

Design and Implementation of Hospital Management System

Adebisi O.A, Oladosu D.A, Busari O.A and Oyewola Y.V Department of Computer Engineering Technology, the Polytechnic, Ibadan

Abstract -The paper developed an automated system that is used to manage patient information and its administration. This was with a view to eliminate the problem of inappropriate data Keeping, inaccurate reports, time wastage in storing, processing and retrieving information encountered by the traditional hospital system in order to improve the overall efficiency of the organization. The tools used to implement the system are Hypertext Markup Language (HTML), Cascading Style Sheets (CSS), Hypertext Preprocessor (PHP), and My Structured Query Language(MySQ).The Proposed system was tested using the information collected from Murab Hospital, Ilorin, kwara State , Nigeria and compared with the existing traditional hospital system. The design provides excellent patient services and improved information infrastructure.

Index Terms-Management system, System design, web application system, Hospital Administration.

I. INTRODUCTION

Hospital is an organization that mobilizes the skills and efforts of a widely divergent group of professionals, semi-professionals, professional's personnel, to provide highly personalized personnel services to patients [1].World health Organization (WHO) has defined hospital as an integral part of social and medical organization that provides the complete curative and preventive health care and treatment to people. Hospitals are the focal points of education for the health professionals and clinical research necessary for advancement of medicine. Thus, the hospital is one of the most complexes of all administrative organizations. The main purpose of the hospital is to provide adequate care and treatment to the people. Various operational works that are done in a hospital include: recording information about the Patients, generating bill, recording information related to diagnosis given to Patients, Keeping record of the Immunization provided to patient, Keeping information about various diseases and medicines available to cure them etc [2]. All these works are done in most hospitals on papers. The need for proper management of the health sector leads to the creation of an electronic means of keeping records, administering discharge, querying of data, prescription helper and also good accountability. Information technology in general enables intra organizational networking that facilitates effective information flow within the various units of a firm [3]. The application of information technology in health care is unceasingly evolving as the quality of patient care in contemporary times seems to depend on

the timely acquisition and processing of clinical information related to the patient [4]. The hospital management system (HMS) comprises a computerized web based application for record keeping, tracking and prescriptions with monitoring. HMS can manage multiple users of the system and can have the track of the right assigned to them. It makes sure that all the users function with the system as per the rights assigned to them and they can get their work done in efficient manner. A good management system should allow for input and output by providing an objective for recording and aggregation information. It should be able to quickly collect and edit data, summarize results, and adjust as well as correct errors promptly [5]. Reference [5] designs HMS that Retrieve Information from the database as quickly as one searches on the screen and authenticate the users with the access control facility to prevent unauthorized users from accessing the data but does not include exporting of Data (History) on the database to appear in various formats (PDF, CSV, TXT). Reference [6] designs various HMS modules but the system is not designed to manage the affairs of the hospital but only built for the Patient Health Records. This paper provides solution to the existing problems of the hospital. The design improves the accuracy of medical records and efficient retrieval and usage of medical records. The purpose of the paper is to design HMS that helps to;

1. Eliminate redundancy in term of data storage. Data will be stored in a computer not heap of files.
2. Reduce the time wasted in retrieving data especially in finding a past health records.
3. increase Efficiency and Interactivity in any area of specialization in the hospital

II. METHODOLOGY

Murab Hospital Ilorin, Kwara state, Nigeria was chosen as a case study due to easy access to the medical information and the consultant. The Hospital was visited to collect appropriate information. The purpose of the Study is to find out the current state of their management system and how to make it more efficient. Various medical personnel were interviewed in other to know their duties and challenges they are facing while discharging their duties. Written vouchers, bills of payment, receipts and other test results were reviewed so as to get how the "System of Number" for referencing and saving for future works and the platform of how to make the manual printed reports into electronic one

A. The Existing Management System at Murab Hospital, Ilorin, Kwara, Nigeria

The information flow used is a one directional system where the receptionist refers patient to doctors, doctors referring patients to the pharmacist either in or out patients and the same way out. The system that is currently being used in the hospital is entirely manual. When a patient requests drugs from the staff, all the information is recorded manually from the drug dispenser (Pharmacist). Similarly when the supplier delivers drugs all the information from the dispenser to the account on drugs is recorded manually. The following are the weaknesses of the current system at the hospital:

1. The hospital staff finds it tiresome and time consuming when computing patient data, drug supplier and staff Payment receipts and voucher cards this leads to delay in medical reports.
2. The hospital Administration currently uses health record files for storing patients and drug supplier's information. This system of information storage is susceptible to security problems such as illegal modification and update of records.
3. The Staff usually waste a lot of time in retrieving data.
4. The paper work reduce the efficiency of the System

B. System Design and Implementation

Table 1 and Table 2 show the hardware requirement of the system and software requirement of the system respectively.

Table1: Hardware Requirement of the System

Hardware	Minimum System Requirements
Processor	1.2 GHZ Processor Speed
Memory	128 MB RAM (256 preferable)
Disk space	60 GIGABYTE
Display	800X600 Colors (1024x768 High color16- bit recommended)

Table 2: Software Requirement of the System

Software	Minimum System Requirements
Operating System	Window 2000 or later
Database Management System	MySQL
Run-time Environment	Wampserver

A relational database (RDBMS) design was used to design the database. RDBMS organizes large amount of data and defines the relationship between the datasets in a consistent and understandable way. RDBMS also provides a structure which is flexible enough to accommodate almost any kind of data. Data dictionaries were used to provide definitions of the data used; these included the final data structures for the various tables and their corresponding data fields, description and sizes the user application programs and interface were developed using PHP, CSS and HTML with support of

PHP and MYSQL. PHP was used to create links, manipulate pages, and manage relational databases storage functions, PHP was used to process queries and request flash to integrate sounds and interfaces was done to develop the model that meets all the requirements of this system. MySQL was used to create and connect relational tables to the database. HTML was used to develop the GUI.

C. The Proposed System

The proposed system is divided into Receptionist's module, Doctor's module and Pharmacist's module.

Receptionist's module

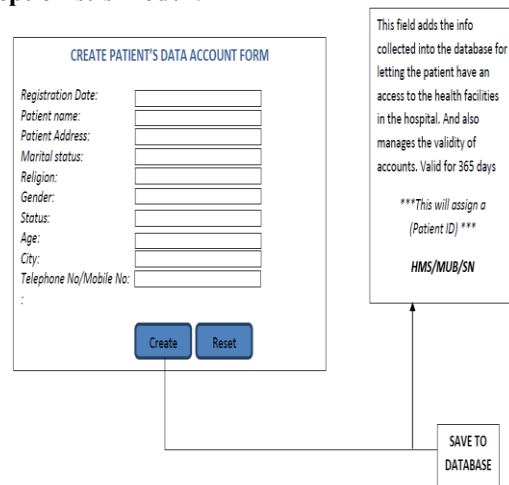


Fig1: Receptionist's module

CREATE DATA ACCOUNT -A Patient ID is assigned for new patients

VERIFY USER - For an existing patient, "Patient ID" is verified to check for the validity of the account

PRG (Payment Receipt Generator) - this assigns a receipt from the voucher generated by the doctor.

Search Engine: To search for the patients data (both payment records and also account authenticity)

Inbox: an advanced feature which will manage messages received from the medical superintendent.

Doctor's module:

Step-By- Step Treatment Record

Verify User → HRE → LMM → DPE → WBE → PVG → DMG → PRINT

Health Record Entry

Diagnosis No:

Registration No:

Diagnosis date:

Remark:

Typhoid Fever	yes	No
Blood	yes	No
Malaria	yes	No
Urine	yes	No
X-ray	Yes	No
ECG	Yes	No

Re-consultation Advice week:

Re-consultation advice date:

FINAL diagnosis Result: IPD OPD

Save & Continue

Hospital Management System (HMS)

Fig 2a: Doctor’s module (Health Record Entry)

Step-By- Step Treatment Record

Verify User → HRE → LMM → DPE → WBE → PVG → DMG → PRINT

Lab Module Manager

X - RAY

Reg Number: SUBMIT Patient Name:

Test Date: X-RAY Name: Age: Gender:

REMARK 1	REMARK 7
REMARK 2	REMARK 8
REMARK 3	REMARK 9
REMARK 4	REMARK 10
REMARK 5	REMARK 11
REMARK 6	OPINION

NEW SAVE EDIT CANCEL **Save & Continue**

Fig 2b: Doctor’s module (Lab Module Manager)

Search Engine: first field: search “With Patient Id” and choose a subdirectory for records to search.

Inbox: an advanced feature which will manage messages received from the medical superintendent.

Pharmacist’s Module:

PHARMACIST MODULE

Enter New Stock (ENS)

Date	Qty	Type of drugs	Pharmacist on file	Time of Entry

SAVE

Fig 3a: Pharmacist’s Module (Enter New Stock)

PHARMACIST MODULE

RECEIPTS FOR DRUGS BOUGHTS

Name of patient:

Registration No:

Reference No:

Doctor on File:

Date:

Payment Method: checks are not allowed

SN	Types Of Drugs Bought	Amount
1	Amoxlylin Biocarbonate	2400
2	Chloroquine Capsules	4000
Total		6400

SAVE **RESET**

Fig 3b: Pharmacist’s Module (Receipts for Drugs bought)

CREATE DATA ACCOUNT (For new patients, a “Unique No” is assigned for medical records on behalf of the patient.)

VERIFY USER: Verifying “Registration No” is assigned to the patient if coming as existing patient in the hospital. Just as to check for the validity of the account)

HRE (Health Record Entry) a link or a function where patient’s records will be inputted either inpatients or outpatients

(LMM) Lab Module Manager takes care of common laboratory test performed in the hospital

DPE (Drug Record Entry) a link or a function where doctor can input patients’ drugs prescribed **WBE** (Ward & Bed Entry) A link which takes care of how beds are assigned and also change of rooms occur

PVG (Payment Voucher Generator) this will assign a voucher No so as for information of Number to flow well in the hospital

DMG (Discharge Manager) this assigns only for Inpatients and has expected date of leaving and also the date left will also be inputted into the system.

Enter New Stock (ENS): This is a link which is strictly meant for entering new stocks

CREATOR (RECEIPT CREATOR): A tabular form of entering drugs bought from the pharmacist and also assigning amount for it.

Sales record Inventor (S.R.I): This is a rendering functions of all sales made in a day which will be a search box that will be queried with date and also accounts for the amount made in a day. Also searching for Stock history will be also be a subcategories under the search record inventor.

Inbox: An advanced feature which will manage messages received from the medical superintendent

III. SYSTEM TESTING

Testing was done was carried out on individual modules of the system to ensure that they meet necessary functional requirements such as authenticating the users of the system, generation of reports on request, allowing administrator to delete records in the database etc.

Integration and system testing were carried out after different modules had been put together to make a complete system in order to ensure that modules are compatible and can be integrated to form a complete working system.

IV. RESULTS

Fig 1, Fig 2 and Fig 3 show Receptionist's module, Doctor's module and Pharmacist's module respectively. The system verify and validate all user input. The user is notified in case of errors detected in the course of using the system. The system captured patient's details at the receptionist which is used to create an account with the doctor and have a reference Id to use in paying bills and charges. The system generates the Patient Identity (ID) and also the Reference ID automatically and identifies inpatients and outpatients which is made possible by a checkbox. Also, it manages entering new stocks of drugs into database and how the drugs are sold which will include assigning a serial number to Reference ID given by the doctor to monitor the sales. The design also allows room for expansion.

V. CONCLUSION

Computerized HMS has been developed. The system solved the problems associated with the existing manual system. Security is also enhanced since access to the system requires authentication. However, the system does not alert the pharmacy of the expiry date of drugs. Also, departments such as security and assets are not included in the design. Therefore, developing an HMS that can alert the pharmacist of the expiry date of drugs at a given time and handle all departments in the hospital will be an attractive research in future.

REFERENCES

- [1] A.K malhotra, Hospital management system: An Evaluation, global Indian Publication, 2009.
- [2] Mansi Chitkara, Namita Khandelwal, and Avinash Chaporkar, Project Report on Hospital Management System", (2010).
- [3] Ayodele Cole Benson, Hospital Information Systems in Nigeria: Review of Literature Vol.1, No 3, 2011.
- [4] Brailer, D. J, (Economic perspective on health information technology. Business Economics, 40(3), 6-14doi:10.2145/20050301.
- [5] Waban Charles, Project report on Computerized Health Records Management System, 2007.
- [6] F.Droma, Project report on 'An automated System for patient Record System', Department of Information Technology maker ere university. (2009).