THE EFFECT OF TECHNOLOGY ON THE FINANCIAL PERFORMANCE OF CONSTRUCTION CONSULTING FIRMS IN NAIROBI COUNTY

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DECLARATION

This research project is my original work and has not been presented for award of any degree in any university

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DEDICATION

This project is dedicated to God and my family without whom this daunting task would not have been completed.

ABSTRACT

The diffusion of innovation theory states that adoption of technology by individuals is based on the individual`s perception with respect to comparative advantage occasioned by used of technology. This then forms the basis for which firms` view innovativeness, complexity, compatibility and relative advantage of adopting technology. Technology Acceptance Model (TAM) on the other hand centers on the how external factors influence the adoption of technology such as user`s behavioral expectations. Disruptive Innovation Theory centers on how technology completely changes the way in which a firm conducts its business whereby the methods of operations typically adopted by the firm are completely reviewed with the adoption of new technology. These theories have generated interest in conducting research on the effect of technology on performance of firms. Various researchers have established a positive correlation between adoption of technology and performance of firms. This study was conducted on construction consulting firms seeking to establish the effect of technology on their financial performance. The study focused on a four year time period between years 2014 to 2018. Data was obtained through questionnaires based on value of net profit, total assets total investments in software, hardware and networking infrastructure, leverage ratio and no. of directors per firm. The study used ANOVA f tests, scatterplots and VIF tests to establish linear regression. The study used linear regression analysis to measure the relationship. The study concluded that technology had a positive relationship with financial performance. The study suggested level of innovation be measured against financial performance for registered contractors operating within Kenya as an area of further study.

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LIST OF ABBREVIATIONS

AAK   Association of Architects of Kenya

BORAQS   Board of Architects and Quantity Surveyors

DOI   Diffusion of innovation theory

EBK   Engineers Board of Kenya

IEK   Institute of Engineers of Kenya

IQSK   Institute of Quantity Surveyors of Kenya

SMEs   Small and Medium Enterprises

SPSS   Statistical Package for the Social Science

CHAPTER ONE: INTRODUCTION

1.1 Background of the Study

Technological state adopted by firms influences the firm`s production costs. Technological improvements caused an involvement of the number of production techniques that are effective and efficient in with respect to reduction in cost profit margin increase on each unit sold or in this case the efficiency of service based or knowledge based services produced by these firms (Hardwick, Khan & Langmead, 1993). According to the modern information economy, investing in intellectual assets is regarded as an advanced and important tactical component towards sustaining industry progress, productivity as well as effectiveness (Berry, 2000). Consulting firms must be technologically innovative to counter business risk occasioned by new entrants within the industry, which increases competition. Such innovations are adopted to improve productivity and financial performance.

The theory of diffusion of innovation (DOI) proposed by Rogers (1995) focuses primarily on potential adopter's perception in relation to advantages and disadvantages of innovation. Some of factors in DOI theory help form a framework that underscores: innovative nature, complexities, and compatibility aspects as well as relative competitive advantage. Based on this theory, these consulting firms under the guidance of the owner-manager can adopt optimal technological innovations which aim to improve speed, consistency and accuracy of output required, create competitive advantage of one firm over others less technologically advanced and assure consumer satisfaction. Thus the theory indicates that the relationship between technological innovations with regard to firm's financial performance does exist.

Construction consulting firms are knowledge intensive service providers (KIBS) whereby knowledge is the key factor of production as well as main offered good. Consultation is the core activity for these consulting firms (Mueller & Zenker,2001). These firms comprise the different professionals working together as a single established firm such as a consortium, sole proprietorship or two directors trained in same profession forming a partnership to provide either quantity surveying, architectural or engineering service as is the case with most local firms within Kenya. While these firms provide a service upon which clients rely for investment within the construction sector, these firms are in business for profit and hence the successful running of a firm is an on-going concern. These firms are the focus group within this study.

1.1.1 Technology

According to Porter (1990) and Pavitt (1991) significance of competence in technology as a source of firm competitiveness as well as at the national level has been firmly established. Technological competence in this case is the package of technological infrastructures, resources, skill and experience; which leads to firm's distinct competitive edge (Prahalad & Hamel, 1990). Nonoka (1991) and Dodgson (1993) further stated that through research and development, these competences can be internally developed, through various organisational learning processes that enhance and sustain the knowledge base. However, firms, no matter the size, all seek external sources for technological process build up inputs. These are technologies transferred from external sources and adopted by consulting firms with the aim of attaining competitive edge and improving financial performance which is the main stay of this study.

Technological innovations entail a wide range of inventions ranging from industry related art, engineering and even applied sciences as well as pure sciences. Examples of these innovations are developments made in electronics, aerospace industry, medical and pharmaceuticals information technology and systems industries (Garcia & Calantone, 2002).The innovations are characterised by evolving of technological supporting markets, entrance of new competitors, distributers and partners to the market with key aim being exploitation of the new technology. The pace to market limit remains low until acquisitions of market know-how is achieved. This is characterised by application of law of diminishing returns and market saturated with copycat products.

Panuwatwanich *et al.*(2009), adopted innovation diffusion such as utilization of advanced technology as the architectural and engineering design sector measurer of innovation where aspects of advanced technology that were measured were design and drafting developments, information design integration and remote collaboration. The focus of this study will primarily be advanced technology utilization through adoption of relevant software, hardware and networks (which enable data handling and team collaboration) set up to support multi-user platforms of these software. These technological innovations are aimed at facilitating for a more efficient and financially productive consulting firm.

1.1.2 Financial Performance

Firms gauge their performance through management practice of measuring the results of an organization in relation to planned policies and operations. The measurements are normally in monetary value and reflected by profitability, technology and leverage.

Evaluation of financial performance of a business makes monetary judgement of the results in relation to business strategies and activities possible. Ratios are normally used in determination of an organization`s financial performance (Ally, 2013).

There are various measures of financial performance with the most widely used being profitability. Profitability is the extent to which a business gains from financial inputs such as the factors used in production. The four functional gauges of firm profitability include NET PROFIT-return on firm assets which measure the profitability, (ROE) measures return owners` equity. A business is profitable when (NET PROFIT) is higher, (ROE) indicates business yield in relation to owners` or shareholders` investment and operating profit margin determines the returns to capital (Crane, 2011).

1.1.3 Effects of Technology on Financial Performance

Innovation brings about Economic development as depicted by qualitative change process. According to (Schumpeter, 1939) innovation is a function of entrepreneurial activity which happens through combination of existing resources. Innovation process is inevitable and the process entails short term discomfort such as loss of jobs brought about by mechanization. However there is great advantage in long run.

Additionally (Davis, 1986) the technology acceptance model, explains usage of computers through attitude and belief in relation to simplification in use a positive attitude that innovation brings about simplification leads to adoption of these innovations and thus positive financial performance as well as growth of the firm due to improved productivity and competitive advantage over firms with dimmer perception on technological innovations.

The adoption of innovative technologies can have an effect on firm performance in various ways. Successfully adopted technological innovation improves productivity of the firm through capacity to improvement of factors of production, and through efficient creation high value products. Marginal productivity Increase is brought by productivity increase. This leads to less predictive firms being pushed out of the market. This therefore leads to greater economic and resource allocation efficiency leading to improved performance (World Bank Group Report; 94671)

Various studies such as innovation effects on small enterprise performance in Nairobi Country in Kenya by Njogu (2014); innovation activities effects on SMEs in the republic of Crotia conducted by Rozic and Sonja (2005); and Nzove (2013) who conducted a study examining the financial innovation effects on SMEs growth in Nairobi all established that adoption of innovations, be they product, process, market and organization innovations registered improved financial performance and growth of the enterprises studied, be they SMEs or banking institutions.

1.1.4 Construction Consulting Firms

Construction industry consulting firms are the key objects in this study with a focus on service providers with knowledge intensive based services (KIBS).These firms are either set-up as sole proprietorships, informal consortiums, and partnerships or integrated consulting firms which offer construction consulting solutions with respect to engineering, quantity surveying or architectural matters under one roof (Mueller and Zenker, 2001). The professional consulting firms are regulated by the different legally mandated boards such as the Board of Architects and Quantity Surveyors (BORAQS) which deals with architects and quantity surveyors and their firms, the training of these

professionals and the roll-out of continuous professional development programs. Engineers are under the ambit of the Engineers Board of Kenya. The individual professionals are mandated to maintain memberships within professional associations such as the (AAK) and (IQSK) where matters relating to the construction industry are addressed at a peer level.

Under CAP 525 which regulates conduct of architects and quantity surveyors and their firms through professional boards, advertisement by professionals and their firms detailing services offered is strictly regulated and in most instances frowned upon, the standard in the industry being quality of service as the main way in which these firms attract, maintain and widen their client base, therefore, market innovations as they relate to advertising are relatively unimportant compared to other enterprises. Since these firms are typically service oriented, product innovation as it relates to developing new products and services geared towards increase in market share and subsequent profitability is not as crucial when compared to other non-professional enterprises, since the product produced by these firms must conform to a set standard and is similar in all firms. For instance, Architectural firms typically provide project management services and produce architectural drawings and Quantity Surveying firms produce bills of quantities and provide contract administration and documentation services. These firms can therefore attain competitive advantage and improve financial performance by adopting organisation innovations and/or technical innovations which are a part of process innovations. This study focuses on technological innovations and their effect on these firms` financial performance.

While local consulting construction firms by themselves do not actively participate in the development of technology, they (firms) are consumers of technological innovations geared towards improvement of productivity within the sector. Such technology is not limited to performance enhanced hardware and industry specific software (such as WinQS, Dimension X, Revit, AutoCAD, ArchiCADQSPro and so forth) but extends to everyday interface programs that ease, data handling, attendance of meetings such as teleconferencing programs such as Skype and programs that allow remote access for software repairs or access to information without the need to actually get to the physical location of the business such as TeamViewer.

2017 Economic Survey report by (KNBS, 2017)report indicated that in 2016,(GDP) recorded a 5.8% expansion, compared 5.7% in 2015 growth in construction activities amongst other sectors decelerated in 2016.It also recorded 9.2% growth which translates to 13.9% increase from 2015. This slow growth is attributed to amongst other reasons, slow loans uptake in the construction sector. However, road construction and housing development recorded increased activities which lead to an increase in employment. In 2015total development expenditure increase by 31.7%and the new completed buildings in Nairobi recorded a growth increase by 7.6%. This is brought about by increased construction both residential and non-residential buildings. Construction consulting firms are run by construction professionals such as architects and engineers, who are agents representing the interests of the Client or the Contractor and advising the principal party concerned on construction matters. Any real or projected increase in activity within the construction sector directly affects the amount of work each construction consulting firm can successfully compete and attain repeat work within the sector. An innovative firm will increasingly retain repeat clients and

obtain new work by continually providing quality work, delivered timely and competing competitively in a market where output of professional work is heavily regulated to protect the interests of consumers and ensure that requirement for professional input within the construction sector is largely sought after amongst developers within this sector. Since there is a projected increase of activity within the construction sector, consulting firms can gain by innovating to meet client needs without compromising in quality of work output. Technological innovation is one such way in which these firms protect their business interests.

1.2 Research Problem

Theories have been broached positively correlating innovation with improved financial performance and growth of firms. This argument is further explained by technology acceptance model (Davis, 1986). The model argues that speed of adoption of any given innovation is dependent upon usefulness perception. A positive technological innovations perception on ease of use results in adoption of these innovations and subsequently leads to positive financial performance as well as growth of the firm due to improved productivity and competitive advantage over firms with dimmer perception on technological innovations. Empirical studies have been done showing a positive correlation between adoption of innovations be they product, process, organisation or market innovations by enterprises and financial institutions to financial performance such as Njogu (2014); who studied the effects of innovations in relation to small medium enterprises financial performance. The study was conducted in Nairobi County, Kenya.

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Construction consulting firms in Nairobi will be the focus of this study and these firms are typically consortiums, partnerships or sole proprietorships offering professional advice addressing construction process concerns commencing from inception up-to but not limited to delivery of finished product to customer. The customer in this case is the individual or entity seeking to develop infrastructure be it a building, civil engineering infrastructure such as roads, dams, bridges and off-shore products such as sea or ocean based oil and gas wells. These firms are mainly Architectural, Engineering or Quantity Surveying firms which are regulated by mandated regulation boards such the Board of Architects and Quantity Surveyors of Kenya and the Engineering regulation Board.

Rozic and Sonja (2005), in their study have established that SMEs that adopt innovations led to increased performance of the firm thus more revenue. The study showed that firms that adopt innovations achieved sustainable competitive advantage and improved performance over their competitors. This study was conducted in Croatia and centred on manufacturing and service SMEs which had at least 11 employees, effectively excluding micro-enterprises from this study. This study will however be centred solely on technological innovations and how adoption of these innovations improve financial performance of construction industry consulting firms. The type of innovation as well as the firms being studied will be very specific.

Njogu (2014), conducted a research on financial performance with regard to innovations in small business enterprises in Nairobi County. The study centred on product, process and market innovations and how these affected financial performance of manufacturing, commercial and trading and service SMEs. The study established that manufacturing SMEs had introduced relatively more innovative goods and

services. The study utilized the balance score card method to assess how innovations affect SMEs in Kenya. This research proposal however centres on consulting firms within the construction industry and how technology affect their financial performance. The measures that will be used to assess firm business performance will be purely financial.

Nyathira (2012), conducted a study with a focus on how financial innovations affect commercial banks performance. The population was 43 commercial banks over four year period and the study results showed that financial innovations contribute to profitability in the banking sector. This research proposal however is solely centred of construction industry consulting firms and how their financial performance is affected by adoption of technological innovations within Nairobi. This study will aim to further refine existing research by providing answers to the question, what is the impact of technical innovations on the monetary execution of construction industry consulting firms in the country?

1.3 Research Objective
This thesis principle targets of the examination in:
 Evaluation of the construction consulting firms in Nairobi to determine the effects of technology on financial performance.

1.4 The Value and Significance of the Study
These examination discoveries will be imperative to consulting firm owners with a goal to embrace technological innovations. The firm owners and or managers may utilize the discoveries of the investigation to settle on the technological developments which

would bring business upper hand to these firms as results of demonstrable improved financial and budgetary returns.

Additionally, the investigation may have suggestions for hypothesis working as well as add to the scholarly discussions on adoption of technological innovations within consulting firms within the construction and related industry.

The thesis will add to the broadening of the apprehension of the effect of technological innovation specifically and use in construction industry consulting firms especially from a firm, sector and developing country perspective. Researchers and academic institutions will utilize the findings of this research as reference point in future research and to identify further research gaps to be examined.

CHAPTER TWO: LITERATURE REVIEW

2.1 Introduction

A section of the thesis outlines and traces various theories on adoption of innovation and empirical review which will be used herein. This chapter will also provide an overview on the various studies undertaken and the results obtained.

2.2 Theoretical Review

This section of the thesis explores the various concepts that can shades more light on the impacts and effects of technological innovation on organizations financial and budgetary performance. A number of theories will be employed to guide this study.

2.2.1 Diffusion of Innovation Theory

According to innovation theory dispersal as explained by a scholar shows that an improvement is transferred over a period of time within a sample population. The DOI perspective has its essential concentration on the adopters view development regarding relative favourable position/detriment; henceforth a portion of the components of the DOI perspective help shape a system that forms the basis for: innovativeness, complexity, compatibility and relative advantage. Furthermore, businesses that intensely utilize particular technologies and mechanical advancements are frequently prime possible candidates for early reception of the up and coming age of that innovation. The dissemination of advancements approach in this investigation is vital in understanding the flow impacting everything in connection to appropriation and utilization of developments and innovations in construction industry consulting firms. The studies are concentrating on selection by organizations as well as individuals. These two sorts of reception assume a part when researching the diffusion and selection

of innovative developments by firms, since in these firms; a considerable lot of the essential choices are made by the proprietor chiefs. The hierarchical choice to embrace innovation progresses toward becoming interlaced with individual recognitions and states of mind of the proprietor director towards that innovation. Diffusion in these firms to a great extent is through relation and networking systems. Since adopting new technologies, assuming other factors of production remain constant, productivity inherently increases.

Construction consulting firms typically trade within the service sector, hence adoption of improved technology, will improve speed, consistency and accuracy of output required, create competitive advantage of one firm over others less technologically advanced and assure consumer satisfaction. All this directly leads to improved financial performance as will be established in this study.

2.2.2 Technology Acceptance Model

Advanced by Davis (1986), the technology acceptance model (TAM) clarifies computers and PC utilization through two cognitive beliefs: usability value as determinants of intention. TAM explains how outside factors impacts conviction, state of mind and aim to utilization based on certain guiding technological premise. For example utilization of an innovation framework is influenced straightforwardly or indirectly by the user's behavioural expectations, disposition, saw helpfulness of the framework, and saw simplicity of the framework.

The theory suggests that outer elements influence goal and real use through interceded value usefulness convenience. Hart et al. (2012), expressed the requirement for TAM to be coordinated with other information technology (IT) approaches that consolidate decision makers' social and eccentric attributes. Venkatesh and Davis (1996), concentrated on understanding the forerunners of the apparent convenience. They presumed that self-viability goes about as a determinant of use convenience both prior and afterward hands-on utilize and that the target ease of use was observed to be a determinant of usability simply after direct involvement with a framework.

While adopting new technology as indicated by various studies that will be outlined later on, has established significant financial performance, enterprise owner-managers` who unilaterally make organizational decisions have to at least, take into account their perceptions on technological innovations specifically the usefulness of adopting these ICT interventions and their attitudes towards ease of use of these systems before adopting these technologies. In spite of the demonstrable improved financial performance after adoption of technological innovations by these enterprises, perceptions by top management do matter.

2.2.3 Disruptive Innovation Theory

The term disruptive innovation showed up in 1997 best-seller, the Innovator's dilemma by Clayton Christensen, which focused on how dynamic innovations lead to the current industry position, this contradicts previous models such as Henderson – Clark model that focuses on disk circle drive industry since it spoke to the most unique, innovatively intermittent and complex industry that could be found in the American economy for example increased packing of memory capacity of a disk. Disruptive is significant in

that it clarifies the kind of innovation firms select to embrace. The advanced design and quantity surveying technology is disruptive because it does away with traditional architectural, engineering and quantity surveying methodologies in favour of newer, vastly different but improved technologies that are beneficial to these firms.

New but radically different technological innovations aim to improve productivity, quality and speed at which the knowledge based services offered and enables the firm to meet required client needs timely. As such, consulting firms that easily adopt new technological innovations have relative competitive advantage, can attain and maintain a broader client base due to improved quality of services offered. This leads to improved financial performance and firm growth.

2.3 Determinants of Financial Performance of Construction Consulting Firms

Monetary performance is a measure of an association's income, benefits, in relation to an incentive as prove by the ascent in the element's offer cost and share price. Development in construction industry consulting firms' productivity is affected by both interior and outside elements. Inner elements concentrate on organization's particular attributes. The outside elements worry on both industry highlights and full scale monetary factors.

2.3.1 Corporate Governance

Jensen and Mecklingm (1976) opines that corporate administration entails formations, frameworks also procedures that organizations utilize to manage and control trading issues of the organization with an objective to improve success of the business, development and responsibility with a definitive objective of improving shareholders

value, maximization of financial well-being and interest promotion together with merits of the other stakeholders. According to some scholars, frameworks are offered for quick access to money, capital lowered costs, financial performance improve and a good image which surrounds the stakeholders. Moreover, these firms in terms of economy have led to a nation's growth due to the rise of modern environment corporate.

2.3.2 Leverage ratio

The firm is a legitimate identity (Waelchi & Pdferer, 2011) and as a legitimate individual, an organization is conceived through consolidation (Gitzmann, 2008 and Pickering, 2011).Teruelet al. (2007), in their study found out that leverage ratio is significant in the way the firm execute its activities. The study attributed firm`s efficiency and benefit level to experience based on the duration with which the business has existed. The hypothesis of learning on job strongly supports that the leverage ratio increments and thus possibility of change in their gainful effectiveness after some time by gaining from their experience, (Balk & Gort, 1993).

An investigation by Ofuan and Izien (2016), affirmed a positive connection between Leverage ratio and productivity among the 30 recorded Nigerian firms as at December 2014. In connection to this examination, construction consulting firms working inside the development business will be more adoptable to the changing customer needs and embrace imaginative measures and consequently have upper hand.

2.3.3 Ownership Structure

Ownership structure of the firm tends to impact on firm performance. Concentrated proprietorships and institutional possessions prompt better control and observing of top

managerial staff and by one means or another power them to embrace beneficial systems to guarantee future income. However little shareholdings by open does not support long run designs, these proprietors are for the most part keen on the transient benefits and not general development of the organization and in a similar case for little or no inward possession. Proprietorship structure ought to be precisely adjusted for the firm to perform well (Mirza & Javed, 2013).

2.3.4 Size of the Firm

Firm's size determines financial and budgetary performance of firms with small firms growing faster compared to large firms. Recent studies on service and manufacturing firms industry supports the argument. This is attributed to small firm's decision making structure in which the decision is made by the owner. Also the small business characteristics such as education, age and experience influence decision towards innovation and technology adoption

2.3.5 Capital Structure

Firm's capital and source of finance structure is a mixture of debt borrowing and equity. A firm must ensure a balanced mix of capital structure and financing. For businesses to implement its plan and policies there is need for sufficient financing (Pandey, 2006).

The major problem faced by firms is inability to access finance. This is a major constrain that forces business enterprises to rely on self-financing and borrowing which may to be sufficient to propel the business fully (Nakhaima, 2016).Therefore, consulting firms need access to finance in order to carry out their business objectives

and realise profits or at the very least break even, with sound strategies leading to a profitable future (Oslen, 2005).

2.4 Empirical Review

This research study will focus on effects of technological innovation on the financial performance of construction industry consulting firms with the dependent variable being financial performance which is measured by Return on Assets. Technology as measured by total investments in computing hardware, advanced construction software and networking set up to allow for multiple users within any given work assignment and support multiple user advanced construction software which is the key independent variables in this study.

2.4.1 Local Evidence

Odunga (2011), conducted a study investigating the strategic management practices of construction companies with a special focus on Kenya. The study sampled 70 registered construction firms with the Ministry of Public works. The study found out that having a written or implied vision, mission and clear objective was common among many of the sampled firms. The firms also carried out situational analysis to establish their strategic position in their operating environment and had strategies on how to achieve their objectives hence actively involved in the strategic formulation process. A majority of the firms however did not have strategic plans on how to achieve their laid down objectives which hindered proper strategic management implementation. It was established that the firms compared the actual performance with the desired performance to determine how far they were from their set targets. The present study focuses on of technological effects on innovations on the financial and budget

performance of construction consulting firms within Nairobi. The referenced study focused on strategic management while the present study will have technological innovations as the independent variable. The referenced study focused on construction firms as listed by the Ministry of Public Works. These firms are essentially contractors within the construction industry. The present study will focus on private consulting firms within the same industry who provide professional services and are listed by BORAQS or EBK. The objectives and focus groups of both studies are different.

Gitau (2011) study focusing on relationship between financial innovation and financial performance of firms with respect to commercial banks in Kenya found out that by commercial banks adoption of financial innovation recorded better results. The study covered a period of 5 years covering 2006 and 2010. The study was conducted on 44 commercial banks in Kenya as per CBK report 2010. This present study will similarly measure financial performance but within construction consulting firms which are private enterprises unlike commercial banks studied by Gitau (2011), which are listed. Additionally, the innovations whose effect on financial performance on the firm will be tested are limited to technological innovations. Gitau (2011), studied financial innovations that were categorized into process, product and institutional innovations.

Similar study was done by Njoroge (2015), where it established a positive correlation between technology and firm's financial performance. The study period was 10 years covering years from 2005 to 2014.Data was collected from Nairobi stock exchange. The study revealed that Total assets increase in total sales and increase in operating cash flow ratio all positively affected the financial performance of construction and allied companies listed at the NSE. The study found that an increase in debt to equity

and increase in total assets both negatively affected financial performance of construction and allied listed firms at NSE. The current study will however examine how adoption of technological innovations affects financial performances of consulting firms within the construction sector. The focus group, unlike the referenced study comprises private firms.

Wachira (2013), conducted an investigation to decide the impacts of technological development on the execution of business banks in Kenya. The examination utilized an elucidating cross sectional plan and focused on all the business banks in Kenya. The study found out that client minded workers at the banks esteemed technological advancements. Besides, the outcomes uncovered a positive and huge connection between banks' execution as far as benefit and selection of different technological advancements including client free innovation, client helped innovation and client straightforward innovation. This present study is focused on technological innovations, namely computing hardware, advanced construction software and networks set up to allow for multiple users within any given work assignment and support multiple user advanced construction software, unlike the technologies studied within the referenced research and is focused on private consulting firms within the construction industry unlike listed commercial banks as studied by Wachira (2010). Oguna (2014), examined the capital mix and structure on effects of financial and budgetary performance of firms listed construction firms and found out that technological advancement has a strong impact on firm performance.

2.4.2 International Evidence

An examination on the effect of innovative activities on SMEs in the Republic of Croatia by Rozic and Sonja (2005) revealed that certain determining factors are essential for innovation especially if adopted by SMEs, some of these factors included the structure of ownership, the level of education of employees and the extent of implementation of strategic changes among others. Email survey was used to collect data where 498 SMEs were sampled by the thesis.

Results from the thesis showed that keen adoption of the deterministic factor which connected with the presentation of the SMEs. The present study is however set up to determine whether adoption of technological innovations by consulting firms within the construction sector affect financial performance of the same firms. The objectives of both studies are different in that the referenced study centres on multiple effects of innovation activities on firms such as increased market share and the innovation activities in this case were originated by the firm. With the present study however, the effect of adopted technologies is financial performance of the consulting firms within the construction sector and the investments in technology employed by the firms for externally developed technological improvements.

A study by Koellinger (2008) in Europe, examined the association between firm performance, and technological innovation. The study sampled 7302 enterprises, the findings revealed that the adoption of internet enables innovation which eventually had a positive effect on innovation. Within this study, firm performance was defined as firm growth, performance and survival within a given business environment measured

through annual turnover, profit and employment growth. Product, internet-enabled and process innovations defined the independent variables and internet based technologies were considered enablers of these innovations. The focus group comprised enterprises from all economic sectors such as education, retail, tourism and others within the European Union from which the data set was drawn. The measures of firm performance were qualitative and the error component method was used for data analysis. The present study however considers technology as an innovation that affects financial performance within private consulting firms within the construction industry as opposed to an enabler of innovations as viewed within the referenced study. Additionally, the firms considered emanate from the construction sector within Nairobi County in Kenya and the measures of performance that will be used are financial while the referenced study uses qualitative measures of firm performance. Regression will be used primarily to analyse data.

On the same vein, a similar investigation was done by Tajuddin, Iberahim and Ismail, (2015) with an aim of establishing the association between the performance of construction firms in Malaysia and innovation. To test innovation, design solutions, project practices and adoption of technology were considered. This study focused on 180 Architectural, Quantity Surveying and Engineering consulting firms all registered by their respective bodies within Malaysia as well as 198 registered contractors working within the country. The units of observation in this study were selected through a stratified approach to allow for representativeness. With the use of the Statistical Package for Social Sciences (SPSS) Version 16.00, data were analysed. To test the relationship, regression analysis was performed. The innovations studied were innovative design solutions, innovative project practices and advanced technology

utilization (software and hardware) all of which were compared against business performance (financial performance) and project performance which centred on non-financial aspect of organizational performance. The findings reveal a strong association between innovation and organisational performance. It was also noted that there was an insignificant impact of innovative design solution and advanced technology dimensions of the performance of projects. The present study focuses solely on technological investments adopted by consulting firms and the resulting effect on the firms` financial performance. Here, the focus group is limited to Architectural, Quantity Surveying and Engineering consulting firms all registered by their respective bodies within Kenya.

2.5 Conceptual Framework

The conceptual framework has been applied in research to sketch likely ways of action or even to exhibit an ultimate tactic to a thought or idea (Mugenda & Mugenda, 2003). The conceptual framework outlined below shows the effect of technology on construction industry consulting firms` financial performance. A general conceptualization diagram as shown below illustrates that firms` financial performance is a dependent variable and value expended in technology (as defined by total annual investments in hardware, software and networking infrastructure) is the independent variable while the age and size of the firm, capital structure, ownership structure and corporate governance are the control variables affecting the dependent and independent variables.
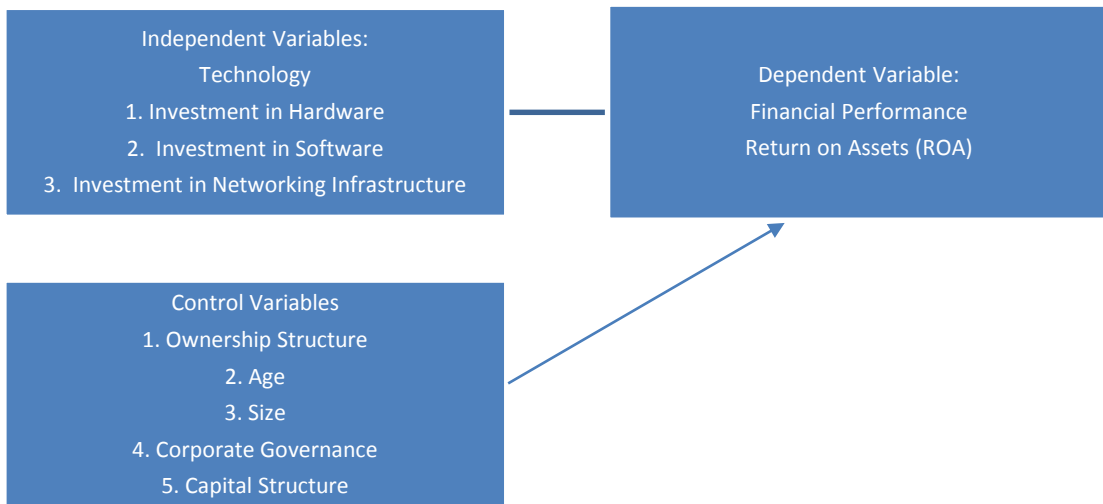
Figure 2.1: Conceptual Model depicting association between Technology and Firms` Financial Performance.

2.6 Summary of Literature Review

The theories discussed herein highlight the importance of adopting innovations to shore up firm financial performance. The adoption of innovations, be they technological, is dependent upon perceived ease of use of the technology, prior know how on usage of technology and such other constructs that have been further explained.

Some explored empirical studies centre on the ability of listed banking facilities or SMEs to adopt various innovations be they financial or technological to improve financial performance by responding to current market trends. The more adaptable a banking institution or an SME is to current consumer trends by way of innovation to meet consumer needs, the better its financial performance. In some cases, the firms develops innovative measures to improve business performance but within the construct of innovative leadership and adept organisational structure. This ensuing

study centres on construction consulting firms and how these firms have improved

financial performance from in adopting various technological investments.

CHAPTER THREE: RESEARCH METHODOLOGY

3.1 Introduction

This sector described procedures and techniques used in the study in order to satisfy the objectives. These include: the research design, target population, sample design, data collection methods, validity and reliability and data analysis.

3.2 Research Design

The research design is defined as the arrangement of conditions for collection and analysis of data whereby the pertinence of the research purpose with economy in procedure are combined, (Kothari, 2004). It is the conceptual structure in which the research is conducted and constitutes the plan for collection, measurement and analysis of data.

The study adopted a descriptive research design which is defined as a design that determines and reports the way things are and uses a pre-planned design for analysis, (Mugenda & Mugenda, 2003). The design should have enough provisions for protection of bias and maximized reliability (Kothari, 2008). In this study, inferential statistics and measures of central, dispersion and distribution were applied. Descriptive research is a method of collecting information by interviewing or administering a questionnaire to a defined sample of individuals (Orodho, 2003). The research focused on the financial performance of construction industry consulting firms over a four (4) year period from 2013 to 2017 as a result of adopting technological innovations.

3.3 Population

Population is the whole group or individual elements, events and objects which have common characteristic that can be observed (Mugenda, 2003). The population in this study comprises all licensed practicing consulting firms within Nairobi.

The target population for the study was 334 licenced consulting firms, registered in Nairobi County with keen focus on the owners and staff of these enterprises. These firms must also bear practicing licences issued by their specific professional licencing boards such as the architects and surveyors (BORAQS) that regulates architectural and quantity surveying firms and engineering board of Kenya (EBK) that regulates Engineering firms.

Table 3.1: Population Frame

Organization	Source	No of Registered Organizations
Engineering Consultants	EBK	150
Architectural Consultants	BORAQS	105
Quantity Surveyor Consultants	BORAQS	79

3.4 Sample

According to Mugenda and Mugenda (2003), it is often impossible to study the whole of the target population therefore, a researcher identifies and defines a sample which must be the most representative of and comparable to the target population on many characteristics which are important to the study. This was the actual purpose of the study.

Table 3.2: Sample Size

Organization	Source	No of Registered Organizations	Sample Size (%)	Sample
Engineering Consultants	EBK	150	40%	60
Architectural Consultants	BORAQS	105	40%	42
Quantity Surveyor Consultants	BORAQS	79	40%	32
TOTAL		334		134

The study targeted 134 consulting firms within Nairobi County. The number represents 40% of the total number of registered consulting firms within Nairobi. Some scholars argued that samples between 10% and 30% if well-chosen can be reliable.

3.5 Data Collection

Collection of data entailed self-administered questionnaires with data collection forms as a key secondary statistics gathering instrument. Forms were used to collect data in those firms. The questionnaires had two parts where the first one focused on the geography and the second one focused on technology and finances, total assets, total investments in hardware, software and networking infrastructure, debt-equity ratio and number of directors per firm all of which established the effect of innovation within the firm.

Evidently, majority of these firms are privately owned entities and access to their audited financial statements may prove difficult. The researcher was left entirely dependent on a firm`s willingness to allow access to its audited financial statements for a study on capital investments in technological innovations. An introductory letter attached to this proposal outlined the specific interest the researcher has in studying the firm`s financial statements and the researcher was willing to limit herself to access of information specific to this study only. Should this information prove difficult to obtain, certain measures can be followed. For instance, there are specific suppliers of construction related software locally whose sales to local firms can be obtained. This information tracked the expenditure on software by construction firms per year. These software suppliers are local distributers for internationally recognised and accepted software developers such as WinQS software.

3.6 Data Validity and Reliability

Reliability relates to the consistency of research instruments in giving similar results after recurrent trials. Validity on the other hand is concerned with the degree of accuracy and ability of making meaningful inferences from the obtained results (Mugenda & Mugenda, 2003). Another scholar coefficient splits the data randomly and a score is then calculated from each set.

3.7 Data Analysis

Infertile numerical records and descriptive numerical records were used collect information. The information was described by descriptive statistical tools establishing the response.

Statistical tools were used for information analysis. Presentations were made by the use of tables and charts and percentages. The researcher in this study focused on endorsing the technological innovations impact and financial performance of construction industry consulting firms, in Nairobi County, Kenya.

3.7.1 Diagnostic Tests

The underlying assumptions of the linear regression, which are linearity, normality and homoscedasticity was tested in continuous data that was used for the regression analysis. The scatter plots of the variables were analyzed by assessing linearity. Additionally, linear regression analysis requires all variables show normality.

3.7.2 Analytical Model

According to Mugenda and Mugenda (2003), regression is a type of analysis used when a researcher is interested in finding out whether an independent variable predicts a given dependent variable. Multiple regression analysis was used to determine whether a group of variables together predict a given dependent variable and will be employed herein.

The following analytical model was used in analysing the relationship between the dependent and independent variables: $Y= \alpha + \beta_1X_1+\beta_2X_2+\beta_3X_3+ \beta_4X_4 + \beta_5X_5+\varepsilon$

Where:

Y- Is the consulting firms` financial performance as a dependent variable measured by Net profit (NET PROFIT) measured by ROA

β_1 – is the co-efficient of hardware

β_2 – is the co-efficient of software

β_3 – is the coefficient of networks

β_4 – is the coefficient of capital structure

β_5 – is the coefficient of corporate governance

X_1 – Hardware which will be measured through log (Investment in Hardware).Here, information on the expenditure by the consulting firm on computing hardware per year such as investment in workstations, uninterruptible power supply hardware, back-up batteries was obtained.

X_2 – Software which was be measured through log (Investment in Software).Here, information on the expenditure by the consulting firm on construction related software such as ArchiCAD, renewal of licenses of such software per year was obtained.

X_3–Networking Infrastructure which was be measured through log(Investment in networking infrastructure).Here, information on the expenditure by the consulting firm on networking infrastructure such as investments in servers, network routers and switches, wireless network infrastructure or wired networking as the case maybe , networking software, maintenance costs per year was obtained.

X_4 – capital structure which was a control variable measured as Debt-Equity Ratio

X_5 – corporate governance which was a control variable measured as (Number of directors)

ε = error or random term

α= constant

3.7.3 Test of Significance

Regression Analysis was utilized in this thesis as the test of importance. The linear regression analysis showed the relationship between the dependent variable which is financial performance and independent variable which is the technological innovation (measured by examining investments in software, hardware and networking infrastructure adopted by sampled firms) and control variables which are capital

structure (measured through the debt-equity ratio) and corporate governance (measured by examining the number of directors if any per firm). The coefficient of determination R^2 and correlation coefficient r will show the degree of association between effects of adopting innovations and financial performance of construction industry consulting firms in Nairobi County. ANOVA (Analysis of Variance) as a statistical tool will also be used in determining the variance among the grouped data for statistical significance.

CHAPTER FOUR: DATA ANALYSIS, RESULTS AND INTERPRETATION

4.1 Introduction

Interpretation and the data analysis are presented in this section. The financial performance of this conduction constructing firms in Nairobi was assessed to determine whether technology affects the research work. Collection of information was obtained in the 134 construction consulting firm owners in Nairobi County. The data sources included questionnaires and annual statements between the years 2014 to 2017. Research objective was determined by the data that was collected and that are financial performance depicted by Net profit, Total assets, Total investments in hardware, Total investments in software, Total investments in networking infrastructure, Leverage ratio and No. Of directors

4.2 Response rate

Table 4.1: Questionnaire Return Rate

No. of questionnaires Returned	Target No. of respondents	Response Rate (%)
128	134	95.92%

The high questionnaire response rate (95.92%) shown in Table 4.1 resulted from the method of administration of the instrument, which was in this case researcher administered. This is acceptable according to Mugenda and Mugenda (2003). This method also ensured that the respondents' queries concerning clarity were addressed at the point of data collection and reduced the effects of language barrier, hence, ensuring a high instrument response and scoring rate .However, caution was exercised so as not

to introduce bias in the process through leading respondents into offering desirable answers.

4.3 Demographic Information

This section discusses the demographic characteristics of the respondents in the study .These included distribution of respondents by their gender, age, level of education and the results are presented in terms of the study objectives.

4.3.1 Level of Education of the Respondent

The respondents were asked to state their level of education according to Figure 4.1.

Figure 4.1: Level of Education
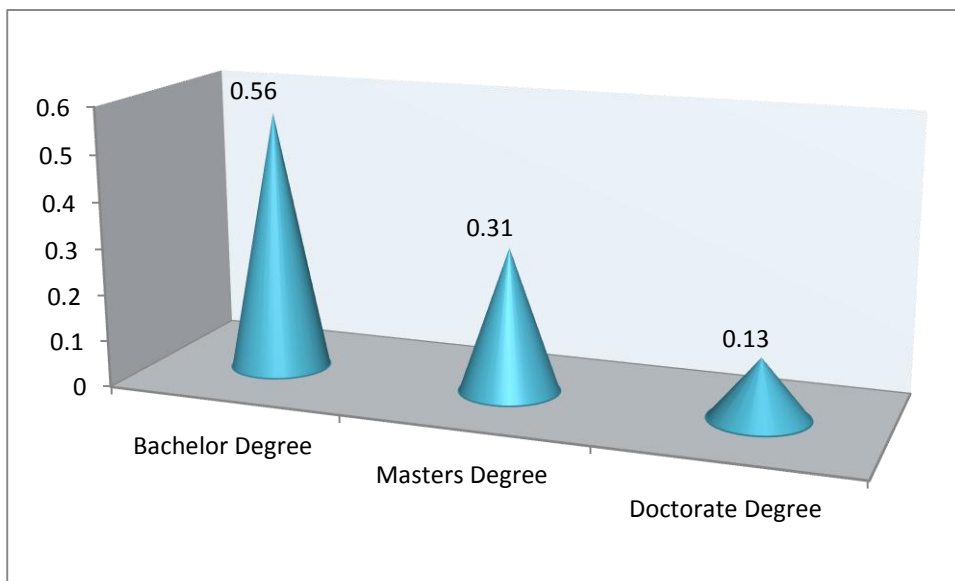
Based on the study findings in Figure 4.1 above, majority of the respondents (56%) had bachelor's degree, 31% had a masters degree while 13% had a doctorate degree. This implies that all the respondents were well educated and thus higher chances of giving reliable information

4.3.2 Ownership structure

Respondents were asked to indicate the ownership structure of their organization. The study findings were as shown in Figure 4.2 below

Figure 4.2: Ownership structure
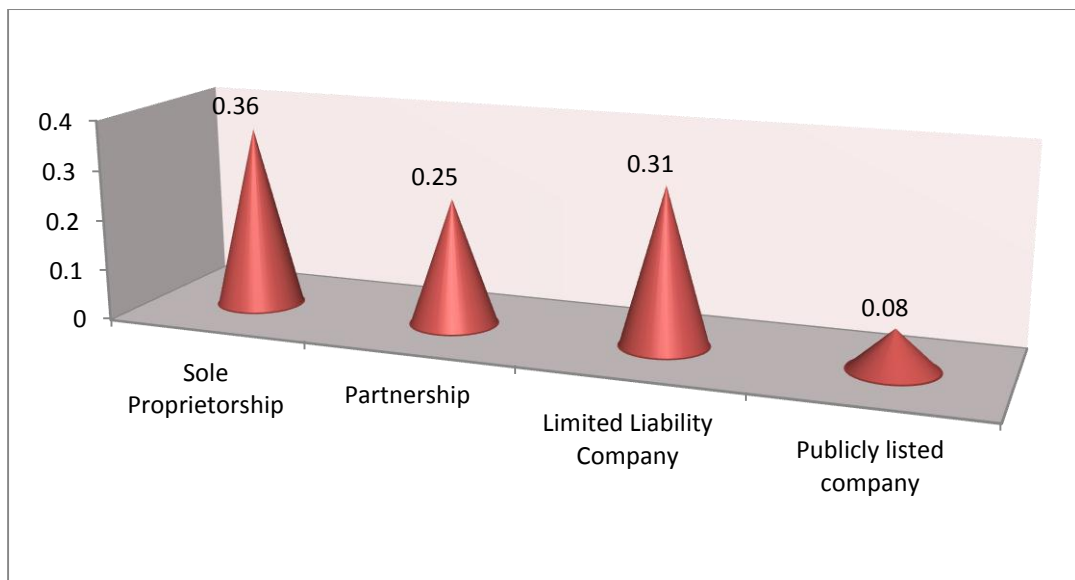
Based on the study findings, majority of the respondents (36%) indicated that their firm was a sole proprietorship, 31% indicated Limited Liability Company, 25% indicated a partnership while 8% indicated that their firm was a publicly listed company.

4.3.3 Nature of the firm`s business

Respondents were asked to describe the nature of their firm`s business. Figure 4.3 presents the study findings.

Figure 4.3: Nature of the firm`s business
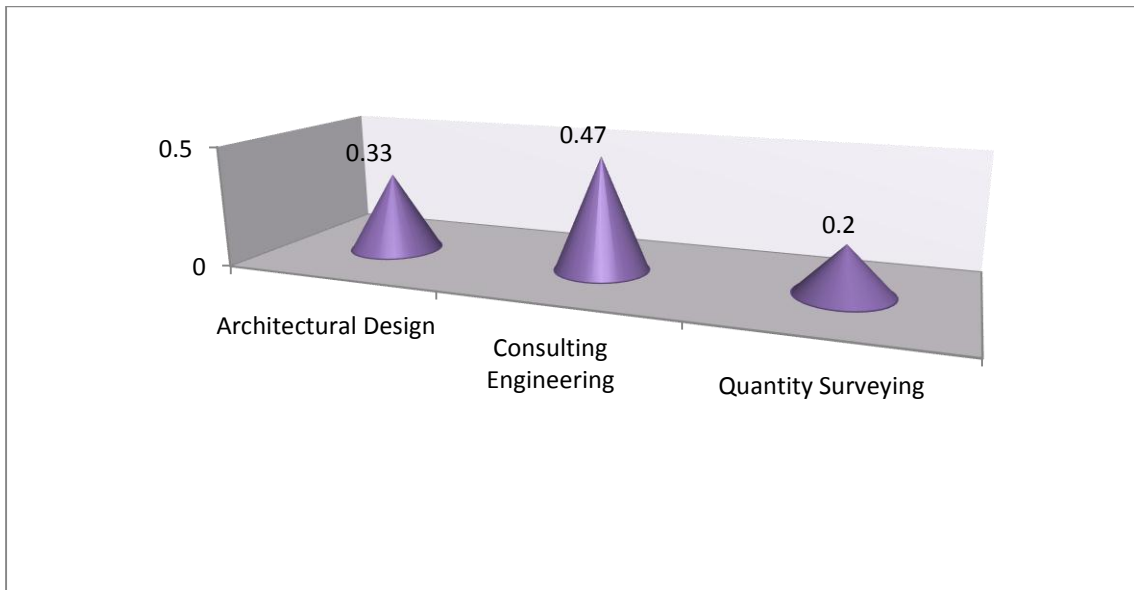
Based on the study findings in figure 4.3 above, majority of the respondents (47%) indicated that their organization was consulting engineering, 33% indicated architectural design while 20% indicated quantity surveying

4.3.4 Years of Operations

The study sought to establish the years that the firm have been operational. The study findings are as presented in Figure 4.1 below

Table 4.2: Age of the firm

	Frequency	Percent
0 - 5	47	36.6
6 - 10	38	29.3
11 - 20	31	24.4
21 - 50	6	4.9
Over 51	6	4.9
Total	**128**	**100**

Based on the study findings, majority of the respondents as represented by 36.6% indicated that their firm has been operational between 0-5 years, 29.3% indicated their firm had been in existence between 6-10 years, 24.4% indicated between 11-20 years, while 4.9% indicated that their firm had been inexistence between 21-50 years and above 51 years respectively. This implies that most of construction consulting firms are relatively new firms.

4.4 Diagnostic Tests

The research paper was able to establish of how suitable the data was by examining on the multi-collinearity for the different kind of variables and the outcome are going to be discussed in the following section.

4.4.1 Tests of Normality

The Shapiro-Wilk test was used to verify if normality exists. As indicated in Table 4.2 below, data collected for analysis is normally distributed. Results indicated that the null hypothesis was rejected as the p value was greater than .05.

Table 4.3: Shapiro-Wilk Test of Normality

	Obs	W	V	z	Prob>z
ROA	**128**	**0.96377**	**1.321**	**0.582**	**0.28022**

4.4.2 Test for Multicollinearity

The variance inflation factors and tolerance levels were used to test for multicollinearity between the dependent and independent variables. Multicollinearity occurs when the independent variables are too highly correlated with each other.

Table 4.4 shows the results

Table 4.4: Coefficients^a

	Tolerance	VIF	COMMENT
Total assets	.943	1.060	No Multicollinearity present
Total investments in hardware	.982	1.018	No Multicollinearity present
Total investments in software	.952	1.051	No Multicollinearity present
Total investments in networking infrastructure	.977	1.024	No Multicollinearity present
Leverage ratio	.968	1.030	No Multicollinearity present
No. Of directors	.981	1.020	No Multicollinearity present

a. dependent variable: financial performance

The collinearity statistics on table 4.4 indicates that there was no multicollinearity since the variance inflation factor (VIF) values were less than recommended value of 10 while the tolerance values are more than the recommended value of 0.2.

4.4.3 Heteroscedasticity

Breusch-Pagan test was applied in order to test for heteroscedasticity. This test is conducted on the basis that there is a normal distribution in the error terms. The null hypothesis of the test is a constant variance. Consequently if the p-value is very significant, the null hypothesis is rejected in support of alternative hypothesis that is variance is not constant. Results below show that the p value is greater than .05 thus the error term is constant.

Table 4.5: Heteroscedasticity Tests

Breusch-Pagan / Cook-Weisberg test for heteroscedasticity

    Ho: Constant variance

    Variables: fitted values of net profit

$$\text{chi2 (1)} = 1.34$$
$$\text{Prob} > \text{chi2} = 0.2476$$

Basing on the level of output, the values obtained were greater than 0.05, hence there is no big difference existing in the variation of dependent to independent variables that were tested.

4.4.4 Homoscedasticity

A plot of standardized values shows that the residual points are closer to the regression line hence signifying the variances are constant. As a result, homoscedasticity is assumed as explained in figure 4.4 bellow.

Figure 4.4: Homoscedasticity
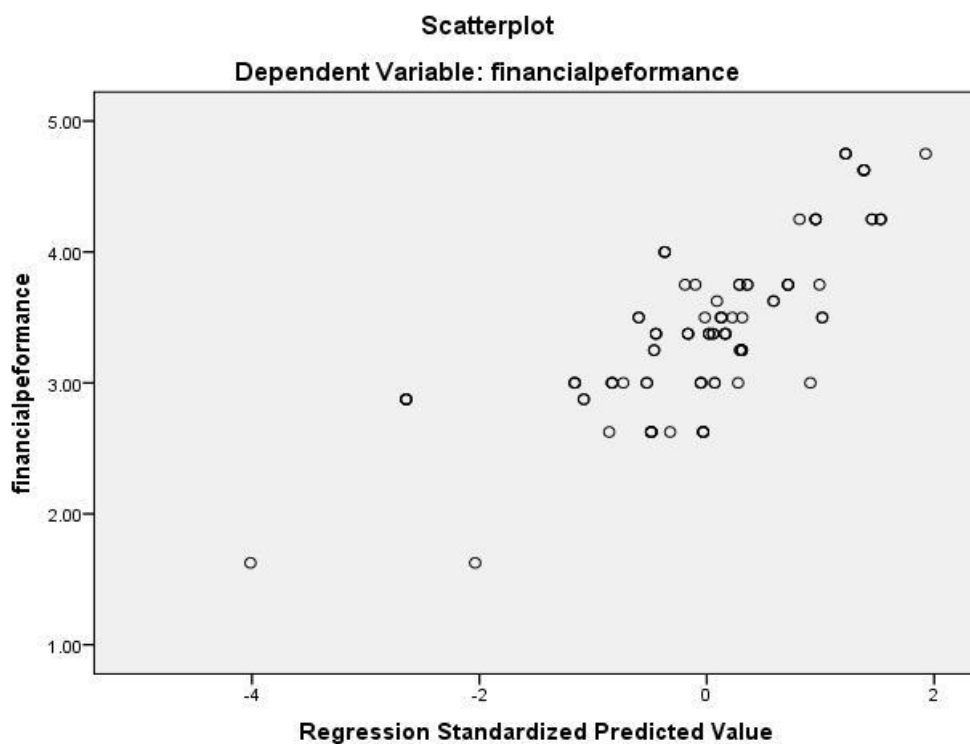
4.5 Regression Analysis

Regression analysis is a large set of tools designed to look at the relationships between dependent variables and independent variables.

The most common sort is linear regression, which looks at the relationship between one continuous dependent variable and one or more independent variables, which may be continuous or categorical. The objective of regression analysis is generally to estimate the relationship between a set of independent variables (regressors) and a dependent variable (outcome).Multiple Linear Regression is very common in the real world.

Financial performance (dependent variable) of these firms was regressed against independent variables which the researcher defined as total assets, Total investments in hardware, Total investments in software, Total investments in networking infrastructure and Leverage ratio and No. Of directors were accounted for in this study.

The following model was adopted by the thesis:

$Fp_t = \beta 0 + \beta_1 X1 + \beta_2 X2 + \beta_3 X3 + \beta_4 X4 + \beta_5 X5 + e_t$

Table 4.6 shows the regression model summary results where R square, adjusted R square and standard error of estimate are presented.

Table 4.6: Model Summary

R	R Square	Adjusted R Square	Std. Error of the Estimate
.891[a]	.794	.784	1.021

There was a similar remarkable effect as indicated in Table 4.7 concerning financial performance of construction consulting organizations in Nairobi. The R squared of 0.794 shows that the independent variables accounted for 79.4% of the variance on financial performance of construction consulting firms in Nairobi County.

Table 4.7 below shows the ANOVA results which explained the model fit through the F statistic and the probability of F-statistic. F statistic assumes equal variability in the independent variables\

Table 4.7: ANOVA

	Sum of Squares	**df**	**Mean Square**	**F**	**Sig.**
Regression	149.36	6	24.89333	6.170931	0.00001[b]
Residual	488.11	121	4.033967		
Total	637.47	127			

Table 4.8 shows the statistics on confidentiality which included Total assets, Total investments in hardware, Total investments in software, Total investments in networking infrastructure, Leverage ratio and No. of directors explained the significance of the models concerning financial performance.

Reflected findings are presented in Table 4.8.

Table 4.8: Coefficients

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	0.70	0.151		4.6755	0.00
	Total assets	0.556	0.221	0.146	2.5158	0.016
	Total investments in hardware	0.601	0.179	0.126	3.3575	0.002
	Total investments in software	0.599	0.123	0.045	4.8699	0.000
	Total investments in networking infrastructure	0.679	0.273	0.142	2.4872	0.017
	Leverage ratio	0.434	0.154	0.371	2.8182	0.008
	No. Of directors	0.409	0.166	0.381	2.4639	0.018

a. Dependent Variable: financial performance

The study showed the findings in the table above that holding Total assets constant, total investments in hardware, Total investments in software, and Total investments in networking infrastructure, Leverage ratio and No. of director's had a significant effect on financial performance of the firms. This research also discovered that there was an increase in Total assets. The No. of directors led to an increase in financial performance by a factor of 0.409. This indicated that unit increases number of directors had the least significant impact on financial performance of construction consulting firms.

4.6 Interpretation of the Study Findings

The study revealed that technology had importance in financial performance of construction consulting firms in Nairobi County. The R squared of 0.794 showed that the independent variables accounted for 79.4% of the variances on financial

performance, of the construction consulting firms in Nairobi County at 5% level of confidence, the statistic were significant. In this case, all the predictor variables, explained a variation in monetary action performance which was relevant in overall model.

This findings in this study agreed with those conducted by some scholars who ied out the thesis in Malaysia where it was established that innovation was significantly positive in influencing organizational and business performance of these firms.

The findings herein also agreed with the Njogu (2014) study on financial performance and innovations in small business enterprises in Nairobi County wherein it was established that manufacturing SMEs which had introduced relatively new innovative goods attained significant increase in their financial performance.

The findings here also agreed with Rozic and Sonja (2005) study in which the researchers established that firms that adopted innovations achieved sustainable competitive advantage and improved performance over their competitors.

CHAPTER FIVE: SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

5.1 Introduction

The study is finalized in this section where the key finding summary is given together with conclusions, recommendations and limitations of the research together with the purpose of the investigation which is demonstrating the linkage between technology and financial performance in construction consulting organizations in Nairobi County.

5.2 Summary

The current thesis was to investigate on the financial performance of construction firms within Nairobi, and whether technology had any effects to it. This was demonstrated by the mean score of responses and regression coefficient.

The regression results showed that consulting firms in Nairobi showed that the majority accounted for the independent variables on financial performance. Total assets, Total investments in hardware, and Total investments in software Total investments in networking infrastructure, Leverage ratio and No. of directors explained a variation in financial performance and that the overall model was significant. Therefore, investments in technology with respect to computing hardware, software and networking infrastructure were significant in the financial performance of construction consulting firms.

5.3 Conclusions

The following conclusions were made from the objective and findings of the thesis:

This study highlights the importance of construction consulting firms in focusing on adopting technology to improve their financial performance. There value of 0.891 shows, that the financial performance is affected by technology. This means that these firms should purpose to invest in technology specific to the construction industry with respect to software, hardware and networking infrastructure to improve efficiency in delivery and competitiveness within the sub-sector.

Additionally, the leverage ratio and corporate governance measured by the debt equity ratio highlights the importance of capital structure and no. of directors respectively to the performance of these firms financially. That an organization with a financial structure able to support investments in technology and corporate governance practices that allow for easier adoption of technology by the firms is key in improving financial performance.

Note that majority of the firms from whom the data analyzed were young firms that had practiced below the age of 5 years and were primarily partnerships or sole proprietorships meaning that these firms were more receptive to adoption of technology with the aim of improving financial performance.

5.4 Recommendations for Policy and Practice

Recommendations have been generated from the results, findings and conclusions of this study. They include:

In construction consulting firms in Nairobi County, there is a there's a good interrelation linking technology and financial performance. Therefore, these firms should invest in technology specific to the construction industry that supports the key function of the firm be it architectural, engineering or quantity surveying to improve its financial performance.

Such technology includes software such as WinQS, DimensionX, ArchiCAD, AutoCAD and the like, networking infrastructure including but not limited to internet routers, switches, Ethernet data cables, servers and the like as well as hardware such as UPS systems, external batteries, high speed work stations and the like to improve service delivery to customers, achieve higher efficiency, reliability and control in the organization.

These firms should also be open to adoption of improved technology, adopt entirely new technological inventions that seek to improve current firm performance, train employees in use of technology, maintain capital structure that allows for investments in technology and have a corporate governance policy that allows for a dynamic work environment that allows for adoption of innovative technologies that solve work place challenges.

5.5 Limitations of the Study

During process of doing this research, some of the targeted participants declined to divulge information by not responding to the questionnaires sent to them. There is a probability that some crucial information may have been missed from the non-respondents thus introducing a response bias in the current study.

There was a reduction in the sample size from the data collected because in some construction organizations in Nairobi, there was unavailability of their financial statements. Since the operating environment is not similar, the results therefore may not be concluded to states. Moreover, the unequivocal conclusions were not drawn due to the unavailability of time where the period was 5 years and it was not enough.

5.6 Suggestions for Further Studies

Financial performance and technology were the two variables associated with the research and more economic sectors other than construction and in other major areas within Kenya other than Nairobi County to establish whether these findings do bear a national outlook. This should be expanded to the neigh boring states to establish whether the adoption of technology has a similar significant effect on financial performance for construction consulting firms.

A study should be conducted examine the level of innovative practices construction consulting firms engage in to improve their relative performance within the sector be they technological or organizational.

Additionally, a study can be conducted to examine the innovative practices adopted by registered contractors to improve their financial performance within the construction sector in Kenya since this study centred on construction consulting firms only.

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APPENDICES

APPENDIX I: INTRODUCTION LETTER TO THE RESPONDENTS

UNIVERSITY OF NAIROBI
COLLEGE OF HUMANITIES & SOCIAL SCIENCES
SCHOOL OF BUSINESS

Telephone: 4184160-5 Ext 215 Telegrams: "Varsity'" Nairobi Telex: 22095 Varsity	P.O. Box 30197 Nairobi, KENYA

12 November 2018

TO WHOM IT MAY CONCERN

Dear Sir/Madam,

INTRODUCTORY LETTER FOR RESEARCH
KINYATI SUSAN WAMBUI – REGISTRATION NO.D63/82066/2015

This is to confirm that the above named is a bona fide student in the Master of Science in Finance (Msc. Finance) option degree program in this University. She is conducting research on *"Effect of Technological Innovations on the Financial Performance of Construction Consulting Firms in Nairobi County"*.

The purpose of this letter is to kindly request you to assist and facilitate the student with necessary data which forms an integral part of the research project. The information and data required is needed for academic purposes only and will be treated in **Strict-Confidence**.

Your assistance will be highly appreciated.

Thank you.

Jane Muturi
For: MSc. Finance Co-Ordinator,
School of Business

LJ/jkm

APPENDIX II: QUESTIONNAIRE

Dear Respondent,

This questionnaire is aimed at gathering secondary data on effect of technological innovations within construction consulting firms on their financial performance. You are kindly requested to fill in the questions following the instructions given. The information you provide will be treated with utmost confidentiality and used for the stated academic goal.

SECTION A: Background information

1. What is your highest level of education?

    a) ☐ Bachelor Degree

    b) ☐ Masters Degree

    c) ☐ Doctorate Degree

    d) ☐ Other _____(Please specify)

2. What is the ownership structure of your firm?

    a) ☐ Sole Proprietorship

    b) ☐ Partnership

    c) ☐ Limited Liability Company

    d) ☐ Publicly listed company

    e) ☐ Other _____(Please specify)

3. What would best describe the nature of your firm`s business?

    a) ☐ Architectural Design

    b) ☐ Consulting Engineering

    c) ☐ Quantity Surveying

d) ☐ Other _____(Please specify)

4. How many years has your firm been operating?

    a) ☐ 0 - 5

    b) ☐ 6 - 10

    c) ☐ 11 - 20

    d) ☐ 21 - 50

    e) ☐ Over 51

SECTION B: TECHNOLOGICAL INNOVATIONS AND FINANCIAL PERFORMANCE

Kindly fill in the following data collection table with financial information obtained from your financial statements starting from financial year 2017/2018 (given as year 1) and working backwards to financial year 2014/2015 (given as year 4).

DATA COLLECTION FORM					
S/No.	INDEPENDENT VARIABLE	YEAR 1	YEAR 2	YEAR 3	YEAR 4
1	NET PROFIT				
2	TOTAL ASSETS				
3	TOTAL INVESTMENTS IN HARDWARE				
4	TOTAL INVESTMENTS IN SOFTWARE				
5	TOTAL INVESTMENTS IN NETWORKING INFRASTRUCTURE				
6	LEVERAGE RATIO (DEBT-EQUITY RATIO= TOTAL DEBT/NET WORTH)				
7	NO. OF DIRECTORS				

THANK YOU