Development of
Hospital Management System for ICDDRB

A Practicum Report Submitted By

Rafiyatul Rabby Ridam

ID # 18103391

In Partial Fulfillment of the Requirements for the Award of

Bachelor of Computer Science and Engineering

Department of Computer Science and Engineering

College of Engineering and Technology

IUBAT – International University of Business Agriculture and Technology

Spring 2022

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Hospital Management System for ICDDRB

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A practicum report submitted in partial fulfillment of the requirements for the degree of Bachelor of Computer Science and Engineering (BCSE) The practicum has been examined and approved by

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Chair and Professor
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College of Engineering and Technology
IUBAT – International University of Business Agriculture and Technology

Spring 2022

Letter of Transmittal

March 15, 2022

The Chairman, Practicum and Placement Board

College of Engineering and Technology - CEAT

IUBAT- International University of Business Agriculture and Technology

4, Embankment Drive Road, Sector 10

Uttara Model Town, Dhaka -1230, Bangladesh.

Subject: Letter of Transmittal.

Sir,

With due respect, I would like to approach you that it is a great opportunity as well as immense pleasure for me to submit this report titled "Development of Hospital Management System for ICDDRB" for the fulfillment of my Practicum course. It was undoubtedly a splendid opportunity for me to work on this project to actualize my theoretical knowledge and has an enormous exposure with the corporate culture of a renowned company. Now I am looking forward for your kind appraisal regarding this practicum report.

I shall remain deeply grateful to you if you kindly go through this report and evaluate my performance. I hope that you would find the report comprehensive and competent augmented.

Thank you,

Rafiyatul Rabby Ridam

ID # 18103391

Program: BCSE

Letter of Authorization

March 15, 2022

IUBAT- International University of Business Agriculture and Technology

4, Embankment Drive Road, Sector 10

Uttara Model Town, Dhaka -1230, Bangladesh.

Subject: Letter of Authorization.

Dear Rafiyatul Rabby Ridam,

You will be happy to know that the project on **"**Development of Hospital Management System for ICDDRB**"** has been assigned to you. Based on your proposal you will have to submit it as soon as possible. We hope you will successfully complete the project on time. After successful completion of the project, you are requested to write a report based on the project.

For any kind of assistance feel free to contact with me.

Co – Supervisor

Dr. Muhammad Hasibur Rashid Chayon
Coordinator and Associate Professor
Dept. of Computer Science and Engineering
IUBAT – International University of Business Agriculture and Technology

Practicum Supervisor

M M Rakibul Hasan

Senior Lecturer

Dept. of Computer Science and Engineering

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Student's Declaration

I am Rafiyatul Rabby Ridam , bearing ID# 18103391, student of BCSE - Bachelor of Computer Science and Engineering program, under the College of Engineering and Technology (CEAT) of IUBAT- International University of Business Agriculture and Technology declaring that, this report on the topic of "Development of Hospital Management System for ICDDRB" has been prepared for the fulfillment of the internship CSC 490, Practicum as well as the partial requirement of BCSE- Bachelor of Computer Science and Engineering degree.

The report and the project on — "Development of Hospital Management System for ICDDRB" Information and Technologies Ltd. are originally prepared by me. All module and procedure of this project is being made after proper inspection and internet information.

It has not been prepared for any other purposes, rewards or presentations.

_____

Rafiyatul Rabby Ridam

ID # 18103391

Program: BCSE

Acknowledgements

I, first and foremost, would like to express our gratitude to Almighty Allah for helping me to complete the report properly.

My sincere thanks to Prof. Dr. Abdur Rab, Honorable Vice Chancellor, IUBAT-International University of Business Agriculture and Technology to give me an opportunity to submit this practicum report.

My profound respect goes to Prof. Dr.Utpal Kanti Das, Chair and Professor, Department of Computer Science and Engineering, IUBAT- International University of Business Agriculture and Technology for approving me to work on the project.

My outmost and sincere gratitude goes to Prof. Dr Hasibur Rashid Chayon , Coordinator of Department of Computer Science and Engineering, IUBAT- International University of Business Agriculture and Technology for allowing me to complete the project.

I would like to express our gratefulness to my supervisor M M Rakibul Hasan, Senior Lecturer, Department of Computer Science and Engineering, IUBAT- International University of Business Agriculture and Technology who has given me the opportunity to make such a project report for not only in this semester but also throughout my whole education life at IUBAT-International University of Business Agriculture and Technology by giving his valuable suggestions and advices at any time, at any situation. I would able to make this report effectively and properly only for his right direction.

I owe my deepest gratitude to my parents and our family members whose inexhaustible love was indispensable to endure in the tragic moments that confronted me once again with the vulnerability of life.

Lastly, this report would not have been possible without the essential and gracious support of many individuals who encouraged and supported us in any respect to complete this thesis on time. I am also so grateful to them.

Supervisor's Certification

This is to certify that Practicum report on "Development of Hospital Management System for ICDDRB" has been carried out by Rafiyatul Rabby Ridam bearing ID# 18103391 of IUBAT – International University of Business Agriculture and Technology as a partial fulfillment of the requirement of practicum defense course. The report has been prepared under my guidance and is a record of the accomplished work carried out successfully. To the best of my knowledge and as per his declaration, no parts of this report has been submitted anywhere for any degree, diploma or certification.

Now he is permitted to submit the report. I wish him success in all his future endeavors.

Practicum Supervisor,

_____

M M Rakibul Hasan

Senior Lecturer

Department of Computer Science and Engineering

IUBAT- International University of Business Agriculture and Technology

Departmental Certification

On behalf of the Department of Computer Science and Engineering of International University of Business Agriculture and Technology (IUBAT) we, the undersigned, certify that this practicum report "Development of Hospital Management System for ICDDRB" for the award of Bachelor of Computer Science and Engineering (BCSE) degree was duly presented by Rafiyatul Rabby Ridam (ID No. 18103391) and accepted by the department.

_____

M M Rakibul Hasan

Senior Lecturer

Department of Computer Science and Engineering

IUBAT- International University of Business Agriculture and Technology

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Dr. Muhammad Hasibur

Rashid Chayon Coordinator

and Associate Professor

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Dr. Utpal Kanti Das

Chair and Professor

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IUBAT – International University of Business Agriculture and Technology

Abbreviations

AFP-Adjusted Function Point

DET-Data Element Type

DFD-Data Flow Diagram

DT-Data Transition

EI-External Input

EIF-External Interfaces File

EO-External Output

EQ-External Query

ER-Entity Relationship

FP-Function Point

FTR-File Type Referenced

TDI-Total Degree of Influence

UFP-Unadjusted Function Point

GSC-General System Characteristics

ILF-Internal Logical File

QA-Quality Assurance

RET-Record Element Type

SDLC-Software Development Life Cycle

TQM - Total quality management

Abstract

Development of Hospital Management System for ICDDRB" is Hospital Web Application developed for practicum project. Where Admin can post and so that other users can see those posts. Guest can get doctor advise remotely from home. Now-a-days all hospital platforms Transforming themselves online based.User data especially user messages that were sent privately. so, this application hides the original message by encrypting the message so that developers himself can't see the messages or abuse it. This application contains 3 actors. Admin can register to the application and a profile will be created at the same time through event for the user, later on user can modify the profile as wish also other user's. Can see one's profile. Admin can create post, Other users can see those post.,Admin can block one user. They can send messages. Employees can respond to a guest issues, admin can see user list and can block them and hide the post from the newsfeed.

Internship Certification

Table of Contents

List of Figures

List of Tables

Chapter 1: Organization Overview

Chapter 1 is representing the organizational overview, mission, vision and about company's various services. In this chapter detailed organizational overview is discussed along with the organizational hierarchy and my position over there as intern.

1.1 Organizational Overview

ICDDR,B a full-featured web solution, software development, mobile application, service providing company in Bangladesh. Its core with the highly qualified Designers and Developers having experience of more than 10 years in various and complex designs and development. ICDDR,B (formerly known as the International Centre for Diarrhoeal Disease Research, Bangladesh) is an international health research organization located in Dhaka, Bangladesh.[1] Dedicated to saving lives through research and treatment, icddr,b addresses some of the most critical health concerns facing the world today, ranging from improving neonatal survival to HIV/AIDS.[2] In collaboration with academic and research institutions over the world, icddr,b conducts research, training and extension activities, as well as programme-based activities, to develop and share knowledge for global lifesaving solutions.

icddr,b is one of the leading research institutes of the Global South, releasing, according to the Thomson Reuters Web of Science, 18 percent of the Bangladesh's publications.

icddr,b has a mix of national and international staff, including public health scientists, laboratory scientists, clinicians, nutritionists, epidemiologists, demographers, social and behavioral scientists, IT professionals, and experts in emerging and re-emerging infectious diseases, and vaccine sciences.

1.2 Organization Services

Information Technology is a part of ICDDR,B which provides all kinds of professional and creative software, Enterprise software integration, Management info system, Web development & Mobile app solutions for their organization.

Web Development: At ICDDR,B we focus on creating search engine friendly, aesthetically appealing and interactive website designs. It is a known fact that to build a strong web presence and to secure the countless marketing opportunities available on the internet, a good website is imperative, thus triggering a race for website design while designing and developing your website, our professionals keep in mind

key factors like easy-navigation, overall consistency and content quality, stipulated timeframes and budget and backend support.

1.3 Organization Location

68 Shaheed Tajuddin Ahmed Ave, Dhaka 1212

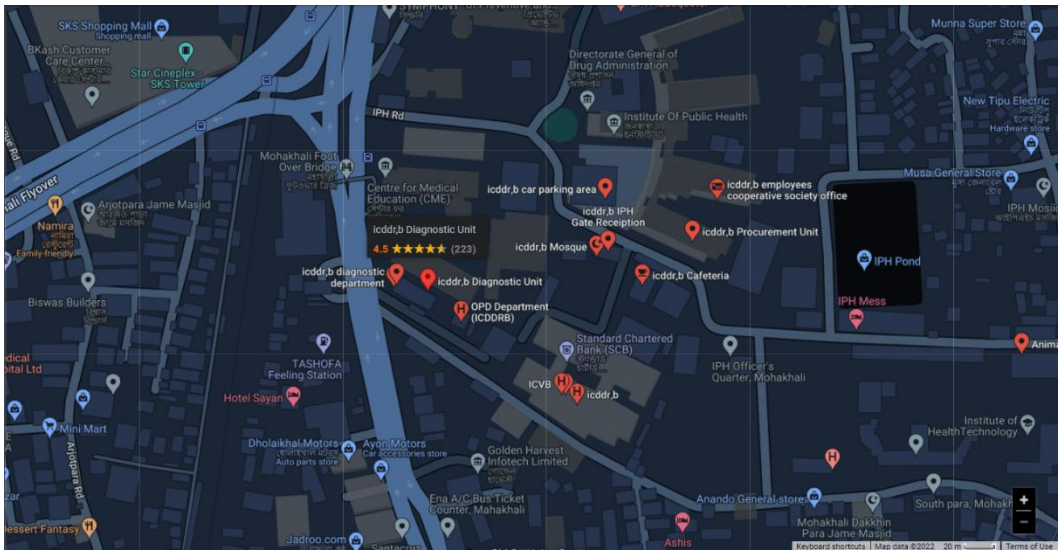

Figure 1. 1: Organization Location (Source: www.icddrb.org)

1.4 Organization Vision

ICDDR,B (formerly known as the International Center for Diarrhoeal Disease Research, Bangladesh) is an international health research organization located in Dhaka, Bangladesh.[1] Dedicated to saving lives through research and treatment, icddr,b addresses some of the most critical health concerns facing the world today, ranging from improving neonatal survival to HIV/AIDS.[2] In collaboration with academic and research institutions over the world, icddr,b conducts research, training and extension activities, as well as programme-based activities, to develop and share knowledge for global lifesaving solutions.icddr,b is one of the leading research institutes of the Global South, releasing, according to the Thomson Reuters Web of Science, 18 percent of the Bangladesh's publications.icddr,b has a mix of national and international staff, including public health scientists, laboratory scientists, clinicians, nutritionists, epidemiologists, demographers, social and behavioral scientists, IT professionals, and experts in emerging and re-emerging infectious diseases, and vaccine sciences.

1.5 Organization Mission

Proactively enable sustainable and quality IT solution to achieve organizational goal in an effective way ensuring excellence in service.

1.6 My position in this Organization

I am an intern developer to this organization. I am guided by a supervisor in this organization. He is very helpful and informative. I really learn a lot from him. I successfully completed my project in time. It was only possible by the guidance of my supervisor. It was also a big experience to maintain the office time for me. I also maintain the other rules of this organization.

I am happy to work with this office. It's really made me prepare for the beginning of my career.

1.7 Organizational Structure

The structure of my organization is drawn below:

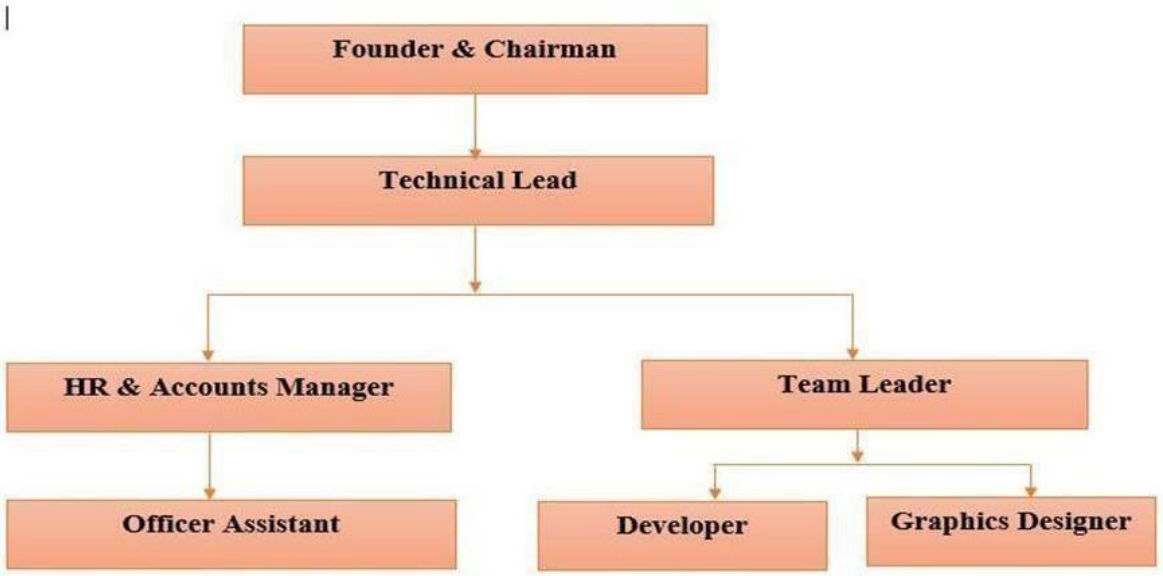

Figure 1. 2: Organization Structure of ICDDR,B

Chapter 2: Introduction

2.1 Introduction

Hospital Management System is a web application where the system uses different types of relations to create a network between different types of people. In the Hospital Management System, people work in different posts where they express their work which other people can see and work on the post and can give their comments. People can send messages to other people and can get messages from others through this process they create a network between them. There will be 3 types of user (Admin, Employee, Guests).Guests can take doctor's advise remotely. So, this project helps the ones to get the main goal of Hospital Management System .it provides 100% message and data encryption which can allow hiding data form admin or from any user expect the use who is meant to see the message or data.

2.2 Background of study

In the 20th century hospitals are transferring their services in online, we use them every day but its still not much developed yet, so this project is all about to highlight some possible features which a hospital can have in their website.

2.3 Objective

To create a Hospital Management System to minimize the hustle of people and maintain a well management in organization.

2.3.1 Broad Objective

The main objective of Hospital Management System is to minimize the hustle of people and maintain a well management in organization., Guests can take doctor's advise remotely, also give the opportunity to modify their profile as their wills.

2.3.2 Specific Objective

This Hospital Management System architecture can handle the issues like,

- The project maintains an echo system in which all the information contains at a central
- DB, which leads easy accessibility and consistency.
- Guests can take doctor's advise remotely.
- User Can modify their profile as their wills.

- User of the post can update his/her profiles.
- Every user can see some specific pages of work .
- User can send or receive message form users by following each other's.
- The Text of the message are encrypted so there is no way to leak.
- User can see all details one user created in that user profile.

2.4 Proposed System Benefits

This proposed system gives the safety from information leaking like text messages also this system gives an opportunity create a friendly network between different types of people from different region.

- Provides instant information.
- The project reduces time.
- User friendly System for User Satisfaction.
- Data are secured.

2.5 Methodology

For this project, two types of data are required primary data secondary data. ICDDR,B provided all types of primary and secondary data needed to develop the system. In the Analysis and Design chapter, I have described the procedure and processes that were followed by me to develop the system.

2.5.1 Data Sources

The sources of data for the purpose of this project are:

- Primary Data
- Secondary Data

2.5.2 Primary Data

The organization (ICDDR,B) provided the primary data which was collected from user. The organizations practical experience, observation, and face-to-face interview with user, the primary data that were required was generated by organization web administrators .

2.5.3 Secondary Data

Secondary data are the data which are generated by real life experiences, studying different articles, newspapers and research papers and another great source for collecting information was via Internet. Data, facts and statistics were collected via internet navigation which made me understand the project better. For that I searched some Hospital Management System, read articles about management.

2.6 Limitation of the Project

Some limitations of my project are:

- Huge database needed.
- This system does not allow any type of calling feature.
- Group and Page feature also not in the system.

2.7 Process Model

There are many situations during which initial software requirements are reasonably well defined, but the general scope of the event effort precludes a purely linear process, additionally, there could also be a compelling got to provide a limited set of software functionality to users quickly then refine and expand thereon functionality in later software releases, The incremental process model is a method of software development where the model is designed, implemented and tested incrementally until the product is finished. It involves both development and maintenance. The product is defined as finished when it satisfies all its requirements. This model combines the properties of the waterfall model with the iterative philosophy of prototyping.

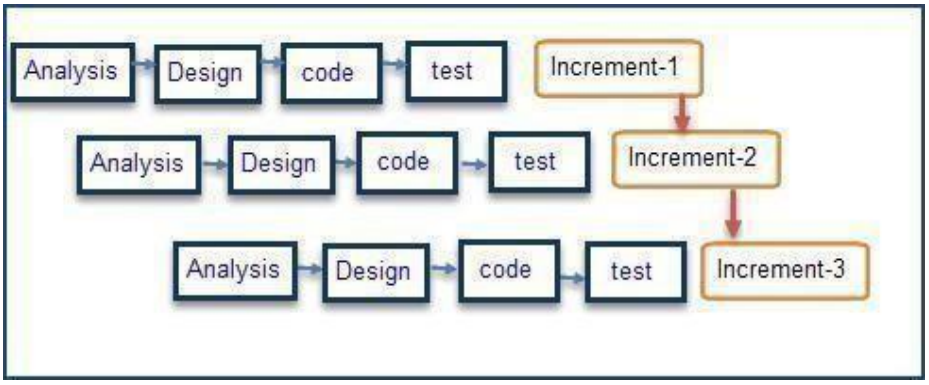

Figure 2. 1: Incremental Process Model (Source: theegeek.com)

Reason for choosing Incremental Process Model

- As it increases code reusability in work process, so it is time efficient.
- This model allows early delivery of parts of the system which is perfect of internship.
- This model supports easier integration of subsystems which allow
- As this model allows integration of sub-system so whole system failure is less.

2.8 Feasibility Study

Feasibility study determines whether that solution is possible or achievable for the organization. This means that the tasks that we'll perform are worth enough or not. There are three major areas of investigation and generating ideas a for new systems. On studying the feasibility of the system, three major considerations are addressed, to seek out whether the automation of the system is possible.

- Technical feasibility
- Economic feasibility
- Operational feasibility

2.8.1 Technical Feasibility

Technical feasibility addresses concerns about hardware capability, reliability, availability, and the skills of the development team. So, I found that this model is technically feasible because this can be developed by the following lines.

To develop this project, need a high-level programming language like PHP. For frontend HTML, CSS, Bootstrap, the framework is Laravel, and for databases Xampp Server is used to user MySQL. To store data an editor (VsCode) needed, a cloud server and a computing device like a computer or Smartphone with a simple configuration and data connection. All the technology which is mentioned above is ready to use. So, our project is technically feasible.

2.8.2 Economic Feasibility

Profitable feasibility determines to what extent a new system, is cost-effective. My software is economically doable. This project can run any OS with medium requirements. So, the cost will be not that much as it gives an opportunity to use any OS.

2.8.3 Operational Feasibility

Operational feasibility addresses concerns about user acceptance, operation support, and the conditions of entities and factors in the association’s external terrain. It's operationally feasible. Anyone can fluently

understand the process of our software. They do need not any redundant training to understand it. Users can use the system by subscribing in and logging in to our site.

So, it's operationally feasible.

Chapter 3: Requirement Engineering

The process of establishing the services that the customer requires from a system and the constraint under which it operates and is developed. Requirement reflects the needs of user for a system that serves a certain purpose such as controlling a device, placing a command or finding information.

3.1 Requirement Engineering

Requirement engineering is, as its name suggests, the engineering discipline of establishing user requirements and specifying software systems. There are numerous definitions of Requirements Engineering; still, they all partake the idea that conditions involve chancing out what people want from a computer system and understanding what their requirements mean in terms of design. Requirements engineering is nearly related to software engineering, which focuses further on the process of designing the system that users want.

- User requirements
- System requirements
- Functional requirements
- Non-functional requirements
- Hardware Requirements
- Software Requirements

3.2 Requirement Analysis

Requirement analysis provides the software designer with a representation of information, function and behavior that can be translated to data, architectural, interface and component level designs. In the following task phases the requirement analysis was done.

3.2.1 User Requirements

Admin:

- Admin can login/register.
- Admin can (View, Update) their profile.
- Admin can manage (View, Block) user.
- Admin can manage (View, Delete) post information.

User:

- User Can login/register.

- User Can manage (View) posts.
- User Can manage (View, Update) their profile.
- User Can manage (View, Update, Delete) their response.
- User Can manage (Send, Receive) messages.
- User Can manage (Send, Receive) emails.
- User Can manage (Send, Receive) QR codes.

Guest:

- Guest can see (View) the dashboard.
- Guest can submit (Send, Receive)their problems and get response through emails.

3.2.2 System Requirements

Admin:

- Admin can login/register.
- For login, login form will be appeared.
  - ✓ Admin must provide required information for login in the form and click “Log in”.
  - ✓ If the provided information of the admin has been matched with the database, then the admin can access his/her panel. If required information doesn’t match the system will not allow her/him to admin panel and will ask for create a new account.
- Admin can (View, Update) their profile.
  - ✓ Using the admin panel an admin can view his/her profile of the system by clicking on “Employees” button from the menu bar.
  - ✓ After clicking on “Profile” button, the system shows the all information on a table.
  - ✓ There will be a “Edit” button. Using this button, admin can edit the information of his/her profile.
- Admin can manage (View, Update) User information
  - ✓ Using the admin panel an admin can manage user information of the system by clicking on “User” button from the side bar.
  - ✓ After clicking on “User” button, the system shows the all-users information on a table.

- ✓ There will be a “Block” button in every tuple. Using these buttons, admin can block the user.
- ✓ After clicking on “Block” button, the system will show a notification message about blocking the user from the system.
- ✓ From the all-user information page admin can also see who blocked user and a “Unblock” Button beside.
- ✓ After clicking “Unblock” Button user will unblocked and can access to the site again.

- Admin can manage (View, Delete) posts.
  - ✓ Using the admin panel an admin can manage posts of the system by clicking on “Post” button from the menu bar.
  - ✓ After clicking on “Posts” button, the system shows the all-post list on a table.
  - ✓ By clicking on the “Delete” button admin can delete the specific post from the system.

User:

- User can see public posts.
  - ✓ Any User (Registered/Unregistered) can see the available public posts in the system by clicking on “Root URL” button from the navbar.
  - ✓ User can do anything else but see without login to the system.

- User can login/register.
  .
  - ✓ To interact with the system, user must need to have an account on the system.
  - ✓ The provided information of the user at registration has been stored in database, then the system will take her/him to the homepage of the system.
  - ✓ If the provided information of the user has been matched with the database, then the user can go to the website. Otherwise, the system will show an error message and suggest registering as a new user or did you forget password.

- Customer can (View, Update) their profile.

- ✓ After login user can view his/her profile of the system by clicking on "Profile" button from the menu bar.
- ✓ After clicking on "Profile" button, the system shows the all information on a table.
- ✓ There will be a "Edit" button. Using this button, user can edit the information of his/her profile.
- ✓ All the post the user made will be under the profile section in a list.

- User can manage ("Send", "Receive") messages.
    - User can click on the "Chat" button on the navbar this will take her/him to the chat page
    - On the chat page user will find a list of users who are following him/her.
    - By clicking on a user, he/she can send and receive messages.

- User can manage ("Update") profile.
    - ✓ On the details page of every post there are option for deleting the post.
    - ✓ "Delete" button is hidden for every user unless it's the owner of the post.
    - ✓ By clicking "Delete" button user can delete post from the database.
    - ✓ After clicking on update "Button" form update from the post will be updated, and can see the change on the post.

3.2.3 Functional Requirements:

Admin:

- Registration
- Login
- View profile

- View Post List
- View User List
- Block User
- Unblock User
- Delete Post
- Logout

User:

- Registration
- Login
- View profile
- Edit Profile
- View Post
- Delete post
- Send messages
- Receive messages
- Logout

3.2.4 Non-Functional Requirements:

- User cannot create more than one accounts using the same Mail Address.
- System will all store the Mail address and Password in Database.
- Admin and User will see their profile information in their profile after login.
- The registration will be validated with valid mail address and account will be verified.

3.2.5 Hardware Requirements:

The hardware listed by no means a minimal demand to run the system, but rather a base limit for running the system easily and comfortably. This is also considering the implicit amount of traffic that may go through the server.

- 1 x Intel Core i3 6^{th} gen Processor.
- 4 GB (DDR4) RAM
- 120 GB 7200 rpm SATA Hard Drive.
- 2 x 10/100/1000 Ethernet, 1 PCIe 2.0x16 slot.

3.2.6 Software Requirements:

- Web Server: Xampp Server Bitnami 7.3.25
- Server-Side Scripting: Laravel 8 Framework of PHP-8.
- Database Engine: MySQL 5.1.34
- Database Tools: MySQL Administrator, MySQL Query Browser
- Designing Tools: Draw.io, Creately
- Text Editor: VsCode

3.3 Use Case Diagram of the System

3.3.1 Use case symbols

Important parts in a use case:

- Actor: An Actor is outside or external the system.
- Use case: Use case A use case represents a function or an action within the system. It's drawn as a round and named with the function.
- System Boundary: System Boundary A system is a sequence of events that be when a stoner interacts with the system and is drawn as a cube. This is a voluntary element but useful when you are imaging large systems.
- Relationship:

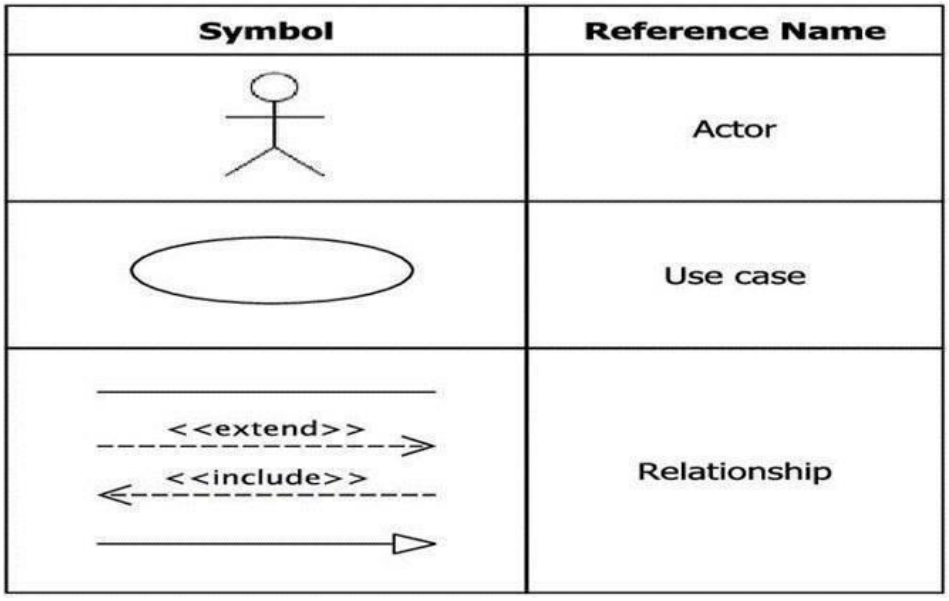

Figure 3. 1: Use Case Symbols

3.3.2 Use case diagram

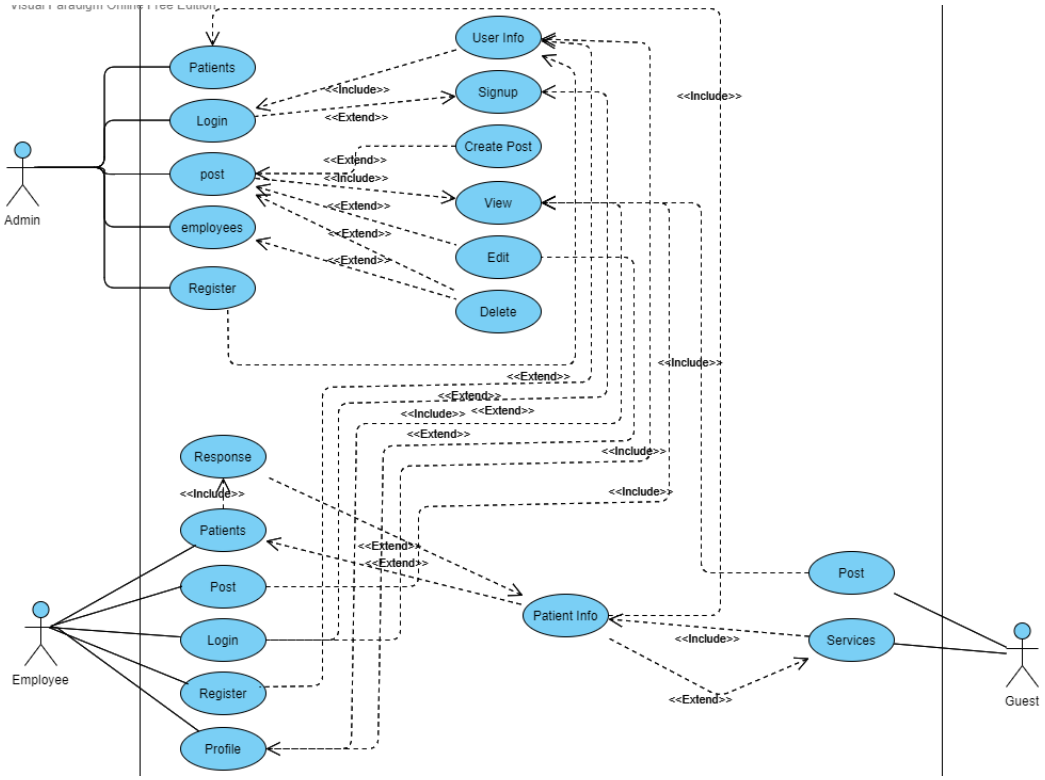

Figure 3. 2: Use Case Diagram for Hospital Management System

3.3.3 Use case text

In the project of 'Development of Hospital Management System", the use case diagram is used to visualize the different types of roles in a system and how those roles interact with the system.

This system is basically a platform where user can communicate with other users. Submit their problems respond according to the specific problem.

- Login: Actor Can Login to the system if they are registered. Actor are Admin, User.
- Actor Registration: Actor are Admin and Users. Admin can manage the users. Visitor can see only the post which are public.
- Audience Type: User can add audience type at time of creating post.
- Post Type: User can post in three ways with image, without image only text and with both image and text.
- Profile: User got a default profile with a default image they can modify it if they want.
- Messages: User can send message to another user if both them are following each other.
- Admin: Admin can block and unblock user blocked user cannot user the system as he/she won't be able to login and admin also can delete any post but can't modify any post information or user information.

Chapter 4: System Planning

System planning chapter shows the functions of the project 'Development of Hospital Management System". The function point estimation, effort distribution and project schedule chart are also shown in this chapter.

4.1 Scope of Project

The scope of the project is to satisfy our clients and keep records of the ongoing project, work analysis. To use the system user do not need any technical knowledge. Some more scopes are:

- Web based application, can be accessible from anywhere by internet browser.
- Searching system is available here for all the transaction.
- Platform independent; run on Windows, Mac or Linux.
- No license fees or renewal fees.

4.2 Function of Proposed System

4.2.1 Function Description

Create Account	F1
Login into the System	F2
Create post	F3
View post	F4
Update post	F5
Send mail	F6
Submit problem	F7
Respond to a problem	F8
Delete problem	F9
QR code generate	F10
Send Message	F11
Receive Message	F12

4.3 System Project Planning

Before starting any project, it is compulsory to estimate the work to be done, the resources that will be required, the time that will elapse from start to finish and to analyze the project to determine whether it

is feasible or not. Software project management commences with a set of activities that collectively called software project planning. Through the software project planning I estimate the work to be done, the resources that will be required, the time that will elapse from start to finish and finally I analyze the project to determine whether it is feasible or not. The activists which are followed in this project planning are:

- System Project Estimation
- Function Point Estimation
- Based Estimation
- Effort Distribution
- Task Scheduling Project
- Schedule Chart Cost
- Estimation

4.3.1 System Project Estimation

The accuracy of a software project estimate predicted based on a number of things:

- ✓ Properly estimated the size of the product to build.
- ✓ The degree to which the project plan reflects the abilities of the software team or engineer
- ✓ The stability of the product requirements and the environment that supports the software engineering effort.

Software size estimation is the most important matter that I have to consider during the software project. If the software size is not calculated properly, then this will cause various problems such as scheduling problems, budget problem etc. As the project is going on, before estimating the software size, I have to confirm that software scope is bounded.

Software size estimation is the most important matter that I have to consider during the software project. If the software size not calculate properly, then this will cause various problems such as scheduling problems, budget problem etc. As the project goes on before estimating the software size, I have to confirm that software scope is bounded.

4.3.2 Function Oriented Metrics

Complexity Matrix

Table 4. 1: Complexity Matrix

EI	1-4 DETs	5-15 DETs	16 or more DETS
1 FTR	Low	Low	Average
2 FTRs	Low	Average	High
3orMoreFTRs	Average	High	High

Table 4. 2: Complexity Matrix 2

EO/EQ	1-5 DETs	6-19 DETs	20 or more DETS
2 to 3 FTRs	Low	Average	High
4 or More FTRs	Average	High	High

Table 4. 3: Complexity Matrix for UFP

Complexity	Transaction Function Type	Transaction Function Type
	EI/EQ	EO
Low	3	4
Average	4	5
High	6	7

Table 4. 4: Complexity Matrix 3

ILF/EIF	1-19 DETs	20-50 DETs	51 or more DETS
1 RET	Low	Low	Average
2 to 5 RETs	Low	Average	High

6 or More RETs	**Average**	**High**	**High**

Table 4. 5: Complexity Matrix for UFP 2

Complexity	Transaction Function Type	Transaction Function Type
	ILF	**EIF**
Low	**7**	**5**
Average	**10**	**7**
High	**15**	**10**

4.4 Identifying Complexity

The task of counting function points should be included as part of the overall project design plan. This is counting function points should be listed and planned. The first function point count should be developed to give sizing used for estimating.

Transactional Functions:

- External Inputs [EI]
- External Outputs [EO]
- External Queries [EQ]

Data Functions:

- Internal Logical Files [ILF]
- External interface files [EIF]

Also, FETs, DET, RET and FTR have been applied for the analysis of data function and transactional functions.

4.4.1 Identifying complexity of transition function

Table 4. 6: Identifying complexity of transition function

Transition function	Fields/File involve	FTRs	DETs
1. Create account (EI)	Fields- id, name, username, email, role, address, password, submit File Name-users	1	8

2.Login(3*EI)	Fields- email, password, submit File Name: users	1	3
3. User can view their profile (EQ)	Fields- username, name, email, bios, url, followers, following, post list File Name: profile, user, post	3	8
4.User can update their profile (EI)	Fields- name, bios, image, url, submit File Name: profile	1	5
5. Visitors Can see public post (EO)	Fields- caption, image, date, like, comment, audience status. File Name: post, user	2	5
6.User can create post (EI)	Fields- id, caption, images, user id, emotion, type, select audience, File Name: post, user	2	6
7. Post details view (EO)	Field- users name, post caption, image, emotion, date, likes, comment, edit, delete, count comment, count like. File Name: user, post, like, comment.	4	11
8. Edit post (EI)	Fields- Select audience, caption, image, submit. File Name: post	1	4
9. Send message (EI)	Fields- user name, message, date, sent button File Name: profile, message	2	4
10.Receive message (EO)	Fields- user name, message, date, sent button File Name: profile, message	1	4
11.Find user (EQ)	Fields- user name, bios, visit profile button File Name: user, profile	1	5
12.Admin view posts (EO)	Fields- caption, username, date, File Name: post, user	2	3
13. Admin hide post (EI)	Fields- caption, username, date, hide button File Name: post, user	2	4
14. Admin view users (EO)	Fields- name, username, date, block button File Name: user	1	4
15. Admin block users (EI)	Fields- name, username, date, block button File Name: user	1	4

4.4.2 Identifying complexity of data function

Table 4. 7: Identifying complexity of data function

Data function	Fields/File involve	R E Ts	D E Ts
1. users (ILF)	**Fields**- id, name, username, status, is active, email, role, password	1	8
2. profile (ILF)	**Fields**- id, user id, title, bios, url, image.	1	7
3. posts (ILF)	**Fields**- id, user id, type, caption, image, emotion	1	6
4. message (ILF)	**Fields-** user id, receiver id, is seen, message	1	4

4.4.3 Unadjusted function point contribution

Table 4. 8: Unadjusted function point contribution of transition function

Transition function	FTRs	DETs	Complexity	UFP
1. Create account (EI)	1	8	Low	3
2. Login (EI)	1	3	Low	3
3. User can view their profile (EQ)	1	8	Low	3
4. User can update their profile (EI)	1	5	Low	3
5. Visitors Can see public post (EO)	2	5	Average	5
6. User can create post (EI)	2	6	Average	4
7. Newsfeed for users (EO)	3	5	Average	5
8. Post details view (EO)	4	11	High	7
9. Edit post (EI)	1	4	Low	3
10. Find friends (EO)	1	1	Low	4
11. Send message (EI)	2	4	Low	3
12. Find user (EQ)	1	5	Low	3
13. Admin view posts (EO)	2	3	Low	4
14. Admin hide post (EI)	2	4	Low	3
15. Admin view users (EO)	1	4	Low	4
26. Admin block users (EI)	1	4	Low	3
Total				60

Table 4. 9: Unadjusted function point contribution for data functions

Data function	RETs	DETs	Complexity	UFP
1. users (ILF)	1	8	Low	7
2. profile (ILF)	1	7	Low	7
3. posts (ILF)	1	6	Low	7
4. message (ILF)	1	4	Low	7
Total				28

4.4.4 Performance and Environmental impact

Table 4. 10: Performance and environmental impact

GSC (General System Characteristics)	TDI
1. Data Communications	4
2. Distributed Data Processing	1
3. Performance	4
4. Heavily Used Configuration	2
5. Transaction Rate	2
6. On-Line Data Entry	1
7. End-user Efficiency	2
8. Online Update	1
9. Complex Processing	2
10. Reusability	2
11. Installation Ease	4
12. Operational Ease	3
13. Multiple Sites	3
14. Facilitate Change	1
Total Degree of Influence (TDI) (Range 0 to 70 -> influence size ±35%)	32

3

4.4.5 Counting Function Point

Value Adjustment Factor (VAF) = (0.65 + (0.01*TDI))

= (0.65 + (0.01*32))

= 0.97

UFP = UFP (Data Function) + UFP (Transition Function)

= 60+28

=88

Adjusted Function Point (AFP) =UFP*VAF

= 88*0.97

= 85.36

Efforts for Project

= AFP * Productivity

= 85.36× 15.5

= 1,323.08 hours

One person works 8 hour per day

=1,323.08/8 = 165.385 days

Approximate 166 days

In a group, there are 2 members

=166/2 = 83 days

In a month, 20 days are working days and 5 days from home

=83/25=3.32 months

Processed Based Estimation

Table 4. 11: Processed based Estimation

Function Name	RG (Client Visit))	Data Analysis	Risk Analysis	Engineering		Developing		Testing	Implementation And Support	Total
				Planning	Design	Coding	Documentation			
F1	0.2	0.9	0.1	0.1	0.6	1.62	0.6	0.9	0.4	5.42
F2	0.6	1.0	0.01	0.01	0.82	2.5	0.82	1.44	0.42	7.62
F3	0.2	0.8	0.1	0.2	0.6	1.9	0.6	0.9	0.4	5.7
F4	0.2	0.7	0.1	0.1	0.5	2.01	0.5	0.7	0.79	5.6
F5	0.3	0.8	0.02	0.1	0.5	1.5	0.5	0.8	0.3	4.82
F6	0.2	1.0	0.1	0.14	0.5	2.0	0.7	1.37	0.5	6.51
F7	0.4	1.8	0.1	0.3	0.5	1.6	0.5	0.8	0.6	6.6
F8	0.4	1.1	0.1	0.3	0.7	2.3	0.7	1.5	0.5	7.6
F9	0.4	0.9	0.1	0.2	1.5	1.1	0.5	0.9	0.3	5.9
F10	0.2	1.2	0.2	0.49	0.88	1.3	1.51	1.4	0.5	7.68
F11	0.4	0.8	0.5	0.5	0.5	1.4	0.6	0.6	0.5	5.8
F12	0.4	1.6	0.23	0.1	0.7	2.1	0.87	1.2	0.5	7.7
F13	0.5	0.6	0.1	0.1	0.5	2.4	0.4	1.0	0.45	6.05
									Total	83
Total	4.4	13.2	1.76	2.64	8.8	23.73	8.8	13.51	6.16	
Percentage	5%	16%	2%	3%	10%	31%	10%	16%	7%	100%

4.4.6 Effort Distribution

The software project estimation technique leads to estimate of work units required to complete the software development in this project, 40% of full software development has been allocated to Coding/Developing, 35% has been allocated to analysis, design and the remaining 25% has been allocated to software testing and support.

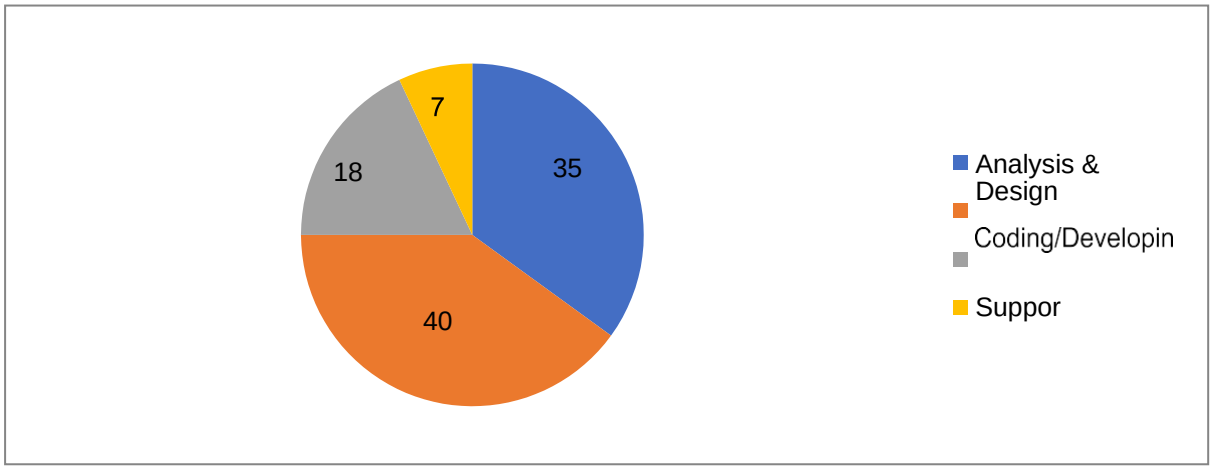

Figure 4. 1: Effort Based Estimation

A detailed view of the effort distribution chart is illustrated below:

In the Pie chart we can see that, among 35% of Analysis and Design we spend 5% for client visit and collect all requirement gathering, 15% for analysis the data and information, 2% for risk analysis, 3% for planning and 10% for designing.

Among 40% of Developing, 30% is used for coding, 10% is used for documentation, 18% is used for testing and last 7% is used for implementing, giving the support to the client.

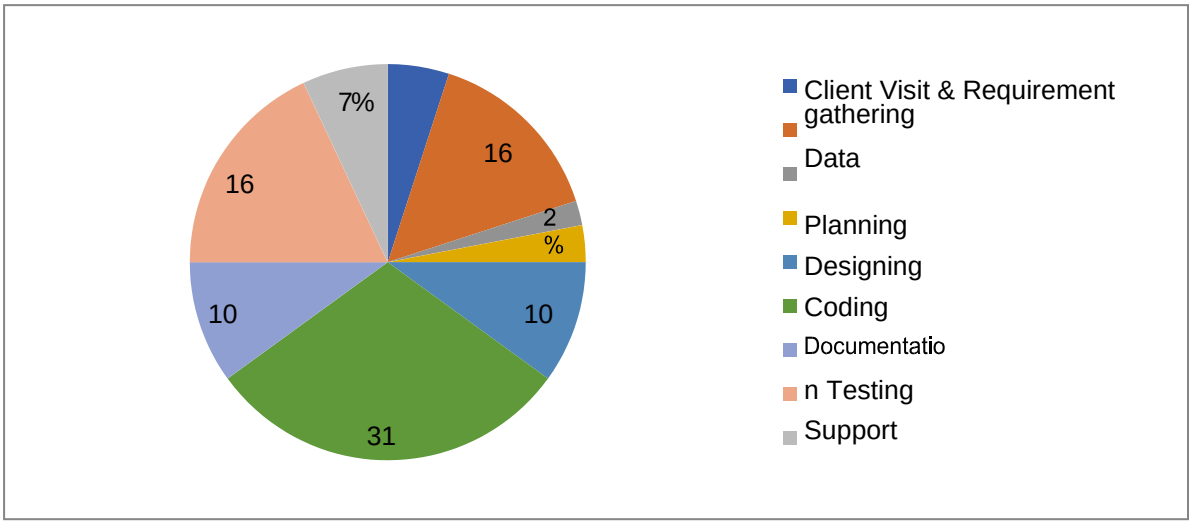

Figure 4. 2: Effort Distribution PIE Chart

4.4.7 Project Schedule

Total system development is a combination set of tasks. This set of tasks should do successionally and timely. The project schedule works as the guideline of the developer of the system. The chart is given below is for developing this project:

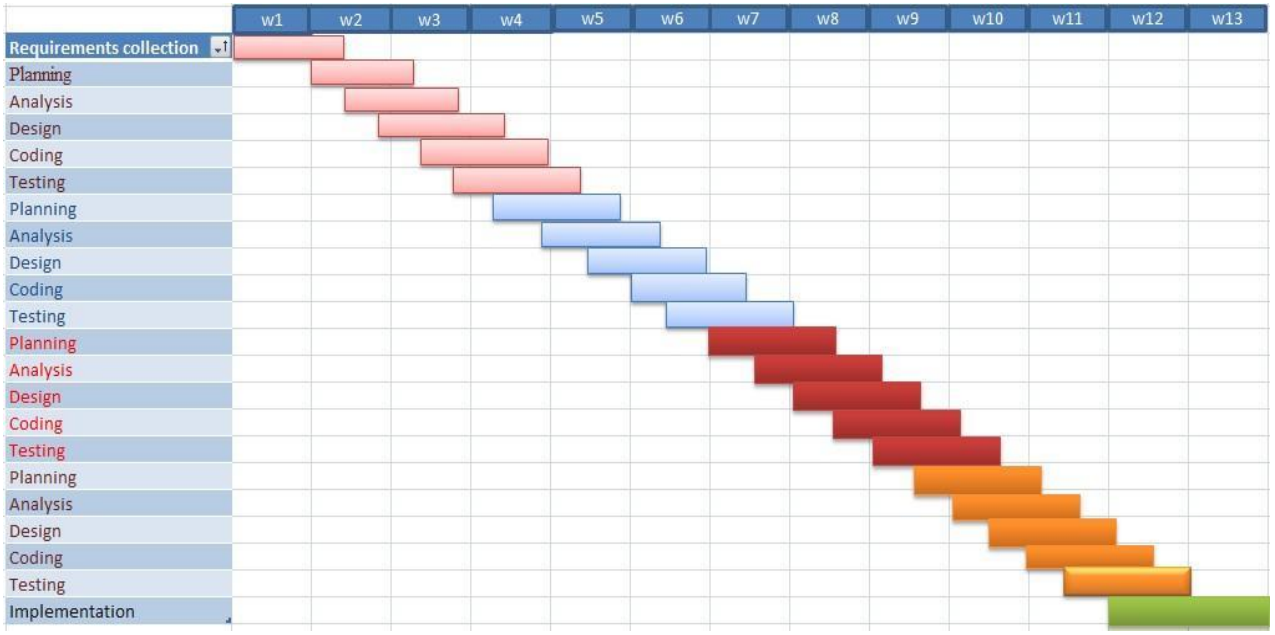

Figure 4. 3: Project Schedule Chart

4.5 Cost Estimation

The approximation of the cost of a program is cost estimation. In this project, there are few factors to analyze and calculate the cost. Given below,

- Personal costs
- Software costs
- Hardware costs
- Other costs

4.5.1 Personnel cost

Number of days in a year = 365

Number of government holidays in a year =24 Number of weekly holidays in a year =52

Total number of working days to develop the project = 365-(52+24) = 289 days Total number of working days per months to develop the project = 289/12

=24.083 days

Organization working hours per day = 8 hours

Organization working hours per month=24.083*8 = 192.664 hours

Total working hour in 3.33 months = 24.083*8*3.33 = Approximately 642 hours

Table 4. 12: Personnel Cost

Position	**Salary/month**	**Salary/hour**
System Analyst	35000	182.29
Designer	25000	130.2
Coder	20000	104.17
Tester	20000	104.17

Total salary of Analyst in 3.33 months =TK 83*182.29

=TK 15130

Total salary of Designer in 3.33 months = TK 180*130.2

= TK 23436

Total salary of Coder in 3.33 months = TK 290*104.17

= TK 30209

Total salary of Tester in 3.33 months = TK 90*104.17

= TK 9375

Table 4. 13: Personnel Cost 2

Designation	**Person**	**Working Hour**	**Salary**	**Total Salary**
System Analyst	One	83	15130	**78150 BDT**
Designer	One	180	23436	
Coder	One	290	30209	
Tester	One	90	9375	

4.5.2 Hardware cost

Cost of a computer = 35000

Computer life = 3 years

Computer Usage = 13 weeks = 3.33 months

Computer cost = (35000/36) *3.33*8 = 25900 BDT

Table 4. 14: Hardware Cost

Hardware	**Cost**
Computer	25900
Modem	1600
Printer	5000
Total	**32500 BDT**

4.5.3 Software cost

Table 4. 15: Software Cost

Name	**Amount**
Windows 10	8500
MS Office 2016	Free
XAMPP	Free
MySQL	Free
Notepad++	Free
Total	**8500 BDT**

4.5.4 Others Cost

Table 4. 16: Estimation of Other Cost

Name	**Price (BDT)**
Transport	2000
House Rent	10000
Other	1500
Total	**13500 BDT**

4.6 Account Table

Table 4. 17: Accounts Table

Particulars	TK
Salary- ● System Analyst ● Designer ● Coder ● Tester	 15130 23436 30209 9375
	78150 BDT
Hardware Cost – ● Computer ● Modem ● Printer	 25900 1600 5000
	32500 BDT
Software Cost – ● Windows 10 ● MS office 2016 ● Xampp ● MySQL ● Notepad++	 8500 Free Free Free Free
	8500 BDT
Other Costs- ● Transport ● House Rent ● Other	 2000 10000 1500
	13500 BDT
Total Cost	**132650 BDT**

Chapter 5: Risk Engineering

5.1 Risk Management

A threat is a serious problem that might or might not be. It's necessary to dissect the potential risks in a project. However, many problems can plague the software project, If the risks of a software project aren't properly analyzed and estimated. Anyone developing any type of system encounters it and it has to be managed.

5.1.1 Stages of Risk

Risk analysis and management are a series of steps that help a software team understand and manage uncertainty. Many problems can plague of software project. A risk is a probably problem; it might happen, it might not. But regardless of the outcome, it's a really good idea to identify it, assess its probability of occurrence, and estimate its impact, and establish a contingency plan should the problem actually occur. Risk analysis and management are a series of steps that help a software them to understand and manage uncertainty. For establish risks managements model the following steps are followed:

Identification: Risk picking out is the process of detecting probable risks or hazards through data collection. An area of data collection and manipulation tools and techniques exists. The team is using both automated and manual techniques to gather data and begin to distinguish potential risks to Web resources. Web scraping is one of the effective ways to gather information about the state of web pages and sites.

Classification: Risk classifying is the process of developing a structured model to categorize risk and fitting observable risk attributes and events into the model. The team combines quantitative and qualitative methods to characterize and classify the risks to Web pages, Web sites, and the hosting servers.

Assessment: Risk assessment is the process of defining relevant risk scenarios or sequences of events that could cause damage or loss and the likelihood of such events. Many sources focus on risk assessment. Rosenthal describes the characteristics of a generic risk assessment standard as "transparent, consistent, consistent, comprehensive, comprehensive, unbiased, uniform, balanced, defensible, enduring, flexible, and accompanied by adequate and sufficient guidelines.

Analysis: Risk analysis determines the potential impact of risk models or scenarios, the possible extent of loss, and the direct and indirect costs of recovery. This step identifies vulnerabilities,

considers the organization's willingness to accept the risk given the potential consequences, and develops mitigation responses.

Implementation: Risk management defines policies, procedures, and mechanisms implementation to manage and respond to recognizable risks. The implemented program should balance the value of assets and the direct and indirect costs of preventing or recovering from loss. To take comprehensive care of a web-based system we must consider the following points:

- Hardware and software environment including any upgrades to the operating system and Web server, the installation of security patches, the removal of insecure services, use of firewalls, etc.
- Procedures such as contracting with reputable service providers, renewing domain name registration, etc.
- Network configuration and maintenance including load balancing, traffic management, and usage monitoring.
- Backup and archiving policies and procedures including the choice of back up media, media replacement interval, number of backups made and storage location.
- Physical location of the server and its vulnerability to fire, flood, earthquake, electric power anomalies, power interruption, temperature fluctuations, theft, and vandalism.

5.1.2 Categories of Risk

There are different categories of risks that should keep in consideration for any software project. The following categories of risks have been considered in this software project.

- **Project risks**: The risks which threaten the project plan. If these risks come into the project, it is likely that the project schedule will delay and that costs will rise up. Project risks identify probable budgetary, schedule, personnel, resource, client, and requirement problems and their impact on the software project.
- **Technical risks**: if these type threats of arise its threats the quality and timeliness of the software to be produced. If a technical risk come software development life time, implementation may become difficult or impossible. Technical risks identify potential design, implementation, interface, verification, and maintenance problems. Moreover, specification ambiguity, technical uncertainty, technical obsolescence is also risk factors.
- **Business risks**: These risks threaten the viability of the software to be built. The business risks can be market risks, building a system that no one really wants. Strategic risks, building

a system that no longer fits into the overall business strategy for the company. Management risks, losing the support of senior management due to a change in focus or a change in people. Budget risks, losing budgetary or personnel commitment.

5.2 The RMMM Plan

- Risk Mitigation: Proactive coming up with for risk avoidance.
- Risk Monitoring: Assessing whether or not expected risks occur or not, guaranteeing Preventive steps are being properly applied, collect info for future risk Analysis, attempt to see that risks caused which problem.
- Risk Management: Actions to be taken within the event, that mitigation steps have Failed and the chance has become a live problem.

Type of Impact: Catastrophic (1), Marginal (2), Tolerable (3), Critical (4).

Type of Probability: very low (<10%), low (10–25%), moderate (25–50%), high (50– 75%), very high (>75%)

Project Risks: In my system, the bellow mentioned projects risks I needed manage..

5.2.1 Project Risks:

Table 5. 1: Project Risk (P01)

Project Risk(P01)	Date: 22-03-20
Name	Changes the requirements
Probability	Low (25%)
Impact	Marginal (2)
Description	Customer may change their requirement
Mitigation and Monitoring	Requirements are redefined by the company due to time or business needs. Meeting will be held with the company regularly. This ensures that the product we are producing solves a problem.
Management	Emergency meeting between both parties to identify new project requirement and goals.
Status	Not occur.

Table 5. 2: Project Risk (P02)

Project Risk (PR02)	Date: 08-11-2020
Name	Poor Quality Documentation
Impact	Catastrophic

Description	Poor quality documentation of the members.
Mitigation and Monitoring	The meeting will be held routinely to offer documentation suggestions and topics. The progress on documentation will also have monitored in each meeting.
Management	The addition of new topics or removal of unnecessary topics into the documentation will assigned to responsible person.
Status	Monitoring it.

5.2.2 Technical Risks:

Table 5. 3: Technical Risk (TR01)

Technical Risks (TR01)	Date:
Name	Computer Crash
Impact	Catastrophic
Description	Computer may crash due to several reasons.
	every day and we can use IPS to stop unexpected shutdown.
Management	If our computer has been crashed then we will restore backup.
Status	We are not facing such kind of problem yet.

Table 5. 4: Technical Risk (TR02)

Technical Risk (TR02)	**Date:**
Name	Technology doesn’t meet specifications.
Impact	Catastrophic
Description	Customer doesn’t have the technology to their desired specification.
Mitigation & Monitoring	Ensures that the product we are producing and the specifications of the customer are equivalent.
Management	The customer should be immediately notified and whatever steps necessary to rectify this problem should be done. Preferably a meeting should be held between the development team and the customer to discuss at length this issue.
Status	We are not facing such kind of problem yet.

Table 5. 5: Technical Risk (TR03)

Technical Risks (TR03)	**Date:**
Name	Poor training skill in team members.
Impact	Catastrophic
Description	Poor training skill in team members to train the client.
Mitigation & Monitoring	The training team should have a clear knowledge about the entire functionality of the software. System analyst need to ensure and monitor it while training session start.
Management	We should arrange a meeting with the train team and come to a point to solve this problem.

5.2.3 Business Risks:

Table 5. 6: Business Risk (BR01)

Business Risk (BR01)	Date:
Name	Insufficient Budget
Impact	Marginal
Description	If the budget is low project may not complete
Mitigation & Monitoring	The project needs streaming server that is costly to set-up. We find several alternative streaming services to reduce the budget risk.
Management	Refinement in project goal. A new plan for regulate the budget.
Status	We are not facing such kind of problem yet.

Table 5. 7: Business Risk (BR02)

Business Risk (BR02)	Date:
Name	Not pay the installment of Software Cost.
Impact	Catastrophic
Description	Customer doesn’t pay for the installment of software cost.
Mitigation & Monitoring	We should make a good communication between customers and ensure that the entire installment will be completed.
Management	The only course of action available would be find out the reason and come in a solution.
Status	The risk has not been arisen yet.

Table 5. 8: Business Risk (BR03)

Business Risk (BR03)	Date:
Name	Late delivery of the project
Impact	Catastrophic
Description	The project may take more time to complete what was estimated.
Mitigation & Monitoring	Steps have been taken to ensure a timely delivery by determining the scope of project.
Management	The only course of action available would be to request an extension to the deadline from customer.
Status	Our project is completed in time.

Table 5. 1: Project Risk (P01)

Project Risk(P01)	Date: 22-03-20
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Management	Emergency meeting between both parties to identify new project requirement and goals.
Status	Not occur.

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Description	Poor quality documentation of the members.
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Management	The addition of new topics or removal of unnecessary topics into the documentation will assigned to responsible person.
Status	Monitoring it.

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Technical Risks (TR01)	Date:
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	every day and we can use IPS to stop unexpected shutdown.
Management	If our computer has been crashed then we will restore backup.
Status	We are not facing such kind of problem yet.

Table 5. 4: Technical Risk (TR02)

Technical Risk (TR02)	**Date:**
Name	Technology doesn't meet specifications.
Impact	Catastrophic
Description	Customer doesn't have the technology to their desired specification.
Mitigation & Monitoring	Ensures that the product we are producing and the specifications of the customer are equivalent.
Management	The customer should be immediately notified and whatever steps necessary to rectify this problem should be done. Preferably a meeting should be held between the development team and the customer to discuss at length this issue.
Status	We are not facing such kind of problem yet.

Table 5. 5: Technical Risk (TR03)

Technical Risks (TR03)	**Date:**
Name	Poor training skill in team members.

Impact	Catastrophic
Description	Poor training skill in team members to train the client.
Mitigation & Monitoring	The training team should have a clear knowledge about the entire functionality of the software. System analyst need to ensure and monitor it while training session start.
Management	We should arrange a meeting with the train team and come to a point to solve this problem.

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Business Risk (BR01)	Date:
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Description	If the budget is low project may not complete
Mitigation & Monitoring	The project needs streaming server that is costly to set-up. We find several alternative streaming services to reduce the budget risk.
Management	Refinement in project goal. A new plan for regulate the budget.
Status	We are not facing such kind of problem yet.

Table 5. 7: Business Risk (BR02)

Business Risk (BR02)	Date:
Name	Not pay the installment of Software Cost.
Impact	Catastrophic
Description	Customer doesn't pay for the installment of software cost.
Mitigation & Monitoring	We should make a good communication between customers and ensure that the entire installment will be completed.
Management	The only course of action available would be find out the reason and come in a solution.
Status	The risk has not been arisen yet.

Table 5. 8: Business Risk (BR03)

Business Risk (BR03)	Date:
Name	Late delivery of the project

Impact	Catastrophic
Description	The project may take more time to complete what was estimated.
Mitigation & Monitoring	Steps have been taken to ensure a timely delivery by determining the scope of project.
Management	The only course of action available would be to request an extension to the deadline from customer.
Status	Our project is completed in time.

Chapter 6: Analysis Modeling

Analysis modeling uses a combination of text and diagrammatic forms to depict requirements for data, function, and behavior in a way that is relatively easy to understand, and more important, straightforward to review for correctness, completeness and consistency. This section presents resources for conventional and object-oriented analysis (OOA) methods as well as resources for UML.

6.1 Software Analysis Pattern

Objectives of analysis Pattern

- Domain Analysis
- Describe what the client requires
- Establish a basis for the creation of a software design
- Define a set of requirements that can be validated once the software is built.

6.2 Activity Diagram

Activity diagrams are graphical representations of workflows of stepwise activities and actions with support for choice, iteration and concurrency. In the Unified Modeling Language, activity diagrams are intended to model both computational and organizational processes. Activity diagrams show the overall flow of control.

Activity Diagram for Admin

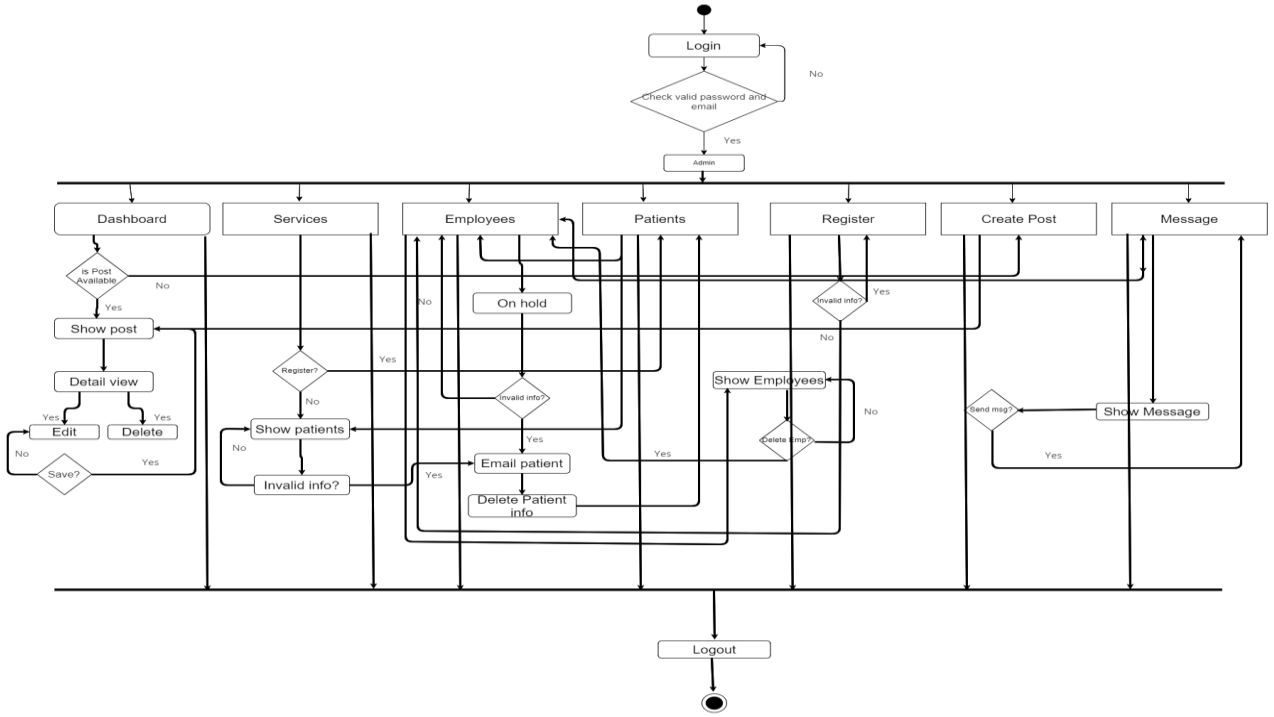


Figure 6. 1: Activity Diagram for Admin

Activity Diagram for Employee

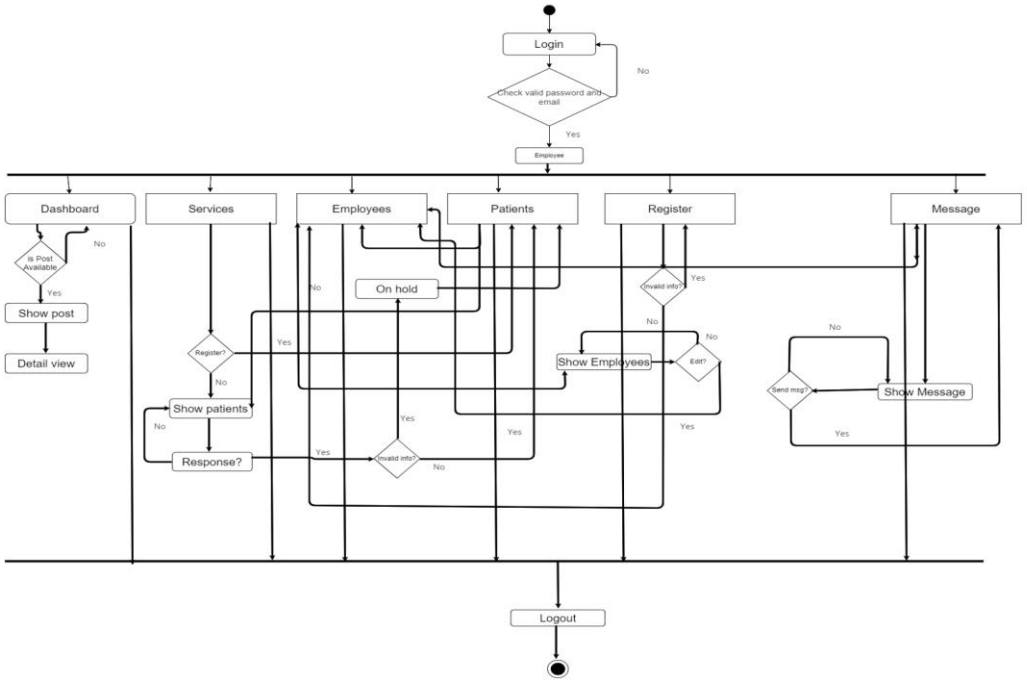


Figure 6. 2: Activity diagram for Employee

Activity Diagram for Guest

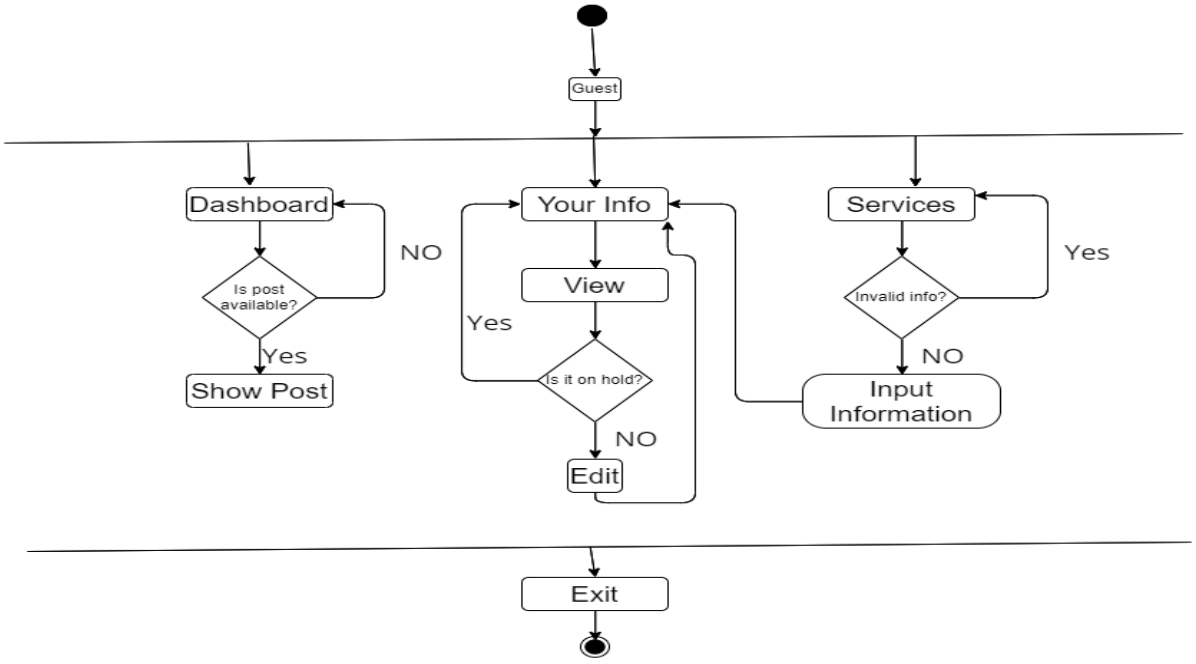


Figure 6. 2: Activity diagram for Guest

6.3 Swim Lane Diagram

A Swim Lane diagram is a type of flowchart that delineates who does what in a process. Using the metaphor of lanes in a pool, a Swim Lane diagram provides clarity and accountability by placing process steps within the horizontal or vertical “Swim lanes” of a particular employee, work group or department. It shows connections, communication and handoffs between these lanes, and it can serve to highlight waste, redundancy and inefficiency in a process.

Swim Lane Diagram for Admin/Employee Login

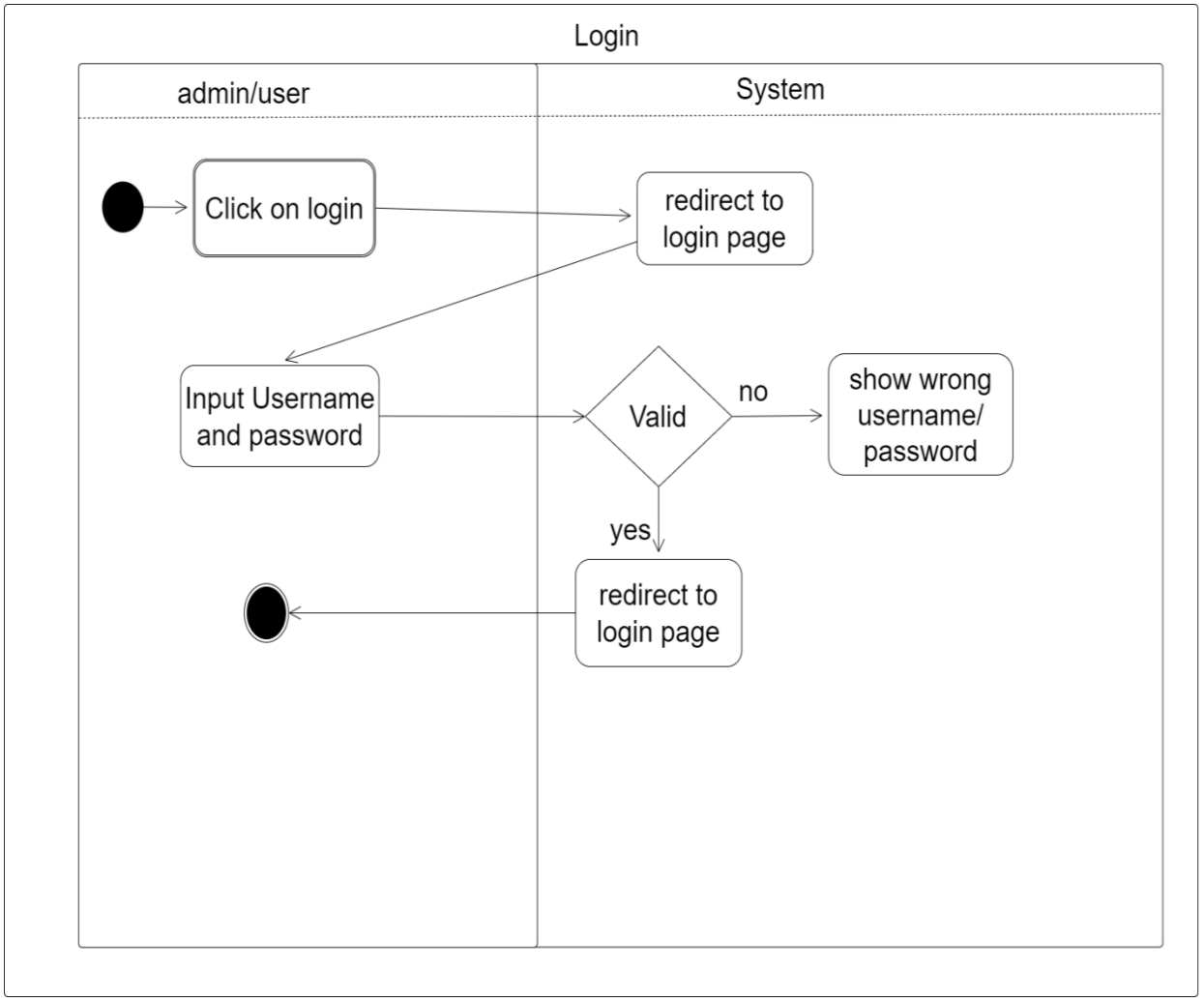


Figure 6. 3: Swim Lane Diagram for admin/Employee login

Swim Lane Diagram for Post

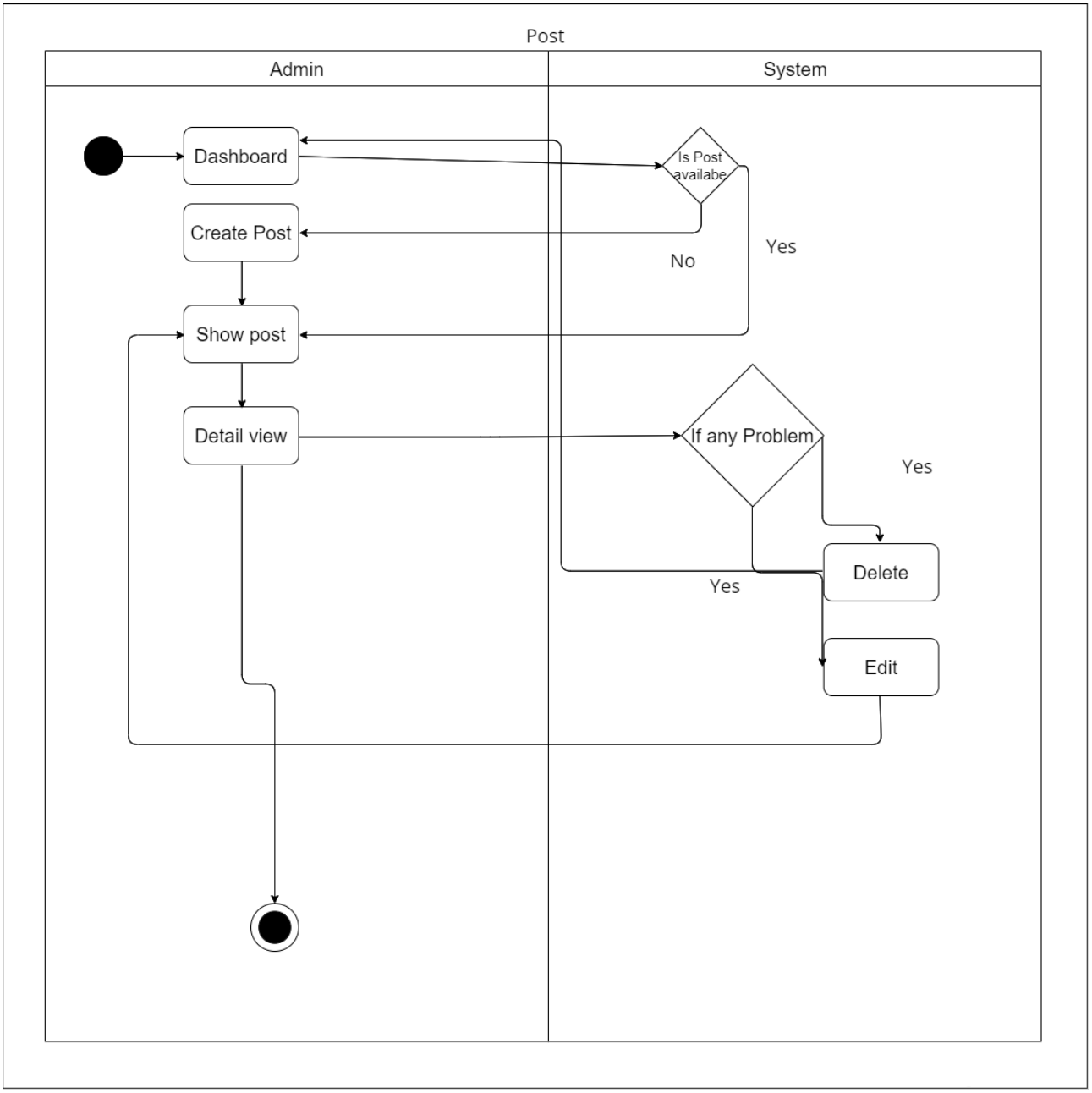


Figure 6. 4: Swim Lane diagram for Post

Swim Lane Diagram for Message

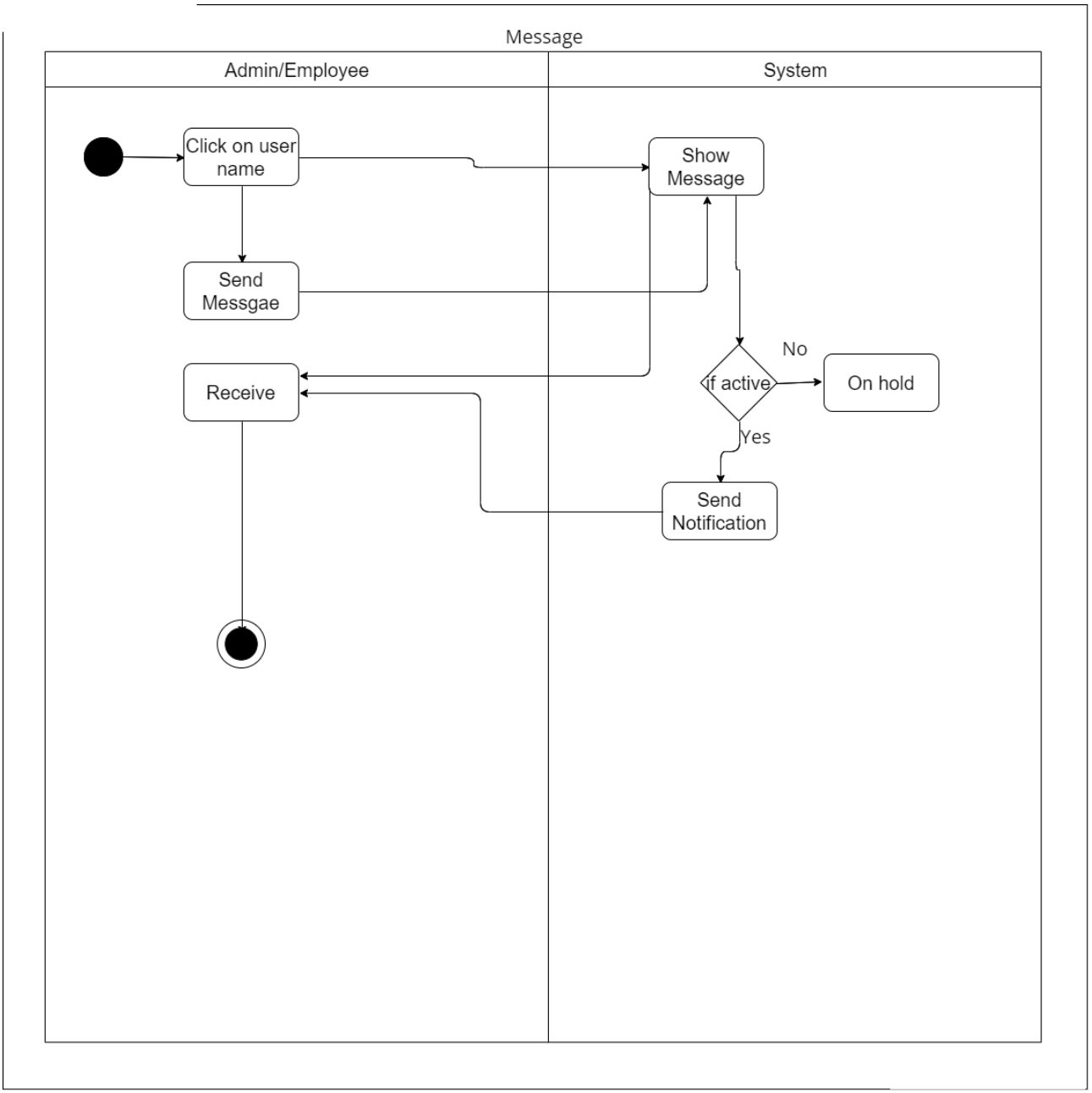


Figure 6. 5: Swim Lane diagram for Message

Swim Lane Diagram for profile

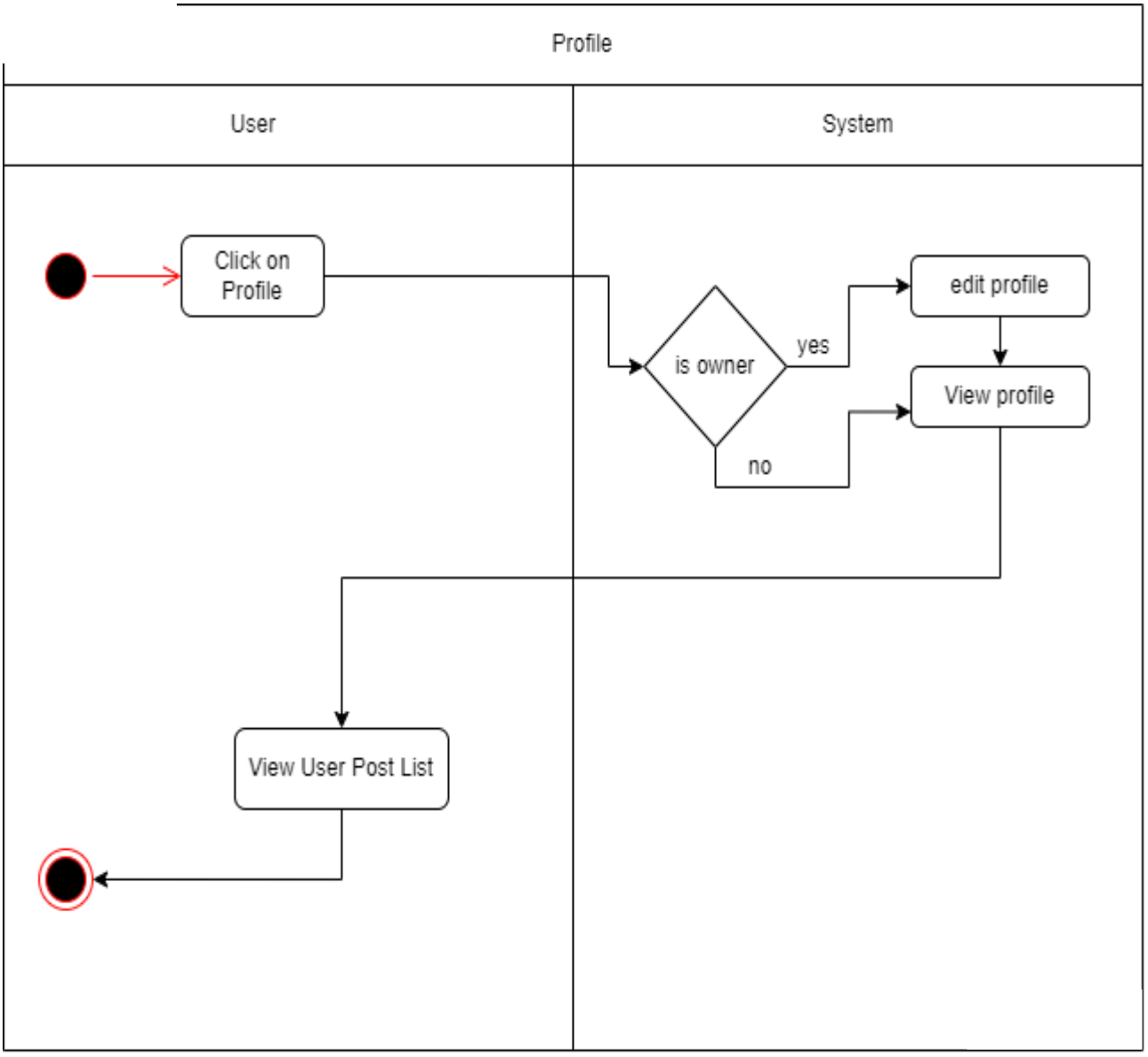


Figure 6. 7: Swim Lane diagram profile

Swim Lane Diagram for Admin

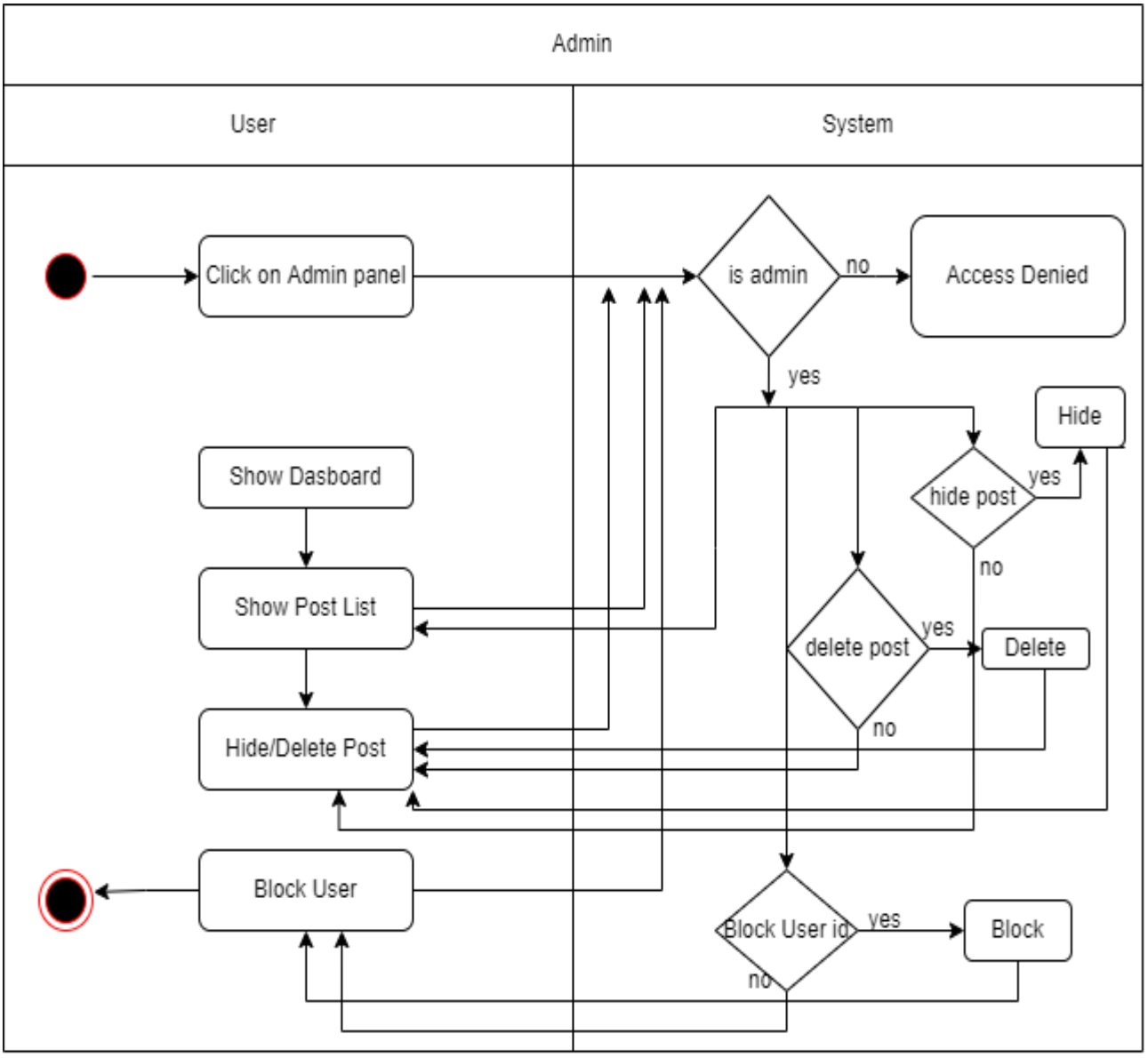


Figure 6. 8: Swim Lane Diagram for admin

Chapter 7: Designing

7.1 Interface design

Login page interface

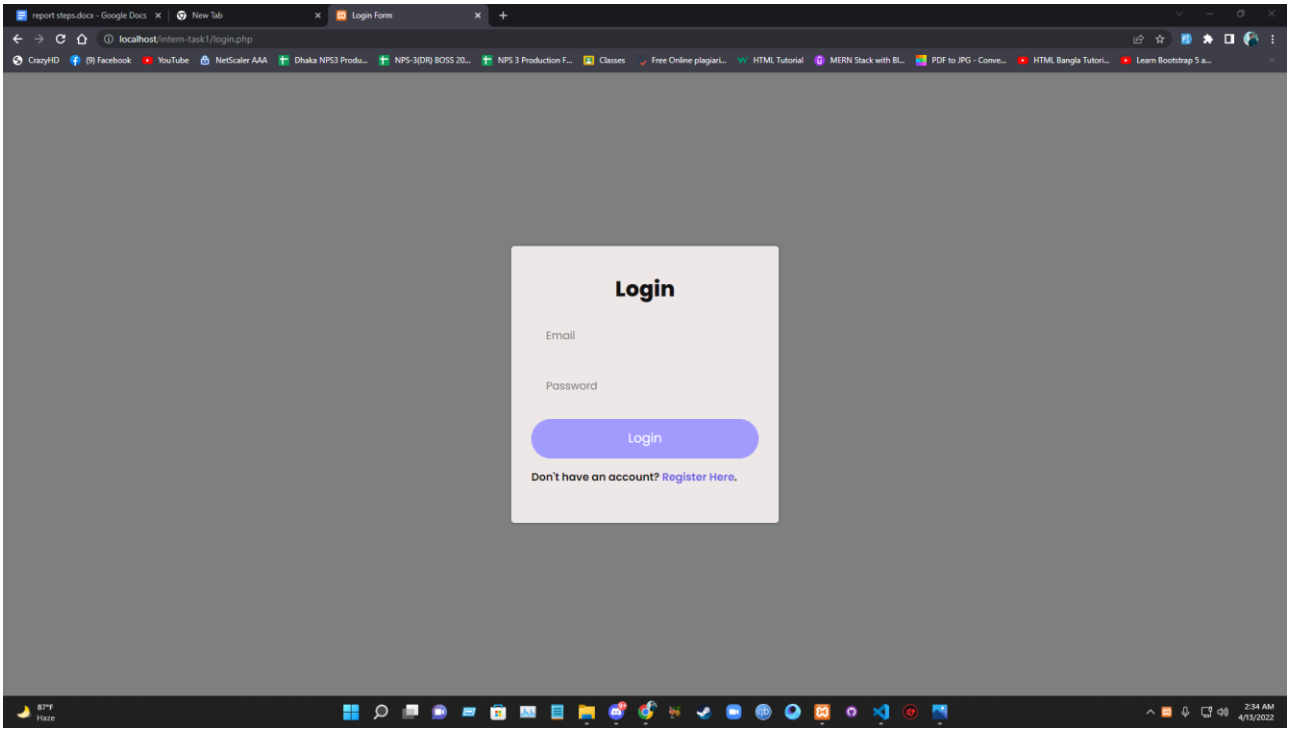


Figure 7. 1: Login page

Registration interface for Login

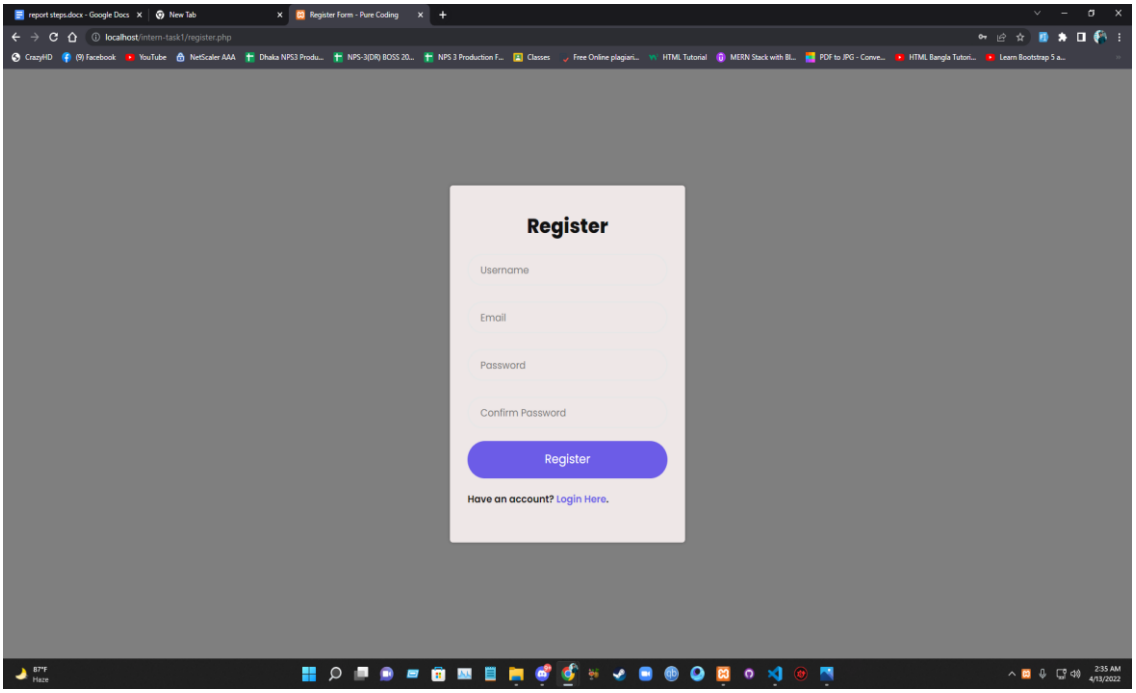
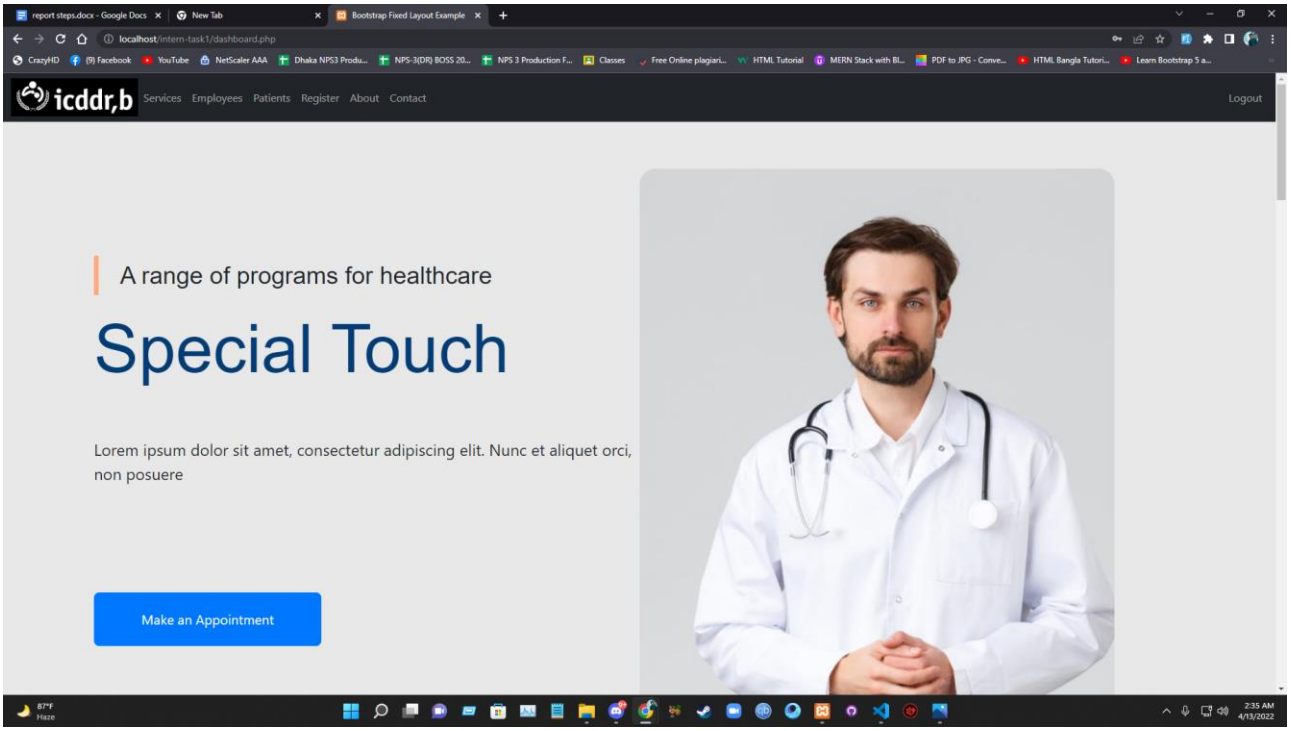


Figure 7. 2: Registration interface for Login

Dashboard interface for user/admin/guest



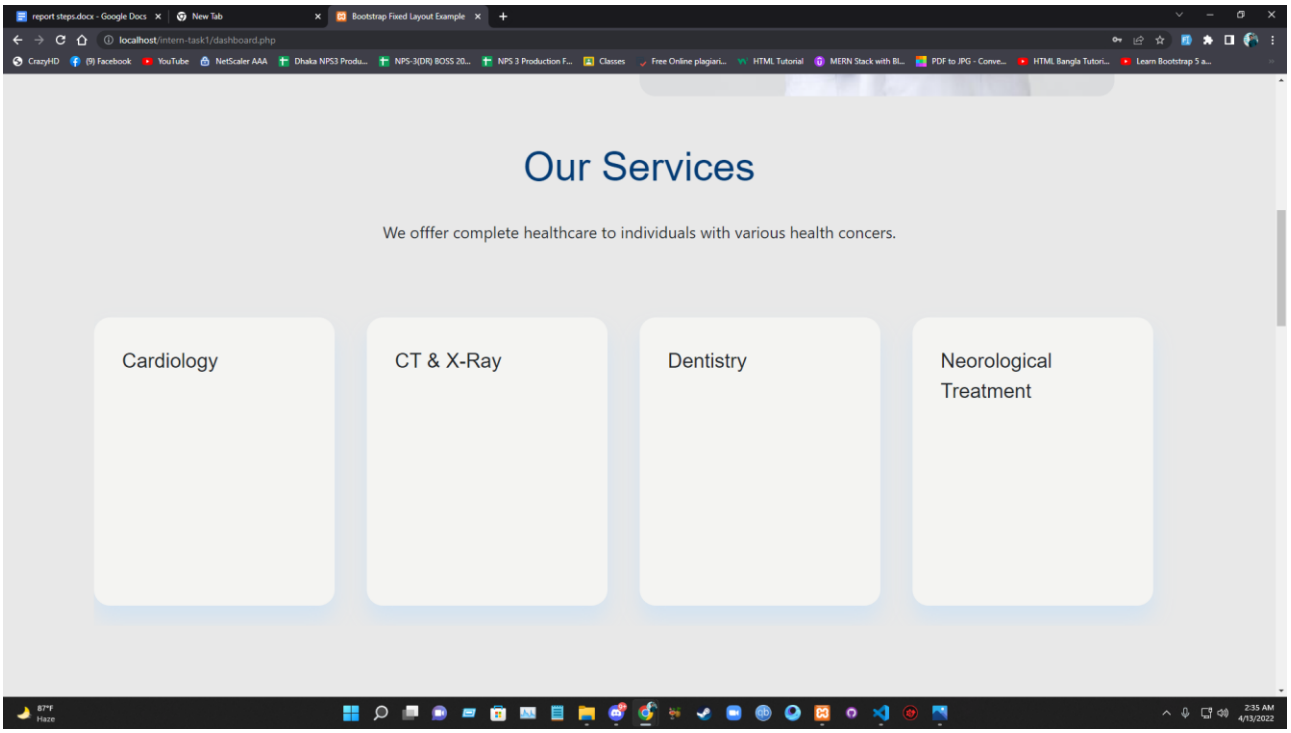


Figure 7. 3: Dashboard View

Patient detail View

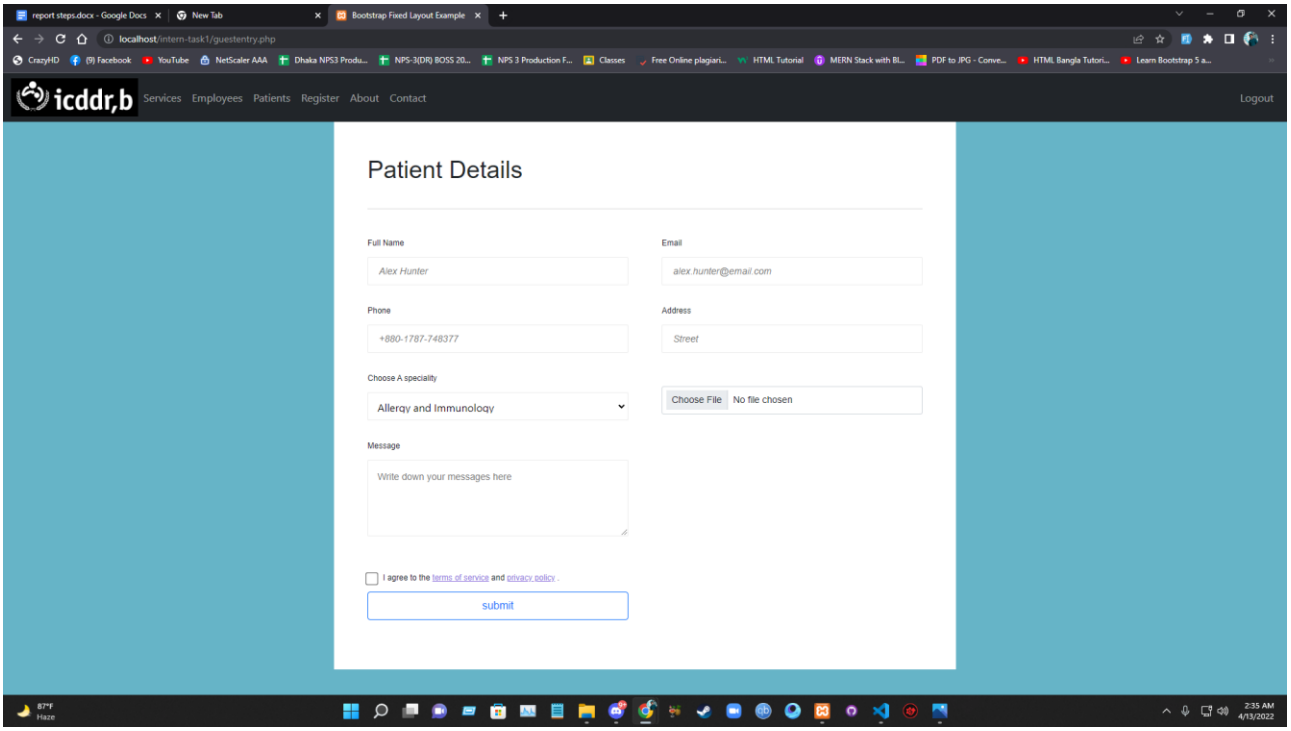


Figure 7. 4: Patient Details view

Employees page View

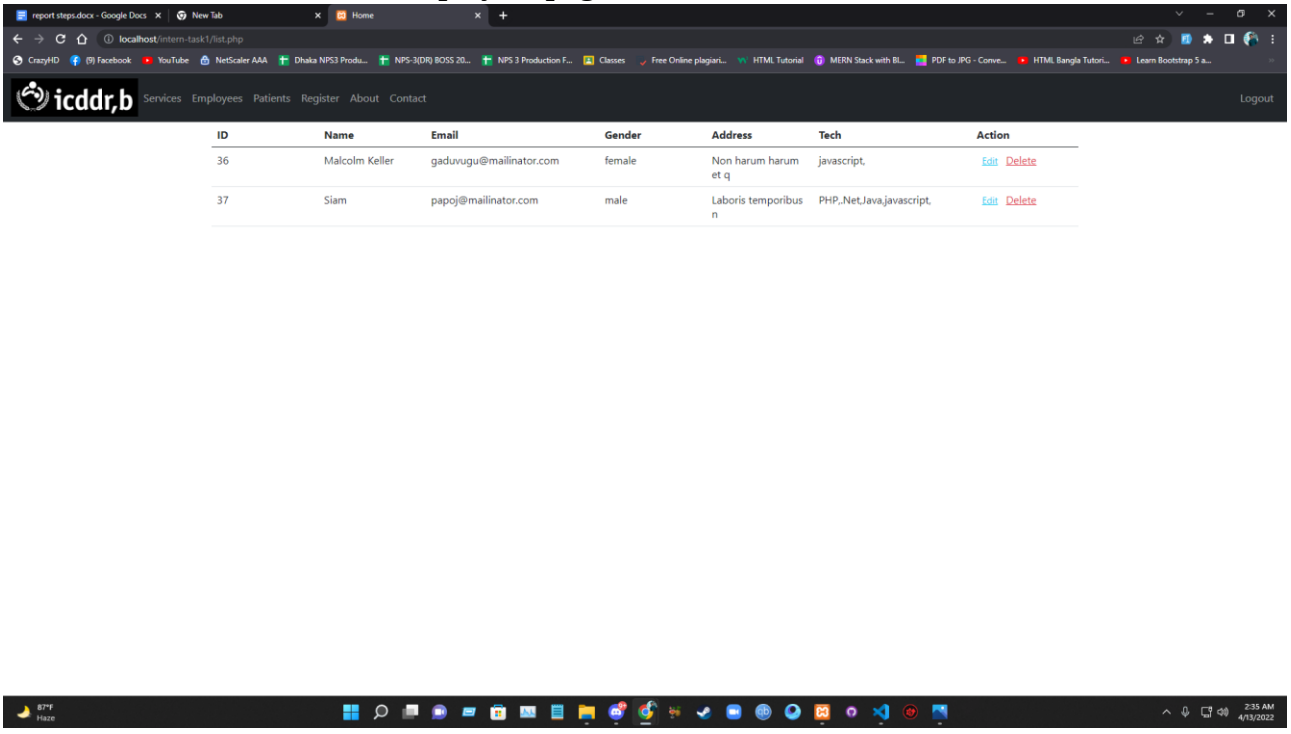


Figure 7. 5: Employees page View

Patients page View

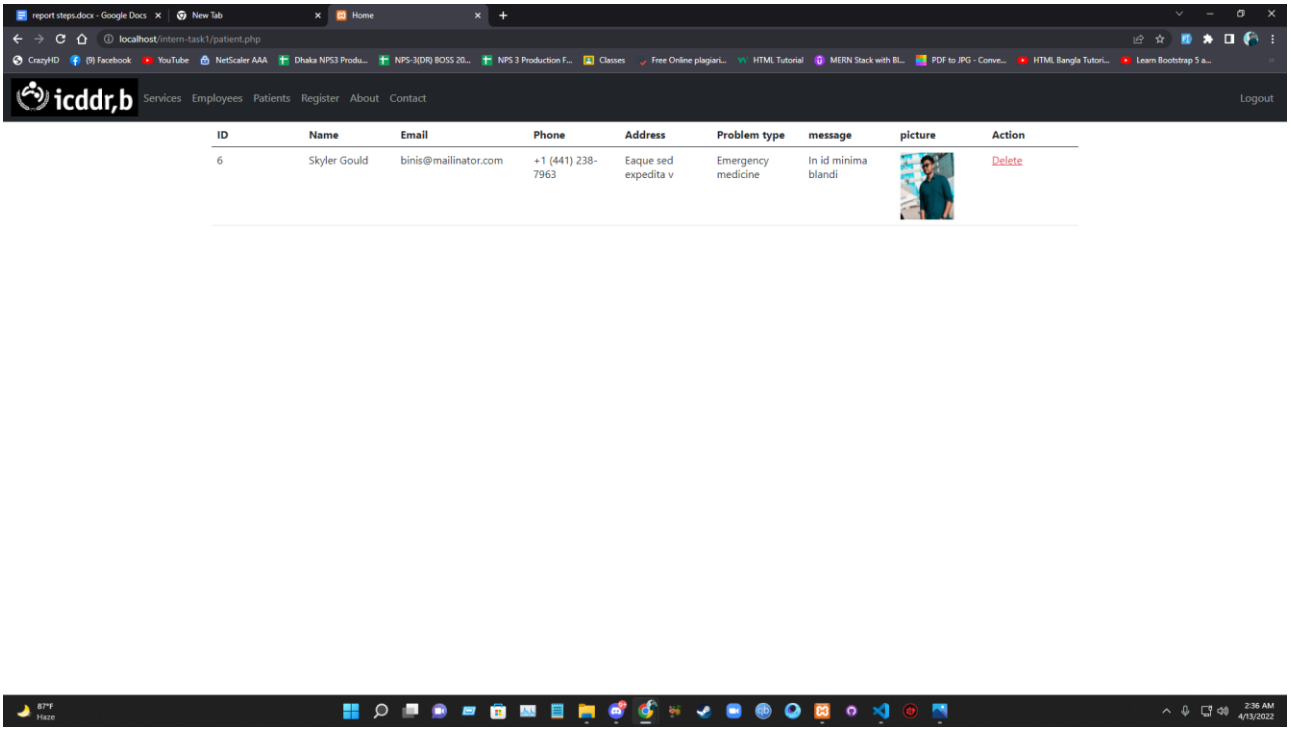


Figure 7. 6: Patient page view

Employees registration page View

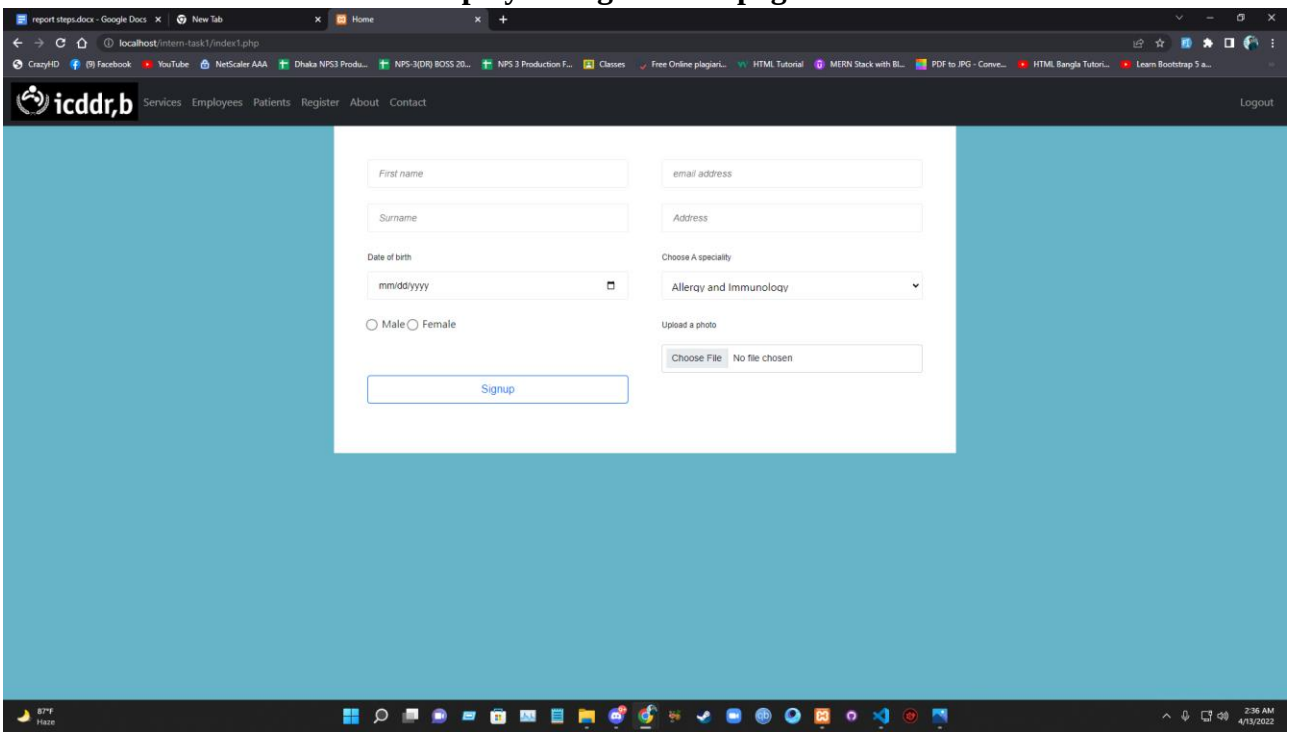


Figure 7. 7: Employees registration page View

Patient info confirmation page

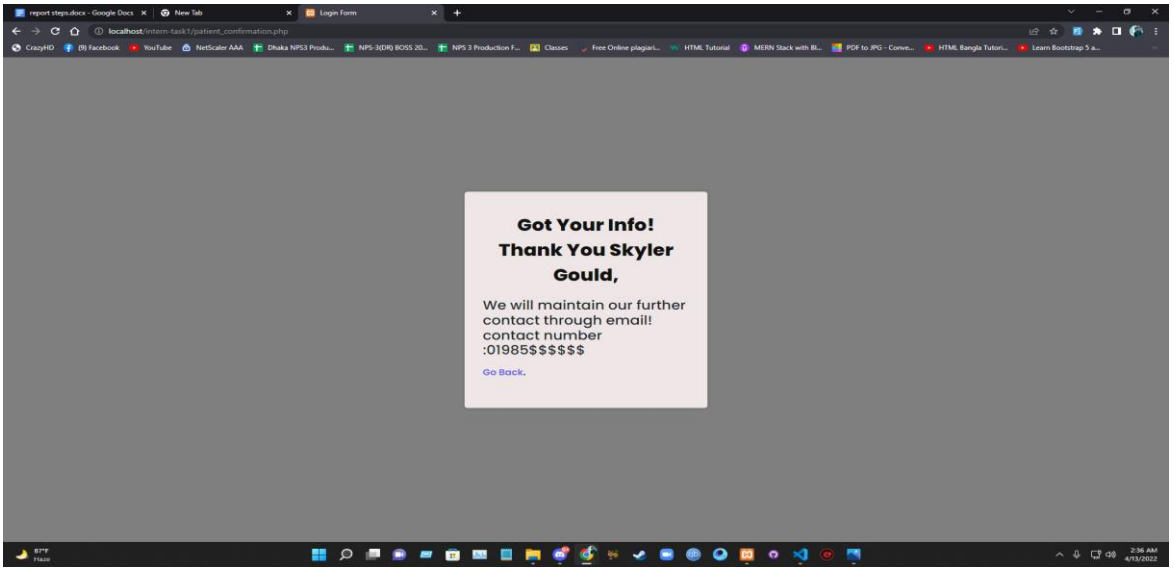


Figure 7. 8: Patient info confirmation page

7.2 Data Flow Diagram

A Data Flow Diagram (DFD) is a traditional visual representation of the information flows within a system. DFD maps out the flow of information for any process or system. It uses defined symbols like rectangles, circles and arrows, plus short text labels, to show data inputs, outputs, storage points and the routes between each destination. It shows how information enters and leaves the system, what changes the information and where information is stored.

Context Level Diagram (0 Level)

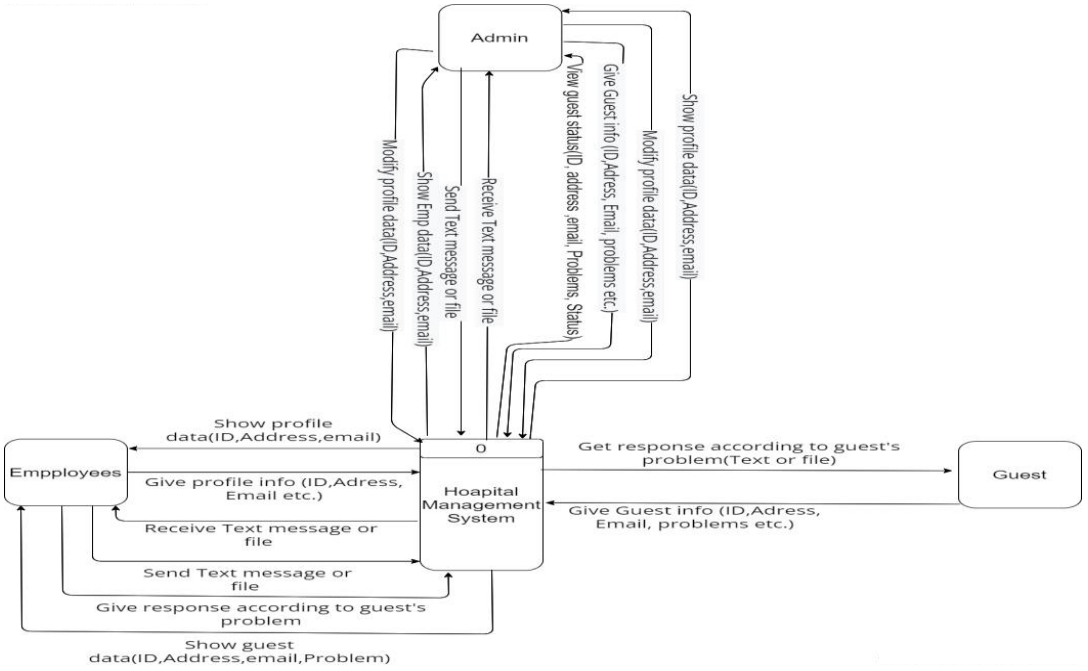


Figure 7. 15: Data Flow Diagram for Context Level (level 0)

Level 1 Data Flow Diagram

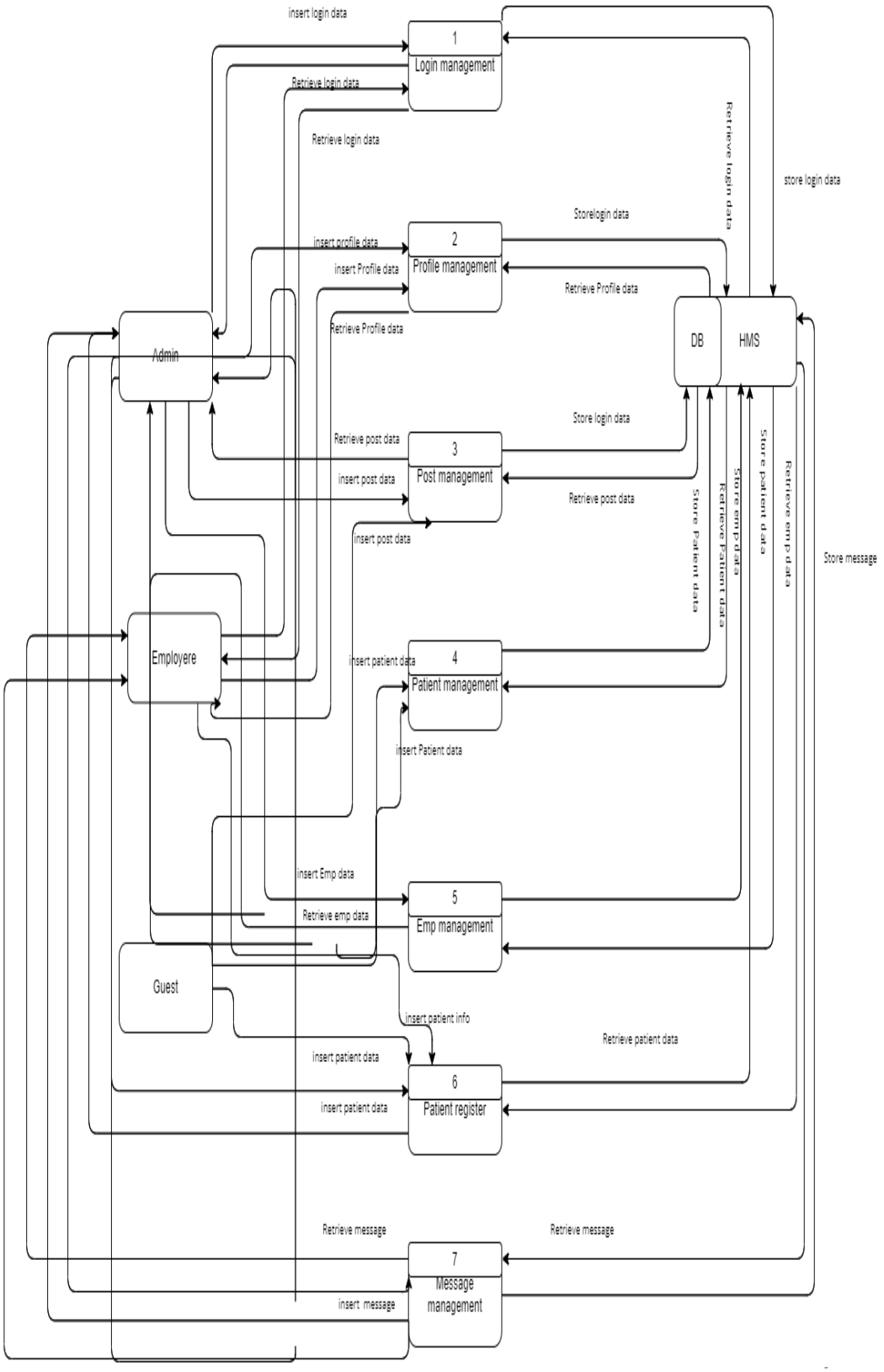


Figure 7. 16: Data Flow Diagram for Level 1

Level 2 DFD of Process 1(Manage Login)

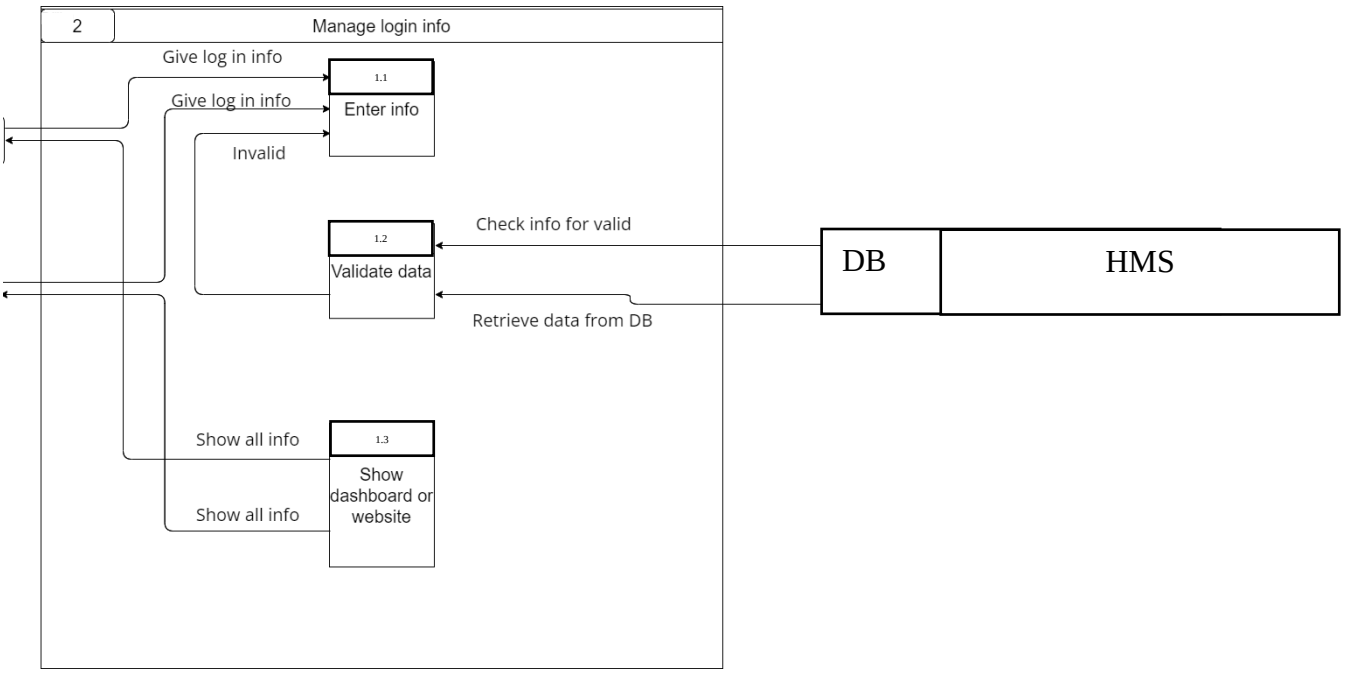


Figure 7. 17: Level 2 DFD of Process 1(Manage Login)

Level 2 DFD of Process 2(Manage Profile)

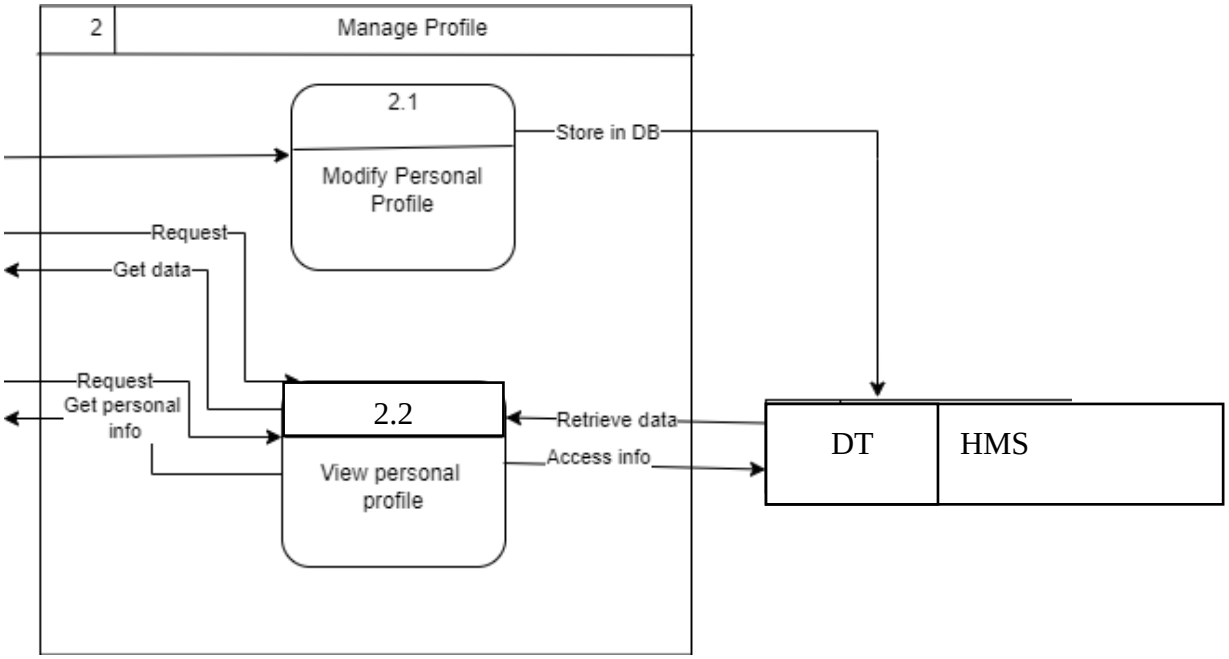


Figure 7. 18: Level 2 DFD of Process 2(Manage Profile)

Level 2 DFD of Process 3(Manage Post)

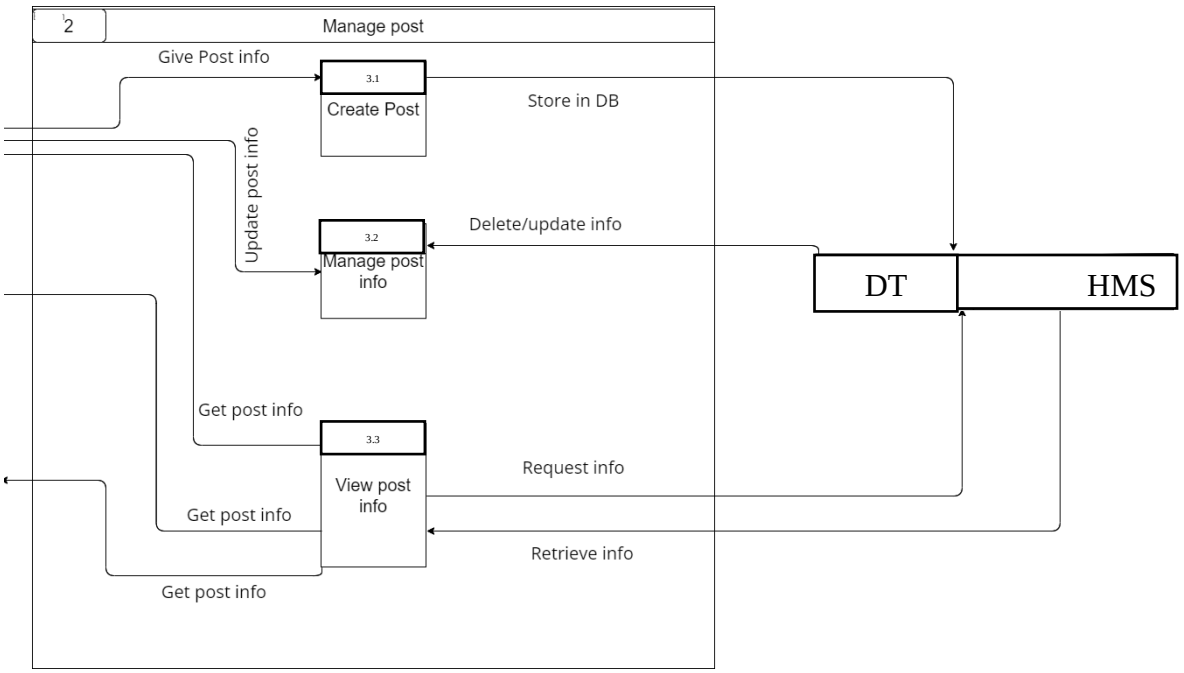


Figure 7. 19: Level 2 DFD of Process 3(Manage Post)

Level 2 DFD of Process 6(Manage Message)

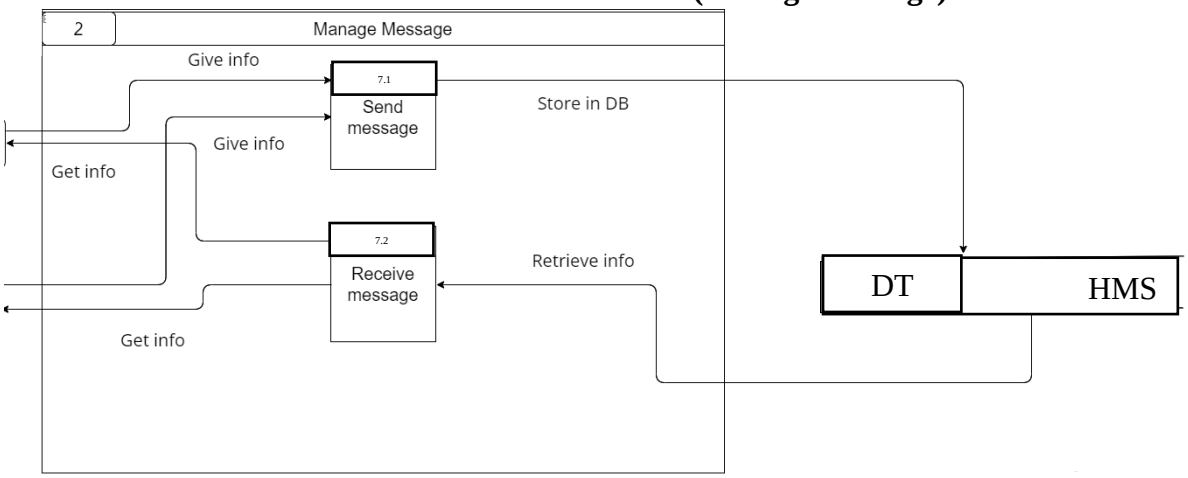


Figure 7. 22: Level 2 DFD of Process 6(Manage Massage)

7.3 Database Design

A database named Development of Hospital Management System is used in this 'Development of LRAS project. The tables of the database are shown below:

Entity Relationship Model

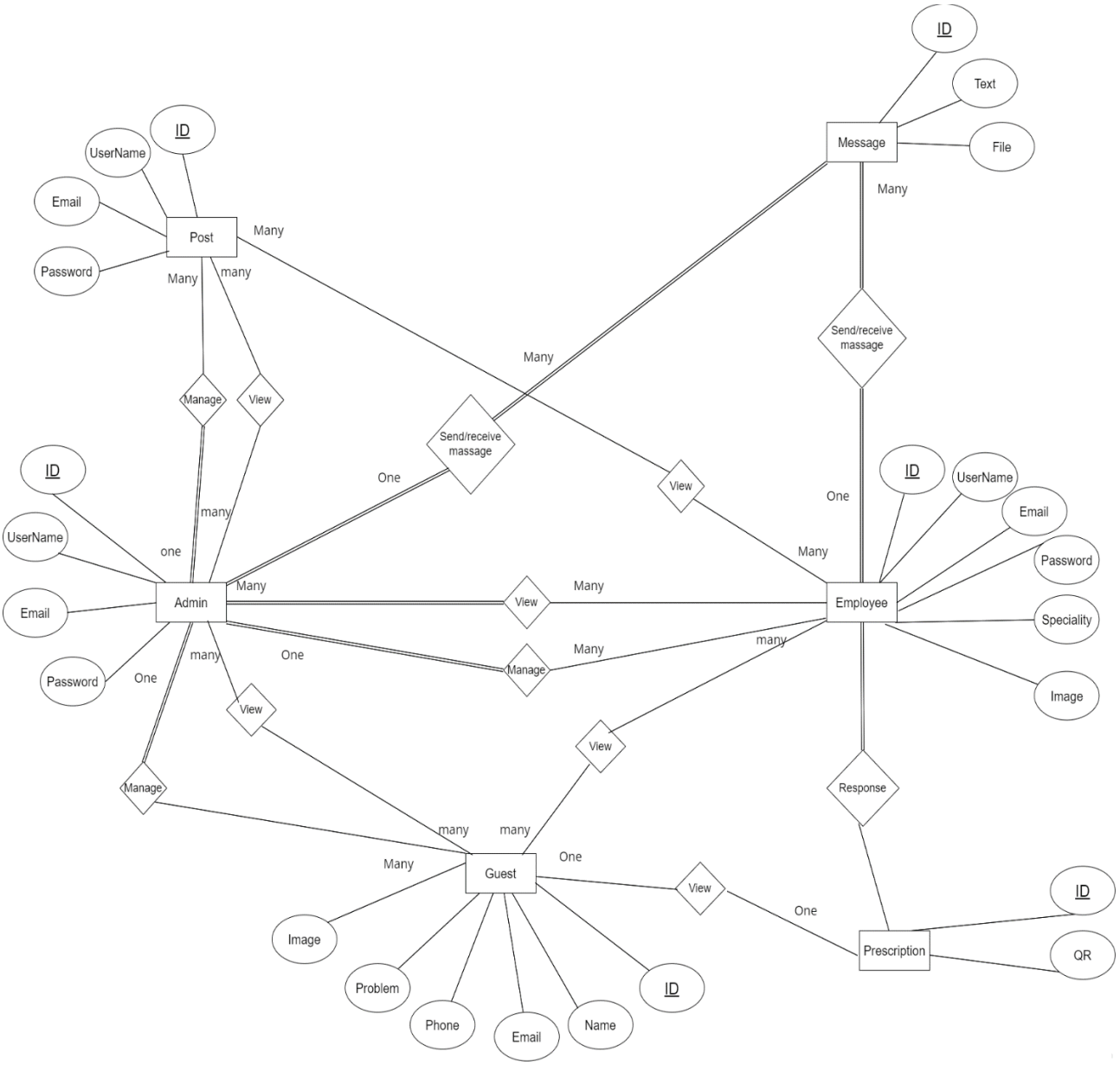


Figure 7. 24: Entity Relationship Diagram

Database Table Structure All Database Table Structure

	Table	Action						Rows	Type	Collation	Size	Overhead
☐	guest	☆	Browse	Structure	Search	Insert	Empty	Drop	1	InnoDB	utf8mb4_general_ci	16.0 KiB	-
☐	post	☆	Browse	Structure	Search	Insert	Empty	Drop	0	InnoDB	utf8mb4_general_ci	16.0 KiB	-
☐	user	☆	Browse	Structure	Search	Insert	Empty	Drop	2	InnoDB	utf8mb4_general_ci	16.0 KiB	-
☐	users	☆	Browse	Structure	Search	Insert	Empty	Drop	3	InnoDB	utf8mb4_general_ci	16.0 KiB	-
	4 tables	Sum							6	InnoDB	utf8mb4_general_ci	64.0 KiB	0 B

Figure 7. 25: All Database Table Structure

Employee Table Structure

	#	Name	Type	Collation	Attributes	Null	Default	Comments	Extra	Action
☐	1	id	int(10)			No	None		AUTO_INCREMENT	Change Drop More
☐	2	name	varchar(255)	utf8mb4_general_ci		No	None			Change Drop More
☐	3	email	varchar(255)	utf8mb4_general_ci		No	None			Change Drop More
☐	4	gender	varchar(255)	utf8mb4_general_ci		No	None			Change Drop More
☐	5	address	varchar(255)	utf8mb4_general_ci		No	None			Change Drop More
☐	6	tech	varchar(255)	utf8mb4_general_ci		No	None			Change Drop More

Figure 7. 26: Employee Table Structure

Admin Table Structure

	#	Name	Type	Collation	Attributes	Null	Default	Comments	Extra	Action
☐	1	id	int(255)			No	None		AUTO_INCREMENT	Change Drop More
☐	2	username	varchar(255)	utf8mb4_general_ci		No	None			Change Drop More
☐	3	email	varchar(255)	utf8mb4_general_ci		No	None			Change Drop More
☐	4	password	varchar(255)	utf8mb4_general_ci		No	None			Change Drop More

Figure 7. 27: Admin Table Structure

Post Table Structure

	#	Name	Type	Collation	Attributes	Null	Default	Comments	Extra	Action
☐	1	id	int(255)			No	None		AUTO_INCREMENT	Change Drop More
☐	2	type	varchar(255)	utf8mb4_general_ci		No	None			Change Drop More
☐	3	caption	varchar(255)	utf8mb4_general_ci		No	None			Change Drop More
☐	4	message	varchar(255)	utf8mb4_general_ci		No	None			Change Drop More

Figure 7. 28: Post Table Structure

Chapter 8: Quality Assurance and Testing

Software testing is the method of analyzing a software item to notice variations between given input and expected output. Also, to assess the feature of A software item. Testing assesses the standard of the product. code testing may be a process that ought to be done throughout the event process. In different words, software testing is a verification and validation process.

Verification:

Verification is the process of ensuring that the product meets the requirements imposed at the start of the development phase. In other words, to make sure the product behaves the way you want it to.

Validation:

Validation is the process of ensuring that the product meets the specified requirements at the end of the development phase. In other words, to ensure that the product is built according to customer requirements.

8.1 System Quality Management

A quality management software system that is automated and links all departments is essential for a regulated or ISQ compliant company. A QMS or TQM (Total Quality Management) system can link each stage of the product development cycle to each department of a company.

There are mainly two types of quality, they are given below:

- Internal Quality
- External Quality

8.1.1 Internal quality:

- Test coverage
- Testability
- Portability
- Thread-safeness
- Conciseness
- Maintainability
- Documentation
- Legibility
- Scalability

8.1.2 External quality:

- Features
- Speed
- Space
- Network usage
- Stability
- Robustness, Ease-of-use
- Determinism
- Back-compatibility

8.1.3 Software Quality Management Process

- The aim of Quality Management (SQM) is to manage the standard of software and development and of its development process.
- A top-quality product is one that meets its necessities and satisfies the user.
- A top-quality culture is a corporation atmosphere wherever quality is viewed as everyone's responsibility.

8.1.4 Quality Assurance Matrix

The quality assurance matrix of the project "Hospital Management System" involves the application of specific quality processes and checking that these qualities have been followed. The quality involved in the system of this software.

8.2 System Testing

System testing is the testing of a whole and totally integrated software package product. Usually, the software is barely one part of a bigger computer-based system. Ultimately, the software is interfaced with different software/hardware systems. System Testing is truly a series of various tests whose sole purpose is to exercise the total computer-based system.

Two Category of Software Testing

- Black Box Testing
- White Box Testing

8.2 Black-box Testing

Black box testing, also called behavioral testing, focuses on the functional requirements of the software. It allows the software engineer to drive sets of input conditions that will fully exercise all

functional requirements of a program. The Black box test method will be applied to the Hospital Management System test modules.

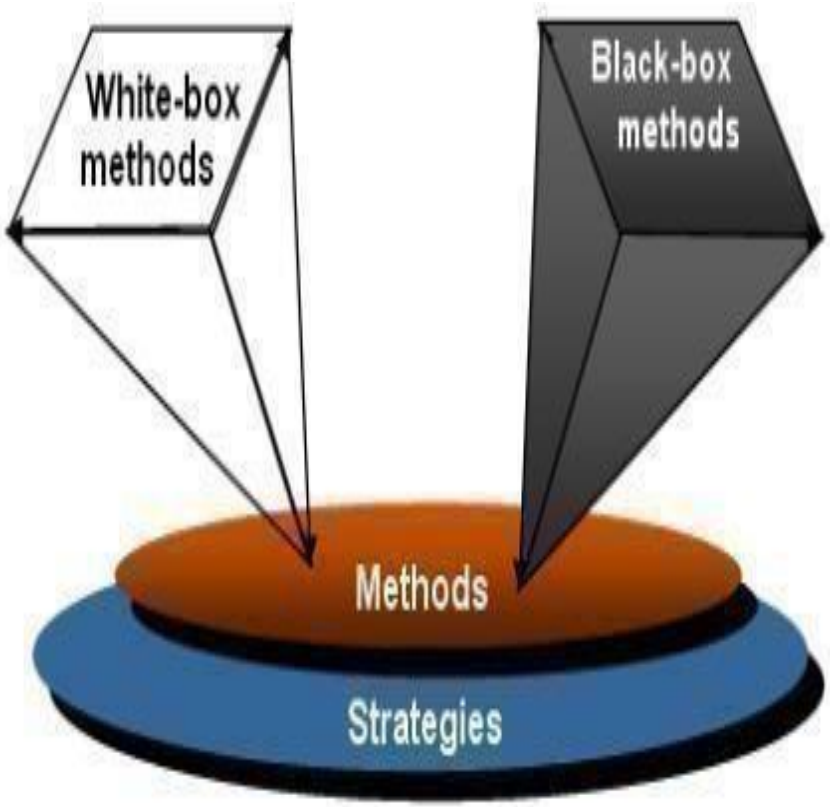


Figure 8. 1: Black box and White box Testing Source (SIMFORM, n.d.)

8.3 White-box Testing

White box testing, also known as glass box testing, is a test case design method that uses the procedural design control framework to derive test cases. Using white box testing methods, the software engineer can derive test cases that,

1. Ensure that all independent paths in a module have been exercised at least once.
2. Exercise all logical decisions on their true and false side
3. Execute all loops to their limits and within their operational limits
4. Exercise internal data structures to ensure their validity.

Modules containing complex calculation modules or decision codes such as checking the availability of elements of the library will be tested using the white box method.

8.3 System Testing Design

➢ Test case 01

Testing scenario No:1	
Scenario	Admin, Employee Login testing scenario of my System.
Input's	Email, password of admin, user for login.
Desired Output's	When enter email, password then get access level define.
Actual output's	For login test, my system work correctly.
Verdict	Getting result from Desired Output's and Actual Output's decided this system is successful for login.

➢ Test Case 02

Testing scenario No:2	
Scenario	Admin can create post.
Input's	post,message will create and stored into database.
Desired Output's	When enter all basic info correctly, display posts in newsfeed, comment on details views of posts comment section.

Actual output’s	Post displayed, my system work correctly.
Verdict	Getting result from Desired Output’s and Actual Output’s decided this system is successful for create post.

➢ Test Case 03

Testing scenario No:4	
Scenario	Admin can register themselves and also employees
Input’s	Admin;’s info or Employee’s info will be stored into the database.
Desired Output’s	When enter all basic info correctly, display Employee details in the system.
Actual output’s	Information displays my system work correctly.
Verdict	Getting result from Desired outputs and actual outputs decided this system is successfully added.

➢ Test Case 04

Testing scenario No:3	
Scenario	Employee and admin can communicate
Input’s	Message or file
Desired Output’s	When enter message or file it send to the desired person
Actual output’s	my system work correctly.
Verdict	Getting result from Desired Output’s and Actual Output’s decided this system is successful for communicate.

➢ Test Case 05

Testing scenario No:4	
Scenario	Employee can register themselves
Input's	Employee info will be stored into the database.
Desired Output's	When enter all basic info correctly, display user details in the system.
Actual output's	Information displays my system work correctly.
Verdict	Getting result from Desired outputs and actual outputs decided this system is successfully added.

➢ Test Case 06

Testing scenario No:4	
Scenario	Guest can submit their problems
Input's	Guest info will be stored into the database.
Desired Output's	When enter all basic info correctly, display Guest details in the system.
Actual output's	Information displays my system work correctly.
Verdict	Getting result from Desired outputs and actual outputs decided this system is successfully added.

Chapter 9: Conclusion

9.1 Preface

Today is the age of modern science and communication, which is crucial for the development of more effective management and operational processes. Provide better and uninterrupted services to keep the service constantly. I was fortunate and blessed to have had the good fortune to work with some of these efficient, friendly and hardworking engineers. My sincere thanks, gratitude and greetings to these wonderful people from the bottom of my heart.

9.2 Practicum and Its Value

In career development, as in most issues in life, there is a direct relationship between commitment and reward. For me, the internship can be a transition between study life in an engineering school and real-world employment through hands-on experience of engineering practices. The four-year undergraduate engineering studies provide the student with theoretical and practical knowledge. Using this knowledge and observing the operating system in real time, the hands-on program clarifies these topics on another level equipped with practical working skills. Considering this fact, it gives us immense pleasure to say that my internship was a successful event. Practical work experience has no other alternative. Before entering the world of work, the student must have real work experience in a major field of study. Now, a one-day recruiter no longer only considers high grades, good communication skills, and part time work experience. They place great importance on a candidate's work experience. Students with better work experience get better job opportunities. ICDDRB gave me the opportunity to work in a professional working environment. During the internship period, I tried my best to make my system efficient. I followed the lessons, methods, tools, and techniques that I learned during my study period at IUBAT. Successful software development is a mix of standard development practices, adequate theoretical knowledge, and developer creativity. Students at IUBAT's College of Engineering and Technology (CEAT) choose this 6-hour weighted practice program, which is semester-long and usually after classes end. A report delivered after the end of the internship followed by a presentation and a comprehensive review of the entire four-year training.

9.3 Future Plan

This project is in its initial stage. So, we will include more features for this system and based on user’s need we will maintain this system and give them support. Some more features are stated below:

- Optimize this website to work with a large scale of data.

- For each notification there will be specific route.
- System will work fast as the more calculation will be added.
- Sing in option using third party applications.

9.4 Conclusion

The biggest experience working at ICDDRB is indeed being a part of designing and implementing software. Our most experience was around the designing issue; I have learnt a lot of new things which were so much unknown to us.

The objective of software planning was to provide a framework that enables the Employees and patients to get a decent work experience within a limited time frame at the beginning of the software project and should be updated regularly as the project progresses. Although I could not include all the functionality that I thought to include in this software, I worked hard to make it fully functional in this small amount of time. As my knowledge of programming grows by time, I shall look to make it a better one in every possible way. I hope this software project serves well to its benefactor and gives ideas to programmers about more advanced automated Hospital Management System related problem solving and data. I think our honorable faculty are supporting us by giving valuable advices and guide lines to accomplish project goal.

I believe I can use this experience in our future career as well.

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