

**CHALLENGES FACING THE IMPLEMENTATION OF HOSPITAL MANAGEMENT
INFORMATION SYSTEMS IN HOSPITALS IN NAIROBI**

BY

NAME: FRANKLIN MUTUMA KIMAMA

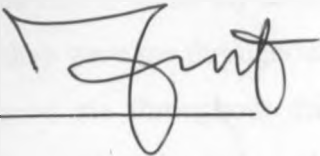
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**A RESEARCH PROJECT SUBMITTED TO THE DEPARTMENT OF MANAGEMENT
SCIENCE OF THE UNIVERSITY OF NAIROBI IN PARTIAL FULFILMENT OF THE
REQUIREMENT FOR AWARD OF THE DEGREE OF MASTER OF BUSINESS
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DECLARATION

This Management research project is my own original work and to the best of my knowledge, it has not been submitted for a degree in any other university.

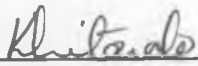
Signed: 

Date: 10/11/2011

Franklin Mutuma Kimama

Reg No: D61/71648/2008

This research project has been submitted for examination with my approval as the university supervisor.

Signed: 

Date: 10/11/2011

Dr. Kate Litondo

Lecturer

School of Business

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First and foremost, I would like to thank GOD who has seen me through all my life up. Thank you Lord for I would not have achieved this without YOU holding my hands.

Secondly I would like to thank my family; Festus, Charles, Winfred and my best friend Virginia, for the support they gave me throughout this project and my supervisor Dr. Kate Litondo for the guidance she gave me throughout this research project. This project could not have been completed on time without her help and support. I am also thankful to the moderator Mr. J. Lelei for his contribution in this work.

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This project could not have been completed without the overwhelming response from the respondents who filled the questionnaires. Thanks for your co-operation and prompt response.

DEDICATION

This work is dedicated to my late mum Mrs. Susan Kimama.

ABSTRACT

Hospitals in Kenya are adopting and implementing ICT in order to improve transparency, efficiency and effectiveness in service delivery through the implementation of Hospital Management Systems (HMIS). The main aim objective of the study was to establish the extent to which hospitals in Nairobi are using HMIS and determine challenges of implementing HMIS in hospitals in Nairobi. The researcher chose hospitals in Nairobi because of time and financial resources available to conduct the research. The study adopted a survey design methodology because the researcher collected data on the current status and usage of HMIS, computerization levels and the challenges in implementing HMIS. The main instrument for data collection was a questionnaire which was administered to IT officers in the hospitals. Drop and pick approach was used to collect the questionnaire. Out of 42 Questionnaires distributed, 36 were filled and returned giving a response rate of 85%.

The research questions were generated from the objectives. The data collected was, coded and analyzed with the aid of SPSS package. Descriptive statistics was used to help in drawing conclusions. It was assumed in data analysis that the results obtained were quite a representative for the general population. The findings of the challenges faced in HMIS implementation in Kenyan hospitals indicate that most hospitals have adopted several practices in their HMIS implementation. The study found that the following challenges are faced by Kenyan hospitals in HMISs implementation. These include the challenge of support from the employees, financial resources, internal communication, and training of users, changeover methods and long procurement processes

The study concludes that to improve the success of HMIS implementation in hospitals, the study recommends; improving planning and coordination of HMISs projects, capacity building through user training, knowledge and skills transfer, transparency in procurement of information systems, involvement of users in system requirement definition, involvement of managers at all levels, sufficient software & hardware evaluation and use of change agents in implementation. The study further recommends employing qualified managers to spearhead HMISs implementation and empowering them through training since they are the drivers of the project. Hospitals intending to implement HMISs should establish and equip IT department which will spearhead automation, development of IT strategy and enterprise architecture.

TABLE OF CONTENTS

DECLARATION	ii
ACKNOWLEDGEMENTS	iii
DEDICATION	iv
ABSTRACT.....	v
LIST OF ABRREVIATIONS.....	viii
CHAPTER ONE: INTRODUCTION.....	1
1.1 Background of the study	1
1.1.2 HMIS implementation challenges.....	3
1.1.3 Major Hospitals in Kenya	4
1.2 Statement of the problem	4
1.3 Objectives of the study	5
1.4 Value of the study	6
CHAPTER TWO: LITERATURE REVIEW.....	7
2.1 Introduction.....	7
2.2 Hospital Management Information Systems.....	7
2.3 Implementation of HMIS.....	8
2.4 Challenges of Implementing HMIS.....	9
2.5 Theoretical Framework.....	11
CHAPTER THREE: RESEARCH METHODOLOGY	12
3.1 Introduction.....	12
3.2 Research Design	12
3.3 Target Population and Sample size.....	12
3.4 Data Collection Procedures	13
3.5 Data validity and reliability	13

3.6 Data Analysis.....	13
CHAPTER FOUR: DATA ANALYSIS, RESULTS AND DISCUSSION.....	14
4.1 To establish the extent to which Major hospitals in Nairobi are using HMIS	15
4.2 To determine challenges of implementing HMIS in Major hospitals in Kenya.	18
CHAPTER FIVE: SUMMARY, CONCLUSION AND RECOMMENDATIONS	28
5.1 Summary	28
5.2 Conclusions.....	28
5.3 Policy Recommendation	29
5.4 Limitations of the study	30
5.5 Recommendations for Further Research.....	31
REFERENCES	32
APPENDIX I: QUESTIONNAIRE	36
APPENDIX 2 LIST OF MAJOR HOSPITALS IN NAIROBI.....	40

LIST OF ABBREVIATIONS

HMIS – Hospital Information Management System

ICT – Information Communication and Technology

IS - information system

E-health- electronic health

E-commerce – electronic Commerce

CIO – Chief Information officer

NHIF- National Health Insurance Fund

SDLC - Software Development Life Cycle

KNH- Kenyatta National Hospital

HR – Human Resource

LIST OF TABLES

Table 4.1: Work Position

Table 4.2: Does the hospital have a HMIS

Table 4.3: Client Base

Table 4.4: Extent of use of the HMIS in hospitals.

Table 4.5: Employees did not support the implementation of HMIS

Table 4.6: Managers did not support the implementation of HMIS

Table 4.7: Users were not fully involved in the implementation of HMIS

Table 4.8: Managers are not fully involved in the implementation of HMIS

Table 4.9: Lacks the financial resources for implementation of HMIS

Table 4.10: Employees have negative attitudes towards changes

Table 4.11: Poor communication

Table 4.12: Poor ICT infrastructure prevent HMIS implementation

Table 4.13: Interoperability/Incompatibility issues

Table 4.14: Lack of system testing

Table 4.15: Lack of training of users

Table 4.16: Poor changeover methods

Table 4.17: Poor skill sets among users

Table 4.18: Poor file conversion and database design

Table 4.19: Inadequate hardware acquisition

Table 4.20: Long procurement processes

Table 4.21: Incompatibility between the new and old system

CHAPTER ONE: INTRODUCTION

1.1 Background of the study

According to Blaya et al. (2008) hospitals are the main health providers in developing countries. Hospitals are subjected to constant impulses from the national government and insurance companies for example National Health Insurance Fund (NHIF) to improve efficiency and effectiveness. The general need to improve patient care makes it necessary to improve effectiveness. Hospitals are now becoming aware of the potential value of integrated services and the collaborative advantage of using information and Communication technologies (ICT's) Spanjers et al. (2001). New forms of alliances among health providers have emerged for example, telecommunication companies are partnering with the health providers in order to provide easier ways for patients to pay for their services using mobile phones for example M-pesa pay bill) Modalities of health service delivery have increased rapidly and ICT has played an important role in many of these changes. Patients are demanding greater responsibility and accountability from their health care professionals therefore health providers are challenged to utilize ICT in order to improve their services.

The use of ICT in hospitals in the country has been increasing gradually. According to Ojo et al (2007) majority of African countries are grappling with major socioeconomic development challenges which include wars, diseases, poverty, corruption and which affect the provision of medical care for both the rich and the poor. As much as this is the case, Richardson (2006) argues that healthcare providers and governments have no choice but to meet healthcare demands for future citizens and the application of ICT is therefore fundamental and inevitable. Electronic health or e-health is defined as the application of Internet and other related technologies such as mobile phones in the healthcare industry to improve the access, efficiency, effectiveness, and quality of clinical and business processes utilized by healthcare organizations, practitioners and patients in an effort to improve the health status of patients (Rodrigues ,2003). Therefore e-health is the utilization of ICT for healthcare provision.

Farrell (2007) states that Kenya has made remarkable progress putting in place an ICT policy framework and implementation strategy which has measurable outcomes and time

frames. However, a number of challenges on the implementation e.g. lack of resources, ICT infrastructure, among others have been experienced. The health sector in Kenya is undergoing various reforms since the new constitution was promulgated in August 2010. He further suggests that reforms are aimed at introducing substantive changes, the relationships among stakeholders and the roles they perform with a view of offering better services. Information systems including ICT's are known to make organizations more effective and efficient in their operations. ICT refers to all technical means used to handle information and aid communication which includes hardware, software and people manning the systems (Horak, 2008).

1.1.1 Hospital Management Systems

According to Shortliffe & Cimino (2006) Hospital management information systems (HMIS) is a comprehensive and integrated information system designed to manage the administrative, financial and clinical aspects of a hospital and it encompasses paper-based information processing as well as data processing and storage equipment. He further adds that HMIS comprises of hardware, software and people who handle the systems. Tan (2005) states that HMIS automates management reporting to support administrative and patient care applications and to reduce time and effort spent on the part of health knowledge workers such as doctors, pharmacists and nurses. Furthermore, HMIS comprises hardware, software and people to operate them in order to ease the management and flow of information among health care stakeholders.

Winter et al.(2001) defines HMIS as a socio-technical subsystem of a hospital that comprises all information processing actions, human and technical actors in their respective roles within the system. According to Tan (2005) HMIS automates routine management reporting to support administrative and patient care applications; designs health office systems and processes to reduce time and effort expenditure on the part of health knowledge workers such as doctors, pharmacists and nurses. Berg(2001) states that HMIS is used for master index, patient management, billing ,insurance management ,pharmacy, radiology, accounts management, order entry, operation theatre, depending with specific hospital and further says that there functionalities may increase.

According to Yeates & Cadle (2001) Implementation of Information system involves a number of activities that are aimed at operationalising the new system in an organization. This involves the following activities; request for approval from the organization's management to implement the new system; acquiring and setting in place the required hardware and software; system Testing; data conversion and database preparation; change management; training of users; and going live with the System. Kendall & Kendall (2008) defines Implementation as the process of assuring that the information system is operational. He points out that for a system to be fully implemented, well-trained users must be involved in its operation. O'Brien (2002) defines implementation as doing what you planned to do. Therefore, implementation is an important activity in deployment of ICT systems to support an organisation and its end users. He sums up implementation as involving hardware and software acquisition, software development and modification, training of system users, system documentation and conversion. According to Duhan et al. (2001) IS implementation refers to anticipating and strategically managing the impacts of change of technology component such that information systems become fully operational as the organization comes to a post-implementation state.

The Ministry of Medical services has also implemented the DHIS2 which is a tool for collection, validation, analysis, and presentation of aggregate statistical data, tailored (but not limited) to integrated health information management activities. It is a generic tool rather than a pre-configured database application, with an open meta-data model and a flexible user interface that allows the user to design the contents of a specific information system without the need for programming. DHIS2 is a modular web-based software package built with free and open source Java frameworks. (<http://dhis2.org/>, 2011)

1.1.2 HMIS implementation challenges

HMIS Implementation comes with a number of challenges to both the institutions that are implementing it and their customers. According to Yeates & Cadle (2001) the major challenges faced in IS implementation include; lack of management support, lack of user involvement, resistance to change, lack of change management program and poor project management. Burke et al. (2001) points out that poor skills set among users is a hindrance

to project implementation. Inadequate skilled staff in a hospital leaves them grappling with the system challenges during and after implementation. Communication barrier is another aspect which must be managed well in order to pass the correct message to other employees in the organization. Otieno (2008) indicates that successful implementation of ICT systems results in benefits to the organization; cost saving, better information handling, timely and accurate information for decision making and competitive edge.

1.1.3 Major Hospitals in Kenya

Kenya has two referral hospitals; Kenyatta National Hospital and Moi Teaching and Referral Hospital in Eldoret, provincial hospitals, district hospitals and other several private hospitals which provide both outpatient and inpatient services. The hospitals which were included in the study were all the hospitals in Nairobi (*see appendix 2*).

1.2 Statement of the problem

Hospitals invest enormous amount of resources in Information systems in order to have a competitive edge, reduce cost in operations, faster storage and retrieval of patient information. The success and failure of system implementation will largely be determined by how an institution handles this stage which is equally important in any project. The need for effective information systems development and implementation is inevitable and more so by hospitals and thus constitute an integral factor in the ongoing development of the business processes. Although the challenges faced in implementation of IS are many, hospitals today are literally being forced into the implementation of IS for their survival.

Kenyatta National hospital which is one of the two referral hospitals in the country has encountered various challenges in the implementation of the system which are; slow pace of ICT implementation; inadequate legal framework for the hospital; inadequate number of staff especially in specialized areas and poor procurement chain. The strategic plan clearly states that there is delayed ICT implementation and have identified implication as inefficiency in service delivery and controls (KNH, 2008).

According to O'Brien (2002) information that is outdated, inaccurate and hard to understand and make decisions is not useful to any entity and especially hospitals which are dealing with human life. He further adds that hospital staff requires high quality information and has

the three main dimensions of useful information which are time, content and form. Lack of immediate information storage and retrievals also is another problem experienced by the hospitals. He emphasizes that information storage is critical since it defines the way the information will be stored and later retrieved for use. The other problems that hospitals experience with the current systems that necessitate change of the Information system include; lack of prompt updating; error prone manual calculation; preparation of accurate and prompt reports.

According to Malik & Khan (2009) Literature on the implementation of HMIS is scarce especially in regard to developing countries like Kenya. It's for this reason that this study will try to fill in the knowledge gap that currently exists and also offer useful leads for further studies in the same field.

This study was different from other studies done because it focused on the challenges faced during the implementation of hospital information systems which were more specific to the health sector. Previous studies focused on general implementation of information systems. For example Otieno (2008) dealt with the Challenges faced in the Implementation of Mobile banking information systems in commercial banks in Kenya while Magutu et al.(2010) concentrated on the implementation of Information systems in state corporations in Kenya. This study aimed to answer the following two questions: To what extent have major hospitals in Kenya automated their processes and what challenges are faced during implementation of Hospital Information systems in hospitals in Nairobi?

1.3 Objectives of the study

The general objective of the study was to determine the challenges that hospitals face while implementing Hospital information Management systems in Hospitals in Nairobi, specifically;

- a) To establish the extent to which hospitals in Nairobi are using HMIS.
- b) To determine challenges of implementing HMIS in hospitals in Nairobi.

1.4 Value of the study

This study will aid ICT Managers/Project managers when making HMIS implementation decisions. To other upcoming hospitals this study will help them avoid the various challenges that have been faced by the major hospitals in Nairobi. To government this study will help in establishing the policies and guidelines on HMIS. To researchers this study may provide reference material for those who want to study other aspects of information systems in hospitals e.g. the other stages in software development life cycle model (SDLC).

CHAPTER TWO: LITERATURE REVIEW

2.1 Introduction

This chapter presents literature review on studies that have been done in the past on information system implementation. ICT has been an integral part of human life and has lead to rapid processing of mass information. According to Ogunsola & Aboyade (2005) ICT is defined as a set of activities which facilitate through electronic means the processing, transmission and display of information. It also refers to technologies people use to share, distribute, gather information and communicate through computers and their networks. The chapter defines the HMIS, describes the implementation stages and the challenges faced during implementation.

2.2 Hospital Management Information Systems

Winter defines HMIS as a sociotechnical subsystem of a hospital that comprises all information processing actions, human and technical actors in their respective roles within the system. According to Tan (2005) HMIS automates routine management reporting to support administrative and patient care applications. Winter defines HMIS as a sociotechnical subsystem of a hospital that comprises all information processing actions, human and technical actors in their respective roles within the system. According to Tan (2005) HMIS automates routine management reporting to support administrative and patient care applications.

Hayajneh et al. (2006) states that HMIS is used for: *Master patient index*- provides a record of all patients registered in a hospital through a unique patient number. It holds demographic, financial and medical details of the patient. *Patient management* helps in tracking patient folders across wards, clinics and other locations in the hospital; inpatient and outpatient scheduling- allows flexible scheduling of patients to their respective clinics and doctors. It manages bookings, generation of appointment slips, rescheduling and cancellation of appointments. *Inpatient management* helps in patient admission, transfer and discharge processes including beds. It has provisions for ward and bed management and produces bar coded labels and admission forms to ensure proper identification of patients. *Billing* provides a flexible and comprehensive means of tracking and consolidating patient

charges from the time of patient registration to the time of discharges and also helps in generating real-time bills for the patients when requested by them or their relatives. *Insurance Management* is used in managing the insurance of patients for approvals, payments, deductibles, coverage and exclusions. *Pharmacy* handles drug information, prescription, dispensing functions and maintains complete drug dosage details and supports various drug classifications and indexes. *Radiology* supports resource scheduling, and request registration with examination details, reporting, post examination registration, film tracking and management information. *Accounts Management* is used in tracking of receivables from debtors, receipt management, journal entries, automatic production of reminders and statements. *Order Entry* maintains requests made from wards and clinics for various services. *Operation Theatre* maintains theatre reservation details, performs on-line scheduling of theatres for any present or future dates, accommodates emergency operation, and generates pre-operation, checklists including instrument lists and personnel assignment sheets.

2.3 Implementation of HMIS

According to Yeates & Wakefield (2003) Information System implementation entails a collection of activities that are aimed at operationalizing a new system in an organisation. He describes Implementation as those activities that are carried out after the system design has been completed and end when the project has been accepted by the user. He also adds that implementation stage is the longest phase on the project and the most labour intensive. It involves a number of activities that include;

Firstly the management approval to implement the new system – before the implementation stage is started, management approval is important since managers control resources including staff needed to implement the system. Managers can hinder the successful implementation of an information system if they feel that the process does not involve them. It is therefore important that they are involved at every stage of the system development.

Secondly, hardware and software acquisition – This involves procurement and installation of hardware and software needed to implement the system. The procurement is done through invitation of bids and selecting the supplier with the highest points. In some cases benchmark is done on previous projects the supplier has undertaken.

Thirdly, system testing – This is done to ensure that the new system has no minimal errors before a roll out. A system has to be tested to ensure that it meets the user requirements. Any errors identified are debugged (corrected). Testing should involve the system users as their input is vital to the testing process and system.

Fourthly, file conversion and database creation – This ensures that data files in the old system are compatible with the new system. In some cases the old files are modified to fit the format of the new system.

Fifthly, use of agents of change – These represent influential and other leaders in the organisation who have capability to easily influence members of staff on issue relating to a new system. They are identified and trained to spearhead the implementation of new system. They are usually influential people with high integrity.

Sixthly, selecting and training the users- users of the new system must be conversant with the system in order to reduce errors and increase productivity and acceptance. Therefore users must be trained on how to use the system and the benefits of the new system. Training can be conducted through practical demos, lectures and video presentation. User manuals and system documentation are also very important in training.

Finally, going live or launching the new system – once the system has been tested and found to be fully working as required, it is launched and rolled out for use. This stage mainly involves 3 activities namely; installation, commissioning and system change-over. Various techniques are used to change over and they include; direct, parallel, phased or pilot. Once the system is live new errors might arise and need support of developers. Therefore a post Implementation team can be set up to provide solutions to errors and problems as they arise. According to Dawson (2005) implementation is the last stage of SDLC and represents the final handover of the system to the user. It includes acceptance testing by the user; training; formal hand over, the setting up of data files; implementing work procedures and documentation.

2.4 Challenges of Implementing HMIS

With the demand for more efficient services in health institutions most of the hospitals are finding it necessary to implement new systems which brings with them the challenges which

must be dealt with or will limit the HMIS implementation. This means that requirements of HMIS will also change and utilize the power of the technology to meet the ongoing needs of the organisation.

Lack of top management support- Most projects fail due to disagreements among the senior managers of the hospital. According to Turbit (2005) Project implementation needs top management involvement to ensure that the right combination of business and IT is done to resolve any conflicts that might arise.

Poor skills sets among users- Burke et al. (2001) points out that poor skills set among HMIS users is a hindrance to project implementation. Inadequate skilled staff in a hospital leaves them grappling with the system challenges during and after implementation. When a hospital is moving from old technology to new technology the skills of its staff need to be upgraded too Turbit (2005). ICT is an area that keeps on changing and therefore staff need to upgrade their skills with respect to the new software that comes into use so as to be in tandem with the changing environment.

Resistance to change - Burke et al. (2001) defines it as refusal to see benefits in a new HMIS because of what individuals are used to (works for them). A case study by Gupta (2000) revealed that the main hurdle experienced by most firms is resistance to change. He further stated that resistance was due to employees' reluctance to learning new techniques or the ICT department reluctant to change due to its attachment to the current systems.

Insufficient Software evaluation- Turbit (2005) states that hospitals need to go through all the processes of the intended software system and ensure that it fits well with their processes e.g. from patient registration to discharge this will greatly help to increase the acceptance level of the system.

Poor Communication- Burke et al. (2001) reiterates that for any information system implementation to succeed constant communication with the affected personnel both technical and other users. He also adds that this should start before you reach implementation stage. Communication is very crucial in implementation of HMIS

Lack of change management program- Lorenzi & Riley (2003) defines change management as the process of assisting individuals and organizations migrate/ move from the old ways of doing things to the new ways of working. She adds that the need for change management starts early when the project has been conceptualized.

Security Issues- According to Kendall & Kendall (2008) security considerations must be included when system implementation is done. They are; physical security which involves controlling access to physical computer resources, logical security which entails controlling software access and user rights for the system users and building procedures to prevent persons from misusing computer hardware and software which is known as behavioral security.

Benefit Realization - Another significant cause for HMIS implementation failure is the unrealistic expectation of benefits on investment. According to Berg (2001) many hospitals end up overstating the returns that a given system will offer but underestimate other expenses that are related to the project e.g. cost of planning, consulting fees, training, testing. When this happens, the project does not stand a chance of achieving the return on investment that was anticipated.

2.5 Theoretical Framework

According to Wanyama & Qin,(2010) Structuration theory was developed by Antony Giddens as a social systems theory. He further states that structuration is a continuous process of the social systems and expounds on the structure as rules and resources needed by the social system and the system refers to the interactions between the actors. In a HMIS the human agents use the rules and resources, the properties of the social system in their everyday activities. The Rules and resources mediate HMIS user's actions and in their use they are continuously changed by the human agents. Kouroubali (2002) states that for successful implementation of HMIS there needs to be a duality approach in terms of the actors and the structure and that the actor enacts change in the structure as they perform their routine activities. For instance a doctor may start collecting detailed patient information when there is no such structure which will then necessitate that the change of existing structure for other clinicians to also keep the same information.

CHAPTER THREE: RESEARCH METHODOLOGY

3.1 Introduction

This chapter deals with the various stages and phases that will be followed in completing this study. The following subsections are included; research design, target population, description of research instruments, sampling design, data collection instruments and procedures and finally data analysis.

3.2 Research Design

Mc Millan & Schumacher (2001) defines research design as the way a study is planned and conducted, the procedure and techniques employed to answer the research problem or question. According to Nachmias & Nachmias (1996) are concerned with turning the research question into a testing project. The best design depends on your research questions. Every design has its positive and negative sides. The research design for this study was a survey. According to Owens (2002) in cross-sectional surveys data is collected at one point in time from a sample selected to represent a larger population.

3.3 Target Population and Sample size

A target population is defined as, the entire group of individuals or items under consideration in any field of inquiry and has a common attribute Mugenda and Mugenda (2003).The population for this study was 41 hospitals in Nairobi(*see attached appendix 2*). The sample size of the study was 41 hospitals which are big in terms of the various types of general ailments alongside specialized medical and surgical interventions and inpatient bed capacity.

The researcher believes that the ICT personnel have the required information implementation of HMIS since they are more acquainted with operations of their respective hospitals. The researcher therefore selected ICT Manager, Senior ICT officer and IT officer. The research questions were systematically developed from the two objectives of the study.

- a) To establish the extent to which Major hospitals in Nairobi are using HMIS.

b) To determine challenges of implementing HMIS in Major hospitals in Kenya.

3.4 Data Collection Procedures

Questionnaires were used to collect the primary data for this research. The questionnaire consisted of both open and closed ended questions providing both quantitative and qualitative data. The questionnaire had three sections: section A covered the general details about the respondent and the organisation. Section B covered the various sections that the HMIS covers in the hospital and section C covered the various challenges experienced during the implementation of HMIS. The questionnaire was administered to ICT staff of the hospitals. A drop and pick method was used to disperse the questionnaires.

3.5 Data validity and reliability

Mugenda and Mugenda (2003) asserted that, the accuracy of data to be collected largely depend on the data collection instruments in terms of validity and reliability. Validity as noted by Robinson (2005) is the degree to which result obtained from the analysis of the data actually represents the phenomenon under study. This was achieved by pre-testing the instrument to be used to identify and change any ambiguous, awkward, or offensive questions and technique as emphasized by Cooper & Schindler (2003). Reliability on the other hand refers to a measure of the degree to which research instruments yield consistent results Mugenda and Mugenda (2003).

3.6 Data Analysis

Each data collected was checked for consistency with data obtained from questionnaires in order to eliminate misleading data which could arise from misrepresentation of questions in the questionnaires. The data was analyzed with the aid of the statistical package for social sciences (SPSS) version 17 and used descriptive statistics. The results were presented using tables, frequency charts and graphs, and the findings were presented using tables, graphs, bar charts and pie charts.

CHAPTER FOUR: DATA ANALYSIS, RESULTS AND DISCUSSION

4.0 Introduction

This chapter presents analysis and findings of the study as set out in the research project methodology. A sample of 36 IT officers constituting 85% of the total population of 42 hospitals in Nairobi of the targeted sample was realized. The analysis was done using the 36 filled and returned questionnaires out of the 42 questionnaires distributed. Since the number of questionnaire collected was more than 30, this was deemed adequate and sufficient for purposes of data analysis as suggested by Field, (2005).

The respondents were quite cooperative and the data provided was taken to be a true representation of the respondents' views due to the independence of the study carried out. However, some of the hospitals did not have established hospital management information systems (HMISs) in their operations; hence the respondents were not able to fill the questionnaires provided. This therefore reduced the response rate by 18%. The analysis of the data was used to establish the practice and to identify the challenges of HMIS implementation in Hospitals in Nairobi. Furthermore the data was also used to relate back the experiences of respondents (IT officers from Hospitals in Nairobi) to the findings of the literature. The respondents were asked to profile their details in the questionnaire provided. The results were analyzed as percentage of the number of respondents in the respective hospitals. The findings indicate that the respondents represented a broad range of employees profile in terms of gender, age, education level and designation they have worked in the current organization. All the respondents were employees who run, manage and maintain IT projects in the respective hospitals. Findings from the research data showed that, the respondents held a wide range of positions.

Table 4.1: Work Position

	Frequency	Percent	Cumulative Percent
ICT Manager	7	19.4	19.4
IT Officer	14	38.9	58.3
Senior IT Officer	3	8.3	66.7
Others	12	33.3	100.0
Total	36	100.0	

Source, Field data 2011

From table 4.1(above), about 19.4% held the position of IT officer, 38.9% IT Officer, 8.3 % Senior IT Officers and 33% were other positions. This shows that over 66.6 % of the staff were qualified IT Officers.

4.1 To establish the extent to which Major hospitals in Nairobi are using HMIS

The first objective of the study sought to establish the extent of use of HMISs in hospitals in Nairobi. The questionnaire had two questions that addressed this objective. From the respondents who filled the questionnaire the results were presented using percentages and tables. The respondents were asked to state whether they have an HMIS and the various areas that HMIS is used in their organisations. The scores were tabulated and ranked as follows:

Table 4.2: Does the hospital have a HMIS

	Frequency	Percent	Valid Percent	Cumulative
Yes	25	69.4	69.4	69.4
No	11	30.6	30.6	100.0
Total	36	100.0	100.0	

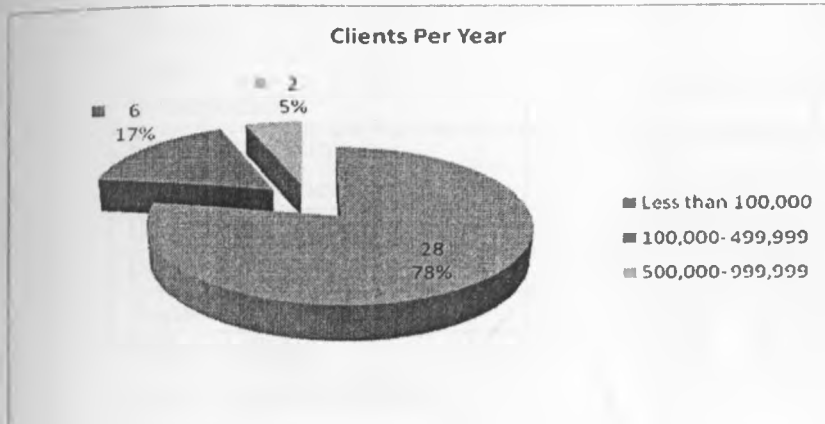
Source, Field data 2011

Table 1 shows that, about 69% of the respondents have an HMIS in operation in their respective organisations whereas the remaining approximately 31% do not have an HMIS in their organisations but have computerized some of the areas of operation in the hospital.

Table 4.3: Client Base

	Frequency	Percent	Valid Percent	Cumulative Percent
Less than 100,000	28	77.8	77.8	77.8
100,000- 499,999	6	16.7	16.7	94.4
500,000- 999,999	2	5.6	5.6	100.0
Total	36	100.0	100.0	

Source, Field data 2011



Source, Field data 2011

Table 3 and pie chart (above) shows that majority of the hospitals are small with about 77 % serving a client base of less than 100,000 patients annually. Hospitals with client base of more than 100,000 patients per year are 8 which represent a percentage of about 23% of the respondents.

Table 4.4 Extent of use of the HMIS in hospitals.

		Responses	No Response	Mean	Std. Deviation	Percentage of use
Clinical Areas	Inpatient scheduling	25	11	2.24	1.589	44.80
	Pharmacy and therapeutics	25	11	2.24	1.422	44.80
	Laboratory	25	11	2.36	1.440	47.20
	Radiology	24	12	2.33	1.435	46.67
	Radiotherapy	25	11	2.88	1.536	57.60
	Medical records	25	11	2.20	1.291	44.00
	Surgery	25	11	2.64	1.497	52.80
	Nursing	25	11	2.12	1.394	42.40
	Dental	23	13	2.65	1.722	53.04
	Orthopedics	25	11	3.28	1.646	65.60
	Results reporting	25	11	2.16	1.519	43.20
	Outpatient scheduling	24	12	2.21	1.587	44.17
	Bed Management	25	11	2.12	1.481	42.40
	Patient tracking	24	12	2.17	1.404	43.33
	Admission and discharge	25	11	2.00	1.291	40.00
	Patient billing	24	12	1.88	1.329	37.50
	Appointment scheduling	25	11	2.28	1.400	45.60
	Patient history	25	11	2.52	1.447	50.40
	Laboratory Medicine	25	11	2.60	1.528	52.00
	Physiotherapy	25	11	3.00	1.384	60.00
Occupational Therapy	25	11	3.16	1.491	63.20	
Nutrition Services	25	11	3.00	1.500	60.00	
Medical Social Work	25	11	3.24	1.300	64.80	
Public Health	24	12	3.63	1.056	72.50	
Administrative Areas	Accounting and Financial management	25	11	2.00	1.500	40.00
	Supplies and Procurement	23	13	1.96	1.364	39.13
	Planning and Development	24	12	3.29	1.367	65.83
	Biomedical Engineering	25	11	3.64	1.350	72.80
	ICT	24	12	2.50	1.532	50.00
	Operational and Compliance Audits	25	11	2.96	1.513	59.20
	Quality Assurance	25	11	2.88	1.481	57.60
	Human Resources Management	25	11	2.84	1.434	56.80

From the table 4 above most of the hospitals use HMIS in automation of their operations. About 45% of the respondents used Inpatient scheduling, pharmacy and therapeutics,

outpatient scheduling and medical records in their operations. 40 % of the respondents had automated fully their accounting and supplies functions which is partly because some hospitals were using manual systems to run their accounting functions. 56.8 % of the respondents had functional modules of HR management in their organisation, 50 % of the respondents had ICT systems in place to manage their operations. Finally from the above table about 50% of the respondents are using HMIS to perform their clinical functions of the hospital while the 55.17 % of the respondents had automated their administrative functions of the hospitals. Tan, (2005) explains that this is possible since the administrative functions of the hospital are easier and have fewer requirements to be adhered to unlike the clinical areas where different equipments from various medical suppliers are unable to integrate with the existing HMIS systems.

4.2 To determine challenges of implementing HMIS in Major hospitals in Kenya.

The second objective of the study sought to determine the challenges of HMISs implementation in Hospitals in Nairobi. From the literature review the researcher identified 28 variables that were used to assess the challenges of HMISs implementation in hospitals. The variables were included in the questionnaire and the respondents were asked to state the extent to which they agreed with the statements in a Likert scale with; 1 = strongly agree, 2 = Agree , 3 = Indifferent, 4 = Disagree and 5 = Strongly Disagree.

Table 4.5: Employees did not support the implementation of HMIS

	Frequency	Percent	Valid Percent	Cumulative
Agree	3	8.3	8.3	8.3
Indifferent	8	22.2	22.2	30.6
Disagree	17	47.2	47.2	77.8
Strongly disagree	8	22.2	22.2	100.0
Total	36	100.0	100.0	

Source, Field data 2011

Table 4 shows that 8 % (3) of the respondents agree that hospital employees did not support the implementation of HMIS, 22.2% (8) of the respondents were indifferent, 47.2 % (17)

disagree with the above view and 22.2% (8) strongly disagree with the view. This shows that a very small percentage of employees resisted the implementation of HMIS in a hospital.

Table 4.6: Managers did not support the implementation of HMIS

	Frequency	Percent	Valid Percent	Cumulative
Strongly agree	1	2.8	2.9	2.9
Indifferent	3	8.3	8.6	11.4
Disagree	12	33.3	34.3	45.7
Strongly disagree	19	52.8	54.3	100.0
Total	35	97.2	100.0	

Source, Field data 2011

Most of the managers supported the implementation of HMIS in hospitals as evident in the table (above).52.8% of the respondents strongly disputed that managers did not support HMIS implementation in their hospitals.33.3 % (5) felt that managers supported system implementation while about 11 % felt that managers actually did not support the implementation of HMIS.

Table 4.7: Users were not fully involved in the implementation of HMIS

	Frequency	Percent	Valid Percent	Cumulative
Agree	2	5.6	5.6	5.6
Indifferent	6	16.7	16.7	22.2
Disagree	21	58.3	58.3	80.6
Strongly disagree	7	19.4	19.4	100.0
Total	36	100.0	100.0	

Source, Field data 2011

19.4% (7) of the respondents said that they strongly disagreed that users were not fully involved in the implementation of HMIS, 58.3 %(21) disagreed that with the same this in total shows that about 77.7 % of the respondents felt that users were involved fully in system implementation while the remaining 23.3 % felt that users are not fully involved in HMIS implementation. Maguire, (2002) Agrees that employees, managers and other system users

are the greatest risk of an information system project since they determine how fast the implementation will be done which ends up saving costs for the organisations.

Table 4.8: Managers are not fully involved in the implementation of HMIS

	Frequency	Percent	Valid Percent	Cumulative
Strongly agree	1	2.8	2.8	2.8
Agree	1	2.8	2.8	5.6
Indifferent	5	13.9	13.9	19.4
Disagree	14	38.9	38.9	58.3
Strongly disagree	15	41.7	41.7	100.0
Total	36	100.0	100.0	

Source, Field data 2011

From the above the above table the respondents agreed that most managers are fully involved with the implementation of HMIS with about 80 % (29), 13.9% (5) of the respondents were indifferent in their opinion, while the remaining 5.6% (2) of the respondents indicated that managers are not fully involved in the implementation of HMIS.

Table 4.9: Lacks the financial resources for implementation of HMIS

	Frequency	Percent	Valid Percent	Cumulative
Agree	2	5.6	5.6	5.6
Indifferent	9	25.0	25.0	30.6
Disagree	11	30.6	30.6	61.1
Strongly disagree	14	38.9	38.9	100.0
Total	36	100.0	100.0	

Source, Field data 2011

From table 8, most of the respondents 69.6% (15) stated that their organisations do not lack the financial resources needed to automate their operations while 25 % (9) were indifferent with the remaining 5.6% (2) of the respondents agree that their organisation lack the resources needed to implement the HMIS.

Table 4.10: Employees have negative attitudes towards changes

	Frequency	Percent	Valid Percent	Cumulative
Strongly agree	3	8.3	8.3	8.3
Agree	2	5.6	5.6	13.9
Indifferent	8	22.2	22.2	36.1
Disagree	16	44.4	44.4	80.6
Strongly disagree	7	19.4	19.4	100.0
Total	36	100.0	100.0	

Source, Field data 2011

From the table 9 63.8 % of the respondents stated that employees in their organisation have a positive attitude towards change, 22.2% (8) were indifferent and the remaining 14.9 % (5) of the respondents expressed that employees had negative attitude towards implementation of HMIS.

Table 4.11: Poor communication

	Frequency	Percent	Valid Percent	Cumulative
Strongly agree	2	5.6	5.6	5.6
Agree	4	11.1	11.1	16.7
Indifferent	9	25.0	25.0	41.7
Disagree	15	41.7	41.7	83.3
Strongly disagree	6	16.7	16.7	100.0
Total	36	100.0	100.0	

Source, Field data 2011

Whereas there is communication on projects implementation 16 % (6) of the respondents agree that the communication is poor and about 40% (14) of the respondents felt that it needs to be worked on. The remaining 60% (21) of the respondents agreed that there is proper communication on project implementation.

Table 4.12: Poor ICT infrastructure prevent HMIS implementation

	Frequency	Percent	Valid Percent	Cumulative
Strongly agree	2	5.6	5.6	5.6
Agree	6	16.7	16.7	22.2
Indifferent	5	13.9	13.9	36.1
Disagree	9	25.0	25.0	61.1
Strongly disagree	14	38.9	38.9	100.0
Total	36	100.0	100.0	

Source, Field data 2011

Most of the organisation respondents disagreed that there is poor ICT infrastructure to implement HMIS in their organisations. They indicated that they have adequate ICT infrastructure to implement HMIS with 63.9% agree that they have sound ICT infrastructure and only 21.3 % agreed that their infrastructure requires to be improved for smooth HMIS implementation.

Table 4.13: Interoperability/Incompatibility issues

	Frequency	Percent	Valid Percent	Cumulative
Strongly agree	1	2.8	2.8	2.8
Agree	4	11.1	11.1	13.9
Indifferent	4	11.1	11.1	25.0
Disagree	9	25.0	25.0	50.0
Strongly disagree	18	50.0	50.0	100.0
Total	36	100.0	100.0	

Source, Field data 2011

50 % of the respondents strongly disagree that there are interoperability/incompatibility issues with the HMIS.25 % of the respondents disagree and while about 13% agree that there are incompatibility issues

Table 4.14: Lack of system testing

	Frequency	Percent	Valid Percent	Cumulative
Strongly agree	2	5.6	5.6	5.6
Agree	1	2.8	2.8	8.3
Indifferent	8	22.2	22.2	30.6
Disagree	12	33.3	33.3	63.9
Strongly disagree	13	36.1	36.1	100.0
Total	36	100.0	100.0	

Source, Field data 2011

Lack of system testing was found to be a minor issue with implementation of HMIS. About 5.6 % (2) and 2.8 % (1) strongly agreed and agreed respectively that lack system testing interferes with the HMIS. About 69.1 % (25) of the respondents stated that lack of system testing does not interfere with the HMIS implementation since most of the organisations used off the shelf HMIS which were standardized for most hospital functions.

Table 4.15: Lack of training of users

	Frequency	Percent	Valid Percent	Cumulative
Agree	2	5.6	5.6	5.6
Indifferent	8	22.2	22.2	27.8
Disagree	13	36.1	36.1	63.9
Strongly disagree	13	36.1	36.1	100.0
Total	36	100.0	100.0	

Source, Field data 2011

Training of users is paramount to implementation of HMIS. About 30% of the respondents agree that there is need for user training on new HMIS.70% of the respondents indicated that user training was not an issue in their organisations. Robert et al (2003) conveys that the implementation of hospital information will require not only retraining end-users, systems professionals and micro-oriented staff but also the overhauling of the data networks to provide the speed, integrity and reliability required by a HMIS.

Table 4.16: Poor changeover methods

	Frequency	Percent	Valid Percent	Cumulative
Strongly agree	3	8.3	8.3	8.3
Agree	1	2.8	2.8	11.1
Indifferent	10	27.8	27.8	38.9
Disagree	10	27.8	27.8	66.7
Strongly disagree	12	33.3	33.3	100.0
Total	36	100.0	100.0	

Source, Field data 2011

Changeover methods are dependent on many factors. E.g. the geographical location of the hospital, number of departments among others. From the above table only 11.1 % (4) or the respondents agree that poor changeover methods lead to a challenge in the implementation of HMIS in their organisation. 27.8% (10) of the respondents are indifferent while the remaining 61.1 (5) of the respondents felt that the poor change over methods contributed to the challenges faced in the implementation of HMIS in their hospital.

Table 4.17: Poor skill sets among users

	Frequency	Percent	Valid Percent	Cumulative
Strongly agree	3	8.3	8.3	8.3
Agree	2	5.6	5.6	13.9
Indifferent	8	22.2	22.2	36.1
Disagree	11	30.6	30.6	66.7
Strongly disagree	12	33.3	33.3	100.0
Total	36	100.0	100.0	

Source, Field data 2011

13.9% of the respondents stated that they had poor skillset amongst the users. Over 63.9% of the respondents disagreed that they have poor skills in their organisation and therefore it was not an issue in their organisation. (Kendall & Kendall, 2008) states that for an information system to be operationalised well trained users must be involved in its operation.

Table 4.18: Poor file conversion and database design

	Frequency	Percent	Valid Percent	Cumulative
Agree	4	11.1	11.4	11.4
Indifferent	6	16.7	17.1	28.6
Disagree	13	36.1	37.1	65.7
Strongly disagree	12	33.3	34.3	100.0
Total	35	97.2	100.0	
No response	1	2.8		
Total	36	100.0		

Source, Field data 2011

File and data conversion was an issue among 25 % (10) of the respondents who agreed that poor file conversions and database design can hinder implementation of HMIS. The remaining 72% (25) had no issues with file conversion and one of the respondents was not responsive on this issue.

Table 4.19: Inadequate hardware acquisition

	Frequency	Percent	Valid Percent	Cumulative
Strongly agree	3	8.3	8.3	8.3
Agree	3	8.3	8.3	16.7
Indifferent	4	11.1	11.1	27.8
Disagree	16	44.4	44.4	72.2
Strongly disagree	10	27.8	27.8	100.0
Total	36	100.0	100.0	

Source, Field data 2011

Most of the hospitals had adequate hardware for the implementation of HMIS. This was reflected from the survey data as per table 18 above which indicates that about 72% had acquired hardware for HMIS implementation. 16.6 % (6) had inadequate hardware for HMIS implementation. This is further explained by the hospitals which had no HMIS system in place. The remaining 11.1% (4) has average hardware in their

hospitals. Duhan et al. (2001) agrees that most information system implementation failures are brought about by lack of proper management of the various components of technology.

Table 4.20: Long procurement processes

	Frequency	Percent	Valid Percent	Cumulative
Strongly agree	7	19.4	28.0	28.0
Agree	8	22.2	32.0	60.0
Indifferent	1	2.8	4.0	64.0
Disagree	5	13.9	20.0	84.0
Strongly disagree	4	11.1	16.0	100.0
Total	25	69.4	100.0	
Non Response	11	30.6		
Total	36	100.0		

Source, Field data 2011

Long procurement processes were noted in many hospitals with 41.6% of the respondents stating that their organisations have long procurement processes. 2.8% of the respondents were indifferent and the remaining 24 % had no issues with the procurement processes. According to (Turbit, 2005) all the processes of HMIS evaluation need to be followed which eventually might end up reducing the overall project period by faster acquisition of the HMIS.

Table 4.21: Incompatibility between the new and old system

	Frequency	Percent	Valid Percent	Cumulative
Strongly agree	2	5.6	5.6	5.6
Agree	6	16.7	16.7	22.2
Indifferent	2	5.6	5.6	27.8
Disagree	12	33.3	33.3	61.1
Strongly disagree	14	38.9	38.9	100.0
Total	36	100.0	100.0	

Source, Field data 2011

Incompatibility issues between the old system and the new system were not evident with about 71% of the respondents saying they did not have issues while 5.6 % were indifferent and 21.3 % stating that they had issues with the interoperability of the HMIS system with other systems. (O'Brien, 2003) confirms that not all systems will experience incompatibility issues especially if the design of the databases is done correctly with the legacy system data in mind.

CHAPTER FIVE: SUMMARY, CONCLUSION AND RECOMMENDATIONS

5.1 Summary

The general purpose of the study was to establish the practice of HMISs implementation in hospitals in Nairobi. Descriptive statistics was used to analyze the data and the results were presented in graphs and tables. The findings of the practice of HMISs implementation in Kenyan hospitals indicate that most hospitals have adopted several practices in their HMIS implementation. Although the approaches adopted have assisted hospitals to implement HMISs, there is lack of detailed HMIS implementation work plan, user training, management involvement, and established ICT department to spearhead ISs implementations. Furthermore, hospitals lack; resources needed for HMIS acquisition, implementation strategy and inadequate ICT infrastructure.

The second objective sought to determine the challenges faced by hospitals in HMISs implementation. The study found that Kenyan hospitals experience the following challenges during HMISs implementation. These included; lack of employees support, lack of Management support, lack of user involvement, inadequate management involvement, Lacks the financial resources, negative attitudes towards changes, lack of proper management strategy, poor communication, inadequate ICT infrastructure, regulatory barriers, interoperability issues, lack of system testing, inadequate of training of users, expertise in hardware and software acquisition, unrealistic return on investment, long procurement processes, software and hardware compatibility, and the challenge of cost benefit analysis.

5.2 Conclusions

The findings established that a number of challenges affect HMIS implementation. As observed in the literature the challenges tend to fall heavily on process and people management. The hospitals have adopted a number of practices in HMISs implementation at various stages of IS development, the good practices include; involving users in requirement definition, user departments initiating ISs projects thus increasing ownership, acquiring the required hardware and infrastructure before ISs implementation. The study

also noted that some practices are the cause of the observed challenges. The findings show that, hospitals experience the difficult in drawing the line between changing business process to suit the HMIS's. Instead of changing the way people work, they work towards modifying the system which end up utilizing more time and increase implementation costs. In addition, HMIS's ends up documenting inefficiencies and redundancies because of poor process definition. Bureaucracies were evident in procurement process and awarding of contracts.

The study noted that, lack of consensus between senior managers and user departments in hospitals delays HMISs implementations. The respondents identified file compatibility and data conversion issues from the legacy system to the new HMISs was as a challenge that is limiting the benefit of quick transaction processing in their organization. The respondents also identified lack of awareness among the managers as an area that can be improved for the successful implementation of HMISs in hospitals. The study established that implementing features outside the scope was common in hospitals as most users gets excited with the new technology and desire to have everything automated. Managing the scope was established as major challenge to hospitals in HMIS implementation. As more features are added to the system the more the HMISs become difficult to use.

Poor planning is a critical challenge to successful ISs implementation. As noted by Maguire, (2002), the respondents revealed that, they had a problem in having their HMISs up and running on time due to inefficient planning, lack of expertise, lack of mechanisms to retain qualified professional leading to poor software evaluations. About 40% of the respondents agreed that communication is not adequately done. Most hospitals experienced a number issue and problems related to desktop computers, and installed software on compatibility issues.

5.3 Policy Recommendation

To improve the success of HMIS implementation in hospitals, the study recommends; improving planning and coordination of HMISs projects, capacity building through user training, knowledge and skills transfer, transparency in procurement of information systems, involvement of users in system requirement definition, involvement of managers at all levels, sufficient software & hardware evaluation and use of change agents in implementation. The study further recommends employing qualified managers to spearhead HMISs implementation and empowering them through training since they are the drivers of the project. Hospitals intending to implement HMISs should establish and equip IT department which will spearhead automation, development of IT strategy and enterprise architecture.

5.4 Limitations of the study

The researcher encountered various limitations that tended to hinder access to information sought by the study. These included; limited time as the research was being undertaken in a short period which limited the scope covered by the research. The companies approached were reluctant in giving information fearing that the information sought would be used to print a negative image about the companies. The researcher handled the problem by carrying with him an introduction letter from the University and assured them that the information they gave would be treated confidentially and it was to be used purely for academic purposes. The questionnaire was also designed in such a way that the respondents' identity would remain anonymous. Lack of sufficient funds limited the researcher from accessing all the institutions in Kenya to collect data for study. The researcher however limited himself to the hospitals in Nairobi which are representative of the hospitals in Kenya.

Whereas there are many stages of HMISs development, the study was limited to implementation stage of the SDLC. The limitation of the resources, made it difficult to obtain responses of all the hospitals in the country, in addition some of the hospitals did not have an established ISs hence, they had a problem in responding to the questionnaires provided thus limiting the response rate. The study therefore targeted only IT officers in hospitals, the study did not interview other stakeholders like project managers and consultants providing services to the hospitals and other key personnel from business

departments like finance and human resources who could have given more insights on HMISs implementations challenges.

5.5 Recommendations for Further Research

The study recommends that more studies should be done in other areas (outside Nairobi) to establish if the same results will hold. In addition other studies can be done that include other employees of the organization for instance the finance managers, human resource managers this will give a broader picture on the resources set a aside for implementation of HMIS. Finally, the study covered only the final stage of SDLC, more studies can be carried out in other stages to ascertain whether the outcomes are related.

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APPENDIX I: QUESTIONNAIRE

SECTION A

Kindly answer all the questions

1. Gender

a. Male []

b. Female []

2. Age

a. 18- 30 []

b. 31-44 []

c. 45-55 []

d. Above 55 []

3. Work Position

a. ICT Manager []

b. IT Officer []

c. Senior IT Officer []

4. Academic Qualification

a. Diploma []

b. Graduate []

c. Post Graduate []

d. Others Specify _____

5. Professional Qualification

MCSD []

CCNA []

MCSE []

Others _____

6. Client base

a. Less than 100,000 []

b. 100,000- 499,999 []

c. 500,000- 999,999 []

d. Over 1 Million []

SECTION B

7. Does the hospital have a HMIS

a. Yes []

b. No []

8. What areas/functions does the HMIS cover in the hospital Rate them in scale of 1-5 where 1 represents strongly agree, 2 represents Agree , 3 represents Indifferent, 4 represents Disagree and 5 represents Strongly Disagree

		1	2	3	4	5
i	Inpatient scheduling					
ii	Pharmacy					
iii	Laboratory					
iv	Radiology					
v	Dietics					
vi	Accounting and Financial management					
vii	Procurement					
viii	medical records					
ix	Surgery					
x	Nursing					
xi	Dental					
xii	order entry					
xiii	Orthopedics					
xiv	results reporting					
xv	outpatient scheduling					
xvi	Bed Management					
Xvii	Patient tracking					
Xviii	Admission and discharge					
Xix	Patient billing					
Xx	Appointment scheduling					
xxi	Patient history					
xxii	Lab requests scheduling					

Others Specify

SECTION C

9. Do you agree with the following issues as the challenges to the implementation of Hospital Management Information system in your organisation, rate them in scale of 1-5 where 1 represents strongly agree, 2 represents Agree , 3 represents Indifferent, 4 represents Disagree and 5 represents Strongly Disagree

		1	2	3	4	5
i	Employees do not support the implementation of HMIS					
ii	Managers do not support the implementation of HMIS					
iii	Users are not fully involved in the implementation of HMIS					
iv	Managers not fully involved in the implementation of HMIS					
v	Lacks the financial resources for implementation of HMIS					
vi	Employees have negative attitudes towards changes					
vii	Lack of proper management strategy					
viii	Poor communication					
ix	Poor ICT infrastructure prevent HMIS implementation					
x	HMIS is less secure					
xi	Regulatory barriers					
xii	Interoperability/Incompatibility issues					
xiii	Lack of system testing					
xiv	Lack of training of users					
xv	Poor changeover methods					
xvi	Poor skillsets among users					
xvii	Insufficient software evaluation					
xviii	Poor file conversion and database design					
xix	Inadequate hardware acquisition					
xx	Inadequate software acquisition					
xxi	Lack of change agents					
xxii	Unrealistic return on investment					
xxiii	Inaccurate information					
xxiv	Lack of adequate ICT Staff					
xxv	Long procurement processes					
xxvi	Volatility of HMIS industry					
xxvii	Insufficient hardware evaluation					
xxviii	Incompatibility between the new and old system					

10. Apart from the challenges mentioned above list any other challenges that you encounter when implementing HMIS.

Thank You

APPENDIX 2 LIST OF MAJOR HOSPITALS IN NAIROBI

No	Name of Hospital	District	Location
1	Aga Khan Hospital	Nairobi West	Westlands
2	Avenue Nursing Hospital	Nairobi West	Westlands
3	Compassionate Hospital	Nairobi North	Kasarani
4	Coptic Hospital	Nairobi West	Westlands
5	Gertrudes Hospital	Nairobi West	Westlands
6	Guru Nanak Hospital	Nairobi North	Central
7	Huruma Maternity Hospital	Nairobi North	Kasarani
8	Jamaa Hospital	Nairobi East	Makadara
9	Jamii Medical Hospital	Nairobi North	Kasarani
10	Kamiti Prison Hospital	Nairobi North	Kasarani
11	Karen Hospital	Nairobi West	Lang'ata
12	Kayole Hospital	Nairobi East	Embakasi
13	Kayole II Sub-District Hospital	Nairobi East	Embakasi
14	Langata Hospital	Nairobi West	Lang'ata
15	Mariakani Cottage Hospital	Nairobi East	Makadara
16	Masaba Hospital	Nairobi West	Westlands
17	Mater Hospital	Nairobi East	Makadara
18	Mathare Hospital	Nairobi North	Central
19	Melchezedek Hospital	Nairobi West	Dagoretti
20	Memorial Hospital	Nairobi West	Dagoretti
21	Metropolitan Hospital	Nairobi East	Makadara
22	Moi Air Base Hospital	Nairobi North	Eastleigh North
23	Mother & Child Hospital	Nairobi North	Eastleigh South
24	MP Shah Hospital	Nairobi West	Westlands
25	Nairobi Equator Hospital	Nairobi West	Lang'ata
26	Nairobi Hospital	Nairobi West	Westlands
27	Nairobi West Hospital	Nairobi West	Lang'ata
28	Nairobi Womens Hospital	Nairobi West	Westlands
29	Nairobi Womens Hospital Adams	Nairobi West	Westlands
30	Olive Tree Hospital	Nairobi West	Langata
31	Parkroad Hospital	Nairobi North	Central
32	Provide International Korogocho	Nairobi North	Kasarani
33	Pumwani Maternity Hospital	Nairobi North	Pumwani
34	Radent Hospital	Nairobi North	Central
35	St Francis Com Hospital	Nairobi North	Kasarani
36	St John Hospital	Nairobi North	Kasarani
37	St Mary's Mission Hospital	Nairobi West	Lang'ata
38	St.Mac's Hospital	Nairobi West	Lang'ata
39	Umoja Hospital	Nairobi East	Embakasi

No	Name of Hospital	District	Location
40	Victory Hospital	Nairobi East	Embakasi
41	Wentworth Hospital	Nairobi East	Embakasi
42	Kenyatta National Hospital	Nairobi	Upper Hill