

**THE INFLUENCE OF INNOVATION AND
TECHNOLOGY STRATEGY AND COMPETITIVE
ADVANTAGE OF CONSTRUCTION COMPANIES IN
KENYA**

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DECLARATION

STUDENT'S DECLARATION

This research project is my original work and has not been presented for a degree at any other university.

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SUPERVISOR'S DECLARATION

This research project has been submitted for examination with my approval as the candidate's University Supervisor.

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DEDICATION

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ABBREVIATIONS AND ACRONYMS

BMS	:	Building Management System
CRM	:	Customer Relationship Management
EBK	:	Engineering Board of Kenya
EPS	:	Expanded Polystyrene Styrofoam
ICT	:	Information Communication and Technology
IT	:	Information Technology
MOW	:	Ministry of Works
NCA	:	National Construction Authority
OECD	:	Organisation for Economic Cooperation and Development
RBT	:	Resource Based Knowledge
R & D	:	Research and Development
ROI	:	Return on Investment
SIC	:	Standard Industrial Classification
T & K	:	Technology and Knowledge
U.N	:	United Nations

ABSTRACT

The aim of the study was to examine how innovation and technology as a strategy influence competitive advantage in the Construction companies in Kenya. The study evaluated how innovation and technology influence competitive advantage of construction companies in Kenya. Cross sectional survey design was used in the study. The study was carried out from 40 selected construction companies in Kenya. Questionnaires were the main data collection tool used. The data collected was analysed through the use of regression analysis. The findings of the study indicated that use of Innovation and technology in the construction companies affects the competitive advantage of a company. The study recommended that all the employees of the construction companies should be involved in the entire process so that the firm can tap all the ideas from every employee in the company. By practising this, the company shall be at a higher level of achieving its competitive advantage. The study revealed that construction companies should use a top down approach when introducing and implementing innovation and technology strategies. Failing to do so, shall demoralise other employees of the company, as they will feel left out and not part of idea implementation. It is also necessary for innovative employees to be given some incentives to motivate them to be more innovative hence encouraging others to follow suit. Construction companies should partner with the construction companies and assist them in carrying out research on finding the best building technologies both locally and globally, which may help the government in decreasing the housing problem in Kenya. Construction companies should also engage non-governmental organizations like Shelter Afrique, UN Habitat among others on how to improve their products and services. To create more awareness, the research recommended that construction companies should partner with media houses and advertise their services and products. County government should also put all construction companies under their jurisdiction on notice to control them from building sub-standard buildings, roads, bridges among others. The study results offer valuable contributions to government, policy makers, the government and other construction companies. The study indicated that there is a strong relationship between innovation and technology as a strategy, and competitive advantage.

CHAPTER ONE

INTRODUCTION

1.1 Background of the Study

Innovation and Technology can be termed as a dynamic network of agents working together in a specific industrial area or economy under a particular institutional infrastructure whereby it is involved in the diffusion, generation and technology utilization. According to Erkko and Ari-Pekka Hameri (1995) survival of a firm that wants to thrive and fly high in these intrinsically ‘unfriendly’ dynamic surroundings, the need for strategic capabilities is paramount. Innovation and technology are some of the examples that a firm should embrace in order to survive and score high in this turbulent environment.

McDonnel and Ansoff (1990) postulate that performance of a firm is optimized when firstly, all the components of a firm’s capability supports each other, secondly, aggressiveness of its strategic behavior matches the turbulence of the environment, thirdly, when the responsiveness of capabilities of a firm matches the aggressiveness of its strategy. The main purpose of innovation and technology of strategy in the construction companies is to attain sustainable competitive advantage. Competitive advantage is accomplished when a firm develops or acquires a mix of dimensions that enables it to outshine its competitors. Other various researchers, managers of various businesses and practitioners have different perspectives of conceptualizing the term innovation and technology and what processes and dimensions define them. This arises due to overlapping of the two concepts hence leading to a great practical challenge. Tidd et al., (2001) defines Innovation as a way whereby opportunities are turned into ideas and immediately put into widely practice in the firm.

According to Bruton and White (2007, p.21) innovation is the process whereby new and improved products and services, materials and processes are formulated or developed and transported to a reserved plant or market. Competition in the construction companies is crucial hence Innovation and technology strategy is inevitable as it offers various gains to the competitor, such as lowering product prices or giving reasons for raising prices due to provision of quality services and benefits (Thomson et al, 2007).

This research study was based on dynamic capability, resource based view and knowledge based view theories. All these theories were necessary in elaborating and explaining the influence of innovation and technology strategy towards achieving competitive advantage. Because of sharp increase in competition in the construction companies, the management in these firms came up with new and practical strategies that put the firms in the competitive edge. Construction companies keeps on evolving or growing from one level to another such as from small to larger and multi-national organizations. These theories were supposed to meet the changing needs of construction companies as they keep on growing to various levels of the life cycle of the organization. Mintzberg (1994) Strategies and plans are rarely implemented as intended.

The study has found out that construction companies in Kenya have embraced innovation and technology strategy to spring up their competitive advantage among their competitors. The study has also found out that regulators and policy makers in the construction companies have to some extent, integrated innovation and technology strategy in their construction projects.

Other scholars have provided more information on how to deal with the challenges of implementing innovation and technology strategies in their target market. The study has brainwashed the construction firm owners' perspective on modern innovation and technology strategy and has shown them the importance of embracing innovation and technologies in the construction companies for a better tomorrow.

The sharp increase of competition in the construction companies has made many construction companies in Kenya to ensure that innovation and technology strategies are implemented despite many challenges that they face. Majority of construction companies have come up with various systems or ways of making sure that there is improvement and modernization of business process, though much is needed to ensure that they achieve more competitive advantage.

1.1.1 Innovation and Technology Strategy

Innovation and technology strategies can be termed as research and design investments, learning and utilization of new innovations and technology by the construction companies in organization and operational process. Researchers such as Bossink (2004) highlighted that innovation and technology concept has great influence on competitiveness of the firm. According to Macomber (2003), leading constructors should modify the economic model so that they can take advantage of IT both currently and in the coming years. Strategic business leaders are not concerned with using computer tools that use the margins of individual productivity; they want the substantial savings in costs and improvements in service that have been won in manufacturing, retail, and financial service companies. These successes are won by using the power of innovation and technology to streamline and improve entire construction companies.

According to McDonnell and Ansoff (1990); Johnson, Scholes and Whittington (2008), Strategy has been defined as scope and direction of an organization over a long period of time whereby the organization proprietors' expectations are fulfilled through constellation of competences and resources Mintzberg (1994) has defined strategy as an element that has multi face that encompasses 5 p's i.e. ploy, position, plan, perspective and pattern. The 5p's are tailor made to fit the action to which it can apply. From these definitions, it can be summarized that strategies connect the firm and the external surroundings and that it supplies direction and coherency when the management is making its decisions.

Competitive advantages are achieved when these strategies are properly adhered to. Currently construction companies have prioritized innovation and technology on their agenda. Due to intensifying labor charges, construction companies have prioritized innovation and technology as a means of becoming competitive in the foreign markets (Nam and Tatum, 1997).

In the 1950s, formal strategic planning was initiated in the United States of America (USA). Peter Drucker (1954) and its main purpose was to recognize the commercial activities of the organization. Drucker was the first scholar to address the concept of strategy and its formulation as a way of managing organizations. OECD (1996, 1997) came up with a study showing that innovation can come out from different sources.

1.1.2 Competitive Advantage

According to Michael Porter (2003) innovation and technology can award you competitive advantage in three ways: 1) restructure the competitive playing field, 2) increase your revenue, or 3) reduce your costs, Majority of the most “wonderful and neat” technologies are (allegedly) justified in the first category. For example, 3D visualization and its cousin, 4D modelling, can help construction companies to differentiate themselves at the interview. But it’s far from clear that they are a) defensible intellectual property or b) that they can impact cost in a significant way. Cost reduction technologies include productivity and planning tools like Meridien Prolog or Primavera Project Planner But they just help a few individuals to go faster; they don’t tend to optimize the system. One could even argue that they work against optimizing the whole contract system; both tools are still marketed for claims control and litigation support, adding the manipulation of information to the already impressive.

Innovation refers to execution of modern or new processes, ideas and technologies to heighten the competitiveness of the companies or the firm. Majority of the analysts recommend that innovation and technology need to be raised in the construction companies (Slaughter, 1998; Winch, 1998; Hampson and Manley, 2001) shows how vital innovation is in the construction companies. In summary engineering and construction companies have no choice but to embrace innovation and technology. Through innovation, they are able to win projects and increase their Return on Investments (ROI) of these projects.

Employment of modern innovation and technology results to competitive advantage for construction companies. In reacting to the rise of uncertainty and turbulence brought by changes in the market, innovation and technological developments and expanded competition. Construction companies have capitalised on and leverage from the opportunities of change.

Some of school of thoughts propose that innovation is not properly managed due to collective individual's motivation (McElroy, 2002). Another school of thought suggests that innovation leads to competitive advantage when properly managed (Janszen and Pries, 1995). Nevertheless the way of doing project in the construction companies and the way various organizations take part with varying competencies have implications on all schools of thought.

Separation make implementation and initiation of innovation and technology challenging and hard (Miyatake and Kangari, 1997), according to Perkinson 2006, a firm that specializes in construction, can raise its level of competitive advantage by incorporating ICT and innovation technology hence coming up with an aggregate jobsite management tool able to analyse the construction project in four ways i.e. Equipment and materials control management, Management of human resource, Project performance control and Supplies and logistics management. Innovation and technology strategy is among the most valued strategy that has to be used and implemented by construction companies in gaining super competitive advantage.

1.1.3 Innovation, Technology Strategy and Competitive Advantage

Competitive advantage is positively correlated to technology. Technology strategies has resulted into improved construction activities, faster service deliveries and hence an increase in profitability. According to (Drucker, 1994), gaining and sustaining competitive advantage is the defining question of strategy. Accordingly, strategy research is motivated by attempting to answer fundamental questions like why do some innovation technology start-ups succeed, while others fail or what determines several firms' performance. In the world wide conjuncture, innovation and technology is viewed as an important strategy in the field of construction companies for gaining competitive advantage. The outcome of this research has provided worthy insights on innovation and technology concept for construction experts as a tool for competitive advantage creation.

According to Porter (2003) for a firm to gain competitive advantage, it must be different. This means that the company must deliberately operate it activities in the best way than its competitors. Sustaining competitive advantage is attained through core competencies that lead to long term advantages to the firm. Innovation and technology contribute a lot towards attaining and sustaining these competitive advantages. Competitive advantage keeps on increasing as the firm uses the best ways to present quality products in the market at the right time and monetary value. Prosperous construction companies should incorporate innovation and technology into their business and corporate strategies to attain competitive advantage. According to Chan and Heide (1992) competitive advantage is achieved when a product or service adds or makes more value i.e. both in attributes and symbolic.

Any suggested proposal drawn toward achieving a competitive advantage of an organization should receive a maximum support from the management. Competitive advantage is a phenomenon that is tangible, felt and can be measured. It is the most valued way that an organization can use to evaluate its success. Competitive advantage shows that an organization is far ahead than its perceived competitors in comparison to how customers value your products and the cost incurred in provision of that product (Lawler III, 2008). The more the sustainability of the competitive advantage, the more intricate it is for business rivals to knock off the advantage. According to Vesey (1991) firms that pioneer services and products into the market have the advantage of getting one-third more profit from the product's life compared to a later arrival. Firms or organization should emphasize on product innovation and technology or differentiation (Porter, 1980).

1.1.4 Construction Companies in Kenya

Innovation and technology influence in the construction companies, is a topic that has been discussed for a considerable period of time. Nevertheless, current statistical data and research shows that construction remains behind other sectors in terms of efficiency and productivity hence leading to blaming of innovation and technology. This research has attempted to illustrate how the current status of innovation and technology in the construction companies, have been increasingly challenged to embrace innovation and technology in order to successfully satisfy the aspirations, expectations and needs of clients and society, and to upgrade their competitiveness (Latham, 1994).

The innovation and technology revolution act as a catalyst in speeding up services and is a client driven. Knowledge Based Engineering is such a new innovation and technology in the construction sector that is doing wonders. The model helps the designers in the construction companies to see new ideas by use of advanced computer added design or Virtual Reality. This technology has a massive effect in the construction companies because it has promoted better construction techniques. These present clients with real choices, hence promoting competitiveness in the companies.

Construction companies in Kenya needs to re-evaluate and improve it innovation and technology strategy and come up with a mechanism which can be used in monitoring innovation and technology needs. Through embracing innovation and technology strategy and new methods of doing things, construction companies place themselves on the competitive edge (Porter, 1990). The research tried to check whether this monitoring mechanism was put in place.

1.2 Research Problem

Innovation, technology and strategy are very crucial concept in any firm today. Any organisations that want to survive in this very competitive and turbulent world must make sure that innovation, technology and strategy are properly put into the right gear. Strategy can be defined as a function of a firm's internal capabilities as it shows the organization the direction that it should follow. Organizations have resulted in coming up with various strategies and a number of steps to ensure that they remain afloat in the market. "Innovate or die" is a slogan or a motto that is used to show how innovation is crucial in today's economy (Robinson and Getz, 2003).

It is apparent that the rising and importance functions of innovation and technology to the firms cannot be kept aside. Strategy innovation and technology are concept that is of importance to all the firms in Kenya. To ensure a competitive advantage, innovation and technology strategies must be directed towards the external environment so as to make sure that firms remain in it business as long as possible. Innovation and technology are necessary aspects of organisations strategy execution. Firms for instance cannot do without innovation and technology as it has become a core contributor in the business function of the firm. It has become so dynamic such that firms cannot survive without innovation and technology. Firms must do innovations, practise and commercialize them so that they can win in this competitive world. For a strategy to be implemented there must be capability, without capability strategy is devoid of strength.

Construction companies today still rely on old traditional ways of communication and documentation like one-on-one meetings, bulky filings, and exchange of paper documents among others (Mohamed and Stewart, 2003). Among the basic human needs is housing. Availability of quality houses to live in matters a lot. In the construction companies, the portion of innovation and technology is huge and narrow study has been done. Further study therefore needs to be done if any significant steps are to be made in improving innovation and technology in the construction firms. The construction companies in Kenya tend to be reluctant in embracing the current building and construction innovations and technologies. This makes them fail in getting most the construction tenders in the country hence losing them to foreign construction companies.

The demand for houses in Kenya outweighs the supply hence both the private sector and the government must encourage firms to come up with alternative ways of building technologies through innovation. KOTO is a great example that uses Expanded Polystyrene Panel (EPS) to construct low cost houses through KOTO Housing Kenya Ltd. It is a private housing developer who came up with the innovation in order to enable them offer low cost houses to the citizens in a span of fourteen days. The government of Kenya authorized the use of the technology in building houses for Kshs 500,000 for Kenyan youths.

In housing construction, immense and limited research has been done and more research still needs to be done to improve the construction of houses in Kenya. Dulaimi et al. (2002) in his study Academia-companies cooperation argues that lack of coordination through academia and companies is the main barrier to innovation and technology in the construction. Mayer (2011) did a study on low cost housing in Kampala, Uganda and found out that it citizens were living in the slums because the private developers and the government concentrated in building high cost houses, that were only afforded by well to do citizens.

Tatum and Nam (1997) states that in the past, construction companies were keen on innovation, because of the intensified labor cost, construction companies place innovation and technology as a way of becoming competitive in the global market. According to Winch (2000), construction companies that are comparatively planned and programmed face more challenges in innovation. In his comparative study about the innovativeness of British and French construction company participating in Channel Tunnel Project, based on this case study, he discovered that the French were much prepared to make process in improved innovations compared to their British counterparts especially when it came to use of automated systems.

Arvantis (2013) carried a study and found out that, lack of embracing new innovation and technologies in housing construction was the main contributor to housing crisis in Kenya. Others were lack of land, lack of access to financiers and gap in demand and supply. To close this gap, construction firms should embrace innovation and technology strategy as they are of much important in the companies. Orege (2007), Sirya (2010), and Mitulla (1984) did a research and found out that a wide shortage of housing existed in Kenya, and a gap between demand and supply was big. Previous studies have used longitudinal surveys and case studies.

Very few studies have been carried out on innovation and technology strategy on construction companies. Therefore, this study was carried out to find out how firms came up with innovations and technology, as a strategy to help in increasing competitive advantage in the construction companies. Likewise, researchers have done very little research on innovation and technology in connection with the construction companies. This study was carried out using a cross sectional survey and the same variables were measured across all the respondents to test the uniformity. Therefore, the research was done in order to fill the knowledge gap and then provides answers to the following question: what is the relationship, between innovation and technology strategy and competitive advantage in the construction companies in Kenya?

1.3 Research Objective

The research objective of this study was to examine how innovation and technology as a strategy correlate or affect competitive advantage of construction companies in Kenya.

1.4 Value of the Study

The study offers valuable contribution to formulation of policy making by the policy makers to incorporate innovation and technology in the construction companies in Kenya. It intends to fill the gap of limited literature on the construction companies in Kenya on what indeed determines the prospect of collaborating partner firm. The study is timely and crucial as it shall enable policy makers to formulate appropriate policies by being able to balance the demand and supply determinants of the provision of the construction infrastructure.

Due to limited resources such as land and with a budding population; consequently affecting the spatial distribution, it becomes possible for construction companies to plan and make selection of the appropriate collaborating partners so as to provide the required facilities in the best quality and in timely manner. The documentation of such a research can be instrumental in providing enlightening policy road map to all construction companies in Kenya.

Penrose's (1958) theory of resource/capability combinations, Rubin (1973) argues that a firm must effectively process capability/resource in its activities so that it can utilize them in effective combination. The theory confirms that if an organisation possesses resources/completeness minus dynamic capabilities, it can be hard to maintain or prolong super-competitive returns in the long run. Porter in his book "Competitive Strategy" put a foundational quest for strategic management theory by stating that "the essence of formulating strategy is relating a company to its environment"

From the aforementioned statement, three conceptual entities clarifies the relationships between innovation, technology and competitiveness i.e. (1) companies (2) strategy and (3) environment (market). These three entities are independent and interacting. Dynamic capability theory is another theory that explains how particular firms allocate resources for innovation and T & K (Probert, Phaal and Cetindamar, 2009). The theory explains that firms that have limited resources also have limited capacity or capabilities in adapting to new T & K. Players in the construction sector can require the findings of this research to find out ways of embracing innovation and technology. The research project shall also provide reference materials to the future researchers wishing to make further studies on the same topic.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

This chapter re-evaluated empirical information and theoretical contents that were available and correlated to the study on innovation and technology strategy. It focused on different theories used in exploring concept of innovation and technology strategy particularly as it correlates with the business environment dynamics and the adaptation of the strategy to achieve maximum competitive advantage.

Through literature, innovation has been defined in various ways. Dulaimi, 2005) he identifies innovation as the development, generation and implementation or making those ideas that are so new to the organization to work hence helping the organization to benefit commercially. Innovation and technology is the significant implementation of new products, processes or management with the aim of increasing the organization's efficiency (Seaden, 2003).

Technology has been defined as the way inputs are transformed into outputs. Technology is equally important in the construction firms hence making it a very distributive resource in the entire firm. The competitiveness of a firm can completely depend on it richness in technology, especially if technology is used as a determinant to the firms monetary value, as this can affect the price of the firms products to the outside world. According to Van Hemel, 1998) to achieve competitive advantage and heightened position in the market, product should be environmentally developed.

2.2 Theoretical Foundation

The research study covered theories that are closely related or connected to strategic management i.e. Dynamic capability theory, Knowledge based view theory and the Resource based view theory.

2.2.1 Dynamic Capability Theory

The word dynamic as used in the theory means the capability of being able to renew competencies in order to accomplish congruence with the ever changing business environment. Dynamic Capability refers to the way an organization or a firm is able to adapt, reconfigure and integrate both external and internal skills, functional and resource competencies to go with the ever-changing environmental requirements Teece et al., (1997).

Dynamic capability theory focuses more on the management abilities and capabilities and resource uniqueness from existing areas like human resources, process development, research and development, product development and organizational learning. Resource based theory according to Pisano and Teece (1994) has explained dynamic theory as the sub-set of the capability/ability or competences that enables the organization to come up with new and quality products, processes and react to the ever-changing market conditions. However, through application of Resource based view and Dynamic based view theories, some limitations may be experienced since it may be hard to determine which one of them either collectively or individually may lead to effective performance hence competitive advantage.

According to Teece and Pisano (1995), he states that it is hard to trace general processes in order to find where the capabilities are based. He continues to say that this is still in informative phases. Moreover, Peteraf (1993) admits that it is hard to come out with a development if one is not familiar with the firm's capability in some specific activities.

Dynamic capability theory assisted the researcher to show how locally owned firms apportion their resources for innovation and technology (Phaal, Probert & Cetindamar, 2009). The theory suggests that organizations with scarce resources have also limited capacity or capability to adopt modern innovation and technology.

2.2.2 Resource Based View

The resource-based theory (RBT) is a very important theory in strategic management. It emanates from the principle that competitive advantage is derived from the firm's internal resources as opposed to their placement in the external environment. RBT has a strong link with the core competencies of the firm (Peteraf, 1993). Resource-based theory maintains that it is beneficial for an organization to engage in a strategy that is not presently being enforced by its competitors.

The theory states that the resource in question must be scarce, rare or difficult to copy or simulate and unique to the organization. In addition, it should also be easy to substitute. Liang et al. (2010) says that Resource Based View Theory is one of the main theories used in strategic management. Resource-based view theory is of high relevance to this research as it portrays various ways in which construction companies utilize their available resources to increase their competitive advantage.

Ireland, Hitt and Hoskisson (1997) confirm that strategic competitiveness is achieved when a firm applies a quality strategy that is based in their own unique resources, core competencies and its internal abilities. Mathur and Jugdev (2013) affirms that through Resource Based View theory, a firms knowledge-based assets that are intangible, are the source of competitive advantage because they appear complicated to imitate and extraordinary unique to the firm.

2.2.3 Knowledge Based View Theory

One of the most strategically important resources of the firm today is knowledge. Knowledge –based theory of the firm regard knowledge as an integral resource because knowledge-based resources are hard to copy and socially complicated. Heterogeneous knowledge bases and abilities among organizations are the main causal factor of sustained competitive advantage and extraordinary corporate performance. Through this theory, construction companies can comfortably acquire the skills required to run their daily activities. According to Snyman and Kruger, (2004), the most main asset of an organization is it knowledge and knowledgeable employees.

Managerial functions, competence and skills can enable the firm to attain it competitive advantage through use of efficient and effective utilization of resources. Firms make or acquire knowledge through learning, knowledge management, knowledge structure and designing various ways to learn. Firms can also acquire more knowledge from sources like membership of professional associations and other informal connections (Conway 1995).

In the construction companies, knowledge-based economies have a great impact in the world market. The market place of today has massively experienced sharp increase in innovation, technology and competition. Knowledge is based or found in people. The greatest asset that a firm has is knowledge and workers with great knowledge; otherwise surviving in the 21st century would be an opportunity cost. It is therefore vital for executives to make sure that their day to day activities strategies to management knowledge strategy in order to make sure that knowledge management system has been utilized according to the plans of the firm to maintain long term maintainable competitive advantage (Kruger and Snyman, 2004).

2.3 Innovation and Technology Strategy

The concept of innovation and technology strategy is one of greatest concern to the practitioners and researchers of today. Various scholars have defined strategy in various ways. Chandler (1962) has defined it as a way in which organization/firms determines its basic objectives and goals, and the way it accepts and adopts necessary steps of actions and the allocation of core resources that are of much requirement in carrying out the objectives.

Porter (1996) defines strategy as coming up with various sets of activities that are geared toward improving an organization's position in the society. Firms/organization's management should always be alert on what to do and what not to do when trying to meet their objectives, and this can be achieved through doing things differently away from their competitors. In the construction companies, few companies possess the required resources or incentives that may retain a good working research and programme development.

Seaden et al. (2003) recently analyzed the relationship between innovation and strategies practices and found out that majority of the listed construction business strategies have a positive relationship with innovation practices. This research also made innovation and technology strategies it research studies hence identifying the effects of innovation and technology and competitive advantage of construction companies in Kenya.

2.4 Empirical Studies and Knowledge Gap

Researchers globally have undertaken several studies on innovation and technology strategy in construction. In Kenya, Arvantis (2013) carried a study and found out that, lack of embracing new innovation and technologies in housing construction was the main contributor to housing crisis in Kenya. Others were lack of land, lack of access to financiers and gap in demand and supply. Majority of researchers classify statistics in respect to construction and other sectors. Construction sector in SIC omit Engineering and Architectural consultancy firms where big amount of innovation and technology designs are done. Further, big portions of value added in the construction companies are maintenance and repair where there is very limited room for innovation productivity and technology.

Debrah & Ofori (2006) found out that experts in the construction firms in Tanzania had deficiencies in similar skills. Deficiencies in local knowledge and project management inter alia can be solved through collaborations. International firms and the government should value this by coming up with policies to boost such collaborations. Among contractors, lack of knowledge and technology includes the competent selection of plant and equipment, financial management, construction project management and ICT.

Empirical study done by Reichstein et al, (2005) through the use of data from 'UK innovation study found that, very few firms engage in process/or product innovation in the construction companies. Further studies revealed that poor interaction with the external environment end up with having poorly formulated research and development (R&D), with low capability of absorbing ideas from external sources.

Whyte (2003), shows that small projects in the construction companies with large unique and design re-use prompt or propel use of reality innovativeness. When the firm or the organization is not big in operations and most of its work is done repetitively, more return on investment (ROI) can be obtained with relatively little investment on innovation and technology. On the other hand, big complex projects create room for innovation and technology to counter other related practical problems. Therefore, it has been suggested that the effect of uniqueness on innovation and technology relies on the nature of the projects. In both contracting and consulting, a visible gap in ICT between local and foreign firms is big.

Literature review in chapter two was introduced by identifying theoretical foundations of innovation and technology. The three main theories that were given priority in this chapter are resource based view theory, knowledge based view theory and dynamic capability theory. These theories both explain how construction companies utilize or employ their resources and competences to match the dynamics of their operating environment. The thoughts of other researchers in the study of innovation and technology strategy were also highlighted. The chapter shows how Innovation and technology strategy in organization leads to competitive advantage. Lastly the chapter also focused on empirical studies and knowledge gaps locating some studies researched under the concept of innovation and technology strategy.

2.5 The Conceptual Framework

This conceptual framework of this study was based on two variables i.e. Innovation and technology strategy as an independent variable and Competitive Advantage as a dependent variable. The conceptual framework assisted in answering the research question. According to the study, competitive advantage was conceptualized as being dependent on innovation and technology strategy.

Independent Variable

Dependent Variable

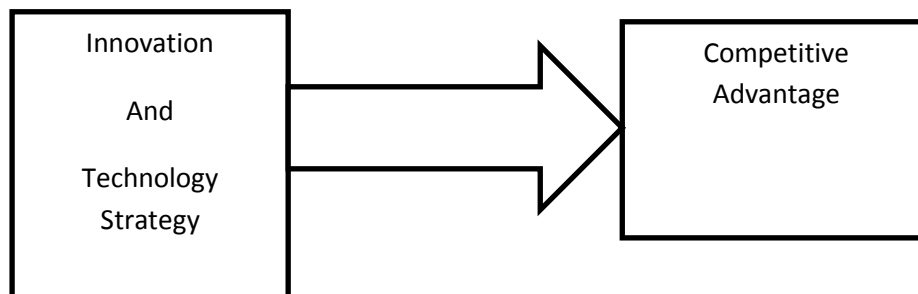


Figure 2.1: Relationship between Innovation and technology and Competitive Advantages. Source: Adopted from Bruton and White (2007, p.21)

According to the conceptual framework, competitive advantage was so dependent on competitive advantage suggesting that without using innovation and technology as a strategy, competitive advantage would be hard to achieve. The researcher found out that 26.5% of the output proved that there was a relationship between innovation and technology strategy and competitive advantage. The residual i.e. 73.5% was explained by other factors not included in the study which also influenced the relationship between innovation and technology strategy and competitive advantage.

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Introduction

Research methodology is defined as a way of finding out the outcomes of a certain problem on a given matter which is also known as research problem. In the methodology, a researcher comes up with various criteria of searching the research problem in question or solving it. According to Industrial Research Institute, (2010) methodology is a way of searching or solving the research problem.

In research methodology, a researcher all the time attempt to find out all the answers up to the conclusion. If the researcher fails to research systematically, the chances of getting the final results become minimal. For exploring or finding research questions, a researcher encounters many challenges that can be effectively tackled through the use of exact research methodology. Industrial Research Institute, (2010).

This chapter discusses the methodology which was applied in the research so as to achieve the research objectives. The section covers a description of the research design, data collection instruments and data analysis tools. The chapter also has different stages that were followed during the research.

3.2 Research Design

The research was conducted using descriptive cross sectional survey as it is concerned with finding out what, where and how of a phenomenon. Descriptive survey as described by (Kothari, Sabino & Zach 2005) is a scientific method which involves observing and describing the behaviour of a subject without influencing it in any way.

A survey was appropriate in this case as it helped the researcher to collect data through behaviours, opinions, attitudes, beliefs or responses from chosen respondents so as to comprehend the population or the group represented. A cross sectional survey design was used because of its low cost and easy access to information. According to Owen (2002) surveys are a good way to gather unique information that is not available from other sources. Survey ensured that the information is unbiased, and can be a true representation of the population of interest.

3.3 Population of the Study

A study population is the complete group of individuals or companies that the researcher wishes to investigate (Sekaran & Bougie, 2010). It is defined in terms of availability of time frame, geographical boundaries, elements and topic of interest.

Mugenda and Mugenda (2003) depict population as an entire group of items or individuals under consideration in any research and have a great importance at the end of the exercise.

The population of the study was composed of forty (40) construction companies operating in Kenya. The study population is important in research since it allows data to be collected from all the relevant parties thus making the research objective and unbiased.

3.4 Data Collection

Data collection is very important and time consuming exercise. The study used primary data. Primary data is the data obtained through interviews, direct observation and surveys for the first time by the researcher. This involved instruments like questionnaires.

The instrument that was used to collect the data was a questionnaire .Questionnaire ensured that confidentiality was upheld. The questionnaire contained three parts. Part A consisted of background information of the respondents and the company, part B; the extent of investment in technology and innovation and part C; the extent of competitive advantage in the construction company. The questionnaires were taken to the respondents and collected within an agreed time. The respondents included managers and heads of departments of the construction companies.

3.5 Data Analysis

Regression analysis was used to analyse the data. Once the data was collected the questionnaires were edited for accuracy, consistency and completeness. Thereafter, the responses were coded into numerical form to facilitate statistical analysis. The data collected was analysed using descriptive statistics (measures of central tendency and measures of variance).

The data was analysed based on the questionnaires results. Standard deviation, mean scores, frequency distribution and percentages were used to summarize the responses and to show the magnitude of similarities and differences. Once the data was collected, the questionnaires were edited for consistency, accuracy and completeness. Cleaning of the data was done to eliminate any discrepancies. The method was more desirable because it ensured a good understanding on innovation and technology strategy and competitive advantage of construction companies in Kenya.

Results were presented in tables. The study used regression model to establish the relationship between innovation, technology and competitive advantage on construction companies in Kenya

The regression model used was in the form,

$$Y = \beta_0 + \beta_1 X_1 + \epsilon.$$

Where:

Y= competitive advantage on construction companies in Kenya (Dependent Variable)

X₁= innovation and technology (Independent Variable)

B₀=Constant which is the value of dependent variable when all the independent variables are zero.

β_j = beta

ϵ . = the error

The chapter introduced research methodology through discussion of the research design applied in the study. It highlighted the value of the research design and also explained cross sectional survey and questionnaire as a research design that was desirable when focusing on such a real life context. The chapter has shown how the collection of the data was done and the specific respondents who were interviewed in the construction companies.

CHAPTER FOUR

DATA ANALYSIS, RESULTS AND DISCUSSION

4.1 Introduction

This chapter interprets and represents the collections of the research conducted to identify the effects of innovation and technology on competitive advantage of construction companies in Kenya. The subjects' matters that were covered in this chapter are innovation, technology, competitive advantage, demographic coverage information and discussions.

Primary data collected was used in order to accomplish the research objective which was to find out the relationship between innovation and technology strategy and competitive advantage of construction companies in Kenya. The respondents in this research were managers of various departments in the construction companies in Kenya. This is because they had first hand information in the management of the company hence being in the best position to provide pertinent information for this research.

Forty (40) questionnaires out of the forty (40) distributed received adequate responses from all the sample size selected. After entry and analysis of all the relevant questionnaires that were completed, the response rate found was 100%. Mugenda and Mugenda (2003) posit that 50% rate of response is satisfactory for analysis, reporting and logical interpretation of data to be presented. This response rate is said to be above average.

4.2 Demographic Information of Construction Companies

This is the part of the research that analyses the findings as per the time or years of the operation of the construction companies in Kenya, whether the company has an IT department and the ownership structure. The responses are analysed in form of tables.

4.2.1 Construction Companies Ownership Structure

Table 4.1: Construction Companies Ownership Structure

Ownership	Frequency	Percentage
Local	40	100.0
Foreign Owned	0	0.0
Both Foreign and locally Owned	0	0.0
Total	40	100.0

Source: Field Study (2017)

Table 4.1 shows that 100% of the construction companies are owned locally.

4.2.2 Duration of Operation of Construction Companies in Kenya

Table 4.2: Duration of Operation of Construction Companies in Kenya

Duration	Frequency	Percentage
Less than 10 years	27	67.5
11-20 years	8	20.0
21-30 years	2	5.0
31-40 years	1	2.5
41-50 years	1	2.5
Over 50 years	1	2.5
Total	40	100.0

Source: Field Study (2017)

The figure outlines that majority of the construction companies under the research have been operating in Kenya for a period of less than 10 years (67.1%). The statistics shows that this is followed by construction companies that have been in operation for a period 11-20 years (20.0%). Moreover, 5.0% and 2.5% indicates construction companies that have been in operation for duration of 21-30 years, 31-40 years and 41-50 years respectively. 2.5% represent construction companies that have been operating in Kenya for a period of over 50 years.

4.3 Demographic Information of the Construction Companies in Kenya

The research carried out demographic analysis of the respondents to find out the features of the respondents (Coopers and Schindler, 2006) and the reactions were as follows according to the various demographic components.

4.3.1 Gender of the Respondents

The study had sought to determine the gender of the respondents as this could have assisted in finding out the gender that responded more to the research and the response was as follows on table 4.3

Table 4.3: Gender of the Respondents

Respondents	Questionnaires				Response level (%)
	Number of administered questionnaires		Response	Non responded	
	Frequency	%	(Frequency)	(Frequency)	
Male	33	82.5	33	0	100
Female	7	17.5	7	0	100
Total	40	100	40	0	100

Source: Field Study (2017)

The outcomes of the research pointed out that, out of the 40 questionnaires that were distributed to the respondents in various construction companies in Kenya, 100% level of response was accorded to them all. The research found out that the response level was 100% and therefore the findings of the research would be descriptive of the subjects under study. Given that the research work recorded 100%, involvement, this is a signal that the researcher's effort was essential in following up with the respondents to make sure that the paraphernalia's of undertaking the research were well managed.

4.3.2 Education Levels of the Respondents

The study had sought to establish the education levels of the respondents. It was important to establish the academic qualifications of the respondents since they are the ones who are charged with the responsibility of developing and implementing strategies. The response was as indicated in Table 4.4

Table 4.4: Education Levels of the Respondents

Education Level	Frequency	Percentage
Certificate	0	0.0
Diploma	19	47.5
Undergraduate	12	30.0
Postgraduate	6	15
Others	3	7.5
Total	40	100

Source: Field Study (2017)

The findings of the research revealed that 47.5% of the respondents had Diploma certificates, 30.0% had University Degrees, 15.0% had postgraduate and 7.5% had other qualifications from other fields. This was an indication that construction companies had employed workforce with high level of education, which is an indicator that innovation and technology should be at the top gear.

4.3.3 Presence of IT Department

Table 4.5: Presence of IT Departments in the Construction Companies

Presence of an IT Department	Frequency	Frequency
Yes	36	90.0
No	4	10.0
Total	40	100.0

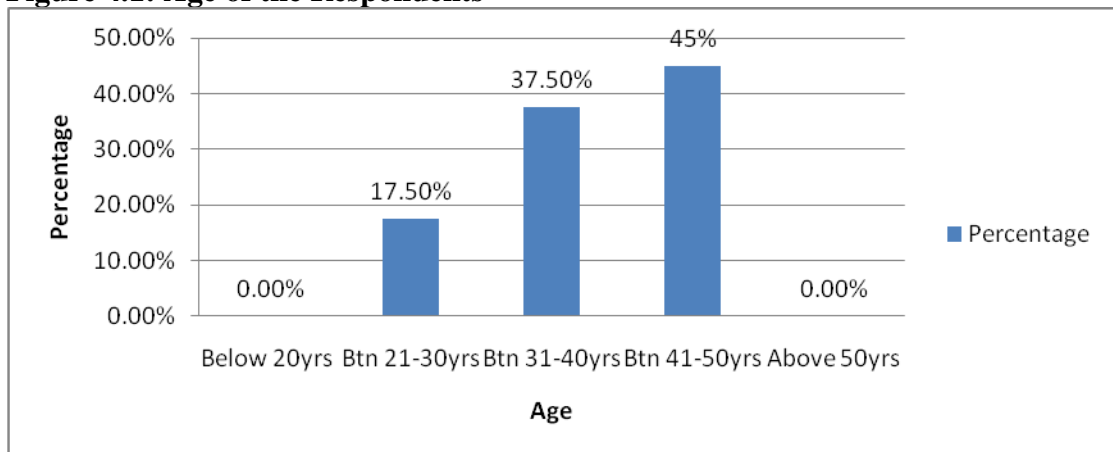
Source: Field Study (2017)

The table above reveals that 90.0% the respondents of the construction companied acknowledged that their companies had IT Department in their companies whereas the other 10.0% admitted that their companies lacked the department.

4.3.4 Age of the Respondents

The research tried to find out the age of the various respondents in the questionnaires and the response was as shown in figure 4.1

Figure 4.1: Age of the Respondents



Source: Field Study (2017)

The outcomes of the research indicated that 17.5% of the respondents in the construction firms were aged between 21-30 years, 37.5% were in the age gap of between 31-40 Years whereas another group at 45% were in the age bracket of 41-50years. 0% of the respondents were below 20 years and 50 years respectively. The research proved that majority of the respondents was aged between 31-40years and 41-50years respectively, the age where innovation is referred as prime.

4.3.5 Respondents Length of Service with the Organization

The study had sought to find out how long the respondents had worked with the organization and the response was as indicated in Table 4.6

Table 4.6: Respondents Years of Service in Firm

No. of Years Worked	Frequency	Percentage
Less than 1 Year	2	5.0
1-3 Years	13	32.5
4-7 Years	19	47.5
8-11 Years	3	7.5
Others	3	7.5
Total	40	100

Source: Field Work (2017)

The finding revealed that 47.5% of the employees had served in the construction firms for duration of between 8-11 years an indicator that staff turnover is low which a health factor to the firm. It was a sign that whatever the respondent articulated in the questionnaire was correct. The more years the respondent had served in the firm, the more conversant he/she was with the questions. 32.5% of the respondents had served for duration of between 1-3 years whereas 5.0% and 7.5% had given their service for a period between 0-1 years and 8-11 years respectively.

4.4 Innovation and Technology Strategy and Competitive Advantage

This part of the study analyses the findings to find out whether there exist a relationship between innovation and technology strategy and competitive advantage in the construction companies. The topics analyzed are the extent of investment in innovation and technology, areas of innovation and technology investment and the extent of competitive advantage.

4.4.1 Extent of Investment in Innovation and Technology

Respondents were requested to give their views on a five point scale of 1 to 5; where 1 = Not at All, 2 = Little Extent, 3 = Moderate Extent, 4 = Great Extent and 5 = Very Great Extent. Their responses were analyzed in tabular form and results detailed in table 4.7

According to the analysis, it was determined that as an outcome of a greater investment in IT some construction companies gained more competitive advantage. On the hand, competitive advantage was not attained by most construction companies in the collection of customer data and provision of high quality customer service. It was eminent that there is a lot that innovation and technology can accomplish as the respondents noted that these can greatly be realised through human interaction.

Table 4.7: Extent of Competitive Advantage

Extent of Investment in Innovation and Technology	Mean	Standard Deviation
Expanded geographical reach	1.30	0.26
Increased turnover and profitability	3.48	0.30
Increased visibility of your company through search engine marketing	3.20	0.60
Reduced your operating overheads	2.90	0.63
Enabled you to collect customer data	3.05	0.75
Reduced marketing and advertising costs	1.48	0.29
High quality customer service	2.50	0.44
Quickened transaction processing	3.10	0.20
Provided 24/7/365 availability of your services	1.15	0.68
Mean Grade	2.46	

Source: Field Work (2017)

According to the results shown in Table 4.7, many of the respondents rated Increased turnover and profitability as being of much significant to a big range as shown by a mean score of 3.48, as well as increased visibility of the construction company through search engine marketing revealed by a mean of 3.20, quickened transaction processing show a mean score of 3.10 and a collection of customer data as displayed by a mean score of 3.05. Reduced operating overheads as shown by a mean score of 2.90 and High quality customer service as shown by a mean score of 2.50. Respondents also further ranked reduced marketing and advertising costs to be significant to a little extent as shown by a mean score of 1.48, expanded geographical reach was also ranked to be of little extent significant with a rank of 1.30 mean score among others.

4.5 Relationship between Innovation and Technology Strategy and Competitive Advantage in Construction Companies in Kenya

According to Ansoff and McDonnell (1990), states that a firm should match its strategy as per its internal capabilities, in order to bar a capability gap from springing up. Capability strengthens strategy hence without it strategy cannot see the light of the day. It is worthy to also note that capability less of strategy is valueless.

The research sought to determine the relationship between innovation and technology strategy and competitive advantage of construction companies in Kenya. According to the study, several respondents were in agreement that there exist a great relationship between innovation and technology strategy and competitive advantage. No organization can accomplish its strategies if it lacks sufficient internal resources. Most construction companies have invested large sum of money to facilitate them carry through with its strategies.

The study also proved that majority of construction companies moderately allocated a meaningful budget on expenditure of innovation and technology. Through this budget, the companies were able to purchase more machineries and equipment like trailers, caterpillars, graders among others to improve the quality of their products. In addition, these construction companies have hired a number of capable, efficient and competent work forces such as mechanical engineers, architects, civil engineers, foremen among others to help the companies satisfy their market share and objectives of the company. Resources are also distributed based on real budgetary requirements. This is in association with the resource-based theory as stated by Kidombo (2007) who noted that material wealth and resources are essential in strategy implementation.

4.5.1 Strategy in the Construction Companies in Kenya

Strategy in an organization is used as a guide by the management to help them achieve their objectives and goals in a smart way. Chandler (1962) explains strategy as the determination of the basic objectives and goals of a firm, and the embracing ways of action and the apportionment of firm's resources required to carry out the objectives. Through proper implementation of the laid down strategies, an organization can leverage their sustainable competitive advantage. The study was meant to find out whether innovation and technology as a strategy influences competitive advantage in the construction companies. Construction companies have portrayed indicators showing that innovation and technology strategy brought more good than harms in the company.

Respondents of various companies attested that their organization has enabled their companies to increase their visibility through search engine, reduced marketing and advertising costs among others. The respondents also indicated that implementation of innovation and technology strategy improved Construction Company's general performance hence enabling it to construct high quality constructions like roads, bridges, houses among others.

Due to the dynamism of the environment, construction companies are supposed to connect their internal capabilities with its strategies. The study revealed that construction companies have taken the fore front by training it staff on innovation and technological skills and even setting aside a budget allocation for innovation and technology development among others. Snyman and Kruger (2004) posit that strategic management is an activity that is evolutionary and can be distinctively be the most important concern for many ages to come.

4.5.2 Innovation in the Construction Companies in Kenya

Innovations beget technology. Without innovation, technology is unattainable. Innovation leads an organization to a competitive advantage due to superior quality of service administered to clients. For an organization to expeditiously carry its duties well, innovation is vital hence inevitable. Organizations must learn to innovate and exploit their innovations in order to meet their clientele demands and raise their competitive advantage. Johnson et al, (2008) posit that majority of the firms have to continuously innovate to guarantee survival and ensure that innovation choices may include matters such as being a pioneer into a particular business or simply becoming a second mover, and how much to listen to potential clients when developing new services and products.

Majority of construction companies are on a daily basis doing revaluations on their innovation by installing the latest software programme for a better production and constructions. Software programmes like CRM and BMS have been procured by construction companies hence enabling the companies to accord maximum exploitation of their new ideas. This shows that the research on innovation strategy connected to technology improvement is crucial in supporting long-term advancement strategies in the organization (Chang, 2010).

Construction companies need to accord their clients long term clientele trust by satisfying them through quality products. Organizations require superior management programmes that must maximize both internal and external innovation. To achieve this, firms require new strategies that are highly supported by technology. Strategies that reduce costs, boost revenue, improve operational efficiency and heighten the general management of the firm's business.

4.5.3 Technology in the Construction Companies in Kenya

Construction companies in Kenya have to some extent adopted technology in their construction activities. Acceptance of technology in the construction firms of late is becoming a practice. Firms are now being recommended to invest heavily on technology in order to stay afloat in this competitive market. Since almost all the firms in the construction business have almost indistinguishable services and products, technological tactics should be put into practice to differentiate their services and products. This leverages the firm to a competitive advantage. Gummesson (1991) also emphasizes that dependability and user-friendliness are essential factors in the valuation of technology-based services.

As an essential component of strategy execution, Van Hemel, 1998 ascertained that competitive advantage and better market status can only be attained through products that are environmentally improved. The study sought to find out how technology was employed by construction companies toward its innovation and technology strategy concept. The interviewee clarified that they employ the use of Expanded Polystyrene Styrofoam (EPS) which is used in building walls of the houses. This is a fabricated technology whereby a mixture of cement is used to cover the EPS panel and guards the walls against termites, fire and bullet.

Studies have been carried out on technology in the construction sector. The study proved that development and effective utilization of current technology leads to provision of important competitive advantage for construction companies. These advantages come from improvements in operations and distinctive technical capability. The researcher also found out that construction companies carry out reevaluation of their technology on a regular basis in order to stay updated and also to play safe.

4.6 Regression Analysis

The study had sought to establish whether there was a relationship between Innovation and Technology Strategy and Competitive Advantage of construction companies operating in Kenya. The study looked at the extent to which changes in Innovation and Technology Strategy would bring in Competitive Advantage of construction companies operating in Kenya.

Table 4.8: Relationship between Innovation and Technology Strategy and Competitive Advantage of construction companies in Kenya: Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.514 ^a	.265	.224	.442

a. Predictors: (Constant), X1, X2, X3

Source: Field Study (2017)

Regression results indicate a significant influence of innovation and technology strategy on the competitive advantage of construction companies in Kenya. The coefficient of determination (R-squared) of 0.265 that presents 26.5% of the total variation in competitive advantage can be explained by Innovation and Technology Strategy. The remaining 73.5% can be explained by the other factors not included in the regression model under investigation. The average deviation of the independent variable from line of the best fit was 0.442.

Table 4.9: Innovation and Technology Strategy Factors effect on Competitive Advantage of Construction Companies in Kenya ANOVA^a

Model	Sum of Squares	df	Mean Square	F	Sig.
Regression	7.664	6	1.277	6.536	.000 ^b
1 Residual	21.302	34	.195		
Total	28.966	40			

Source: Field Study (2017)

Regression analysis was used to test the effect of innovation and technology strategy on competitive advantage of construction companies in Kenya. The regression output indicated above shows that Innovation and Technology Strategy variable as valid (F (6, 34) =.535, (P=.000))

The findings of the study also indicate that there is a significant variance between Innovation and technology strategy and competitive advantage of construction companies in Kenya. This means that Innovation and Technology Strategy can be used as predictors in explaining the relationship between competitive advantage of construction companies in Kenya.

Table 4.10: Effect of Innovation and Technology Strategy on Competitive Advantage of Construction Companies in Kenya /Regression Coefficient

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
(Constant)	.556	.201		2.770	.007
1 Expenditure on development of IT effect on competitive advantage	.115	.028	.250	2.402	.018
1 Training cost to improve Innovation and Technology skills effect on competitive advantage	.136	.046	.295	2.963	.004

Source: Field Study (2017)

The study had sought to establish the extent to which changes in innovation and Technology Strategy would have on the competitive advantage of the construction companies in Kenya. The findings considered the response on the two responses under innovation and Technology Strategy. The regression results indicates that Innovation and Technology Strategy factors have ($X_1: \beta_1 = 0.28$, $X_2: \beta_2 = 0.046$) effect on competitive advantage of the construction companies in Kenya.

The findings of the study indicates ($P < 0.018$, $P < 0.04$) values .This indicates that a critical value of 0.05% Innovation and Technology Strategy factors would influence competitive advantage of construction companies in Kenya. In conclusion though, there is a significant relationship between Innovation and Technology Strategy and competitive advantage of construction companies in Kenya.

4.7 Discussion of Results

The research sought to determine the demographic information of construction companies in Kenya. The researcher found out that 100% of construction companies are locally owned, pointing a very sharp increase of construction companies in the country. This also confirms that the country has a contributive environment that is geared toward boosting startup of local companies. However, the authority needs to improve on its regulations in order to avoid or bar quacks from invading the industry hence degrading the quality and also endangering the lives of Kenyans. This shall guarantee a foundation that is solid for all the construction companies. Innovation and technology also has big impact on proper establishment of service delivery options Bagozzi and Dabholkar (2002).

According to the survey, 8.6% of construction companies have been doing business in Kenya for duration of less than 10 years. This could be attributed to the stringent measures laid by the authority in the establishment of a construction companies. The study shows that 90% of the construction companies under survey have IT department in their establishment which is an indicator that construction companies have taken cognizant of innovation and technology. “Innovate or die” is a slogan or a motto that is used to show how innovation is crucial in today’s economy (Robinson and Getz, 2003).

The research also found out that construction companies have committed good amount of fund in procuring sophisticated and modern technology in their establishment to enable them serve their clientele with quality products. Due to the competition of construction companies among themselves, the increase in funds to boost the quality of production is on the rise year by year. It is normally established that innovation is the execution of significantly new products, processes or management tactics in order to increase competence of an organization (Seaden, 2003).

The researcher established that through investment in innovation and technology done by the construction companies to meet their objectives, construction companies have so far experienced the benefits through increase in turnover and profitability. Cost of advertising and marketing has decreased sharply. A firm's core objective is to develop a low cost producer in its industry (Yontoa, 2008). Through partnering with banks and M-pesa, construction companies have quickened their transaction processes. High quality clientele service didn’t go well with the use of innovation and technology strategy according to this research. Bauer (2005), states that technology draws new clients and improves clientele perception.

Clientele and manufacturing firms are crucial industry participants in terms of motivating innovation. Customers are commonly well-thought-out to have enormous capability to exert influence on organizations and persons who take part in the construction in a way that promotes innovation (Barlow, Gann and Salter, 2000; Customers are capable to heighten innovation in construction in various ways. They can pinpoint specific innovative requirements to be supplied by developers and building product suppliers.

The study has revealed that 47.5% of the employees in the construction firms have worked for duration of between 4-7 years. This means that the cost of hiring and recruiting new employees is low, which is an advantage to the firm. Majority of the construction firms in Kenya have an IT department. According to the study, 90.0% of the respondents have an IT department in the firms whereas 10% of the respondents lack an IT department. This is a strong indication that majority of the construction companies have embraced innovation and technology. Hamel (2000) states, an innovation competency could be the new competitive improvement in the new era. Innovation proficiency could help firms better manage the arising dangers as well as realize the benefits of innovation.

The research has shown that there is a great relationship between innovation and technology strategy and competitive advantage in the construction companies in Kenya. Innovation and technology improves services hence increasing the clientele base. This leads to high customer services. Lockyer (2011) goes further to tell us that if you do not look after your customers, your competitors will. According to the study, increased turnover had a mean of 3.48 an indicator of what innovation and technology can do to construction companies in Kenya.

The study also sought to find out the demographic information of construction companies in Kenya. It was established that 100% of construction companies are locally owned. This confirms a remarkable growth in the construction companies, an assurance that the environment is favourable for promoting start-up of local construction companies in the country. Regulation of the companies is therefore vital to warrant that as much as there is growth in the construction sector, construction companies have concrete foundation. Hamel (1996, 2000) posit that radical business idea innovation is now dominant. He continues to states that the present environment is unfriendly to industry incumbents and friendly to industry revolutionaries.

The fortifications that secure the industrial oligarchy have crushed under the mass of deregulation, technological disturbance, social change and globalization. Findings of this study also indicate that 67.5% of construction companies have been in job for less than 10years, showing the rate at which construction companies is being registered at. 20%of the construction companies have been operating in Kenya for a period between 11-20 years an indicator that construction companies are doing well.

Turnover and profitability was also increased due to great investment in innovation and technology hence facilitating the construction companies to meet their financial obligation. On the contrary, competitive advantage failed to be attained by several construction companies when it came to provision of high quality customer service and collection of customer data. Dabholkar (1994) ascertains that when the client is in direct interaction with the technology, there is more control such as with Internet. When a customer freely selects to utilize technology as a method of service delivery the effect is high in relation to quality attributes. Some respondents felt that some IT systems like CRM and BMS are too expensive to invest in. All these activities are done physically.

The findings of the study also indicate that there is a significant relationship between Innovation and technology strategy and competitive advantage of construction companies in Kenya. This means that Innovation and Technology Strategy can be used as predictors in explaining the variation in the competitive Advantage of construction companies in Kenya. Akdag and Zineldin (2011) established that price competitiveness is a less key factor for clients when evaluating their business relationship. In conclusion though, there is a significant relationship between Innovation and Technology Strategy factors and competitive advantage of the construction companies in Kenya.

CHAPTER FIVE

SUMMARY, CONCLUSION AND RECOMMENDATIONS

5.1 Introduction

This is the last chapter that summarizes the findings of the research, conclusions, limitations and recommendations for practice and policy and give suggestions for further research. Further studies are based on the objectives of the research. The researcher evaluates the findings and gives necessary recommendations for future consumption.

In the summary section, the researcher summarized the whole research work by showing how the utilization of innovation and technology in the construction companies in Kenya has promoted competitive advantage in the construction sector. It gives suggestions for future studies on the influence of innovation and technology strategy and competitive advantage of construction companies in Kenya.

The researcher assesses the results and provides necessary recommendations. In conclusion, the research is comprised of findings, recommendations and suggestions for further studies on the influence of innovation and technology strategy and competitive advantage of construction companies in Kenya.

5.2 Summary of Findings

According to chapter one of this research, the main objective of the research was to determine the relationship between innovation and technology strategy and competitive advantage on construction companies in Kenya. The study has indeed shown that innovation and technology influences competitive advantage. The study has revealed that more investment in innovation and technology may not show the impact immediately. According to Bauer (2005), technology entices new clientele.

Bossink (2004) pointed out that innovation idea has a great effect on competitive policies which is in line with the findings of this research. Construction companies which have utilized much of their budget in innovation and technology have been in the forefront in offering efficient and quality services. The research has shown that construction companies came up with very effective innovation and technologies strategies in the construction sector. Lack of innovation and technology strategies in some construction companies have led to retardation due to failure in embracing innovation and technology. “Innovate or die” is a slogan or a motto that is used to show how innovation is crucial in today’s economy (Robinson and Getz, 2003).

Higher levels of innovation and technology placed by construction companies have proved that there is a greater likelihood of increase in economic growth. A construction project is termed as successful when it is accomplished or finished within a stipulated time, as per the budget and as per the specifications of the customer. The project is deemed satisfaction when it meets the client’s specifications. All these are made possible through proper utilization of innovation and technology. At the bottom line construction firms and engineering need to innovate in order to win construction tenders and to improve the projects. Construction companies must innovate in order to compete. Development and effective utilization of modern technology can provide vital competitive advantage construction and engineering firms. These advantages come from typical technical ability and operational improvements.

5.3 Conclusion of the Study

From the research findings and answers to the questions, conclusions drawn from the study are that in today's world, business is informational based, innovation and technology is the backbone under which business is harbored. Innovation and technology increases the utilization of information in the firm both internally and externally. Through innovation and technology, construction companies creates strong bond with their clients through faster services and quality products. Through embracing innovation and technology, construction firms finds other greater and sophisticated methods and ways to exploit technology to the advantage of the firm. Ivory (2005) says that the customers' purpose of using established innovations instead of taking risks in fresh innovations impede the development of technological frontline which can cause adverse impact to the industry in the long term.

Through innovation and technology, construction firms are able to install systems like customer relationship management, building management systems and other computer aided technologies to aid their services. This system improves the firms' services and they end up as a big boost to the construction firm hence promoting competitive advantage in the construction companies in Kenya.

Construction companies is among the firms that require high advancement of innovation and technology bearing in mind the rate at which buildings and bridges have been collapsing in the recent years. This research concludes that construction companies should embrace and utilize innovation and technology in order to cope with the rising competition both locally and globally and also gain competitive advantage.

Nevertheless whether the construction companies are innovative or not; there are worries over the absence of efficient diffusion of innovation through the firm. Previous study attributes scarcity of innovation not to the lack of ability, but to the lack of a coordinated energy to connect market needs and innovative ability. Productivity development in construction is far beneath the national average. Number of firms involved in product and/or procedural innovation in construction companies is smaller than other sectors. Further it was pointed out that construction companies do not interact with the external environment and they have badly developed R&D, with low ability to grip ideas from external environment due to absence of attention to innovation in external sources. However, R&D cannot be taken into account as a direct measurement of innovation despite positive correlation. There are number of cases where innovation slowed away from the norm.

5.4 Recommendations and Implications of the Study

The study revealed that construction companies should use a top down approach when introducing and implementing innovation, technology and technology. This demoralise other employees of the company as they fell left out and not part of ideas implementation. The researcher therefore recommends that all the employees of the construction companies should be involved in the entire process so that the firm can tap all the ideas from every employee of the company. By practising this, the company shall be at a higher level of achieving its competitive advantage and the employees shall feel part of the company. Innovative employees should also be given some incentives to motivate them to become more innovative and encourage others to follow suit.

Innovation and technology in construction companies in Kenya has assisted a lot in increasing the revenues of the company hence raising its profit. High quality customer service has also been improved among others. This can increase the firm's market share both locally and regionally. Company's website has also helped in attracting and retaining more clients.

Construction companies in Kenya should also contemplate on forming partnership with the government and various government authorities like NCA (National Construction Authorities), MOW (Ministry of Works), (EBK) Engineers Board of Kenya among other authorities. This can help them stay updated as they continue interacting with other bodies. Construction companies can also help the government in improving and alleviating housing problem, by putting up quality and affordable houses hence boosting the economic growth. Construction can end up creating more market for their products and services.

Researcher also recommends that the government of Kenya should partner with the construction companies and assist them on carrying out research on finding the best building technologies both locally and globally which can help the government in decreasing the housing problem in Kenya. Construction companies should also engage non-governmental organization's Shelter Afrique, UN Habitat among others on how to improve their products and services. To create more awareness, the researcher recommends that construction companies should partner with media houses and advertise their services and products. County government should also put all construction companies under their jurisdiction on notice to control them from building sub-standard buildings, roads, bridges among others.

5.5 Limitations of the Study

The researcher experienced some challenges during and at the time of data collection. Some respondents lacked confidence during the data collection time as they feared disclosing some vital information. Others feared exposing the weaknesses of their companies. Getting feedback from the targeted respondents was also another hurdle. This was due to their busy schedule that required their attention in the company.

Respondents also feared that releasing some of their confidential information could be leaked to their business rivals, which in turn could be used against them. To encounter this, the researcher solved the problem by introducing the authorizing letter from the institution. The researcher also gave them assurance that the information was only meant for academic purpose and a copy of the research work would be given to them upon their request for their future reference and for personal perusal.

Collection of the data became a big challenge due to shortage of time. This is because the researcher has an employment and most of the time occupied with office work. Getting permission from the management to go for data collection was not that easy. All in all, the researcher managed to collect the data as per the stipulated time. The researcher also would wait for too long before securing a chance to interview the respondents. Sometimes the researcher would even get one questionnaire filled in a day.

5.6 Areas for Further Research

The researcher recommends more research to be done to find out the relationship between innovation, technology and strategy in the construction companies in Kenya. This would contribute a lot to the Kenyan government and various construction companies in Kenya, on how to improve the state of construction in the country. Further study can also be conducted on the utilization of innovation and technology as a way of reducing operational overheads in the construction companies. The research disclosed that the business of investing in innovation and technology is a very expensive exercise bearing in mind the dynamism of technology and the fact that technology is very obsolete.

The researcher recommends that more study should be done to find out how innovation and technology can be well put into practice to cut down other cost in the construction companies. More studies should be conducted on how innovation and technology can also be used to enable the company in collecting customer data and facilitate in increased turnover and profitability of the company. Since this research confined its study to only forty construction companies in Kenya, the researcher recommends further research to be carried out on innovation and technology strategy. This can help in providing information on the same topic.

The researcher recommends that further study should be conducted to identify the diffusion of knowledge, diffusion of innovation and find out the benefits within the construction firms in Kenya. The researcher should look for organizational cultures and structures that support innovation, coordination and management problems, in innovation and actions to evaluate innovation as areas that need more study to ascertain knowledge gaps to be studied in future.

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APPENDICES

Appendix I: Letter of Introduction



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SCHOOL OF BUSINESS

Telephone: 020-2059162
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P.O. Box 30197
Nairobi, Kenya

DATE 2nd/10/2017

TO WHOM IT MAY CONCERN

The bearer of this letter MARTIN MWIKA MUTHUYA
Registration No. D 61/81397/2015

is a bona fide continuing student in the Master of Business Administration (MBA) degree program in this University.

He/she is required to submit as part of his/her coursework assessment a research project report on a management problem. We would like the students to do their projects on real problems affecting firms in Kenya. We would, therefore, appreciate your assistance to enable him/her collect data in your organization.

The results of the report will be used solely for academic purposes and a copy of the same will be availed to the interviewed organizations on request.

Thank you.



PATRICK NYABUTO
SENIOR ADMINISTRATIVE ASSISTANT
SCHOOL OF BUSINESS

Appendix II: Research Questionnaire

Instructions: Kindly complete the following questionnaire using the instructions provided for each set of question. Tick appropriately.

Confidentiality: The responses you provide will be kept strictly confidential. No reference will be made to any individual(s) or institution in the report of the study.

PART A: BACKGROUND INFORMATION

A1: Respondents Profile

1. What is your gender?

Male Female

2. In which of the following age brackets do you belong?

Below 20 years 21 - 30 years 31 - 40 years 41 - 50 years above 50 years

3. What is your education level? (State the highest level)

Certificate Diploma Undergraduate Post Graduate Other

4. How many years have you worked with the company?

Less than 1 year 1 - 3 years 4 - 7 years 8 - 11 years Over 11 years

5. What is your career orientation?

Accounts Marketing Operations IT Professional other,

(Specify) _____

A2: Company Profile

6. How long has the company been in operation in Kenya?

Less than 10 years 11 - 20 years 21 - 30 years 31 - 40 years 41 - 50 years Over 50 years

7. What is the ownership of the company?

Locally Owned Foreign Owned Both Local/Foreign Owned

8. Number of employees?

Less than 100 100 – 500 501 - 1000 1001 – 1500 1501 – 2000 More than 2000.

9. Is there an IT Department in your company?

Yes No

PART B: EXTENT OF INVESTMENT IN TECHNOLOGY AND INNOVATION IN YOUR COMPANY

10. To what extent has your company invested in innovation and technology in each of the following aspects? Rate on a 5-point scale, where 1=Not at all, 2=little extent, 3=moderate extent, 4=great extent and 5=very great extent. Rate by ticking the appropriate column

Extent of investment in technology & innovation in the company	1	2	3	4	5
Cost of I&T (investment)					
Expenditure on development of I&T					
Training cost to improve Innovation and Technology skills					

PART C: EXTENT OF COMPETITIVE ADVANTAGE IN YOUR CONSTRUCTION COMPANY

12. To what extent has your company gained competitive advantage in each of the following aspects? Rate on a 5-point scale, where 1=Not at all, 2=little extent, 3=moderate extent, 4=great extent and 5=very great extent. Rate by ticking the appropriate column.

	1	2	3	4	5
Expanded geographical reach					
Increased visibility of your company through search engine marketing					
Increased your turnover and Profitability					
Provided 24/7/365 availability of your construction services					
Reduced marketing and advertising costs					
Enabled you to collect customer data					
Reduced your operating overheads					
Quickened transaction processing					
High Quality customer service					

16. Please give any other comment that you may deem useful for this exercise?

.....

Thank you for your time and cooperation

Appendix III: List of Construction Firms

The table below is a list of sampled construction companies in Kenya.

1.	Kabiru Developers ltd
2.	Land Mark Holdings
3.	Terz Engineering Limited
4.	Bulldall Construction ltd
5.	Kalalu Building Contractors
6.	Frema General Contractors Ltd.
7.	Gititu Contraction ltd
8.	Jipan Construction ltd
9.	Mjengo Engineering & Construction Co.
10.	Mellech Engineering & Construction Company.
11.	Riflo Industries ltd
12.	Dunhill Building Constructors ltd
13.	Dokimos Constructors ltd
14.	Modular interiors ltd
15.	Seremala Construction & Engineering Limited
16.	Trikei Construction ltd
17.	Ace Builders ltd
18.	Buffalo Construction & Services.
19.	Builders Constructors ltd
20.	Jakim Contractors ltd
21.	Twiga Construction Company
22.	G. Putton Contractors ltd
23.	H Young & Company East Africa Ltd.
24.	Kikuto Construction
25.	Mawe Construction Company
26.	Mareka Enterprises Ltd, Holding & Civil Contractors
27.	Seaman Builders & Civil
28.	Lee Construction ltd
29.	Seyan Brothers ltd
30.	Sava Builders ltd
31.	Simakon Builders & Civil
32.	N. K Brothers ltd
33.	Buildex Enterprises Ltd
34.	Majoja Construction ltd
35.	Third Concept Contraction Co.
36.	Mau West Co. Limited.
37.	Bomco Building Contractors ltd
38.	Kinoti & Sons Construction Co.
39.	OM Builders (K) Ltd
40.	Northern Construction ltd

Source: Field Study (2017)