FACTORS INFLUENCING ADOPTION OF ICT STRATEGY IN THE KENyan PUBLIC HEALTH SECTOR – A CASE STUDY OF THE KENYATTA NATIONAL HOSPITAL

BY

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UNITED STATES INTERNATIONAL UNIVERSITY – AFRICA

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A Research Project Report Submitted to Chandaria School of Business in Partial Fulfillment of the Requirement for the Degree of Masters in Business Administration (MBA)

UNITED STATES INTERNATIONAL UNIVERSITY – AFRICA

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STUDENT’S DECLARATION

I, the undersigned, declare that this is my original work and has not been submitted to any other college, institution or university other than the United States International University in Nairobi for academic credit.

Signed: ___________________________  Date: ___________________________

Bernard Maganjo (ID 642956)

This project has been presented for examination with my approval as the appointed supervisor.

Signed: ___________________________  Date: ___________________________

Prof. Fred O. Newa

Signed: ___________________________  Date: ___________________________

Dean, Chandaria School of Business
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The use of Information Communication and Technology (ICT) is of benefit to many sectors. ICT can enable an organization to have a one stop shop of information and records of customers which enhances service delivery. The Kenyan public health sector can also benefit from the use of ICT in managing patient data nationwide. The Kenyan government is making significant strides in the adoption of ICT strategy in public health care. Despite the efforts to adopt the use of ICT in the Kenyan public health sector, most health care facilities are still registering patients using pen and paper. Therefore, this report sought to investigate the factors that influence the adoption of ICT strategy.

The study was guided by the following objectives: To establish the influence of financial factors on ICT strategy adoption; to determine the infrastructure factors influencing adoption of ICT strategy and to establish the influence skills and knowledge gaps have on ICT strategy adoption at the Kenyatta National Hospital. This report assumed that the samples collected were a representative of the total population of health professionals in the Kenyatta National Hospital, and that the respondents would cooperate to give honest and objective information when answering the research questions.

The research methodology for this project report was the descriptive research design. Data was collected using structured questionnaires which were administered to the personnel in the hospital. The project report aimed at sampling a minimum of seventy-seven staff at the Kenyatta National Hospital. This represented ten percent of the total population from the selected departments. The data was analyzed using measures of central tendency, measures of dispersion and presented in charts, graphs and tables after analysis using the SPSS software analysis tool.

The finding from the analysis showed that the most significant financial factors influencing the adoption of ICT strategy in Kenyatta National Hospital was procurement procedures. This was followed by cost of equipment and business practices. The following infrastructure factors were found to most affect ICT strategy adoption: The hospital had a dedicated IT department and most staff were able to access IT equipment. Patient exposure to technology was found to have a moderate influence. Patient medical history as well as distance from the hospital were
found to significantly influence the adoption of ICT strategy. Privacy and security of patient
and hospital data were found to affect ICT strategy adoption to a very great extent. The
organization was found to utilize ICT in preparation of online objectives and budgets and
creating awareness of vaccinations. Skills and knowledge gaps influence the adoption of ICT
strategy. The study found that lack of training as well as low level of literacy in technology to
be a hindrance of adoption of ICT strategy in the organization. Effective leadership was also
found to be paramount in the adoption of ICT strategy in Kenyatta National Hospital.

The following conclusions were drawn from the research. The hospital can ensure that they
have a robust procurement office that is in sync with the management on the needs of the
hospital in order to make purchases early and in bulk in order to get the most competitive rate
which will bring down the cost on goods and equipment to the organization and in turn bring
down the cost of services to patients. In order for an organization to fully implement an ICT
strategy, all processes must be fully automated to ensure efficiency. The capturing of patient
medical records using ICT can also enhance service delivery for patients who are far away
from Kenyatta National Hospital. It is important for the organization to invest in information
security measures such as network security, security software such as anti-malware and
antivirus aimed at protecting patient information as well as hospital records. Lack of training
and low level of literacy in technology can severely impact the adoption of ICT strategy. The
management should therefore seek ways to increase the frequency and availability of trainings
to staff. This will in turn improve the literacy levels in technology among all staff and their
willingness to embrace the ICT in all their operations. The hospital was found to have effective
and competent leadership.

From the analysis of the data, it is recommended that the organization should have an effective
procurement department that understands the needs of the hospital’s equipment and supplies
required ahead of time in order to avoid delays of service delivery. The management should
integrate the use of ICT in all functions of the day to day running of the organization. The
organization should put in place a yearly training calendar of trainings with clear roadmaps
indicating the various competencies to be attained by the trainees upon completion of the
training. The organization should ensure that top leadership embrace technology in order to
successfully adopt ICT strategy.
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Thank you and may God Bless you all.
DEDICATION

I dedicate this paper to my family, especially my wife who was my biggest cheerleader. She stepped in to help when I was busy completing my research paper. Your support has made this possible.
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CHAPTER ONE

1.0 INTRODUCTION

1.1. Background of the Problem

Healthcare is a sector that is experiencing a considerable number of internal, but also external pressures. Continuous progress in Information and Communication Technologies (ICT) has resulted in new methods and new opportunities to support or even enable new types of health care services. Information and Communication Technology (ICT) is a strategic and critical tool in all organizations worldwide. Some strategists refer to ICT as an organization’s competitive weapon since ICT influences the organizations design, the management control systems, as well as the organizational culture (Chesher & Skok, 2010). According to (Conrad & Schneider, 2011), quality health care at affordable cost has been the focus of many governments. Over the last 25 years, health care delivery has been undergoing continuing changes (Wahab, Omer, & Attalla, Factors Affecting Doctors’ Intention to Adopt Electronic Medicine, 2010).

Healthcare technology is among the most important equipment in a hospital. It helps to improve the quality and performance of treatments (Christensson, 2010). Healthcare is an information-intensive industry, and accurate timely information is most critical to health industry. To that end, the very nature of work in the healthcare industry has always necessitated an atmosphere of collaboration and sharing of resources (Evelyn & Mark, 2012). The continuous and growing interest in ICT adoption is also attributed to the exponential growth in the number of internet users worldwide, with a bigger increase reported from users in developing countries (Drury, 2015).

According to (Curry, 2010), in the past, acquiring patient information was accomplished largely by asking the patient to provide information several times to a number of different providers. Each provider then maintained his or her own paper-based records of patient interactions, and these records may or may not be shared between providers. The dependence on accurate, timely, comprehensive information for correct diagnosis and treatment introduces the issue of multiple data entry points risky and costly for healthcare providers and patients (Gatero, 2010). To combat these issues, healthcare has seen a more intense movement toward
organizational integration, beginning with the formation of hospital systems over three decades ago.

Arendt (2013) study on Information Systems for health care insists that integration efforts resulted in improvements in cost and quality of care, new innovations in patient care led to a decreased need for hospital inpatient care. More diversified services were required which called for expertise and resources that could not be provided effectively by hospitals alone (i.e., outpatient services, home health services, long-term care, and hospice services). In addition, attention began to turn to IT as an untapped resource with potential for healthcare systems improvement. As a result, the early 1990s saw the beginning of a new form of healthcare network known as the integrated delivery system (Evelyn & Mark, 2012). The healthcare industry today is plagued by many challenges, especially the rising costs of healthcare. Currently, Kenya spends $ 2.8 million annually on healthcare alone translating to 7% of the country’s GDP (African Population and Health Research Center, 2015).

In another study, (Bukachi & Walsh, 2012), healthcare sector lacks effective mechanisms to coordinate patient care, share relevant information, and monitor compliance with relevant guidelines. Increased use of information technology in healthcare especially the introduction of clinical decision support and better linkages in and among systems would result in process simplification. Over the last decade, the use of Information and Communications Technology (ICT) has helped develop new ways of providing efficient and secure healthcare. This has resulted in a rapid increase in the use of ICT applications in healthcare, collectively, commonly referred to as eHealth. ICT has been referred to as a key instrument in healthcare delivery and public health internationally (Drury, 2015).

Calman , Kitson, and Hauser (2010) concluded that when designed and implemented effectively, ICT can improve access for geographically isolated communities; provide support for healthcare workers; aid in data sharing; provide visual tool linking population and environmental information with disease outbreaks; and is an effective electronic means for data capture, storage, interpretation and management. In this context, ICT for health refers to any tool that facilitates the communication, processing or transmission of information by electronic means for the purpose of improving human health (Bukachi & Walsh, 2012). While
the early years of health ICT development and policies concentrated on technologies to be used by health professionals, home based health ICT aiming at patient users is now a prioritized area (Arendt, 2013). More and more technologies intended for use in patients’ homes are being designed.

Evelyn and Mark (2012) explored the widespread private use of the internet for health purposes in developed countries and found that it has been taken as an indication of a new grass roots phenomenon in health care, indicating a democratic development where patients gain control of their health records (Hardey, 2011). However, the growth of patient-oriented ICT is not only a grass roots phenomenon deriving from patient needs. When outlining the background for this development, the health care system’s struggle to cope with demand is also highly relevant. In spite of large economic investments, the pressure on the health care sector continues to grow. More and more human conditions are being considered relevant for professional medicine, a process often described as medicalization (Conrad & Schneider, 2011). In this historical context, ICT is investigated as a means to develop a more effective health care system, where less money is spent but tasks are performed with undis turbed or even improved quality. The Internet has been an effective tool in health promotion campaigns, as it reaches a large number of people at and low costs (Korp, 2006).

Mugo (2014) examined how the adoption of ICT strategy in Kenya has increased with the years, although the patterns are still inconsistent and the adoption rate slow, the awareness is still on the rise. ICT and organizational integration provide a value synergy through comparability, alignment of strategies and objectives, and the collaboration of healthcare personnel. ICT integration can enhance the processes and capabilities of healthcare management in public health facilities by both the medical providers and the patients in Kenya (WHO, 2011). Some known and assumed barriers to ICT strategy adoption in Kenyan health care include: lack of physical access, slow or unreliable internet connectivity, high subscription cost of information materials; lack of awareness of what is available; lack of relevance of available information (i.e. not meeting peoples’ needs in terms of scope, style, or format); lack of time and incentives to access information; and lack of interpretation skills.
Gatero (2010) concludes that many critical information needs of the medical professionals are not being met adequately. Improved usage of ICT is viewed as the only realistic strategy for enhancing information access and information sharing among the medical professionals at the Kenyatta National Hospital. In order to enhance access to health information at Kenyatta National Hospital, the following recommendations were made: establishment of a hospital library and information services, appointment of information professionals with skills and capabilities to conduct online information searches to assist in clinical decision-making and ability to train clinicians in ICT skills; formulation of ICT strategies and policy; capital investments in the form of internet and supporting ICT infrastructure; involvement of all stakeholders; and allocation of adequate financial resources for improved access to health information by the medical professionals (Gatero, 2010).

1.2. Statement of the Problem

Developed countries have embraced the use of information communications technologies (ICT) within the hospitals and health clinics. A few examples of the use of ICT include computerization of medical records, electronic scheduling for appointments, and use of the Internet for the purposes of communication and the use of magnetic cards. According to Hardey (2011), ICT plays an important role in delivering healthcare today. Healthcare professional including doctors and nurses are occupied in what is seen as a radical action plan for improving the national healthcare services in most countries.

International Telecommunication Union (2016) explored and found that most health care facilities (both public and private) would benefit from having an integrated ICT network to manage their data and health care resources. Significant strides in equipping hospitals with the modern equipment and trained staff to serve the public have been achieved worldwide. The slow adoption ICT strategy has become a critical challenge in the health care industry, both public and private. Efficient ICT systems would significantly improve the delivery of service to patients and improve the utilization of resources within the health centers (Conrad & Schneider, 2011). The adoption of ICT strategy would also to streamline key processes in the health care industry, integrate activities across health care organizations, reduce overall health care costs, improve medical record management, health program management and improve patient care quality. The utilization of ICT technology within hospital facilities is low
worldwide. Studies have shown that ICT implementation failure rates could be as high as eighty percent.

A study by Lorenzi et al., (2008), found that 19% of Electronic Medical Records (EMRs) are uninstalled after implementation, and approximately 30% are not used to their full potential by the staff in the United States. This study was done in the United States whose business environment is not similar to that in Kenya hence limiting the applicability in the current study settings. Sood et al., (2008) established that adaptation of Electronic Medical and Personal Health Records in developing countries is low. Similarly, Mulwa (2013) found out that in Kenyan hospitals, data is entered manually and is thus bound to human error, misplacement or loss of files, and thus may increase the cases of misdiagnosis of a patient. The Kenyan public health sector would significantly benefit from having a robust ICT system to manage patients’ data records and offer support services. As well, public hospitals that are also teaching and research centers would also benefit from a similar system.

All the above studies were conducted in different contexts and on different variables from the ones adopted in this study hence limiting the application of their findings in the case of the current study. For example, from the various studies that have been carried out, there are no policy frameworks formulated to encourage and promote the use of ICT as tools for health information access and dissemination. The policies must address the long term users’ and organizational needs and should also be flexible and constantly reviewed in keeping with technological trends (Gatero, 2010). Similarly, there is need to enhance technological infrastructure on which diffusion and use of ICT can take place. Lack of ICT infrastructure is a key reason hindering access to online health information sources, and is clearly a more pressing problem that lack of available information (Chesher & Skok, 2010).

Allocation of adequate financial resources is critical in ICT strategy adoption. However, this factor is often ignored by the decision makers. Harnessing of the potentials of the internet and ICT in general goes hand in hand with improvement of technological infrastructure as well as sensitization for the sponsoring organization. Adequate budgetary allocation must be provided for the purchase of appropriate hardware and software and other accessories; cost of installation, support and maintenance. Therefore, Kenyatta National Hospital should develop
cost models that will sustain investment in ICT strategy in a way that will immensely improve accessibility of information as well as the daily operations of the hospital.

Little has been mentioned about ICT skills development and training in the case studies. Building ICT skills is an important concept for any ICT intervention because new skills are required for operating computers, browsing the internet for research and making use of various communication tools such as e-mail, video conferencing etc. For example, health care practitioners need continuing education and training to learn ICT and keep up with new developments in hardware, software and services. Therefore, investing in human capacity is essential in ICT strategy adoption (Maheu, Hitten, & Allen, 2013).

Furthermore, ICT skills development and training for the medical professionals should be seen as more than just a stop-gap measure, but also as vital tools needed for the promotion of evidence-based culture, which is essential to improving the quality of medical care (Nyella & Mndeme, 2010). Hospitals are complex, information-rich environments in which people need to collaborate to provide appropriate patient care, with patient care. This study will therefore seek to determine the factors influencing the adoption of ICT strategy in Kenyatta National Hospital and determine the recommendations for improvement in online health facilities.

1.3. Purpose of the Study

The purpose of this study is to investigate the factors influencing the adoption ICT strategy in Kenyatta National Hospital.

1.4. Research Questions

The study will be guided by the following research questions:

1.4.1 How do financial resources influence the adoption of ICT strategy in Kenyatta National Hospital?
1.4.2 How does infrastructure influence the adoption of ICT strategy in Kenyatta National Hospital?
1.4.3 How do skills and knowledge gaps influence the adoption of ICT strategy in Kenyatta National Hospital?
1.5. **Significance of the Study**

The study is important to the following:

1.5.1 **Patients**

Up to date, patient records at Kenyatta National Hospital are paper-based. For example, every time a patient is admitted to the hospital, many forms are completed and added to the patient’s folder. Treatments are documented by hand and recorded on paper charts and nursing records. Eventually, these records are added to the patient’s file. Therefore, for a patient who is admitted to hospital regularly, their paper records could become very large and awkward to handle. An even bigger problem is the risk of misfiling the records amongst the many thousands stored in the hospital. Many hospitals are now adopting ICT strategy in their daily operations. ICT strategy adoption in Kenyatta National Hospital will increase the quality in the patient assistance. One of the most important flaws of this sector is the fragmentation of the health care and the difficulties for efficiently transmitting the information. ICT can help improve patient safety through the direct access to the medical case story, checking the treatments online, keeping track of patients’ progress and anticipating possible medical errors. In addition, results from tests in hospital can be added to patient’s record as soon as the test is complete, which will be available immediately to the doctor.

1.5.2 **Medical Professionals**

With more and more hospitals and practices using medical technology like mobile devices on the job, physicians can now have access to any type of information they need e.g. patient history or records, and more within mere seconds. Similarly, ICT has equipped medical professionals with the ability to effortlessly carry these mobile devices around with them throughout the day, thus they are never far from the information they need. ICT strategy adoption will result in improved efficiencies and health care outcomes. The technology will help streamline doctor-doctor and doctor-patient communication etc.
1.5.3 Kenyatta National Hospital

Despite ICT strategy adoption being expensive, it is very critical in hospitals. Hospitals are extremely technical places with complex ICT equipment in wards, laboratories, pharmacies and offices. They are also very large and so they need communication equipment to keep everyone in touch. Kenyatta National Hospital will greatly improve patient treatment by adopting ICT strategy. Another great advantage of adoption ICT strategy to Kenyatta National Hospital is the availability of information. Information will always be available and cannot be lost or left sitting on a desk.

1.5.4 Other Hospitals

ICT strategy adoption at Kenyatta National Hospital will immensely improve monitoring of patients, diagnosis of illnesses, expert systems, patient record management among others. There will also be notable improvement in quality of health care because of the far-reaching capabilities of information systems. In addition, other hospitals will benefit from decreased costs upon adoption of ICT strategy. For example, when a physician orders a test by computer, it can automatically display information that promotes cost-effective testing and treatment.

1.5.5 County and National Government

Current changes in government policy present exceptional opportunities for information professionals to contribute to the delivery of quality health care by emphasizing the centrality of high-quality information to the achievement of the goals of the health services. The National and County governments can benefit reduced medical spending following ICT strategy adoption in Kenyatta National Hospital. For example, using ICT and serious games for health help reduce medical costs by reducing the time required to process data and manage paperwork. The system for image transmission and storage is essential to promote the development of the electronic medical case story and telemedicine since it speeds up the tests and the gathering of results.

1.5.6 Researchers

This study will also be of benefit to researchers who can determine the gaps for improvement in the delivery of ICT to the health care management in not only Kenyatta National Hospital,
but all health care facilities in the world. It could also be used to quantify the benefits to health care facilities adopting ICT strategy.

1.6. Scope of the Study

This study will be limited to the factors that influence the adoption of ICT strategy in the Kenyatta National Hospital. The study population will be drawn from physicians and other Kenyatta National Hospital employees. The research study is expected to be carried out in one month.

1.7. Definition of Terms

1.7.1 Strategy

Mintzberg defines strategy as having the following four components: a plan which is a means of getting from one place to another, a pattern which is a series of actions carried out over time, a position which reflects the direction of the company, and a perspective which describes the vision and mission of the company (Mintzberg, 1994).

1.7.2 Public Health

Public health is defined as the science of protecting the safety and improving the health of communities through education, policy making and research for disease and injury prevention (Ansoff & McDonnell, 1990).

1.7.3 Organizational strategy

This is the sum of the actions a company intends to take to achieve long-term goals. Together, these actions make up a company’s strategic plan (Raymond, Charles, Alan, & Henry, 1978).

1.7.4 Financial Resources

This is the money required to pay employees, purchase materials, and generally keep the business operating (William, Robert, & Jack, 2008).
1.7.5 **Infrastructure**

All the hardware, software, networks, facilities, etc. that are required to develop, test, deliver, monitor, control, or support IT services. IT infrastructure includes all Information Technology but not the associated people, processes and documentation (Sjaak, 2013).

1.7.6 **Skill**

Skill is the knowledge and ability to do something well (Ansoff & McDonnell, 1990).

1.8. **Chapter Summary**

Embracing ICT initiatives would improve the management of health care data for individuals and communities by providing new and more efficient ways of accessing, communicating, and storing information. ICT can help bridge the information divides that have emerged in the health sector. Both patients and doctors can benefit from having access to their health information in real time regardless of their location across the country and thus promote improved health care.

Chapter will review the relevant literature on factors influencing adoption of ICT strategy in Kenyatta National Hospital. It will critically look at the availability of funds, training, infrastructure and ICT knowledge gaps. It will outline empirical review as well as the conceptual framework variables. Chapter three will consist of research methodology which will be used in the study. It will cover the research design, target population, sample design, data collection, validity and reliability of data collection instruments, as well as data analysis techniques. Chapter four will consist of data analysis, presentation and interpretations and discussions. Chapter five will consist of summary of the findings, discussion, conclusion and recommendation based on the study.
CHAPTER TWO

2.0 LITERATURE REVIEW

2.1. Introduction

This chapter shall review the various concepts as well as the existing empirical studies that exist on the importance and benefits of embracing ICT strategy in Kenyatta National Hospital. The chapter shall begin with an introduction and overview of the literature studied. It shall be divided into three sections based on the research questions that include; how financial resources, infrastructure, skills and knowledge gaps influence the adoption of ICT strategy in the Kenyatta National Hospital.

2.2. Influence of Financial Resources on Adoption of ICT Strategy

Financial resources have adverse effects on the adoption of ICT strategy in the health sector. The availability of financial resources plays an important role in the adoption decisions, since the high cost of acquiring technologies have been found to be a major barrier. Financial resources are needed not only for the initial procurement and installation of technologies, but also for training personnel, for covering operating expenses, for maintenance of the technology and its enhancements in the future. This research discusses the following factors: cost of equipment, procurement procedures, cost of hiring skilled personnel and poor resource management.

2.2.1. Cost Associated with ICT Equipment

ICT has potential if properly deployed to lower costs of health care, while opening up new modalities for patient treatment and welfare (Arendt, 2013). ICT strategy deployment increases the accessibility to health care especially for those that are vulnerable or in the remote areas that are mostly in need of health care. ICT strategy adoption comes at a cost. Without the requisite funds, it is difficult to benefit from the full potential of ICT strategy adoption (Calman, Kitson, & Hauser, 2010).

The overall cost of implementation is cited as a barrier to the use of technology in the health care system (Chesher & Skok, 2010). The adoption of ICT in Kenyatta National Hospital
would significantly reduce paperwork in the hospital management which in turn translates to reduced paper trail, reduced cases of medical errors, reduced turnaround time in viewing medical reports and in the long run contributes towards lowering health care costs (Acharya, 2010). The cost of implementing ICT strategy in the public healthcare system could be lowered by using existing equipment and infrastructure at the facilities such as mobile and broadband technology which has become widely accessible countrywide. Some of the costs include: price of computers, installation cost and maintenance fee (Kenyanya, 2015).

2.2.2. Procurement Procedures

Wittig (2003) describes procurement is a critical area of financial management systems which is continuously undergoing reforms aimed at enhancing the efficiency of utilization of public resources. Public procurement is an important function of any government, aiming to satisfy requirements for goods, works, systems, and services in a timely manner. Ideally, public procurement should meet the basic principles of good governance, transparency, accountability, and moreover should ensure value for money (Christensson, 2010). These principles are critical to poverty reduction as well as effective utilization of resources.

The Government of Kenya is constantly reviewing the performance of the public procurement system to offer efficient services to its people (Gatero, 2010). The emerging trends of technology scale and technical complexity of systems require a constant evaluation to ensure that the systems are up to date (Drury, 2015). External donors are often willing to financially assist the government to meet its ICT objectives in health care management as long as due process in procurement and donor obligations are adhered to (Frank, Shiv , & Faustin, 2012).

2.2.3. Cost of Hiring Skilled Personnel

In the study of technology adoption by Mexican firms, Gladys (2011) reports an interesting finding. She found that the provision of employee training increases technology adoption in firms. Other authors suggest that new ideas which are easy to understand are more quickly adopted than innovations which require one to develop new knowledge and skills (Bukachi & Walsh, 2012). Likewise, systems perceived as the easiest to use and the least complex have a greater possibility of being accepted and used by potential users (Agarwal & Prasad, 2013). There are significant costs in the transition from a paper to computerized system, such as the
temporary work of data entry from papers to computerized systems. Such a transition could pose a hindrance to productivity and management of staff costs such as hiring data entry clerks, proof-reading the entered data, and hiring a system administrator to take care of the system when technical issues arise and learning new skills (Bukachi & Walsh, 2012).

The government of Kenya has been investing actively in developing infrastructure. This has contributed to an increase in the number of internet users and the promotion of internet-based services, it is also true that the technological constraints that the health care sector has been facing are mainly in part a lack of education and skills in ICT which is an important means to obtain a competitive advantage in this global market (African Population and Health Research Center, 2015).

The cost of training employees (healthcare professionals) has continued to be a key issue in the adoption of ICT strategy in Kenyatta National Hospital. Besides, health care facilities do not develop training plans. In most Kenyan public health care facilities, there is reluctance amongst management to invest in training their employees because they are afraid of losing their employees to other hospitals (e.g. private hospitals) upon their completion of such trainings, when qualifications are increase (Arendt, 2013).

2.2.4. Poor Resource Management

The health sector is an important sector in the economy of a country. A country with poor health systems and policies is bound to experience low economic growth as productivity of citizens might is greatly affected by illness and death from curable cases (Conrad & Schneider, 2011). Lack of finances and equipment resources are a challenge to public health institutions in the adoption of modern technologies. In developing countries quality of healthcare services are low due to poor public resource management, scarcity of trained clinicians and majority of the citizens not able to afford high cost of healthcare services, and these are problems that can be alleviated by embracing ethical resource management in developing countries (Nyella & Mndeme, 2010).

Kenyanya (2015) describes financial management is an art and a science in any industry, but health care is particularly challenging because the industry changes so fast. The amount of money incurred by the centralized government in terms of compensating and paying hospital
bills for its citizens have been immense, mainly due to lack of insurance by most of the citizens. There are no proper policies to address the issues related with insurance, or acquisition of any form of medical cover to cater for medical related bills. Affordability is therefore limited to the affluent few, with the majority, and especially in the rural areas being left at the mercies of well-wishers and in worst situations, succumb to illnesses due to lack of medical attention. Per Turin (2010), lack of proper policies to sensitize communities on issues of medical cover is also instigated by ignorance, with many individuals in sub-Saharan Africa being semi-illiterate. Illiteracy and ignorance coupled with lack of government intervention has led to escalating mortality rates due to preventable diseases like malaria.

2.2.5. High Cost of Installation

Worldwide, the installation cost of modern computer based health Information System is very high. This is the main reason why healthcare facilities opt for manual systems in managing medical information. Evoh (2012) noted that to meet the objectives of an ICT-based training and employment generation program for underprivileged youth in Africa it requires strong regulatory frameworks and contributions from the World Bank. The installation costs include employee training, salaries for the company providing the service, etc. The use healthcare Information Systems technology has been growing slowly due to the costs associated with it. In contrast, the benefit it provides to the organization exceeds installation costs. A study done by Devin, Johnson and Sutherland (2014), found that training interventions lead to positive outcomes for the majority of SME employees, particularly those working in organizations with relatively formalized training practices.

When a new system is installed in an organization, employees need to be trained on how to operate the system efficiently. This is because without the knowledge of the system, it becomes difficult to operate and use the system. There is always a significant correlation between the employee perceived training effectiveness and their commitment, job satisfaction and motivation (Beckinsale & Ram, 2010). If employees are trained properly they are likely to bring out positive results to the company in terms of reputation, profits and shareholders wealth maximization. According to Ahmed (2012) training also reduces employee turnover, motivate employees, boost room occupancy and increase profitability in a highly competitive industry.
2.2.6. Business Practices

Firm’s previous ICT experience has also influence on the adoption (Chesher & Skok, 2010). Effective healthcare information systems are part of good business practices and effective internal controls in any organization or firm. Effective internal controls in any business facilitate generation of profits and minimization of expenditures. Internal controls consist of procedures to be followed by every person in the organization to ensure smooth flow of operations. A study carried out by Jenny and Kent (2013) in Australian hospitals revealed that there was a weak association between the use of internal audit and strong corporate governance. This means that for the internal controls to be effective there should be good corporate governance. Good corporate governance includes good business practices and a management structure establishing good relationship between the managers, board of directors and the staff. The delivery of any strategy is more successful if an organization knows who oversees it. Have senior management drive the policy, appoint sustainability champions and communicate the importance of sustainability to every level of the organization.

Research carried out by Aluchna (2012), revealed that complying with corporate governance best practices in Poland was associated with lower return on investment, but turned out insignificant when study was done again for the second and third years. The study was statistically insignificant when only rated companies were included in the research sample. There is need for supervisors and managers to ensure that firm procedures are followed effectively. Although healthcare facilities may not be willing to implement internal controls, they should try what they can because without internal controls the hospitals can face a lot of risks and end up closing or with poor medical service (Glandon, 2013).

There is need for health information systems that lead to effective internal controls. Internal controls ensure that there is minimization of errors in the financial transactions of the business. Financial information systems also detect errors in advance and therefore the finance department is enabled to correct the errors early in advance. As Jianming (2010) noted, ``it is highly possible to discover problems existing in Management Information System (MIS) through the inspection of the information in error state, deduce the state of systems' operation, predict systematic development, and organize and design development strategy``.
2.3. Infrastructure Influence on the Adoption of ICT Strategy

Infrastructure is critical in the adoption of ICT strategy in the public health care sector. Some of the infrastructure concerns discussed include: internet connectivity, lack of gadgets, distance, transportation and security.

2.3.1. Internet connectivity

Telecommunication infrastructure plays a key role in public health. Transmission of health information between health institutions and other health institutions, with patients, as well as health institutions and third parties such as insurance companies, patients and health institutions is negatively affected if telecommunication and internet penetration is low (Mugo, 2014). Hospitals equipped with high levels of IT infrastructure and with good managerial structures are more likely to adopt ICT strategy systems than were other types of hospitals. Hospitals with greater IT infrastructure can easily invest in ICT systems because they have a favorable environment.

The growing interest in ICT adoption is also attributed to the growth in the number of internet users worldwide, with a larger increase reported from users in developing countries especially in the compared to the developed regions (ITU, 2016). Countries with higher GDP per capita, high literacy rate, and a well-established telecommunication infrastructure enjoy a higher dispersion of internet. That is the reason why advanced economies such as Hong Kong, Singapore, South Korea, and Taiwan lead Asia in internet development, followed by countries like Malaysia, Brunei, and Thailand (Hao & Chow, 2004).

Poor ICT infrastructure and internet penetration in developing countries hampers ICT strategy adoption. Developing countries that have high internet penetration, bandwidth may still be a challenge, thereby limiting adoption of telemedicine and other internet based eHealth applications. Research by Beckinsale & Ram (2010) identified poor services of ISPs as an issue for non-utilization of sophisticated ICT strategy adoption amongst the health care sector facilities. The researchers identified that the services provided by ISPs in Kenya are inefficient and usually characterized by very low bandwidth, frequent disconnections and high subscription rates.
2.3.2. Access to devices / gadgets

Information and communications technology (ICT) is a term that includes any communication device or application, including radio, television, mobile phones, computer network hardware and software, satellite systems and so on, as well as associated various services and applications, such as videoconferencing and e-learning (Beckinsale & Ram, 2010). Therefore, the availability of different communication tools at a reasonable price is crucial for ICT strategy adoption in the Kenyan public health sector. ICT strategy adoption cannot be used straight “out of the box”, and therefore to generate the desired benefits, it must be interconnected with other devices to “complement”.

Therefore, lack of access to these devices introduce major obstacles in the wide adoption of ICT strategy. Current devices may not be compatible with the new ICT strategy for Kenyatta National Hospital. This may lead to reluctance to get rid of the current systems already in place to have an integrated system (Davdson & Heslinga, 2013).

2.3.3. Distance

Gatero (2010) noted that ICT has evolved over time as a means of overcoming two principle communication barriers: time and distance. It is assumed that codified knowledge can be exchanged regardless of distance by using technologies for communication. However, to transfer tacit knowledge requires to share a common work experience through face to face relations. As a consequence, geographical proximity appears as a necessary condition for an efficient share of knowledge, especially in the case of tacit knowledge as well as intensive activities such as innovation creation and diffusion.

Whereas information may be transmitted across distances, to transfer knowledge needs communication and repeated interactions. Therefore, the geographical location of clients will influence ICT strategy adoption (Drury, 2015).

2.3.4. Lack of electricity

According to IEA (2009), 1.5 billion people worldwide lack access to electricity. This severely impedes economic development (Zerriffi, 2010). Electricity is central to: income generating activities for small and large scale businesses, provision of health services (i.e. lighting for
emergency surgeries at night, refrigeration of vaccines), and for education among other uses. In addition, electricity can enhance social connectivity through the shared experiences of television radio and the use of cellular phones (Agarwal & Prasad, 2013). The electricity access problem is most severe in sub-Saharan Africa, where almost half of the population is without electricity (IEA 2009). Rural/urban disparities in electricity access are also prevalent in sub-Saharan Africa, where the urban electrification rate is 57%, but only 12% of people have access to electricity in rural areas (IEA 2009). Without electricity, it is impossible to successfully adopt ICT strategy.

According to Kenyanya (2015), many counties in Kenya have remote areas without access to electricity. Kenya being a developing country, the government has not been able to connect all parts of the country to the national electricity grid. Consequently, those health care facilities that fall under such areas are left handicapped and may not be able to adopt ICT strategy.

2.3.5. Privacy and Security

When the health care facility makes its decision based on the information processed by the system, privacy should be considered. It is important to note that managers use knowledge of health information mainly for financial and strategic matters which focus more on risk issues than security issues (Frank, Shiv, & Faustin, 2012). A study done by Sommestad et al., (2011) found that security flaws are common in medical information and control systems operating critical infrastructure. Privacy needs to be maintained especially in medical information and treatment matters of any health care facility. In the western developed countries, the right to privacy is taken seriously and private information in the health and financial activities is protected by law (Wymer & Regan, 2015).

Despite the presence of other challenges that countries may face in the adoption of ICT strategy in the public health care sector; privacy and security are the two most important challenges involved in protecting patient healthcare information from accidental or intentional misuse (Maheu, Hitten, & Allen, 2013). System stability, in the context of the security and privacy credentials given to the authorized users, computerized health record systems deal with sensitive medical information on patients which should be treated with confidentiality. In the USA, security and privacy is enforced by use of passwords dependent on sub-routines that
check against a hash-code of the password. They have enacted strict privacy laws regarding patient information to improve the security of ICT applications (U.S. Department of Health and Human Services, 2012; Pascale Carayon, 2009). One of the important tools for data security is by using audit trails as some of the security breaches might have resulted from misuse of access privileges by authorized persons (Curry, 2010).

In Indonesia, as most of ICT implementations elsewhere, this is done by hospital incentives, and many of them are relying on the password protection for the security (Drury, 2015). However, with the lack of clear security standards ethical issues are likely to arise. The confidentiality of the patient healthcare information may be broken internally or by accidental disclosure, insider curiosity or insider subordination or may be broken from outside intrusion through unauthorized access. It is of utmost importance to keep such information safe because if otherwise revealed to unauthorized parties it could then cause legal suits (Frank, Shiv, & Faustin, 2012).

Inappropriate disclosure of patient information also leads to legal problems. According to (Wittig, 2013) health care professionals are more concerned about legal issues than the patients themselves since they are more aware of their professional work ethics. Reliability of the systems is the probability that a device performs its intended function within the set parameters. A system dealing with patient information must offer reliability in order to give the health care professionals some confidence that the system will always be available when needed. Technically, a major concern would be secure access to patient records if there are technical hitches within the systems hardware and software (Chesher & Skok, 2010). Privacy and security is a very serious challenge facing ICT strategy adoption in Kenyatta National Hospital.

2.4. Influence of Skills and Knowledge Gaps on the Adoption of ICT Strategy

Physicians as well as the patients have been found to have insufficient skills and technical knowledge in dealing with ICT innovations, which has resulted in resistance in the implementation of ICT initiatives in healthcare (Zerriffi, 2010).
2.4.1. Lack of training

Unqualified people will be unable to operate the financial Information System properly. That is why organizations are encouraged to employ qualified personnel, and if not they should have programs to train them (Calman, Kitson, & Hauser, 2010). Since training the unqualified staff is costly, organizations are encouraged to recruit only qualified staff to avoid extra costs. A study conducted by Mirza and Riaz (2012) to assess the need for training in the health sector found that in practice training identifies more than one training need; the training manager, working with management, prioritizes the training based on urgency, the number of employees needing training, and the resources required. Most health care facilities adopt the strategy of outsourcing the operation of health care information systems. Outsourcing of activities is cheaper as there are no extra costs associated with the training of employees.

Training boosts awareness and confidence level as users can overcome technophobia while relating usage to expected benefits (Sahay and Walsham, 2012). In countries that have assimilated ICT training for clinicians on the global stage, acceptance of eHealth and actual use is relatively high (Khan et al., 2012). Qureshi et al. (2013) argue that optimal use of IT towards the transformation of health care requires IT knowledge in the medical communities. As the disadvantaged users are playing catch up, the advantaged ICT users are always adopting newer technology and services. According to Malik et al. (2010) sluggish internet use among doctors in Pakistan was due to unavailability of proper technology and lack of computer training.

Without adequate ICT training, user involvement in selection and development of ICT systems becomes difficult and if it happens, it is not only to rubberstamp the experts’ decisions. This might lead to having health care systems that are not widely accepted or used adequately. According to IT-Online (2015), although there are many ICT solutions available they are neither well-known nor much used an explanation for this anomaly is the limited availability of suitable technologies. In a study by Sood et al. (2014) which examined challenges that healthcare workforce face while implementing ICT strategy, technology and computer literacy was the main challenge. Omary et al. (2011) attributes low adoption of ICT strategy among developing countries to lack of computer skills amongst the clinicians. There exists a training gap between high, medium, low and non-users. Computerized Health Records are hi-tech
systems and complex hardware and software; therefore, a certain level of computer knowledge is required for its effective use (Miller and Sim, 2013). There are inadequate personnel with capacity for management and data analysis.

The health care professionals must show willingness to invest in Information Technology for enhanced quality assurance Cibulskis and Hiawalyer (2012). According to Flanagan (2013), technology integration is meant to be cross curricular rather than become a separate course or topic in itself. In the same context, most of the current generation of experienced health care professionals received their qualifications before IT programs were introduced and for those still in study don’t have that much concentration on studying IT related courses. Health care system developers overlook the level of computer skills required from health care professionals to efficiently operate the system like good typing skills to enter patient medical information, notes and prescriptions into the health care system and general knowledge on how database systems work could be lacking and could lead to typos. This general lack of skills could hinder the wide adoption of ICT strategy.

Also, complexities of systems due to the amount of data they need to store refine and give a comprehensive report. For those with limited ICT training might have a problem with catching up on the usability of some ICT functions and systems. In general, the systems might not have the appropriate graphical user interface that is easy to maneuver around. The lack of ICT training could lead the health care professionals to regard the health care system as extremely complicated. Miller and Sim, (2014) argue that health care systems could be challenging to use because of the multiplicity of screens, many unclear options and navigational aids”. The complexity and usability problem could result in wrong system feeds and wrong interpretation. Further health care practitioners must allocate time and effort to master the systems so that they can handle the system effectively and efficiently. There could also be the concern of the ever-changing technology. The machine based systems could become obsolete as time passes and not be valid to use any more as the systems reach their limitations (Arendt, 2013).

The correlation between ICT training and adoption of health care systems is also discussed by Ojo et al (2011) who points out that inadequate ICT skills in the health sector in Kenya explains the low adoption of health care technology systems. Hogan and Palmer (2015) believe those
health care professionals who lack the ICT skills of processing the online health data end up spending too much time on the same. According to Miller and Sim (2014), the health care professionals might have some ICT training but the systems available cannot meet their special needs or requirements. Some health care professionals could also use the excuse that the systems are not “customized” for them but for larger health facilities. According to Randeree (2011), "customizability refers to the ability to be adapted of the technology system that fails to conform to specific needs of the user applications".

Health care professionals are not technical nor are they ICT experts, hence for them to operate the systems they need as much training and support for the systems and they might be reluctant to adopt the systems if they are not given adequate support (Ludwick et al, 2010). Simon et al (2012) similarly noted that “health care professionals struggle to get appropriate technical training and support for the systems from the vendor and if they do get this support it comes at a cost”.

2.4.2. Illiteracy in Technology

Illiteracy has largely affected ICT strategy adoption in the health care sector. Culture may influence the level of illiteracy in information technology and even in other fields such as record keeping (Bukachi & Walsh, 2012). For example, in some cultures technology is believed to be evil and meant to destroy the young and growing generation. Cultural dimensions have a greater influence on takeoff time in countries with highly developed economies, dense populations and low illiteracy rates. Cultural dimension of individualism also has a significant context independent influence on takeoff dynamics, whereas masculinity has no such effect (Calman, Kitson, & Hauser, 2010). By these authors saying that masculinity has no effect on illiteracy, it contrasts with some African communities that also believe that men are supposed to be more educated than women.

In fact, they believe that educating a girl child is only waste of money and resources as the girl will finally be married. Kumar, Mitra & Murayama (2013) revealed that in India the probability of working is higher for a male child compared to a girl child because girl children are often engaged in household activities and even when they are engaged in income earning jobs they are displayed as helpers. Even where the health care systems operate efficiently in the
organization, the users of medical information are unable to interpret the results. This leads to
the users making wrong investment decision because they do not understand the terms used in
the financial reports and are unable to interpret the medical results effectively (Gatero, 2010).

As most organizations look for qualified people to fill different positions in the organization,
they must also consider other factors. These include the ability of leading, motivating,
innovating, being independent and working under pressure. This is the reason why besides
seeking academic qualification, computer literacy and relevant working experience, most
potential employers now require graduates to possess additional qualities such as leadership,
motivation, innovative skills, being independent and able to work under pressure. The
government of Kenya is trying to do away with illiteracy level in women by supporting girl
child education and even encouraging women to innovate by providing youth and women with
funds. The government is also trying to improve technology in the country through laptop
project, where the standard one kids will be provided with laptops (Nyella & Mndeme, 2010).

With regards to the skills issue, Mugo (2014) explored that health care institutions tend to
avoid the use of ICT in their operations, if it is complex. Alam and Noor (2009) also identify
the lack of suitable technical and managerial staff with sufficient ICT expertise as a major
barrier for the health care sector in terms of adopting ICT strategy and concludes the health
care facilities usually lack skills amongst their workforce.

Lack of skilled staff frustrates successful ICT strategy implementations. It is often reported
that hospitals are unable to use equipment effectively, despite the confirmation to the
specifications. This is due to lack of human resource skills (Frank, Shiv, & Faustin, 2012).
Similarly, Lee and Kim (2012) advocate that lack of technological skills amongst the health
care workers / employees and their management capability can be a barrier to the adoption and
extension of ICT systems. The authors highlighted in their research, that some health care
practitioners are concerned about the introduction of ICT because of the fear that their
employees might not be familiar with it.

2.4.3. Effective Leadership

Effective leadership entails ability to inspire employees to be honest, to be confident, to
encourage team work, to communicate effectively and to make right decisions, and to help
employees achieve goals (Zerriffi, 2010). People have different perceptions about leadership and that is why one person can be called a leader by some people while others regard him or her as a ruler. According to Muchiri, Ray and Cooksey (2011), males and non-management employees perceive effective leadership as that which emphasizes fairness, equality and honesty, develops staff, fosters workplace harmony, and is trustworthy. Female employees see effective leadership as one with ability to communicate, make decisions and support by the leader. They see it as being important tool of evaluating how a department contributes to achievement of organizational goals. Finally, employees at the management level underscore vision, support by the leader, and see integrity as important on how a work unit could contribute to organizational leadership effectiveness (Beckinsale & Ram, 2010).

Effective leadership can help improve ICT strategy adoption because it increases employees’ morale and improves the working environment. Hughbank and Horn (2013) noted that certain leadership approaches are formal, only succeeding in formal settings and environments while others are dependent upon conditioning of the leader. Regardless of one’s leadership style and characteristics, it is critical that both leaders and followers define and understand the variances between failure and success within an organization. This means that for leadership to be effective the leader and followers need to understand each other properly, because without it the organization will be full of conflicts. An example is conflict arising because an employee did not record in the health care system all the patients’ details and information as well as prescriptions made by the doctors (Frank, Shiv, & Faustin, 2012).

Effective leadership increases the health care facility operations and performance because the facility can achieve its goals as the leaders envision and empower and inspire employees. This in turn motivates employees and enables them to perform their duties efficiently. Organizations with recognized leadership brands outperform others in their industry in revenue, net income, and share price and leadership reputation increases even more significantly in a tough economy (McLaughlin & Mott, 2010). Development of leadership should be comprehensive and systematic to produce leaders who can face the organizational changes with confidence (Agarwal & Prasad, 2013).

There should be no discrimination of employees in the work place. When some employees are discriminated against others, they feel isolated leading to demoralization. When a section of
employees is isolated by their managers or supervisors, they can be tempted to tamper with the health care system as a way of revenging against the facility for the discrimination. According to Appelbaum, Semerjian and Mohan (2012), transformational and ethical leadership are both very effective tools for managers to counter workplace bullying and is the means of installing ethical climate in the workplace as the most effective way of avoiding workplace bullying.

For leadership to be effective management should make efforts of improving leader employee relationship. Improved leadership in turn improves performance of health care systems and increases acceptance of the ICT strategy. The managers must have to realize that the tendency for individuals to act selfishly on behalf of their organization is unethical and therefore being aware of this behavior will provide leaders with a greater ability to build trust and develop joint strategies which will provide positive outcomes (Meaklim, 2013). Leaders should therefore understand that working with employees in the right way leads to achievement of sustainable performance and a deep understanding of complexity and the importance of systems. In addition, conducive working environment for employees creates sensitivity to the role of the leader in creating conditions of trust and empowerment through their own behavior and self-awareness (Davdson & Heslinga, 2013). Effective leadership is all what is needed by most organizations for their financial information systems to function properly and bring out fantastic results.

2.5. Chapter Summary

This chapter reviewed the literature based on factors influencing adoption of ICT strategy in Kenyatta National Hospital, the challenges facing ICT strategy adoption and the measures that can improve the adoption of ICT strategy adoption. Each research question was analyzed in detail. Chapter three shall describe the research methodology to be used in the study while chapter four shall analyze the results and findings of the study using SPSS. Finally, chapter five shall discuss the findings of the study, as well as make conclusions and recommendations.
CHAPTER THREE

3.0 RESEARCH METHODOLOGY

3.1 Introduction

This chapter presents the research methodology used in the study. It comprises the research design, population and sampling design, data collection methods, research procedures and data analysis methods used in the study. The chapter ends with a summary.

3.2 Research Design

Research design is the blueprint for fulfilling objectives and answering questions (Cooper & Schindler, 2014). The study will use descriptive research design to explain the factors influencing the adoption of ICT strategy in Kenyatta National Hospital. According to Hodkinson (2009), descriptive studies are often designed to collect data that describe the characteristics of persons, events or situation. Descriptive research design can be quantitative or qualitative. Quantitative research design is chosen because it will help the researcher to know more about the characteristics of the population and to understand the aspects in the field of study and draw accurate conclusions and make recommendations.

A survey in form of standardized questions will be conducted on Kenyatta National Hospital personnel. The independent variable of the study is ICT strategy while the dependent variable is health sector. The study is guided by three variables which include factors influencing ICT strategy adoption, how infrastructure influences ICT strategy adoption and skill and knowledge gaps that influence the adoption of ICT strategy in the Kenyatta National Hospital.

3.3 Population and Sampling Design

3.3.1 Population

Cooper and Schindler (2014) defined population as the total collections of elements about which the researcher wishes to make inferences. The target population of the study will be the personnel at Kenyatta National Hospital. Kenyatta National Hospital which has a population of 3047 (Source: Human Resource Records Complement 2015).
Table 3.1: Population of the study

<table>
<thead>
<tr>
<th>Category</th>
<th>No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Medical Staff (Physicians, Dentists &amp; Pharmacists)</td>
<td>308</td>
</tr>
<tr>
<td>Nursing Staff</td>
<td>2209</td>
</tr>
<tr>
<td>Accountants</td>
<td>42</td>
</tr>
<tr>
<td>Administration and Record Officers</td>
<td>134</td>
</tr>
<tr>
<td>ICT (Administrators &amp; Support)</td>
<td>32</td>
</tr>
<tr>
<td>Human Resource Officers</td>
<td>34</td>
</tr>
<tr>
<td>Supply Chain</td>
<td>167</td>
</tr>
<tr>
<td>Lab Technologists and Technicians</td>
<td>225</td>
</tr>
<tr>
<td>Management</td>
<td>60</td>
</tr>
<tr>
<td>Occupational Therapists &amp; Physiotherapists</td>
<td>170</td>
</tr>
<tr>
<td>Social Workers</td>
<td>125</td>
</tr>
<tr>
<td>Support Staff (Cleaners)</td>
<td>916</td>
</tr>
<tr>
<td>Interns</td>
<td>37</td>
</tr>
<tr>
<td>Nutrition and Dietetic</td>
<td>12</td>
</tr>
<tr>
<td>Security</td>
<td>34</td>
</tr>
<tr>
<td>Drivers</td>
<td>45</td>
</tr>
<tr>
<td>Counsellors</td>
<td>31</td>
</tr>
<tr>
<td>Ethics and Research</td>
<td>23</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td><strong>4604</strong></td>
</tr>
</tbody>
</table>

3.3.2 Sampling Design

Sampling is a method used to select a representative population from the total population (Creswell, 2010). Although collecting data from the total population is desirable, this may not be achieved for a large population size. Sampling therefore enables a researcher to choose some elements which shall represent the total population.

3.3.2.1 Sampling Frame

Sampling frame is the list of elements from which the sample is drawn (Cooper & Schindler, 2014). The sampling frame should consist of the targeted population. The sampling frame for this research is the number of employees across various departments as summarized in the
table below. This data was obtained from the human resource database and provides a list of employees in the departments as seen in the table 3.1 above.

3.3.2.2 Sampling Technique

A sampling technique is the method of selecting a sample to represent a total population (Creswell, 2010). The stratified random sampling technique will be used for this research. Stratified sampling gives every stratum a chance of being selected to ensure a proportionate representation of population in the sample. In addition, the simple random technique will be used. Simple random sampling consists of a sample of individuals that exist in a population i.e. the individuals are randomly selected from the population and placed into a sample. In this case, the reason for using simple random sampling is to select a sample size that is an unbiased representation of the population.

3.3.2.3 Sample Size

A sample size is described as a set of elements from which data is collected. Large sample sizes are preferred by researchers (Cooper & Schindler, 2014). Kenyatta National Hospital has a large population and not all staff will be relevant for this proposal. However, the following categories of staff were deemed relevant for the study; Medicine, Management, Finance and Accounts, Information Technology (IT), Therapy, Human Resource as well as Administration and Records. The sample size for this research was 10 percent of the aforementioned population which amounted to 78 respondents as shown in the table below. This was representative of the selected departments from the total population shown in the table below.

<table>
<thead>
<tr>
<th>Category</th>
<th>No.</th>
<th>10% Staff</th>
</tr>
</thead>
<tbody>
<tr>
<td>Medicine</td>
<td>308</td>
<td>31</td>
</tr>
<tr>
<td>Management</td>
<td>60</td>
<td>6</td>
</tr>
<tr>
<td>Finance and Accounts</td>
<td>42</td>
<td>4</td>
</tr>
<tr>
<td>Information Technology (IT)</td>
<td>32</td>
<td>3</td>
</tr>
<tr>
<td>Therapy</td>
<td>170</td>
<td>17</td>
</tr>
<tr>
<td>Human Resource</td>
<td>34</td>
<td>4</td>
</tr>
<tr>
<td>Administration and Records</td>
<td>134</td>
<td>13</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td><strong>780</strong></td>
<td><strong>78</strong></td>
</tr>
</tbody>
</table>
3.4 Data Collection Methods

A structured questionnaire will be used to collect primary data. A structured questionnaire is a set of coded questions with well-defined patterns following a sequence of questions (Acharya, 2010). These are preferred as they are easy to administer and have few dependencies during data analysis. A Likert scale of one to five will be used to measure the extent to which the respondents agree or disagree with the questions. The scales will include: strongly disagree (1), disagree (2), neutral (3), agree (4) and strongly agree (5). Some questions will have an option of “other” where respondents can describe other responses not included in the structured section. It will be divided in four parts. Part I will comprise of demographic information about the respondent, their departments of work and their tenure with the hospital. Part II will comprise of financial factors affecting the adoption of ICT strategy in the Kenyatta National Hospital: cost of equipment, procurement procedures, cost of hiring skilled personnel, and internet connectivity. Part III will evaluate how infrastructure influences adoption of ICT strategy in the Kenyatta National Hospital while part IV will look at how skills and knowledge gaps influence the adoption of ICT strategy in the Kenyatta National Hospital.

3.5 Research Procedures

Before collecting any information, the researcher shall request authority from Kenyatta National Hospital to conduct the study from their organization. The researcher will then conduct a pilot test of the questionnaire using a sample of five respondents randomly selected from the sampling frame. The pilot study will be used to identify any errors and unclear or ambiguous items in the questionnaire. Feedback from the pilot study will be used to correct any errors in the questionnaire before the researcher proceeds with data collection. The researcher will book appointments with the officers in the health care facility involved in the study to enable fast collection of data. The questionnaires will be distributed to the various randomly selected respondents at Kenyatta National Hospital. To ensure that the researcher gets a high response rate, the questionnaire will be written in simple and clear terms. The researcher shall be available to clarify any issue to the respondents. The researcher will give the respondents a period of one week to fill their questionnaires. The questionnaires shall be accompanied with a cover letter assuring that confidentiality will be highly observed. The
researcher will provide incentive by promising summarized copy of findings to the respondents.

3.6 Data Analysis Technique

Quantitative technique will be used for analysis. The variables will be coded and entered in Statistical Packages for Social Sciences (SPSS) version 24.0 computer software. The data collected will be coded, edited for errors and then analyzed. The data obtained from the research instruments will be analyzed by use of descriptive statistics mainly frequency distribution tables, percentages, mean and correlation coefficient. The study will make use of both the graphical and numerical techniques to summarize the data. The presentation of data will be in form of pie charts and graphs for easier interpretation. This will enable more understanding of the results and findings.

3.7 Chapter Summary

This chapter describes the methodology that will be applied in carrying out the study. The research design applied will be descriptive. The population will be comprised of 77 Kenyatta National Hospital staff. Due to the large number of staff, it is therefore, appropriate to use the descriptive research design. The chapter describes in details the research design, population and sampling design, data collection methods, research procedures and data analysis methods. The next chapter will discuss the research findings while chapter five will present a summary of the study and make conclusions and recommendations based on the result findings in chapter four.
CHAPTER FOUR

4.0 DATA ANALYSIS AND PRESENTATION

4.1 Introduction

The responses to the questionnaire to the respondents were analyzed. This chapter presents the finding of the study and from the four parts of the questionnaire which collected data on the demographic information of the staff, the economic factors that influence ICT strategy adoption, extent to which infrastructure influences adoption of ICT strategy, as well as how skills and knowledge gaps influence ICT strategy adoption in the Kenyan public health sector. It is presented in tables, graphs and pie charts to describe the data.

4.2 Findings from Demographic Data

This section presents the responses from the participants in the organization. The Kenyatta National Hospital has a total of four thousand, six hundred and four staff (4,604). However, for purposes of this study, seven out of all eighteen departments were deemed relevant for this study and were chosen to represent the entire hospital population. The target population for the study was ten percent of the staff from the seven departments mounting to seventy-eight (78). The response rate achieved was 88.46% as represented in the table below.

Table 4.1: Response Rate

<table>
<thead>
<tr>
<th>DEPARTMENT</th>
<th>MALE</th>
<th>FEMALE</th>
<th>RESPONSE RATE</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Medicine</td>
<td>12</td>
<td>11</td>
<td></td>
</tr>
<tr>
<td>2 Management</td>
<td>4</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>3 Finance and Accounts</td>
<td>2</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>4 Information Technology (IT)</td>
<td>2</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>5 Therapy</td>
<td>6</td>
<td>11</td>
<td></td>
</tr>
<tr>
<td>6 Human Resource</td>
<td>2</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>7 Administration &amp; Records</td>
<td>8</td>
<td>5</td>
<td></td>
</tr>
<tr>
<td>SUM</td>
<td>36</td>
<td>33</td>
<td>88.46%</td>
</tr>
</tbody>
</table>
4.2.1 Gender of the Respondents

Fifty two percent (52%) of the respondents were male while forty eight percent (48%) of the respondents were female. This is represented graphically by figure 4-1 and is representative of the Kenyatta National Hospital population.

![Figure 4-1: Respondents Gender](image)

4.2.2 Age of the Respondents

The respondent’s ages were grouped in a ten-year range from between 20-30 to 51 to 60. Most respondents were aged between 41 and 50. This is represented in figure 4-2 below.

![Figure 4-2: Respondents Age](image)
4.2.3 Number of Years at the Organization

The number of years an employee has worked in an organization was grouped in five ranges from zero to more than 21. Most respondents were found to have worked for the organization between six and ten years as shown in the table below.

<table>
<thead>
<tr>
<th>Years</th>
<th>Frequency</th>
<th>Cumulative Frequency</th>
<th>Percent (%)</th>
<th>Cumulative Percent (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>0-5</td>
<td>18</td>
<td>18</td>
<td>26</td>
<td>26</td>
</tr>
<tr>
<td>6-10</td>
<td>20</td>
<td>38</td>
<td>29</td>
<td>55</td>
</tr>
<tr>
<td>11-15</td>
<td>19</td>
<td>57</td>
<td>27</td>
<td>82</td>
</tr>
<tr>
<td>16-20</td>
<td>10</td>
<td>67</td>
<td>15</td>
<td>97</td>
</tr>
<tr>
<td>21 and over</td>
<td>2</td>
<td>69</td>
<td>3</td>
<td>100</td>
</tr>
</tbody>
</table>

4.2.4 Departments in the Organization

There were seven departments selected for the study namely: Medical staff, Management, Accountants ICT, Occupational Therapy, Human Resources, Administration and Records Officers. Given that the operations of Kenyatta National Hospital focus on healthcare, it follows that most of the staff are in the Medical and Therapy departments as shown in figure 3 below.

Figure 4-3: Respondents Work Department
4.2.5 Marital Status

The study captured the marital status of the staff. It was found that 59% of the respondents are married while 41% are single as shown in the figure below.

![Pie chart showing marital status](image)

*Figure 4-4: Respondents Marital Status*

4.3 Financial Factors Influencing ICT Strategy Adoption at Kenyatta National Hospital

The purpose of the study was to investigate the factors influencing adoption of ICT strategy in the Kenyan public health sector and focused on Kenyatta National Hospital. The questionnaire addressed the research questions in three sections:

Section 1: What are the financial factors that influence ICT strategy adoption in Kenyan public health sector? – A case study of Kenyatta National Hospital

Section 2: To what extent does infrastructure influence ICT strategy adoption in Kenyan public health sector? – A case study of Kenyatta National Hospital

Section 3: To what extent to skills and knowledge gaps influence ICT strategy adoption in Kenyan public health sector? – A case study of Kenyatta National Hospital
The results from each section are discussed in this chapter. The respondents were asked to identify the extent to which financial factors such as cost of equipment, cost of hiring new personnel, high cost of installation, procurement procedures, poor resource management as well as business practices influence ICT adoption in the Kenyatta National Hospital.

To determine the financial factor affecting ICT strategy adoption, the mean, standard deviation and co-efficient of variation were computed as shown in below.

### Table 4.3: Financial Factors

<table>
<thead>
<tr>
<th>Financial Factors</th>
<th>Mean</th>
<th>Std. Deviation</th>
<th>CoEff of Variation</th>
<th>Rank</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cost of Equipment</td>
<td>4.03</td>
<td>1.084</td>
<td>0.269</td>
<td>2</td>
</tr>
<tr>
<td>Cost of Hiring New Personnel</td>
<td>3.72</td>
<td>1.149</td>
<td>0.308</td>
<td>5</td>
</tr>
<tr>
<td>High Cost of Installation</td>
<td>3.78</td>
<td>1.162</td>
<td>0.307</td>
<td>4</td>
</tr>
<tr>
<td>Procurement Procedures</td>
<td>4.17</td>
<td>0.804</td>
<td>0.193</td>
<td>1</td>
</tr>
<tr>
<td>Poor Resources Management</td>
<td>3.36</td>
<td>1.248</td>
<td>0.371</td>
<td>6</td>
</tr>
<tr>
<td>Business Practices</td>
<td>3.80</td>
<td>1.119</td>
<td>0.295</td>
<td>3</td>
</tr>
</tbody>
</table>

The mean and the standard deviation of the variables are not sufficient in ranking the most significant financial factor influencing ICT strategy adoption. The coefficient of variation was hence used which is the standard deviation divided by the mean of the variables. The lower the coefficient the higher the rank of the factor. Procurement procedures was the highest ranked financial factor while poor resource management was ranked lowest as a financial factor influencing ICT strategy adoption at the Kenyatta National Hospital.

### 4.4 Infrastructure Factors Influencing ICT Strategy Adoption at Kenyatta National Hospital

Infrastructure may influence the adoption of ICT strategy adoption in several ways. This research analyzed the following six factors: Level of IT investment, patient exposure to technology, patient medical history, distance, privacy and security as well as lack of electricity.

### 4.4.1 IT Investment
The level of investment in IT can influence ICT strategy adoption in any organization. IT investment factors include all staff having computers with access to Internet and intranet, accessibility of essential services and devices by staff to perform work outside the office, sufficiently trained staff in the efficient and effective use of IT resources, hospital having a dedicated IT department, customized software for the different departments, as well as integrated software to manage funding and budget. The results from the survey are summarized in the table below.

Table 4.4: IT Investment Factors

<table>
<thead>
<tr>
<th>IT Investment Factors</th>
<th>Mean</th>
<th>Std. Deviation</th>
<th>CoEff of Variation</th>
<th>Rank</th>
</tr>
</thead>
<tbody>
<tr>
<td>IT Investment: All staff have workstations with access to intranet and internet for communications</td>
<td>2.13</td>
<td>0.640</td>
<td>0.300</td>
<td>5</td>
</tr>
<tr>
<td>IT Investment: All staff able to access essential services and devices and perform work outside the office</td>
<td>2.01</td>
<td>0.556</td>
<td>0.276</td>
<td>2</td>
</tr>
<tr>
<td>IT Investment: All staff have been sufficiently trained on effective and efficient use of IT resources</td>
<td>2.35</td>
<td>0.872</td>
<td>0.371</td>
<td>6</td>
</tr>
<tr>
<td>IT Investment: The hospital has a dedicated IT department</td>
<td>4.29</td>
<td>0.709</td>
<td>0.165</td>
<td>1</td>
</tr>
<tr>
<td>IT Investment: Each department uses customized software</td>
<td>2.80</td>
<td>0.797</td>
<td>0.285</td>
<td>3</td>
</tr>
<tr>
<td>IT Investment: The hospital has integrated software to manage their funding and budget</td>
<td>2.51</td>
<td>0.740</td>
<td>0.295</td>
<td>4</td>
</tr>
<tr>
<td>IT Investment: All Circulars and other internal documents are available and easily searchable electronically</td>
<td>2.13</td>
<td>0.821</td>
<td>0.385</td>
<td>7</td>
</tr>
</tbody>
</table>

From the coefficient of variation, the hospital has a dedicated IT department was ranked as the most significant infrastructure and IT investment factor while all circulars and other internal documents are available and easily searchable electronically was the least significant factor influencing adoption of adoption of ICT strategy in the Kenyatta National Hospital.
4.4.2 Patient Exposure

Patient exposure could have an influence on the adoption of ICT strategy adoption in an organization. The survey attempted to establish the extent to which patient exposure influences adoption of ICT strategy at the hospital. The results are summarized in the table below.

*Table 4.5: Patient Exposure*

<table>
<thead>
<tr>
<th>Extent</th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Very great extent</td>
<td>6</td>
<td>9</td>
</tr>
<tr>
<td>Great extent</td>
<td>17</td>
<td>25</td>
</tr>
<tr>
<td>Moderate extent</td>
<td>23</td>
<td>33</td>
</tr>
<tr>
<td>Less extent</td>
<td>20</td>
<td>29</td>
</tr>
<tr>
<td>Not at all</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>69</strong></td>
<td><strong>100</strong></td>
</tr>
</tbody>
</table>

Most respondents indicated that patient exposure has a moderate influence on the adoption of ICT strategy at Kenyatta National Hospital.

4.4.3 Patient Medical History

The survey aimed to establish if patient medical history has any influence on ICT strategy adoption at the Kenyatta National Hospital. The table below summarizes the outcome from the respondents.

*Table 4.6: Patient Medical History*

<table>
<thead>
<tr>
<th>Extent</th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Very great extent</td>
<td>19</td>
<td>28</td>
</tr>
<tr>
<td>Great extent</td>
<td>20</td>
<td>29</td>
</tr>
<tr>
<td>Moderate extent</td>
<td>21</td>
<td>30</td>
</tr>
<tr>
<td>Less extent</td>
<td>8</td>
<td>12</td>
</tr>
<tr>
<td>Not at all</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>69</strong></td>
<td><strong>100</strong></td>
</tr>
</tbody>
</table>

The survey showed that most respondents felt that patient medical history influences adoption of ICT strategy at the Kenyatta National Hospital to a great extent.
4.4.4 Distance

Patient distance from the health facility was a factor that the survey sought to investigate to find the extent to which it influences ICT strategy adoption in the hospital. The analysis is summarized below.

*Table 4.7: Distance*

<table>
<thead>
<tr>
<th>Extent</th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Very great extent</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>Great extent</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Moderate extent</td>
<td>27</td>
<td>39</td>
</tr>
<tr>
<td>Less extent</td>
<td>16</td>
<td>23</td>
</tr>
<tr>
<td>Not at all</td>
<td>22</td>
<td>32</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>69</strong></td>
<td><strong>100</strong></td>
</tr>
</tbody>
</table>

It was clear that most of the respondents felt that distance has a moderate influence on the adoption of ICT strategy at the Kenyatta National Hospital.

4.4.5 Privacy and Security

Privacy and security could have an influence on the adoption of ICT strategy adoption in the health sector. The survey attempted to establish the extent to which privacy and security influences adoption of ICT strategy at the hospital. The results are summarized in the table below.

*Table 4.8: Privacy and Security*

<table>
<thead>
<tr>
<th>Extent</th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Very great extent</td>
<td>43</td>
<td>62</td>
</tr>
<tr>
<td>Great extent</td>
<td>18</td>
<td>26</td>
</tr>
<tr>
<td>Moderate extent</td>
<td>4</td>
<td>6</td>
</tr>
<tr>
<td>Less extent</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>Not at all</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>69</strong></td>
<td><strong>100</strong></td>
</tr>
</tbody>
</table>

Majority of the respondents felt that privacy and security influences the adoption of ICT strategy at Kenyatta National Hospital to a very great extent.
4.4.6 Lack of Electricity

The survey aimed to establish if lack of electricity has any influence on ICT strategy adoption at the Kenyatta National Hospital. The table below summarizes the outcome from the respondents.

Table 4.9: Lack of Electricity

<table>
<thead>
<tr>
<th>Extent</th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Very great extent</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Great extent</td>
<td>9</td>
<td>13</td>
</tr>
<tr>
<td>Moderate extent</td>
<td>9</td>
<td>13</td>
</tr>
<tr>
<td>Less extent</td>
<td>18</td>
<td>26</td>
</tr>
<tr>
<td>Not at all</td>
<td>32</td>
<td>46</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>69</strong></td>
<td><strong>100</strong></td>
</tr>
</tbody>
</table>

The survey revealed that lack of electricity does not influence the adoption of ICT strategy in Kenyatta National Hospital at all.

4.4.7 ICT Utilization

ICT utilization in an organization can have tremendous impact on ICT strategy adoption. The survey sought to investigate on how ICT is utilized in Kenyatta National Hospital to determine if in deed ICT has been embrace in the day to day operations. The table below shows the outcome from the survey.

Table 4.10: ICT Utilization

<table>
<thead>
<tr>
<th>ICT Utilization</th>
<th>Mean</th>
<th>Std. Deviation</th>
<th>CoEff of Variation</th>
<th>Rank</th>
</tr>
</thead>
<tbody>
<tr>
<td>ICT Utilization: Setting up patient appointments</td>
<td>1.77</td>
<td>0.83</td>
<td>0.47</td>
<td>5</td>
</tr>
<tr>
<td>ICT Utilization: Alerting patients on the next due appointments</td>
<td>1.58</td>
<td>0.65</td>
<td>0.41</td>
<td>3</td>
</tr>
<tr>
<td>ICT Utilization: Store patient information from birth</td>
<td>1.65</td>
<td>0.72</td>
<td>0.44</td>
<td>4</td>
</tr>
<tr>
<td>ICT Utilization: Preparing annual objectives and budgets</td>
<td>1.59</td>
<td>0.63</td>
<td>0.39</td>
<td>1</td>
</tr>
<tr>
<td>ICT Utilization: Sensitization and creating awareness of vaccines</td>
<td>1.48</td>
<td>0.58</td>
<td>0.40</td>
<td>2</td>
</tr>
</tbody>
</table>
The coefficient of variation was used which is the standard deviation divided by the mean of the variables. The lower the coefficient the higher the rank of the factor. Preparing annual objectives and budgets was the highest ranked ICT utilization factor while setting up patient appointments was ranked lowest as an ICT utilization factor influencing ICT strategy adoption at the Kenyatta National Hospital.

4.5 Skills and Knowledge Gaps Influencing Adoption of ICT Strategy in Kenyatta National Hospital

Skills and knowledge gaps may influence the adoption of ICT strategy adoption in several ways. This research analyzed the following factors: Training, level of literacy in technology, as well as effective leadership. The responses were analyzed as follows:

4.5.1 Lack of Training

The survey sought to investigate the extent to which lack of training influences adoption of ICT strategy in Kenyatta National Hospital. The response was as shown in the table below.

<table>
<thead>
<tr>
<th>Extent</th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Very great extent</td>
<td>10</td>
<td>14</td>
</tr>
<tr>
<td>Great extent</td>
<td>20</td>
<td>29</td>
</tr>
<tr>
<td>Moderate extent</td>
<td>32</td>
<td>46</td>
</tr>
<tr>
<td>Less extent</td>
<td>6</td>
<td>9</td>
</tr>
<tr>
<td>Not at all</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>69</strong></td>
<td><strong>100</strong></td>
</tr>
</tbody>
</table>

Most respondents felt that Lack of training has an influence on ICT strategy adoption in Kenyatta National Hospital to a moderate extent.

4.5.2 Level of Literacy in Technology

The study tried to understand whether the level of literacy in technology among the hospital’s health care professionals influences the adoption of ICT strategy. The outcome from the respondents is shown in the figure below.
Most respondents implied that the level of literacy in technology has very little or hardly influences the adoption of ICT strategy at Kenyatta National Hospital.

4.5.3 Effective leadership

Effective leadership or lack thereof can have a considerable influence on ICT strategy adoption in any organization. This study sought to find out the extent effective leadership influences ICT strategy in the Kenyatta National Hospital. The table below summarizes the outcome from the survey.

<table>
<thead>
<tr>
<th>Extent</th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Very great extent</td>
<td>44</td>
<td>64</td>
</tr>
<tr>
<td>Great extent</td>
<td>19</td>
<td>28</td>
</tr>
<tr>
<td>Moderate extent</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>Less Extent</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>Not at all</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>Total</td>
<td>69</td>
<td>100</td>
</tr>
</tbody>
</table>
From the study, it was clear that the respondents felt that effective leadership in Kenyatta National Hospital influences the adoption of ICT strategy to a very great extent.

A cross tabulation of gender and the top ranked skills and knowledge gaps factors chosen by the respondents shows that there was a significant number of both male and female employees the top factors. The table below shows the total percent of gender that agreed to a very great extent, great extent as well as moderate extent with the various skills and knowledge factors affecting ICT strategy adoption in Kenyatta National Hospital.

*Table 4.13: Cross Tabulation of Skills and Knowledge Gaps*

<table>
<thead>
<tr>
<th>Skills &amp; Knowledge Gaps: Extent lack of training influences adoption of ICT strategy</th>
<th>Total</th>
<th>Agree to a great &amp; moderate extent Total %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Very great extent</td>
<td>Great extent</td>
<td>Moderate extent</td>
</tr>
<tr>
<td>Male</td>
<td>4</td>
<td>15</td>
</tr>
<tr>
<td>Female</td>
<td>6</td>
<td>5</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Skills &amp; Knowledge Gaps: Extent level of literacy in technology influences adoption of ICT strategy</th>
<th>Total</th>
<th>Agree to a moderate &amp; less extent Total %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Less than 20%</td>
<td>21%-40%</td>
<td>41%-60%</td>
</tr>
<tr>
<td>Male</td>
<td>5</td>
<td>12</td>
</tr>
<tr>
<td>Female</td>
<td>3</td>
<td>15</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Skills &amp; Knowledge Gaps: Extent effective leadership influences adoption of ICT strategy</th>
<th>Total</th>
<th>Agree to a very great &amp; great extent Total %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Very great extent</td>
<td>Great extent</td>
<td>Moderate extent</td>
</tr>
<tr>
<td>Male</td>
<td>22</td>
<td>14</td>
</tr>
<tr>
<td>Female</td>
<td>22</td>
<td>5</td>
</tr>
</tbody>
</table>
The financial, infrastructure, skills and knowledge factors influencing ICT adoption at Kenyatta National Hospital were further analyzed to determine their relationship with each other.

**Table 4.14: Correlation of Financial, Infrastructure, Skills and Knowledge Factors**

<table>
<thead>
<tr>
<th></th>
<th>Skills Knowledge</th>
<th>Infrastructure Factors</th>
<th>Financial Factors</th>
<th>Adoption Factors</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Skills</strong></td>
<td>-</td>
<td>-</td>
<td>0.110</td>
<td>0.014</td>
</tr>
<tr>
<td></td>
<td>1.000</td>
<td>-0.028</td>
<td>0.110</td>
<td>0.014</td>
</tr>
<tr>
<td><strong>Knowledge</strong></td>
<td></td>
<td>-0.028</td>
<td>0.370</td>
<td>0.014</td>
</tr>
<tr>
<td></td>
<td></td>
<td>0.817</td>
<td>0.370</td>
<td>0.014</td>
</tr>
<tr>
<td><strong>Infrastructure</strong></td>
<td>-0.028</td>
<td>1.000</td>
<td>0.204</td>
<td>0.084</td>
</tr>
<tr>
<td>Factors</td>
<td></td>
<td>0.817</td>
<td>0.204</td>
<td>0.084</td>
</tr>
<tr>
<td></td>
<td></td>
<td>69</td>
<td>69</td>
<td>69</td>
</tr>
<tr>
<td><strong>Financial</strong></td>
<td></td>
<td>0.110</td>
<td>1.000</td>
<td>-0.026</td>
</tr>
<tr>
<td>Factors</td>
<td></td>
<td>0.370</td>
<td>1.000</td>
<td>-0.026</td>
</tr>
<tr>
<td></td>
<td></td>
<td>69</td>
<td>69</td>
<td>69</td>
</tr>
<tr>
<td><strong>Adoption</strong></td>
<td></td>
<td>0.296*</td>
<td>-0.026</td>
<td>1.000</td>
</tr>
<tr>
<td>Factors</td>
<td></td>
<td>0.014</td>
<td>-0.026</td>
<td>1.000</td>
</tr>
<tr>
<td></td>
<td></td>
<td>69</td>
<td>69</td>
<td>69</td>
</tr>
</tbody>
</table>

*Correlation is significant at the 0.05 level (2-tailed).

To test hypothesis, a Pearson correlation between the means of financial factors, infrastructure as well as skills and knowledge gaps variables was carried out to investigate their relationship with ICT strategy adoption at Kenyatta National Hospital. This study found that there exists a significant positive correlation between skills and knowledge gaps and ICT strategy adoption factors at $r = 0.296$, $p > 0.05$ (Table 4-13).

**Table 4.15: Model Summary**

<table>
<thead>
<tr>
<th>Model</th>
<th>R</th>
<th>R Square</th>
<th>Adjusted R Square</th>
<th>Std. Error of the Estimate</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>.296a</td>
<td>0.088</td>
<td>0.074</td>
<td>0.49214</td>
</tr>
</tbody>
</table>

* Predictors: (Constant), Skills and Knowledge Gaps
The model summary shows that the correlation coefficient for the skills and knowledge gaps is average (R=0.296) which suggests that there exists an average degree of relationship between the predictors and indicators. Moreover, the adjusted R square is 0.074 which suggests that 7.4% of variation in ICT strategy adoption is explained by the independent variables (skills and knowledge gaps) studied. To check linearity of the equation, an ANOVA goodness fit was computed. The results are given in Table 4-18.

*Table 4.16: ANOVA*

<table>
<thead>
<tr>
<th>Model</th>
<th>Sum of Squares</th>
<th>df</th>
<th>Mean Square</th>
<th>F</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Regression</td>
<td>1.558</td>
<td>1</td>
<td>1.558</td>
<td>6.432</td>
<td>.014a</td>
</tr>
<tr>
<td>Residual</td>
<td>16.228</td>
<td>67</td>
<td>0.242</td>
<td>0.05</td>
<td>0.05</td>
</tr>
<tr>
<td>Total</td>
<td>17.786</td>
<td>68</td>
<td>0.242</td>
<td>1.00</td>
<td>1.00</td>
</tr>
</tbody>
</table>

a. Dependent Variable: Adoption Factors

The ANOVA statistics show that there exists a significant regression equation, $F(1, 67) = 6.432$, $p<0.05$. This implies that there is a linear relationship between skills and knowledge gaps and factors influencing adoption of ICT strategy at Kenyatta National Hospital. This means that at least one of the population partial regression coefficients of the predictors is not 0 and the population value for the multiple R squared is the coefficients of the analysis given in Table 4-19.

*Table 4.17: Coefficients*

<table>
<thead>
<tr>
<th>Model</th>
<th>Unstandardized Coefficients</th>
<th>Standardized Coefficients</th>
<th>t</th>
<th>Sig.</th>
<th>95.0% Confidence Interval for B</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>B Std. Error Beta Lower Bound Upper Bound</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>(Constant) 1.049 0.231 0.296 0.588 1.509</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Skills Knowledge Gaps 0.257 0.101 2.536 0.014 0.055 0.459</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

a. Dependent Variable: Adoption Factors
Using the constant and $\beta$ coefficients of skills and knowledge gaps ($x_1$) an estimated prediction (regression) equation for the model can be written as:

$$y = 1.049 + 0.257\beta_1$$

This shows that skills and knowledge gaps ($0.257\beta_1$) as a predictor has positive influence on the adoption of ICT strategy at Kenyatta National Hospital. Moreover, the statistics reveal that skills and knowledge gaps had significant ($p<0.05$) effect on adoption of ICT strategy in Kenyatta National Hospital.

### 4.6 Chapter Summary

The analysis of the questionnaire data presented the view of the respondents on the four parts of the questionnaire; the demographic data of the respondents, the economic factors influencing ICT strategy adoption, extent to which infrastructure influences ICT strategy adoption and the skills and knowledge gaps that influence the adoption of ICT strategy at the Kenyatta National Hospital. The following chapter discusses the results from the survey and provides conclusions and recommendations to the hospital’s management.
CHAPTER FIVE

5.0 DISCUSSION, CONCLUSIONS AND RECOMMENDATIONS

5.1 Introduction

This chapter presents the summary of the findings of the study, conclusion, recommendations, suggestions and implication of the study results. These are aimed at providing answers to the main research questions and making suggestions on how various systems can be improved in adoption of ICT strategy at the Kenyatta National Hospital.

5.2 Summary of Findings

The purpose of conducting this research was to identify the factors influencing adoption of ICT strategy in the Kenyan Public Health Sector and focused on Kenyatta National Hospital. The respondents for the study involved medical staff (physicians, dentists and pharmacists), management, accountants, ICT (administrative and support), occupational therapist and physiotherapists, human resource officers, administration as well as record officers. The study relied on questionnaires administered to the respondents to determine their perceptions on probable factors likely to influence adoption of ICT strategy in Kenyatta National Hospital.

The objective of the research was to answer three questions namely: how financial resources influence adoption of ICT strategy, how infrastructure influences the adoption of ICT strategy as well as how skills and knowledge gaps influence the adoption of ICT strategy in Kenyatta National Hospital. Data collected was analyzed using measures of central tendency and measures of dispersion and presented in charts, graphs and tables after analysis using the SPSS analysis software tool. Comparisons were made with previous empirical studies that were related to the study topic.

The demographic information is summarized in the following paragraphs. The questionnaire had a higher response rate from the females than males. The respondent’s ages were grouped in ten year ranges from twenty to sixty years. Most respondents were aged between forty-one and fifty years. The respondents were questioned on the number of years they have worked for the organization between zero to twenty-one years and above. Most respondents were found to have worked for between six to ten years. Of the seven departments in the organization,
most of the staff are in the medical and therapy departments. Most of the respondents were found to be married compared to those who were single.

The findings from study established that there exists a significant positive relationship between skills and knowledge gaps and adoption of ICT strategy. Therefore, we can conclude that skills and knowledge gaps had a significant influence on adoption of ICT strategy at the Kenyatta National Hospital. The study further showed that there existed no significant relationship between infrastructure factors and adoption of ICT strategy at the hospital. Also, there existed a negative relationship between financial factors and adoption of ICT strategy at the hospital.

5.3 Discussion of Findings

5.3.1 Influence of Financial Factors on ICT strategy adoption

The findings obtained from the study show that the majority of the respondents agreed that procurement procedures was the most significant financial factor influencing the adoption of ICT strategy in Kenyatta National Hospital. This was followed by cost of equipment, business practices, high cost of installation, cost of hiring new personnel and subsequently poor resource management which was found to be the least significant financial factor. The findings obtained from the study agree with those by Christenssson (2010) who implied that delays in the public procurement process are caused by failure to start the procurement process on time, long approval processes due to the various stages in the procurement process, many different levels of approving authorities, as well as delays in contract negotiations.

The study showed that the procurement process and approvals at the hospital depend on the monetary value and complexity of the procurement requirement thus leading to delays when the procurement requirement is costly. Similarly, when the procurements at the hospital are donor funded, there usually arises need for donor approval at different stages of the procurement process thus introducing delays in acquiring new equipment for the hospital. This in turn frustrates the efforts to adopt ICT strategy at Kenyatta National Hospital. Further investigations indicated that procurement procedures at the hospital are not transparent in that all procedural steps are not based on open, predictable, known and written procedures, including the process and criteria used for awarding contracts to ensure equality. The procurement procedures at the hospital are not fair by not allowing competent suppliers to have
equal chances to participate in tenders. This contradicts the findings of Gatero (2010) who found that the Government of Kenya constantly reviews performance of the public procurement system to ensure transparency and fairness through the Public Procurement Oversight Authority (PPOA). The Public Procurement Oversight Authority mandated by the government ensures that many procurement problems are avoided and improves the confidence and respect in public procurement. This is achieved through effective record keeping and documentation; making sure that all bidding, procedure, evaluation and award documents are public and available in a timely manner; and ensuring public access to information through effective communication channels. This creates a positive impression of the procuring entity, procurement officers and anyone directly or indirectly involved in the public procurement process.

Due to the dynamic nature of technology, corporates are encouraged to allocate resources and embrace new technology in order to remain relevant in the market place and increase efficiency. Due to the challenge posed by procurement procedures in the hospital, this in turn limits the effectiveness as well as efficiency of the hospital’s personnel in performing their duties and research since the hospital is not able to procure the required equipment on time. This is in line with Nyella et al (2010) who established that insufficient ICT resources limit medical staff in performing their duties such as; online trainings, administering online prescription and maintaining electronic patient medical records among others.

Cost of equipment at the Kenyatta National Hospital was ranked as the second most significant financial factor influencing adoption of ICT strategy adoption. The findings coincide with Chesher et al (2013) who stated that technology is expensive in nature and requires prior planning and budgetary allocation of adequate resources for the smooth and seamless adoption of ICT strategy. According to the respondents cost of equipment involves sourcing the required equipment, installation of equipment, equipment maintenance, personnel training, sensitization, and more. Business practices were ranked as the third most significant financial factor influencing the adoption of ICT strategy. The respondents indicated in the survey that inefficient business practices such as; bureaucracies, increased paper work, resistance to change, long approval process among others, delayed the delivery of services at the hospital.
5.3.2 Influence of Infrastructure on ICT strategy adoption

The study found that the hospital’s management acknowledges the importance of ICT strategy adoption by investing in an IT department. The respondents were confident that the hospital’s management team was on the right path towards adoption of ICT strategy. Study findings revealed that investment in an IT department was ranked as the most significant IT investment factor. Davidson and Heslinga, (2013) stated that businesses today cannot survive without an IT department. The respondents acknowledged that the role of an IT department is essential to the hospital. A company’s IT department plans, operates and supports an organization’s IT infrastructure, enabling business users to carry out their roles efficiently, productively and securely. This is inline with Hao and Chow (2004) who found that no company today can survive in isolation, nor can it work without the use of computer technology. If you use computer technology, you need to have an IT department.

The IT department at Kenyatta National Hospital handles communication by creation and maintenance of the hospital’s email which is used as the primary means on communication between the staff. This would be difficult to manage if the hospital had not invested in an IT department equiped with staff with the required technical knowledge. The hospital handles sensitive information that cannot be shared with all employees or other patients. With the IT department, you can not only keep track of who is seeing what information but also see how they are using it. This is the most important task that the IT department performs. In addition, the hospital’s IT department is responsible for storage of information.

Patient exposure to ICT can influence its adoption in an organization. For instance, patients in private hospitals enjoy the use of digital records of their medical data which can be accessed by any doctor within the facility at a touch of a button. In public hospitals, however, this is a challenge and thus indicated in the study showing that patient exposure only moderately influences the adoption of ICT. The use of ICT to capture a patient’s medical history is of great significance to medical staff in understanding a patient’s medical information. This can assist in more accurate diagnosis and administering of drugs. The survey showed that most respondents agree to a great extent that a patient’s medical history influences the adoption of ICT strategy at the Kenyatta National Hospital.
Kenyatta National Hospital is the largest referral hospital in East and Central Africa. This means that patients come from all over the country for specialized treatment. The respondents indicated that distance from the health facility influences the adoption of ICT strategy in that, if patients could upload doctor referral notes and previous tests and scans, if any, this would enhance treatment and diagnosis without the patient having to travel to Kenyatta National Hospital all the time to physically see the medical specialist. Information security and confidentiality is of great importance and moreso, in the health care sector which handles patient’s personal medical records. Majority of the respondents felt that privacy and security influences the adoption of ICT strategy to a great extent. Management has to ensure that stringent security measures are taken to safeguard patient medical records even as the health facility adopts ICT strategy.

From the study, the respondents ranked the factors influencing the utilization of ICT strategy. ICT is most used to prepare annual objectives and budgets. Sensitization and creating awareness of vaccines was ranked second. Third was alerting patients on next due appointments. This study was supported by Calman et al., (2010) who found out that adoption rate of ICT strategy in hospitals has not been very high due to costs associated with its installation. However, Nyella and Mndeme, (2010) research in India showed that the uptake and adoption of ICT strategy in hospitals was high. The difference between Kenya and India could be due to prioritization of the health sector by government budget that seems to be higher in India than in developing countries including Kenya.

5.3.3 Influence of skills and knowledge gaps on ICT strategy adoption

The survey sought to find out the extent to which lack of training influenced adoption of ICT strategy at the hospital. It emerged that most of the respondents felt that lack of training did not significantly influence the adoption of ICT strategy at Kenyatta National Hospital. Most respondents indicated that lack of training only moderately influenced the adoption of ICT strategy. The level of literacy in technology among hospital health care professionals can affect the adoption of ICT strategy at an organization if very few staff are conversant with technology. The respondents indicated that the hospital’s management outsources when they lack certain technical skills. This is a measure of bridging the gap of technology literacy. This is in line
with Khan et al, (2012) who found that common approaches of closing IT skills gap include recruitment process outsourcing, social recruiting, off-site training, employee mentor initiatives, mentoring services, in house turnkey training, and partnerships with universities. Most respondents in the survey indicated that the level of literacy had influence on ICT strategy adoption to a low percentage.

Good leadership in any organization is the backbone of its success. Most of the respondents said that effective leadership influenced the adoption of ICT strategy to a very great extent. Top management decisions significantly affect the implementation of not only ICT but any strategy within an organization and its implementation among the staff. In some organizations, the skills and knowledge gaps in male and female employees may vary. Males are often assumed to be better skilled than women. However, at Kenyatta National Hospital, the survey found that the skills and knowledge gaps among males and females varied by less than ten percent in regard to the extent of lack training as well as the level of literacy among staff. All male staff argued that effective leadership influences adoption of ICT strategy to great extent as opposed to eighty two percent of females.

The study established that there was a positive significant relationship between the skills and knowledge gaps factors and ICT strategy adoption factors. Correlation analysis between skills and knowledge gaps and ICT strategy at a 2 tailed gave a pearson correlation coefficient 0.014 implying a positive and significant relationship.

The model of the study was $Y = 1.049 + 0.257 \text{ Skills and Knowledge Gaps}$.

From the model, skills and knowledge gaps was the main factor influencing the adoption of ICT strategy at the Kenyatta National Hospital. The results above agree with those obtained by Bukachi and Walsh, (2012), Randeree (2011) and Gatero (2010) who reported that the above factor had an impact on ICT strategy adoption in the health sector. The researchers had suggested that the health sector should put emphasis on this factor in realizing adoption of ICT strategy.
5.4 Conclusions

The purpose of this study was to investigate the factors influencing adoption of ICT strategy at Kenyatta National Hospital. There was a good response rate on the questionnaire from the staff who were eager to respond to the issues affecting ICT strategy implementation in the organization and were looking forward to the recommendations of the study being adopted. The following conclusions can be drawn from the study.

5.4.1 Conclusions on the Influence of Financial Factors on ICT strategy adoption

The survey investigated the financial factors influencing ICT strategy adoption. The most significant factor was found to be procurement procedures. Second was cost of equipment and third was business practices. Kenyatta National Hospital being a government organization has to abide by the government public procurement rules and regulations. These procedures, although intended to create efficiency and avoid public waste of funds, are often misused and can bring about delays in the purchase of goods and equipment. Private hospitals are not subjected to these regulations and are often able to purchase items faster and at more competitive prices. The hospital can ensure that they have a robust procurement office that is in sync with the management on the needs of the hospital in order to make purchases early and in bulk in order to get the most competitive rate which will bring down the cost on goods and equipment to the organization and in turn bring down the cost of services to patients.

5.4.2 Conclusions on the Influence of Infrastructure Factors on ICT strategy adoption

For an organization to effectively implement ICT strategy, it must invest in good equipment, skilled staff, as well as conduct frequent staff trainings as well as upgrading of software to ensure that they remain current in the fast changing field of ICT. The study found that the hospital has a dedicated IT department that oversees ICT strategy implementation. This is a great initiative that the management should strive to ensure that the department is well staffed with the required competencies as well as financed to ensure the smooth adoption of ICT strategy in the hospital.

In order for an organization to fully implement an ICT strategy, all processes must be fully automated for both the staff and customers to ensure efficiency. Patients in this case must be willing to accept the use of ICT in the hospital in order to receive services. This should be
regardless of their knowledge or exposure in ICT and can thus request for help if not conversant. The use of ICT by patients can significantly assist in capturing their medical records which can be easily traced in understanding the history of a patient when receiving treatment. The adoption of ICT strategy in capturing patients’ medical records can be of great use if implemented nationwide. Kenyatta National Hospital being a referral hospital, a specialist can assist a patient from anywhere in the country without the patient having to physically come in diagnosis or treatment. This can be of significant saving of resources such as transportation, food and accommodation for patients travelling from far counties.

Information security and privacy has become of significant importance due to hacking and invasion of private information by malicious criminals. It is important for the organization to invest in information security measures such as network security, security software such as anti-malware and antivirus aimed at protecting patient information as well as hospital records.

The powering of ICT equipment requires electricity. Some of the challenges experienced in the Kenyan industry are power outages and interruptions. This can be of hindrance to the operations of the hospital during a power failure. The management should therefore invest in power backups to avoid interruptions in the running of daily operations.

Currently, Kenyatta National Hospital utilizes ICT most in the preparation of annual objectives and budgets as well as the sensitization and creation of awareness of vaccines. ICT technology has many functions which the hospital can adopt and can significantly improve the operations of the organization such as; managing stock levels and dispensing of medicines, creating patient and staff logs, setting up patient appointments, transmitting laboratory results among other functions. The management can look into implementing these functions with time.

5.4.3 Conclusions on Influence of Skills and Knowledge Gaps on ICT strategy adoption

Staff level of training and competency in ICT is of great importance in any organization that intends to adopt ICT strategy. ICT training among the IT staff enables better utilization and adoption of the ICT strategy. The survey showed that lack of training had a moderate extent of influence at Kenyatta National Hospital. The management should therefore seek ways to increase the frequency and availability of trainings to staff. This will in turn improve the
literacy levels in technology among all staff and their willingness to embrace the ICT in all their operations.

Effective leadership in an organization will determine the success of implementation of any strategy. From the study, the respondents indicated that good leadership in the hospital would influence the adoption of ICT strategy to a very great extent. The adoption of ICT strategy will be fully embraced by a management team that acknowledges the importance of ICT in an organization.

Crosstabulation of skills and knowledge gaps in male and female employees showed no significant differences between the two genders on training, literacy in technology and leadership. This shows that both male and female staff should equally possess ICT knowledge and skills to effectively implement its strategy. Management should offer frequent training to staff on current and emerging technologies in order to ensure that the organization keeps up with emerging trends.

5.5 Recommendations

The following recommendations can be made from the findings of the research.

5.5.1 Recommendations for Improvement

5.5.1.1 Recommendations on Financial Factors Influencing Adoption of ICT Strategy

The organization should ensure that they have an effective procurement department that understands the needs of the hospital’s equipment and supplies required ahead of time in order to avoid delays of delivery and thus interrupt delivery of services to staff and patients. Advance ordering of items in bulk will also ensure that they get the most cost effective prices. To get the most out of the hospital’s procurement process, the following steps can be taken to make it even better; taking social responsibility seriously in order to increase profitability, use of contract management systems to help in tracking the hospital’s formal documents and to ensure that high standards are always being met, automating the process using the right e-procurement program to streamline the process making it easier than ever to create contracts, send payment, and track invoices and shipment in order to drive efficiencies, usig supplier relationship
management into the procurement process as well as continuously looking for new opportunities for improvement.

5.5.1.2 Recommendations on Infrastructure Factors Influencing Adoption of ICT Strategy

Kenyatta National Hospital should continue to staff its IT department as well as continuously train the employees on current ICT technology implemented in the hospital. Similarly, the staff should have adequate IT equipment that is accessible and in good working condition for the hospital’s operations.

The organization’s management should fully embrace the use of ICT in all functions of the hospital to enhance efficiency in service delivery. This will be of significant help to the patients receiving treatment and in maintaining of their medical records for future.

Cybercrime has become a threat to many organizations. Kenyatta National Hospital should therefore ensure that they have invested in competent information security staff as well as latest information security software to safeguard the confidential data and records they posses.

The organization should also invest in heavy duty power backup generators to ensure seamless continuity of operations during power outages as this would interfere with productivity and ICT operations in the hospital.

The management should look into integrating the use of ICT in more functions of the day to day running of the organization. This will be in addition to the current use of ICT in preparing annual budgets and objectives, sensitization and creation of awareness of vaccines among other uses.

5.5.1.3 Recommendations on Skills and Knowledge Gaps Influencing Adoption of ICT Strategy

The organization should put in place a yearly training calendar of trainings with clear roadmaps indicating the various competencies to be attained by the trainees upon completion of the training. This training opportunities should be equally offered to both male and female employees of the organization. This will in turn ensure that the level of ICT literacy among staff improves over time. Training opportunities are a great motivator to staff as they offer career
progression opportunities and hence more staff will be willing to embrace the use of ICT in their daily operations.

Effective leadership is the backbone of success to any organization. Kenyatta National Hospital is no exception and should therefore ensure that its top management, and especially the CEO is highly qualified and embraces technology in order to fully implement and support and ICT strategy in the organization.

5.5.2 Recommendations for Further Studies

In order to fully understand the factors influencing the adoption of ICT strategy in the Kenyan Public Health Sector, the researcher recommends the study of more than one public hospital in Kenya. This will enable the researcher to make a comparative analysis of the factors affecting the adoption of ICT among various health institutions.
REFERENCES


Burnes, B. (1996). Management decision 34(10). No such thing as... a “one best way” to manage organizational change, 11-18.


APPENDICES

APPENDIX 1: LETTER OF TRANSMITTAL

Bernard Maganjo Mwangi
P.O. Box 76779-00620,
Nairobi, Kenya
7th July, 2016

Dear Respondent,

RE: FACTORS INFLUENCING ADOPTION OF ICT STRATEGY IN THE KENYAN PUBLIC HEALTH SECTOR – A CASE STUDY OF KENYATTA NATIONAL HOSPITAL

Adoption of ICT strategy in Kenyatta National Hospital is beneficial and has a great impact to not only the medical practitioners but also the patients.

The adoption of ICT strategy would also to streamline key processes in the health care industry, integrate activities across health care organizations, reduce overall health care costs, improve medical record management, health program management and improve patient care quality.

This questionnaire is part of my MBA study at USIU to identify the factors that influence the adoption of ICT strategy in Kenyatta National Hospital, strategies that the public health sector can implement to increase use of ICT and the benefits of adopting ICT strategy.

Your participation will contribute significantly to developing a strategy for the Kenyatta National Hospital to embrace ICT strategy in their operations.

The information from this survey will be confidential. We will send you a summary of the survey results if you provide your contact details.

Thank you very much for your participation.

Sincerely,

Bernard Maganjo Mwangi
United States International University – Africa
Chandaria School of Business
APPENDIX 11: QUESTIONNAIRE

FACTORS INFLUENCING ICT STRATEGY ADOPTING IN THE KENYAN PUBLIC HEALTH SECTOR – A CASE STUDY OF KENYATTA NATIONAL HOSPITAL

Part I: Demographic Details

1. Name of organization

........................................................................................................................................................................

2. Your designation

........................................................................................................................................................................

3. What is your Gender? (tick where appropriate)
   ___ Male
   ___ Female

4. What is your Age Bracket? (tick where appropriate)
   ___ 20 – 30 years
   ___ 31 – 40 years
   ___ 41 – 50 years
   ___ 51 – 60 years
   ___ 61 and over

5. How many years have you worked for the organization? (tick where appropriate)
   ___ 0-5 years
   ___ 6-10 years
   ___ 11-15 years
   ___ 16-20 years
   ___ 21 and over

6. In which department do you serve the organization? (tick where appropriate)
   ___ Medical Staff (Physicians, Dentists, Pharmacists)
   ___ Management
   ___ Accountants
   ___ ICT Support
   ___ Occupational Therapists and Physiotherapists
   ___ Human Resource Officers
   ___ Administration and Record Officers

7. What is your marital status? (tick where appropriate)
   ___ Single
   ___ Married
PART II: Financial Factors That Influence ICT Strategy Adoption in Kenyan Public Health Sector - A Case Study of Kenyatta National Hospital

8. The following factors influence the adoption of ICT strategy in the organization / facility. Please indicate the extent to which each of this has influenced ICT strategy adoption in your organization. Use a scale of 1-5 where 1= strongly disagree, 2= Disagree, 3= Neutral, 4= Agree and 5= Strongly agree. (tick where appropriate)

<table>
<thead>
<tr>
<th>Financial Factor</th>
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<th>5</th>
</tr>
</thead>
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<tr>
<td>Cost of Equipment</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Procurement Procedures</td>
<td></td>
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<tr>
<td>Cost of Hiring Skilled Personnel</td>
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<td>Poor Resources Management</td>
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<td>High Cost of Installation</td>
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<tr>
<td>Business Practices</td>
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<tr>
<td>Others</td>
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PART III: Infrastructure influence ICT Strategy Adoption in Kenyan Public Health Sector - A Case Study of Kenyatta National Hospital

9. To what extent do the following indicators of IT investment apply in your organization? (Use a scale of 1 to 5 where; 1 = no extent at all, 2 = less extent, 3 = moderate extent, 4 = good extent and 5 = very great extent) (tick where appropriate)

<table>
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<tr>
<th>Statement</th>
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</thead>
<tbody>
<tr>
<td>All staff have workstations with access to intranet and internet for communications</td>
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<td>All staff able to access essential services and devices and perform work outside the office</td>
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<td>All staff have been sufficiently trained on effective and efficient use of IT resources</td>
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</table>
The organization / hospital has a dedicated IT department

Each department uses customized software

The organization / hospital has integrated software to manage their funding and budget

All circulars and other internal documents are available and easily searchable electronically

Others (please specify)

10. To what extent does patient exposure to technology influence ICT strategy implementation in your organization?

   a) Very great extent [  ]
   b) Great extent [  ]
   c) Moderate extent [  ]
   d) Less extent [  ]
   e) Not at all [  ]

11. To what extent lack of patient medical record history influence ICT strategy implementation in your organization?

   a) Very great extent [  ]
   b) Great extent [  ]
   c) Moderate extent [  ]
   d) Less extent [  ]
   e) Not at all [  ]

12. To what extent does distance influence ICT strategy implementation in your organization?

   a) Very great extent [  ]
   b) Great extent [  ]
   c) Moderate extent [  ]
d) Less extent [ ]
e) Not at all [ ]

13. To what extent does privacy and security influence ICT strategy implementation in your organization?

a) Very great extent [ ]
b) Great extent [ ]
c) Moderate extent [ ]
d) Less extent [ ]
e) Not at all [ ]

14. To what extent lack of electricity influence ICT strategy implementation in your organization?

a) Very great extent [ ]
b) Great extent [ ]
c) Moderate extent [ ]
d) Less extent [ ]
e) Not at all [ ]

15. To what extent has the health care facility utilized ICT in the strategy implementation at the following levels? (Use a scale of 1 to 5 where; 1 = no extent at all, 2 = less extent, 3 = moderate extent, 4 = good extent and 5 = very great extent) (tick where appropriate)

<table>
<thead>
<tr>
<th>Tasks</th>
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<tbody>
<tr>
<td>Setting up patient appointments</td>
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<td>Alerting patients on the next due appointments</td>
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<td>Store patient information from birth</td>
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<td>Preparing annual objectives and budgets</td>
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<td>Sensitization and creating awareness of vaccines</td>
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<td>Others</td>
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PART IV: Skills and Knowledge Gaps Influencing ICT Strategy Adoption in Your Organization

16. To what extent does lack of training influence the adoption of ICT strategy in your organization?
   a) Very great extent [ ]
   b) Great extent [ ]
   c) Moderate extent [ ]
   d) Less extent [ ]
   e) Not at all [ ]

17. Do you believe that the level of literacy in technology among the health care professionals in your organization influences the adoption of ICT strategy? If so, by what percentage? (tick where appropriate)
   a) Less than 20% [ ]
   b) 21% to 40% [ ]
   c) 41% to 60% [ ]
   d) 61% to 80% [ ]
   e) More than 81% [ ]

18. To what extent does effective leadership influence the adoption of ICT strategy in your organization?
   a) Very great extent [ ]
   b) Great extent [ ]
   c) Moderate extent [ ]
   d) Less extent [ ]
   e) Not at all [ ]

THANK YOU FOR YOUR PARTICIPATION