

ONLINE HOSPITAL MANAGEMENT SYSTEM

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ABSTRACT: This paper aims to address the online hospital management system as an area to enhance medical field. Patients tend to spend a lot of time for treatment, this tends to result in patient being attended lately, the manual system was looked in detail with a help to find out the need to improve the system. A computerized program was designed to bring about improvement in the care of individual patients, with a view of taking the advantage of computer speed, storage and retrieved facilities. The software was designed to take care of patient's registration, billing, treatment and payments.

KEYWORDS: Hospital, Management System.

1. INTRODUCTION

Hospital barely deals with care for the health of the patients. Health is one of the important factors for the development with regards to human resources for the improvement in the lives of the human beings. The world modern concept of hospitals has change with the way the technological development touches different areas of human life especially in the health sector. In some of the hospitals manual operations still take place having finding it difficult to manage the patients' data. The need for the advancement to underdeveloped patient care sector needs to be advanced with regards to the recent development in the health sector. Hospital can be said to be specialized body where patient care is the number one focal point in which all the activities of the hospital revolve. Latest equipment needs to be provided and also a team of trained staff need to be trained in order to coordinate the common goal of restoring, improving and maintaining a good health for the people who went there for treatment.

Nowadays where computer has touches our way of life, it is evident that majority of the hospitals do not adapt the recent technology, especially in most of the hospitals daily operation are done manually, but recently number of patient grows but still some hospitals practice the use of manual method of managing data for the patient, scheduling appointment etc.

2. RELATED STUDY

M. Ajay *et al.* ([2]), the authors works extensively on the development of an online hospital system with multispecialty that deals with patient care, they developed a website that keeps a daily activities of the patient ,as well as the doctors staffs and nurses of the hospital with admin as the manager of the activities. The authors use spiral model as the software design methodology for the system, the system also has the capability of retrieving and entering of inpatient and outpatient when needed, at last the authors came a conclusion with allowing an easy access with regards to admission of patient, doctors scheduling appointment, staff scheduling etc.

Olusanya O. *et al.* ([3]), designed a Hospital Management System (HMS). The system provides the benefits of streamlined operations, enhanced administration & control, superior patient care, strict cost control and improved profitability. The system uses JAVA as the front-end software which is an Object Oriented Programming language and has connectivity with the back-end software.

According to Ward *et al.*, ([6]), health care policy makers seeking ways of improving quality of patient care at a reduced cost are leveraging hospital information systems to achieve these objectives such as administrative and financial information systems, reimbursement and other administrative.

Many customized versions of E-hospital management solutions (E-HMS) and Hospital Information systems (HIS) available in the market, a generic module wise version of E-Hospital management system is charted out to give a clear understanding for researchers and industry experts. From the specific successful case studies analysed in the study, 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.

Thuan D. N. *et al.* ([4]), researched the infrastructure and current medical data management systems in Vietnam and designed an electronic medical record keeping system to acquire, process, store and share health information in a fully automated computer network-based system. The modules in the system have automated data acquisition from Ultrasound, Digital Radiography, CT scanner, MRI and Laboratory stations, and manage pharmacy and financial information and other related activities in the hospital. Database servers currently store personal information along with text data, image data and will store video data in the future. The system will allow the patient to login and review online their medical records at home. The system was tested in the Biomedical Informatics Laboratory at the Hanoi University of Science and Technology and implemented in KhanhLuong hospital in Hanoi, Vietnam. It meets the needs for healthcare in developing countries with low investment cost, ease of implementation, and convenience for doctors and medical staff.

Ayodele C. B. ([1]) examined empirically the factors hindering adoption of hospital information systems in Nigeria. The study was focused on the perceived paucity of health information technology policy in Nigeria and the causes of poor implementation of hospital information systems in the country. The findings of the literature review highlighted hindrances to the adoption of hospital information systems to include; the high cost of full implementation of a hospital information system, inadequate human capital, corruption, and problems associated with poor infrastructure in Nigeria. The recommendations were that the Nigerian government needs to provide stable electricity, basic communication infrastructures, and Internet access to boost private initiatives in the adoption of health information technology across the country.

According to Weimar ([5]), electronic data interchange is part of the applications of a robust and integrated electronic health record system. The type of integrated system envisioned by President Bush's administration is aimed at warehousing the health care information of all Americans in a national database by 2014.

3. METHODOLOGY

This part presents in details the various operations performed by the system and their relationship within and outside of the system. That is, system analysis. During analysis, data are collected from the files, decision points and transactions handled by the existing system using fact finding techniques (interview and on-site observation). The goal of any system development is to develop and implement a

system that is reliable and works effectively. This can be achieved through good and accurate design. Object oriented analysis and design methodology will be used in order to achieve a better design.

3.1. Method of data collection

During this paper work, data collection was carried out in many places. In gathering and collecting necessary data and information needed for system analysis, two major fact-finding techniques were used in this work and they are:

- (a) Primary source
- (b) Secondary source

Primary Source:

Primary source refers to the sources of collecting original data in which the researcher made use of empirical approach such as personal interview.

Secondary Source:

The need for the secondary sources of data for this kind of project cannot be over emphasized. The secondary data were obtained by the researcher from magazines, Journal, Newspapers, Library source

The fact finding techniques used in order to study the existing system was interview.

Interview: Using this method, various departments or units of the clinic was consulted and questions were asked about how they carry out their activities and the problems they are encountering as while working with the current system. Interview was used as a fact finding technique for this project.

Interview was chosen because it enables me to gather information about the system in details. It also allows me to clear and cross check doubts. This method also helps gap the areas of misunderstandings and help to discuss in details about the future problems that may creep into the system. The information collected is quite accurate and reliable

The software process model used in the development of this system is

3.2. Technical tools

- Technical tools used in the interacting with or in the collecting of data carrying this research successfully are open and papers to record the interview between the interview and the staff of Yariman Bakura specialist hospital .in which the most important things needed is their idea an how they want the system to be developed to function .The system will be designed using HTML, MySQL, XAMPP Server, PHP for effective use.
- **Notepad++.** Notepad++ is a free source code editor that supports several programming languages. It will be used as a text editor to write the application code, for both PHP and SQL.

- **MySQL.** MySQL is an open source Relational Database Management System. MySQL is very fast reliable and flexible Database Management System. It provides a very high performance and it is multi-threaded and multi user Relational Database management system.it allow user to select any information many tables
- **XAMPP Server.** XAMPP is a free and open source cross-platform web server solution stack package, consisting mainly of the Apache HTTP Server, MySQL database, and interpreters for scripts written in the PHP and Perl programming languages. XAMPP is used as a development tool, to allow website designers and programmers to test their work on their own computers without any access to the Internet.
- **PHP.** PHP (recursive acronym for PHP: Hypertext Preprocessor) is a widely-used open source general-purpose scripting language that is especially suited for web development and can be embedded into HTML. As my backward of my web it responsible generating any activities be young to end user only the developers.
- **HTML.** Hyper Text Markup Language (HTML) is a markup language for creating web pages and other information that can be displayed in a web browser. HTML is written in the form of HTML elements consisting of tags enclosed in angle brackets (<>) within the web page content.

3.3. Data analysis

To study any system, the analyst needs to collect facts and all relevant information about the system. The success of any project is depended upon the accuracy of available information. Facts about the system were collected using one fact finding techniques; interview.

Accurate information is collected about the existing system with the help of these techniques.

FIRST INTERVIEW

The first interview was conducted with a medical doctor in Yariman Bakura Specialist Hospital Gusau. And the interviews took about 30 minutes. The interview is as follows.

1. Does and patients have his /her own separate file?

Answer:

Yes every patient has separate file .But some time it is very difficult to get his record .because the file are many.

2. How the doctor does prescribe Drugs?

Answer:

The used to take patients complain and then make a proper history taken from the patients By consider the severity of the illness to make proper description of drugs to his illness.

3. How do the Nurses manage to give bed allocation in the hospital?

Answer:

Base on severity of the illness and duration of hospital staying.

4. How does the doctor fix next appointment?

Answer:

According to the duration of the first treatment.

5. How does the receptionist register new patients?

Answer:

Patients has to come to the receptionist desk to make register.

6. Does the pharmacist dispensing drugs and know of the availability of the drugs in the in the store?

Answer:

Yes pharmacist is responsible for dispensing drugs to patients and preparing drugs bill but pharmacist has no any means of tracking drugs record such as the drugs availability since no record about drugs are kept.

7. Are the doctors responsible for determining whether the patients should be in-patients or out-patients?

Answer:

Yes and also even the Nurse can decide.

8. Does the receptionist have reminder of patient's appointment with doctor?

Answer:

Yes But using patients follow up and patients hand card because is manually.

9. How does the receptionist allocate file number?

Answer

The receptionist use to write patients file number in front of his file record.

10. How fast can the receptionist access patient record?

Answer:

It is very difficult to a receptionist to access patients record within a short period of time because they have a lot of files patient are kept it take at least thirty minute to retrieve a file.

SECOND INTERVIEW

The second interview was conducted with a pharmacist in Yariman Bakura Specialist Hospital, Gusau. And the interviews took about 25 minutes .The interview is as follows.

1. Does the pharmacist dispensing drugs and know of the availability of the drugs in the in the store?

Answer:

Yes pharmacist is responsible for dispensing drugs to patients and preparing drugs bill but pharmacist has no any means of tracking drugs

record such as the drugs availability since no record about drugs are kept.

2. How the doctor does prescribe Drugs?

Answer:

The used to take patients complain and then make a proper history taken from the patients

By consider the severity of the illness to make proper description of drugs to his illness.

By physical examination (i.e.investigation)

E.g. auscultation, percussion.

3. How does the receptionist allocate file number?

Answer:

The receptionist use to write patients file number in front of his file record or attaché to the file.

4. How does the receptionist register new patients?

Answer:

Patients has to come to the receptionist desk to make register and some time they use to get all necessary information related to the patients, so that to open file to him on the desk table. .

5. How the doctor does fix next appointment?

Answer:

According to the duration/lent of the first treatment he made to the patients.

6. Does the receptionist have reminder of patient's appointment with doctor?

Answer:

Yes, by the use of patients follow up and patients hand card because it is a manual method and some time it is been done by the two doctors or receptionist.

7. How fast can the receptionist access patient record?

Answer:

It is very difficult to a receptionist to access patients record within a short period of time because they have a lot of files patient are kept it take at least thirty minute to retrieve a file because patients file are many .

8. How do the Nurses manage to give bed allocation in the hospital?

Answer:

Base on severity of the illness and duration of hospital staying, and bed allocation, patient's medication, and treatment, booking patients surgery are done by the nurse manually.

9. Are the doctors responsible for determining whether the patients should be in-patients or out-patients?

Answer:

Yes, he is because is the only who determine the illness of the patients should be admitted to a bed medication unless when he is not around so nurse can take over.

10. Does any patient have his /her own separate file?

Answer:

Yes every patient has separate file .But some time it is very difficult to get his record .because the file are many.

4. ANALYSIS AND RESULTS

The existing system of Yariman Bakura Specialist Hospital is completely manual, meaning that all the activities are performed manually without the help of a computer system. The system is composed of four different department or units, which includes: reception unit, pharmacy unit, nurse unit, and doctors unit. Each of these units performs different functions and everything is done manually. The drawback of the existing system is that; data retrieval becomes more difficult, it is also difficult to handle the whole system manually and get accurate result. Redundancy of data may occur and this may lead to the inconsistency which makes the manual system to be time-consuming.

- Based on first and second interview I conducted, I came up with conclusion that every patient has separate file in the hospital by his necessary information and medication treatment.
- Based on first and second interview I conducted, I concluded that there is only one way for the doctor to prescribe a patient by taking complaint from patient and make proper list on taking whether by consider the severity of the illness or auscultator, percussive.
- From my first and second interview, I come up with conclusion that only nurse has the responsibility to manage and give bed allocation in the hospital.
- Through all the information I got from my first and second interview I, come up with final conclusion result that there is only one way that doctor can fix next appointment based on the justification of the first treatment.
- Based on first and second interview I conducted, I come up with conclusion that only pharmacist has the right to dispensing drug to patient and know the available drugs in the store.
- Through my first and second interview I the researcher conducted, I come up with conclusion that every patient has a right to the receptionists to make registration.
- From my first and second interview I conducted, I come up with final conclusion that only doctor has the responsibility for determining whether patient should be in-

patient (admitted) or out-patient (not admitted) in the hospital.

- Based on my first and second interview I conducted, I the researcher come up a conclusion saying that the receptionist can remind patient appointment with the doctor using patient hand card.
- From all the necessary information I got from my first and second interview conducted, I come up with conclusion that there is only one way that receptionist can allocate patient file number for each patient.
- Based on first and second interview, I the researcher came up with a conclusion that to reduce the time wasted during accessing patient file's is to come up with new computerized system that manage this problem.

4.1. System design

Systems design is the process of defining the architecture, components, modules, interfaces, and data for a system to satisfy specified requirements. Systems design could be seen as the application of systems theory to product development.

- Based on the user requirements and the detailed analysis of a new system, the new system must be designed. The design phase of any system is very important, vital and crucial because the success of any system depends largely on its design specifications. In this phase, the final specifications are used for translating the model into a design of the desired system. In this phase, modules are being defined showing their relationships to one another in a way known as a structural chart using structured tools. The reason for the design phase is to specify a particular software system that will meet the stated requirements gathered at the analysis phase.
- Structured design divides a program into smaller, independent modules and they are arranged orderly in a hierarchy that shows a model of the application area which is organized in a top-down manner. The concept of modification thus comes from structured design which is an attempt to reduce complexity and make a problem manageable by sub-dividing it into smaller segment

4.1.1. Use Case diagram

A use case diagram is a representation of a user's interaction with the system and depicting the specifications of a use case. A use case diagram can portray the different types of users of a system and the various ways that they interact with the system.

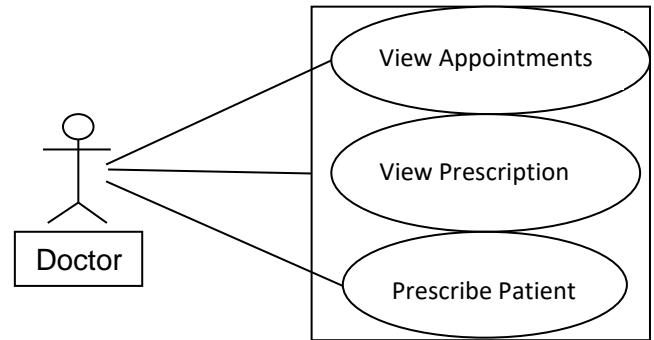


Figure 1: Index Page

Figure 2 is the landing page of Yariman Bakura Specialist Hospital Management System, with an overview product packages and image of admin block of the hospital.

Figure 3 displays the form for registration of new patient into the database.

The staff login form page (Figure 4) requires the username and password of the staff to login the staff into the system.

The patient login form page (Figure 5) requires the patient code and password to login to the patient system.

Figure 6 is the page that display after confirming that the staff is a doctor.

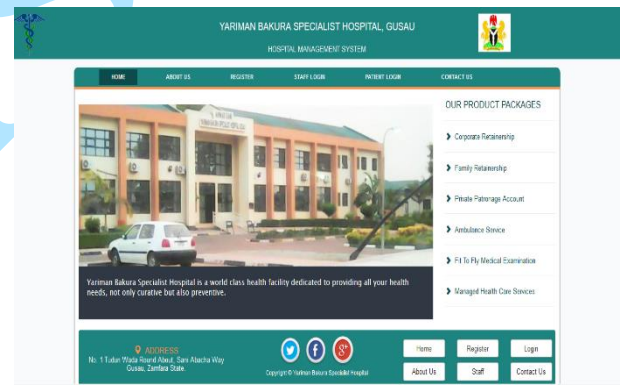


Figure 2: Welcome page



Figure 3: Patient Registration Page

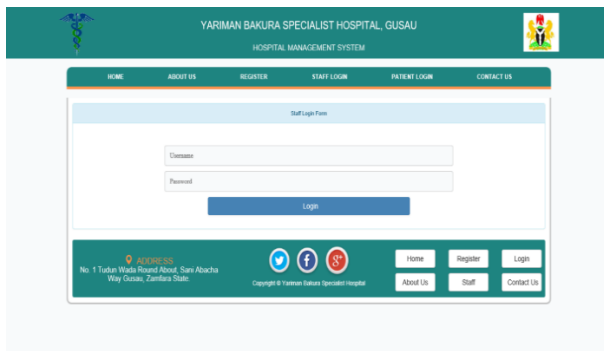


Figure 4: Staff Login Form

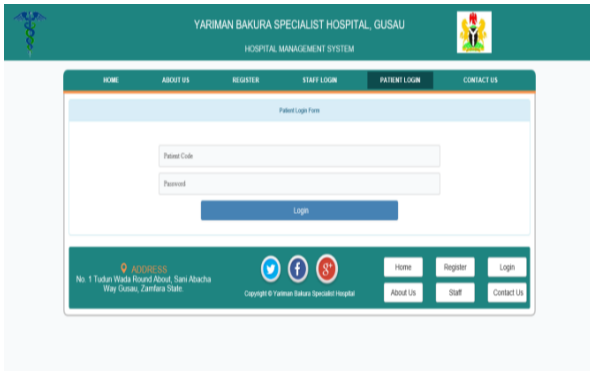


Figure 5: Patient Login Form

Admin profile page (Figure 7) displays the details of the system super admin including the passport of the admin.

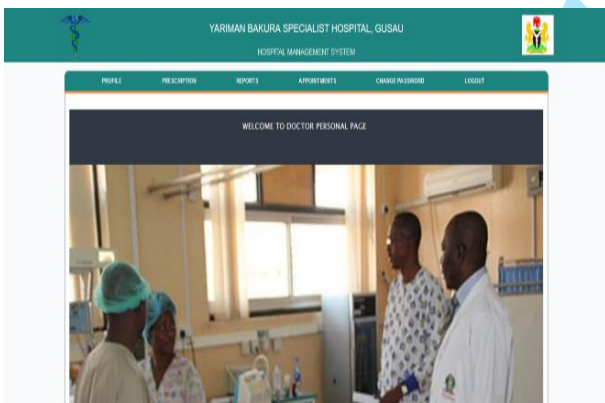


Figure 6: Doctor Personal Page

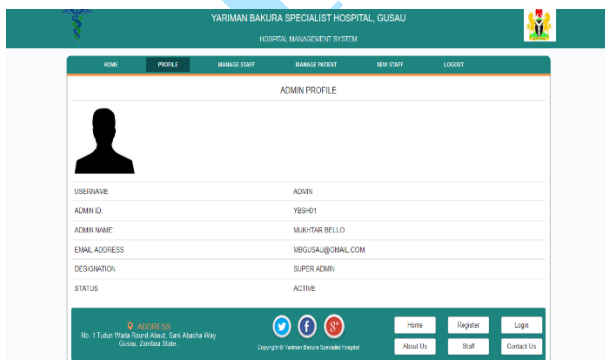


Figure 7: Admin Profile Page



Figure 8: Add New Staff Form Page

The page from Figure 8 requires the admin only to fill in the details of a new staff into the system database.

4.2. System testing and evaluation

After a system is developed, there is a need to test and verify that the system or program is “error free”, this refers to system testing. System Testing entails the process of executing a program using a test data with the purpose of uncovering and correcting errors in the program.

4.2.1. System testing

For the purpose of this paper, unit testing and integrated testing technique are considered.

Unit Testing: During unit testing, individual system components or modules are tested to ensure that they work accurately. The system modules are: patient module, administrator module, receptionist module, doctor module, nurse module, and pharmacist module. At this stage some errors were found and corrected.

Integrated Testing: Integrated testing was also conducted by bringing all the system components together and tested the system as a whole. Some errors were also found after the integration and they are corrected.

5. CONCLUSIONS

The Online Hospital Management System for Yariman Bakura Specialist Hospital Gusau, was successfully developed and it provides faster, economical, accurate, efficient, flexible, and reliable ways of processing patients and hospital information. The system is user friendly such that it is easy to learn and use. The system also has the capability of verifying user inputs by detecting invalid input and provides error messages to notify the user.

RECOMMENDATION

The automated Online Hospital Management System for Yariman Bakura Specialist Hospital is developed to solve problems faced by the Hospital Management such as high management cost and administrative inefficiencies and also provide them with efficient, fast, and reliable information processing and storage. Despite all these features, there is a room for any interested person to further build and incorporate additional features or capabilities into the system. In view of this, it is recommended to incorporate an Online Messaging System which will allow registered patients to interact with doctors electronically without coming to the clinic. It is also recommended to further improve the system by incorporating an Online Self Diagnostic System which if developed allow registered patients to find treatments and advice for minor diseases at the comfort of their home without coming to the clinic. Considering the system's capabilities, it is also recommended for any clinic that wishes to automate their system to adapt this system.

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