EFFECT OF KNOWLEDGE MANAGEMENT ON PERFORMANCE OF RESEARCH INSTITUTIONS: CASE STUDY OF KEMRI KISUMU COUNTY, KENYA

BY

CHUMA ESTHER NYABOKE

A RESEARCH PROJECT SUBMITTED IN PARTIAL FULFILMENT OF THE REQUIREMENTS FOR THE DEGREE OF MASTERS IN BUSINESS ADMINISTRATION.

DEPARTMENT OF BUSINESS AND ECONOMICS

MASENO UNIVERSITY

DECLARATION

I declare that, this project is my own original work and has not been presented for any award by any institution.

Signed: _____ Date: _____

CHUMA ESTHER NYABOKE

MBA/BE/00007/2016

Supervisor

This project has been submitted for examination with my approval as the University Supervisor.

Signed: _____ Date: _____

DR. BEATRICE ABONG'O

DEPARTMENT OF BUSINESS ADMINISTRATION

SCHOOL OF BUSINESS AND ECONOMICS

MASENO UNIVERSITY

ACKNOWLEDGEMENT

I am grateful to the Almighty God for enabling me to reach this far. I am grateful to my project supervisor Dr. Beatrice Abong'o for the professional guidance, positive criticism and support throughout this work.

I sincerely thank my family for their never ending moral support, my classmates for their positive criticism and contributions.

DEDICATION

Special dedication to my family who gave me the moral support I needed during my studies.

ABSTRACT

Research institutions are here for social good. Parastatal research institutions engage in activities relating to social and economic rights and are formed not to be suppliers of the goods and services but to advance knowledge and provide Science and technological support. However recent trends in the research sector from 2015 to date show increased beneficiaries on one hand but high employee turnover and de-motivation on another. This suggests a shortfall in application of knowledge management strategies. The need for performance cuts across the public and private sector yet previous studies have focused on the profit making entities but there is no known study relating to knowledge acquisition, conversion, protection and application in research institutions. The purpose of this study was to establish the effect of knowledge management on performance of research institutions focusing a case study of KEMRI Kisumu County. The specific objectives were to assess the effect of knowledge acquisition, knowledge conversion, knowledge protection and knowledge application on performance of KEMRI Kisumu County. This study was anchored on resource-based view theory and cognitive learning theory and adopted a case study design. The target population of this study was 201 management staff working in the KEMRI. The study employed a purposive sampling technique where 164 Management staff was sampled for the study from the population. The study achieved a 96.3% which was sufficient. Primary data were collected from the respondents' management staff working in the KEMRI using personally administered questionnaires. The instruments were tested for validity using the expert judgement of the supervisor and reliability using pre-test technique. A pilot study was conducted involving 16 respondents who did not participate in the final study representing 10% of the sample size. The pilot revealed Cronbach Alpha variables for Knowledge acquisition, conversion, protection and application as 0.888, 0.873, 0.743 and 0.831 subsequently. The Alpha Values were greater than 0.7 which was reliable. The data were cleaned which entailed checking for errors in entry, descriptive statistics such as frequencies, percentages, mean score and standard deviation was estimated for all the quantitative variables. Multiple regression analysis was used to establish the relations between the independent and dependent variables. From the regression analysis, knowledge acquisition, knowledge conversion, knowledge protection and knowledge application correlates positively to performance given by $\boldsymbol{\beta}$=0.921, p=.013, $\boldsymbol{\beta}$=0.664, p=.004, $\boldsymbol{\beta}$=0.718, p=.025, $\boldsymbol{\beta}$=0.629, p=.000 respectively. It is concluded that increase in knowledge acquisition, knowledge conversion, knowledge protection and knowledge application lead to improved performance at KEMRI. In line with the findings, the study recommends that the firm vigorously adopts knowledge acquisition, conversion, protection and application as it will directly lead to improved performance of in areas such as teamwork, operating systems and processes, staff knowledge and expertise, learning and development and the results of the learning process, beneficiary satisfaction rates and stakeholder engagements, number of the beneficiaries of the firm's ventures, customer service quality, employee motivation and customer satisfaction. Additionally, to optimize the gains of this strategy, the paper recommends that the firm reduces bureaucracies in access to knowledge, top management should ensure knowledge creation is a top priority, and that knowledge sharing culture begin early in the employees' career and knowledge workers should be held accountable for their knowledge exchange efforts

TABLE OF CONTENT

LIST OF ABBREVIATIONS AND ACRONYMS

KEMRI: Kenya Medical Research Institute

CGHR: Centre for Global Health Research

KM: Knowledge Management

RBV: Resource Based view theory

IM: Information Management

ICM: Intellectual Capital Management

NDA: Non-Disclosure Agreements

DF: Data Filtering

DLP: Connection, Data Leakage Prevention

ERM: Enterprise Rights Management

IC: Intellectual Capital

KIBS: Knowledge-Intensive Business Services

KPMG: Klynveld Peat Marwick Goerdeler

NPOs: Non-Profit Organization

RFID: Radio-Frequency Identification

SWOT: Strengths, Weaknesses, Opportunities and Threats

TS: Terminal Server

WCM: Work Centred Model

AMREF: African Medical and Research Foundation

BPR: Business Process Re-Engineering

CoP: Communities of practices

OE: Organizational Effectiveness

SMEs: Small and Medium Enterprises

IP: Intellectual Property

TQM: Total Quality Management

LIST OF TABLES

LIST OF FIGURES

LIST OF APPENDICES

CHAPTER ONE

INTRODUCTION

This chapter contains the background of the study on effect of knowledge Management on performance of research institutions. It contains the statement of the problem, research objectives and hypothesis, rationale of the study, scope and the conceptual framework to be adopted.

1.1 Background of the Study

Globalization, rapid technological developments and dynamic business environment have contributed to uncertainty and unpredictability in all sectors which have emphasized the importance of the ability of an organization to adapt to unexpected changes. Therefore, dynamism is important for organizations to tailor their operations and their capability to cope with changes in the operating environment in order to enhance their effectiveness in business. Organizations with adaptability as one of their main characteristics can survive and prosper in today's environment. Beneficial impacts of dynamism are increasingly acknowledged and support that is more empirical emerges on the link between dynamic capabilities and firm effectiveness (Sharifi & Zhang, 2009).

To cope with changes in business environment, research institutions are embracing the concept of knowledge management (KM) as a process of gathering, managing and sharing employees' knowledge capital throughout the organization to ensure organizational effectiveness. According to Kelleher and Levene (2009), knowledge sharing throughout the organization enhances existing organizational business processes, introduces more efficient and effective business processes and removes redundant processes. It is a discipline that promotes a collaborative and integrated approach to the

creation, capture, organization access and use of an enterprise's knowledge assets. KM has therefore become a mainstream priority for companies of all sizes and a complement to the organization's business activities. With new economy increasingly becoming a more knowledge-based economy, knowledge is becoming the most important asset for organizational success among other assets such as capital, materials, machineries, and properties (Kelleher &Levene, 2009).

Many research institutions have benefited immensely from adoption of KM techniques. Gray (2011) indicated that through successful knowledge capturing, sharing, and creation, firms can improve organisational effectiveness therefore enhancing the performance and creating more possibilities to gain performances . In knowledge management , an organization's competitive advantages depend on the organization ability to learn faster than its competitors to ensure effectiveness in its operation do. Sunassee and Sewry (2011) noted that there is indisputable need for knowledge management practices in the workplace to enable managers to promote knowledge sharing, acquisition and retention of intellectual capital. Organizations irrespective of size have realized that for them to grow, stay competitive and survive; they have to constantly change their strategies to meet new business demands (Sandhawalia & Dalcher, 2011). The benefits that an organization can reap from knowledge management depends on the ability of the organization to collect and use knowledge, skills and behaviours which have the potential to enhance learning of its members and improve the organizational effectiveness and future performance (Rezgui, Hopfe & Vorakulpipat, 2010).

Research institutions are agreeing that to grow, stay competitive and survive, they have to constantly change their strategies to meet new business demands and this explains the

growth of interest in knowledge management over the last decade. Those organizations that work as if their environment is still stable (old world of business), not only are they losing the organizational effectiveness; but also, they are facing huge financial losses. It is argued that companies are having difficulties in tackling KM. However, those that are advanced in implementing knowledge management are reaping benefits (Hannan & Freeman, 2012).

1.1.1 Concept of Knowledge Management

Knowledge is facts, skills and understanding that one has gained, especially through learning or experience, which enhance one's ability of evaluating context, making decisions and taking actions (Earl, 2011). Knowledge is a justified personal belief. Davenport and Prusak (2010) highlighted that knowledge has been recognized as one of the most important resources of the 21st Century and has received considerable attention in the management literature. The rise of the knowledge economy has helped organizations to recognize that knowledge assets are rapidly becoming their most precious competitive advantage and that learning to manage those assets better has become a competitive necessity. Knowledge is a fluid mixes of framed experience, values, contextual information, and expert insight provides a framework for evaluating and incorporating new experiences and information.

Polanyi (2009) indicated that knowledge comprises both the hardware and software side. The hardware side or the articulate form of knowledge is that which is represented explicitly in physical or material objects, such as a patent. It is the know-how of information. Tacit knowledge, the software side of information, is intuitive, non-verbalized, and not yet articulated information. The creation of knowledge occurs when

tacit knowledge is articulated through the codification of experience and information into articulate form. More than half of the knowledge in organizations is tacit and that an even greater portion of the valuable knowledge is tacit. Bearing this in mind, it is apparent that knowledge operations processes that can enable the conversion and transfer of knowledge in firms are crucial. Furthermore, the risks associated with the transfer and sharing of knowledge should be the concern of all managers since making knowledge easy to transfer is a double-edged sword, because the characteristics that facilitate knowledge transfer inside the firm, articulability, observability, system independence - are also likely to make it relatively easy for competitors to imitate (Teigland, 2010).

According to Bontis and Nikitopoulos (2011), knowledge management is the process of applying a systematic approach to the capture, structure, management, and dissemination of knowledge throughout an organization in order to work faster, reuse best practices, and reduce costly rework from project to project. Smith and Lyles (2013) highlighted that knowledge management also focuses on intellectual capital management (ICM) which is those pieces of knowledge that are of business value to the organization— referred to as intellectual capital or assets. Although some of these are more visible (patents, intellectual property), the majority consists of know-how, know-why, experience, and expertise that tend to reside within the head of one or a few employees. The best way to retain valuable knowledge is to identify intellectual assets and then to ensure that legacy materials are produced and subsequently stored in such a way as to make their future retrieval and reuse as easy as possible.

Knowledge management is the planning, organizing, motivating, and controlling of people, processes and systems in the organization to ensure that its knowledge-related

assets are improved and effectively employed (Easterby-Smith & Lyles, 2013). Knowledge-related assets include knowledge in the form of printed documents such as patents and manuals, knowledge stored in electronic repositories such as a best-practices database, employees' knowledge about the best way to do their jobs, knowledge that is held by teams who have been working on focused problems and knowledge that is embedded in the organization's products, processes and relationships.

King and Lekse (2013) stated that knowledge management is the deliberate and systematic coordination of an organization's people, technology, processes, and organizational structure in order to add value through reuse and innovation. This coordination is achieved through creating, sharing, and applying knowledge as well as through feeding the valuable lessons learned and best practices into corporate memory in order to foster continued organizational learning. The basic aim of knowledge management is to leverage knowledge to the organization's advantage.

1.1.2 Concept of Organizational performance

Kent and Weese (2012) indicated that performance of the organizations is measured by the congruence between the goals of the organization and the observed outcome. Measurement is important in deciding the degree of this congruence between the goals and the outcomes. The performance is measured as how well it works and achieves to its intended results. The participants who are in relationship with the organization such as employees, customers or shareholders play the main role for the organizational performance. Therefore, the organizational performance as related with the 'supplying the customer and employee satisfaction', 'increase of the productivity', and 'profit for the organization'.

Kohli and Jaworski (2010) point out three groups of activities to ensure value creation for the customers to ensure organization performance. An analysis of these activities show both the element of knowledge management and dynamic capabilities by the organization. They noted that these activities include, generation of market intelligence relating to present and future customer's needs, dissemination of intelligence across departments within the organization (knowledge management) and the organizational responsiveness to variation in business environment (dynamic capabilities). The points of inquiry in this study will therefore be: what knowledge management strategies are employed in the organization? What is their relationship with organization performance?

According to Huber (2008), organizational performance is also defined by employees' level of satisfaction. No matter how automated an organization, high productivity for an organization depends on how organization disseminates information to employees through staff training to equip employees with knowledge of how to perform their tasks with ease. Training is an indispensable strategy of knowledge management for organization to achieve its goals (effectiveness). Huber (2008) therefore notes that, organizations should endeavour to supply the employees' informational expectations in order to approach the employee satisfaction to ensure effectiveness in an organization. Hartman (2013) noted that enhanced employees' satisfaction increases the profitability of the organization and thus performance.

According to Rastogi (2009) research institutions effectiveness captures organizational performance plus the myriad internal performance outcomes normally associated with more efficient or effective operations and other external measures that relate to considerations that are broader than those simply associated with economic valuation

(either by shareholders, managers, or customers), such as corporate social responsibility. It's important to note that highly effective organizations exhibit strengths across five areas: leadership, decision-making and structure, people, work processes and systems, and culture.

1.1.3 Relationship between Knowledge Management and Organizational Performance

Knowledge management process involves planning, organizing, motivating, and controlling of people, processes and systems in the organization to ensure that its knowledge-related assets are improved and effectively employed (Easterby-Smith & Lyles, 2013). It is therefore a process through which organizations generate value from their intellectual and knowledge-based assets. It uses an integrated approach in identifying, capturing, retrieving, sharing/protecting, and evaluating an organization's information assets. Knowledge-related assets include knowledge in the form of printed documents such as patents and manuals, knowledge stored in electronic repositories such as a best-practices database, employees' knowledge about the best way to do their jobs, knowledge that is held by teams who have been working on focused problems and knowledge that is embedded in the organization's products, processes and relationships (Earl, 2011).

Knowledge management treats knowledge as an extremely important asset that deserves to be carefully looked after. Anything related to knowledge assets, their acquisition, creation, refinement, storage, transfer, sharing, and utilization, are KM activities (Earl, 2011). Oliver and Kandadi (2012) noted that knowledge management process aims at systematic finding, selecting, organizing, distilling and presenting information to improve

an employee's comprehension in a specific area of interest. KM helps an organization to gain insight and understanding from its own experience. Specific knowledge management activities help focus on organization on acquiring, storing and utilizing knowledge for problem solving, dynamic leaning, strategic planning and decision making. It also prevents intellectual assets from decay, adds to firm intelligence and provides increased flexibility.

The KM function in the research institutions operates these processes, develops methodologies and systems to support them, and motivates people to participate in them. The goals of KM are the leveraging and improvement of the organization's knowledge assets to effectuate better knowledge practices, improved organizational behaviours, better decisions and improved organizational performance. Although individuals certainly can personally perform each of the KM processes, KM is largely an organizational activity that focuses on what managers can do to enable KM's goals to be achieved, how they can motivate individuals to participate in achieving them and how they can create social processes that will facilitate KM success (Oliver & Kandadi, 2012).

1.1.4 Kenya Medical Research Institute

Kenya Medical Research Institute (KEMRI) is a State Corporation established through the Science and Technology (Amendment) Act of 1979 as the national body responsible for carrying out health research in Kenya, a function it has performed by developing scientists and mounting research infrastructure. To perform its functions, it has to collaborate with other organizations and learning institutions to advance research and training. Research companies depend heavily on storage, and transfer of knowledge to

generate and advance knowledge. This study will study the effects of this on research companies.

In order to achieve its mandate, KEMRI has developed a framework which has enabled it to decentralize its research functions and services to seven regional centers. The seven Centre's serve the 47 counties in line with the strategic pillar of health research which is one of the goals of devolution. KEMRI has also empowered and developed a considerable number of scientists, administrative and technical staffs that have enabled the organization achieve recognition as a centre of eminence in health research. KEMRI is guided by the values of social action which is achieved through numerous corporate social responsibilities that include public health education, community involvement and community diagnostic services (www.kemri.org).

Research institutions are under tremendous pressure for increased accountability from external and internal sources. External pressures raised by stakeholders like employers and government agencies for measurable improvements in performance. Can knowledge management lead to improvements in sharing knowledge, both explicit and tacit, and subsequently benefit the organization as a whole. According to Delphi Group (in Goodman and Schieman, 2010), employees spend 7 to 20 percent of their time on the job replicating existing solutions for others. This means that companies need not spend money on acquiring knowledge in their possession and reinventing the wheel, but in its transfer instead. A study by Ernst & Young reported that 44 percent of employees are poor or very poor at transferring knowledge (Goodman and Schieman, 2010). Stan Lomax (2003) in his article best practices for managers and expatriates reported that Multinational companies invest up to two million U.S dollars per expatriate and lose up to

40 percent of its expatriates after just two years of their return from their assignment. Additionally, the collective amnesia of the remaining experts result in a loss of at least 50 percent of the information they accumulated during their assignments.

Gold, Malhotra and Segars (2001) provided a knowledge management model that entails acquisition, conversion, application, and protection knowledge. Nonaka et al. (2006) define knowledge creation as a constant process of learning and acquiring new contexts and views. Knowledge conversion according to Tseng (2010) is a social process where individuals with different knowledge interact and thereby create new knowledge which grows the quality and quantity of both tacit and explicit knowledge. It takes the form of synthesis, refinement, integration, combination, coordination, distribution, and restructuring of knowledge (Sandhawalia and Dalcher, 2011). Knowledge application involves implementing both tacit and explicit with the purpose of achieving organization goals in the most economically advantageous manner (Monavvarian and khamda, 2010). The knowledge protection process refers to the ability to guard organizational knowledge from illegal or inappropriate use (Gold et al., 2001). The theory of core competency (Prahalad & Hamel, 1990) states that firms must capitalize on their strengths relative to other organizations. A core competency can take various forms, including technical/subject matter know-how (Kawshala, 2007). Whereas there is a concurrence that knowledge management would be of immense benefits to organizations if adopted, Goodman and Schieman (2010) and Lomax (2003) paint a different picture. Solutions to organizations challenges remain localized but empirical review by the authors point to an absurd scenario where they never get adapted for replication, or key elements are forgotten. Anderson (2009) also notes that knowledge management has become one of the most important trends in business, yet many knowledge management initiatives fail.

Against this backdrop, the researcher will examine the significance of KM on organization performance in anticipation that the paper will give insights on its roles thus improve the status of KM in the organization. This study postulates that if knowledge is captured via a knowledge management process, then a firm will benefit positively and as such a study is hereby undertaken to examine the effects of knowledge management on performance of research companies.

1.2 Statement of the Problem

Lack of information access to those with the proper credentials in organizations and organizational culture that does not embrace learning, sharing and changes has greatly affected institutions performance. Knowledge management in the Kenyan research institutions has not accomplished the same scale of applications and empirical research as in other fields. This is even compounded by knowledge hoarding among the employees seeing it as a source of power. KEMRI has constantly changing structures that has directed employees learning how to be smart, quick, agile and responsive to be able to accomplish the goals of the institution. This has resulted in poor succession planning. In such circumstances, an understanding of the potentially strategic dimension to knowledge management could help KEMRI to break the vicious circle of resource constraints and market vulnerability by enabling them to compete on more sustainable terms. Previously, studies have been done on the effect of knowledge management on organizational performance. Locally, studies have been conducted on effect of knowledge management on performance of institution. However, from the literature reviewed there is no precise information on the effect of knowledge management on the performance of research institutions in Kenya. Therefore, the study established the effect of knowledge

management on performance of research institutions focusing at a case study of KEMRI – Kisumu to bridge the research gap.

1.3 Objectives of the Study

1.3.1 General Objective

The general objective was to establish the effect of knowledge management on performance of research institutions focusing at a case study of KEMRI - Kisumu.

1.3.2 Specific Objectives

The specific objectives of the study was;

i. To establish the effect of knowledge acquisition on performance of KEMRI – Kisumu.
ii. To examine the effect of knowledge conversion on performance of KEMRI – Kisumu.
iii. To determine the effect of knowledge protection on performance of KEMRI – Kisumu.
iv. To find out the effect of knowledge application on performance of KEMRI– Kisumu.

1.4 Research Hypotheses

Knowledge acquisition

i. H_o There is no effect of knowledge acquisition on organization performance
ii. H_1 There is effect of knowledge acquisition on organization performance

Knowledge conversion

i. H_o There is no effect of knowledge conversion on organization performance

ii. H_1 There is effect of knowledge conversion on organization performance

Knowledge protection

i. H_o There is no effect of knowledge protection on organization performance

ii. H_1 There is effect of knowledge protection on organization performance

Knowledge application

i. H_o There is no effect of knowledge application on organization performance

ii. H_1 There is effect of knowledge application on organization performance

1.5 Justification and Significance of the Study

There is general agreement that many managers all over the world are realizing that knowledge in the form of expertise, competence is the organization's most important asset and its quality, and availability affects all aspects of the organization. Research institutions deal with numerous customers and have a wide range of products and therefore it is very important for them to develop and deploy knowledge management because their success and survival depends on the quality and relevance of their services.

The practical importance of the study lies in its promotion of the understanding by managers of research institutions in respect to nurturing and harnessing organizational knowledge resources, which should enable them to identify those strategies, which would maximize the benefits to be gained from knowledge management and organizational effectiveness initiatives. The study would also benefit the government and other service firms in Kenya in that its findings would help them to continuously improve their capabilities for knowledge management.

This study would evaluate the strategies of KM and its effects on performance. This would help human capital managers optimize the gains of this strategy amidst challenges facing the current organization such as layoffs and high labour mobility rate. Research institutions would also benefit from this study as it would establish best practices and rationale of managing knowledge as a resource. It would also improve the researcher's skills in people management. It would also sharpen the researcher's skills in identifying, analyzing and solving business dilemmas. The study would add value to the existing and growing pool of knowledge in the field of KM. It would also recommend areas for further studies thus forming a basis for further research.

1.6 Scope of the Study

This study seeks to establish the effect of knowledge management on performance of research institutions. The study specifically established the effect of knowledge acquisition, knowledge conversion, knowledge protection and knowledge application on performance of KEMRI– Kisumu. To achieve this objective, the study was conducted at KEMRI – Kisumu for six months from June to November 2018. Staff of the institution constituted the target population from where a purposive sample of the management staff were drawn. The study collected primary data using questionnaires.

1.7 Conceptual Framework

A conceptual framework is an interconnected set of ideas (theories) about how a particular phenomenon functions or is related to its parts. The framework serves as the basis for understanding the causal or correlational patterns of interconnections across events, ideas, observations, concepts, knowledge, interpretations and other components of experience (Marilla, 2010).

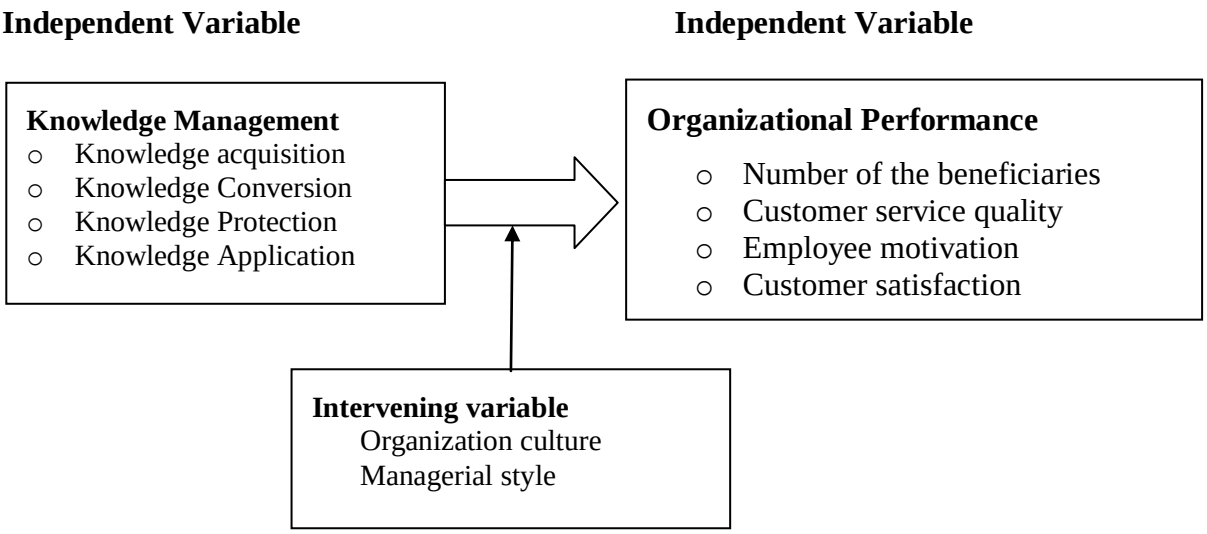

Figure 1: Conceptual Framework showing effect of Knowledge management on organization performance

Adopted from Oso and Onen (2009)

In the conceptual framework above Knowledge management is conceptualized to affect organization performance. In particular, knowledge acquisition, conversion, protection and application affect organization performance in terms of number of the beneficiaries, customer service quality, employee motivation, customer satisfaction

It is conceptualized that knowledge management process ensures acquisition of knowledge throughout the organization and provides the necessary components to improve decision-making capabilities and hence improves organization effectiveness. In business organization, knowledge management avoids information redundancy and ensures that the information fits organizational operational and functional requirements and therefore promotes organizational effectiveness.

Learnt information needs to be converted into forms that offer immediate use to organization to ensure effectiveness. Knowledge conversions occur when people engage in practical activities through participation in social practices, under the guidance of people who are more experienced. This process involves changing knowledge to a form that is readily applicable to an organization and therefore ensures organizational effectiveness.

Knowledge theft and plagiarism result in substantial economic losses and damages to organizational image. Knowledge-intense product data created and utilized in organizations is particularly at risk, because many different stakeholders access sensitive content and hence the need to protect strategic knowledge resources of an organization to ensure organizational effectiveness.

Knowledge application is an important knowledge management process because knowledge has become a strategic asset in today's competitive advantage. Application of knowledge helps to achieve organizational effectiveness by inserting knowledge into organizations processes and procedure.

CHAPTER TWO

LITERATURE REVIEW

This study brings into focus previous literature on the KM and performance of a firm. It discusses the literature related to the KM, the theories that have shaped the understanding of KM and performance. A summary of the review and study gaps is also undertaken.

2.1 Theoretical Literature Review

This study is anchored on resource-based view theory and cognitive learning theory.

2.1.1 Resource Based View Theory

The resource-based view (RBV) emphasizes that a firm utilizes its resources and capabilities to create a competitive advantage that ultimately results in superior value creation and achieve organizational effectiveness. In order to achieve organizational effectiveness, the firm must allocate its resources and capabilities wisely against competing needs as a result of changing business environment. RBV depicts companies as a collection of resources and capabilities required for product or market competition. Resources are the physical capital, human capital, and organizational capital owned or controlled by a firm that can be used to conceive of and implement strategies (Barney, 1991). According to Barney, resources and capabilities need to meet a four point criteria to provide superior performance. First, they must be valuable, enabling a firm to not only exploit its environmental opportunities but also neutralise its threats. Secondly they must be rare among its current or potential competitors. Thirdly they must be costly to imitate, and lastly they must be without close strategic substitutes. Capabilities reflect company's ability to combine resources that the organization can muster in ways that promote superior performance in a dynamic business environment (Teece *et al*., 1997). Makadok

(2001) identifies two key distinctions between resources and capabilities. First, capabilities are a special type of organizationally embedded, non-transferable, firm-specific resource. Second the purpose of capabilities is to improve the productivity of the other resources possessed by the firm. Based on the theory, could it be concluded that information and knowledge resources and capabilities are valuable, rare, costly to imitate and without close strategic substitutes? If the assertion holds, does information and knowledge therefore enable a firm to not only exploit its environmental opportunities but also neutralise its threats? Does it therefore mean that knowledge acquisition, knowledge conversion and knowledge application, can be used to manage and increase Social Capital, to enhance Firm Performance and to sustain competitive advantages?

Building on the RBV, the knowledge-based view of the firm considers knowledge as the most strategically significant resource of the firm (Grant, 2008). This view considers a firm to be a distributed knowledge system composed of knowledge-holding employees, and this view holds that the firm's role is to coordinate the work of those employees so that they can create knowledge and value for the firm (Spender, 2006). Could this therefore imply that research institutions' absorptive capacity could be enhanced through KM processes that allow the firm to acquire, convert and apply existing and new knowledge by adding value to the Social Capital while improving their performance?

2.1.2 Cognitive Learning Theory

This theory states that humans generate knowledge and meaning through sequential development of an individual's cognitive abilities, such as the mental processes of recognize, recall, analyze, reflect, apply, create, understand, and evaluate. According to the Cognitivists', (Stankosky, 1976; Bruner, 1960; Bruner, 1966) learning process is

adoptive learning of techniques, procedures, organization, and structure to develop internal cognitive structure that strengthens synapses in the brain.

According to cognitive learning theory, learning involves a change in one's cognitive structure. This change occurs when new information or experiences are combined with existing knowledge stored in long term memory. In this sense, new knowledge is constructed, remembered and applied by learners, a process that enables firms to be competitive in a changing environment. The turbulent and changing environments nowadays has intensified need to learn and get ahead of rival organizations (Takashi 2001). According to Takashi, firms need to keep pace with rapidly changing market developments and respond rapidly to unexpected market dynamics by identifying investment opportunities to achieve advantageous positioning alignment with the environment thus placing the firm on a roadmap to achieving a sustainable competitive advantage and improving organizational performance.

The theory holds that the learner is expected to use skill and knowledge obtained during learning to solve problems in real life situations, (Nonaka, 2013). Does it therefore mean that the gained knowledge can be used to a firms advantage. On the other hand, modern organizations are faced with highly skilled and educated but mobile human capital. Information overload is a common scenario too. Information must be effectively disseminated or learned in short periods of time. Despite these challenges, what is the rationale of adopting knowledge management?

2.2 Conceptual Literature Review

2.2.1 Knowledge Acquisition

The entire basis for the investment in and development of knowledge- management technologies is premised on the belief that an effective KMS should disseminate knowledge throughout the organization and provide the necessary components to improve decision-making capabilities (Alavi & Leidner, 2009). The impact of the use of KMS on explicit knowledge acquisition is critical given that explicit knowledge provides the foundation for and is the precursor of tacit knowledge development (Alavi & Leidner, 2009; Roberts & Ashton, 2013). As such, acquisition of explicit knowledge is a critical component in the development and sustenance of expertise (Barua & Mukhopadhyay, 2009). It is under the same premises that this study is founded.

Broadly, knowledge can be tacit, and can be explicit and can be non-analysable. It can be difficult to transfer knowledge efficiently and effectively, especially across a range of units of analysis: individual, group and organisation, and can be socially complex, such as managing talent in mergers and acquisitions and other knowledge-intensive settings. Whelan, Collings and Donnellan (2010) view knowledge using this kind of lens. Schilling and Kluge (2009) found that ambiguity is negatively related to organizational learning.

According to Robertson and Hammersley (2009), the acquisition of knowledge and the process of organizational learning, are foundational components of the knowledge process. From more specific socio-cultural perspectives, Tylor (2008) seek to explain knowledge acquisition and environment in SMEs and Mork, Yeh, Lai and Ho, (2008) discuss the significant questions surrounding conflicting epistemic cultures and obstacles for learning across communities of practice; the influence of social interaction on

knowledge creation; while Seufert's (2000) view of work-based learning and the management of knowledge give an integrated concept of organizational learning.

The philosophical role of organizational learning can be seen in Müller -Merbach (2007) and Blackman Connelly and Henderson (2004) who asks whether double loop learning creates knowledge which is reliable. Aspects of the changing nature of knowledge and its role in change management is stressed by Rowley's (2000) articulation of the journey from learning organization to knowledge entrepreneur and also in Sternberg and Horvath(2008) view on the role of tacit knowledge in support of organizational learning.

Rastogi (2009) noted that knowledge acquisition in an organization could be seen via a range of processes: the individual, shared understanding; diffusion and finally embedding. At the individual level, Spender (2000) focus on reflection and reflexivity, and on shared understanding in working groups to create and reframe meaning, while embedding is via inter level dialogue which addresses emotional, relational and political tensions. Embeddedness is seen in the addressing of systemic tensions, political and cultural barriers. Zollo and Winter (2002) view the individual level in the context of generation of a variation of ideas, while shared understanding is seen in internal selection, diffusion is via variation and spatial replication and embeddedness is in retention and routinization. For Lopez *et al.* (2005), the focus of the individual is on the acquisition of knowledge, shared understanding is achieved via interpretations, diffusion is via distribution among organizational members and embeddedness comes via organizational memory, systems and rules. As noted by Gao and Riley (2010), some forms of knowledge are valued for their symbolic or iconic status, which may have the function of distinguishing 'insiders

from outsiders', and they emphasize that knowledge and identity are intimately connected.

Zollo and Winter (2002) indicated that, given that knowledge creation is a complex and fuzzy process, the main role of the organization is to provide the proper context for facilitating group activities as well as creation and accumulation of knowledge at an individual level. The following five conditions are considered as requirements in promoting the knowledge creation spiral. The first one is intention, this is the level of organizational aspiration to its goals is the driver of the knowledge spiral. Business settings within the efforts to achieve the goals usually take the form of the strategy. From the viewpoint of organizational knowledge creation, the essence of strategy lies in developing the organizational capability to assure, create, accumulate and exploit knowledge. Autonomy is the second condition for promoting the knowledge spiral. It increases individual motivation to create new knowledge or original ideas (Gao & Riley, 2010).

Fluctuation and creative chaos is the third one. Fluctuation (breakdown of routines, habits etc.) and 'creative chaos' increase tension and focus attention on defining problems and resolving crises. They promote the knowledge spiral by strengthening the subjective commitment of individuals as well as stimulation of interaction with the external environment. Also, there is redundancy as the forth condition for promoting knowledge creation in an organization. In business organizations, redundancy refers to intentional overlapping of information between employees and departments about various business activities, management responsibilities and the company as a whole. It is characterized by information that goes beyond the immediate operational and functional requirement for

an organization. It should be noted that this information is still useful as it helps speed up the knowledge creation process through sharing of extra information. Finally, required variety is the fifth condition for promoting knowledge creation in an organization. An internal diversity organization should match the variety and complexity of the environment. Providing equal access to information within the organization supports the exchange of different viewpoints and interpretations of new information. Organizational members can cope with many unexpected events if they have a variety of information and experience (Gao & Riley, 2010).

Kong (2008) conducted a study on the role of intellectual capital in non-profits. This was necessitated since according to him, very little systematic research had examined the applicability of strategic management concepts like SWOT (strengths, weaknesses, opportunities and threats) analysis, industrial organization, resource-based view and core competency, knowledge-based view, Balanced Scorecard and intellectual capital (IC) in the non-profit context. The paper established that Knowledge is critical to for-profit organizations as it is to NPOs, and that organizations that accumulate, apply and share knowledge are often perceived as leaders rather than followers and to succeed as opposed to fail in a knowledge-based economy. This paper will add onto Kong's study by taking into consideration the role of knowledge acquisition in the relationship between intellectual capital and competitive advantage.

2.2.2 Knowledge Conversion

Knowledge conversion involves the process where tacit knowledge has to be made explicit in order to be captured. Northouse (2008) makes a distinction between tacit and explicit knowledge. He defines the implicit knowledge as knowledge that can be observed

in a performance of a good professional – his/her approach, methods, or actions. Explicit knowledge, on the other hand, is academic or technical data or information that exists in a concrete form of a manual, book, copyright, patent, or mathematical expression. It is carefully and systematically codified, stored in databases and shared through print, electronic methods, formal education, and other formal means. It is commonly used and can be freely reused to solve similar types of problems (Smith, 2007). Tacit knowledge is mainly based on lived experience while explicit knowledge refers to the rules and procedures that a company follows (Chong, 2010). They both play very important parts in knowledge creation, sharing and storing processes. Chong (2005) adds cultural knowledge to the list of the essential knowledge categories and defines it as the environment in which the company and the individual (within the company) operate. Conversion and creation of knowledge occur based on explicit, tacit and cultural knowledge a person possesses or has access to (Chong 2005).

Conversion of knowledge, as represented by: Nonaka, Oliver and KandadiK (2003); Bergman (2005); Chua (2002); and Robertson and Hammersley (2009 can be seen as a synthesizing process, incorporating the influence of social interaction on knowledge creation and as a model of change management. Tsoukas (2003) suggests that knowledge conversion occurs when people engage in practical activities through participation in social practices, under the guidance of people who are more experienced. Hildreth and Kimble (2002) emphasize the importance of a mentor in the organization who has a lot of tacit knowledge and who guides the newcomer in learning this tacit knowledge through a practice. In these authors' view, action requires tacit knowledge, which is acquired in the social practice of which the individual is a member. An alternative to knowledge conversion is a process of shifting between focal and subsidiary awareness. The

individual shifts awareness between the task and the tools, reflects on their own experiences, uses language to remind oneself of what they already know, thematizes certain circumstances, and discusses them with others (Tsoukas, 2003). In this view of knowledge as social practice, Cook and Brown (1999) point out that new knowledge and novel ways of knowing are generated through the interplay between reflection, thematization, and experience within situated interaction.

According to Nonaka and Krogh (2009) organizational knowledge conversion is based on two dimensions. The first dimension shows that only individuals create knowledge. The second dimension relates to the interaction between explicit and tacit knowledge. These two dimensions form the basis for defining the four processes of conversion of knowledge; socialization, externalization, combination and internalization. The process that transfers tacit knowledge in one person to tacit knowledge in another person is socialization. It is experiential, active and a living thing, involving capturing knowledge by walking around and through direct interaction with customers and suppliers outside the organization and people inside the organization. This depends on having shared experience, and results in acquired skills and common mental models. Socialization is primarily a process between individuals (Nonaka& Krogh, 2009; Nonaka & Takeuchi, 1995).

The process for making tacit knowledge explicit is externalization. One case is the articulation of one's own tacit knowledge - ideas or images in words, metaphors, analogies. A second case is eliciting and translating the tacit knowledge of others - customer, experts for example - into a readily understandable form, e.g., explicit knowledge. Dialogue is an important means for both. During such face- to-face

communication people share beliefs and learn how to better articulate their thinking, though instantaneous feedback and the simultaneous exchange of ideas. Externalization is a process among individuals within a group (Nonaka & Krogh, 2009).

Once knowledge is explicit, it can be transferred as explicit knowledge through a process Nonaka calls combination. This is the area where information technology is most helpful, because explicit knowledge can be conveyed in documents, email, data bases, as well as through meetings and briefings. The key steps collecting relevant internal and external knowledge, dissemination, and editing/processing to make it more usable. Combination allows knowledge transfer among groups across organizations (Nonaka & Krogh, 2009). Internalization is the process of understanding and absorbing explicit knowledge in to tacit knowledge held by the individual. Knowledge in the tacit form is actionable by the owner. Internalization is largely experiential, in order to actualize concepts and methods, either through the actual doing or through simulations. The internalization process transfers organization and group explicit knowledge to the individual (Nonaka & Krogh, 2009). In summary, knowledge conversion aims at ease of transferability of acquired knowledge. The study will examine the forecast on the implications of this KM strategy on organization performance.

2.2.3 Knowledge Protection

Knowledge and competencies of various disciplines and involved stakeholders are combined so that synergies establish and broader and better solution spectra are created (Haberfellner, Daenzer & Becker, 2012). Knowledge sharing and exchange between involved parties is essential for a successful accomplishment of the task in an organization for organizational effectiveness. Globalized markets as well as increasing

cost and innovation pressure lead to heterogeneous, distributed environments, which require intense knowledge exchange via Internet communication across enterprise boundaries. In this regard, protection of innovative knowledge and intellectual property (IP) plays a decisive role because corporate knowledge is crucial for economic success and competitiveness of enterprises. Moreover, knowledge theft and plagiarism result in substantial economic losses and damages to organizational image.

Knowledge-intense product data created and utilized in organisations is particularly at risk, because many different stakeholders access sensitive content. Strong access restrictions are not always advantageous because cooperation between participants is interfered as well as ability and efficiency of the organisation thought is compromised. In the area of conflict between knowledge provision and knowledge protection, industrial enterprises demand appropriate protection means that solve the problem. Practice shows that, until now, organizational and juridical protection means are not capable of solving the goal conflict and the piracy and plagiarism situation alone (Haberfellner, Daenzer, & Becker, 2012).

Protecting valuable knowledge and intellectual property of companies is assisted by various existing protection means. These can be distinguished in different categories depending on their type of utilization and implementation into corporate processes and infrastructure. Juridical protection means, such as patents, copyright or trademarks are well-established instruments to protect own intellectual property. They set a legal framework for the utilization of protected knowledge and enable the copyright owner to pursue economic interests by civil law in case of illegitimate plagiarism or piracy. Juridical protection means are not suitable for pre emptive knowledge protection because they do not actively prevent knowledge from being stolen or misused. In addition to that,

they can be circumvented and even legitimate actions for injunction or compensation often take a long time (Bosch, 2011).

Strategic protection means are targeted at controlling knowledge and knowledge bearer in context of a long-term company strategy. This includes retention of any stakeholder that is directly or indirectly involved with company's own knowledge. Usual means in this category are long-term retention of partner firms or suppliers as well as own employees, they act as implicit knowledge bearers (Putz & von Rundstedt, 2006). Another way of protecting knowledge is through organizational protection means are means that are used to protect knowledge in a preventive manner. These methods focus on controlling behavior of personnel accessing knowledge inside and outside the company. Typical examples for this kind of measures are: Spatial separation of company departments, video surveillance, personnel identification, physical access controls and non-disclosure agreements (NDA). This category of means has a direct and wide impact on corporate environments and collaboration experience. Protection efficiency, implementation cost and reasonability have to be examined on an individual basis and under consideration of legal aspects (Mbirithi, 2014).

Another method identified for knowledge protection is through technical protection means. Technical protection means are designed to provide protection of knowledge in physical objects or product and organizational data. Physical objects such as prototypes or complete products contain and represent knowledge in a materialized form, which can be protected by obfuscation methods (disguised prototype cars), copy-protection methods (high functional integration, software copy protection) and design methods (specialized manufacturing process, surface technology). In addition to that, different identification

technologies, such as radio-frequency identification tags (RFID tags), bar codes, micro color-codes, can be used to tackle plagiarism, piracy and loss of knowledge in cooperation and supply chains (Abele, Kuske & Lang, 2011).

Also, as identified by Marwick (2004), organizations can protect knowledge through Digital product data. Digital product data can be protected by using methods that influence the processing of data, manipulate data or use IT security techniques. This sub-category can be divided into reactive and pre-emptive protection methods. Digital Watermarking is designed for reactive protection and can be used for identifying where data loss occurred or who forwarded sensitive content. The most important pre-emptive methods are: Terminal Server (TS) connection, Data Leakage Prevention (DLP), Data Filtering (DF) and Enterprise Rights Management (ERM).

Terminal Server is an application that receives user inputs and transmits graphical user interface output via a network connection. The engineer connects to the server and works remotely on the provided environment. Advantages of this method are scalability and central manageability of the server. On the other hand, compared to workstation usage, performance limitations exist when running graphically intensive tasks (Kiamba, 2009). Data Leakage Prevention monitors data and controls distribution ways in the system. DLP systems are implemented at host or network level. The DLP module controls any possible data channel and restricts accordingly. Examples for controlled channels are removable storage media, network file transfers, e-mail attachments, printers, etc. Many different DLP systems are available that suit corporate data protection requirements and allow permanent detailed tracking of information and user activities (Kiamba, 2009). However,

due to the latter, utilization may be problematic in respect to employee data privacy regulations (Kelleher, 2010).

Data Filtering is the most important engineering knowledge protection approach that is based on knowledge reduction principles. Individual elements containing valuable knowledge are intentionally removed from documents before these documents are exchanged. Hence, the overall knowledge amount stored in specific documents is decreased to minimize risk of knowledge loss. Prior to removing parts of documents, knowledge containing elements have to be identified and classified first (Creswell, 2006). Knowledge management often includes management of intellectual property such as patents, copyrights, trademarks, and service marks. Organizations that own intellectual property need ways to automate workflow and support the management and analysis of inventions, patents and related matters. It often takes a long time to file and obtained approved rights to intellectual property, and organizations need support to track this process, more so for international organizations. Intellectual property regulations require owners of copyrights, trademarks, and service marks to pay legal fees at specific points in time; otherwise the rights can be lost. For licensing issues, it is also important to track licensees and royalties. Another aspect of intellectual property is the protection of digital content covered by copyright. Intellectual property management is mainly an explicit-to-explicit knowledge conversion. It is based on knowledge repositories and, thus, deals with all aspects of knowledge storage, organization and knowledge distribution in a controlled way (Kelleher, 2010).

Knowledge loss has been identified as a failure factor in KM adoption (Goodman and Schieman, 2010). This paper will examine the case for knowledge protection guided by

the following, is knowledge recognized as a strategic asset that needs protection just like other key assets? Does knowledge protection enhance organization performance or does it act as a barrier to knowledge sharing?

2.2.4 Knowledge Application

Knowledge application refers to activities associated with the flow of knowledge from one party to another (Newman & Conrad, 2009). According to Marwick (2011), efficient and effective knowledge management typically requires an appropriate combination of organizational, social, and managerial initiatives along with the deployment of appropriate technology for application of knowledge. Although a complete tacit-explicit split cannot be achieved (Inkpen & Dinur, 2012), it is a useful way to understand the different characteristics and nature of different types of knowledge that require different processing, procedures and tools to be managed and dealt with. Application of knowledge is an important process of knowledge management. Knowledge management (KM) is now becoming more vital for successful management of construction projects and a complement to the business activities of organisations. With the new economy increasingly becoming a more knowledge-based economy, knowledge is becoming the most important asset for organisational success among other assets such as capital, materials, machineries, and properties (Kelleher & Levene, 2010).

Riungu (2015) examined the effect of knowledge management practices on organizational performance of the 21 mobile telephone companies in Kenya using a descriptive survey research design. The study found out that the management of mobile telephone companies in Kenya understand the term knowledge management, as an alternative strategy by organizations to improve competitive performance. KM is used for

acquisition, sharing and application of management knowledge in the institution so as to better manage and apply organizations tangible and intangible knowledge assets. The study concluded that knowledge management influences organization performance in various aspects such as, knowledgeable employees, improving decision making in the organization, improving service offering to clients, reducing operational costs and improving organizational competitiveness.

According to Ahmad and Ann (2008), with the successful application of useful knowledge, industrial companies can improve the process of organisational learning to enhance performance and create more possibilities to gain competitive advantages for the organization. Blumentritt and Johnston (2009) suggested that in order to gain competitive advantages, organisations need to enhance the information-knowledge application especially through the implementation of IT-based improvements to enhance information management and socially-based mechanisms to enhance knowledge management. Love, Edum-Fotwe and Irani (2013) indicated that organisations have shown an increased awareness of KM application as a necessary prerequisite for improved quality, innovations, business performance, efficiency of project delivery, and relationships with partners, suppliers and clients to gain competitive advantages.

Stankosky (2012) noted that businesses need knowledge management programs which concentrates with knowledge application, because knowledge has become a strategic asset in today's competitive advantage. Chong (2010) indicates that 58.5 percent of the Malaysian IT companies have made significant investments in KM. The knowledge application is embedded in and carried through multiple entities including organization culture and identity, routines, policies, systems, and documents, as well as individuals.

Also, Eisemon (2014) indicated that knowledge application also includes technical resources, human resources and cultural, structural resources and the resources which builds KM capability that is related to competitive advantage. Doaei and Dehghani (2010) noted that knowledge infrastructure capabilities and knowledge process capabilities especially the application process influences organizational performance greatly.

According to Eisemon (2014), application of knowledge is an important source of competitive advantage for organisations. Knowledge technology can be supportive in knowledge application, by inserting knowledge into organizations processes and procedure. Thus, information technology can enhance and provide a positive influence by integration and application with facilitating the capture a, updating and accessibility of organizational directives (Alavi & Leinder, 2011). An important role in the success of knowledge management system is the sharing of both the implicit and the tacit knowledge in which the motivation and commitment of the people plays a significant role (Dyer & McDonough, 2011; Kameli, 2009).

The essential factor in knowledge application is creating an appropriate classification scheme to organize information into meaningful categories in a knowledge database that can be easily accessed by its employees (Blair & Wallman, 2001). Majority of knowledge management research has been on advanced technology and techniques used to facilitate knowledge sharing. A knowledge organization has been defined as an organization that realizes the importance of its knowledge and applies techniques to maximize the use of this knowledge to its employees, shareholders and customers. However, any firm interested in making the transition to becoming a knowledge organization has to ensure that its culture is aligned with the requirements for KM success. As attractive as KM is

for enhancing an organization's operations, many commonly agree that there is an important precondition.

Jelenic (2011) studied the importance of knowledge management in organizations – with emphasis on the balanced scorecard learning and growth perspective. Jelenic reviewed secondary data and established that globalization has brought enormous changes in business thinking and technologies and the organizations who want to survive in unpredictable and complex competitive markets should quickly adapt to the new dynamics of business. Jelenic concluded that intangible resources are the decisive factors of business success and modern companies should recognize all business processes as processes of knowledge. Knowledge should thus be considered as strategic company's resource, the source of competitive advantage and business success in the 21st century.

However, knowledge application has challenges which hinder its effective achievement of organizational goals. Carrillo, Robinson, Al-Ghassani and Anumba (2010) noted that the challenges for KM become more difficult when dealing with tacit knowledge because individuals normally regard tacit knowledge as a source of strength and personal rather than organisational property. Many individuals regard their knowledge as a personal property and source of strength and most of typical existing which hinders its application in organisations. Further, employees of the organisations are reluctant to share their knowledge with others, while changing these people's behavior is not easy (Nonaka, 2011). Lack of trust among employees, lack of time, lack of KM awareness, lack of openness to new ideas, intolerance of management for creative mistakes and refusal of solutions from people in lower positions, can negatively affect knowledge application process (Davenport & Prusak, 2010). Past studies point to a positive correlation between

knowledge application and organization performance. However none of the studies can be linked to not for profit organizations. Does the argument hold for NPOs too? This paper will examine the case for knowledge application on performance of research institutions.

2.2 Empirical Literature Review

Previous empirical studies have investigated the knowledge management capabilities. This category focus on the relationships among the knowledge enablers, the emphasis is on the examination of the effect of knowledge management capabilities.

2.2.1 Knowledge Acquisition

Agbim (2014) assessed the effect of knowledge acquisition on competitive advantage based on a knowledge-based and resource-based study. The study adopted ex-post-facto research design and multistage sampling technique to select the elements that completed the questionnaire from the population of employees of the selected hotels. The validity and reliability of the questionnaire was confirmed using KaiserMayer-Olin (KMO), Bartlett and Cronbach alpha tests. Linear regression statistical method was employed to test the research hypothesis. It was found that knowledge acquisition is significantly related to competitive advantage. In view of this, hoteliers and hotel managers should employ ICT systems, skilled knowledge workers and all other relevant knowledge management resources that will further help to enhance knowledge acquisition. At every point in time, efforts should be made to acquire modern and latest systems and to improve employees' skills through training and retraining. Again, a cordial relationship between employees/managers and customers/the general public should be encouraged to ensure free flow of relevant information/knowledge from the customers/public to the organization.

Saini (2013) adopted a structural equation modeling approach to investigate impact of knowledge management practices on selected industries. Using the literature review, Saini's paper developed a knowledge management instrument and it tested a conceptual model linking knowledge management practices and organizational performance, using descriptive statistics and structural equation modeling technique. Primary data was collected from SMEs of three industries i.e. software, pharmaceutical and textiles in North India. The study confirmed the relationship between adoption of knowledge management practices and improved organizational performance, competitiveness and employee retention rates in the selected SMEs. This paper will examine this in the research organizations context.

Shoo, Matuku, Ireri, Nyagero and Gatonga (2012) conducted an analysis of AMREF's progress to determine the place of knowledge management in influencing lasting health change in Africa. The aim of the paper was to identify AMREF's current Knowledge Management implementation status, problems and constraints encountered after two years of enforcement of the strategy and suggest the way forward. Quantitative data on number and foci of AMREF research publications were collected using a questionnaire. Focus group discussions and in-depth interviews were used to gather data on explanations for the trend of publications and the status of the implementation of the 2010-2014 Knowledge Management Strategy. Key findings of the study point out the need to assess the effect of knowledge conversion, storage, application and protection in the health sector. It was evidenced from their paper that on research output, peer reviewed articles started declining in the year 2000 but there had been a rapid increase of technical documents afterward which however started declining from around 2005. This implies that knowledge creation and storage was on a decline then. They found out that although

knowledge sharing takes place in AMREF, it occurs in an unstructured way and is often unconscious, limited and inefficient. They also established that there was not only inadequate awareness of Knowledge Management and its potential impact on improved performance but also inadequate integration of KM into staff roles hence limiting sharing both tacit and explicit knowledge. They acknowledged that AMREF has not only an elaborate central and web-based system for storage, transfer and retrieval of its documents but also large amounts of documents which still mainly remain in form of donor reports, surveys and evaluation reports. However, they found out that only a small amount of this literature is captured, processed, and shared using the corporate knowledge and information dissemination platforms such as the main AMREF Website, the Intranet and the Digital Resource Centre. Moreover, a small amount of such documentation has been published into Health Learning Materials and in peer reviewed journals and a number of these publications were not in the Resource Centre database. The researchers extolled the organization has an impressive record of research and publications but faulted its systems for managing and sharing this knowledge to influence policy and practice in Africa hence called for urgent improvements to realize this potential. This paper addresses the rationale of knowledge management on organization performance. It is hoped that this paper will shed light on the impact of KM strategies on performance thus improving its place in research organizations.

2.2.2 Knowledge Conversion

Kinyua (2015) examined effect of knowledge conversion and knowledge application on performance of commercial banks in Kenya. The study adopted explanatory and cross-sectional survey design. The target population of this study comprised of all the 43 Commercial Banks in Kenya. The unit of observation was the functional area in each

bank. Five areas were identified in each bank comprising human resource, finance, marketing, information communication technology, and operations in each bank. This study used primary and secondary data. Primary data was collected using a semi structured questionnaire. The questionnaire was administered using the drop-and-pick later method. Quantitative data was analysed using descriptive and inferential statistics. Descriptive statistics included percentages, frequencies, means, and standard deviations while inferential statistics involved regression analysis. Results from quantitative data analysis were presented using figures and tables. Qualitative data was analysed on the basis of common themes and presented in narrative form. The findings of the study established that knowledge conversion and knowledge application positively influence performance. Management of Commercial Banks should encourage interaction between employees and customers.

Oliver and Kandadik (2012) stress the central role of human factor in knowledge generation. According to them, knowledge is the individual ability to draw distinctions within a collective domain of action, based on an appreciation of context or theory, or both (Tsoukas & Vladimirou 2001). Thus, knowledge becomes organizational simply due to the fact that it is generated, developed, and maintained by individuals within organizations. The KPMG's European Knowledge Management Survey 2002/2003 conducted a detailed survey on knowledge management among top 500 organizations in the United Kingdom, France, Germany and the Netherlands. The aim of the survey is to act as a benchmark for the current state of knowledge management in the European profit and non-profit sectors. Key findings were that 80% consider knowledge a strategic asset. 78% of respondents believe they are currently missing out on business opportunities by failing to successfully exploit available knowledge. Companies estimate that, on average,

6% of revenue as a percentage of annual turnover or budget is being missed from failing to exploit knowledge effectively. 51% state that involvement of the board members increased in the past three years. This implies that an analysis of the effect of KM on performance is important to giving strategic direction in this field.

Detlor, Ruhi, Turel, Bergeron, Choo, Heaton, and Paquette (2006) sought to study the effects of organizational knowledge management (KM) context on KM practices. Data were collected at a large Canadian law firm via a Web-based survey instrument from over 400 participants comprising professional and support staff working in various office locations. The purpose of the study was to gain insight on the antecedents of knowledge management behaviors in organizations. A theoretical model explicating the impact of an organization's KM environment on both organizational and individual KM behaviors was developed and tested using structural equation modeling techniques. The moderating effects of age, biological sex, job category, and years spent in the organization were also examined. Results indicated that an organization's knowledge management environment impacts on both organizational as well as personal knowledge management behaviors. Furthermore, organizational KM behavior also influences personal KM behavior, thus acting as a mediator between the overarching organizational knowledge management policies and practices and the employees' individual practices. Based on this empirical evidence, recommendations are suggested for organizations wishing to institutionalize knowledge management initiatives in their firms.

Abdul (2004) noted that knowledge management helps an organization to gain insight and understanding from its own experience. Specific knowledge management activities help focus on organisation on acquiring, storing and utilizing knowledge for problem solving,

dynamic leaning, strategic planning and decision making. It also prevents intellectual assets from decay, adds to firm intelligence and provides increased flexibility. According to Gray (2011), knowledge management process is an audit of intellectual assets that highlights unique sources, critical functions and potential bottlenecks, which hinder knowledge flows to the point of use. Knowledge management process protects intellectual assets from decay, seeks opportunities to enhance decisions, services and products through adding intelligence, increasing value and providing flexibility. Knowledge management process complements and enhances other organizational initiatives such as total quality management (TQM), business process re-engineering (BPR) and organizational learning, for enhanced organizational effectiveness.

2.2.3 Knowledge Protection

Bolisani, Paiola, and Scarso (2013) examined knowledge protection in knowledge-intensive business services (KIBS). The paper addressed four research questions: whether KIBS firms perceive the necessity to protect their knowledge? If so, whether they protect it? What method (or combinations of methods) they typically use? What are the main factors affecting the approaches to knowledge protection adopted by these companies? They employed a survey of 471 KIBS companies located in the Northeast of Italy and operating in three different sectors: IT Services, Design and Communication, Professional Services. The study classified the types of knowledge protection mechanisms and investigated similarities and differences in knowledge protection between KIBS operating in distinct sectors, having different size, and pursuing different knowledge management strategies. The study focused on the profit making entities and did not highlight the role of knowledge protection on performance of the firm

but rather whether firms embrace knowledge protection, the knowledge protection methods and factors affecting them.

Tseng (2010) analyzed the correlation between organizational culture and knowledge conversion on corporate performance. The study utilized knowledge externalization, knowledge combination, knowledge internalization and knowledge socialization to measure knowledge conversion and revealed that knowledge socialization has no effect on corporate performance, findings that are inconsistent to the extent that knowledge resources have been found to contribute to performance. Questionnaire and statistical analytical techniques were applied to gain best exploration on organizational culture, knowledge conversion and corporate performance. The study targeted the largest Taiwanese corporations, compiled by the China Credit Information Service (2006), from which 650 corporations were selected. Managers for knowledge management supervisors, senior human resource managers, and senior R&D managers were sampled and in total, 139 questionnaires were returned out of which 131 were valid making the effective response rate 20.15%. This is not adequate for making generalization and drawing conclusions as recommended by Mugenda and Mugenda (1999).

Shoo, Matuku, Ireri, Nyagero and Gatonga (2012) conducted an analysis of AMREF's progress to determine the place of knowledge management in influencing lasting health change in Africa. The aim of the paper was to identify AMREF's current Knowledge Management implementation status, problems and constraints encountered after two years of enforcement of the strategy and suggest the way forward. Quantitative data on number and foci of AMREF research publications were collected using a questionnaire. Focus group discussions and in-depth interviews were used to gather data on explanations for

the trend of publications and the status of the implementation of the 2010-2014 Knowledge Management Strategy. Key findings of the study point out the need to assess the effect of knowledge conversion, storage, application and protection in the health sector. It was evidenced from their paper that on research output, peer reviewed articles started declining in the year 2000 but there had been a rapid increase of technical documents afterward which however started declining from around 2005. This implies that knowledge creation and storage was on a decline then. They found out that although knowledge sharing takes place in AMREF, it occurs in an unstructured way and is often unconscious, limited and inefficient. They also established that there was not only inadequate awareness of Knowledge Management and its potential impact on improved performance but also inadequate integration of KM into staff roles hence limiting sharing both tacit and explicit knowledge. They acknowledged that AMREF has not only an elaborate central and web-based system for storage, transfer and retrieval of its documents but also large amounts of documents which still mainly remain in form of donor reports, surveys and evaluation reports. However, they found out that only a small amount of this literature is captured, processed, and shared using the corporate knowledge and information dissemination platforms such as the main AMREF Website, the Intranet and the Digital Resource Centre. Moreover, a small amount of such documentation has been published into Health Learning Materials and in peer reviewed journals and a number of these publications were not in the Resource Centre database. The researchers extolled the organization has an impressive record of research and publications but faulted its systems for managing and sharing this knowledge to influence policy and practice in Africa hence called for urgent improvements to realize this potential. This paper addresses the rationale of knowledge management on organization performance. It

is hoped that this paper will shed light on the impact of KM strategies on performance thus improving its place in research organizations

Serban and Luan (2011) noted that effective knowledge management helps in change management, influencing business strategy, and a host of other high-value-added activities that impact organizational effectiveness (OE). In knowledge management process, human resource is an indispensable resource. Many firms are highly dependent on their human capital for their organizational effectiveness. The market value of human resource increasingly depends on their intangible assets, such as their knowledge, core competencies, and organizational capabilities (Ulrich & Small Nonaka, 2011). In addition, change seems to be almost a constant today, so that organizations have an increased level of need for expertise and capability to handle changes in management and the implementation of new business policies, practices, knowledge and strategies. Chong (2011) proposed that activities such as appropriate employee's staffing, employee's ability and technology development, systematic organizational structure development, construction of compensation system about employee's performance should be promoted to use knowledge asset effectively for enhanced organizational effectiveness.

2.2.4 Knowledge Application

Also, Earl (2011) conducted a study to establish effective knowledge management model from the perspective of organizational capabilities. This perspective suggests that a knowledge infrastructure consisting of technology, structure, and culture along with knowledge process architecture of acquisition, conversion, application, and protection are essential organizational capabilities or preconditions for effective knowledge management. Lee and Choi (2003) emphasized that knowledge management consists of

processes to manage knowledge and enablers (or capabilities) to support these processes. They also argue that knowledge management enablers consist of organizational culture, structure, people, and information technology support.

Yusoff and Daudi (2010) using a 7-point Likert scale, correlation analysis and regression analysis concluded that knowledge application positively influences performance consistent with McKeen, Zack and Singh (2006) study that used a 5-point Likert scale, and showed that there was a statically significant positive link between perceptions of high adoption of the KM practices and perceptions of high organizational performance. However, the conclusion of Yusoff and Daudi's study cannot be generalised because of the low response rate of thirty eight percent.

Miguel, Saavedra and Lindemann (2016) in the International Design Conference reviewed factors influencing knowledge application. This was against the premise that most studies have concentrated their work on collection, storage and transfer of knowledge ignoring whether knowledge is finally applied. They did a review of the factors influencing knowledge application from relevant literature in the field of knowledge management and collected 364 factors named by the authors of 31 journal papers which were then analysed and classified into the 4 categories of the Work Centred Model (WCM) namely infrastructure, strategic, knowledge and psycho social factors. The paper provided a summary of a large amount of hardly comparable research results aligned to one unique model. They further proposed that the WCM can now be used as a base to develop new approaches to support knowledge application and understand to which factors new approaches contribute positively or negatively.

Clarke, Sankaran, Sankaran and Xu (2008) conducted a literature to review to investigate the gaps in the current literature on knowledge management. They reviewed 80 knowledge management papers from seven selected journals in the disciplines of information systems, business, management and operations research, where they identified the current status, activities and directions of knowledge management research. They suggested the need for more research on the evaluation of knowledge management performance since knowledge management adoption decisions rely greatly on the expected performance of knowledge management.

Mahmood and Shah (2015) conducted a literature review research on knowledge management in Pakistan. An overview of knowledge management initiatives and attempts in any form were focus of this research in and about Pakistan. Knowledge management related information was collected by literature search through websites, research journal archives, and library catalogues. The study found out that knowledge management is directly linked with organizational objectives of high productivity, innovation, and greater outputs and recommended that industry and academicians should join hands to go side by side for proper grooming of knowledge management in Pakistan. The researchers identified that knowledge management is gaining roots in Pakistan, that's why there are many gaps in its theoretical and practical implications. Many research studies were conducted for academic purpose rather than for the fulfillment of industrial requirements.

Gray (2011) examined empirically that the mutual relationships between knowledge management practice ways proposed in organization to support creation, storage, and transfer of knowledge can raise organizational effectiveness. Specifically, Gray presented five ways notably formal training of employees, construction of knowledge repository, informal knowledge fairs of employees, spur of communities of practices (CoP), and talk

rooms of R&D employees about their current projects for knowledge management practice ways to raise organizational performance. However, knowledge need in industry is influenced by a myriad of factors depending on geographical location, levels of technological sophistication, and economic status of the nation.

2.3 Summary of Literature Review

The acquisition of knowledge and the process of organizational learning are foundational components of the knowledge process. From more specific socio-cultural perspectives, organizations that accumulate, apply and share knowledge are often perceived as leaders rather than followers and to succeed as opposed to fail in a knowledge-based economy. Knowledge conversion involves the process where tacit knowledge has to be made explicit in order to be captured. Explicit knowledge, on the other hand, is academic or technical data or information that exists in a concrete form of a manual, book, copyright, patent, or mathematical expression. It is carefully and systematically codified, stored in databases and shared through print, electronic methods, formal education, and other formal means. It is commonly used and can be freely reused to solve similar types of problems.

Knowledge sharing and exchange between involved parties is essential for a successful accomplishment of the task in an organization for organizational effectiveness. Globalized markets as well as increasing cost and innovation pressure lead to heterogeneous, distributed environments, which require intense knowledge exchange via Internet communication across enterprise boundaries. In this regard, protection of innovative knowledge and intellectual property (IP) plays a decisive role because corporate knowledge is crucial for economic success and competitiveness of enterprises.

Moreover, knowledge theft and plagiarism result in substantial economic losses and damages to organizational image. Knowledge application refers to dimension of information. It refers to activities associated with the flow of knowledge from one party to another. Efficient and effective knowledge management typically requires an appropriate combination of organizational, social, and managerial initiatives along with the deployment of appropriate technology for application of knowledge. With the successful application of useful knowledge, companies can improve the process of organisational learning to enhance performance and create more possibilities to gain competitive advantages for the organization. Does the argument hold for not for profit organizations and in particular research institutions as it does for profit oriented firms? What therefore is the effect of KM on research firms?

CHAPTER THREE

RESEARCH METHODOLOGY

This chapter discusses the research design that was adopted for this study, target population for the study, the sampling design, data collection instruments, and the data analysis methods that were adopted.

3.1 Research Design

Research design is the general plan of how one goes about answering the research questions (Bryman& Bell, 2007). This methodology allows researchers to develop a theoretical interpretation of an organizational phenomenon. As defined by Strauss and Corbin, (1990), the grounded theory approach is a qualitative research method that uses a systematic set of procedures to develop an inductively derived grounded theory about a phenomenon. Using the grounded theory methodology, this study offered a conceptual interpretation of the various themes that emerge for the phenomenon under study. The qualitative approach is selected in this study since it is particularly useful for studying meanings, perceptions, and complex processes (Creswell, 2012), especially when the research question addresses little investigated phenomena and socially constructed elements (Charmaz, 2006; Yin, 2009).

This research employed a case study design. According to Mugenda and Mugenda (1999), a case study design is an intensive and exhaustive investigation of an individual, group, institution or phenomenon for the purposes of generalizations. Gulsecen & Kubat (2006) also acknowledged that it can be considered a robust research method particularly when a holistic, in-depth investigation is required. Tellis, (1997) also notes that by including both quantitative and qualitative data, case study helps explain both the process

and outcome of a phenomenon through complete observation, reconstruction and analysis of the cases under investigation hence its justification for this study.

3.2 Study Area

The study area for the study was KEMRI – Kisumu which represented other research institutions in Kenya. The Centre for Global Health Research is one of the ten (10) Research Centres of the Kenya Medical Research Institute (KEMRI). The Centre is strategically located in Kisumu, western Kenya, in an area that is endemic for major infectious diseases. Since its establishment in 1984, Centre for Global Health Research has been on the world map as the site of ground-breaking research focusing on infectious diseases of medical importance.

3.3 Target Population

According to Nassiuma (2000), a population is a well-defined or set of people, services, elements, and events, group of things or households that are being investigated. The target population of this study was the all 201-management staff working in the KEMRI–Kisumu.

3.4 Sample Frame

The sampling frame describes the list of all population units from which the sample was selected (Cooper & Schindler, 2013). The study adopted a 2-stage purposive sampling technique. The researcher purposively sampled all the management staff of KEMRI who was stratified into top, middle and lower level management and a random sample picked from each strata. According to Mugenda and Mugenda (1999), purposive or judgemental sampling is a sampling technique in which the researcher consciously selects specific

elements or subjects for inclusion in a study in order to ensure that the elements have certain characteristics relevant to the study hence its justification for the study. Stratified sampling on the other hand involves dividing the target population into several groups that are alike and a random selection is made from each group. This enabled the researcher achieve greater precision as it enables more accurate representation of the subgroups within the population

Table 3. 1: Management Staff Strata

	Frequency	**Percentage**
Top management	36	17.9
Middle level management	77	38.3
Low level management	88	43.8
Total	**201**	**100**

To obtain the desired sample size for the study with the population of 201, Nassiuma (2000) formula is used as shown;

$$n = \frac{N(cv^2)}{Cv^2 + (N-1)e^2} \quad \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots 3.1$$

Where ***n***= sample size

N = population (201)

Cv= coefficient of variation (take 0.6)

e= tolerance of desired level of confidence (take 0.05) at 95% confidence level)

$$n = \frac{201(0.6^2)}{0.6^2 + (201-1)0.05^2} = 164$$

To obtain the desired sample size from each stratum, stratified sampling formula is used $i = n\ (N/P)$, (Kothari, 2009). Where: ***i*** are the number of respondents in the stratum to be sampled, ***n*** is the sample size, ***N*** is the population of the specific stratum, ***P*** is the population.

The sample size of each stratum is calculated using the formula $i = n\ (N/P)$,

The study employed stratified random sampling technique in coming up with a sample size of 164 respondents from a total of 201 of representatives of management staff. Stratified random sampling is unbiased sampling method of grouping heterogeneous population into homogenous subsets then making a selection within the individual subset to ensure representativeness (Bryman & Bell, 2013). The goal of stratified random sampling is to achieve the desired representation from various sub-groups in the population. In stratified random sampling subjects are selected in such a way that the existing sub-groups in the population are more or less represented in the sample (Sekaran, 2012). The method was used since the population can be divided into distinct groups bearing distinct characteristics. From each stratum, simple random sampling was used to select the respondents for the questionnaires.

Table 3. 2: Sampling Frame

	Frequency	**Ratio**	**Sample Size**
Top management	36	0.816	29
Middle level management	77	0.816	63
Low level management	88	0.816	72
Total	**201**		**164**

3.5 Data Collection Methods

Data collection is a means by which information is obtained from the selected subjects of an investigation (Sproul, 2011). He further explains that primary data is data that is used for a scientific purpose for which it was collected. Primary data collection was adopted for this study.

3.5.1 Sources of Data

Primary data was collected from the respondents' management staff working in the KEMRI – Kisumu. Questionnaires had questions prompting the respondents to avail the information being sought. Closed ended questions were used in an effort to conserve time and money as well as to facilitate an easier analysis as they are in immediate usable form; while the open-ended questions were used as they encourage the respondent to give an in-depth and felt response without feeling held back in revealing of any information. With open ended questions, a respondent's response gives an insight to his or her feelings, background, hidden motivation, interests and decisions.

3.5.2 Data Collection Procedures

This refers to means by which the researcher used to gather the required data or information. The study used primary data (Kothari, 2003). On the primary data, questionnaires were used to collect data. The researcher administered the questionnaire individually to all respondents. Care and control by the researcher was exercised to ensure all questionnaires issued to the respondents were received. To achieve this, the researcher maintained a register of questionnaires, which was sent and received. The questionnaire was administered using a drop and pick later method to the sampled respondents.

3.5.3 Instrument for Data Collection

Primary data was obtained using self-administered questionnaires while secondary data was obtained using data collection sheet. The questionnaire is made up of both open ended and closed ended questions covering issues associated to effect of knowledge management on performance of research institutions focusing at a case study of KEMRI - Kisumu. The open-ended questions were used so as to encourage the respondent to give an in-depth and felt response without feeling held back in illuminating of any information and the closed ended questions allow respondent to respond from limited options that had been stated. According to Edwards (2014), the open ended or unstructured questions allow profound response from the respondents while the closed or structured questions are generally easier to evaluate. The questionnaires were used in an effort to conserve time and money as well as to facilitate an easier analysis as they are in immediate usable form.

3.5.4 Reliability of Research Instruments

Instrument reliability on the other hand is the extent to which a research instrument produces similar results on different occasions under similar conditions. It's the degree of consistency with which it measures whatever it is meant to measure (Bell, 2010). The pre-testing aimed at determining the reliability of the research tools including the wording, structure and sequence of the questions. Reliability is a measure of the degree to which a research instrument yields consistent results or data after repeated trials (Neuman, 2010). A construct composite reliability co-efficient (Cronbach alpha) of 0.7 or above, for all the constructs, is considered to be adequate for this study (Rousson, Gasser &Seifer, 2012). Reliability coefficient Cronbach's alpha (α) which is computed as follows:

$\alpha = k/k-1 \times [1-\sum (S^2)/\sum S^2 sum]$ ……3.2

Where: α= Cronbach's alpha

k = Number of responses

$\sum (S^2)$ = Variance of individual items summed up

$\sum S^2 sum$ = Variance of summed up scores

Reliability analysis was subsequently done using Cronbach's Alpha which measures the internal consistency by establishing if certain items within a scale measure the same construct. Kothari (2004) established the Alpha value threshold at 0.7. The results were as shown in Table 3.3.

Table 3. 3: Reliability Analysis

	Cronbach's Alpha	**Decision**
Knowledge acquisition	0.888	Reliable
Knowledge conversion	0.873	Reliable
Knowledge protection	0.743	Reliable
Knowledge application	0.831	Reliable

Source: Research data (2018)

From the results in Table 3.3, Cronbach Alpha was established for every objective which formed a scale. All the variables were reliable since their Cronbach Alpha value were greater than 0.7 in which knowledge acquisition had the highest Cronbach Alpha value of 0.888 and knowledge protection had the lowest Cronbach Alpha value of 0.743. As per Malhotra (2015), if all the variables are reliable then the research instrument is reliable and therefore no amendments required.

3.5.5 Validity of Research Instruments

Pilot testing was done to establish the validity of the research instrumentation and to enhance face validity (Joppe, 2009). The purpose of pilot study was to check completeness, ambiguity and gauge time taken to collect data using proposed data collection instrument. Validity is the degree to which results obtained from analysis of the data actually represent the phenomenon under study. To ensure construct and criterion validity of this study, a pilot study was conducted involving 16 respondents who was not participate in the final study representing 10% of the sample size. To ensure content validity, the researcher relied on the expert judgement of the supervisor.

3.6 Data Analysis

Data was analysed using Statistical Package for Social Sciences. All the questionnaires received was referenced and items in the questionnaire was coded to facilitate data entry. Descriptive statistics was used because they enable the researcher to meaningfully describe distribution of scores or measurements using few indices. The qualitative data from the open-ended questions were analysed using conceptual content analysis.

Inferential analysis was also done using correlation and regression analysis (multiple regression analysis). Multiple regression analysis was used to establish the relations between the independent and dependent variables. Multiple regression tools were used because it is the procedure that uses two or more independent variables to predict a dependent variable. Multiple regression attempts to determine whether a group of variables together predict a given dependent variable (Babbie, 2010). The multiple regression model was generally assuming the following equation;

$$Y_i = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \varepsilon \qquad \ldots 3.3$$

Where:-

Y_i= organizational performance

β_0=constant

β_1, β_2, β_3 and β_4 = Beta coefficients

X_1= knowledge acquisition

X_2= knowledge conversion

X_3= knowledge protection

X_4= knowledge application

ε = Error term

In testing the significance of the model, the coefficient of determination (R^2) was used to measure the extent to which the variation effect of knowledge management on performance of research institutions. F-statistic was also computed at 95% confidence level.

3.7 Data Presentation

Primary data obtained from questionnaires were analysed and descriptive statistics such as frequencies, percentages, mean score and standard deviation was estimated for all the quantitative variables and information presented inform of tables and graphs. Based on Saunders, Lewis and Thornhill (2009) recommendation on the analysis of qualitative data, collected data was organized, sorted out, coded and thematically analysed, searching for meaning, interpreting and drawing of conclusions on the basis of concepts. Then it was presented in prose.

3.8 Research Ethics

The researcher requested for a letter of introduction from Maseno University to present to KEMRI – Kisumu so as to be allowed to collect data from its staff. Before collecting the data for the study, respondents in the sample were briefed by the researcher on the importance of the study and the overall expectations. An affirmation of confidentiality observance was given indicating that a firm's information was kept confidential and was only used for the purpose of this study. The researcher requested the respondents to fill in the questionnaire out of their own free will. Respect for the respondents were observed. The researcher acknowledged the source of information.

CHAPTER FOUR

RESULTS AND DISCUSSIONS

The findings from the respondents' responses on the questions in the questionnaires are presented in this chapter. The chapter is organized to present the findings by first looking at the response rate, the demographic variables and objectives. In order to simplify the discussions, the researcher provided tables that summarize the collective reactions of the respondents on their demographic data and the effect of knowledge management on performance of KEMRI– Kisumu County, Kenya.

4.1 Response Rate

As shown in Table 4.1, the questionnaires that the researcher administered were 164 out of which only 117 fully filled questionnaires were returned. This gave a response rate of 96.3% which was within what Sekaran (2003) prescribed as a significant response rate for statistical analysis and established it at a minimum value of 50 percent.

Table 4.1: Response Rate

	Frequency	**Percentages**
Response	117	71.3%
Non-response	47	28.7%
Total	**164**	**100.00**

Source: Research data (2018)

4.2 Background Information

This section required the respondents to indicate their background information including gender, highest level of education and how long they had been with KEMRI. This information is presented in form tables and sections.

4.2.1 Gender of the Respondents

The researcher required the respondents to indicate their gender. Their responses are presented in Table 4.3.

Table 4. 2: Gender of the Respondents

	Frequency	**Percent**
Male	72	61.5
Female	45	38.5
Total	**117**	**100**

Source: Research data (2018)

As per the findings, the results showed that most of the respondents were male as illustrated by 61.5% and the rest of the respondents were female as shown by 38.5%. The findings show that most of the respondents were male. This was male are more interested in research more than women and hence they are more likely to be employed in KEMRI. However, some female respondents participated in the study implying that the researcher was not gender biased in data collection. This made the data collected to be reliable since all the genders were represented providing a wide range of responses.

4.2.2 Highest Level of Education

The respondents indicated their highest level of education as requested by the researcher. Table 4.4 presents their responses.

Table 4.3: Highest Level of Education

	Frequency	**Percent**
Diploma	15	12.8
Bachelors	63	53.8
Masters	25	21.4
PhD	14	12
Total	**117**	**100**

Source: Research data (2018)

From Table 4.3 the results show that the highest level of most of the respondents was bachelors as shown by 53.8%, followed by masters as shown by 21.4%, followed by diploma as shown by 12.8% and the least of the respondents indicated that their highest level of education was PhD as shown by 12%. This implied that most of the respondent's level of education was bachelors. This information was of great importance for it helped the researcher to know whether the respondents were fit to give reliable information. This also showed that most of the respondents had basic education to be able to respond to the questionnaires effectively.

4.2.3 Working Experience with KEMRI - CGHR

The researcher requested the respondents to indicate how long they had been with KEMRI - Kisumu. Their responses were presented in Table 4.4.

Table 4.4: Experience with KEMRI

	Frequency	Percent
Less than 3 year	20	17.1
4 to 6 years	30	25.6
7 to 9 years	56	47.9
10 years and above	11	9.4
Total	**117**	**100**

Source: Research data (2018)

Table 4.4 results show that most of the respondents had been with KEMRI – Kisumu for 7 to 9 years as expressed by 47.9%, followed by those who had been with KEMRI – Kisumu for 4 to 6 years as illustrated by 25.6%, followed by those that had been with KEMRI – Kisumu for less than 3 years as shown by 17.1% and the least were those who had been with KEMRI – Kisumu for more than 10 years as shown 9.4%. This implied that all the respondents had been with KEMRI – Kisumu for some time. It also implies that since most of the respondents had an experience of 7 to 9 years, the information they provided could be relied upon. The more years respondents have in experience in research the more information he or she possess.

4.3 Knowledge Acquisition

The study sought to establish the effect of knowledge acquisition on performance of KEMRI – Kisumu. Therefore, the researcher asked the respondents to indicate the extent to which knowledge acquisition affect performance of KEMRI – Kisumu. Their replies were as shown in Table 4.5.

Table 4.5: Responses on Extent to which Knowledge Acquisition affects Performance of KEMRI

	Frequency	**Percent**
Little extent	4	3.4
Moderate extent	43	36.8
Great extent	43	36.8
Very great extent	27	23.1
Total	**117**	**100**

Source: Research data (2018)

As per the findings, 36.8% of the respondents indicated that knowledge acquisition affect performance of KEMRI – Kisumu to a great extent, 36.8% indicated to a moderate extent, 23.1% indicated to a very great extent and 3.4% indicated that knowledge acquisition affect performance of KEMRI CGHR – Kisumu to a little extent. These findings imply that knowledge acquisition has effect on performance of research institutions. These findings are in line with Robertson and Hammersley (2009) who noted that the acquisition of knowledge and the process of organizational learning, are foundational components of the knowledge process. From more specific socio-cultural perspectives. Knowledge acquisition in an organization could be seen via a range of processes: the individual, shared understanding; diffusion and finally embedding. The findings are in line with Resource Based View Theory that emphasizes that a firm utilizes its resources and capabilities to create a competitive advantage that ultimately results in superior value creation and achieve organizational effectiveness. In order to achieve organizational effectiveness, the firm must allocate its resources and capabilities wisely against competing needs as a result of changing business environment

Further the researcher requested the respondents to indicate extent to which various aspects of knowledge acquisition affect performance of KEMRI – Kisumu. The findings were as illustrated in Table 4.6.

Table 4.6: Aspects of Knowledge Acquisition Affecting Performance of KEMRI

	Mean	Std. Dev.
Employees obtain new knowledge from external sources (e.g. through seminars, journals, expert networks, business partners and clients).	4.145	0.802
Employees acquire knowledge from written sources (e.g. projects documentation, organisational procedures, instructions and formal documented sources).	3.821	0.816
Employees acquire knowledge from other employees informally from co-workers	3.470	0.566
Knowledge acquisition results in Development of knowledge	2.615	0.555
Knowledge acquisition facilitates knowledge dissemination	3.769	0.648
Knowledge acquisition facilitates development and sustenance of expertise	2.393	0.707

Source: Research data (2018)

As per the findings, to a great extent the respondents indicated that employees greatly obtain new knowledge from external sources (e.g. through seminars, journals, expert networks, business partners and clients) as shown by a mean of 4.145, that employees greatly acquire knowledge from written sources (e.g. projects documentation, organisational procedures, instructions and formal documented sources) as shown by a mean of 3.821 and that knowledge acquisition facilitates knowledge dissemination as shown by a mean of 3.769. The respondents also indicated that employees moderately

acquire knowledge from other employees informally from co-workers as shown by a mean of 3.470, that knowledge acquisition moderately results in Development of knowledge as shown by a mean of 2.615 and that knowledge acquisition lowly facilitates development and sustenance of expertise as shown by a mean of 2.393. This implies that to a great extent, knowledge acquisition enables employees get new knowledge from external sources, written sources, and co-workers, and facilitates development and sustenance of expertise thereby affecting the firm's performance. However the low mean of 2.393 on development and sustenance of expertise points to a labour mobility challenge affecting the modern organization and knowledge management. These findings are in line with Alavi and Leidner (2009) who argues that the impact of the use of KMS on explicit knowledge acquisition is critical given that explicit knowledge provides the foundation for and is the precursor of tacit knowledge development. As such, acquisition of explicit knowledge is a critical component in the development and sustenance of expertise and consequently a firm performance driver. It is under the same premises that this study is founded.

The respondents were asked to state other ways in which knowledge acquisition affects performance and from research data it was established that it improved focus in human capital and created an organized approach to knowledge acquisition enabling the organization to tap optimally into this resource thereby directly contributing to performance, it creates an active people to people network thereby improving collaboration and teamwork, and it aligns the organization culture by creating an optimal knowledge sharing strategy. These findings show that knowledge application has effect on organization performance

4.4 Knowledge Conversion

The researcher sought to determine the effect of knowledge conversion on performance of KEMRI – Kisumu. Hence the respondents were requested to indicate the extent to which knowledge conversion affect performance of KEMRI – Kisumu. The study results were as shown in Table 4.7.

Table 4.7: Responses on Extent to which Knowledge Conversion affects Performance of KEMRI

	Frequency	Percent
Little extent	8	6.8
Moderate extent	47	40.2
Great extent	42	35.9
Very great extent	20	17.1
Total	**117**	**100**

Source: Research data (2018)

From the findings, 40.2% of the respondents indicated that knowledge conversion affect performance of KEMRI – Kisumu to a moderate extent, 35.9% indicated to a great extent, 17.1% indicated to a very great extent and 6.8% of the respondents indicated that knowledge conversion affect performance of KEMRI – Kisumu to a little extent. This implies that knowledge conversion has effect on performance, a finding that is in agreement with Nonaka and Krogh (2009) who noted that organizational knowledge conversion is based on two dimensions. The first dimension shows that only individuals create knowledge. The second dimension relates to the interaction between explicit and tacit knowledge. These two dimensions form the basis for defining the four processes of conversion of knowledge; socialization, externalization, combination and internalization which were postulated as performance drivers.

Further the researcher requested the respondents to indicate extent to which various aspects of aspects of knowledge conversion affect performance of KEMRI – Kisumu. The findings were as illustrated in Table 4.8.

Table 4.8: Aspects of Knowledge Conversion Affecting Performance of KEMRI

	Mean	Std. Dev.
Employees are willing to share learnt knowledge and experience	4.060	0.874
Employees consider both successful and unsuccessful experiences valuable	4.214	0.879
Learnt knowledge and experience are shared routinely	3.675	0.859
Learnt knowledge and experience are documented for future reference	3.786	0.869
There is a structured format, such as a classification scheme, to follow when documenting lessons learned	2.393	0.491
Documented knowledge is available for use as and when required	3.992	0.876

Source: Research data (2018)

From the findings, the respondents indicated that to a great extent, employees consider both successful and unsuccessful experiences valuable as illustrated by a mean of 4.214, employees are willing to share learnt knowledge and experience as illustrated by a mean of 4.060 and that documented knowledge is available for use as and when required as illustrated by a mean of 3.992. Further the respondents indicated that to great extent learnt knowledge and experience are documented for future reference as illustrated by a mean of 3.786 and learnt knowledge and experience are shared routinely as illustrated by a mean of 3.675. However, the respondents indicated that to low extent, there is a structured format, such as a classification scheme, to follow when documenting lessons learned as illustrated by a mean of 2.393. These findings imply that past experiences, willingness to share knowledge, documentation and classification schemes affect performance. The low

mean of 2.393 on classification scheme suggests need for improvement in this area as regards knowledge conversion. These findings are in line with Tsoukas (2003) who suggests that knowledge conversion occurs when people engage in practical activities through participation in social practices, under the guidance of people who are more experienced. An alternative to knowledge conversion is a process of shifting between focal and subsidiary awareness. The individual shifts awareness between the task and the tools, reflects on their own experiences, uses language to remind oneself of what they already know, thematizes certain circumstances, and discusses them with others which was proposed to affect performance.

The respondents were asked to state other ways in which knowledge conversion affects performance and from research data it was established that it is a perfect strategy for reducing loss of organizational know-how by capturing both explicit and tacit knowledge, it enables the firm and participants capture critical knowledge across projects, teams and departments through explicit mediums thereby making key data resources not only discoverable but also reusable, and it enhances timely access to knowledge thereby speeding processes within the organization, it promotes cooperation and exchange of experience among workers, and it enables consistency in capturing and sharing of information thereby affecting the firms performance.

4.5 Knowledge Protection

The study sought to assess the effect of knowledge protection on performance of KEMRI – Kisumu. Thus, the researcher also asked the respondents to indicate the extent to which knowledge protection affect performance of KEMRI – Kisumu. Their replies were as shown in Table 4.9.

Table 4.2: Responses on the Extent to which Knowledge Protection affects Performance of KEMRI

	Frequency	Percent
Little extent	18	15.4
Moderate extent	23	19.7
Great extent	48	41
Very great extent	28	23.9
Total	**117**	**100**

Source: Research data (2018)

As per the research data findings, 41% of the respondents indicated that knowledge protection affect performance of KEMRI – Kisumu to a great extent, 23.9% indicated to a very great extent, 19.7% indicated to a moderate extent and 15.4% indicated that knowledge protection affect performance of KEMRI – Kisumu to a little extent implying a cause effect relationship between knowledge protection and performance. This is in line with Bosch (2011) who argues for knowledge protection and emphasizes that juridical protection means are not suitable for pre emptive knowledge protection because they do not actively prevent knowledge from being stolen or misused. In addition to that, they can be circumvented and even legitimate actions for injunction or compensation often take a long time.

Further the researcher requested the respondents to indicate extent to which various aspects of knowledge protection affect performance of KEMRI – Kisumu. The findings were as illustrated in Table 4.10.

Table 4. 3: Aspects of Knowledge Protection Affecting Performance of KEMRI

	Mean	Std. Dev.
Training is available for documented knowledge	4.137	0.819
Strategic protection ensures retention of knowledge and expert workers	3.744	0.842
Technical protection measures are in place to avoid unauthorised access	2.274	0.467
Classification and codification of documented knowledge is in place to enable quick access	3.778	0.975
Digital records are held for documented knowledge for ease of access and future reference	4.205	0.783

As per the findings, to a great extent the respondents indicated that digital records are held for documented knowledge for ease of access and future reference as indicated by a mean of 4.205, that training is available for documented knowledge as indicated by a mean of 4.137, that classification and codification of documented knowledge is in place to enable quick access as indicated by a mean of 3.778 and that strategic protection ensures retention of knowledge and expert workers as indicated by a mean of 3.744. However, to a low extent, the respondents indicated that technical protection measures are in place to avoid unauthorized access as indicated by a mean of 2.274. It is evident here that digital records, training, classification and codification, strategic protection and technical protection have an effect on performance. The mean of 2.274 on strategic protection points to a scenario where there should be more investment on this area. These findings correlate with Haberfellner, Daenzer and Becker (2012) who noted that protecting valuable knowledge and intellectual property of companies is assisted by various existing protection means and aim at improving a firms capabilities and competitive strengths.

The respondents were asked to state other ways in which knowledge protection affects performance and from research data findings it was established that it played a critical in complementing employment policies which created guidelines on use and sharing of company information, and acted as an enabler to a robust recovery system is thereby ensuring efficiency in storing company documents and records that are required for the company and its operations thereby impacting on performance. It was however noted that knowledge protection created a red tape that ensured access against authorized sanctions but increased time to access to information and decision making.

4.6 Knowledge Application

Further the researcher sought to find out the effect of knowledge application on performance of KEMRI – Kisumu. Therefore, the respondents were asked to indicate the extent to which knowledge application affect performance of KEMRI – Kisumu. Their replies were as shown in Table 4.11.

Table 4.4: Responses on Extent to which Knowledge Application affect Performance of KEMRI

	Frequency	**Percent**
Little extent	12	10.3
Moderate extent	24	20.5
Great extent	56	47.9
Very great extent	25	21.4
Total	**117**	**100**

Source: Research data (2018)

As per the findings, 47.9% of the respondents indicated that knowledge application affect performance of KEMRI – Kisumu to a great extent, 21.4% indicated to a very great extent, 20.5% indicated to a moderate extent, 10.3% indicated that knowledge application affect performance of KEMRI – Kisumu to a little extent. From research data, a causal relationship exists between knowledge application and performance. This concurs with Marwick (2011) who argues that efficient and effective knowledge management typically requires an appropriate combination of organizational, social, and managerial initiatives along with the deployment of appropriate technology for application of knowledge.

Further the researcher requested the respondents to indicate extent to which various aspects of knowledge application affect performance of KEMRI – Kisumu. The findings were as illustrated in Table 4.12.

Table 4. 5: Aspects of Knowledge Application Affecting Performance of KEMRI

	Mean	**Std. Dev.**
Use of documented knowledge aids faster and superior decision making	2.470	0.566
Use of documented knowledge enhances creativity and innovation	3.684	0.582
Use of documented knowledge enhances replication of past successes and avoidance of failures	4.120	0.800
Employees regard knowledge as organization property and freely share and adopt it	2.803	0.591
Employees regard knowledge as learning tools	3.915	0.847

Source: Research data (2018)

From the findings, the respondents indicated that to a great extent, use of documented knowledge enhances replication of past successes and avoidance of failures as shown by a

mean of 4.120, employees regard knowledge as learning tools as shown by a mean of 3.915 and use of documented knowledge enhances creativity and innovation as shown by a mean of 3.684. However, the respondents indicated that to moderate extent employees regard knowledge as organization property and freely share and adopt it as shown by a mean of 2.803 and that to a low extent, use of documented knowledge aids faster and superior decision making as shown by a mean of 2.470. This implies that documented knowledge guides future actions, facilitates learning, enhances creativity and aids faster and superior decision making thereby impacting on the firm's performance. This is in line with Riungu (2015) who examined the effect of knowledge management practices on organizational performance of the 21 mobile telephone companies in Kenya and found out that the management of mobile telephone companies in Kenya understand the term knowledge management, as an alternative strategy by organizations to improve competitive performance. The low mean of 2.47 on aiding faster and superior decision making may be in line with the previous finding on knowledge protection where there seems to be bureaucracies hampering quick access to documented knowledge and consequently affecting decision making speed.

The respondents were asked to state other ways in which knowledge application affects performance and from research data it was established that knowledge application aids continuous improvement processes hence efficiency in the overall business process, it is a good motivation tool as it not only supported employee growth and development but also served as a reward tool, it enabled sharing of specialist know-how thereby enabling goal achievement

4.7 Performance of KEMRI – Kisumu

The respondents were also asked to indicate the trend of performance of KEMRI – Kisumu for the last five years. Their replies were as shown in Table 4.13.

Table 4. 136: Trend of Performance of KEMRI – Kisumu

	Mean	Std. Dev.
Number of the beneficiaries	4.162	0.861
Customer service quality	3.838	0.820
Employee motivation	3.205	0.714
Customer satisfaction	4.120	0.832

Source: Research data (2018)

As per the findings, the respondents indicated that number of the beneficiaries as shown by a mean of 4.162, that customer satisfaction as shown by a mean of 4.120 and that customer service quality as shown by a mean of 3.838 had improved for the last five years while employee motivation as shown by a mean of 3.205 had been constant for the last five years. These findings show improved performance trends in the firm implying a positive effect of knowledge management strategies on the firm's performance. These findings concur with Kent and Weese (2012) who indicated that performance of the organizations is measured by the congruence between the goals of the organization and the observed outcome. Measurement is important in deciding the degree of this congruence between the goals and the outcomes. The performance is measured as how well it works and achieves to its intended results. The participants who are in relationship with the organization such as employees, customers or shareholders play the main role for the organizational performance.

The respondents were asked other performance indicators recorded over the past five years and from research data it was found out that the firm experienced improvements in teamwork, operating systems and processes, staff knowledge and expertise, learning and development and the results of the learning process, beneficiary satisfaction rates and stakeholder engagements.

The study respondents were asked to make recommendations as regards knowledge management to improve the performance of KEMRI – Kisumu and the research data found out that a measurement system should be in place to show the value of KM in the organization and thereby improve its status, the firm should invest more in exit interviews and succession planning to capture knowledge optimally from outgoing staff, top management should prioritize KM activities to improve its place and results, and ease of access to information should be improved to reduce response time.

4.8 Regression Analysis

This was conducted to determine the relationship between knowledge acquisition, knowledge conversion, knowledge protection and knowledge application as the independent variables against the dependent variable performance of KEMRI – Kisumu. The researcher conducted a multiple regression analysis so as to test relationship among variables (independent) on performance of KEMRI – Kisumu. The researcher applied the statistical package for social sciences to code, enter and compute the measurements of the multiple regressions for the study. The results were as presented in Table 4.13, Table 4.14 and Table 4.14.

Table 4.7: Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	0.839	0.704	0.694	1.313

Source: Research data (2018)

From the study results, Table 4.14 is a model fit which establishes how fit the model equation fits the data. The results of multiple regression analysis obtained multiple correlation coefficient (R) of 0.839 indicates positive correlation of knowledge acquisition, knowledge conversion, knowledge protection and knowledge application with Performance. Our coefficient of determination R^2 is 0.704 implying that 70.4% of variations in dependent variable (Performance) are explained by the independent variables (Knowledge management) present in our model. The adjusted R^2 was used to establish the predictive power of the study model and it was found to be 0.694 implying that 69.4% of the variations in performance of KEMRI – Kisumu are explained by changes in knowledge acquisition, knowledge conversion, knowledge protection and knowledge application.

Table 4.8: Analysis of Variance (ANOVA)

Model		Sum of Squares	Df	Mean Square	F	Sign.
1	Regression	471.632	4	117.908	66.625	.000
	Residual	198.208	112	1.770		
	Total	**669.84**	**116**			

The probability value of 0.000 indicates that the regression relationship was highly significant in predicting how the knowledge acquisition, knowledge conversion, knowledge protection and knowledge application affected performance of research institutions in Kenya. The F calculated at 5 per cent level of significance was 66.625. Since F calculated is greater than the F-critical (value = 2.405) and p-value was less than 0.05, we reject the null hypothesis and conclude that the overall model was significant.

Table 4.16: Regression Coefficients

	Un standardized Coefficients		**Standardized Coefficients**	**t**	**Sig**
	B	**Std. Error**	**Beta**		
(Constant)	0.864	0.112		7.714	.000
Knowledge acquisition	0.995	0.393	0.921	2.532	.013
Knowledge conversion	0.717	0.244	0.664	2.939	.004
Knowledge protection	0.775	0.339	0.718	2.286	.025
Knowledge application	0.679	0.178	0.629	3.815	.000

The regression equation obtained from this outcome was: -

$$\mathbf{Y = 0.864+0.995X_1 + 0.717X_2 +0.775X_3 + 0.679X_4}$$

As per the study results, it was revealed that if all independent variables were held constant at zero, then the performance of KEMRI – Kisumu will be 0.987.

4.9 Effect of Knowledge Acquisition on Performance of KEMRI – Kisumu

To test the hypothesis that there is no effect of knowledge acquisition on organization performance, regression analysis was used and revealed that knowledge acquisition correlates to performance (β=0.921, p=.013) which is positive and significant hence the null hypothesis is rejected and the alternative hypothesis is adopted. This means that 1 standard deviation in knowledge acquisition will result in a change of 0.921 standard deviation units in performance implying that investment in knowledge acquisition will improve performance of KEMRI – Kisumu. The t calculated value of 2.532 is also greater that $t_{0.05,116}$ of 1.980626 hence the conclusion that the regression variable is significant. This data concurs with Riungu (2015) who established positive correlation between knowledge acquisition and performance of mobile telephone companies in Kenya (β=0.628, p=.028)

4.9.1 Effect of Knowledge Conversion on Performance of KEMRI – Kisumu

To test the hypothesis that there is no effect of knowledge conversion on organization performance, regression analysis was used and revealed that knowledge conversion has a cause effect relationship with performance (β=0.664, p=.004) which is positive and significant hence the null hypothesis is rejected and the alternative hypothesis is adopted. This implies that 1 standard deviation in knowledge conversion will result in a change of 0.664 standard deviation units in performance implying that if the firm adds to its knowledge acquisition efforts it will experience improved performance. The t calculated value of 2.939 is also greater that $t_{0.05,116}$ of 1.980626 hence the conclusion that the predictor variable is significant. This data concurs with the knowledge-based view of the firm considers knowledge as the most strategically significant resource of the firm (Grant,

2008) but contrasts Tseng (2010) assertion that knowledge socialization has no effect on corporate performance

4.9.2 Effect of Knowledge Protection on Performance of KEMRI – Kisumu

The researcher tested the hypothesis that there is no effect of knowledge protection on organization performance, regression analysis was used and revealed that knowledge protection has a causal relationship with performance (β=0.718, p=.025) which is positive and significant hence the null hypothesis is rejected and the alternative hypothesis is adopted. This finding implies that 1 standard deviation in knowledge protection will result in a change of 0.718 standard deviation units in performance thereby signifying that if the firm improves its knowledge acquisition efforts it will experience enhanced performance. The t calculated value of 2.286 is also greater that $t_{0.05,116}$ of 1.980626 hence the conclusion that the regression variable is significant. This is in concurrence with the KPMG's European Knowledge Management Survey 2002/2003 that established that 80% of top 500 organizations in the United Kingdom, France, Germany and the Netherlands consider knowledge a strategic asset hence its protection.

4.9.3 Effect of Knowledge Application on Performance of KEMRI – Kisumu

Finally, the researcher tested the hypothesis that there is no effect of knowledge application on organization performance, regression analysis was used and revealed that knowledge application has a contributory relationship with performance (β=0.629, p=.000) which is positive and strongly significant hence the null hypothesis is rejected and the alternative hypothesis is adopted. This finding implies that 1 standard deviation in knowledge application will result in a change of 0.718 standard deviation units in performance thereby signifying that if the improvement of the firm's knowledge

application efforts it will result in superior performance. The t calculated value of 3.815 is also greater that $t_{0.05,116}$ of 1.980626 hence the conclusion that the variable is significant. This data is in concurrence with Riungu (2015) who established positive cause effect relationship between knowledge application and performance of mobile telephone companies in Kenya ($\boldsymbol{\beta}$=0.555, p=.027).

Overall, Knowledge acquisition strategy had the greatest effect on performance of KEMRI – Kisumu followed by knowledge protection strategy then knowledge conversion strategy while knowledge application strategy had the least effect on the performance of KEMRI – Kisumu. All the variables were significant since p-values were less than 0.05.

CHAPTER FIVE

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

This chapter presents summary of the data findings, conclusion drawn from the findings highlighted and recommendation made. The conclusions and recommendations drawn are focused on addressing the objective of the study.

5.1 Summary of Findings

The first objective of the study sought to establish the effect of knowledge acquisition on performance of KEMRI – Kisumu. The study found that knowledge acquisition affect performance of KEMRI – Kisumu to a great extent. The study found that employees greatly obtain new knowledge from external sources (e.g. through seminars, journals, expert networks, business partners and clients), that employees greatly acquire knowledge from written sources (e.g. projects documentation, organizational procedures, instructions and formal documented sources) and that knowledge acquisition facilitates knowledge dissemination. The study found that employees moderately acquire knowledge from other employees informally from co-workers, that knowledge acquisition moderately results in Development of knowledge and that knowledge acquisition lowly facilitates development and sustenance of expertise. Moreover The respondents also stated that Knowledge acquisition improved focus in human asset and created an organized approach to knowledge acquisition enabling the organization optimize this resource, created an active people to people network thereby improving collaboration and teamwork, and it aligned the organization culture by creating an optimal knowledge sharing strategy thereby improving organization performance.

The second objective explored the effect of knowledge conversion on performance of KEMRI – Kisumu. The study found that knowledge conversion affects performance of KEMRI – Kisumu to a moderate extent. The study established that to a great extent, employees consider willing both successful and unsuccessful experiences valuable, employees are willing to share learnt knowledge and experience and that documented knowledge is available for use as and when required, and that learnt knowledge and experience are documented for future reference and learnt knowledge and experience are shared routinely. The study also revealed that to low extent, there is a structured format, such as and classification scheme, to follow when documenting lessons learned. Additionally it was established that it reduced loss of organizational know-how by capturing both explicit and tacit knowledge, it enabled the firm and participants explicitly capture critical knowledge thereby making key data resources not only discoverable but also reusable, it promoted timely access to knowledge thereby speeding processes within the organization, it encouraged cooperation and exchange of experience among workers, and it enabled consistency in capturing and sharing of information thereby improving the firms performance.

The third objective sought to assess the effect of knowledge protection on performance of KEMRI – Kisumu. The study found that knowledge protection affect performance of KEMRI – Kisumu to a great extent. The study revealed that digital records are held for documented knowledge for ease of access and future reference, that training is available for documented knowledge, that classification and codification of documented knowledge is in place to enable quick access and that strategic protection ensures retention of knowledge and expert workers. The study also established that to a moderate extent, technical protection measures are in place to avoid unauthorized access. Moreover, the

respondents noted that knowledge protection created guidelines on use and sharing of company information, enabled backup recovery system is thereby minimizing data loss and impacting positively on performance. However, knowledge protection also created bureaucracies that ensured only authorized access on one hand but increased time to access to information and decision making.

Lastly the study sought to find out the effect of knowledge application on performance of KEMRI – Kisumu. The study found that knowledge application affect performance of KEMRI – Kisumu to a great extent. The study established that to a great extent, use of documented knowledge enhances replication of past successes and avoidance of failures, employees regard knowledge as learning tools and use of documented knowledge enhances creativity and innovation. The study revealed that to low extent employees regard knowledge as organization property and freely share and adopt it and use of documented knowledge aids faster and superior decision making. Moreover it was established that knowledge application results in continuous improvement processes hence efficiency in the overall business process, is a good motivation tool that supported employee growth and development and reward mechanisms, and enabled sharing of specialist know-how thereby enabling goal achievement and improved performance.

The respondents acknowledged improvements in teamwork, operating systems and processes, staff knowledge and expertise, learning and development and the results of the learning process, beneficiary satisfaction rates and stakeholder engagements, number of the beneficiaries of the firms ventures, customer service quality, employee motivation and customer satisfaction attributed to investment in knowledge management.

5.2 Conclusions

The study found that knowledge acquisition significantly facilitates knowledge dissemination, enables acquisition of knowledge from other employees, results in development of knowledge, and facilitates development and sustenance of expertise.

Moreover, the strategy results in continuous improvement processes employee motivation tool and improved sharing of specialist know-how thereby enabling goal achievement and improved performance. The researcher therefore concludes that knowledge acquisition affects performance of KEMRI significantly.

The findings have exhibited that through knowledge conversion, employees consider both successful and unsuccessful experiences valuable, employees are willing to share learnt knowledge and experience, that documented knowledge is available for use as and when required, learnt knowledge and experience are documented for future reference and learnt knowledge and experience are shared routinely. Additionally from research data it was deduced that knowledge conversion reduced loss of organizational know-how, enabled the firm and participants explicitly capture critical knowledge thereby making key data resources not only discoverable but also reusable, promoted timely access to knowledge, encouraged cooperation and exchange of experience among workers, and enabled consistency in capturing and sharing of information thereby improving the firms performance. The researcher therefore concludes that knowledge conversion affects performance of KEMRI positively.

The study found that through knowledge protection, digital records are held for documented knowledge for ease of access and future reference, training is available for

documented knowledge, that classification and codification of documented knowledge is in place to enable quick access and that strategic protection ensures retention of knowledge and expert workers. In addition it was realized that the strategy created guidelines on use and sharing of company information, enabled backup recovery system is thereby minimizing data loss and impacting positively on performance. In conclusion, knowledge protection affects performance of KEMRI significantly.

The study found that knowledge application enables use of documented knowledge that enhances replication of past successes and avoidance of failures, employees regard knowledge as learning tools, use of documented knowledge enhances creativity and innovation, employees regard knowledge as organization property and freely share and adopt it and use of documented knowledge aids faster and superior decision making. Moreover, knowledge application results in continuous improvement processes, employee motivation and enables sharing of specialist know-how thereby enabling goal achievement and improved performance. The researcher therefore concludes that knowledge application affects performance of KEMRI positively.

5.3 Recommendations

The study has exhibited a strongly positive causal relationship between knowledge management variables (knowledge acquisition, conversion, protection and application) and performance of KEMRI. In particular the study subjects noted improvements in teamwork, operating systems and processes, staff knowledge and expertise, learning and development and the results of the learning process, beneficiary satisfaction rates and stakeholder engagements, number of the beneficiaries of the firm's ventures, customer service quality, employee motivation and customer satisfaction to be attributed to

investment in knowledge management. The researcher hereby recommends that the firm improves investment in knowledge acquisition, conversion, protection and application as it is a noble idea as it adds value to the organizations goal and ultimately its performance.

The study recommends that the research institutions should ensure they have formalized by way of policy the following knowledge capture and acquisition practices; brainstorming, subject matter experts, expert systems/ knowledge bases and after-action reviews. This is to ensure sufficiency in operational knowledge. The research institutions should also implement the following knowledge sharing practices; succession planning, communities of practice, storytelling, mentorship, phased retirement, coaching and orientation. This is to ensure identification of relevant operational knowledge in the institution, and facilitate the sharing of available knowledge in the institution.

The study also points out that for faster decision making, bureaucracies as to access of knowledge should be reduced. Moreover top management to make sure that knowledge creation is a top priority, ensure that knowledge sharing culture begin early in the employees' career and knowledge workers should be held accountable for their knowledge exchange efforts. The management should.

5.4 Limitations of the Study

The following constraints were encountered in the course of the research study:

Some respondents targeted in this study were reluctant in giving information fearing that some of the knowledge management strategies were considered as core secrets and as such the information being sought could print a negative image about them. The researcher carried an introduction letter from the University to assure them that the

information they give was treated with confidentiality and was used purely for academic purposes. Further, the results of the study was limited to the extent to which the respondents were willing to provide accurate, objective and reliable information. The researcher checked for consistency and test the reliability of the data collected.

5.6 Areas for Further Research

This study was limited to KEMRI. The study therefore recommends the same study to be redone to cover all the other research institutions in Kenya. Knowledge management implementation is not without challenges. A study on the challenges in knowledge management in research institutions in Kenya should be conducted. The same study should be carried out in the other sectors to find out if the same results will be obtained.

The study also recommends further studies to determine the impact of management factor as a major determinant to the adoption of knowledge management practices and organization performance.

REFERENCES

Alavi, M., &Leinder, D. (2001). Knowledge Management and Knowledge Management Systems: Conceptual Foundations and Research Issues. *MIS Quarterly*, 25(1), 134 - 207.

Barney, J., B. (2011). Is The Resource-Based View A Useful Perspective For Strategic Management Research? Yes. Academy of Management Review, 26 (1), 41–56.

Barua, A., Kriebel, C., &Mukhopadhyay, T., (2008). Information Technology and Business Value: An Analytical and Empirical Investigation. *Information Systems Research* 6(1), 3–23.

Blumentritt, R., & Johnston, R. (2009). Towards A Strategy For Knowledge Management, *Technology Analysis and Strategic Management*, 11(3), 287-300.

Bontis, N., &Nikitopoulos, H. (2011). Parallels in *Knowledge Cycles*. *Computers in Human Behavior*, 27(4), 1438-1444.

Bosch, K. W. (2011). *A Framework of Characterizing Knowledge Management Methods, Practices, and Technologies*. Washington University Course EMGT 298.T1, Spring.

Bryman, A., & Bell, E (2007). *Synthesizing Research; A Guide for Literature Reviews* (3rd edn). Sage: Thousand Oaks.

Bryman, A., & Bell, E. (2013). *Synthesizing Research*; A Guide for Literature Reviews (3rdEd) Sage: Thousand Oaks.

Carrillo, P.M., Robinson, H., Al-Ghassani, A.& Anumba, C. (2010). Knowledge Management in UK Construction: Strategies, Resources and Barriers. *Project Management Journal*, 35(1), 46-56.

Chong, S. C. (2010). KM critical Success Factors: A Comparison of Perceived Importance Versus Implementation in Malaysian ICT Companies. *The Learning Organization*, 13(3), 118-132.

Creswell, J. W (2003).*Research Design: Qualitative, Quantitative, and Mixed Methods Approaches*. Thousand Oaks: Sage Publications, Inc

.

Davenport, T. H. (2011). Putting the Enterprise into the Enterprise System. *Harvard Business Review*, 76(4), 45-89.

Davenport, T. H., & Prusak L. (2010). Working knowledge: How organizations manage what they organizational memory. *Sloan Management Review*, 41(3), 69–79.

Davenport, T. H., & Prusak, L. (2010).*Working knowledge: How organizations manage what they know*. Boston: Harvard Business School Press.

Doaei, H. A., & Dehghani, J. (2010). Strategic Gap Analysis of KM Dimensions in Knowledge Based Organizations. *Journal of Strategic Management Studies*, 1(1), 47-68.

Drucker, P. F. (2008). *Managing Oneself*. Harvard Business Review Press.

Dyer, G., & McDonough, B. (2001). The State of KM. *Knowledge Management Journal, 6*(1), 56 – 90.

Earl, M. (2011). Knowledge Management Strategies. *Journal of Management Information Systems*, 18(1), 215–223.

Easterby-Smith, M., & Lyles, M. (2013). *The Blackwell Handbook of Organizational Learning and Knowledge Management*. Oxford: Blackwell.

Eisemon, T. (2012). Private Initiatives in Higher Education in Kenya. *Journal of Higher Education*, 24(2), 157-175.

Bolisani, E., Paiola, M., & Scarso, E. (2013) "Knowledge protection in knowledge-intensive business services", *Journal of Intellectual Capital*, Vol. 14 Issue: 2, pp.192-211, https://doi.org/10.1108/14691931311323841

Goodman, N., Schieman, J. (2010). Using knowledge management to leverage training and development initiatives, *Industrial and Commercial Training, Emerald Group Publishing Limited*, Vol. 42 Issue: 2, pp.112-115

Grant, R. M. (2008). The Resource-Based Theory of Competitive Advantage: Implications for Strategy Formulation, *California Management Review*, 33(3), 114-35.

Gray, K. (2011). The Ontario leadership framework 2012. *With a Discussion of the Research Foundations*, 47(7), 45-67.

Gold, A.H., Malhotra, A. and Segars, A.H., (2001). Knowledge management: An organizational capabilities perspective, *Journal of Management Information Systems*, 18(1), pp. 185-214

Hannan, M. T., & Freeman, Jr. (2012). *Obstacles to the Comparative Study of Organisational Effectiveness*. San Francisco: Jossey-Bass.

Hartman, E. M. (2006). *Organizational Ethics and the Good Life*. New York: Oxford University Press.

Huber, G. (2008). Organizational Learning: The Contributing Processes and the Literatures, *Organization Science*, 2(1), 88-115.

Inkpen, A. C., & Dinur, A. (2012). Knowledge management processes and international joint venture. *Organization Science*, *9*(4), 454-68.

Kelleher, D., &Levene, S. (2010). *Knowledge Management: A Guide to Good Practice, British Standards Institution*, London, UK.

Kiamba, C. (2009). *Entrepreneurialism and Adaptability in Kenyan Universities in The Face Of Declining Donor and Government Support*. A paper presented at the Nuffic Conference on The changing landscape at The Hague.

King, W.R., &Lekse. W. (2013). Deriving Managerial Benefit From Knowledge Search: A Paradigm 340 Shift? *Information and Management,* 43(7), 874–883.

King, W.R., &Ko. D. G. (2011). Evaluating Knowledge Management and the Learning Organization: An Information/Knowledge Value Chain Approach. *Communications of the Association for Information Systems,* 5(14), 1–26.

Levene, S. (2009). Governing Knowledge Sharing In Organizations: Levels of Analysis, Governance Mechanisms, and Research Directions. *Journal of Management Studies*, 47(3), 455-482.

Lomax S. (2003). *Best Practices for Managers and Expatriates—A Guide on Selection, Hiring, and Compensation*. New York: John Wiley & Sons, Inc

Love, P., Edum-Fotwe, F., & Irani, Z. (2013). Management of Knowledge in Project Environments. *International Journal of Project Management*, 21(7), 155-156.

Makadok, A. C. (2001). Learning and Knowledge Acquisition through International Strategic Alliances, Competitiveness and Global Leadership in the 21st Century. *The Academy of Management Executive*, 12(12), 223-229.

Marwick, A. D. (2010). Knowledge Management Technology. *IBM Systems Journal*, 40(4), 56 – 79.

Mbirithi, D. M. (2014). *Management Challenges Facing Kenya's Public Universities and Implications For the Quality Of Education*. Unpublished MBA project, Kenyatta University.

Nassiuma, D. K. (2000). *Survey Sampling*: *Theory and Practice*, (Unpublished MBA thesis, University of Nairobi).

Newman, B., & Conrad, K. W. (2009). *A Framework of Characterizing Knowledge Management Methods, Practices, and Technologies*, Washington University Course EMGT 298.T1, Spring.

Nonaka, I. (2011). The Knowledge-Creating Company. *Harvard Business Review*, 85(78), 162-171.

Nonaka, I., & Takeuchi, H. (2011). The Wise Leader. *Harvard Business Review*, 89(5), 58-67.

Northouse, P. (2004). *Leadership*: *Theory and Practice* (3rd Ed.). Thousand Oaks, CA: Sage.

Okunoye, A., &Bertaux, N. (2008). *Addressing Contextual Issues in Knowledge Management: A Guiding Framework*. New York, NY.

Oliver, S., & Kandadik., R. (2012). How to Develop Knowledge Culture in Organizations? A Multiple 357 Case Study of Large Distributed Organizations. *Journal of Knowledge Management*, 10(4), 6–24.

Porter, M.E. (2011). *Competitive Advantage: Creating and Sustaining Superior Performance, with a new introduction*. New York: Free Press.

Rastogi, P.N. (2000). Knowledge Management and Intellectual Capital - The New Virtuous Reality of Competitiveness. *Human Systems Management*, 19(1), 39-49.

Rezgui, Y., Hopfe, C. J., & Vorakulpipat, C. (2010). Generations of Knowledge Management in the Architecture, Engineering and Construction Industry: An Evolutionary Perspective. *Advanced Engineering Informatics*, 24(2), 219-228.

Riungu, A. K. (2015). *Effect of knowledge management practices on performance of mobile telephone companies in Kenya*. Unpublished MBA project, University of Nairobi.

Robertson, M., & Hammersley, G.M. (2000). Knowledge Management Practices Within A Knowledge Intensive Firm: The Significance of the People Management Dimension, *Journal of European Industrial Training*, 24(2), 241-53.

Rumelt, R., Schendel, D., & Teece, D., (2008). Strategic Management and Economics. *Strategic Management Journal* 12(5), 29-67.

Saunders, M., Lewis, P., Thornhill, A. (2009). *Research Methods for Business Students*, 5th edition, Prentice Hall.

Sekaran, U. (2012). *Research Methods for Business: A Skill Building Approach*. (4th Ed). New York: John Wiley and Sons.

Serban, A. M. & Luan, J. (2012). Overview of Knowledge Management. *New Directions for Institutional Research*, 2002(113), 5-16.

Sharifi, S., & Zhang, M. (2009). Sense-making and recipes: examples from selected small firms. *International Journal of Entrepreneurial Behavior& Research*, 15(6), 555-570

Shoo R, Matuku W, Ireri J, Nyagero J, and Gatonga P. The place of knowledge management in influencing lasting health change in Africa: An analysis of AMREF's progress, *Pan Afr Med J*. 13(1): 3.

Spender, J. C. (2006). *Competitive Advantage From Tacit Knowledge?Unpacking The Concept And Its Strategic Implications*. London: Sage, 56-73.

Sproul, D. (2013). Genomic Insights into Cancer-Associated Aberrant Cpg Island Hypermethylation. *Briefings in Functional Genomics*, 12(3), 174-190.

Stankosky, M. (2012).*Creating the Discipline of Knowledge Management*. Butterworth: Heinemann Publication.

Sternberg, R. J., & Horvath, J. A. (2008). A prototype view of expert teaching. *Educational Researcher,* 24(6), 9-17.

Stonehouse, G. H., & Pemberton, J. D. (2009). Learning and Knowledge Management in the Intelligent Organization. Participation and Empowerment: *An International Journal,* 7(5):94-144.

Sunassee , H.D., &Sewry, K.H (2011). Meeting Czech Knowledge Management Challenges Head-On: KM-Be. At-It. *Knowledge Management in Emerging Economies: Social, Organizational and Cultural Implementation,* 6(7), 56-90. www.kemri.org

Takashi T.; (2001). Learning Organizations, Asian Productivity Organization. *Educational Researcher,* 2(6), 12-23.

Teigland, R. (2009). Born Virtuals and Avapreneurship: A Case Study of Achieving Successful Outcomes in Peace Train–a Second Life Organization. *Journal for Virtual Worlds Research*, 2(4), 67-90.

Thompson, M. D. (2005). Knowledge Management and Knowledge Management Systems: Conceptual Foundations and Research Issues. *MIS Quarterly*, 25(1), 134 - 207.

Wangari, E. (2009). *A Study of the Linkage of Critical Success Factors and Knowledge Management Systems at Olivado Kenya (EPZ) Ltd.* (Unpublished MBA thesis,University of Nairobi).

Wemby, A. (2010). *Crafting a Dual-Market Strategy: A Case Study of Burberry*. Sage Publications

Wilkesmann, U., Wilkesmann, M., &Virgillito, A. (2009). The Absence of Cooperation is Not Necessarily Defection: Structural and Motivational Constraints of Knowledge Transfer in a Social Dilemma Situation. *Organization Studies,* 30(10), 1141-1164.

Yeh, Y. J., Lai, S. Q., &Ho, C. T. (2006). Knowledge Management Enablers: A Case Study, *Industrial Management and Data Systems*, 106(6), pp. 793-810.

Zollo, M. & Winter, S. (2011). *From Organizational Routines to Dynamic Capabilities. Working Paper 99-07*, Reginald H. Jones Center, the Wharton School, University of Pennsylvania.

APPENDICES

Appendix I: Research Questionnaire

All the information in this questionnaire will be treated with strict confidentiality.

Section A: General Information

1. Indicate your Gender

   Male:[ ] Female:[ ]

2. Indicate highest Level of Education

   PHD [ ] Masters [ ] Bachelors [ ] Diploma[ ] Certificate[ ]

3. How long have you been with KEMRI - CGHR?

   Less than 3 years [ ] 4-6 years [ ] 7-9 years [ ]

   10 years and above [ ]

Section B: Effect of Knowledge Management on Performance of Research Institutions Focusing at a Case Study of KEMRI CGHR - Kisumu

Knowledge acquisition

4) To what extent does knowledge acquisition affect performance of KEMRI CGHR – Kisumu?

   Very great extent [ ] Great extent [ ]

   Moderate extent [ ] Little extent [ ] No extent [ ]

5) Please indicate the extent that the following aspects of knowledge acquisition affect performance of KEMRI CGHR – Kisumu?

   Where: 5- Very Great Extent 4-Great Extent 3-Moderate Extent

   2-Low Extent 1- No Extent

	1	**2**	**3**	**4**	**5**
Employees obtain new knowledge from external sources (e.g. through seminars, journals, expert networks, business partners and clients).					
Employees acquire knowledge from written sources (e.g. projects documentation, organisational procedures, instructions and formal documented sources).					
Employees acquire knowledge from other employees informally from co-workers					
Knowledge acquisition results in Development of knowledge					
Knowledge acquisition facilitates knowledge dissemination					
Knowledge acquisition facilitates development and sustenance of expertise					

6) In what other ways does knowledge acquisition affect performance of KEMRI–Kisumu (*specify*)?

.....

.....

.....

Knowledge conversion

7) To what extent does knowledge conversion affect performance of KEMRI – Kisumu?

Very great extent [ ] Great extent [ ]

Moderate extent [ ] Little extent [ ] No extent [ ]

8) Please indicate the extent that the following aspects of knowledge conversion affect performance of KEMRI CGHR – Kisumu?

Where: 5- Very Great Extent 4-Great Extent 3-Moderate Extent

2-Low Extent 1- No Extent

	1	**2**	**3**	**4**	**5**
Employees are willing to share learnt knowledge and experience					
Employees consider both successful and unsuccessful experiences valuable					
Learnt knowledge and experience are shared routinely					
Learnt knowledge and experience are documented for future reference					
There is a structured format, such as a classification scheme, to follow when documenting lessons learned					
Documented knowledge is available for use as and when required					

9) In what other ways does knowledge conversion affect performance of KEMRI – Kisumu?

.....

.....

Knowledge protection

10) To what extent does knowledge protection affect performance of KEMRI – Kisumu?

Very great extent [ ] Great extent [ ]

Moderate extent [ ] Little extent [ ] No extent [ ]

11) Please indicate the extent that the following aspects of knowledge protection affect performance of KEMRI CGHR – Kisumu?

Where: 5- Very Great Extent 4-Great Extent 3-Moderate Extent
2-Low Extent 1- No Extent

	1	**2**	**3**	**4**	**5**
Training is available for documented knowledge					
Strategic protection ensures retention of knowledge and expert workers					
Technical protection measures are in place to avoid unauthorised access					
Classification and codification of documented knowledge is in place to enable quick access					
Digital records are held for documented knowledge for ease of access and future reference					

12) In what other ways does knowledge protection affect performance of KEMRI – Kisumu?

.....

.....

.....

Knowledge application

13) To what extent does knowledge application affect performance of KEMRI – Kisumu?

Very great extent [ ] Great extent [ ]

Moderate extent [ ] Little extent [ ] No extent [ ]

14) Please indicate the extent that the following aspects of knowledge application affect performance of KEMRI CGHR – Kisumu?

Where: 5- Very Great Extent 4-Great Extent 3-Moderate Extent
2-Low Extent 1- No Extent

	1	2	3	4	5
Use of documented knowledge aids faster and superior decision making					
Use of documented knowledge enhances creativity and innovation					
Use of documented knowledge enhances replication of past successes and avoidance of failures					
Employees regard knowledge as organization property and freely share and adopt it					
Employees regard knowledge as learning tools					

15) In what other ways does knowledge application affect performance of KEMRI–Kisumu?

.....

.....

.....

Performance of KEMRI CGHR – Kisumu

16) What has been the trend of performance of KEMRI – Kisumu for the last five years?

Where: 5- Greatly Improved 4-Improved 3-Constant

2-Decreased 1- Greatly Decreased

	1	2	3	4	5
Number of the beneficiaries					
Customer service quality					
Employee motivation					
Customer satisfaction					

Others (*specify*)

.....

.....

.....

17. In your opinion what do you recommend as regards knowledge management to improve performance of KEMRI – Kisumu?

.....

.....

THANK YOU

Appendix II: Work Plan

Activity/Months							
	Aug 018	**Sept 018**	**Oct 018**	**Nov 018**	**Dec 018**	**Jan 019**	**Feb 019**
Project proposal writing	✓						
Corrections		✓					
Data collection			✓	✓			
Data analysis				✓			
Report writing					✓		
Submission of report						✓	✓

Appendix III: Budget

Item	Quantity	Cost (Kshs.)	Total (Kshs.)
1. Personnel			
Research assistants	3days	@4000.00	12000.00
2. Materials			
Photocopy paper	3reams	@ 500.00	1500.00
Ball pens	1 case	@ 500.00	500.00
Foolscap	3 reams	@ 300.00	300.00
Calling card (Telkom)			1,000.00
Scratch card			1,000.00
Internet			1000.00
3. Data analysis			
Statistical analysis			35,000.00
4. Report Preparation			
Typing			4000.00
Printing			5000.00
Binding			2000.00
Total			**63,300.00**