WEB-BASED PATHOLOGY LAB REPORTING SYSTEM FOR GEREHU GENERAL HOSPITAL PORT MORESBY PAPUA NEW GUINEA

GEREHU GENERAL HOSPITAL AUTOMATED PATHOLOGY LAB REPORTING SYSTEM

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Abstract – *Gerehu General Hospital is one of a government owned health care institution in Port Moresby, Papua New Guinea, that serves to the growth of the health care sector, focusing on primary health care, referrals and teaching. The use of the existing pathology lab reporting system of Gerehu General Hospital serves its patients with the normal manual paper file recording and reporting system. The hospital currently experiences some constraints from the use of manual paper file recording and reporting such as loss of patient data, filing of data of the same patient in numerous files, data tempering, lack of data backup, the consumption of time when trying to compile patients' data. To facilitate paper file driven liability, Gerehu General Hospital pathology lab reporting system must have an automated pathology lab reporting system. The web-based Pathology Lab Reporting System for the mentioned health care institution proposed by the researcher is basically to automate the paper file patient data recording and reporting system into a computerized system to make it more effective for the hospital's patients in its record keeping and reporting. The system is built on an object-oriented and database platform. The implementation of the proposed automated pathology lab reporting system at Gerehu General Hospital is expected to solve the existing problems.*

Keywords: Gerehu General Hospital, web-based, Automated Pathology Lab Reporting System, Paper file driven liability, Paper file recording and reporting system.

I. PREFACE

Reporting is to give a spoken or written account of something that one has observed, heard, done, or investigated. Patients are given reports after going through laboratory tests to know the status of their illness. Gerehu General Hospital is one of the many health institutions that offers clinical pathology services, ranging haematology, toxiology, immunology and serology to name a few. Problems that exist in the running system are pathology services and activity for the patients accessing the hospital for immediate same-day testing and getting results consume a lot of time as patients wait hours for their results to be printed and given to them and misplacement of information and less effective test result delivery. Of the problems that exist in Gerehu General Hospital, the author is interested in raising the title of the research **"GEREHU GENERAL HOSPITAL AUTOMATED PATHOLOGY LAB REPORTING SYSTEM".**

This research has similarities and differences with previous researches with the same theme, the similarity of this research with research conducted by Jennifer Furtado [1] entitled "Utilization of synoptic reporting in Vancouver Island Health Authority (VIHA) and the effect on quality and processes of pathology reporting", that is the same as developing an improved process of pathology reporting, while the similarity between this research and the research conducted by Ruban Monu [2] entitled "Design and implementation of a basic laboratory information system for resource limited settings", that is that is the same as developing a web-based laboratory information system. Whereas the difference between this research and the research carried out by Jennifer Furtado [1] that is using synoptic reporting approach. Whereas the difference between this study and the research conducted by Ruban Monu [2] that is the functions of the system are more broader.

The purpose of this study is to find out the problems or obstacles in the pathology lab reporting system that runs on Gerehu General Hospital, To design a web-based pathology lab reporting system at Gerehu General Hospital, To test the web-based pathology lab reporting system at Gerehu General Hospital, To implement a web-based pathology lab reporting system at Gerehu General Hospital.

II. LITERATURE REVIEW

A. Understanding System

The system is a collection of elements that interact with one another to carry out a process to achieve a specific goal [3].

B. Understanding Information

Information is a collection of data that has been processed into a useful form for the recipient [4].

C. Definition of Reporting

An account or statement describing in detail an event, situation, or the like, usually as the result of observation, inquiry, etc.

D. Definition of Pathology Lab Reporting System

Pathology Lab Reporting System is a module that can be used to enter patient's details before and after conducting the test, give test reports to the patient, and provides efficient management of pathology lab test records.

III. RESEARCH METHODS

The research method used by the writer in conducting this research is using descriptive qualitative method, the writer uses this method because the author makes a systematic description of the phenomena that occur in the object of research.

Data collection methods are carried out by direct observation on Gerehu General Hospital and a phone interview with the staff of Gerehu General Hospital to obtain primary data. While secondary data, the authors collects documents relating to the pathology lab reporting system that is running.

The systems approach method the researcher used in the research is the Object-Oriented System Approach and is visualized with UML (Unified Modeling Language) diagrams as follows: Use Case Diagram, Activity Diagrams, Sequence Diagrams, Class Diagram, Collaboration Diagrams and Development Diagrams.

IV. RESULTS AND DISCUSSION

A. System Design

The system to be developed in this study will be the on-site Automated Pathology Lab Reporting System of the Gerehu General Hospital in Port Moresby, Papua New Guinea. The system will assist the ongoing pathology laboratory operation including the hospital management, administration and the hospital staff working on this system of serving the patients laboratory test process.

B. System Design Objectives

The purpose of the design of this system is to facilitate the patients and staff process the pathology procedures. The patient can have access at any time while being on-site at the hospital to check their account on their laboratory test results. The operator only receives the laboratory test information and does a report of the information on the system and the report copy is automatically saved on the system's database.

C. Overview of the Proposed System

The proposed on-site pathology lab reporting system of Gerehu General Hospital will contain client-server concept. The web-server serves an interface in the form of web pages to the users. The firewall acts as a barrier control between incoming and outgoing network traffic from web server client. The application will be installed and run on XAMPP server and can be accessed by the user or client through a web browser via intranet connection.
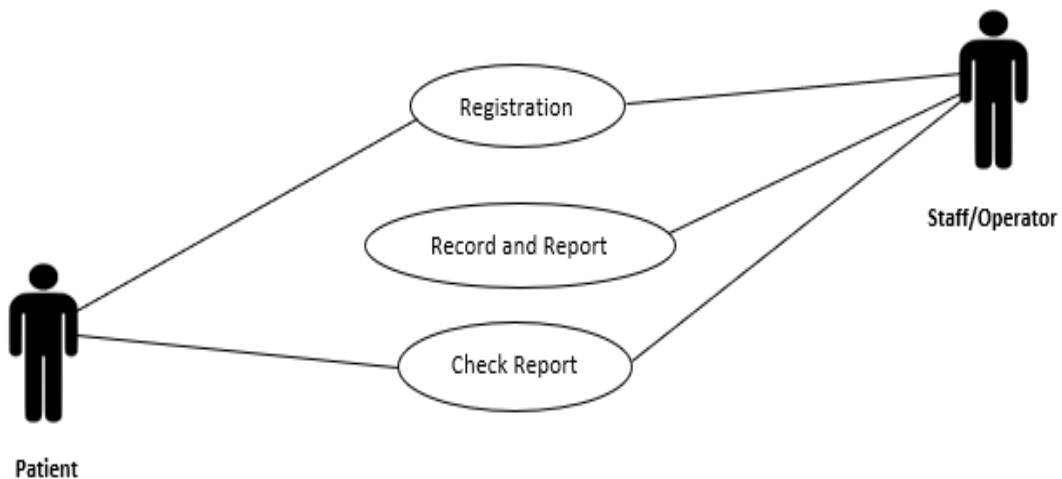

Figure 1. Use case diagram of proposed system

1. **Software Implementation**
   Server:
   a. Windows 10 operating system.
   b. XAMPP 1.8.1 as a host server and for local database storage.
   c. Sublime Text, or notepad++ for coding the PHP program.
   d. Mozilla Firefox 11/ Google chrome as a browser for running the system.

   Client:
   a. Windows 10 operating system.
   b. Mozilla Firefox 11/ Google chrome as a browser for running the system.

2. **Hardware Implementation**
   Server:
   a. Processor: Intel Quad core 2GHz+ CPU
   b. Memory: 12GB RAM
   c. Hard drive: 2TB Seagate HDD
   d. VGA: Intel (R) HD Graphics
   e. Monitor: 15" Advance

   Client:
   a. Processor: Intel Quad core 2GHz+ CPU
   b. Memory: 8GB RAM
   c. Hard drive: 500GB Seagate HDD
   d. VGA: Intel (R) HD Graphics
   e. Monitor: 15" Advance

3. **Interface Implementation**
   The following is the interface of the web-based pathology lab reporting system proposed at Gerehu General Hospital:
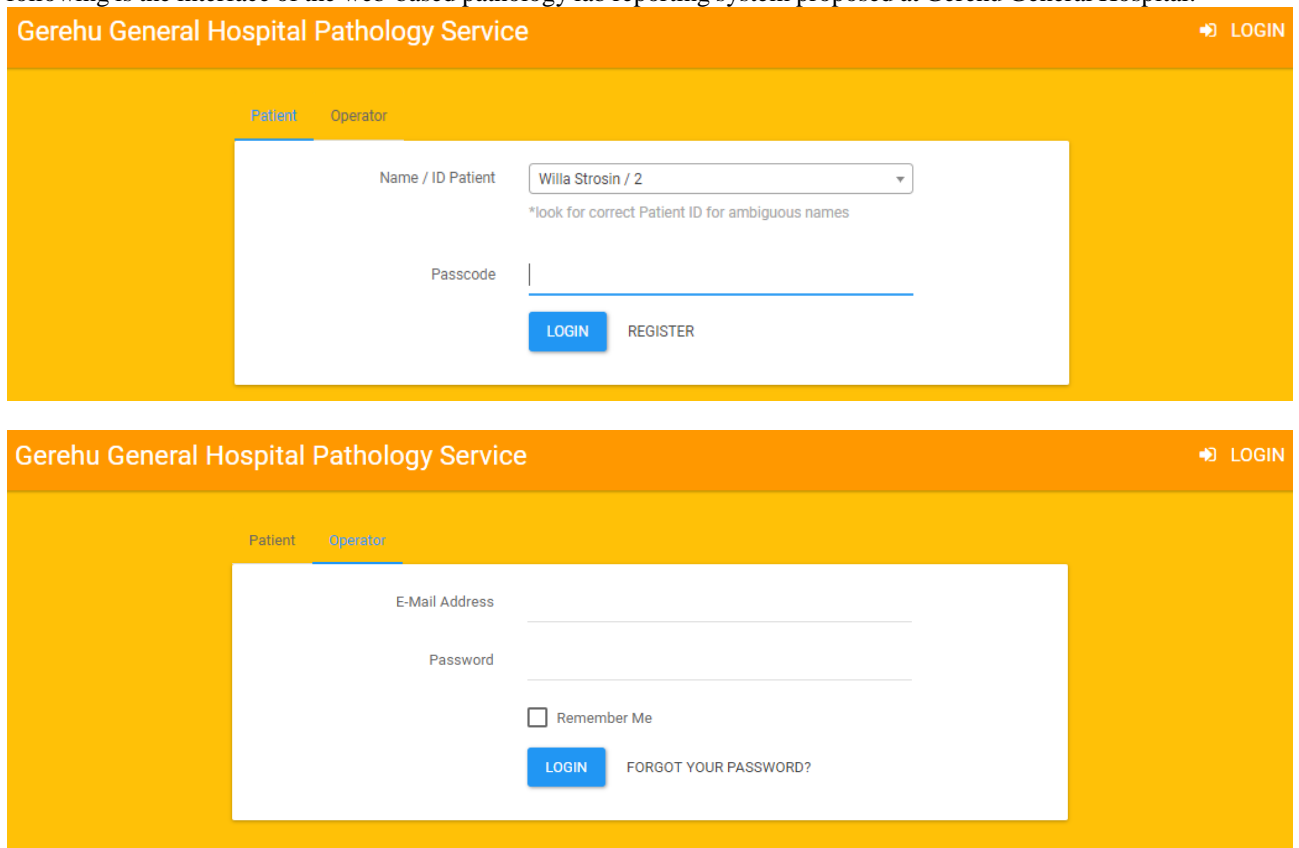
Figure 2. Login Pages

V. CONCLUSIONS AND SUGGESTIONS

Conclusions

The conclusion of this research titled "Gerehu General Hospital pathology lab reporting system" is as follows;

1. The web-based application can manage the patient laboratory testing activities by registering the patient into the system, compiling laboratory test results, viewing reports and forwarding reports to their email accounts making laboratory reporting more efficient on site.

2. This web-based pathology lab reporting application can manage sending patients' lab test report automatically to the patients account and email within the pathology lab system. From just easily accessing the pathology lab reporting system and entering the test details into the report form and saving or sending it.

3. This application is an automated system that keeps record of the patients' pathology lab reports. The patient will be always be up to date by checking their lab test reports in this web-based application. Information of the patients' lab test results will be uploaded/updated by the pathology operator and staff to keep the patient updated and monitored. This will help manage the pathology lab reporting in an effective and efficient manner.

Suggestions

This Gerehu General Hospital Pathology Lab Reporting System will have more improvement into it. Thus, it is reviewable and open to further development by contributing innovations to increase its features and functions in the existing software program. These are some suggestions of the features and functions that can be added into this application.

Academic Uses

1. **Institutions**

This research paper is openly usable and referenced journal for the future students which will work on similar projects.

2. **For Other Researchers**

The determination of this research is mostly possible for the future researchers whom wish to further their knowledge in the study of information system or pathology reporting systems.

Practical Uses

This development of the automated pathology lab reporting system will be operated by Gerehu General Hospital to improve the pathology lab test reporting system in a more effective and efficient way to make it easier for the hospital to manage and satisfy their customers/patients and is a better pathology lab reporting system for the hospital management in decision making. To an extent, this automated pathology lab reporting system can also be proposed to the other healthcare institutions which have similar issues as Gerehu General Hospital. To join with other small clinics or community health centers to create a conducive environment for their pathology services.

Others

1. To develop the system into an online system so that patients who are already registered in the system can book their queue number a day prior to the day they wish to take or retake a lab test. Also, the operators can be able to compile reports outside work hours to cut down on their workload of creating or updating patient reports.

2. To have a mobile app for the patients to use from their smartphones and tablets. The mobile will be downloaded from the Google play store or Apple app store.

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