

**INNOVATION AND OPERATIONAL PERFORMANCE OF TOP 100
RATED KPMG FIRMS IN KENYA**

BY

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**A Research Project Submitted In Partial Fulfillment Of The
Requirement For Award Of Master Of Business Administration Degree
(Operational Management), School Of Business, University Of Nairobi**

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DECLARATION

This research project report is my original work and has not been submitted to any other college, institution or university.

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Date: _____

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D61/67304/2013

This research project report has been presented with my approval as the appointed university supervisor.

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DEDICATION

I dedicate this research project report to my parents John and Beatrice Gatu for their support, prayers and the sacrifices they have made. Also to my sisters Angela and Lilian Gatu for their encouragement and assistance in completion of this project. Finally to my friends and managers/employees of top 100 KPMG rated firms in Kenya who contributed directly or indirectly and for their cooperation in conducting the project..

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LIST OF ABBREVIATIONS

ERP	Enterprise resource planning
GDP	Gross Domestic Product
ICT	Information and communication technology
KPMG	Klynveld Peat Marwick Goerdeler
OECD	Organizations for Economic Co-operation and Development
R&D	Research and development
RBV	Resource Based View Theory
SMEs	Small and Medium Scale Enterprises
SPSS	Statistical Package for Social Sciences
UNCTAD	United Nations Conference on Trade and Development

ABSTRACT

The main objective was to examine the influence of innovation and operational performance of Top 100 rated KPMG firms in Kenya. The objectives were to examine the influence of product innovations, process innovations, information processing and communication innovations on operational performance of Top100 rated KPMG firms in Kenya. The study was anchored on Diffusion of innovation Theory and Resource Based View Theory (RBV). The study adopted descriptive research design and targetted the KPMG Top 100 rated firms in Kenya which are within Nairobi County. The unit of observation was the managers in the firms. The study collected primary data through use of a questionnaire. The collected data was analyzed through descriptive and inferential statistics. The analyzed data was presented in tables, and bar charts. The study found out that majority of the respondents indicated that ICT enhanced product innovations in their organizations to a great extent. It was established that the ICT based innovations led to introduction of new products and services in the Top 100 rated KPMG firms in Kenya. Majority of the respondents revealed that process innovations influenced operational performance of their organizations to a great extent. It was also found out that information processing and communication innovations influenced operational performance of their organizations to a great extent. The study concludes that product innovations significantly influences operational performance of Top 100 rated KPMG firms in Kenya. The study concludes that process innovations have a positive and statistically significant relationship with operational performance of Top 100 rated KPMG firms. The study also concludes that information processing and communication innovations significantly influence operational performance of Top 100 rated KPMG firms. The study recommends that there is need to increase access to useful ICT to the small and medium sized companies which are the basically forms the Top 100 rated KPMG firms in Kenya. ICT play a key role in enhancing innovations in these firms which helps in adding value, quality and enhanced efficiency which subsequently improves performance of the medium sized firms. The government should create policies that support innovations in small and medium sized companies in Kenya and also help in development of technologies with local conditions and market demands.

CHAPTER ONE: INTRODUCTION

1.1 Background of the Study

Innovations are transforming the nature of products, processes and even competition itself. This innovations revolution is sweeping through the economy and no organization or company can escape its effects. It is observed that the result of the revolution is leading to dramatic reductions in the cost of obtaining, processing and transmitting information and at the same time changing the way business is done (Ozigbo & Ezeaku, 2009). Innovation, including product, process, marketing, and organizational innovation within a firm, is considered as one of essential component for surviving and growing. These innovation activities create value and competitive advantages for successful organizations; therefore, understanding the firm's overall innovation is the first and foremost to understand the role of innovation on operational performance (Tuan *et al.*, 2016).

There is evidence to show that there is a relationship between innovation and operational performance. Marques and Ferreira (2009) interpret firms' innovation efforts as evidence of their increasing awareness of innovation as a source of superior performance. Kafetzopoulos and Psomas (2015) also assert that innovation directly contributes to product quality and operational performance. Thus, innovation is an opportunity for a manufacturing firm to improve its performance. Yusuf (2013) also found out that innovations enable firms to cut costs and improve efficiency. The author confirmed that innovations have diverse and positive impact on the growth and operational performance of firms. According to Abubakar and Tasmin (2012), ICT has become in recent years an important feature in promoting and facilitating the conduction of business operations and delivering services to customers. The use of ICTs is at best one factor among others that improve innovations in mid-sized companies and subsequently their performance (Wolf, 2001).

1.1.1 Innovation

Innovation is defined as “the implementation of a new or significantly improved product (good or service), or process, a new marketing method, or a new organizational method in business practices, workplace organization or external relations” (OECD, 2005 p.46). Porter (2001) argues that today the issue for organizations is not the acquisition and deployment of technology but rather how companies innovate. Product initiation or development can no longer be solely determined by internal R&D functions, but rather depends on the contributions of a broad range of external players. External players might include suppliers, customers and research institutes.

According to Hall, Lotti and Mairesse (2013) innovations in firms may be in form of production innovations, product innovations, information processing innovations or information communication innovations. The adoption of innovations by firms provides the ability of rapid access to data, assessment, processing and dissemination of large data volumes. Consequently, only those firms which use the state-of-the-art technologies and innovations have the opportunity to enter the international market and remain competitive despite the challenges of globalization, liberalization and scientific and technical progress. Innovations help firms to increase their productivity and achieve higher business performance (Ongori & Migiro, 2010). Equally, innovations can achieve a differentiation advantage by securing relationship with customers through better quality servicing.

Information and communication technologies (ICTs) are a valuable source of business innovation because they provide substantial efficiency gains. Koellinger (2005) revealed that ICT makes it possible to reduce transaction costs, improve business processes, facilitate coordination with suppliers, fragment processes along the value chain (both horizontally and vertically) and across different geographical locations, and increase diversification. Gretton, Gali and Parham (2004) suggested two reasons why business use of ICT

encourages innovative activity. Firstly, ICT is a 'general purpose technology' which provides an 'indispensable platform' upon which further productivity-enhancing changes, such as product and process innovations, can be based. Secondly, the spillover effects from ICT usage, such as network economies, can be sources of productivity gains. ICT usage has drastically modified communication, sales and information methods, thus enabling companies to achieve strong competitive advantages in both production and product development (Jespersen & Nuka, 2010).

1.1.2 Operational Performance

Lusch and Laczniak (2009) define performance as the total economic results of the activities undertaken by an organization. Performance comprises the actual output or results of an organization as measured against its intended outputs (or goals and objectives). Operational performance objectives are the areas of operational performance that a company tries to improve, in a bid to meet its corporate strategy. After defining its corporate strategy, a company will identify the relevant operational performance objectives to measure and configure the environment, to enable the objectives to be accomplished. According to Neely (2007), author of the book "Business Performance Measurement: Unifying Theory and Integrating Practice," there are five main operational performance objectives: speed, quality, costs, flexibility, and dependability.

Operations can contribute significantly to financial performance of the company, for example, reducing overheads of sales, forming operations teams that give added value. The operations of a firm should be efficient and effective. Effectiveness is the expanse to which customers' needs are fulfilled, while efficiency is defined as a measure of how economical firms' resources are employed (Duarte, 2011). Innovation doesn't only involve developing new products or services. It often focuses on improving what already exists, for example the business' workflow,

production or sales process. Such innovation can lead to great improvements in business operational performance and efficiency.

Santa *et al.* (2014) suggest that the dimensions stemming from technological innovation effectiveness such as system quality, information quality, service quality, user satisfaction and the performance objectives stemming from operational performance such as cost, quality, reliability, flexibility and speed are important and significantly well-correlated factors. These factors promote the alignment between technological innovation effectiveness and operational performance and should be the focus for managers in achieving effective implementation of technological innovations.

1.1.3 Top 100 Rated KPMG Firms

Top 100 Rated KPMG Firms are majorly mid-sized companies operating in Kenya and which have shown remarkable performance in their respective sectors. Top 100 Mid-sized Companies is an annual survey launched in Kenya in 2008, Uganda (2009) and Tanzania (2010) by auditing firm KPMG East Africa and the Business Daily (Business Daily, 2012). A ‘Top 100 mid-sized company’ is one that ranks ahead of its peers in the various sectors in the country. The ranking is based on a number of financial parameters/indicators, which are: revenue growth, profit growth, returns to shareholders, cash generation, involvement in corporate social responsibility, and the role played by innovation in their operations. The ranking also capture other characteristics such as business confidence outlook, talent policies, and contribution to job creation. The top 100 companies’ list is therefore based on quantitative criteria, based on selected financial indicators (Business Daily, 2018).

Mid-size companies play a critical role in the development of the Kenya economy. These firms play a key role in employment creation, income generation and are the bedrock for industrializing the Country in the near future (Economic Survey, 2009). According to Muganda (2016) SMEs have a huge

contribution of to the growth of the economy. The middle and lower tier of businesses are the real employers in the Kenyan economy and keeps the country going.

The award by KPMG and Business Daily recognizes the firms that have had remarkable innovation of unique software products that offer solutions to the needs of businesses in managing people, process and governance. The increased use of ICT in these firms has led to increased innovations. Innovations have led to development of new products to meet customer needs, quality products, improved business processes, and has enhanced management of risks in the firms (Muganda, 2016).

1.2 Statement of the Problem

To compete in the global markets, organizations strive to make the outstanding performance. Understanding the relation between innovation and performance in both large, medium, and small firms is of crucial importance for sustained performance of these firms (De Jong *et al.*, 2013). However, there is limited amount of research concerning innovations and their effects on operational performance of middle sized firms, an indication of the fact that medium, and small firms started to innovate relatively recently with the advancement of technology (Alam & Noor, 2009). In developing countries, globalization, increased competitive pressure and rapid technological changes have brought the business world to a point in history and thus, small and medium enterprise sector in Africa and are the hardest hit (Ocloo *et al.*, 2014). However, Innovations (Organizational innovation, product innovation, marketing innovation) has been seen to have a positive effect on the operational performance of these firms which could improve their competitiveness in the global markets (Makanyeza & Dzvuke, 2015).

Given the significant role the middle sized firms in Kenya are playing to the Kenyan Economy and the increased adoption of technology-solutions by the middle sized firms; there is need to critically examine how the innovations are influencing the various performance aspects such as businesses processes, quality of products, cost of operations flexibility, among others. In Kenya, small and middle sized organizations are operating in an increasingly competitive market. Migiro (2006) revealed challenges facing Kenyan

medium sized companies require innovations. One way to achieving growth and sustaining performance is to encourage and foster innovative practices and creativity internally within the organisation; innovation is often a condition for simple survival (Letangule & Letting, 2012). The rapid spread of information and communication technologies and ever decreasing prices for communication different parts of the world have increased innovations in various organizations and enhanced improved efficiency, reduced transaction costs and technical improvement in production (Tarutė & Gatautis, 2014). One basic question of this study is whether product, production innovations, information processing innovations, information communication innovations has helped improve the operational performance of middle sized firms in Kenya.

A review of the international studies shows that Hsueh and Tu (2004) examined innovation and the operational performance of newly established medium enterprises in Taiwan, Atalay, Anafarta and Sarvan (2013) looked at the relationship between innovation and firm performance in Turkey, while Kafetzopoulos and Psomas (2015) looked at the impact of innovation capability on the performance of manufacturing companies in Greece. None of the above studies has filled the gaps that this study sought to fill. A review of the local studies conducted shows that Kiveu and Ofafa (2013) conducted a study on enhancing market access in Kenyan middle sized firms through technology innovations. Mokaya and Njuguna (2012) looked at the adoption and use of technology by small enterprises in Thika town while Ongori and Migiro (2011) conducted a study on understanding the drivers of adoption of innovations by Kenyan middle sized firms. There is very little evidence in the Kenyan context on how innovations influence performance of middle sized firms in Kenya.

It is against this background therefore that the study sought to determine the influence of innovations on operational performance of Top100 KPMG firms in Kenya. The study sought to establish how product innovations influence operational performance of Top 100 rated KPMG firms in Kenya, how process innovations influenced operational performance of Top 100 rated KPMG firms in Kenya and how

information processing and communication innovations influenced operational performance of Top 100 rated KPMG firms in Kenya.

1.3 Research Objective

The main objective was to examine the influence of innovation and operational performance of Top 100 rated KPMG firms in Kenya.

The study was guided by the following specific objectives:

- i. To examine the influence of product innovations on operational performance of Top100 rated KPMG firms in Kenya.
- ii. To establish the influence of process innovations on operational performance of Top100 rated KPMG firms in Kenya.
- iii. To determine the influence of information processing and communication innovations on operational performance of Top100 rated KPMG firms in Kenya.

1.4 Value of the Study

The study is expected to be beneficial to management of Top100 KPMG firms in Kenya. With the increasing competition through globalization which puts them under considerable pressure; the study will findings and recommendations will guide the middle sized firms on the innovations they need to adopt in order achieve operational performance. With the knowledge on how innovations influence operational performance of Top100 KPMG firms; the study may influence the management of these middle sized firms to adopt appropriate strategies to enhance innovations in their organizations.

The study would be imperative to the Kenyan government. In the recent past, the Kenyan government has realized the importance and potential of the middle sized firms to the Kenyan economy. In this regard, it has been developing policies and programs to assist them boost their growth and development. This study will therefore help the government in indentifying the innovation needs of the SMEs and thus provide infrastructural development and provision of financial resources (such as financial assistance) to help them easily adopt and integrate innovations in their operations.

The findings were also expected to be of valuable to the researchers and academicians, since it would add value to the existing body of knowledge on how innovations influence operational performance of middle sized firms. The academicians and researchers may also find useful research gaps that may stimulate interest for further research in future.

CHAPTER TWO: LITERATURE REVIEW

2.1 Introduction

This chapter provides a review of past literature alongside the theoretical review. It has a schematic diagram that shows the relationship between the independent variables and dependent variable.

2.2 Theoretical Review

This section discusses the theories that are attributed by other authors and scholars and are critical in guiding the study. This study was informed by Diffusion of innovation Theory Resource Based View Theory (RBV) and Theory of Constraints.

2.2.1 Diffusion of Innovation Theory

Rogers' Diffusion of innovation Theory seeks to explain how new ideas or innovations are adopted. This theory proposes that there are five attributes of an innovation that affect adoption: relative advantage, compatibility, complexity, triability and observability (Rogers, 2003). Relative advantage is the degree to which an innovation is perceived as being better than the idea it supersedes. Rogers' theory suggests that innovation that have a clear, unambiguous advantage over previous approach will be more easily adopted and implemented. Current research evidence indicates that if a potential user saw no relative advantage in using the innovation, it would not be adopted (Rogers & Kim, 2010).

The study was guided by the diffusion theory which offers a rich perspective on innovation and the forces that drive adoption of innovations and those that restrain them. The diffusion theory argues that characteristics of innovations affect the rate of adoption. The theory therefore guided this study in helping understand the characteristics of the existing innovations that have encouraged or prompted the middle sized firms to adopt various technologies in their businesses.

2.2.2 Resource-Based View Theory

This theory was developed by Birge Wenefeldt in 1984. The basis of the resource-based view is that successful firms will find their future competitiveness on the development of distinctive and unique capabilities, which may often be implicit or intangible in nature. Thus, the essence of strategy is or should be defined by the firm's unique resources and capabilities. Furthermore, the value creating potential of strategy, that is the firm's ability to establish and sustain a profitable market position, critically depends on the firm's generating capacity of its underlying resources and capabilities (Pearce & Robinson, 2007).

The resource based view (RBV) suggests that competitive advantage and performance results are a consequence of firm-specific resources and capabilities that are costly to copy by other competitors (Barney *et al.* 2011). These resources and capabilities can be important factors of sustainable competitive advantage and superior firm performance if they possess certain special characteristics. They should be valuable, increasing efficiency and effectiveness, rare, imperfectly imitable and non-substitutable. If all the firms were equal in terms of resources there would be no profitability differences among them because any strategy could be implemented by any firm in the same industry. The underlying logic holds that the sustainability of effects of a competitive position rests primarily on the cost of resources and capabilities utilized for implementing the strategy pursued (Learned *et al.*, 1969).

The theory therefore emphasizes on the internal resources of the firm as the source of performance and competitive advantage, rather than the external environment. In regard to this study, these capabilities e.g. expertise could also be generated from the external context of the firm necessitated by the developments in technology. Hence, in view of this explanation, the following factors can be viewed as forming bundles of firm assets

important to the firm and for inclusion in the framework: resources and capabilities, top management support, cost of innovations, human capital and networks.

2.2.3 Theory of Constraints (TOC)

The theory of constraints, developed by Dr. Eliyahu Moshe Goldratt in the 1980s, identifies factors preventing a company from reaching its goals. The theory measures operational performance in key areas and uses the results to streamline operations (Gupta & Boyd, 2008). According to Goldratt (1984), the TOC approach recognizes that every organization must be understood as a system with a goal, and so, every action taken by any part of the system must be judged by its impact on the whole system goal. The author outlines a five-step process to applying the theory: 1). Identify the process' constraints, 2) Decide how best to exploit the process constraints, 3). Subordinate everything else to the above decisions, 4). Evaluate the process constraint, and 5). Remove the constraint and re-evaluate the process.

One of the appealing characteristics of the Theory of Constraints is that it inherently prioritizes improvement activities. The top priority is always the current constraint. In environments where there is an urgent need to improve, TOC offers a highly focused methodology for creating rapid improvement (Gupta & Boyd, 2008). A successful Theory of Constraints implementation will have the following benefits: Increased profit (the primary goal of TOC for most companies), fast improvement (a result of focusing all attention on one critical area – the system constraint), improved capacity (optimizing the constraint enables more product to be manufactured), reduced lead times (optimizing the constraint results in smoother and faster product flow), and reduced inventory (eliminating bottlenecks means there will be less work-in-process) (Lockamy & Spencer, 1998).

The implications of the theory are far reaching in terms of understanding bottlenecks to a process and better managing these bottlenecks to create an

efficient process flow in an organization. The theory of constraints is an important tool for operations managers to manage bottlenecks and improve process flows hence improving operational performance. This theory guides this study in establishing whether innovations can help manage process/operations flow bottlenecks in medium enterprises firms in order to create an efficient flow of operations hence improving operational performance.

2.3 Innovation

An innovation refers to the implementation of a new or considerably improved product or process, and also includes new marketing or organisational methods. Based on the Oslo Manual there are four different types of innovation, namely product innovations, process innovations, marketing innovations and organisational innovations (OECD & Eurostat, 2005).

2.3.1 Product Innovations

A product innovation is the introduction of a good or service that is new or has significantly improved characteristics or intended uses. These include significant improvements in technical specifications, components and materials, incorporated software, user friendliness or other functional characteristics. Product innovations include both new products and new uses for existing products (OECD, 2012). Information and communication technologies are being deployed in all spheres of business activities including new product development and innovations (Bhatt & Ved, 2013).

Spiezia (2011) investigated whether ICT use enables innovation using a firm-level data for eight OECD countries. The results established that ICT facilitate innovation, and are particularly strong for product innovation. Spiezia's findings also suggest that ICT use has a highly significant effect on innovation not only for the service sector, but for the manufacturing sector as well. Aoun and Dubrocard (2012) also investigated the relationship between ICT and innovation based on a sample of Luxembourgian firms between 2004 and 2006. Their results suggest that there is a positive and significant

correlation between ICT use and innovation for firms that have introduced product innovations.

2.3.2 Process Innovations

A study by Vilaseca (2017) on the role that Information and Communication Technologies (ICT) plays in the processes of product innovation and marketing, established that intensive ICT use in marketing makes the company more innovative, as it perceives that its usage breaks down barriers to innovation and speeds up processes that in turn become more efficient. Increasing ICT use in marketing also encourages company predisposition to collaborate with and integrate particular agents within the business environment in the development of the innovation process, improving the degree of adaptation of the new product to market demands.

Another study by Bartel *et al.* (2015) on a sample of 212 U.S. firms in the valve industry; found out that IT promotes increased production of customized products (that is, product innovation according to the customer's specifications), and improved considerably production process efficiency. Hempell (2015) using a production function framework and data from 1222 German service firms demonstrated that innovation and ICT use are complementary, that is, mutually reinforcing, with respect to productivity.

2.3.3 Information Processing and Communication Innovations

ICT is the technology required for information processing, in particular, the use of electronic computers, communication devices and software applications to convert, store, protect, process, transmit and retrieve information from anywhere, anytime. Agboola (2016) observed that some payments are now being automated and absolute volume of cash transactions are brought about by the adoption of ICT to the payment system both in developed and developing Nations. ICTs have been identified as key tools in management processes. A study by revealed that they have a remarkable potential to

contribute to improved operational performance and sustained competitive advantage for businesses (Apulu & Latham, 2010).

A study by Bazhenova *et al.* (2012) on the impact of information and communication technologies on business process management on small and medium enterprises in the emerging countries, established that the evolution of technology has significantly influenced the business by improving business processes. The ICT provides the ability of rapid access to data, assessment, processing and dissemination of large data volumes. ICT is being implemented as part of the business strategy to support the business processes. ICT-solutions were found to help SMEs to increase their productivity, enhance efficiency, flexibility and achieve higher business performance.

The use of Information and Communication Technology (ICT) has considerably changed the way in which organisations operate and communicate. With the advent of technology, there are new forms of communication such as Internet, e-mail or video conferencing etc. Using technology in communication has become a necessity. According to Ramey (2013), there has been observable impact of technology in communication in businesses. Today, every business uses technology in its own way to reach the media and targeted consumers. Also, businesses have embraced technology by easing communication within companies and among investors and suppliers. Studies by Agboola (2016) and Ayo (2016) found out that, the growing rate of ICT particularly the internet has influenced at an exponential rate online interaction and communication within and with parties outside organizations.

2.4 Operational Performance Measurement

The contemporary measures of operational performance are cost, speed, dependability, quality and flexibility (Belekoukias, 2014). Speed measures how fast a company can deliver its products and generates sales quotes. This objective is concerned with such issues as the time that it takes to manufacture and process one or more products of the company or the

time that it takes to research a new product and develop it. Typically, quality is considered to measure how well a product conforms to certain specifications. However, according to Neely (2007), it's more than that. It's also how desirable the features of the product are; how reliable the product is; how durable it is; how easily it can be serviced; how well it performs its intended function; and, how much the customers believe in its value. All of these are relevant measures of quality.

On costs, the objective is to look at how much variation there is in the unit cost of a product as measured by changes in a variety of factors, including the volume and the variety of the products. Products that feature a greater variety tend to sport lower volumes and higher unit costs and vice versa. Ultimately, this affects the price of the product, the costs of producing it, and the profits to be obtained from that product (Kushwaha, 2012). On the other hand, flexible operations are operations that can configure the product lines to deal with various requirements and to also adjust these product lines quickly to new requirements. The latter is also closely related to the speed objective. A company should be able to produce different quality product varieties and also adapt its operations to suit different market conditions and delivery schedules (Awwad, 2007).

On dependability, operational performance objective measures how dependable the company is when it comes to timely delivery of products to its customers, in accordance with planned prices and costs. The product's ability to function in an intended way consistently over a reasonable period of time is also a measure of its dependability (Santa *et al.*, 2014). According to Slack and Lewis (2002) excelling at one or more of these operations performance objectives can enable an organization to pursue a business strategy based on a corresponding competitive factor.

2.5 Empirical Review

ICTs are a valuable source of business innovation because they provide substantial efficiency gains. A review of existing literature shows that Koellinger (2005) conducted an empirical study of E-business Usage, Innovation and Firm Performance. He revealed that ICT makes it possible to reduce transaction costs, improve business processes, facilitate coordination with suppliers, fragment processes along the value chain (both horizontally and vertically) and across different geographical locations, and increase diversification. ICTs innovations in middle sized firms are also said to provide means to accessibility, processing and distributing greater amounts of data and information quickly in the organisation to aid the process of making thoughtful decisions (Jimmy & Li, 2003). Nguyen (2009) also argue that owners/ managers who are in position to recognise opportunities and threats in their environment especially in choosing the market target are in position to develop appropriate strategies to retain and increase their market share by adopting ICTs in their business to access to local and global market. Moreover, large volume of information intensity will tend to compel middle sized firms owner/managers to adopt ICTs to assist in management and operational control.

A study by Becker *et al.* (2007) on process management also revealed that due to the integration of business processes implemented by ERP, it becomes possible to eliminate the boundaries between functional departments, increase the access to information and its seamless movement between the various departments. Among the benefits caused by ERP implementation, one can note such improvements in the operating activity of the company as reduced time of the product development and product withdrawal to the market, as well as the emergence of the ability of quick response to the competitive pressures and changing market conditions. However, studies by Chong (2007) on business process management for middle sized firms in Australian wine industry; and Balocco, Mogre and Toletti (2009) established that the usage of ICT in

business process management for middle sized firms in developing countries is quite low.

Bayo-Moriones and Lera-Lopez (2007) while conducting a firm-level analysis of determinants of ICT innovations in Spain revealed that, ICT could help firms to achieve cost leadership by improving efficiency across business processes. For example, implementing ICT software at different stages of the production cycle could help make better decisions and cut-down costs associated with errors. Equally, ICT can achieve a differentiation advantage by securing relationship with customers through better quality servicing such as e-banking.

Gretton, Gali and Parham (2004) suggested two reasons why business use of ICT encourages innovative activity. Firstly, ICT is a 'general purpose technology' which provides an 'indispensable platform' upon which further productivity-enhancing changes, such as product and process innovations, can be based. For example, a business which establishes a web presence sets the groundwork from which process innovations, such as electronic ordering and delivery, can be easily developed. In this way, adopting general purpose ICT makes it relatively easier and cheaper for businesses to develop innovations. Secondly, the spillover effects from ICT usage, such as network economies, can be sources of productivity gains. For example, staff in businesses which have adopted broadband Internet are able to collaborate with wider networks of academics and international researchers more closely on the development of innovations and keep abreast of current consumer trends. These are spillover benefits because the R&D efforts of other researchers in the collaborative group can be appropriated by all.

Gago and Rubalcaba (2007) econometric analysis also confirms that ICTs play an important role in enabling business innovation. They found out that, businesses which invests in ICT, particularly those which regard their

investment as very important, or strategically important, are significantly more likely to engage in services innovation. A number of studies have demonstrated that valuable insight into the relationships among innovation and ICT variables can be generated by linking firm level datasets.

The findings by OECD (2010) support the evidence that ICTs act an enabler of innovation, in particular for product and marketing innovation. However, these effects are large both in manufacturing and services. No evidence is found, that ICT use increases the capability of a firm to cooperate with other firms/institutions, nor do the ICT intensive firms have higher capacity to develop innovation in-house or to introduce more “innovative” new-to-the-market products. These results suggest that ICTs enable firms to adopt innovation but they do not increase their “inventive” capabilities, i.e. the capability to develop new products and processes. Bazhenova *et al.* (2012) also argues that the role of innovative technologies, such as ERP systems for SMEs in emerging markets is an important factor in the development of small and medium businesses. However, there is a need to adapt the existing solutions to the real needs and possibilities of small and medium businesses.

2.6 Conceptual Framework

The conceptual framework shows the hypothesized interaction between independent variables and the dependent variable in the study. In this study, the independent variables are: production innovations, information processing innovations and information communication innovations while the dependent variable is operational performance. The conceptual frame work is presented in the Figure 2.1 below.

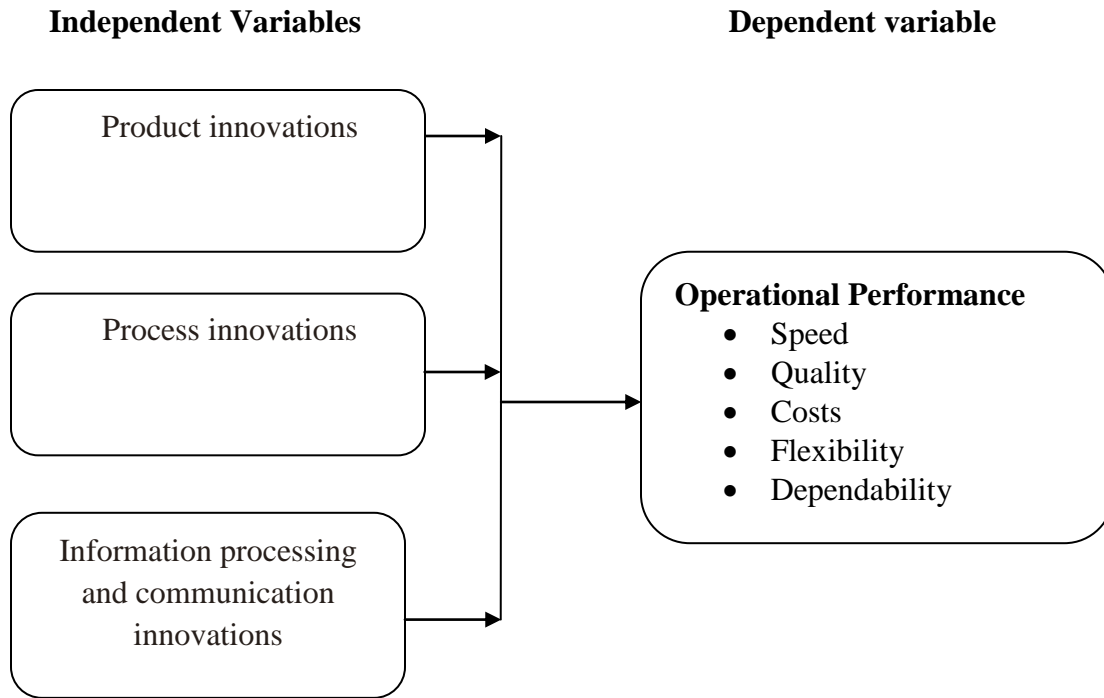


Figure 1: Conceptual Framework

CHAPTER THREE: RESEARCH METHODOLOGY

3.1 Introduction

The chapter looked at the research methods that were employed in the study in order to achieve the objectives of the study. The chapter covered the research design adopted, population of study, sample size and sampling technique, data collection instrument, pilot testing and data analysis procedures.

3.2 Research Design

The study adopted descriptive research design. Robson (2002) points out that descriptive research design is a scientific method which involves observing and describing the behavior of a subject without influencing it in any way. Descriptive studies are used to describe various aspects of the phenomenon, casting light on current issues or problems through a process of data collection that enables them to describe the situation under study.

The descriptive design was appropriate for this study since it presents several advantages as they provide a multifaceted approach for data collection that enhances the study to describe what is going on. This type of research helps create new research questions, or form hypotheses about cause and effect relationships. Descriptive research design also facilitated the use of a questionnaire to gather quantitative and qualitative data for the study, and the opportunity to integrate the qualitative and quantitative methods of data collection (Mugenda & Mugenda, 2003).

3.3 Population

The study targeted the KPMG Top 100 rated firms in Kenya (2016) which are within Nairobi County. Since the population is small, a census study was adopted whereby the entire population of KPMG Top 100 rated Firms (2016) were considered for the study. According to Cooper and Schindler (2007) a census is feasible when the population is small and necessary when the elements are quite different from each other. When the population is small and

variable, any sample drawn may not be representative of the population from which it is drawn. Therefore, a census study was deemed appropriate for study since the sampling frame is small. Thus the entire population formed the sample size for the study. The researcher targeted the managers in the KPMG Top 100 rated firms since they understood better how innovations in their organizations influence their firms performance thus they can give reliable data.

3.4 Data Collection

The study collected primary data. The data was collected using a questionnaire. The questionnaire had both closed and open-ended questions. The closed ended questions enabled the questionnaire to gather quantitative data while open-ended questions enabled the questionnaire to collect qualitative data. Questionnaires were considered for the study since they can economically and easily collect data from a large number of people. They are also simple to administer and help gather quantitative data in a standardised way, making it relatively easy to analyse (Kombo & Tromp, 2006). The researcher personally administered the questionnaire to the respondents. However, where the respondents were busy or unable to fill the questionnaires at that moment, drop and pick later method was adopted.

A pre-test of the questionnaire was conducted prior to the actual data collection. The developed questionnaire was checked for its validity and reliability through pilot testing. The research subjected the questionnaire to 5 managers from other SMEs (other than the targeted Top 100 SMEs) to participate in the pilot study. According to Mugenda and Mugenda (2003) a successful pilot study would use 1% to 10% of the actual sample size.

Reliability test measures the internal consistency of the questionnaire. An instrument is reliable when it can measure a variable accurately and obtain the same results over a period of time. Reliability will be calculated with the help of Statistical Package for Social Sciences (SPSS). Cronbach's alpha was used whereby a co-efficient of above 0.7 was established which implied

that the instruments are sufficiently reliable for the measurement. Validity involve how accurately the data obtained represents the variables of the study (Saunders *et. al.*, 2003). Validity of the questionnaire was established by the research and supervisor reviewing the items. The instruments were discussed with supervisors. The feedback from the supervisors and the experts helped in modifying the instruments.

3.5 Data Analysis

The data collected by the questionnaire will be edited, coded, entered into Statistical Package for Social Sciences (SPSS) which also aided in the data analysis. This study generated both qualitative and quantitative data. Both descriptive and inferential statistics were adopted for the study. The quantitative data was analyzed using descriptive and inferential statistics. The qualitative data was analysed through content analysed and presented in respective themes in accordance with study objectives. Descriptive statistics included frequency distribution tables and measures of central tendency (the mean), measures of variability (standard deviation) and measures of relative frequencies. The inferential statistics included a regression model which established the relationship between variables. Data was presented using tables, charts and graphs.

The multivariate linear regression model adopted took the form:

$$Y = \alpha + \beta_1 \chi_1 + \beta_2 \chi_2 + \beta_3 \chi_3 + \epsilon$$

Whereby Y is Operational Performance, α is the constant, X_1 is Product innovations, X_2 is process innovations, X_3 is information processing and communication innovations, β_1 , β_2 and β_3 are the regression coefficient or change included in Y by each χ , and ϵ is the error term.

The beta (β) values explained whether the relationship between the dependent and the independent variable is high or low, positive or negative. The ANOVA test showed the significance of regression model to give reliable result.

The p value measured the significance of the variables in the regression model; whereby, if the p value of the variable is 0.05 (5%) and below, then the relationship was deemed significant while where the p value co-efficient of the variable is above 0.05, then the relationship of the variables was deemed to be insignificant.

3.6 Summary of Methodology

Objective	Data collection	Analysis
Product Innovation	<ul style="list-style-type: none"> • Quantitative data-nominal data, Ordinal data • Qualitative data. 	<ul style="list-style-type: none"> • Descriptive statistics – Frequency & percentage distribution tables, mean scores & Standard deviation. • Inferential statistics - Regression Analysis
Process Innovation	<ul style="list-style-type: none"> • Quantitative data-nominal data, Ordinal data • Qualitative data. 	<ul style="list-style-type: none"> • Descriptive statistics – Frequency & percentage distribution tables, mean scores & Standard deviation. • Inferential statistics - Regression Analysis
Information Processing and Communication Innovation	<ul style="list-style-type: none"> • Quantitative data-nominal data, Ordinal data • Qualitative data. 	<ul style="list-style-type: none"> • Descriptive statistics – Frequency & percentage distribution tables, mean scores & Standard deviation. • Inferential statistics - Regression Analysis

CHAPTER FOUR: DATA PRESENTATION, ANALYSIS, AND INTERPRETATION

4.1 Introduction

This chapter entails the findings of the study based on the data collected. The study sought to examine the influence of innovation and operational performance of Top 100 rated KPMG firms in Kenya. The data was analyzed through descriptive and inferential analysis and presented in tables, pie charts, and bar graphs.

4.2 Response Rate

This section sought to determine the response rate of the study so as to determine whether it was adequate enough to provide reliable results that could help make inference on the study. The study response rate is shown in Table 4.1.

Table 4.1: Response Rate

Respondents	Frequency	Percent
Responded	78	78.0
Not Responded	22	22.0
Total Sample Size	100	100.0

Source: Research Data (2018)

The study sample size was 100 managers from KPMG rated Firms. Out of this target sample size, 78 questionnaires were successfully received in time for analysis, which translate to a response rate of 78%. This high response rate was achieved since the respondents in most organisation were co-operative and willing to give information. According to Mugenda and Mugenda (2003) fifty percent response rate is adequate, sixty percent is good and above seventy percent is rated very well. The responses were therefore adequate enough for the study to form conclusions on the objectives of the study.

4.3 Product Innovation and Operational Performance

In this section, the study sought to examine the influence of product innovations on operational performance of Top 100 rated KPMG firms in Kenya. To achieve this objective the study enquired from the respondents on the extent to which ICT enhanced product innovations in the organization, and to indicate their agreement on aspects of process innovations in their organization.

4.3.1 Extent ICT Enhanced Product Innovations in the Organization

The respondents were asked to indicate the extent to which ICT had enhanced product innovations in their organizations. The findings are presented in Table 4.2.

Table 4.2: Extent ICT Enhanced Product Innovations in the Organization

Extent	Frequency	Percent
Very Great extent	28	35.9
Great Extent	44	56.4
Moderate Extent	6	7.7
Small extent	-	-
Total	78	100.0

Source: Research Data (2018)

The results in Table 4.2 show that majority (56.4%) of the respondents indicated that ICT enhanced product innovations in their organizations to a great extent. This was supported by 35.9% of the respondents who indicated to a very great extent. However, 7.7% of the respondents reported that ICT enhanced product innovations in their organizations to a moderate extent. From the findings, it can therefore be deduced that ICT enhanced product innovations in Top 100 rated KPMG firms to a great extent.

4.3.2 Product Innovations in Top 100 Rated KPMG Firms

The respondents were asked to indicate their level of agreement on statements on product innovations in in Top 100 rated KPMG firms. A five point likert scale was used to interpret the findings where a mean score of 1- 2.5

implies that the respondents disagreed with the statement, a mean score of 2.6-3.5 implies that the respondents were neutral, while a mean score of 3.6-5.0 implies that there was agreement with the statement. The findings are presented in Table 4.3.

Table 4.3: Product Innovations in Top 100 Rated KPMG Firms

Statements on Product Innovations	N	Mean	Std. Deviation
Innovations have enhanced new uses for existing products in the organization.	78	4.17	0.710
Innovations have enhanced improvements in technical specifications of products in the organisation.	78	4.15	0.704
Innovations in the organisation have led to introduction of new products and services.	78	4.12	0.702
Innovation has improved functional characteristics of the products.	78	3.95	0.737

Source: Research Data (2018)

The study findings show that the respondents agreed that innovations had enhanced improvements in technical specifications of products in the organization (mean score = 4.15), and had also led to introduction of new products and services (mean score = 4.12). The respondents also agreed that process innovations as a result of ICT had enhanced new uses for existing products in the organization (mean score = 4.17), and had also improved functional characteristics of the products (mean score = 3.95).

4.4 Process Innovations and Operational Performance

The study sought to establish the influence of process innovations on operational performance of Top 100 rated KPMG firms in Kenya. To achieve this objective, the study enquired on whether ICT had enhanced the adoption of process innovations in the organisation, and the extent to which process innovations influenced operational performance of their organization.

4.4.1 Whether the Organization had Adopted Process Innovations

The respondents were asked to indicate whether the organization adopted process innovations as a result of ICT. The findings are presented in Table 4.4.

Table 4.4: Whether the Organization had Adopted Process Innovations

Responses	Frequency	Percent
Yes	78	100.0
No	-	-
Total	78	100.0

Source: Research Data (2018)

The study results in Table 4.4 show that all the respondents (100%, n=78) indicated that their organizations had adopted process innovations as a result of ICT.

The respondents stated that they had integrated new technologies in their process such as production, hence improving efficiency and reducing costs of production. The respondents also reported that ICT had also enhanced value addition in products, improved products packaging, and also facilitated modifications and improvement of processes such as marketing and procurement process.

4.4.2 Process Innovations and Operational Performance

The respondents were asked to indicate their extent of agreement on statements on process innovations in their organization. A five point likert scale where a mean score of 1 - 2.5 implies that the respondents disagreed with the statement, a mean score of 2.6 - 3.5 implies that the respondents were neutral (did not agree or disagree), while a mean score of 3.6-5.0 implies that there was agreement with the statement. The findings are presented in Table 4.5.

Table 4.5: Process Innovations and Operational Performance

Statements on Process Innovations	N	Mean	Std. Deviation
Has reduced cost of production	78	4.28	0.719
It has improved the overall efficiency and quality in production	78	4.01	0.712
Process innovations adopted has improved efficiency in resource allocation	78	3.99	0.814
Process innovations has led to technical improvement of products (value addition)	78	3.17	0.710

Source: Research Data (2018)

The study results in Table 4.5 show that the respondents agreed that the process innovations carried out in the organization as a result of ICT had reduced cost of production (mean score = 4.28). The respondents also agreed that process innovations had improved the overall efficiency and quality in production (mean score = 4.01), and also improved efficiency in resource allocation (mean score = 3.99). However, the respondents were neutral when asked whether process innovations had led to technical improvement and value addition of the products as shown by the mean score 3.17.

4.4.3 Extent Process Innovations Influence Operational Performance

The respondents were asked to indicate the extent to which process innovations influenced operational performance of their organizations. The results are presented in Figure 4.1.

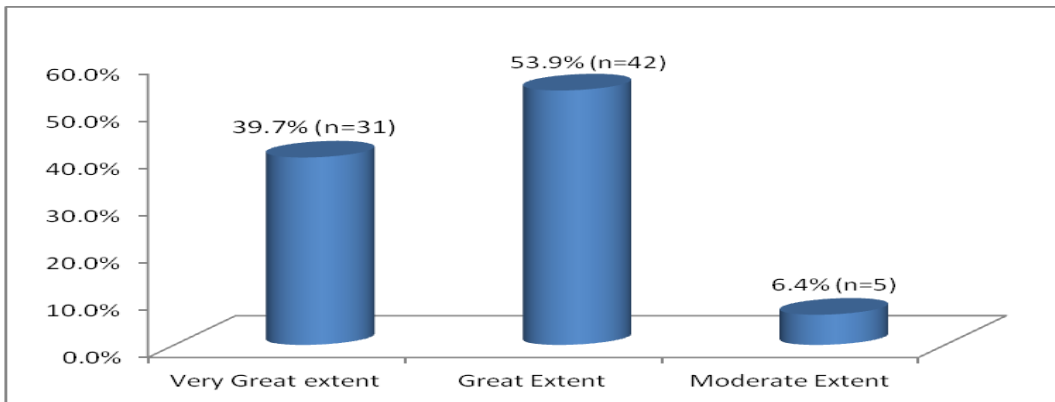


Figure 4.1: Extent Process Innovations Influence Operational Performance

Source: Research Data (2018)

The study results in Figure 4.1 show that 53.9% of the respondents indicated that process innovations influenced operational performance of their organizations to a great extent while 39.7% indicated to a very great extent. However, 6.4% of the respondents were of the opinion that process innovations influenced operational performance of their organizations to a moderate extent.

4.5 Information Processing, Communication Innovations and Operational Performance

In this section, the study sought to determine the influence of information processing and communication innovations on operational performance of Top100 rated KPMG firms in Kenya. To achieve this objective, the study enquired on the ICT-enabled information processing technologies and information-communication technologies that the organization had adopted. The study also enquired on the extent to which information processing and communication innovations influenced operational performance in the organisations.

4.5.1 ICT-Enabled Information Processing Technologies Adopted

The respondents were asked to indicate the ICT-enabled information processing technologies adopted by their organizations. The findings are presented in Table 4.6.

Table 4.6: ICT-Enabled Information Processing Technologies Adopted

Technologies	Frequency	Percent
ERP system	64	82.1
E-Procurement	70	89.7
SAAS Applications	11	14.1
Mobile technologies	72	92.3

Source: Research Data (2018)

The study findings show that 92.3% of the respondents indicated that their organisation had adopted mobile technologies while 89.7% indicated that they had adopted E-Procurement systems for the management of the procurement process. Majority (82.1%) of the respondents indicated that their organizations had adopted

Enterprise resource planning (ERP) systems, while 14.1% had adopted SAAS applications in the ir business processes.

Some respondents further stated that their organizations had adopted transaction processing systems, HR Systems and payroll systems to help them management their staff.

4.5.2 ICT Enabled Information-Communication Technologies

The respondents bwere asked to indicate whether their organization had adopted the following ICT enabled information-communication technologies. The findings are presented in Table 4.7.

Table 4.6: ICT Enabled Information-Communication Technologies

Technologies	Frequency	Percent
Electronic mail (e-mail)	78	100.0
Electronic bulletin boards	18	23.1
Conferencing technologies	37	47.4
Fax machines	69	88.5
Telephone/voice mail	78	100.0

Source: Research Data (2018)

The findings in Table 4.6 show that all the respondents (100%, n=78) revealed that their organizations were using ICT enabled information-communication technologies such as E-mails and telephones or voice mail respectively. On the other hand, 88.5% of the respondents indicate that their organizations used fax machines which facilitated telephonic transmission of scanned-in printed material while 47.4% had adopted conferencing technologies in their organizations. These technologies enhanced communication in their organisations.

4.5.3 Information Processing, Communication Innovations and Operational Performance

The respondents were asked to indicate the extent to which they agreed with the statements on information processing innovations and communication innovations in their organizations. A five point likert scale where a mean score of 1- 2.5 implies that the respondents disagreed with the statement, a mean score of 2.6-3.5 implies that the respondents were neutral, while a mean score of 3.6-5.0 implies that there was agreement with the statement. The findings are presented in Table 4.7.

Table 4.7: Information Processing, Communication Innovations and Operational Performance

Statements	N	Mean	Std. Deviation
Enhances easy access to relevant information across the departments	78	4.36	0.738
Information communication technologies enhance easy access to information and staff across the organization	78	4.32	0.570
The technologies adopted enhance communication between departments in the organization.	78	4.21	0.709
Provides integrated support for quick decision making	78	4.09	0.900
Enhances dissemination of data and information quickly in the organization.	78	4.01	0.764
Enhance quick flow of information to aid in operational control and decision making process	78	4.00	0.756
Improves the operating activities of the company e.g. reduced time of the product development, information processing.	78	3.97	0.720
Helps in information standardization	78	3.87	0.632

Source: Research Data (2018)

The study results in Table 4.7 show that the respondents agreed that information processing and communication technologies adopted enhanced easy access to relevant information across the departments (mean score = 4.36), and also enhanced communication between departments in the organization (mean score = 4.21). The study also found out that information communication technologies enhance easy access to information and staff across the organization (mean score = 4.32) and also enhanced dissemination of data and information quickly in the organization (mean score = 4.01). Moreover, the respondents agreed that the information processing and communication technologies provided integrated support for quick decision making (mean score = 4.09) and enhanced quick flow of information to aid in operational control and decision making process (mean score = 4.00).

4.5.4: Extent Information Processing and Communication Innovations Influence Operational Performance

The respondents were asked to indicate the extent to which information processing and communication innovations influenced operational performance of their organizations. The findings are presented in Figure 4.2.

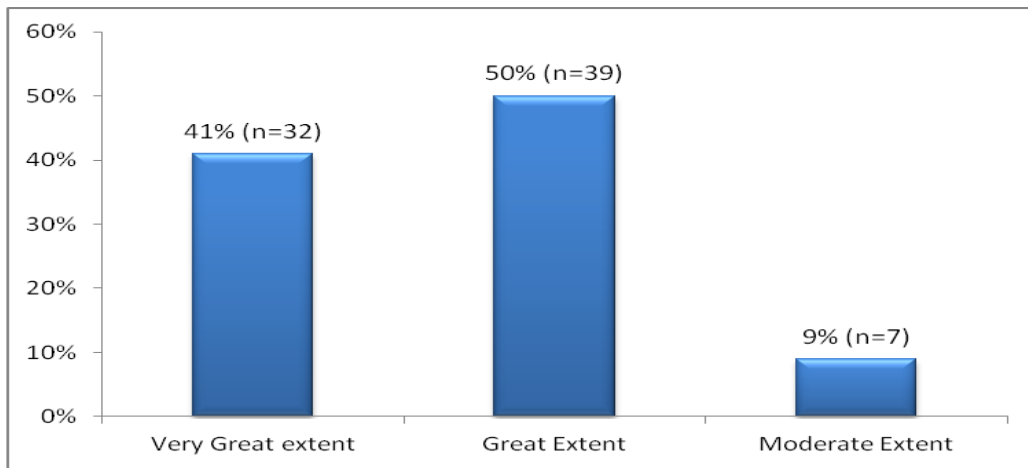


Figure 4.2: Extent Information Processing and Communication Innovations Influence Operational Performance

Source: Research Data (2018)

The results in Figure 4.2 shows that 50% of the respondents indicated that information processing and communication innovations influenced operational performance of their organizations to a great extent. This was supported by 41% of the respondents who indicated that such innovations influenced operational performance of their organizations to a very great extent. However, 9% of the respondents revealed that information processing and communication innovations influenced operational performance of their organizations to a moderate extent.

4.6 Innovations and Operational Performance

In this section, the respondents were asked to indicate the extent to which ICT based innovations influenced the various operational performance aspects of the Top 100 rated KPMG firms in Kenya. A five point likert scale was used where a mean score of 1 - 2.5 implies that the respondents disagreed with the statement, a mean score of 2.6 - 3.5 implies that the respondents were neutral (did not agree or disagree), while a mean score of 3.6-5.0 implies that the respondents agreed with the statement. The findings are presented in Table 4.8.

Table 4.8: Innovations and Operational Performance

Operational Performance Measures	N	Mean	Std. Deviation
Product innovation and development has enhanced quality of products and services offered by the organisation.	78	4.32	0.570
Innovations in the firms have reduced costs of operations.	78	4.18	0.679
Innovation in the firm has enhanced speed of operations in the organization.	78	4.10	0.766
Innovations in the firms has enhanced flexibility and dependability in delivery of products to its customers	78	3.99	0.781
Innovations in the firms has enhanced dependability - doing things/activities on time, such as delivery of products/services	78	3.81	0.625

Source: Research Data (2018)

The study findings in Table 4.8 show that the respondents agreed that product innovation and development had improved the quality of products and services offered by their organization (mean score = 4.32) and had also helped reduce the costs of operations (mean score = 4.18). The respondents also agreed that innovation in the firm had enhanced speed of operations in the organization and had also has enhanced flexibility in delivery of products to its customers, as shown by the mean scores 4.10 and 3.99 respectively.

4.7 Regression Analysis

A regression analysis was carried out to determine the form of relationship between the variables in the study. The study sought to establish the relationship between ICT based innovations (product innovations, process innovations, information processing and communication innovations) and operational performance of Top 100 rated KPMG firms in Kenya. The regression results are presented below.

Table 4.9: Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	0.812(a)	0.660	0.642	0.24619
a. Predictors: (Constant), product innovations, process innovations, information processing and communication innovations				

Source: Research Data (2018)

The R is correlation coefficient which measures the strength of a linear relationship between variables. The results in Table 4.9 show an R value of 0.812 implies that there is a strong relationship between the variables in the study. R-Squared is the coefficient of determination which explains how well the model predicts the observation; is a statistical measure of how close the data is to the fitted regression line. The results show an Adjusted R Square value of 0.642. This implies that the three forms of innovations (product innovations, process innovations, information processing and communication innovations) explained 64.2% of operational performance of Top 100 rated KPMG firms

in Kenya. The remaining percentage of 35.8% can be explained by other variables not included in the study.

Table 4.10: ANOVA (b)

ANOVA ^b						
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	6.795	3	2.265	37.378	0.000(a)
	Residual	4.514	74	0.061		
	Total	11.309	77			
a. Predictors: (Constant), product innovations, process innovations, information processing and communication innovations.						
b. Dependent Variable: Operational Performance						

Source: Research Data (2018)

The ANOVA shows the output of the ANOVA analysis and whether there is a statistically significant difference between the variables means. The results in Table 4.10 shows the significance value is $p=0.001$, which is below 0.05. Therefore, there is a statistically significant difference. The results show that the regression model has a 0.001 (0.1%) probability of giving a wrong prediction. This therefore means that the regression model results are reliable.

Table 4.11: Regression Coefficients(a)

Coefficients ^a						
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	0.564	0.408		1.382	0.171
	Product Innovations	0.404	0.056	0.568	7.203	0.000
	Process innovations	0.465	0.097	0.372	4.794	0.000
	Information processing and communication innovations	0.449	0.094	0.359	4.763	0.000
a. Dependent Variable: Operational Performance						

Source: Research Data (2018)

The results in Table 4.11 show that there is a positive and statistically significant relationship between product innovations and operational performance of Top 100 rated KPMG firms as shown by $\beta = 0.404$ and $p=0.001$. The results also show there is a positive and statistically significant relationship between process innovations and operational performance of Top 100 rated KPMG firms as shown by $\beta = 0.465$ and $p=0.001$. The findings further shows that there is a positive and statistically significant association between information processing and communication innovations and perational performance of Top 100 rated KPMG firms as shown by $\beta = 0.449$ and $p=0.001<0.05$, which is less than 0.05.

CHAPTER FIVE: SUMMARY OF FINDINGS, CONCLUSIONS AND RECOMMENDATIONS

5.1 Introduction

This chapter covers the summary of findings, conclusions and recommendations of the study based on the objective of the study. In this section, the study answers the research questions and makes inferences on the entire research. The chapter also outlines the recommendations made and suggestions for any further research.

5.2 Summary of Findings

This section presents the summary of key findings in the study as per the study objectives.

5.2.1 Product Innovation and Operational Performance

The study sought to establish the influence of product innovations on operational performance of Top100 rated KPMG firms in Kenya. The study found out that majority of the respondents indicated that ICT enhanced product innovations in their organizations to a great extent. It was established that the ICT based innovations had enhanced improvements in technical specifications of products and also led to introduction of new products and services in the Top 100 rated KPMG firms in Kenya. The innovations also enhanced new uses for existing products in the organization and also improved functional characteristics of the products. The regression results show that there is a positive and statistically significant relationship between product innovations and operational performance of Top 100 rated KPMG firms.

5.2.2 Process Innovations and Operational Performance

The second objective was to establish the influence of process innovations on operational performance of Top100 rated KPMG firms in Kenya. The study found out that the Top 100 rated KPMG firms had adopted or integrated new technologies in their process such as production, marketing, procurement process hence improving efficiency and reducing costs of production. Improved production also led to greater productivity and flexibility in the organizations. The study established that ICT based process innovations had

reduced cost of production and improved the overall efficiency and quality in production process. Majority of the respondents revealed that process innovations influenced operational performance of their organizations to a great extent. The regression results found out there is a positive and statistically significant relationship between process innovations and operational performance of Top 100 rated KPMG firms.

5.2.3 Information Processing, Communication Innovations and Operational Performance

The third objective was to determine the influence of information processing and communication innovations on operational performance of Top 100 rated KPMG firms in Kenya. The study found out that the Top 100 rated KPMG firms had adopted information processing and communication technologies such as mobile technologies, business processing technologies such as E-Procurement system, ERP systems, HR Systems and payroll systems as well as transaction processing systems. The respondents agreed that the information processing and communication technologies adopted enhanced easy access to relevant information across the departments, and improved communication between departments in the organization. The information communication technologies also enhance easy access to information and staff across the organization and also enhanced dissemination of data and information quickly in the organization.

In addition, the respondents agreed that the information processing and communication technologies enhanced quick flow of information to aid in operational control and decision making process. On overall, most of the respondents indicated that information processing and communication innovations influenced operational performance of their organizations to a great extent. The regression results found out that there is a positive and statistically significant association between information processing and communication innovations and operational performance of Top 100 rated KPMG firms.

5.3 Conclusions

The study concludes that product innovations significantly influences operational performance of Top 100 rated KPMG firms in Kenya. Adoption of ICT by these firms has enhanced product innovations in these organizations and this have enhanced improvement in technical specifications of products and to introduction of new products and services. The innovations also enhanced new uses for existing products in the organization and also improved functional characteristics of the products.

The study concludes that process innovations have a positive and statistically significant relationship with operational performance of Top 100 rated KPMG firms. ICT has enabled integration of new technologies in the organisation process such as production, marketing, procurement process hence improving efficiency and reducing costs of production. Improved production also led to greater productivity and flexibility in the organizations, which enhanced operational performance of the firms.

The study concludes that information processing and communication innovations significantly influence operational performance of Top 100 rated KPMG firms. Adoption of adopted information processing and communication technologies such as mobile technologies, business processing technologies enhanced easy access to relevant information across the departments, and improved communication between departments in the organization. It also enhanced dissemination of data and information quickly in the organization, hence improving operational performance.

5.4 Recommendations

The study recommends that there is need to increase access to useful ICT to the small and medium sized companies which are the basically forms the Top 100 rated KPMG firms in Kenya. The study have shown that ICT play a key role in enhancing innovations in these firms which helps in adding value, quality and enhanced efficiency which subsequently improves performance of the medium sized firms. This role could be played by business organizations, SME associations etc as they are aware of the information needs of small enterprises and can at the same time help to form and increase

networks that will increase access to information about best Information and communication technologies.

As the Top 100 rated KPMG firms adopt new technologies, there is need for increased training of the staff on the new technologies so as to enhance maximum use of these technologies. This would enhance improved expertise on technology creativity in order to enhance innovations in the firms. The firms should support ICT literacy among the staff as skilled staff are able to efficiently use the technologies in the organization to achieve performance.

Also of importance for these medium sized enterprises are improved government policies where regulations that support adoption of ICT in these firms. The government should create policies that support innovations in small and medium sized companies in Kenya and also help in development of technologies with local conditions and market demands. This would help reduce the business obstacles that hinder small and medium sized firms to adopt and implement Information and communication technologies.

5.5 Limitations of the Study

In carrying out the study, the researcher encountered a few challenges. One of the challenges was that, the target respondents for this study were managers. Majority of them were quite busy and had tight schedule due to work pressure and could not therefore have adequate time to answer the questionnaires at the time the researcher presented the questionnaire to them. To ensure that they adequately answered the questionnaire, the researcher used drop and pick later method as as to allow the respondents to answer the questionnaire at their own free time.

Another limitation of this study is that, it was only limited to Top 100 rated KPMG firms in Kenya. And therefore the findings may not generalised to other firms like the large companies due to the different nature of these companies, in terms of resources, assets etc. In addition, this study did not look at all forms of innovations, and therefore other studies needs to be conducted to fill these gaps.

5.6 Recommendations for Further Research

This study sought to examine the influence of innovation and operational performance of Top 100 rated KPMG firms in Kenya. The study recommends that a further research be conducted on other sectors of the economy for comparison of results. In this era of increased adoption of ICT and new innovations, organizations in each sector of the economy need to know how they can benefit from such innovations. The future studies should also research on other forms of innovations such as market innovations and how they influence operational performance of medium-sized organizations in Kenya. These future studies will continue to enlighten and give insight to companies on the new forms of innovations and how they enhance performance in the organizations.

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APPENDICES

Appendix I: Introduction Letter



UNIVERSITY OF NAIROBI
SCHOOL OF BUSINESS

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P.O. Box 30197
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DATE 29/10/2018

TO WHOM IT MAY CONCERN

The bearer of this letter EDWARD NJOROGE GATO

Registration No. 061/67304/2013

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.



PROF. JAMES M. NJIHIA
DEAN, SCHOOL OF BUSINESS

Appendix II: Questionnaire

Tick (☐) where appropriate.

Section A: Product Innovations

1. To what extent has ICT enhanced product innovations in your organization?

Very great extent [] Great extent [] Moderate extent []
 Small extent [] Not at all []

2. To what extent do you agree with the following statements on product innovations in your organization? Use a scale of 1 to 5 where 1 is strongly disagree, 2 is disagree, 3 is Neutral, 4 is agree and 5 is Strongly agree

Statements on Product Innovations	1	2	3	4	5
Innovations in the organisation have led to introduction of new products and services.					
Innovations have enhanced improvements in technical specifications of products in the organisation.					
Innovation has improved functional characteristics of the products.					
Innovations have enhanced new uses for existing products in the organization.					

Section B: Process Innovations

3. Has your organization adopted process innovations?

YES [] No []

b). If yes, which ones?.....

4. To what extent do you agree with the following statements on process innovations in your organization? Use a scale of 1 to 5 where 1 is strongly disagree, 2 is disagree, 3 is Neutral, 4 is agree and 5 is Strongly agree

Statements on Process innovations	1	2	3	4	5
Process innovations adopted has improved efficiency in resource allocation					
Has reduced cost of production					
Process innovations has led to technical improvement of products (value addition)					
It has improved the overall efficiency and quality in production					

5. On overall, to what extent do process innovations influence operational performance of your organization?

Not at all [] Small extent [] Moderate extent []
 Great extent [] Very great extent []

Section C: Information Processing and Communication Innovations

6. Which of the following ICT-enabled business process technologies has your organization adopted?

ERP system [] E-Procurement [] SAAS Applications []
 Mobile technologies []

b). Others (specify).....

7. Which of the following ICT enabled information-communication technologies has your organization adopted?

	Yes	No
i). Electronic mail (e-mail)	[]	[]
ii). Electronic bulletin boards	[]	[]
iii). Conferencing technologies	[]	[]
iv). Fax machines	[]	[]
v). Telephone/voice mail	[]	[]

b). Any other information-communication innovations (specify).....

8. To what extent do you agree with the following statements on Information Processing innovations in your organization? Use a scale of 1 to 5 where 1 is strongly disagree, 2 is disagree, 3 is Neutral, 4 is agree and 5 is Strongly agree

Statements on Information Processing Innovations	1	2	3	4	5
The technologies adopted enhance communication between departments in the organization.					
Enhances easy access to relevant information across the departments					
Helps in information standardization					
Improves the operating activities of the company e.g. reduced time of the product development, information processing.					
Provides integrated support for quick decision making					
Information communication technologies enhance easy access to information and staff across the organization.					
Enhances dissemination of data and information quickly in the organization.					
Enhance quick flow of information to aid in operational control and decision making process					

9. On overall, to what extent do information processing and communication innovations influence operational performance of your organization?

Not at all [] Small extent [] Moderate extent [] Great extent []
 Very great extent []

Section D: Innovations and Operational Performance

10. To what extent do you agree with the following statements on innovations influence the following performance aspects in your organization? Use a scale of 1 to 5 where 1 is strongly disagree, 2 is disagree, 3 is Neutral, 4 is agree and 5 is Strongly agree

Statements on Innovation and Operational Performance	1	2	3	4	5
Product innovation and development has enhanced quality of products and services offered by the organisation.					
Innovation in the firm has enhanced speed of operations in the organization.					
Innovations in the firms has enhanced flexibility in delivery of products to its customers					
Innovations in the firms have reduced costs of operations.					
Innovations in the firms has enhanced dependability - doing things/activities on time, such as delivery of products/services					

11. How else has innovations improved operational performance in your organization?

.....

.....

.....

THANK YOU FOR YOUR PARTICIPATION