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AND TECHNOLOGY

Regional Centre of Excellence in Biomedical Engineering and e-Health (CEBE)

**DEVELOPMENT OF WEB BASED PATIENTS TRANSFER MANAGEMENT SYSTEM
IN RWANDA HOSPITALS**

By:

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A Dissertation Submitted to the Regional Centre of Excellence in Biomedical Engineering and e-Health (CEBE), University of Rwanda as partial fulfilment of the requirements for the Master's Degree in Biomedical Engineering.

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DECLARATION

I, KANYARWANDA Daniel, declare that this dissertation entitled “**Development of Web based patients transfer management system in Rwanda Hospitals**” is my original work based on research and prototype and has not been submitted for any other degree or professional qualification.

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Date: 30th July 2024



Regional Centre of Excellence in Biomedical Engineering and e-Health (CEBE)

CERTIFICATE

This is to certify that the project entitled “**Development of Web based patients transfer management system in Rwanda Hospitals**” is a record of original work done by KANYARWANDA Daniel with Reference number:215028607, a MSc. Degree student in Biomedical Engineering. This work has been submitted under the guidance of Dr. Kizito Nkurikiyeyezu

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ABSTRACT

The implementation of e-Health is one of the key pillars in strengthening health care systems in Rwanda. Among different forms of e Health systems, HMIS, OpenClinic and OpenMRS has been adapted by MoH to help in management of hospital in great effective and efficient manner. However, from the time of their deployment the issue of appropriate patients transfer is still challenge. This study aims to” Development of Web-based Patient Transfer Management System in Rwanda Hospitals" to address the pressing challenges faced by healthcare facilities in Rwanda, particularly the issues of long queues, extended appointment wait times, time-consuming processes, and increased expenses for patients. Through, patients transfer management system, the Doctor at health center can transfer patient to the hospital, therefore, it is done by filling the form appeared on health center portal. Moreover, the system gives patient or client a space to views the result taken by doctor by logs in on patients portal as well as he/she views and follow up the status the transfer in the appointment history. The referral hospital’s doctor approves the transfer received from health center and provides a response to the confirm his/her availability and Time to meet with patient. The Developed system was designed and works successfully at its expectation. it provide information on doctor availability, enables efficient appointment scheduling ensuring that patients are promptly matched with the right doctors based on their medical needs. Hence, the system improves the patient's chances of quick recovery and well-being.

Key Words: e-Health, Patient Transfer Management, healthcare facilities and medical record system

LIST OF ACRONYMS

HMIS: Hospital Management Information System

EMR: Electronic Medical Records

HF: Health facility

FOSS: Free Open Source Software

ICT: Information communication Technology

MoH: Ministry of Health

PIH: Partners In Health

TB: Tuberculosis

WHO: World Health Organization

LMICs: Low- and Middle-Income Countries

HIV: Human Immunodeficiency Virus

AIDS: Acquisition Immune Deficiency Syndrome

EHRs: Electronic Health Record System

HTML: Hyper Text Markup Language

PHP: Hyper pre processor

CSS: Cascading Style Sheet

SQL: Structured Queries Language

JS: Java Script

JSON: Java Script Object Notation

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CHAPTER 1. GENERAL INTRODUCTION

1.1 Background of study

Electronic Medical Records (EMR), as a health information technology innovation, has been perceived to improve efficiency and increase the effectiveness of health care delivery[1]. To adopt an EMR, many hospitals are actively converting from a paper-based work environment to a paperless electronic record, thus transforming the health information management (HIM) resources[1]. The primary purpose of an EMR system is to support a high-quality effective integrated health care information system, which is independent of the place and time of health care delivery through Information communication technology[2]. The introduction of EMR in the primary health care delivery system has enhanced care quality, increased safety, improved efficiency, and augmented the capacity to conduct research. Universality of an EMR allows ease in terms of compliance for chart requests, improves external and intra-office communication, and ensures a higher quality of documentation[2].The EMR provides built-in protocols, improves medication management, increases comprehensive patient education, and brings together compilation of automated reports and data analysis, which does improve health care delivery[3]. The EMR allows “greater and more seamless flow of information within a digital health care infrastructure, created by electronic health records (EHRs), encompasses and leverages digital progress, and can transform the way care is delivered and compensated”[4]. Within Africa, 15 resource poor countries have implemented an EMR. Initially instituted as a pilot program to a more comprehensive implementation phase, findings demonstrated considerable advantages over a paper based system. These advantages included enhancement of healthcare delivery, facilitation of decision-making process, increased accuracy of medication lists, legible notes and prescriptions and immediately available charts[5].

The Rwandan Ministry of Health introduced an EMR system known as “OpenClinic” and “OpenMRS” in many public health facilities[4].These EMR systems are intended to support the country’s vision enhanced Information Technology communication (ICT)in health care delivery. The new EMR will provide a highly effective, reliable, secure, and innovative information system supporting clinical management decisions at the bedside level as defined by the Health Sector Strategic Plan. The Rwandan health system has reached a pivotal stage of development and implementation of an EMR systems to increase utilization countrywide[4]. OpenClinic EMR developed in 1990, and has been utilized in 20 hospitals and medical clinics in Rwanda since 2007. OpenClinic,a fully-integrated hospital information system, replacing all paper based

systems and archiving of patient records. Openclinic is based on a multi-tiered network design and the software is capable of servicing several thousand patients. The OpenClinic software system covers numerous different aspects of care delivery and planning within hospitals. Areas supported include patient admissions, medical records, medication administration, clinical data repository, statistical analysis, test results, pharmacy and hospital supply management, order communication, and financial management records [6]. Since the implementation of the EMR in Rwanda it has not been using in patient transfer management system. Therefore, this research project came up with "Development of Web-based Patient Transfer Management System in Rwanda Hospitals"

1.2 Problem statement

The transfer of patients from one hospital to another, particularly to more advanced or specialized healthcare facilities, is a critical aspect of modern medical care. Hospitals make these transfers with the primary goal of ensuring that patients receive the highest level of specialized care and expertise available for their specific medical conditions. Advanced hospitals often have cutting-edge technology, highly skilled medical professionals, and a broader range of medical specialties and resources, making them better equipped to diagnose, treat, and manage complex or rare illnesses. These transfers are typically initiated when the patient's current healthcare facility lacks the necessary resources, technology, or medical expertise to provide optimal care. Whether it's for advanced surgeries, specialized treatments, access to specific medical specialists, or the availability of crucial medical equipment.

Currently, the existing patient transfer process in Rwanda's hospitals is often manual and paper-based which is time-consuming processes leading to delays and errors in transferring patients from one hospital to another. In addition, this manual system is inaccurate due to the reason of issuing Transfer without knowing exact schedule or availability of doctor who will be in charge to care the patient. This will result the delays in receiving medical attention, long que at hospital as well as severe consequences for patients in need of urgent care. Therefore, it is that back ground that push me to come up with "Development of Web based patients transfer management system in Rwanda Hospitals " to solve a multitude of critical challenges demonstrated by existing system. This system is able to provide information on doctor availability, schedules, and expertise. It enables efficient appointment scheduling ensuring that patients are promptly matched with the right doctors based on their medical needs. Hence, the system improves the patient's chances of quick recovery and well-being.

1.3 Research Questions

1. What are the specific needs of Rwanda hospitals regarding patient transfer management?
2. What features are essential for a web-based system to facilitate efficient patient transfers in Rwanda?
3. What challenges may arise in implementing such a system in Rwanda hospitals, and how can they be overcome?

1.4 Objectives

1.4.1 General Objective

The "Development of Web-based Patients transfer management system in Rwanda Hospitals" aims to build an integrated digital platform that can provide information on doctor availability, schedules, and expertise. It also facilitates efficient appointment scheduling, guaranteeing that patients are quickly matched with the appropriate doctors based on their medical needs. The project addresses the current challenges of inefficiencies in the patient transfer process within Rwanda's healthcare facilities.

1.4.2 Specific Objectives

- To digitize patient transfer process between different health facilities
- To create a patient portal that enabling him/her to track the status of his/her transfer.
- To develop interoperability system between health care facilities to allow one to respond transfer requested by other through digital online platform.
- To provide notification on transfer status and appointment date
- To host the developed system on cloud to be accessed by every one

1.5 Study Scope

This project's scope is limited to development of web-based patient transfer management system using High level programming language such as PHP, Bootstrap, JavaScript and CSS. The system will be hosted on cloud to be accessible all over the world.

1.6 Significance of the Study

The key Significances which are envisioned through a comprehensive patient transfer management system are:

- Enhanced healthcare service availability and access;

- Improved healthcare quality, safety and outcomes;
- Increased service efficiency, productivity and cost effectiveness that satisfies citizens, patients and providers;
- Provision of evidence-based information required to make appropriate, timely and informed clinical decisions concerning patient care;
- Provision of more comprehensive reports that enable better informed decisions in health service planning.

1.7 Organization

This project is subdivided in 5 main chapters and each chapter has also its subchapters.

Chapter one (General Introduction): which contains background of the study, problem statement, research questions, objectives, Scope of project, significance of the study and subdivision of the project.

The second chapter, the "Literature Review," summarizes earlier research on this topic that was either similar to or related to it in other nations, continents, or areas.

Chapter three (Research Methodology): this part shows in the details the way the study was conducted, it includes the study area, Research design, Research instrument, system requirement and system architecture.

The fourth chapter, "Results and Discussion," in this chapter the acquired results will be presented together with their implications.

The final chapter, "Conclusion and Recommendation," identifies areas that require improvement and encouragement, such as conducting additional research. It also offers recommendations for how to best apply the results of the current study.

1.8 Summary

Chapter One of this study establishes the context by outlining the problem statement, the study's goals, its importance, and its extent. It talks about how Rwandan hospitals are now having trouble effectively handling patient transfers and how a modernized system is required to solve these problems. The thorough knowledge of the issues with patient transfer management that currently exist and the expectation of how the suggested web-based system will handle these difficulties provide the drive to move on to the next chapter. This chapter establishes a strong framework for the remainder of the research and piques readers' interest in the conclusions, solutions, and results presented in the following chapters.

CHAPTER 2. RELATED LITERATURE

2.1. Over view on eHealth in Rwandan Hospitals.

In recent years, the adoption of eHealth in Rwandan hospitals has emerged as a transformative force, revolutionizing healthcare delivery and management. The implementation of eHealth solutions has streamlined administrative processes, enhanced patient care, and facilitated efficient communication among healthcare professionals. Rwanda's commitment to building a robust health information infrastructure is evident in initiatives like the Rwanda Health Information Exchange (RHIE), which promotes interoperability among healthcare systems[4]. Additionally, the deployment of electronic medical records (EMRs) has improved the accuracy and accessibility of patient information. While the progress in eHealth adoption is commendable, challenges persist, including the need for ongoing infrastructure development, workforce training, and ensuring data security and privacy. Nevertheless, the overall impact of eHealth in Rwandan hospitals underscores its potential to further advance healthcare outcomes and contribute to the country's broader health system goals[7].

According to Dr. Richard Gakuba, the national e-health coordinator at MoH, the ministry has identified e-health as one of the fundamental pillars in strengthening health care systems. “.

Investment is still required because this technology is expensive and there are still infrastructure issues. Hospital information management system(HIMS) is one type of e-health system adopted by MoH to help in management of hospital in great efficiency manner [7][4].

The following functions will be supported by an integrated Hospital Management Information System that all referral hospitals will have, according to MoH plans. District hospitals will have a choice of these functions based on their size and services provided[8].

Additionally, MoH anticipates that this HMIS will save costs by preventing duplicative or unnecessary diagnostic or therapeutic procedures, by improving communication across healthcare facilities, and by involving patients. Other goals of eHealth include: lowering errors, lowering or eliminating falsifications, lowering the amount of labor needed, and directing towards "best known practice"[9].

In developing countries due to low income generation; free open source software (FOSS) are mostly chosen for Hospital Information Management. OpenClinic and OpenMRS are commonly used in different hospitals and are both Free open Source [10]

2.2. OPEN SOURCE SOFTWARE IN HOSPITAL INFORMATION MANAGEMENT

The term FOSS covers a series of software applications that share a number of significant features, such as the ability to run the program for any purpose, the freedom to examine its operation and modify it to suit one's needs, the ability to redistribute copies of the program, and the freedom to alter or improve it and make the changes publicly available[10]. Furthermore, open source software (OSS) is characterized by being free (downloading the software is cost-free), open (anyone can read the source code and modify it), and collaborative, meaning that the strength of OSS stems from the fact that those who enhance or modify it share the results with other members of the opensource community[11][7].

Since 2006, Rwandan hospitals have been using the open source OpenMRS and OpenClinic eHealth technologies. The benefits of FOSS are that due to there are no license fees associated with open source software, it is less expensive than proprietary software.

Another significant benefit of FOSS is its flexibility to adapt its publicly available source code to local functional, cultural, organizational, or language-related requirements.

According to [12]allowing developers to freely experiment with open source software will promote a local ICT software and services economy by helping to create local technological skills for a marginal cost, or even for free.

2.2.1. OPENMRS

OpenMRS is an open-source software platform for building EHRs, with a focus on health care needs in low- and middle-income countries (LMICs). Founded in 2004, the OpenMRS community set goals to create a public software platform to assist health care organizations worldwide in developing EHR systems that were adaptable to local needs, owned by local organizations, and programmed by local developers as much as possible[13]. Initially, OpenMRS was used for HIV and TB treatment in outpatient settings, supporting projects funded by the US President's Emergency Plan for AIDS Relief and the Global Fund for AIDS, Tuberculosis, and Malaria. Currently, it covers a wide range of clinical areas. Partners In Health implemented and currently supports OpenMRS in 46 health centers and 3 hospitals in Rwanda covering HIV care, pediatrics, primary care, cardiology, and oncology. Between 2009 and 2013, the Rwanda MoH

deployed OpenMRS to >300 health centers providing HIV care throughout the country [7][4]. Before and during deployment, OpenMRS had to be customized to support the Rwanda MoH requirements. A dedicated 9-month course led by Partners In Health/Inshuti Mu Buzima trained programmers in enterprise Java and health information system design [4][7]. Several graduates were hired by the MoH and created custom OpenMRS modules for HIV and primary care using OpenMRS version 1.6 core code. This is the version of OpenMRS used in the control sites for this study. Unstable internet connectivity in rural Rwanda (similar to many low-income countries) required each site to run its own instance on a local server, requiring stable power and local technical support[14].

2.2.2. OPENCLINIC

Open Clinic is an open-source software platform designed to streamline and enhance the management of healthcare facilities and clinics. With a focus on efficiency and accessibility, Open Clinic offers a range of features to support various aspects of healthcare administration. It facilitates the systematic management of patient information, including electronic health records and demographic details. Open Clinic also incorporates billing and invoicing functionalities, ensuring smooth financial transactions within the healthcare facility. Additionally, the software assists in prescription management, providing a digital solution for generating and tracking medication orders. Through reporting and analytics tools, healthcare administrators can gain valuable insights into patient outcomes and resource utilization. With user access control, Open Clinic ensures that different healthcare professionals have appropriate access levels based on their roles. The platform's open-source nature allows for customization to suit the specific needs of healthcare institutions, contributing to a more adaptable and tailored solution for diverse healthcare settings[15].

OpenClinic in Rwanda

Implementation of OpenClinic tools started at Kigali University teaching Hospital in 2007. Funding was provided by Belgian Technical cooperation aiming in rehabilitation of this Hospital after 1994 Genocide , early the BTC decided to fund OpenClinic. Implementation in Districts Hospital Nyamata and Rutongo then come Muhima and Kibagabaga Hospitals. After the Luxemburg development agency (Lux Development) agreed on funding similar implementation in Rwamagana District Hospital. The OpenClinic Tools also has been implemented at Gihundwe and Ndera Neuro-psychiatric Hospitals under support of Rwandan Diaspora and MIDA-funding[13]. Also different private hospital decide to implement the OpenClinic in their

Hospital, those are Carrefour, Bien Naître, La Medicale, BMC, Croix du Sud. There is a study done in three Hospital using OpenClinic in Rwanda; Kigali University Teaching Hospital (KUTH), Neuro-psychiatric hospital Caraës-Ndera (NPH-CN) and Gihundwe district hospital (GDH)[14]. These projects aimed to empower hospital staff in collecting and analyzing hospital information by using OpenClinic, an open source hospital information management system the results show that routine OpenClinic utilization increased by 20% (from 36.0% to 56.3%) at CHUK between 2010 and 2012 and skills levels increased significantly in admission (+9.2%) and laboratory (+10.0%) departments where the training programs were run. The results obtained from the hospitals of Gihundwe and Ndera showed that the 2 hospitals almost doubled their income one year after implementation and indicators like case load, encounter load and numbers of provided health care deliveries continue to increase linearly, demonstrating the continuity of OpenClinic utilization [16][8]

The major functional categories founded in OpenClinic tools are[17]:

- Patient identification: (Patient ID): this module concerns a master patient index; patient identification badge. This is the scope in all sites of implementation.
- Admission Discharge and Transfert module (ADT), take care of all administrative information related to outpatient visits and in patients admission.
- Financial management: this category covers module such as administration and encoding, patient and insurer invoice, payment administration and account receivable follow up and interfacing with third part accounting solutions and provision of financial fraud detection.
- Reason for encounter (RFE): registration of ICPC-2 coded patients reason for coming to the HF.
- Diagnostic: ICD-10, ICPR-2 and DSM-4 based clinical information classification for coding of patients diagnosis.
- Outcome: give simple semi quantitative scale: recovery, improvement, deterioration death, unknown and escaped.
- Clinical content: OpenClinic toolkit to replace paper based system
- Lab: Full laboratory information management system exploiting full traceability and support for work-list functionality.

- Reporting: it include Internal reporting, External reporting and Global Health Barometer (full automatic health and performance indicator).
- Other modules from the above should be added according to the need of HF

CHAPTER 3. RESEARCH METHODOLOGY

3.1. Data collection

The primary stage of development of patients transfers management system is data gathering. This includes the selection of where the study will be conducted and know the existing ehealth technologies in that health facilities. The data were obtained by visiting the selected health facilities and by reading the literatures of different authors related to ehealth technologies.

3.1.1. Types of Data Collected and their relevance in answering the research question

➤ Current Patient Transfer Procedures

- Knowing of existing protocols and workflows for patient transfers between hospitals.
- Average time taken for transfer's process

➤ Challenges and Bottlenecks

- Surveys or interviews with healthcare professionals to identify common challenges and inefficiencies in the current system.
- Data on delays, miscommunications, and errors that occur during the transfer process.

➤ Patient Data

- Patient demographics, medical histories, and types of transfers commonly needed.
- Sensitivity and privacy requirements for patient data.

➤ Stakeholder Requirements:

- Feedback from doctors, nurses, administrative staff, and patients regarding their needs and expectations for a new system.
- Legal and regulatory requirements for patient data management and transfer.

▪ Relevance of the Data

Each type of data collected is relevant to different aspects of the research question

➤ Current Procedures and Challenges

- Understanding the existing process and identifying pain points is crucial for designing a system that addresses real-world issues.

➤ Technical Infrastructure

- Ensuring compatibility and feasibility of the web-based system with the current technical capabilities of hospitals.

➤ **Patient Data and Privacy**

- Ensuring that the system can handle sensitive patient data securely

➤ **Stakeholder Requirements**

- Aligning the system's features with the needs and expectations of its users will ensure higher adoption and usability.

3.2. Study area description

The study was conducted within health facilities in which this system is firstly implanted as a case study. These health facilities are Gishari health center, Rwamagana health center and Rwamagana Hospitals. Gishari and Rwamagana health centers were taken as reference among of health centers that used to transfer patients at Rwamagana Hospital.

Gishari Health center is located in Gishari sector, Rwamagana District, Eastern province while Rwamagana health center and Rwamagana Hospital located in Kigabiro sector, Rwamagana District, Eastern Province.

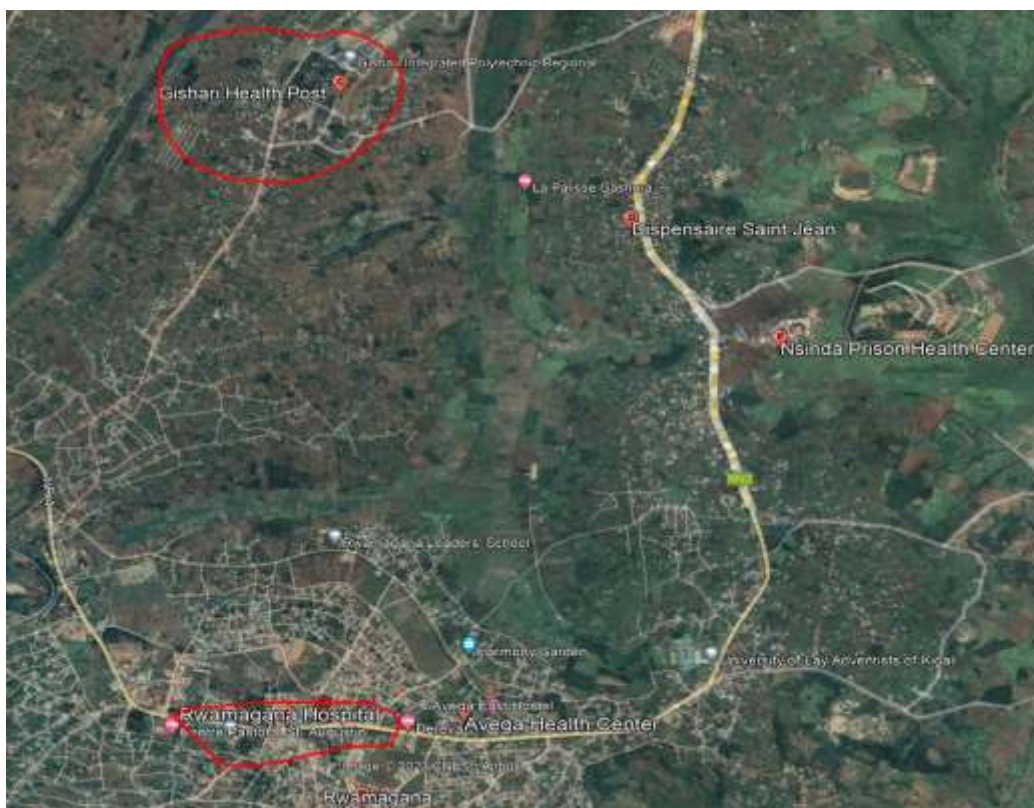


Figure 1:Geographical location of Gishari and Rwamagana Health facilities.

3.3 Research Technologies and Tools

The patient transfer management system is website based system developed using four high level programming languages: JAVA SCRIPT, MYSQL, PHP and CSS comes in form of boot strap for easing the coding via link.

3.3.1 PHP

PHP is a server-side scripting language, meaning that scripts are executed by servers. After that, the server routes requests, offers data upon request, and arranges the data in a database.

After processing a script request, a web server delivers HTML-formatted output to a web browser. To prevent unauthorized users from accessing the data and source code, the information is stored in a web server database. Users can access databases and do tasks like personalizing a website and dynamically changing its content with scripts. In order to create web apps, users also frequently utilize scripting languages.

PHP syntax:

The term "escaping to PHP" refers to the process of separating standard HTML from PHP code. This can be accomplished in a number of methods. A few techniques are already configured by default; however, we must modify the php.ini file's configuration in order to use some additional methods, such as Short-open or ASP-style tags. PHP can also be embedded into HTML using these tags. For this use, four such tags are available.

The script starts with `<?php` and ends with `?>`. These tags are also called 'Canonical PHP tags'. Everything outside of a pair of opening and closing tags is ignored by the PHP parser. The open and closing tags are called delimiters. Every PHP command ends with a semi-colon (;).

3.3.2 MYSQL

Structured query language (SQL) serves as the foundation for MySQL, a relational database management system (RDBMS) created by Oracle. An organized collection of data is called a **database**. A simple grocery list, an image gallery, or a location to store the enormous volumes of data on a corporate network could all be examples of what it is. A relational database, specifically, is a digital repository that gathers information and arranges it using the relational paradigm. Tables in this model are made up of rows and columns, and the relationships between the various data pieces adhere to a rigid logic. To put it simply, an RDBMS is the collection of software tools needed to create, administer, and query a database. Within this project called

patient transfer management system, three types of commands were used to run the data: Data Definition Language, Data Manipulation language and Data Control Language.

- **Data Definition Language:** commands are used to define the structure of a database. These commands include CREATE, ALTER, and DROP; **CREATE command** is used to create a new database or table., **ALTER. Command** is used to modify an existing database or table, and DROP command is used to delete a database or table.
- **Data Manipulation language:** are used to manipulate data in a database. These commands include **SELECT, INSERT, UPDATE, and DELETE.** **SELECT** is used to select data from a database, **INSERT** is used to insert data into a database, **UPDATE** is used to update data in a database, and **DELETE** is used to delete data from a database.
- **Data Control Language:** are used to control access to data in a database. These commands include **GRANT and REVOKE.** **GRANT** is used to give users permissions to access data in a database, and **REVOKE** is used to remove permissions from users to access data in a database.

3.3.3 BOOTSTRAP

Bootstrap is a free and open-source web development framework. Its purpose is to make the process of developing mobile-first, responsive websites easier by offering a set of template designs' syntax. Stated differently, Bootstrap makes it easier for web developers to create websites more quickly by relieving them of the burden of learning basic commands and functionalities. It is made up of scripts based on HTML, CSS, and JS for different aspects and features of web design.

Bootstrap was used to create a responsive website through linking and utilizes I frame to create dashboard. It is used in line with java scripts combined to create better viewer of the website. Bootstrap contained a toolkit helped to create a fronted end viewer within short time. The hereunder are the step followed during the website site design;

Step1: A file called **“index.html “as a root.** Include the `<meta name="viewport">` tag as well for proper responsive behavior in mobile devices.

```
<!doctype html>
<html lang="en">
<head>
  <meta charset="utf-8">
  <meta name="viewport" content="width=device-width, initial-scale=1">
  <title>Bootstrap demo</title>
```

```

</head>
<body>
  <h1>Patient Transfer Management system </h1>
</body>
</html>

```

Step2: Add Bootstrap's CSS and JS. Place the <link> tag in the <head> for our CSS, and the <script> tag for our JavaScript bundle (including Popper for positioning dropdowns, poppers, and tooltips) before the closing </body>.

```

<!doctype html>
<html lang="en">
  <head>
    <meta charset="utf-8">
    <meta name="viewport" content="width=device-width, initial-scale=1">
    <title>Bootstrap demo</title>
    <link href="https://cdn.jsdelivr.net/npm/bootstrap@5.3.3/dist/css/bootstrap.min.css"
rel="stylesheet" integrity="sha384-
QWTKZyjpPEjISv5WaRU9OFeRpok6YctnYmDr5pNlyT2bRjXh0JMhY6hW+ALEwIH"
crossorigin="anonymous">
  </head>
  <body>
    <h1>Hello, world!</h1>
    <script src="https://cdn.jsdelivr.net/npm/bootstrap@5.3.3/dist/js/bootstrap.bundle.min.js"
integrity="sha384-
YvpcrYf0tY3lHB60NNkmXc5s9fDVZLESaAA55NDzOxhy9GkcIdslK1eN7N6jIeHz"
crossorigin="anonymous"></script>
  </body>
</html>

```

3.3.4 JAVA SCRIPTS

JavaScript is a scripting or programming language that allows you to implement complex features on web pages every time a web page does more than just sit there and display static information for you to look at displaying timely content updates, interactive maps, animated 2D/3D graphics, scrolling video jukeboxes.

Java script syntax:

// How to create variables:

```
var x;
```

```
let y;
```

// How to use variables:

```
x = 5;
```

```
y = 6;
```

```
let z = x + y;
```

3.4 Research instruments

3.4.1 Observation

This method was used in time of collecting the information from the health center where by the sheet filled in time the doctor transferred a patient to referral hospital. The existing sheet was made by patients address, consultation results, Name of hospital to whom is transferred, types of Drugs on health center level and the Doctor or Nurse name who conduct the check up for patients

3.4.2 Documentation

Documentation was used particularly in time of developing the websites where by it is done especially in time scripting the code that run the system. Here the written text, illustrations or video that describe the tooltips used to make the website to be responsive and productive were used especially for the use of Bootstrap. Infact, software documentation is a critical process in the overall development process of the patient transfer management system. Moreover, the documentation of writing the thesis through out, the reading of different paper relates this project.

3.5. System Requirements

The Development of Web based patients transfer management system in Rwanda Hospitals will be a fully website system that will be developed using high level languages programming such as

CHAPTER 4. THE PROJECT RESULTS AND DISCUSSION

4.1 Introduction

Chapter four describes the result obtained from the web design called **patient transfer management system**. The results were taken through xampp server software to run the data bases of the system and, therefore, Database was created in xampp using PHP my admin. Moreover, the system was designed using MYSQL, HTML, CSS and PHP high level programming language with Java scripts. MYSQL is used to create table and run it in xampp server, therefore, the admin table is the main table used to insert and display other tables using PHP. Insertion of data in web tables was done using database name, password and server name that run the machine, Though, the information display was also done using PHP as well. Moreover, the HTML was used to mark up the web pages of the websites.

4.2 Description of Data base tables

4.2.1. Admin table

The admin table was created using MYSQL language where by this table with four containing columns :id, username, password and updation time . these columns were created using the following MYSQL code:`{INSERT INTO `admin`(`id`, `username`, `password`, `updationDate`) VALUES ('[value-1]','[value-2]','[value-3]','[value-4]')}`. The aforementioned MYSQL code executes the table below when it run in xampp server. The admin table helps the system administrator to manage all portal of the system websites through logging in on his portal , briefly, the admin has right to add health center, and manages all information of the entire system.

▼	id	username	password	updationDate
delete	1	kanyarwanda	123456	

Figure 3:Admin table

The admin portal home page viewer was created using login form containing the username and password to get in admin portal.

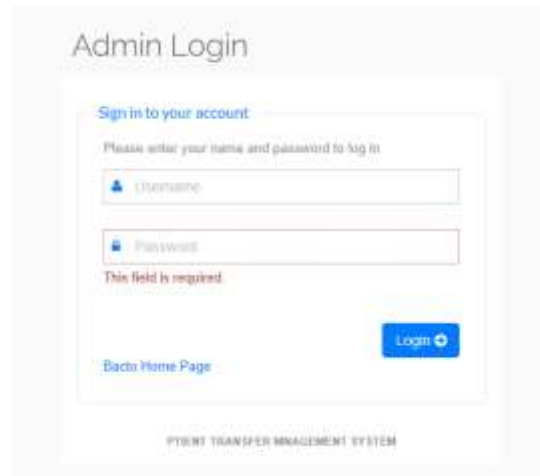


Figure 4 Admin login form

The admin needs to login on his/ her portal by entering the credentials saved in admin table in XAMPP and thereby, the admin has a right to add health center and view the consultation from different health center being transferred at the referral hospital. In admin portal, the system is made by side navigation bar and Dashboard. The side navigation bar was: dashboard, Doctors, Users, patients, Appointment History, Contactus Queries, Doctor session Logs, Reports, Pages and Patient search. Admin manages the all information appeared on this navigation bar as it appeared on this dashboard. Means that the admin would access the information either through dash board or through the side navigation menus.

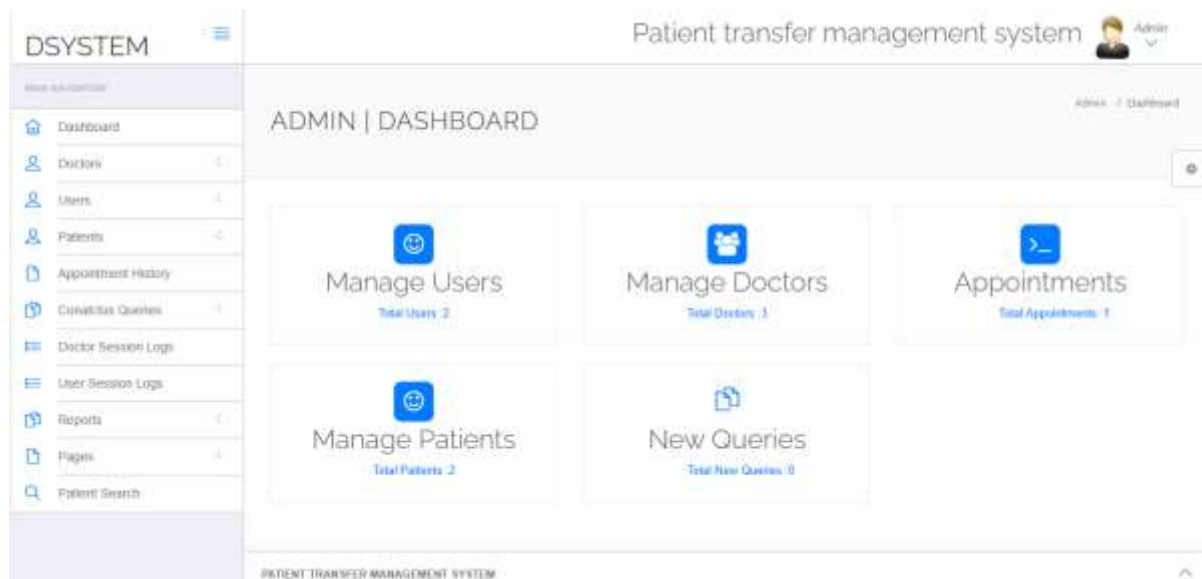


Figure 5 Admin portal side

The admin manages the doctors, means that admin manages Doctor area of specialization, and add their address. The add admin adds the doctor with following information: name of the

doctor, health center's name, Doctor email and password. All those information are filled in form created at side navigation bar called add Doctor.

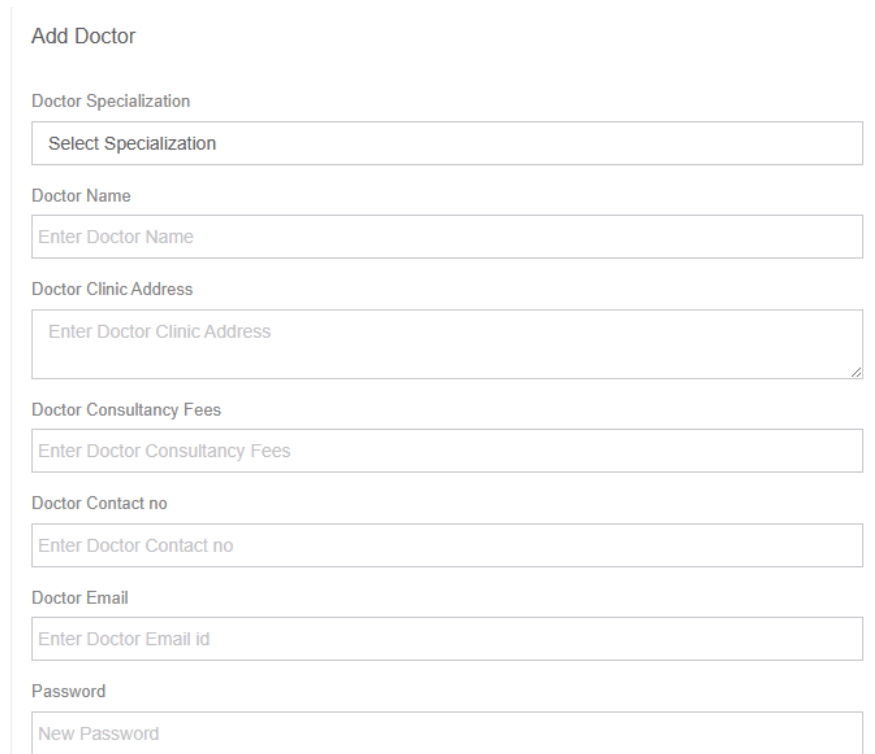


Figure 6 Add Doctor form

Admin has right to view the list of the doctors at health centers as well as at the referral hospital.



#	Specialization	Doctor Name	Creation Date	Action
1.	Dentist	KWIZERA FIDDELE	2024-02-16 11:32:57	 
2.	Neulmrogy	karahanyuze	2024-02-16 13:09:48	 
3.	NURSESIST	EMILE	2024-02-17 10:37:12	 

Figure 7 Manage doctor's table

Moreover, the admin, has right to manages and view the system user, view appointment history, number doctors' logs in the system, use sessions logs in the system and download a report from the system to keep the evidence.

ADMIN | DOCTOR SESSION LOGS

#	User id	Username	User IP	Login time	Logout Time	Status
1	4	kwizafstak@gmail.com	-1	2024-02-16 11:33:30	16-02-2024 03:05:24 PM	Success
2		kwizafstak@gmail.com	-1	2024-02-16 11:52:50		Failed
3		kwizafstak@gmail.com	-1	2024-02-16 12:27:57		Failed
4		kwizafstak@gmail.com	-1	2024-02-16 12:28:10		Failed
5	5	karahanyuze@gmail.com	-1	2024-02-16 13:18:25	16-02-2024 04:03:22 PM	Success
6	5	karahanyuze@gmail.com	-1	2024-02-16 13:34:57	16-02-2024 05:08:12 PM	Success
7	5	karahanyuze@gmail.com	-1	2024-02-16 13:47:53		Success
8		emle@gmail.com	-1	2024-02-17 10:41:51		Failed
9	6	emle@gmail.com	-1	2024-02-17 10:42:07	17-02-2024 02:18:43 PM	Success
10	6	emle@gmail.com	-1	2024-02-17 10:54:50	17-02-2024 02:46:57 PM	Success
11		emle@gmail.com	-1	2024-02-24 16:09:23		Failed

Figure 8 Doctor Session logs in

ADMIN | MANAGE USERS

Manage Users

#	Full Name	Adress	City	Gender	Email	Creation Date	Updation Date	Action
1	nkunduwaje	BYUMBA	MUTETE	female	nkunduwaje@gmail.com	2024-02-16 11:39:39		
2	KAMANA	KIGALI	nyaraugege	male	kamana@gmail.com	2024-02-17 10:31:15		

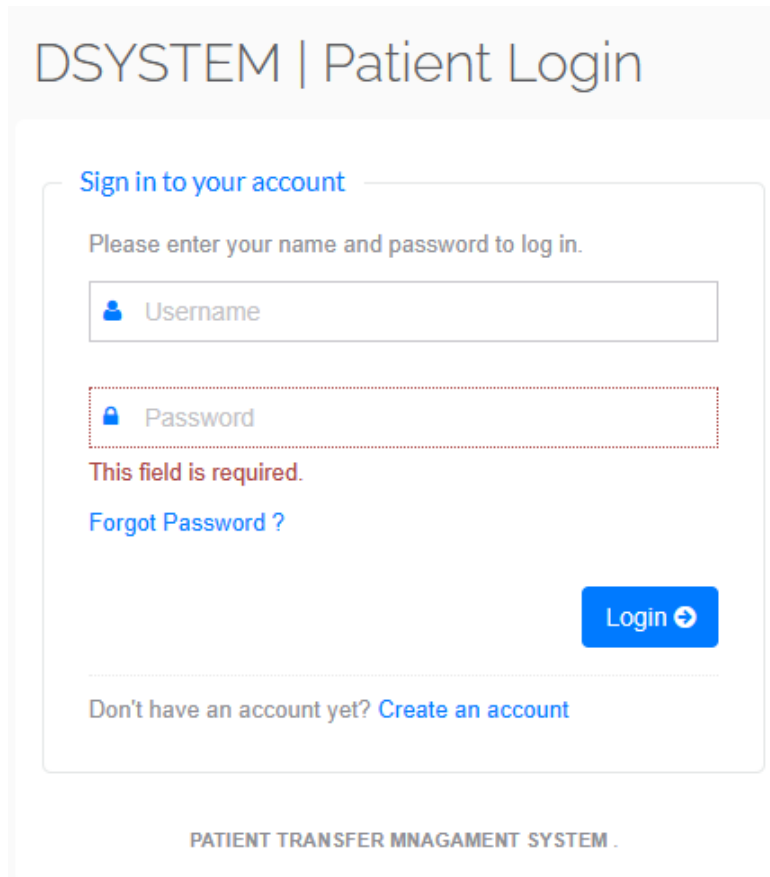
Within user session login, the admin views the number at which the patients get logs in the system and views the user id ,log in time , log out and status if the user is logs in successful or not yet logs in .

ADMIN | USER SESSION LOGS

#	User id	Username	User IP	Login time	Logout Time	Status
1	3	nkunduwaje@gmail.com	-1	2024-02-16 11:40:17	16-02-2024 03:13:34 PM	Success
2	3	nkunduwaje@gmail.com	-1	2024-02-16 12:46:04		Success
3	3	nkunduwaje@gmail.com	-1	2024-02-16 13:16:06	16-02-2024 04:49:58 PM	Success
4	3	nkunduwaje@gmail.com	-1	2024-02-16 13:32:16	16-02-2024 05:03:02 PM	Success
5	3	nkunduwaje@gmail.com	-1	2024-02-16 13:46:14	16-02-2024 05:17:34 PM	Success
6	4	kamana@gmail.com	-1	2024-02-17 10:31:50	17-02-2024 02:04:16 PM	Success

4.2.2 Patient table

Patient table has addition features of signing up, means that the patient would be able on their selves to create their own account for accessing and communicating to the doctor or nurses immediately via the system.



DSYSTEM | Patient Login

Sign in to your account

Please enter your name and password to log in.

This field is required.

[Forgot Password ?](#)

Don't have an account yet? [Create an account](#)

PATIENT TRANSFER MNAGAMENT SYSTEM .

When the patient or user wishes to logs in he/she has to fill the below table and hit submit button, and when, it is clicked , the registered patients were inserted into the patients table .

Registration

Sign Up

Enter your personal details below:

Gender:

Female Male

Enter your account details below:

 I agree

Already have an account? [Log-in](#)

[Submit](#)

The patients portal has priorities for patients to requesting the appointment to the doctor by click on book appointment, and view the appointment history as well as the medical history. The book appointment is a form that has to be filled by patient to request an immediate appointment without any consultation from a qualified nurse or Doctor, this form is containing a time to which a patients wishes to meet with the Doctor. The doctor approves the appointment of patients and provides a feedback to the patients.

The screenshot shows the 'Patient transfer management system' dashboard. On the left is a sidebar with the logo 'DSYSTEM' and a menu containing 'Dashboard', 'Book Appointment', 'Appointment History', and 'Medical History'. The main content area is titled 'USER | DASHBOARD' and features three large interactive cards: 'My Profile' with an 'Update Profile' link, 'My Appointments' with a 'View Appointment History' link, and 'Book My Appointment' with a 'Book Appointment' link. The top right corner shows a user profile icon and the text 'User / Dashboard'.

Book Appointment

Doctor Specialization

Select Specialization

Doctors

Select Doctor

Consultancy Fees

Date

Time

9:00 PM

eg : 10:00 PM

Submit

USER | APPOINTMENT HISTORY

User / Appointment History

#	Doctor Name	Specialization	Consultancy Fee	Appointment Date / Time	Appointment Creation Date	Current Status	Action
---	-------------	----------------	-----------------	-------------------------	---------------------------	----------------	--------

USERS | MEDICAL HISTORY

Users / View Medical History

View Medical History

#	Patient Name	Patient Contact Number	Patient Gender	Creation Date	Update Date	Action
---	--------------	------------------------	----------------	---------------	-------------	--------

4.2.3. Health center table

The health center portal prints the appointment history, patients, and search. In appointment history the doctor could visualize the appointment requested by the patient and provide a response to the patient and therefore, fill the consultation results form if it is checked up by the Doctor.

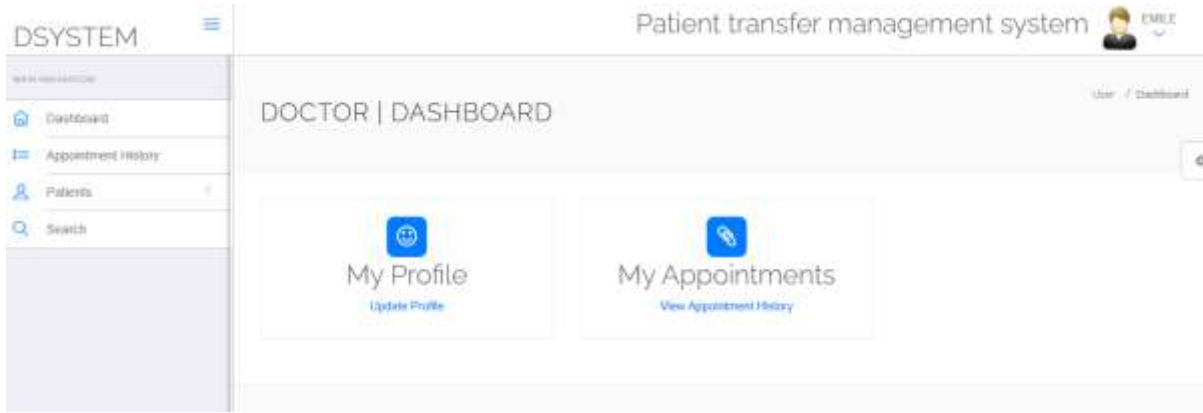


Figure 9 Health center portal

Through the health center portal, the doctor would send a request to the hospital for patient transfer and therefore, the Doctor at referral hospital approves the transfer from health center. Within this portal, the doctor would view only the given appointment history and provide a response for rendezvous immediately. Therefore, the transfer button appeared here to transfer the patient in time the health center transfers a patient to the referral hospital. When the patient is transferred, the admin and chief doctor would approve the transfer from health center. The chief doctor and referral hospital's doctor is in hospital portal, things that the transfer is on health center portal to the referral hospital portal.

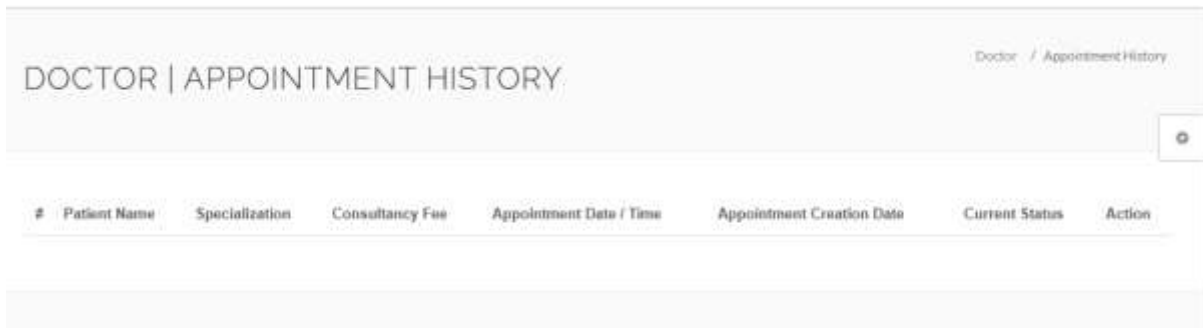


Figure 10 Appointment history form

The below form shows the patient information filled by doctor appointed and highlights patient name, patient contact number, patient email, gender, patient address and patient age.

Add Patient

Patient Name

Patient Contact no

Patient Email

Gender

Female Male

Patient Address

Patient Age

4.2.4 Referral hospital table

The referral hospital created using MYSQL and PHP as high-level programming language, thereby within, this portal the personnel who are able to logs in are only the Nurses and Doctors, who got registered by Admin. on this portal, the doctors and Nurses might view all transferred patients by health center. The doctor who views the transfer first can approve the transfer and provide the appointment from health center, however, the chief detector has right to assign the doctor to following up the patient being transferred at referral hospital. Moreover, the chief Doctor would able to download the report that shows the patients transferred from health center and approved transfers as well as their previous consultation conducted at health center level.

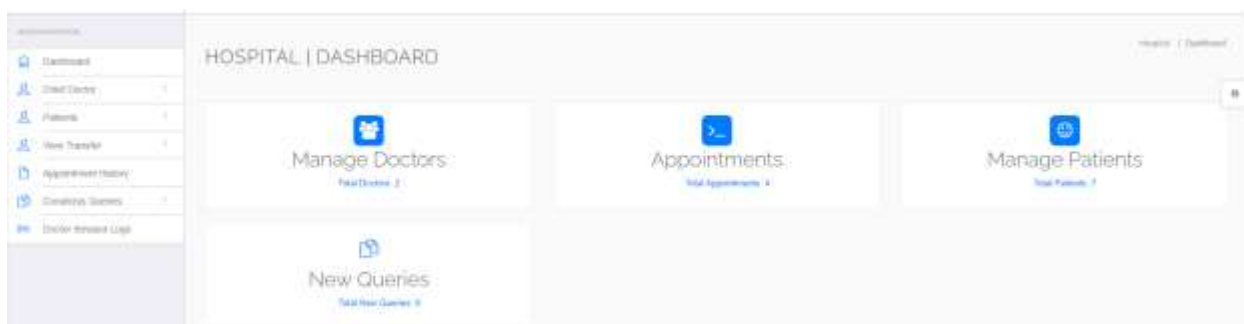


Figure 11 Hospital portal

4.3.Home page of the patient transfer management system

The home page was being developed using bootstrap and HTML being executed to print out the top navigation bar. Bootstrap facilitates to cascade and perform styling the website developed and, on the home, page was used to decorate the home page. Moreover, the bootstrap is used on other portal to develop dash board appeared for all portals made the system. HTML is used in this website to create the entire home page and needs to interact with bootstrap for better viewer.

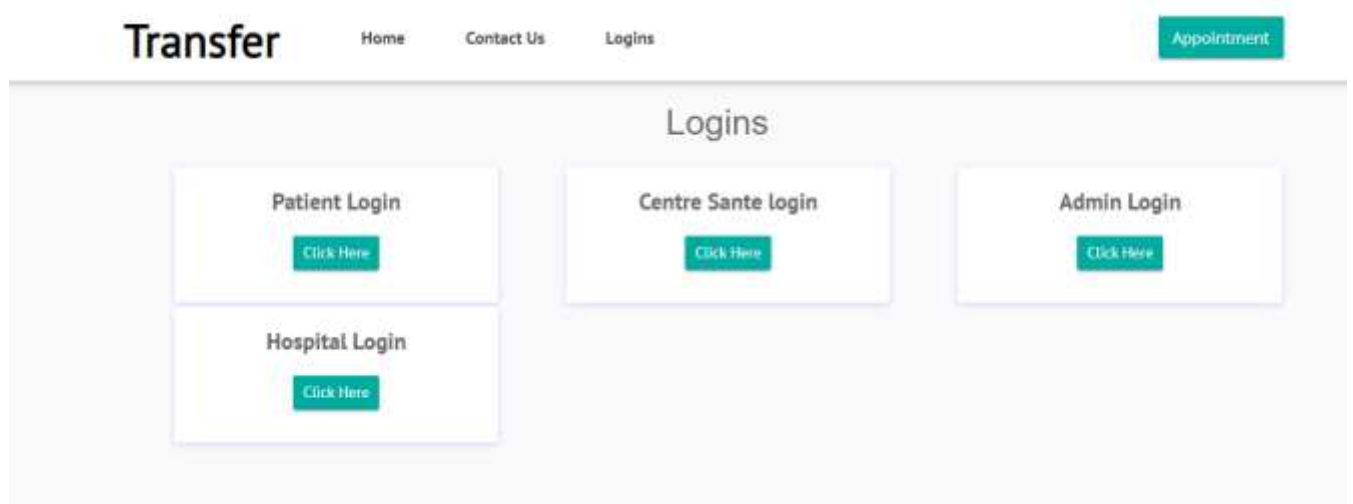


Figure 12 patient transfer management system home page

CHAPTER 5. CONCLUSION AND RECOMMENDATION

5.1 Conclusion

This study presented the patient transfer management system, whereby the transfer done between health center facilities it means from health center to the referral hospital. Through the developed system, four portals were designed; patient portal, health center, hospital portal and admin portal. All portals are connected to facilitate the transfer to be done in easy way through this designed system and facilitate the doctors to track the appointment of the transferred patient through the system. Therefore, the transfer is done by a doctor from health center and is the only one who has transfer button and doctor might send the request to referral hospital and waits the transfer approval or appointment from hospital. This system is digitalized as it manages the transfer between health center and referral hospital over the system and generate a report regards to a number of transfers received from health center. However, this designed system worked locally on the computer as it is aforementioned and the computer used hereof, acts as a server of the designed things that, in order to run the system it needs to be hosted so that it will be accessed over domain name given by the hosting company.

The design system holds the patient consultation results and its corresponding Doctor address who checked up the patient for easing the way of sharing information between the Doctor at referral side and Doctor at health center side. In addition to that patient on his/herself shall request an appointment to Doctor if patient wishes to meet with the Doctor via this system for consultation.

5.2 Recommendations

This study suggests the following actions:

To the hospital administration: in order to fully profit from the eHealth system, users clinicians in particular must be encouraged to utilize it. It is preferable that all employees be introduced to the system and given assistance to be familiar with it.

To IT help desk: To ensure that the system continues to function as intended, the IT staff must constantly support users in their urgent efforts to overcome obstacles.

To Network administrator: Network problem must be solved so that users will not be discouraged to use the system

To MOH: MOH should facilitate the deployment of this system in all health facilities and promote the use of it especially in patient transfer request process.

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APPENDICES

Appendix : The Utilized Codes

```
<?php
include_once('hms/include/config.php');
if(isset($_POST['submit']))
{
$name=$_POST['fullname'];
$email=$_POST['emailid'];
$mobileno=$_POST['mobileno'];
$dscrption=$_POST['description'];
$query=mysqli_query($con,"insert into tblcontactus(fullname,email,contactno,message)
value('$name','$email','$mobileno','$dscrption)");
echo "<script>alert('Your information succesfully submitted');</script>";
echo "<script>>window.location.href ='index.php'</script>";

} ?>
<!doctype html>
<html lang="en">

<head>
<meta charset="utf-8">
<meta name="viewport" content="width=device-width, initial-scale=1, shrink-to-fit=no">
<title> Patient transfer management system</title>

<link rel="shortcut icon" href="assets/images/fav.jpg">
<link rel="stylesheet" href="assets/css/bootstrap.min.css">
<link rel="stylesheet" href="assets/css/fontawsom-all.min.css">
<link rel="stylesheet" href="assets/css/animate.css">
<link rel="stylesheet" type="text/css" href="assets/css/style.css" />
</head>

<body>

<!-- ##### Header Starts Here#####-->

<header id="menu-jk">

<div id="nav-head" class="header-nav">
<div class="container">
<div class="row">
<div class="col-lg-2 col-md-3 col-sm-12" style="color:#000;font-weight:bold; font-size:42px; margin-top: 1% !important;">Transfer
<a data-toggle="collapse" data-target="#menu" href="#menu" ><i class="fas d-block d-md-none small-menu fa-bars"></i></a>
</div>
<div id="menu" class="col-lg-8 col-md-9 d-none d-md-block nav-item">
```

```

        <ul>
            <li><a href="#">Home</a></li>
            <!--<li><a href="#services">Services</a></li>
            <li><a href="#about_us">About Us</a></li>
            <li><a href="#gallery">Gallery</a></li>-->
            <li><a href="#contact_us">Contact Us</a></li>
            <li><a href="#logins">Logins</a></li>
        </ul>
    </div>
    <div class="col-sm-2 d-none d-lg-block appoint">
        <a class="btn btn-success" href="hms/user-login.php">Appointment</a>
    </div>
</div>

</div>
</div>
</header>

<!-- ##### Slider Starts Here#####-->

<!-- <div class="slider-detail">

    <div id="carouselExampleIndicators" class="carousel slide" data-ride="carousel">
        <ol class="carousel-indicators">
            <li data-target="#carouselExampleIndicators" data-slide-to="0" class="active"></li>
            <li data-target="#carouselExampleIndicators" data-slide-to="1"></li>
        </ol>

        <div class="carousel-inner">
            <div class="carousel-item ">
                
                <div class="carousel-cover"></div>
                <div class="carousel-caption vdg-cur d-none d-md-block">
                    <h5 class="animated bounceInDown">Patient transfer management system</h5>

                </div>
            </div>
            <div class="carousel-item active">
                
                <div class="carousel-cover"></div>
                <div class="carousel-caption vdg-cur d-none d-md-block">

```

```
<h5 class="animated bounceInDown">Patient transfer management system</h5>
```

```
</div>
```

```
</div>
```

```
</div>
```

```
<a class="carousel-control-prev" href="#carouselExampleIndicators" role="button" data-  
slide="prev">
```

```
<span class="carousel-control-prev-icon" aria-hidden="true"></span>
```

```
<span class="sr-only">Previous</span>
```

```
</a>
```

```
<a class="carousel-control-next" href="#carouselExampleIndicators" role="button" data-  
slide="next">
```

```
<span class="carousel-control-next-icon" aria-hidden="true"></span>
```

```
<span class="sr-only">Next</span>
```

```
</a>
```

```
</div>
```

```
</div> -->
```

```
<!-- ***** Logins ***** -->
```

```
<section id="logins" class="our-blog container-fluid">
```

```
<div class="container">
```

```
<div class="inner-title">
```

```
<h2>Logins</h2>
```

```
</div>
```

```
<div class="col-sm-12 blog-cont">
```

```
<div class="row no-margin">
```

```
<div class="col-sm-4 blog-smk">
```

```
<div class="blog-single">
```

```

```

```
<div class="blog-single-det">
```

```
<h6>Patient Login</h6>
```

```
<a href="hms/user-login.php" target="_blank">
```

```
<button class="btn btn-success btn-sm">Click Here</button>
```

```
</a>
```

```
</div>
```

```
</div>
```

```
</div>
```

```
<div class="col-sm-4 blog-smk">
```

```
<div class="blog-single">
```

```


<div class="blog-single-det">
  <h6>Centre Sante login</h6>
  <a href="hms/doctor" target="_blank">
    <button class="btn btn-success btn-sm">Click Here</button>
  </a>
</div>
</div>
</div>
```

```
<div class="col-sm-4 blog-smk">
  <div class="blog-single">

    <div class="blog-single-det">
      <h6>Admin Login</h6>

      <a href="hms/admin" target="_blank">
        <button class="btn btn-success btn-sm">Click Here</button>
      </a>
    </div>
  </div>
</div>
```

```
<div class="col-sm-4 blog-smk">
  <div class="blog-single">

    <div class="blog-single-det">
      <h6>Hospital Login</h6>

      <a href="hms/hospital" target="_blank">
        <button class="btn btn-success btn-sm">Click Here</button>
      </a>
    </div>
  </div>
</div>
```

```
</div>
</div>
```

```
</div>
</section>
```

```
<!-- ##### Our Departments Starts Here#####-->
```

```
<!--
<section id="services" class="key-features department">
  <div class="container">
    <div class="inner-title">

      <h2>Our Key Features</h2>
      <p>Take a look at some of our key features</p>
    </div>

    <div class="row">
      <div class="col-lg-4 col-md-6">
        <div class="single-key">
          <i class="fas fa-heartbeat"></i>
          <h5>Cardiology</h5>
        </div>
      </div>

      <div class="col-lg-4 col-md-6">
        <div class="single-key">
          <i class="fas fa-ribbon"></i>
          <h5>Orthopaedic</h5>
        </div>
      </div>

      <div class="col-lg-4 col-md-6">
        <div class="single-key">
          <i class="fab fa-monero"></i>
          <h5>Neurologist</h5>
        </div>
      </div>

      <div class="col-lg-4 col-md-6">
        <div class="single-key">
          <i class="fas fa-capsules"></i>
          <h5>Pharma Pipeline</h5>
        </div>
      </div>

      <div class="col-lg-4 col-md-6">
```

```
<div class="single-key">
  <i class="fas fa-prescription-bottle-alt"></i>
  <h5>Pharma Team</h5>
</div>
</div>
```

```
<div class="col-lg-4 col-md-6">
  <div class="single-key">
    <i class="far fa-thumbs-up"></i>
    <h5>High Quality treatments</h5>
  </div>
</div>
</div>
```

```
</div>
```

```
</section>
-->
```

```
<!-- ***** About Us Starts Here ***** --
>
```

```
<!--
<section id="about_us" class="about-us">
  <div class="row no-margin">
    <div class="col-sm-6 image-bg no-padding">

      </div>
      <div class="col-sm-6 abut-yoiu">
        <h3>About Our Hospital</h3>
```

```
<?php
//$ret=mysqli_query($con,"select * from tblpage where PageType='aboutus' ");
//while ($row=mysqli_fetch_array($ret)) {
?>
```

```
<p><?php echo $row['PageDescription'];?>.</p><?php } ?>
  </div>
</div>
</section> -->
```

```

        <!-- ***** Gallery Starts Here ***** -->
-->
<!-- <div id="gallery" class="gallery">
<div class="container">
    <div class="inner-title">

        <h2>Our Gallery</h2>
        <p>View Our Gallery</p>
    </div>
    <div class="row">

<div class="gallery-filter d-none d-sm-block">
    <button class="btn btn-default filter-button" data-filter="all">All</button>
    <button class="btn btn-default filter-button" data-filter="hdpe">Dental</button>
    <button class="btn btn-default filter-button" data-filter="sprinkle">Cardiology</button>
    <button class="btn btn-default filter-button" data-filter="spray">Neurology</button>
    <button class="btn btn-default filter-button" data-filter="irrigation">Laboratry</button>
</div>
<br/>

<div class="gallery_product col-lg-4 col-md-4 col-sm-4 col-xs-6 filter hdpe">
    
</div>

<div class="gallery_product col-lg-4 col-md-4 col-sm-4 col-xs-6 filter sprinkle">
    
</div>

<div class="gallery_product col-lg-4 col-md-4 col-sm-4 col-xs-6 filter hdpe">
    
</div>

<div class="gallery_product col-lg-4 col-md-4 col-sm-4 col-xs-6 filter irrigation">
    
</div>

<div class="gallery_product col-lg-4 col-md-4 col-sm-4 col-xs-6 filter spray">
    
</div>

<div class="gallery_product col-lg-4 col-md-4 col-sm-4 col-xs-6 filter spray">
    
</div>

</div>

```

</div>

</div>-->

<!-- ##### Gallery End ##### -->

<!-- ***** Contact Us Starts Here ***** -->

<section id="contact_us" class="contact-us-single">

<div class="row no-margin">

<div class="col-sm-12 cop-ck">

<form method="post">

<h2 >Contact Form</h2>

<div class="row cf-ro">

<div class="col-sm-3"><label>Enter Name :</label></div>

<div class="col-sm-8"><input type="text" placeholder="Enter Name" name="fullname" class="form-control input-sm" required ></div>

</div>

<div class="row cf-ro">

<div class="col-sm-3"><label>Email Address :</label></div>

<div class="col-sm-8"><input type="text" name="emailid" placeholder="Enter Email Address" class="form-control input-sm" required></div>

</div>

<div class="row cf-ro">

<div class="col-sm-3"><label>Mobile Number:</label></div>

<div class="col-sm-8"><input type="text" name="mobilen" placeholder="Enter Mobile Number" class="form-control input-sm" required ></div>

</div>

<div class="row cf-ro">

<div class="col-sm-3"><label>Enter Message:</label></div>

<div class="col-sm-8"><textarea rows="5" placeholder="Enter Your Message" class="form-control input-sm" name="description" required></textarea>

</div>

</div>

<div class="row cf-ro">

<div class="col-sm-3"><label></label></div>

<div class="col-sm-8">

<button class="btn btn-success btn-sm" type="submit" name="submit">Send Message</button>

</div>

</div>

</form>

</div>

</div>

</section>

```
<!-- ##### Footer Starts Here#####-->
```

```
<footer class="footer">  
  <div class="container">  
    <div class="row">
```

```
      <div class="col-md-6 col-sm-12">  
        <h2>Useful Links</h2>  
        <ul class="list-unstyled link-list">  
          <!--<li><a ui-sref="about" href="#about">About us</a><i class="fa fa-angle-  
right"></i></li>  
          <li><a ui-sref="portfolio" href="#services">Services</a><i class="fa fa-angle-  
right"></i></li>-->  
          <li><a ui-sref="products" href="#logins">Logins</a><i class="fa fa-angle-  
right"></i></li>  
          <!--<li><a ui-sref="gallery" href="#gallery">Gallery</a><i class="fa fa-angle-  
right"></i></li>-->  
          <li><a ui-sref="contact" href="#contact">Contact us</a><i class="fa fa-angle-  
right"></i></li>  
        </ul>  
      </div>  
      <div class="col-md-6 col-sm-12 map-img">  
        <h2>Contact Us</h2>  
        <address class="md-margin-bottom-40">
```

```
<?php  
$ret=mysqli_query($con,"select * from tblpage where PageType='contactus' ");  
while ($row=mysqli_fetch_array($ret)) {  
?>  
  
    <?php echo $row['PageDescription'];?> <br>  
    Phone: <?php echo $row['MobileNumber'];?> <br>  
    Email: <a href="mailto:<?php echo $row['Email'];?>" class=""><?php echo  
$row['Email'];?></a><br>  
    Timing: <?php echo $row['OpenningTime'];?>  
  </address>
```

```
<?php } ?>
```

```
</div>
</div>
</div>
```

```
</footer>
<div class="copy">
  <div class="container">
    Patient transfer management system
```

```
</div>
```

```
</div>
```

```
</body>
```

```
<script src="assets/js/jquery-3.2.1.min.js"></script>
<script src="assets/js/popper.min.js"></script>
<script src="assets/js/bootstrap.min.js"></script>
<script src="assets/plugins/scroll-nav/js/jquery.easing.min.js"></script>
<script src="assets/plugins/scroll-nav/js/scrolling-nav.js"></script>
<script src="assets/plugins/scroll-fixed/jquery-scrolltofixed-min.js"></script>
```

```
<script src="assets/js/script.js"></script>
```

```
</html>
```