

ADDIS ABABA UNIVERSITY

SCHOOL OF COMMERCE DEPARTEMENT OF

PROJECT MANAGEMENT

ASSESSMENT OF ELECTRONIC HEALTH MANAGEMENT INFORMATION

SYSTEM (e-HMIS) PROJECT IMPLEMENTATION IN PUBLIC

HOSPITALS;IN THE CASE OF ADDIS ABABA CITY ADMINISTRATION

HEALTH BUREAU

A RESEARCH PROJECT SUBMITTED TO ADDIS ABABA UNIVERSITY SCHOOL OF
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Addis Ababa, Ethiopia

ASSESSMENT OF ELECTRONIC HEALTH MANAGEMENT INFORMATION SYSTEM
(e-HMIS) PROJECT IMPLEMENTATION IN PUBLIC HOSPITALS;IN THE CASE OF
ADDIS ABABA CITY ADMINISTRATION HEALTH BUREAU

BY: ZEBIBA AHMED

Approved by Examining Board

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JUNE, 2017

Addis Ababa, Ethiopia

DECLARATION

I, Zebiba Ahmed declare that the project entitled “Assessment of electronic health management information system (e-HMIS) project implementation in public hospitals; in the case of Addis Ababa City Administration Health Bureau” is my original work and has not been presented for a degree in this university or any other university and that all sources of material used for the project have been duly acknowledged.

Signature.....

Date.....

LETTER OF CERTIFICATION

This is to certify that Zebiba Ahmed has conducted this project work entitled “Assessment of electronic health management information system (e-HMIS) project implementation in public hospitals; in the case of Addis Ababa City Administration Health Bureau” is under my supervision. This project work is original and suitable for the submission in partial fulfillment of the requirement for the award of Master of Arts Degree in Project Management.

SolomonMarkos(PhD)_____

Date and Signature

Acknowledgment

First and for most, I would like to say Alhamdulillah for his invaluable care and support throughout the course of my life.

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LIST OF ABBREVIATIONS

AACAHB	Addis Ababa City Administration Health Bureau
e-HMIS	Electronic Health Management Information System
FMOH	Federal Ministry of Health
HIS	Health Information System
HSDP	Health Sector Development Program
ICT	Information Communication and Technology
SPSS	Statistical Package for Social Sciences
TAM	Technology Acceptance Model
USAID	United States Agency for International Development
WHO	World Health Organization

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ABSTRACT

The topic of the study is “Assessment of Electronic Health Management Information System (e-HMIS) project implementation in public hospitals; in the case of Addis Ababa City Administration Health Bureau”. The main objective of the study is to assess the extent to which public hospitals under AACAHB are using e-HMIS and identify challenges of implementing e-HMIS in public hospitals. The researcher chose public hospitals under AACAHB because of time and financial resources available to conduct the study. The study design is descriptive, the sampling technique is purposive. Data is collected through interview and questionnaire. The data collected was, coded and analyzed with the aid of SPSS version 20 package and MS-Excel 2010. Descriptive statistics was used to help in drawing conclusions. The findings of the study reveal that there were challenges on training of users, financial resources, adequate human resources, support from the staffs and managements, and ICT infrastructures. Whereas the project has good practice in software infrastructure. Based on the findings, the following recommendations are forwarded; give frequent training, assign adequate budget and support and involvement of managers at all levels.

Key words: *e-HMIS implementation, e-Health project implementation, e-HMIS in public Hospitals*

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CHAPTER ONE

INTRODUCTION

1.1. Background of the study

Ethiopia is located in the northeastern part of Africa, also known as the Horn of Africa. The country has a total area of about 1.1 million square kilometers and a population of more than 85,000,000, Ethiopia is Africa's second most populous country. The annual population growth rate is 2.6 percent, with a high fertility rate of 5.4 children per woman. The current life expectancy is only fifty-five years. The literacy rate is 36 percent, compared with an average of 62 percent for Sub-Saharan African countries and 64 percent for the group of nations classified as "low-income" countries (FMOH, 2005a, 2005b).

In Ethiopia, the ratio of health professionals to population is very low and considered among the lowest in the world. The national and regional figures for doctor to population ratio have gotten worse, and health staff is unevenly distributed, with most healthcare professionals clustered in major urban such as Addis Ababa and Dire Dawa (FMOH, 2005c). Due to the shortage of healthcare providers such as nurses and general practitioners, patients often suffer from limited or nonexistent access to specialized care services. In a 2007 ranking by the World Health Organization (WHO), Ethiopia ranked 180 of 190 countries surveyed. The WHO survey indicated that Ethiopia had 46,666 total healthcare personnel, yielding a physician to population ratio of 1:42,706 (Photius, 2013).

The growth of ICTs (Information and Communication Technologies) provides opportunities to improve human development and confront social, economic, and health disparities (OECD, 2008). Despite the heralded news that ICT will provide low-cost, fast solutions to improving the healthcare services of world populations, the grim reality is that we cannot easily close the gap and erase the inequities caused by the digital divide (UNDP, 2004).

According to a report by WHO (2011) on analyzing disrupted health systems in countries in crisis training course, the investment in Health Information Management Systems could reap multiple benefits, including: Helping decision makers to detect and control emerging and

endemic health problems, monitor progress towards health goals, and promote equity. In addition, it will empower individuals and communities with timely and understandable health related information, and lead to an improvement in the quality of services. The use of Health Information Management Systems were assist in strengthening the evidence base for effective health policies, permitting evaluation of scale-up efforts, enable innovation through research, improve governance, mobilizing new resources and ensuring accountability. (Lau F et al, 2006).

Over the recent years, health information technology has been seen as a tool that can be used to improve the quality of health care and patient safety. The critical role of information technology in health care systems is to meet the six aims of care; care that is safe, effective, efficient, timely, equitable and patient-centered (crossing the quality of chasm, 2001). Health information technology involves the exchange of health information in an electronic environment. It is used to support the health care quality and efficiency by providing tools to improve patient care and to reduce administration overhead.

Health information management can be defined as the maintenance of health records by traditional (paper-based) and electronic means in hospitals, health departments, health insurance companies, and other facilities that provide health care or maintenance of health records (Stansfield, 2005). In order for a HMIS to function fully, data from different sources must be integrated. Secondly, data should be analyzed and interpreted so that recommendations are made to improve the performance of health services (Talisuna et al., 2000). One key important aspect of the HMIS is that information must be transformed into actions at all levels and hence, there is need to have adequate capacity for collection, analysis, interpretation and use of the information that the system generates (Nekesa, 2014).

Electronic Health management information system (e-HMIS) is an electronic health record (EHR) system capturing all patient information from encounter to discharge (Ndira, S. 2008).Health management information system (HMIS) is important to strengthening the health system particularly in developing countries, because it helps to improve the health service delivery to satisfy health care demands, increase competitiveness on the supply side and hereby satisfy the clients depending quality health care service WHO (2000).

The FMOH of Ethiopia has initiated a major reform of the HMIS/M & E (monitoring and evaluation) following the business process Re-engineering principles since 2006. A strategy was developed by the FMOH to implement the new system throughout the country as discussed and agreed by all. Following assessment of the old system a new system was designed and pilot tested in 2006 and 2007 and approved for national scale up in December 2007. In the newly designed system, the mission of HMIS/M & E as indicated in the strategy plan is to support continuous improvement of the health services and the health status of the population through action-oriented, evidence-based decision making, based on quality information(FMOH, Monitoring and Evaluation Case Team 2009).

The role of information communication technologies (ICT) can no longer be ignored within the health care industry (Clark, T. 2007). The health care industry has to depend on information technology (IT) to maintain and improve both clinical and business operations (Bernstein,M.L. Mccreless,T. and Cot, M.J. 2007).

The FMOH, supported by its technical partners, is involved in a number of ICT projects and services. These projects and services have been classified into the following major areas: Data Warehouse; Electronic Medical Records; Geographical Information Systems; Tele-Education; Telemedicine; Human Resource Information System; Health Integrated Financial Information System; and Electronic Health Management Information System e-HMIS (FMOH 2012).

1.2. Statement of the Problem

e-HMIS forms a backbone for strong health systems, most developing countries still face a challenge in strengthening routine health information systems.

Although reliable and timely health information is the foundation of public health action, it is often unavailable due to different constraints in systems for data collection, analysis, dissemination and use. Consequently, decision-makers cannot identify problems and needs, track progress, evaluate the impact of interventions and make evidence-based decisions on health policy, program design and resource allocation. The access and use of information by program managers and service providers help resolve bottlenecks and improve program implementation. This eventually leads to improvement in health service delivery and thereby improvement in the health status of the population.

At national level there are two different e-HMIS software developed and implemented in Addis Ababa and Southern Nation Nationality People's Region. The first one is smart e-HMIS module that is developed using Microsoft and implemented by center for disease control in 31 health facilities, all public hospitals, and all sub cities in Addis Ababa including regional health bureau. The second one is web based e-HMIS software with a scanning technology as a backup, and implemented by USAID in all health facilities in Southern Nation Nationality People's Region and the e-HMIS implementations were started three years back for both of the group. But both e-HMIS system didn't address the objective stated at the project initiation such as data accuracy, data redundancy, data completeness and timely data use for planning and decision making process (FMOH, 2010).

The major problems that contribute to e-HMIS not serve its purposes and not meet its objectives are lack of attention given to e-HMIS, shortage of resource and inadequate use of technology (FMOH 2016) as well as lack of trained manpower, absence of standards and guidelines, inadequate staffing and poor ownership (HSDP 2011-2012).

On the other hand, the ongoing 'business-process re-engineering' in the health sector and e-HMIS program in particular has resulted several measures to be taken. There is still considerable lack of clarity around the role of specific technical support agencies in roll-out of the e-HMIS, especially Tullen University which has been leading this work in the past two years (WHO, 2009).

It is, therefore, essential to assess the effectiveness as well as the challenges and prospects of the e-HMIS implementation.

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

Public hospitals in the Addis Ababa city Administration has encountered various challenges in the implementation of the e-HMIS which are; lack of knowledge/skill, lack of training, inadequate finance, slow pace of ICT implementation/infrastructure; inadequate legal framework for the hospital; inadequate number of human resource especially in specialized areas and poor management support. The strategic plan clearly states that there is delayed ICT implementation and have identified implication as inefficiency in service delivery and controls (FMOH,2008).

According to O'Brien (2002) information that is outdated, inaccurate and hard to understand and make decisions is not useful to any entity and especially hospitals which are dealing with human life. He further adds that hospital staff requires high quality information and has the three main dimensions of useful information which are time, content and form. Lack of immediate information storage and retrievals also is another problem experienced by the hospitals. He emphasizes that information storage is critical since it defines the way the information will be stored and later retrieved for use. The other problems that hospitals experience with the current systems that necessitate change of the Information system include; lack of prompt updating; error prone manual calculation; preparation of accurate and prompt reports.

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

This study will focus on the assess e-HMISimplementation and challenges faced during the implementation which will more specific to the Public Hospitals.

1.3. Research Question

- To what extent public hospitals are using e-HMIS project?
- What are the challenges to implement e-HMIS project in public hospitals?
- What are the possible solutions for the effective implementation of the new e-HMIS project?

1.4. Objective

1.4.1. General objective

The overall objective of this study was to assess the new e-HMIS project implementation in public hospitals under Addis Ababa City Administration Health Bureau.

1.4.2. Specific objectives

The specific objectives of this study are:

- To assess the extent to which Area in public hospitals are using e-HMIS
- To identify challenges of implementing e-HMIS in public hospitals
- To propose possible solutions for the effective implementation of the new e-HMIS project.

1.5. Significance of the study

This study is primarily aimed at fulfilling the academic requirement. It can also serve as a starting point for assessment of the current e-HMIS based on the situation in public Hospitals, in Addis Ababa City Administration Health Bureau to identify the strength and weakness of the project at national level to take appropriate measure at infantile stage of implementation.

The study can therefore serve to understand ideal and practical situation of the new e-HMIS through this work on the current trends in public Hospital in Addis Ababa City Administration Health Bureau. This assessment is therefore significant

- To Addis Ababa City Administration Health Bureau to find out their problems and strength in implementing the e-HMIS, with the aim of helping them to improve their e-HMIS status by take corrective measures on areas functioning least in the new e-HMIS.
- Also be important for planning, decision making process and serving as a starting point for other health information system.
- To serve as a spring board for those who wish to adopt and extend it further in wider and deeper scale at national level.
- It can be an addition to the existing literatures and to the efforts in this regard.

1.6. The Scope of study

This study is focused on the assessment of the new e-HMIS project implementation in six public Hospitals under Addis Ababa City Administration health Bureau. The scope of the study was also delimited to one of the project management phase, which was project implementation. The reasons for these delimitations of the study are time and resource constraint.

1.7. Operational Definitions

Core process or case team- work department or unit in the new civil service reform context in Ethiopia

Health Information System- a system that integrates data collection, processing, reporting and use of information necessary for improving health service effectiveness through better management at all levels of health services.

Electronic Health Management Information System- an Electronic information system specially designed to assist in the management of health services.

Information- an organized set of data that gives meaning

Success factors- the use of data quality assurance tools, monitoring performances, existence of skilled staff, well designed formats, standardized set of indicators, budget for e-HMIS, ICT use, coordination, cooperation, communication, shared responsibility among stakeholders,

Information System- a system that provides information support to the decision-making at each level of an organization

Ownership- To consider, accept and prioritize e-HMIS as core activity or as part and parcel of professional duty.

System- a collection of components that work together to achieve a common objective

Technical partners- A group of partners organized to support e-HMIS activities

Utilization of Information- use of information for different purposes (planning, decision making, to take action, to provide information) at all levels of health sector.

1.8. Organization of the study

This study was organized into five chapters. Chapter one of the study contains introduction, giving a background, statement of the problem, objectives, significance, and the scope of the study.

Chapter two was about literature review, under this part of the study. Chapter three was to try to show the methodology which was used in the study. It covers the study area, study design, source and sample population, sample size and sample procedures, method of data collection and method of data analysis. Chapter four of this study was to come up with the study data analysis, results and discussion. Chapter five was about summary, conclusion and recommendations. References and appendices were at the end of the paper.

CHAPTER TWO

LITERATURE REVIEW

2.1. Introduction

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

2.2. Theoretical Literature Review

2.2.1. Definitions of Project

A project is a temporary endeavor undertaken to create a unique product, service or result. The temporary nature of projects indicates that a project has a definite beginning and end. The end is reached when the project's objectives have been achieved, or when the projects objectives will not or cannot be met, or when the need for the project is no longer exists,(Gatti2008).

A project may also be terminated if the client (customer sponsor, or champion) wishes to terminate the project. Temporary does not necessarily mean the duration of the project is short. It refers to the project's engagement and its longevity. Temporary does not typically apply to the product, service, or result created by the project; most projects are undertaken to create lasting outcome. For example, a project to build a national monument will create a result expected to last for centuries. Project can also have social, economic, and environmental impacts that far outlive the projects themselves. In every case, however, the duration of project is finite; projects are not ongoing efforts (Cooper et al., 2005).

Every project creates a unique product, service, or result. The outcome of the project may be tangible or intangible. Although repetitive elements may be present in some project deliverables and activities, this repetition does not change the fundamental, but unique characteristics of the

project work. For example, office buildings can be constructed with same of similar materials and by the same of different teams.

However, each building project remains unique with a different location, different design, different circumstances and situations, different stakeholders, and so on (Ibid).

Some writers and practitioners of project management state the meaning of projects as any undertaking that has a beginning and an end; requires budget and resources, and has a goal or objective to achieve, that may range from simple activities like preparing holiday dinner for extended family members to mega projects that require many years and huge amount of budget. But the commonly accepted definition of a project is that “A project is a sequence of unique, complex, and connected activities that have one goal or purpose and that must be completed by a specific time, within budget, and according to specification”(Wysocki, 2014). This definition consists of attributes that differ an undertaking from other routine activities. To be called a project, an undertaking should be unique, should have one goal and should be completed within constraints. The uniqueness of a project brings risk to the scene and its presence as inevitable. Dr. Mike Bell in his article “Effective and Efficient Project Management” expressed the presence of risk in projects as a key point that differentiates projects from routine activities.

Another definition of a project that incorporates the concept of having business value beyond being completed within the stated constraints is given by Dr. Robert K. Wysocki. It is stated as “A project is a sequence of finite dependent activities whose successful completion results in the delivery of the expected business value that validated doing the project”. Other known authors on the field also agree on this concept of implementing a project having business value to deliver at its completion either immediately or after some time of its completion. A project will be of no value or the effort made to implement it will be wasted if it could not deliver the required business value at the end.

2.2.2. Project Management

Project management is a type of management discipline that focuses on managing projects. The Project Management Institute formally defines project management as: “The application of knowledge, skills, tools and techniques to project activities to meet the project requirements” (Project Management Institute, 2004). It doesn’t necessarily mean that every organization having

implementing a project or projects is practicing project management or uses its principles, techniques, tools and templates.

Some organizations manage projects using the traditional hierarchical structure and others incorporate the project structure in to their existing structure and there are also organizations with pure project organizational structure. Organizations also differ in their project management maturity level depending on extent of their project management practice (Kerzner, 2009). In defining project management it is also worth considering the definitions of programs and portfolios and to see their difference with projects. A program is defined as a collection of related projects. For a program considered to be completed, the projects may be required to be completed in a specific order. In most cases programs are of larger scope than a single project since they comprise multiple projects. Unlike projects, programs can have many goals (Wysocki, 2014). For example, a huge government reform program can have different goals such as poverty reduction, to grow the economy by some percent, etc

2.2.3. Project implementation

According to Project management Body of knowledge, a project can be said to have been successfully implemented if it completed within the set timeframe, within the set budget, if it meets the objectives for which it was set for and if it is accepted by the clients for whom it was meant for. Software development, testing and troubleshooting is essential during the implementation of the system (Wee, 2000). In addition, it is imperative to troubleshoot system to ensure proper functioning of the system (Holland et al, 1999).

According to Wekesa (2008), on a study on Utilization of the Health Information Management System by community health workers in the Amref facility in Kibera, states that inadequate refresher training has contributed to inadequate use of the health management system. Employees need to be trained to understand how the system will change the business process. In addition, extra training and on-site support for staff as well as managers needs to be conducted during implementation (Wee, 2000).

Management support is important in keeping track of the project progress. This can be achieved by measuring each milestone achieved against set targets. A study on the factors influencing the acceptance of electronic health records highlighted that perceived ease of use, age and level of education may cause end users to embrace or reject information technology (Glandon et al,

2008). According to the Technology Acceptance Model (TAM), perceived ease of use refers to how difficult a person believes the proposed system would be to use. Age has an influence on the acceptance and utilization of the system in that, younger people embrace technology more openly as compared to older people (Heeks, 2006).

2.2.4. Challenges of projectImplementation

According to Jeffrey K. Pinto and Dennis P. Slevin, the process of project implementation, involving the successful development and introduction of projects in the organization, presents an ongoing challenge for managers. The project implementation process is complex, usually requiring simultaneous attention to a wide variety of human, budgetary, and technical variables. Major challenges are;

1. Top Management Support for projects, or indeed for any implementation, has long been considered of great importance in distinguishing between their ultimate success or failure. It sees project management as not only dependent on top management for authority, direction, and support, but as ultimately the conduit for implementing top management's plans, or goals, for the organization. Further, it shows that the degree of management support for a project will lead to significant variations in the clients' degree of ultimate acceptance or resistance to that project or product. For the purposes of our classification, the factor Top Management Support refers to both the nature and amount of support the project manager can expect from management both for himself as leader and for the project. Management's support of the project may involve aspects such as allocation of sufficient resources (financial, manpower, time, etc.) as well as the project manager's confidence in their support in the event of crises.
2. Human resources issues, including recruitment, selection, and training. An important, but often overlooked, aspect of the implementation process concerns the nature of the human resources involved. In many situations, human resources for the project team are chosen with less-than-full regard for the skills necessary to actively contribute to implementation success. Some current writers on implementations are including the human resources variable in the equation for project team performance and project success. Developed a contingency model of the implementation process which includes "people" as a situational variable whose knowledge, skills, goals, and personalities must be considered in assessing the environment of the organization. Only after such a diagnosis takes place

can the project management team begin to set objectives and design the implementation approach. For the model, Personnel, as a factor, is concerned with developing a project team with the requisite skills to perform their function. Further, it is important to determine whether project management has built sufficient commitment toward project success on the part of team members.

3. **Technical Skill** It is important that the implementation be well managed by people who understand the project. In addition, there must exist adequate technology and adequate IT infrastructure to support the project. Technical skill refers to the necessity of not only having the necessary personnel for the implementation team, but ensuring that they possess the necessary technical skills and have adequate technology to perform their tasks. Writing on implementation risk analysis, identifies two of the eight risk factors as being caused by technical incompatibility: the user's unfamiliarity with the systems or technology, and cost ineffectiveness. In addition to Client Consultation at an earlier stage in the project implementation process, it remains of ultimate importance to determine whether the clients for whom the project has been initiated will accept it.
4. **Client Acceptance** refers to the final stage in the implementation process, at which time the ultimate efficacy of the project is to be determined. Too often project managers make the mistake of believing that if they handle the other stages of the implementation process well, the client (either internal or external to the organization) will accept the resulting project. In fact, as several writers have shown, client acceptance is a stage in project implementation that must be managed like any other. As an implementation strategy, discusses the importance of user participation in the early stages of system development as a way of improving the likelihood of later acceptance. Examine the use of "intermediaries" to act as a liaison between the designer, or implementation team, and the project's potential users as a method to aid in client acceptance.
5. **Evaluation, Monitoring and Feedback** refer to the project control processes by which at each stage of the project implementation, key personnel receive feedback on how the project is comparing to initial projections. Making allowances for adequate evaluation monitoring and feedback mechanisms gives the project manager the ability to anticipate problems, to oversee corrective measures, and to ensure that no deficiencies are

overlooked. Demonstrate the evolving nature of implementation and model building paradigms to have reached the state including formal feedback channels between the model builder and the user. From a budgeting perspective, emphasize the importance of constant monitoring and "fine-tuning" of the process of implementation. For the model, Monitoring and Feedback refers not only to project schedule and budget, but to monitoring performance of members of the project team.

6. Communication the need for adequate communication channels is extremely important in creating an atmosphere for successful project implementation. Communication is not only essential within the project team itself, but between the team and the rest of the organization as well as with the client. As the factor Communication has been developed for the model, it refers not only to feedback mechanisms, but the necessity of exchanging information with both clients and the rest of the organization concerning project goals, changes in policies and procedures, status reports, etc.
7. Troubleshooting as problem areas exist in almost every implementation. Regardless of how carefully the project was initially planned, it is impossible to foresee every trouble area or problem that could possibly arise. As a result, it is important that the project manager make adequate initial arrangements for "troubleshooting" mechanisms to be included in the implementation plan. Such mechanisms make it easier not only to react to problems as they arise, but to foresee and possibly forestall potential trouble areas in the implementation process.

2.2.5. Hospital Electronic health Management Information Systems

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

Hayajneh et al. (2006) states that e-HMIS is used for: Master patient index- provides a record of all patients registered in a hospital through a unique patient number. It holds demographic, financial and medical details of the patient. Patient management helps in tracking patient folders across wards, clinics and other locations in the hospital; inpatient and outpatient scheduling- allows flexible scheduling of patients to their respective clinics and doctors. It manages bookings, generation of appointment slips, rescheduling and cancellation of appointments. Inpatient management helps in patient admission, transfer and discharge processes including beds. It has provisions for ward and bed management and produces bar code labels and admission forms to ensure proper identification of patients. Billing provides a flexible and comprehensive means of tracking and consolidating patient charges from the time of patient registration to the time of discharges and also helps in generating real-time bills for the patients when requested by them or their relatives. Insurance Management is used in managing the insurance of patients for approvals, payments, deductibles, coverage and exclusions. Pharmacy handles drug information, prescription, dispensing functions and maintains complete drug dosage details and supports various drug classifications and indexes. Radiology supports resource scheduling, and request registration with examination details, reporting, post examination registration, film tracking and management information.

Accounts Management is used in tracking of receivables from debtors, receipt management, journal entries, automatic production of reminders and statements. Order Entry maintains requests made from wards and clinics for various services. Operation Theatre maintains theatre reservation details, performs on-line scheduling of theatres for any present or future dates, accommodates emergency operation, and generates pre-operation, checklists including instrument lists and personnel assignment sheets.

2.2.6. Implementation of e-HMIS

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

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

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

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

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

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

Sixthly, selecting and training the users- users of the new system must be conversant with the system in order to reduce errors and increase productivity and acceptance. Therefore users must be trained on how to use the system and the benefits of the new system. Training can be conducted through practical demos, lectures and video presentation. User manuals and system documentation are also very important in training Yeates & Wakefield (2003).

Finally, going live or launching the new system - once the system has been tested and found to be fully working as required, it is launched and rolled out for use. This stage mainly involves 3

activities namely; installation, commissioning and system change-over. Various techniques are used to change over and they include; direct, parallel, phased or pilot. Once the system is live new errors might arise and need support of developers. Therefore a post Implementation team can be set up to provide solutions to errors and problems as they arise. According to Dawson (2005) implementation is the last stage of software development life cycle and represents the final handover of the system to the user. It includes acceptance testing by the user; training; formal hand over, the setting up of data files; implementing work procedures and documentation.

2.2.7.Challenges of Implementing e-HMIS

With the demand for more efficient services in health institutions most of the hospitals are finding it necessary to implement new systems which brings with them the challenges which must be dealt with or will limit the e-HMIS implementation. This means that requirements of e-HMIS will also change and utilize the power of the technology to meet the ongoing needs of the organization.

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

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

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

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

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

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

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

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

2.2.8. Health management information system in Ethiopia

According to HMIS in developing countries(2009) since 1993, Ethiopia has been pursuing a national health policy advocating the decentralization of the health care sector, with a major focus on community level services. In order to make health services available to the local population, in 2004 the Ethiopian government adopted an Essential Health Service Package through the previously created Health Service Extension Program in 2004. The Essential Health Service Package aims to provide equal access to essential health services and covers five major

health interventions: Family Health Services, Communicable Disease Prevention and Control Services, Hygiene and Environmental Health Services, Health Education and Communication Services, Basic Curative Care and Treatment of Major Chronic Conditions.

Ethiopia is working toward fulfilling a comprehensive 20-year program, the Health Sector Development Program (HSDP). The HSDP timeline is broken into five-year phases, and is currently in its third five-year phase (2005/06 through 2009/10). The third 5-year phase of HSDP seeks to end poverty and meet the Millennium Development Goals. In addition, the current HSDP attempts to “strengthen the health management information system [HMIS]” in Ethiopia, which, in general terms, represents a “combination of health services-based data sources”.

The Ethiopian e-HMIS is implemented by the Federal Ministry of Health (FMOH). Meanwhile, the Central Statistical Agency, a division of the Ethiopian government, manages “population – based health information sources” - censuses, ad hoc surveys, and registering vital events. The e-HMIS was established “support informed strategic decision-making by providing quality data that help managers and health workers plan and manage the health service system.”

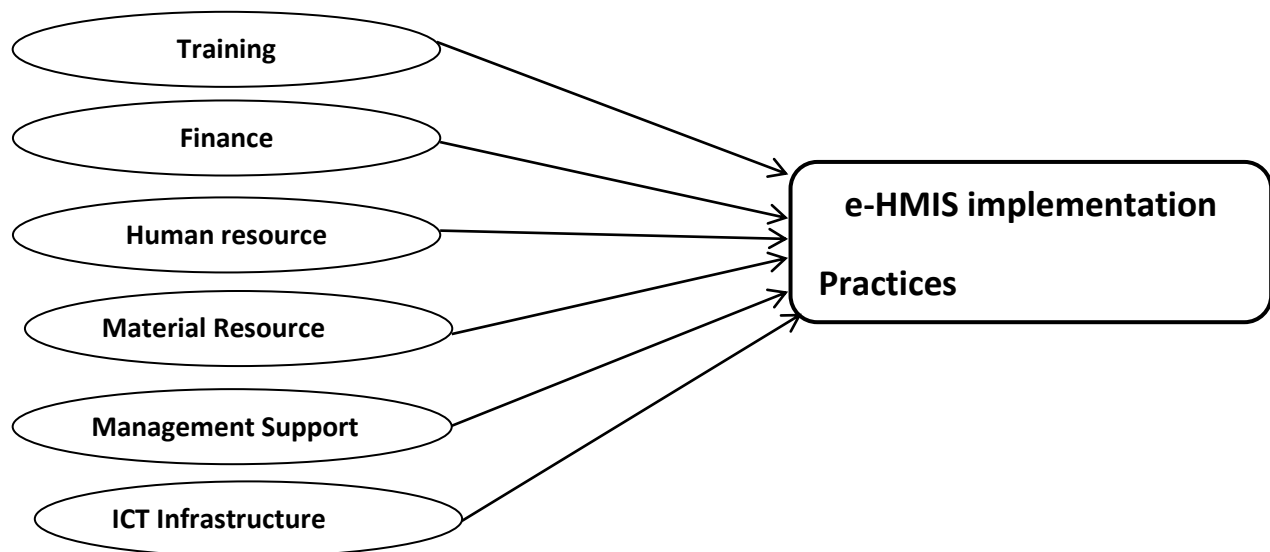
In an effort to improve the performance of the HMIS, Ethiopia contracted with the consulting firm John Snow, Inc. (JSI) in 2006 to perform an evaluation and redesign of the HMIS. As the HMIS is predominantly paper-based, this project was to culminate in the design and deployment of an e-HMIS, following reform and revision of the existing paper-based system. As of 2008, a comprehensive electronic HMIS has been developed in conjunction with doctors associated with Tulane University and is now being deployed to health facilities in several regions of the country, with an eventual nationwide rollout eventually slated to occur.

In addition to the 2006 reform of the HMIS, Ethiopia completed an assessment of the HMIS under the auspices of the Health Metrics Network in 2007. This assessment found the HMIS to be “cumbersome and fragmented.” Among the major HMIS challenges and weaknesses were the absence of an implementation strategy and guidelines; The shortage of human resources and high staff turnover; Inadequate skills for gathering and analyzing data among health care staff at lower levels; Unsatisfactory quality of data in the reports, resulting in a compromised ability to make informed decisions; Fragment information flow, including parallel reporting system channels causing increased workload. It would appear from the Health Metrics Network assessment that

the 2006 reform of the HIS, while perhaps effective to some degree, did not address all issues necessary for an effective national HIS. The 2006 reform addressed only minimal changes to routine practices in the health system, namely, reduction of indicators and redesign of forms. However, the reform failed to encourage behavioral changes amongst managers and administrators in the HMIS, a result that would have required substantially more resources and a more coordinated effort.

The conceptual frame work of this study was developed by the combination of relate Literatures such as According to Wekesa (2008), Wee (2000), Jeffrey K. Pinto and Dennis P. Slevin, Turbit (2005), Burke et al. (2001), Gupta (2000) etc. That was discussed above.

Figure 2.1 Conceptual Framework of the study



Sources; Developed by researcher based on literature

Training

Lack of appropriate ICT training was found to be one of the major challenges hampering implementation of ICT projects. For effective ICT project utilization in public hospitals project staffs must have knowledge of how to integrate the technology challenges in using the technology, drawback of the technology and knowledge of showing other alternative ways of using the technology and skills of guiding and supporting the users of the project (Pelgrum, 2001, cited in Khan, 2012). This indicates that access to technology to integrate ICT in Health alone never bring the quality Health service that we need to provide unless staffs and users of the project know how to use the technology in their health system.

Finance

Money that assign to the project, resources for this money and enough money assigned to the projects all are these are major problems to implement ICT project. Limited funds still presents a challenge in rolling out the e-Health projects in Ethiopia (David Gichoya, 2005).

Human Resources

According to Jeffrey K. Pinto and Dennis P. Slevin, Human resources issues; including recruitment, selection, and training. An important, but often overlooked, aspect of the implementation process concerns the nature of the human resources involved. In many situations, human resources for the project team are chosen with less-than-full regard for the skills necessary to actively contribute to implementation success. Some current writers on implementations are including the human resources variable in the equation for project team performance and project success. Developed a contingency model of the implementation process which includes "people" as a situational variable whose knowledge, skills, goals, and personalities must be considered in assessing the environment of the organization.

Management Support

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

ICT infrastructures

Sufficient technology materials like computers uninterrupted power supply or alternative sources of electric power, good internet access, broad band connectivity and suitable server room conditions for using the technology are supportive conditions for the ICT project implementation. If not, these are the main challenge to ICT project implementation (David Gichoya, 2005).

CHAPTER THREE

Research Methodology

This section deals with the various stages and phases that were followed in completing this study. The following subsections are included; study area, study design, sources of data, source population, sampling design, data collection instruments and finally data analysis.

3.1. Study Area

The study was conducted in Addis Ababa, a capital city of the Federal Republic of Ethiopia. The city is divided for administrative purpose into 10 sub cities and 99 kebeles in which about 2.7 million residents as well.

There are about 500 health facilities in Addis Ababa which range from government specialized hospitals to privately owned ones, from higher clinics to lower clinics and from health centers to health posts. There are 30 hospitals, 26 health centers, 94 special clinics, 99 higher clinics, 146 medium clinics, and 103 lower clinics. Among these health facilities, six public hospitals and all the 26 health centers are administered by Addis Ababa City Administration Health Bureau (FMOH, 2015/16). The study areas of this study were only six public hospitals (Gandi, Zewditu, Yekatit-12, Ras Desta, Truneshi Bejinegand Menelik II) that are under Addis Ababa city Administration Health Bureau.

3.2. Research Design

Me Millan & Schumacher (2001) defines study design as the way a study is planned and conducted, the procedure and techniques employed to answer the research problem or question. According to Nachmias & Nachmias (1996) are concerned with turning the study question into a testing project. The best design depends on your study questions. Every design has its positive and negative sides. The study design for this study was a descriptive study design, utilizing quantitative and qualitative study (mixed approach), was employed to describe the status of the new e-HMIS implementation program.

All six public Hospitals under AACAHB in the study population was covered management unit, e-HMIS unit, quality unit, public relation unit, IT unit and liaison unit their reporting system and experience of respondents on e-HMIS activities was asked. An in depth interview was conducted with candidates which was planning,

Monitoring and evaluation department heads from six public hospitals under Addis Ababa City Administration Health Bureau.

3.3. Sources of data

In order to undertake this study, the necessary data was collected from both primary and secondary sources. The Primary data was collected from six e-HMIS focal persons, six quality officers, six IT officer, four liaison officers, four public relation officers and four chief executive officer and five planning, monitoring and evaluation heads of the hospitals that are currently working in all public Hospitals under Addis Ababa City Administration Health Bureau. In addition, from the primary sources, different published and unpublished documents like journals, books, magazines, websites, study findings, policy documents, manuals and other relevant materials was referred.

3.4. Study population

All Public hospitals e-HMIS focal persons, chief executive officer of the hospitals, quality officers, IT officer, liaison officers, public relations officers and planning, monitoring and evaluation department heads worked under Addis Ababa City Administration Health Bureau were the study population.

3.4.1. Inclusion and Exclusion criteria

Inclusion criteria-health professional that take training and directly involve in e-HMIS project at Hospitals, Chief Executive Officers of the hospitals, e-HMIS focal persons or IT officer or those staff working on behalf, quality officers, liaison officers, public relation officers and planning, monitoring and evaluation department heads in all public hospitals under Addis Ababa City Administration Health Bureau who was expected to use data for decision making and reporting are included in the study.

Exclusion criteria-persons that are not volunteer to participate are excluded.

3.5. Target population

The total population of the study was 36 staffs working on e-HMIS and e-HMIS related activities in the selected hospitals. According to (Kothari, 2004), census is a complete enumeration of all

items in the population is obtained. For this reason and the number is manageable the researcher used census for these 36 target population. But Among 36 questioners 30 were appropriately filled and returned back. Because some of the respondents were on an annual leave and the remaining are not interesting to fill after taking the questionnaires.

3.6. Method of Data Collection

To collect the data two methods were employed. The quantitative method was used for assessment part by using a self-administered questionnaire. Qualitative method was used to further explore the results found from the quantitative study using in depth semi-structured interview with selected participants.

3.7. Method of Data Analysis

Concerning the analysis, the quantitative data collected was cleaned, coded and entered to computer using statistical package for social sciences (SPSS) version 20 and Microsoft Excel 2010. Descriptive statistical analyses such as frequency mean and percentage was used to present, analyze and interpret the data collected. The qualitative data obtained from the respondents were summarized and analyzed by thematic narrative analysis.

3.8. Data Quality Management

The questionnaires and Interviewers for both the quantitative and qualitative parts were trained for data collector. At the same time the tool was also checked by the investigators for the completeness and consistency of the data and inconsistent questionnaires and interviews were rejected from the data collected at the spot. Interviews were conducted by the principal investigator to avoid any miss understanding.

3.9. Ethical Issues

The ethical issues need to be considered in a scientific research was also consider in this study. The study was approved by the research review ethical committee of AACAHB. Permission was granted from all public hospitals administrative office to conduct the study. During data collection individuals were informed about the purpose of the study. The study result depend on the data provide by the respondents and the qualitative data obtain from interview and the process is realistic and bias free. In addition, the researcher asked for consent of the interviewees and pledged to keep the confidentiality of the information gather to conduct this study.

CHAPTER FOUR

4. DATA ANALYSIS, RESULTS AND DISCUSSION

4.1. Introduction

This chapter presents analysis and findings of the study as set out in the study project methodology. A sample of 30 respondents constituting 83.33% of the total population of 6 public hospitals under AACAHB of the targeted sample was realized. The analysis was done using the 30 filled and returned questionnaires out of the 36 questionnaires distributed and the rest 6 were not responses due to different reasons like shortage of time, lack of interest after take the questionnaires. Since the number of questionnaire collected was 30, this was deemed adequate and sufficient for purposes of data analysis as suggested by Field (2005).

The respondents were quite cooperative and the data provided was taken to be a true representation of the respondents' views due to the independence of the study carried out. However, some of the hospitals did not have adequately established e-HMIS unit in their operation; hence the respondents were not able to fill the questionnaires provided. This therefore reduced the response rate by 16.66%. The analysis of the data was used to establish the practice and to identify the challenges of e-HMIS implementation in public Hospitals under AACAHB. Furthermore the data was also used to relate back the experiences of respondents the findings of the literature. The respondents were asked to their background details in the questionnaire provided. The results were analyzed as percentage of the number of respondents in the respective hospitals. The findings indicate that the respondents represented a broad range of employees' background in terms of hospital work, work position, experience, gender, education level and specialization they have worked in the current organization. All the respondents were employees who run, manage, maintain and direct relation to e-HMIS projects in the respective hospitals. Findings from the study data showed below

Table 4.1: Background of Study Participants

Variable name		Frequency	Percentage	Remark
Name of hospitals	Truneshi Hospital	6	20	
	Zewiditu hospital	6	20	
	Gandhi hospital	6	20	
	Rasdesta hospital	3	10	
	Yekatit 12 hospital	5	16.7	
	Menelik II hospital	4	13.3	
Total		30	100	
Working position of respondents	CHIEF EXECUTIVE OFFICER	4	13.3	
	e-HMIS officer	6	20.0	
	Quality officer	6	20.0	
	IT officer	7	23.3	
	liaison officer	3	10	
	Public relation officer	4	13.3	
Total		30	100	
Experience	1-3 Year	19	63.3	
	4-5 Year	8	26.7	
	More than 5 Year	3	10	
Total		30	100	
Gender	Male	19	63.3	
	Female	11	36.7	
Total		30	100	
Educational level	Diploma	2	6.7	
	BSC/BA	20	66.7	
	MSC/MA	8	26.7	
	PhD	0	0	
Total		30	100	
Field of specialization	Health officer	2	6.7	
	Laboratory	2	6.7	
	Environmental health	4	13.3	
	pharmacy	1	3.3	
	Nurses	3	10	
	IT	10	33.3	
	Health assistant	2	6.7	
	General practitioners	5	16.7	
	Others	1	3.3	
Total		30	100	

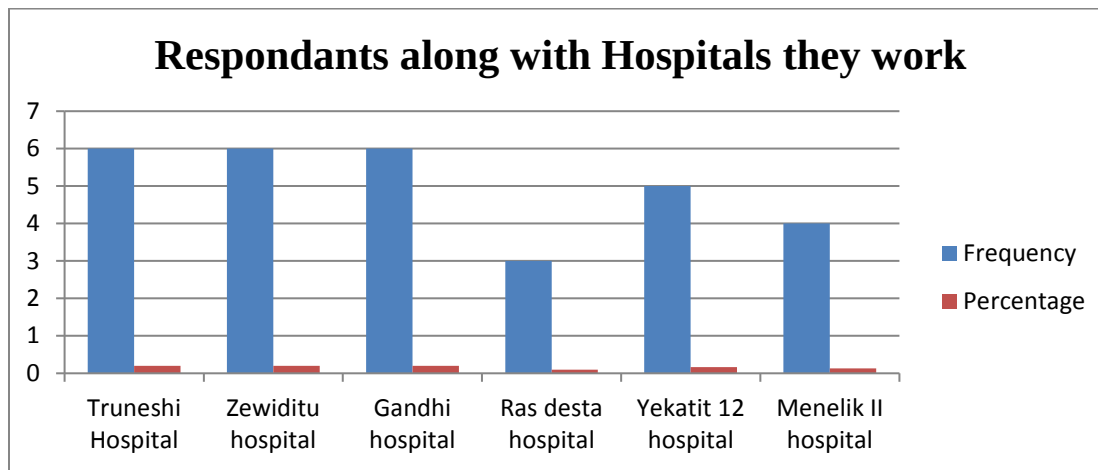


Figure 4.1: Hospitals Respondents working

30 respondents in different professions and qualifications in six different hospitals participated in this study. Based on the above finding Table 4.1 and chart 1 show that 6 (20%) are from Truneshi Hospital, 6 (20%) are from ZewidituHospital,6 (20%) are from Gandhi Hospital,3 (10%) are from Rasdesta Hospital,5 (16.7%) are from Yekatit 12 Hospital and 4 (13.3%) are from Menelik II Hospital.

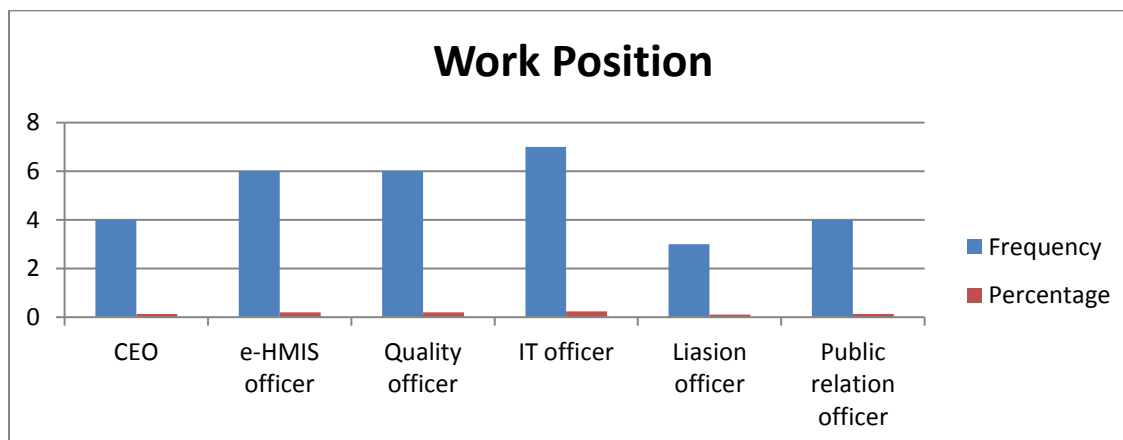


Figure4.2: Work Position

From table 4.1 and Chart 4.2 (above), about4(13.3%) held theposition of chief executive officer, 6(20%) e-HMIS office, 6(20%) Quality officer, 7(23.3%) IT officer, 3(10%) Liaison Officer and 4(13.3%) were Public relation OfficerPositions.

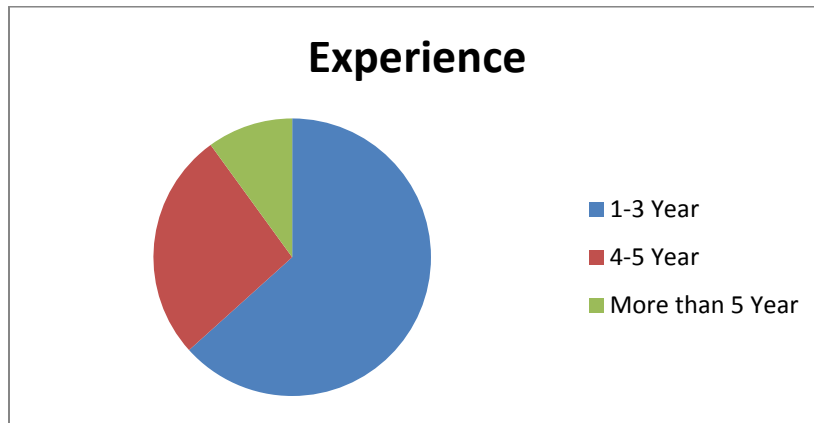


Figure 4.3 Work Experiences of Respondents

Table 4.1 and Chart 4.3 shows that majority of respondents had work experience of 1-3 Years 19(63.3%)in the hospital, 8(26.7%)had work experience of 4-5 Year and Small number of respondents 3(10%) had more than 5 Year work experience in the hospital.

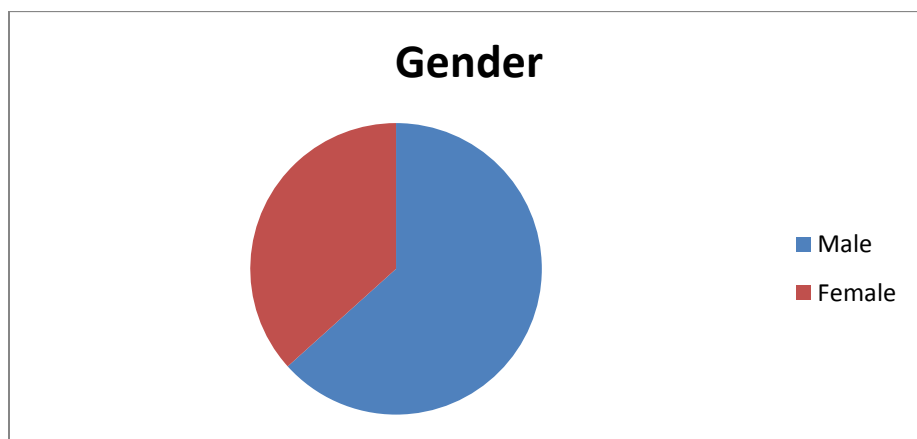


Figure 4.4: Gender

From total respondents 19(63.3%) were male and 11(36.7%) were female.

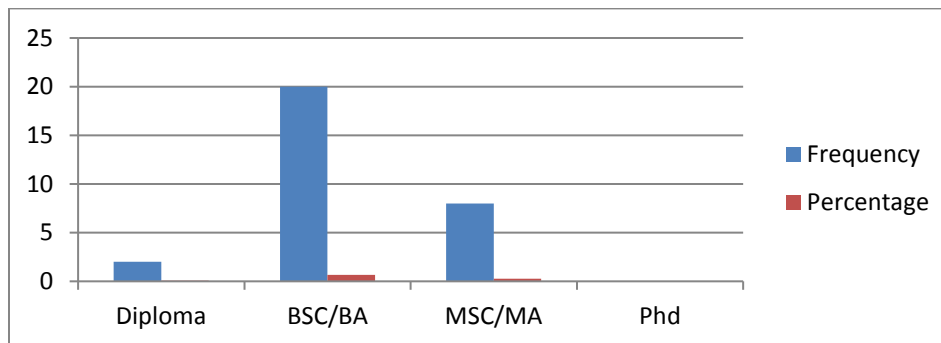


Figure 4.5: Educational Level

Based on table 4.4 and Chart 4.5 The Educational level of study participants is Diploma 2(6.7%), first degree BSC/BA 20(66.7%) and MSC/MA 8(26.7%) there is no PhD. Minimum Educational Level of participants were diploma and maximum were MSC/MA degree.

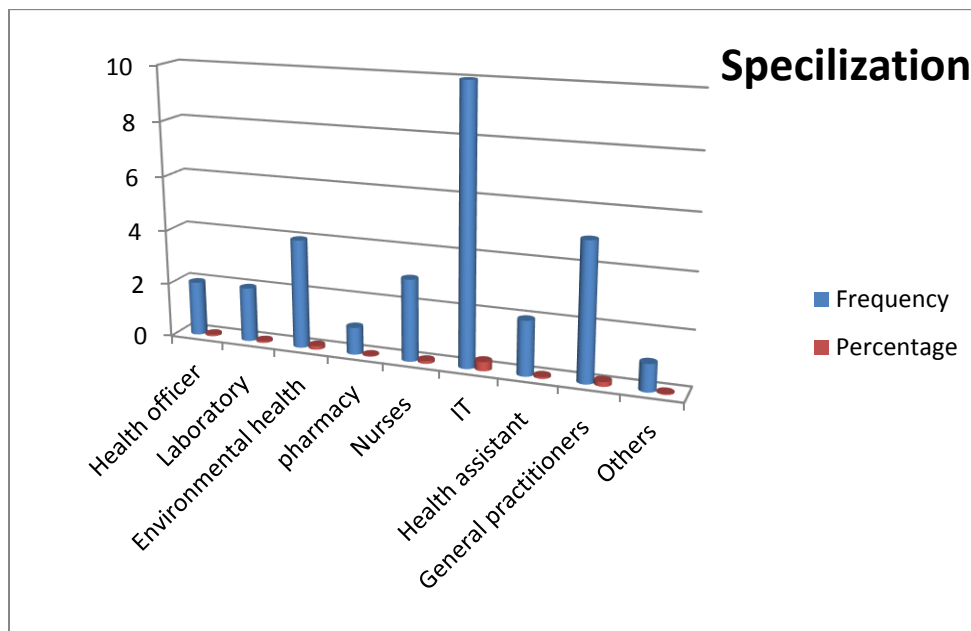


Figure 4.6: Field of Specialization

According to table 4.1 and chart 4.6 among the study participants 2(6.7%) are Health officer, 2(6.7%) are Laboratory, 4(13.3%) are Environmental health, 1(3.3%) are pharmacist, 3(10%) are Nurses, 10(33.3%) are ITs, 2(6.7%) Health Assistant, 5(16.7%) are General practitioners and 1(3.3%) include other profession.

4.2. The extent to which Public hospitals are using e-HMIS

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

Table 4.2Extent of use of the e-HMIS in Public hospitalsor Area /function e-HMIS Covers

No	Department	Agree	Dis agree	Mean	Std. Deviation
1	Inpatient scheduling	30(100%)	0	4	0
2	Pharmacy	30(100%)	0	4	0
3	Radiology	29(96.7%)	1(3.3%)	3.9	0.547
4	Dental	30(100%)	0	4	0
5	medical records	30(100%)	0	4	0
6	Surgery	29(96.7%)	1(3.3%)	3.9	0.547
7	Nursing	29(96.7%)	1(3.3%)	3.9	0.547
8	order entry	28(93.3%)	2(6.7%)	3.8	0.761
9	Orthopedics	30(100%)	0	4	0
10	results reporting	30(100%)	0	4	0
11	outpatient scheduling	30(100%)	0	4	0
12	Patient tracking	30(100%)	0	4	0
13	Laboratory	30(100%)	0	4	0

From the table 4.2 above most of the hospitals use e-HMIS in automation of their operations. About 100% of the respondents used Inpatient scheduling, pharmacy, Dental, medical records, Orthopedics, results reporting, outpatient scheduling, Patient tracking and Laboratory. Some the hospitals were using 29(96.7%) functional in Radiology, 29(96.7%) functional in Surgery, 29(96.7%) functional in Nursing and 28(93.3%) functional in order entry.

Finally from the above table almost all of the respondents are using e-HMIS to perform their clinical functions of the hospital in all Area. Tan, (2005) explains that this is possible since the clinical functions of the hospital are easier and have fewer requirements to be adhered.

4.3. Challenges of implementing e-HMIS in public hospitals

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

Table 4.3 Training

Variable	Responses						
	Strongly Disagree	Disagree	Indifferent	Agree	Strongly Agree	Mean	St. Deviation
Regular on the job e-HMIS training program to users	19(63.3%)	11(36.7%)	0	0	0	1.36	0.49
On the job e-HMIS training program given to persons who may concern	16(53.3%)	14(46.7%)	0	0	0	1.46	0.5
Users have a basic skill of computer knowledge to implement e-HMIS	10(33.3%)	11(36.7%)	1(3.3%)	8(26.7%)	0	2.23	1.19
Require further training on e-HMIS to perform your job effectively	1(3.3%)	0	0	12(40%)	17(56.7%)	4.46	0.81
Adequate training given for the intended users of the e-HMIS is affecting the implementation of e-HMIS	1(3.3%)	0	0	13(43.3%)	16(53.3%)	4.43	0.81
Grand mean & Standard Deviation						1.6889	0.47893

Table 4.3 above shows the training program on the e-HMIS system in the public hospitals under AACAHB. Among the six public hospitals 19(63.3%) of respondents were Strongly Disagree and 11(36.7%) of the respondents Disagree for regular on the job e-HMIS training program to users. 16(53.3%) of respondents stated Strongly Disagree 14(46.7%) of respondents stated Disagree On the job e-HMIS training program given to persons who may concern. 21(70%) of respondents Disagree, 1(3.3%) of respondents indifferent but 8(26.7%) of respondents are agree to the idea of Users have a basic skill of computer knowledge to implement e-HMIS. 29(96.7%) of the respondents in the Public hospitals stated that required further training on e-HMIS system

to perform your job effectively and only 1(3.3%) of respondent said there is no further training required. According to the respondents, out of the thirty public respondents 29(70%) they said adequate training given for the intended users of the e-HMIS is affecting the implementation of e-HMIS, 1(3.3%) said not affecting the implementation.

In case of challenge no 1 adequate e-HMIS training for Users, the questions answered by the respondents' rate as between strongly disagree and disagree with the weighted mean is 1.6889. This implies lack of adequate e-HMIS training to users is one challenge for effective implementation of the e-HMIS project. In addition to this in this mean implies additional training required for effective implementation of e-HMIS project.

Based on the interview conducted to planning, monitoring and evaluation heads of Gandhi memorial hospital, Yekatit 12 Hospital, TruneshiBejineng hospital and menelik II hospital they said the same to the result get from interview "lack of regular training program" is one challenge to implement the system.

Table 4.4 Finance

Variable	Responses						
	Strongly Disagree	Disagree	Indifferent	Agree	Strongly Agree	Mean	St. Deviation
Your Hospital have assign budget to e-HMIS	12(40%)	7(23.3%)	0	11(36.7%)	0	2.3	1.34
Incentives given to the e-HMIS staffs during the implementation of e-HMIS	23(76.7%)	7(23.3%)	0	0	0	1.23	4.3
Adequate finance to the implementation of the e-HMIS	7(23.3%)	10(33.3%)	0	13(43.3%)	0	2.6	1.27
Financial resources for implementation of e-HMIS	19(63.3%)	11(36.7%)	0	0	0	1.36	0.49
Grand mean & Standard Deviation						1.8917	0.55197

Table 4.4 indicates some hospitals have assigned budget 11(36.7%) of respondents were agreed but the majority of the hospitals have not assigned budget 19(63.3%) respondents were not agreed (Disagree) this. According to the respondents 30(100%) of respondents were Disagreed and strongly Disagreed that they have incentives given to the e-HMIS staffs during the implementation of the e-HMIS project. According to the respondents out of the thirty respondents 17(56.6%) of the respondents were Disagreed and strongly Disagreed in adequate

finance to the implementation of e-HMIS and the remaining 13(43.3%) of the respondents were agreed in adequate finance to the implementation of e-HMIS. All of the respondents 30(100%) were Disagree and strongly Disagree the financial resources for implementation of e-HMIS.

Concerning challenge no 2 which refers to the adequate finance, incentives and financial resources of the e-HMIS project implementation the respondents rate as between strongly disagree and disagree the weighted mean is **1.8917**. This implies finance related problem also another challenges of e-HMIS implementation.

According to the interview result Zewiditu, Yekatit12, and Menelik II hospitals have budgets specifically allocated to the implementation of the project. Even though there is allocated budget to the project in these hospitals the budget is used to other purpose not the implementation of the project. There are also no sufficient incentives to e-HMIS staffs.

Table 4.5 Human Resource

Variable	Responses						
	Strongly Disagree	Disagree	Indifferent	Agree	Strongly Agree	Mean	St. Deviation
Adequate e-HMIS staffs to implement the e-HMIS	7(23.3%)	19(63.3%)	4(13.3%)	0	0	1.9	0.6
Staffs responsible to implement the e-HMIS	14(46.7%)	10(33.3%)	0	6(20%)	0	1.9	1.14
e-HMIS staffs support the implementation of e-HMIS	6(20%)	19(63.3%)	0	5(16.7%)	0	2.1	0.9
e-HMIS staffs fully involved in the implementation of e-HMIS	10(33.3%)	20(66.6%)	0	0	0	1.66	0.4
Adequate ICT Staff support the implementation of e-HMIS	23(90%)	7(10%)	0	0	0	1.1	0.3
Grand mean & Standard Deviation						1.7467	0.34415

Table 4.5 Showed that, 7(23.3%) of the respondents were strongly Disagree, 19(63.3%) of the respondents were Disagree and 4(13.3%) of the respondents were indifferent the idea of adequate e-HMIS staffs to implement the e-HMIS. 14(46.7%) of the respondents were strongly Disagree, 10(33.3%) of the respondents were Disagree and 6(20%) of the respondents were Agree

the idea of Staffs responsible to implement the e-HMIS. 6(20%) of the respondents were strongly Disagree and 19(63.3%) of the respondents were Disagree and 5(16.7%) of the respondents were Agree the idea of e-HMIS staffs support the implementation of e-HMIS. 23(90%) of the respondents were strongly Disagree, 7(10%) of the respondents were Disagree the idea of Adequate ICT Staff support the implementation of e-HMIS. This shows that a very small percentage of e-HMIS and ICT staff support and involved in the implementation of e-HMIS project in a hospital.

According to challenge no 3 which states Adequate and skilled staff or human resources respondents rate as strongly disagree and disagree with weighted mean **1.7467**. This implies as there is no enough skilled and adequate number of e-HMIS implementation staff. So we need to have enough and adequate staff to implement these project effectively.

According to the finding of the study the Human Resource staffs in Yekatit 12, Tirunesh Beijing, Zewditu and Menelik II Hoapitals do not support the implementation of the project. They are also not fully involved in the implementation of the project rather they focus on other responsibilities have. In addition they have computer skills gap.

Table 4.6 Material Resource

Variable	Responses						
	Strongly Disagree	Disagree	Indifferent	Agree	Strongly Agree	Mean	St. Deviation
Adequate of the e-HMIS materials resource to implement e-HMIS	16(53.3%)	9(30%)	0	5(16.7%)	0	1.8	1.09
e-HMIS unit in your Hospital organized adequately	23(76.7%)	6(20%)	0	1(3.33%)	0	1.3	0.65
Grand mean & Standard Deviation						1.5500	0.62076

Table 4.6 shows that 16(53.3%) of the respondents said that they strongly disagreed, 9(30%) of respondents said that they Disagree, 5(16.7%) of respondents were agree the idea of adequate e-HMIS materials resource to implement e-HMIS. 23(76.7%) of respondents were strongly

disagreed, 6(20%)of respondent were disagree and only 1(3.33%)of respondent were agree by the idea of e-HMIS unit in their hospital organized adequately.

Respondents rate challenge no. 4 regarding of adequate material to implement the project of e-HMIS strongly disagreed and disagree with weighted mean of 1.55. This implies for no adequate material to implement e-HMIS project and adequate material is essential for effective project implementation.

Table 4.7 Management Support

Variable	Responses						St. Deviation
	Strongly Disagree	Disagree	Indifferent	Agree	Strongly Agree	Mean	
Managers support the implementation of e-HMIS	22(73.3%)	6(20%)	0	1(3.3%)	1(3.3%)	1.43	0.9
Managers fully involved in the implementation of e-HMIS	17(56.7%)	10(33.3%)	0	3(10%)	0	1.63	0.92
Managers attitudes towards changes	9(30%)	16(53.3%)	2(6.7%)	3(10%)	0	1.96	0.88
Guide lines from top management to implement the e-HMIS	12(40%)	13(43.3%)	1(3.3%)	4(13.3%)	0	1.9	0.99
Proper management strategy	7(23.3%)	7 (23.3%)	0	14(46.7%)	2(6.7%)	2.9	1.39
Management responsibility	8(26.3%)	16(53.3%)	2(6.7%)	4(13.3%)	0	2.06	0.94
Grand mean & Standard Deviation						1.9833	0.47816

Most of the managers did not support the implementation of e-HMIS in hospitals as evident in the table (above). 22(73.3%)of the respondents strongly disagree that managers supporte-HMIS implementation in their hospitals. 6(20%) of respondents disagree that managers support e-HMIS implementation and the remaining 2(6.7%) of respondents that agree managers support e-HMIS implementation.

17(56.7%) of the respondents said that they strongly disagreed that managers were fully involved in the implementation of e-HMIS, 10(33.3%) of the respondents were disagreed that with the same this in total shows that about 27(90%) of the respondents felt that managers were fully

involved in the implementation of e-HMIS in hospitals while the remaining 3(10%) of respondents were agree felt that managers were fully involved in the implementation of e-HMIS in hospitals.

From the table above 4.7 9(30%)of the respondents were strongly disagree stated that managers attitudes towards changes in their Hospital, 16(53.3%)of the respondents were disagree, 2(6.7%) of respondents were indifferent and the remaining 3(10%)of the respondents agree that managers attitudes towards changes in their Hospitals towards implementation of e-HMIS.

Base on the above table 4.7; 12(40%) of the respondents were strongly disagree stated that guide lines from top management to implement the e-HMIS, 13(43.3%) of the respondents were disagree, 1(3.3%) of respondents were indifferent and the remaining 4(13.3%) of the respondents agree that guide lines from top management to implement the e-HMIS.

Whereas there is proper management strategy on projects implementation 14(46.6%) of the respondents were strongly Disagree and disagree that proper management strategy to implement e-HMIS project. The remaining 16(53.4%) of the respondents agreed that there is proper management strategy on project implementation. therefore it was not an issue in their hospital when compare in to the others.

24(79.6%) of the respondents were stated that management had less responsibility. 2(6.7%) of respondents were indifferentand4(13.3%) of the respondents agreed that they management had responsibility in the implementation of e-HMIS their hospital.

Form table 4.7 above, in case of challenge no 5 regarding to have management support in order to implement thee-HMIS project, respondents rate as strongly disagreed and disagree with the weighted mean of **1.9833**. This implies for effective e-HMIS implementation managers must think and create a supportive environment.

This implies that the higher support from management will be the higher implementation of the technology. Management support plays a significant role for effective e-HMIS implementation.

The Heads of the Planning, Monitoring and Evaluation of Zewditu, Tirunesh Beijing, Yekatit and Gandhi Hospitals responded that the management of the hospitals do not give any guideline and support to the implementation of the project and also they believe that it is adding additional work load to themselves.

Table 4.8 ICT infrastructure(Hardware)

Variable	Responses						
	Strongly Disagree	Disagree	Indifferent	Agree	Strongly Agree	Mean	St. Deviation
The e-HMIS has all the required ICT infrastructure to implementation	20(66.7%)	10(33.3%)	0	0	0	1.3	0.47
There is an effective procurement processes that support e-HMIS implementation	23(76.7%)	4(13.3%)	2(6.7%)	1(3.3%)	0	1.36	0.76
Adequate hardware acquisition	1(3.3%)	8(26.7%)	3(10%)	15(50%)	3(10%)	3.36	1.09
Sufficient hardware evaluation	19(63.3%)	10(33.3%)	0	1(3.3%)		1.43	0.67
Volatility of e-HMIS industry	4(13.3%)	14(46.7%)	10(33.3%)	1(3.3%)	1(3.3%)	2.36	0.88
Grand mean & Standard Deviation						1.9733	0.38857

All of the hospital respondents 30(100%) disagreed that e-HMIS has all the required ICT infrastructure to implement e-HMIS in their Hospitals. They indicated that they have sound ICT infrastructure requires to be improved highly for the smooth e-HMIS implementation.

Effective procurement processes were not common in many hospitals with 27(89.6%) of the respondents stating that their hospital have not effective procurement processes. 2(6.7%)of the respondents were indifferent and the remaining 1(3.3%) of the respondents were agree on the issues with the procurement processes.

Most of the hospitals had adequate hardware acquisition for the implementation of e-HMIS. This was reflected from the table 4.8 above which indicate that about 18(60%) of the respondents said that hospitals had adequate hardware acquisition for e-HMIS implementation. 9(30%) of the respondents had inadequate hardware acquisition for e-HMIS implementation. The remaining 3(10%) of respondents were indifferent in the same idea.

1(3.3%) of the respondents were agree and stated that they had Sufficient hardware evaluation. Over 28(96.6%) of the respondents strongly disagree and disagreed that Sufficient hardware evaluation in their hospital. Therefore it was an important issue in their hospital to evaluate hardware sufficiently.

Volatility of e-HMIS industry is dependent on many factors. Eg. the geographical location of the hospital and number of departments among others. From the above table only 2(6.7%) of the respondents agree and strongly agree that the issue of volatility of e-HMIS industry lead to a challenge in the implementation of e-HMIS in their hospital. 10 (33.3%) of the respondents are indifferent while the remaining 18 (60%) of the respondents were strongly disagree and disagree the Volatility of e-HMIS industry contributed to the challenges faced the implementation of HMIS in their hospital.

In case of challenge no 6 Adequate ICT infrastructure, in the 1st section related to Hardware the respondents rate as strongly disagree and disagree with the weighted mean is 1.9733. This implies no adequate Hardware ICT infrastructure at the time of e-HMIS implementation.

According to the finding of the study, Gandi, Yekatit 12, Tirunesh Beijing, and Zewditu Hospitals have full IT equipments that are obtained from a donor that supports the implementation of e-HMIS project but the IT hardware infrastructure of the project is not well established while Menelik II Hospital does not have the IT equipments at all.

Table 4.9 ICT infrastructure (Software)

Variable	Responses						St. Deviation
	Strongly Disagree	Disagree	Indifferent	Agree	Strongly Agree	Mean	
e-HMIS system is secure	1(3.3%)	6(20%)	1(3.3%)	15(50%)	7(23.3%)	3.7	1.4
Compatible to other software	2(6.7%)	9(30%)	2(6.7%)	17(56.7%)	0	3.13	1.07
Testing of e-HMIS	3(10%)	17(56.7%)	2(6.7%)	8(26.7%)	0	2.5	1.00
Sufficient software evaluation	21(70%)	9(30%)	0	0	0	1.3	0.46
Adequate software acquisition	19(63.3%)	11(36.7%)	0	0	0	1.36	0.49
Compatibility between the new and old system	2(6.7%)	0	2(6.7%)	20(66.7%)	6(20%)	3.93	0.94
Grand mean & Standard Deviation						3.8111	0.3061

According to the table 4.9 above; e-HMIS system secure was an issue among 22 (73.3%) of the respondents who agreed, 1(3.3%) of respondents were strongly disagree, 6(20%) of respondents were disagree, 1(3.3%) of the respondents were indifferent the issue that e-HMIS system is secure.

2(6.7%) of the respondents strongly disagree that there are compatible to other software issues with the e-HMIS. 9(30%) of the respondents disagree, 2(6.7%) of the respondents indifferent and while about 17(56.7%) of respondents agree that there are compatible to other software issues.

Lack of system/software testing was found to be a major issue with the implementation of e-HMIS. About 3(10%) and 17(56.7%) strongly disagreed and disagreed respectively that system/software testing of the e-HMIS. About 2(6.7%) of the respondents were indifferent and 8(26.7%) of respondent agree that there is a system/software testing in the e-HMIS implementation.

Like Hardware evaluation software evaluation also important to implement the system. 21(70%)of the respondents were strongly disagree and stated that they had Sufficient hardware evaluation. Over 28(96.6%) of the respondents were strongly disagree and 9(30%) of respondents were disagreed that Sufficient software evaluation in their hospital. Just like hardware evaluation software evaluation is equally important issue in their hospital.

From the table 4.9 above which indicate that about 19(63.3%) of the respondents were strongly disagree, 11(36.7%) of respondents were disagree that hospitals had adequate software acquisition for e-HMIS implementation. That mean total 30(100%) of the respondents had no adequate software acquisition for e-HMIS implementation.

Compatibility issues between the old system and the new system were only 2(6.7%)of respondent were strongly disagree,2(6.7%) of respondents were indifferent but the remaining 26(86.7%) of respondentswere agree by the compatibility issues between the old system and the new system e-HMIS system.

Based on the data above challenge no 6 section two states that adequate software infrastructure. Respondent's rate as near to agree with the weighted mean is 3.8111. This implies when compared to the pervious results software related issues are adequate infrastructure toimplement e-HMIS project and this is not the challenge to implement the project. But without hardware

infrastructure software infrastructure only is not important to the effective implementation of e-HMIS implementation.

According to the finding of the study, the result of the interview is similar to the result of the study from the questionnaire that all of the heads of planning, monitoring and evaluation department said, “There is no ICT software infrastructure problem”

According to the mean result shows that adequate material resource, adequate Training support, adequate e-HMIS skilled professionals (Human Resource),adequate finance, adequate Hardware IT infrastructure, proper management guideline and support respectively are the challenges to implementation the e-HMIS system in their institutions. Whereas adequate software IT infrastructure is enough to facilitate the implementation of the e-HMIS system in their institution.

CHAPTER FIVE

5.SUMMARY, CONCLUSION ANDRECOMMENDATIONS

5.1. Summary

The general purpose of the study was to assess the new e-HMIS project implementation in public hospitals under Addis Ababa city Administration Health Bureau. Descriptive statistics was used to analyze the data and the results were presented in table, graphs and chart. The findings of the practice of e-HMIS implementation in public hospitals under Addis Ababa City Administration Health Bureau indicate that most hospitals have adopted several practices in their e-HMIS implementation.

The second objective sought to determine the challenges faced by hospitals in e-HMIS implementation in public hospitals. The study found that in public hospitals under Addis Ababa City Administration Health Bureau experience the following six major challenges during e-HMIS implementation.

- Lack of adequate training for Users of the project
- Lack of adequate finance to implement the project
- Lack of skilled and adequate human resource
- Lack of material resources
- Lack of management support and
- Poor ICT(hardware) infrastructures

These major challenges listed above includes other challenges like; lack regular on the job e-HMIS training program to users, program are not given to persons who may concern, users have not a basic skill of computer, Hospital have not assign adequate budget, lack of incentives given to the e-HMIS staffs, lack of adequate finance, lack of financial resources, lack of adequate e-HMIS and ICT staffs, lack of e-HMIS& ICT staffs support & involvement, lack of adequate e-HMIS materials,lack of management involvement & support, and adequatelyorganized ICT and e-HMIS department to spearhead ISs implementations, Managers attitudes towards changes,inadequate ICT infrastructure, long procurement processes,lack of system testing and lack of hardware and software evaluation.

5.2. Conclusion

The Study finding illustrate that Addis Ababa City Administration Health Bureau has a strong desire for implementing the e-HMIS project in Public Hospitals. However, this e-HMIS project encounters various challenges during its implementation.

According to the study result the major Challenges that affect the e-HMIS project implementation in selected public hospitals were lack of adequate training; this is one reason to have not skilled e-HMIS staffs to implement the project.

Moreover, lack of adequate budget during project implementation, lack of adequate skill/knowledge to implement the project, lack of adequate material resources, Lack of adequate e-HMIS staffs that help the implementation of the project and to operate and integrate the project in the hospitals also determine the effective implementation.

Furthermore, absence of awareness among staffs of e-HMIS and Managementsof the hospitals about the benefits of the e-HMIS project, lack of e-HMIS staffs and Managements support, lack of well-organized ICT (Hardware) infrastructure that used to install the software and to enhance overall project effectiveness are the major challenges identified by this study.

Therefore, based on the overall finding of this study it is concluded that there is e-HMIS implementationgap between the stated in the project plan by the donor and its current situation at public hospitals.

In general, the findings of the study answered the study objective i.e. it was able to assess the extent to which area e-HMIS are use and to determine the challenges implementing e-HMIS project in public hospitals under Addis Ababa City Administration Health Bureau.

5.3. Recommendation

Based on the finding of the study, the following recommendations are forwarded to avoid challenges that hinder the implementation of e-HMIS system in public hospital under Addis Ababa City Administration Health Bureau.

- To improve the success of e-HMIS implementation in hospitals, the study recommends the FMOH has to improve special budget and give a special attention to the e-HMIS department to solve financial problems of the studied hospitals and to coordinate the e-HMIS projects.
- Awareness should be created on the purpose and usefulness of the e-HMIS project. Involvement of users in system requirement definition and involvement of managers at all levels is very important to make the concerned staffs aware of the importance of the e-HMIS system.
- The FMOH must give frequent on-the-job training to upgrade the knowledge of the e-HMIS staffs and knowledge and skills should be transferred.
- Improve the ICT infrastructure, software & hardware evaluation and use of change agents in implementation.
- The FMOH has to assign the concerned e-HMIS staffs for each public hospital. The study further recommends employing qualified managers to spearhead e-HMIS implementation and empowering them through training and incentives since they are the drivers of the project. Hospitals intending to implement e-HMIS should establish and equip IT department which will spearhead automation.
- Finally whatever all things done well e-HMIS project needs a close follow up and control. So a well-organized Management guideline and support system must be established to perform two basic activities. The first one is encouraging e-HMIS staffs to participate on action research regarding the progress of the integration, constraints faced, other alternatives to use the project related to staffs' interest. Secondly the Addis Ababa city Administration Health Bureau should have a strategic plan and the plan should incorporate every necessary Budget, human resources, how and when to evaluate the effectiveness of the project which covers the project plan, implementation, effectiveness and users' acceptance of the technology.

5.4. Limitations of the study

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

Whereas there are many stages of e-HMIS project development, the study was limited to implementation stage of the software development life cycle. The limitation of the resources, made it difficult to obtain responses of all the hospitals in the city, in addition some of the hospitals did not have an established IS hence, they had a problem in responding to the questionnaires provided thus limiting the response rate. The study therefore targeted only persons who directly related to the project in the hospitals.

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ANNEXES

Addis Ababa University School of Commerce Graduate Program

Dear Respondents

My name is zebiba Ahmed a postgraduate student in Addis Ababa University School of Commerce undertaking a thesis entitled “Assessment of Electronic Health Management Information System (e-HMIS) Project Implementation in Public Hospitals; In The Case Of Addis Ababa City Administration Health Bureau”. To fulfill requirement for award of MA degree in project management. I kindly request you to fill this questionnaire genuinely.

Your name will not appear and all the information you provide to me will be strictly confidential. Your participation in this study does not involve any direct risk or benefit for you but it is very useful since your answers, as well as those of other participants will help to assess the implementation of e-HMIS in public Hospitals under Addis Ababa city Administration Health Bureau and to give possible solution.

Thank you for sparing your precious time. In case you need any clarification on the questions please contact me on +251921-25-86-88

Questionnaire

SECTION 1: Background

Respondent No. _____

1. Name of the Hospital you are working in _____
2. Your working position in the hospital _____
3. Number of years you have been working in this Hospital
A) 1 to 3 years B) 4-5years C) More than 5 years
4. Gender A) Male B) Female
5. Your educational Level
 A) Diploma B) BSC/BA C) MSC/MA
 D) PHD
6. What is your field of specialization please encircle.
A) Health Officer B) Laboratory Technician
C) Environmental Health D) Pharmacist
E) Nurse F) Pharmacy Technician
G) Health Assistant H) General Practitioner
I) IT
J) Other (please specify) _____

SECTION 2: Area/Function e-HMIS Covers

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

No	Area	1	2	3	4	5
1	Inpatient scheduling					
2	Pharmacy					
3	Radiology					
4	Dental					
5	medical records					
6	Surgery					
7	Nursing					
8	order entry					
9	Orthopedics					
10	results reporting					
11	outpatient scheduling					
12	Patient tracking					
13	Laboratory					

Others Specify

SECTION 3: e-HMIS Challenges

Do you agree with the following issues as the challenges to the implementation of e-HMIS in your Hospitals, rate them in scale of 1-5 where 1 represents strongly Disagree, 2 represents Disagree , 3 represents Indifferent, 4 represents Agree and 5 represents Strongly agree

		1	2	3	4	5
1. Training						
1	Regular on the job e-HMIS training program to users					
2	On the job e-HMIS training program given to persons who may concern					
3	Require further training on e-HMIS to perform your job effectively					
4	Adequate training given for the intended users of the e-HMIS is affecting the implementation of e-HMIS					
2. Finance						
1	Your Hospital have assign budget to e-HMIS					
2	Incentives given to the e-HMIS staffs during the implementation of e-HMIS					
3	Adequate finance to the implementation of the e-HMIS					
4	The financial resources for implementation of e-HMIS					
3. Human Resource						
1	Adequate e-HMIS staffs to implement the e-HMIS					
2	Staffs responsible to implement the e-HMIS					
3	e-HMIS staffs support the implementation of e-HMIS					
4	e-HMIS staffs fully involved in the implementation of e-HMIS					
5	adequate ICT Staff support implementation of e-HMIS					
Knowledge/Skill						
1	Users have a basic skill of computer knowledge to implement e-HMIS					
2	Adequate skilled staffs to the implementation of e-HMIS					
3	Skill sets among users					
4. Material Resource						
1	Adequate of the e-HMIS materials resource to implement e-HMIS					
2	e-HMIS unit in your Hospital organized adequately					
5. Management Support						
1	Managers support the implementation of e-HMIS					
2	Managers fully involved in the implementation of e-HMIS					
3	Managers attitudes towards changes					
4	Guide lines from top management to implement the e-HMIS					
5	Proper management strategy					
6	Management responsibility					
6. ICT infrastructure						
1	ICT infrastructure prevent e-HMIS implementation					
Hardware						
1	Long procurement processes					
2	Adequate hardware acquisition					
3	Sufficient hardware evaluation					

4	Volatility of e-HMIS industry					
Software						
1	e-HMIS is less secure					
2	Interoperability/ Incompatibility issues					
3	Testing of e-HMIS					
4	Sufficient software evaluation					
5	File conversion and database design					
6	Adequate software acquisition					
7	Compatibility between the new and old system					

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

In-Depth Interview for planning, monitoring and evaluation head of the Hospitals

1. Does your Hospital haveadequately organized e-HMISunit?
2. Do you think that the e-HMIS staffs are accepting the implementation of the e-HMIS system in your Hospital?
3. Are there challenges that are affecting the implementation of the e-HMIS in your Hospital?
4. Is there a regular on the job training program about the e-HMIS in your Hospital?
5. Does your Hospital assign adequate budget for the e-HMIS?
6. Are the IT equipmentadequatefor the e-HMIS implementation in your Hospital?
7. Do the e-HMIS staffs have skill in operating e-HMISsoftware?
8. Is there adequateguideline of management system to implemente-HMIS in your Hospital?
9. Do you believe that management support system has a direct impact on improved implementation of the e-HMIS in the health service in your Hospital?
10. In your opinion what are the Challenges to implement the e-HMIS system in your Hospital?
11. Does your Hospital have a plan to continue the existing system of the e-HMIS inthe future?

CLOSING

Thank you for sharing your views and ideas on this important issue. It will be very helpful to us.