

**FACTORS INFLUENCING IMPLEMENTATION OF HEALTH
MANAGEMENT INFORMATION SYSTEMS IN GOVERNMENT
HEALTH CARE FACILITIES IN KENYA: THE CASE OF
KIBWEZI HEALTH CARE FACILITIES MAKUENI COUNTY**

BY

KIOKO KITHUKI

**A RESEARCH PROJECT REPORT SUBMITTED IN PARTIAL FULFILMENT FOR
THE AWARD OF A DEGREE OF MASTER OF ARTS IN PROJECT PLANNING AND
MANAGEMENT OF UNIVERSITY OF NAIROBI.**

2012

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DECLARATION

This project is my original work and has not been presented to any other examination body.

Kioko Kithuki

Signature



Date

25/11/2012

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This research project has been submitted with my approval as the University of Nairobi
Supervisor



Ruth Wanjiru Njora

Department of Extra Mural Studies

University of Nairobi

20/11/2012

Date

DEDICATIONS

I dedicate this project report to my loving wife, **Mary Kakuvi Kioko**, my daughters, **Cecilia**, **Agnes** and **Janet** for encouraging me and for their continuous support all through till I completed this project. There is no doubt in my mind that without their continued support I could not have completed this process.

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TABLE OF CONTENTS	
DECLARATION.....	ii
DEDICATIONS	iii
ACKNOWLEDGEMENTS	iv
TABLE OF CONTENTS	v
LIST OF TABLES	viii
LIST OF FIGURES	ix
ABBREVIATIONS AND ACRONYMES	x
ABSTRACT.....	xii
CHAPTER ONE: INTRODUCTION.....	13
1.1 Background to the Study.....	13
1.2 Statement of the Problem.....	17
1.3 Purpose of the Study	19
1.4 Objectives.....	19
1.5 Research Questions.....	19
1.6 Significance of the study.....	20
1.7 Delimitation of the Study.....	21
1.8 Limitation of the Study.....	21
1.9 Assumptions of the Study	21
1.10 Definition of Significant Terms.....	22
1.11 Summary	23
CHAPTER TWO: LITERATURE REVIEW.....	24
2.1 Introduction.....	24
2.2 Empirical literature	24
2.3 Theoretical Framework.....	30
2.3.1 The Stakeholders theory	30

2.3.2 Diffusion of Innovation Theory	31
2.3.3 Resource Based Theory	31
2.4 Planning Implementation of HMIS.....	32
2.5 Stakeholders and Implementation of HMIS	32
2.6 Technology and Implementation of HMIS	34
2.7 Human capacity development and Implementation of HMIS	34
2.8 Finance and Implementation of HMIS	36
2.9 Summary.....	38
CHAPTER THREE: RESEARCH METHODOLOGY	39
3.1 Introduction.....	39
3.2 Research Design.....	39
3.3 Target Population.....	39
3.4 Sampling Procedure	40
3.5 Research Instruments	41
3.6 Validity	42
3.7 Reliability.....	42
3.8 Operational Definition of Variables.....	43
3.9 Methods of data analysis.....	43
3.10 Summary.....	44
CHAPTER FOUR: DATA ANALYSIS, PRESENTATION AND INTERPRETATION ...	45
4.1 Introduction.....	45
4.2 Response Rate.....	45
4.3 Reliability Analysis.....	46
4.4 Personal Information.....	46
4.5 Influence of Planning on the Implementation.....	49

4.6 Stakeholders.....	51
4.7 Technology	54
4.8 Human Capacity Development	56
4.9 Finance.....	58
4.9 Inferential Statistics	60
CHAPTER FIVE: SUMMARY OF FINDINGS, DISCUSSIONS, CONCLUSION AND RECOMMENDATION.....	63
5.1 Introduction.....	63
5.2 Summary of Findings.....	63
5.3 Discussions	66
5.4 Conclusion	68
5.5 Recommendations.....	70
5.6 Suggestions for Further Research	72
REFERENCES.....	73
APPENDIX I: INTRODUCTION LETTER.....	76
APPENDIX II: QUESTIONNAIRE	77
APPENDIX III: SCHEDULE OF RESEARCH ACTIVITIES.....	85
APPENDIX IV: BUDGET ESTIMATES.....	86
APPENDIX V: KIBWEZI MAP	87

LIST OF TABLES

Table 3.1: Population	40
Table 3.2: Sample size	41
Table 3.3: Operational Definition of Variables	43
Table 4.1: Response Rate.....	45
Table 4.2: Reliability Analysis	46
Table 4.3: Age of the Respondents	47
Table 4.4: Highest Education Level.....	47
Table 4.5: Working Experience	48
Table 4.6: Influence of Planning.....	49
Table 4.7: Extent to Which Planning Issues Influences	50
Table 4.8: Influence of Stakeholders	52
Table 4.9: Extent to Which stakeholders	53
Table 4.10: Influence of Technology.....	54
Table 4.11: Extent to Which technology Issues.....	55
Table 4.12: Human Capacity Development.....	56
Table 4.13: Extent to Which human capacity Issues	57
Table 4.14: Influence of Finance	58
Table 4.15: Extent to which finance issues.....	59
Table 4.16: Correlation Analysis Results	61

LIST OF FIGURES

Figure1: Conceptual Framework37

ABBREVIATIONS AND ACRONYMES

ATM	Automated Teller Machine
CBK	Central Bank of Kenya
COTU – K	Central Organization of Trade Union of Kenya
DHIS	District Health Information System
EI	Emotional Intelligence
ERS	Economic Recovery Strategy (ERS)
HMIS	Health Information Management System
HIS	Health Information System
HR	Human Resource
HRM	Human Resource Management
ICT	Information and Communication Technologies
IICD	Institute for Communication and Development
KHPF	Kenya Health Policy Framework
KCB	Kenya Commercial Bank
KEMRI	Kenya Medical Research Institute
MOH	Ministry of Health
MBA	Master of Business Administration
NBK	National Bank of Kenya
NHSSP	National Health Sector Strategic Plan
NSE	Nairobi Stock Exchange

ROA Return on Assets
ROE Return on Investment
US United States
WHO World Health Organization

xi
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ABSTRACT

Health Management Information system is a system designed to integrate data collection, processing, reporting, and use for the improvement of patient health services, effectiveness and efficiency through better management of patient data at all levels of implementation. The main objective of the study was to assess the factors influencing implementation of health management information systems in government health care facilities in Kenya, a case of Kibwezi district health care facilities Makueni County. The study specifically aimed to; assess how Planning, Stakeholders, technology, human capacity development and to find out how finance influences the implementation of health management information systems in government health care facilities. The study adopted a descriptive case study research design and the study population consisted of 200 health care workers at Kibwezi Health Care Facilities. The study specifically targeted 30 doctors and clinical officers, 150 nurses and 20 IT staff since they are the one involved in the implementation of health management information systems. The study adopted a probability sample design by applying a stratified random sampling technique to select a sample size of 100 respondents. Questionnaires were used as the major data collection instruments. Descriptive statistics data analysis method was applied to analyze the gathered data using a Statistical Package for Social Scientists (SPSS) that was used to compute response frequencies, percentages and mean, standard deviation and variance results. The obtained findings were presented using tables, pie charts and bar charts. Further, inferential statistics using correlation analysis was used to determine the relationship between research variables. The study found out that planning was major factor that greatly influenced effective implementation of health management information systems in government health care facilities. lack of stakeholders support hindered allocation of enough financial resources for strengthening effective implementation of HMIS. The study drew conclusions that poor and lack of implementation of HMIS in many government health care facilities in Kenya is greatly influenced by poor planning and strategizing, lack of stakeholders support, lack of embracement of ICT, lack of human capacity development in ICT and health management and inadequate financial resources. The study recommended that; the management of government health care facilities should undertake effective planning and strategizing by drafting and implementing effective strategic plans; the top management in the government health care facilities should employ effective leadership styles and demonstrate a high level of engagement in the HMIS implementation process; health care facilities should implement effective ICT infrastructure to support automation of health recording function; government health care facilities should recruit competent workforce and implement continuous human resource capacity development programs such as training workshops, seminars and career development opportunities. Finally the government through the ministry of health should allocate adequate funds for financing HMIS implementation process

CHAPTER ONE

INTRODUCTION

1.1 Background to the Study

Health Information management systems are systems used to collect, analyze, retain, retrieve and evaluate health information (Haux et al,2004). The WHO (2005) article on “Issues in health information” adds to this definition by stating that a health management information system incorporates all the data needed by policy makers, clinicians and health service users to improve and protect population health. The goal of a Health Management Information System is to check quality by comparing perceptions of services delivered with the expected standards and to provide timely and accurate information leading to better health care planning and improved diagnosis and more patients getting access to health services for an entire country (Haux et al, 2004).

According to Tan (2002) a health information system usually describes several separate subsystems containing data. These includes; disease surveillance and outbreak notification, data generated through household surveys, registration of vital events and censuses (births, deaths and causes of death),data collection based on patient and service records and reporting from community health workers, health workers and health facilities, programme-specific monitoring and evaluation (for example for TB, HIV/AIDS, and EPI) and administration and resource management (including budget, personnel, and supplies) (WHO, 2005).

The function of a health information system is to bring together data from all these subsystems, to share and disseminate them to the many different audiences for health information, and to ensure that health information is used rationally, effectively and efficiently to improve health action (Nicole,2007). A strong health information system is an essential component of sound programme development and implementation, and is a requirement for strategic decision making, providing the basis upon which improved health outcomes depend. The difference between hospital information systems and health information systems has been defined by Haux et al. (2004). He states that such complexes or systems of processing data, information and

knowledge in health care environments are called health information systems. The first difference is the level where the system is being implemented. A health management information system being on the national level shows that hospital information systems are just one instance or subsystem of health information systems. The aim of health information systems was and is as simple as relevant: to contribute to a high quality, efficient patient care. This aim is primarily centered towards the patient and towards medical and nursing care, the administrative and management tasks are then needed to support such care (Nicole,2007).

The health management information system can be on a district or national level and consists of data for policy and strategy its main goal is to provide timely and accurate information leading to better health care planning and improved diagnosis and more patients getting access to health services for an entire country. A health management information system will consist of two subsystems which define an HMIS a hospital management information system and a patient management information system (Nicole,2007). The patient management information system deal with all the information related to patients like, patient data, patient billing, patient treatments and patient prescriptions. A hospital management information system is used to manage clinical information of the hospital concerning financing and logistics, accounting, record keeping, HR management asset management and stock management (Nicole,2007).

The health system in developing countries has changed drastically in the last few years from a centralized system with hierarchical reporting to a decentralized system. Health systems in a centralized system only used to focus on morbidity and mortality reporting from individual health units to the district and national level (Gladwin et al., 2003). With the introduction of a decentralized system there has been significant change, emphasized by the Ministry of Health (MOH), through the implementation of health management information systems (HMIS) which emphasize the use of information at the point of collection. Through decentralization more freedom and responsibilities are given to each point of care meaning that more skills are demanded of primary health care managers, concerning the data and information handling at all levels of a health care system on a global level (Gladwin et al. 2000).

To provide optimal care, healthcare institutions need timely patient information from various sources at the point-of-care, and need a comprehensive, complete and fully functional system to fulfill all these needs (Mathew,2009). One way to achieve this is through the use of ICT in health care. ICT is defined in this research as a tool that facilitates communication, the processing and transmission of information and the sharing of knowledge by electronic means. This encompasses the full range of electronic digital and analogue ICT, from radio and television to telephones (fixed and mobile), computers, electronic-based media such as digital text and audio-video recording, and the Internet, but excludes the non-electronic technologies. However this does not lessen the importance of non-electronic technologies such as paper-based text for sharing information and knowledge or communicating about health (WHO, 2004).

The introduction of information systems in healthcare knows of failures and successes. What has become apparent is that the introduction of such a system many times fails because of issues related to the organization itself. Kuhn et al. (2001) allocate the success rate of a project as being 80 percent dependent on the development of the social and political interaction skills of the developer and 20 percent or less on the implementation of the hardware and software technology. In developing countries this means that issues like the national and organizational culture play a big role. Another issue is the loss of individual benefits like extra income (Mathew,2009). The introduction of technology would also mean that illegal money making and fraud would become visible. These are some of the issues that play a role in developing countries which have a big impact on the successful introduction of information systems in hospitals in these countries. The World Health Organization (WHO) identified the district-oriented health information systems as a priority and noted that 'weakness of information support is acknowledged by most member states as a persistent obstacle to vigorous and objective management'. Efforts made to strengthen national information systems have often produced little improvement and have sometimes made the problems worse (Gladwin et al. 2003). This is why there is a need in low income countries for research on the development of practical health information systems to guide policy and management decisions and for improvement of the existing systems. This will be essential to achieve the new health information system on all levels (Gladwin et al. 2003).

The International Institute for Communication and Development (IICD) works in 9 countries in Africa and Latin America and has since 1998 been supporting partner organizations with the introduction of Information and Communication Technologies (ICT) for development and poverty alleviation, amongst others in the health sector. For the past years they have been supporting projects in Mali, Tanzania, Uganda and Zambia implementing systems into healthcare. IICD also sees the importance of a decentralized system for health information management and wants to take stock of the achievements of projects that have been implementing information systems, gather experiences and lessons learnt and identify challenges for introducing and using IS in healthcare.

There is also still much confusion in literature about the definition which should be used for the HMIS abbreviation. What it stands for and how and when it should be used properly seems to be an international problem. Starting with a clear definition of the HMIS will also be a goal of this research. Therefore meaningful, comparable information on health system performance and the key factors that explain these variations can strengthen the scientific foundations of health policy at the international and national levels.

On 15 February 2012 the Ministry of Health in Kenya launched the district Health Information System DHIS at the Panafric Hotel, Nairobi. The DHIS is a very robust web-based open source system that collects all health and health related data/indicators at all levels from the community level, facility, district, county and national levels (www.medical.go.ke,2012). DHIS cloud infrastructure enables users to collect data using all existing technologies including any kind of internet enabled phones(mobile access), thus creating a wider reach of use by health workers and stakeholders across the country (www.medical.go.ke,2012).

Kenya Health Information System is undergoing transformation to ensure it meets a globally competitive advantage in providing high quality information to the citizens through revitalization and leveraging of health information technology in the line with Kenya Vision 2030: " A globally competitive, newly industrializing, middle income country that is able to provide a high quality of life to all citizen in strategic environment"(www.medical.go.ke,2012).

As the Ministries of Health decentralize their core business, the demand for sound information to support economic development of health sector. Health Information System (HIS) is integral part of the health system strengthening. The implementation of the Health Information Software (DHIS2) is one of the efforts in strengthening the information system gearing towards improving service delivery. It is free and open source web based software that is implemented on a central server based on a cloud infrastructure. It uses internet and mobile network (www.medical.go.ke,2012).

1.2 Statement of the Problem

According to the WHO (2007) few HMIS systems in developing countries are ineffective because the available data often tend to be out of date therefore making trend assessment particularly difficult. And in these countries accurate health information is needed the most. This is why statistical, public health and biomedical knowledge and expertise are very much required (Nicole,2007).

In Kenya implementation of health management information systems in government health care facilities is characterized by poor information processing that is used by institutions, such as health ministries, national statistics offices, ministries for labour, social welfare, planning and finance, the private sector, civil society, donors and development assistance agencies. This negatively affects formulation of better health policies since there lacks valid health information for policy development. With a vast majority of data producers health information systems have evolved following administrative, economic, legal or donor pressures and have been fragmented by the demands of disease-focused programs and the diversity of donor requirements and international initiatives

Planning and strategizing is an important way to map out possible directions that the information system will be used for on the short and longer term (Gladwin et al. 2003). Processes in Healthcare are important and optimal adaptation of IS to workflow in health care institutions is required (Nicole,2007). Lack of proper planning and strategizing is a major problem hindering Kibwezi district health care facilities from implementing Health Management Information System. The management of the health facilities do not carry effective planning before the

commencement of the HMIS project implementation process and this makes it difficult for the application of effective HMIS implementation strategies.

Because HMIS project is dependent upon the stakeholders for implementation and use of the project, the needs of these parties and their roles are normally not explicitly documented and hence are not taken into consideration when designing and implementing the HMIS. This makes it difficult for most of the stakeholders at Kibwezi district health care facilities to effectively support the implementation and application of HMIS in health care facilities.

Technology issues arising as result of the need for better computer hardware's and soft wares that support effective implementation of HMIS hampers the creation of supportive environment for the implementation and application of HMIS in Kibwezi district health care facilities (George, 2009). Technology problems also concern a lack of standardization, electrical power and backup of the system. A good backup for the systems is a problem in all the cases leaving computers prone to viruses. There is also a need for alternative ways to produce electricity: shortage of energy hinders continuous activities and delays the implementation of projects many times (Kuhn et al. 2001).

Many health care facilities in Kibwezi district do not have human resource capacity capable of supporting and sustaining the implementation and application of HMIS. Lack of computer literacy and brain drain on local level is a critical issue because most of the people especially in rural areas lacks the required competency in the use of HMIS. The employed training programs do not facilitate towards equipping the hospital staff with competitive skills in effective application of HMIS. This encourages the use of manual health management systems and low emphasis on HMIS application (Edward,2010).

Finance is also a key obstacle to the implementation of HMIS in most of Kibwezi district health care facilities, the funds allocated by the government through the ministry of health only support implementation of certain stages of HMIS and do not finance the overall implementation of all HMIS packages. This affects the sustainability of the HMIS system and the available donor support do not also fully finance the implementation of HMIS projects (Moses,2008).

In spite of having various studies on the implementation of health management information systems, none of the studies have specifically focused on factors influencing implementation of health management information systems in government health care facilities. This hence left a major gap amongst HMIS project managers on effective implementation of HMIS in many government health care facilities in Kenya. It is therefore against this back drop that this study was undertaken to fill the missing knowledge gap by assessing the factors influencing implementation of health management information systems in government health care facilities with specific reference to Kibwezi district health care facilities.

1.3 Purpose of the Study

The main purpose of the study was to assess the factors influencing implementation of health management information systems in government health care facilities in Kenya, a case of Kibwezi district health care facilities.

1.1 Objectives

- i. To assess how planning influence the implementation of health management information systems in government health care facilities
- ii. To establish how Stakeholders' influences the implementation of health management information systems in government health care facilities
- iii. To determine how technology influences the implementation of health management information systems in government health care facilities
- iv. To assess how human capacity development influences the implementation of health management information systems in government health care facilities
- v. To find out how finance influences the implementation of health management information systems in government health care facilities

1.5 Research Questions

The study attempted to answer the following research questions;

- i. How does planning influence the implementation of health management information systems in government health care facilities?

- ii. How do stakeholders' influence the implementation of health management information systems in government health care facilities?
- iii. How does technology influence the implementation of health management information systems in government health care facilities?
- iv. How does human capacity development influence the implementation of health management information systems in government health care
- v. How does finance influence the implementation of health management information systems in government health care facilities?

1.6 Significance of the study

In Kenya there is much research done on health issues but there lacks a major study on the introduction of technologies like health information systems. This research will therefore be of great value to the government and donor agencies that contribute towards delivery of various health care services. This research will also give recommendations that will help in the introduction of health management information systems in government health care facilities

The study will be of great significance to the Ministry of health since the obtained findings will assist the ministry to identify and manage the key factors influencing implementation of health management information systems in government health care facilities in Kenya.

The study is of great value to project managers involved in the implementation of health management information systems in government health care facilities in Kenya. The study findings will help in exposing the most critical factors that hinder the success of HMIS and this will help the project managers to employ effective measures that would assist effective implementation of HMIS.

Health workers will also find the study to be of great value since it will offer solution to the major problems affecting effective implementation of HMIS. This will influence offering of better training and remunerations to health care workers in order to equip them with competitive skills on HMIS implementation and also improve their morale and commitment on HMIS

application. This will help in reducing paper work and easy access to health records hence easing execution of health care job task functions.

The study is of great significance to other researchers since it acts as a source of information on factors influencing implementation of health management information systems in government health care facilities and this will enrich the literature review of future studies, future researchers will therefore find the study report helpful when covering other areas that were not included by this study. The report will act as reference and stimulate the interest among academicians and thereby encouraging further researches on the implementation of health management information systems in government health care facilities.

1.7 Delimitation of the Study

The study covered Kibwezi district health care facilities situated in Kibwezi district. The study population comprised of health care workers in all the government health care facilities. The study was conducted within a duration of two months.

1.8 Limitations of the Study

The management of many health care facilities found it to be against the organization confidentiality policy to expose HMIS implementation challenges. This restricted most of the respondents to answer some of the questionnaires since they thought that the obtained data would be treated as confidential and harmful to the image of health care facility. The researcher thus presented the introduction letter obtained from the university to the respondents and this avoided suspicion and enabled the healthcare management to disclose much information concerning the factors influencing implementation of health management information systems in government health care facilities.

1.9 Assumptions of the Study

In undertaking the study, it was assumed that the implementation of health management information systems in government health care facilities in Kenya is influenced by; poor HMIS project planning, lack of stake holders support, lack of embracement of effective technology, lack of human capacity development and financial management challenges.

1. 10 Definition of Significant Terms

Health Management Information Systems

Health management information systems are systems used to collect, analyze, retain, retrieve and evaluate health information (Haux et al,2004).

Patient Management Information System

Is an information system that deal with all the information related to patients like, patient data, patient billing, patient treatments and patient prescriptions

Management Information System

MIS (management information systems) is a general term for the computer systems in an enterprise that provide information about its business operations. It's also used to refer to the people who manage these systems. Typically, in a large corporation, "MIS" or the "MIS department" refers to a central or centrally-coordinated system of computer expertise and management, often including mainframe systems but also including by extension the corporation's entire network of computer resources (Nicole,2007).

Government Health Care Facilities

Government health care facilities are medical facilities operated by the ministry of health to offer health care services to the general public. They range from small clinics and doctor's offices to urgent care centers and large hospitals with elaborate emergency rooms and trauma centers.

Public Health facilities

Public health care facilities are medical facilities for providing health care services to the general public. They range from small clinics, dispensaries, health centers and hospitals.

1. 11 Summary

This chapter introduced the study by explaining the Health Information Management Systems in the back ground to the study. The chapter explained the study problem, highlighted the study purpose, research objectives and questions, significance of the study, delimitations of the study, limitation of the study, assumptions of the study and definitions of significant terms. The next chapter covered the literature review of the study.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

This chapter discusses the literature review of the study. In this chapter, literature was reviewed from journals, books, working papers, reports and periodicals. Literature review helped to orient the reader on existing theoretical issues and previous studies on factors influencing implementation of health management information systems in government health care facilities.

2.3 Empirical literature

A study by Husein (2006) revealed that a hospital consists of various organizational units with differing tasks for various types of healthcare professionals. These units often tend to be in very different locations in a hospital. A good example would have to be the physician who sends a patient to a clinic who is then transferred to a hospital. Every time the patient moves to one place information about his condition is registered. This often leads to missing information and double registration due to the lack of cooperation between the different instances like the doctor, pharmacy, hospital and insurance. There is a visible gap between the information needed and the information exchanged. Critical patient information is often not available when and where needed and this makes the whole process take much longer. One way to make this gap disappear is by providing intensive internal communication among organizational units and healthcare professionals as well as external communication (e.g. to insurance organizations, general practitioners, etc.). This suggests moving from healthcare to integrated care, meaning, the merging of hospitals and individual practices into larger integrated healthcare networks. This is called a decentralized network of healthcare delivery by replacing hospitals as the only centers of care delivery (Bossert, 2008). The new hospital information systems have due to these changes taken in a much broader scope. According to the WHO (2004) few health information systems in developing countries are ineffective because the available data often tend to be out of date therefore making trend assessment particularly difficult. And in these countries accurate health information is needed the most. This is why statistical, public health and biomedical knowledge and expertise are very much required.

A study by Edward (2010) found out that the health information system is a comprehensive and integrated structure that collects, collates, analyses, evaluates, stores, disseminates, health and health-related data and information for use by all. The HIS, like any system, consists of parts which are interrelated, interdependent and work towards a common goal. The malfunctioning of any part affects other parts of the system. The functionality of an HIS may differ from organization to organization. In general the system is a combination of Health Information and Management Information. The system collects information on health (Morbidity and mortality statistics, Service statistics) and on management (human resources, financial, fixed assets and infrastructure, drugs and supplies logistics) and performs comparative analysis with population-based data from various surveys. The HIS is a powerful tool for making health care delivery more effective and efficient (Ministry of medical services and Ministry of Health,2010).

Health data is generated from many sources individuals, health facilities, disease surveillance sites, the community and geographical (spatial) areas or units. The data is then summarized, analyzed and used at the district, province and the national levels depending on needs. Data is transmitted from these sources to the districts, then to the provinces and to the national level. Feedback loops exist at all levels. Within the health sector, data management is either paper based or electronic in different parts of the country. Data is collected manually (paper based) and reported to the districts where it is summarized and analysed, then transmitted to the national level through the province (Edward,2010)

According to (Bossert,2008) the problem with this information is that it is haphazardly produced and used by institutions, such as health ministries, national statistics offices, ministries for labour, social welfare, planning and finance, the private sector, civil society, donors and development assistance agencies. With a vast majority of data producers health information systems have evolved following administrative, economic, legal or donor pressures and have been fragmented by the demands of disease-focused programs and the diversity of donor requirements and international initiatives.

A study by Campos (2005) found out that in Brazil, the health information system in Ceara State is organized at three levels of the health system: central, regional and local, at the local level all

facilities (hospitals, health centers and health posts) are active in data collection. At this level, data collected by the health posts are transmitted monthly to the health centers, whereas data collected by the community health agent are transmitted to the health agent's programme coordination in each municipality. These data, together with those collected in the health centers and those from the hospitals on in-patients are transmitted to the Municipal Health Secretariat after compilation. The Municipal Health Secretariat consolidates and transmits the data to the Regional Health Department. This process of bottom-up data transmission takes place on a monthly basis, except in the case of notifiable diseases surveillance reports which are submitted to the Municipal Health Secretariat every week (Campos,2005).

Payton, (2009) concurred that in Liberia, both the Poverty Reduction Strategy and the National Health Policy have placed establishing the Health Management Information System (HMIS) as a high priority task. Health and management information are integral parts of a national health system. This information is a basic management tool and a key input for the improvement of the health status in the country. The HMIS primary objective is to provide reliable, relevant, up-to-date, adequate, timely, and reasonably complete information on health needs, delivery of services, availability and use of resources, and effectiveness of services for health managers at the facility, county, and national levels. Information plays a central role in supporting strategic goals and in underpinning the principles of the National Health Policy and Plan (Payton,2009). As the country has just started rebuilding its various systems including the health sector, understandably, a functional HMIS does not yet exist. It needs to be conceptualized, designed, and developed so as to provide much needed information support for better planning and management of health services (Payton, 2009).

A study by Nicole (2007) found out that in Kenya, the overall policy guidance for the health sector is through the Government of Kenya Vision 2030 and the Kenya Health Policy Framework (KHPF, 1994-2010). One of the key challenges in the health sector identified in First Medium Term Plan of Vision 2030 is weak health information systems. Various weaknesses identified in the existing information systems include lack of guidelines and policy, inadequate capacities of HIS staff, lack of integration, many parallel data collection systems, and poor

coordination, amongst others. Overall the current HIS provides limited information for monitoring health goals and empowering communities and individuals with timely and understandable information on health and health related interventions. In view of the above weaknesses, the ministries of health, i.e. the Ministry of Medical Services and the Ministry of Public Health and Sanitation together with her partners developed a 5 year Strategic Plan for Health Information Systems to be developed and institutionalized to guide the implementation of HIS activities at all levels (Nicole,2007).

In Kenya, Key HIS statistical constituencies include: civil registration system whose vital events include registration of live births, deaths, marriages, divorces, adoptions, recognition, and legitimating; the Kenya National Bureaus of Statistics (KNBS) as the custodian of all Government Statistical information and therefore maintains a database for all national surveys including national population and housing censuses and population based health statistics derived from national surveys; Afri Afya (African Network for Health Management and Communication), which is a consortium of seven Kenya-based health development agencies (Ministry of medical services and Ministry of Heath,2010).

In Kenya, the Health sector developed the National Health Sector Strategic Plan II (NHSSP II) 2005-2010 in line with Economic Recovery Strategy (ERS) and Millennium Development Goals (MDGs). NHSSP II has adopted the Kenya Essential Package for Health (KEPH) and the sector wide approach (SWAp) as its main strategies. Monitoring and Evaluation of implementation of KEPH is an essential component of NHSSP II that allows tracking of results. This monitoring process is coordinated by both the Ministry of Medical Services and Ministry of Public Health and Sanitation, through the Division of Health Information System (HIS) (Ministry of medical services and Ministry of Heath,2010).

The Division of Health Information System (HIS) is charged with the responsibility of collecting, collating, analyzing, publishing and disseminating health and management data and information to all stakeholders (both public and private) for evidence based decision making. The information that is disseminated is used for planning and management of health services and programmes. HIS collect routine data from various sources such as: health facilities (both public

and private); research institutions (e.g. KEMRI); disease/sentinel surveillance sites; civil registration; Kenya National Bureau of Statistics (surveys and censuses) and other Government Ministries (Edward,2010).

However, a number of weaknesses have been observed with the existing system especially in coordination and maintenance of a uniform system in both the public and private sectors to monitor implementation of health services. This has been largely attributed to lack of a policy and legal framework to harmonize and enforce the data and information management at all levels since the establishment of HIS in 1972. This has been evident with the increase in the demand for health information for evidence based decision making. Other weaknesses include exclusion of key providers in the private and quasi government sectors. Culture of information generation and use remains under-developed or is limited, inadequate capacities of staff in HIS, many parallel data collection systems, lack of policy and guidelines, poor coordination, and limited funding (Oyugi,2010).

Those with the most severe health problems are often those with weakest HIS. When global organizations and donors implement their own data collection to respond to their specific needs, they tend to focus narrowly on specific disease areas and their inputs are uncoordinated and duplicative. This also serves as a disincentive to national authorities to invest in health information systems, thus exacerbating problems of poor coordination. The end result is a perverse combination of data overload due to too many poorly coordinated efforts and simultaneous lack of data needed for decision-making (Oyugi,2010).

A study by WHO (2004) Health Information System in Kenya faces a number of challenges. Firstly, there is a proliferation of data collection tools most of which have been developed by the public health sector for the management of its sector information. A number of these forms have their origins in programmes developed and executed solely by the public health sector with minimal or no engagement with other health care providers. Apart from the question of the continuing relevance of some of these tools, the overwhelming demands from higher levels do not support data for planning and decision-making at the lower levels. The end result is that there

is poor coordination and linkages between the different data collection systems leading to significant duplication and/or omission of key data sets for performance assessment.

Secondly, the lack of or inadequacy of requisite skills at all levels coupled with a perception of non-usefulness of information and data collected at the lower levels have conspired to create an exceptionally low level of commitment from health providers. Programme focused strategies receive more support and recognition as a result of the lack of commitment. This has led to difficulties in coordination since programmes have differing priorities and the ultimate is to justify the use of resources put at their disposal. However, the major challenge seems to be the lack of dependence on evidence for accountability within the health sector. At the various levels, funding and other resources are made available even if managers fail to report adequately on performance. These challenges underscore the need to create the necessary policy and regulatory environment and to define a legal framework for information management and reporting in the health sector (WHO,2004).

Burnes (2009) noted that lack of proper planning and strategizing before implementation of health management information systems hinders the success of HMIS implementation process and in many public health care facilities in African countries. Graham (2008) found out that many government health care facilities fail to succeed in implementation of HMIS due to, lack of effective HMIS planning methodology, lack of HMIS action plans, poor strategic planning process and use of ineffective information management systems.

Emmanuel (2008) concurred that lack of stakeholders support greatly affects allocation of enough financial resources for supporting effective implementation of HMIS in many government health care facilities. Phillip (2007) affirmed that lack of management support, poor monitoring and evaluation, low level of health care workers commitment and inadequate funding from government support greatly affected implementation of HMIS in government health care facilities.

Edward (2010) noted that many government health care facilities lacks better computer hardware's and soft ware's and this creates unsupportive environment for effective

implementation of HMIS. Nicole (2007) identified that effective implementation of HMIS in many health care facilities in developing nations is greatly hampered by the use of low quality computer hardware's and software's, lack of alternative sources of electrical power, poor communication technology and lack of automated information processing procedures.

Payton (2009) established that absence of effective human capacity development programs affects creation of competitive human resources for supporting effective implementation of HMIS. Moses (2008) noted effective implementation of HMIS in many government health care facilities fails due to lack of skilled ICT work force, lack of regular training on use of HMIS, low level of staff competency and recruitment of unqualified staff to guide on HMIS implementation process.

Mathew (2009) asserted that financial resources constraints is a major obstacle affective effective implementation of HMIS in government health care facilities since the allocated funds are normally insufficient to finance all the HMIS implementation processes. Edward (2010) revealed that many government health care facilities in Kenya fails to effectively embrace HMIS due to lack of alternative sources of funds, allocation of inadequate funds, lack of application of effective internal control systems and lack of effective auditing and budgeting procedures

2.3 Theoretical Framework

This sections explains major theories on the factors influencing the implementation of Health Information Management Systems

2.3.1 The Stakeholders theory

Stakeholder theory can be defined as “any group or individual who can affect or is affected by the achievement of the organization’s objectives”. Unlike agency theory in which the managers are working and serving for the stakeholders, stakeholder theorists suggest that managers in organizations have a network of relationships to serve this include the suppliers, employees and business partners. Similarly, the stakeholder approach also considers the provision of resources as a central role of board members success. This will result in the firm's ability to build consensus among all critical stakeholders. The board of directors is hence seen as the place where conflicting interests are mediated, and where the necessary cohesion is created. The

stakeholder theory argues about the importance of a firm paying special attention to the various stakeholder groups that include; customers, suppliers, employees, the local community and shareholders are deemed to also have a stake in the business of a firm (Gibson, 2000). Effective implementation of health information management systems calls for higher level of stakeholders support and lack of stakeholders support hinders the success of the HIMS implementation process.

2.3.2 Diffusion of Innovation Theory

Diffusion of innovation theory is a set of generalizations regarding the typical spread of innovations within a social system (Rogers,2005). Diffusion is the process by which an innovation is communicated through certain channels over time among the members of a social system. Given that decisions are not authoritative or collective, each member of the social system faces his/her own innovation-decision that follows a 5-step process: The first step is Knowledge where a person becomes aware of an innovation and has some idea of how it functions. The second step is Persuasion where a person forms a favorable or unfavorable attitude toward the innovation. The third step is decision where a person engages in activities that lead to a choice to adopt or reject the innovation. The fourth step is implementation where a person puts an innovation into use. The last and fifth step is confirmation where a person evaluates the results of an innovation-decision already made (Rogers,2005).

The most striking feature of diffusion theory is that, for most members of a social system, the innovation-decision depends heavily on the innovation-decisions of the other members of the system. The innovation-decision is made through a cost-benefit analysis where the major obstacle is uncertainty. People will adopt an innovation if they believe that the innovation may yield some relative advantage (Rogers, 2005). Adoption of health information management systems is dependent on how people adopts or rejects technology innovations.

2.3.3 Resource Based Theory

According to Resource Based Theory resources are inputs into a firm's production process; can be classified into three categories as; physical capital, human capital and organizational capital (Crook, 2008). A capability is a capacity for a set of resources to perform a stretch task of an

activity. Each organization is a collection of unique resources and capabilities that provides the basis for its strategy and the primary source of its returns. In the 21st-century hyper-competitive landscape, a firm is a collection of evolving capabilities that is managed dynamically in pursuit of above-average returns. Thus, differences in firm's performances across time are driven primarily by their unique resources and capabilities rather than by an industry's structural characteristics (Crook,2008). Adoption of health information management system is dependent on availability of both human and financial resources. Lack of sufficient human resources in terms of trained and skilled personnel hinders the organization capacity in supporting the implementation of health information management systems.

2.4 Planning Implementation of HMIS

Planning and strategizing is an important way to map out possible directions that the information system will be used for on the short and longer term (Gladwin et al. 2003). Processes in Healthcare are important and optimal adaptation of 'IS' to workflow in health care institutions is required. HMIS improvement should focus upon utilizing information during planning always make explicit plans to support the informational management approach and put support strategies in place. In health care, however, the 'core business process' consists of highly knowledge-intensive, professional work, typified by a complexity that defies the predictability and standardization required for simple reengineering.

2.5 Stakeholders and Implementation of HMIS

Because the HMIS project is dependent upon the stakeholders for implementation and use of the project, the needs of these parties and their roles have to be explicitly documented and have to be taken into consideration when designing and implementing the HMIS. The stakeholders are the human part of the organization and many times pursue different objectives, concerns, priorities and constraints. According to Rogers et al. (2002) stakeholders are all the people or organizations that will be affected by the system and who have a direct or indirect influence on the system requirements. This can be: the development team itself, the managers, recipients of the products output, direct users and their managers, people who may lose their jobs etc. The view of the introduction of the process of an HMIS includes most of all a handling of the

stakeholders and working together of the different groups to get to a single point of view. These different goals are an issue that make data management in health care organizations a challenging undertaking (Gladwin et al,2001).

The successful implementation of ICT and health programmes requires complex balancing of the competing views and concerns of the different stakeholders. Some clinicians will view new technology with suspicion, fearing its challenge to their professional autonomy and status. Patients will often seize on the potential benefits (particularly in making care accessible where care would otherwise not be available) but will also hold legitimate concerns about the security and confidentiality of any electronically held patient data. IT specialists may seek to use cutting edge technology where existing tried and tested technology would be more than adequate to deliver real improvements in patient care. Policy makers may require convincing that the initial investment costs in the new technology will bring the benefits promised. All these differing views and concerns need to be addressed at the outset of any intervention involving ICT (Chetley et al, 2006).

Based on the framework by Winter et al. (2001, 2003) the following stakeholders and their interest and roles can be distinguished in an HMIS; Top management are stake holders interested in seamless and cost-effective operation of the hospital. They approve the plans, probably together with the funding institutions, which are primarily interested in the financial consequences. Funding institutions are primarily interested in the financial consequences. Employees, e.g. physicians, nurses, administrative staff: eliciting the requirements for own use

Clinical, administrative, and service departments: eliciting the requirements for own use
Information management department (IM department) will usually create and maintain proposals for the plans. They are interested in clearly defined requirements for their work reflecting tactical management issues, which cannot be done without effective backing from the top management.
Consultants: help creating or updating plans, but can also be effective in negotiations for the project approval. Hardware and software vendors: constructing or maintaining components of hospital information systems (Almeida,2003).

2.6 Technology and Implementation of HMIS

Technology as a factor which consists of the sub-factors hardware, software and connectivity with their own matching issues. The hardware needed should be identified before the introduction of the system. This means that at the start of the project an assessment should be made about the hardware already available and the hardware which is still needed for full introduction of the system. Software One of the major concerns with IS, is the fact that users often claim that they are not user friendly and lack intuitive data input. Because of the way in which data is put into a system reflects the individual's practice style. The interface design and structure of the data need therefore to conform to each other. The other issue is that it depends on the technology being used. Flexibility and adaptability is also a challenge when introducing such a system. Here looking for the right terminology for input is also a concern (Kuhn et al. 2001). Software content issues include the lack of local content creation, the language used and the relevance of content to the local situation. Appropriate language is frequently neglected in ICT programmes and little content is available in local languages for health programmes (Chetley et al, 2006). Another concern of any health organization in the integration of health information systems is the fact that healthcare institutions need timely patient information from various sources at the point of care. This means buying a fully functional system fulfilling all their needs from one vendor. This suggests working with standards for better data integration (Kuhn et al. 2001).

Technology problems concerns a lack of standardization, electrical power and backup of the system. A good backup for the systems is a problem in all the cases leaving computers prone to viruses. There is also a need for alternative ways to produce electricity: shortage of energy hinders continuous activities and delays the implementation of projects many times. The lack of money hinders the introduction of alternative ways to produce power (Gibson,2000).

2.7 Human capacity development and Implementation of HMIS

Human capacity development entails the capability of the health care facilities to have skilled personnel and develop existing personnel in order to support effective implementation and use of HMIS. While capacity to adapt information to ensure that it is culturally appropriate and relevant

is a major challenge, so too is the capacity to use ICT effectively. A skilled ICT work force is an essential ingredient for the effective use of ICT in healthcare. Systems professionals, services providers and project team leaders with high skill levels and experience in an organization are important components of success. It is therefore very important to identify the skills present in the organization and the skills which still need to be trained (Chetley et al. 2006). Training is also an important part of capacity development. If the intended training approach is not undertaken there will be a lack of understanding of changes needed to accompany the innovation. HMIS data collection, processing and information use assumes a certain level of general education and specialist training amongst health workers, which is often not available, especially in smaller health units in developing countries. Too few HMIS training for health unit personnel to grasp new skills, such as data processing, compiling graphs and statistics will then lead to unsuccessful skills and a lack of the right capacity. This is why workers' skills should always be aligned with the HMIS (Chetley et al,2006).

Investing in capacity development and training in technological, communication and content development of skills will ensure more successful implementation of an HMIS. Making opportunities available to see the HMIS in practice or a clearly reported trial should accompany innovation introduction (training). Teaching skills should also be an integral part of supervisor's training to be able to help them teach and manage others. Strategies to overcome lack of skills amongst less well-educated health workers need to be developed during the planning and strategy (Gladwin et al. 2003).

Overall lack of computer literacy and brain drain on local level is a critical issue because most of the people - especially in rural areas - have never used a computer. Training as a part of capacity development is also an element of awareness. From the analysis can be concluded that even though the training being received is of good quality, not enough time is given to training. Data misinterpretation due to the lack of the right capacity is a problem which is experienced in all developing countries. Training should be a continuous process to change people from what they are used to, to new technology because it is very hard to let go of previous institutionalized practices.

2.8 Finance and Implementation of HMIS

Finance involves the monetary resources that must be allocated to fund the implementation of HMIS. Clear analysis of the costs are required at the beginning of the projects to indicate the budget needed for a project, because costs often turned out to be much higher than expected. Running short of money from the donors is a common problem and can jeopardize the entire project because this has also an effect on the sustainability of the entire system (Kuhn et al. 2001).

Generally, there is little investment in ICT for health in most developing countries. The picture is one of fragmentation, with many different varieties of ICT being acquired from different donors. Invariably, there is no national health information and IT infrastructure to underpin the delivery of health care. It is very important to make a realistic financial plan for all the costs in the system before the introduction of the HMIS (Gladwin et al, 2003). Sustainability is very important when considering the introduction of an HMIS in an organization, especially in local hospitals in developing countries. Being able to continue supporting the system financially on the long run is an important issue to consider. Plans for sustainability should be clearly expressed ensuring that capital investments and costs are identified up front as well as ICT, capacity and infrastructure requirements. Monitoring and evaluation is also part of the sustainability failure to adopt a particular IM strategy may signal inappropriateness. Also by encouraging partnerships between stakeholders on local, national, regional and international level sustainability can grow (Gladwin et al. 2003).

Conceptual Framework

Intervening Variable

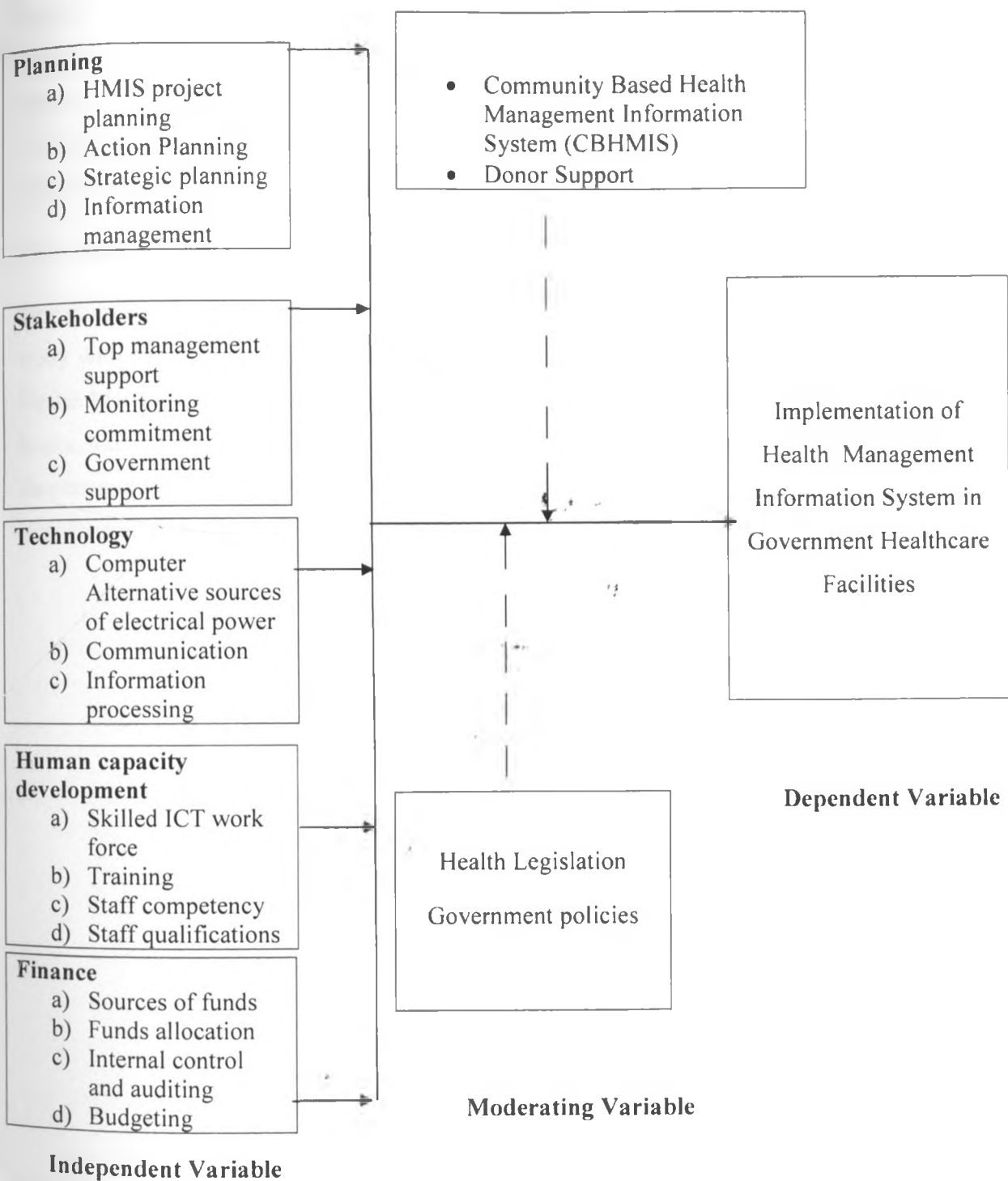


Fig. 1 Conceptual Framework.

The conceptual framework shows the relationship between the independent variables, intervening variables, moderating variable and dependent variable. The conceptual framework demonstrates that the independent variables are; planning, stakeholders, technology, human capacity development and finance. The intervening variables are donor support, government policies and community based health management information system. The moderating variable is health legislation.

2.9 Summary

This chapter discussed the literature review of the research study, literature review provided the study with an explanation of the theoretical rationale on factors influencing implementation of Health Management Information System. The literature was reviewed from, journals, published books, internet, periodicals and working papers on Health Management Information System. The chapter explained the theoretical orientation, empirical review and conceptual framework. The next chapter explains the research methodology.

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Introduction

This chapter explores the methodological approach for the study and it covers the design, population sample, data analysis and presentation.

3.2 Research Design

According to Sekeran (2003), survey research design is type of design used to obtain information concerning the current status of the phenomena to describe "what exists" with respect to variables or conditions in a situation. Dempsey (2003) describes Survey research as a design in which data are collected with questionnaires or through personal interviews with members of an identified population covering a wide geographical area. The study adopted a survey research design since the study intended to gather quantitative and qualitative data that describes the nature and characteristics of factors influencing implementation of health management information systems in government health care facilities in Kenya. The study considered this design appropriate since it facilitated towards gathering of reliable data describing the factors influencing implementation of health management information systems in government health care facilities in Kenya.

3.3 Target Population

According to the ministry of Health (2012) Kibwezi district has got a total of 5 public health facilities with an average of 40 health care workers in each facility. The study population was a total of 200 health care workers working in Kibwezi Health Care Facilities. The study specifically targeted 30 doctors and clinical officers, 150 nurses and 20 IT staff since they are the one involved in the implementation of health management information systems and thus stands high chances of providing the study with reliable information on factors influencing implementation of health management information systems in government health care facilities in Kenya. The list of the health care workers was sourced from the Ministry of Health and

Medical Services and was used as the sampling frame for the study. The target population was categories as shown in the table 3.1.

Table 3.1 Population

Category	Target population	Sample Size
Doctors/Clinicians	30	15
Nurses	150	75
IT staff	20	10
Total	200	100

3.4 Sampling Procedure

The study adopted a probability sample design by applying a stratified random sampling technique to select a sample size of 100 respondents. According to Serekan (2003) stratified sampling was considered appropriate since it gives all respondents an equal chance of being selected as a study respondent and thus it has no bias and eases generalization of the obtained findings. Stratified random sampling was used to group respondents into three strata's. Simple random sampling will be used to select 50% of the population on each stratum. A sample size of 50% was justifiable since according to Orodho (2003) 10%-50% of the sample gives unbiased representation of all respondents' opinions in the target population and this assists in generalization of research findings when the study design is descriptive. The sample selection and size was shown in table 3.2. The list containing the names of the respondents in the respective three population categories was sourced from Ministry of Medical Services and was used as the sampling frame for the study. The sample population of the study was thus a total of 100 respondents (50%) of the total target population as shown in Table 3.2.

Table 3.2 Sample Size

Category	Target population	Sample size	Percentage
Doctors/Clinicians	30	15	50
Nurses	150	75	50
IT staff	20	10	50
Total	200	100	50

3.5 Research Instruments

In this study the main data collection instruments were questionnaires containing both open ended and close ended questions, personal interview and observation methods was also used. A questionnaire is a form containing a set of questions, especially one addressed to a statistically significant number of subjects as a way of gathering information for a survey (Orodho,2003). Personal interview is a conversation between two people, (the interviewer and the interviewee) where questions are asked by the interviewer to obtain information from the interviewee (Orodho,2003). Questionnaires were preferred because according to Dempsey (2003) they are effective data collection instruments that allow respondents to give much of their opinions pertaining the researched problem. According to Kothari (2003) the information obtained from questionnaires is free from bias and researchers influence and thus accurate and valid data will be gathered. The questions addressed by the questionnaires sought to find out the factors influencing implementation of health management information systems in government health care facilities in Kenya. The questionnaires were the main source of primary data which was used by the study.

Secondary data was gathered from reference materials, which has key information that was helpful to this research study. Collection of secondary data was obtained through desk research mainly from the past reference materials and other published materials on factors influencing implementation of health management information. Some of the sources of secondary data are presented in the literature review of the study.

3.6 Validity

Validity refers to the extent to which an instrument measures what is supposed to measure data need not only to be reliable but also true and accurate. If a measurement is valid, it is also reliable (Joppe,2000). The study conducted a pilot study to test the validity and reliability of the questionnaires. According to Sekeran (2003), a pilot study is necessary for testing the reliability of data collection instruments, reliability of research as determining whether the research truly measures what it was intended to measure or how truthful the research results are. Pilot study is thus conducted to detect weakness in design and instrumentation and to provide accurate data for selection of a sample (Cooper & Schindler, 2003). The pilot test involved selecting 10 respondents from various health care facilities in Nairobi and issuing them with the questionnaires. The coefficient of the data gathered from the pilot study was computed with assistance of Statistical Package for Social Sciences (SPSS). A coefficient of above 0.5 indicated that the data collection instruments are valid (Zinbarg, 2005). The recommendations from the supervisor and the pilot study individuals were used to improve on data collection instruments. The questionnaires were thereafter self administered to a total of 100 respondents in the sample size. After one week the questionnaires were picked and data analyses began.

3.7 Reliability

Reliability refers to the consistence, stability, or dependability of the data. Whenever an investigator measures a variable, he or she wants to be sure that the measurement provides dependable and consistent results (Cooper & Schindler,2003). A reliable measurement is one that if repeated a second time gives the same results as it did the first time. If the results are different, then the measurement is unreliable (Mugenda,2008). The Cronbach's alpha coefficient of reliability was used to test the reliability of questionnaires. According to Zinbarg (2005), Cronbach's alpha is a coefficient of reliability that gives an unbiased estimate of data generalizability. An alpha coefficient higher than 0.75 presents a relatively high internal consistency of the obtained data and could be generalized to reflect opinions of all respondents in the target population. After obtaining a coefficient of above 0.75, the gathered data was considered to have a relatively high internal consistency and could be generalized to reflect opinions of all respondents in the target population.

3.8 Operational Definition of Variables

The study operationalised the research variables as follows using an ordinal scale of 1-5. (1= not at all, 2 = small extent, 3 = moderate extent, 4 = large extent, 5 = very large extent).

Table 3.3 Operational Definition of Variables

Independent Variablea	Indicator	Measure	Scale	Instrument
Planning	e) HMIS project planning f) Action Planning g) Strategic planning h) Information management	Nominal	5 Point Likert Scale	Questionnaires
Stakeholders issues	d) Top management support e) Monitoring and evaluation f) Health care workers commitment g) Funding institutions and government support	Ordinal	5 Point Likert Scale	Interviews
Technology issues	d) Computer hardware and software e) Alternative sources of electrical power f) Communication technology g) Information processing	Nominal	5 Point Likert Scale	Observation Questionnaire Interviews
Human capacity development	e) Skilled ICT work force f) Training g) Staff competency h) Staff qualifications	Nominal	5 Point Likert Scale	Questionnaire Observation
Finance	e) Sources of funds f) Funds allocation g) Internal control and auditing h) Budgeting	Nominal	5 Point Likert Scale	Questionnaire Structured interview Observation

3.9 Methods of data analysis

Descriptive statistics data analysis method was applied to analyze numerical data gathered using closed ended questions. The Statistical Package for Social Sciences (SPSS) computer software

was used for analysis to generate data array that was used for subsequent analysis of the data. SPSS Version 17 has got descriptive statistics features that assist in variable response comparison and gives clear indication of responses frequencies. The data was cleaned, coded, categorized per each of the research variables and then analyzed using descriptive analysis such as percentage mean and STD deviation. Pearson correlation was carried out to establish the relationship between the research variables. The findings were presented using tables, since tables are user friendly and shows response frequencies as well as percentages of the respondents' opinions on factors influencing implementation of health management information systems in government health care facilities in Kenya. Qualitative data analyses method using content analysis was applied to analyze the data gathered using open end questions where the respondents give their personal opinions on factors influencing implementation of health management information systems in government health care facilities in Kenya.

3.10 Summary

This chapter discussed the research design and methodology of the study; these entailed the methods and procedures that assist the researcher in identifying the sources of data, the sampling method to be used, the sampling design and sample size. It further showed the data collection methods to be used, techniques, instruments and procedures. It also explained the data analysis, interpretation and presentation methods. The next chapter covered the data analysis, presentation and interpretation

CHAPTER FOUR

DATA ANALYSIS, PRESENTATION AND INTERPRETATION

4.1 Introduction

This chapter discusses data analysis, presentation and interpretation of the research findings, the chapter elaborates the processes, techniques and procedures applied to analyze, present and interpret the data gathered using the questionnaires. The chapter explains quantitative data analysis, cross tabulation tables and mean scores on factors influencing implementation of health management information systems in government health care facilities in Kenya, a case of Kibwezi district health care facilities Makueni County.

4.2 Response Rate

The analysis of the response rate was conducted to establish the total number of the respondents who participated in answering of the questionnaires. The table 4.1 below presents the analysis of the response rate.

Table 4.1 Response Rate

Variables	Frequency	Percentage
Response	62	62
Non response	38	38
Total	100	100

The Table 4.1 shows that the study issued a total of 100 questionnaires and received back 62 filled questionnaires which were 62% of the total sample size and the non response was only 38% of the total sample size. The response rate 62% of the respondents indicated that the gathered data met the generalization standards since according to Cooper & Schindler (2003) a response rate above 30% of the total sample size contributes towards gathering of sufficient data that can be generalized to represent the opinions of the entire population on the sought problem.

4.3 Reliability Analysis

To determine the degree of reliability and validity of the questionnaires, the gathered data during the pilot study was subjected to reliability analysis using Cronbach's alpha coefficient of reliability in order to find out if the obtained data was accurate and reliable. The reliability analysis results were presented in table 4.2.

Table 4.2 Reliability Analysis

Variables	Cronbach's Alpha Results
Planning	.901
Stakeholders Influence	.929
Technology	.920
Capacity development	.902
Finance	.907

The Table 4.2 indicates that the gathered data was reliable since the coefficient values of 0.935 to 0.943 was above 0.75 and an alpha coefficient higher than 0.75 indicates that the gathered data had a relatively high internal consistency and could be relied upon to gather reliable and accurate data on the study problem. According to Zinbarg (2005), Cronbach's alpha is a coefficient of reliability that gives an unbiased estimate of data generalizability. This indicates that the gathered data helped in assessing the factors influencing implementation of health management information systems in government health care facilities in Kenya with specific reference to Kibwezi district health care facilities Makeni County.

4.4 Personal Information

The study gathered personal information from the respondents and presented the finding as follows

4.4.1 Age of the Respondents

The study sought to find out the age of the respondents in order to ensure that all respondents' age groups working in health care facilities participate in the study. Table 4.3 shows the age distribution of the respondents who participated in the research study.

Table 4.3 Age of the Respondents

Response	Frequency	Percentage
18- 30yrs	9	14%
31-40 yrs	31	50%
41 -50 yrs	16	26%
51 yrs and over	6	10%
Total	62	100%

The table 4.3 presents that majority of the respondents who were 50% were in the age category of 31-40 years, 26% were in the age category of 41-40 years, 14% were in the age category of 18-30 years and 10% were in the age category of 51 years and over. This demonstrated that the study involved all the employees in all the age categories and this helped to eliminate cases of data misrepresentation and bias that could have been influenced by exclusion of respondents of certain age categories.

4.4.2 Highest Education Level

To determine on if the respondents held the required competencies in their respective job task functions the study gathered data on respondents' highest education level. Table 4.4 shows the respondents highest education level

Table 4.4 Highest Education Level

Response	Frequency	Percentage
Secondary level	4	6%
College level	36	58%
University level	13	21%
Professional Qualification	9	15%
Total	62	100%

Table 4.4 demonstrates that majority (58%) of the respondents had college education level, 21% had university degrees, 15% had professional qualifications such as Institute of Project Management, Chartered Institute of Purchasing and Supplies Management (CIPS) and Certified Public Accountants (CPA) and 6% had secondary education level. The study hence deduced that most of the respondents were professionally qualified in their respective job undertakings and thus possessed more knowledge on factors influencing implementation of health management information systems in government health care facilities. This was tandem with findings by Braxton (2008) that respondents with enough knowledge and skills on the study problem assists in providing reliable and accurate data on issues surrounding the study problem.

4.4.3 Working Experience

To establish the length of time in which respondents had worked in the health care facilities the study gathered data on respondents working experience. The table 4.5 shows the respondents working experiences;

Table 4.5 Working Experience

Response	Frequency	Percentage
Less than 5 years	9	14%
6-10 Years	30	48%
11-15years	13	22%
16 years and above	10	16%
Total	62	100%

The table 4.5 shows that majority (48%) of the respondents had a working experience of 6-10 years, 22% had a working experience of 11-15years, 16% of the respondents had a working experience of 16 years and above and 14% had a working experience of less than 5 years. This indicates that majority of the respondents had been in the government health care facilities for a

long time and thus stood higher chances of providing the study with reliable and accurate information on HMIS implementation problems. This too concurred with Braxton (2008) that respondents with a high working experience assist in providing reliable and accurate data pertaining to the study problem when research is descriptive.

4.5 Influence of Planning on the Implementation of Health Management Information Systems in Government Health Care Facilities

4.5.1 Influence of Planning

The table 4.6 shows respondents opinions on if planning affected the implementation of health management information systems in government health care facilities.

Table 4.6 Influence of Planning

Response	Frequency	Percentage
Yes	53	86%
No	9	14%
Total	62	100%

Table 4.6 shows that majority (86%) of the respondents were to the opinion that planning affect the implementation of health management information systems in government health care facilities and a few who were 14% felt otherwise and indicated that planning did not affect implementation of health management information systems. The majority of the respondents affirmed that lack of planning and strategizing hindered the development and deployment of effective health management information systems that addressed the heath information management problems faced by the government heath care facilities. The respondents also argued that lack of proper planning affected design and implementation of feasible health management information systems. These findings concurred with Burnes (2009) that lack of

proper planning and strategizing before implementation of health management information systems hinders the success of HMIS implementation process and in many public health care facilities in African countries. The study hence deduced that planning is core factor that should be prioritized during implementation of HMIS since it helps in mapping out the possible directions for effective implementation of HMIS in government health care facilities.

4.5.2 Extent to Which Planning Issues Influences the Implementation of Health Management Information Systems in Government Health Care Facilities

Using a likert scale of (1= not at all, 2 = small extent, 3 = moderate extent, 4 = large extent, 5 = very large extent) respondents rated extent to which planning issues influences the implementation of health management information systems in government health care facilities. The findings were presented on table 4.7.

Table 4.7: Extent to Which Planning Issues Influences the Implementation of Health Management Information Systems in Government Health Care Facilities

Planning issues	N	Mean	Std. Deviation	Variance
HMIS project planning	62	4.2419	1.05092	1.104
Action Planning	62	4.2903	.68681	.472
Strategic planning	62	4.6613	.59900	.359
Information management	62	4.4839	.82466	.680
Valid N (listwise)	62			

Table 4.7 hence presents that a mean of 4.24 was scored on HMIS project planning and this indicates that HMIS project planning affected implementation of HMIS systems in government health care facilities to a large extent. A mean of 4.29 was scored on action planning and this indicates that action planning affected implementation of HMIS systems in government health care facilities to a large extent. A mean of 4.66 was scored on strategic planning and this

indicates that strategic planning affected implementation of HMIS systems in government health care facilities to a large extent. A mean of 4.48 was scored on information management and this indicates that information management affected implementation of HMIS systems in government health care facilities to a large extent.

The respondent contended that lack of effective HMIS planning approach, lack of HMIS project implementation action plans, poor strategic planning process and absence of effective information management systems hindered effective planning of HMIS project implementation in government health care facilities. These findings echoed findings by Graham (2008) that many government health care facilities fail to succeed in implementation of HMIS due to, lack of effective HMIS planning methodology, lack of HMIS action plans, poor strategic planning process and use of ineffective information management systems. The study hence alluded that planning for HMIS implementation is greatly influenced by HMIS planning approach, HMIS project implementation action plans, HMIS strategizing and use of effective information management systems

The table 4.7 further shows that low standard deviation and variance was obtained on all the planning issues and this indicates the closeness of the respondents' answers and increased level and accuracy and reliability of the obtained findings. As can be observed in the table, only on HMIS project planning where the standard deviation and the variance was slightly higher than other planning issues and this was influenced by the fact that respondents did not strongly rate slightly underrated HMIS project planning as a core planning issue affecting the implementation of HMIS in government health care facilities.

4.6 Stakeholders

4.6.1 Influence of Stakeholders on implementation of health management information systems

Table 4.8 presents findings on the effect of Stakeholders on implementation of health management information systems

Table 4.8 Influence of Stakeholders

Response	Frequency	Percentage
Yes	58	93%
No	4	7%
Total	62	100%

Table 4.8 shows that majority (93%) of the respondents indicated stakeholders affected the implementation of health management information systems in government health care facilities and a few who were 7% expressed that stakeholders did not affect implementation of health management information systems. The majority of the respondent explained that lack of stakeholders support hindered allocation of enough financial resources for strengthening effective implementation of HMIS and this negatively affected sustainable implementation of HMIS in government health care facilities. These findings contended with Emmanuel (2008) that lack of stakeholders support greatly affects allocation of enough financial resources for supporting effective implementation of HMIS in many government health care facilities.

4.6.2 Extent to Which stakeholders issues Influences the Implementation of Health Management Information Systems in Government Health Care Facilities

Using a likert scale of (1= not at all, 2 = small extent, 3 = moderate extent, 4 = large extent, 5 = very large extent) respondents rated extent to which stakeholders issues influences the implementation of health management information systems in government health care facilities. The findings were presented on table 4.9.

Table 4.9: Extent to Which stakeholders Issues Influences the Implementation of Health Management Information Systems in Government Health Care Facilities

Stakeholders issues	N	Mean	Std. Deviation	Variance
Top management support	62	4.6129	.58267	.340
Monitoring and evaluation	62	4.3065	.58921	.347
Health care workers commitment	62	4.3871	.89360	.799
Funding institutions and government support	62	4.6290	.48701	.237
Valid N (listwise)	62			

Table 4.9 demonstrates that a mean of 4.61 indicated that top management support was a major stakeholder's issue that greatly affected implementation of HMIS to a large extent, a mean of 4.30 shows that monitoring and evaluation was a core stakeholders issue that greatly affected implementation of HMIS to a large extent, a mean of 4.38 shows that health workers commitment was a major stakeholders issue that greatly affected implementation of HMIS to a large extent and lastly a mean of 4.62 indicated that funding institution and government support was a major stakeholders issue that greatly affected implementation of HMIS to a large extent. The respondents finally explained that top management support, monitoring and evaluation, health care workers commitment and funding institutions and government support were the major determinants of stakeholders support that greatly affected implementation of HMIS in government health care facilities. These findings were in agreement with Phillip (2007) that lack of management support, poor monitoring and evaluation, low level of health care workers commitment and inadequate funding from government support greatly affected implementation of HMIS in government health care facilities.

The table 4.9 further shows that low standard deviation and variance was obtained on all the stakeholders' issues and this indicates the closeness of the respondents' answers and increased level and accuracy and reliability of the obtained findings. As can be observed in the table 4.9, only on monitoring and evolution and health workers commitment where the standard deviation and the variance was slightly higher than other stakeholders issues and this was influenced by the fact that respondents strongly rated the two issues as the core stakeholders issues that greatly affected the implementation of HMIS in government health care facilities.

4.7 Technology

4.7.1 Influence of Technology on implementation of health management information systems

Table 4.10 shows findings on the effect of technology on the implementation of health management information systems.

Table 4.10 Influence of technology

Response	Frequency	Percentage
Yes	53	85%
No	9	15%
Total	62	100%

Table 4.10 shows that majority (85%) of the respondents were to the opinion that technology affected the implementation of health management information systems in government health care facilities and a few who were 15% expressed otherwise and indicated that technology did not affect implementation of health management information systems. The majority of the respondents affirmed that lack of application of modern information communication technology through the use of latest computer hard ware's and software's created unfavorable environment for the implementation of HMIS in many government health care facilities and this was in agreement with observation made by Edward (2010) that many government health care facilities

lacks better computer hardware's and soft ware's and this creates unsupportive environment for effective implementation of HMIS. The study hence alluded that lack of effective embracement of modern technology in use of computer hardware's and software's hinders creation of supportive environment for the HMIS implementation in many government heath care facilities

4.7.2 Extent to Which technology issues Influences the Implementation of Health Management Information Systems in Government Health Care Facilities

Using a likert scale of (1= not at all, 2 = small extent, 3 = moderate extent, 4 = large extent, 5 = very large extent) respondents rated extent to which technology issues influences the implementation of health management information systems in government health care facilities. The findings were presented on table 4.11.

Table 4.11: Extent to Which technology Issues Influences the Implementation of Health Management Information Systems in Government Health Care Facilities

Technology issues	N	Mean	Std. Deviation	Variance
Computer hardware and software	62	4.6129	.63646	.405
Alternative sources of electrical power	62	4.1452	.69770	.487
Communication technology	62	4.5161	.64635	.418
Information processing	62	4.5161	.69523	.483
Valid N (listwise)	62			

Table 4.11 shows that a mean of 4.61 was scored on computer hardware's and software's and this indicates that computer hardware's and software's affected implementation of HMIS systems in government health care facilities to a large extent. A mean of 4.14 was scored on Alternative sources of electrical power and this indicates that lack of alternative sources of electrical power affected implementation of HMIS systems in government health care facilities

to a large extent. A mean of 4.51 was scored on communication technology and this indicates that communication technology affected implementation of HMIS systems in government health care facilities to a large extent. Finally a mean of 4.51 was scored on information processing and this indicates that information processing affected implementation of HMIS systems in government health care facilities to a large extent. The respondents explained that the use of low quality computer hardware's and software's, lack of alternative sources of electrical power, poor communication technology and lack of automated information processing methods greatly hindered effective implementation of HMIS in many government health care facilities. This corresponded with findings by Nicole (2007) that effective implementation of HMIS in many health care facilities in developing nations is greatly hampered by the use of low quality computer hardware's and software's, lack of alternative sources of electrical power, poor communication technology and lack of automated information processing procedures. The table 4.11 further shows that low standard deviation and variance was obtained on all the technology issues and this indicates that the respondents understood the question and gave almost similar answers since the closeness of the respondents' answers was very narrow. As can be observed in the table 4.11, all the technology issues record almost the same standard deviation and variance and this demonstrates the all the issues were rated to affect implementation of HMIS to a large extent.

4.8 Human Capacity Development

4.8.1 Influence of Human Capacity Development on implementation of health management information systems

Table 4.12 shows findings on the effect of Human Capacity Development on implementation of health management information systems.

Table 4.12 Influence of Human Capacity Development

Response	Frequency	Percentage
Yes	57	92%
No	5	8%
Total	62	100%

Table 4.12 shows that majority (92%) of the respondents were to the opinion that human capacity development affected the implementation of health management information systems in government health care facilities and a few who were 8% felt otherwise and indicated that human capacity development did not affect implementation of health management information systems. The majority of the respondents contended that lack of continuous human capacity development programs such as training and career development opportunities hindered development of competitive manpower for supporting effective implementation of HMIS in many government health care facilities. These findings concurred with Payton (2009) that absence of effective human capacity development programs affects creation of competitive human resources for supporting effective implementation of HMIS. The study hence affirmed that lack of human capacity development is core factor that makes it difficult for government health care facilities to effectively implement HMIS.

4.8.2 Extent to Which Human Capacity Development issues Influences the Implementation of Health Management Information Systems in Government Health Care Facilities

Using a likert scale of (1= not at all, 2 = small extent, 3 = moderate extent, 4 = large extent, 5 = very large extent) respondents rated extent to which human capacity development issues influences the implementation of health management information systems in government health care facilities. The findings were presented on table 4.13.

Table 4.13: Extent to Which human capacity Issues Influences the Implementation of Health Management Information Systems in Government Health Care Facilities

Human capacity development issues	N	Mean	Std. Deviation	Variance
Skilled ICT work force	62	3.8871	.85132	.725
Training	62	4.2097	.63082	.398
Staff competency	62	4.2097	.63082	.398
Staff qualifications	62	3.8548	.76494	.585
Valid N (listwise)	62			

Table 4.13 presents that a mean of 3.88 was scored on skilled ICT workforce and this indicates that skilled ICT workforce affected implementation of HMIS systems in government health care facilities to a moderate extent. A mean of 4.20 was scored on training and this indicates that training affected implementation of HMIS systems in government health care facilities to a large extent. A mean of 4.20 was scored on staff competency and this indicates that staff competency affected implementation of HMIS systems in government health care facilities to a large extent. A mean of 3.85 was scored on staff qualifications and this indicated that staff qualifications affected implementation of HMIS systems in government health care facilities to a moderate extent. The respondents stated that lack of skilled ICT work force, lack of training on use of HMIS, low level of staff competency and recruitment of unqualified staff hindered implementation of HMIS in government health care facilities. These findings contended with Moses (2008) effective implementation of HMIS in many government health care faculties fails due to lack of skilled ICT work force, lack of regular training on use of HMIS, low level of staff competency and recruitment of unqualified staff to guide on HMIS implementation process. The table 4.13 further shows that low standard deviation and variance was obtained on all the human capacity issues and this indicates the closeness of the respondents' answers and increased level and accuracy and reliability of the obtained findings.

4.9 Finance

4.9.1 Influence of Finance on implementation of health management information systems

Table 4.14 shows findings on the effect of finance on implementation of health management information systems.

Table 4.14 Influence of Finance

Response	Frequency	Percentage
Yes	48	77%
No	14	23%
Total	62	100%

Table 4.14 shows that majority (77%) of the respondents felt that finance affected the implementation of health management information systems in government health care facilities and a few who were 23% felt otherwise and indicated that finance did not affect implementation of health management information systems. The majority of the respondent affirmed that lack of allocation of adequate funds by the ministry of health and poor management of the available funds affected effective implementation of HMIS. These findings concurred with Mathew (2009) that financial resources constraints is a major obstacle affective effective implementation of HMIS in government health care facilities since the allocated funds are normally insufficient to finance all the HMIS implementation processes. The study therefore deduced that financial challenges in terms of funds allocation and funds management are major challenges affecting effective implementation of HMIS in government health care facilities.

4.9.2 Extent to which finance issues Influences the Implementation of Health Management Information Systems in Government Health Care Facilities

Using a likert scale of (1= not at all, 2 = small extent, 3 = moderate extent, 4 = large extent, 5 = very large extent) respondents rated extent to which finance issues influences the implementation of health management information systems in government health care facilities. The findings were presented on table 4.15.

Table 4.15: Extent to which finance issues Influences the Implementation of Health Management Information Systems in Government Health Care Facilities

Finance issues	N	Mean	Std. Deviation	Variance
Sources of funds	62	4.0484	.83818	.703
Funds allocation	62	4.7742	.52540	.276
Internal control and auditing	62	4.5161	.59346	.352
Budgeting	62	4.0323	.51111	.261
Valid N (listwise)	62			

Table 4.15 hence presents that a mean of 4.04 was scored on sources of funds and this indicates that sources of funds affected implementation of HMIS systems in government health care facilities to a large extent. A mean of 4.77 was scored on funds allocation and this indicates that funds allocation affected implementation of HMIS systems in government health care facilities to a large extent. A mean of 4.51 was scored on internal control and auditing and this indicates that internal control and auditing affected implementation of HMIS systems in government health care facilities to a large extent. A mean of 4.03 was scored on budgeting and this indicates that budgeting affected implementation of HMIS systems in government health care facilities to a large extent. The respondents argued that lack of alternative sources of funds, allocation of inadequate funds, lack of application of effective internal control systems for enhancing effective use of funds and lack of effective auditing and budgeting procedures greatly affected implementation of HMIS to a large extent. These findings were in agreement with Edward (2010) that many government health care facilities in Kenya fails to effectively embrace HMIS due to lack of alternative sources of funds, allocation of inadequate funds, lack of application of effective internal control systems and lack of effective auditing and budgeting procedures. The table 4.15 further shows that low standard deviation and variance was obtained on all the finance issues and this indicates the respondents rated all the issues to affect implementation of HMIS to a large extent.

4.9 Inferential Statistics

To determine how the research variables related to each other, correlation analysis was conducted. Correlation is a statistical measurement of the relationship between two variables. Possible correlations range from +1 to -1. A zero correlation indicates that there is no relationship between the variables. A correlation of -1 indicates a perfect negative correlation, meaning that as one variable goes up, the other goes down. A correlation of +1 indicates a perfect positive correlation, meaning that both variables move in the same direction together (Serekan, 2003).

Table 4.16 Correlation Analysis Results

Variables		HMIS	Planning	Stakeholders	Technology	HRC	Finance
HMIS	Pearson Correlation	1	.959**	.879**	.839**	.919**	.799**
	Sig. (2-tailed)		.000	.000	.000	.000	.000
	N	56	56	56	56	56	56
Planning	Pearson Correlation	.959**	1	.916**	.874**	.958**	.833**
	Sig. (2-tailed)	.000		.000	.000	.000	.000
	N	56	56	56	56	56	56
Stakeholders	Pearson Correlation	.879**	.916**	1	.955**	.956**	.909**
	Sig. (2-tailed)	.000	.000		.000	.000	.000
	N	56	56	56	56	56	56
Technology	Pearson Correlation	.839**	.874**	.955**	1	.913**	.952**
	Sig. (2-tailed)	.000	.000	.000		.000	.000
	N	56	56	56	56	56	56
HRC	Pearson Correlation	.919**	.958**	.956**	.913**	1	.869**
	Sig. (2-tailed)	.000	.000	.000	.000		.000
	N	56	56	56	56	56	56
Finance	Pearson Correlation	.799**	.833**	.909**	.952**	.869**	1
	Sig. (2-tailed)	.000	.000	.000	.000	.000	
	N	56	56	56	56	56	56

** . Correlation is significant at the 0.01 level (2-tailed).

Table 4.16 hence shows that all the independent variables had a strong positive correlation with the implementation of HMIS in government health care facilities (p-values < 0.01). Planning had a strong positive correlation with effective implementation of HMIS with r value of .959; stakeholders recorded an r value of .879 and this indicates that stakeholders had a strong positive correlation with effective implementation of HMIS; technology recorded an r value of .839 hence indicating that technology had a strong positive correlation with the effective implementation of HMIS; human resource capacity had an r value of .919 and this indicated that human resource capacity had a strong positive correlation with effective implementation of

HMIS. Finally, finance had an r value of .799 and this indicated that finance had a strong positive correlation with effective implementation of HMIS.

CHAPTER FIVE

SUMMARY OF FINDINGS, DISCUSSION, CONCLUSIONS AND RECOMMENDATIONS

5.1 Introduction

This chapter presents a summary of the findings, conclusion and recommendations of the study based on the specific objectives that guided the entire research on factors influencing implementation of health management information systems in government health care facilities in Kenya. The chapter covers the summary of the major findings, conclusion and recommendations.

5.2 Summary of Findings

5.2.1 Influence of Planning on implementation of health management information systems

The study found out that planning was major factor that greatly influenced effective implementation of health management information systems in government health care facilities. It was noted that majority (86%) of the respondent affirmed that lack of planning and strategizing hindered the development and deployment of effective health management information systems that addressed the health information management problems faced by the government health care facilities. The study noted that lack of proper planning affected design and implementation of feasible health management information systems and this concurred with findings by Burnes (2009) that lack of proper planning and strategizing before implementation of health management information systems hinders the success of HMIS implementation process and in many public health care facilities in African countries. The study identified that lack of effective HMIS planning approach, lack of HMIS project implementation action plans, poor strategic planning process and absence of effective information management systems hindered effective planning of HMIS project implementation in many government health care facilities. These echoed findings by Graham (2008) that many government health care facilities fail to succeed in implementation of HMIS due to, lack of effective HMIS planning methodology, lack of HMIS action plans, poor strategic planning process and use of ineffective information management systems.

5.2.2 Influence of Stakeholders on implementation of health management information systems

The study established that stakeholders support greatly influenced the implementation of health management information systems in most of the government health care facilities. It was identified that majority (93%) of the respondents indicated lack of stakeholders support hindered allocation of enough financial resources for strengthening effective implementation of HMIS and this negatively affected sustainable implementation of HMIS in government health care facilities. These findings were in agreement with Emmanuel (2008) that lack of stakeholders support greatly affects allocation of enough financial resources for supporting effective implementation of HMIS in many government health care facilities. It was revealed that lack of top management support, poor monitoring and evaluation, low level of health care workers commitment and funding institutions and lack of government support were the major determinants of stakeholders support that greatly affected implementation of HMIS in government health care facilities. These contended with Phillip (2007) that lack of management support, poor monitoring and evaluation, low level of health care workers commitment and inadequate funding from government support greatly affected implementation of HMIS in government health care facilities.

5.2.3 Influence of Technology on implementation of health management information systems

Technology was found to have a major influence on the implementation of health management information systems and this was supported by majority (85%) of the respondents who affirmed that lack of application of modern information communication technology through the use of latest computer hard ware's and software's created unfavorable environment for the implementation of HMIS in many government health care facilities. This was found to be in agreement with observation made by Edward (2010) that many government health care facilities lacks better computer hardware's and soft ware's and this creates unsupportive environment for effective implementation of HMIS. The study found out that the use of low quality computer hardware's and software's, lack of alternative sources of electrical power, poor communication

technology and lack of automated information processing methods greatly hindered effective implementation of HMIS in many government health care facilities.

5.2.4 Influence of Human Resource Capacity on implementation of health management information systems

Human capacity development was found to be a major critical factor that hindered effective implementation of HMIS in many government health care facilities. This was supported by majority (92%) of the respondents who contended that lack of continuous human capacity development programs such as training and career development opportunities hindered development of competitive manpower for supporting effective implementation of HMIS in many government health care facilities. These findings concurred with Payton (2009) that absence of effective human capacity development programs affects creation of competitive human resources for supporting effective implementation of HMIS. The study noted that lack of skilled ICT work force, lack of training on use of HMIS, low level of staff competency and recruitment of unqualified staff hindered implementation of HMIS in government health care facilities. These findings contended with Moses (2008) that effective implementation of HMIS in many government health care facilities fails due to lack of skilled ICT work force, lack of regular training on use of HMIS, low level of staff competency and recruitment of unqualified staff to guide on HMIS implementation process.

5.2.4 Influence of Finance on implementation of health management information systems

The study revealed that finance was a key factor that influenced how HMIS was implemented in government health care facilities. This was expressed by majority (77%) of the respondents who affirmed that lack of allocation of adequate funds by the ministry of health and poor management of the available funds affected effective implementation of HMIS. These findings concurred with Mathew (2009) that financial resources constraints is a major obstacle affective effective implementation of HMIS in government health care facilities since the allocated funds are normally insufficient to finance all the HMIS implementation processes. The study found out that lack of alternative sources of funds, allocation of inadequate funds, lack of application of effective internal control systems for enhancing effective use of funds and lack of effective

auditing and budgeting procedures greatly affected implementation of HMIS to a large extent. These findings were in agreement with Edward (2010) that many government health care facilities in Kenya fails to effectively embrace HMIS due to lack of alternative sources of funds, allocation of inadequate funds, lack of application of effective internal control systems and lack of effective auditing and budgeting procedures.

5.3 Discussions

5.3.1 Influence of Planning on the Implementation of Health Management Information Systems in Government Health Care Facilities

The majority of the respondents affirmed that lack of planning and strategizing hindered the development and deployment of effective health management information systems that addressed the health information management problems faced by the government health care facilities. The respondent contended that lack of effective HMIS planning approach, lack of HMIS project implementation action plans, poor strategic planning process and absence of effective information management systems hindered effective planning of HMIS project implementation in government health care facilities. These findings echoed findings by Graham (2008) that many government health care facilities fail to succeed in implementation of HMIS due to, lack of effective HMIS planning methodology, lack of HMIS action plans, poor strategic planning process and use of ineffective information management systems. The study hence alluded that planning for HMIS implementation is greatly influenced by HMIS planning approach, HMIS project implementation action plans, HMIS strategizing and use of effective information management systems

5.3.2 Influence of Stakeholders on implementation of health management information systems

The majority of the respondent explained that lack of stakeholders support hindered allocation of enough financial resources for strengthening effective implementation of HMIS and this negatively affected sustainable implementation of HMIS in government health care facilities. These findings contended with Emmanuel (2008) that lack of stakeholders support greatly affects allocation of enough financial resources for supporting effective implementation of HMIS in

many government health care facilities. The respondents finally explained that top management support, monitoring and evaluation, health care workers commitment and funding institutions and government support were the major determinants of stakeholders support that greatly affected implementation of HMIS in government health care facilities. These findings were in agreement with Phillip (2007) that lack of management support, poor monitoring and evaluation, low level of health care workers commitment and inadequate funding from government support greatly affected implementation of HMIS in government health care facilities.

5.3.3 Influence of Technology on implementation of health management information systems

The majority of the respondents affirmed that lack of application of modern information communication technology through the use of latest computer hardware's and software's created unfavorable environment for the implementation of HMIS in many government health care facilities and this was in agreement with observation made by Edward (2010) that many government health care facilities lacks better computer hardware's and software's and this creates unsupportive environment for effective implementation of HMIS. The respondents explained that the use of low quality computer hardware's and software's, lack of alternative sources of electrical power, poor communication technology and lack of automated information processing methods greatly hindered effective implementation of HMIS in many government health care facilities. This corresponded with findings by Nicole (2007) that effective implementation of HMIS in many health care facilities in developing nations is greatly hampered by the use of low quality computer hardware's and software's, lack of alternative sources of electrical power, poor communication technology and lack of automated information processing procedures

5.3.4 Influence of Human Capacity Development on implementation of health management information systems

The majority of the respondents contended that lack of continuous human capacity development programs such as training and career development opportunities hindered development of

competitive manpower for supporting effective implementation of HMIS in many government health care facilities. These findings concurred with Payton (2009) that absence of effective human capacity development programs affects creation of competitive human resources for supporting effective implementation of HMIS. The study hence affirmed that lack of human capacity development is core factor that makes it difficult for government health care facilities to effectively implement HMIS. The respondents stated that lack of skilled ICT work force, lack of training on use of HMIS, low level of staff competency and recruitment of unqualified staff hindered implementation of HMIS in government health care facilities. These findings contended with Moses (2008) effective implementation of HMIS in many government health care faculties fails due to lack of skilled ICT work force, lack of regular training on use of HMIS, low level of staff competency and recruitment of unqualified staff to guide on HMIS implementation process

5.3.5 Influence of Finance on implementation of health management information systems

The study found out that lack of allocation of adequate funds by the ministry of health and poor management of the available funds affected effective implementation of HMIS. These findings concurred with Mathew (2009) that financial resources constraints is a major obstacle affective effective implementation of HMIS in government health care facilities since the allocated funds are normally insufficient to finance all the HMIS implementation processes. The respondents argued that lack of alternative sources of funds, allocation of inadequate funds, lack of application of effective internal control systems for enhancing effective use of funds and lack of effective auditing and budgeting procedures greatly affected implementation of HMIS to a large extent. These findings were in agreement with Edward (2010) that many government health care facilities in Kenya fails to effectively embrace HMIS due to lack of alternative sources of funds, allocation of inadequate funds, lack of application of effective internal control systems and lack of effective auditing and budgeting procedures

5.4 Conclusion

Poor and lack of implementation of HMIS in many government health care facilities in Kenya is greatly influenced by poor planning and strategizing, lack of stakeholders support, lack of embracement of ICT, lack of human capacity development in ICT and health management and

inadequate financial resources. Effective implementation of HMIS in Kibwezi District health care facilities and other government health care facilities in the country can only be realized through effective management of these key factors.

Planning and strategizing helps to map out requirements and the implementation process of HMIS. Planning of HMIS implementation process fails due to lack of effective HMIS planning approach, lack of HMIS project implementation action plans, poor strategic planning process and absence of effective information management systems hindered effective planning of HMIS project implementation in many government health care facilities.

HMIS project implementation is dependent upon the stakeholders support, the needs of various stakeholders and their roles have to be explicitly documented and have to be taken into consideration when designing and implementing the HMIS. Since stakeholders pursue different objectives, concerns, priorities and constraints proper orientation should be given before implementation of the HMIS in order to make stakeholders understand and participate in the HMIS implementation process. Top management support, health care workers commitment and government support should be given much emphasis in order to support effective implementation of the HMIS systems.

Technology is major factor that greatly influences effective implementation of HMIS in many government health care facilities. Technology adoption in terms of ICT provides a supportive environment for the implementation of HMIS and lack of effective ICT infrastructure slows the pace of HMIS implementation. Technology perception amongst the health care workers leads to resistance in change of manual health care management systems to HMIS since most health care workers fear losing their respective jobs. Lack of better computer hardwares and softwares hinders adoption of latest versions of HMIS systems and this affects integration of all patient information from various sources at the point of care. Buying a fully functional system fulfilling all healthcare needs from one vendor and customizing the system is an expensive undertaking and this lowers the standards for better data integration in HMIS.

Implementation of HMIS requires development of human capacity in order to create competent personnel with technical knowledge and skills on HMIS application. Human capacity development entails the capability of the health care facilities to have skilled personnel and develop existing personnel in order to support effective implementation and use of HMIS. A skilled ICT work force is an essential ingredient for the effective use of ICT in healthcare. Training is an important part of capacity development since when health care workers are not trained on use of HMIS there is lack of understanding of the requirements of the HMIS implementation. HMIS data collection, processing and information use assumes requires a high level of general education and specialist training amongst health workers, which is often not available, especially in many government health care facilities.

The implementation of HMIS in many government health facilities fails due to lack of adequate financial resources and poor management of the allocated financial resources. Overreliance on donors support in funding for the HMIS projects affects the sustainability of the application of HMIS in many government health care facilities since donors withdraws funding after a short time. Lack of effective internal control systems and budgeting process leads to misappropriation of HMIS implementation funds and this leads to implementation of substandard HMIS system and lack of system maintenance.

5.5 Recommendations

To strengthen the implementation of HMIS in government health care facilities, the study suggested the following recommendations;

5.5.1 Planning and Implementation of HMIS

The management of government health care facilities should undertake effective planning and strategizing by drafting and implementing effective strategic plans. HMIS implementation should focus on utilizing information during planning and strategy and make explicit strategies to support the informational management approach. The health care management should employ effective HMIS planning approach, draft effective HMIS project implementation action plans, and implement effective information management systems.

5.5.2 Stakeholders and Implementation of HMIS

To improve on the level of stakeholders support in the implementation of HMIS, the top management in the government health care facilities should employ effective leadership styles and demonstrate a high level of engagement in the HMIS implementation process. Better employees' remuneration packages should be given to healthcare workers in order to improve their work morale and increase their level of commitment in HMIS application. The government through the ministry of health should give the strongest support by allocating enough funds and deploying competent personnel to oversee the HMIS project implementation process. All the healthcare employees, nurses, clinicians, IT staff and doctors should be given enough training to equip them with skills and competencies for effective application of HMIS in executing their duties.

5.5.3 Technology and Implementation of HMIS

To improve on technology, government health care facilities should first identify computer hardware and software required for HMIS implementation. The acquired HMIS interface design and structure of the data should conform to each other. Flexibility and adaptability of the HMIS system should be given much emphasis in order to support proper system customization. High HMIS systems standards should be embraced and alternative sources of energy like solar and wind energy should be implemented in remote health care facilities to support smooth running of the HMIS systems. To enhance effective integration of the patient information with ICT, health care facilities should implement effective ICT infrastructure to support automation of health recording functions. Excessive use of manual patient recording procedures should be discouraged in order to promote the use of computerized recording systems.

5.5.4 Human Resource Capacity and Implementation of HMIS

Government health care facilities should recruit competent workforce and implement continuous human resource capacity development programs such as training workshops, seminars and career development opportunities. Before implementation of HMIS, the human resource department in healthcare facilities should undertake an effective job evaluation program in order to determine the employees training needs in comparison with the HMIS project implementation human

resources capacity needs. The employees' skills gap analysis should be determined and effective training programs should be employed to strengthen the existing human resource capacity by equipping the healthcare workers with competitive knowledge and skills on HMIS application. Health care facilities should always have competent staff with competitive skills in ICT and health care management.

5.5.5 Finance and Implementation of HMIS

The government through the ministry of health should allocate adequate funds for financing HMIS implementation process. The funds should cater for the HMIS procurement, customization, maintenance and training of HMIS personnel. Effective internal control systems, budgeting processes and auditing systems should be put in place in order to ensure proper utilization of HMIS funds and elimination of case of misappropriation of the HMIS project funds. The government should collaboratively work with donor agencies such as AMREF Kenya and USAID in order to continue funding the donor initiated HMIS projects after the donors withdrawal.

5.6 Suggestions for Further Research

The study narrowed its research undertakings into the major HMIS implementation influencing factors that were addressed by the specific objectives of the study. These included; planning, stakeholders, technology, human capacity development and finance. The study noted that there were other factors like government policies and procurement methods that had a major influence on effective implementation of HMIS. The study therefore proposes a suggestion for further studies on the effect of government policies and procurement methods on HMIS implementation and on other factors that contributes towards increased level of effectiveness in the implementation of HMIS in many government health care facilities in Kenya.

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APPENDIX I: INTRODUCTION LETTER

THE MANAGEMENT

KIBWEZI HEALTH CARE FACILITIES

P.O BOX

NAIROBI

KENYA

Dear Sir /Madam,

REF: COLLECTION OF DATA

I'm a student at Nairobi University pursuing a Masters Degree course. I'm currently undertaking a research project on "**Factors Influencing Implementation of Health Management Information Systems in Government Health Care Facilities in Kenya**" which is a requirement so that I can be awarded my masters degree. I'm therefore seeking your assistance to fill the questionnaires attached

All the information given will be held confidential and will only be used for educational purpose.

Much thanks in advance

Yours faithfully

KIOKO KITHUKI

APPENDIX 11: QUESTIONNAIRE

Introduction

This questionnaire seeks to gather information on factors influencing implementation of health management information systems in government health care facilities in Kenya. Please spare your ten minutes to respond to these questions, all information you provide will be treated with utmost confidentiality and only used for academic purposes thank you in advance.

Section 1

Personal Information

(Instruction -Tick where appropriate)

1. Age:

- 18- 30yrs
- 31-40 yrs
- 41 –50 yrs
- 51 yrs and over

2. Highest Education Level

- Secondary level
- College level
- University level
- Professional Qualification (Specify.....)

3. Working Experience

- Less than 5 years
- 6-10 Years
- 11-15years
- 16 years and above

4. Does planning affect the implementation of health management information systems in government health care facilities?

- Yes
- No

If Yes/No explain.....

.....

.....

5. Please indicate the extent to which the following planning issues influences the implementation of health management information systems in government health care facilities. Please record your answer by ticking at the space provided, by the scale indicator.

(1= not at all, 2 = small extent, 3 = moderate extent, 4 = large extent, 5 = very large extent)

Planning issues	1	2	3	4	5
HMIS project planning					
Action Planning					

Strategic planning					
Information management					

6. Could you suggest how planning issues should be managed in order to support the implementation of health management information systems? (Explain)? (Explain)

.....

.....

7. Does Stakeholders affect the implementation of health management information systems in government health care facilities?

- Yes
- No

If Yes/No explain.....

.....

.....

8. Please indicate the extent to which the following stakeholders issues affect the implementation of health management information systems in government health care facilities. Please record your answer by ticking at the space provided, by the scale indicator.

(1= not at all, 2 = small extent, 3 = moderate extent, 4 = large extent, 5 = very large extent)

Stakeholders issues	1	2	3	4	5
Top management support					
Monitoring and evaluation					
Health care workers commitment					
Funding institutions and government support					

9. Could you suggest how stakeholders should support the implementation of health management information systems in government health care facilities? (Explain)

? (Explain)

.....

.....

10. Does technology affect the implementation of health management information systems in government health care facilities?

Yes

No

If Yes/No explain.....

.....

.....

11. Please indicate the extent to which the following technology issues affect the implementation of health management information systems in government health care facilities. Please record your answer by ticking at the space provided, by the scale indicator.

(1= not at all, 2 = small extent, 3 = moderate extent, 4 = large extent, 5 = very large extent)

Technology issues	1	2	3	4	5
Computer hardware and software					
Alternative sources of electrical power					
Communication technology					
Information processing					

12. Could you suggest how technology should be improved to support the implementation of health management information systems in government health care facilities?

.....

13. Does human capacity development affect the implementation of health management information systems in government health care facilities?

Yes

No

If Yes/No explain.....

.....

.....

14. Please indicate the extent to which the following human capacity development issues affect the implementation of health management information systems in government health care facilities. Please record your answer by ticking at the space provided, by the scale indicator.

(1= not at all, 2 = small extent, 3 = moderate extent, 4 = large extent, 5 = very large extent)

Human capacity development issues	1	2	3	4	5
Skilled ICT work force					
Training					
Staff competency					
Staff qualifications					

15. Could you suggest how human capacity development issues should be managed to support the implementation of health management information systems in government health care facilities?

.....

16 . Does finance affect the implementation of health management information systems in government health care facilities?

Yes

No

If Yes/No explain.....

.....

.....

17. Please indicate the extent to which the following finance issues affect the implementation of health management information systems in government health care facilities. Please record your answer by ticking at the space provided, by the scale indicator.

(1= not at all, 2 = small extent, 3 = moderate extent, 4 = large extent, 5 = very large extent)

Finance issues	1	2	3	4	5
Sources of funds					

Funds allocation					
Internal control and auditing					
Budgeting					

18. Could you suggest how finance issues should be managed to support the implementation of health management information systems in government health care facilities?

.....

APPENDIX III: SCHEDULE OF RESEARCH ACTIVITIES

ACTIVITY	SCHEDULE					
	January 2012- February	March 2012	April 2012	May 2012	June 2012	July 2012
✓ Development of Proposal						
✓ Presentation of proposal ✓ Correction ✓ Data correction						
✓ Data Analysis ✓ Report writing						
✓ Writing of the research report ✓ Presentation of the project ✓ Corrections						
✓ Submitting the research project report						

Source; Author (2012)

APPENDIX IV: BUDGET ESTIMATES

ITEM	QUANTITY	UNIT COST (KSHS)	TOTAL COST (KSHS)
Stationary	5 reams	500	2,500
Traveling (Fuel)	21 kms (6 days)	1000	10,000
Typing services	80 pages (5 copies)	10	4,000
Binding	80 pages (5 copies)	100	500
Photocopying	80 pages (5 copies)	2	800
Lunch	6 lunches	300	1,800
Data collection and analysis			24,000
Total			35,600

Source; Author (2012)

APPENDIX V: KIBWEZI MAP

2°00'S

