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WORLD TECHNOLOGY HANDLING FLOWS PHARMACY INFORMATION SYSTEM

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ABSTRACT

This project titled "Pharmacy Information System", is a web based interactive application with primary aim of improving accuracy, safety and efficiency in processing pharmacy transactions and reporting. It applies on both billing and stock by providing secure and interactive way of recording medicines and sales, simplifies the work of searching a medicine availability and expiration, checking stock status and alert system for almost expiring drugs, generating reports easily and automation of billing for both patients and health insurance companies.

This system solves the problem of much time spent in checking availability of a medicine, expired medicines and reporting, it improves also security and integrity of information due to the use of Relational Database Management System, where data correctness and accuracy are assured, data access is also controlled along with authentication. It also solves the error prone problem in billing and financial reports as the existing system of manually maintained records where information processing was done using hard copies.

The system is built and implemented using a three-tier application design approach. The design of the graphical user interface will be designed with Hypertext Mark-up Language (HTML), CSS and JavaScript (Ajax and jQuery), MySQL is used for database development while PHP is used as a language. The Methodology will be based on Object-oriented analysis and design (OOAD) the phases are planning, analysis, design and implementation. Following the System Development Life Cycle, waterfall model approach.

Introduction

Nowadays Information and Communication Technology (ICT) plays a great role in different fields or areas, Health Care System is the one. This leads to various studies and researches are being conducted to selected health care facilities. It is necessary to ensure a technologically appropriate, equitable, affordable, efficient and environmentally adaptable and consumer friendly system, designed to fully utilize the ICT for the maximum benefit in the health care Industry (Barnett et al., 2019).

Rwanda has vast opportunities to improve in this section by using information and communication technology (ICT) which will digitalize the system, by ensuring the other requirements and newer techniques. Applying digitalized and modern pharmacy, the health sector of Rwanda can be improved dramatically (*Joshi and Pant,* 2011).

Certain departments can only be run by graduate pharmacists like extemporaneous preparation, prescription review and patient counseling. Here Computers have great relevant on storing data's securely and ease access on them in short period of time

In order to exploit the ICT in health care system, Pharmacy Information System is being build. Pharmacy Information System is robust, integrated technology. Pharmacy Information System deals with the maintenance with drugs and consumable in the pharmacy unit. The set-up of the Pharmacy Information system will ensure availability of sufficient quantity of drugs. Pharmacy Information System will be designed to detect drug interaction.

In general, The Pharmacy Information System is based on Computer Technology that gives service for users, managed by the pharmacist who gives implementation of function relatively in effective times as well as will design for removing time wasting, saving resources, easy data access of the medicine, security on data input and data access by removing almost manual based system the difference Pharmacy are maintained (Saha et al., 2018).

In developed countries, pharmacies are mainly supervised and serviced by clinically experienced graduate pharmacists. They along with physicians and nurses to ensure the quality treatment and patient compliance. But in Rwanda, graduate pharmacists are not directly involved in patient care. Here, some Pharmacies are mainly run diploma pharmacists who are not clinically trained. They cannot review prescriptions as a result

proper care cannot be taken the patient (Um et al., 2010).

This is pharmacy management system; it is used to manage most pharmacy related activities in the pharmacy.

Methodology and Techniques

During research data collection, it is necessary to have a good methodology and suitable techniques for better way of achieving objectives.

Object oriented analysis and design method (OOADM)

Object-oriented analysis and design (OOAD) is a technical approach used in the analysis and design of an application or system through the application of the object-oriented paradigm and concepts; including visual modeling. This is applied throughout the development life cycle of the application or system, fostering better product quality and even encouraging stakeholder participation and communication (Liping, 2006)

Techniques

It is practical methods or skills applied to particular tasks identified as part of the research. It is increasingly common for researchers and academics to combine multiple techniques within a single research project (Mixed-Mode Data Collection). This approach helps to reduce mistakes and inconsistencies that can arise. Therefore, the following techniques are preferred to be used:

Interview

An interview is generally a qualitative research technique which involves asking open-ended questions to converse with respondents and collect elicit data about a subject. The interviewer in most cases is the subject matter expert who intends to understand respondent opinions in a wellplanned and executed series of questions and answers

Observation

It is a social research technique that involves the direct observation of phenomena in their natural setting. Therefore, when doing a research, you have to observe the existing system on your own in order to master how it operates

Documentation

This is the main method used while collecting secondary data from files and official documents at case study institution relevant to this work. Consulting documentation about system security in our carrier, news articles on internet, reading books and different documents related to the use of ICT to secure information or data from unauthorized access. Documentation is the evidence provided for

information and ideas borrowed from others. That evidence includes both primary sources and secondary sources

RESULTS AND DISCUSION

To design or upgrade new system is the process that requires to learn more about the current system (so called the as-is system) and investigates its major problems by envisioning the ways to solve them by either design a new system (to-be system) or upgrade the current system functionality. This process helps in giving a detailed view and understanding on how the present system works.

Furthermore, the analysis will also indicate the problems faced in the current system and give clear direction of how to solve them by improving the current system functionality. This chapter will detail overview of the institution, role and assignment. It will also demonstrate major problem within the current problems and suggest solutions that have to be implemented in order to solve those problems.

Pharmacy Information System Use Case Diagram

A use case diagram is a graphic representation of the interactions between the elements of a system. It is used to make clear, identify and organize the requirements of the system (Bittner, 2002)**.** Use case diagram is the primary form of system/software requirements for a new software program underdeveloped. Use cases specify the expected behavior (what), and not the exact method of making it happen (how). Use cases once specified can be denoted both textual and visual representation (i.e. use case diagram). A key concept of use case modeling is that it helps us design a system from the end user's perspective. It is an effective technique for communicating system behavior in the user's terms by specifying all externally visible system behavior.

A use case diagram is usually simple. It does not show the detail of the use cases:

It only summarizes some of the relationships between use cases, actors, and systems.

It does not show the order in which steps are performed to achieve the goals of each use case

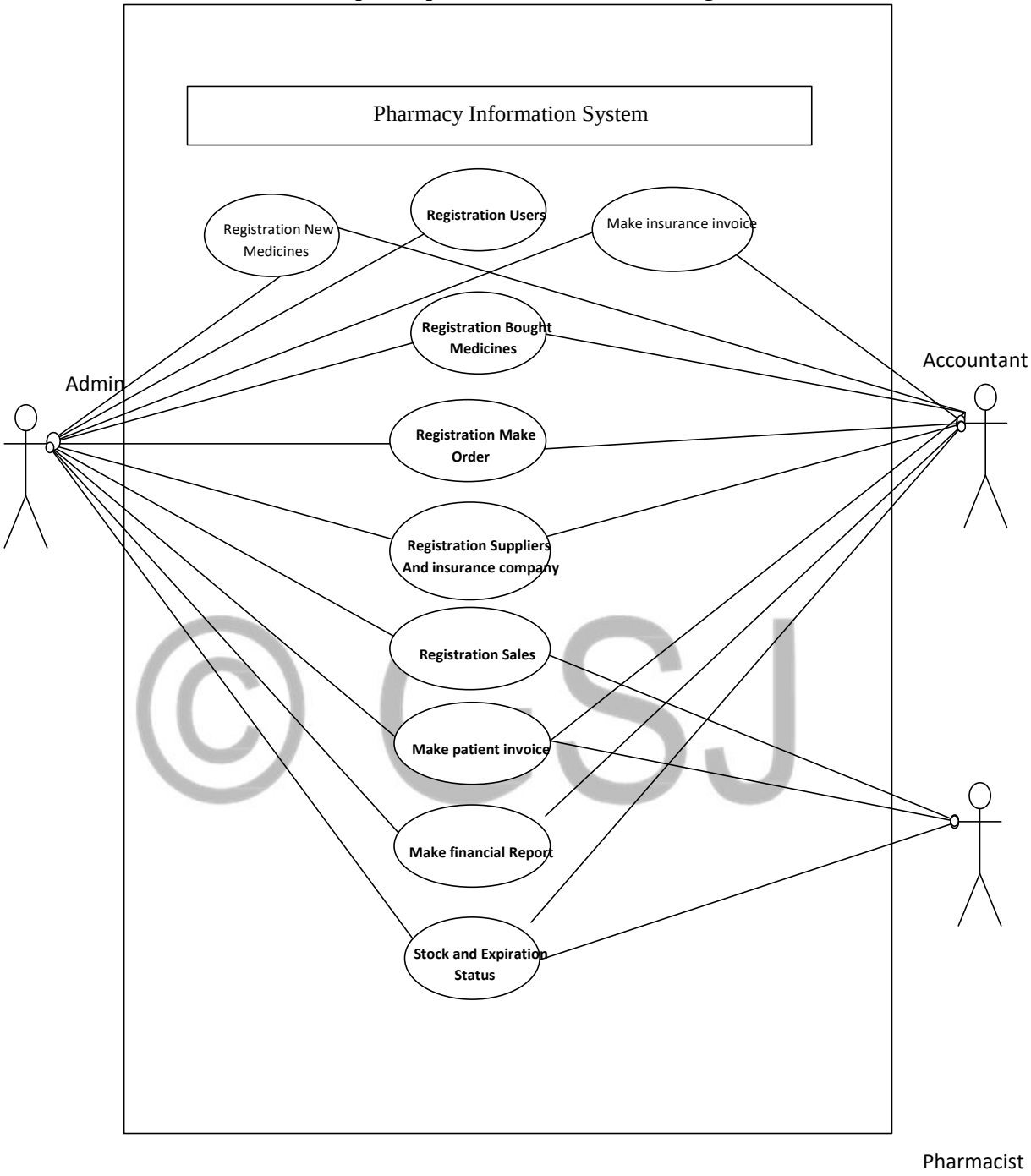

Figure 1: Use Case diagram

IMPLEMENTATION OF THE PROPOSED SYSTEM

The user interface will be housed through a system, Pharmacy Information System. This system will have several menus, helping users to navigate the system. Below are Provided the initial design of the user interface which give the general overview of how all the pages/interfaces or forms will look.

1. **Welcome page:** This is the first page that will be displayed when the system is launched. it will help the system user to navigate to the login page, if he/her forget password he/she may rest his/her password

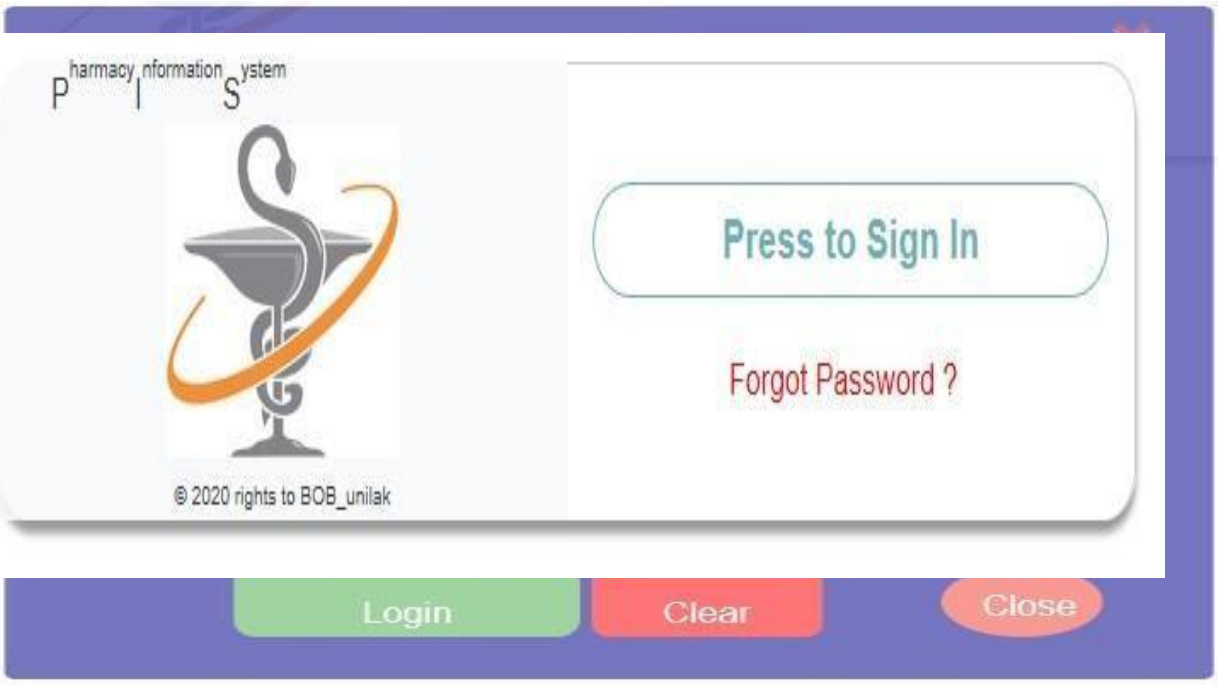

Figure 2: Login page

2. **Login form:** This page is used to by the system users (Admin, Accountant and Pharmacist) to login into system. The system will verify the username and password for user authentication
3. **Medicine Registration form**: This form is used by the pharmacist to register new medicines

Figure 3: New Medicine Registration Page

4. **Ordering Medicines Page:** This form is used by the Admin/Accountant to ordering medicines

Figure 4: Ordering Medicines Page

5. **Register Brought Medicines Page:** This form is used by the Admin/Accountant to Register Brought medicines

Figure 5: Brought Medicines Registration

6. **Patient _Prescribing Health Facility Medicines Registration Pages:** This form is used by the Pharmacist/ Admin Record to Patient Information

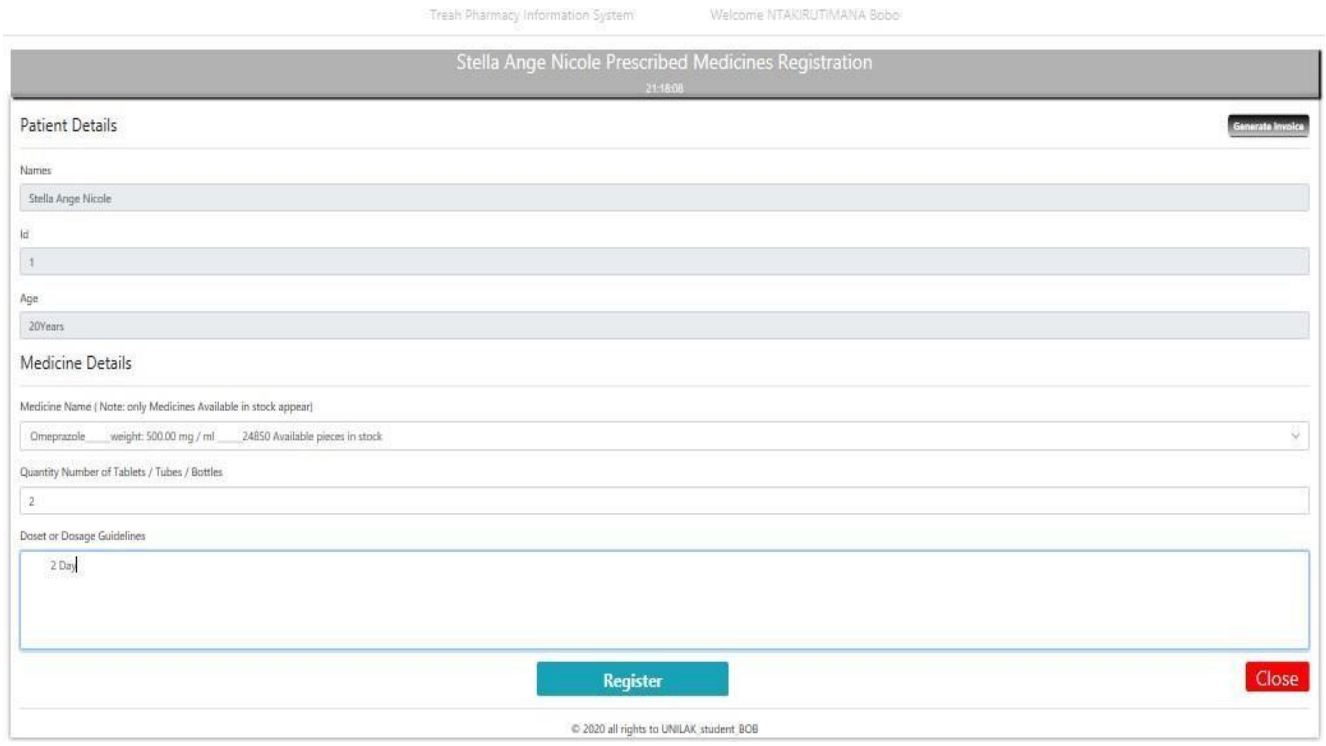

Figure 6: Patient _Prescribing Health Facility Medicines Registration Page

Prepare Patient Invoice Pages: This form is used by the Pharmacist/ Admin to Prepare Patient Invoice and show output.

Figure 7: Patient Invoice Page

7. **Insurance Company Invoice page**: This form is used by the Accountant to Report Insurance Company Invoice

Figure 8: Insurance Company Invoice Page

8. **Financial Report Page**: This form is used by the Accountant/Admin to Report Financial Statement Company Invoice

Figure 9: Financial Report Page

9. **Stock Status and Medicines Expiration Page:** This form is used by the Admin/ Accountant/Pharmacist to Checking Stock Status and Medicines Expiration and output.

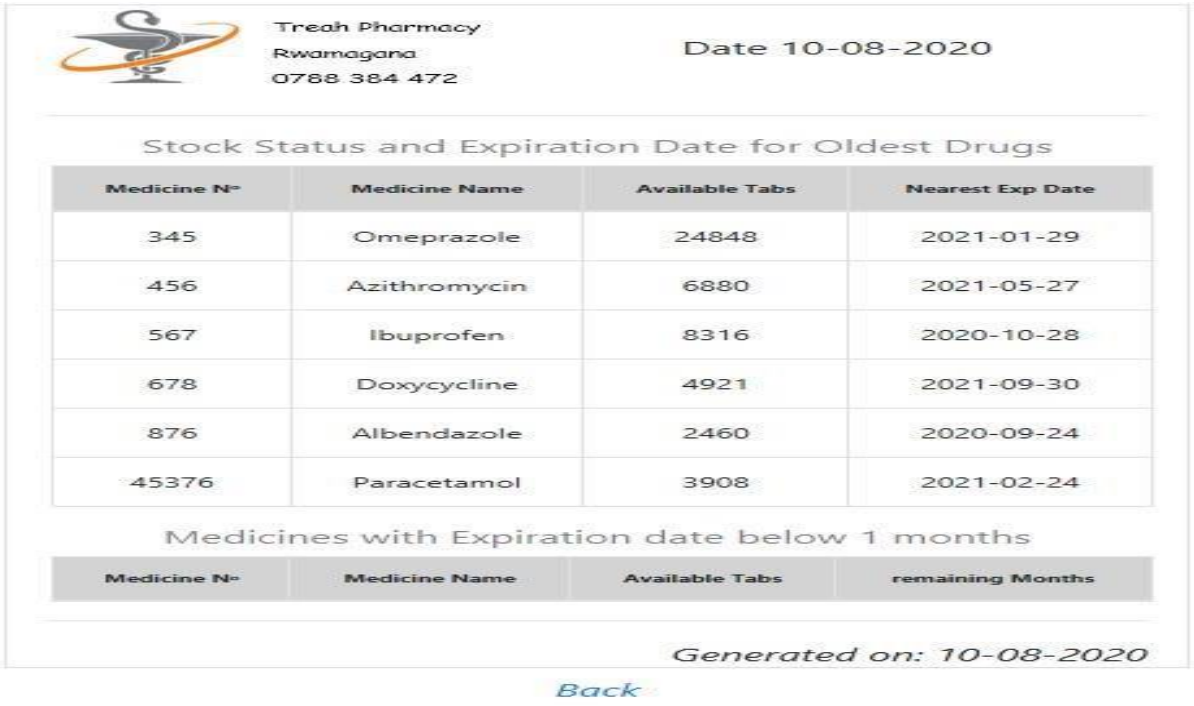

Figure 10: Stock Status and Medicines Expiration Report Page

Conclusion

Pharmacy management system has been designed to improve the accuracy, enhance safety and efficiency in the pharmaceutical store. It is a computer based system which will help both Admin, Pharmacist and Accountant to improve inventory management, cost and sales operations, medical safety etc. Pharmacy management system was developed to ensure the security of information and reliability of Pharmacy records when accessing and providing services to the customers. The information gathered during the data collection was properly analyzed and the results provided the basis for the new system. The system was tested and found to be functional and the outputs produced by this system were encouraging. The application will hence reduce the loss of information unlike the existing system and also information will be processed fast.

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