Masters (MIT) Project Final Report

March 2018

Please tick relevant Stream	
MIT(General) : MIT3101	
MIT(e-Learning) : MIT3111	
MIT(Multimedia) : MIT3121	

For MIT(General) Projects only	
Research Project	
Implementation Project	

Project Title	Online Appointment System For Kotelawala Defence University Hospital
Student Name	Koralage Wathsala Dilhani Silva
Registration No.	2015mit057
Index No.	15550571
Supervisor's Name	Dr. G.D.S.P. Wimalaratne

For Office Use ONLY

1

Online Appointment System for Kotelawala Defence University Hospital

A dissertation submitted for the Degree of Master of Information Technology

K.W.D Silva

University of Colombo School of Computing

2018

Declaration

The thesis is my original work and has not been submitted previously for a degree at this or any other university/institute.

To the best of my knowledge it does not contain any material published or written by another person, except as acknowledged in the text.

Student Name: K.W.D Silva

Registration Number: 2015mit057

Index Number: 15550571

_____

Signature: Date:

This is to certify that this thesis is based on the work of

Mr. /Ms.

Under my supervision. The thesis has been prepared according to the format stipulated and is of acceptable standard.

Certified by:

Supervisor Name: Dr. G.D.S.P. Wimalaratne

_____

Signature: Date:

Abstract

Health care is a fast growing industry in the all over countries. Online Appointment scheduling is one of the key processes in this industry. This thesis focused on on-line appointment system for KDU hospital.

The project title as "ONLINE APPOINTMENT SYSTEM FOR KOTELAWALA DEFENCE UNIVERSITY HOSPITAL" it is a web based application. It maintains records of patient details, doctor details and appointment details.

KDU online doctor appointment System contains two main modules. One module is the application designed for the patient that contains a login screen. The patient has to register himself before logging in to the application. After logging in, the patient can view the Doctor details. The patient has the option of decide on a doctor from the list of doctors and can view the doctor's details. The patient can request for an appointment on his/her preferred day/time. The selected day/time slot will be reserved and patient received automated e-mail. The second module is the admin module that is designed on the website. The admin can add doctor, view patient's details and doctor's details and can view appointments also. The doctors also are given the access of updating their personal profiles. Apart from that, the system also facilitates the generation of a report of the patient's history which will be generated by the admin, so that the doctor can view the patient's history without any delay. Thus the time taken to treat a patient will be reduced and efficient, accurate and improved service could be provided to the patients.

The system aims to help the patients to take appointment online through internet and track their records through it. KDU has been facing problems due to its paper-based appointment system. The increase in the number of patients visiting, it has become difficult to manage the appointment system manually. The purpose of this project is to solve these complications by creating custom-built database software to manage the appointment system

The above mentioned web based system is designed according to object oriented Analysis and design techniques and UML (Unified modelling language) used to model the system. While the system is a web based solution the most powerful scripting language Angular js & PHP has used for building up the logic of the system. Bootstrap and HTML used to model interface. A MySQL has used at the back end for the database handling. Apache Friends XAMPP version 3.2.2 was used to implement a web server.

Acknowledgement

I would like to express my gratitude to my supervisor Dr. G.D.S.P.Wimalaratne for the useful comments, remarks and engagement through the learning process of this master thesis. Furthermore I would like to thank my friends for introducing me to the topic as well for the support on the way. Also, I would like to thank my Family, who has supported me throughout entire process, both by keeping me harmonious and helping me putting pieces together.

Table of Content

List of table

List of Figures

CHAPTER 1:   Introduction

The proposed system is to make an online web application for easily taking appointment of a patient see the schedule of doctors, so that everyone can get information about doctor's availability, time period, and send request to any doctor for medicine. Doctors and patients can also easily communicate with each other from anywhere. This project is aimed at developing an online application for patient to appointing doctors. Users have to logging in the system to be able to take appointment of a doctor. Doctors have to logging to see his appointments. The proposed system could be accessed from any corner of the world on net.

1.1   Motivation

Kotelawala Defence University is much more interested introducing a web based online doctor Appointment system for their university hospital, to make their tasks easier to control without paper work.

Admin will be able to register doctor, view/delete patient listing, and finally moderate (insert, update and delete) information. The functionalities of the software are focused below in brief:

- Can view, edit, and update their profile from anywhere.
- User friendly interfaces.
- Doctor and patient information are stored.
- All users can login by using username and password to access their information.
- Reduce the paperwork and storage area.
- Improve accuracy in result.

1.2   Statement of the problem

The current booking system is manual as all the work is done and kept in files. Because hospital management staff will be facing some problems issuing booking appointment of patients. All the necessary booking is done in hard copy. So, it become much difficult for staff to keep the records updated all the time. As an example, if the patients need to change the appointments in date it become difficult for them to find out the patients booking details for updating as there are so many patient booking records. Again, regarding current system patient cannot give feedback online and staff cannot reply to them promptly.

The proposed project is a smart appointment booking system that provides patients or any user an easy way of booking a doctor's appointment online. This is a web based application that overcomes the issue of managing and booking appointments according to user's choice. The task sometimes becomes very tedious for the compounder or doctor himself in manually allocating appointments for the users as per their availability. Hence this project offers an effective solution where users can view doctors available and select the preferred date and time.

1.3 Aims and Objectives

The system aims to help the patients to take appointment online through internet and track their records through it. KDU has been facing problems due to its paper-based appointment system. The increase in the number of patients visiting, it has become difficult to manage the appointment system manually. The purpose of this project is to solve these complications by creating custom-built database software to manage the appointment system. For the receptionist it makes easy to set date and time for the treatment of the patient to the relevant doctor. Doctor enters medical prescription and receptionist takes the print. It also helps to maintain doctor's consultation fee, Laboratories and Testing charges automatically.

- The main objective is to develop an Online Appointment system.
- To provide a way to make appointment reservations for patients.
- To choose from different doctors with appointments available, at the time and on the day of the users' choice
- After the booking, patient can have received e-mail and text message reminders. For an example, after booking patient received doctor arrival massage.
- To automate the report generation module
- To computerized the patients' information review and maintenance.

1.4 Scope

The scope of this project will focus on the patient, doctors and hospitals who will use the system to make and manage the appointment via online services. This project will be implemented and useful for all doctors and patient. The doctor and hospital to manage the appointment for the patients those who would like to have the appointment for the doctor in specific place date via online system anytime and anywhere. And this system does, after the patient arrive hospital, nurse collects the patient's information and sends it to the doctor before the patient is diagnosed.

The system has been facing problems due to its paper-based appointment system. With the increase in the number of patients visiting, it has become difficult to manage the appointment system manually. Recording of appointments and creating registers by pen and paper has become a tedious task. And also it's difficult to manage huge number of patient database.

This online web application gives solution to the KDU patients and employees. This system which manages complete KDU details in a single application and in a single database. The users will use this system to handle all the functionalities easily. Doctors will also use the system to keep track of the patients consulting to them. The intentions of the system are to reduce over-time pay and increase the number of patients that can be treated accurately.

1.5 Structure of Dissertation Outline

Chapter 1-Introduction

Describes the problems being faced currently and how to address all those problems with the proposed system. Project scope, goals and dissertation structure is also provided.

Chapter 2-Background

This chapter targets a crucial review of matching systems and technologies and related applications. Additionally, it is aimed for the evaluation of hiring process and justification of tool and technology selections with quotation.

Chapter 3-Analysis and Design

Provide description of ER diagram, UML diagrams and the methodological approach that are applied in the program designing. Also, consists of the requirement analysis, functional and non-functional requirements of the system design.

Chapter 4-Implementation

Appropriate coding and implementation tools and techniques which are used to developing the system are included.

Chapter 5-Evaluation

Developed system is tested against the user requirements, which are gathered at the beginning. Actual data from the client's environment is used. The chapter also includes aspects such as test plan, test cases, use of test automation tools and testing frameworks.

Chapter 6-Conclusion and Future work

This chapter summarizes the work; discusses its findings and contributions; points out limitations of the current work and outlines directions for future research.

CHAPTER 2: Background/ Literature Review

2.1 Background

Web based online booking system develop for the newly open Kotelawala Defence University Hospital (KDUH). This project is manly focus to investigate the efficacy of the web-based online booking system for outpatients. To deal with this problem an online booking system will be very necessary. Online booking system is accessed on internet by using devices which have internet connection at any time. KDUH online booking system is a convenient and an efficient way to deal with this problem. The KDUH online system will enable people access details of hospital and other services online and also do the booking online. The system will have all the necessary information about hospital on one single website which accessible by anyone who wants information or online booking

Online booking system for KDUH is used to manage access to service providers. Many factors affect the performance of appointment systems which include arrival and service time variability, patient and provider preferences, available information technology and the experience level of the scheduling staff. Thus a proper scheduling system has to develop by considering all these factors which will increase patient satisfaction, which in turn increases profit. An online booking system allows individuals to conveniently and securely book their appointments online. Compared to the usual queuing method, the web-based booking system could significantly increase patient's satisfaction with registration and reduce total waiting time effectively.
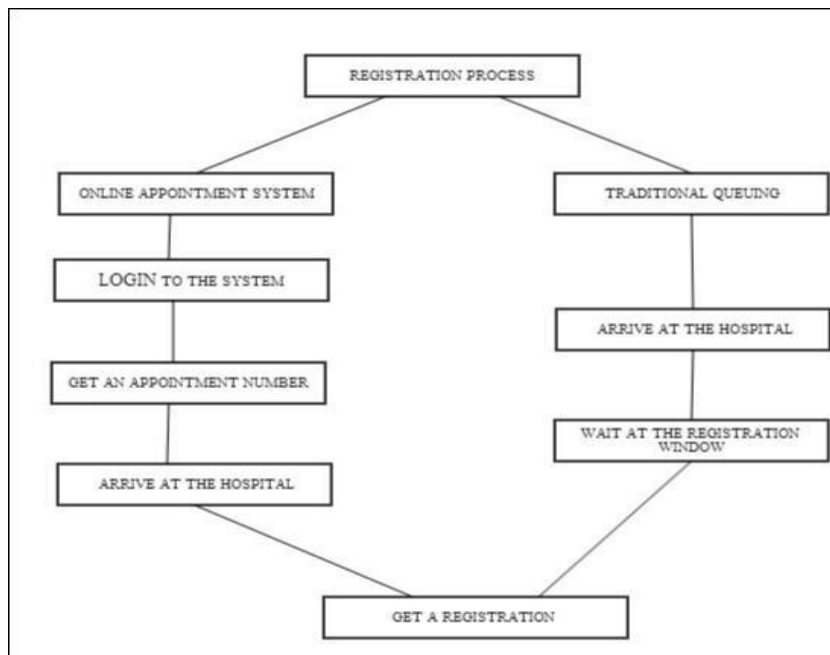

Figure 2:1Flowchart for Traditional v/s Online Appointment system

2.2 Literature Review

I read some papers related to this work. The main objective of their work is given below,

NHIS Outpatient in Nigerian Teaching Hospitals - The number of missed appointments in healthcare institutions in Nigeria caused problems, hence the need for integrated healthcare system to intervene and provide seamless care for patients. Appointment scheduling system lies at the intersection of providing efficiency and timely access to health services. This research presents an online National Health Insurance Scheme (NHIS) Outpatient Medical Appointment Booking System where NHIS patients can access and view any available personnel or doctor order to book an appointment with the corresponding time as specified by the available doctor. [1]

Doctor Appointment Booking System – NevonProjects - This system is a smart appointment booking system that provides patients or any user an easy way of booking a doctor's appointment online. This is a web based application that overcomes the issue of managing and booking appointments according to user's choice or demands. They use this module. (http://nevonprojects.com) [2]

Oger medical information system -The appointment module is an electronic paperless application designed with high flexibility and ease of usage, implemented in single clinics and polyclinics. The system serves in managing appointments for different resources.

A Web-Based Appointment System - web-based appointment system by integrating with Intelligent System techniques. It does not have any ID and password to log-in before making any appointment. Role of agent is to manage information in databases. It is not only doctor but also other appointments. Here I found that, they have not any user account. [3]

CHAPTER 3:   Analysis and Design

3.1   Introduction

The chapter describes the system study, analysis, (user requirement & system and hard ware requirement) design strengths and weaknesses of the current system, Contest level diagrams, Entity Relationship Diagram.

3.2   System Study

The study was carried out at Patient, Doctors and Hospital the main purpose of the study was to find out how the process of recording patient's data is carried out. The system that is currently being used Patient, Doctor and Hospital is entirety manuals. But we are creating online appointment system, that is very lazy and more hesitation from the real information, doctor availability and proper time maintenance of the doctor appointment system.

3.3   System Analysis

During the system study period, we can categorize into two parts our online doctor appointment system, As a user requirement and system and hardware requirement.

3.3.1   User requirement

Referring existing system, I have investigated and found out how the current system operates, not only that but also tried out which problems are faced and how best they can be settled. The users described some of the basic requirements of the system this includes Search for Patients, Register Patient, Update record, Doctor information record, view doctor availability record and view all types of reports.

3.3.2   Functional and Non Functional Requirements

3.3.3   Functional requirements

- View Doctor Information
- Search Doctor
- View Appointment
- Search Module
- Appointment Booking
- Check-in form Submitting
- Appointment management
- Schedule a timing
- Past appointment Management

3.3.4 Non-functional requirements

- Responsive and user friendly UI
- Speed
- Less weight
- Reliability

3.4 System Design

Design is the first step in the development stage. Software design involves three technical activities - design, coding, implementation and testing that are required to build and verify the software. The design activities are of main importance in this part, because in this activity, decisions finally affecting the success of the software implementation and its ease of maintenance. Design is the only way to correctly translate the customer requirements into finished software or a system. Design is the place where quality is bringing up in development.

3.4.1 System Architecture

Figure 3:1System Architecture

17
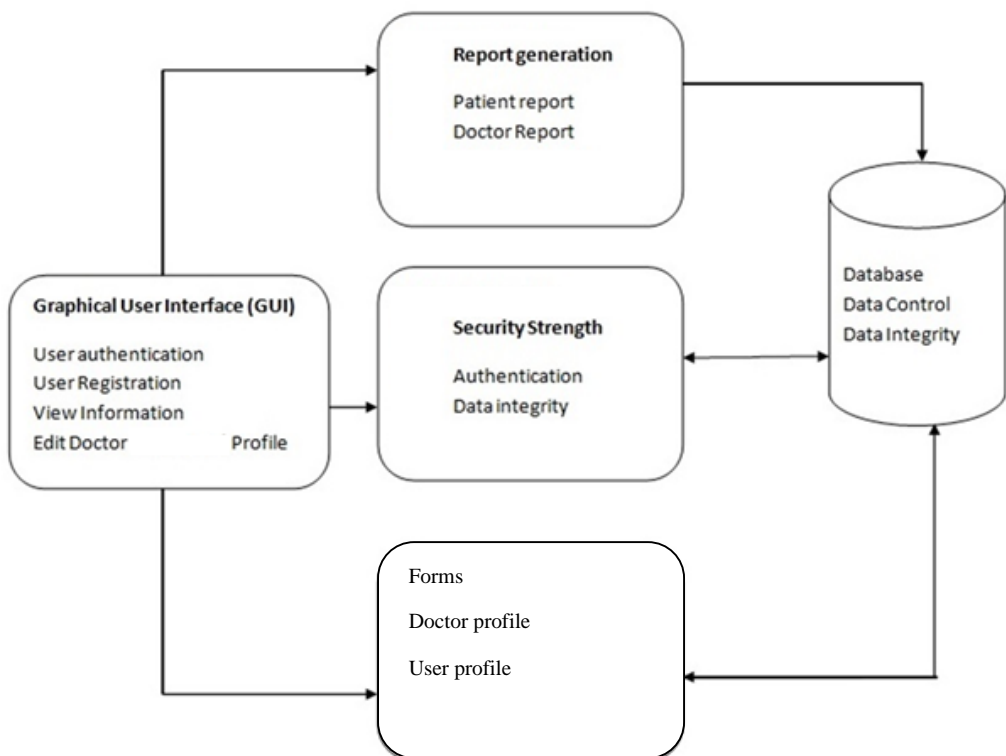
3.4.2 Entity Relationship Diagram (ER Diagram)

ER diagram is a graphical representation of entities and their relationship to each other, typically used in computing regarding the organization of data within database or information systems. Entity is a piece of data, object or concept which described which data should store. Relationship is how data is shared between entities.

Entity

Which are represented by rectangle. An entity is an object or concept that has its existence in the real world. It includes all those things about which data is collected. A weak entity is an entity that must defined by a foreign key relationship with another entity as it cannot be uniquely identified by its own attributes alone.

Attributes

Which are represented by ovals. A key attribute is the unique, distinguishing characteristic of the entity. For example, an employee's social security number might be the employee's key attribute.

An Entity Set

It is a set of entities of the same type that share the same properties, or attributes.

Process

A process shows a transformation or manipulation of data flows within the system.

Actions

Which are represented by diamond shapes, show how two entities share information in the database.
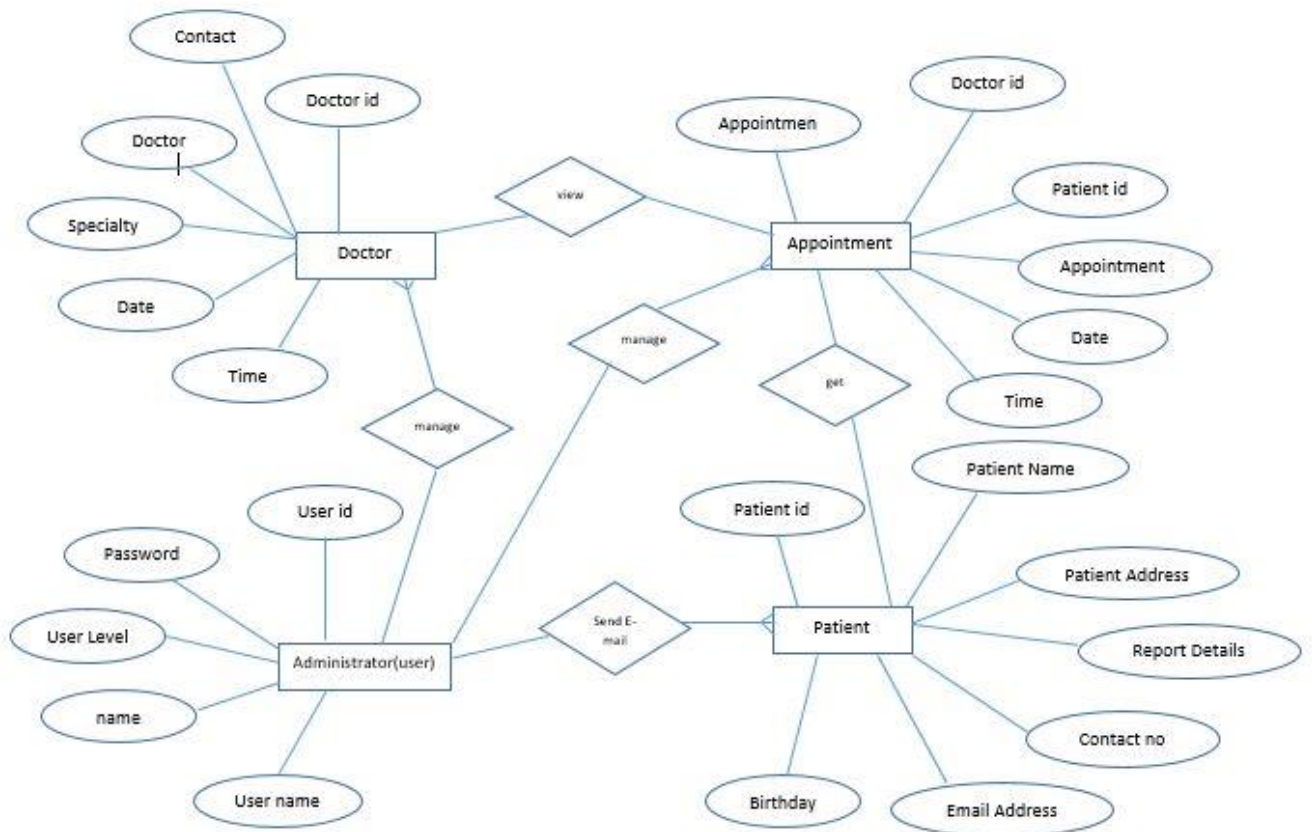
Figure 3:2ER diagram

3.4.3 Use Case Diagram

Use case diagrams are consisting in Unified Modeling Language. The diagram can be used to represent a Context mode for a system. In Use Case diagram an actor are users of the system and playing a role.
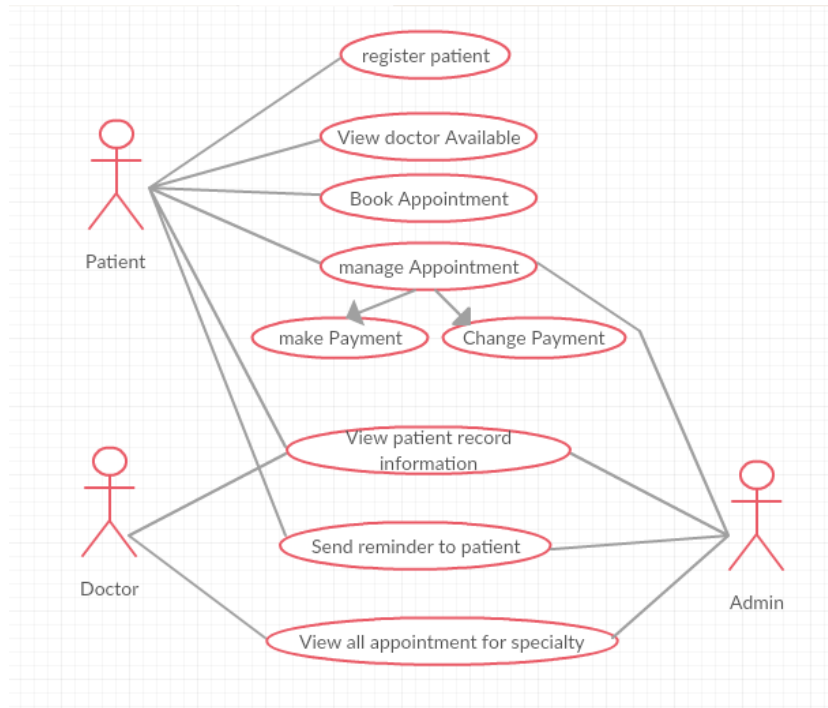
Figure 3:3Use case Diagram

3.4.4 Activity Diagram Login module
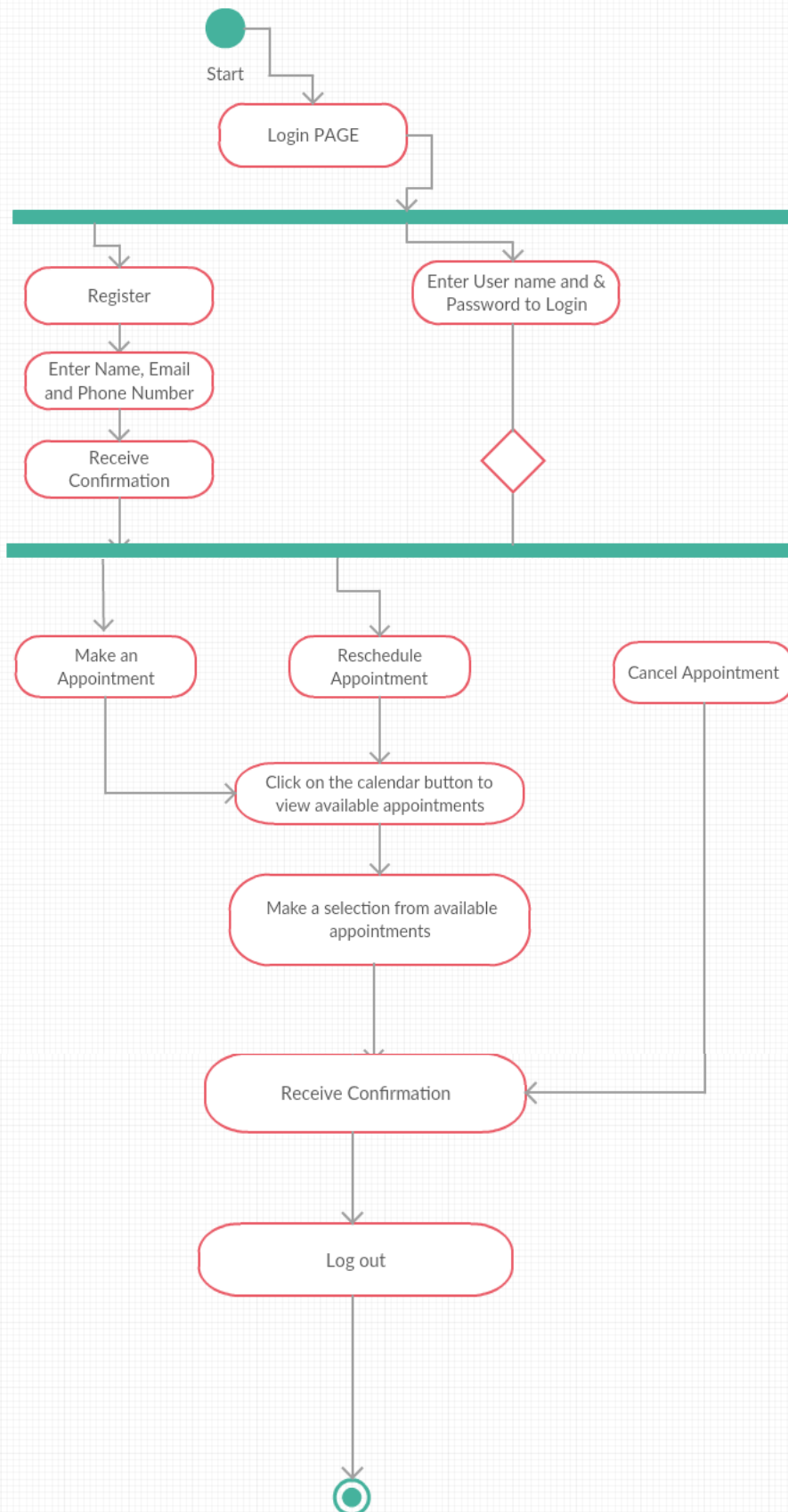
Figure 3:5ctivity Diagram

3.4.5 Sequence Diagram

Sequence Diagram is defined as a dynamic model for a use case which is used for showing the interaction between classes for particular time period. This diagram include message, time.
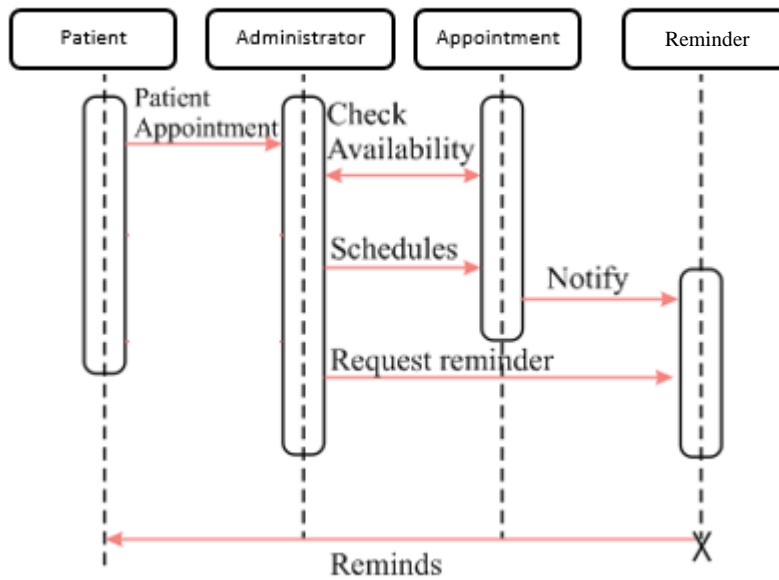
Figure 3:6Sequence Diagram

CHAPTER 4: Implementation

4.1 Chapter Overview

Implementation is the process of converting user requirement and system functionalities into actual working system. This phase takes more time compared to other stages in software development life cycle. System is well implemented in order to achieve system functionalities which are identified in system analysis stage. Design patterns and technology which are identified in system design stage were used to implement the system very efficiency and timely.

4.2 Implementation Environment

The implementation Environment is based on various aspects such as developing software, framework and etc.

Software	Hardware
• Microsoft Windows 10 Ultimate - 64bit • WAMP Server • MYSQL Server	Intel(R) Core(TM) i5-2670QM @ 2.20GHz 4 GB RAM 500 GB Hard disk

4.3 Technologies

- ✓ PHP and Angular js was chosen as the main developing language to develop the system.
- ✓ MYSQL was chosen to handle databases queries of the system
- ✓ HTML and bootstrap was used to make the interface and CSS used apply style to the interface to make the system more user friendly.
- ✓ Angular js was used to the client side validations such as form validating

4.4 Tools

- ✓ Firefox' web browser, this was used to JavaScript debugging, analyzing network usage. Further it's facilitate inspect the HTML and modify the HTML layout and the styles in real-time.
- ✓ Adobe Photoshop CS5 is photo editing software which was used to edit images, logos and banners of user interface of the system.

4.5   Open source frameworks

4.5.1   Bootstrap v3.0

Bootstrap is a free and open-source collection of tools for creating websites and web applications. It contains HTML- and CSS-based design templates for typography, forms, buttons, navigation and other interface components, as well as optional JavaScript extensions. It aims to ease the development of dynamic websites and web applications. Bootstrap is a front end framework, that is, an interface for the user, unlike the server-side code which resides on the "back end" or server. Bootstrap includes readymade design patterns which can be easily apply to the HTML tags and provides fully responsive interfaces.

4.5.2   XAMPP

XAMPP is freely available open source cross-platform web solution package which was developed by Apache Friends. It contains Apache HTTP Server, Maria DB database, PHP, and Perl. XAMPP works equally well on Windows, Linux and Mac operating systems. To develop databases used MySQL which was built in XAMPP bundle.

4.5.3   AngularJS

AngularJS is a JavaScript-based open-source front-end web application framework mainly maintained by Google and by a community of individuals and corporations to address many of the challenges encountered in developing single-page applications. The JavaScript components complement Apache Cordova, a framework used for developing cross-platform mobile apps. It aims to simplify both the development and the testing of such applications by providing a framework for client-side model–view–controller (MVC) and model–view–view model (MVVM) architectures, along with components commonly used in rich Internet applications. In 2014, the original AngularJS team began working on the Angular application platform.

4.6 System Interfaces

All System interfaces in this chapter were created in angular js, php, css, html and bootstrap.

Figure 4:1System Interfaces

Doctor Search Page

This page is patient can access the search doctor and view the doctor available time and can know the time to views the doctor actual time. Then the system is patient not a more time queue.
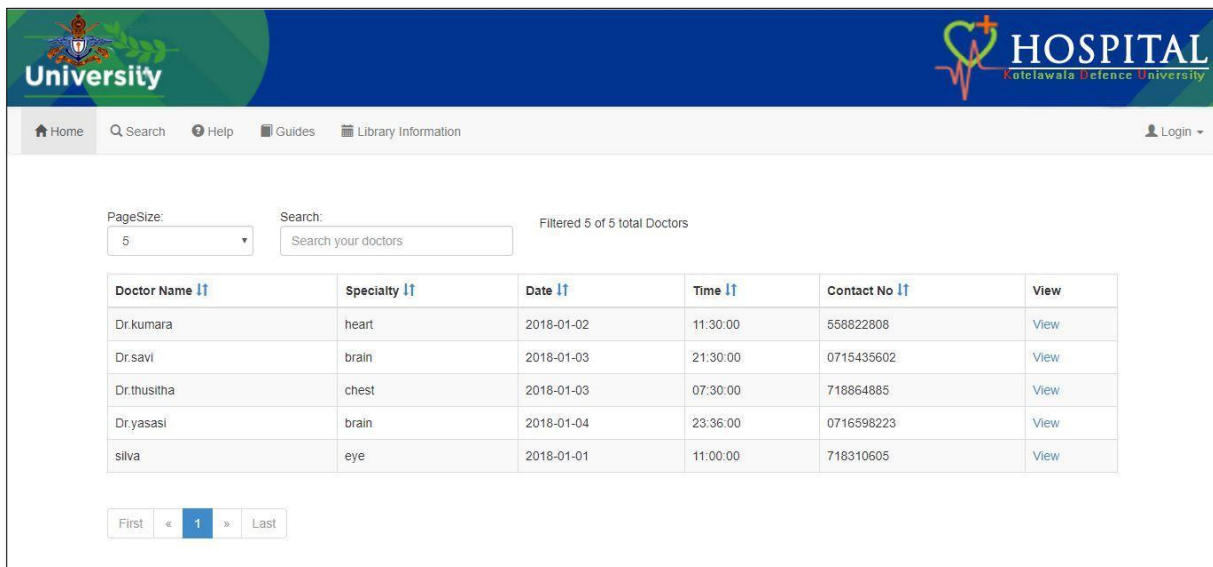
Figure 4:2Doctor Search Page

Patient Appointment Home Page

This page is patient can access the appointment and booking doctor.
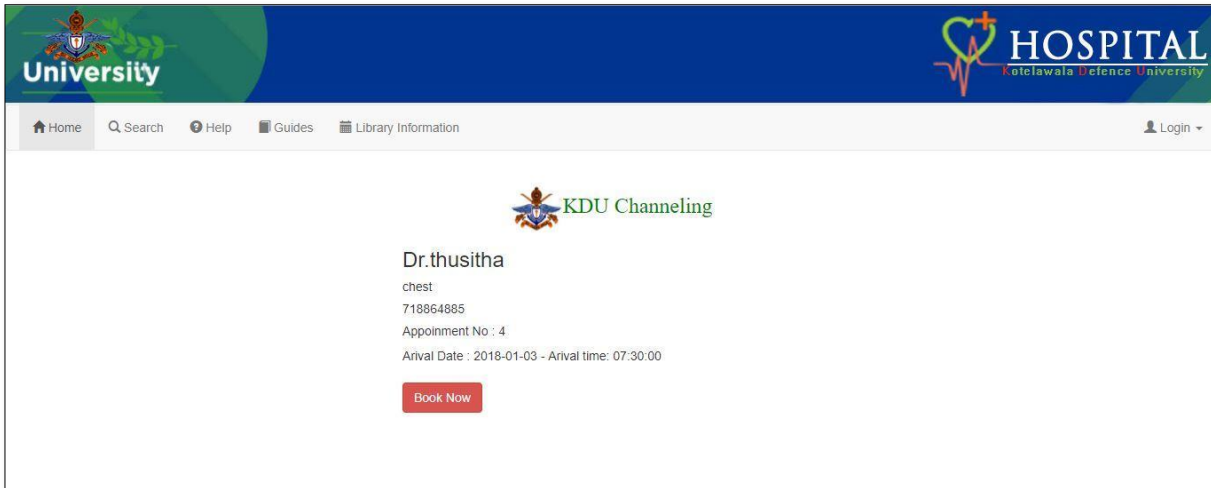
Figure 4:3Patient Appointment Home Page

Payment gateway page
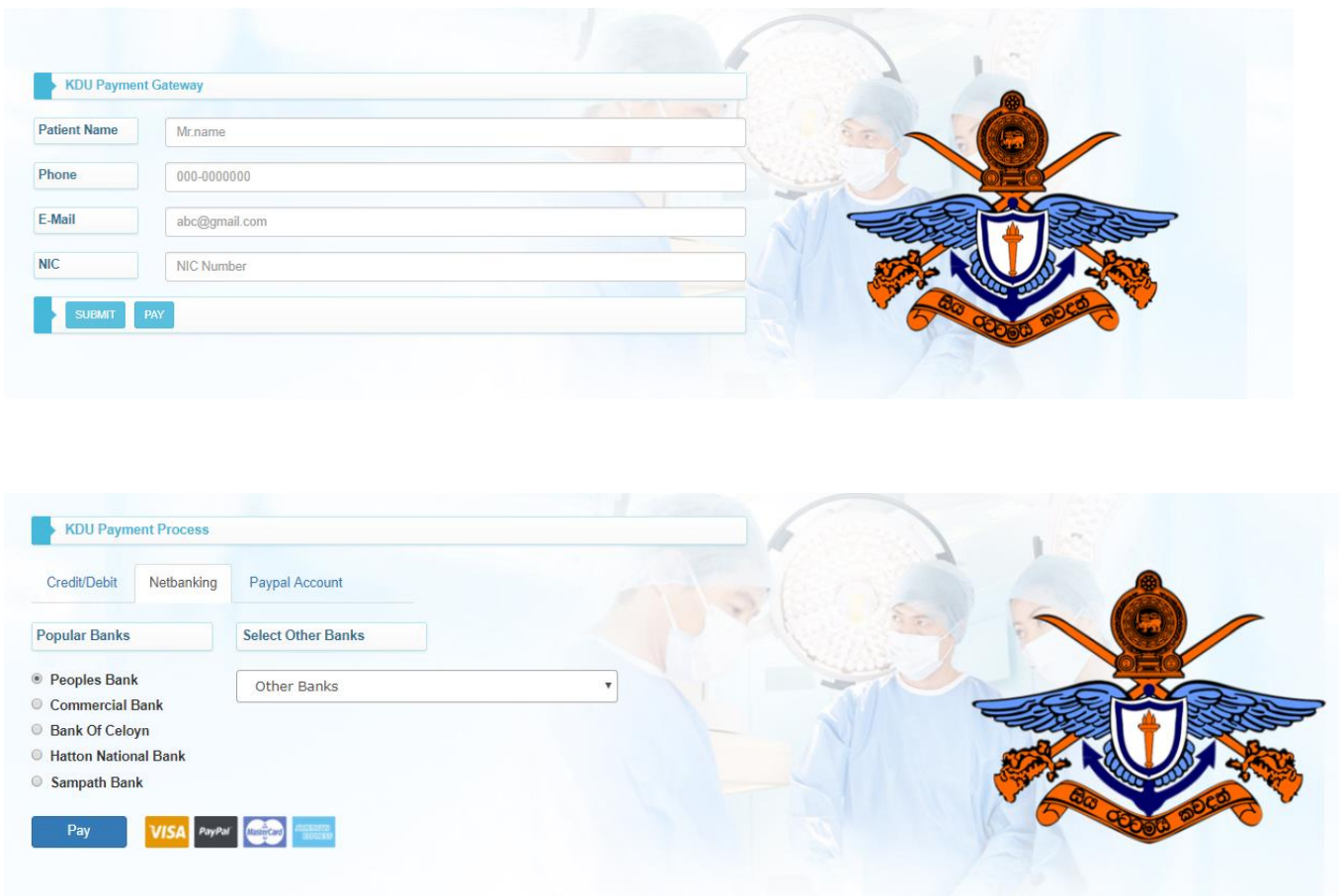
Figure 4:4Payment gateway page

Figure 4:5 PayPal Account page

Login Form for the Different Users

Only authorized user with the right user name and password has right to access the services to particular department as like Patients, admin and nurse he or she intern to view. When wrong user name and password is used the System rejects access to the services.

Figure 4:6Login Form for the Different Users

System Administration Home Page

The system administrator can add, edit system user and has access to view the services.
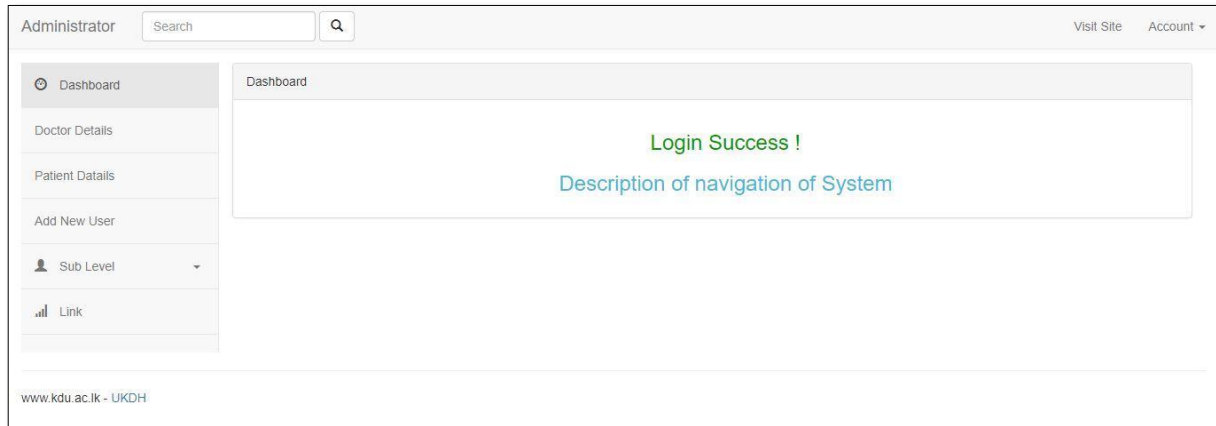
Figure 4:7 System Administration Home Page

Enter patient details page (backend the system)
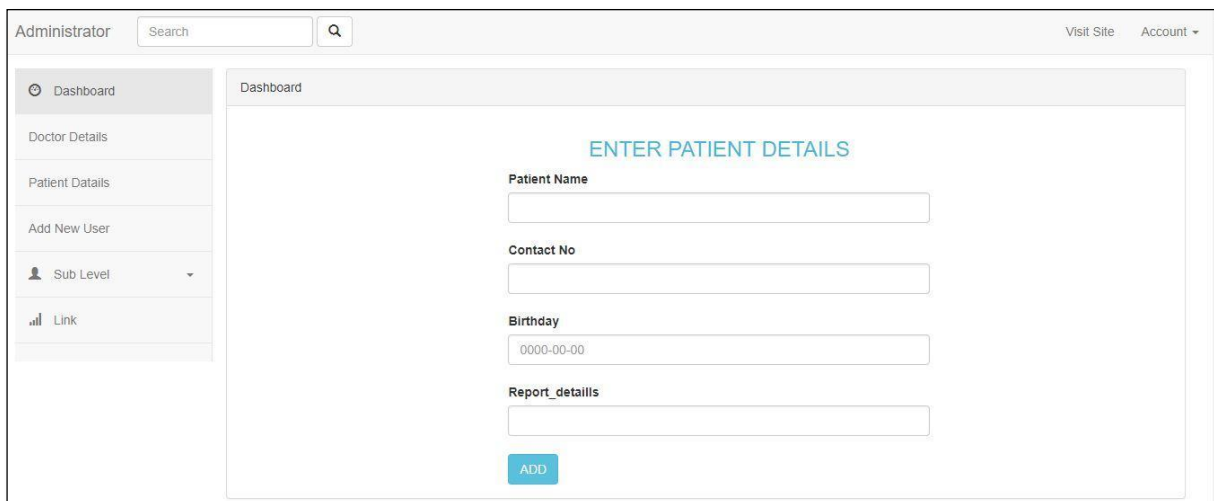
Figure 4:8Enter patient details page

Enter Doctor Detail's page (backend the system)
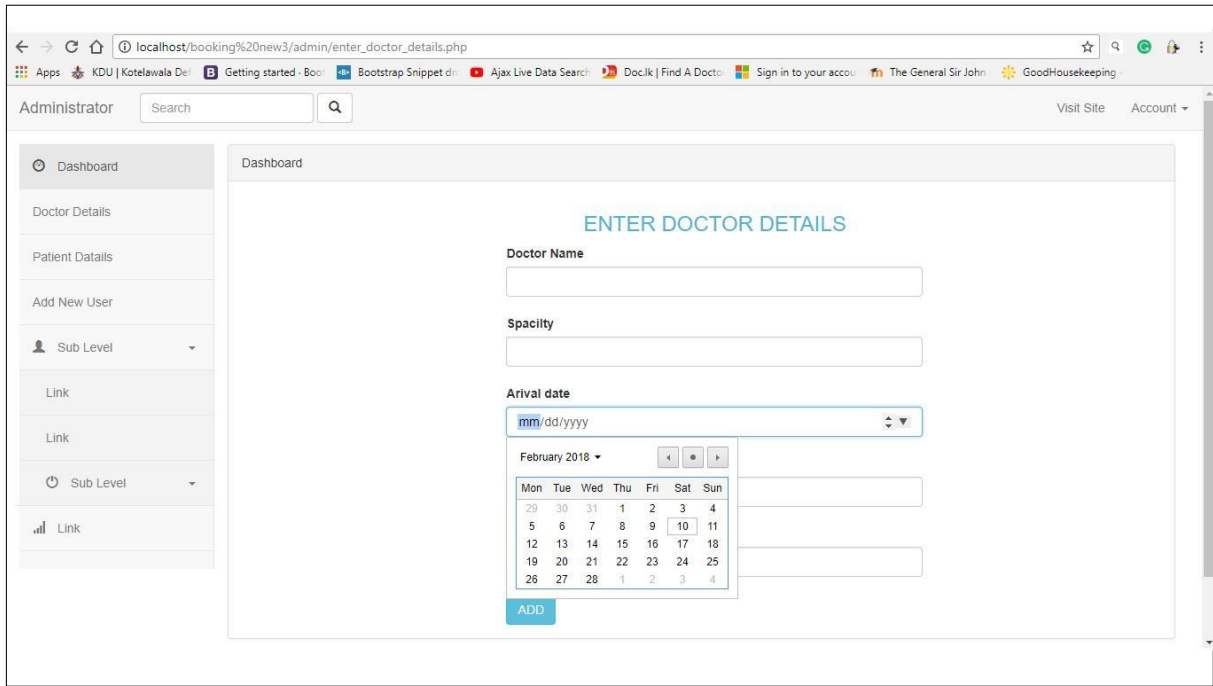
Figure 4:9Enter Doctor Detail's page

Other pages in Admin

Change User Password
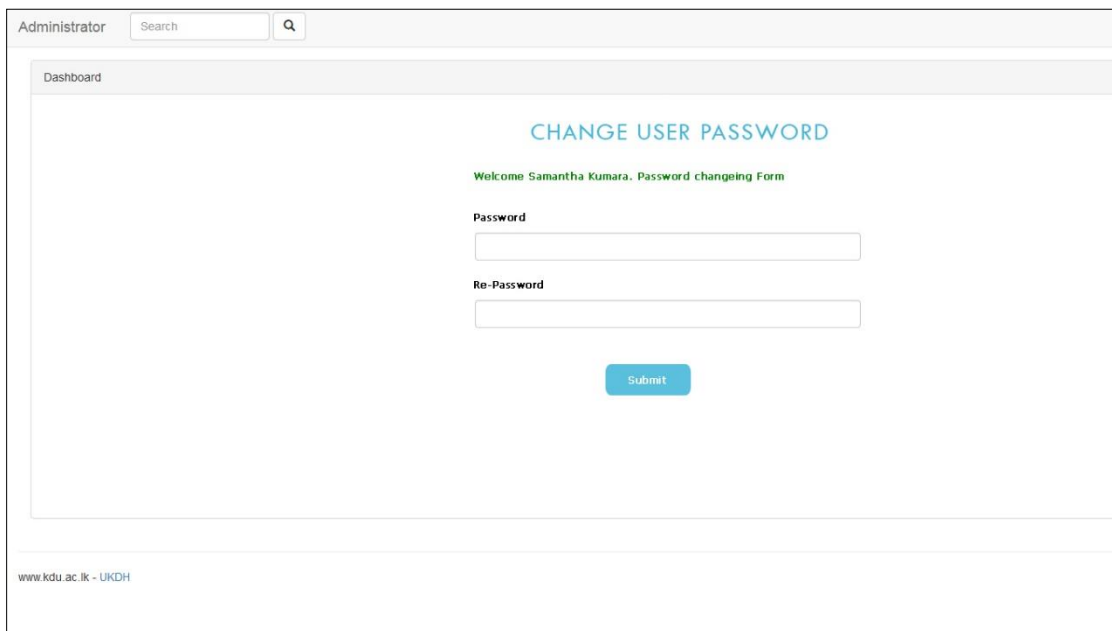
Figure 4:11 Change User Password

Doctor appointment list

Figure 4:12Doctor appointment list

Enter User Level

Figure 4:13 Enter User Level

Send Email Message by Group

Figure 4:14 Send Email Message by Group

Send email-message
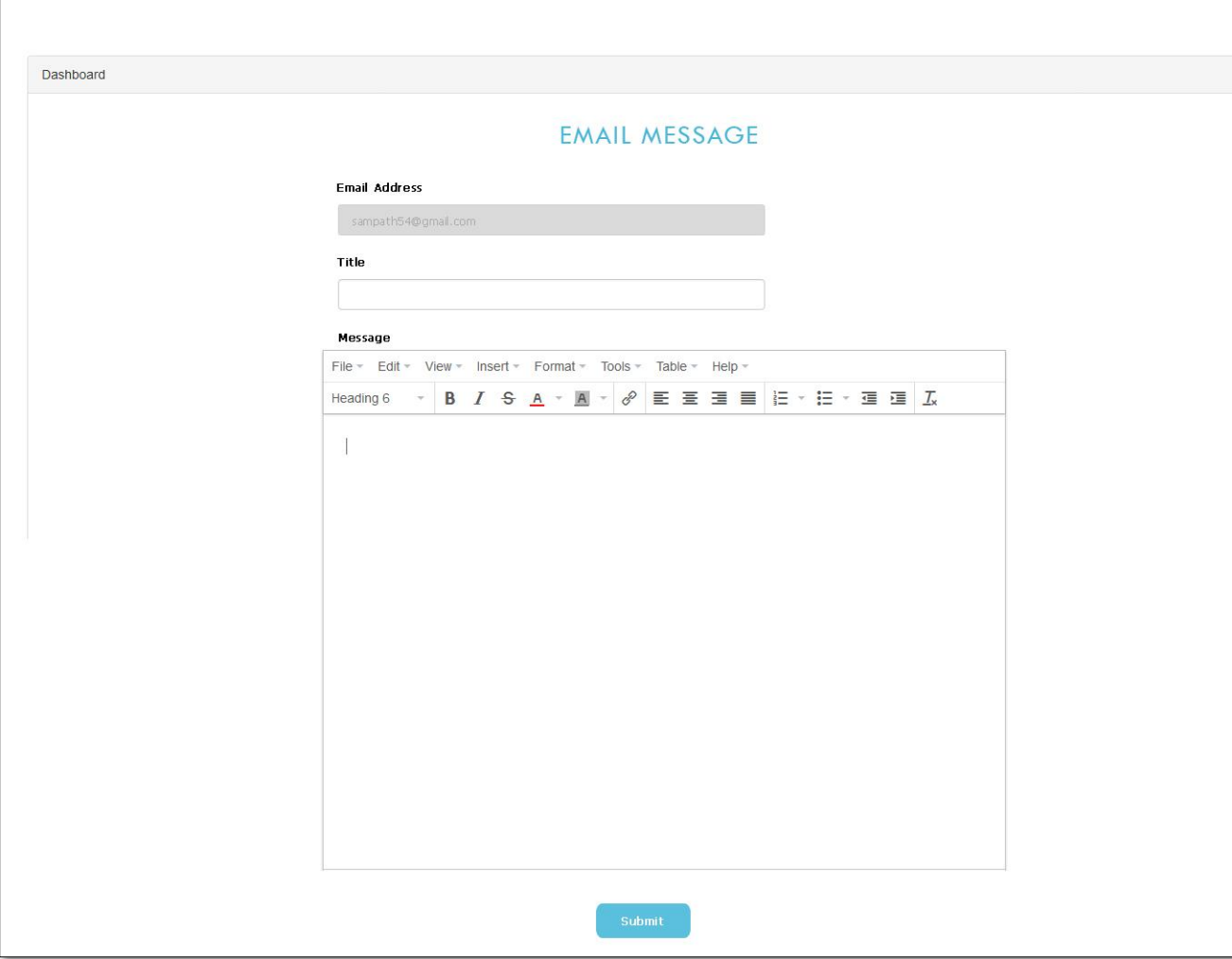
Figure 4:15 Send email-message

Appointment-confirmation
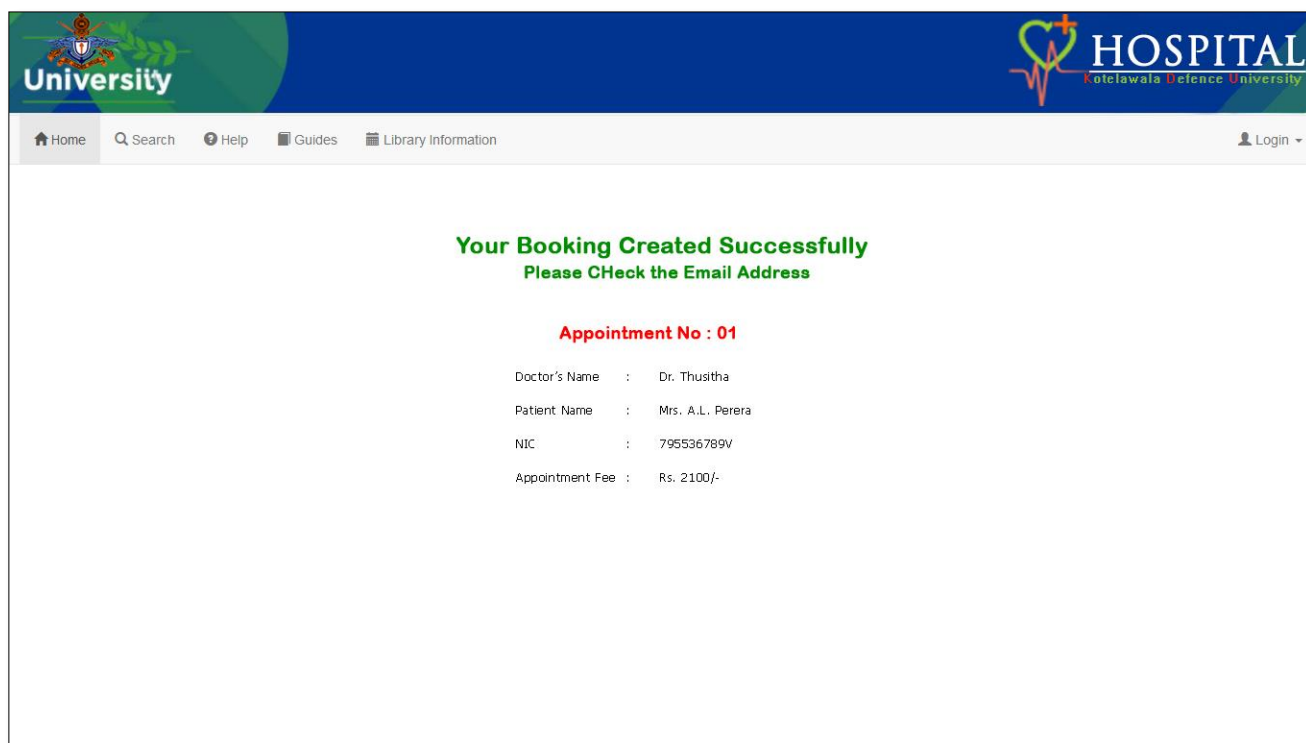
Figure 4:16 Appointment-confirmation

Send SMS
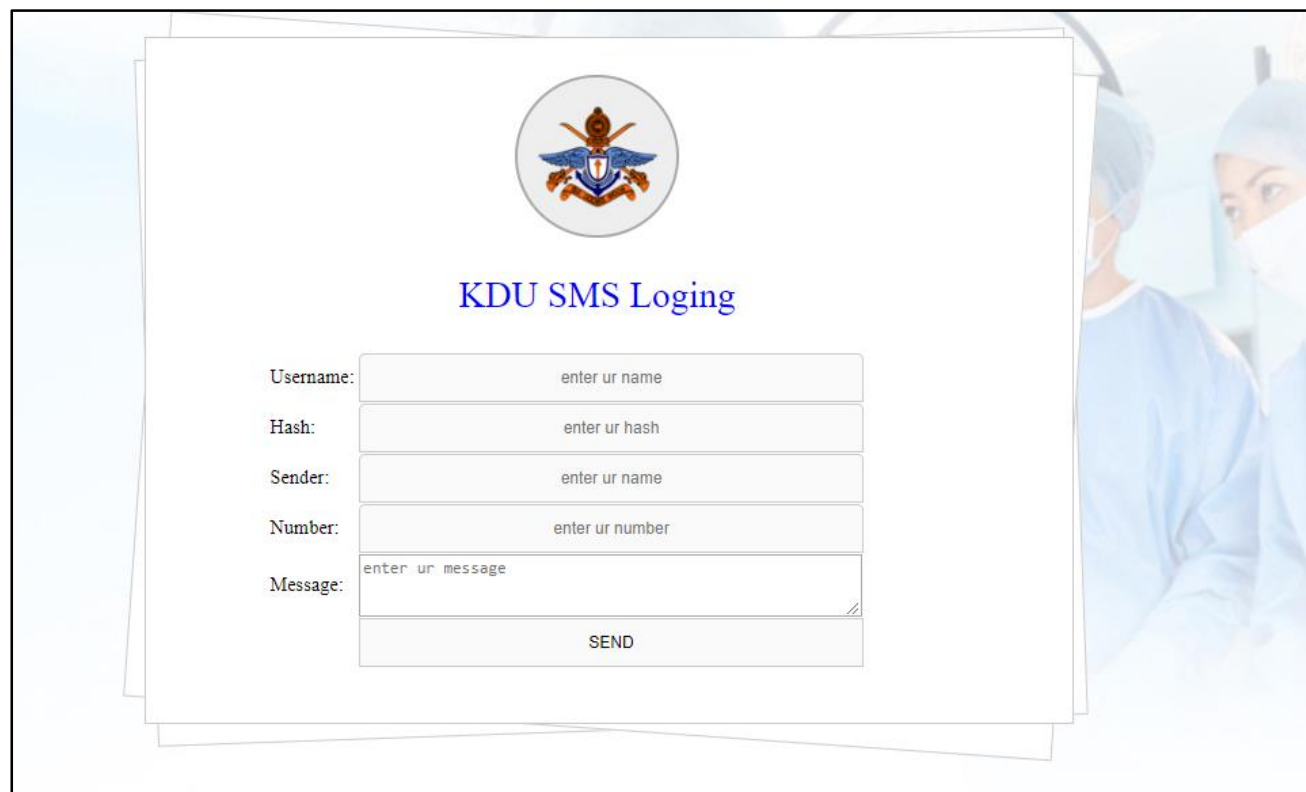
Figure 4:17 SMS interface

33

Report generating

sp / Name	ENT Surgeon	Eye surgeon	Oncological Surgeon	Oncologist - Cancer Specialist	Paediatric Oncologist	Physician	Surgeon	Totals
Dr. K.G.N. SENEVIRATNE	1							1
Dr. LAKSHMEN OBEYSEKARA				1				1
Dr. LALANTHA GURUSINGHE		1						1
Dr. MAHANADA UDUKALA			1					1
Dr. MAHENDRA SOMATHILAKA					1			1
Dr. NANDANA DICKMADUGODA						1		1
Dr. ROHANA R. VIDANAGE		1						1
Dr.KUSUM RATHNAYAKE							1	1
Totals	1	2	1	1	1	1	1	8

Figure 4:18 Report generating tool

Date	2018-04-10	2018-04-11				2018-04-12	2018-04-17	2018-04-20		Totals
sp / Name	ENT Surgeon	Oncological Surgeon	Oncologist - Cancer Specialist	Surgeon	Eye surgeon	Paediatric Oncologist	Eye surgeon	Physician		
Dr. K.G.N. SENEVIRATNE	1									1
Dr. LAKSHMEN OBEYSEKARA			1							1
Dr. LALANTHA GURUSINGHE					1					1
Dr. MAHANADA UDUKALA		1								1
Dr. MAHENDRA SOMATHILAKA						1				1
Dr. NANDANA DICKMADUGODA								1		1
Dr. ROHANA R. VIDANAGE							1			1
Dr.KUSUM RATHNAYAKE				1						1
Totals	1	1	1	1	1	1	1	1		8

34

CHAPTER 5:   Evaluation

Developed system is tested against the user requirements, which are gathered at the beginning. Actual data from the client's environment is used. The chapter also includes aspects such as test plan, test cases, use of test automation tools and testing frameworks

5.1   The following items will be considered in testing:

1. Login
2. Logout
3. Create new user (Administrator)
4. Create Type Appointment (Administrator)
5. Create Doctor Profile (Administrator)
6. Book an Appointment(Patient)
7. Edit Doctor Profile (Administrator)
8. Cancel Doctor's Appointment (Administrator)
9. Cancel Patient's Appointment (Patient)

Login

There are three kinds of uses of KDU hospital online doctor appointment system, patient, doctor, and administrator. To use the KDU hospital online doctor appointment system, all uses need to be identified and authorized. Users enter their username and password to login the system.

Case	Input Data	Expected Results
Login page	correct user Name correct password and press on login Button	Displays the welcome information to the user Based on the user's role (admin, doctor, or patient), the corresponding menu page (admin menu, doctor menu, and patient menu) will be displayed on the page.
	correct User Name incorrect Password and press on login Button	Displays error message
	incorrect User Name correct Password and	Displays error.

	Press on login Button	
	Not enter any username or password	Display error message " please input your username and password to retry."
	Press login button.	

Table 5-1 Login to the system

Logout

Case	Input Data	Expected Results
Logout menu	User click the logout menu	Redirect to the login page The menu pages only has "login" and "register " two menu items

Table 5-2 Logout the system

Create Patient Profile (Patient)

On the home page, a new patient can choose 'New Registration' option from the menu.

Case	Input Data	Expected Results
Create Patient Profile	Fill in all the fields in the registration form as required Press Submit button	Display a data insert successfully
	Leave all the fields empty Press Submit button	Display an error message that user needs to fill in the required information
	Fill in the fields according to an existing patient Press Submit button	Display a message that the record already exists

Table 5-3 Create Patient Profile

Create new user (Administrator)

After logging in, the Administrator can choose 'Create New user (nurse)' option from the menu. The Administrator will be able to see a form where he/she will be required to fill in all the relevant information in the given fields

Case	Input Data	Expected Results
	Fill in the fields in New user form as required Press Submit button	Display a message confirming that a new user is created successfully
	Fill in the fields according to an existing user Press Submit button	Display a message that the record already exists
	Leave all the fields empty Press Submit button	Display an error message that user needs to fill in the required information

Table 5-4 Create new user

Create Type Appointment (Administrator)

After logging in, the Administrator can choose Create New Appointment Type option from the menu. The Administrator will be able to see a form where he/she will be required to fill in all the relevant information in the given fields

Case	Input Data	Expected Results
	Fill in the fields in New Appointment type form as required Press Submit button	Display a message confirming that a new Appointment type is created successfully

Case	Input Data	Expected Results
	Fill all fields with correct values Click on submit button	A new web page is displayed doctor profile was created successfully.
	Provide a Doctor Login ID that already exists in the system Fill all other fields in the form correctly. Click on submit button	An error message displayed, duplicate login-ID provided.
	Fill in the fields according to an existing Appointment Type Press Submit button	Display a message that the record already exists

Table 5-5 Create Type Appointment

Book an Appointment (Patient)

After logging into KDU hospital system, the patient has the option to schedule an appointment.

Case	Input Data	Expected Results
	Arrive at Schedule Appointment interface	Backend: Personal information (patient key, user ID, first name, last name, date of birth, address, telephone number, email address) is stored in session
	Click on a day from the calendar	Backend: Day is stored in session Interface: Step 4 (select time) is displayed; displays time slots for day according to

		estimated duration of appointment type; displays available time slots .
	Click Confirm button	Backend: Appointment (appointment key, doctor key, patient key, type key, date, start time, end time,) is inserted into the database Interface: Confirmation is displayed; displays appointment type, date, time

Table 5-6 Book an Appointment (Patient)

Edit Doctor Profile (Administrator)

The doctor's information may need changes. The administrator can modify the profile after logging in.

Case	Input Data	Expected Results
	Try to change the "Login ID" field	Since this field is read only nothing will happen.
	Nothing changed in the form fields. Submit button is clicked.	Backend: Fields related to the doctor chose are re-saved in the Doctor and User tables in the database.
	The password field is filled with a value different from that given in the "Confirm Password" field. All other fields are filled correctly. Submit button is clicked.	A pop up error message is displayed informing the administrator.
	All/Some Fields in the form are left without modification. Submit button is clicked.	A pop up error message is displayed.

Table 5-7Edit Doctor Profile (Administrator)

Cancel Doctor's Appointment (Administrator)

Case	Input Data	Expected Results
	Check to select Patient's first and second name Check an appointment to Cancel Press Submit button	Cancel the selected appointment by changing the appointment status into 1
	Check to select Patient's Appointment's date Check an appointment to Cancel Press Submit button	Cancel the selected appointment by changing the appointment status into 1
	Press Submit button without selecting any appointment(s) to cancel	Display an alert message informing the user to select an appointment to cancel

Table 5-8 Cancel Doctor's Appointment (Administrator)

Cancel Patient's Appointment (Patient)

Case	Input Data	Expected Results
	Check an appointment to Cancel Press Submit button	Display all the information related to the selected patient's appointment Cancel the selected appointment by changing the appointment status into 1
	Check an appointment to Cancel Press Submit button	Display all the information related to the selected patient's appointment Cancel the selected appointment by changing the appointment status into 1
	Press Submit button without selecting any appointment to cancel	Display an alert message informing the user to select an appointment to cancel

Table 5-9 Cancel Patient's Appointment (Patient)

CHAPTER 6:   Conclusion

6.1   Introduction

This Chapter describes discuss the objectives of the system required in earlier chapters, limitation of the system conclusion and recommendation of the System.

6.2   Lesson Learned

Gained knowledge and good experience while developing the system. From the requirement gathering phase to end phase learned everything is helped to develop a successful system. Applying theory to practice is hard sometimes. Gained good knowledge about how to use new programming languages (Angular js, PHP, HTML, CSS, and JavaScript), design patterns, how to use a new framework (CI), and bootstrap templates for developing user interfaces.

Learned how to write a documentation of the thesis also really important. Therefore, lots of self-learning was carried out throughout this process.

6.3   Conclusion

Developed Online Doctor Appointment system is easy to use user friendly system which any new person can easily understand. Achieved objectives are:

- ✓ User can see the schedule date, time and serial no.
- ✓ Doctor can see how much appointment he gets for a specific day
- ✓ Admin can generate reports.
- ✓ Registered patient gets conformation email
- ✓ Email notifications.
- ✓ Admin can query the database
- ✓ make appointment reservations for patients.

CHAPTER 7: References

[1]"Research Gate | Share and discover research", Research Gate, 2017. [Online]. Available: http://www.researchgate.net. [Accessed: 14- Oct- 2017].

[2]"Electronics & software engineering projects for students with IT projects | NevonProjects", Nevonprojects.com, 2017. [Online]. Available: http://www.nevonprojects.com. [Accessed: 14- Oct- 2017].

[3]"Online Doctor Appointment Booking System - Book My Doctor", *CodeCanyon*, 2018. [Online]. Available: https://codecanyon.net/item/book-my-doctor/13150333. [Accessed: 10- Feb- 2018].

[4]J. GIPL, "Online doctor & medical appointment systems & solutions | Fullestop", *Fullestop.com*, 2018. [Online]. Available: https://www.fullestop.com/online-doctor-appointment-system.html. [Accessed: 10- Feb- 2018].

[5]"Cite a Website - Cite This for Me", *Arxiv.org*, 2018. [Online]. Available: https://arxiv.org/ftp/arxiv/papers/1701/1701.08786.pdf. [Accessed: 10- Feb- 2018].

[6]A. Peter Idowu, O. Olusegun Adeosun and K. Oladipo Williams, "Dependable Online Appointment Booking System for Nhis Outpatient in Nigerian Teaching Hospitals", *International Journal of Computer Science and Information Technology*, vol. 6, no. 4, pp. 59-73, 2014.

[7]"Cite a Website - Cite This For Me", *Ijircce.com*, 2018. [Online]. Available: https://www.ijircce.com/upload/2016/february/56_10_Online.pdf. [Accessed: 10- Feb- 2018].