

E-MEDICARE

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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.

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APPROVAL

This Project titled “**E-Medicare**”, submitted by Md. Mahfuzur Rahman, Id: 151-15-4680 and Md. Motaleb Hossain, Id: 151-15-5245 and Md. Mohaimenul Islam , Id: 151-15-5081 to the Department of Computer Science and Engineering, Daffodil International University, has been accepted as satisfactory for the partial fulfillment of the requirements for the degree of B.Sc. in Computer Science and Engineering (BSc) and approved as to its style and contents. The presentation has been held on December 11, 2018.

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We hereby declare that, this project has been done by us under the supervision of **Israt Ferdous, Lecturer, Department of CSE** at 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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ABSTRACT

E-Medicare is a web based online health care system. This is a collaborative platform of doctor, patient and medical organization. In this system each citizen of our country will have a unique medical id. The previous details about their medical history will be stored in their profile. Doctor also capable of visiting the profile of a patient by the patient's profile to see his previous prescriptions and symptoms and can write prescriptions there. Same as citizen, doctors and medical service centers also have their own id by which they will provide their services. Patient can also get treatment via our video calling process. Doctors will get a payment from the patient during the treatment in video calling. The medical service centers also can offer their services and important notice through **E-Medicare**. Above all it is a digital system of treatment and an assemblage among citizen of Bangladesh, doctors and medical service centers.

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CHAPTER 1

Introduction

1.1 Introduction

The health system of Bangladesh relies heavily on the government or the public sector for financing and setting overall policies and service delivery mechanisms. [1]. Generally, there exist a lot of govt. and private medical service providers in Bangladesh. The services of these medical organization are in a good level but there are a few online medical systems in our country which are not enough for all kind of solutions of patients. For example, “**BdHealthSolution**” is an online clinic for the Bangladeshi people and provide online consultations and treatments using a remote doctor/patient interface. [2]. To upgrade the online medical system, we made up our mind to make a project named E-Medicare.

E-Medicare , is a system consist of a lot of web pages stands for Electronic Medicare .It is a complex web application containing a lot of tools that enables you to access own profiles , doctor and hospital details. This is a collaboration platform among citizen, doctor and all hospital in the country. That means patient can get treatment and doctor can give treatment in a digital way. And e- Medicare is the medium between them. If patient get their treatment with just a snap of fingers, it will add a new horizon of ease in our day-to-day life. Every citizen will have a medical id, every doctor will have a doctor id and every medical service providers will have their own Medicare id. Through this any citizen can get their treatment and related information. Therefore the main aim of e-Medicare is to ensure a very easier treatment procedure by just a Website. E- Medicare also will keep doctors, patients and Medicenter in a touch. Now it is very much possible to communicate with doctor, who are available at this moment by sitting at home through a video call. And people can get this facilities by this website. So if you have a device that is enough to brows internet and if you have internet in your device then you can access any kind of medical related information by visiting E-Medicare (website).

1.2 Motivation

There exists at least one reason behind every good or bad thing. Most of the things had been done to get rid of some problems. That means when some problem occurs that make our life painful then we make some solutions that make our life easier and flexible. So there is a lot of reasons behind the making of E-Medicare. And these reasons are nothing but some severe problems that we are facing from a long time, which motivated us to create this web application. These reasons that motivated us are given bellow:

- (i) **Time Complexity:** People go to hospital when they need an immediate treatment to get rid of the diseases they are suffering from. Doctors suggest them to do a lot of tests and after making the tests people have to wait for a long time to get their test reports. If the patient's house is far away from the hospital, then they have to suffer in the long run for this. Sometime they need to make a long journey only for the result. Watching this problem, we became agree to make this project.
- (ii) **Prescription problems:** Sometimes patients go to the doctor without any previous prescriptions. It happens may be for loosing previous prescriptions or forgetting to bring with them. This hampers their proper treatment in many case. This grounds to make e-Medicare.
- (iii) **Unawareness about doctor and medicenter:** Many people goes to the hospital without knowing anything about doctors and hospital. Sometimes it happens that people go to the doctors who are not suitable for his/her disease. To overcome this problem we decided to make E-Medicare.
- (iv) **Vaccine Date missing:** Most of the times we forget our important vaccine date. Missing date can create restarting of pushing vaccination from the beginning. Also ignoring this can increase the possibility of respective diseases sometimes. Next vaccination date and place irrespective of place is also a problem. So facing these problems we decided to make E-Medicare.

- (v) **Unawareness about opportunities:** Most of the times people remain unaware about the opportunities and offer that are given by the hospitals. Such as, free treatment, treatment and tests in low costs etc. So we motivated to make something that will give all at once.
- (vi) **Doctor's platform:** Many doctors of our country remain jobless after completing their study. So for giving them a good platform we determined to make e-Medicare. Here they can give simple to complex treatment by video calling process.

These are the main problems those motivated us to make **E-Medicare**. This leads us to select it as our final project hoping we can bring up something good on the table.

1.3 Objectives

The main objective of our project is to make Bangladesh medical ecosystem more efficient and reliable and technical. That means the activities of medical system will be done in digital way. The first target is to collaborate this project with Bangladesh govt. and then ensure a medical ID as well as a medical profile for each citizen of our country. Alongside the citizen doctor and medical service provider's id also will be ensured. The objective is to collaborate among the patients, the doctors and the medical service providers of the country. This project is also a patient monitoring system. That will store all information of patient in their profile and doctors can monitor it when it is needed. Another objective of this project to aware people about various kinds of services such as the polio vaccine date, Vitamin A capsule etc. E-Medicare will also help people to know about the offers given by the medical service providers such as free treatment, special doctors etc.

The most important thing is E-Medicare will reduce the time and trouble by saving their report and prescriptions in their profile. The test reports also to upload in their profiles. So they need not to wait for their reports.

1.4 Expected Outcomes

The primary outcome of this project is to have a digital medical system. e-Medicare will make a good relationship about the citizen, doctors and medical service providers. Some important outcomes of this project that we expect are given below:

- (i) Patient Monitoring:** e-Medicare will ensure a medical ID and a profile for each citizen of Bangladesh. Every citizen will have a database in their profile. So the test reports, previous and present prescriptions will be uploaded there. Therefore doctor can easily monitor it by entering his/her profile.
- (ii) Time savior:** Another expected outcome from E-Medicare is, it will save patient's time and help them to get rid of troubles. Patient has to wait in the hospital to get their reports or have to come from far for getting their reports. But e-Medicare will help the people to save their time. medical service providers will update their reports on patient's profile. So patient can get it from anywhere with the help of internet by accessing his profile.
- (iii) Video Calling:** A video calling system will be added in this project that will help the people to get connected with doctors from anywhere of the world. People can only be connected with the available doctors.
- (iv) Doctor's platform:** E-Medicare will have a platform where doctors can expose themselves to the people. So it will be a good opportunity for the jobless doctors. People also can visit doctor's profile to know them in details. Such as in which subject he is specialised in.
- (v) Medicenter's Platform:** There will be a platform for medical service providers where they can advertise their offers and opportunities. People can also get these from at home. People also will be aware about the Vaccine date and time.

These are the main outcomes for those we are making this project. As it is very useful and will be used in Electronic way that's why we named it **E-Medicare**.

CHAPTER 2

Background

2.1 Introduction

Before starting to make this project (E-Medicare) we did a deep studies about its background. The information that we gained from this research will be represented here divided in some sectors. These sectors are about the history of e-Medicare and the content that needed to make this project. These sectors would help us to make this project more unique than others and to know about the languages that we needed for it (E-Medicare).

2.2 Who Needs e-Medicare?

Basically E-Medicare is a web application which is made for each people of our country. People of all category will need this. Doctors and Hospitals also need this. When citizen, doctors and hospital will use it together then it will be a complete system. How these three types of users will use this project is given bellow:

- i. Citizen as a user: The main purpose of this project to ensure a medical id and an online profile for each citizen. All kinds of medical information will be saved in their profile. As well as they also can get any kind of information about doctors and hospital. So people of all class will need this project.
- ii. Doctor as a user: Doctors will need this project for two different work. First one is, when a patient will come to him, he must check his profile. Then he need to visit this website. Another one is the most important thing of this project. As well as a citizen id all doctors will have a doctor id. So doctors also have their profile where they can expose themselves and all kind of details will be reserved there. People can search their profile if they need. So doctor also need this project.
- iii. Hospital organization as a user: All hospital will have a medical service providers ID. All information about medical service center will be reserved in their profile. They can make

their own advertisement in this project. And they need to store all information about their doctors and patients. The Administration of hospital will give the needed reports and prescription to the patient's profile. So it is must to be a user of this project.

After all we can come a decision that Citizen, Doctor and Medicenter are the part and parcel of **E-Medicare**.

2.3 Related Works

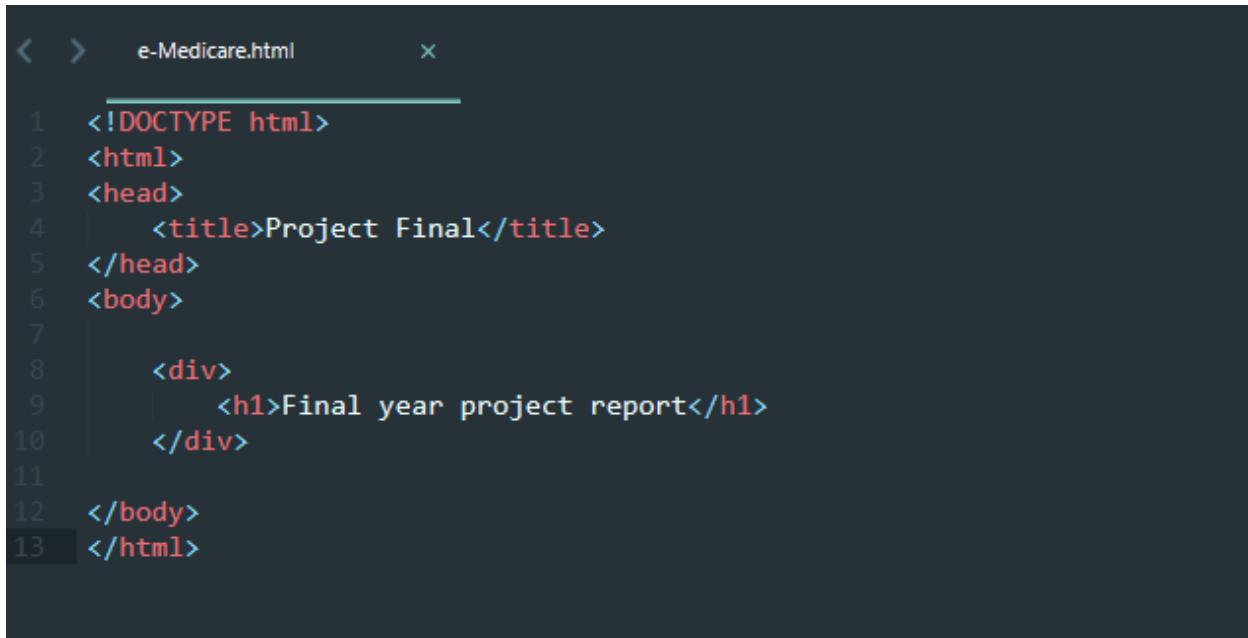
The outlook and functionalities of a project depend on the technology that is used to make the project. As E-Medicare is a web based project, so we needed to study into the field of web technologies to select which technologies should be used to make this project. The technologies that we used in this project are described briefly bellow:

2.3.1 HTML

HTML stands for "Hypertext Markup Language". HTML is the language that is used to create the structure of webpages. "Hypertext" refers to the hyperlinks that an HTML page may contain. "Markup language" refers to the way tags are used to define the page layout and elements within the page. There are too many tags used in HTML. Tags are the words stay inside <angle-brackets>. [3]

Below is an example of HTML used to define a basic webpage with a title and a single paragraph of text [4].

Code example:



```
< > e-Medicare.html x

1  <!DOCTYPE html>
2  <html>
3  <head>
4      <title>Project Final</title>
5  </head>
6  <body>
7
8      <div>
9          <h1>Final year project report</h1>
10     </div>
11
12 </body>
13 </html>
```

Figure. 2.1: HTML code

2.3.2 CSS

Stands for "Cascading Style Sheet." Cascading style sheets are used to format the layout of Web pages. They can be used to define text styles, table sizes, and other aspects of Web pages that previously could only be defined in a page's HTML. [5]

We can take a look at this design. It's simple yet elegant. Behind the scene to make a HTML structure to look like this we have used CSS.

While CSS is great for creating text styles, it is helpful for formatting other aspects of Web page layout as well. For example, CSS can be used to define the cell padding of table cells, the style, thickness, and color of a table's border, and the padding around images or other objects. CSS gives

CSS code:

```
1  body{  
2      background: purple;  
3      color: gray;  
4  }  
5  
6  .navbar{  
7      font-size: 14px !important;  
8      padding: 5px;  
9  }
```

Figure. 2.2: CSS code

Web design with CSS:

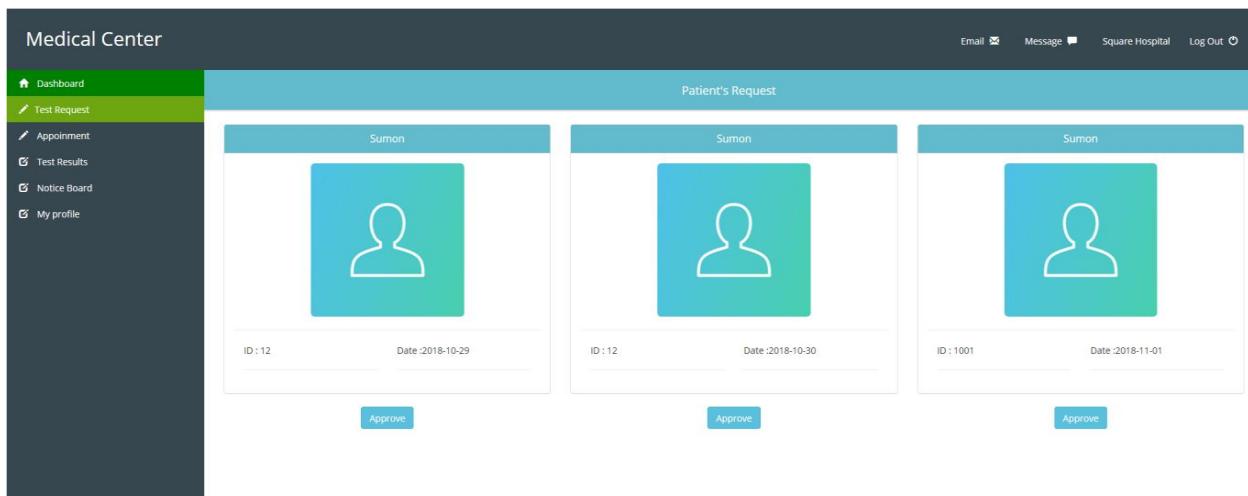


Figure. 2.3: CSS design

Web developers have more exact control over how Web pages will look than HTML does. This is why most Web pages today incorporate cascading style sheets. [6].

2.3.3 Bootstrap

Bootstrap is a popular web development framework used for creating websites. It was developed by a team at Twitter and has been an open source project since 2011. The Bootstrap framework includes CSS styles, JavaScript libraries, and HTML files. Bootstrap provides a way for developers to easily build responsive websites rather than designing them from scratch. [7]

The whole front-end design of this project is based on bootstrap 3.3.7 framework. We developers prefer front-end design framework over raw CSS.

Design example:

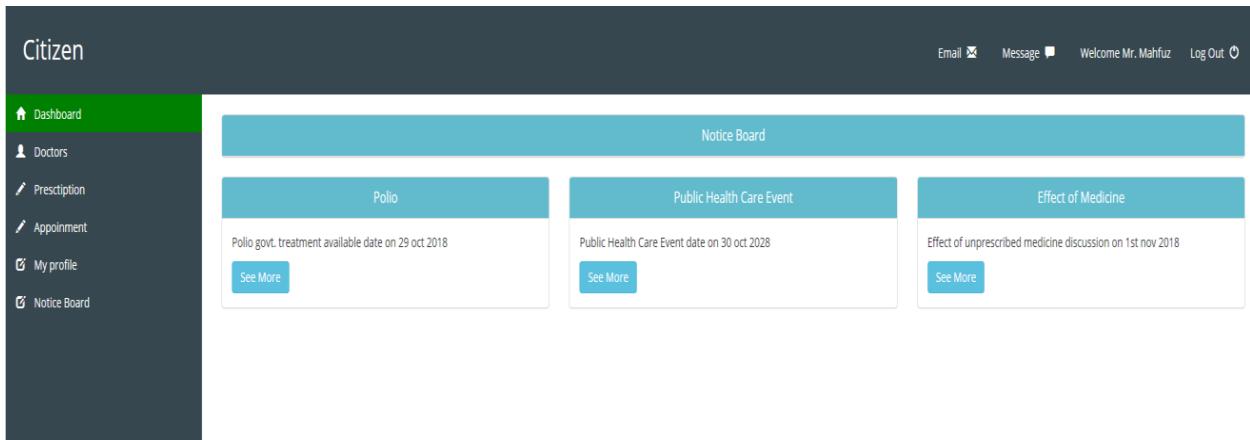


Figure. 2.4: Bootstrap design

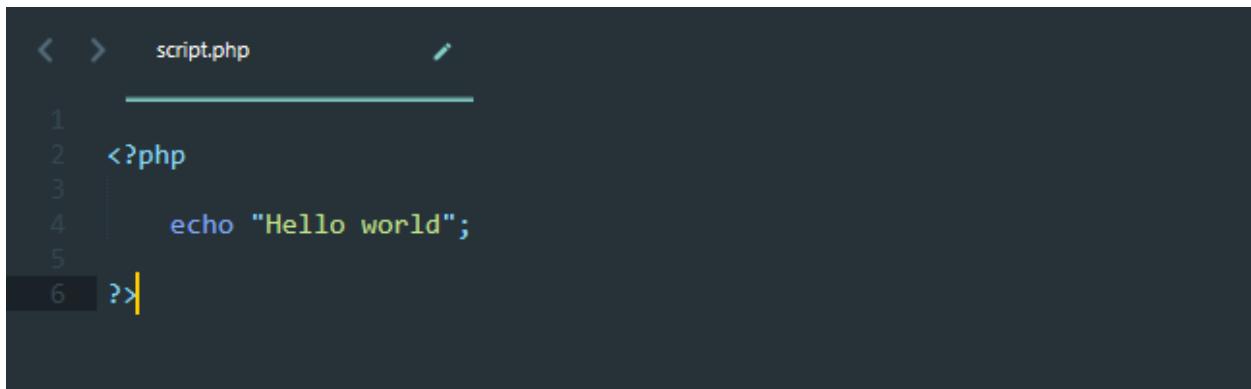
2.3.4 PHP

PHP stands for "Hypertext Preprocessor." PHP is an HTML embedded Web scripting language. This means PHP code can be inserted into the HTML of a Web page. When a PHP page is accessed, the PHP code is read or by the server the page resides on. The output from the PHP functions on the page are typically returned as HTML code, which can be read by the browser. [8].

PHP offers several advantages,

The back-end mechanism of our project is done with PHP as a server side language.

PHP code example:



```
< > script.php
1
2 <?php
3
4     echo "Hello world";
5
6 ?>
```

A screenshot of a code editor window titled "script.php". The code consists of six lines of PHP syntax. Line 1 is a blank line. Line 2 starts with the opening tag "<?php". Line 3 is a blank line. Line 4 contains the "echo" statement "echo \"Hello world\";". Line 5 is a blank line. Line 6 ends with the closing tag "?>". The code is color-coded: blue for tags like "<?php" and "?>", green for strings like "Hello world", and black for comments and other text.

Figure. 2.5: PHP code

2.3.5 JavaScript

JavaScript (JS) is a scripting languages, primarily used on the Web. JavaScript is an interpreted language. Thus, it doesn't need to be compiled. JavaScript renders web pages in an interactive and dynamic fashion. [9]

JavaScript is a client-side scripting language, which means the source code is processed by the client's web browser rather than on the web server. This means JavaScript functions can run after a webpage has loaded without communicating with the server. [10]

2.3.6 JQuery

JQuery is a JavaScript library that allows web developers to add extra functionality to their websites.

- It simplifies the complicated things from JavaScript like the AJAX calls and the DOM manipulation. [11]
- Effects and animations.
- Ajax.
- DOM element selections functions.

2.3.7 MySQL

MySQL is the world's most popular open source database, enabling the cost-effective delivery of reliable, high-performance and scalable Web-based and embedded database applications. There are several database servers, MySQL is one of them. It is fit for both small and larger applications. It is free and supports SQL on several platforms.

We have used MySQL with PHP to make our system dynamic. The project schema is shown at figure 2.6 is the part where we have used it.

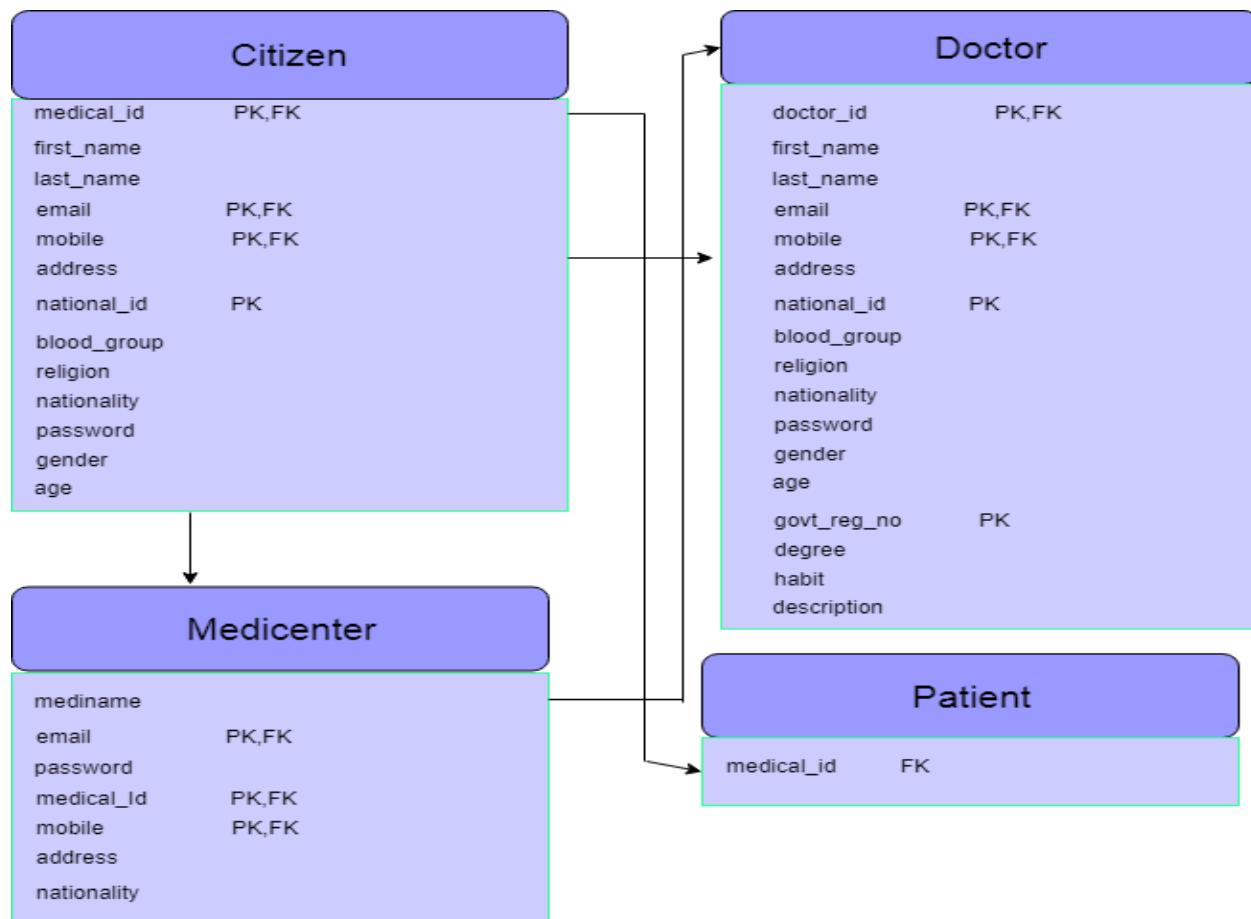


Figure. 2.6: Use of MySQL

CHAPTER 3

Literature Review

3.1 Introduction

A literature review or narrative review is a type of review article. A literature review is a scholarly paper, which includes the current knowledge including substantive findings, as well as theoretical and methodological contributions to a particular topic. Literature reviews are secondary sources, and do not report new or original experimental work. Most often associated with academic-oriented literature, such reviews are found in academic journals, and are not to be confused with book reviews that may also appear in the same publication. Literature reviews are a basis for research in nearly every academic field.[12].

3.2 Related Works

Collaboration among citizen, doctor & medical service provides is the concept and working for a modern medical system that will give us choice of new environment in Bangladesh. Before planning of this project we researched about the related works or projects which is already exist in the web portal. And we got a lot of things related to our work. The Literature review of e-Medicare (our project) is given bellow . This review will describe the similarity and desimilarity of our project with the existance.

3.2.1 Online doctor:

Online doctor is a term that emerged during the 2000s, used by both the media and academics, to describe a generation of physicians and health practitioners who deliver healthcare, including drug prescription, over the internet.

In the 2000s, many people came to treat the internet as a first, or at least a major, source of information and communication. Health advice is now the second-most popular topic that people search for on the internet. With the advent of broadband and videoconferencing, many individuals have turned to online doctors to receive online consultations and purchase prescription drugs. Use of this technology has many advantages for both the doctor and the patient, including cost savings, convenience, accessibility, and improved privacy and communication.

In the US, a 2006 study found that searching for information on prescription or over-the-counter drugs was the fifth most popular search topic, and a 2004 study found that 4% of Americans had purchased prescription medications online. A 2009 survey conducted by Geneva-based Health on the Net Foundation found one-in-ten Europeans buys medicines from websites and one-third claim to use online consultation. In Germany, approximately seven million people buy from mail-order pharmacies, and mail-order sales account for approximately 8–10% of total pharmaceutical sales. [13]

In 2008, the Royal Pharmaceutical Society of Great Britain reported that approximately two million people in Great Britain were regularly purchasing pharmaceuticals online (both with a prescription from registered online UK doctors and without prescriptions from other websites).[14]

A recent survey commissioned by Pfizer, the Medicines and Healthcare products Regulatory Agency, RPSGB, the Patients Association and HEART UK found that 15% of the British adults asked had bought a prescription-only medicine online.[15]

In developed countries, many online doctors prescribe so-called ‘lifestyle drugs’, such as for weight loss, hair loss or erectile dysfunction. The RPSGB has identified the most popular products prescribed online as Prozac (an antidepressant), Viagra (for erectile dysfunction), Valium (a tranquilizer), Ritalin (psychostimulant), Seriatim (a synthetic growth hormone) and Provigil (a psychostimulant). A study in the USA has also shown that antibiotics are commonly available online without prescription. [16]

3.2.2 E-Health:

E-Health (also written e-health) is a relatively recent healthcare practice supported by electronic processes and communication, dating back to at least 1999. Usage of the term varies. A study in 2005 found 51 unique definitions. Some argue that it is interchangeable with health informatics with a broad definition covering electronic/digital processes in health while others use it in the narrower sense of healthcare practice using the Internet. It can also include health applications and links on mobile phones, referred to as m-Health or m-Health. Since about 2011, the increasing recognition of the need for better cyber-security and regulation may result in the need for these specialized resources to develop safer e-Health solutions that can withstand these growing threats. [17]

The term can encompass a range of services or systems that are at the edge of medicine / healthcare and information technology, including:

- ❖ Electronic health record: enabling the communication of patient data between different healthcare professionals (GPs, specialists *etc.*);
- ❖ Computerized physician order entry: a means of requesting diagnostic tests and treatments electronically and receiving the results
- ❖ e-Prescribing: access to prescribing options, printing prescriptions to patients and sometimes electronic transmission of prescriptions from doctors to pharmacists
- ❖ Clinical decision support system: providing information electronically about protocols and standards for healthcare professionals to use in diagnosing and treating patients
- ❖ Telemedicine: physical and psychological diagnosis and treatments at a distance, including tele monitoring of patients functions;
- ❖ Consumer health informatics: use of electronic resources on medical topics by healthy individuals or patients;
- ❖ Health knowledge management: *e.g.* in an overview of latest medical journals, best practice guidelines or epidemiological tracking.

- ❖ Virtual healthcare teams: consisting of healthcare professionals who collaborate and share information on patients through digital equipment (for transmural care);
- ❖ m-Health or m-Health: includes the use of mobile devices in collecting aggregate and patient-level health data, providing healthcare information to practitioners, researchers, and patients, real-time monitoring of patient vitals, and direct provision of care (via mobile telemedicine);
- ❖ Medical research using grids: powerful computing and data management capabilities to handle large amounts of heterogeneous data.
- ❖ Health informatics / healthcare information systems: also often refer to software solutions for appointment scheduling, patient data management, work schedule management and other administrative tasks surrounding health [18]

3.3.3 E-patients:

An E-patient is a health consumer who participates fully in his/her medical care, primarily by gathering information about medical conditions that impact them and their families, using the Internet and other digital tools. The term encompasses those who seek guidance for their own ailments and the friends and family members who go online on their behalf. E-patients report two effects of their health research: "better health information and services, and different, but not always better, relationships with their doctors. [19]

We learned a lot of things from these topics and we fixed our mind to make a project which will contain all features in one project. After researching this types of existence we planned to make E-Medicare.

CHAPTER 4

Implementation

4.1 Implementation Model

In software development cycle its urgent to make models. It defines the proposed methodology which will be implemented of a system.

It may contain some sorts of diagrams such as Unified Modeling Language Diagram (UML), Use Case Diagram, Business Process Model (BPM) or any kind of logical model e.g. Entity Relation Diagram (ER Diagram) etc. [20]

4.1.1 Data Model

The Logical Data Model, also known as Logical Schema is a kind of data model for a particular problem of a particular database management technology but the structure of data such as tables and columns or XML or OOP classes. [102] It is a version of data model which represents requirements of business, entire or partial, and it is developed before physical data model. [21]

This Entity Relation Diagram (ER Diagram) contains the whole idea of our extensive project. The yellow rectangulars represent the entity and the gray diamonds represent the relationship among entities.

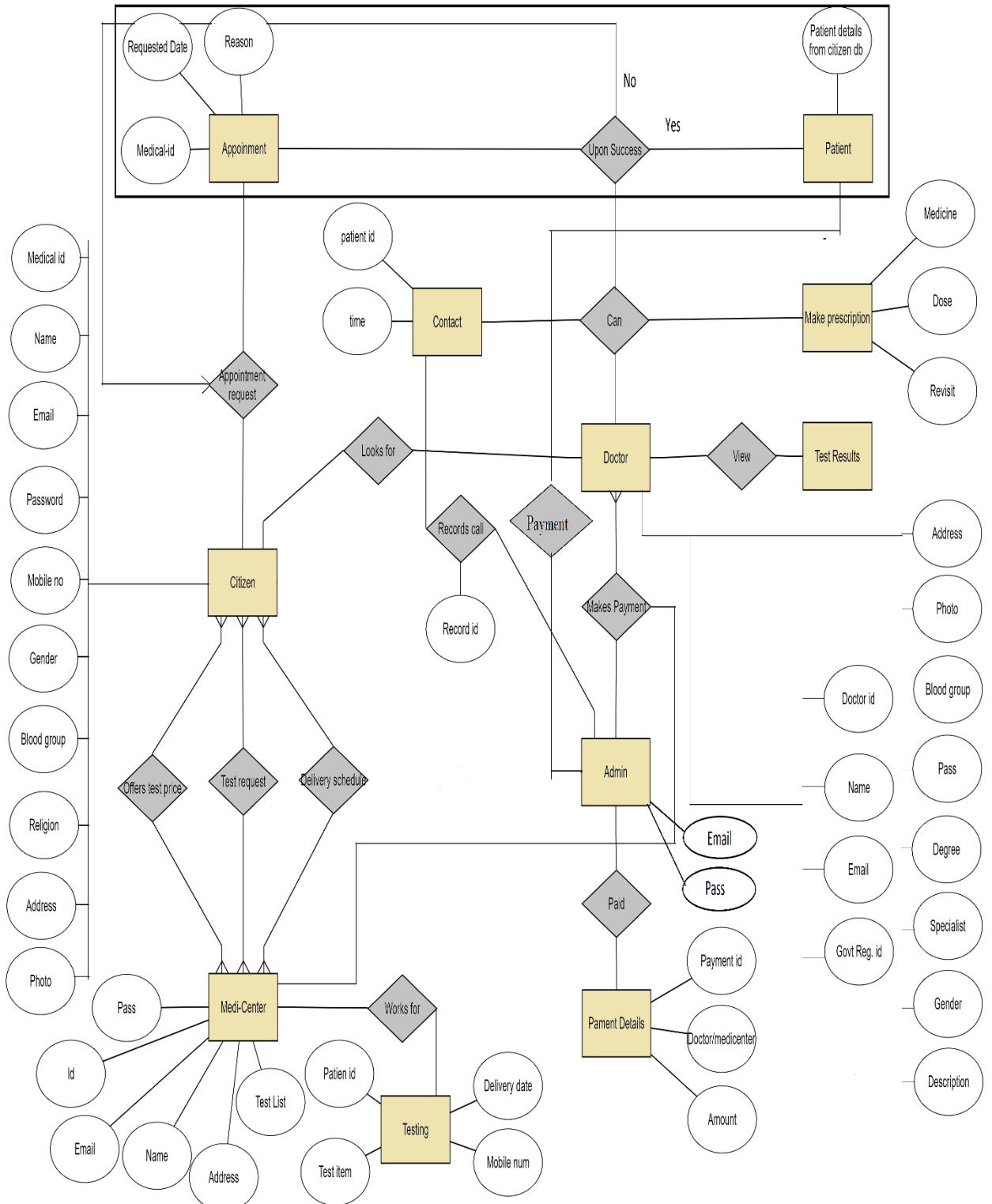


Figure. 4.1: Entity Relationship Diagram

4.1.2 Database Schema

A database schema is a visual and logical architecture of a database created on a database management system.

It provides a graphical view of the entire database architecture and structure. It provides a means for logically grouping and displaying database objects such as tables, fields, functions and relations. [22].

This schema shows the database design of e-Medicare.

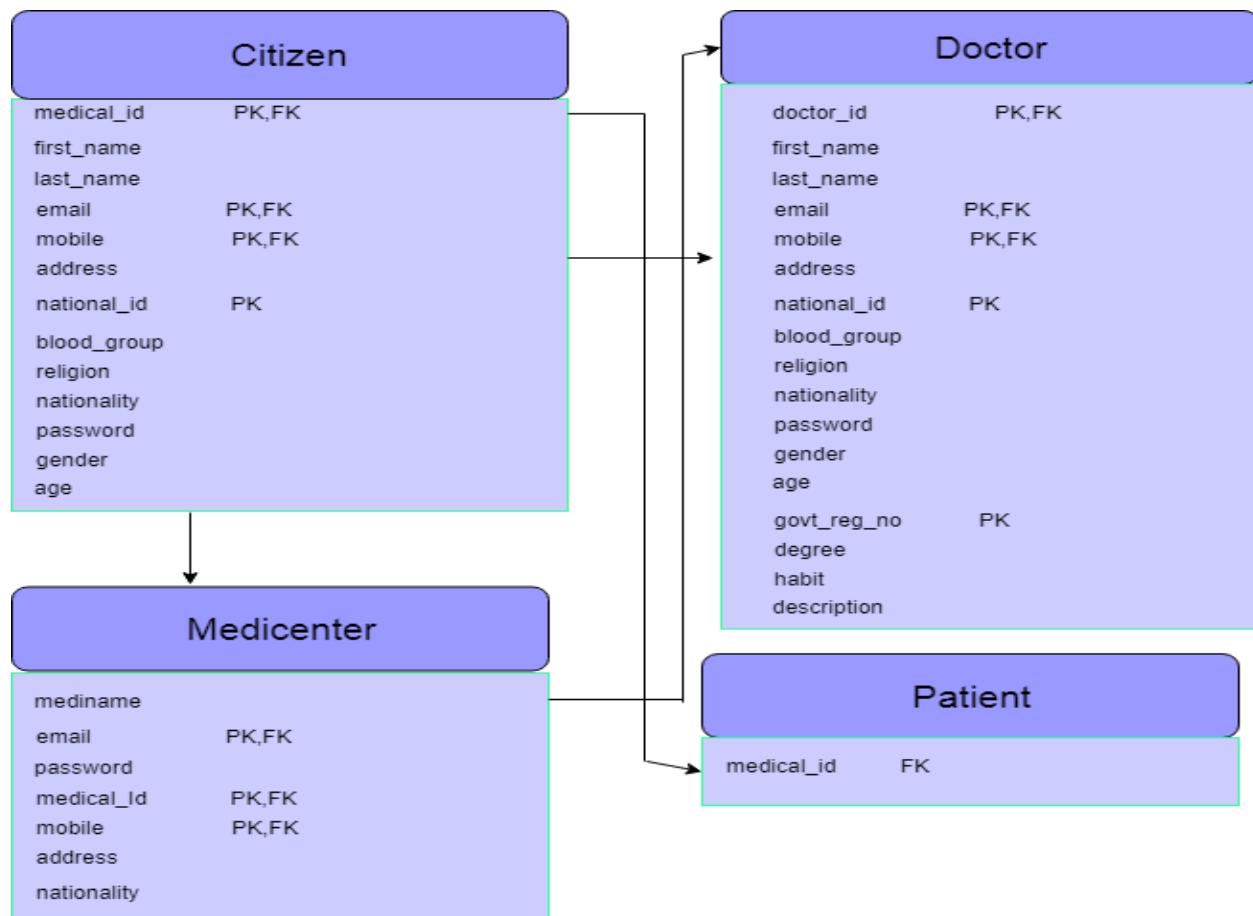


Figure. 4.2: Database Schema

4.2 Design Specification

A design specification is a detailed document providing information about a designed product or process. For example, the design specification must include all necessary drawings, dimensions, environmental factors, ergonomic factors, aesthetic factors, maintenance that will be needed, etc. It may also give specific examples of how the design should be executed, helping others work properly (a guideline for what the person should do). [23].

4.2.1 Front-end Design

- ❖ Login interface design
- ❖ Registration interface design
- ❖ Layout design
- ❖ Citizen interface design
- ❖ Doctor interface design
- ❖ Medical center interface design
- ❖ Patient appointment design
- ❖ Confirmation design
- ❖ Doctor appointment schedule
- ❖ Prescription making and monitoring
- ❖ Medical center's schedule
- ❖ Medical center's test report sending
- ❖ Dashboard

4.2.2 Back-end Design

- ❖ Whole process will be divided into three parts (citizen, doctor and medical service provider).
- ❖ All of them have registration and login system.
- ❖ Fetching doctors to citizen from database by location
- ❖ Payment mechanism

- ❖ Message to doctor
- ❖ Voice call (video/audio)
- ❖ Take appointment from doctor
- ❖ Schedule for doctor's appointment and medical centers for getting test results.
- ❖ Prescription from doctor
- ❖ Fetch medical centers from database to citizen by location
- ❖ Citizen can send prescription to medical center for testing
- ❖ Medical center will give a date to citizen for testing his prescription.
- ❖ Schedule for all prescription testing
- ❖ Medical centers can offer good price for their tests
- ❖ Doctor can send prescription to citizen
- ❖ Video call
- ❖ Appointment schedule

4.2.3 Interaction Design & UX

Despite of being a huge system of backend work load we have tried to make comfortable, easy to understand user interface. We have used button, dropdown-menu and icons with JavaScript library named as JQuery to make a smooth transition among application pages.

4.3 Implementation Requirements

Implementation for our proposed project are divided into some parts

- ❖ **Used Technology:** The main requirements for our project are some web technology e.g. HTML, CSS, Bootstrap, JavaScript, PHP, MySQL, jQuery, Ajax etc. We have already discussed detailed in chapter 2.
- ❖ **Tools and Sites:** Sublime IDE, XAMPP, Notepad++, Firefox Browser etc.
- ❖ **Teamwork:** A stable team with active team members.

4.4 Implementation of E-Medicare

In this section we have tried to show our whole design interface for better understanding of the system. Everything will be shown step by step with specific sub point.

4.4.1 Home

This is the home page of our project. Though we can't provide the full page image but we will try to make you understand some menu we have developed here.

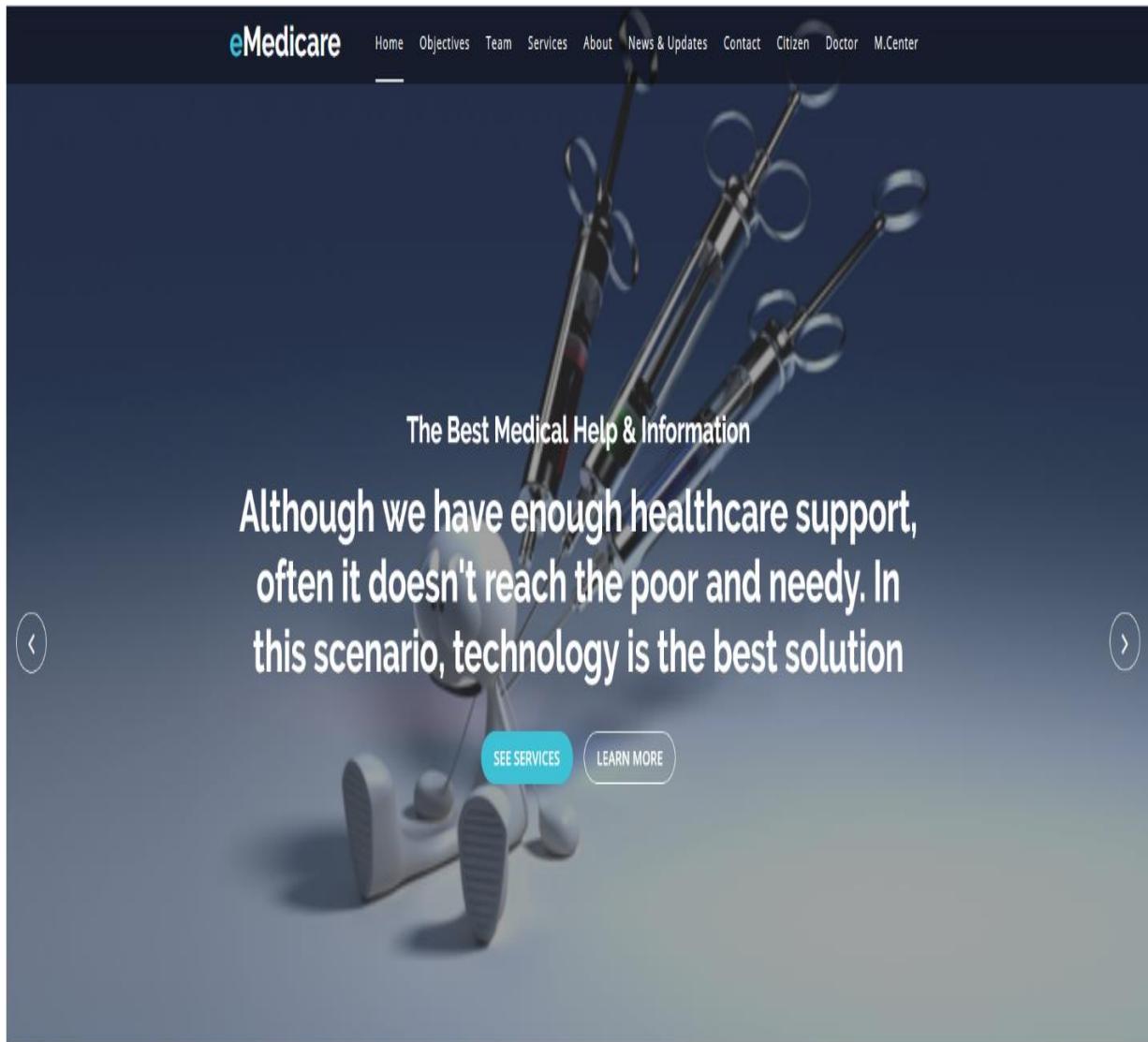


Figure. 4.3: Home

The main navbar has several menus such as motivation, objective of our project, citizen, doctor & medical service providers. Citizen contains the mechanisms what a user actually can do as patient. Doctor and medical service providers also have the related features to their own.

4.4.2 Layout

This is the layout of project e-Medicare.

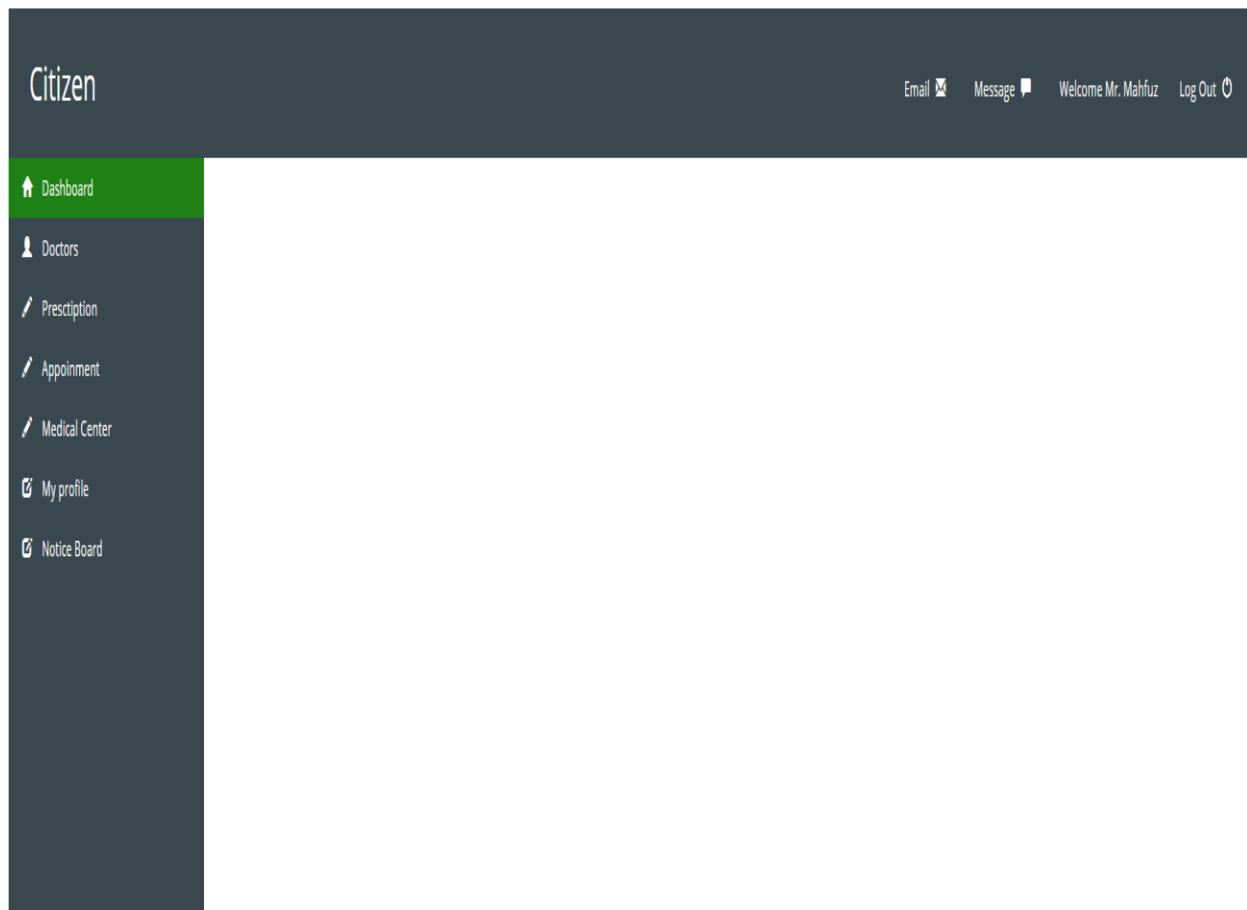


Figure: 4.4: Layout

4.4.3 Login

The login interface is given below:

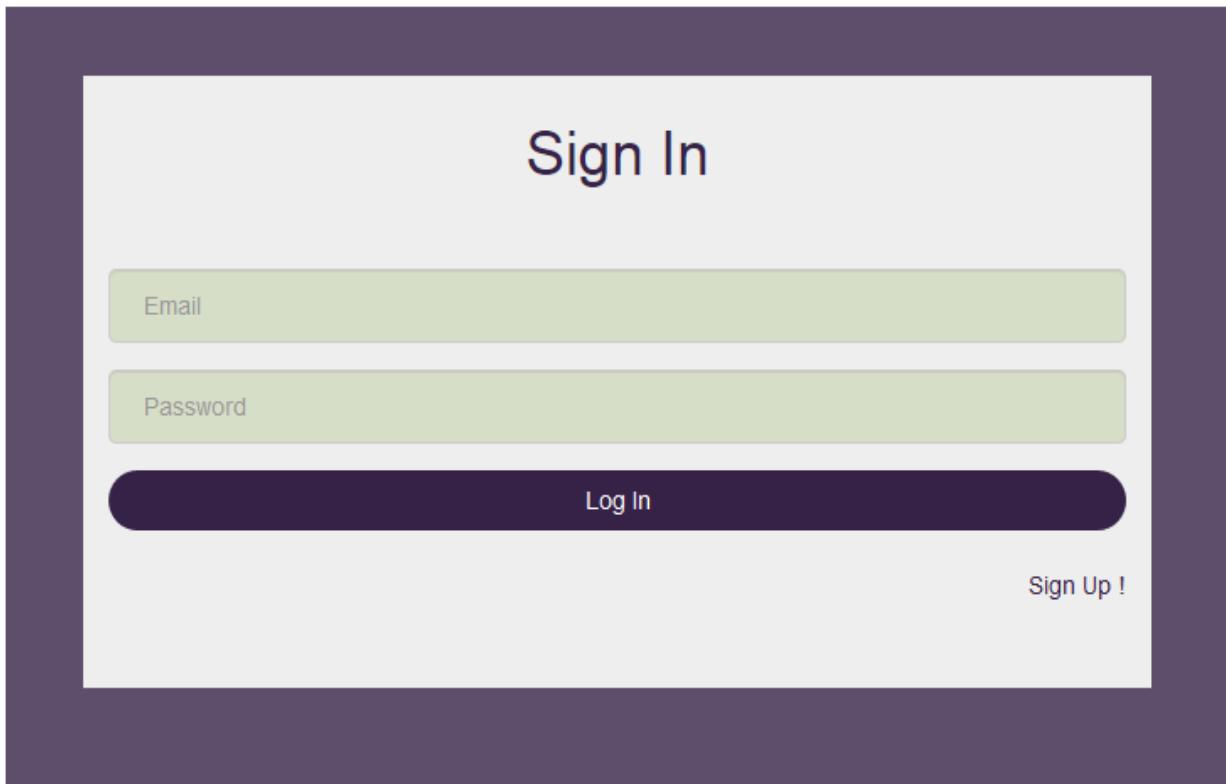


Figure. 4.5: Login

This login procedure is applicable for Citizen, Doctor & Medicenter. Citizen, Doctor & Medicenter can login via Email & Password. Also they can directly go to the sign up option for registration.

4.4.4 Registration (3 registration form)

Citizen sign-up:

The Citizen sign-up is given below:



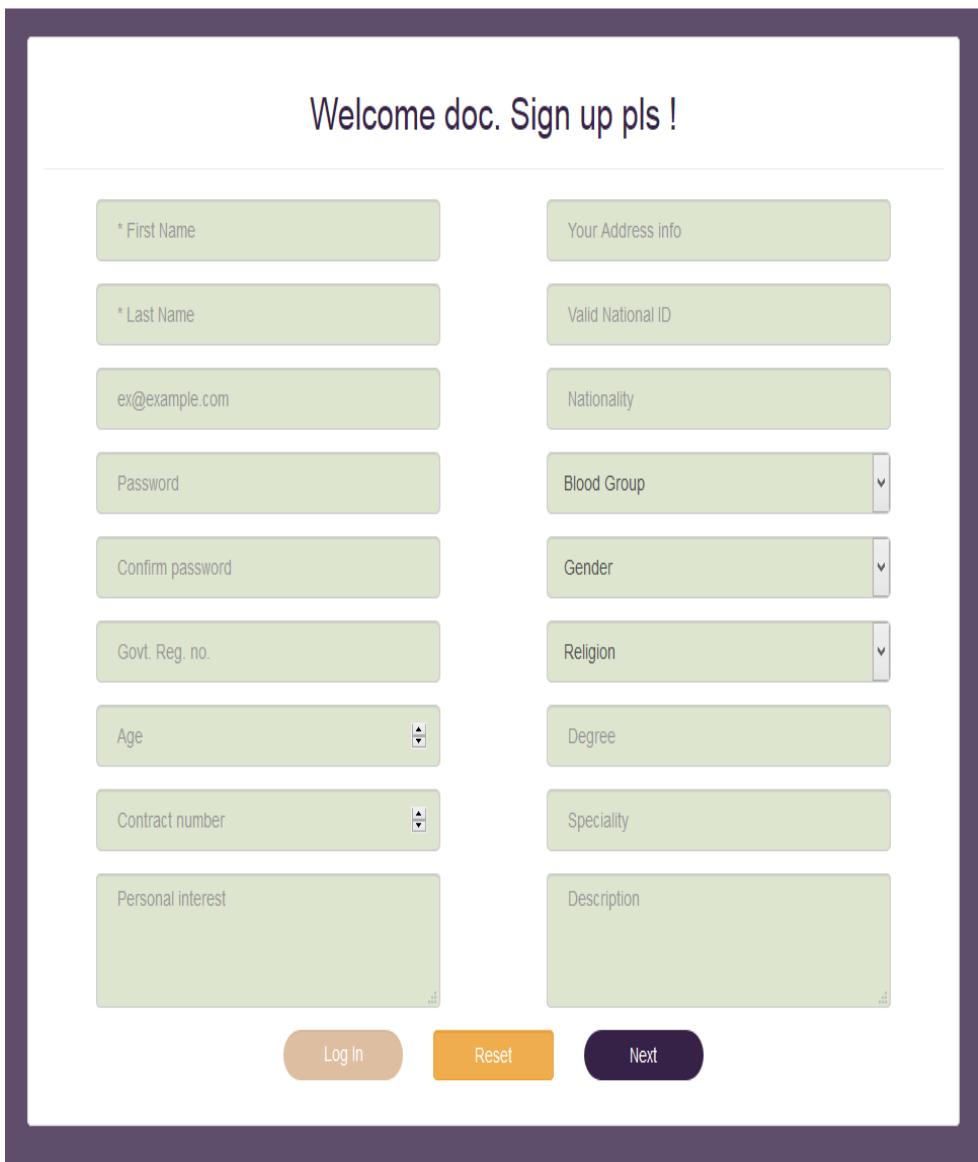
The image shows a 'Sign UP' form for citizens. It consists of two columns of input fields. The left column includes fields for First Name, Last Name, email (name@example.com), Password, Confirm password, Age, and Contract number. The right column includes fields for Your Address info, Valid National ID, Blood Group, Gender, Religion, Nationality, and Weight. Each field is enclosed in a light green rectangular box. Below the fields are two buttons: a tan-colored 'Log In' button and a dark purple 'Create Account' button.

Figure. 4.6: Sign-up (Citizen)

Citizen can sign-up on e-Medicare to create their profile using First name, Last name, Email, Password, Age, Contact number, Address information, National Id, Blood group, Gender, Religion, Nationality, Weight .

Doctor Sign-up:

The Doctor sign-up is given below:



The image shows a sign-up form for doctors on a white background with a dark purple border. At the top center, it says "Welcome doc. Sign up pls !". Below this are two columns of input fields:

* First Name	Your Address info
* Last Name	Valid National ID
ex@example.com	Nationality
Password	Blood Group
Confirm password	Gender
Govt. Reg. no.	Religion
Age	Degree
Contract number	Speciality
Personal interest	Description

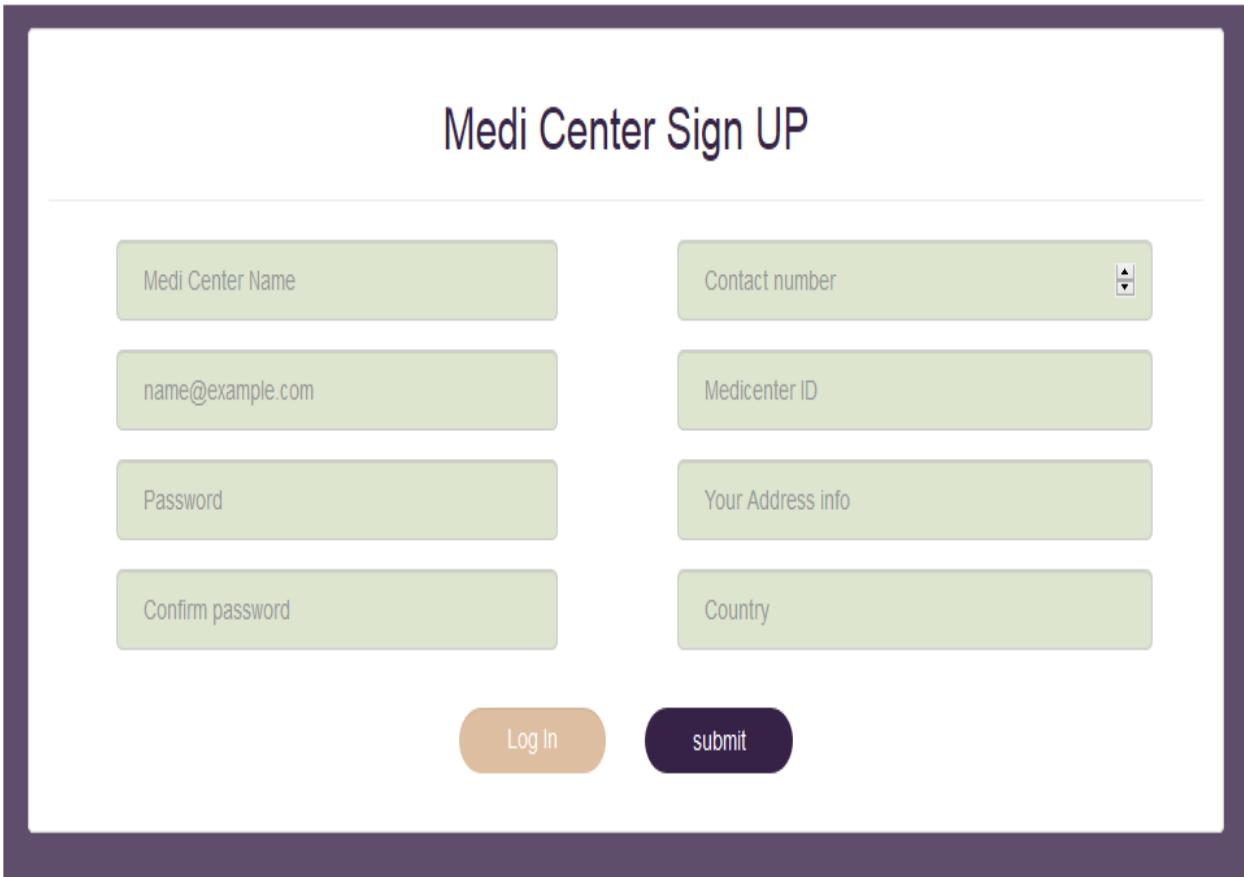
At the bottom are three buttons: "Log In" (brown), "Reset" (orange), and "Next" (dark blue).

Figure. 4.7 Sign-up (Doctor)

Doctor can sign-up on e-Medicare to create their profile using First name, Last name, Email, Password, Gov.Reg.no, Age, Contact number, Personal interest, Address information, National Id, Blood group, Gender, Religion, Degree, specialty, Description .

Medicenter Sign-up:

The Medicenter sign-up is given below:



The image shows a sign-up form titled "Medi Center Sign UP". The form is divided into two columns of five input fields each. The first column contains: "Medi Center Name", "name@example.com", "Password", and "Confirm password". The second column contains: "Contact number" (with up/down arrows), "Medicenter ID", "Your Address info", and "Country". At the bottom left is a "Log In" button, and at the bottom right is a "submit" button.

Medi Center Sign UP	
Medi Center Name	Contact number
name@example.com	Medicenter ID
Password	Your Address info
Confirm password	Country
<input type="button" value="Log In"/>	<input type="button" value="submit"/>

Figure. 4.8 Sign-up (medicenter)

Medicenter can sign-up on e-Medicare to create their profile using medicenter name, Email, Password, Contact number, Medicenter ID, Address info, Country .

4.4.5 Dashboard

Citizen dashboard that gives overall information.

The screenshot shows the Citizen dashboard with a dark header bar. On the left is a vertical sidebar with a green header tab labeled 'Dashboard' and a list of menu items: Doctors, Prescription, Appointment, Medical Center, My profile, and Notice Board. The main area has three cards: 'Doctors Appointment' (1), 'M.Center Appointment' (2), and 'Account Balance' (1500 tk). The top right corner shows 'Welcome Mr. Mahfuz' and 'Log Out'.

Figure. 4.9: Dashboard

4.4.6 Profile

Citizen profile:

The screenshot shows the Citizen profile page. The sidebar includes 'Dashboard', 'Doctors', 'Prescription', 'Appointment', 'My profile' (which is selected and highlighted in green), and 'Notice Board'. The main content area has tabs for 'General Information' and 'Contact information'. Under 'Basic info', there is a placeholder image of a doctor, and fields for First Name (Mahfuz), Last Name (Sozeeb), and About me (Mahfuz). Under 'General Information', fields include Blood group (A+), Medical id (12), National id (aaaaaaaaaaaa), Nationality, Religion (Islam), Gender (Male), and Age (22). Under 'Contact information', fields include Email (g@gmail.com), Mobile no (111111111111), and Address (aaaaaaaaaaaa).

Figure. 4.10: Profile (Citizen)

After completing sign-up & login citizen can access to show and edit his/her information in this profile.

Doctor profile:

Doctor

Email Message Welcome Mr. Mahfuz Log Out

Dashboard Patients Notice Board My profile

General Information

Blood group: A+

Medical id: 1424

National id: hm616-616m-mumu-6116

Nationality: Bangladeshi

Religion: Islam

Gender: Male

Age: 30

Contact information

Email: m@gmail.com

Mobile no: 01768094971

Basic info

First Name: Mahfuz

Last Name: Sozeeb

About me: Mahfuz

Figure. 4.11: Profile (Doctor)

After completing sign-up & login Doctor can access to show and edit his/her information in this profile.

4.4.7 Available doctors

Citizen can see either Doctors are available or not.

The screenshot shows the Citizen application's interface. At the top, there is a dark header bar with the text "Citizen" on the left and "Welcome Mr. Mahfuz" on the right, along with icons for Email, Message, and Log Out. Below this is a navigation sidebar on the left with the following options: Dashboard (selected), Doctors, Prescription, Appointment, My profile, and Notice Board. The main content area has a blue header bar with the text "Doctors". Below this, there are two separate sections, each representing a doctor profile. The first section is for "Dr. Mahfuz Sozeeb" and includes fields for Degree (MBBS), Gender (Male), Specialist (Not Yet), Address (Dhanmondi, Dhaka), and a description: "Hi I'm Dr. Mahfuz. Im here to help you through medication and with proper care.". It also features a photo of a male doctor with a stethoscope and a "Make an appointment" button. The second section is for "Dr. Sumon Islam" and includes similar fields: Degree (MBBS), Gender (Male), Specialist (Not Yet), Address (Mirpur, Dhaka), and a description: "Hi I'm Dr.Sumon. Are you feeling sickness? Don't worry I got your back. Make an quick appointment.". It also features a photo of a male doctor with a stethoscope and a "Make an appointment" button.

Figure. 4.12: Available doctors

4.4.8 Making an appointment

Citizen can make appointment using 3 schedule time Morning, Afternoon and Night .All the schedule have categorized in eight time slots. Each and every time slots are also divided 15 minutes. Citizen need to click active button to book an appointment.

The screenshot shows the Citizen app interface. On the left is a sidebar with a dark blue header and a light blue body containing navigation links: Dashboard, Doctors, Prescription, Appointment, My profile, and Notice Board. The main area has a dark blue header with the word 'Citizen' on the left and user info on the right: Email, Message, Welcome Mr. Mahfuz, and Log Out. Below the header is a teal-colored 'Appointment' button. Underneath it is a search bar with the placeholder 'Pick up your date:' followed by a date input field showing '2018-10-30' and a 'Show Schedule' button. The main content area is a grid titled 'Morning', 'Afternoon', and 'Night'. Each grid has two columns: 'Time' and 'Status'. The 'Morning' grid shows 8 time slots from 10:00 AM to 12:00 PM, all marked as 'Active'. The 'Afternoon' grid shows 8 time slots from 04:00 PM to 06:00 PM, all marked as 'Active'. The 'Night' grid shows 8 time slots from 08:00 PM to 10:00 PM, all marked as 'Active'.

Morning	Afternoon	Night			
Time	Status	Time	Status	Time	Status
10:00 AM - 10:15 AM	Active	04:00 PM - 04:15 PM	Active	08:00 PM - 08:15 PM	Active
10:15 AM - 10:30 AM	Active	04:15 PM - 04:30 PM	Active	08:15 PM - 08:30 PM	Active
10:30 AM - 10:45 AM	Active	04:30 PM - 04:45 PM	Active	08:30 PM - 08:45 PM	Active
10:45 AM - 11:00 AM	Active	04:45 PM - 05:00 PM	Active	08:45 PM - 09:00 PM	Active
11:00 AM - 11:15 AM	Active	05:00 PM - 05:15 PM	Active	09:00 PM - 09:15 PM	Active
11:15 AM - 11:30 AM	Active	05:15 PM - 05:30 PM	Active	09:15 PM - 09:30 PM	Active
11:30 AM - 11:45 AM	Active	05:30 PM - 05:45 PM	Active	09:30 PM - 09:45 PM	Active
11:45 AM - 12:00 PM	Active	05:45 PM - 06:00 PM	Active	09:45 PM - 10:00 PM	Active

Figure. 4.13: Making an appointment

4.4.9 Confirmation of appointment

To complete the appointment, a citizen need to write the reason of appointment and confirm the payment.

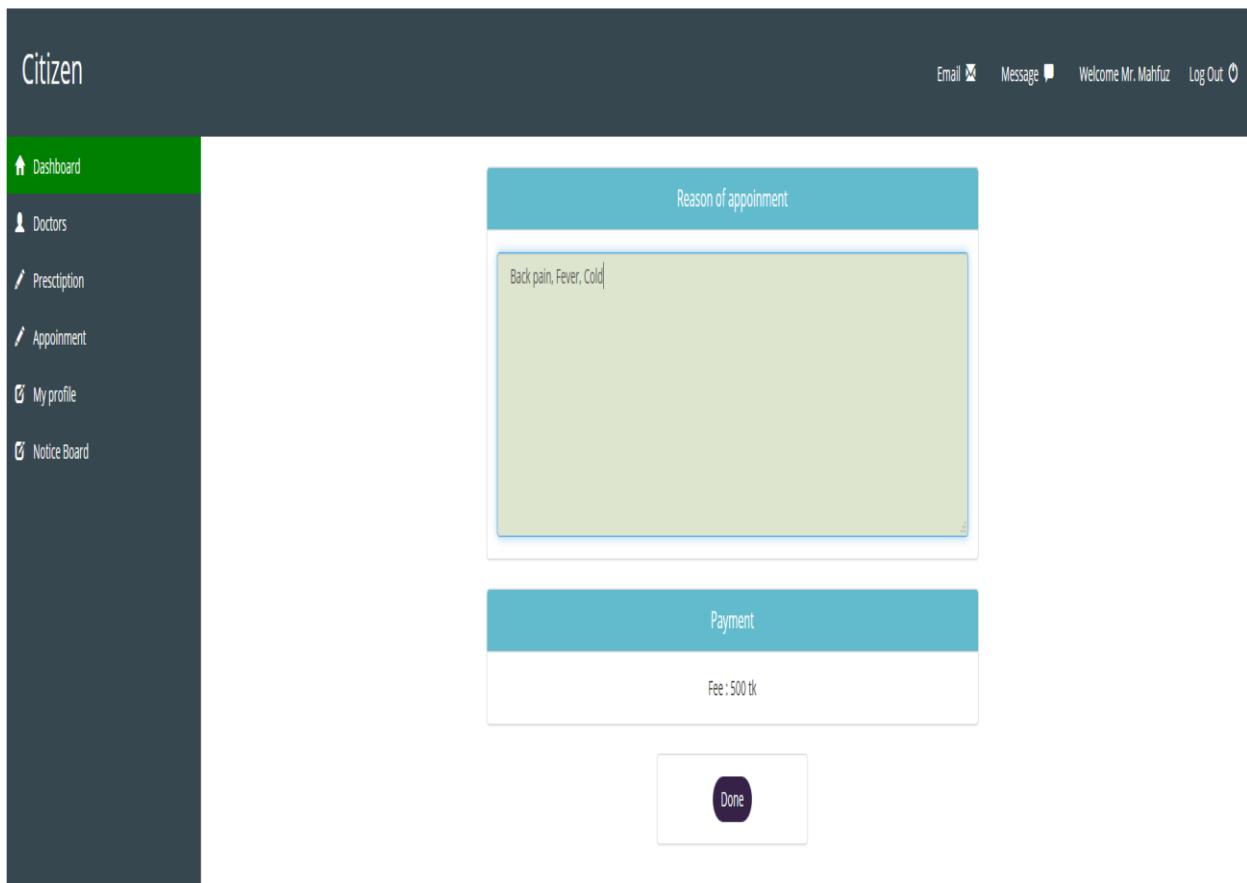


Figure: 4.14: Confirmation of appointment

4.4.10 Medical service provider

The screenshot shows a user interface for a medical service provider. At the top, there's a dark header with the word "Citizen". On the right side of the header are links for "Email" (with a message icon), "Message" (with a reply icon), "Welcome Mr. Mahfuz", and "Log Out". Below the header is a navigation menu on the left with the following items: Dashboard (selected), Doctors, Prescription, Appointment, Medical Center (highlighted in green), My profile, and Notice Board.

The main content area is titled "Medical Service Centers" and displays three service centers: "Medinova", "Regency Medical", and "Square Hospital". Each center has a thumbnail image, contact information, and a "Test request" button.

Service Center	Email	Address	Contact num	Country	Action
Medinova	medi@gmail.com	Dhanmondi, Dhaka	01765156851	Bangladesh	Test request
Regency Medical	regency@gmail.com	Mirpur, Dhaka	01765511254	Bangladesh	Test request
Square Hospital	square@gmail.com	Dhaka	019596546845	Bangladesh	Test request

Figure: 4.15: Medical service provide

4.4.11 Doctor's schedule for appointments

Doctor can view the expected patients schedule with time and date slots.

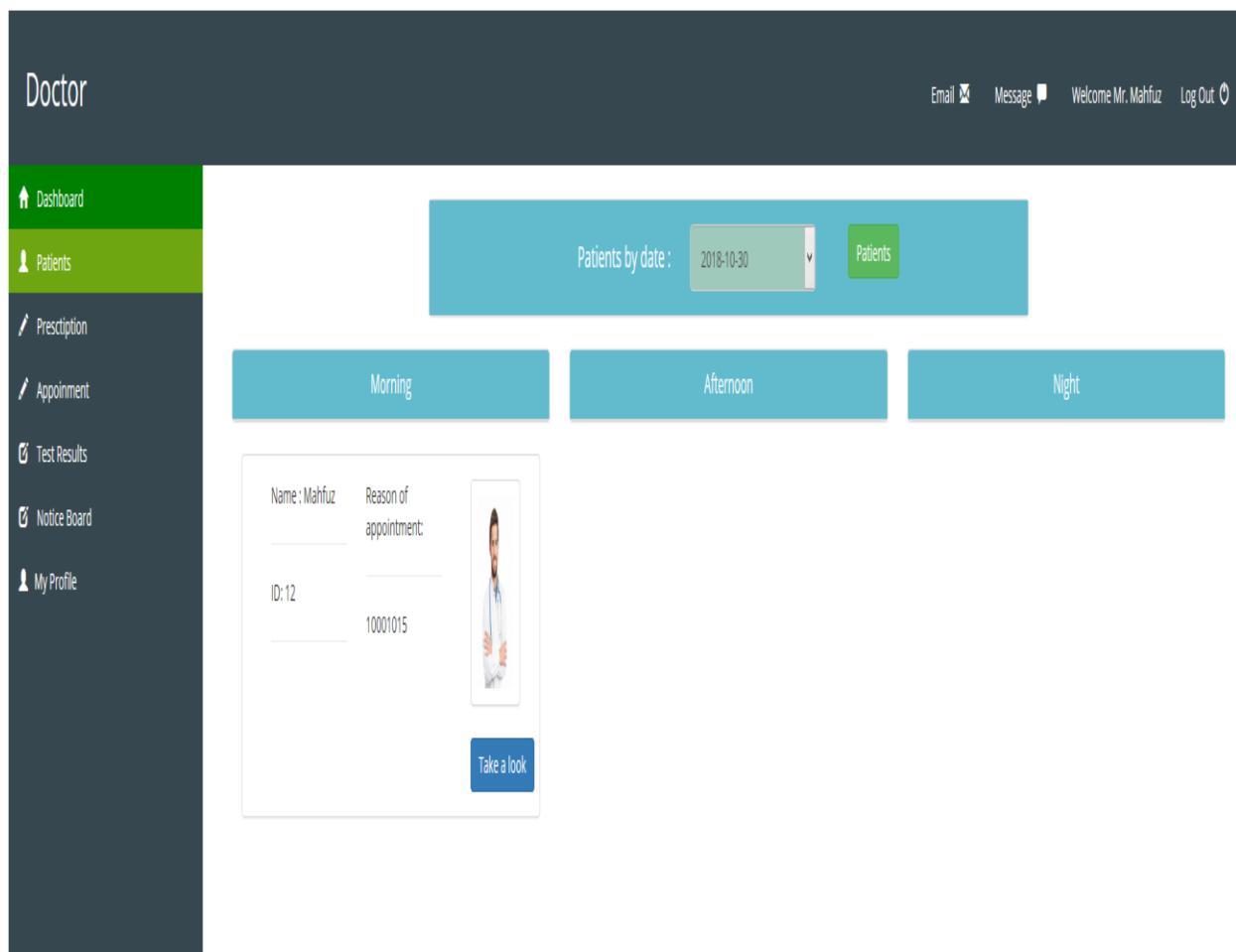


Figure: 4.16: Doctor's schedule for appointments

4.4.12 Making a prescription online

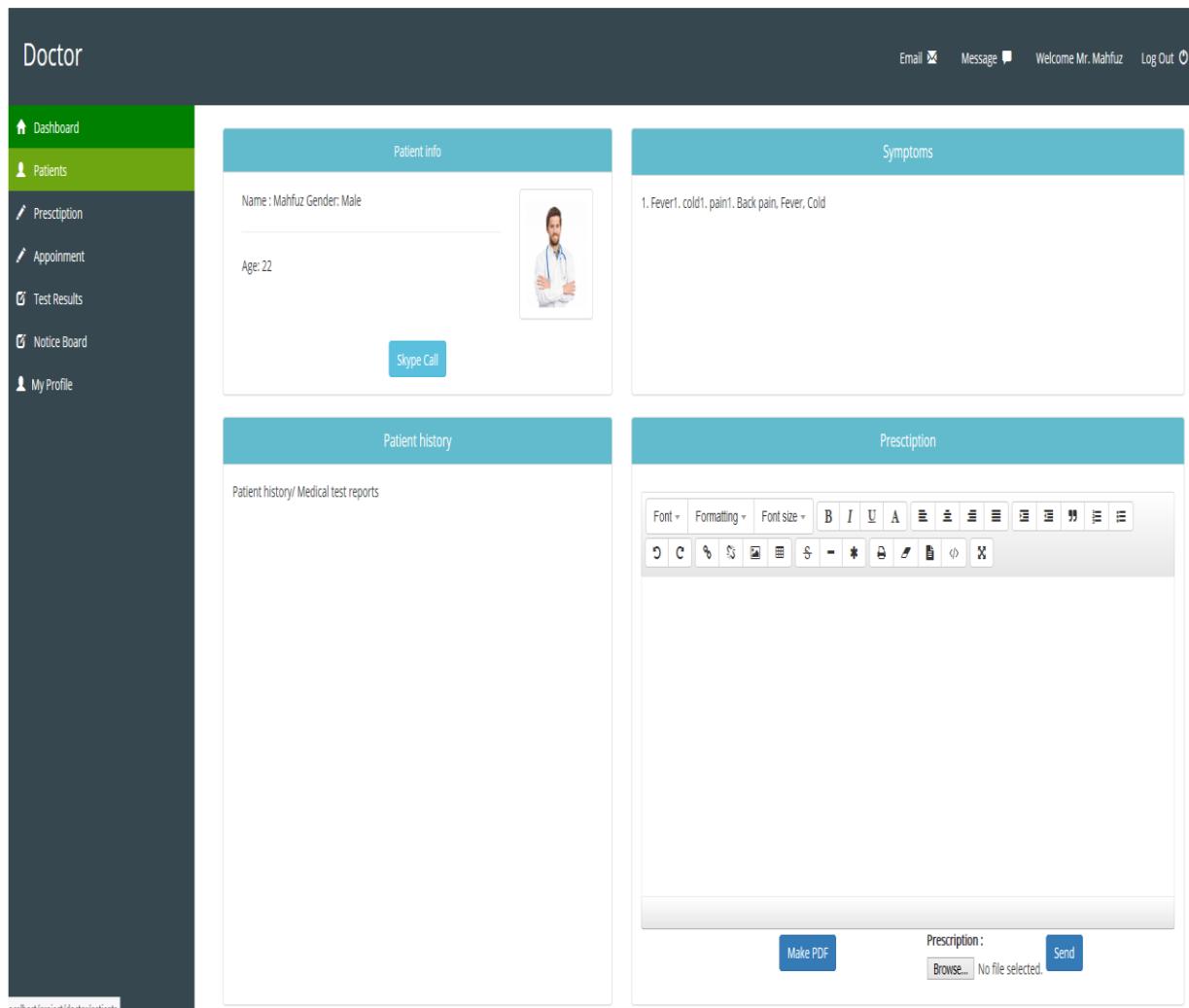


Figure: 4.17: Making a prescription online

There are four categories in this page.

❖ Patients info:

In this categories contains patient's Name, Gender and age. Patient also can make a video call using Skype call.

❖ Symptoms:

All previous prescription and disease details will be stored in this part.

❖ Patient history:

All previous appointment will be stored here.

❖ Prescription:

Doctor can write instant prescription about the patient. Doctor can make a pdf of the prescription and can send it to patient's profile.

4.4.13 Video calling between doctor & patients

Doctors can make a video call with a patient directly via our video calling mechanism.

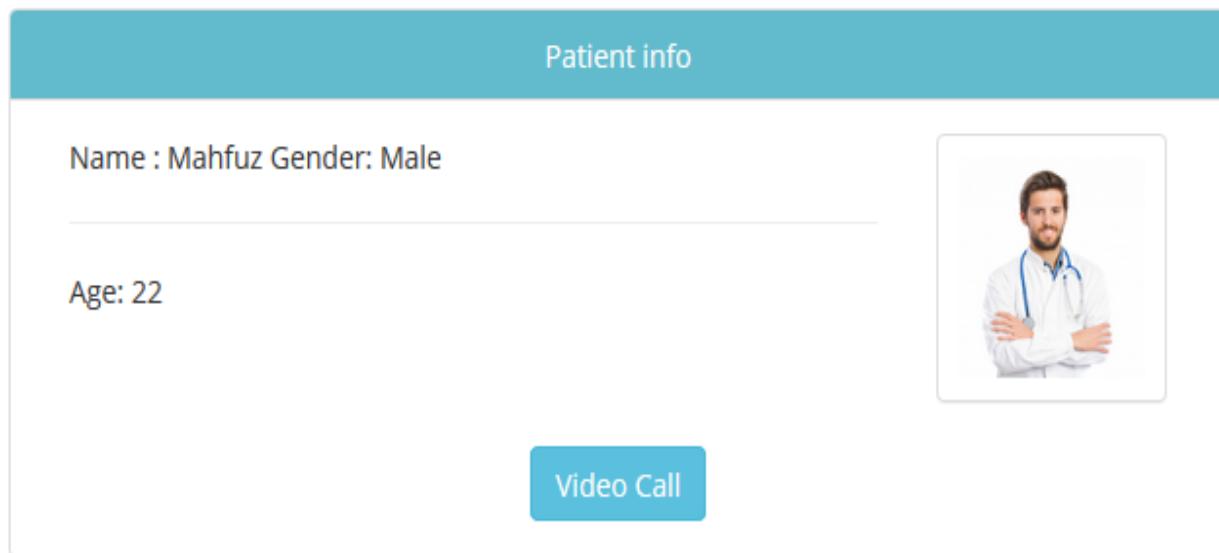


Figure: 4.18: Video Call

We have built our video calling system with webRTC, JavaScript library. Image is given below. We have used only one device here for testing purposes. It works on multiple devices in real time too. Doctor & patient will join from both end for their conversation.

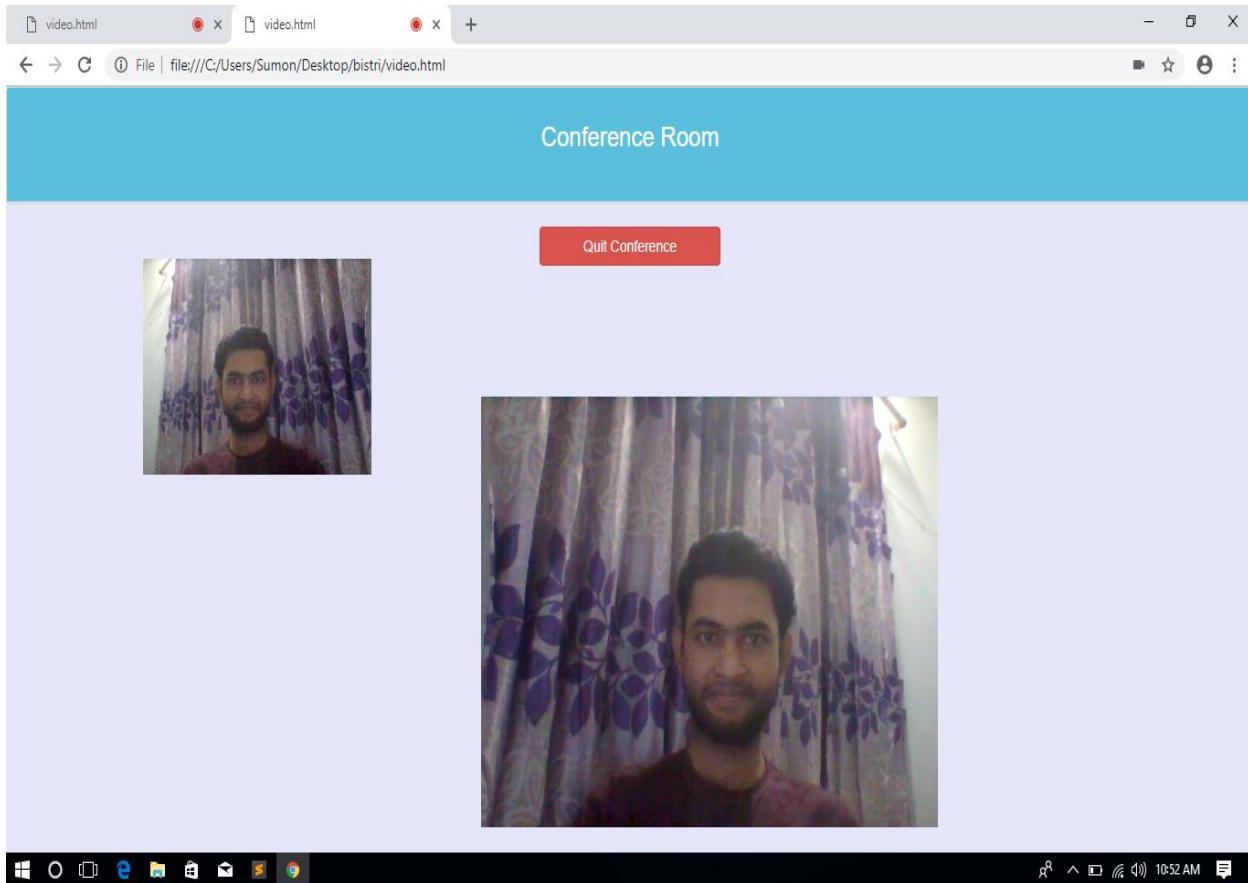


Figure: 4.19: WebRTC call

WebRTC:

WebRTC stands for web real-time communications. it is JavaScript library for making video/audio call with browser. It reduces the burden of hard building mechanism and makes it easier to use for developers. Most of the browsers support WebRTC nowadays. Google is the producer of webRTC.

4.4.14 Medical center is receiving patients test request

In this page medical center can receive patients test request and approve them.

The screenshot shows the 'Patient's Request' section of the Medical Center application. On the left, a sidebar menu includes 'Dashboard', 'Test Request' (which is selected and highlighted in green), 'Appointment', 'Test Results', 'Notice Board', and 'My profile'. The main area is titled 'Patient's Request' and displays three patient entries. Each entry has a placeholder profile picture labeled 'Sumon', an ID (ID: 12 or 1001), a date (2018-10-29 or 2018-11-01), and an 'Approve' button at the bottom. The top right of the screen shows navigation links: Email, Message, Square Hospital, and Log Out.

Figure 4.20: Medical center is receiving patients test request

4.4.15 Providing test manage price

Medicenter can manages price for each and every test.

The screenshot shows the Medicenter application interface. At the top, there is a dark header bar with the text "Medical Center". On the right side of the header are links for "Email" (with a mail icon), "Message" (with a message icon), "Medinova", and "Log Out". Below the header is a vertical navigation sidebar on the left with four items: "Dashboard" (green background), "Approval" (dark grey background), "Manage Price" (light green background, currently selected), and "Notice Board". The main content area has a light blue header bar with the text "Price Management". Below it are two sections: "Current Test's Prices" and "Update Test's Prices". The "Current Test's Prices" section contains a table with three rows of data:

Tests Name	Tests Price	Test ID
Abdominal MRI	500	10002
Abdominal Tap	500	1512
Abdominal Ultrasound	500	4521

The "Update Test's Prices" section contains input fields for "Test Id" (containing "Test id") and "Updated Price" (containing "New price"), along with a "Update Price" button.

Figure: 4.21: Providing test manage price

4.4.16 Notice board

Any kinds of notice will be show on this page.

The screenshot shows the Citizen interface. On the left is a sidebar with a green header containing 'Dashboard' and other options: 'Doctors', 'Prescription', 'Appointment', 'My profile', and 'Notice Board'. The main area has a teal header 'Notice Board'. Below it are three cards: 'Polio' (Polio govt. treatment available date on 29 oct 2018), 'Public Health Care Event' (Public Health Care Event date on 30 oct 2028), and 'Effect of Medicine' (Effect of unprescribed medicine discussion on 1st nov 2018). Each card has a 'See More' button at the bottom right.

Figure: 4.22: Notice board

4.4.17 Email Sending

The screenshot shows the Medical Center interface. On the left is a sidebar with a green header containing 'Dashboard' and other options: 'Approval', 'Manage Price', and 'Notice Board'. The main area has a teal header 'Email'. It contains fields for 'Sent to' (To) and 'Subject', and a large 'Message' area with a scroll bar. At the bottom is a 'Send Mail' button.

Figure: 4.23: Email Sending

CHAPTER 5

Conclusion and Future Scope

5.1 Discussion and Conclusion

Doing this kind of work as final year project is a matter of good luck for us. Because, first it helped us to build up our confidence to do something big, something different. On the other hand, there is no doubt that, it is a huge work for some novice students like us. The main goal of this project was to improve our medical access, lower the traveling problems in city like Dhaka, save time through the bless of internet & modern communication medium.

We have gone through many challenges and difficulties during the time of working for this project and for these, we learned so many things – both technical, ethical and professional. Eight months ago, when we first started working, there were lacks in our technical experience that we recovered during working with the project. And also, we had to learn many new things nonetheless. The other great thing is working in a team. There is so much to learn about team working because it is necessary, effective, productive and difficult. So for this team work our professionalisms also improved remarkably and we believe this will be a fit companion for building up our career.

Though there are some limitations of our project that was already discussed before but it has some good features. The most important thing is e-Medicare will make the medical system easier than ever and both doctor and patient will get the benefits. Though we started to make this project thinking the problem of common people but now we succeed to make platforms individually for doctor, citizen and medical service center. We have added a lot of features in this project. We will update this project and add some extra features in it. These features are in our future plan described at section 5.2.

5.1 Limitation

To make this project we have faced some difficulties. These difficulties are not only from development side but also they are coming from complex mechanism and high end technology. Some of the difficulties we have faced so far are given below.

- ❖ Complex developing structure.
- ❖ Nested jQuery programs.
- ❖ Paid payment mechanism.
- ❖ We didn't able to use php framework like Laravel.

5.2 Future Work

- ❖ We want to contribute this project for the people of Bangladesh so we are expecting govt. help in this regard.
- ❖ Add new features.
- ❖ Add online pharmacy system in it.
- ❖ We will make it more secure.

After all we come to a decision that e-Medicare is a complete project that would be helpful for all kind of people of Bangladesh. We are proud to make this project.

References

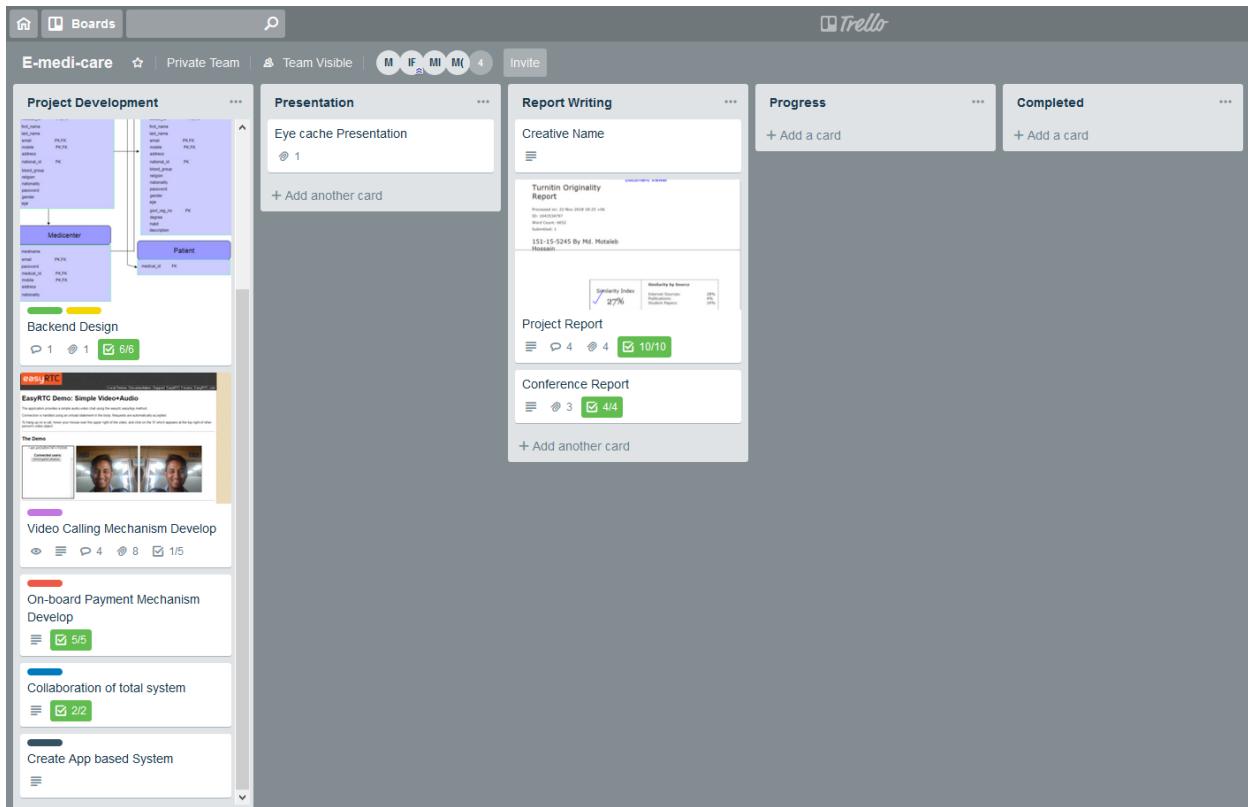
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Appendix

Trello:

We've developed our project on the way using the software development tool named 'Trello'. It kept track of every step of our project. Brief discussion on every work and short documentation was a nice way for demonstration.



Work progress on trello (Home)

E-medi-care

|

Daffodil International University

Free



Team Visible

**Invite****Presentation**

...

Project Development

...

Create App based System

**Report Writing**

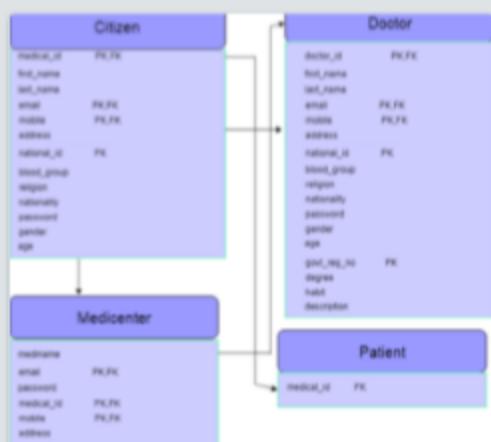
...

E-Medicare

**Progress**

...

Completed

**Backend Design**

1



1



1

6/6

The screenshot shows a Trello board with several cards:

- EasyRTC Demo: Simple Video+Audio**
A card showing a video call interface with two users. It includes a note: "The application provides a simple audio-video chat using the easyRTC easyRTC method. Connection is handled using an instant invitation in the body. Requests are automatically accepted. To hang up on a call, hover your mouse over the upper right of the video, and click on the 'X' which appears at the top right of other person's video display." Below the video are icons for eye, list, comment, and checklist, followed by a green button with a checkmark and the text "5/5".
- Video Calling Mechanism Develop**
A card with a green progress bar. Below it are icons for eye, list, comment, and checklist, followed by a green button with a checkmark and the text "5/5".
- Website Design**
A card with a green progress bar. Below it are icons for eye, list, comment, and checklist, followed by a green button with a checkmark and the text "10/10".
- Collaboration of total system**
A card with a blue progress bar. Below it are icons for list and checklist, followed by a green button with a checkmark and the text "2/2".
- On-board Payment Mechanism Develop**
A card with a red progress bar. Below it are icons for list and checklist, followed by a green button with a checkmark and the text "5/5".
- Turnitin Originality Report**
A card showing Turnitin results. It says "Similarity Index: 22%". Below it are icons for list and checklist, followed by a green button with a checkmark and the text "10/10".
- Project Report**
A card with a green progress bar. Below it are icons for eye, list, comment, and checklist, followed by a green button with a checkmark and the text "10/10".
- Conference Report**
A card with a green progress bar. Below it are icons for list and checklist, followed by a green button with a checkmark and the text "4/4".
- Eye cache Presentation**
A card with a green progress bar. Below it is an icon for checklist, followed by the number "1".

Document Viewer

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