Digital Hospital

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This Report Presented in Partial Fulfillment of the Requirements for the Degree of Bachelor of Science in Computer Science and Engineering

Department of Software Engineering

Daffodil International University

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APPROVAL

This Project titled is "**Digital Hospital**", submitted by Mahedi Hasan to the Department of Software Engineering, Daffodil International University, has been accepted as satisfactory for the partial fulfillment of the requirements for the degree of Bachelor of Science in Software Engineering and approved as to its style and contents.

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DECLARATION

We hereby declare that, this project has been done by us under the supervision of **Ms. Mahmuda Rawnak Jahan, Lecturer,** Department of Software Engineering, and Daffodil International University. We also declare that neither this project nor any part of this project has been submitted elsewhere for award of any degree or diploma.

_____

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ACKNOWLEDGEMENT

First we express our heartiest thanks and gratefulness to almighty ALLAH for His divine blessing makes us possible to complete the final year project/internship successfully.

We really grateful and wish our profound our indebtedness to my **Supervisor Ms. Mahmuda Rawnak Jahan**, **Lecturer**, Department of Software Engineering, Daffodil International University, Dhaka. Deep Knowledge & keen interest of our supervisor in the field of "Digital Hospital" to carry out this project. His endless patience, scholarly guidance, continual encouragement, constant and energetic supervision, constructive criticism, valuable advice, reading many inferior draft and correcting them at all stage have made it possible to complete this project.

We would like to thank our entire course mate in Daffodil International University, who took part in this discuss while completing the course work.

Finally, I am such a great amount of grateful to my parents that, I was constantly supported by them. They always prioritize my opinion and inspired me also.

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ABSTRACT

A unique online based Digital Hospital for both patients and hospital stuffs (Doctors, Management). The primary target of this design is to make hospital experience better than we currently have. Hospital is a place where no one willingly wants to visit but there are times when we need to. The old system of hospitals are not very user friendly. The first is knowing which hospital to be visited for sufferers. There are lots of other problems that makes your hospital experience bad. Main focus is to make peoples life easier in the hour of need. I am working to design such a system that will reduce a lot of human suffering and be beside of them in the time of need. There are automated hospital management system but they do not provide any functionality for us. Even the doctors do not have access to their patient's data while they are at home. It will be great for the patients to have a system that will keep them close to their personal data like: prescriptions, test reports and other important materials. Patients will be able to browse through all the doctors available and ask for appointment for their desired doctor. A doctor will also experience the similar benefits.

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TABLE OF CONTENTS

Chapter 1: Introduction 1
1.1 Project overview 1
1.2 Project Purpose 1
1.2.1 Background 1
1.2.2 Benefits of this project 2
1.2.3 Goal 2
1.3 Stakeholders 2
1.4 Project Schedule 3
1.4.1 Gantt Chart 3
1.4.2 Release Plan/Milestone 4
Chapter 2: Software Requirement Specification 5
2.1 Functional Requirements 5
2.2 Nonfunctional Requirements 7
2.3 Performance Requirements 8
2.3.1 Speed and Latency Requirements 8
2.3.2 Precision or Accuracy Requirements 8
2.3.3 Capacity Requirements 9
2.4 Dependability Requirements 9
2.4.1. Reliability Requirements 9
2.4.2 Availability Requirements 9
2.4.3 Robustness and Fault Tolerance Requirements 9
2.5 Maintainability and Supportability Requirements 10
2.5.1 Maintenance Requirements 10
2.5.2 Supportability Requirements 11
2.5.3 Adaptability Requirements 11
2.6 Security Requirements 11
2.6.1Access Requirements 11
2.6.2Integrity Requirements 12
2.6.3Privacy Requirements 12
2.7 Look and Feel Requirements 12
2.7.1 Appearance Requirement 12
2.8 Usability and Human Integrity Requirements 12

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2.8.1 Ease of Use Requirements 12
2.8.2 Understand-ability and Politeness Requirements 12
Chapter 3: System Analysis 13
3.1 Use Case Diagram 13
3.2 Use Case Description (for each use case) 14
3.3 Activity Diagram 17
3.4 System Sequence Diagram 22
Chapter: 4 System Design Specification 27
4.1 Class Diagram 27
4.2 Entity Relationship Diagram 28
4.3 Development Tools & Technology 29
4.3.1 HTML 29
4.3.2 CSS 29
4.3.3 PHP 29
4.3.4 Laravel Framework 30
4.3.5 MySQL 30
4.3.6 XAMPP 31
4.3.7 JavaScript 31
Chapter 5: System Testing 32
5.1 Testing Features 32
5.2 Features not to be tested 32
5.3 Test Cases 33
5.3.1 Test Case Table -1 33
5.3.2 Test Case Table -2 34
5.3.3 Test Case Table -3 35
5.3.4 Test Case Table -4 36
5.3.5 Test Case Table -5 37
5.3.6 Test Case Table -6 38
Chapter 6: User Interface 39
Chapter7: Project Summary 45
7.1 Summary 45
7.2 Limitations 45
7.3 Obstacles and Achievements 45

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7.4 Future Scope 45
7.5 References 46

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List of Figure

Figure 1: Gantt chart 3
Figure 2: (Use case diagram for “Digital Hospital”) 13
Figure 3: (Activity Diagram for Login Where patient, doctor & Admin can login with valid information) 17
Figure 4: (Activity Diagram for sign up where patient & doctor can register with valid information) 18
Figure 5: (Activity Diagram for create blog post, where Admin & doctor can write post for aware of people about medicine, diseases information and patient can view the information) 19
Figure 6: (Activity Diagram for Make Appointment, Where patient get service and pay their charge to confirm there appointment) 20
Figure 7: (Activity Diagram for Payments, Where patient get service and pay their charge) . 21
Figure 8: (Sequence Diagram for login in in Digital Hospital site) 22
Figure 9: (Sequence diagram for signup in Digital Hospital site) 23
Figure 10: (Sequence diagram for blog post Info in Digital Hospital site) 24
Figure 11: (Make an Appointment sequence Diagram for Patient, Here they can consult with Doctor for their need in Digital Hospital site) 25
Figure 12: (Sequence diagram for payment in the Digital Hospital site) 26
Figure 13: (Class Diagram for Digital Hospital) 27
Figure 14: (Entity Relationship Diagram in Digital Hospital) 28
Figure 15: (Doctor and Patients Can Registration in “Digital Hospital” with name, email, password, repeat password) 39
Figure 16: (User can login to “Digital Hospital” with email and password) 39
Figure 17: (Doctor Can Update their personal information in “Digital Hospital”) 40
Figure 18: (Doctor Can see all information in “Digital Hospital” from Doctor Dashboard) 40
Figure 19: (Doctor Can See all Appointment list of Patient in “Digital Hospital”) 41
Figure 20: (Here Patients can make an appointment for future consultancy) 41
Figure 21: (Patients can pay their bill after adding appointment for confirming Appointment) 42
Figure 22: (This option for admin use which is used for create blog post) 42
Figure 23: (Blog post list option for admin, who can see all details about active blog) 43
Figure 24: (View blog for visitor, who want to know about medicine and various type of viruses) 43
Figure 25: (This is Homepage, here patients and doctor can choose their desired selection) 44

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List of Table

Table 1.....4
Table 2.....5
Table 3.....5
Table 4.....5
Table 5.....6
Table 6.....6
Table 7.....6
Table 8.....7
Table 9.....7
Table 10.....8
Table 11.....8
Table 12.....9
Table 13.....9
Table 14.....10
Table 15.....10
Table 16.....11
Table 17.....11
Table 18.....12

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Chapter 1: Introduction

1.1 Project overview

This is a unique web-based “Digital Hospital” for both patients and hospital stuffs (Doctors, Management). The primary target of this design is to make hospital experience better than we currently have. Patients can get better treatment from doctor by staying their home and doctor can prescribed patient by their health query, Patients can meet with their expecting doctor by using video call from this system, Admin also manage patients/doctor information,
Payment details, Appointment of Doctors, Emergency and services.

1.2 Project Purpose

1.2.1 Background

In the pandemic situation patient and other diseases suffering from get admitted into hospital and don’t get proper treatment. People of our country face this problem mostly because our hospital management system is not well settled. In this time, I realize that I wanted to develop a web application and this application will provide us some features and functions for users as patient and doctor. Patient can choose their doctor and get appointment also get prescription about their health query. And others features and functions are managed by an admin.

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1.2.2 Benefits of this project

This system will provide full facilities for internet users who want to get treatment by staying home and maintain their safety. “Digital Hospital” system benefits are given below:

- This system can save our time.
- User can choose their doctor.
- User can get appointment in their need of emergency.
- User can appoint their doctor by setting date and time

1.2.3 Goal

In this era, Time and security is a valuable thing for of all us. Whenever life is lost, it is not. So in this situation we should focus on our safety first.

The aim of this system is to make it simple for users to get medication and doctor's appointments while staying at home. This will help to save their lives, and the user will be able to get treatment quickly.

It would be fantastic for patients to have a system that allows them to keep track of their personal information, such as prescriptions, test results, and other vital documents.

1.3 Stakeholders

Admin: Admin has complete control over the "Digital Hospital." This requires that the administrator log in with a correct username and password. The details of users (Patients and Doctors) can then be viewed by the administrator. Admins will handle the blog part of the website, which contains information about medicines and illnesses, as well as the emergency and services sections, as well as the entire website's activities.

Patient: Patients can access a doctor's profile and schedule an appointment with their preferred doctor. Patients get a prescription and are able to resolve their issues. Other features include an emergency ambulance service and a payment option, all of which are available while using this site's services.

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Doctor: The doctor has access to the patient's profile. If the patient's prior record is still available, the doctor will see it, as well as the payment information for the treatment that the doctor offers immediately or according to an appointment schedule.

1.4 Project Schedule

1.4.1 Gantt Chart

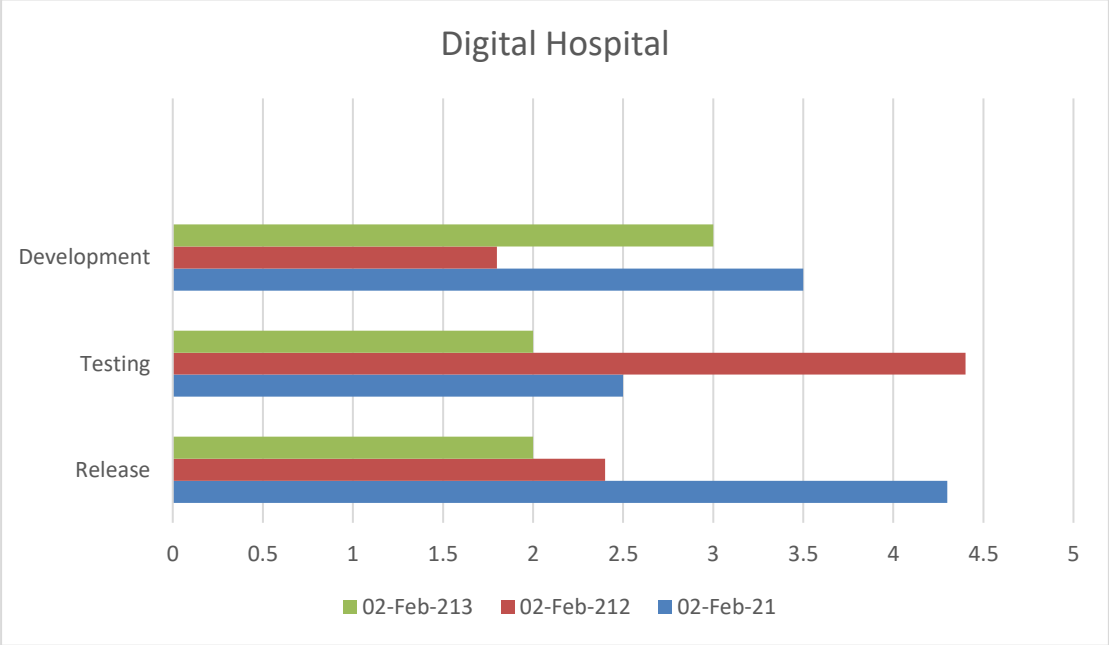

Figure 1: Gantt chart

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1.4.2 Release Plan/Milestone

Task No	Task Name	Time
1	Requirement analysis	3 week
2	Project proposal	4 week
3	Database design	2 week
4	User interface design	3 week
5	Implementation	4 week
6	Testing	3week
7	Evaluating the project	3week

Table 1

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Chapter 2: Software Requirement Specification

2.1 Functional Requirements

FR-01	Patient Registration
Description	Without register patient do not able to see this website. To view doctor and get treatment and appointment. If patient need emergency and other services they need to register in this system. This module will help the patient to register in this system.
Stakeholders	Patient

Table 2

FR-02	Doctor Registration
Description	Without register, Doctor do not able to see this website service features, To view appointments, Collect patient data or any other work, Doctor must be needed to register as a Doctor in this system. This module will help to register in this system as a Doctor.
Stakeholders	Doctor

Table 3

FR-03	Edit Profile
Description	After login to system user must be edit their profile, Update their name, Address, Phone, and Gender in the system. User and admin can view the details of doctor and patient. This module will help the user to get details in this system.
Stakeholders	Admin, Patient, Doctor

Table 4

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FR-04	View Doctor
Description	After login in to the system patient can view all doctor details in their home page and also search for a doctor which one they want and get appointment from the doctor by submitting the appointment form.
Stakeholders	Patients

Table 5

FR-05	Appointments
Description	Doctor is notifying for patients appointments. When doctor view the appointment she/he will see the problem of a patient and give the prescription. And Also set the appointment call and date and time for giving better treatment.
Stakeholders	Doctor

Table 6

FR-06	Payments
Description	When a patient wants to get service from this site like doctor appointment or ambulance they need to pay for this service. Without any pay they can't get service.
Stakeholders	Patients, Doctor

Table 7

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FR-07	Ambulance
Description	When a patient need ambulance, they call them here by registering this system
Stakeholders	Patient, Admin

Table 8

2.2 Nonfunctional Requirements

NFR-01	Privacy Policy
Description	Application should be secure so that no one can access users private information.
Stakeholders	Users

Table 9

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NFR-02	User Friendly
Description	Simple and easy interface for both patients and doctors, because of that they can browse this site easily.
Stakeholders	Users

Table 10

2.3 Performance Requirements

It's a very important thing to take care of the performance of a project. For ensuring a good performance, this project has some requirements which will ensure a better performance.

2.3.1 Speed and Latency Requirements

PR-01	Page Refresh Rate
Description	While the doctors and patients browsing this system the page will show within a moment. It also depends on doctors and patients internet connection.
Stakeholders	Patients, Doctors

Table 11

2.3.2 Precision or Accuracy Requirements

There is nothing specific accuracy requirements.

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2.3.3 Capacity Requirements

This system is able to manage all the information of doctors, patients and application.

PR-02	At first the system will contain all the registered patient and doctor information.
Description	The information of registered doctor and patient will be stored in database.
Stakeholders	Patient, Doctor

Table 12

2.4 Dependability Requirements

2.4.1. Reliability Requirements

- Admin, patient and doctor should be login to the system using his/her valid email and password.
- Admin can easily update all available request.
- Patient and doctor can view their appointments.

2.4.2 Availability Requirements

DR-01	Must be available the system at 24x7
Description	Must be available the system at 24 hours in a day. Must be updated the system regularly. Need to know command for run properly and easily.
Stakeholders	Patient, Doctor, System Developer

Table 13

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2.4.3 Robustness and Fault Tolerance Requirements

DR-02	This system manage over access.
Description	Sometimes multiple users can over access to this system. The system can handle multiple user access. The system has almost ensured 0% crush.
Stakeholders	N/A

Table 14

2.5 Maintainability and Supportability Requirements

2.5.1 Maintenance Requirements

MS-01	The system can support to browse this site in any time.
Description	• Patient can access the site and view doctors and get appointments any time. • Doctor can view appointments of patients and prescribe that patient through this system.
Stakeholders	Doctor, Patient

Table 15

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2.5.2 Supportability Requirements

MS-02	This system maintenance should be quick.
Description	This system helps to update the accounts information and member info at any time.
Stakeholders	N/A

Table 16

2.5.3 Adaptability Requirements

No visible adaptability requirements.

2.6 Security Requirements

This system has some security requirements. Like-

- Username/Password
- Validation
- Authentication

2.6.1Access Requirements

SR-01	This system gives security policy.
Description	Without registering any patient and doctor in this system he/she will be not able to access the website. This mechanism provides security services.
Stakeholders	Doctor, Patient

Table 17

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2.6.2Integrity Requirements

To protect credentials of user from being stolen, all password share stored in encrypted form.

The Requirements significantly reduces the value of stolen user credentials, it's not easy to decrypt the password.

2.6.3Privacy Requirements

SR-02	All data will be protected
Description	All data are protected. All data are stored in database using encrypted form. It's not easy to decrypt.
Stakeholders	Doctor, Patient

Table 18

2.7 Look and Feel Requirements

2.7.1 Appearance Requirement

[1] The user interface must be attractive.
[2] The user interface must be user friendly.
[3] The user interface must be user interactive.

2.8 Usability and Human Integrity Requirements

2.8.1 Ease of Use Requirements

This system is very easy for use and also understandable.

2.8.2 Understand-ability and Politeness Requirements

This system is very easy for understand and also usable.

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Chapter 3: System Analysis

3.1 Use Case Diagram

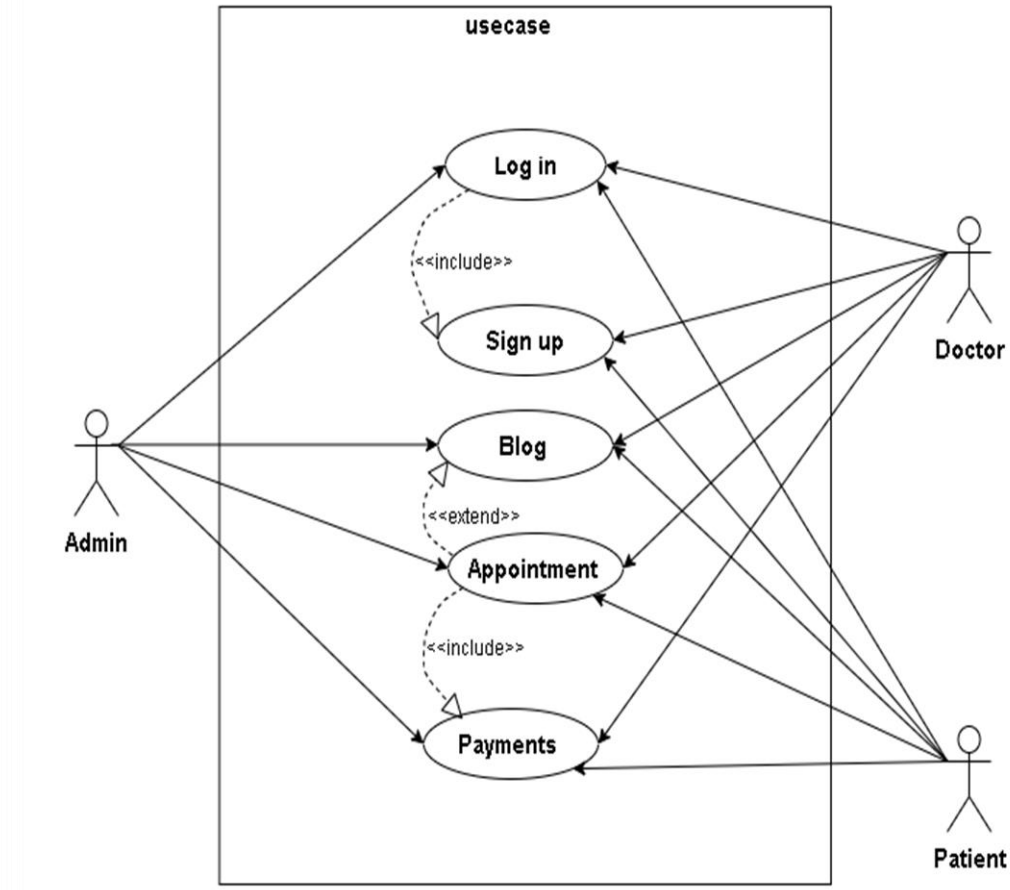

Figure 2: (Use case diagram for "Digital Hospital")

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3.2 Use Case Description (for each use case)

Use case description for Registration/Signup

Use Case Name: Register to system.

Actor: Patient, Doctor

Pre-condition: None

Primary Path:

- Enter name.
- Enter password.
- Enter Email.

Exceptional Path:

- Name field is empty. Go to step 1 and give a name.
- Password field is empty. Go to step 2 and give a password.
- Email field is empty go to step 3 and give email address.
- Given email is invalid go to step 3 and retype valid email.

Post condition: Successfully create account.

Use case description for Login

Use Case Name: Login to system.

Actor: Admin, Patient, Doctor.

Pre-condition: Registration.

Primary Path:

- Enter username.
- Enter password.
- Submit username and password.

Exceptional Path:

- If email and password invalid then submit a valid email and password. Post condition: Successfully Login to the system.

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Use case description for Personal Information

Use Case Name: personal Information

Actor: Patient, Doctor

Pre-condition: Login and select profile.

Primary Path:

- Select Profile.
- Enter Name.
- Enter Age.
- Enter Address.
- Enter Phone number.
- Enter Gender.
- Enter Blood group.
- Submit.

Exceptional Path:

- Name field is empty. Go to step 1 and enter the name
- Age field is empty. Go to step 2 and enter the age.
- Address field is empty. Go to step 3 and enter the address.
- Phone number field is empty. Go to step 4 and enter the phone number.
- Gender field is empty. Go to step 5 and enter the gender
- Blood group field is empty. Go to step 6 enter blood group.

Post condition: Profile is update.

Use case description for Appointments

Use Case Name: Appointment.

Actor: Patient.

Pre-condition: Login and view doctor.

Primary Path:

- Select view doctor option
- View the doctor details.
- Select appointment.
- Enter appointment letter.
- Submit the appointment.

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Exceptional Path:

- Email is invalid. Enter a valid email for login.
- Password is invalid. Enter valid password.
- Appointment letter field is empty. Enter the appointment letter.

Post condition: Appointment submission successful.

Use case description for Forgot Password

Use Case Name: Forgot Password.

Actor: Admin, Patient, Doctor.

Pre-condition: Login.

Primary Path:

- Select login option.
- Enter Email
- Enter wrong password.
- Submit.

Exceptional Path:

If password reset link not found then wait for admin's response. Post condition: Create new password successfully

Use case description for Appointment History

Use Case Name: Appointment History.

Actor: Admin, Patient

Pre-condition: Login.

Primary Path:

- Select profile.
- Select my appointment.
- View appointment history.

Exceptional Path: None.

Post condition: View appointment history successfully.

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3.3 Activity Diagram

Login

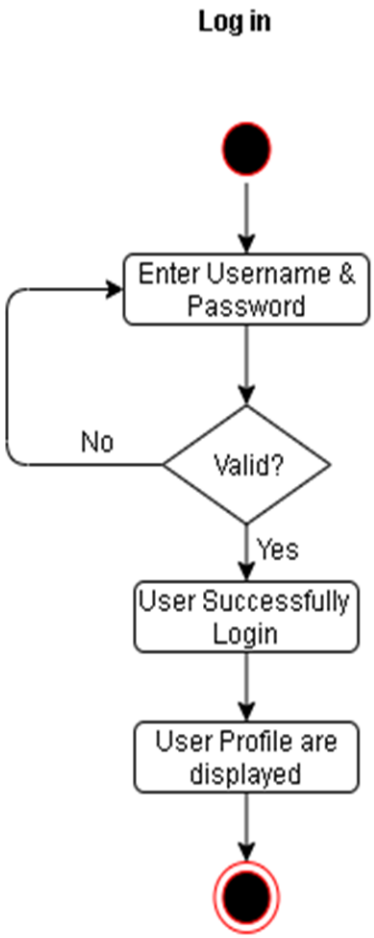

Figure 3: (Activity Diagram for Login Where patient, doctor & Admin can login with valid information)

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Sign Up

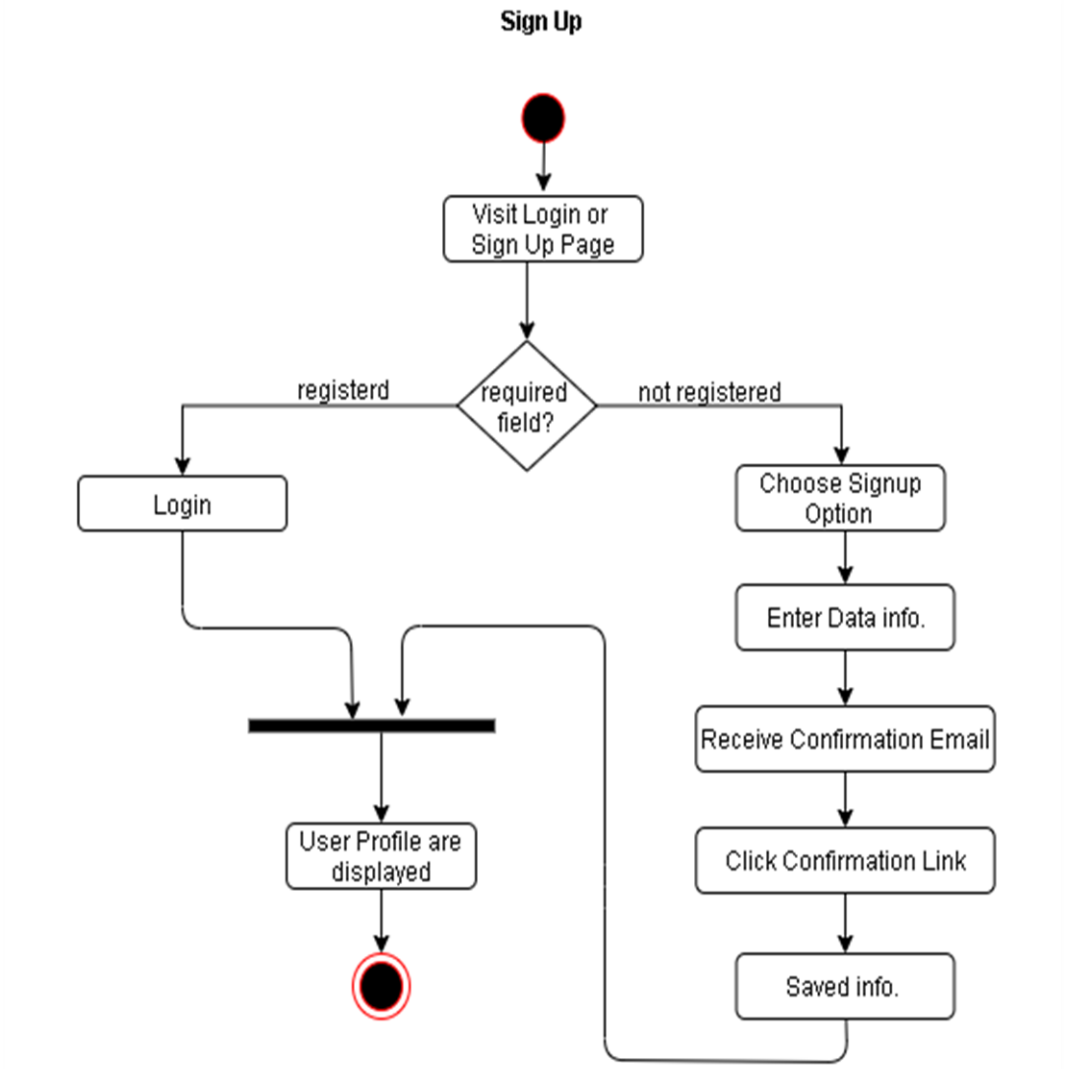

Figure 4: (Activity Diagram for sign up where patient & doctor can register with valid information)

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Activity diagram for Create Blog Post:

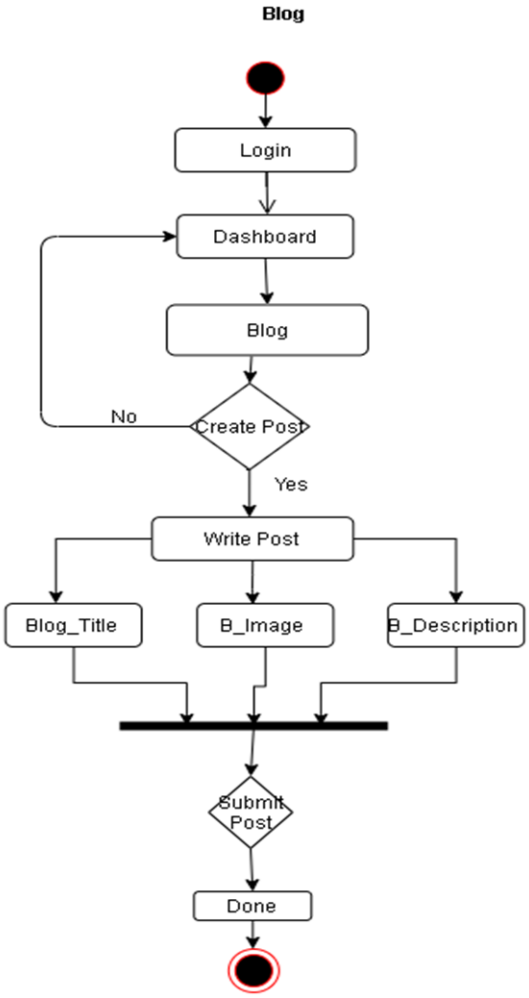

Figure 5: (Activity Diagram for create blog post, where Admin & doctor can write post for aware of people about medicine, diseases information and patient can view the information)

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Activity Diagram for Make an Appointment

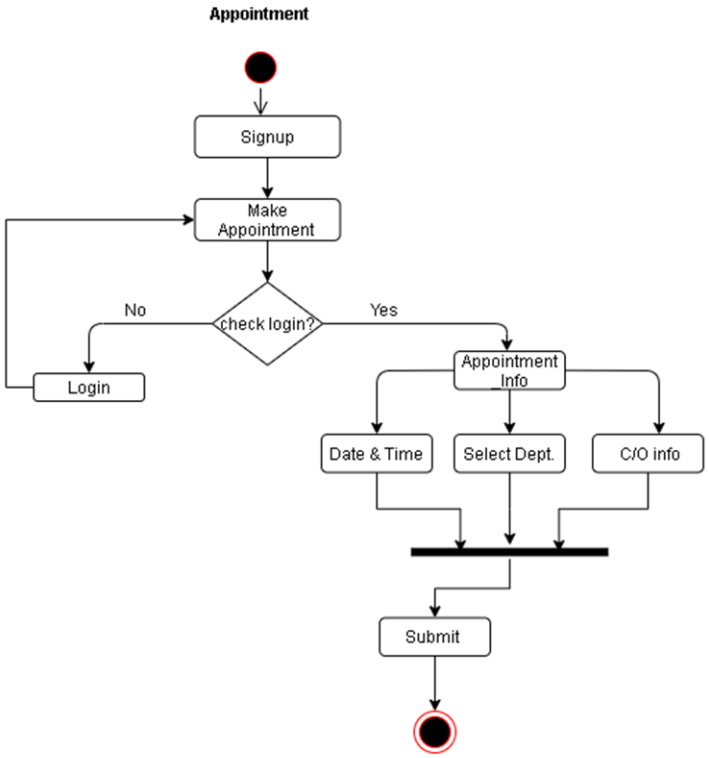

Figure 6: (Activity Diagram for Make Appointment, Where patient get service and pay their charge to confirm there appointment)

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Activity Diagram for Payment

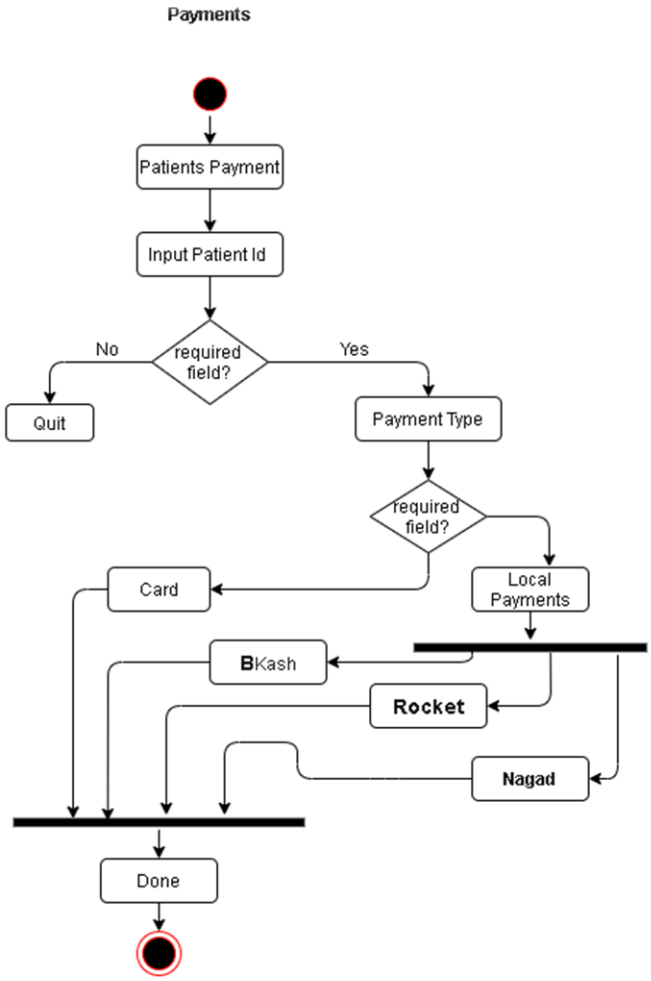

Figure 7: (Activity Diagram for Payments, Where patient get service and pay their charge)

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3.4 System Sequence Diagram

Sequence diagram for Login:

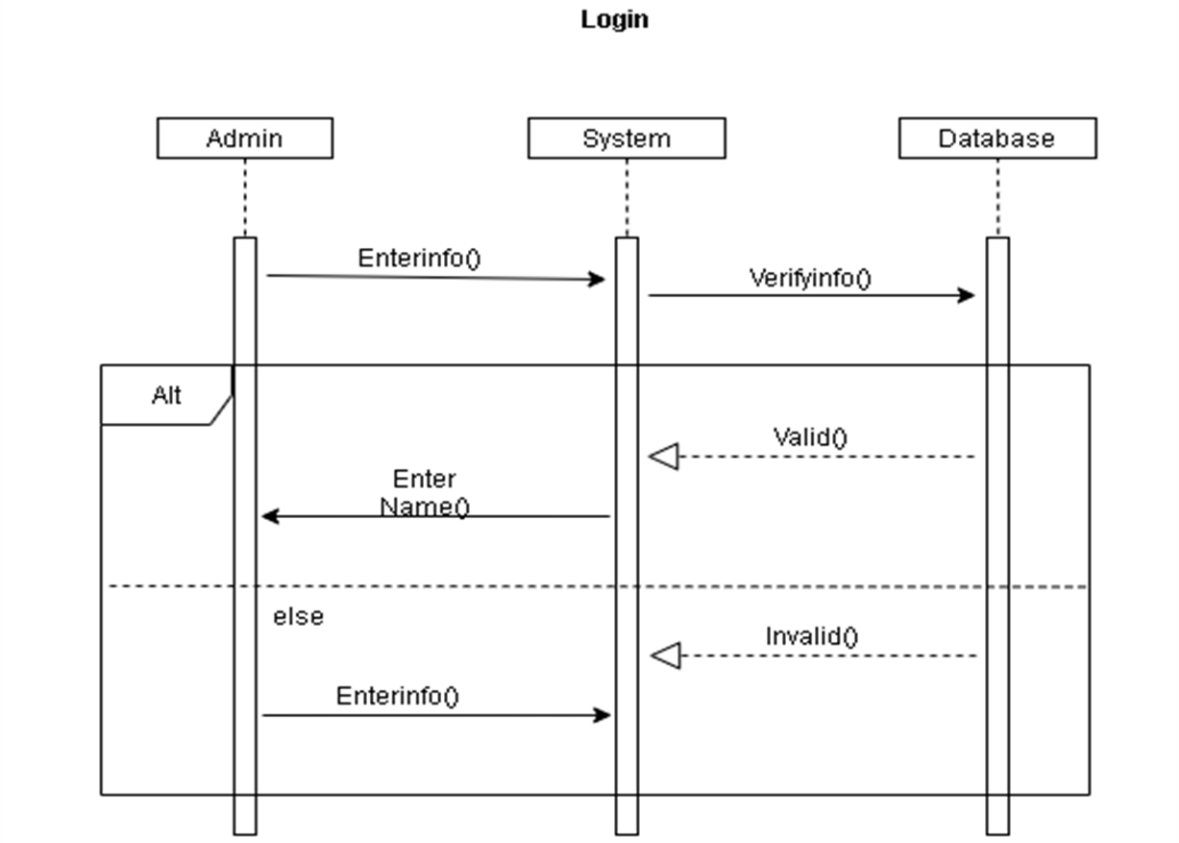

Figure 8: (Sequence Diagram for login in in Digital Hospital site)

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Signup

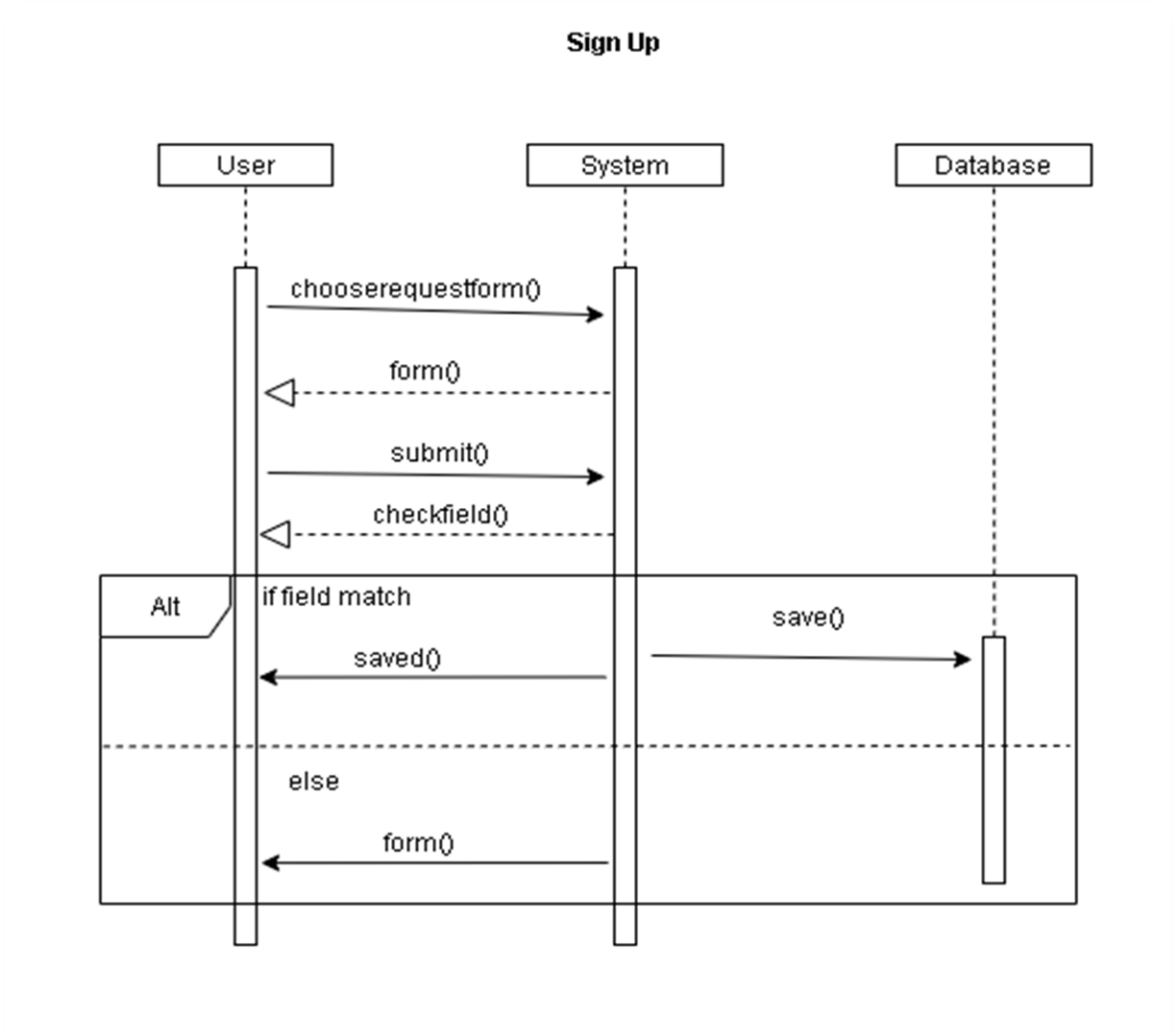

Figure 9: (Sequence diagram for signup in Digital Hospital site)

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Blog Post

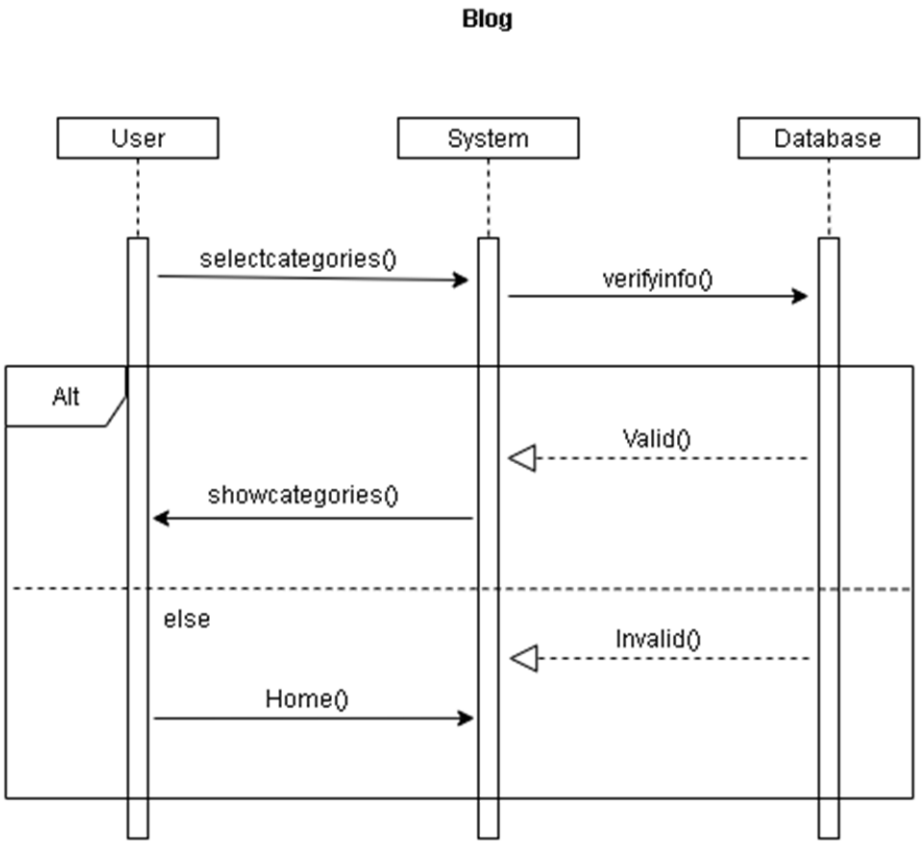

Figure 10: (Sequence diagram for blog post Info in Digital Hospital site)

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Make an Appointment

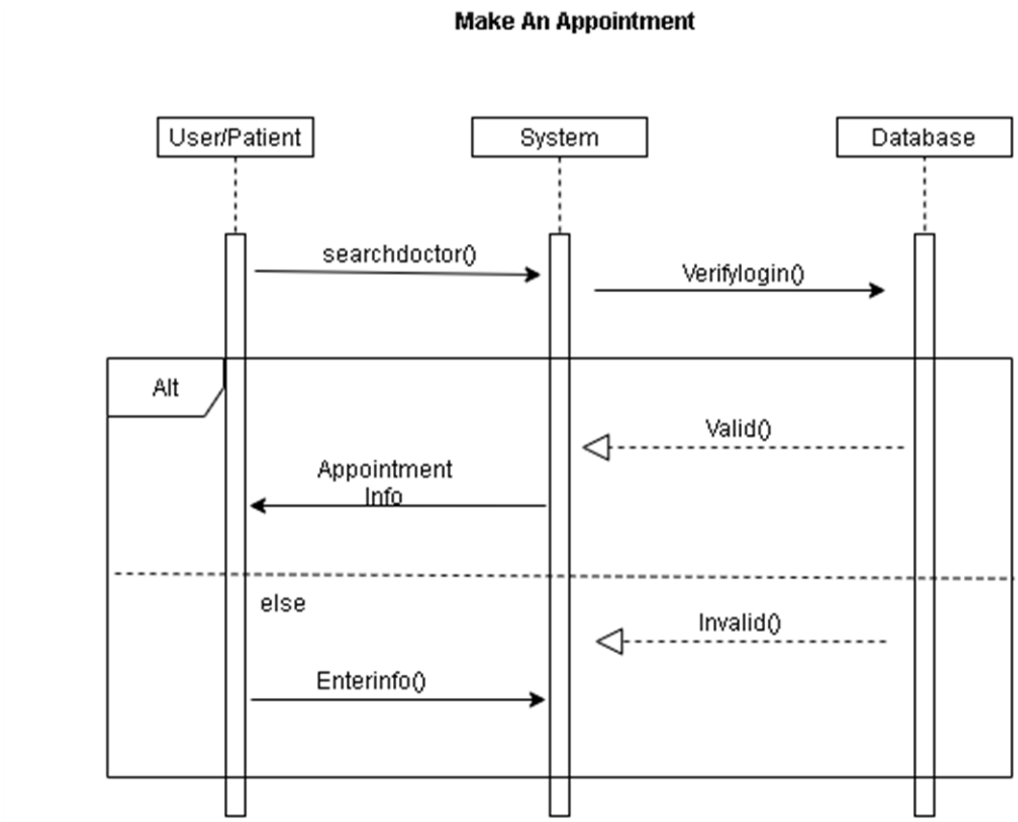

Figure 11: (Make an Appointment sequence Diagram for Patient, Here they can consult with Doctor for their need in Digital Hospital site)

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Payments

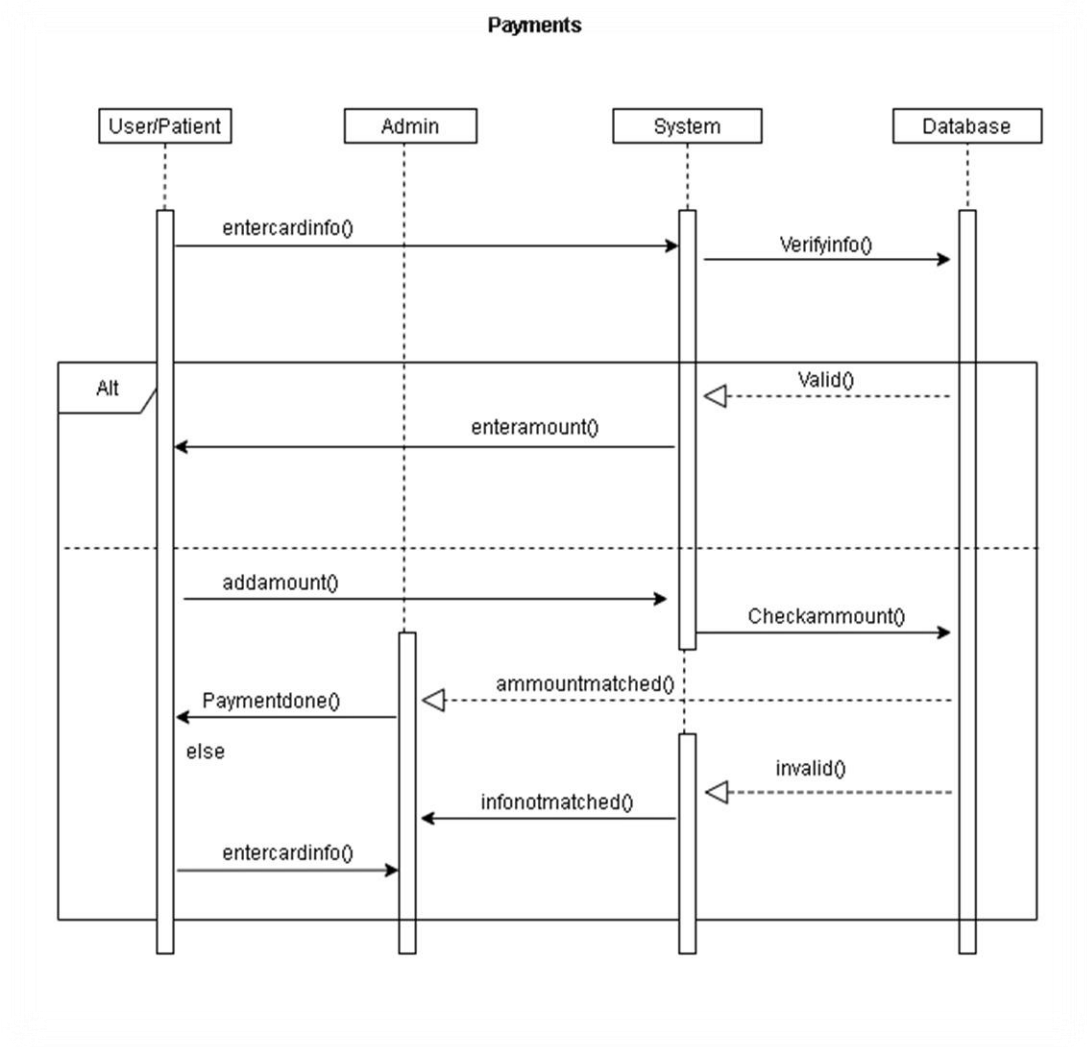

Figure 12: (Sequence diagram for payment in the Digital Hospital site)

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Chapter: 4 System Design Specification

4.1 Class Diagram

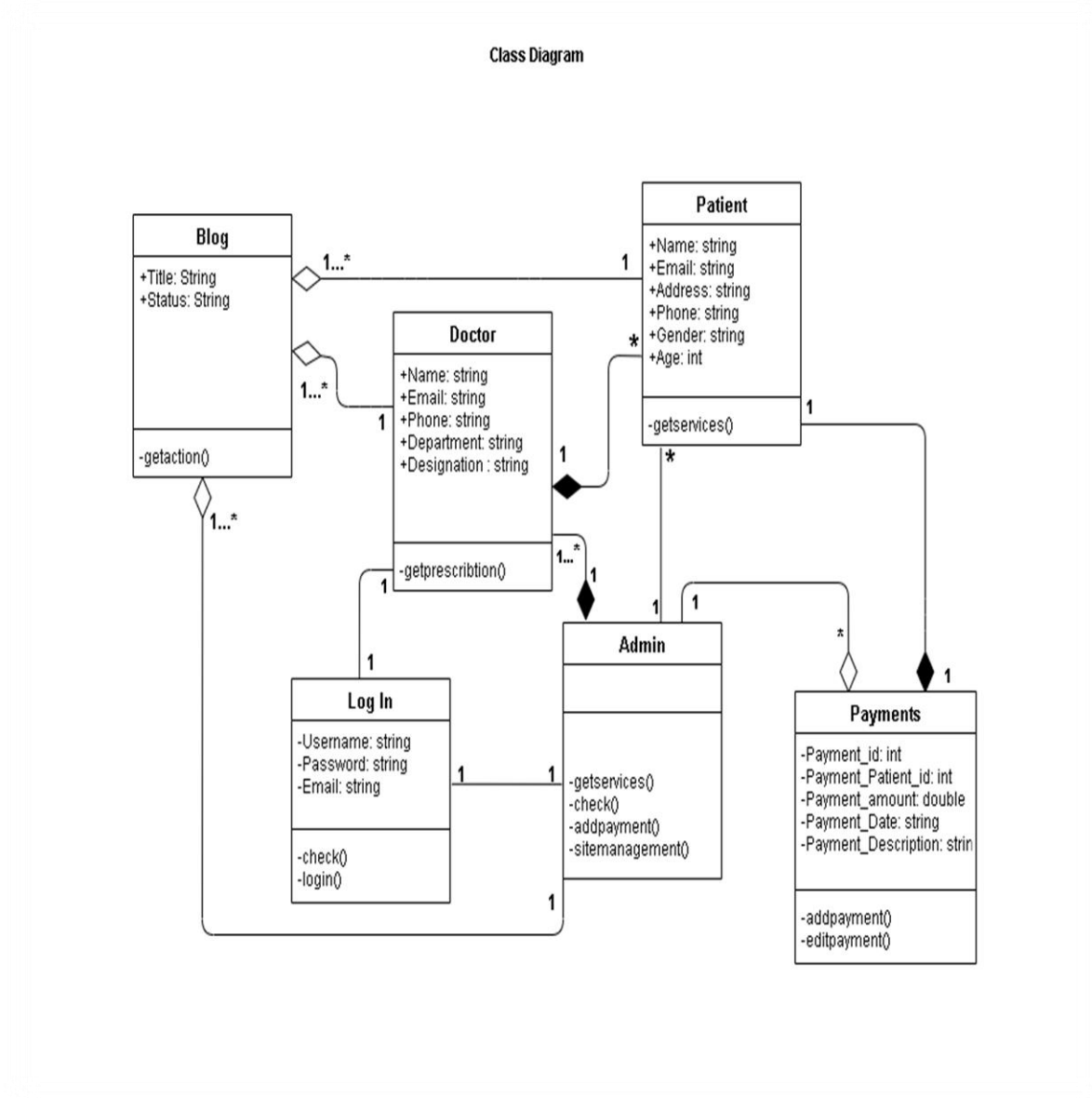

Figure 13: (Class Diagram for Digital Hospital)

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4.2 Entity Relationship Diagram

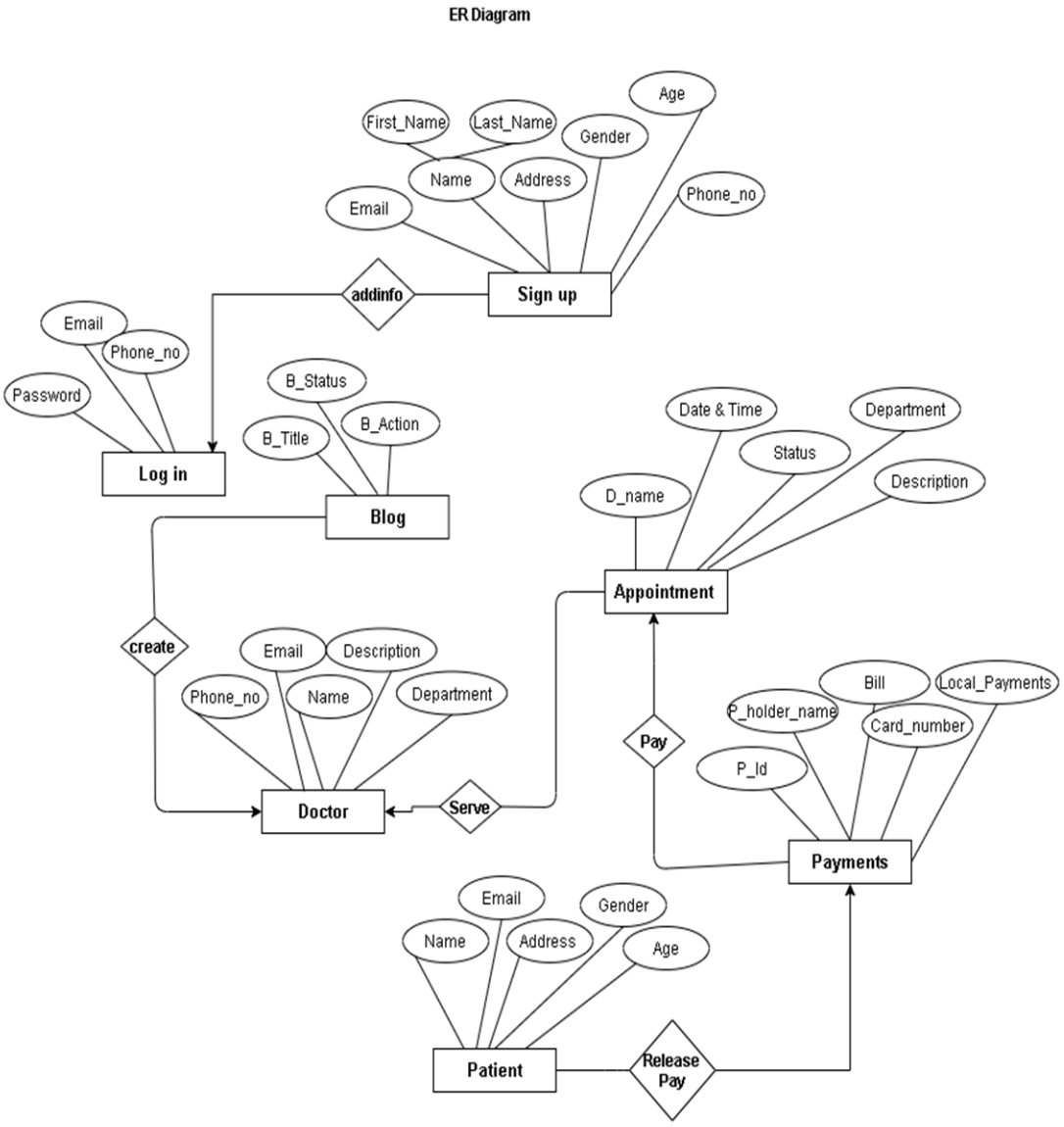

Figure 14: (Entity Relationship Diagram in Digital Hospital)

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4.3 Development Tools & Technology

While there are number of software tools to develop and implement the online based, I even have chosen those are open source, in order that it'll reduce the developing cost of the project. For designing the project HTML, CSS, JavaScript, Bootstraps, Apache server as web server,

PHP and Laravel Framework for creating the system dynamic. MySQL as database server. All of the tools are open source.

4.3.1 HTML

In this project HTML used for define the structure. HTML may be a terminology wont to structure an internet page and its content also stands for Hyper Text terminology .HTML consists of series of elements. Which you employ to surround or wrap. HTML documents are described by HTML tags. Each HTML tag describes different document content. HTML used because:

•Can make a word or image hyperlink.

•Can make the font bigger and smaller.

•Supported by all browser.

•Cost effective.

4.3.2 CSS

CSS (Cascading Style Sheets) is that the language we won't to style an HTML document. CSS used for describing how HTML elements should be displayed, including color, layout, and fronts. CSS saves tons of works. It can control the layout of multiple sites all directly. Consider HTML due to the inspiration, and CSS because the aesthetic choices.

4.3.3 PHP

In this project making the online page content dynamic and for interconnecting with database coding done by PHP. PHP stats for Hypertext Preprocessor. The rational of using PHP are:

- PHP can generate dynamic page content.
- PHP can used for implement the business logical layers.

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- PHP can collect form data.
- PHP can send and receive cookies.
- Anyone can use PHP to create a special area for any website members.
- PHP can encrypt data.
- PHP are often wont to control user access.

With PHP we cannot limited to output HTML. We will output images, PDF files, and even flash movies. We will also output any text, like XHTML and XML.

4.3.4 Laravel Framework

In this project making the web page content dynamic and for interconnecting with Laravel Framework the reason of using Laravel Framework, Laravel is a framework for creating web applications with an easy to use syntax. Laravel features a very rich set of features which can boost the speed of web development

4.3.5 MySQL

MySQL may be a database system used for the online application and it runs that runs on a server. The rational of using MySQL are:

- MySQL are often wont to store anything from a single record.
- MySQL is extremely fast, reliable, and straightforward to use.
- MySQL uses standard SQL.
- MySQL compiles on variety of platforms.
- MySQL is liberal to download and use.

The data during a MySQL database are stored in tables. A table may be a collection of related data, and it consists of columns and rows.

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4.3.6 XAMPP

XAMPP might be a free and open source cross-stage web worker arrangement stack bundle created by Apache Friends, comprising mainly of the Apache HTTP Server, Maria DB information base, and mediators for contents written in the PHP and Perl programming languages. XAMPP represents Cross-Platform (X), Apache (A), Maria DB (M), and PHP

(P) and Perl (P). It is an easy, lightweight Apache distribution that creates it incredibly simple for developers to make a zone web server for testing purposes. All that expected to arrange a web server – server application (Apache), database (Maria DB)

And scripting language (PHP) – is included in an extractable document. XAMPP is furthermore cross-platform, which propose its functions admiral on Linux, Mac and Windows.

Since most real web server arrangements utilize similar parts as XAMPP, it makes changing from a local test server to a live server very simple also.

4.3.7 JavaScript

JavaScript is an implementation of the ECMA Scripts language standard and is typically used to enable programmatic access to computational objects within a host environment. It can be characterized as a prototype-based object-oriented scripting language that is dynamic, weakly typed and has first-class functions. It is also considered a functional programming language like scheme because it has closures and supports higher-order functions. JavaScript is primarily used in the form of client-side JavaScript, implemented as part of a web browser in order to provide enhanced user interface and dynamic websites.

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Chapter 5: System Testing

System Testing

Many tech teams choose a research method that is halfway between the two extremes. It takes a step-by-step approach to testing, starting with individual program unit testing, then moving on to test design to make unit integration easier, and finally concluding with unit testing. Tests that put the built system to the test

5.1 Testing Features

Feature testing is the method of making improvements to a software system to implement or modify one or more new features. Each of these features is said to have a function that is useful, intuitive, and reliable.

5.2 Features not to be tested

Featured Id	Featured Name	Involved User
001	Edit profile	Doctor, Patient
002	Services	Patient, Doctor, Admin
003	View Doctor	Patient, Admin
004	View Patient	Admin, Doctor
005	View Appointment	Admin, Doctor
006	Contact	Admin, Patient, Doctor
007	About	Patient, Doctor
008	Logout	Admin, Patient, Doctor

Table: 19

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5.3 Test Cases

5.3.1 Test Case Table -1

Test Case #001		Test case name: Signup		
Test Priority: Medium		System: Digital Hospital		
Designed By: Mahedi Hasan		Designed Date: 10.03.21		
Executed By: Mahedi Hasan		Executed Date: 10.03.21		
Short Description: This section cover the functionalities of registration new user.				
Pre-condition: Visit to Digital Hospital Site				
Step	Action	Expected Result	Pass/ Fail	Actual Result
01	New User	Display Successful message	pass	Pass
02	Enter empty value for any required field	Display error message	pass	Pass
03	All the input field is filled but confirm password is not match	Display Password Mismatch!	Pass	Pass

Table: 20

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5.3.2 Test Case Table -2

Test Case #002	Test case name: Login
Test Priority: High	System: Digital Hospital
Designed By: Mahedi Hasan	Designed Date: 10.03.21
Executed By: Mahedi Hasan	Executed Date: 10.03.21
Short Description: The user is registered and trying to login to website when the system will check validity	
Pre-condition: • User must be registered.	

Step	Action	Expected Result	Pass/ Fail	Actual Result
01	Enter valid email and password then submit.	Successfully login	Pass	Pass
02	Enter invalid email/password then submit.	Invalid emails or password	Pass	Pass
03	Empty email and password field then submit.	Email field is required password field is required	pass	Pass

Table: 21

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5.3.3 Test Case Table -3

Test Case #003		Test case name: Patient Profile		
Test Priority: High		System: Digital Hospital		
Designed By: Mahedi Hasan		Designed Date: 10.03.21		
Executed By: Mahedi Hasan		Executed Date: 10.03.21		
Short Description: Patient profile view only registered patient.				
Pre-condition: 1. Registration must be completed. 2. Login.				
Step	Action	Expected Result	Pass/ Fail	Actual Result
01	[after login] Click the my profile option	Successfully view profile	pass	Pass
02	Enter name, age, blood group, address, phone and gender then submit.	Successfully updated profile	Pass	Pass
03	Click the logout Option	Successfully logout the system.	Pass	Pass

Table: 22

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5.3.4 Test Case Table -4

Test Case #004		Test case name: Emergency(Appointment)		
Test Priority: High		System: Digital Hospital		
Designed By: Mahedi Hasan		Designed Date: 10.03.21		
Executed By: Mahedi Hasan		Executed Date: 10.03.21		
Short Description: Patient and admin can view appointments				
Pre-condition: 1. Login.				
Step	Action	Expected Result	Pass/ Fail	Actual Result
01	[after login] Click the profile option	Show the profile	pass	Pass
02	Click the appointment option	Successfully view the appointment history	pass	Pass
03	Click the logout option	Successfully logout to the system	pass	Pass

Table: 23

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5.3.5 Test Case Table -5

Test Case #005		Test case name: Doctor profile		
Test Priority: High		System: Digital Hospital		
Designed By: Mahedi Hasan		Designed Date: 10.03.21		
Executed By: Mahedi Hasan		Executed Date: 10.03.21		
Short Description: Doctor profile view only registered doctor.				
Pre-condition: 1. Login				
Step	Action	Expected Result	Pass/ Fail	Actual Result
01	[after login] Click the my profile option	Successfully view profile	pass	Pass
02	Enter name, hospital, phone, education, specialist, gender and then submit.	Successfully updated profile	pass	Pass
03	Click the logout option	Successfully logout to the system	pass	Pass

Table: 24

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5.3.6 Test Case Table -6

Test Case #001		Test case name: View Appointments		
Test Priority: High		System: Digital Hospital		
Designed By: Mahedi Hasan		Designed Date: 10.03.21		
Executed By: Mahedi Hasan		Executed Date: 10.03.21		
Short Description: Doctor can view appointment of patient.				
Pre-condition: 1. Login				
Step	Action	Expected Result	Pass/ Fail	Actual Result
01	Click the appointments option	Show the appointments list	pass	Pass
02	Click the view option	Show patient details	Pass	Pass
03	Click the prescription option and write prescription	Successfully added prescription.	Pass	Pass
04	Click the visit our option and set the time	Successfully added time	Pass	Pass
05	Click the calling option and set appointment	Successfully added appointment	pass	Pass
06	Click the health option and click good or bad option	Successfully added health	pass	Pass

Table: 25

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Chapter 6: User Interface

Registration

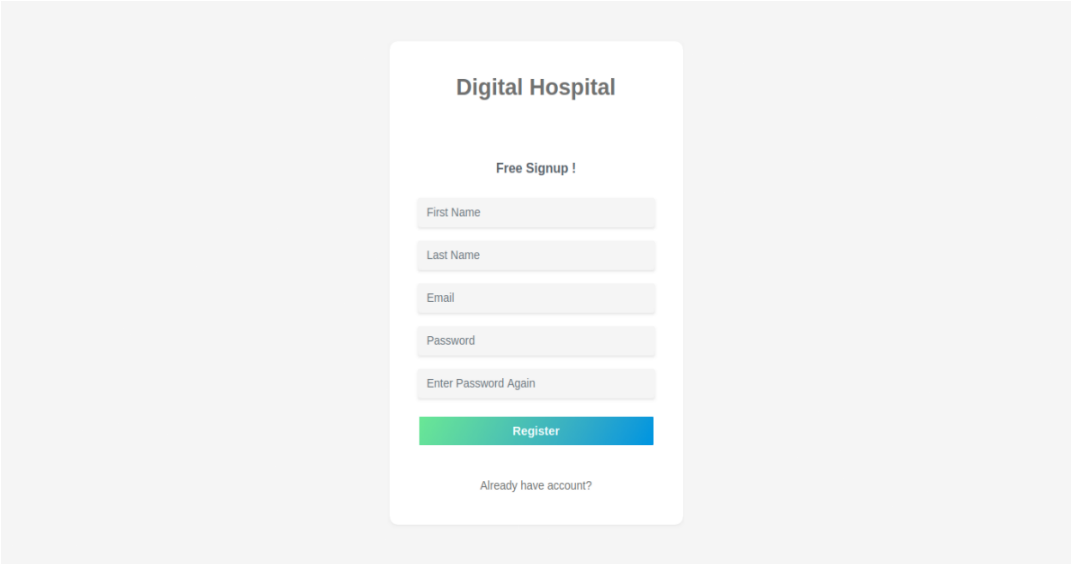

Figure 15: (Doctor and Patients Can Registration in "Digital Hospital" with name, email, password, repeat password)

User Login

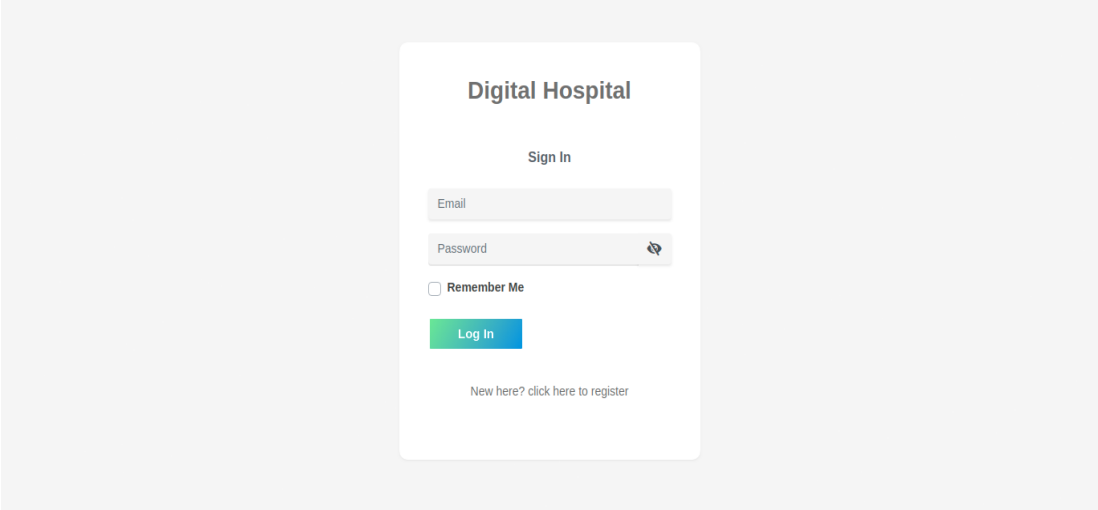

Figure 16: (User can login to "Digital Hospital" with email and password)

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Doctor Dashboard

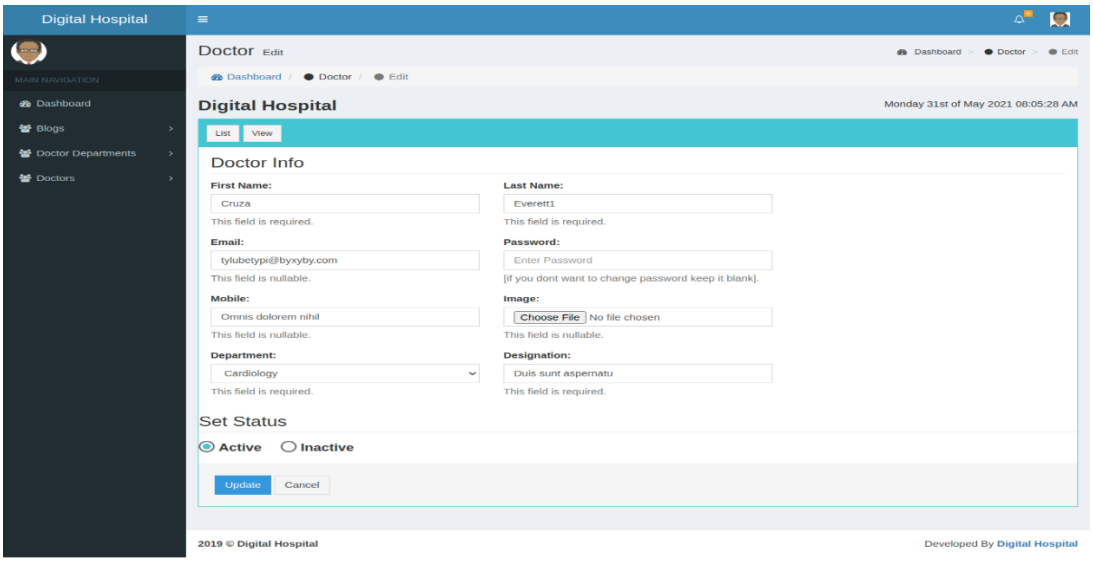

Figure 17: (Doctor Can Update their personal information in "Digital Hospital")

Doctor Profile

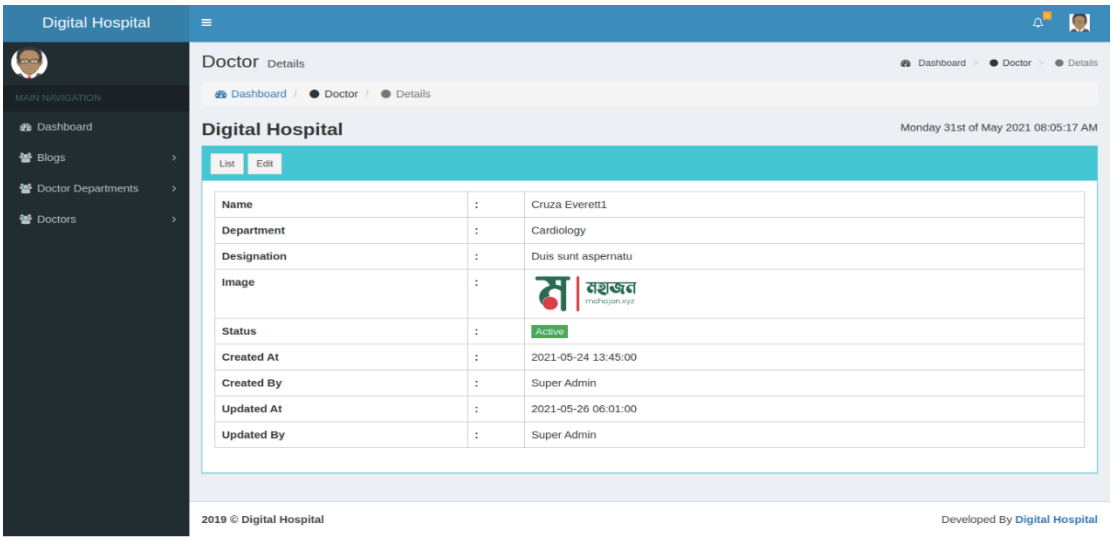

Figure 18: (Doctor Can see all information in "Digital Hospital" from Doctor Dashboard)

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Appointment List & Calling or Text Options

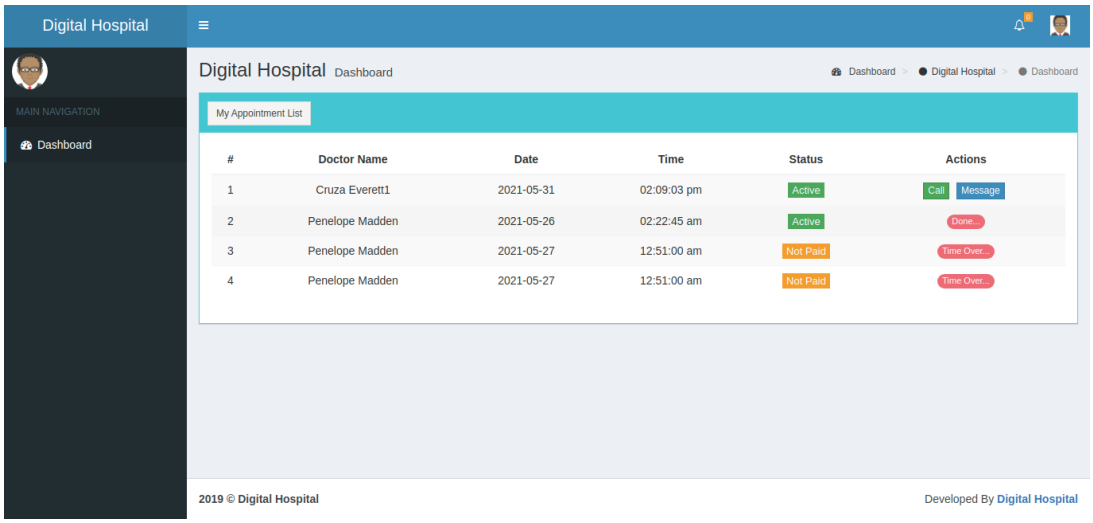

Figure 19: (Doctor Can See all Appointment list of Patient in "Digital Hospital")

Make an Appointment

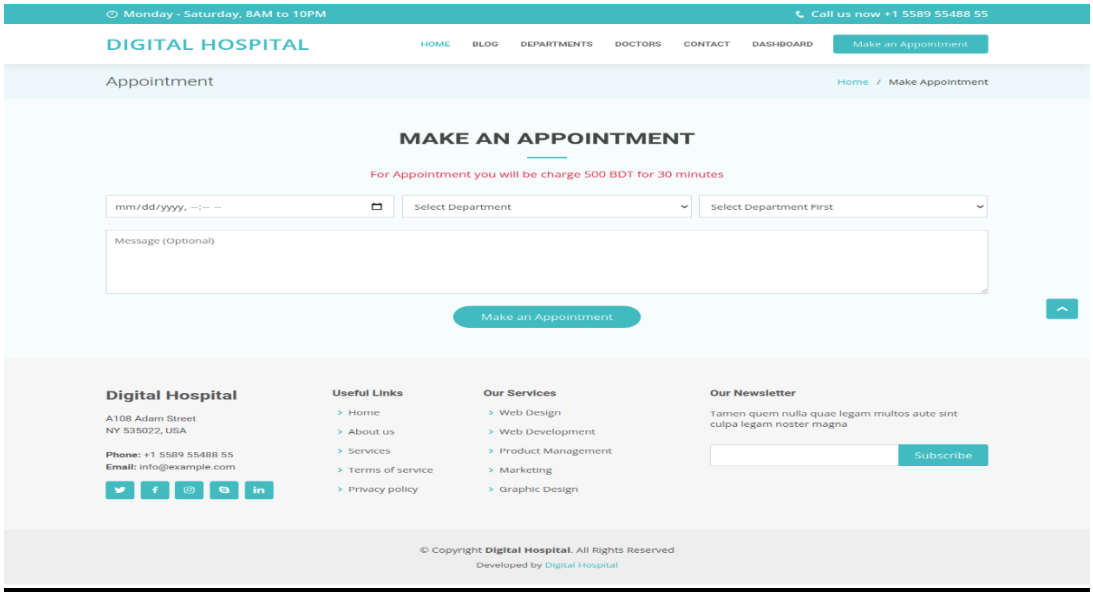

Figure 20: (Here Patients can make an appointment for future consultancy)

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Payments

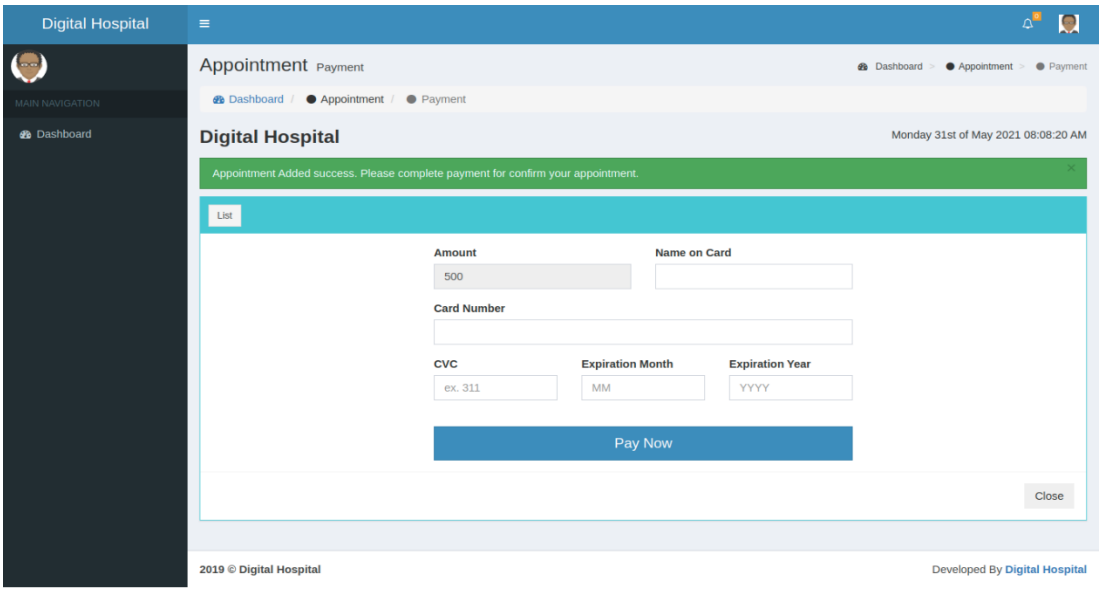

Figure 21: (Patients can pay their bill after adding appointment for confirming Appointment)

Blog Post Create

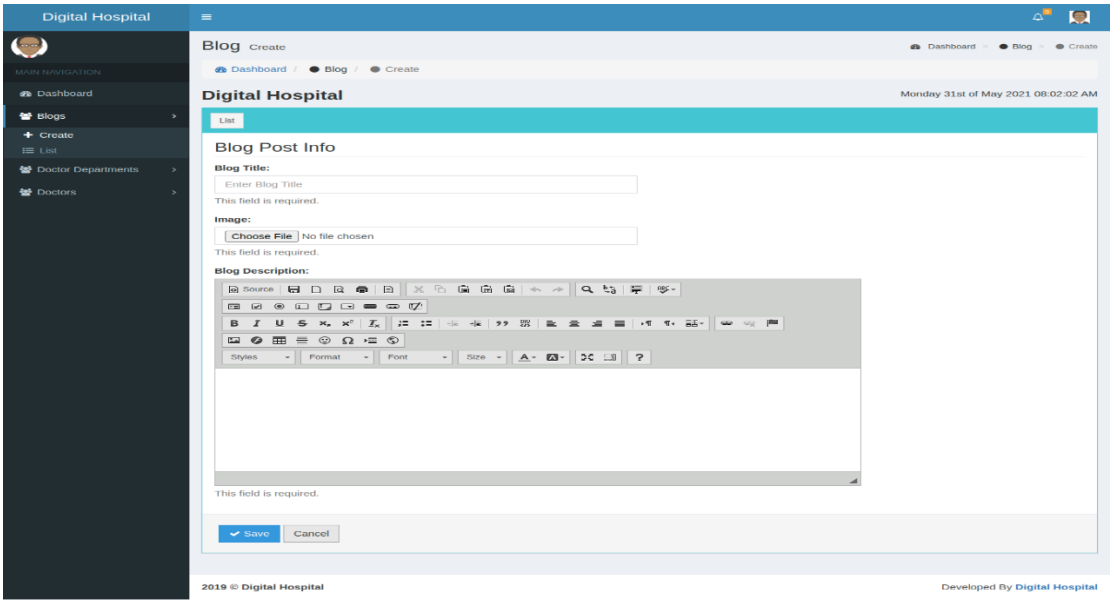

Figure 22: (This option for admin use which is used for create blog post)

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Blog Post List

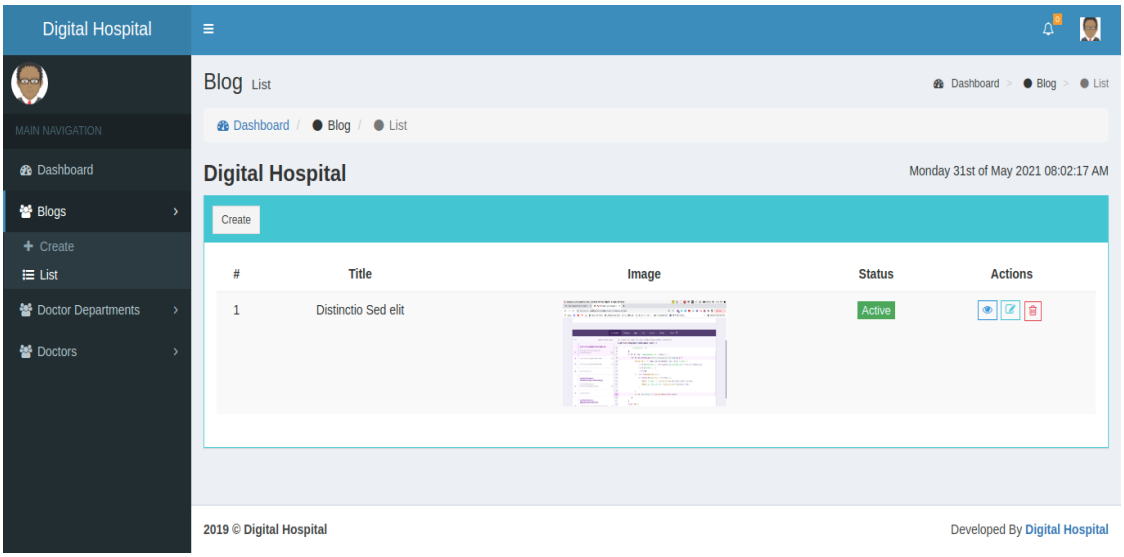

Figure 23: (Blog post list option for admin, who can see all details about active blog)

View Blog Details

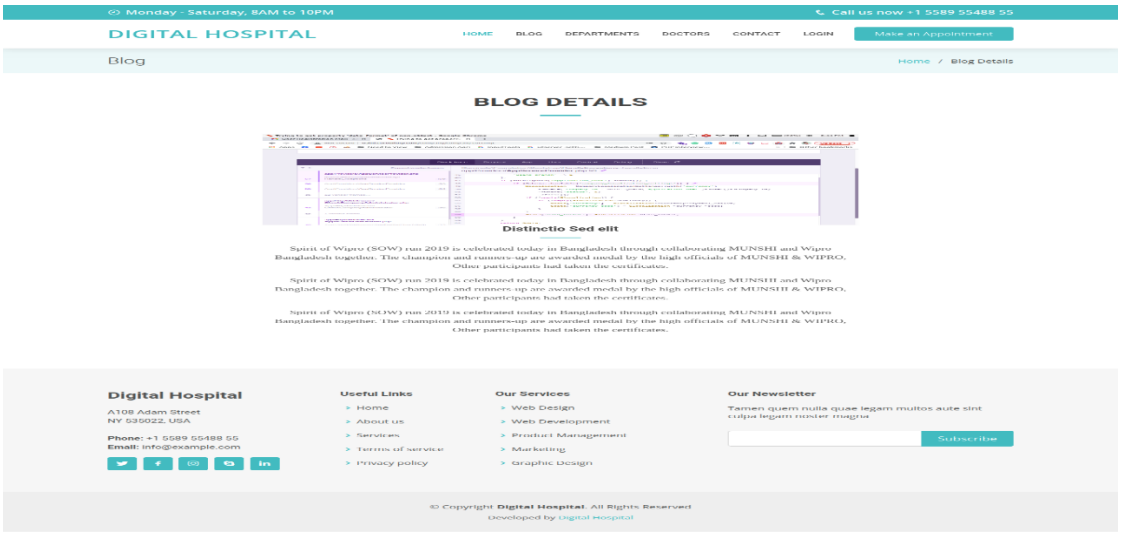

Figure 24: (View blog for visitor, who want to know about medicine and various type of viruses)

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Homepage

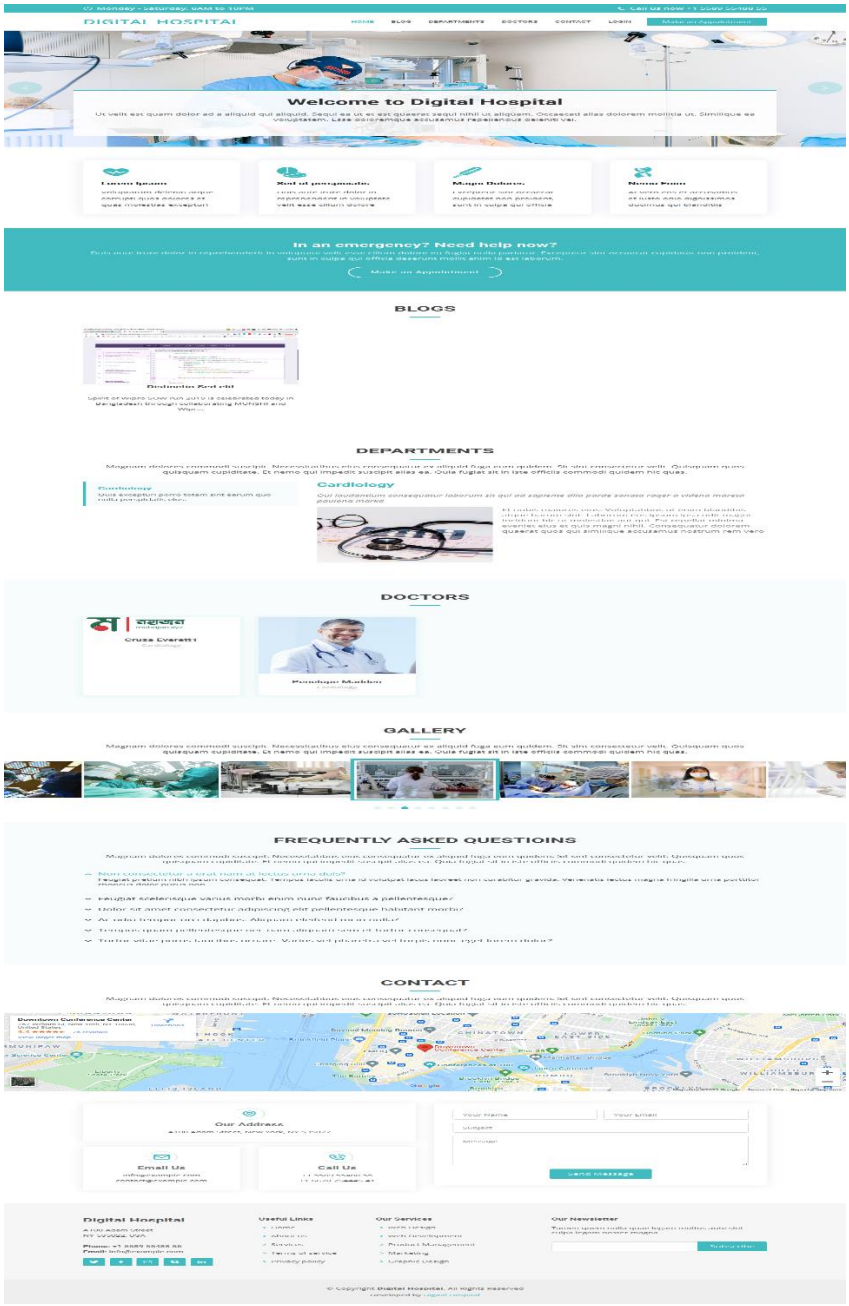

Figure 25: (This is Homepage, here patients and doctor can choose their desired selection)

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Chapter7: Project Summary

7.1 Summary

This project has been started from January. From that beginning time I gather many requirement, I studied some websites about digital hospital then I give my proposal.

First of all I'm gathering the all-important requirement for this project.

After gathering requirement, I done analysis all requirement and that i done system's design during this step, I done testing of all functional features and a few non-functional features.

7.2 Limitations

It is very hard to develop something with none limitations. This project has some

Limitations: Limitation area's follows: -

7.2.1 Not fully responsive.

7.2.2 Not highly secure.

7.2.3 Not fully updated for features.

7.3 Obstacles and Achievements

To walk within the great way, one's need to face many obstacles. By facing obstacles one will get some achievements. to look data after joining an obstacle formed. Al though I even have done it by taking help from my supervisor, friends and by searching the answer from Google. I achieve my confident to develop this project alone.

7.4 Future Scope

By working with this project, I even have learnt many things. This project will give me some opportunity to figure with this sort of comparable project.

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7.5 References

To complete audit application, I have taken help from many places. Some references are given bellow:-

- https://www.youtube.com/watch?v=nao7Ujy2q7w
- https://stackoverflow.com/
- https://getbootstrap.com/
- https://laravel.io/
- https://laracasts.com/series/whats-new-in-laravel-7

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