Performance of Public Institutes of Technology in Kenya: A Proposal

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ABSTRACT

The emergence of knowledge-based economies has placed significant reliance on effective management of knowledge for sustainable strategic competitive advantage. This proposal seeks to determine the relationship among knowledge management infrastructure, knowledge management processes, competitive advantage and performance of public institutes of technology in Kenya. After an in-depth study of literature, the proposal concludes that with proper attention towards knowledge management infrastructure, knowledge management processes, competitive advantage and performance of public institutes of technology in Kenya. After an in-depth study of literature, the proposal concludes that with proper attention towards knowledge management infrastructure, knowledge management processes and competitive advantage, institutes of technology can outperform their competitors. Initially the research was conducted by the use of Google scholar search engine with the keywords being “Knowledge management infrastructure”, “Knowledge management process”, “Competitive advantage” and “Institutes of technology performance” to understand the basic interpretation of vital terminologies. Furthermore, different research papers were searched using the same key words from Emerald, Science Direct, JSTOR and EBSCO hosts and a detailed review done of each paper. In order to be among the top performers in this era of information, institutes of technology should accept, adopt and consistently foster their knowledge management practices. They have to provide a platform for knowledge management practices by developing organizational culture and motivating their human element. Once the platform is created, knowledge acquisition, storage and application becomes inevitable. This proposal demonstrates that knowledge management is a key driver of organizational performance and a critical tool for organizational survival, competitiveness and profitability. Hence, creating, managing, sharing and utilizing knowledge effectively is vital for organizations to take full advantage of the value of knowledge.
1. Introduction

It is no longer a controversy that we live in a globalized world characterized by fast information transfer across large geographic areas by means of the Internet. The consequence of this globalization is the emergence of knowledge-based economies where effective management of human capital ensures that workers continue to create the right value for the economy. Nowadays, organizations no longer compete solely on financial capital strength; rather knowledge is the new competitive advantage in business. In fact, the Gross Domestic Product (GDP) growth rate is now determined, amongst other factors, by the quantum and quality of knowledge stock harnessed and applied in the production process in sectors of the economy. These knowledge-based economies require that good knowledge management infrastructure and processes be implemented for organizational effectiveness.

In recent years, the importance of knowledge management has been widely recognized as the foundations of industrialized economies shifted from natural resources to intellectual assets. Since 1995, there has been an explosion in the literature surrounding the developing concept of knowledge management. Much of the interest in knowledge management came from the realization that organizations compete on their knowledge-based assets. Even non-competitive organizations such as governmental institutions and nonprofits organizations succeed or fail based on their ability to leverage their knowledge-based assets.

Teng and Song (2011) suggest that the importance of knowledge management is no longer restricted to knowledge intensive firms in the high-tech industries but to all sectors of the economy. Zack (2003) further says that even companies in the traditional industries, such as cement, can benefit greatly from Knowledge Management. In essence Knowledge Management is beneficial to all sectors, be it educational, banking, telecommunications, production/manufacturing, and even the public sectors. Knowledge Management implies a framework for designing an organization’s strategy, structures, and processes so that the organization can use what it knows to learn and to create economic and social value for its customers and community.

Kenya is not an exemption to the importance of knowledge management. Mosoti and Masheka (2010) postulate that in the implementation of knowledge management process in organizations in Nairobi, technology is largely used in knowledge management process but does not maximize the use of knowledge management because culture, leadership and strategy are ignored in the process. Wachira (2012) reveals that the level of awareness of knowledge
management is high and that top management is ready to support the initiative in Kenya’s steel manufacturing firms.

However, Cheruiyot et al. (2012) report that despite acknowledging that knowledge management is a critical organizational asset base, most organizations are yet to develop a knowledge management policy. Similarly, Mungai (2012), concedes that knowledge management is not well understood or valued in most organizations, more so public institutions, consequently, it is neglected leading to loss of competitive advantage for organizational development and growth.

To remedy such a loss, Akinyi (2015) suggests that computer technologies are capable of assisting knowledge seekers and experts engaged in different types of knowledge acquisition process such as socialization, combination, externalization, and internalization.

More importantly, effective and efficient transfer of experiences, insights and know-how among different experts and decision makers is a prerequisite for high quality decision making and coordinated, organizational action. Indeed, Kangogo and Gachunga (2015) indicate that knowledge in organizations is shared mostly in meetings and workshops but other forms of knowledge sharing such as training programs, brainstorming sessions and use of various electronic media such as emails, intranet and telephone conversations are effective channels of knowledge sharing.

It is no gainsaying the fact that knowledge management is a veritable tool for the improvement of services and process and for growth and productivity. Evidence shows that it is of central importance to organizations as it represents a major source of competitive advantage for organizations (De Long & Fahey, 2000). Moreover, sustainable competitive advantage and innovation hinges on effective management of organizations’ vast and varied knowledge assets. Institutes of technology as knowledge based institutions are expected to manage knowledge for sustainable competitive advantage, growth and innovation in Kenya. The extent to which the institutes have realized this expectation is yet to be established. If as generally believed that the quality of students being produced yearly is on the decline is anything to go by, then the performance of the institutes is also on the decline. Different reasons have been floated for this sordid performance in the educational sector such as quality of teachers because they constitute the direct labour, incessant strikes and sexual harassment.
Leadership commitment on investing in research and development differs among institutes of technology in Kenya. Kenyan technical education is yet to embrace the culture of entering into strategic alliances. Most college libraries are not well equipped for storing knowledge. They do not have recent and up to date books and journals and e-libraries are not developed. Inadequate funding and unreliable power supply seriously affect the application of ICT resources in institutes of technology libraries. Hence, knowledge storing and dissemination is compromised.

1.1 Knowledge Management Infrastructure

Knowledge management infrastructures are organizational mechanisms for intentionally and consistently fostering knowledge through knowledge creation, protection and facilitating knowledge sharing in an organization (Stonehouse and Pemberton, 1999; Ichijo et al., 1998; Chen 2008). Moreover, appropriate infrastructures could enhance an organization’s ability to manage knowledge (Pan and Scarbrough, 1998) in conformity with socio-technical theory. The two perspectives are not unique to management of information systems research (Bostrom and Heinen, 1977); they consist of two jointly independent but correlative interacting components. The social perspective is concerned with the attributes of people (attitudes, skills, and values), the relationships among people, and organizational structure. The technical perspective is concerned with technology required to transform inputs to outputs (Bostrom and Heinen, 1977). Organizational culture, organizational structure, and people are social infrastructure; information technology is a technical infrastructure.

Firstly, organizational culture is essential for successful knowledge management (Davenport et al., 1998; Demarest, 1997; Gold et al., 2001; Chen 2008). More importantly, Chase (1998) indicates that 80 percent of their survey participants recognize culture as the most important factor for creating a knowledge-based organization. Culture is a basic building block to knowledge management as it affects how an organization accepts and fosters knowledge management activities. Of course, culture defines not only what knowledge is valued, but also what knowledge must be kept inside the organization for sustained innovative advantage (Long, 1997; Ndlela and Toit, 2001; Lee and Kim, 2001b; Davenport and Prusak, 1998). Consequently, organizations should establish an appropriate culture for creation and sharing of knowledge within an organization (Holsapple and Joshi, 2001; Leonard-Barton, 1995) on the concept of care. Care, as a key infrastructure for organizational relationship is founded on collaboration, trust, and learning based on care (Eppler and Sukowski, 2000; Krogh, 1998). Similarly, care characterizes interactions between receivers and providers in organizations, and
should be understood as a quality of relationship rather than in terms of roles and functions (Ichijo et al., 1998).

Secondly, organizational structure may encourage or inhibit knowledge management (Gold et al., 2001; Hedlund, 1994; Nonaka and Takeuchi, 1995). As a case in point, Ichijo et al. (1998) insist that firms should maintain consistency between their structures and how they intend to put their knowledge to use. Organizations’ structures should be organized so that they are close to the context for knowledge creation and are able to act for knowledge creation. It is important that organizational structure should be designed for flexibility so that they encourage creation and sharing knowledge across boundaries within the organization. Various studies suggest flexible organizational structures based on their flexibility as appropriate for effective knowledge management. Specifically, modular organizational design (Sanchez and Mahoney, 1996), hypertext organization (Nonaka and Takeuchi, 1995) as well as structural factors such as centralization and formalization (Menon and Varadarajan, 1992; Eppler and Sukowski, 2000; Jarvenpaa and Staples, 2000; Lubit, 2001; Riggins and Rhee, 1999) are cases in point.

Thirdly, people are central to organizational knowledge creation (Chase, 1998; Holsapple and Joshi, 2001; Ndlela and Toit, 2001). Doubtless, they are seen as an important infrastructural component when trying to implement a knowledge management program (Ndlela and Toit, 2001; Choi, 2002). Indeed, Zack (1999c) suggests that knowledge management is 10 percent technology and 90 percent people. It is people who create and share knowledge. Organization should make their people understand the importance of knowledge management. Therefore, managing people who can and are willing to create and share knowledge is important (O’Dell and Grayson, 1999). Knowledge and competence could be acquired by admitting new people with desirable skills. The skills embodied in employees are the dimension most often associated with knowledge management (Leonard-Barton, 1995; Stonehouse and Pemberton, 1999). In particular, T-shaped skills embodied in employees are most often associated with core capabilities (Iansiti, 1993; Johannenssen et al., 1999; Leonard-Barton, 1995; Chen 2008) which allow them to have meaningful and synergistic conversations with one another (Madhavan and Grover, 1998).

Fourthly, technology contributes to knowledge creation (Gold et al., 2001). Such technology infrastructure includes information technology and its capabilities (Raven and Prasser, 1996; Scott, 1998; Zack, 1999c). Information technology is widely employed to connect people with reusable codified knowledge, and it facilitates conversations. It qualifies as a natural medium for knowledge flow. Through the linkage of information technology in an organization,
previously fragmented flows of knowledge could be integrated (Gold et al., 2001; Choi, 2002)). Some leading theorists have warned about strong investments in information technology, possibly at the expense of investments in human capital (Sveiby, 1997).

However, investments in information technology seem to be unavoidable to scale up knowledge management projects (Borghoff and Pareschi, 1997). Sophisticated knowledge management systems pay off because of their ability to re-use knowledge (Davenport et al., 1998; Hansen et al., 1999; Markus, 2001; Weiser and Morrison, 1998). Among technology related variables, this proposal focuses on how information technology supports the use and accessibility (Stonehouse and Pemberton, 1999; Choi, 2002; Leonard-Barton, 1995; Chen 2008) of knowledge management. Public institutes of technology should invest in a comprehensive infrastructure capable of supporting various dimensions of knowledge management activities (Gold et al., 2001; Choi, 2002; Gottschalk, 2000).

1.2 Knowledge Management Processes

Knowledge management process is the heart of knowledge management. Therefore, most studies document phases of knowledge management process. In a bid to capture tacit knowledge and make it explicit for everybody within an organization, Arthur (1996) proposes a process consisting of application, sharing, creation, identification, collection, adaptation and organization. Similarly, Arthur (1998) proposes a process consisting of acquisition, creation, saving, disseminating and use. More importantly, Delphi (1998) proposes four key knowledge management processes. Firstly, capturing is related to obtaining external knowledge and creating knowledge by research or experience. Secondly, sharing is synonymous with how organizations access knowledge anytime and from any place. Thirdly, leveraging is concerned with conversion of knowledge into commodity deliverables. In feeding process, knowledge is embedded in product to increase value. Similarly, Demarest (1997) presents knowledge management processes as construction, embodiment, dissemination, and use. Construction refers to the process of discovering or structuring a kind of knowledge. Embodiment refers to the process of choosing a container for knowledge. Dissemination refers to the human processes and technical infrastructure that make embodied knowledge available to people within the firm. Usage refers to the ultimate objective of any knowledge management system.

On their part, Ernst & Young (1998) present four knowledge management processes consisting of planning, acquiring, applying, and assessing. On the one hand, Jang and Lee (1998) propose knowledge creation organizational memory process consisting of knowledge acquisition,
schema codification, knowledge codification, knowledge retrieval, knowledge embedding, problem analysis, problem solving, and knowledge shaping. On the other hand, Kolb (1984) proposes knowledge development process consisting of experience, observation, conceptualization, and experimentation. On its part, KPMG (1998) proposes knowledge cycle representing seven basic processes of knowledge creation: application, exploitation, sharing, dissemination, encapsulation, sourcing and learning.

Some studies (Leonard-Barton 1995; Nevis et al. 1995; Lee and Kim (2001a) suggest knowledge management processes consisting of problem solving, implementing and integrating, experimenting, and importing of knowledge, acquisition from external and internal sources, dissemination, and utilization. Knowledge acquisition means that the development or creation of skills, insights, and relationships. Knowledge dissemination means that the dissemination of what has been learned. Utilization means that the integration of learning so it is broadly available and can be generalized to new situations. Similarly, other studies (Nonaka and Takeuchi, 1995; Pan and Scarbrough, 1998;) propose knowledge creation processes consisting of sharing tacit knowledge, creating concepts, justifying those concepts, building an archetype, and cross leveling knowledge; as well as knowledge generation, processing, storage, dissemination, and use/reuse of knowledge.

Furthermore, Pentland (1995) proposes a set of five knowledge management processes based on Holzner and Marx (1979). Firstly, construction is the process through which new material is added or replaced within the collective stock of knowledge. Secondly, organization is the process by which bodies of knowledge are related to each other, classified, or integrated. Thirdly, once a new observation or experience has passed the test and been socially ratified as knowledge, it gets to be stored. Fourthly, distribution is a critical issue in any organization. Lastly, application is concerned with the possibility of obtaining performance improvement. Likewise, Probst (1998) suggests eight building blocks which are composed of knowledge goal, identification, acquisition, development, distribution, preservation, use, and measurement whereas Ruggles (1997) proposes knowledge processes including generation, codification, and transfer. Knowledge generation includes all activities which bring to light knowledge which is new, whether to the individual, to the group, or to the world. Knowledge codification is the capture and representation of knowledge so that it can be re-used either by an individual or by an organization. Knowledge transfer involves the movement of knowledge from one location to another and its subsequent absorption.
1.3 Competitive Advantage

Competitive advantage is a privileged status enjoyed by an organization over others. The concept derives from the ability to offer consumers greater value for money through reduced prices or to offer them the provision of commodities that may justify higher prices. Competitive advantage is the extent to which an organization is able to create a defendable multi-layered position over its core competitors.

Competitive advantage results in increased benefits. It is known to be a function of the extent to which an organization adapts and applies its resources in the exploitation of prevailing market conditions. Such a situation is founded on the level of knowledge about current market conditions, production technological knowledge, and updated processes. Sustainable competitive advantage could be attained through cost leadership, a differentiation approach, or (new) focus approaches. A sustainable competitive advantage arises from implementing a unique value-creating strategy emanating from a unique combination of internal organizational resources and capabilities that cannot be replicated by competitors.

Thus, a sustainable competitive advantage allows the maintenance and improvement of the enterprise’s competitive position in the market. An advantage enables a business to survive in its competition over a long period. We argue that managers should be committed to creating an economic value to their stakeholders. The best means to create that value is to focus on sustainable competitive advantage as its input. Knowledge assets contribute to competitive advantage through a holistic approach spanning knowledge management, business strategic management, organizational and human resource management. Kenya’s technical institutions of higher learning depend exclusively on the national government for all their budgetary needs which is not adequate thereby lacking in competitiveness and thus stifling innovation and performance.

1.4 Performance

Organizational performance is characterized by sustained results over a prolonged period. This justifies classification into high performing organizations and low performing organizations. Performance is rated based on five dimensions; price, quality, flexibility, delivery times and after-sales-support. Similarly, performance is rated with respect to industry peers. High performance is preferred to low performance due to the latter’s relation to total collapse of the organization. Sound, stable, management practice consisting of professional personnel practices such as clear promotional human development guidelines, job security, grievance
systems, formal training, and above-market pay, team work, information sharing, and accommodative union relation policies significantly influence performance. A high-performance organization is one that achieves financial and non-financial results that are exceedingly better than those of its peers over a period such as five years or more.

1.4.1 High-Performance Organizational Factors

Managers who practice open door policy nurture others employees by cultivating trust and honesty. Such managers are role models in their organizations. Workforce quality is better enhanced by continuous skills update on diverse flexible, resilient and complimentary personnel. Organizations must therefore have in a place a system of retaining high skilled employees through clear developmental stages, which absorb young employees as well as tap into senior more experienced employees on their way out of the organization. Long-term orientation to all stakeholders requires commitment. This ensures that the organization maintains mutually beneficial enduring long-term relationships and partnership with stakeholders to anticipate and effectively respond to environmental dynamics.

Continuous improvement characterized by setting the organization apart from its peer group, and structuring its processes, products, and services in such a way that the unique strategy is achieved in an innovative way. Such continuous innovation of products, processes, and services create new sources of competitive advantage to meet market changes.

1.5 Current Status of Technical Education in Kenya

Technical and Vocational Education and Training (TVET) refers to the study of technologies and related sciences and the acquisition of practice, skills and knowledge relating to an occupation in various sectors of economic and social life. In the present study, the concept of vocational education implies the preparation of an individual for an occupation or career. This involves both the liberal and technical aspects of education. The liberal aspects include the philosophical, moral and cultural elements that an individual must possess to fit into a given society.

TVET incorporates technical training institutions (TTIs), youth polytechnics (YPs), MSE training and demonstration centres, and national youth service skills development centres, national polytechnics and technical universities (Nyerere, 2009). In TVET refers to vocational pre-employment training provided to both young people and mature learners in a structured training environment with the aim of acquiring job-related skills and competences. Currently, there are 47 public institutions comprising: 31 Technical Training Institutes, 2 National
Polytechnics, 1 Technical Teachers’ College, 2 Technical Universities and 10 Institutes of Technology. These institutions are regulated by the Directorate of Technical Education under the Ministry of Higher Education Science and Technology. The institutions concentrate on five major areas of training, which are: Engineering, Health and Applied Sciences, Business Studies, Institutional Management and Information Technology/Computer Science. There are, however many other courses offered apart from the ones mentioned. This study will focus on the ten public Institutes of Technology in Kenya.

Technical, Vocational Education and Training (TVET) has been recognized as the wide-diversified education system instrumental in making the remarkable contribution to economic growth of a country by way of suitable manpower production relevant to the needs of industry, society and changing technological work environment. The government of Kenya envisions a 30 percent increase in enrolment in TVET institutions by the year 2030. For this to be realized, TVET institutions have to engage a number of strategies as detailed in the TVET national policy. TVET institutions are facing serious competition from universities coupled with the negative perception generally held against them as dumping grounds for those who fail to clinch university admission.

1.6 Statement of Problem

Knowledge management is increasingly popularized in various societies, organizations and governments because of its confirmed importance in fostering knowledge creation, codification, transfer, and development of knowledge capital capability. Furthermore, knowledge management is identified as a framework for designing an organization’s strategy, structures, and processes so that the organization can use what it knows to learn and to create economic and social value for its customers and community. Institutes of technology and other higher education institutions are knowledge based organizations. They are therefore exposed increasingly to market place pressures similar to other business entities. Consequently, it is prudent to suppose that knowledge management might have something important to offer higher education institutions in Kenya.

However, most institutes of technology are not investing much on research and development and governmental input is likewise irregular leading to resource inadequacy. Similarly, such institutes of technology may not have embraced knowledge sharing and integrated it into their corporate culture since ICT, which is a major tool of knowledge sharing, is not adequately funded. This leads to impaired coaching and mentoring programmes, document and records
management, poor skills transfer from retiring staff which ultimately derails effective capture of staff knowledge for retention in these academic institutions. Most universities in Kenya have improved policies and procedures allowing them to implement new learning approaches such as e-learning. However, Institutes of technology are yet to catch up with such knowledge management processes.

The Kenya Economic Survey 2015 report shows that student enrolment in TIVET institutions declined to 145,142 in 2014 from 148,009 in 2013. While enrolment in Technical Universities increased by 22.8 percent. This creates a concern for TVET institutions and thus the question: “How can TVET institutions create a competitive advantage by implementing knowledge management strategies? A lot of research has been done but most of them are wider in scope and largely based on business organizations. This proposal bridges this gap by focussing its attention on infrastructural aspects of knowledge management in public institutes of technology in Kenya and accompanying implications on their performance.

1.7 Research Objectives

1.7.1 General Objective

In essence, this proposal seeks to determine the relationship among knowledge management infrastructure, knowledge management processes, competitive advantage and performance of public institutes of technology in Kenya.

1.7.2 Specific Objectives

Based on the above objective, specific areas of focus of this proposal are to:

I. Establish the relationship between knowledge management infrastructure and performance of public institutes of technology in Kenya.

II. Establish the relationship between knowledge management infrastructure and knowledge management processes in public institutes of technology in Kenya.

III. Determine the relationship between knowledge management processes and performance of public institutes of technology in Kenya.

IV. Establish the effect of competitive advantage on the relationship between knowledge management infrastructure and performance of public institutes in Kenya.

V. Determine the effect of knowledge management processes on the relationship between knowledge management infrastructure and performance of public institutes in Kenya.
VI. Establish the joint effect of knowledge management infrastructure, knowledge management processes, and competitive advantage on performance of public institutes in Kenya.

1.8 Research Questions

1.8.1 General Research Question

A guiding research question of this proposal is: what is the relationship among knowledge management infrastructure, processes, competitive advantage and performance of public institutes of technology.

1.8.2 Specific Research Questions

The proposal is therefore premised on the following specific research questions:

I. What is the relationship between knowledge management infrastructure and performance of public institutes of technology in Kenya?

II. What is the relationship between knowledge management infrastructure and knowledge management processes in public institutes of technology in Kenya?

III. What is the relationship between knowledge management processes and performance of public institutes of technology in Kenya?

IV. What is the effect of competitive advantage on the relationship between knowledge management infrastructure and performance of public institutes of technology in Kenya?

V. What is the effect of knowledge management processes on the relationship between knowledge management infrastructure and performance of institutes of technology in Kenya?

VI. What is the joint effect of knowledge management infrastructure, knowledge management processes, competitive advantage and performance of public institutes of technology?

1.9 Significance of Study

This proposal focuses on how knowledge management supports educational institutions’ competitive advantage assuming that organizational performance improves under appropriate knowledge management infrastructure and processes. Therefore, this research is significant to both academics and practitioners alike.
Business Organizations

This proposal clarifies specific roles of knowledge management processes. It appreciates the integrative nature of Knowledge management processes and knowledge management infrastructure. Such integration structures coordination for the purpose of managing knowledge effectively (Gold et al., 2001). Knowledge management processes are enhanced by appropriate knowledge management infrastructure (Pan and Scarbrough, 1998; Stonehouse and Pemberton, 1999). Therefore, this proposal considers knowledge management infrastructure as prerequisites for knowledge management processes.

Emerging Economies

This proposal highlights the dynamic alignment of knowledge management infrastructure, processes and competitive advantage and their implications on performance of public institutes of technology in Kenya. Empirical results provide a theoretical foundation for why firms should adjust their knowledge strategies along with their knowledge creation processes. This proposal therefore facilitates empirical research in Kenya to establish distinctive strategic positions, in line with knowledge management that institutes of technology should adopt, to gain competitive advantage while undertaking their core business of knowledge generation, dissemination and storage through knowledge repositories.

The Government

In line with Kenya’s vision 2030, this proposal seeks to improve the technical capacity of output (human capability) from public institutes of technology. This proposal better informs government policy in terms of resource allocation (bandwidth and equipment) with a view to enhancing output quality of these institutes. With regard to human resource management, the government stands informed about how to mine capacity enhancement skills from both current teaching force and retired resource persons within knowledge management process.

TVET authority

This proposal is relevant to TVET authority as an organ of government tasked with regulation of conduct of public institutes of technology. Guidelines set out in this proposal could be used as a yardstick for standardizing operations of all institutes of technology in Kenya. This would reduce skill discrepancies among students graduating from various institutes of technology in Kenya.
Scope of the Study

This proposal seeks to investigate knowledge management in all public institutes of technology in Kenya for the period starting January 1st 2012 to December 31st 2016. The study population encompasses college administration, select teaching staff and select subordinate staff.

Limitations of Study

This proposal seeks to investigate Knowledge management processes and competitive advantage on the relationship between knowledge infrastructure and performance of organizations. The first limitation would arise from operationalizing study variables such as trust and T-shaped skills. Similarly, other measures of people factor such as gender and age apart from T-shaped skills could result in different findings. This proposal will adopt correlational descriptive survey through questionnaires and semi-structured interviews. By using Likert scale for data capture, respondents could over-rate or under-rate their scoring on some questions thereby distorting reality on the ground.

2. Literature Review

2.1 Introduction

A literature review is significant in any research in that it shares the results of studies that have been undertaken and are closely related to the research being undertaken, thereby avoiding overlaps of literature by providing objectivity. It also provides a framework for establishing the importance of the study by relating it to the larger ongoing dialogues by filling in gaps and benchmarking the results of a study with other findings (Kothari, 2004; Creswell, 2009). Most importantly, it aids the researchers to acquaint themselves to methodologies, content and conclusions of others’ research in order to articulate the key research issues relevant to the theory in question. Consequently, this chapter reviews and provides a synthesis of literature relating to knowledge management and performance of public institutes of technology in Kenya.

2.2 Theoretical Review of Knowledge Management

This proposal is premised on three theories: the resource-based view theory, Dynamic capabilities theory and Knowledge-based theory. A discussion of these theories and their relevance to the current study is presented hereunder.
2.2.1 The Resource-Based View (RBV)

This theory is attributable to Penrose (1959). Over time, Barney and Conner (1991) have developed it. It analyzes a firm in terms of its resource-base, which could be thought of as strength or weakness of a given frame. These resources when protected against imitation, transfer or substitution could enable the firm achieve competitive advantage and superior long-term performance. Such organizational resources include routines, culture, invisible assets, human resources and information technology. Sustained competitive advantage comes from complementary resources in creating heterogeneity of efficiency in industry and value, rareness, inimitability, and non-substitutability of the complementary resources (Barney, 1991). The capability to deploy groups of resources is the key for management success (Teece et al., 1997). But RBV suffers from over-relying on inconsistent assumptions of rationality, treats knowledge as a general resource, rather than having special characteristics. It therefore does not distinguish between different types of knowledge-based capabilities. In addition, this theory does not precisely specify the distinctions between resources and capabilities. This proposal seeks to determine how institutes of technology could transform their unique human resources into a competitive advantage worthy of high performance.

2.2.2 Social Capital Theory

One of the primary focuses of this proposal is on the relationship between knowledge infrastructure and knowledge processes. This relationship could be explained by the use of social capital theory. The social capital concept has been applied since its early use to explain a wide range of social phenomena (Nahapiet and Ghoshal, 1998). The main proposition of social capital theory is that networks of relationships constitute a valuable resource for the conduct of social affairs, providing their members with the collectivity-owned capital. Social capital as the sum of the actual and potential resources embedded within and derived from the network of relationships possessed by an individual or social unit (Burt, 1992).

Although social capital has many different attributes, it can be categorized into three dimensions: the structural, the relational, and the cognitive (Nahapiet and Ghoshal, 1998). Structural dimension refers to the overall pattern of connections between actors (Burt, 1992). Relational dimension refers to assets created and leveraged through relationships. It includes various facets such as trust, norms, obligations, and identifications (Putnam, 1995; Coleman, 1990; Burt, 1992; Hakansson and Snehota, 1995). Cognitive dimension refers to resources
providing shared representations, interpretations, and systems of meaning among parties (Cicourel, 1973).

This theory can describe the relationship between knowledge enablers and knowledge management process. Social capital facilitates the development of intellectual capital by affecting the conditions necessary for exchange and combination to occur (Nahapiet and Ghoshal, 1998). Social capital consists of various knowledge infrastructures such as organizational structure and culture. Intellectual capital refers to knowledge and knowing capability of social collectivity; it means knowledge management processes and its results (Nahapiet and Ghoshal, 1998). Therefore, this proposal proposes correlates the relationship between knowledge infrastructure and knowledge management processes on the basis of social capital theory. It provides systematic mechanisms for how knowledge infrastructure could improve knowledge management processes.

2.2.3 Systems Thinking Theory

There is a general recognition among academics that knowledge management is a cross-functional and multifaceted discipline. A variety of components make up knowledge management and the understanding of their interaction is important; a holistic view is very useful (Ndlela and Toit, 2001; Chen 2008). To this end, an integrative research model is necessary; i.e., the relationships among knowledge infrastructure, processes, and organizational performance should be identified within the framework of systems thinking. Systems thinking theory considers problems in their entirety (Rubenstein-Montano et al. 2001; Senge, 1990). Problem solving in this way includes pattern finding to enhance understanding of, and responsiveness to, the problem.

System thinking theory examines relationships between the various parts of the system. It is championed on the premise that there are emergent properties of systems that do not subsist when systems are decoupled into smaller parts (Senge, 1990). This theory is able to describe complex and dynamic characteristics of knowledge management in a systematic fashion. For example, the people (the knowledge people create, share, and use), the culture for knowledge sharing, organizational structure, and the technological infrastructure for knowledge management should be considered for effective knowledge management. This approach to knowledge management emphasized the concern raised by Tsoukas (1996) regarding the lack of an integrative framework in organizations to provide a general sense of direction for knowledge management. Furthermore, systems thinking theory is important for knowledge
management because the theory can ensure that the same important components are addressed and compared by knowledge management endeavors (Schlake, 1995). It provides systematic mechanisms for how knowledge enablers can improve organizational performance and for studying connections between knowledge management processes and organizational performance.

2.3 Empirical Literature Review

This section reviews studies on the relationship between knowledge management infrastructure, processes, competitive advantage and performance of public institutes of technology in Kenya.

2.3.1 Knowledge Management Infrastructure and Performance

Wachira (2012) studied the application of knowledge management within Kenyan steel manufacturing industry. The study revealed that the level of awareness of knowledge management is high and that top management recognizes the importance of knowledge management and is ready to support the initiative. Despite awareness levels, the adoption of knowledge management is low due to cultural and technological barriers. This particular study analyses knowledge management in private manufacturing firms where most of the labour force uses psychomotor domain in production process. The current proposal targets public institutes of technology in Kenya where a majority of labour force use their cognitive domain for service production and delivery.

Cheruiyot et al. (2012) studied the institutionalization of knowledge management in manufacturing enterprises in Kenya. Despite acknowledging that knowledge management was a critical organizational asset base, they noted that most organizations had not yet developed a knowledge management policy. This study is similar to Wachira (2012) in its context where psychomotor domain drives production to the bulk of labour force save for the management team. The current proposal seeks to study public institutes of technology, academic institutions where cognitive domain drives production process. Mungai (2012) holds that knowledge management is not well understood or valued in most organizations, more so public institutions, consequently, it is neglected leading to loss of competitive advantage for organizational development and growth. It would be interesting subjecting Mungai’s (2012) findings to empirical testing in public institutes of technology in Kenya and how adoption of knowledge management would go a long way in enhancing competitive advantage in these institutions.
Omogeafe and Ohimai (2014) in their study on the relationship between Knowledge Management process and creativity among 389 faculty members in Nigerian Universities, by use of correlations, and regression analysis and analysis of variance (ANOVA) found that Knowledge management practices led to differences in performance and that variations in knowledge management practices led to differences in organizational performance; Knowledge management was statistically positively related with overall performance, innovation, growth and competitive advantage. Knowledge management was effective in all universities except Benson Idahosa University; knowledge management practices are significantly related to innovation, competitive advantage and growth in University of Benin, Benin City, University of Port Harcourt, Ambrose Alli University and Delta State University.

This means that by fostering knowledge management programmes in these universities, performance will be significantly improved. The study fails to capture knowledge management in technical institutions as well as institutes of technology. The current study focuses on knowledge management practices and Performance in public institutes of technology in Kenya.

Although technology enhances the organization’s ability to conduct knowledge management activities, as a single construct it is not sufficient on its own. Njiraine (2012), for example, found that indigenous knowledge is challenged by current technological and communication advancements, e.g. Face book, Twitter and email. More specifically, indigenous Knowledge policies in both Kenya and South Africa should be reviewed to reflect the changing environment in which the two countries are operating. In addition, there should be heightened efforts to create an independent department in a vibrant ministry that deals with Indigenous Knowledge to ensure that indigenous knowledge is put into the best possible use. The study concentrates on identifying indigenous knowledge policies and legislation, governance structures and their roles in Kenya and South Africa. This proposal specifically targets public institutes of technology in Kenya and their knowledge management endeavors.

2.3.2 Knowledge management infrastructure and competitive advantage

A study by Kiseli (2016) on the effect of knowledge management capabilities on competitive advantage in the Kenya hospitality industry: The case of five star hotels in Kenya. Study variables included social perspectives (organizational culture organizational structure, People skills), process capability (acquisition/generation, conversion/sharing, application, protection/storage), Innovation Agility (Experimentation with new ideas Exploration of new paradigms, Pursuit of new strategies and Exploration of new knowledge) and Competitive advantage in five star hotels (Market Share, Customer loyalty, Customers’ satisfaction and
sales Volume). By employing case study research design with multivariate linear regression, correlation analysis and multiple regression analysis, findings reveal that knowledge management process capability is a key driver in achieving organizational competitiveness. It promotes knowledge discovery and detection, knowledge re-use, and knowledge acquisition in five star hotels. The study concentrates on knowledge management practices within hospitality industry specifically five star hotels by using case study approach. The current proposal seeks to conduct a similar study in public institutes of technology (academic institutions) in Kenya through descriptive survey method.

Kangogo and Gachunga (2015) examined the influence of knowledge management practices on enhancing service delivery in the banking sector in Kenya: A case of commercial banks in Kenya. By using descriptive survey, correlational analysis, multiple regression, Analysis of variance (ANOVA) knowledge acquisition played a major role to enhance service delivery in the banking sector in Kenya. Results from the study indicate that knowledge in the organizations is shared mostly in meetings and workshops but other forms of knowledge sharing were also used such as through training programs, at brainstorming sessions and by use of various electronic media such as emails, intranet and telephone conversations. The study was conducted within the banking sector. The current proposal will replicate the study within public institutes of technology in Kenya which are academic institutions with a totally different organizational structure and managerial locus of control from banks.

Akinyi (2015) conducted a study on the influence of training, communication, information technology and leadership on implementation of knowledge management in state corporations in Kenya. Findings suggest that computer technologies are capable of assisting knowledge seekers and experts engaged in different types of knowledge acquisition process such as socialization, combination, externalization, and internalization. More importantly, effective and efficient transfer of experiences, insights and know-how among different experts and decision makers is a prerequisite for high quality decision making and coordinated, organizational action. The study was conducted in commercial state corporations in Kenya. The current proposal focuses on public institutes of technology and how they tap into knowledge management to boost their performance.

Nzioki et al. (2015) investigated the influence of cross-cultural diversity factors on Knowledge Management from a Strategic Human Resource Management perspective of Kenya homegrown multinational firms. From the sampled 17 selected companies a total of 284 managers were sampled from each category of companies as respondents. Findings reveal that
main cross-cultural diversity factors namely differences in education system, language difference, business ethics and culture influenced knowledge management in the East Africa Common Market. The study concentrates on commercial multinationals in East Africa. The current proposal concentrates on public institutes of technology operating in Kenya.
The hypotheses to be tested flow from the objectives of the study and are anchored on literature review conceptual model of this proposal.

**Hypothesis 1**

Based on the first objective, this proposal seeks to establish the relationship between knowledge management infrastructure and performance of public institutes of technology in Kenya. Hence the following hypothesis will be tested:

**H01:** Knowledge Management infrastructure has no significant effect on performance of public institutes of technology in Kenya.

**Hypothesis 2**

Based on the second objective, this proposal seeks to establish the relationship between knowledge management infrastructure and knowledge management processes. Hence, the following hypothesis will be tested:

**H02:** Knowledge management infrastructure has no significant effect on knowledge management processes in public institutes of technology in Kenya.

**Hypothesis 3**

Based on the third objective, this proposal seeks to determine the relationship between knowledge management processes and performance of public institutes of technology in Kenya. Hence, the following hypothesis will be tested:

**H03:** Knowledge management processes have no significant relationship with performance of public institutes of technology in Kenya.

**Hypothesis 4**

Based on the fourth objective, this proposal seeks to establish the mediating effect of competitive advantage on the relationship between knowledge management infrastructure and performance of public institutes of technology in Kenya. Hence, the following hypothesis will be tested:

**H04:** The effect of knowledge management infrastructure on performance of public institutes of technology in Kenya is not mediated by competitive advantage.
Hypothesis 5

Based on the fifth objective, this proposal seeks to determine the effect of knowledge management processes on the relationship between knowledge management infrastructure and performance of public institutes of technology in Kenya. Hence, the following hypothesis will be tested:

**H05:** Knowledge management processes in public institutes of technology in Kenya do not moderate the effect of knowledge management infrastructure on performance.

Hypothesis 6

Based on the sixth objective, this proposal seeks to establish the joint effect of knowledge management infrastructure, knowledge management processes, and competitive advantage on performance of public institutes of technology in Kenya. Hence, the following hypothesis will be tested:

**H06:** There is no significant joint effect of knowledge management infrastructure, knowledge management processes, and competitive advantage on performance of public institutes of technology in Kenya.

3. Research Methodology

3.1 Introduction

This section presents steps and approaches that will be followed in executing the proposed study. Specifically, it discusses the research philosophy, the research design, the study population, data collection methods, reliability and validity of the measurement instruments, operationalization of the study variables and data analysis procedures.

3.2 Research Philosophy

Among the various research approaches that exist, two extreme research philosophies may be distinguished, namely a phenomenological and a positivistic paradigm. The phenomenological paradigm is also known as the qualitative, subjectivist, humanistic or interpretive research paradigm, whereas the positivistic paradigm is alternatively known as the quantitative, objective, scientific, experimentalist or traditionalist research paradigm (Blumberg et al., 2005). A phenomenological research paradigm or mindset is concerned with understanding human behavior from the researcher’s own frame of reference. The act of investigating a reality within a phenomenological context is thus seen as having an effect on that reality. Researchers using this paradigm essentially focus on the meaning that individuals attach to actual
experiences related to a concept or a phenomenon rather than on measuring it (Miller & Salkind, 2002). This further implies that phenomenologists have to interact personally with the objects (or units of analysis) being investigated. According to this approach the opinions of experts are sought rather than drawing samples from a population (Collis & Hussey, 2003).

A positivistic paradigm consists of several beliefs about how a researcher can make sense to others, and it is based on the assumption that all researchers are fallible. As such, it is posited that human behavioral studies should be conducted in the same manner as studies in the natural sciences (Blumberg et al., 2005). Positivism is based on realism in that it searches for the truths ‘out there’. As this research strives to test a number of quantitative hypotheses, a positivistic research philosophy was adapted. This is because positivists place a strong emphasis on the quantification of constructs and believe that the best, or the only, way of measuring the properties of phenomena is through quantitative measurement. The overriding features of a positivistic philosophy are therefore the production of quantitative data based on large samples as well as on theory and hypothesis testing.

### 3.3 Research Design

This study will adopt a correlational descriptive research design to correlate knowledge management infrastructure, processes, competitive advantage and performance of public institutes of technology in Kenya. Certainly, researchers point to different facets of descriptive studies such as in-depth descriptions of specific individuals, social events, groups, companies or social artifacts (Sekaran, 1992). In addition, Collis and Hussey (2003) suggest that description of phenomena may range from narrative type (as in historic and discourse analyses) to highly structured statistical analysis (as in correlation studies).

This is in line with good research practice in which social science researchers are increasingly advocating for methodological triangulation of both qualitative and quantitative research methods, which draw conclusions and make inferences from several data sources, using different methods, investigators, and theories (Creswell, 2008). This proposal will adopt survey questionnaires and unstructured interviews for data collection. It examines how knowledge management practices relate to organizational outcomes specifically with regard to public institutes of technology in Kenya.
3.4 Population and Sample

The unit of analysis in this study is a public institute of technology and the target population will be all the 14 public institutes of technology in Kenya as of 31st December 2016. Due to the small size of the population of study a census survey will be conducted.

3.5 Data Collection

The research objectives pertain to the positivistic dimension of this proposal and imply that appropriate procedures for the sourcing of primary quantitative data needed to be planned and executed. Blumberg et al. (2005) point out that the reliability and validity of a study can be seriously jeopardized if incorrect data collection methods are employed. Consequently, great care will be taken to utilize acceptable methods.

3.6 Data Analysis

This study will adopt Sekaran’s (1992) four-step model of data analysis including getting data ready for analysis, getting a feel for the data, testing the goodness of fit of the data and hypothesis testing. Descriptive statistics including measures of central tendency for Likert scale variables in the questionnaire will be calculated. Standard deviation will be used to reveal dispersions in the underlying data while other measures such as coefficient of variation, kurtosis and skewness will also be computed.

Correlation analysis will measure strength of the relationship between knowledge management infrastructure and performance of public institutes of technology; knowledge management infrastructure and knowledge management processes; Knowledge management processes and performance of public institutes of technology in Kenya; effect of competitive advantage on the relationship between knowledge management infrastructure and performance of public institutes of technology in Kenya; effect of knowledge management processes on the relationship between knowledge management infrastructure and performance of public institutes of technology in Kenya; and the joint effect of Knowledge management infrastructure, knowledge management processes and competitive advantage on performance of public institutes of technology in Kenya. This will establish the suitability of data for regression analysis by ensuring that the dependent and independent variables have a statistically significant relationship while at the same time controlling for multi-collinearity problem which occurs if any two independent variables are highly correlated (Cooper & Schindler, 2003).
Hierarchical multiple linear regression model will be used to assess the nature of the relationship between various variables hypothesized in the study at 5% level of significance. If adding the variable contributes value to the model, then they will be retained, but all other variables in the model are re-tested to see if they are still contributing to the success of the model. If they no longer contribute significantly, they are removed. This ensures that only the minimum possible set of predictor variables is included in the model (Sekaran, 1992; Statman, 2000; and Kempf and Osthoff, 2007). Reliability tests such as multi-collinearity tests, adjusted coefficient of determination (adjusted $R^2$), F-tests and t-tests will be computed on the model to determine strength of relationship among study variable.

3.6 Operationalization of Study Variables

The current research considers four variables within the construct of knowledge management infrastructure (culture, structure, IT and people) as the independent variable, knowledge processes as the moderating variable, competitive advantage as the mediating variable and performance as the dependent variable.

Knowledge management infrastructure refers to organizational mechanisms for intentionally and consistently fostering knowledge through knowledge creation, protection and facilitating knowledge sharing in an organization. KM infrastructure can be classified into two major capabilities, technical and social infrastructure. Technical infrastructure includes physical, IT infrastructure, devices and components. Social infrastructure, on the other hand, includes culture, structure, and human resources (Kushwaha, 2015).

Organizational culture is a system of shared values and beliefs that produces norms of behavior and establishes an organizational way of life. The successful implementation of knowledge management requires an organizational culture that encourages employees to create and share knowledge (Ho et al. 2014). Culture will be measured through values such as trust, confidence, cooperation, learning, and recognition of expertise.

Organizational structure has multiple dimensions including centralization, formalization, in addition to the incentive system, which is needed to encourage knowledge creation and sharing.

Functional process of KM process can be considered as a cycle of input-output as any other system, where process clearly indicates that knowledge management takes information, knowledge, and people as its basic inputs, and applied knowledge and intellectual capital as its desired outputs. Its dimensions in this proposal include socialization, combination, acquisition, application, protection, internalization and externalization.
Socialization (tacit to tacit): the first phase of the KM process is sharing and distributing the ideas and the interaction of tacit knowledge with tacit knowledge. The same event occurs during the dynamics of effective teams or between colleagues with common ideas. In this phase, the members discuss about what is more important and use the others’ thoughts. Socialization is also known as converting new knowledge through shared experiences.

Combination is when explicit knowledge, in the form of different collections of knowledge, already exchanged, distributed, and documented or discussed during meetings and sessions, is processed and categorized in order to create new knowledge. It is easily documented and distributed, when the knowledge is explicit and evident.

Knowledge acquisition involves processes leading to obtaining knowledge.

Different terms refer to the acquisition of knowledge such as acquire, seek, generate, gather, collect, capture.

Knowledge application involves using the knowledge in performing tasks like problem solving, decision making, new idea generating and learning.

Internalization involves the process of converting the explicit knowledge to tacit knowledge. Internalizing these ideas is effective in creating an understanding and developing a learning culture (learning through action).

Externalization (tacit to explicit): This process focuses on tacit to explicit knowledge linking. Externalization requires the expression of tacit knowledge and its translation into comprehensible forms that can be understood by others. In a team climate, metaphors and allegories assist the individuals to externalize their own tacit knowledge (personal experiences, ideas and beliefs) and imagine a clear picture of others’ ideas.

Competitive advantage is the extent to which an organization is able to create a defendable position over its competitors. It is measured in this proposal through student enrolment, performance and innovativeness and staff commitment

Organization performance depicts output from these academic institutions measured in terms of financial dimensions, client satisfaction, employee dimension, leasing and growth and harmonized internal processes.
4. Conclusion

This proposal seeks to correlate knowledge management infrastructure and performance of public institutes of technology in Kenya, knowledge management infrastructure and knowledge management processes and joint implication of infrastructure, processes and competitive advantage on performance of these institutes. From literature review, it is evident that effective deployment of information technologies in organizations would facilitate knowledge acquisition, processing, storage and dissemination, as well as promote and sustain personal knowledge access and sharing among staff for improved personal and organizational productivity. Institutions of higher education are citadels of knowledge creation and dissemination (Jain 2017). With proper infrastructure in place coupled with smooth flowing processes, the management of knowledge becomes an asset to these knowledge-based organizations. Results from this proposal will inform policy formulation towards effective knowledge management in institutions of higher education particularly public institutes of technology in Kenya.

References


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