

**OPERATIONS INNOVATION AND PERFORMANCE OF LEVEL SIX PUBLIC  
HOSPITALS IN KENYA**

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**DECLARATION**

The project is my original work and has not been submitted for another degree in any other university.

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## **DEDICATION**

I dedicate this Project to my father, Francis Ndoria for his moral support and constant encouragement throughout my education. I also dedicate it to my Husband Bernard Kimani and our son Adrian Kimani who have given me moral and spiritual support during the period of the study. God Bless them abundantly.

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## **ABBREVIATIONS AND ACRONYMS**

<b>CEO</b>	Chief Executive Officer
<b>FBOs</b>	Faith Based Organizations
<b>SEM</b>	Structural Equation Modeling
<b>SMEs</b>	Small and Medium Enterprises

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## ABSTRACT

Innovation is among the key strategies which companies in different operational sectors adopt so as to gain a competitive advantage amongst its competitors. For a firm to be said to have accomplished in being innovative, they must exhibit effective products/services, effective processes, application of modern technologies as well as new ideas that can be found very readily within the market settings or as well as the society in which the firm operates. Today's value is generated by operations, while tomorrow's opportunities are created by innovations. Big innovations are created from small ones due to the cumulative strength that comes with innovation. The term market innovation entails mixing and selection of various markets in order to establish customers preferred purchasing preference. The performance of a firm is usually considered based on the efficiency and effectiveness of the firm's operations, of which the firm's profitability is the most utilized financial measure that is employed when it comes to the overall determination of organizational performance. Level six hospitals in Kenya (mostly private) are operating in increasingly competitive, highly regulated and dynamic market and therefore they have to formulate strategies to ensure their survival. The study objective was to establish effects of operations innovation on performance of level six public hospitals in Kenya. The study was guided by Theory of Diffusion of Innovation as well as the Organizational control theory. A descriptive cross-sectional research design was adopted to undertake this survey. The target population that formed the unit of analysis for this study were level six public hospitals in Kenya. The four level six hospitals in Kenya constituted the study population. Primary data for the study data was collected using semi structured questionnaires. Quantitative data was collected and statistical analyzed. The results of the survey found out that level six hospitals utilized ICT as their technology innovation strategy. The study also established that ICT is a technology innovation strategy that contributed to hospital service delivery. Further, the study found out that innovation strategies contribute to hospital service delivery through improved innovation process. The study concludes that information and communication technology is the most used technology innovation technology among level six hospitals in Kenya and that introduction of new products is the most widely used product innovation strategy among the level six hospitals in Kenya. The study finally recommends that the continuous technological change. It was also recommended that the ministry of health in Kenya should create an enabling environment that enhances innovations among level six hospitals for full realization of the innovation strategies benefits.

## **CHAPTER ONE: INTRODUCTION**

### **1.1 Background of the Study**

Current dynamic environment in which business operates needs to be capable of constantly innovating in order to be successful. Innovation not only involves the introduction of new products or changing the use of an existing product, introduction of new processes but also changing the organization structure as well as the administrative structure (Hult, Hurley & Knight, 2014). Innovation is among the key strategies which companies in different operational sectors adopt so as to gain a competitive advantage amongst its competitors (Hamel, 2013). For firms to be innovative, they usually adopt modern technologies as well as effective management practices that are aimed to produce favorable results ultimately leading to efficient performance (Johnson, Scholes and Whittington, 2011).

While conducting this study, two key theories namely theory of diffusion of innovation and the Resource Based View theory will be utilized in explaining the various innovative strategies that firms utilizes as well as the overall relationship in regard to company's performance (Hatch, 2018). In this regard, innovation is defined as the utilization of adequate solutions that are expected to meet new or the already existing needs of the market. For a firm to be said to have accomplished in being innovative, they must exhibit effective products/services, effective processes, application of modern technologies as well as new ideas that can be found very readily within the market settings or as well as the society in which the firm operates.

In Kenya, the health sector is categorized into three broad categories, namely public healthcare sector, private healthcare sector and Faith Based Organizations (FBOs). Basing on the number of healthcare facilities available, the public healthcare sector is the largest sector in Kenya with private healthcare sector at number two and FBOs at number three. However, in rural areas, there is a notable large healthcare disparity in the country.

In Kenya, the Constitution promulgated in 2010 delineates two levels of governance namely the National and County Government (Okech & Lelegwe, 2016). Based on the new Constitution the healthcare sector was devolved to the County Government, and the National Government retained the referral hospitals and the parastatals within the Ministry of Health. The referral hospitals which are categorized as level V and VI receive funding from the national hospital.

### **1.1.1 Operations Innovation**

According to Bartes, (2013), innovation is the process involving the entire application of new processes, concepts, as well as products and services. Today's value is generated by operations, while tomorrow's opportunities are created by innovations. The distinction between innovations and operations is uncertainty. Intertwining of creativity and routine throughout the process makes innovation a unique process. Creativity is often seen as a basis of innovation. Creative ideas and the ability to convert that idea into action to bring about change leads to innovation (Jin, et al, 2014). Innovation is about people coming up with new notions as well as providing clients with additional values which in turn provides an amicable factor for many firms internationally. Big innovations are created from small ones due to the cumulative strength that comes with innovation.

In the global perspective nowadays, the notion of markets dynamism has allowed the concept of innovation to be a key economic contribution of various organizations. As Frankelius, (2014) posit, the capacity of a firm to provide valuable resources and inventive environment which is capable of providing new and additional ideas to their clients is a key contribution to ensure organizational innovative strategies. The need to develop innovative services and product delivery is very important. To meet these demands, the integration of operations strategy and innovation plans is fundamental (Damanpour & Gopkrishnan, 2011). Polevoi (2013) added that it is very paramount for a firm to practice new innovative strategies which are very essential in ensuring to ensure that they have extreme competitive advantage over their competitors in terms of the market they serve, production processes they utilize, technology used among other aspects.

Market innovation includes market selection and mix so as to meet a client's buying preferences. Business process engineering and quality function deployment is embraced in process innovation (Minai and Lucky, 2011). Process innovation refers to the implementation of the new strategies of firms production techniques which are essentially new or which are more upgraded than the already existing ones (OECD, 2005). Technology drives the innovation ability of new products which generates competitive advantage (Gunasekaran et al., 2012). Organizational innovation is a new method of organizational workplace, business organization or external relations. Its main objective is reduction of administrative and transaction costs by improving workplace satisfaction.

### **1.1.2 Organizational Performance**

Organization performance is defined as a multidimensional paradigm which is utilized in the form of both financial and non-financial strategies such as sales value, assets net worth, income, number of staffs, business share in the market, as well as the overall customer's satisfaction. Additionally, when evaluating the overall performance of an organization, other factors such as staff satisfaction as well as the non-monetary business goals are also very significant to consider. Therefore, as Zahra, (2013) asserts, it is impossible for the organization performance to be determined in an adequate manner without taking account of both financial and nonfinancial measures.

Generally, the performance of a firm is usually considered based on the efficiency and effectiveness of the firm's operations. As such, organizational profitability is the most utilized financial measure that is employed when it comes to the overall determination of organizational performance. Therefore, the mostly adopted and accepted measure of the firms performance is the profitability level of the firm since it is very easier to assess the efficiency and effectiveness of the operations of the organization (Bora & Bulut, 2015). Traditionally, various financial measures have overtime been utilized in measuring the performance of firms including profitability, earnings per share (EPS), return on investment (ROI), current ratio, market share, revenue growth among others (Bora and Bulut, 2008).

### **1.1.3 Operations Innovation and Organizational Performance**

Most previous studies undertaken on the organizational innovation-performance have established that a significant association exist between the level of the firm's performance and its overall innovative level (Damanpour & Evan, 2014; Wu et al., 2013). A study by Miller (2011) found that majority of organizations employ technical improvement which are intended to ensure that such firms enjoy a significant competitive advantage against their competitors in the market in which they operate. A comprehensive survey conducted by Wolff & Pett (2014) and Walker (2014) which focused on influence of innovation on process and products of the performance of a firm found out that some specific dynamics in products are related to growth of the organization.

A study carried out by Aswani (2010) established that the strategic innovation and performance of various government sponsored institutions of higher learning were positively correlated. Additionally, Kemoli (2010) conducted survey on critical performance and innovations of all listed banks in Kenya. Survey results established that majority of financial institutions have left their traditional approaches and have now embarked on introducing various innovative strategies in their corporate strategies to attract new customers base and thus expand their business operations.

Wachira (2013) while conducting a survey titled influence of technology innovations and their subsequent impacts on how major listed banks in Kenya performs financially. The review concluded technology is a driving force on banks' performance and highlighted its intensity in driving the banks' profitability. The studies concluded that strategic innovation has substantial effect on the performance of various organizations.

#### **1.1.4 Hospitals in Kenya**

Under the healthcare sector in Kenya, hospitals are ranked in six levels – community health centers that provide primary healthcare are level one, level two provide preventive and promotive healthcare with a degree of curative services for common ailments on outpatient basis. Level three offers mainly nursing and maternity services. Level four hospitals offer secondary care with outpatient, inpatient and theatres services.

Level five hospitals are regional referral hospitals with a bed capacity greater than 30, with capacity to deal with live threatening and chronic illnesses. Finally, level six are national referral hospitals that are capable of dealing with complex illnesses (Ministry of Health Kenya 2015). According to Muga, Kizito, Mbaya and Gakuru (2015), these hospitals are either private or public healthcare provider in Kenya. Further the private hospitals are classified as faith-based hospitals, for profit and not for profit hospitals catering for all socio-economic groups.

In Kenya there are no minimum standard requirements other than the statutory regulations for the delivery of quality healthcare in both private and public hospitals, which mainly is the role of the central government (Wamuyu 2015). Level six hospitals are required to offer teaching and training which one of their key functions is. As such, the hospitals on the study provides basic and post-graduate training for health professionals (Kenya Health Policy 2014-2030).



### **1.1.5 Level Six Public Hospitals in Kenya**

In Kenya, all hospitals categorized as level six hospitals are deemed as the centers of excellence and as such, they are tasked with providing Kenyans with complex and sustainable healthcare services especially where modern healthcare technology and highly skilled medical personnel are required. Additionally, level six hospitals in Kenya are also tasked with offering support training to healthcare personnel's both in pre-service and in-service. However, level six hospitals in Kenya are characterized by high concentration of resources and as such they are somehow costly to run those (Nyonges et al., 2015). All level six hospitals thus perform the following functions.

Health care level six hospital are responsible for providing complex curative healthcare in Kenya. These hospitals are also tasked with preventive care as well as participation in general public health programmes and the total primary health care system. As such, all level hospitals in Kenya are managed as country's referral hospitals. In Kenya, these referral hospitals are tasked with the provision of vital health information relating to various health problems and diseases. Further, extra-mural treatment alternatives to hospitalization are offered at these level six hospitals including a single day surgery home hospitalization, patient's home care, and other outreach services (Government of Kenya, 2011).

Quality of care. It is the requirement of the Ministry of health in Kenya that all level six hospitals provide leadership in health sector by setting high health standards as well as other treatment protocols. As such, the most extensive and best healthcare services are expected to be offered these level six hospitals. Access to care is another function that level six hospitals are expected to play because it is at these hospitals that tertiary care is well developed as such it is where patients can access these services. Conducting research on various health matters is also another notable function of level six hospitals. This is facilitated by the fact that these referral hospitals have high resources concentration and healthcare personnel's hence they are able to resolve local and national healthcare solutions through elaborative research at their laboratories.

## **1.2 Research Problem**

Operations innovation is viewed an important factor for high return and growth of organizations. Walker, (2014) argues that operations innovation has effects on corporate performance through production of better market performance which result in superior performance and competitive advantage. Private owned firms need for innovational strategies is high since these firms operates in an environment which is very competitive hence being more innovative is very essential for their ultimate survival in the market (Tidd, Bessant and Pavitt, 2011). Markides, (2008) further states that, firms which have seriously embraced the concept of operations innovations are in a position to disrupt their rivals functioning through establishing great values for themselves, customers, and every other party who may be of interest to the organization.

Level six hospitals in Kenya (mostly private) are operating in increasingly competitive, highly regulated and dynamic market and therefore they have to formulate strategies to ensure their survival. Interestingly, while private hospital is making the highest profits, public hospitals have been making huge losses and paralyzed operations.

In this regard, various studies have been done trying to understand this dynamic. Gebauer, et al., (2012) conducted a study on learning processes, absorptive capacity and combinative capabilities as elements of operations innovation in Switzerland. The study found out that the emergence of modern technology has been a significant facilitator of operations innovation in recent years which have ensured that the overall transaction costs have reduced. McAdam and Keogh (2014) did a study on transitioning towards creativity and innovation measurement in SMEs in Australia using a multiple SME-based case research methodology.

The study established that the reason why many organizations are moving towards operations innovation is for them to attain a more competitive edge in their operating markets which are increasingly competitive. Geroski, (2015) undertook a review which aimed to found out the impacts of the firms, product, process as well as the marketing innovations on various business aspects on a total of one hundred and eighty-four manufacturing companies Turkey. The study established that an optimistic impact of organizational performance in Turkey's manufacturing sector.

Locally, Kiiyuru (2014) studied effects of innovation strategies on performance of Kenya commercial banks using a questionnaire to collect data and through descriptive statistics. The study revealed that the commercial banks in Kenya had employed value creation through low prices, making all the necessary resources available, ensuring that their customers are satisfied by their services, enrolling new products and services as well as ensuring that they retain their customers and have in place sufficient strategies to innovate in the market. Gitonga, (2013) studied the innovation processes and the perceived role of the CEO in the banking industry. Questionnaires were utilized to gather the survey data and was statistically analyzed. The study found out that operation innovations were an important part of firm success.

Karanja, (2009) studied the innovation strategies taken by insurance companies in Kenya. Primary data was utilized entirely during this study which was gathered using semi-structured questionnaires and analyzed statistically. From the findings of the study, it was concluded that firms that embraces modern innovative strategies tend to be in a better position to gain competitive edge as well as having a upper hand when it comes to the value of their shareholders. While these studies have focused on operations innovation, none of them has studied the effect of operations innovation on performance of the level six public hospitals in Kenya. Therefore, the current study aimed to investigate the effect of operations innovation on performance of level six public hospitals in Kenya?

### **1.3 Research Objectives**

To determine the effect of operations innovation on performance of level six public hospitals in Kenya.

### **1.4 Value of the Study**

Findings of the survey were of significant in the field of strategic management especially in operations innovation. The academicians as well as the scholars in the operations field are will get a wide understanding of operations innovation thus adding to the already prevailing pool of knowledge, thus, filling the knowledge gaps. Additionally, the study was able to fill the gap existing in operations innovation and organization performance.

The research was of significance to various parties who include the management, the patients, researchers and academicians. To the management, the study findings demonstrated the contribution of operations innovation to performance of their hospitals. Therefore, by management adopting the study findings, were able come up with operations innovation operations which ensured increased financial returns.

To the patients and the public, as a result of this study informed them of improved services and processes which educate and create hope and confidence on hospitals. To policy makers, the study revealed key information explaining the difference in performance level six hospitals in Kenya. This ensured that regulators and policy makers like Ministry of Health to develop policies to boost performance of level six public hospitals.

## CHAPTER TWO: LITERATURE REVIEW

### 2.1 Introduction

Innovation has been analyzed in various disciplines and is defined from various dimensions (Damanpour & Schneider, 2006). In broad terms, innovation can be considered as the establishment of innovative ideas (Ibid). At the Company level, innovation processes are more associated with the firm's learning and it thus refers to firm's ability to adopt, accept as well as establish new products/services, ideas and processes (Calantonea et al., 2002).

However, innovation in services industry somehow differs from those of firms in the manufacturing sector. This is because, in service sector, innovations are basically minor changes which are normally applied to products and processes (Fuglsang, 2008). Nevertheless, research has established that service sector innovations are a bit integrated and complex compared to other sectors. Modern approaches as a way of dealing with innovations processes were established by Davenport (1993) as some of the key innovation types.

These new tactics assists companies realize cost minimization through process cost, quality increasing as well as increasing in process cost, increase quality, the levels of service and other organizational goals (Ibid). Based on this, process innovation in the service sector is the overall application of new technologies or significant improvement of production techniques (OECD, 2005). The methods might concern new equipment, production companies or a combination of these changes and may be gotten from the use of new knowledge.

This process innovation normally causes the functioning of the products not to be changed thus reducing the overall costs related to their production by a significant percentage (Adner & Levinthal, 2001). This part provides a review of the already existing literature on operations innovation and performance. This involves review of theoretical aspects related to the study, empirical studies that relate to operations innovation and the research gaps.

## **2.2 Theoretical Foundation**

The Theory of Diffusion of Innovation as well as the Organizational control theory formed the backbone upon which this study was based.

### **2.2.1 Theory of Diffusion of Innovation**

It is of great significance for organizations to understand how new technologies are adopted. Rogers (1997) postulates that diffusion entails the process by which communication with regards to innovation are made among the members of a certain organization, through certain channels of transferring information. Individual's adopter category are the key determinants in which an individual/ organization adopts innovation which includes the both early adopters and majority, laggards and innovators.

In general, the period for adoption becomes shorter for individuals who adopt an innovation first as compared to those who adopt the technology later. Rogers, (1995) seeks to explain the criteria of adoption of new ideas and innovations and proposes five attributes. These are; compatibility, complexity, relative advantage, observe ability and trial ability. The theory suggests that clear cut and unambiguous innovations have advantage over the previous approaches and are easily implemented and adopted.

Compatibility was the extent to which an innovation fit existing values, needs of potential adopters and past experiences. Greenhalgh et al, (2004) provides that the compatibility level of an innovation strategy being adopted allows for it to be extreme adoptable compared to ones which are not easily compatible. Therefore, complexity can be simple termed as the perceived difficulty for the overall adoption of a given innovation.

### **2.2.2 Resource Based View**

This is usually based on the firm 's internal competence that is organization resources and capabilities. According to Barney (2011), the competitive advantage of a firm is created from such capabilities that are unique and cannot be substituted and are the main drivers of the organization performance. They make the key competencies of the organization (Prahalad and Hamel, 2010).

Therefore, Resource-based theory, provides that a firm aim to maintain competitive advantage through introduction of new products and to achieve this, a firm will have to close the competitive gap through the adoption of the available resources as well as utilizing them in the most cost-efficient way (Krim, 2013). It therefore emphasizes that the available resources of a firm are the key to the profitability of that firm as well as its effective strategic advantage (Barney, 2011). This theory therefore foes against the assumptions of the traditional economics in that it doesn't consider organizational resources as being perfectly mobile and homogeneous. The theory on its part considers organizational resources as being heterogeneously spread between various organizations and that they can be easily transferred across various organizations.

Based on this, Barney (2011) therefore provides that, organizational resources can be broadly sub-divided into three key categories. Barney provides that these categories tangible resources, organizational resources as well as the human resources. Therefore, the key function of various organizational resources can be said to enabling firms in conceiving as well as implementing various strategic strategies which are aimed to improve its operational efficiency and effectiveness.

Therefore, in the event where a firm utilizes its available resources in the most effective and efficient ways, such a firm will be in a position to compete favorably against their rivals through utilizing and exploiting these resources to create opportunities in the market thus being in a position to threaten their rivals' strategic resources. However, organizational resources can sometimes be considered as imperfectly imitable especially in the event where they have unique history, or even having social complexity Barney (2011). Additionally, organizational resources might be considered as being non-substitutable especially in the event where another firm is not in a position to implement equal strategies even when using alternate resources.

### **2.3 Concept of Operations Innovation**

There have been reports of use of the term innovation in the late 1880s to mean something unusual. It wasn't until German economist Joseph Alois Schumpeter's work that the concept came to be influential in business. Schumpeter (1912) made reference to innovation as the process of making new combination.



Žižlavský, (2011) described innovation as process, organizational and product changes that do not have scientific origin but arise from a combination of existing technologies and their application in a new context. The notion that innovation relates to making new combinations whether of the same things or in addition to new elements is relevant to this study. Gamal et al., (2011) defines innovation as introducing new products, services, or processes through a specific business model into the marketplace, either by commercialization and utilization.

From this definition, innovation entails product/service, process as well as various organizational models innovations which contribute to strengthening of the company's competitive advantage. This definition highlights multidimensional and complex activity that is necessary for firms to compete favorably in the market.

#### **2.4 Operations Innovation and Organization Performance Measurements**

Different ways are used by different businesses to measure performance. Most prefer financial indicators to gauge their performance (Kiraka, 2013). Return on assets (Hafeez, 2013), the average half or annual customer rate, gross profit and the return on investment (Mwobobia, 2012) are also used. Some other frequent performance measures include productivity, market share, profitability, growth, competitive position and stakeholder satisfaction (Kantor, 2001). According to Chesbrough, (2010), business performance is categorized into the following categories rational goals, dimensions, micro processes, human relations as well as open system, in which case each category is measured based on each and every changes observable in its variables.

The outside environment generally rates a business's capability according to its performance (Kantor, 2001). This explains why a firm's performance is more of a mirror for the enterprises. The goal accomplishment level is used more often than not to define how a business is performing (Kemp, 2003). Firm performance is said to be the outcome that is achieved when a firm meets its goals (Wladawsky-Berger, 2008). Conventionally, the variation in firm's performance is linked to business structure (Ruttan, 1984).

The neo-classical economic theory however sees a business's growth as the process of achieving the minimum point of the average cost. P.A, (1995) came up with a theory that was resource-based where a business's performance is reliant on the firm resources and abilities the business has to source sustainable market competitive advantages. Ruttan (2014) argues that for firms to grow, they must be able to mobilize access and position resources. How a business adopts and uses different strategies also determines the performance. To each business, its own operations; therefore, performance is concerted in its operations (Wladawsky-Berger, 2014).

## **2.5 Empirical Studies and Knowledge Gaps**

Hafeez et al (2013) conducted a study on how Pakistan's company's SME Performance was influenced by Innovation and Relational Learning Influence. The researcher used 352 SMEs from Pakistan where he also employed the Structural Equation Modeling (SEM) in analyzing of the data. Firm performance was found to be significantly affected by technological innovation and relational learning; and also an insignificant relation was found on firm performance by non-technological innovation. The study also gave conclusions on the topic, implications and recommendations to be used in other future studies. Kiraka (2013) also undertook another study on how Firm Performance was affected by innovativeness where he intended to find out how knowledge as a factor played a role in determining the innovation and performance's relationship on SMEs in general.

The results showed that product and process innovativeness had a considerable positive relationship with performance of SMEs. Ongwae, Mukulu & Odhiambo (2013) conducted a study on the Kenyan SMEs and how enterprise growth related with innovation of electrical machinery enterprises. A descriptive survey design was used in the study. The relationship between the two variables was determined through Qualitative and quantitative approaches of the Nairobi City County SMEs. Enterprise growth was found to be affected by innovations, and they both had a positive link. The support of innovations from the government for SMEs was recommended to help them sustain their businesses and also the SMEs needed to improve the machineries they used so as to ensure that they kept up with growth and competitiveness.

Odhiambo (2008) conducted a study on innovation strategies at the standard chartered bank (Kenya) limited. A case study was conducted. The researcher conducted an in-depth personal interview with the top and middle managers at the bank. The study established that Standard Chartered Firm (Kenya) Limited bank has been able to successfully introduce various innovative strategies ranging from product, technological to customer care thus contributing enormously to its profitability over the years.

Kiiyuru (2014) also investigated Kenyan commercial banks and how their performance was affected by innovation strategies. Due to the fact that it's efficient, cheap and easy to use, a questionnaire was used in collection of the data required for the study. Analyzation of the data was done through means, standard deviation and frequency distribution of the descriptive statistics.

The qualitative data was analyzed using content analysis and finding presented in prose form. The study revealed that the commercial banks in Kenya had employed creating of pricing to create value, resources and capabilities availability, satisfaction of customers and new markets; retention and entry through implementing effective innovation strategies. The banks had also implemented various strategies in their activities to improve efficiency and provision of easy and fast services for their customers. Roselyn and Ngumi (2013) also investigated how commercial banks in Kenya's income was influenced by bank innovations; they both concluded that commercial banks' income was affected by bank innovations moderately.

A study by Miller (2011) found that majority of organizations employ technical improvement which are intended to ensure that such firms enjoy a significant competitive advantage against their competitors in the market in which they operate. A comprehensive survey conducted by Wolff & Pett (2014) and Walker (2014) which focused on influence of innovation on process and products of the performance of a firm found out that some specific dynamics in products are related to growth of the organization. A study carried out by Aswani (2010) established that the strategic innovation and performance of various government sponsored institutions of higher learning were positively correlated. Additionally, Kemoli (2010) conducted a survey on critical performance and innovations of all listed banks in Kenya. Survey results established that majority of financial institutions have left their traditional approaches and have now embarked on introducing various innovative strategies in their corporate strategies to attract new customers base and thus expand their business operations.

Commercial banks in Kenya were investigated and how their profitability was affected by bank innovations such as ICT, Gakure and Ngumi (2013) concluded that bank profitability was significantly affected by bank innovations. This thus explains that the level of profitability of banks in Kenya was affected by how effective the banks had been able to improve their innovation and how well they had implemented innovative strategies. These strategies include mobile banking, internet banking and agency banking where they have recorded high capabilities of boosting their earnings and control of their costs through the adoption of these innovation strategies.

## **CHAPTER THREE: RESEARCH METHODOLOGY**

### **3.1 Introduction**

Chapter three is a discussion of the study's methods and describes the research design. The chapter contains the study research design, the targeted population and how they were sampled. Also data that was used, the instrument, how the exercise was conducted and how data was analyzed is also presented in this section.

### **3.2 Research Design**

A research design is considered to be a plan/structure of undertaking study investigation aimed at seeking answers to survey questions. As such, a research design provides an outline of various research work such as research hypothesis, data collection techniques, data analyses procedures as well as presentation of the study results (Mugenda & Mugenda, 1999).

A descriptive cross-sectional research design was adopted in this research with census approach being used because all the level six public hospitals in Kenya were studied and data was obtained at a specific time and to describe the study problem.

According to Mugenda & Mugenda, (2003), the purpose of descriptive research design is to establish as well as reporting the way things being studied are. Additionally, Creswell (2003) provides that the utilization of descriptive research design is considered appropriate in the event where the study data being investigated is describing an individual, a company or even a specific setting.

Further, descriptive study design is very appropriate because it protects the research against biasness and there is also maximum reliability of the study results (Kothari, 2008). Additionally, descriptive research design was appropriate for this study because it utilized pre-planned design for analysis. Therefore, in this current study measures of central tendency, inferential statistics as well as measures of distribution were used to present the study data.

### **3.3 Population of the Study**

According to Mugenda & Mugenda, (2003), study population is defined as the whole group of things or even people that are of interest and as such the researcher aims to investigate. Additionally, population is defined as the entire group of persons or even things/objects that have common characteristics that can be observed together.

Therefore, study population is a well-defined large set of objects of similar nature such as individuals, elements, services, events, or group of things that are of interest as a whole and are being investigated. Specifically, a target population is the precise population that the researcher is interested to investigate and to establish the required conclusion.

The target population that formed the unit of analysis for this study were level six public hospitals in Kenya. Study participants were the directors- marketing, strategy and operations for the hospitals. These are instrumental people in operations management processes in the organizations. The study used census method to get the population of the study.

### 3.4 Data Collection

A semi structured questionnaire was used in collection of primary data as shown in appendix 1. According to Mugenda and Mugenda (2003), the questionnaire method is the most appropriate tool where comprehensive information is required. The questionnaire contained, open ended and closed ended questions.

A Likert scale was used and had five options for the respondents to pick. Likert scale is preferred as it shows respondents feelings on various statements with relation to operations innovation and performance of level six public hospitals in Kenya. The study targeted three respondents from each hospital. Directors- marketing, strategy and operations managers was the target respondents, as they are involved in innovation and management. The questionnaires were sent to the respondents through email, or through drop and pick later method, as per the respondent's advice and convenience.

### 3.5 Data Analysis

Quantitative type of data was collected, and statistical analysis were used in the data analysis. The analysis started by checking the gathered raw data for completeness, accuracy, and usefulness. The data was then be tabulated and classified.

The data was analyzed using descriptive statistics including percentages, frequency tables, mean and standard deviation in order to achieve the set objective. Standard editing and coding procedures were used. Correlation and linear regression were also be used. A multivariate regression equation was used as follows;

$$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \mu$$

Where:

Y = Firm performance measured

X<sub>1</sub> = Technology innovation

X<sub>2</sub> = Product innovation

X<sub>3</sub> = Process innovation

X<sub>4</sub> = Organizational innovations



## **CHAPTER FOUR: DATA ANALYSIS, INTERPRETATION AND PRESENTATION**

### **4.1 Introduction**

This chapter covers data analysis, presentation, interpretation and summary of the study findings. The main purpose of this study is to determine the effects of operations innovation on performance of level six public hospitals in Kenya. Standard deviation, percentage and frequency tables have been used by the researcher to present the data.

The results are given in sections starting with the key operations innovations; organizational innovation in the hospitals for the last three years; organization innovation strategies and lastly the performance in level six public hospitals in Kenya. The study analyzed data on key operations innovations including technology innovation strategies; process innovation strategies and product innovation strategies.

The study also analyzed data on organizational innovation in the hospitals for the last three years; performance in level six public hospitals in Kenya and the inferential statistics to explain how the two variables related and had an effect on each other (Technology innovation, Product innovation, Process innovation and Organizational innovations).

### **4.2 Questionnaire Response Rate**

The study sample size was 12 respondents from the four-selected level six hospitals. Out of the 12 respondents, 10 respondents participated in the study. This represents 83% of the respondents.

An excellent response rate is 70%, 60% rate is good and 50% is adequate according to Mugenda and Mugenda (2013), for analysis and reporting. Face to face administering of the questionnaires to the respondents by the researcher as well as a detailed discussion on the purpose of the research with the respondents contributed to higher response rate. The respondents being part of the management felt the need to discuss the role of innovation in the operations of hospital to enhance performance.

### **4.3 Key Operations Innovations**

This section discusses the findings on the key operation innovation adopted by level six hospitals in Kenya and their performance. How a business adopts and uses different strategies also determines the performance. To each business, its own operations; therefore, performance is concerted in its operations.

#### **4.3.1 Technology Innovation Strategies Used by the Hospitals**

The study sought to establish the technology innovation used by the hospital. As per the study results, 50% of the respondents indicated that their hospitals used information and communication technology as their technology innovation strategy, 20% indicated that their hospitals used management development systems, and new technology as their strategy innovation strategies, 10% of the respondents indicated that their hospitals used integrated systems approaches as their strategy innovation technology. However, there was no single respondent who indicated synthetic data and unstructured text application, social networking, online collaboration and Web conferencing and Virtualization or grid computing as being used in their hospitals as a strategy innovation technology as depicted by table 4.1.

**Table 4.1: Technology Innovation Strategies Used by the Hospitals**

<b>Technology Innovation Strategy</b>	<b>Frequenc y</b>	<b>Percentag e</b>
Integrated systems (IS) approaches	1	10
Management Development Systems	2	20
Information and Communication Technology	5	50
Social networking, online collaboration and Web conferencing	-	-
Virtualization or grid computing	-	-
Synthetic data and unstructured text applications	-	-
New Technology development	2	20
<b>Total</b>	<b>10</b>	<b>100</b>

**Source: Research 2018**

The findings from the study imply that hospitals used management development systems, modern technology and integrated system approaches as their technology innovation strategy.

#### **4.3.2 Process Innovation Strategies Used by the Hospitals**

The researcher aimed to establish the process innovation strategies used by the hospitals. According to the study results, most 50% of the study respondents indicated that their hospitals used conformance to regulation and guideline as a strategy, 30% indicated that their hospitals used reduction of costs as their process innovation strategy, 20% of the respondents indicated they used improved innovation process as their process innovation strategy. However, none of the respondents indicated that their hospitals used new service introduction as their process innovation strategies respectively as shown by table 4.2.

**Table 4.2: Process Innovation Strategies Used by the Hospitals**

<b>Process Innovation Strategy</b>	<b>Frequency</b>	<b>Percentage</b>
Reduction of costs	3	30
Improved innovation process	2	20
Conformance to regulations	5	50
New service introduction	-	-
<b>Total</b>	<b>10</b>	<b>100</b>

**Source: Research 2018**

The findings from the study imply that the level six hospitals mostly conformed to the regulations and reduction of costs as the process innovation strategy. The bureaucratic nature on innovation and implementation hinders process innovation in level six hospitals the respondent's unison agreed.

#### **4.3.3 Product Innovation Strategies Employed by the Hospitals**

The study aimed to find out the product innovation strategies employed by the hospitals. According to the study results, 30% of the respondents indicated that their hospitals employed product improvement as their product innovation strategy, 30% indicated that their hospitals employed product range extension as their product innovation strategies, 20% indicated that their hospital employed as their product replacement strategy, 10% while indicated that their hospitals employed product costs revision/improvement and new product introduction as their product innovation strategy. However, no respondent indicated product repositioning as being employed in their hospitals as a product innovation strategy as shown by table 4.3.

**Table 4.3: Product (Services) Innovation Strategies Employed by the Hospitals**

<b>Product Innovation Strategy</b>	<b>Frequency</b>	<b>Percentage</b>
Product improvement	3	30
Product range extension	3	30
Product costs revision/improvement	1	10
Product replacement	2	20
New product introduction	1	10
Product repositioning	-	-
<b>Total</b>	<b>10</b>	<b>100</b>

**Source: Research 2018**

The findings from the study implies that the level six hospitals employed product improvement and product range extension as their product innovation strategy; product cost revision/ improvement and product replacement as their product innovation strategies. New product introduction was done at a slow pace to due various consultation to various stakeholders and approval by the ministry of Health.

#### **4.4 Organizational Innovation in the Hospitals for the Last Three Years**

The study aimed to establish the extent to which the following organizational innovation items were implemented in the hospitals for the past three years. According to the study results, most of the respondents strongly agreed that renewing the human resource management system was the innovation item that their hospital had implemented for the last three years as indicated by a mean score of 3.573.

Respondents also strongly agreed that renewing the supply chain management system was the innovation item that their hospital had implemented for the last three years as shown by a mean score of 3.426. Respondents further strongly agreed that renewing the routines, procedures and processes employed to execute firm activities in innovative manner was the innovation item that their hospital had implemented for the last three years as shown by a mean score of 3.409. Further, the respondents agreed that renewing the in-firm management information system and information sharing practice was the innovation item that their hospital had implemented for the last three years as shown by a mean score of 3.377.

Respondents also agreed that renewing the production and quality management systems was the innovation item that their hospital had implemented for the last three years as shown by a mean score of 3.000. Lastly, the respondents moderately agreed that renewing the organization structure to facilitate teamwork was the innovation item that their hospital had implemented for the last three years as shown by a mean score of 2.688.

**Table 4.4: Organizational Innovation in the Hospitals for the Last Three Years**

<b>Statements</b>	<b>Mean</b>	<b>STDev</b>
Renewing the routines, procedures and processes employed to execute firm activities in innovative manner.	3.409	0.972
Renewing the supply chain management system.	3.426	0.902
Renewing the production and quality management systems.	3.000	0.894
Renewing the human resources management system.	3.573	0.717
Renewing the in-firm management information system and information sharing practice.	3.377	1.011
Renewing the organization structure to facilitate teamwork.	2.688	1.026

**Source: Research 2018**

The findings from the study implies that renewing the organization human resource management, supply chain management system and renewing the routines, procedures and processes employed to execute firm activities in innovative manner were the innovation item that their hospital had implemented for the last three years to enhance performance

#### **4.5 Operations Innovations**

The current study sought to establish the effects of operations innovations on the performance of level six hospitals in Kenya.

##### **4.5.1 Technology Innovation Strategies**

The study sought to find out how technology innovation strategies contribute to the hospital service delivery. According to the study results, most of the respondents strongly agreed that information and communication technology is technology innovation strategy

that contributed to hospital service delivery as shown by a mean of 3.852. The respondents also strongly agreed that management development systems is the technology innovation that contribute to hospital service delivery as depicted by a mean score of 3.541. Additionally, the respondents agreed that synthetic data and unstructured text applications is the technology innovation that contribute to hospital service delivery as depicted by a mean score of 3.442. Further, the respondents moderately agreed with a mean score of 2.688, 2.639 and 2.557 that virtualization or grid computing, integrated systems (IS) approaches and modern technology development are the technology innovations that contribute to hospital service delivery respectively. Lastly, the respondents disagreed that social networking, online collaboration and Web conferencing is the technology innovations that contribute to hospital service delivery respectively as shown by a mean of 2.098.

**Table 4.5: Technology Innovation Strategies**

<b>Statements</b>	<b>Mean</b>	<b>STDev</b>
Integrated systems (IS) approaches	2.639	1.3
Management Development Systems	3.541	0.6
Information and Communication Technology	3.852	0.98
Social networking, online collaboration and Web conferencing	2.098	1.1
Virtualization or grid computing	2.688	1.0
Synthetic data and unstructured text applications	3.442	1.0
New Technology development	2.557	1.1

**Source: Research 2018**

The findings from the study implies that information and communication technology; management development systems and synthetic data and unstructured text applications were the innovation strategy that contributed to hospital service delivery.



#### 4.5.2 Process Innovation Strategies

The study aimed to investigate how process innovation strategies contribute to the hospital service delivery. The study results revealed that, most of the respondents strongly agreed that generating better (new) ways to serve patients was the process innovation strategy that contribute to the hospital service delivery as depicted by a mean score of 3.754. Respondents agreed that offering the best service is the process innovation strategy that contribute to the hospital service delivery as shown by a mean score of 3.377. Also, the respondents agreed that improving the mix of offered services is the process innovation strategy that contribute to the hospital service delivery as depicted by the mean score of 3.000.

Further, respondents indicated that identifying better (new) potential markets and helping in market segmentation are the process innovation strategies that contribute to the hospital service delivery as depicted by a mean score of 2.901 and 2.557 respectively.

**Table 4.6: Process Innovation Strategies**

<b>Statements</b>	<b>Mean</b>	<b>STDev</b>
Helps in market segmentation	2.557	1.147
Improving the mix of offered services	3.000	1.140
Offering the best service	3.377	0.819
Identifying better (new) potential markets	2.901	0.568
Generating better (new) ways to serve patients	3.754	0.649

**Source: Research 2018**

The findings from the study implies that generating better (new) ways to serve patients; offering the best service and improving the mix of offered services were the process innovation strategy that contributed to the hospital service delivery.

### 4.5.3 Product Innovation Strategies

The study sought to establish how product innovation strategies contribute to the hospital service delivery. Respondents strongly agreed that satisfactory quality of products and services is a product innovation strategy that contribute to the hospital service delivery as shown by a mean score of 3.852. Respondents also strongly agreed that ability to satisfy the patients' needs is a product innovation strategy that contribute to the hospital service delivery as shown by a mean score of 3.573.

Additionally, the respondents agreed that frequent market research and knowledge of patients' needs are product innovation strategies that contribute to the hospital service delivery as shown by a mean score of 3.409 and 3.377 respectively. Lastly, the respondents moderately agreed that wide range of services offered, high quality products and services at lower fee and shortening duration of obtaining a product or service are product innovation strategies that contribute to the hospital service delivery as shown by a mean score of 2.901, 2.721 and 2.688 respectively.

Table 4.7: Product Innovation Strategies

<b>Statement</b>	<b>Mean</b>	<b>STDev</b>
Wide range of services offered	2.901	0.568
Shortening duration of obtaining a product or service	2.688	1.026
Satisfactory quality of products and services	3.852	0.98
Frequent market research	3.409	0.972
High quality products and services at lower fee	2.721	0.452
Knowledge of patient needs	3.377	0.819
Ability to satisfy the patient	3.573	0.717

**Source: Research 2018**

The findings from the study implies that satisfactory quality of products and services; ability to satisfy the patients' needs and frequent market research and knowledge of patients' needs was a product innovation strategy that contribute to the hospital service delivery.

#### 4.5.4 Organization Innovation Strategies

The study aimed to establish how organization innovation strategies contribute to the hospital service delivery. Study results established that, respondents strongly agreed that renewing the routines, procedures and processes employed to execute firm activities in innovative manner is the organization innovation strategy that contribute to the hospital service delivery as shown by a mean of 4.34.

Respondents also agreed that renewing the human resources management system, renewing the production and quality management systems and renewing the in-firm management information system and information sharing practice are the organizational strategies that contribute to the hospital service delivery as shown by the mean scores of 3.573, 3.377 and 3.163 respectively. Lastly, respondents moderately agreed that renewing the organization structure to facilitate teamwork and renewing the supply chain management system are the organizational strategies that contribute to hospital service delivery as depicted by the mean scores of 2.901 and 2.721 respectively.

**Table 4.8: Organization Innovation Strategies**

<b>Statements</b>	<b>Mean</b>	<b>STDev</b>
Renewing the routines, procedures and processes employed to execute firm activities in innovative manner	4.341	0.215
Renewing the supply chain management system	2.721	0.452
Renewing the production and quality management systems	3.377	0.819
Renewing the human resources management system	3.573	0.717
Renewing the in-firm management information system and information sharing practice	3.163	0.965
Renewing the organization structure to facilitate teamwork	2.901	0.568

**Source: Research 2018**

The findings from the study implies that renewing the routines, procedures and processes employed to execute firm activities in innovative manner and renewing the human resources management system, renewing the production and quality management systems and renewing the in-firm management information system and information sharing practice was the organization innovation strategy that contribute to the hospital service delivery.

#### **4.6 Key Drivers of Operations Innovations in Level Six Public Hospitals in Kenya**

The study aimed to investigate how various innovation strategies contributes to hospital service delivery. The study results indicated that, most of the respondents agreed that innovation strategies contribute to hospital service delivery through improved innovation process as depicted by the means scores of 3.409. Respondents also agreed with a mean score of 3.377 that innovation strategies contribute to hospital service delivery through conformance to regulation.

Further, respondents agreed that innovation strategies contribute to hospital service delivery through reduction of costs and introduction of new products as shown by the mean scores of 3.114 and 3.032 respectively.

**Table 4.9: Drivers of Operations Innovations in Level Six Public Hospitals**

<b>Operations innovations</b>	<b>Mean</b>	<b>STDev</b>
Reduction of costs	3.114	1.05
Improved innovation process	3.409	0.972
Conformance to regulations	3.377	0.819
New products introduction	3.032	0.893

**Source: Research 2018**

The findings from the study implies that innovation strategies contribute to hospital service delivery through improved innovation process; innovation strategies contribute to hospital service delivery through conformance to regulation and innovation strategies contribute to hospital service delivery through reduction of costs and introduction of new products.

#### **4.7 Performance in Level Six Public Hospitals in Kenya**

The study aimed to establish how the respondents rated the level of achievement of the various innovative performance items in their organization in the last three years compared to the previous years. Respondents indicated with a mean score of 3.754 that innovative strategies were very successful in improving service quality in the last three years compared to the previous years. Respondents also indicated with a mean score of 3.541 that innovative strategies were very successful in increasing the volume flexibility of their hospitals in the last three years compared to the previous years.

Further, respondents indicated with a mean of 3.245 that innovative strategies were successful in decreasing the operational unit cost in their hospitals in the last three years compared to the previous years. Lastly, respondents indicated with a mean score of 3.032 that innovative strategies were successful in ensuring time delivery of services in their hospitals in the last three years compared to the previous years.

**Table 4.10: Performance in Level Six Public Hospitals in Kenya**

<b>Statements</b>	<b>Mean</b>	<b>STDev</b>
Service quality	3.754	0.649
Operational unit cost - Increase () or Decrease ()	3.245	1.043
Volume flexibility - Increase () or Decrease ()	3.541	0.992
On time delivery	3.032	0.893

**Source: Research 2018**

The findings from the study implies that innovative strategies were very successful in improving service quality in the last three years compared to the previous years; innovative strategies were very successful in increasing the volume flexibility of their hospitals in the last three years compared to the previous years and innovative strategies were successful in decreasing the operational unit cost in their hospitals in the last three years compared to the previous years.

#### **4.8 Inferential Statistics**

Further the researcher conducted a multiple regression analysis so as to analyze the effects of operations innovation on performance of level six public hospitals in Kenya. The coding, entering and computing of the multiple regressions' measurements were done through the statistical package for social sciences (SPSS) by the researcher.

Changes in both of the variables and their effects on each other were explained by coefficient of determination (Technology innovation, Product innovation, Process innovation and Organizational innovations). The performance of the organization was explained by the fur variables discussed in this study where they represented an 83.4% of the adjusted R<sup>2</sup>. 16.6% represented the other factors that are not discussed in this chapter of performance on firms'. This 16.6% should therefore be discussed to determine how and their degree effect on firm's performance of level six public hospitals in Kenya.

**Table 4.11 Regression Coefficients**

<b>Model</b>	<b>Unstandardized Coefficients</b>		<b>Standardized Coefficients</b>		
	<b>B</b>	<b>Std. Error</b>	<b>Beta</b>	<b>t</b>	<b>Sig.</b>
(Constant)	1.308	1.342		1.623	0.357
Technology innovation	0.558	0.310	0.172	4.342	.0276
Product innovation	0.731	0.156	0.210	3.592	.0285
Process innovation	0.785	0.322	0.097	3.542	.0202
Organizational innovations	0.620	0.285	0.148	3.458	.0249

**Source: Research (2018)**

The four variables discussed in this study and how they affected performance was determined through multiple regression analysis. As per the SPSS generated table 4.19, the equation

$(Y = \beta_0 + \beta_1X_1 + \beta_2X_2 + \beta_3X_3 + \beta_4X_4 + \epsilon)$  becomes:

$$Y = 1.308 + 0.558X_1 + 0.785X_2 + 0.620X_3 + 0.731X_4$$

Considering all the factors discussed was established through the above regression equation (Technology innovation, Product innovation, Process innovation and Organizational innovations) constant at zero, performance of level six public hospitals in Kenya will be 1.308. This infers that use of Technology innovation contributed most to performance of level six public hospitals in Kenya followed by Product innovation then Process innovation while Organizational innovations contributed the little to performance of level six public hospitals in Kenya.

#### 4.8.1 Model Summary

At 5% level of significance and 95% confidence level, Technology innovation had a significance level of 0.0285; Product innovation had a significance level of 0.0276, Process innovation had a 0.0249 significance level while Organizational innovations had a 0.0202 significant level.

**Table 4.12 Model Summary**

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	0.913	0.834	0.751	0.4538

**Source: Research 2018**

This implies that organizational innovations are the most significant factor influencing customer satisfaction.



#### 4.8.2 Anova

**Table 4.13 ANOVA (Analysis of Variance)**

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	1.424	9	.208	3.23	.002 <sup>a</sup>
	Residual	5.375	20	.232		
	Total	6.799	29			

**Source: Research Data (2018)**

a. Predictors: (Constant), (Technology innovation, Product innovation, Process innovation and Organizational innovations)

b. Dependent Variable: Organizational performance in the public water sector in Kenya

The "F" column provides a statistic for testing the hypothesis that all  $\beta \neq 0$  against the

null hypothesis that  $\beta = 0$  (Weisberg, 2015). From the findings the significance value is

.002 which is less than 0.05 thus the model is statistically significance in predicting how

Technology innovation, Product innovation, Process innovation and Organizational

innovations affect performance of level six public hospitals in Kenya. The (p) value of

0.000 supports this probability. The reported p value was less than the significance level

of 0.05 and hence the overall model was a good fit.

#### 4.9 Discussion of Study Findings

The study established that most of the respondents strongly agreed that information and

communication technology is technology innovation strategy that contributed to hospital

service delivery as shown by a mean of 3.852. The study results agree with a study

undertaken by Gakure and Ngumi (2013) who stated that commercial banks in Kenya

were investigated and how their profitability was affected by bank innovations such as

ICT, they both concluded that bank profitability was significantly affected by bank

innovations.

The study concluded that most of the respondents strongly agreed that generating better (new) ways to serve patients is the process innovation strategy that contribute to the hospital service delivery as depicted by a mean score of 3.754. This study finding disagrees with a study undertaken by Roselyn and Ngumi (2013) also investigated how commercial banks in Kenya's income was influenced by bank innovations; they both concluded that commercial banks' income was affected by bank innovations moderately.

Further, the study found out that respondents strongly agreed that satisfactory quality of products and services is a product innovation strategy that contribute to the hospital service delivery as indicated by a mean score of 3.852. Moreover, the study found out that respondents strongly agreed that routines renewing procedures and processes employed to conduct hospitals activities in innovative manner is the organization innovation strategy that contribute to the hospital service delivery as demonstrated by a mean of 4.34.

The study results indicated that, most of the respondents agreed that innovation strategies contribute to hospital service delivery through improved innovation process as depicted by the means scores of 3.409. The study results agree with a survey conducted by Ongwae, Mukulu & Odhiambo (2013) on how SMEs dealing with electrical machinery enterprises in Kenya performance was affected by innovations and enterprise growth where a positive relationship was determined.

Respondents indicated with a mean score of 3.754 that innovative strategies were very successful in improving service quality in the last three years compared to the previous years. This study finding agrees with a study on innovativeness and Firm Performance undertaken by Kiraka (2013) where the objective of the research was to depict the then state of knowledge regarding the relation between innovation and performance in general and for SMEs.

The results showed that product and process innovativeness had a considerable positive relationship with performance of SMEs Respondents also indicated with a mean score of 3.541 that innovative strategies were very successful in increasing the volume flexibility of their hospitals in the last three years compared to the previous years.

## **CHAPTER FIVE: SUMMARY, CONCLUSION AND RECOMMENDATIONS**

### **5.1 Introduction**

This chapter presents the discussion, conclusion and recommendations of key data findings on the effects of operations innovation on performance of level six public hospitals in Kenya. Therefore, this chapter is structured into summary of the study findings, conclusion and recommendations drawn. In the summary of the study findings, the study results found out that most respondents indicated that their hospitals used improved innovation process as their process innovation strategy. In addition, the study results established that respondents indicated that their hospitals employed new product introduction as their product innovation strategy.

The study also discussed the conclusions of the study where information and communication technology were the most used technology innovation technology among level six hospitals in Kenya, introduction of new products is the most widely unused product innovation strategy among the level six hospitals in Kenya and also that renewing the organization structure to facilitate teamwork is widely implemented innovation strategy amongst level six hospitals for the last three years. This is because introduction of a new product has to go a thorough approvals. The deep and detailed consultation in level six hospital make it difficult to organization restructuring as an innovative strategy.

## **5.2 Summary of the Study Findings**

The study results established most of the respondents indicated that their hospitals used information and communication technology as their technology innovation strategy. Also, the study results found out that most respondents indicated that their hospitals used improved innovation process as their process innovation strategy. In addition, the study results established that respondents indicated that their hospitals employed conformance to guidelines as their product innovation strategy.

Further, it established that many of the respondents strongly agreed that renewing the organization structure to facilitate teamwork was rarely used as the innovation for the last three years. Further, the study established that most of the respondents strongly agreed that information and communication technology is technology innovation strategy that contributed to hospital service delivery.

Additionally, the study established that most of the respondents strongly agreed that generating better (new) ways to serve patients is the process innovation strategy that contribute to the hospital service delivery. The also study found out that respondents strongly agreed that satisfactory quality of products and services is a product innovation strategy that contribute to the hospital service delivery. In addition, the study found out that respondents strongly agreed that renewing the routines, procedures and processes employed to execute firm activities in innovative manner is the organization innovation strategy that contribute to the hospital service delivery.

The study results established that most of the respondents agreed that innovation strategies contributed to hospital service delivery through improved innovation process which is integrated systems. The study also found out that innovation strategies contributed to hospital service delivery through conformance to regulation. The study established that most of the respondents indicated that innovative strategies were very successful in improving service quality in the last three years compared to the previous years. The study also established that innovative strategies of integrated systems were very successful in increasing the volume flexibility of their hospitals in the last three years compared to the previous years.

### **5.3 Conclusion**

The study aimed to establish the effect of operations innovation on performance of level six public hospitals in Kenya. The study conclusion was thus based on the research objective. The study concluded that information and communication technology was the most used technology innovation technology among level six hospitals in Kenya, conformance to regulations and guidelines is the most widely used product innovation strategy among the level six hospitals in Kenya and also that renewing the organization structure to facilitate teamwork is rarely implemented innovation strategy amongst level six hospitals for the last three years.

The study concluded that the technology, process, product and organization innovation strategies played a critical role in service delivery through various improved innovation processes in level six hospitals in Kenya. Most innovative strategies employed by level six hospitals in Kenya were successful in improving the quality of services quality and increasing the volume of flexibility of level six hospitals among the level six hospitals in the last three years compared to the previous years. However, the level six hospital need to urgently invest in technology and reduce the bureaucracy that seem to hinder the implementation of modern technology.

#### **5.4 Recommendations**

The study recommends that healthcare institutions should embrace modern technological innovations to adapt to the continuous technological change. This is because; modern technological operational innovations encourage ease of service delivery in the healthcare sector. As such, health care institutions should ensure that they have the necessary infrastructural facilities, adequate financial resources and well-equipped staff in terms of knowledge and skills on recent technology so as to be in position to get the best of the operations innovations in their overall performance.

The study also recommends that hospitals in Kenya despite their levels should ensure that they introduce new healthcare services and product, employ cost reduction strategies, and undertake innovation improvement processes as well as complying with the relevant health regulations. This will assist them tap well into needs of patients and the new products and services will come up with their own source of marketing strength.

The study further recommends that the ministry of health in Kenya should create an enabling environment that enhances innovations among level six hospitals for full realization of the innovation strategies benefits. Reduce bureaucracy and in technology innovation, that is evidence even in slightest of the services offered by level six hospitals which include among other things installation and repairing of the new machines as radiology machines in most level six hospitals. Complying with policies and regulations will enable level six hospitals to improve their performance due to product, market, process, organization and technology innovations among others which must function effectively.

The study recommends continuous innovation in operations to save more lives and improve and or enhance performance. The operation innovation should aim to be patients oriented rather than conformance to guideline. This will help the hospitals in knowing the most urgent operation innovation that should be implemented. Improved operations through innovations lead to improved overall performance.

### **5.5 Limitations of the Study**

The nature of level six hospitals did not allow proper data collection as the respondents felt restricted to give much information about the hospitals. This led to some respondents not responding to the study tools, while other were reluctant to give much detailed information about the hospitals. They felt as they were giving classified information

Time and flexibility of the respondent was restricted by the fact that level Six hospitals in Kenya are quite busy being the Large and referral hospitals hence respondent felt time was limited on their end, the researcher persuaded the respondents and made them understand the research is to help some of the unspoken problems within level six hospitals.

### **5.6 Suggestions for Further Research**

The study investigated effect of operations innovation on performance of level six public hospitals in Kenya. It therefore suggests that future research should be carried out among other levels such as level four, level five (regional) hospitals across Kenya to establish the effect of operations innovation on such hospitals performance.



The scope of this study was on public level six hospitals (national referral) and thus there is need to evaluate private level six hospitals which seems to be far much ahead in adoption and implementation technological innovation in their operations. Further research should be carried out to investigate the effectiveness of such Private hospitals in comparison to Public hospitals of the same level.

Study should also be done to assess the adequacy of the policy, legal and institutional frameworks that guide implementations of innovation Public hospitals. Evidence from the study shows implementation of modern technology in equipment's and machines have been poorly coordinated and delayed, due to lack of standard operational procedures and long consultations that affects the performance of such hospitals.

Bureaucracy has been a challenge that has delayed implementation of innovation and purchase of modern equipment in Public hospitals in Kenya, it has also led to duplication of efforts and wasteful use of resources. A study on these factors can offer more helpful avenues to effectively adopt innovations and greatly improve performance of such Hospitals.

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**Appendix I: Introduction**



**UNIVERSITY OF NAIROBI  
SCHOOL OF BUSINESS**

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P.O. Box 30197  
Nairobi, Kenya

DATE 27/11/2018

*Proceed and  
analyze the  
new data  
and write chapter 4 for*

**TO WHOM IT MAY CONCERN**

The bearer of this letter VIOLET MUTHONI NDORIAH

Registration No. DG/18752/2016

*[Signature]*  
28/11/2018

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: Research Questionnaire**

This questionnaire is designed to collect data that will help in better understanding the effect of operations innovation on performance of level six public hospitals in Kenya. The data provided by this questionnaire will be treated in strict confidence. Please do not indicate your name or that of your institution.

**Section A: Key Operations Innovations**

Which technology innovation strategies does your hospital use? (You can tick more than one)

- Integrated systems (IS) approaches [ ]
- Management Development Systems [ ]
- Information and Communication Technology [ ]
- Social networking, online collaboration and Web conferencing [ ]
- Virtualization or grid computing [ ]
- Synthetic data and unstructured text applications [ ]
- New Technology development [ ]
- Others please specify .....

Which process innovation strategies does your hospital use? (You can tick more than one)

- Reduction of costs [ ]
- Improved innovation process [ ]
- Conformance to regulations [ ]
- New service introduction [ ]



Others please specify .....

What form of product innovation strategies does your hospital employ? (You can tick more than one)

- Product improvement [ ]
- Product range extension [ ]
- Product costs revision/improvement [ ]
- Product replacement [ ]
- New product introduction [ ]
- Product repositioning [ ]

Others, please specify.....

To what extent were the following organizational innovation items implemented in your organization in the last three years? (Use a scale of 1 to 5 where 5 is strongly agreed and 1 is strongly disagree)

Statements	1	2	3	4	5
Renewing the routines, procedures and processes employed to execute firm activities in innovative manner.					
Renewing the supply chain management system					
Renewing the production and quality management systems					
Renewing the human resources management system.					
Renewing the in-firm management information system and information sharing practice					
Renewing the organization structure to facilitate teamwork					

## Section B: Operations Innovations

How do the above operations innovation strategies contribute to the hospital's service delivery? (Use a scale of 1 to 5 where 5 is strongly agreed and 1 is strongly disagree).

<b>Technology innovation</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>
Integrated systems (IS) approaches					
Management Development Systems					
Information and Communication Technology					
Social networking, online collaboration and Web conferencing					
Virtualization or grid computing					
Synthetic data and unstructured text applications					
New Technology development					
<b>Process Innovation Strategies</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>
Helps in market segmentation					
Improving the mix of offered services					
Offering the best service					
Identifying better (new) potential markets					
Generating better (new) ways to serve patients					
<b>Product innovation</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>
Wide range of services offered					
Shortening duration of obtaining a product or service					
Satisfactory quality of products and services					
Frequent market research					
High quality products and services at lower fee					

Knowledge of patient needs					
Ability to satisfy the patient					
<b>Organizational innovations</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>
Renewing the routines, procedures and processes employed to execute firm activities in innovative manner					
Renewing the supply chain management system					
Renewing the production and quality management systems					
Renewing the human resources management system.					
Renewing the in-firm management information system and information sharing practice					
Renewing the organization structure to facilitate teamwork					

**Section C: Key drivers of operations innovations in level six public hospitals in Kenya.**

How do the above innovation strategies contribute to the firm's service delivery? (Use a scale of 1 to 5 where 5 is strongly agreed and 1 is strongly disagree).

<b>Operations innovations</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>
Reduction of costs					
Improved innovation process					
Conformance to regulations					
New products introduction					

**Section D: Performance in level six public hospitals in Kenya**

How would you rate the level of achievement of the following innovative performance items in your organization in the last three years compared to the previous years? (Five-point scales ranging from 1= very unsuccessful to 5= very successful)

<b>Performance</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>
Service quality					
Operational unit cost - Increase ( ) or Decrease ( )					
Volume flexibility - Increase ( ) or Decrease ( )					
On time delivery					

**THANK YOU FOR YOUR TIME**

### **Appendix III: List of Level Six Hospitals**

- i. Kenyatta National Hospital
- ii. National Spine and Injury Referral Hospital
- iii. Mathari Referral Hospital
- iv. Moi Teaching and Referral Hospitals

**Source: Kenya Health Sector Report, (2018)**

## Appendix IV: Originality Report

### OPERATIONS INNOVATION AND PERFORMANCE OF LEVEL SIX PUBLIC HOSPITALS IN KENYA

#### ORIGINALITY REPORT

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