# COVER PAGE



## PATIENT MANAGEMENT INFORMATION SYSTEM FOR UASIN GISHU SUB-COUNTY HOSPITAL UASIN GISHU COUNTY

## A presentation on the use of Microsoft word submitted to computer science department.

## Presented by:

## Name: Hittmeyer Nyabuto and Mary Muthoni

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# DECLARATION

## Supervisors: Dr. Dorothy Rambim

## INSTITUTION: Masinde Muliro University

## SCHOOL: computing and informatics

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# CHAPTER ONE:

## 1.0 Introduction

### This chapter presents Background of the study, statement of the problem, aim of the study, objectives, scope and the significance of the study

## 1.1 Background of the Study

### Due to dynamic advancement in technology, computer age has dominated almost every manual and semi-computerized system. Information systems are increasingly important for measuring and improving the quality and coverage of health services (Lippeveld, Sauerborn, Bodart, 2000).The global shift from curative to preventive care, from hospital care to community and public health care, from centralized to decentralized health care, from a specific project approach to a comprehensive sectoral approach, has necessitated the restructuring of fragmented health information systems into single comprehensive health and management information systems. The restructuring of health information systems has become an important trend in the entire developing world since the adoption of primary health care as a global strategy for achieving the ‘health for all’ goals (Campbell 1997). Ever since, the restructuring or strengthening of information systems has been a learning process.

### In hospitals a service are basically curative and preventive and is offered in clinic unit, x-ray/ ultra sound, laboratory cancer centre and dental unit in the hospital. Other services include admission (ward) inpatient (where drugs are issued), physiotherapy and family planning.The hospital offers 24 hours services to its staff and the entire population. The records of patients at UasinGishu Sub-County Hospital over time been run down due to large numbers of patients, this led to poor record keeping since it’s a paper based system. The reason why the current system used is manual has led to a variety of problems and these include; unnecessary duplication of the data especially for inpatients and outpatients, inconsistence may occur since data is held more than once and hard to analyze the data hence difficult to trace the flow of patient past medication data. This has led to the emergence of new technologies to solve this problem. According to Jantz (2001) the emergence of computer based information system has changed the world a great deal, both large and small system have adopted the new methodology by use of personal computer; to fulfill several roles in the production of information therefore computerizing the documentation of patient record to enable easier manipulation of the input process and output will bring us to this existing new world of information system.

Patients records and disease pattern documentation is concerned with documentation of information obtained from patients and their particular health system in order to function properly. If this information is not documented perfectly causing some data to get misplaced, the health system will not be efficient.According tang (2001) In examine the document system that in existence at the hospital that is mostly manual much importance has been placed on creating a system that document the inpatient record using a computerized database system with a secure procedure for accessing it (Yuen, Law, Wong, 2003). Patient information past and present is extremely vital in the provision of patient’s care which guides the physician in the making of right decision about the diagnosis. The rapid growth of information technology and system made to choose the health care industry to borrow a page from the air industry for the sake of patient’s safety. Pilots have instant access to the data they need in whether condition and mechanical function to make information decision about navigation and delay.

## 1.2 Problem Statement

### The absence of a well-established information system to serve patient and staff has led to delays in service delivery. There is a lot of time consumed due to slow and tedious manually searched records. Records of each patient admitted and staff require management for retrieval in order to meet timely records in the health unit. In some instances this has the loss of patient and staff records. This is basically because of the weakness of the existing system which includes over reliance on paper based work. Paper files consume a lot of the office space, slow recording, processing and retrieval of patient details. Accessing and sharing of information by different departments is difficult due to poor information management. It is against this background that the study sought design an automated system for patient record management at UasinGishu sub-county hospital UasinGishu County.

## 1.3 Main aim of the Study

### The study will focus on developing a patient management information system for UasinGishu sub-county hospital UasinGishu County

## 1.4 Specific Objectives

### The study will seek:

### To collect data and identify the system requirements

### To design patient management information system

### To implement the system.

## 1.5 Limitations

### Limitations are categorized into parts: Researchers limitation and system limitations

# 1.6 Researcher limitations

### There will be no time available for the system to be implemented in a working environment.

### Programming languages: it will be difficult in selecting the appropriate language to develop the system.

### The researcher might haveproblems in data collection because it will be done during the time when the hospitalis busy therefore getting the required information might be hard.

## 1.7System limitations

### The system will be limited to only patient records and will not accommodate the rest of the data about the hospitalor even the staff data.

## 1.8 Benefits and beneficiaries of the Study

### Many health units use manual systems of data management with no customized software application to speed up data processing; this has led to time wastage in locating of different documents and a lot of paper work in the offices. A customized management information system will help the health unit in improving the data security, easy record access, and reduction on stationary costs among others. In addition, patients will be able to know their medication details, how long their admission will take, it will also enable the management to know who are currently admitted, which rooms are available, and the available drugs and this will be done at a faster rate than before and errors will be minimized.

## 1.9Rational of implementing the project

### Many hospitals are still adopting the manual system of hospital management. This method of hospital management have continued to pose a lot of setbacks, and problems to medical practitioners, nurses, patients and other staffs both private and government hospitals.This projecttherefore is justified based on the cost of running the manual system compare with the one of the automated system. It offers the hospital management issue and provides bases for large database, accuracy of information and exposes the user to the knowledge of computing. This will be done by fully automating the operation of the hospital, improving and standardize practice planning andefficient and communication skill in the hospital, achieve good computing skills for management and to provide timely access to patients andpersonnel records.

### The surrounding hospitals like Moi Teaching and Referral Hospital and St. Lukes has already embraced the digital management system and they are really doing great. They are making a lot of profits at the moment than before, and there is overall cost reduction and work efficiency.

### When patients follow a standardized care path supported by automation, it is more likely they will stay on track towards predicted outcomes. Additionally, automation can help detect when a patient has deviated from the recommended care plan so the care team can intervene.Generally automated system has a lot of benefits compared to manual system and it will bringa lot of benefits to uasinGishu sub county hospital when it will be implemented.

# CHAPTER TWO: LITERATURE REVIEW

## 2.1 Introduction

### This section presents extensive review of literature in their respective area of study and academically and professionally in order to explicitly point out the problem being fixed by the project.

## 2.1.1 Patient Information Systems

### A Patient Information System (PIS) is just another component of this comprehensive process, aiming to increase the efficiency with which hospitals work. The general principle behind such a system is the enabling of the authorized hospital staff to store and access data for their patients. This patient information system is connected to a database which is protected through several layers of security (World Health Organization [WHO], 2012). There are several users of this system including doctors and nurses, hospital IT support staff and lastly, patients (Paul, Ezz, &Kuljis, 2012). The engagement of these three main components in the patient information system is what enables this system to yield satisfactory results. Patients together with doctors provide the data for the system, i.e. personal

### Information and medical record. This information is used again by doctors in all other meetings with their patients and also by managers to generate data about costs and other maintenance relateddetails (WHO, 2012). Other features of this system include allowing patients to schedule meetings at available time slots, thus, increasing the interactivity between patient and doctor (WHO,2012).

This kind of system, as part of a larger process of computerization of health care, has been praised for its efficient way of administering patients. The benefits of using this system range from reducing costs for hospitals to prescribing better treatment methods due to being able to follow patients’ entire medical history (WHO, 2012; Johnson, 2011; Perera, Holbrook, Thabane, Foster &Willison, 2011). Thousands of private and public hospitals have started using these kinds of systems toimprove their performance and many of them have found that these systems have proven to be very successful (WHO, 2012). Among praised attributes of letting a software handle most of the management of the patients are increase in efficiency in terms of speed of handling patients and also interms of prescribing better treatments, reduced cost per patient as many bureaucratic procedures are cut in half, and increased patient self-treatment and interactivity between the three abovementioned components (WHO, 2012).

## 2.1.2 Patient Information Systems in Developing Countries

### In a study, the health systems of 19 less developed countries were analyzed in detail, with a special focus on their ICT incorporation in medicine (Vital Wave Consulting, 2009). In this study, the countries’ progress on incorporating ICT in their medical processes was evaluated through a standard set by the researcher as follows: Level 1- Manual; Level 2- Optimization; Level 3- Electronic reporting; Level 4- operational systems such as pharmacy, radiology, laboratory, and Level 5- total integration of the data from public and private clinics or hospitals.In addition to simply reflecting the situation in developing countries, this and other studies have come up with some recommendations for developing countries when it comes to PISs. The recommendations include using simple and relevant technology, to build upon what is already being used, and to incorporate in the process of decision-making all the relevant stakeholder (Vital Wave Consulting, 2009; WHO, 2012; Chetley, 2012).

## 2.1.3 State of Electronics of Patient Record Management System

According to Murphy (1999), an electronic heath record (EHR) is a medical record or any other information relating to the past, present or future physical and mental health or condition of a patient which resides in the computer that captures, transmits, receives, stores, retrieves, links and manipulates multimedia data for the primary purpose of providing health care and health related services. It also includes patient demographic, SOAP notes, problems, medications, and vital sign posts medical history, immunizations, laboratory data and radiology reports. An EHR automates and streamlines the clinical workflow. The EHR has ability to generate a complete record clinical patient encounter as well as supporting other care related activities directly or indirectly via interface including evidence based on decision support, quality management and outcome reporting.Patient information system has benefits which accrue in the long run. According to Wang (2003) the long term benefit of the health electronic record (HER), the united states of used it to minimize a cost benefit per provider for having used an (HER) system over a five (5) year period was estimated to be at $87000 and $330900 over a ten (10) year period. The implementation of this project was likely to reduce the cost in the long run.

# 2.2 Related Studies

### According to Mennel (2006) study on pioneering security on line Patient Record management and collaboration between doctors clinical and hospital using secured internet transmission. In this project doctors are able to view patient medical records immediately at their private offices using secure internet transmission. The project aimed at increasing competitiveness of the medical profession by improving the accuracy of medical records and efficient retrieval and usage of medical records. Patient medical records are very critical for doctors to establish their diagnosis, with detailed and on-hand patients‟ medical records; doctors can make appropriate medical decision efficiently. Security was a critical issue in the storage and transferring of patient medical records between hospitals and doctors‟ offices. All clients were authenticated with a 2 patient identity number.

### According to Sejfia (2015) study on implementing a Patient Information System in Public Hospitals in Kosovo, it was noted that the changes inHealth Information Strategy compliant with are required to reflect the needs of the stakeholders are mostly related with adding more functionalities that could benefit patients directly. Patients have suggested that they need more interactivity from this system, in terms of scheduling appointments, contacting with their doctor or accessing their full medical history.This project also recommended for the Ministry of the Health to look closely to the developments of the PIS in Serbia. According to Pedro & de Paula (2011) study on hospital information systems: a study of electronic patient recordsdespite some problems in their usage, the benefits of electronic patient records outweigh possible disadvantages

According to Tuula (2012) study on the success of a management information system in health care the main category "usage of management information system" consisted of four sub-categories: (1) system quality, (2) information quality, (3) use and user satisfaction and (4) development of information culture. Conclusions: There were many organizational and cultural aspects which influence the use of MIS in addition to factors concerning system usability and users. The connection between information culture and information use was recognized and the managers proposed numerous ways to increase the use of information in management work. The implementation and use of management information system did not seem to be planned as an essential tool in strategic information management in the health care organization studied.

### According to Mona Choi, Lee Yang, and Sun-Mi Lee (2014) NMISs were effective in time saving and useful in nursing care. Because there was a lack of quality in the reviewed studies, well-designed research, such as randomized controlled trials, should be conducted to more objectively evaluate the effectiveness of NMISs.Hesamaddin, Azizah, Samireh&Sedigheh (2015) found out that the nurses in this sample perceived that HIS qualities of timeliness and reliability contributed to complete and accurate information about patients in nursing practice. These qualities appeared to enhance the value of the HIS in the nurses’ perception.Premkumar&Kalpana (2013) found out that the success factors and challenges faced in successful E-HMS implementation are highlighted. Some of the mandatory standards like HIPAA are discussed in detail for clarity on Healthcare system implementation requirements.Streveler (2004) grouped the component making HIS into 2 which are information processing and management. Information processing involves data collection, transmission, processing, analysis and presentation of information for use in patient care and health care management decisions. Health management system cannot exist alone but as functional unit aimed at improving the health of individuals and that of the community.

## 2.3 Summary and Knowledge Gap

### Studies have been done on patient’s management across the globe. Mennel (2006) study on pioneering security on line Patient Record management and collaboration between doctors clinical and hospital using secured internet transmission. Sejfia (2015) study on implementing a Patient Information System in Public Hospitals in Kosovo. According to Tuula (2012) study on the success of a management information system in health. According to Mona Choi, Lee Yang, and Sun-Mi Lee (2014) NMISs were effective in time saving and useful in nursing care. PremkumarKalpana K., (2013) E –Hospital Management & Hospital Information Systems – Changing. All these studies were done elsewhere other than UAsinGishu County therefore this study will seek to find out the patients management in county hospital UasinGishu County.

# CHAPTER THREE: RESEARCH METHODOLOGY

## 3.0 INTRODUCTION

### This chapter presents target users of the product target population sample population methods of data collection system requirements and software development methodology

## 3.1 Target users of the product

### The system will target registration clerks, pharmacist, clinical officers, nurses and doctors at the UasinGishu sub county hospital Eldoret town

## 3.2 Target population

### Accord and Khan (2008) define a target population as any group of individuals with one or so characteristics in common that the researcher is interested in. The target population for this study includedregistration clerks and pharmacist at the hospital. According to the hospital there are 25 employees at the two departments. Therefore the study will target 25 employees at the hospital.

## 3.3 Sample Procedure

A census approach will be used since the researcher wished to enumerate the whole unit entailing all the safety at the airport. According to Kothari (2004) the use of a census survey ensures that all the items are covered and no element of chance is left which ensures a higher rate of accuracy.

# 3.4 Methods of data collection

### The study will use observation and questionnaires as our research methods. Through this the study will be able to collect raw data on PRMS at UasinGishu sub county hospital

## 3.4.1 Observation

The researcher will observe their daily as regards their current system at the specified department. A follow up will be made to determine the time it took to carry out the patient record management.

## 3.4.2 Questionnaires

### The efficiencies and inefficiencies of the current system will be reviewed by issuing questionnaires to the users of the system. This will helpthe study to establish the requirements of the proposed system.Annum (2014) states that a questionnaire is a form or document with a set of questions deliberately designed to elicit responses from respondents or research informants for the purpose of collecting data or information

## 3.5 System requirements

### This section describes the hardware components and software requirements needed for effective and efficient running of the system

Table 4.0 Hardware Requirements

Table 1 :hardware requirements

|  |  |
| --- | --- |
| Hardware | Minimum System requirement |
| Processor | 2.4 GHZ processor speed |
| Memory | 128 MB RAM (256 MB Recommended) |
| Disk space | 80 GB (including 20 GB for database Management system) |
| Display | 800 x 600 colors (1024 x 768 High color- 16 bit Recommended) |

The table above shows hardware components of the machine that allows the system to function as required for using PIMS

Table 4.1 Software Requirements

Table : Software requirements

|  |  |
| --- | --- |
| Software | Minimum System requirement |
| Operating System | Windows 7 or later |
| Database Management System | MYSQL |
| Run-time Environment | Apache/tomcat5 server |

The table above shows software requirements recommended to enable the system to run as required for using PIMS

# 3.6 Software development methodology

### A relational database design was used to design the database. A relational database management system (RDBMS) is an excellent tool for organizing large amount of data and defining the relationship between the datasets in a consistent and understandable way. A RDBMS provides a structure which is flexible enough to accommodate almost any kind of data. Relationships between the tables were defined by creating special columns (keys), which contain the same set of values in each table. The tables can be joined in different combinations to extract the needed data. A RDBMS also offered flexibility that enabled redesign and regeneration of reports from the database without need to re-enter the data.

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[Table 2:Software requirements 10](#_Toc513122390)

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