

SMS BASED APPOINTMENT MANAGEMENT SYSTEM

BY

SYED FAKRUR RASHID

ID: 121-25-235

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

Supervised By

Dr. Syed Akhter Hossain

Professor and Head

Department of Computer Science and Engineering

Daffodil International University



DAFFODIL INTERNATIONAL UNIVERSITY

DHAKA, BANGLADESH

October, 2012

APPROVAL

This Project titled “**SMS Based web portal for fixing appointments with doctors**”, submitted by Syed Fakrur Rashid 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 M.Sc. in Computer Science and Engineering and approved as to its style and contents. The presentation has been held on 11th October, 2012.

BOARD OF EXAMINERS

Dr Syed Akhter Hossain
Professor and Head

Department of Computer Science and Engineering
Faculty of Science & Information Technology
Daffodil International University

Chairman

Dr Yousuf Mahbubul Islam
Professor

Department of Computer Science and Engineering
Faculty of Science & Information Technology
Daffodil International University

Internal Examiner

Dr Md Kabirul Islam
Associate Professor

Department of Computer Science and Engineering
Faculty of Science & Information Technology
Daffodil International University

Internal Examiner

Dr Mohammad Shorif Uddin
Professor

Department of Computer Science and Engineering
Jahangirnagar University

External Examiner

DECLARATION

I hereby declare that, this project has been done by us under the supervision of **Dr. Syed Akhter Hossain, Professor and Head, Department of Computer Science and Engineering, Daffodil International University**. I also declare that neither this project nor any part of this project has been submitted elsewhere for award of any degree or diploma. Any material reproduced in this project has been properly acknowledged.

Supervised by:

**Dr. Syed Akhter Hossain
Professor and Head
Department of Computer Science and Engineering
Daffodil International University
Bangladesh**

Submitted by:

(Syed Fakrur Rashid)
ID: 121-25-235
Dept: CSE
Daffodil International University

ACKNOWLEDGEMENT

First we express our heartiest thanks and gratefulness to almighty Allah for His divine blessing makes us possible to complete this project successfully.

We fell grateful to and wish our profound our indebtedness to **Dr. Syed Akhter Hossain, Professor and Head**, Department of Computer Science and Engineering, Daffodil International University. Deep Knowledge & keen interest of our supervisor in the field of wireless network influenced us 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, we must acknowledge with due respect the constant support and patients of our parents.

ABSTRACT

This project titled “**SMS Based web portal for fixing appointments with doctors**” for fixing appointment with the doctors online could be a start of providing medical services online to the clients of Bangladesh.

The system could be used to maintain doctors’ information and fixing appointment with them not only as a small scale of one individual hospital or medical service provider but as a large scale by holding information about the doctors’ of an entire city or the whole country, for example Dhaka city’s famous Cardiologists. The portal provides the clients the ease of searching doctors of their need and fixing appointment with them. It also provides individual profile to the users to maintain their records and using them for further references. The portal also holds information and profiles of blood donors who are willing to donate blood to the needed. It also works as a portal to advertise information about the famous hospitals for the clients to look up and contact with them during their emergencies. Using PHP v 5.3.1 and MySQL v 5.1.41 for back-end scripting and database management and HTML 5 and CSS 3 for the front-end the web portal was implemented to provide dynamic services to clients.

Keywords: Online Appointment, SMS Based Appointment, SMS Reminder

TABLE OF CONTENTS

CONTENTS	PAGE
Board of Examiners	I
Declaration	II
Acknowledgements	III
Abstract	IV
CHAPTER	
CHAPTER-1: INTRODUCTION	1-4
1.1 Project Background	2
1.2 Key Features	3
1.3 Why Appointment Management System	3
1.4 Expected Impact of the Project	4
1.5 Definitions	4
CHAPTER-2: BACKGROUND	6-18
2.1 Background of Online and SMS System in Bangladesh	7
2.2 Present Scenario in Bangladesh	8
2.3 Problems' in existing system	8
2.4 Comparative Analysis (Traditional System and Proposed System)	9
2.5 Main Objective	9
2.6 Components of an online appointment system	10
2.7 Development Process	12
2.8 Our proposed system requirements	13
2.9 Records Maintenance	17
2.10 Software and Tools	17
CHAPTER-3: SYSTEM DESIGN	19-43
3.1 Introduction	20
3.2 Design Methodology	20
3.3 Process Modeling	20
3.3.1 Use Case Diagram	21
3.4 Dynamic Modeling	24

LIST OF FIGURES

FIGURES	PAGE NO
Fig 1: Use Case Diagram for making appointment	21
Fig 2: Use Case Diagram for Creating Schedule	22
Fig 3: Use Case Diagram for blood donation system	22
Fig 4: Use Case Diagram for administration	23
Fig 5: Class Diagram for SMS based Appointment Management System	24
Fig 6: Patients making an appointment and get status update	25
Fig 7: Doctors setting a schedule and get status update	26
Fig 8: Data flow diagram of doctor's registration process	28
Fig 9: Data flow diagram of patients' registration process	29
Fig 10: Data flow diagram of donors' registration process	30
Fig 11: Data flow diagram of login and logout process	31
Fig 12: Appointment fixing process by patients	33
Fig 13: Data flow diagram of rescheduling appointment	34
Fig 14: Data flow diagram of patients' records maintenance process	35
Fig 15. E-R diagram	36
Fig 16. Schema Diagram of the system	37
Fig 17: Business Process manage for Patients	24
Fig 18: Business Process Model for Doctors	43
Fig 19: Dashboard	45
Fig 20: Add Doctors information	46
Fig 21: View All Doctors	47
Fig 22: Viewing Doctors Detail	47

Fig 23: View Doctors Schedule	48
Fig 24: View all appointments	48
Fig 25: View Calendar	49
Fig 26: View Details in Calendar	49
Fig 27: View All Schedule	50
Fig 28: Add patients information	51
Fig: 29: View all patients	51
Fig: 29: View all patients	52
Fig 30: Patients Details Information's	52
Fig 31: Patients Details Basic Information's	52
Fig 32: Patients Details Appointments	53
Fig 33: Patients Details Prescriptions	53
Fig 34: Adding Basic Information's	54
Fig 35: Creating Prescription	54
Fig 36: Search blood Information	55
Fig 37: Search Blood Results	56
Fig 38: Taking Appointment	56
Fig 39: Taking Appointment Post Dated	57
Fig 40: Add Specialization	57
Fig 41: View Specialization	58
Fig 42: Change Password	58

LIST OF TABLES

TABLES	PAGE NO
Table 1: Bangladesh - Telecoms, Mobile, Broadband and Forecasts	7

Chapter 1
INTRODUCTION

INTRODUCTION

1.1 Project Background

Needless to say that Information technology has changed the way in which business is being done today. It has turned the world into a huge virtual market place where the activities can be done in second sitting in front of the computer terminal and using the cell phone from anywhere. This technology helps users to make the activity effective and fast.

1. Cost of management being low and leads to financial benefit.
2. Removal of business complexities.
3. A huge number of activities can be done in less time.
4. Capacity to provide large number of information, which is not possible by the existing system.

Web portals are emerging as the new generation of web enabled services for the internet users where the users not only views information about a certain sector or range of products but now a day they are taking part in receiving various online services that ease their various needs. It is giving opportunities for the providers to provide various unique

services that benefit their clients and give them an opportunity to do business using technologies and internet. Targeting the clients who need medical services the online doctors' appointment management system has been developed with the aim of providing services to the clients by working as a portal for the users in Bangladesh. Although there are many websites of the hospitals in Bangladesh, these websites haven't yet started any online services that can ease the medical services to the clients more efficiently. Getting an appointment to a doctor of a particular hospital is usually done by phone calls or physically going to the hospitals. The online appointment fixing system hence will ease up this process and also as it works as a portal, there will be no need to go to individual websites to find doctors' information. Appointment management systems main users will be patients and the doctors. The doctors will have the opportunity to highlight their profile to the patients who would by searching them in the portal fix appointments with them. It also provides profiles for the individual users to store records for future reference. This portal will also provide profiles to the blood donors who can highlight their information by maintaining a profile to the users who need blood. This portal also gives the users to advertise about hospitals that would help the clients to learn about emergency services in Bangladesh.

The main focus of the portal is to manage the appointment fixing system from online and using cell phone SMS. The appointment fixing system includes making schedule, fixing appointment, viewing appointments and storing records, changing schedule and notifying users about the changes etc. These complex modules are included to ease up the appointment maintenance system for the users.

The idea was developed by analyzing the need of the outdoor patients of Square Hospitals Ltd. who would appreciate an online medical service system. This project, under Square InformatiX Ltd. would be one of the pioneers of online medical service provider of Bangladesh.

1.2 Key Features

As primary focus of Online Appoint Management System is to manage appointment fixing where patients can make appointments with the doctors it requires the following features to be implemented in the project:

- 1 Schedule daily appointment list of patients
- 2 View patients complete information
- 3 Track / schedule individual doctor's appointments
- 4 Assign time slot to each doctor
- 5 Check Doctors availability for patient's appointment
- 6 Save no-show appointments information
- 7 Maintain cancel appointments information

1.3 Why Appointment Management System

- **Save time-** It is possible to get the appointment done online/ Using SMS within few minutes it helps you save a lot of time that you waste on calls to make appointments.
- **Decreases no-shows** - This service provides you automated SMS/ email Reminder to inform patient about their scheduled appointments. Thus these reminders help to reduce the number of no-shows.
- **Anytime almost 24/7 Appointment-** It's not important for the patients to make an appointment only within few hours. They can make appointment any time according to their convenience. This also helps patients to check all the time slots and make the booking on time which suits them the best.
- **User friendly system-** This system works like an online receptionist for your convenience. It's self-explanatory and user friendly software which provides you best service whenever you arrive and depart.
- **Business promotion/ inform news-** It is possible to announce special announcement regarding any aping or any offer to the customer.
- **Check Appointment history** -Both patient and doctors can easily view all previous and upcoming scheduled appointments or the program of upcoming events.

- **Statistics of your schedules** - It is possible view statistics of your appointments in online appointment system.

1.4 Expected Impact of the Project

The SMS based web portal for appointment management system will be developed very specifically for the hospitals, clinics, doctors to make their appointment management process more smooth and hassle free for both patients and doctors. Since this system will support both online accesses using internet and SMS so the user will have many options choose between. In some patients may not have internet access but they can make appointment using their cell phone from anywhere.

1.5 Definitions

Database

Databases are designed to offer an organized mechanism for storing, managing and retrieving information. They use many tables to store data.

SSL

SSL (Secure Sockets Layer) is the standard security technology for establishing an encrypted link between a web server and a browser. This link ensures that all data passed between the web server and browsers remain private and integral.

GUI

Graphical User Interface is method of interaction with a computer which uses icons and command lists controlled by a mouse. It is generally simpler and easier to understand and work with than command line interfaces.

Cron

Cron is the scheduling daemon of the Linux operating system. Cron is useful for users in running regular tasks without your manual intervention.

SMS

Short message service, a system that enables cellular phone users to send and receive text messages

XAMPP :

XAMPP (or) is a free and open source cross-platform web server package, consisting mainly of the Apache HTTP Server, MySQL database, and interpreters for scripts written in the PHP and Perl programming languages.

Chapter-2

BACKGROUND

BACKGROUND

2.1 Background of Online System and SMS System in Bangladesh

Bangladesh's mobile market passed 60 million subscribers by June 2010 with penetration running at 37%.

This had been preceded by a significant three-year period in which the country saw mobile subscriber numbers more than treble as the market expanded rapidly.

Grameen Phone was far and away the leading mobile operator, claiming close to 27 million subscribers, or 44% of the total mobile subscriber base, as at mid-2010, despite the best commercial efforts of its five competitors.

Internet penetration remains low (0.4% user penetration by end-2009) and Internet subscription rates are considerably lower.

Although broadband Internet services remain virtually non-existent in Bangladesh, following the granting of a number of WiMAX licences in 2008, there was considerable optimism that this is about to change as WiMAX networks were being rolled out.

Category	2009	2010
Total number of subscribers	52.4 million	65.0 million
Annual growth	16%	24%
Mobile penetration (population)	32%	39%

Table 1: [Bangladesh - Telecoms, Mobile, Broadband and Forecasts](#) [10]

The number of mobile user in Bangladesh is growing day by day. The persons who don't have internet access they can easy make appointment with the system. It will take less the one minute to make an appointment.

2.2 Present Scenario in Bangladesh

An appointment is necessary because doctors are busy and an appointment system is a good way of organizing their time. In our existing system in Bangladesh to make an appointment it is required to make a phone call, or go in to talk directly to a receptionist. If you phone, a receptionist and not the doctor, answers the phone. Tell them your name, the doctor you are booked in to see and the time of your appointment. You'll then be told to take a seat in the waiting room. Be prepared to wait a while before the doctor is able to see you. They may not be ready to see you on time, but don't worry, its not because they have forgotten or can't be bothered with you, it's because some of their other appointments have over run.

2.3 Problems in existing system:

- Required to make a call within a limited time may be 1 or two hour
- Not possible to take according to patents convenient time

- Post dated appointment is not possible
- Take much time to call being connected as many person try simultaneously
- It take time and money to reach the hospital physically and make appointment
- May take aprox. 20 mins to get the call being connected after continuous try
- No reminder facility available for the appointment

2.4 Comparative Analysis

Traditional Appointment System has one thing in common:

In our traditional system appointments are taken over the phone by receptionists, or made in-person

A manual appointment process requires a significant amount of staff time and resources for operating procedures.

The appointment does not end when a date and time is confirmed.

Information related to the scheduled appointment is not managed and maintained.

Proposed appointment management system

- Patient appointment system can be greatly simplified with capable online scheduling tools and appointment management system
- Receptionists can easily manage doctor's appointment schedules, patient records and individual appointments.
- Patient can make an appointment throw the internet online and even using cell phone.
- Patient can search by doctors` name or departments` name. And many more

2.5 Main Objective

Many people face anxiety when attempting to schedule a doctor's appointment. Whether the appointment is important for some patients, the goal is to maintain an appointment time and date that is manageable to patients home and work schedule.

While many hospitals are developing new ways of allowing patients to schedule appointments, telephone calls and directs are still the way most complete the appointment.

Appointment system can greatly improve the way to schedule and manage Their appointment processes by giving their patients the ability to book their own dates and times online and at any hour of the day, not just during normal operating hours.

Just as the scopes of business vary greatly among hospitals, so the types of appointment system there may have both options like self-scheduled and default scheduled with online appointment system.

Our main objective is to overcome existing constrains discussed above may be resolved and improved using the proposed system this includes

- To provide better service in hospital.
- To reduce the Congestion at hospitals.
- To save time, effort and money

This application is to be implemented to provide online appointment facility for hospital. The appointments are to be mapped in available schedule provided by doctors.

2.6 Components of Appointment System

An appointment system consists of a number of vital components:

- A database

- Website
- SMS Service
- Security system
- Cron job is a command for scheduling a task

Database

I am going to use MySQL because it is characterized as a free, fast, reliable open source relational database. It does lack some sophistication and facilities, but it has an active development team and, as it goes from release to release, more capabilities are added. I choose this database because

- Because of its unique storage engine architecture MySQL performance is very high and lightweight.
- Supports large number of embedded applications which makes MySQL very flexible.
- Use of Triggers, Stored procedures and views which allows the developer to give a higher productivity.
- Allows transactions to be rolled back, commit and crash recovery.
- Triggers & cursor

Website

Website makes a system simple and easy to get access to information and services like the appointment management system. It creates better efficiency, effective patient communications, and a great opportunity to realize actual need.

Security

A widely used solution for security problem is a Secure Socket Layer (or SSL), which allows information exchanged between two parties to be encrypted. This can help prevent any unauthorized third party from intercepting sensitive information.

SMS Service

Short Message Service (SMS) is text messaging service component of phone, web, or mobile communication systems, using standard communications protocols that allow the exchange of short text messages between fixed line or mobile phone devices.

In the proposed system there will be the feature to make appointment using SMS like

- Booking an appointment
- Cancelling an appointment
- Confirming an appointment
- Getting a doctor schedule
- Querying doctor(s) info

Cron Jobs

Cron is a unix, solaris utility that allows tasks to be automatically run in the background at regular intervals by the cron daemon. These tasks are often termed as cron jobs in unix, solaris. Crontab is a file which contains the schedule of cron entries to be run and at specified times

Basically this run a PHP script file in specific intervals. In my system this wil execute a php file every 5 minutes.

2.7 Development Process

There are many appointment management system but most don't have some features like SMS in Bangladesh based, reminder and export date for other software use available on the market. However, if I want to develop online appointment system from scratch, one can use a 5-step development process

Step 1: Requirements analysis

Step 2: Sub-system selection

Step 3: Prototype development

Step 4: GUI development

Step 5: Integration and system test

This design process begins by gathering user requirements and building a general model of the appointment management system. An analysis is then done of how the new system will integrate into the current business model. The new system design is then divided into modules, which are developed separately. A prototype of the appointment management system is produced in the early stages of development to give doctors and patients a feel of what the final system will be like. The fourth step of the process involves developing the GUI for the front-end of the system. The final step in the development process is the testing of the various modules and components of the system and the integration of the online appointment system into the business.

2.8 Requirements

In our proposed system there will be panels for user, doctors and patients

After existing system analysis requirements for appointment system defines

2.8.1 User Panels

The system required four types of user panels from where the users would be able to interact with the system. These four user panels are:

2.8.1.1 Admin panel

There would be one more admin with some given privileges to operate on the system. The admin would be able to login to his panel using a user name and password and this login panel for admin would be separated from the system's modules for the common users. The admin panel would contain the following modules:

- A separate login window
- Predefined user name and password
- Privilege to change user name and password from the admins profile
- View basic information about the registered patients and privilege to remove them from the portal when required
- Register doctors to the system
- View basic information about the registered doctors and privilege to remove them from the portal when required
- View basic information about the registered blood donors and privilege to remove them from the portal when required

2.8.1.2 Doctors Panel

As this portal would hold profiles for doctors each doctor registered to the portal would have the following modules that would enable them to interact with the system:

- A login window linked to the main home page
- Privilege to edit basic information/update basic information from their profile
- Privilege to set appointment schedule
- Privilege to change/remove appointment schedule
- Privilege to view fixed appointments
- Privilege to cancel appointments for a particular date

2.8.1.3 Patients' Panel

Similar to the doctors profiles the registered patients would have access to their individual profiles in the portal. As per the system requirements the patients profiles would contain the following features:

- A login window linked to the main home page
- Privilege to view fixed appointments with the doctors
- Privilege to make new appointments from their profile

2.8.1.4 Donors' Panel

Each registered donors would have a profile in the portal to access and update their basic information for other users to view.

2.8.2 Registration Process

As per the system requirement the registration process of the users would follow separate processes. Such as:

2.8.2.1 Registering Doctors

The doctors' registration process would be handled by the admin and it will be done as follows:

- Admin would insert the following information about the doctors:
 - ✓ Doctor's first name
 - ✓ Doctor's last name
 - ✓ Doctor's specialization
 - ✓ Doctor's email address
- Once admin submits the information doctor's email address would need to be verified by the doctor
- Once the email address is verified the doctor would be registered and he would receive a password in his email address to access his profile in the portal using that email address and password

2.8.2.2 Registering Patients

Patients' registration process would differ from the doctors'. In this case patients' would be registered during the time of making appointment for the first time.

- A patient would have to fill up a form during the first time of making an appointment using the portal
- Once he/she fills out the form with their basic information they would be redirected to select a doctor for making appointment

- Once the appointment is fixed patient would receive a serial number and a password for his/her profile in the portal in his/her email address
- Registered patients then can access their profile using their email address and given password
- Once registered, patient can make appointment from their profile without filling out a form to insert their basic information like before

2.8.2.3 Registering Donors

Registering donors is a simple process of filling out a registration form and verifying email address. Once the email address is verified the donor would receive a password for his profile in the portal. And can access to the profile using his email address and given password.

2.8.3 Appointment Management

As primary focus of this system is to manage appointment fixing module where patients can make appointments with the doctors it requires the following features to be implemented:

- Scheduling appointment timing by doctors from their profiles
 - ✓ Doctors can schedule new timing
 - ✓ Doctors can reschedule old timing
 - ✓ Doctors can remove timing from schedule
- Doctors can view appointed patients for a particular date
- Doctors can cancel appointment for a particular date

- Patients would receive serial number after making appointment
- Patients can view fixed appointments' schedule in their profiles
- Patients can make new appointments from their profiles
- Patient would be notified if his appointment with a doctor is cancelled or rescheduled by that doctor

2.9 Records Maintenance

Records that would become a part of the portal for the users would be containing the following features:

- Generating patients' records by the doctors while meeting them in the due date of appointment
- Records should be stored in doctor's and patient's profiles
- Basic information of the users would be stored in their profiles and they would be able to update them
- All records would be stored in and fetched from the database

2.10 Software and Tools

Front-end design

As per requirement the front-end of the website is designed using HTML 5 and CSS3 and for some features some jquery modules have been integrated to the system.

Back-end design

The back-end of the system is developed using PHP 5 and MySQL for integrating and managing database.

Why I chosen PHP and MY SQL

PHP will be our doorway to MySQL, a middle man of sorts that can communicate with various technologies and transfer data between them. MySQL is one of those languages that PHP seems to mesh with very well, and the open source community is constantly adding a more expansive and useful structure to the language. We will use PHP to open connections, close connections, select data from the database, parse it, and much more.

If you happen to be new to database technologies and deep data storage, MySQL offers a nice soft cushion to bring you into understanding and working with database systems. When you feel comfortable working with MySQL and PHP together you can jump into our PHP+MySQL applications made for learning application logic. Many open source applications use MySQL as a data storage method, including many of the applications we offer here. If a database is required for the project, we will use MySQL to cover our needs. MySQL is very stable, secure, and user friendly enough for beginners to jump right into it.

Other Tools

Bizagi

Bizagi is the leading Business Process Management (BPMS) solution for faster and flexible process automation. A powerful and simple BPM Suite designed to solve real business problems. Corporate customers in over 50 countries rely on Bizagi to run their core business processes

JQuery: jQuery is a multi-browser JavaScript library designed to simplify the client-side scripting of HTML. It was released in January 2006 at BarCamp NYC by John Resig. Used by over 55% of the 10,000 most visited websites, jQuery is the most popular JavaScript library in use today.

Jquery UI

The jQuery UI Datepicker is a highly configurable plugin that adds datepicker functionality to your pages. You can customize the date format and language, restrict the selectable date ranges and add in buttons and other navigation options easily.

PHPMailer

PHPMailer is a PHP class for PHP that provides a package of functions to send email. PHPMailer supports nearly all possibilities to send email: mail(), Sendmail, qmail & direct to SMTP server. You can use any feature of SMTP-based e-mail, multiple recipients via to, CC, BCC, etc.

Chapter-3

SYSTEM DESIGN

SYSTEM DESIGNING ISSUES

3.1 Introduction

In this section, we will discuss system designing issues of line appointment system. We will look at the design methodologies used as well as the UML models of the system.

3.2 Design Methodology

Object-oriented analysis and design (OAD) is often part of the development of large scale systems and programs often using the Unified Modeling Language (UML). OAD applies object-modeling techniques to analyze the requirements for a context for example, a system, a set of system modules, an organization, or a business unit and to design a solution. Most modern object-oriented analysis and design methodologies are use case driven across requirements, design, implementation, testing, and deployment. Use cases

were invented with object oriented programming, but they're also very well suited for systems that will be implemented in the procedural paradigm. The Unified Modeling Language (UML) has become the standard modeling language used in object-oriented analysis and design to graphically illustrate system concepts. For the reason “UML” methodology is going to be used in the project which supports Object-oriented analysis and design

3.3 Process Modeling

3.3.1 Use Case diagram

3.3.1.1 Use Case Diagram for making appointment

Actor: Patient

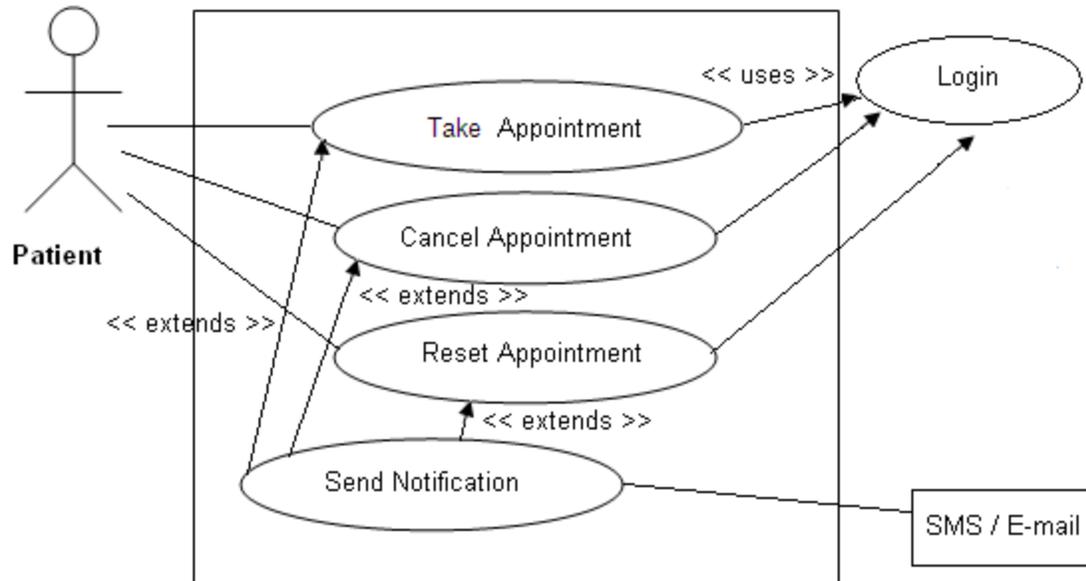


Fig 1: Use Case Diagram for making appointment

Patients can take appointment but they have to login to the system. They can cancel, reset the appointment. They will get notification before 24 Hour and 3 hour.

3.3.1.2 Use Case Diagram for Creating Schedule

Actor: Doctor

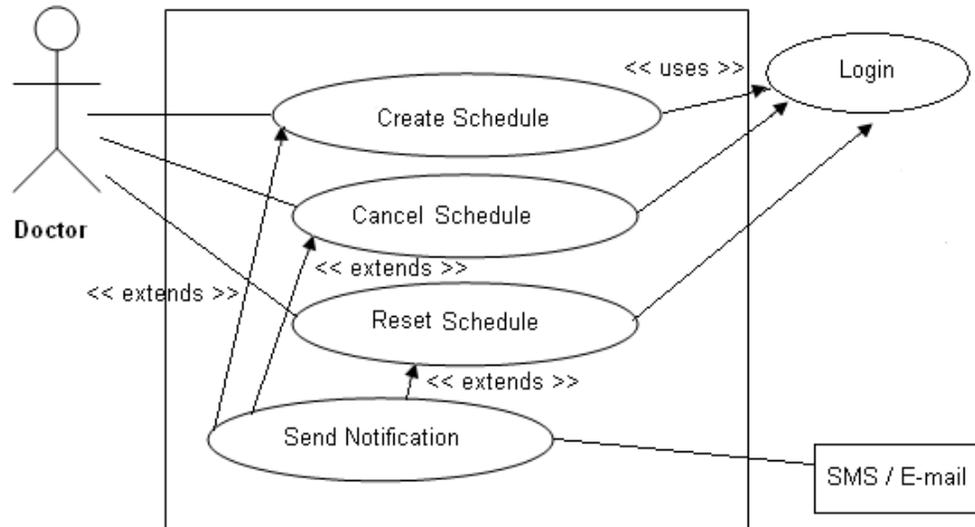


Fig 2: Use Case Diagram for Creating Schedule

Doctors can set schedule but they have to login to the system. They can view appointments and cancel, reset schedule.

3.3.1.3 Use Case Diagram for blood donation system

Actor: Donor

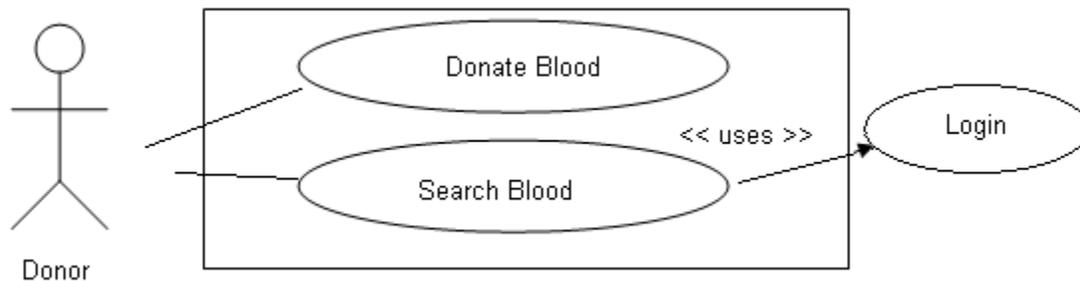


Fig 3: Use Case Diagram for blood donation system

Blood Donor can add blood information and search blood.

3.3.1.4 Use Case Diagram for administration

Actor: Admin

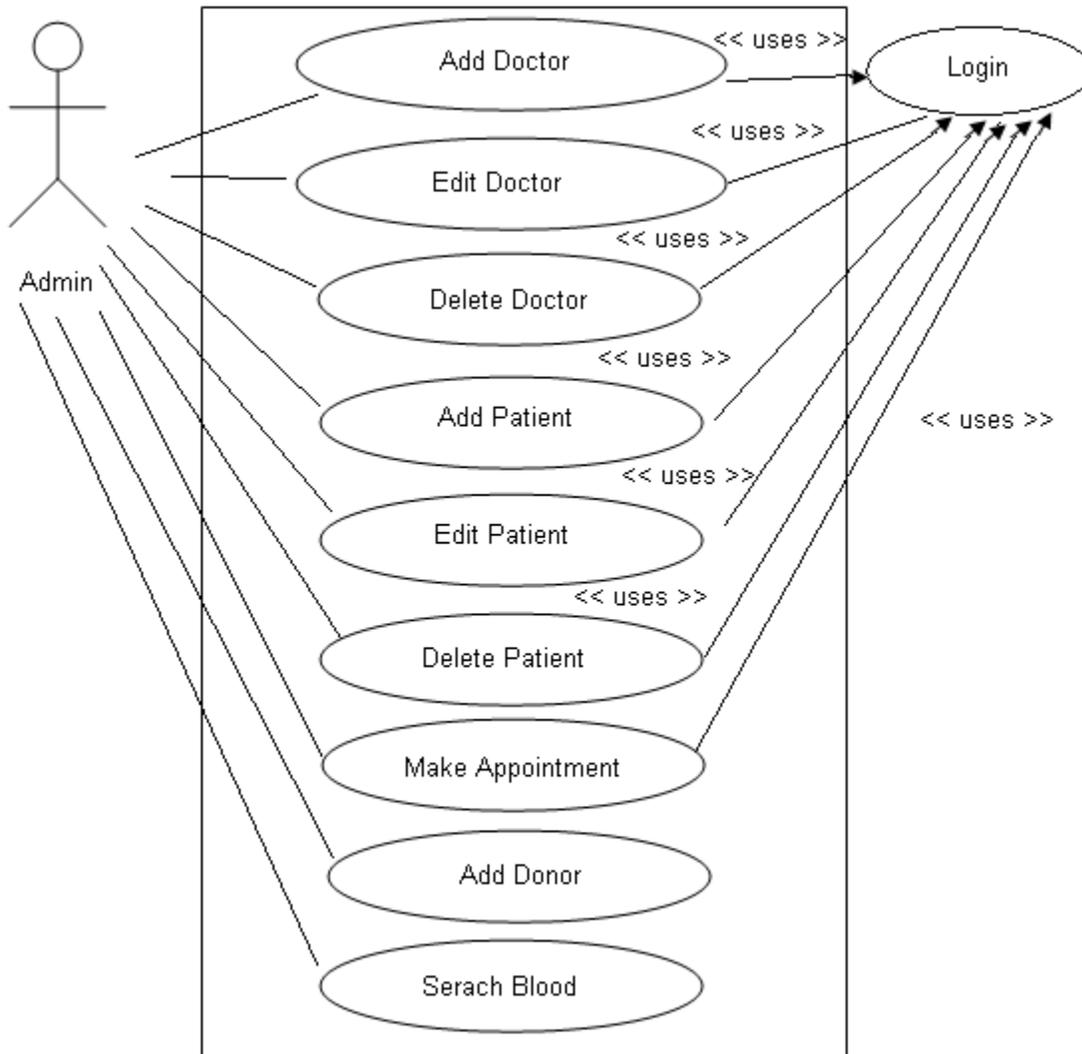


Fig 4: Use Case Diagram for administration

Admin can add/ Edit/ View doctors information and patients information but they need to login to the system

3.4 Dynamic Modeling

3.4.1 Class diagram

A Class diagram gives an overview of a system by showing its classes and the relationships among them. Class diagrams are static they display what interacts but not what happens when they do interact.

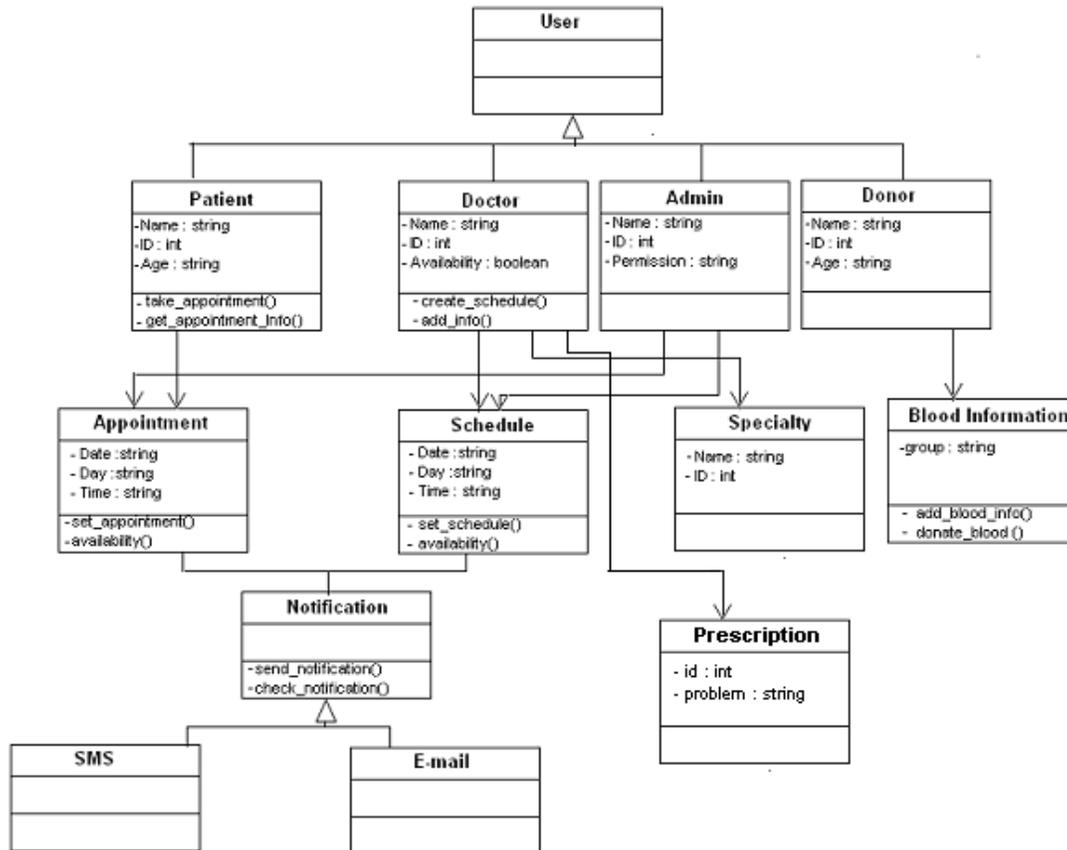


Fig 5: Class Diagram for SMS based Appointment Management System

3.5 Sequence Diagram

Class and object diagrams are static model views. Sequence diagrams are dynamic. They describe how objects collaborate.

3.5.1 Patients making an appointment and get status update

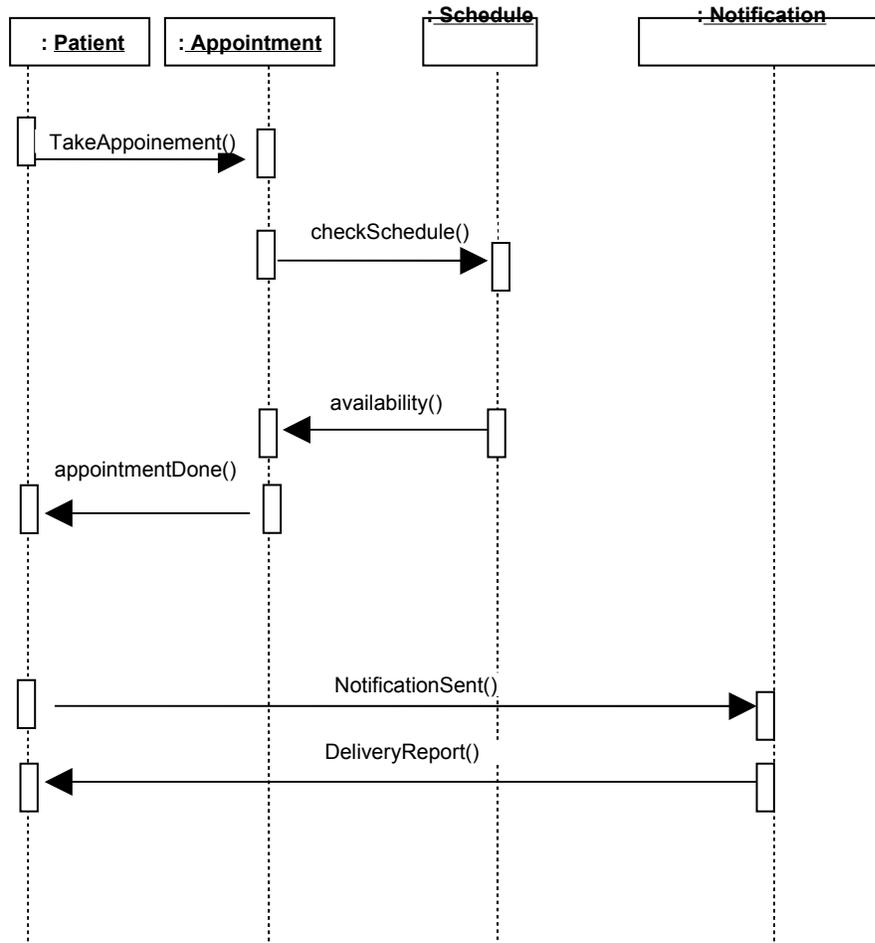


Fig 6: Patients making an appointment and get status update

3.5.2 Doctors setting a schedule and get status update

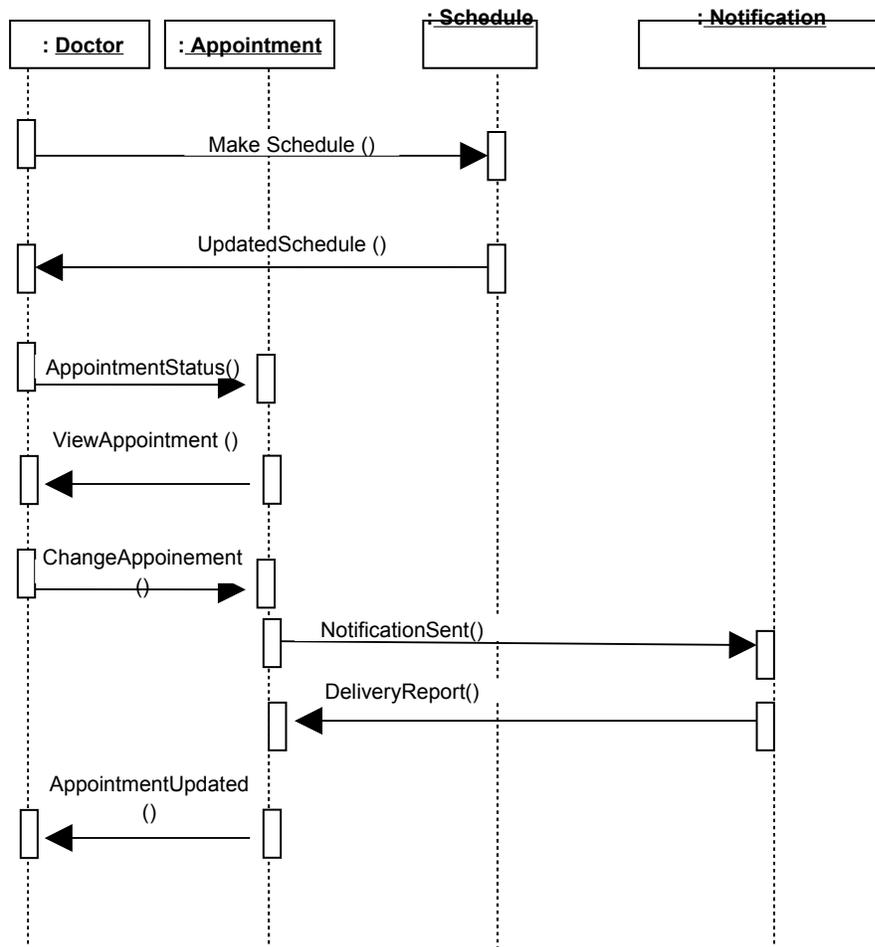


Fig 7: Doctors setting a schedule and get status update

3.6. System Design

According to the requirements the project was designed and developed to implement different features and processes that the system required. The processes with their features are discussed in the following manner:

- The user registration process
 - ✓ Doctors' registration
 - ✓ Patients' registration

- ✓ Donors' registration
- The login/profile access process
- The appointment management process
 - ✓ Scheduling timing for appointments by doctors
 - ✓ Fixing appointments with doctors
 - ✓ Rescheduling appointments by doctors
- The record maintenance process
- The user removal process
- Viewing doctors' and donors' profile
- SMS Notification system

As we move on implementing each process, every required feature of the portal was implemented successfully step by step. Below the detail description of each process is discussed.

3.6.1 User registration process

As the portal would have three types of users each type of users would be registered to the portal in three different processes:

3.6.1.1 Doctors' registration process

The doctors would be registered by the admin. This process is an administrative job done in the portal. The registration process requires that the admin would insert some information related to the doctor to be registered. When the admin is done by inserting the doctors' information an email is sent to the doctor and a confirmation link is sent in

the email to verify the doctor's email address. Once verified successfully, the doctor receives another email containing a system generated password from the portal to use it for accessing his portal account.

In the back-end of this process two tables are maintained in the database to accomplish the process. The first table holds information that are inserted by the admin about the doctor and a randomly generated confirmation link that is sent to the doctor by email. When the doctor clicks the link to confirm his email address the data are transferred to the second table from the first table and a randomly generated password is inserted in the second table in a field corresponding to the doctor being registered. This password is sent to the doctor in the same email address and the data from the first table are deleted. (See Appendix A for codes of the doctors' registration process)

The emails are sent using PHP Mailer class [1] that uses SMTP server to send email.

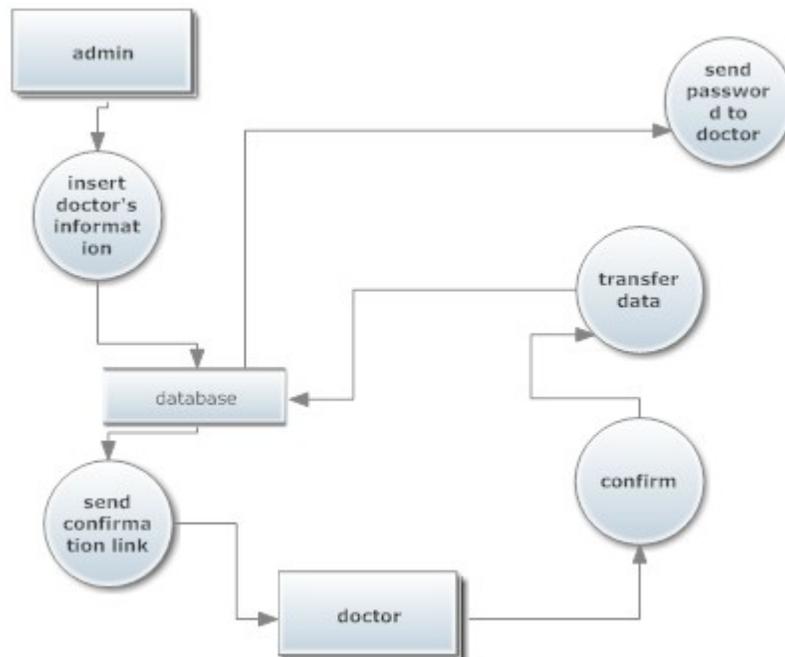


Fig 8: Data flow diagram of doctor's registration process

3.6.1.2 Patients' registration process

The patients' registration process is a parallel process with the appointment fixing process with doctors. During the appointment fixing process patients are needed to fill out a form with their basic information. These data are stored in a table as temporary data until the patient fixes an appointment with a doctor. If the patient successfully fixes an appointment with a doctor the data are transferred to another table and the temporary data stored before are deleted. A randomly generated password for the portal account and a serial number which is generated while making appointment is sent to the patients' email address. (See Appendix A for codes of registering patients to the portal)

As this process is parallel to the appointment fixing process with the doctor, it is discussed further in the Fixing appointments with doctors under the Appointment management process section.

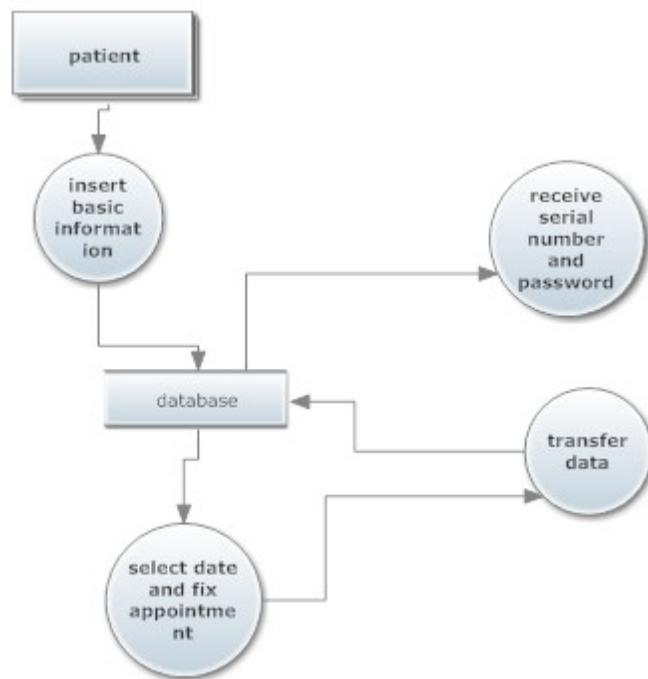


Fig 9: Data flow diagram of patients' registration process

3.6.1.3 Donors' registration process

The donors' registration process is the most simple registration process and follows a straight forward way of filling out a registration form and confirming email address by clicking a randomly generated passkey that is sent to the donors' email address. It is also implemented using two tables in the database. One for temporarily holding data until the email address is validated. After validation the data are transferred to another table that will hold donors' information in the system.

After successful confirmation the registered donors receive a randomly generated password for the portal account.

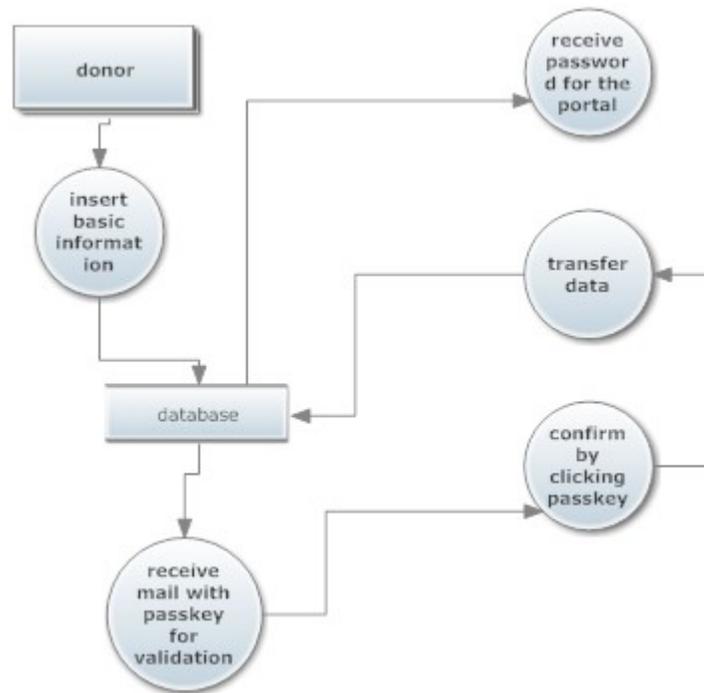


Fig 10: Data flow diagram of donors' registration process

3.6.2 Login / profile access process

The login process for the registered users and the admin follows the same procedure of creating a session variable [2] in PHP and then resuming that user's session when he is logged in to his profile and expiring that session when he logs out from his profile.

The registered users need their email address that they provided during registration and the password that was sent to them in that email address during their registration. Using that email address and given password they can login to their profiles and operate in the portal using some given privileges.

The admin panel is a separate part from the actual user interface for the clients. The admin needs to enter his user name and password that are already stored in the database.

The session for each user starts or is created if the email address (or for the admin user name) and password matches with the data stored in the database. With that session resuming the user accesses to his profile and they can make any changes that are permitted by the system. When a user logs out the session expires. (See Appendix A for code for login and logout process)

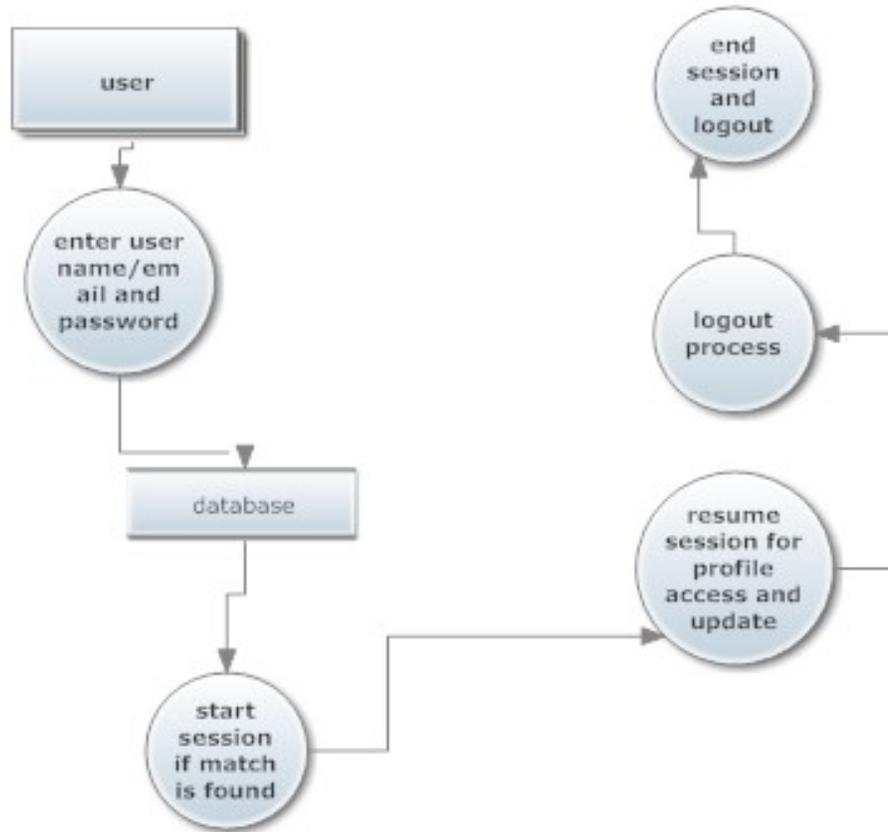


Fig 11: Data flow diagram of login and logout process

3.6.3 Appointment Management Process

The appointment management process is the most important feature of the system. It comprises of three individual processes whose implementation is discussed as follows

Scheduling timing for appointments by doctors

The appointment timings are set by the individual doctors in their profile. The system provides an interface for selecting days and time for a corresponding day to set appointment timing for that day. In this system the appointment timing is set keeping the days of the week in mind and scheduling timing for a particular day.

By selecting a day or multiple days and entering time for that day or days in the predefined format the appointment timings for that doctor are scheduled when the doctor presses submit.

A separate table in the database is used for implementing this feature. In that table the appointment timings are inserted corresponding to the id of the doctor who entered the data. That id is tracked using session variable in PHP.

This schedule is viewed by the patients during fixing appointment with the doctors.

Fixing appointment with the doctors by patients

As mentioned earlier this process is the continuation of the patients' registration process. After entering his basic information the patient would have to choose a consultant category e.g. cardiology, surgery etc to select doctor with the chosen specialization for fixing appointment with him/her. Once the patient chooses the category and presses next he is redirected to a page where he can view the doctors' profiles. If he finds a doctor with whom he wants to make an appointment he can choose a timing from the doctor's schedule and fix appointment in that timing for a particular date. Once he successfully chooses a date he receives a serial number and password for portal account in his email address that he gave during the registration. (See Appendix A for codes of rescheduling appointment timing and notifying patients)

Once the patient is registered to the portal he can then fix appointments from his profile by only choosing a preferred doctor and selecting a date. The registered patients can view their upcoming appointments from their profiles.

Similarly after fixing an appointment the old patients also receive an email with a serial number for that particular date's appointment. (See appendix A for codes for fixing appointments by patients) The jquery datePicker [3] plugin has been integrated in this process for selecting date from a calendar.

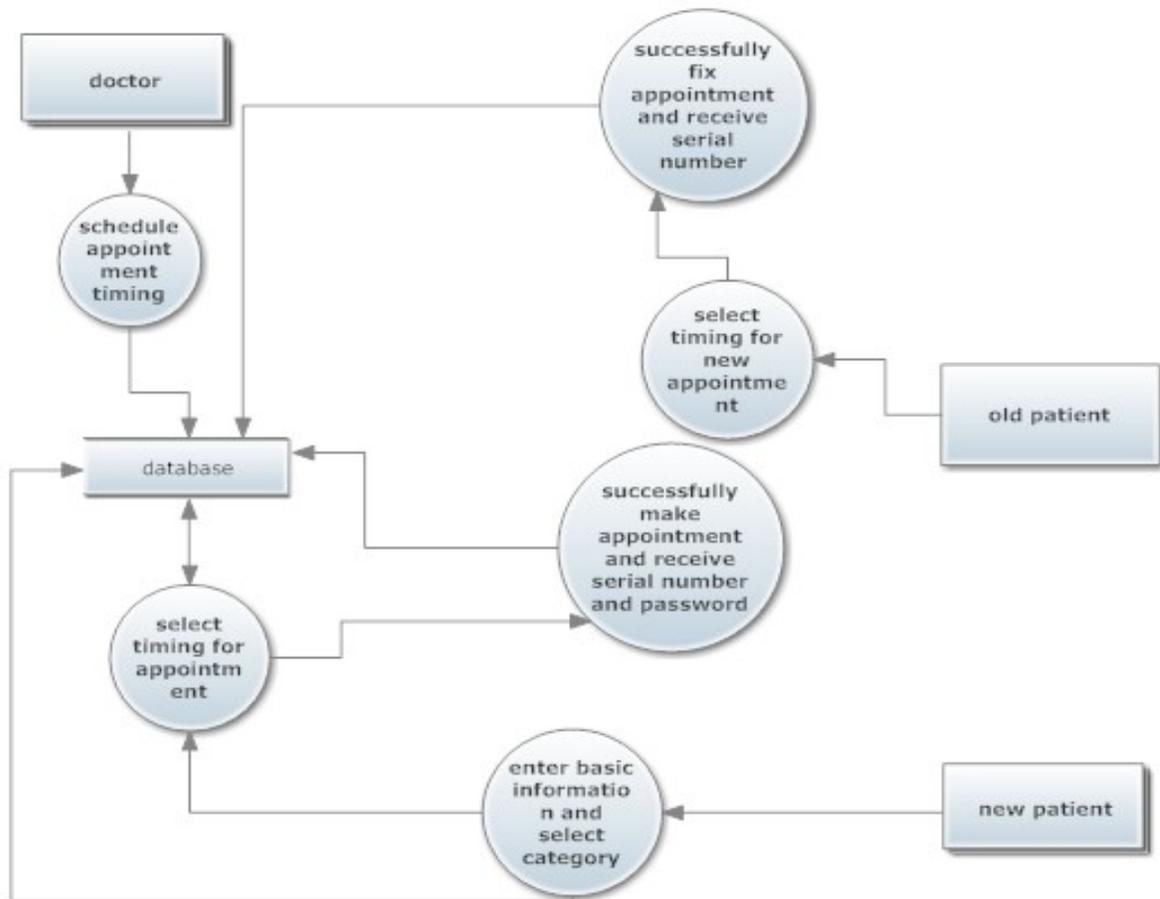


Fig 12: Appointment fixing process by patients

Rescheduling appointments by doctors

The system also allows doctors to reschedule their appointment timing. The doctors can add new day and timing, update old timing or cancel appointments for particular days and they can also remove existing timing from the schedule.

For each update made in the schedule by the doctors the patients who had appointment with them would receive a notification in their email address stating the nature of the update made by the doctor. They can check their portal account to view the notified change.

Fig17. Email notification sent to the patient after any change in the appointment timing by the doctor

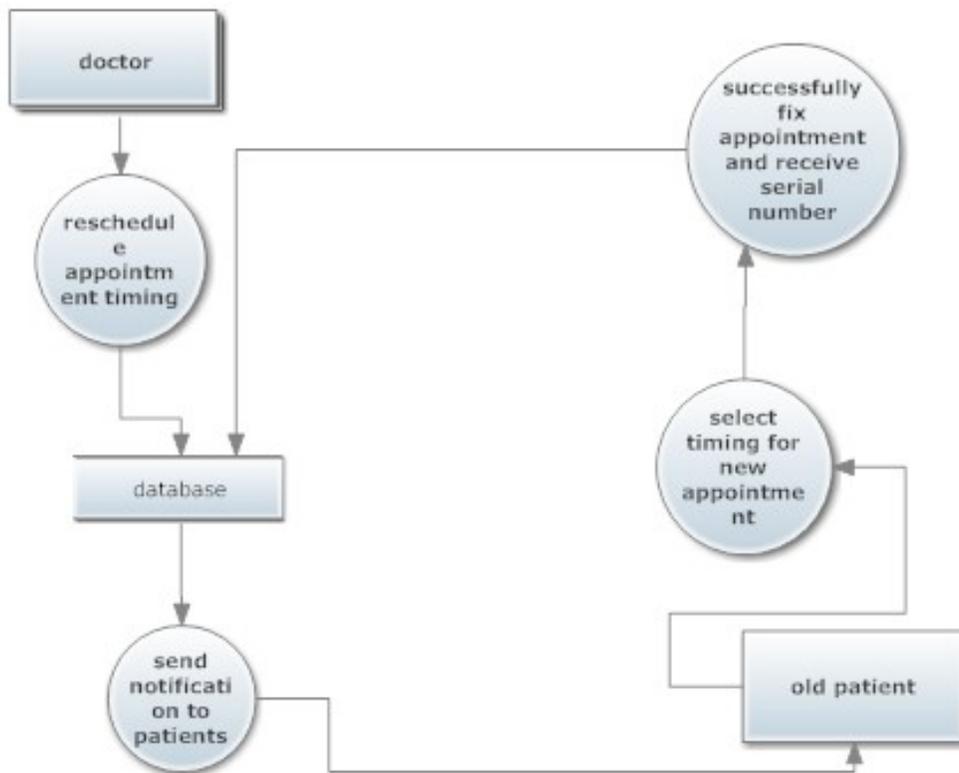


Fig 13: Data flow diagram of rescheduling appointment

3.6.4 Record Maintenance Process

The patients' records are generated in the system when the doctor enters patients' prescription while they come to visit the doctor. This process is a straight forward approach of entering data about the patient or the visitor by the doctor who is being visited. For implementing this process the PHP GET[] variable is used as an important element which helped to track the patient's id and create separate session within the session of the ongoing doctor's profile who is inserting the records. Thus at the end we have two sets of data one is the patient's data that is recorded by the doctor and the doctor's data who is recording the patient's data. This data are stored in both the doctor's and the patient's profiles for further reference.

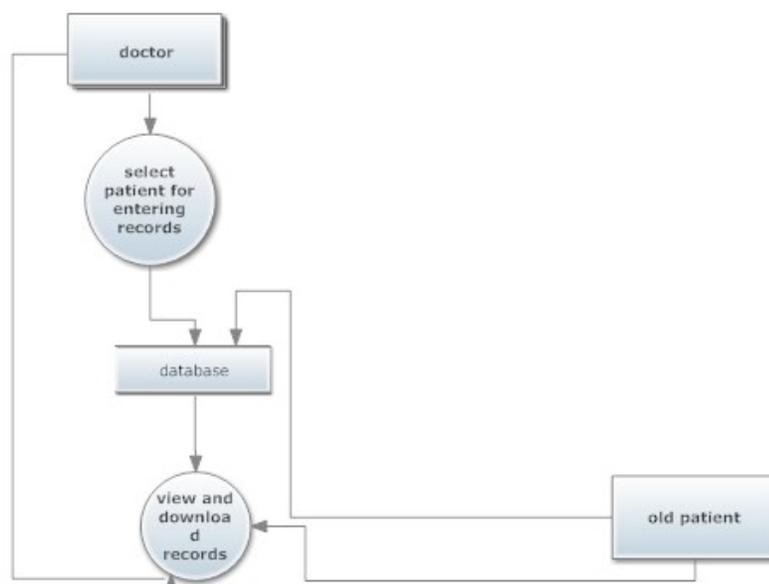


Fig 14: Data flow diagram of patients' records maintenance process

3.7 Entity Relationship diagram

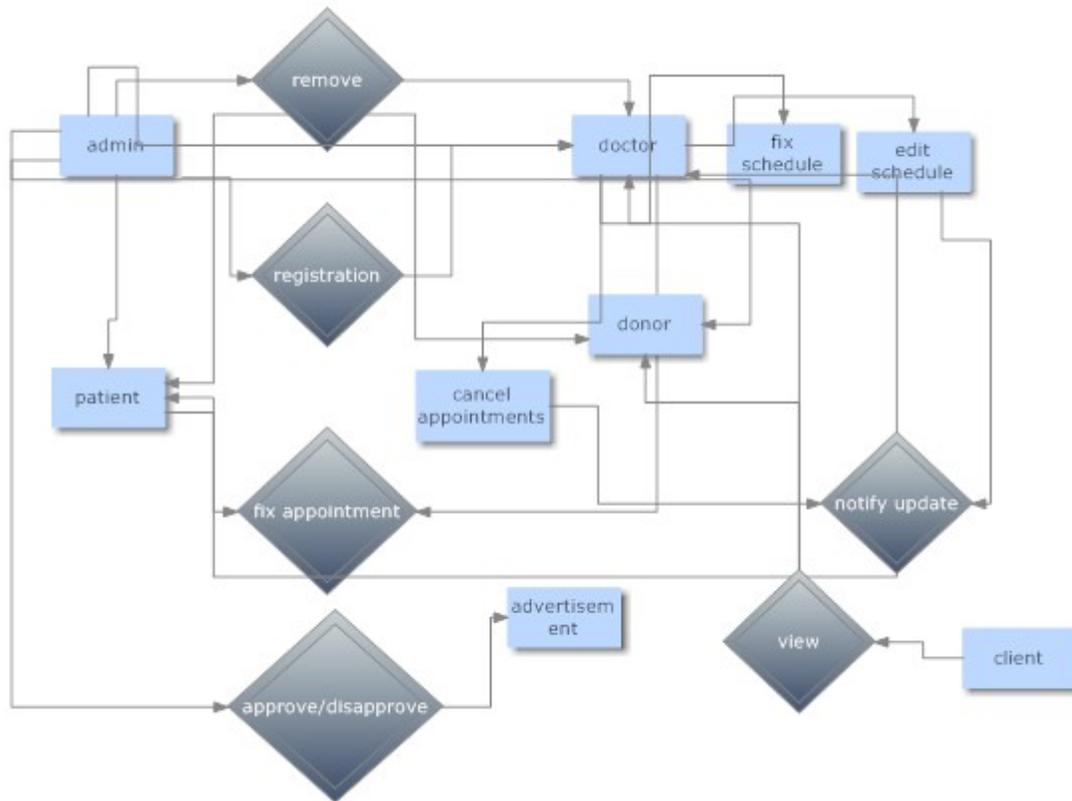


Fig 15: E-R diagram

3.8 Schema Diagram

The objects identified in the previous section can be mapped into database tables, which will store all the necessary information about each object. The following diagram shows how some of these objects will be mapped to database tables:

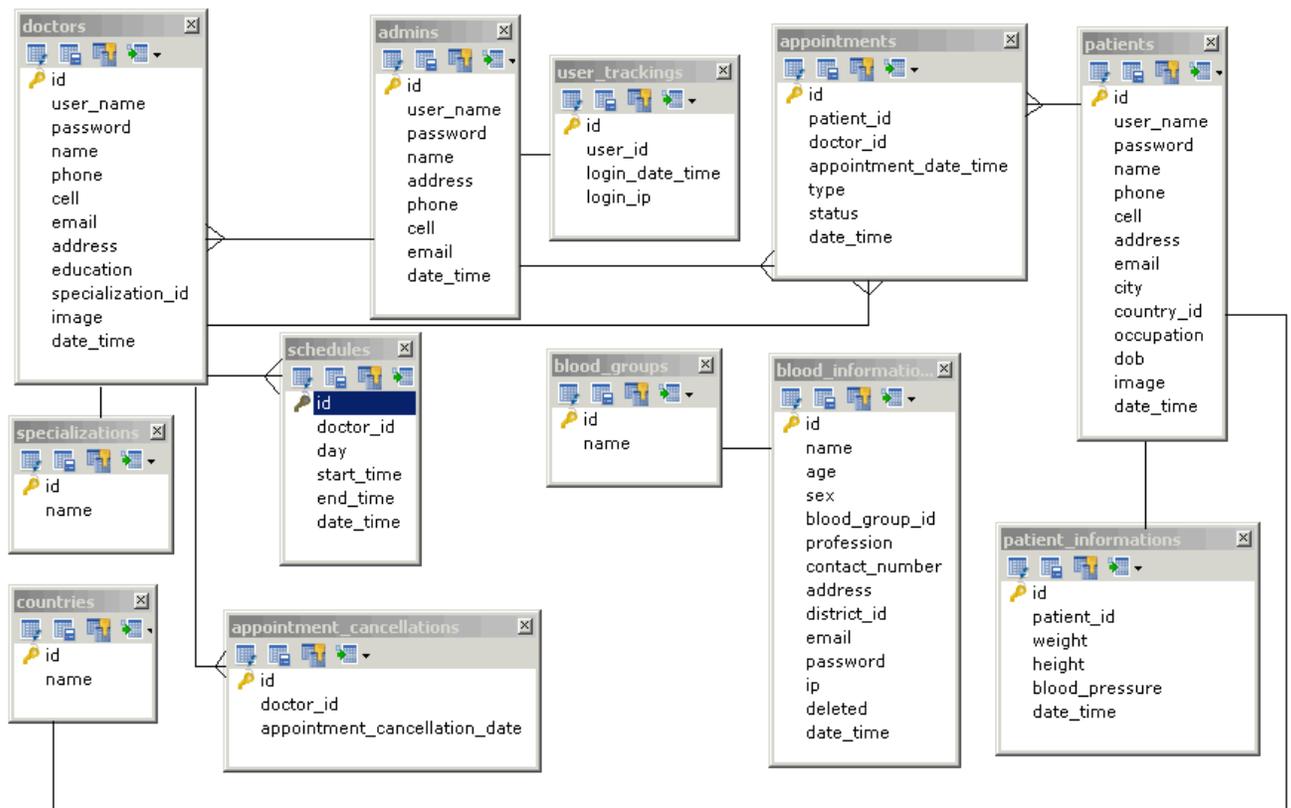


Fig 16. Schema Diagram of the system

3.9 Object Oriented Design of Portal Features

3.9.1 Basic Login Feature

All the forms used in the project are provided here with their functionality:



The image shows a simple login form with the following elements:

- Text label: "Sign In"
- Text label: "Username" above a text input field.
- Text label: "Password" above a text input field.
- Text button: "Login" below the password input field.

Fig: Login to Admin Panel Form is used for logging in to the Admin Control Panel

3.9.2 Website Administration Page

A website administrator will be given the task of maintaining the system. The administrator's tasks will include management of doctors and patient information's, making regular backups of the database, and making sure that the system is working correctly. In order to do this the administrator will need an interface through which he or she can access the portal's data. For this purpose, we will provide the administrator with a website administration webpage, which will allow the administrator to carry out the following tasks:

- Manage doctor's account
- Manage Patients account
- Manages schedule and view reports
- Take decisions depending on statistics

Patient Features:

- Make Appointment
 - 1) Earliest possible
 - 2) Post dates
- Cancel Appointment
- View Appointments
- Search Doctors
- Search Blood status
- View Doctors Detail (Detail Schedule)

Doctors Features:

They don't have much time to enter all details. Considering this we make the options as simple as possible

- Add schedule
- View Appointments
- Cancel appointments
- Search blood

Admin

- Add/ Edit/ View Doctor Information
- Add/ Edit/ View Patient Information
- Add Donor
- Search Blood Donor
- Make Appointment

- Post Date Appointments
- Make / View Appointments
- Add/ View Specialization
- Login Statistics
- Change password
- Logout

Notification using Cron Job

0 status =Notification not Sent

1 status =Appointment Notification sent

2 status =Notification sent prior 24 Hour

3 status =Notification sent prior 3 Hour

3.9.3 SMS / Email format

You have an appointment with Dr. Arif Hossain on 12/12/2012 5:15 PM Appointment ID: 1349.

To cancel the appointment type c and reply.

To make appointment type a DoctorID -> Send SMS

To cancel appointment c DoctorID(optional) -> Send SMS

3.9.4 E-Mail Notification Service

Patient will be notified using email service. In order to do this we need to utilize an SMTP server to automate the e-mails sending process.

3.9.5 System Security

The appoint management system must offer sufficient security measures to ensure that Patients information such as passwords, email addresses and telephone numbers are processed and stored in a secure manner. To achieve this, we must use trusted and proven security measures to secure the communication between the website and the Users. We must also restrict access to the administration page, doctors and patients page. All these components must provide some form of user authentication (i.e. username and password).

3.10 System Models

3.10.1 Objects

The appointment management system will consist of a set of many interacting objects or entities. Using Object Oriented Analysis, the following objects were extracted from the project requirement:

Patients

- First name and surname
- address
- Telephone number
- E-mail address
- Password

Doctors

- First name and surname
- Mobile telephone number
- Home telephone number
- Specialty Password

Admins

- Username
- Password
- Access permission

3.10.2 Business Process Modeling

Business Process modeling for patients

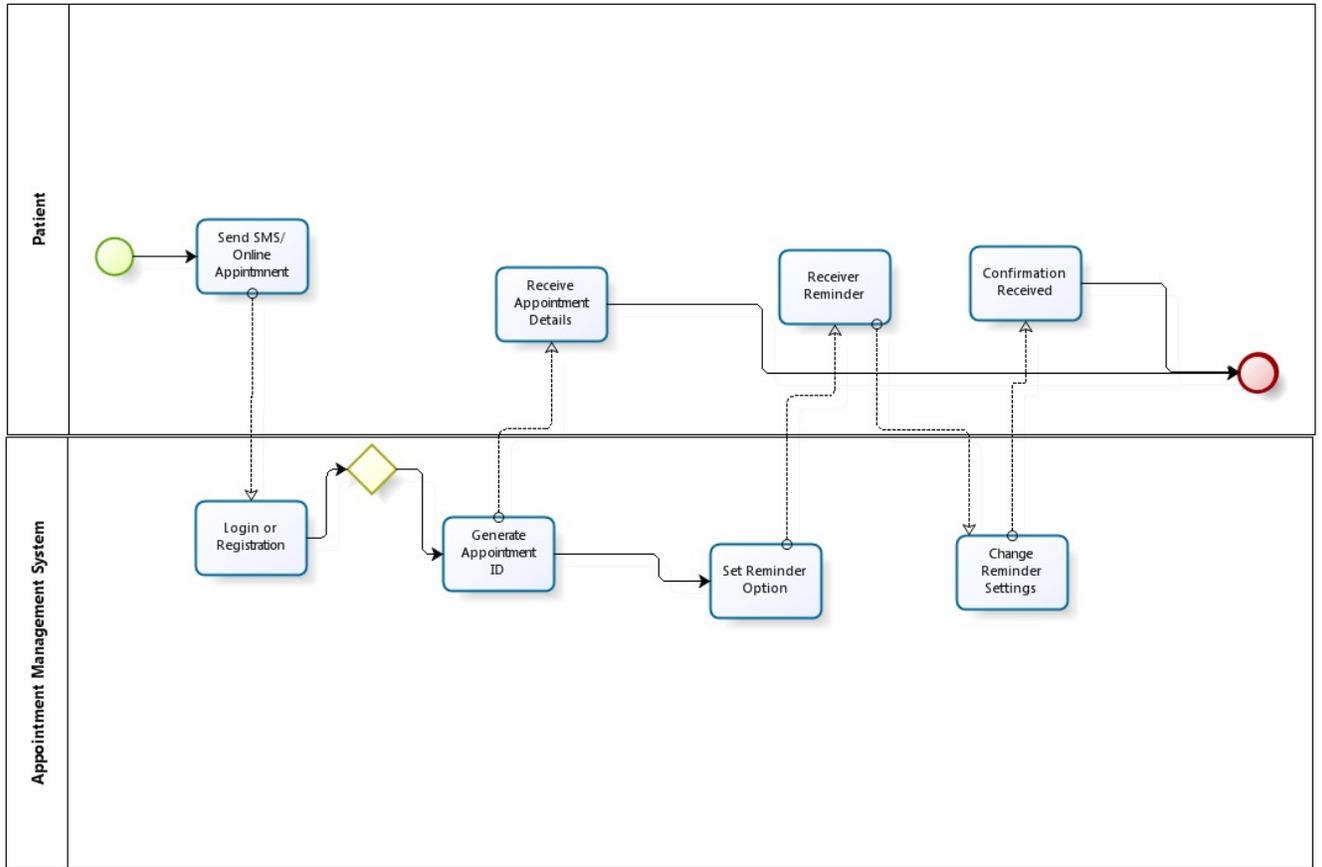


Fig 17: Business Process manage for Patients

Business Process modeling for doctors

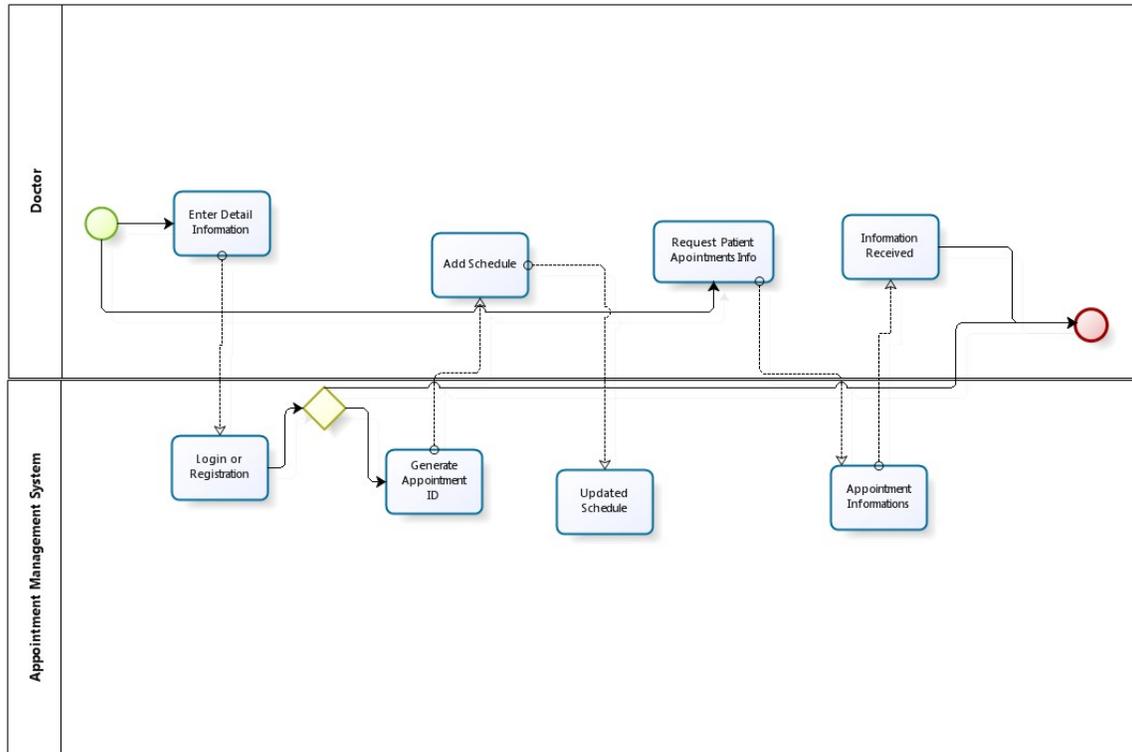


Fig 18: Business Process Model for Doctors

Chapter 4

FORM LAYOUT AND DESIGN

4.1 Form and Layout Designs

4.1.1 Dashboard

After click on login option from the left menu of home page, it will show login page for both admin and member. User has to select their status from list menu and they have to submit valid user ID & password. After inserting valid user information they can access the system with their access privilege. Login page are showing below:

Layout



Fig 19: Dashboard

4.1.2 Adding Doctors information

Doctor's information can be added from the admin panel only and it will shoot email to the doctors email address

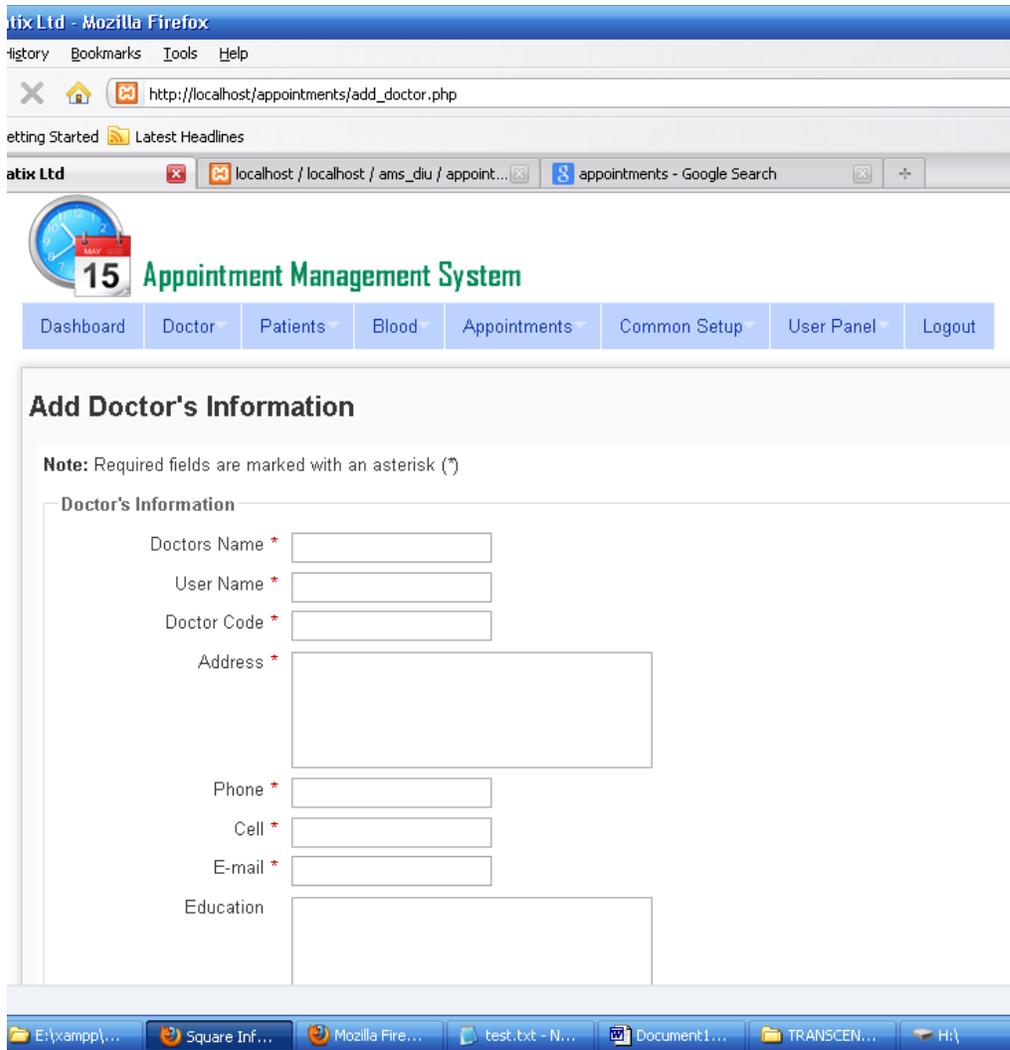


Fig 20: Add Doctors information

4.1.3 List of doctors can viewed from the view doctors page

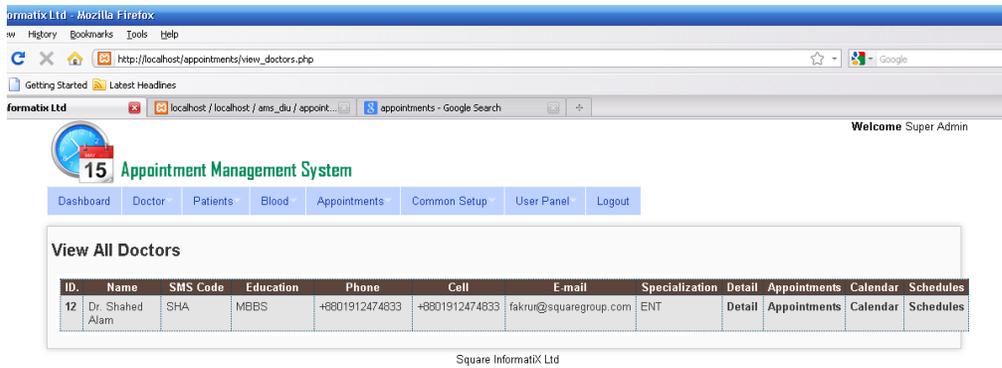


Fig 21: View All Doctors

Doctors Detail can be seen from the link doctors detail link

4.1.4 Viewing Doctors Details



Fig 22: Viewing Doctors Detail

4.1.5 Viewing Doctors Schedule

The screenshot shows the 'Appointment Management System' interface. The 'View Doctor's Detail' page has two tabs: 'Doctor's Information' and 'Schedules'. The 'Schedules' tab is active, displaying a table with the following data:

Schedule			
Day	Start Time	End Time	
Monday	16:00:00	20:00:00	Edit
Tuesday	16:00:00	20:00:00	Edit
Wednesday	16:00:00	20:00:00	Edit
Thursday	16:00:00	20:00:00	Edit
Friday	16:00:00	20:00:00	Edit
Saturday	16:00:00	20:00:00	Edit

At the bottom of the page, it says 'Square Informatix Ltd'.

Fig 23: View Doctors Schedule

4.1.6 Viewing All Appointments

All appointments in a particular day can be seen from the link all appointments

The screenshot shows the 'Appointment Management System' interface. The 'View All Appointments' page displays a table with the following data:

ID.	Doctor Name	Patient Name	Appointment Date Time	Type	Status	Prescription
3	Dr. Shahed Alam	Mithun Hassan	2012-10-02 17:00:00	Earliest Possible	Notification not Sent	Add Prescription
4	Dr. Shahed Alam	Mithun Hassan	2012-10-03 22:00:00	Post Dated	Notification not Sent	Add Prescription

Fig 24: View all appointments

4.1.7 Viewing doctor's appointment for a particular doctor can be seen in calendar format

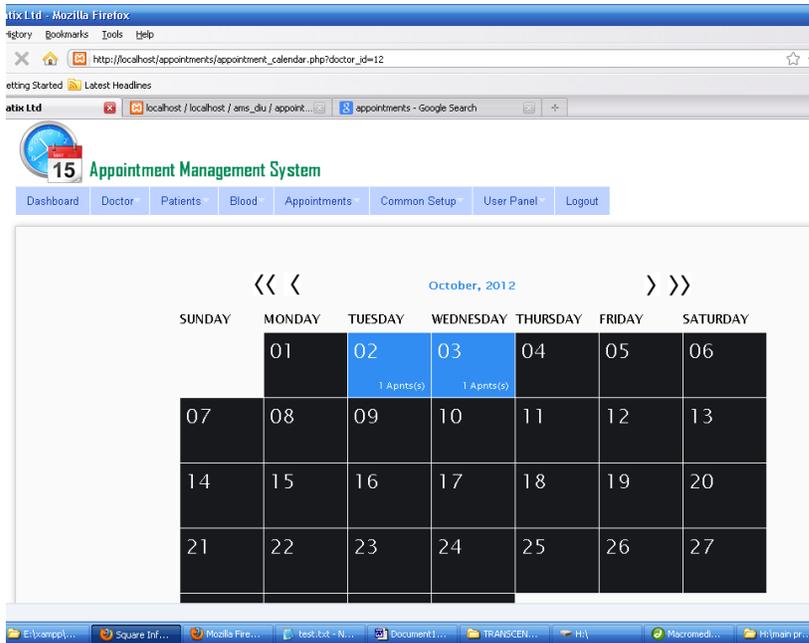


Fig 25: View Calendar

4.1.8 By clicking the blue block the detail appointments can be seen

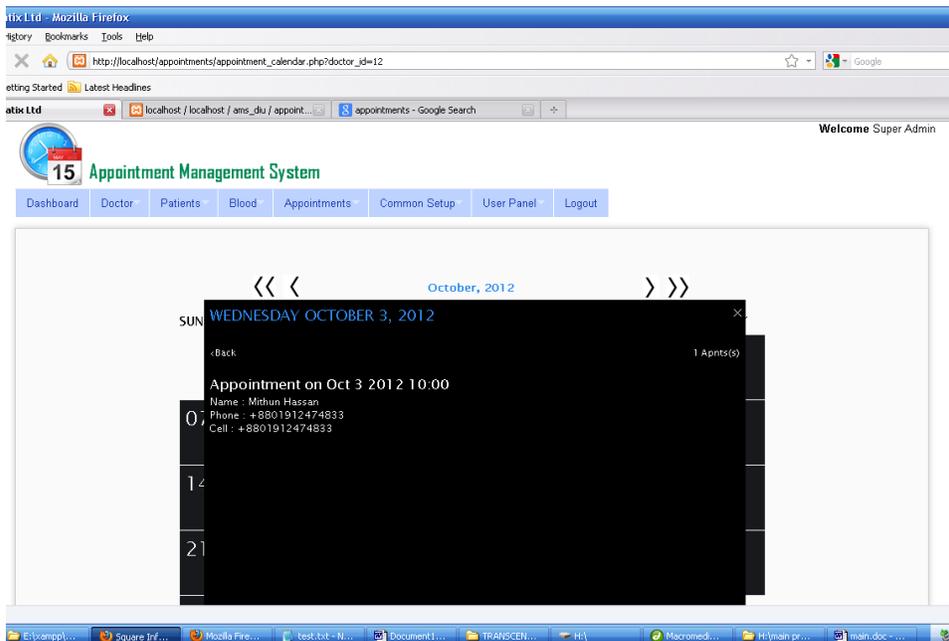
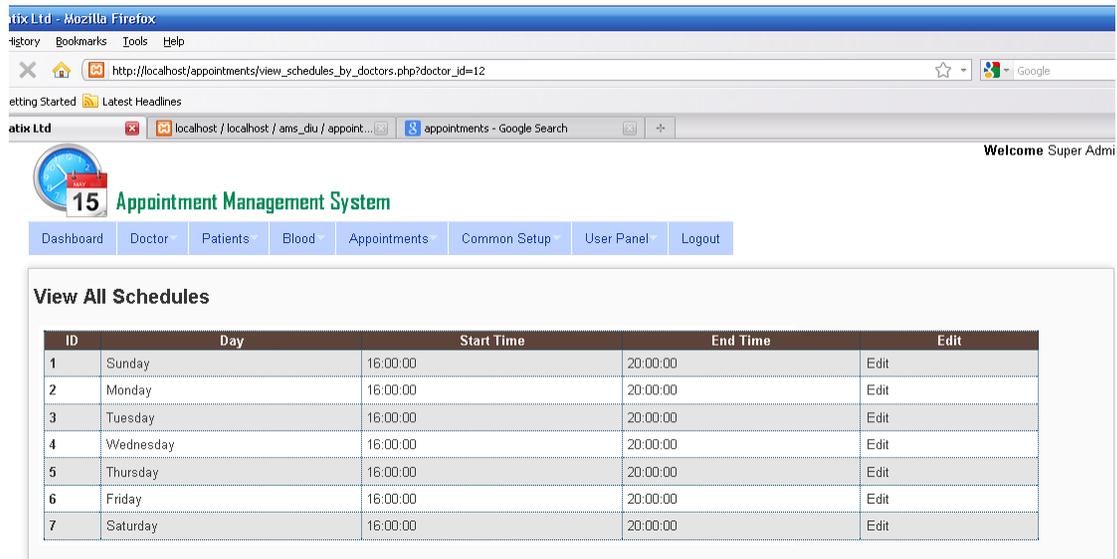


Fig 26: View Details in Calendar

4.1.9 Individual doctor's schedule can be seen from the schedule link it will like this



Appointment Management System

Dashboard Doctor Patients Blood Appointments Common Setup User Panel Logout

View All Schedules

ID	Day	Start Time	End Time	Edit
1	Sunday	16:00:00	20:00:00	Edit
2	Monday	16:00:00	20:00:00	Edit
3	Tuesday	16:00:00	20:00:00	Edit
4	Wednesday	16:00:00	20:00:00	Edit
5	Thursday	16:00:00	20:00:00	Edit
6	Friday	16:00:00	20:00:00	Edit
7	Saturday	16:00:00	20:00:00	Edit

Fig 27: View All Schedule

4.1.10 Adding Patient Information that can be done from admin panel or by receptionist

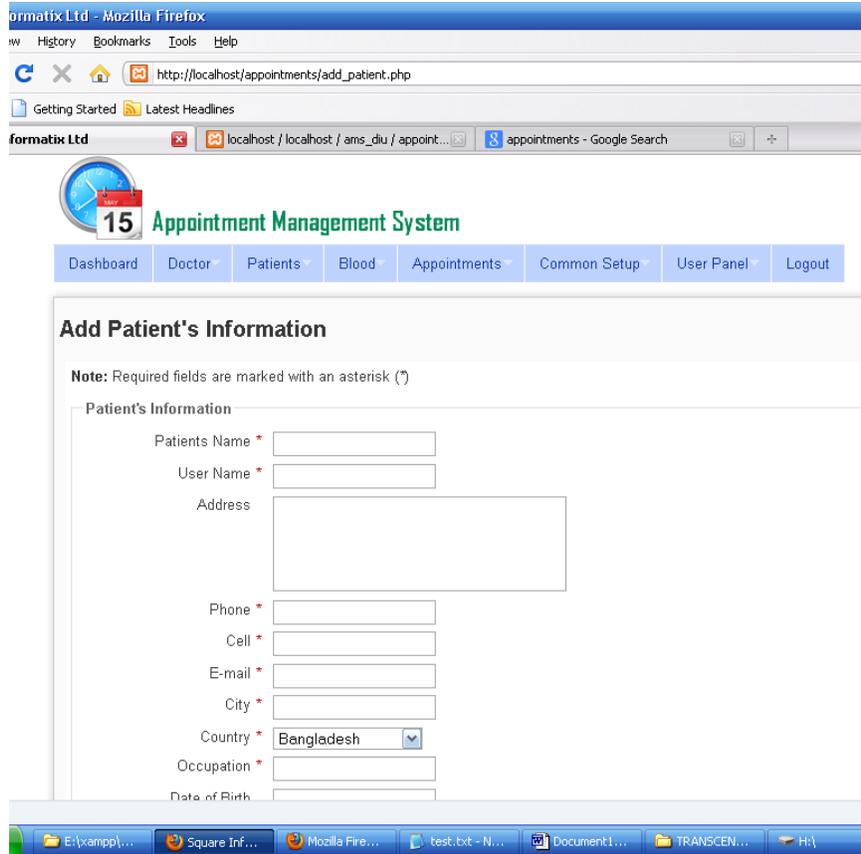


Fig 28: Add patients information

4.1.11 View all patients the list will appear like this right now there are only one patient there

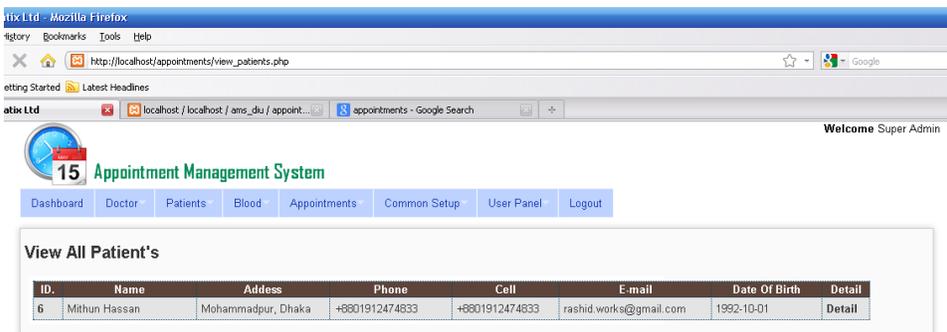


Fig: 29: View all patients

4.1.12 Individual patient details can be seen from the detail link

It contains information, Details, Appointments, Prescription

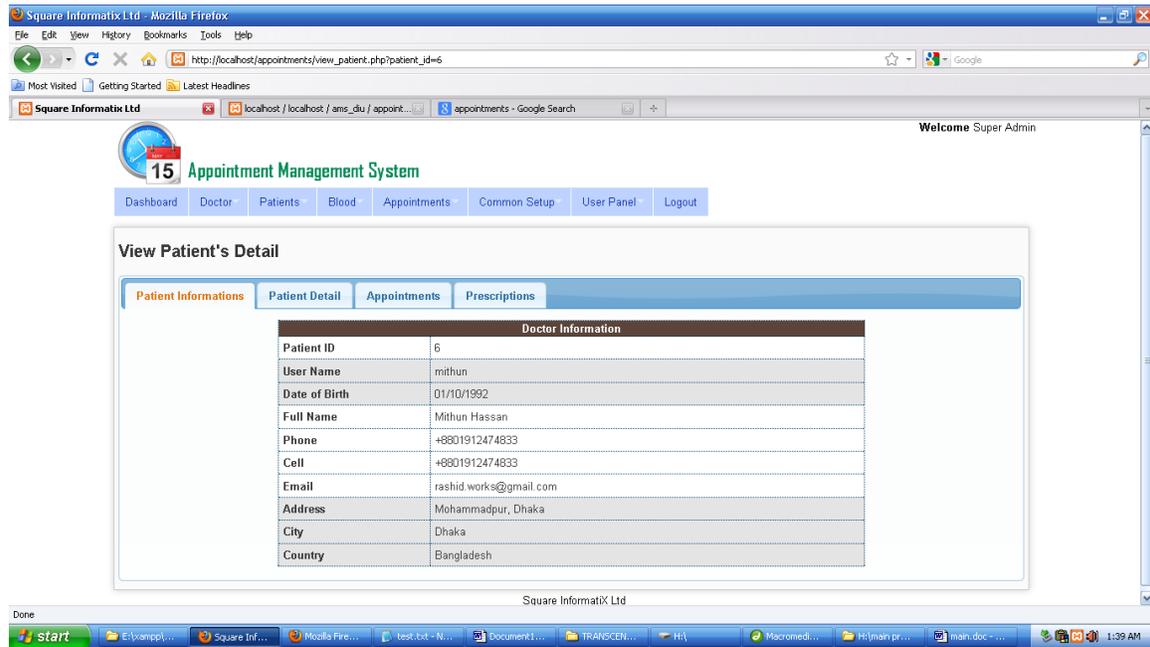


Fig 30: Patients Details Information's

This tab contains Weight, Height, blood group information the basic parameters

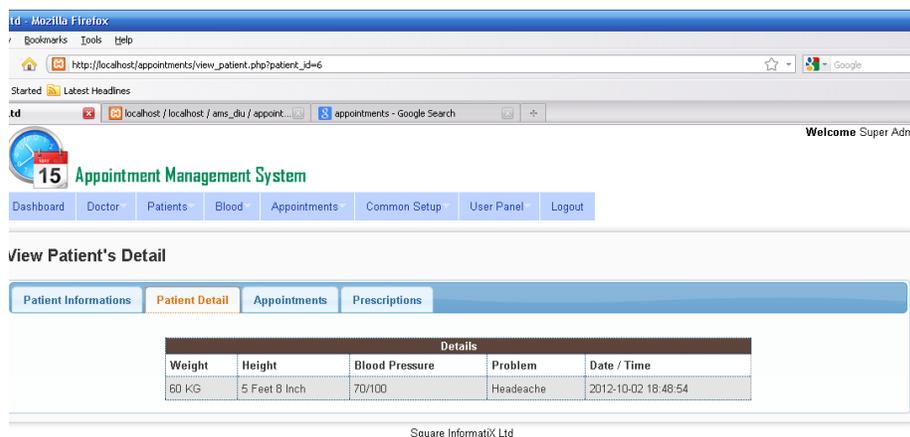


Fig 31: Patients Details Basic Information's

Third Tab contain Appointment date time and the status and type of the appointment

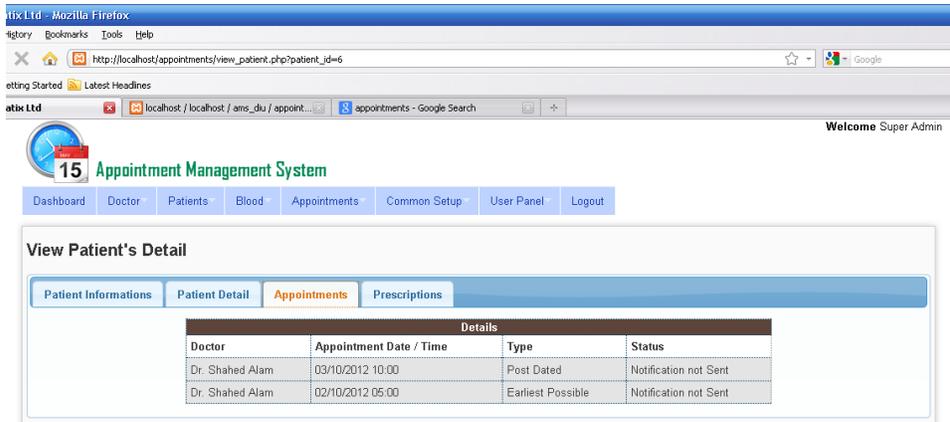


Fig 32: Patients Details Appointments

Fourth tab contains prescription information's like

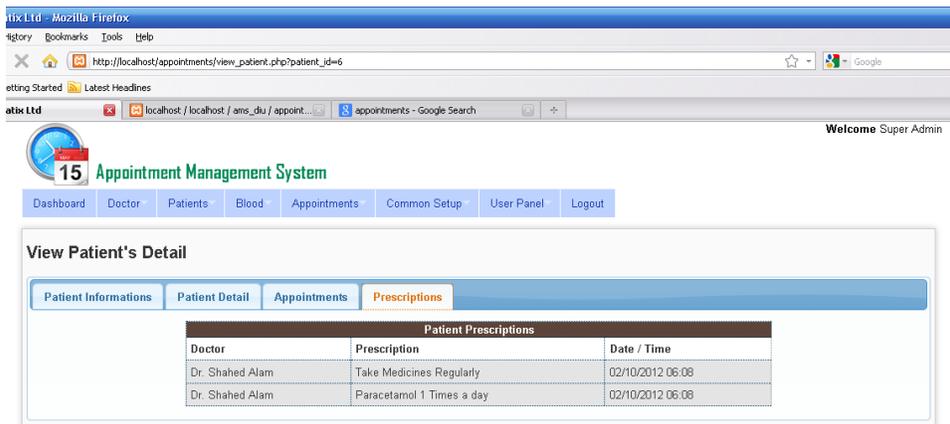


Fig 33: Patients Details Prescriptions

Adding patients height, weight, blood pressure that is taken before prescribing the form is

Firefox - Appointment Management System

http://localhost/appointments/add_patient_informations.php

Welcome Super Admin

15 Appointment Management System

Dashboard Doctor Patients Blood Appointments Common Setup User Panel Logout

Take an appointment at earliest possible

Note: Required fields are marked with an asterisk (*)

Take an appointment

Patient Name * [Mithun Hassan]

Weight * []

Height * []

Blood Pressure * []

Problems * []

Submit

Fig 34: Adding Basic Information's

Create Prescription

Prescription can be created from individual doctors account using the form keeping the entry as minimum as possible

Firefox - Appointment Management System

http://localhost/appointments/add_patient_prescriptions.php?appointment_id=3&doctor_id=12

Welcome Super Admin

15 Appointment Management System

Dashboard Doctor Patients Blood Appointments Common Setup User Panel Logout

Create Prescription

Note: Required fields are marked with an asterisk (*)

Create Prescription

Patient Name * Mithun Hassan

Date of Birth * 01/10/1992

Problem * Headache

Prescription * []

Submit

Fig 35: Creating Prescription

Add Blood donor's information

Admin off the assigned person can add blood donor information using the following fields like

The screenshot shows a web browser window with the URL `http://localhost/appointments/add_donor.php`. The page title is "Appointment Management System" and it features a navigation menu with items like "Dashboard", "Doctor", "Patients", "Blood", "Appointments", "Common Setup", "User Panel", and "Logout". The main content area is titled "Add Donor's Information" and includes a note: "Note: Required fields are marked with an asterisk (*)". The form fields are: Name (text input), Age (text input), Sex (dropdown menu), Blood Group (dropdown menu with "A+" selected), Profession (dropdown menu), Phone (text input), Address (text area), District (dropdown menu with "Barguna" selected), and E-mail (text input).

Fig 35: Add Donor Information

Searching blood information

Administrator, doctors even patients can search blood group in a particular district using the form. Patient will not have full access

The screenshot shows a web browser window with the URL `http://localhost/appointments/search_donors.php`. The page title is "Appointment Management System" and it features a navigation menu with items like "Dashboard", "Doctor", "Patients", "Blood", "Appointments", "Common Setup", "User Panel", and "Logout". The main content area is titled "View Blood Donors" and includes a search form with two dropdown menus: "Blood Group" (with "A+" selected) and "District" (with "Barguna" selected). Below the dropdowns are "Submit" and "Reset" buttons.

Fig 36: Search blood Information

Result of the blood group search viewed like this. Patient can see availability not all details.

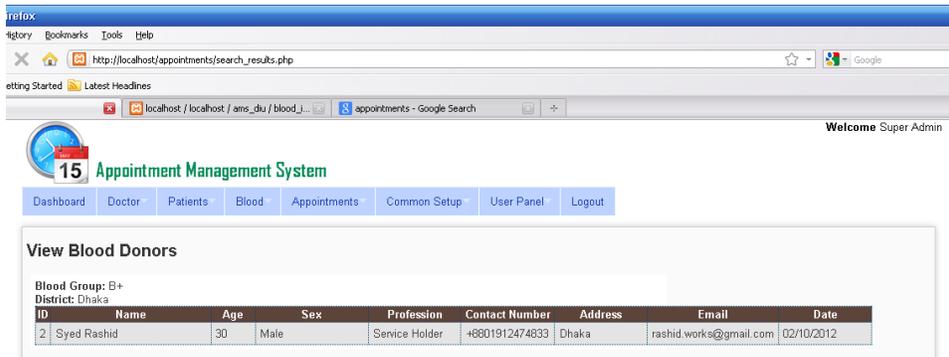


Fig 37: Search Blood Results

4.1.11 Taking an appointment earliest possible

Taking an appointment earliest possible can be done using a simple form for containing the doctor name only after that it will send email and SMS notification

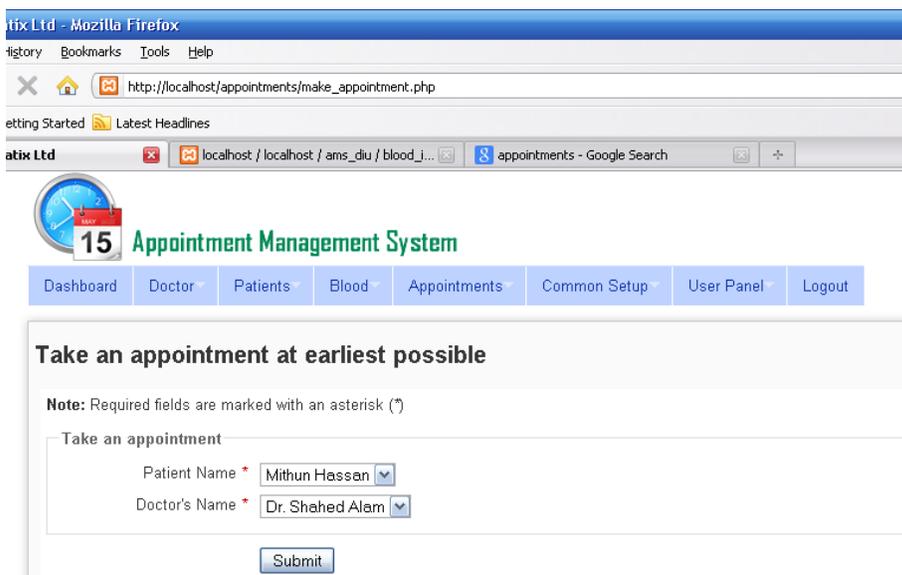


Fig 38: Taking Appointment

4.1.12 Take appointment post dated

Appointment can be taken on a particular date using the form after that it also will send email and SMS notification

The screenshot shows a web browser window with the URL `http://localhost/appointments/make_appointment_post_dated.php`. The page title is "Appointment Management System". The navigation menu includes "Dashboard", "Doctor", "Patients", "Blood", "Appointments", "Common Setup", "User Panel", and "Logout". The main content area is titled "Make a post dated appointment" and contains a form with the following fields:

- Note: Required fields are marked with an asterisk (*)
- Take an appointment
- Patient Name * (Dropdown menu: Mithun Hassan)
- Doctor's Name * (Dropdown menu: Dr. Shahed Alam)
- Date / Time of Appointment * (Calendar and Time picker)

The calendar shows the month of October 2012, with the 3rd selected. The time is set to 01:58 AM. The text "Square Informatix Ltd" is visible at the bottom right of the form area.

Fig 39: Taking Appointment Post Dated

There are some common setup forms like

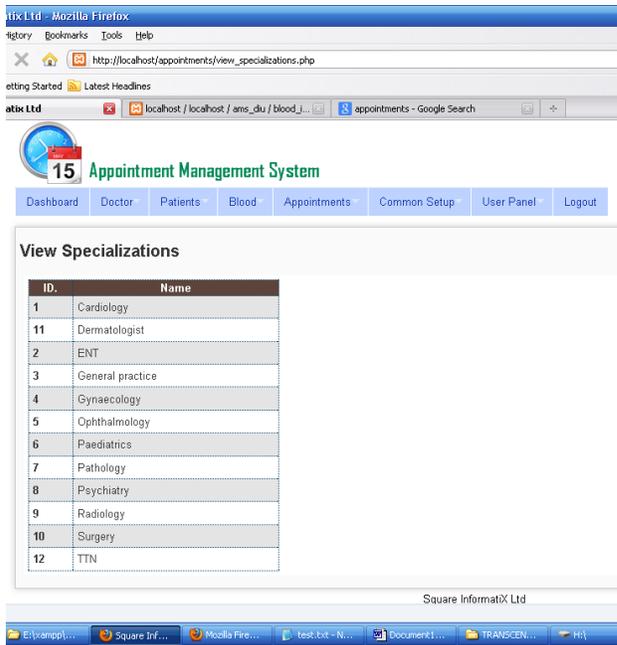
4.1.13 For adding Specializations field Like “ENT”.

The screenshot shows a web browser window with the URL `http://localhost/appointments/add_specialization.php`. The page title is "Appointment Management System". The navigation menu includes "Dashboard", "Doctor", "Patients", "Blood", "Appointments", "Common Setup", "User Panel", and "Logout". The main content area is titled "Add Specialization" and contains a form with the following fields:

- Note: Required fields are marked with an asterisk (*)
- Add Specialization
- Title * (Text input field)
- Submit (Button)

Fig 40: Add Specialization

Viewing Specialization entries



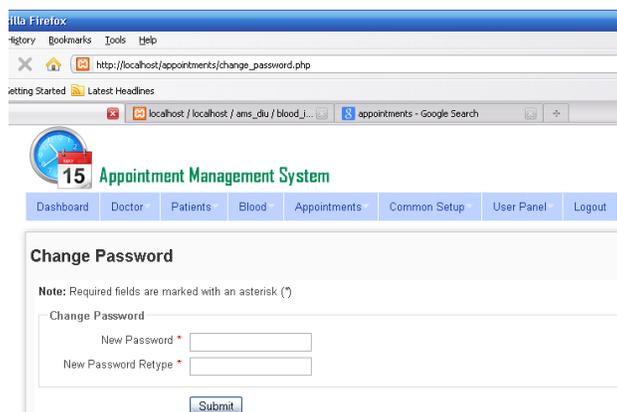
The screenshot shows a web browser window displaying the Appointment Management System. The page title is "15 Appointment Management System". The navigation menu includes Dashboard, Doctor, Patients, Blood, Appointments, Common Setup, User Panel, and Logout. The main content area is titled "View Specializations" and contains a table with the following data:

ID.	Name
1	Cardiology
11	Dermatologist
2	ENT
3	General practice
4	Gynaecology
5	Ophthalmology
6	Paediatrics
7	Pathology
8	Psychiatry
9	Radiology
10	Surgery
12	TTN

The footer of the page reads "Suaire InformatIX Ltd".

Fig 41: View Specialization

4.1.14 Change password option for all type of users



The screenshot shows a web browser window displaying the Appointment Management System. The page title is "15 Appointment Management System". The navigation menu includes Dashboard, Doctor, Patients, Blood, Appointments, Common Setup, User Panel, and Logout. The main content area is titled "Change Password" and contains a form with the following fields:

Note: Required fields are marked with an asterisk (*)

Change Password

New Password *

New Password Retype *

Fig 42: Change Password

Chapter-5

IMPLEMENTATION

IMPLEMENTATION

5.1 Introduction

Implementation of a new system can take place to determine that success of the system. Implementation stages of a system provide user confidence.

The site which has designed is now viewed only in the local terminals but our intention of our creating website is to share it with the world and just not restrict it only to us. In this stage we will publish the system to the in the Internet or the intranet server.

5.2 Hardware Requirements

5.2.1 Computer Server

The computer server is used to website's files, as well as the database which will contain the website's data. This computer system will be used to host the system. It was decided that the website would be hosted from the author's desktop computer, which has a 3.4 Gigahertz CPU, 2 Gigabytes of DDR2 memory and 500 Gigabytes of Hard Drive storage. We believe that this is sufficient for development and testing purposes.

5.2.2 ADSL Router

The ADSL router is used to establish a broadband internet connection from the server hosting the website to the internet. The internet connection used in this instance is a 4 Megabit ADSL line provided by Telkom. This line provides transfer speeds of up to 460 Kilobytes per second for FTP and HTTP transfers. We believe this transfer speed is sufficient for testing purposes, where the load on the server is relatively low.

5.2.3 GSM Modem

A GSM modem is a specialized type of modem which accepts a SIM card, and operates over a subscription to a mobile operator, just like a mobile phone. e.

When a GSM modem is connected to a computer, this allows the computer to use the GSM modem to communicate over the mobile network. While these GSM modems are most frequently used to provide mobile internet connectivity, many of them can also be used for sending and receiving SMS and MMS messages.

5.3 Software Requirements

5.3.1 Database Server and Administration Tools

The database server allows the System to store and retrieve information that will be used by the system. The administration tools allow the database administrator to make backups or any necessary changes to the website's database.

Since one of our objectives is to minimize the cost of this system, we chose MySQL Server for our database needs. MySQL was chosen because it is a trusted and very popular open-source database system that is available free-of-charge and comes with a multitude of useful administration tools (MySQL Query Browser, MySQL Administrator and MySQL Instance Manager). These GUI-based tools accommodate for the average computer user in terms of usability.

MySQL Server version 5.1.1 together with MySQL GUI Tools version 5.0 RC9a (for Windows XP) was used for the system and both are available at www.mysql.com.

5.3.2 Web Server

The web server allows any computer with an internet or local area network connection to host a website. It does this by associating a particular folder on the local machine with the computer's IP address (WAN or LAN). When someone from a different computer attempts to access the IP address of the hosting computer using HTTP, they are redirected to chosen root folder specified in the web server's configuration file.

For the purposes of the appointment management, we decided to use the popular open-source web server called Apache, which is available at <http://www.apache.org/>. Apache Web Server version 2.0.59 was chosen due to its full compatibility with version 5.2.2 of the PHP Server.

Another advantage of Apache Server is that it is bundled with OpenSSL (v0.9.7j) open-source security package. This package will allow us to secure our connections when credit purchases are made on the website.

5.3.3 SMTP Server

5.3.4 PHP Server

The PHP Server allows the host computer's browser to execute PHP code and view PHP web pages.

PHP version 5.2.2 was used for the appointment management system. Although version 6.0 was available, this older version of PHP is fully compatible with the version of the Apache Web Server that was used. The PHP Server is available at <http://www.php.net/>.

5.3.5 FTP Server

The FTP server allows files to be transferred to the hosting computer server using the File Transfer Protocol. This can be done via the web, which allows the e-commerce website's files to be updated from any location that has an internet connection.

The freeware War FTP Filezilla v3.5.0 was used to accomplish the task of setting up a fully functional FTP site. The FTP site allowed the development and testing of the website to be done from different locations. It also allowed files to be downloaded and uploaded to and from the server with ease. The War FTP Filezilla comes with an extensive security feature that ensures that only authorized users gain access to the website's files. Authentication is done using a username and password.

The FTP Filezilla is available at <http://filezilla-project.org>.

5.3.6 NetBeans (IDE)

The NetBeans PHP editor has options for code templates and code generation, refactoring, parameter tooltips, hints and quick fixes, and smart code completion facility.

5.4 Implementation process

In order to send or receive SMS messages using your computer, Mobile phone attach your phone to the PC with a phone-to-PC data cable. The cable can be attached to the USB port of your computer. One advantage of using USB connections is that it can attach quite a large number of phones to the same PC with the help of USB hubs available at a low cost.

Chapter-6

TESTING

TESTING

6.1 Introduction

Testing is the process of establishing the existence of errors. The main aim of testing is to find errors. I made a test plan to test my system. I have used three types of test method in this project, which is given below: -

- Module testing (including validation test)
- Integration testing
- Acceptance testing

6.2 Logging In

The user entered the username “admin” and password “admin”, which were assigned to the administrative website user when the system was installed and configured. The webpage refreshed and displayed the main administration webpage. This was the expected output of the test case.

6.3 Website Administration Functions

The user accessed the website administration page by clicking on the Admin button at the bottom left-hand-corner of the main website. This took the user to the Login page, where the user was prompted for a username and a password. This was the expected output of the test case.

6.4 Logging Off

The logged in user clicked on the Logoff button at the top of the website. This refreshed the page and presented the user with the Account Logout page, which informed the user that successfully logged off and that it was safe to leave computer. The user then clicked on the login button make sure that she was logged off, the webpage refreshed and presented her with the Account Login page. This was the expected output of the test case.

6.5 Testing Summery

I tested all three panels assigned for Doctors, patients and administrator. The project was tested in the localhost with all possible options. The testing involved using some dummy records and inserting them to populate the database and to check whether the features are producing results properly.

The testing process involved:

- Testing for the user registration process
- Testing for the email sending and validation process
- Testing for the successful login process
- Testing for form validation
- Testing for creating appointment schedule and rescheduling appointment
- Testing for fixing appointment
- Testing for feature updates and removes from the system interface by the users
- Testing for sending and receiving notifications properly
- Testing for proper record generation and maintenance

The project was successfully tested and few bugs were fixed. It was discovered during the testing that some features would be easier to implement in some alternative manner, and their implementation methods were changed.

Chapter-7

ACHIEVEMENTS, CONCLUSION AND FUTURE DIRECTIONS

Achievements, Conclusion and Future Directions

7.1 Achievements and Discussion

The challenging part of this project was to make a user friendly system that minimizes the work for the user but benefits the user in the way that the project was targeted. It would be a pioneer of online medical services in Bangladesh by giving dynamic online services to the clients rather than being only informative. This project can be integrated with a hospital management system to enrich the system to become much useful. For the time being this system can populate individual doctors' information and help patients to receive service by fixing appointments with them online. This system also gives the doctors an opportunity to make it easier for the patients to reach them.

Also the other services that the system offers can be beneficial to the clients as well as the providers. Advertising about the hospital would make this a portal for all the renowned hospitals of Bangladesh.

Service such as blood bank is an important and useful feature of the portal that would help the people to find blood donors easily at the time of need.

The entire project has been implemented keep in mind that it should be beneficial to the users and that it could be taken to higher levels in the future. It was an opportunity set by

Square InformatiX Ltd. to develop a project that is useful and requires continual observation for the growth of the project.

7.2 Conclusion

This project reports contain complete description of the development processes and stages of SMS based Appointment Management System. To develop the project I have gone through the main stages of the system development life cycle from preliminary investigation to implementation.

To document the software development process I have used UML (Unified Modeling Language) of Object Oriented Technology as modeling tools. UML is a diagramming technique for modeling the system requirements, analysis and design.

The software has been developed using PHP programming language and Mysql database. PHP has been used as the Interface design tools and MySQL back end tools to create the database. The interface component will retrieves data from the database and will manipulate according to the business needs. The users will be able to communicate with the database through the front end interface which has been designed very specifically for doctors and patients and easy to understand.

7.2.1 Future Directions:

- Integrate and customize it for other system like hotel booking, air reservation etc.
- Implementation of popular local payment method like Bkask, Mobicash it will ensure less no shows

- ❑ In further versions we can go for Oracle Database if the data volume is very high
- ❑ Android and I phone application can be developed to integrate with the system since it is being popular
- ❑ Implement Interactive voice response (IVR) that will allow the system to interact with humans using voice and key pad response.

References

- [1] UML for the IT Business Analyst: A Practical Guide to Object-Oriented Requirements Gathering by *Howard Podeswa*
- [2] Unified Modeling Language User Guide, 2nd Edition *Grady Booch, James Rumbaugh, Ivar Jacobson*
- [3] Schaum's Outline of UML: Second Edition *Simon Bennett, John Skelton, Ken Lunn*
- [4] PHP and MySQL Web Development, Second Edition by *Luke Welling*
- [5] Database Systems: Design, Implementation, & Management, 5th Edition by *Rob & Coronel*
- [6] Systems Analysis and Design with UML Version 2.0: An Object-Oriented Approach by *Alan Dennis, Barbara Haley Wixom, and David Tegarden*
- [7] Database Systems: Design, Implementation, and Management by *Peter Rob*
- [8] PHP 6 and MySQL 5 for Dynamic Web Sites: Visual QuickPro Guide by *Larry Ullman*
- [9] Datepicker | jQuery UI (<http://jqueryui.com/datepicker/>)<http://www.hrmsllc.com>
- [10] Bangladesh - Telecoms, Mobile, Broadband and Forecasts (<http://www.telecomsmarketresearch.com/research>)
- [11] The world's most popular open source database (<http://www.mysql.com>)
- [12] Server-side HTML embedded scripting language. It provides web developers with a full suite of tools for building dynamic websites. (www.php.net)
- [13] Online Web Tutorials (<http://www.w3schools.com>)