that 21.8% of variation in organizational innovation is explained by variation in size and knowledge strategy (R Squared = 0.218). The model shows that Change in R Squared is 0.209, which means that knowledge strategy explains an additional 20.9% variance in organizational innovation. The change in R Squared is significant (F change = 46.463, p < 0.05). ANOVA results show that Model 2 which includes size and knowledge strategy is significant (F = 24.246, p < 0.05). The regression coefficients show a significant positive relationship between knowledge strategy and organizational innovation (β = 0.462, t = 6.816, p < 0.05). Thus, the results show that the
second condition for mediation was satisfied, that is the independent variable (knowledge strategy) and mediating variable (organizational innovation) were significantly related.

In the third step, the dependent variable, organizational performance was regressed on the potential mediator, organizational innovation. This step was intended to show whether the mediating variable and dependent variable were significantly related. Size was entered in the model as a control variable. The results of the analysis are presented in Table 4.23.

**Table 4.23: Simple Regression Results for Effect of Organizational Innovation on Organizational Performance**

<table>
<thead>
<tr>
<th>Model</th>
<th>R Square</th>
<th>Adjusted R Square</th>
<th>Std. Error of the Estimate</th>
<th>R Square Change</th>
<th>F Change</th>
<th>df1</th>
<th>df2</th>
<th>Sig. F Change</th>
</tr>
</thead>
<tbody>
<tr>
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<td>.024</td>
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<td>.70705</td>
<td>.024</td>
<td>4.306</td>
<td>1</td>
<td>.039</td>
</tr>
<tr>
<td>2</td>
<td>.605b</td>
<td>.366</td>
<td>.359</td>
<td>.57122</td>
<td>.343</td>
<td>95.711</td>
<td>1</td>
<td>.000</td>
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</tbody>
</table>

**ANOVAa**

<table>
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<th>df</th>
<th>Mean Square</th>
<th>F</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
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<td>1</td>
<td>2.152</td>
<td>4.306</td>
</tr>
<tr>
<td>Residual</td>
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<td>178</td>
<td>.500</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>91.137</td>
<td>179</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Regression</td>
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<td>16.691</td>
<td>51.154</td>
<td>.000b</td>
</tr>
<tr>
<td>Residual</td>
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<td>.326</td>
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<tr>
<td>Total</td>
<td>91.137</td>
<td>179</td>
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</table>

**Coefficients**

<table>
<thead>
<tr>
<th>Model</th>
<th>Unstandardized Coefficients</th>
<th>Standardized Coefficients</th>
<th>t</th>
<th>Sig.</th>
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</thead>
<tbody>
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<td>.148</td>
<td>23.618</td>
</tr>
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<td>Size</td>
<td>.080</td>
<td>.039</td>
<td>.154</td>
</tr>
<tr>
<td></td>
<td>(Constant)</td>
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<tr>
<td>2</td>
<td>Size</td>
<td>.051</td>
<td>.031</td>
<td>.098</td>
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<tr>
<td></td>
<td>Organizational innovation</td>
<td>.688</td>
<td>.070</td>
<td>.588</td>
</tr>
</tbody>
</table>

a. Predictors: (Constant), Size
b. Predictors: (Constant), Organizational innovation
c. Dependent Variable: Organizational performance

As shown in Table 4.23, Model 1 indicates R Squared of 0.024. This shows that 2.4% of the variance in organizational performance is explained by variation in size. The ANOVA results indicate that the model is significant (F = 4.306, p < 0.05). The standardized coefficients show that the effect of size on organizational performance is positive and significant (β = 0.154, t = 2.075, p < 0.05).
Model 2 shows that after organizational innovation was added to the model, R Squared increased to 0.366, which means that 36.6% of the variance in organizational performance is explained by variation in size and organizational innovation. Model 2 further shows that change in R Squared is 0.343. This shows that organizational innovation explains an additional 34.3% variation in organizational performance. The results show that the change in R Squared is statically significant \((F \text{ change} = 95.711, p < 0.05)\). The ANOVA results show that the effect of size and organizational innovation on organizational performance is statistically significant \((F = 51.154, p < 0.05)\). The regression coefficients show that organizational innovation has a significant positive effect on organizational performance \((\beta = 0.588, t = 9.783, p < 0.05)\). This means that the third condition for mediation was satisfied since the mediating variable (organizational innovation) and dependent variable (organizational performance) were significantly related.

In the fourth step, the dependent variable, organizational performance was regressed on the independent variable, knowledge strategy and the mediating variable, organizational innovation as blocks. Size was entered in the model as a control variable. The significance of the relationship between the dependent variable and independent variable was assessed after the effect of the mediating variable was controlled for. If the variable was a complete mediator, the relation between the independent variable and dependent variable would not be significant after the effect of the mediating variable was controlled for. The results of the analysis are presented in Table 4.24.
Table 4.24: Hierarchical Regression Results for Effect of Knowledge Strategy on Organizational Performance, Controlling for the Effect Organizational Innovation

<table>
<thead>
<tr>
<th>Model</th>
<th>R Square</th>
<th>Adjusted R Square</th>
<th>Std. Error of the Estimate</th>
<th>R Square Change</th>
<th>Change Statistics</th>
<th>Sig. F Change</th>
<th>df1</th>
<th>df2</th>
<th>Sig. F Change</th>
</tr>
</thead>
<tbody>
<tr>
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<td>.154a</td>
<td>.024</td>
<td>.018</td>
<td>.70799</td>
<td>4.209</td>
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<td>174</td>
<td>.042</td>
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<td>.605b</td>
<td>.366</td>
<td>.359</td>
<td>.57130</td>
<td>93.548</td>
<td>1</td>
<td>173</td>
<td>.000</td>
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<tr>
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<td>.611c</td>
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ANOVA

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<th>Sig.</th>
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<td>2.104</td>
<td>4.209</td>
</tr>
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<td></td>
<td>Residual</td>
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<td>174</td>
<td>.500</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>89.101</td>
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<td>.326</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Total</td>
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<td>175</td>
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<td></td>
</tr>
<tr>
<td></td>
<td>Regression</td>
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Coefficients

<table>
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<tr>
<th>Model</th>
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<th>Standardized Coefficients</th>
<th>t</th>
<th>Sig.</th>
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</thead>
<tbody>
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<td>B</td>
<td>Std. Error</td>
<td>Beta</td>
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</tr>
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<td>1</td>
<td>(Constant)</td>
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<td>Size</td>
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<td>.039</td>
<td>.154</td>
</tr>
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<td>.098</td>
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<td>.588</td>
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<td>Knowledge strategy</td>
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<td>.096</td>
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</table>

a. Predictors: (Constant), Size
b. Predictors: (Constant), Size, Organizational innovation
c. Predictors: (Constant), Size, Organizational innovation, Knowledge strategy
d. Dependent Variable: Organizational performance

As shown in Model 1 in Table 4.24, R Squared is 0.024 indicating that variation in size explains 2.4% of the variance in organizational performance. The ANOVA results indicate that Model 1 was significant (F = 4.209, p < 0.05). The standardized coefficients show that the effect of size on organizational performance is positive and significant (β = 0.154, t = 2.052, p < 0.05).

Model 2 shows that 36.6% of the variation in organizational performance is explained by variation in size and organizational innovation (R Squared = 0.366). Model 2 further
shows that addition of organizational innovation explained additional 34.3% (R Squared change = 0.343) variation in organizational performance. The additional variation in organizational performance was significant (F change = 93.548, \( p < 0.05 \)). The ANOVA results show that Model 2 which includes size and organizational innovation is significant (F = 49.998, \( p < 0.05 \)). The standardized coefficients show that the effect of organizational innovation on organizational performance is positive and significant (\( \beta = 0.588, t = 9.672, p < 0.05 \)).

Model 3 shows that 37.3% of the variation in organizational performance is explained by variation in size, organizational innovation and knowledge strategy (R Squared = 0.373). The model shows that when knowledge strategy was added to the model, change in R Squared was 0.007, which means that knowledge strategy explains an additional 0.7% of the variation in organizational performance. The change in R Squared is not significant (F change = 1.930, \( p > 0.05 \)). However, ANOVA results show that the effect of size, organizational innovation and knowledge strategy is significant (F = 34.155, \( p < 0.05 \)).

Further, the standardized coefficients in Model 3 show that the effect of knowledge strategy on organizational performance which was significant in the first analysis was no longer significant (\( \beta = 0.096, t = 1.389, p > 0.05 \)) when controlling for the effect of the mediating variable, organizational innovation. Thus, the final condition for demonstrating mediation was also met. A summary of the results of the mediated regression analysis are shown in Figure 4.3.

**Figure 4.3: Regression Coefficients for Statistical Test of Mediation**

*\( p < .05 \); ns = not significant
The results in Figure 4.3 show that all the conditions for full mediation were met. These results show that knowledge strategy affects organizational performance through organizational innovation, hence supporting Hypothesis H2 which proposed that the effect of knowledge strategy on organizational performance is mediated by organizational innovation.

4.6.3 Knowledge Strategy, Organizational Characteristics and Performance

Hypothesis H3 predicted that the effect of knowledge strategy on organizational performance is moderated by organizational characteristics. The hypothesis was tested using hierarchical regression analysis. The analysis involved entering variables in steps. In the first step, organizational performance was regressed on knowledge strategy. In the second step, the composite score of the dimensions of potential moderating variable, organizational characteristics was entered in the model. In the third step, the interaction term was added to the model. The regression outputs were checked to determine if there was a significant change in R squared which could be attributed to the interaction effect of knowledge strategy and organizational characteristics. Firm size was entered in the model as a control variable. The results of the analysis are presented in Table 4.25.
Table 4.25: Hierarchical Regression Results for Moderating Effect of Organizational Characteristics on the Relationship between Knowledge Strategy and Organizational Performance

<table>
<thead>
<tr>
<th>Model</th>
<th>R</th>
<th>R Square</th>
<th>Adjusted R Square</th>
<th>Std. Error of the Estimate</th>
<th>Change Statistics</th>
<th>F Change</th>
<th>df1</th>
<th>df2</th>
<th>Sig. F Change</th>
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</thead>
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<td>.70730</td>
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<td>158</td>
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**ANOVA**

<table>
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<tr>
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<th>df</th>
<th>Mean Square</th>
<th>F</th>
<th>Sig.</th>
</tr>
</thead>
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<td>1.912</td>
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<td>.500</td>
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<tr>
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<td>Residual</td>
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<td>.443</td>
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<td>159</td>
<td></td>
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<td>3</td>
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<td>4</td>
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<tr>
<td>4</td>
<td>Total</td>
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**Coefficients**

<table>
<thead>
<tr>
<th>Model</th>
<th>Unstandardized Coefficients</th>
<th>Standardized Coefficients</th>
<th>t</th>
<th>Sig.</th>
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<td>(Constant) B</td>
<td>Std. Error</td>
<td>Beta</td>
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<tr>
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<td>Size</td>
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<td>2</td>
<td>(Constant) B</td>
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<td></td>
<td>Size</td>
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<td>.039</td>
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<td>Knowledge strategy</td>
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<td>Size</td>
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<td>.038</td>
<td>.036</td>
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<td></td>
<td>Knowledge strategy</td>
<td>.187</td>
<td>.117</td>
<td>.143</td>
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<tr>
<td></td>
<td>Organizational characteristics</td>
<td>.587</td>
<td>.154</td>
<td>.351</td>
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<tr>
<td>4</td>
<td>(Constant) B</td>
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<td>2.056</td>
<td>-2.178</td>
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<td></td>
<td>Knowledge strategy</td>
<td>.012</td>
<td>.040</td>
<td>.023</td>
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<tr>
<td></td>
<td>Organizational characteristics</td>
<td>1.616</td>
<td>.567</td>
<td>1.239</td>
</tr>
<tr>
<td>4</td>
<td>Knowledge strategy*organizational characteristics</td>
<td>.383</td>
<td>.149</td>
<td>1.746</td>
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a. Predictors: (Constant), Size
b. Predictors: (Constant), Size, Knowledge strategy
c. Predictors: (Constant), Size, Knowledge strategy, Organizational characteristics
d. Predictors: (Constant), Size, Knowledge strategy, Organizational characteristics, knowledge strategy*organizational characteristics
e. Dependent Variable: Organizational performance
As shown in Table 4.25, R Squared for Model 1 in which organizational performance was regressed on firm size was 0.024. This indicates that 2.4% of the variation in organizational performance is explained by variation in size. The ANOVA results indicate that Model 1 is not significant (F = 3.822, p > 0.05). The standardized coefficients show that the effect of size on organizational performance is positive but not significant (β = 0.154, t = 1.955, p > 0.05).

Model 2 shows that when organizational performance was regressed on size and knowledge strategy, R Squared increased to 0.141, indicating that 14.1% of the variation in organizational performance is explained by variation in size and knowledge strategy. The model shows that Knowledge strategy explains additional 11.8% variation in organizational performance (R Squared Change = 0.118). The additional variation in organizational performance explained by knowledge strategy is significant (F Change = 21.544, p < 0.05). The ANOVA results indicate that Model 2 which includes size and knowledge strategy as predictor variables is significant (F = 12.931, p < 0.05). The standardized coefficients show that the effect of knowledge strategy on organizational performance is positive and significant (β = 0.347, t = 4.642, p < 0.05).

Model 3 shows that when organizational characteristics was added to the model, R Squared increased to 0.215 indicating that 21.5% of the variation in organizational performance is explained by variation in size, knowledge strategy and organizational characteristics. The model shows that R Squared change is 0.073, which shows that additional 7.3% variation in organizational performance is explained by organizational characteristics. The additional variation in organizational performance is significant (F change= 14.548, p < 0.05). The ANOVA results show that the model which includes size, knowledge strategy and organizational characteristics is significant (F = 14.214, p < 0.05). The standardized coefficients show that the effect of organizational characteristics on organizational performance is positive and significant (β = 0.351, t = 3.814, p < 0.05), and the effect of knowledge strategy on organizational performance is positive (β = 0.143) but not significant (t = 1.598, p > 0.05).
In Model 4, the interaction term (knowledge strategy*organizational characteristics) was introduced. The R Squared increased to 0.247, indicating that 24.7% of the variation in organizational performance is explained by variation in firm size, knowledge strategy, organizational characteristics and the interaction term. Model 4 also shows that change in R Squared is 0.032, indicating that 3.2% of the variation in organizational performance is explained by the interaction between knowledge strategy and organizational characteristics. The model also indicates that the additional variation in organizational performance attributed to the interaction term is statistically significant (F change = 6.627, p < 0.05). The ANOVA results show that the model which includes size, knowledge strategy, organizational characteristics and the interaction term as predictor variables is significant (F = 12.702, p < 0.05). Regarding the relative effect of the predictor variables in explaining variation in organizational performance, standardized coefficients in Model 4 revealed that the interaction term had a greater effect ($\beta = 1.746, t = 2.574, p < 0.05$) followed by knowledge strategy ($\beta = 1.239, t = 2.850, p < 0.05$), and organizational characteristics ($\beta = 1.202, t = 3.507, p < 0.05$). Further, the standardized coefficients show that all the predictor variables have a significant positive effect on organizational performance. The results indicate that organizational characteristics is a significant moderator of the relationship between knowledge strategy and organizational performance, supporting Hypothesis H3, which predicted that the effect of knowledge strategy on organizational performance is moderated by organizational characteristics.

4.6.4 Knowledge Strategy, Organizational Characteristics, Innovation and Performance

Hypothesis H4 stated that the joint effect of knowledge strategy, organizational characteristics and organizational innovation on organizational performance is greater than the effect of knowledge strategy on organizational performance. This hypothesis was tested in two steps: in the first step, organizational performance was regressed on the composite score of the dimensions of knowledge strategy to determine the individual effect of knowledge strategy on organizational performance. In the second step, organizational performance was regressed on the composite scores of the dimensions of knowledge strategy, organizational characteristics and organizational innovation to determine the joint effect of the variables on organizational performance. The effect of
firm size was controlled for in the analysis. The results of the regression analyses are presented in Table 4.26.

**Table 4.26: Regression Results for Joint Effect of Knowledge Strategy, Organizational Characteristics and Organizational Innovation on Organizational Performance**

<table>
<thead>
<tr>
<th>Model</th>
<th>R</th>
<th>R Square</th>
<th>Adjusted R Square</th>
<th>Std. Error of the Estimate</th>
<th>R Square Change</th>
<th>F Change</th>
<th>df1</th>
<th>df2</th>
<th>Sig. F Change</th>
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<tr>
<td>1</td>
<td>.154&lt;sup&gt;a&lt;/sup&gt;</td>
<td>.024</td>
<td>.018</td>
<td>.70727</td>
<td>.024</td>
<td>3.870</td>
<td>1</td>
<td>160</td>
<td>.051</td>
</tr>
<tr>
<td>2</td>
<td>.376&lt;sup&gt;b&lt;/sup&gt;</td>
<td>.141</td>
<td>.131</td>
<td>.66531</td>
<td>.118</td>
<td>21.819</td>
<td>1</td>
<td>159</td>
<td>.000</td>
</tr>
<tr>
<td>3</td>
<td>.614&lt;sup&gt;c&lt;/sup&gt;</td>
<td>.377</td>
<td>.361</td>
<td>.57056</td>
<td>.235</td>
<td>29.596</td>
<td>2</td>
<td>157</td>
<td>.000</td>
</tr>
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</table>

<table>
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<tr>
<th>ANOVA&lt;sup&gt;d&lt;/sup&gt;</th>
<th>Model</th>
<th>Sum of Squares</th>
<th>df</th>
<th>Mean Square</th>
<th>F</th>
<th>Sig.</th>
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<tr>
<td>1</td>
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<td>1</td>
<td>1.936</td>
<td>3.870</td>
<td>.051&lt;sup&gt;a&lt;/sup&gt;</td>
</tr>
<tr>
<td></td>
<td>Residual</td>
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<td>160</td>
<td>.500</td>
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<tr>
<td></td>
<td>Total</td>
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<td></td>
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<td>Regression</td>
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<td>2</td>
<td>5.797</td>
<td>13.096</td>
<td>.000&lt;sup&gt;b&lt;/sup&gt;</td>
</tr>
<tr>
<td></td>
<td>Residual</td>
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<td>.443</td>
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</tr>
<tr>
<td></td>
<td>Total</td>
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<tr>
<td>3</td>
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<td>.000&lt;sup&gt;c&lt;/sup&gt;</td>
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<tr>
<td></td>
<td>Total</td>
<td>81.973</td>
<td>161</td>
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</table>

<table>
<thead>
<tr>
<th>Coefficients&lt;sup&gt;d&lt;/sup&gt;</th>
<th>Model</th>
<th>Unstandardized Coefficients</th>
<th>Standardized Coefficients</th>
<th>t</th>
<th>Sig.</th>
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<td></td>
<td>B</td>
<td>Std. Error</td>
<td>Beta</td>
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<td>(Constant)</td>
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<td>.157</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Size</td>
<td>.080</td>
<td>.041</td>
<td>.154</td>
<td>.967</td>
</tr>
<tr>
<td>2</td>
<td>Size</td>
<td>.053</td>
<td>.039</td>
<td>.101</td>
<td>1.356</td>
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<td>.347</td>
<td>4.671</td>
</tr>
<tr>
<td></td>
<td>(Constant)</td>
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<td>.430</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Size</td>
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<td>.034</td>
<td>.073</td>
<td>1.106</td>
</tr>
<tr>
<td></td>
<td>Knowledge strategy</td>
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<td>.105</td>
<td>.063</td>
<td>.781</td>
</tr>
<tr>
<td></td>
<td>Organizational innovation</td>
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<td>.094</td>
<td>.512</td>
<td>6.384</td>
</tr>
<tr>
<td></td>
<td>Organizational characteristics</td>
<td>.138</td>
<td>.154</td>
<td>.082</td>
<td>.895</td>
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</tbody>
</table>

a. Predictors: (Constant), Size
b. Predictors: (Constant), Size, Knowledge strategy
c. Predictors: (Constant), Size, Knowledge strategy, Organizational innovation, Organizational characteristics
d. Dependent Variable: Organizational performance

As shown in Table 4.26, R Squared value for Model 1 is 0.024, which indicates that 2.4% of the variation in organizational performance is explained by variation in firm size. The ANOVA results indicate that the model is not significant (F = 3.870, p > 0.05). The
standardized coefficients show that the effect of size on organizational performance is positive but not significant ($\beta = 0.154, t = 1.967, p > 0.05$).

Model 2 shows that 14.1% of the variation in organizational performance is explained by variation in size and knowledge strategy (R Squared = 0.141). The model shows that addition of knowledge strategy explained additional 11.8% variation in organizational performance (R Squared change = 0.118). The additional variation in organizational performance explained by knowledge strategy was significant (F change = 21.819, $p < 0.05$). The ANOVA results indicate that the model including size and knowledge strategy was significant (F = 13.096, $p < 0.05$). The standardized coefficients show that the effect of knowledge strategy on organizational performance is positive and significant ($\beta = 0.347, t = 4.671, p < 0.05$).

Model 3 shows that when all the three predictor variables (knowledge strategy, organizational innovation and organizational characteristics) were simultaneously entered in the model, R Squared increased to 0.377, which indicates that 37.7% of the variation in organizational performance is explained by variation in size, knowledge strategy, organizational innovation and organizational characteristics. The model further shows that when the predictor variables were added to the model, change in R Squared was 0.235, which means that the variables explained additional 23.5% variation in organizational performance. The change in R Squared was significant (F change = 29.596, $p < 0.05$). The ANOVA results show that Model 3 which included size, knowledge strategy, organizational innovation and organizational characteristics is significant ($F = 23.701, p < 0.05$). Regarding the relative influence of the three predictor variables in explaining variation in organizational performance, the standardized coefficients indicate that organizational innovation has greater and significant positive effect on organizational performance ($\beta = 0.512, t = 6.384, p < 0.05$), followed by organizational characteristics ($\beta = 0.082, t = 0.895, p > 0.05$), and knowledge strategy ($\beta = 0.063, t = 0.781, p > 0.05$) which were not significant.

Model 3 shows that the additional variation in organizational performance (23.5%) explained by variation in the predictor variables (knowledge strategy, organizational
innovation and organizational characteristics) jointly, is greater that the additional variation in organizational performance (11.8%) explained by knowledge strategy alone. Thus, the results show that the joint effect of knowledge strategy, organizational characteristics, and organizational innovation on organizational performance was greater than the effect of knowledge strategy on organizational performance. Hence, the results support Hypothesis H4.

4.6.5 Summary of Results of Tests of Hypotheses

Test of hypotheses began by testing the main effect of knowledge strategy on organizational performance and the influence of organizational innovation and organizational characteristics on the relationship. Finally, the study tested the joint effect of knowledge strategy, organizational innovation and organizational characteristics on organizational performance. The results supported all the hypotheses of the study. Summary of the results of the tests of hypotheses are presented in Table 4.27.
## Table 4.27: Summary of the Results of the Tests of Hypotheses

<table>
<thead>
<tr>
<th>Hypothesis</th>
<th>Results</th>
<th>Conclusion</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>H1. Knowledge strategy has a positive effect on organizational performance.</strong></td>
<td>Change in $R^2 = 0.122$, positive effect of knowledge exploration on organizational performance ($\beta = 0.305, t = 3.465, p &lt; 0.05$) and positive effect of knowledge exploitation on organizational performance ($\beta = 0.076, t = 0.878, p &gt; 0.05$).</td>
<td><strong>H1 Supported</strong></td>
</tr>
<tr>
<td><strong>H2. The effect of knowledge strategy on organizational performance is mediated by organizational innovation.</strong></td>
<td>Significant relationship between knowledge strategy and organizational performance ($\beta = 0.347, t = 4.872, p &lt; 0.05$); significant relationship between knowledge strategy and organizational innovation ($\beta = 0.462, t = 6.816, p &lt; 0.05$); significant relationship between organizational innovation and performance ($\beta = 0.588, t = 9.783, p &lt; 0.05$); relationship between knowledge strategy and performance was no longer significant when the effect of organizational innovation is controlled for ($\beta = 0.096, t = 1.389, p &gt; 0.05$).</td>
<td><strong>H2 Supported</strong></td>
</tr>
<tr>
<td><strong>H3. The effect of knowledge strategy on organizational performance is moderated by organizational characteristics.</strong></td>
<td>Significant change in $R^2$ after addition of interaction term (knowledge strategy*organizational characteristics); significant $F$ change (change in $R^2 = 0.032, F$ change = 6.627, $p &lt; 0.05$)</td>
<td><strong>H3 Supported</strong></td>
</tr>
<tr>
<td><strong>H4. The joint effect of knowledge strategy, organizational characteristics, and organizational innovation on organizational performance is greater than the effect of knowledge strategy on organizational performance.</strong></td>
<td>Change in R Squared value for joint effect model ($R^2 = 0.235, F = 29.596, p &lt; 0.05$) is greater than change in R Squared value for individual effect model ($R^2 = 0.118, F = 21.819, p &lt; 0.05$).</td>
<td><strong>H4 Supported</strong></td>
</tr>
</tbody>
</table>

### 4.7 Discussion of Results

This section discusses the results of this study to show the extent to which the results are consistent or inconsistent with the results of past studies. The discussion is based on the research objectives and hypotheses.
4.7.1 Knowledge Strategy and Organizational Performance

The first objective of the study was to determine the effect of knowledge strategy on organizational performance. It was hypothesized that knowledge strategy has a positive effect on organizational performance. The hypothesis was tested using multiple regression analysis. The regression results showed a positive and significant relationship between knowledge exploration and organizational performance ($\beta = 0.305, t = 3.465, p < 0.05$) and a positive but insignificant relationship between knowledge exploitation and organizational performance ($\beta = 0.076, t = 0.878, p > 0.05$). Thus, the results supported Hypothesis H1, that knowledge strategy has a positive effect on organizational performance.

The findings of this study are consistent with the findings of the studies by Bierly and Daly (2007) and Lubatkin et al. (2006), which reported that joint pursuit of knowledge exploration and exploitation was positively related with organizational performance. The findings also concur with the findings of He and Wong (2004) who found that pursuit of both knowledge exploration and exploitation was positively related with sales growth performance. The positive coefficients for both knowledge exploration and knowledge exploitation suggest that those firms that have higher capability to simultaneously pursue knowledge exploration and exploitation will achieve higher levels of organizational performance. These findings support the suggestion (March, 1991; Tushman & O’Reilly, 1996) that organizations need to develop capabilities for knowledge exploration and exploitation to enhance performance. Regarding the individual effects of knowledge exploration and knowledge exploitation on organizational performance, the findings of this study show that knowledge exploration has a greater influence than knowledge exploitation on organizational performance. This finding is consistent with the finding of the study by Bierly & Daly (2007) which revealed that exploration had a stronger influence on performance than exploitation, and exploitation and performance were positively related up to a point after which they were negatively correlated.

The regression results of this study show low variation in organizational performance (12.2%) explained by variation in knowledge exploration and exploitation. This low explanatory power can be explained by the fact that knowledge strategy is a relatively
new concept (Bierly & Daly, 2007) which manufacturing firms in Kenya may have just started to implement and hence knowledge strategies have not started to yield high performance outcomes. Another possibility is that some of the firms in the study sample are small and therefore lack adequate resources required to adequately invest in knowledge exploration and knowledge exploitation to achieve higher performance.

The results of this study also revealed that the effect of knowledge exploitation on organizational performance was positive but not significant. A possible explanation of the insignificant effect of knowledge exploitation on organizational performance may be that the firms may have developed capabilities in knowledge exploration and have not excelled in knowledge exploitation to enhance their efficiencies required to enhance performance. Further, the results showed that knowledge exploration had a positive and significant effect on organizational performance while knowledge exploitation had a positive but insignificant effect on organizational performance. This may be explained by the argument that knowledge exploration is innovation oriented, which has a positive effect on competitive advantage and performance than knowledge exploitation that focuses on attaining efficiency (March, 1991; Levinthal & March, 1993; Bierly & Daly, 2007).

4.7.2 Knowledge Strategy, Organizational Innovation and Performance

The second objective of the study sought to establish whether organizational innovation mediates the relationship between knowledge strategy and organizational performance. It was hypothesized that the effect of knowledge strategy on organizational performance is mediated by organizational innovation. The hypothesis was tested following Baron and Kenny’s (1986) procedure. The results showed a significant relationship between knowledge strategy (independent variable) and organizational performance (dependent variable) \( \beta = 0.347, t = 4.872, p < 0.05 \); significant relationship between knowledge strategy and organizational innovation (mediating variable) \( \beta = 0.462, t = 6.816, p < 0.05 \), and significant relationship between organizational innovation and organizational performance \( \beta = 0.588, t = 9.783, p < 0.05 \). Further, the effect of knowledge strategy on organizational performance was no longer significant when the effect of organizational innovation was controlled for \( \beta = 0.096, t = 1.389, p > 0.05 \). These results show that all
the conditions for full mediation were met and hence the results supported the hypothesis that organizational innovation mediates the effect of knowledge strategy on organizational performance.

This finding is consistent with the finding of Darroch and McNaughton (2003) who established that firms adopting more KM practices in terms of knowledge acquisition and dissemination were more innovative and achieved higher financial performance. The finding also corroborates Lopez-Nicholas and Merono-Cerdan’s (2011) finding that strategic KM in terms of codifications and personalization of knowledge has impact on organizational innovation and performance directly and indirectly through an increase on innovation capability. Generally, the findings of this study support those from prior studies that organizational innovation mediates the relationship between knowledge initiatives comprising knowledge acquisition and dissemination (Darroch & McNaughton, 2003), codification and personalization of knowledge (Lopez-Nicholas & Merono-Cerdan, 2011), and organizational performance. However, this study focussed only on knowledge strategy in terms of knowledge exploration and exploitation. This study adds to the existing body of knowledge by showing that organizational innovation mediates the relationship between knowledge strategy and organizational performance.

4.7.3 Knowledge Strategy, Organizational Characteristics and Performance
The third objective sought to determine the influence of organizational characteristics on the relationship between knowledge strategy and organizational performance. The resulting hypothesis that the effect of knowledge strategy on organizational performance is moderated by organizational characteristics was tested using hierarchical regression analysis. The regression results showed that the interaction between knowledge strategy and organizational characteristics resulted in a significant increase in $R^2$ (change in $R^2 = 0.032$, $F$ change = 6.627, $p < 0.05$). These results support the hypothesis that the effect of knowledge strategy on organizational performance is moderated by organizational characteristics.

These results confirm the argument from previous studies that in order to succeed, KM initiatives require important enablers such as a culture of collaboration and trust (Chong
& Chong, 2009; Lee & Choi, 2003), strategic leadership and friendly culture that supports learning and sharing of knowledge (Bierly & Daly, 2007; Vera & Crossan, 2004). Alignment of KM initiatives to these factors increases the effect of knowledge strategy on organizational performance. However, unlike prior studies which examined the role organizational characteristics play as enablers of KM initiatives, this study focussed on the moderating effect of organizational characteristics on the relationship between knowledge strategy and organizational performance. The study contributes to knowledge by showing empirically that organizational characteristics are a necessary condition for the effect of knowledge strategy on organizational performance.

4.7.4 Knowledge Strategy, Organizational Characteristics, Innovation and Performance

The fourth objective of the study was to establish whether the joint effect of knowledge strategy, organizational characteristics and organizational innovation on organizational performance is greater than the effect of knowledge strategy on organizational performance. The resulting hypothesis was tested by regressing organizational performance on knowledge strategy alone to examine the individual effect of knowledge strategy on organizational performance, and then on a combination of all the predictor variables to examine the joint effect of knowledge strategy, organizational characteristics, and organizational innovation on organizational performance. The results showed that the variation in organizational performance explained by variation in the combination of all the predictor variables (23.5%) was greater than the variation in organizational performance explained by variation in knowledge strategy alone (11.8%). Hence, the results supported the hypothesis that the joint effect of knowledge strategy, organizational characteristics and organizational innovation on organizational performance is greater than the effect of knowledge strategy on organizational performance.

The above findings lend support to the contingency perspective (Donaldson, 1987) and existing literature which suggests that alignment of organizational processes with situational variables such as organizational characteristics and organizational innovation enhances organizational outcomes. The findings of this study further lend support to the view that alignment among organizational variables achieves high performance. By
showing that the joint effect of knowledge strategy, organizational characteristics and innovation on organizational performance is greater than the individual effect of knowledge strategy, this study makes important contribution in lending empirical support to contingency perspective on the relationship between knowledge strategy and organizational performance.

4.8 Summary of the Chapter

This chapter presented the results of the study. The chapter began by presenting the response rate and assessment of research instruments and regression assumptions. The profiles of respondents and organizations were then presented. This was followed by descriptive statistics, correlation analysis and the tests of hypotheses. Finally, the chapter presented discussion of results of the study. The next and final chapter presents summary, conclusions, implications and recommendations of the study.
CHAPTER FIVE
SUMMARY, CONCLUSIONS, IMPLICATIONS AND RECOMMENDATIONS

5.1 Introduction
This chapter presents the summary of the research findings, conclusions, implications and recommendations of the study. The chapter discusses summary of findings regarding the research objectives, hypotheses, and conclusions of the study. Finally, the chapter discusses implications of the study to management theory and practice; limitations of the study and directions for further research.

5.2 Summary of Findings
This study examined the role of organizational characteristics and innovation on the relationship between knowledge strategy and organizational performance. The data for the study was collected from 184 manufacturing firms in Kenya. The findings revealed that the firms to a great extent practice knowledge strategy that is, both knowledge exploration and knowledge exploitation. Regarding organizational characteristics of the firms, to a great extent the firms are characterized by centralized, formalized and complex structures. Cultural orientations of the firms are characterized by high levels of involvement, consistency, adaptability, mission, collaboration and trust. Regarding strategic leadership, to a great extent the firms practice strategic leadership in terms is transformational and transactional leadership. Further, the results also revealed that to a great extent the firms practice product and process innovation. Most of the firms indicted that their performance ranked in top forty percent in their industries.

The first objective of the study was to determine the effect of knowledge strategy on organizational performance. The findings reveal a positive relationship between the dimensions of knowledge strategy, knowledge exploration and exploitation, and organizational performance, supporting Hypothesis H1. Further, the findings show that knowledge exploration had a significant positive effect on performance, while knowledge exploitation strategy had a positive but insignificant effect on performance.

The second objective of the study was to establish whether organizational innovation mediates the relationship between knowledge strategy and organizational performance.
The regression results show that all the conditions for demonstrating complete mediation were met; hence showing that organizational innovation mediates the effect of knowledge strategy on organizational performance. The results support Hypothesis H2 which predicted that the effect of knowledge strategy on organizational performance is mediated by organizational innovation.

The third objective of the study was to determine the influence of organizational characteristics on the relationship between knowledge strategy and organizational performance. Data on the three variables were subjected to hierarchical regression analysis. The results revealed that interaction between knowledge strategy (independent variable) and organizational characteristics (a moderator) explained significant variance in organizational performance. Hence, Hypothesis H3 which stated that the effect of knowledge strategy on organizational performance is moderated by organizational characteristics was supported.

The fourth objective of the study sought to establish whether the joint effect of knowledge strategy, organizational characteristics and organizational innovation on organizational performance is greater than the effect of knowledge strategy on organizational performance. The corresponding hypothesis was tested using simple and multiple regression analysis. The regression results showed that the combination of knowledge strategy, organizational characteristics and organizational innovation explained greater variance in organizational performance, than the variance explained by knowledge strategy alone. Thus, the results supported Hypothesis H4.

5.3 Conclusions

The broad objective of this study was to examine the role of organizational characteristics and innovation on the relationship between knowledge strategy and organizational performance. The specific objectives of the study were to determine the effect of knowledge strategy on organizational performance; establish whether organizational innovation mediates the relationship between knowledge strategy and organizational performance; determine the influence of organizational characteristics on the relationship between knowledge strategy and organizational performance; and establish whether the
joint effect of knowledge strategy, organizational characteristics and organizational innovation on organizational performance is greater than the effect of knowledge strategy on organizational performance. The findings of the study lead to the following conclusions:

There is a linkage between knowledge strategy and performance of manufacturing firms in Kenya; and knowledge strategy is positively related to the performance of the firms. The finding confirms that knowledge strategy is crucial in enhancing organizational performance. Hence, higher levels of knowledge strategy would result in higher levels of organizational performance.

The results also revealed that organizational innovation mediates the relationship between knowledge strategy and organizational performance. In other words, knowledge strategy results in organizational innovation which in turn affects organizational performance. Thus, knowledge strategy is crucial in enhancing organizational innovation and subsequently organizational performance.

The results further reveal that organizational characteristics moderate the relationship between knowledge strategy and organizational performance. That is, aligning knowledge strategy with organizational characteristics enhances the effect of knowledge strategy on organizational performance.

Finally, the results show that the combined effect of knowledge strategy, organizational characteristics and organizational innovation on organizational performance is greater than the effect of knowledge strategy alone. This shows that integrating knowledge strategy, organizational characteristics and organizational innovation achieves greater effect on organizational performance than that of knowledge strategy alone.

5.4 Implications of the Research Findings and Recommendations
This study was based on the resource based theory, knowledge based view, dynamic capabilities approach and contingency theory to determine the effect of knowledge strategy on organizational performance; establish whether organizational innovation mediates the effect of knowledge strategy on organizational performance; determine the
moderating effect of organizational characteristics on the relationship between knowledge strategy and organizational performance; and establish whether the joint effect of knowledge strategy, organizational characteristics and organizational innovation on organizational performance is greater than the effect of knowledge strategy on organizational performance. The findings of the study conducted in manufacturing firms in Kenya have various implications for strategic management theory, and management policy and practice as explained below.

5.4.1 Implications for Strategic Management Theory
The study found that knowledge strategy has a positive effect on organizational performance in manufacturing firms in Kenya. This finding supports the arguments of resource based theory. The theory assumes that a firm’s competitive edge and performance is enhanced when it has resources that are valuable, rare, inimitable and non-substitutable. Knowledge as an intangible resource meets all these characteristics of strategic resources. The finding of this study thus confirms the argument of resource based theory that development and utilization of strategic resources enhances organizational performance.

Further, the finding that knowledge strategy has a positive effect on organizational performance empirically confirms the knowledge based view of the firm. The theory views the organization as the site for the development, dissemination and use of knowledge; and posits that development of stocks of knowledge and utilization of the knowledge creates competitive advantage and superior firm performance. This study confirms the prediction of the theory by showing that firms with higher knowledge exploration and exploitation achieved higher performance.

The study further reveals that organizational innovation mediates the effect of knowledge strategy on organizational performance. This finding supports the arguments of the dynamic capabilities approach. The theory emphasizes that firms need to integrate, reconfigure, upgrade and recreate their resources and capabilities in response to the rapidly changing environment to attain competitive advantage. The theory suggests that firms build their competences through organizational learning to increase stocks of
knowledge which in turn enhances innovation to enable the firms adapt to the changing environment to attain competitive advantage and superior performance. Thus, the finding of the study empirically confirms the perspective that creation of knowledge (knowledge exploration) and use of knowledge (exploitation) generate insights which enhance innovative performance, which in turn improves a firm’s competitive advantage and performance. Thus the study contributes to the understanding of the processes through which knowledge strategy results in improvement in organizational performance. That is, knowledge generates new insights which results to innovation (development of new products and process) to respond to market changes, as a way of creating and sustaining competitive advantage and achieving higher performance.

It was also found that organizational characteristics moderate the effect of knowledge strategy on organizational performance. This finding supports the arguments of contingency theory. The theory suggests that congruency among organizational variables such as strategy, structure and context is critical in enhancing performance. Thus, this study adds to the empirical support of the contingency perspective that interaction of organizational processes such as knowledge strategy and situational factors such as organizational characteristics results in higher performance outcomes.

An integrated model that examined the combined effect of variables on organizational performance was adopted in this study. The finding that the combined effect of knowledge strategy, organizational characteristics and organizational innovation was greater than the individual effect of knowledge strategy on organizational performance also supports the arguments of the contingency theory. The empirical support of the integrative model supports the contingency perspective that integrating contingency variables, knowledge strategy, organizational characteristics and innovation achieves higher performance outcomes.

Thus, by examining the role of organizational characteristics and innovation on the relationship between knowledge strategy and performance of manufacturing firms in Kenya, this study contributes in confirming the arguments of resource based theory, knowledge based view, dynamic capabilities approach, and contingency theory in the
context of manufacturing firms in Kenya. Further, the study advances the research stream by suggesting areas for future research in the area of knowledge strategy and organizational performance.

5.4.2 Implications for Management Policy and Practice

This study has implications to management policy and practice. First, the study confirmed a positive linkage between knowledge strategy and organizational performance. This implies that pursuit of knowledge exploration and exploitation is essential for a healthy organization. Thus, to create competitive advantage and improve organizational performance in the increasingly competitive environment, firms need to focus resources on knowledge exploration and exploitation. Further, the study revealed that knowledge exploration has a greater and significant influence on organizational performance than the influence of knowledge exploitation on organizational performance. However, descriptive statistics revealed that manufacturing firms in Kenya put more emphasis on knowledge exploitation than knowledge exploration. Thus, firms need to focus resources to enhance knowledge exploration activities.

Second, the study reveals that organizational innovation mediates the relationship between knowledge strategy and organizational performance. This indicates that knowledge strategy affects organizational performance through increased organizational innovation. Thus, to improve organizational performance, managers need to create and use knowledge to generate new insights necessary to develop innovative products and processes. In other words, firms need to turn knowledge to innovation to enhance performance.

Third, the findings show that the relationship between knowledge strategy and organizational performance is moderated by organizational characteristics. This implies that managers should understand under which circumstances knowledge strategy leads to superior performance, and pay attention to the influence of the contingency factors in managing the relationship. In light of the findings of this study, to improve organizational performance, knowledge strategy needs to be aligned with supportive organizational characteristics such as supportive structure, culture and strategic leadership.
Fourth, the results show that the joint effect of knowledge strategy, organizational characteristics and organizational innovation is greater than the individual effect of knowledge strategy on organizational performance. This implies that to enhance organizational performance, managers need to integrate knowledge strategy with supportive situational factors such as organizational characteristics and innovation.

5.5 Limitations of the Study

This study has made a contribution in providing understanding of the role of organizational characteristics and organizational innovation in the relationship between knowledge strategy and organizational performance. However, the study has some limitations.

The study adopted a cross-sectional survey research design in which data was collected once at a single point in time. The one-time survey was adopted due to the constraints of cost and time. Although cross-sectional studies are helpful in getting insights into aspects of variables, perceptions vary over time and thus cross-sectional studies have limitations in determining causal relationships.

This study was conducted in manufacturing companies in Kenya. Manufacturing firms may differ with service firms in that they are more technological and scale intensive than service firms which are more skill intensive. Thus, manufacturing firms are likely to be different from service firms in knowledge management and innovation activities. Hence the findings of this study may not be generalizable to service firms. Further, countries differ in terms of contextual factors such as economic conditions and technological advancements. These contextual differences may affect levels of innovation and performance. Hence, because of these contextual differences across countries, the findings of this study conducted in Kenya, may not be generalizable to other countries with different contextual conditions.

This study used one respondent in each firm to collect data; and the respondents were mainly company executive officers. Single respondent studies are prone to single respondent bias which may affect the validity of the study.
5.6 Recommendations for Further Research

This study contributes to the understanding of the relationship between knowledge strategy and organizational performance, and the role of organizational characteristics and innovation on the relationship. However, further research is necessary to address some of the limitations of this study and extend this stream of research.

This study adopted a cross-sectional survey. Such studies have limitations on providing explanations on the linkage between variables. A longitudinal study could increase understanding of the influence of contingency factors on relationship between knowledge strategy and organizational performance. Thus, future research should adopt longitudinal research design in data collection to enhance understanding of the relationship between the variables.

The study should be replicated in service sector and other countries. Such replication could further determine whether the results of this study can be generalized to other sectors or countries with different contextual conditions. This will enhance understanding of the relationship between knowledge strategy and organizational performance in different contexts.

The respondents of this study were executive officers and one respondent was used in each organization to collect data. To minimize the effect of single respondent bias, future research can use multiple respondents including executive officers and middle managers.

In this study, knowledge strategy was conceptualized using the widely used conceptualization in terms of knowledge exploration and knowledge exploitation. Future research should broaden the conceptualization of knowledge strategy to include other aspects such as internal and external sourcing of knowledge.

Future studies may consider inclusion of other organizational variables which may influence the relationship between knowledge strategy and organizational performance either as moderating or mediating variables. The variables may include organizational resources, age and size.
REFERENCES


APPENDICES

Appendix I: Study Questionnaire

Section I: Organizational Profile

Please provide the following information regarding your organization.

1. Position of respondent ________________________________

2. Name of the organization ______________________________

3. Year of establishment _________________________________

4. Majority ownership (tick one)
   (a) Local [ ]
   (b) Foreign [ ]
   (c) Other, specify ________________________________

5. Manufacturing sub-sector in which your organization falls (tick as appropriate)
   (a) Building, mining & construction [ ]
   (b) Chemical & allied [ ]
   (c) Energy, Electrical & Electronics [ ]
   (d) Food, Beverage & Tobacco [ ]
   (e) Leather & Footwear [ ]
   (f) Metal & Allied [ ]
   (g) Motor Vehicle & accessories [ ]
   (h) Paper & Board [ ]
   (i) Pharmaceutical & Medical Equipment [ ]
   (j) Plastics & Rubber [ ]
   (k) Textile & Apparels [ ]
   (l) Timber & Wood [ ]

6. Markets served (tick as appropriate)
   (a) Domestic markets only [ ]
   (b) Foreign markets only [ ]
   (c) Domestic and foreign markets [ ]
7. Number of years the organization has been in operation in Kenya (tick as appropriate)
   - Less than 6 years [ ]
   - 6 to 10 years [ ]
   - 11 to 15 years [ ]
   - 16 to 20 years [ ]
   - More than 20 years [ ]

8. Total number of permanent employees in Kenya (tick as appropriate)
   - Less than 50 [ ]
   - 51 to 100 [ ]
   - More than 100 [ ]

Section II: Knowledge Strategies

The statements presented below describe aspects of knowledge strategy in organizations. Please indicate the extent to which you agree that each of the statements describes your firm by ticking ‘√’ in the appropriate box (from 1 to 5); where: 1 = Strongly Disagree (SD); 2 = Disagree (D); 3 = Neutral (N); 4 = Agree (A); 5 = Strongly Agree (SA)

<table>
<thead>
<tr>
<th>(a) Knowledge exploration</th>
<th>SD 1</th>
<th>D 2</th>
<th>N 3</th>
<th>A 4</th>
<th>SA 5</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 We frequently experiment with radical new ideas</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>2 At our firm employees frequently come up with creative ideas that challenge conventional ideas</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>3 Compared to our principal competitors, a high percentage of our firm’s sales come from new products launched within the past 3 years</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>4 We are usually one of the first firms in our industry to use new, breakthrough technologies</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>(b) Knowledge exploitation</th>
<th>SD 1</th>
<th>D 2</th>
<th>N 3</th>
<th>A 4</th>
<th>SA 5</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 At our firm, a strong emphasis is placed on improving efficiency</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>2 Our firm excels at refining existing technologies</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>3 We frequently adjust our procedures, rules, and policies to make things work better</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
</tbody>
</table>
Section III: Organizational Characteristics

(a) Organizational Structure

The statements presented below describe aspects of organizational structure. Please indicate the extent to which you agree that each of the statements describes your firm by ticking ‘√’ in the appropriate box (from 1 to 5); where: 1 = Strongly Disagree (SD); 2 = Disagree (D); 3 = Neutral (N); 4 = Agree (A); 5 = Strongly Agree (SA)

<table>
<thead>
<tr>
<th>(i) Formalization</th>
<th>SD 1</th>
<th>D 2</th>
<th>N 3</th>
<th>A 4</th>
<th>SA 5</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 In our organization, there are many activities that are covered by formal procedures</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>2 In our organization, contact with our organization is on a formal or planned basis</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>3 In our organization, rules and procedures are written</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>4 In our organization, employees cannot ignore the rules and reach informal agreements to handle some situations</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>5 In our organization, employees cannot make their own rules on the job</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
</tbody>
</table>

(ii) Centralization

| 1 In our organization only a few people at the upper levels are involved in making decisions | 1    | 2   | 3   | 4   | 5    |
| 2 In our organization employees cannot make decisions without approval           | 1    | 2   | 3   | 4   | 5    |
| 3 In our organization employees cannot take action without a supervisor          | 1    | 2   | 3   | 4   | 5    |
| 4 In our organization employees are not encouraged to make their own decisions   | 1    | 2   | 3   | 4   | 5    |
| 5 In our organization employees need to refer to someone else to make decisions | 1    | 2   | 3   | 4   | 5    |

(iii) Complexity

| 1 This organization has many professional specialities                          | 1    | 2   | 3   | 4   | 5    |
| 2 This organization has high functional diversification                         | 1    | 2   | 3   | 4   | 5    |
| 3 This organization has great variety in core processes                         | 1    | 2   | 3   | 4   | 5    |
| 4 This organization has many hierarchical levels                               | 1    | 2   | 3   | 4   | 5    |
| 5 This organization has a high span of control                                 | 1    | 2   | 3   | 4   | 5    |
| 6 This organization has high geographical dispersion of operating sites         | 1    | 2   | 3   | 4   | 5    |
(b) Organizational Culture

The statements presented below describe aspects of organizational culture. Please indicate the extent to which you agree that each of the statements describes your firm by ticking ‘√’ in the appropriate box (from 1 to 5); where: 1 = Strongly Disagree (SD); 2 = Disagree (D); 3 = Neutral (N); 4 = Agree (A); 5 = Strongly Agree (SA)

<table>
<thead>
<tr>
<th>(i) Involvement</th>
<th>SD 1</th>
<th>D 2</th>
<th>N 3</th>
<th>A 4</th>
<th>SA 5</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Most people in this organization have input into the decisions affecting them</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>2</td>
<td>Cooperation and collaboration across functional roles is actively encouraged</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
</tbody>
</table>

(ii) Consistency

| 1 | There is a high level of agreement about the way that we do things in this organization | 1 | 2 | 3 | 4 | 5 |
| 2 | Our approach to doing business is very consistent and predictable | 1 | 2 | 3 | 4 | 5 |

(iii) Adaptability

| 1 | Customers’ comments and recommendations often lead to changes in this organization | 1 | 2 | 3 | 4 | 5 |
| 2 | This organization is very responsive and adapts to changes easily | 1 | 2 | 3 | 4 | 5 |

(iv) Mission

| 1 | This organization has a long-term purpose and direction | 1 | 2 | 3 | 4 | 5 |
| 2 | There is a shared vision of what this organization will be like in the future | 1 | 2 | 3 | 4 | 5 |

(v) Collaboration

<p>| 1 | In our organization, collaboration among employees is high | 1 | 2 | 3 | 4 | 5 |
| 2 | In our organization employees are highly willing to support each other | 1 | 2 | 3 | 4 | 5 |
| 3 | There is willingness to collaborate across organizational units within our organization | 1 | 2 | 3 | 4 | 5 |
| 4 | There is willingness within our organization to accept responsibility for failure | 1 | 2 | 3 | 4 | 5 |</p>
<table>
<thead>
<tr>
<th></th>
<th>(vi) Trust</th>
<th>SD</th>
<th>D</th>
<th>N</th>
<th>A</th>
<th>SA</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Our employees are generally trustworthy</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>2</td>
<td>Our employees have trust in each other members’ intentions and behaviours</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>3</td>
<td>Our employees have trust in each others’ ability</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>4</td>
<td>Our employees have trust in each others’ commitment to the organizational goals</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>5</td>
<td>Our employees have trust in each others’ commitment to the company as a whole</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>6</td>
<td>Our employees have relationships based on trust in each other</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
</tbody>
</table>
(c) **Strategic Leadership**

The statements presented below describe aspects of strategic leadership styles. Please indicate the extent to which you agree that each of the statements describes leadership style of your organization’s top management by ticking ‘✓’ in the appropriate box (from 1 to 5); where: 1 = Strongly Disagree (SD); 2 = Disagree (D); 3 = Neutral (N); 4 = Agree (A); 5 = Strongly Agree (SA)

(i) **Transformational leadership**

<table>
<thead>
<tr>
<th>Idealized influence/charismatic leadership</th>
<th>SD</th>
<th>D</th>
<th>N</th>
<th>A</th>
<th>SA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Makes everyone enthusiastic about assignments</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>Is completely trusted by the employees</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>Encourages employees to express their ideas and opinions</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
</tbody>
</table>

(ii) **Inspirational motivation**

<table>
<thead>
<tr>
<th>Inspirational motivation</th>
<th>SD</th>
<th>D</th>
<th>N</th>
<th>A</th>
<th>SA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Inspires employees</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>Inspires employees’ loyalty to leadership</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>Inspires employees’ loyalty to the organization</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
</tbody>
</table>

(ii) **Intellectual stimulation**

<table>
<thead>
<tr>
<th>Intellectual stimulation</th>
<th>SD</th>
<th>D</th>
<th>N</th>
<th>A</th>
<th>SA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gets employees to rethink ideas that they had never questioned before</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>Enables employees to think about old problems in new ways</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>Provides employees with new ways of looking at things</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
</tbody>
</table>

(ii) **Individualized consideration**

<table>
<thead>
<tr>
<th>Individualized consideration</th>
<th>SD</th>
<th>D</th>
<th>N</th>
<th>A</th>
<th>SA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gives personal attention to members who seem neglected</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>Finds out what employees want and tries to help them get it</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>Expresses appreciation to employees when they do a good job</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
</tbody>
</table>
(ii) Transactional leadership

<table>
<thead>
<tr>
<th>Contingent reward</th>
<th>SD 1</th>
<th>D 2</th>
<th>N 3</th>
<th>A 4</th>
<th>SA 5</th>
</tr>
</thead>
<tbody>
<tr>
<td>The management of this organization . . .</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1. Tells employees what to do if they want to be rewarded for their efforts</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>2. Allows agreement between what employees are expected to put into the group effort and what they can get out of it</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>3. Allows negotiation with employees about what they can get from what they can accomplish</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
</tbody>
</table>

Management by exception- active

| The management of this organization . . .                                         |      |     |     |     |      |
| 1. Asks employees no more of them than what is absolutely essential to get the work done | 1    | 2   | 3   | 4   | 5    |
| 2. Allows employees to take initiatives but does not encourage them to do so      | 1    | 2   | 3   | 4   | 5    |
| 3. Tells employees what they have to know to do their job                          | 1    | 2   | 3   | 4   | 5    |

Section IV: Organizational Innovation

The statements presented below describe aspects of innovation activities in organizations. Please indicate the extent to which you agree that each of the statements describes your firm by ticking ‘√’ in the appropriate box (from 1 to 5); where: 1= Strongly Disagree (SD); 2 = Disagree (D); 3 = Neutral (N); 4 = Agree (A); 5 = Strongly Agree (SA)

<table>
<thead>
<tr>
<th>(a) Product Innovation</th>
<th>SD 1</th>
<th>D 2</th>
<th>N 3</th>
<th>A 4</th>
<th>SA 5</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Our firm often creates and commercializes products with totally new performance</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>2. Our firm introduces new products to the market before competitors</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>3. Our firm often improves existing products</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>(b) Process Innovation</th>
<th>SD 1</th>
<th>D 2</th>
<th>N 3</th>
<th>A 4</th>
<th>SA 5</th>
</tr>
</thead>
<tbody>
<tr>
<td>4. Our firm often introduces new production processes and methods</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>5. Our firm often improves production processes and methods</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
</tbody>
</table>
Section V: Organizational Performance

The table below presents dimensions of organizational performance. Please tick ‘√’ in the box (from 1 to 5) which you feel best estimates how your firm’s performance currently ranks compared to other firms in your industry on each dimension; where: 1 = Lowest 20%, 2 = Lower 20%, 3 = Middle 20%, 4 = Next 20%, 5 = Top 20%.

<table>
<thead>
<tr>
<th></th>
<th>Lowest 20%</th>
<th>Lower 20%</th>
<th>Middle 20%</th>
<th>Next 20%</th>
<th>Top 20%</th>
</tr>
</thead>
<tbody>
<tr>
<td>(a) Financial performance</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1 Return on assets</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>2 Return on equity</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>(b) Market performance</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1 Market share</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>2 Sales growth</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
</tbody>
</table>
Appendix II: Manufacturing Firms in Kenya

Building, Mining and Construction Sector

1. African Diatomite
2. ARM Cement Ltd
3. Bamburi Cement Limited
4. Bamburi Special Products Ltd
5. Central Glass Industries
6. East Africa Portland Cement
7. Flamingo Tiles (Kenya) Limited
8. Glenn Investments Ltd
9. Homa Lime Company Ltd
10. International Energy Technik Ltd
11. Karsan Murji & Company Limited
12. Kenbro Industries Ltd
13. Kenya Builders & Concrete Ltd
14. Krystalline Salt Ltd
15. Kurawa Industries Ltd
16. Malindi Salt Works
17. Manson Hart Kenya Ltd
18. Mombasa Cement Ltd
19. Orbit Enterprises Ltd
20. Saj Ceramics Ltd
22. Vallem Construction Ltd

Chemical & Allied Sector

1. Anffi Kenya Ltd
2. Basco Products (K) Ltd
3. Bayer East Africa Ltd
4. Beiersdorf East Africa Ltd
5. Blue Ring Products Ltd
6. BOC Kenya Limited
7. Buyline Industries Limited
8. Canon Chemicals Limited
9. Carbacid (CO2) Limited
10. Chemicals and Solvents (EA) Ltd
11. Chrysal Africa Limited
12. Continental Products Ltd
13. Cooper K – Brands Ltd
14. Crown Gases Ltd
15. Crown Paints (Kenya) Ltd
16. Darfords Enterprises Ltd
17. Decase Chemicals Ltd
18. Deluxe Inks Ltd
19. Desbro Kenya Limited
20. Doric Industries Ltd
21. Eastern Chemicals Industries
22. Elex Products Ltd
23. European Perfumes & Cosmetics Co. Ltd
24. Eveready Batteries East Africa Ltd
25. Galaxy Paints & Coating Co. Ltd
26. Grand Paints Ltd
27. Haco Tigerbrands East Africa Ltd
28. Henkel Kenya Ltd
29. Interconsumer Products Ltd
30. Johnson Diversey East Africa Ltd
31. Jumbo Mattress Industries Ltd
32. Kamili Packers Ltd
33. Kel Chemicals Limited
34. Kemia International Ltd
35. Ken Nat Ink & Chemicals Ltd
36. Kridha Limited
37. Leatherlife (EPZ) Ltd
38. L’Oreal East Africa Ltd
<table>
<thead>
<tr>
<th></th>
<th>Company Name</th>
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</thead>
<tbody>
<tr>
<td>39</td>
<td>Maroo Polymers Ltd</td>
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<tr>
<td>40</td>
<td>Match Masters Ltd</td>
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<tr>
<td>41</td>
<td>Metoxide Africa Ltd</td>
</tr>
<tr>
<td>42</td>
<td>Milly Glass Works Ltd</td>
</tr>
<tr>
<td>43</td>
<td>Murphy Chemicals Ltd</td>
</tr>
<tr>
<td>44</td>
<td>Odex Chemicals Ltd</td>
</tr>
<tr>
<td>45</td>
<td>Orbit Chemicals Industries Limited</td>
</tr>
<tr>
<td>46</td>
<td>Osho Chemicals Industries Ltd</td>
</tr>
<tr>
<td>47</td>
<td>Pan Africa Chemicals Ltd</td>
</tr>
<tr>
<td>48</td>
<td>Polychem East Africa</td>
</tr>
<tr>
<td>49</td>
<td>Procter &amp; Gamble East Africa Ltd</td>
</tr>
<tr>
<td>50</td>
<td>Pyrethrum Board of Kenya</td>
</tr>
<tr>
<td>51</td>
<td>PZ Cussons EA Ltd</td>
</tr>
<tr>
<td>52</td>
<td>Reckitt Benckiser (E.A.) Ltd</td>
</tr>
<tr>
<td>53</td>
<td>Revolution Stores Ltd</td>
</tr>
<tr>
<td>54</td>
<td>Rok Industries Ltd</td>
</tr>
<tr>
<td>55</td>
<td>Rumorth Group of Companies Ltd</td>
</tr>
<tr>
<td>56</td>
<td>Sadolin Paints (E.A.) Ltd</td>
</tr>
<tr>
<td>57</td>
<td>SC Johnson and Son Kenya</td>
</tr>
<tr>
<td>58</td>
<td>Seweco Paints Ltd</td>
</tr>
<tr>
<td>59</td>
<td>Shreeji Chemicals Limited</td>
</tr>
<tr>
<td>60</td>
<td>Soilex Prosolve Limited</td>
</tr>
<tr>
<td>61</td>
<td>Strategic Industries Limited</td>
</tr>
<tr>
<td>62</td>
<td>Supa Brite Ltd</td>
</tr>
<tr>
<td>63</td>
<td>Superfoam Ltd</td>
</tr>
<tr>
<td>64</td>
<td>Syngenta East Africa Ltd</td>
</tr>
<tr>
<td>65</td>
<td>Synresins Ltd</td>
</tr>
<tr>
<td>66</td>
<td>Tata Chemicals Magadi Ltd</td>
</tr>
<tr>
<td>67</td>
<td>Tri-Clover Industries (K) Ltd</td>
</tr>
<tr>
<td>68</td>
<td>Tropikal Brand (Afrika) Ltd</td>
</tr>
<tr>
<td>69</td>
<td>Twiga Chemical Industries Limited</td>
</tr>
</tbody>
</table>
70. Unilever East and Southern Africa
71. Vitafoam Products Limited
72. Waridi Creations Ltd

Energy, Electricals & Electronics Sector
1. Amedo Centre Kenya Ltd
2. Asano International Limited
3. Assa Abloy East Africa Limited
4. Aucma Digital Technology Africa Ltd
5. Avery East Africa Ltd
6. Baumann Engineering Limited
7. Biogas Power Holdings (EA) Ltd
8. Centurion Systems Limited
9. Daima Energy Services Ltd
10. Digitech East Africa Limited
11. East African Cables Ltd
12. Holman Brothers (E.A.) Ltd
13. IberaAfrica Power (EA) Ltd
15. Karan Biofuel Limited
16. Kenwest Cables Ltd
17. Kenya Petroleum Refineries Ltd
18. Kenya Power Ltd
19. Libya Oil Kenya Limited
20. Manufacturers & Suppliers (K) Ltd
21. Marshall Fowler (Engineers)
22. Metlex International Ltd
23. Metsec Ltd
24. Mustek East Africa Limited
25. Nationwide Electrical Industries Ltd
26. Optimum Lubricants Ltd
27. Ouru Power Limited
28. PCTL Automation Ltd
29. Pentagon Agencies
30. Power Technics Ltd
31. Protel Studios
32. Reliable Electricals Engineers (Nrb) Ltd
33. Roka Industries Ltd
34. Socabelec (EA) Ltd
35. Sollatek Electronics (Kenya) Limited
36. Specialised Power Systems Ltd
37. Synergy-Pro
38. Ubbik East Africa
39. Virtual City Ltd

Food, Beverages & Tobacco Sector
1. Africa Spirits Limited
2. Agricultural & Veterinary Supplies Ltd
3. Agriner Agricultural Development
4. Agro Chemical and Food Company Ltd
5. Alliance One Tobacco Kenya Ltd
6. Al-Mahra Industries Ltd
7. Alpha Fine Foods Ltd
8. Alpine Coolers Limited
9. Aquamist Limited
10. Arkay Industries Ltd
11. Bakers Corner Ltd
12. Bakex Millers Ltd
13. Belat Enterprises
14. Belfast Millers Ltd
15. Beverage Services (K) Ltd
16. Bidco Oil Refineries Ltd
17. Bio Food Products Ltd
18. Bounty Limited
19. The Breakfast Cereal Company (K) Ltd
20. British American Tobacco Kenya Limited
21. Broadway Bakery Ltd
22. Brookside Dairy Ltd
23. Bunda Cakes & Feeds Ltd
24. Butali Sugar Mills Ltd
25. Buzek Dairy Limited
26. C. Dormans Ltd
27. C. Czarnikow Sugar East Africa Ltd
28. Cadbury Kenya Limited
29. Caffe Del Duca Ltd
30. Candy Kenya Ltd
31. Capwell Industries Limited
32. Centrofood Industries Limited
33. Chai Trading Company Limited
34. Chemilil Sugar Company Ltd
35. Chirag Kenya Limited
36. Coast Silos (K) Ltd
37. Coastal Bottlers Limited
38. Coca-Cola East & Central Africa Ltd
39. Coffee Agriworks Ltd
40. CoffTea Agencies
41. Corn Products Kenya Ltd
42. Danone Baby Nutrition Africa and Overseas
43. Tropikal Brand (Africa) Ltd
44. Del Monte Kenya Ltd
45. Diamond Industries Ltd
46. East African Breweries Ltd
47. East Africa Sea Food Ltd
48. East Africa Seed Co. Ltd
49. Edible Oil Products
50. Eldoret Grains Ltd
51. Ennsvalley Bakery Ltd
52. Equator Bottlers Ltd
53. Erdemann Co. (K) Ltd
54. Europack Industries Limited
55. Excell Chemicals Ltd
56. Farmers Choice Ltd
57. Fresh Produce Exporters Association of Kenya
58. Frigoken Ltd
59. Giloil Company Limited
60. Githunguri Dairy Farmers Co-operative Society
61. Global Fresh Ltd
62. Global Tea & Commodities (K) Limited
63. Gold Crown Beverages (K) Ltd
64. Gold Crown Foods (EPZ) Ltd
65. Gonas Best Ltd
66. Green Forest Foods Ltd
67. Happy Cow Ltd
68. Heritage Foods Kenya Ltd
69. Highlands Canners Ltd
70. Highlands Mineral Water Company Ltd
71. Insta Products (EPZ) Ltd
72. Jambo Biscuits (K) Ltd
73. James Finlay Kenya Ltd
74. Jetlak Foods Ltd
75. Juja Coffee Exporters
76. Kabianga Dairy Ltd
77. Kakuzi
78. Kambu Distillers Limited
79. Kamili Packers Ltd
80. Kapa Oil Refineries Limited
81. Karirana Estate Ltd
82. Kenafric Industries Ltd
83. Kenblest Limited
84. Kenchic Limited
85. Kensalt Ltd
86. Kenshop Supermarket (TI) Hot Bread Section
87. Kenya Meat Commission
88. Kenya Nut Company Ltd
89. Kenya Seed Company Ltd
90. Kenya Sweets Ltd
91. Kenya Tea Development Agency
92. Kenya Tea Growers Association
93. Kenya Tea Packers Ltd (KETEPA)
94. Kenya Wine Agencies Limited
95. Keroche Industries Ltd
96. Kevian Kenya Ltd
97. Kibos Sugar and Allied Industries
98. Kinangop Dairy Limited
99. Kisii Bottlers Ltd
100. Kitui Flour Mills Ltd
101. Koba Waters Ltd
102. Krish Commodities Ltd
103. Kuguru Food Complex Ltd
104. Kwality Candles and Sweets Ltd
105. London Distillers (K) Ltd
106. Mafuko Industries Limited
107. Mama Millers Limited
108. Manji Food Industries Limited
109. Mastermind Tobacco (K) Ltd
110. Mayfeeds Kenya Limited
111. Melvin Marsh International
112. Menengai Oil Refineries Ltd
113. Milly Fruit Processors Ltd
114. Mini Bakeries (Nbi) Ltd
115. Miritini Kenya Ltd
116. Mjengo Limited
117. Mombasa Maize Millers
118. Mount Kenya Bottlers Ltd
119. Mumias Sugar Company Limited
120. Munyiri Special Honey Ltd
121. Mzuri Sweets Ltd
122. Nairobi Bottlers Ltd
123. Nairobi Flour Mills Ltd
124. NAS Airport Services Ltd
125. New Kenya Co-Operative Creameries Ltd
126. NesFoods Industries Ltd
127. Nestle Foods Kenya Ltd
128. Nicola Farms Ltd
129. Njoro Canning Factory (Kenya) Ltd
130. Norda Industries Ltd
131. Nutro Manufacturers EPZ Ltd
132. Palmhouse Diaries Ltd
133. Patco Industries Limited
134. Pearl Industries Ltd
135. Pearly Waters Limited
136. Pembe Flour Mills Ltd
137. Premier Flour Mills Ltd
138. Premier Food Industries Limited
139. Pride Industries Ltd
140. Pristine International Ltd
141. Proctor & Allan (E.A.) Ltd
142. Promasidor Kenya Ltd
143. Pwani Oil Products Ltd
144. Rafiki Millers Ltd
145. Razco Ltd
146. Re-Suns Spices Limited
147. Rift Valley Bottlers Ltd
148. Sameer Agriculture & Livestock (Kenya) Ltd
149. SBC Kenya Limited
150. Sigma Supplies Ltd
151. Spectre International Ltd
152. Spice World Ltd
153. Sunny Processors Ltd
154. Sweet Rus Limited
155. Trufoods Ltd
156. Trust Feeds Ltd
157. Trust Flour Mills Ltd
158. T.S.S. Grain Millers Limited
159. Umoja Flour Mills Ltd
160. Umoja Maintenance Centre (K) Limited
161. Unga Group Ltd
162. United Millers Ltd
163. Usafi Services Ltd
164. Valuepak Foods
165. Valley Confectionery Ltd
166. W.E. Tilley (Muthaiga) Ltd
167. Wanainchi Marine Products (K) Limited
168. Wanji Food Industries Limited
169. West Kenya Sugar Company Limited
170. Wrigley Company (E.A.) Ltd
171. Xpressions Flora Ltd
Leather & Footwear Sector

1. Alpharama Limited
2. Athi River Tanneries Ltd
3. Bata Shoe Company (Kenya) Ltd
4. Budget Shoes Limited
5. C & P Shoe Industries Ltd
6. Leather Industries of Kenya Limited
7. Maridadi Seasons Handcraft
8. Sandstorm Africa Limited
9. Zingo Investments Limited

Metal & Allied Sector

1. African Marine & General Engineering Co. Ltd
2. Alloy Steel Casting Ltd
3. Apex Steel Limited
4. ASL Limited- Steel Division
5. ASP Company Ltd
6. Athi River Steel Plant
7. Atlantic Ltd
8. Blue Nile Wire Products Ltd
9. Booth Extrusions Limited
10. Brollo Kenya Limited
11. City Engineering Works (K) Limited
12. Cook ‘N Lite Ltd
13. Corrugated Sheets Ltd
14. Crystal Industries Ltd
15. Davis & Shirtliff Ltd
16. Devki Steel Mills Ltd
17. Doshi Enterprises Ltd
18. East Africa Spectre Limited
19. East African Foundry Works (K) Ltd
20. Easy Clean Africa Limited
21. Eldoret Farm Machinery
22. Elite Tools
23. Farm Engineering Industries Limited
24. Friendship Container Manufacturer Ltd
25. Ganglong International Company Limited
26. General Aluminium Fabricators Ltd
27. Greif East Africa Ltd
28. Heavy Engineering Ltd
29. Hobra Manufacturing Ltd
30. Insteel Limited
31. Iron Art Limited
32. Kaluworks Ltd
33. Kens Metal Industries
34. Kenya General Industries Ltd
36. Khetshi Dharamshi & Co. Ltd
37. Kitchen King Ltd
38. Laminate Tube Industries Limited
39. Mabati Rolling Mills Limited
40. Marvel Lifestyle Ltd
41. Mecol Limited
42. Metal Crowns Ltd
43. Modulec Engineering Systems Ltd
44. Nail & Steel Products Ltd
45. Nampak Kenya Ltd
46. Napro Industries Limited
47. Narcol Aluminium Rolling Mills Ltd
48. Ndume Ltd
49. Northstar Packaging Ltd
50. Orbit Engineering Ltd
51. Rolmil Kenya Ltd
52. Safal Mitek Ltd
53. Sheffield Steel Systems Ltd
54. Siya Industries (K) Ltd
55. Soni Technical Services Ltd
56. Southern Engineering Co. Ltd
57. Specialised Engineering Co. (EA) Ltd
58. Standard Rolling Mills Ltd
59. Steel Structures Ltd
60. Steelmakers Ltd
61. Steelwool (Africa) Ltd
62. Tarmal Wire Products Ltd
63. Technoconstruct Kenya Ltd
64. Technosteel Industries Limited
65. Tononoka Rolling mills Ltd
66. Tononoka Steel Ltd
67. Vicensa Investments Ltd
68. Viking Industries Ltd
69. Warren Enterprises Ltd
70. Welding Alloys Limited
71. Wire Products Ltd

Motor Vehicle & Accessories Sector
1. Alamdar Trading Company Limited
2. Associated Battery Manufacturers (EA) Ltd
3. Assemblers Ltd
4. Auto Anciliaries Ltd
5. Auto Industries Ltd
6. Auto springs Manufacturers Ltd
7. Autofine Filters & Seals Ltd
8. Automotive & Industrial Battery Manufacturers
9. Banbros Ltd
10. Bhachu Industries Ltd

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11. BMG Holdings Ltd
12. Choda Fabricators Ltd
13. Chui Auto Spring Industries Ltd
14. CMC Motors Group Ltd
15. Foton East Africa Ltd
16. General Motor East Africa Limited
17. Handa (K) Ltd
18. Igo Holdings Ltd
19. Impala Glass Industries Ltd
20. Kenya Coach Industries Ltd
22. Kenya Vehicle Manufacturers Limited
23. King-Bird (K) Ltd
24. Labh Singh Harnam Singh Ltd
25. Mann Manufacturing Co. Ltd
26. Master Fabricators Ltd
27. Megh Cushion Industries Ltd
28. Motorbike Africa Ltd
29. Mutsimoto Company Limited
30. Pipe Manufacturers Ltd
31. Sohansons Limited
32. Songyi Motorcycles International Ltd
33. Theevan Enterprises Ltd
34. Turaco Limited
35. Toyota Kenya Ltd
36. Transtrailers Limited
37. Unifilters Kenya Ltd
38. Uni-Truck World Ltd
39. Varsani Brakelinings Ltd

**Paper & Board Sector**
1. Adpak International Limited
2. Allpack Industries Ltd
3. Andika Industries Ltd
4. Associated paper & Stationery Ltd
5. Autolitho Ltd
6. Bag and Envelope Converters
7. Bags & Balers Manufacturers (K) Ltd
8. Belsize Industries Ltd
9. Brand Printers Ltd
10. Carton Manufacturers Ltd
11. Cartubox Industries (E.A) Ltd
12. Cempack Solutions Ltd
13. Chandaria Industries Ltd
14. Colour Labels Ltd
15. Colour Packaging Limited
16. Colourprint Ltd
17. D.L Patel Press Ltd
18. Dodhia Packaging Limited
19. East Africa Packaging Industries Limited
20. East Africa Paper Converters Ltd
21. Elite Offset Ltd
22. Ellams Products
23. English Press Limited
24. Euro Packaging Ltd
25. Flora Printers Ltd
26. Fortunes Printers & Stationers Ltd
27. Franciscan Kolbe Press
28. General Printers Limited
29. Graphics & Allied Ltd
30. Guaca Stationers Ltd
31. Highland Paper Mills Ltd
32. Icons Printers Ltd
33. Interlabels Africa Ltd
34. International Paper & Board Supplies Ltd
35. Kartasi Industries Limited
36. Kenafric Diaries Manufacturers Limited
37. Kenya Litho Ltd
38. Kenya Stationers Ltd
39. Kim-Fay East Africa Ltd
40. Kul Graphics Ltd
41. L.A.B International Kenya Limited
42. Label Converters
43. Manipal International Printing Press Ltd
44. Modern Lithographic (K) Ltd
45. Mufindi Paper Ltd
46. Nation Media Group Limited- Printing Plant
47. National Printing Press Limited
48. Packaging Manufacturers (1976) Ltd
49. Paper House of Kenya Ltd
50. Paperbags Limited
51. Phoenix Matches Ltd
52. Pressmaster Ltd
53. Printing Services Ltd
54. Printpak
55. Printwell Industries Ltd
56. Punchlines Ltd
57. Ramco Printing works Ltd
58. Regal Press Kenya Ltd
59. Stallion Stationary manufacturers Ltd
60. Standard Group Ltd
61. Statpack Industries Ltd
62. Taws Limited
63. Tetra Pak Ltd
64. The Rodwell Press Ltd
65. Twiga Stationers & Printers Ltd
66. Uneeco Paper Products Ltd
67. United Bags Manufacturers Ltd
68. Vakharia International Paper Mills Ltd

**Pharmaceutical & Medical Equipment Sector**
1. African Cotton Industries Ltd
2. Alpha Medical Manufacturers Ltd
3. Benmed Pharmaceuticals Limited
4. Beta Healthcare International
5. Biodeal Laboratories Ltd
6. Biopharma Ltd
7. Cosmos Limited
8. Dawa Limited
9. Elys Chemical Industries Limited
10. Gesto Pharmaceuticals Ltd
11. GlaxoSmithKline Kenya Ltd
12. Global Merchants Ltd
13. KAM Industries
14. Laboratory & Allied Limited
15. Manhar Brothers (K) Ltd
16. Medivet Products Ltd
17. Novelty Manufacturing Ltd
18. Osschemie (K) Limited
19. Pharm Access Africa Ltd
20. Pharmaceutical Manufacturing Co. (K) Ltd
21. Regal Pharmaceuticals Ltd
22. Revital Healthcare (EPZ) Ltd
23. Skylight Chemicals Limited
24. Universal Corporation Limited
Plastics & Rubber Sector
1. ACME Containers Ltd
2. Afro plastics (K) Ltd
3. Betrad (K) Ltd
4. Bluesky Industries Ltd
5. Bobmil Industries Ltd
6. Cables & Plastics Ltd
7. Complast Industries Limited
8. Dune Packaging Limited
9. Dynaplas Limited
10. Elgitread (Kenya) Ltd
11. Elgon Kenya Ltd
12. Eslon Plastics of Kenya Ltd
13. Five Star Industries Ltd
14. General Plastics Limited
15. Hi-Plast Ltd
16. Jamlam Industries Ltd
18. Kenpoly Manufacturers Limited
19. Kentainers Ltd
20. Kenya Suitcase Manufacturers Limited
21. L.G. Harris & Co. Ltd
22. Lakhir Plastics Limited
23. Laneeb Plastic Industries Ltd
24. Malplast Industries Ltd
25. Metro Plastics Kenya Limited
26. Mombasa Polythene Bags Ltd
27. Nairobi Plastics Ltd
28. Ombi Rubber Roilers Ltd
29. Packaging industries Ltd
30. Packaging Masters Limited
31. Plastic Electricons
32. Plastics & Rubber Industries Ltd
33. Polly Propelin Bags Ltd
34. Polyblend Limited
35. Polyflex Industries Limited
36. Polythene Industries Ltd
37. Premier Industries Ltd
38. Princeware Africa (Kenya) Ltd
39. Prosel Ltd
40. Pyramid Packaging Ltd
41. Qplast Industries Ltd
42. Raffia Bags (K) Ltd
43. Rubber Products Ltd
44. Safepak Limited
45. Sameer Africa Ltd
46. Sanpac Africa Ltd
47. Shiv Enterprises (E) Ltd
48. Signode Packaging Systems Ltd
49. Silpack Industries Limited
50. Singh Retread Ltd
51. Solvochem East Africa Ltd
52. Springbox Kenya Ltd
53. Styloplast Limited
54. Sumaria Industries Ltd
55. Super Manufacturers Ltd
56. Techpak Industries Ltd
57. Thermopak Limited
58. Thermos Limited
59. Treadsetters Tyres Ltd
60. Umoja Rubber Products Limited
61. Uni-Plastics Limited
62. Vyatu Ltd
63. Wonderpac Industries Ltd
64. Zaferchand Punja Ltd

Textile & Apparels Sector
1. Allitex EPZ Ltd
2. Alpha Knits Ltd
3. Apex Apparels (EPZ) Ltd
4. Ashton Apparel EPZ Ltd
5. Bedi Investments Limited
6. Comfort The Children International
7. Dharamshi & Co Ltd
8. Esmailji Sheikh Essaji & Sons
9. Fantex (K) Ltd
10. Forces Equipment (Kenya) Ltd
11. Future Garment (EPZ) Ltd
12. Global Apparels Kenya EPZ Ltd
13. Hantex Garments EPZ Ltd
14. Insight Kenya
15. Kamyn Industries Limited
16. Kapric Apparels EPZ Ltd
17. Kavirondo Filments Ltd
18. Kema (EA) Ltd
19. Ken-Knit (Kenya) Ltd
20. Kenya Knit Garment (EPZ) Ltd
22. Kenya Tents Limited
23. Kenya Trading (EPZ) Ltd
24. Kikoy Co. Ltd
25. Kikoy Mall
26. Kikoy Mall EPZ Ltd
27. Le Stud Limited
28. Leena Apparels Ltd
29. Lifeworks Shukrani Limited
30. Mega Garments Industries Kenya (EPZ)
31. Mega Spin Ltd
32. Midco Textiles (EA) Ltd
33. Mombasa Apparels
34. Nakuru Industries Ltd
35. New Wide Garments (K) Ltd
36. Ngecha Industries Ltd
37. Oriental Mills Ltd
38. Penny Galore Ltd
39. Protex Kenya EPZ Ltd
40. Ricardo EPZ Int. Co. Ltd
41. Rivatex (East Africa) Ltd
42. Royal Garment Industries Ltd
43. Rupa Mills Ltd
44. Senior Best Garments Kenya EPZ Ltd
45. Shin-Ace Garments Kenya (EPZ) Ltd
46. Soko International
47. Spin Knit Limited
48. Spinners & Spinners Ltd
49. Squaredeal Uniforms Centre Ltd
50. Straightline Enterprises
51. Summit Fibres Limited
52. Sunflag Textiles & Knitwear Mills Ltd
53. Tarpo Industries Limited
54. Teita Estate Ltd
55. Thika Cloth Mills Ltd
56. TSS Spinning and Weaving Ltd
57. United Aryan (EPZ) Ltd
58. Vajas Manufacturers Ltd
59. Wildlife Work (EPZ) Ltd
60. World of Kikoys

**Timber, Wood & Furniture Sector**
1. Comply Industries Ltd
2. Economic Housing Group Ltd
3. Fine Wood Works Ltd
4. Furniture International Limited
5. Kenya Wood Limited
6. Neo Interior Decorators Ltd
7. Newline Ltd
8. Panesar’s Kenya Ltd
9. PG Bison Ltd
10. Rai Plywoods (Kenya) Ltd
11. Rosewood Furniture Manufacturers
12. Shah Timber Mart Ltd
13. Shamco Industries Ltd
14. Timber Treatment International Ltd
15. Timsales Ltd
16. Wood Makers (K) Ltd
17. Woodtex Kenya Ltd

**Total= 655**

Kenya Association of Manufacturers (2014)
Appendix III: Target Sample
Building, Mining and Construction Sector
1. African Diatomite- Gilgil
2. Bamburi Cement Limited- Nairobi
3. Central Glass Industries- Nairobi
4. Flamingo Tiles (Kenya) Limited- Nairobi
5. Homa Lime Company Ltd- Koru- Muhoroni
6. Karsan Murji & Company Limited- Nairobi
7. Kenya Builders & Concrete Ltd- Nairobi
8. Kurawa Industries Ltd- Mombasa
9. Manson Hart Kenya Ltd- Nairobi
10. Orbit Enterprises Ltd- Nairobi
11. Vallem Construction Ltd- Thika

Chemical & Allied Sector
1. Basco Products (K) Ltd- Nairobi
2. Beiersdorf East Africa Ltd- Nairobi
3. BOC Kenya Limited- Nairobi
4. Canon Chemicals Limited- Nairobi
5. Chemicals and Solvents (EA) Ltd- Nairobi
6. Continental Products Ltd- Nairobi
7. Crown Gases Ltd- Nairobi
8. Darfords Enterprises Ltd- Athi River
9. Deluxe Inks Ltd- Nairobi
10. Doric Industries Ltd- Nairobi
11. Elex Products Ltd- Nairobi
12. Eveready Batteries East Africa Ltd- Nairobi
13. Grand Paints Ltd- Nairobi
14. Henkel Kenya Ltd- Nairobi
15. Johnson Diversey East Africa Ltd- Nairobi
16. Kamili Packers Ltd- Nairobi
17. Kemia International Ltd- Nairobi
18. Kridha Limited - Nairobi
19. L’Oreal East Africa Ltd - Nairobi
20. Match Masters Ltd - Nairobi
21. Milly Glass Works Ltd - Mombasa
22. Odex Chemicals Ltd - Nairobi
23. Osho Chemicals Industries Ltd - Nairobi
24. Polychem East Africa - Nairobi
25. Pyrethrum Board of Kenya - Nakuru
26. Reckitt Benckiser (E.A.) Ltd - Nairobi
27. Rok Industries Ltd - Nairobi
28. Sadolin Paints (E.A.) Ltd - Nairobi
29. Seweco Paints Ltd - Nairobi

**Energy, Electricals & Electronics Sector**
1. Asano International Limited - Nairobi
2. Aucma Digital Technology Africa Ltd - Nairobi
3. Baumann Engineering Limited - Nairobi
4. Centurion Systems Limited - Nairobi
5. Digitech East Africa Limited - Nairobi
6. Holman Brothers (E.A.) Ltd - Nairobi
7. International Energy Technik Ltd - Nairobi
8. Kenwest Cables Ltd - Nairobi
9. Kenya Power Ltd - Nairobi
10. Manufacturers & Suppliers (K) Ltd - Nairobi
11. Metlex International Ltd - Nairobi
12. Mustek East Africa Limited - Nairobi
13. Optimum Lubricants Ltd - Nairobi
14. PCTL Automation Ltd - Nairobi
15. Power Technics Ltd - Nairobi

**Food, Beverages & Tobacco Sector**
1. Agricultural & Veterinary Supplies Ltd - Eldoret
2. Agro Chemical and Food Company Ltd- Muhoroni
3. Al-Mahra Industries Ltd- Nairobi
4. Alpine Coolers Limited- Nairobi
5. Arkay Industries Ltd- Eldoret
6. Bakex Millers Ltd- Thika
7. Belfast Millers Ltd- Nairobi
8. Bidco Oil Refineries Ltd- Thika
9. Bounty Limited- Nairobi
11. Brookside Dairy Ltd- Ruiru
12. Butali Sugar Mills Ltd- Kakamega
13. C. Dormans Ltd- Nairobi
14. Cadbury Kenya Limited- Nairobi
15. Candy Kenya Ltd- Nairobi
16. Centrofood Industries Limited- Thika
17. Chemilil Sugar Company Ltd- Kisumu
18. Coast Silos (K) Ltd- Mombasa
19. Coca-Cola East & Central Africa Ltd- Nairobi
20. CoffTea Agencies- Mombasa
21. Danone Baby Nutrition Africa and Overseas- Nairobi
22. Del Monte Kenya Ltd- Thika
23. East African Breweries Ltd- Nairobi
24. East Africa Seed Co. Ltd- Nairobi
25. Eldoret Grains Ltd-Eldoret
26. Equator Bottlers Ltd- Kisumu
27. Europack Industries Limited- Nairobi
28. Farmers Choice Ltd- Nairobi
29. Frigoken Ltd- Nairobi
30. Githunguri Dairy Farmers Co-operative Society- Githunguri- Kiambu
31. Global Tea & Commodities (K) Limited- Mombasa
32. Gold Crown Foods (EPZ) Ltd- Mombasa
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<td>63.</td>
<td>NesFoods Industries Ltd</td>
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64. Nicola Farms Ltd- Maragua  
65. Norda Industries Ltd- Nairobi  
66. Palmhouse Diaries Ltd- Nairobi  

**Leather & Footwear Sector**  
1. Alpharama Limited- Athi River  
2. Athi River Tanneries Ltd- Athi River  
3. Bata Shoe Company (Kenya) Ltd- Limuru  
4. Budget Shoes Limited- Nairobi  
5. C & P Shoe Industries Ltd- Nairobi  
7. Maridadi Seasons Handcraft- Malindi  

**Metal & Allied Sector**  
1. Alloy Steel Casting Ltd- Ruaraka  
2. ASL Limited- Steel Division- Nairobi  
3. Athi River Steel Plant- Nairobi  
4. Blue Nile Wire Products Ltd- Kikuyu  
5. Brollo Kenya Limited- Mombasa  
6. Cook 'N Lite Ltd- Mombasa  
7. Crystal Industries Ltd- Nairobi  
8. Devki Steel Mills Ltd- Nairobi  
9. East Africa Spectre Limited- Nairobi  
10. Easy Clean Africa Limited- Nairobi  
11. Elite Tools- Nairobi  
12. Friendship Container Manufacturer Ltd- Nairobi  
13. General Aluminium Fabricators Ltd- Nairobi  
14. Heavy Engineering Ltd- Nairobi  
15. Insteel Limited- Nairobi  
16. Kaluworks Ltd- Nairobi  
17. Kenya General Industries Ltd- Mombasa  
18. Khetshi Dharamshi & Co. Ltd- Nairobi
19. Laminate Tube Industries Limited- Eldoret
20. Marvel Lifestyle Ltd- Nairobi
21. Metal Crowns Ltd- Nairobi
22. Nail & Steel Products Ltd- Nairobi
23. Napro Industries Limited- Nairobi
24. Ndume Ltd- Gilgil
25. Orbit Engineering Ltd- Nairobi
26. Safal Mitek Ltd- Nairobi
27. Siya Industries (K) Ltd- Nairobi
28. Southern Engineering Co. Ltd- Mombasa
29. Standard Rolling Mills Ltd- Mombasa

**Motor Vehicle & Accessories Sector**
1. Associated Battery Manufacturers (EA) Ltd- Nairobi
2. Auto Ancillaries Ltd- Nairobi
3. Auto springs Manufacturers Ltd- Nairobi
4. Automotive & Industrial Battery Manufacturers- Nairobi
5. Bhachu Industries Ltd- Nairobi
6. Choda Fabricators Ltd- Nairobi
7. CMC Motors Group Ltd- Nairobi
8. General Motors East Africa Limited- Nairobi
9. Igo Holdings Ltd- Eldoret
10. Kenya Coach Industries Ltd- Nairobi
11. Kenya Vehicle Manufacturers Limited- Thika
12. Labh Singh Harnam Singh Ltd- Nairobi
13. Master Fabricators Ltd- Nairobi
14. Motorbike Africa Ltd- Thika
15. Pipe Manufacturers Ltd- Nairobi

**Paper & Board Sector**
1. Adpak International Limited- Nairobi
2. Andika Industries Ltd- Kisumu
3. Autolitho Ltd- Nairobi
4. Bags & Balers Manufacturers (K) Ltd- Nairobi
5. Brand Printers Ltd- Nairobi
6. Cartubox Industries (E.A) Ltd- Nakuru
7. Chandaria Industries Ltd- Nairobi
8. Colour Packaging Limited- Nairobi
9. D.L Patel Press Ltd- Nairobi
10. East Africa Packaging Industries Limited- Nairobi
11. Elite Offset Ltd- Nairobi
13. Flora Printers Ltd- Mombasa
14. Franciscan Kolbe Press- Nairobi
15. Graphics & Allied Ltd- Nairobi
17. Interlabels Africa Ltd- Nairobi
18. Kartasi Industries Limited- Nairobi
19. Kenya Litho Ltd- Nairobi
20. Kim-Fay East Africa Ltd- Nairobi
22. Manipal International Printing Press Ltd- Nairobi
23. Mufindi Paper Ltd- Nairobi
25. Paper House of Kenya Ltd- Nairobi
26. Phoenix Matches Ltd- Kisumu

Pharmaceutical & Medical Equipment Sector
1. Alpha Medical Manufacturers Ltd- Nairobi
2. Beta Healthcare International- Nairobi
3. Biopharma Ltd- Nairobi
4. Dawa Limited- Nairobi
5. Gesto Pharmaceuticals Ltd- Nairobi
6. Global Merchants Ltd- Nairobi
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**Plastics & Rubber Sector**

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<td>L.G. Harris &amp; Co. Ltd</td>
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<td>Rubber Products Ltd</td>
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<td>Sameer Africa Ltd</td>
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<td>24.</td>
<td>Shiv Enterprises (E) Ltd</td>
<td>Eldoret</td>
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</table>
Textile & Apparels Sector
1. Alpha Knits Ltd- Nairobi
2. Ashton Apparel EPZ Ltd- Mombasa
3. Comfort The Children International- Nakuru
4. Esmailji Sheikh Essaji & Sons- Mombasa
5. Forces Equipment (Kenya)Ltd- Nairobi
6. Global Apparels Kenya EPZ Ltd- Athi River
7. Insight Kenya- Nairobi
8. Kapric Apparels EPZ Ltd- Mombasa
9. Kema (EA) Ltd- Nairobi
10. Kenya Knit Garment (EPZ) Ltd- Mombasa
11. Kenya Tents Limited- Nairobi
12. Kikoy Co. Ltd- Nairobi
13. Kikoy Mall EPZ Ltd- Athi River
14. Leena Apparels Ltd- Mombasa
15. Mega Garments Industries Kenya (EPZ)- Mombasa
16. Midco Textiles (EA) Ltd- Nairobi
17. Nakuru Industries Ltd- Nakuru
18. Ngecha Industries Ltd- Nairobi
19. Penny Galore Ltd- Nairobi
20. Ricardo EPZ Int. Co. Ltd- Athi River
21. Royal Garment Industries Ltd- Athi River
22. Senior Best Garments Kenya EPZ Ltd- Mombasa
23. Soko International- Mombasa

Timber, Wood & Furniture Sector
1. Comply Industries Ltd- Nakuru
2. Fine Wood Works Ltd- Nairobi
3. Kenya Wood Limited- Nairobi
4. Newline Ltd- Nairobi
5. PG Bison Ltd- Nairobi
6. Rosewood Furniture Manufacturers- Nairobi
7. Shamco Industries Ltd- Nairobi
8. Timsales Ltd- Nairobi
9. Woodtex Kenya Ltd- Nairobi

Total= 266
Appendix IV: Authorization of the Study

Henry Kimwomi Kombo
University of Nairobi
School of Business
P.O. Box 30197
NAIROBI
Tel 0724811372
henrykombo@gmail.com;

4th June 2014

To Whom It May Concern

Dear Sir/Madam,

RE: REQUEST FOR RESEARCH DATA FROM YOUR COMPANY
I am a student pursuing Doctor of Philosophy (PhD) degree programme in Business Administration at the University of Nairobi, School of Business. To fulfil the requirements of the degree, I am undertaking a research study. Your organization was selected to participate in the study, titled “Organizational Characteristics, Innovation, Knowledge Strategy and Performance of Manufacturing Firms in Kenya.”

The questionnaire forms an integral part of the study. I am therefore, kindly requesting you to assist in facilitating the completion of the questionnaire. The data required is needed for academic purposes only and will be treated with strict confidentiality.

Your participation is highly appreciated and should you require any clarification, please do not hesitate to contact me.

Yours sincerely,
Henry Kimwomi Kombo
24th April, 2014

TO WHOM IT MAY CONCERN

RE: HENRY KIMWONI KOMBO: D80/8354/2003

This is to certify that, HENRY KIMWONI KOMBO: D80/8354/2003 is a Ph.D candidate in the School of Business, University of Nairobi. The title of his study is: "Organizational Characteristics, Innovation, Knowledge Strategy and Performance of Manufacturing Firms in Kenya".

The purpose of this letter therefore, is to kindly request you to assist and facilitate in carrying out the research/study in your organization. A questionnaire is herewith attached for your kind consideration and necessary action.

Data and information obtained through this exercise will be used for academic purposes only. Hence, the respondents are requested not to indicate their names anywhere on the questionnaire.

We look forward to your cooperation.

Thank you,

PROF. MARTIN OGUTU
FOR: ASSOCIATE DEAN
GRADUATE BUSINESS STUDIES
SCHOOL OF BUSINESS
THIS IS TO CERTIFY THAT:

HENRY KIMWOKOM, KOMBO

OF UNIVERSITY OF NAIROBI, 0-2010

NAKURU, has been permitted to conduct research in all counties county

on the topic: ORGANIZATIONAL CHARACTERISTICS, INNOVATION, KNOWLEDGE STRATEGY AND PERFORMANCE OF MANUFACTURING FIRMS IN KENYA.

for the period ending: 31st December, 2014

Applicant's Signature

[Signature]

The National Commission for Science, Technology and Innovation

CONDITIONS

1. You must report to the County Commissioner and the County Executive Officer of the area before embarking on your research. Failure to do that may lead to the cancellation of your permit.

2. Government Officers will not be interviewed without prior appointment.

3. No questionnaire will be used unless it has been approved.

4. Excavation, mining and collection of biological specimens are subject to further permission from the relevant Government Ministries.

5. You are required to submit at least two (2) hard copies and one (1) soft copy of your final report.

6. The Government of Kenya reserves the right to modify the conditions of this permit including its cancellation without notice.

RESEARCH CLEARANCE PERMIT

Republic of Kenya

National Commission for Science, Technology and Innovation

Serial No.: 1738

CONTRACTS: see back page
Appendix V: Supplementary Statistical Analysis Results

Table A1: Total Variance Explained for Knowledge Strategy

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<th>Initial Eigenvalues</th>
<th>Extraction Sums of Squared Loadings</th>
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Extraction Method: Principal Component Analysis.
Figure A1: Scree Plot for Knowledge Strategy
Table A2: Total Variance Explained for Organizational Structure

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Extraction Method: Principal Component Analysis.
Figure A2: Scree Plot for Organizational Structure
Table A3: Total Variance Explained for Organizational Culture

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Extraction Method: Principal Component Analysis.
Figure A3: Scree Plot for Organizational Culture
Table A4: Total Variance Explained for Strategic Leadership

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Extraction Method: Principal Component Analysis.
Figure A4: Scree Plot for Strategic Leadership
### Table A5: Total Variance Explained for Organizational Innovation

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Extraction Method: Principal Component Analysis.
Figure A5: Scree Plot for Organizational Innovation
Table A6: Total Variance Explained for Organizational Performance

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Extraction Method: Principal Component Analysis.

Figure A6: Scree Plot for Organizational Performance