



Tribhuvan University
Faculty of Humanities and Social Sciences
PATIENT REPORT MANAGEMENT SYSTEM

A PROJECT PROPOSAL

Submitted to
Department of Computer Application
Ratna RajyaLaxmi Campus, Kathmandu

In partial fulfilment of the requirements for the Bachelors in Computer Application

Submitted by:
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Supervisors' Recommendation

I hereby recommend that this project prepared under my supervision by Sonik Badal and Dabal Budha entitled “**Patient Report Management System**” in partial fulfilment of the requirements for the degree of Bachelor of Computer Application is recommended for the final evaluation.

Mr.Roshan Maharjan

SUPERVISOR

Lecturer

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Letter of Approval

This is to certify that this project prepared by **Sonik Badal** and **Dabal Budha** entitled “**Patient Report Management System**” in partial fulfilment of the requirements for the degree of Bachelor in Computer Application has been evaluated. In our opinion it is satisfactory in the scope and quality as a project for the required degree.

| | |
|--|--|
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| <hr/> Internal Examiner | <hr/> External Examiner |

Abstract

The project entitled ‘Patient Report Management System’ is a web-based project. This project has designed and implemented an application that will generate a report for a clinic with minimum user inputs. This system can add patients, create their medical reports, and stores them in a database. It is also able to view old reports of a patient and edit them if required. This system only provides authority to delete patients, reports, or modify users to the admin. In this system the backend is developed using PHP, the frontend using HTML, CSS, and JavaScript, and MYSQL is used for the database. This project will help management to save time used in developing and managing both reports and patients.

Keywords: -

Patient, Report Web-based application, HTML, CSS, PHP, JavaScript, MySQL

Acknowledgement

The satisfaction that accompanies the successful completion of any task would be incomplete without the mention of people whose ceaseless cooperation made it possible, whose constant guidance and encouragement crown all efforts with success.

We are grateful to our project guide **Mr. Roshan Maharjan** sir for his guidance, inspiration, and constructive suggestions that helped us for preparing this project.

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List of Abbreviations

HTML – HyperText Markup Language

CSS – Cascading Style Sheet

JS – JavaScript

PHP – Personal Home Page

UI – User Interface

ER – Entity Relationship

DFD – Data Flow Diagram

HTTP: HyperText Transfer Protocol

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Chapter 1: Introduction

1.1. Introduction

Patient Report management System plays a great role and has a potential effect on day to day performance measures, this type of system has highly evolved over decades due to high demand for their use, effectiveness, and efficiency in any given institution. Due to rapid change of technology, the use of such a system has become a necessity to any health institution for better performance and be used with quite a large number of patients at the same time and save time, resources, and creates awareness of the evolving technology. This system provides the feature of searching, creating, and storing the report of patients of the respective institution.

It is a fully-fledged system that is aimed at enabling manual Medical centres to keep track of all the patient reports and be accessed with ease. This system helps to improve medical services and increase efficiency. The developed system enhances the quality and efficiency and also ease for assessing the report. This system also helps doctors to know a patients' complete medical conditions and history in an efficient manner.

1.2. Problem Statement

In the context of Nepal, many patient have to face hurdles. They doesn't get the proper information about their medical report. They also have to register themselves first which is a tedious job. They also get a report which they don't understand at all and often lost their past medical reports.

1.3. Objectives

The objectives of Patient Report Management System are:

- To display complete patient medical history.
- To display the name of doctors that have examined the patient.
- To ease doctors to know patient details.

1.4. Scope and Limitation

This system is designed to save everyone time by cutting tedious paper works. This system also provides users access to easily add/edit both patient and their reports. Users can also view or print patient reports, both past and present reports.

However, this system won't be useful if there is no network connection. This system is also developed only as a web application. This system also doesn't alert anyone via email.

1.5. Report Organization

Chapter 1 consists of introduction, problem statements, objectives, scope and limitations regarding the project.

Chapter 2 contains background study and literature review. It shows the analyses done to an existing system in brief

Chapter 3 consists of requirement analysis which includes function and non-functional requirement, feasibility study includes technical, economical, operation and schedule feasibility, data modelling includes ER diagram, process modelling includes DFD diagrams.

Chapter 4 summarize on implementing and testing, tools used for preparation of the project. Testing includes unit testing and system testing.

Chapter 5 includes lesson learnt/outcome, conclusion and future recommendation.

Chapter 2: Background Study and Literature Review

2.1. Background Study

For this project, much research and review were done on some of the related websites and applications. Throughout the research, it was found that there are very few websites or applications related to storing patient report records. So, the users are unable to see their past reports if lost.

2.2. Literature Review

Medical institutions are facing serious problems in providing care to patients with increasingly complex conditions, in a shorter period as well as administrative pressures to improve productivity and quality. Sorrentino [1] advocates that automation can provide them with an opportunity to direct their time and effort to meaningful patient care.

Tedious administrative tasks can be eliminated using computerization.

Adderley [2] maintains that “computerization has allowed more time for personalized patient care and patient/staff interaction”. They also concluded that “it (computerization) has made information readily available for acquisition and analysis of data”.

Anderson [3] also argue that a computer-based patient record could improve health care in several important ways. It could provide practitioners with rapid access to more reliable patient data. It could also support clinical decision-making, clinical reminders and alerts, quality assurance, and outcomes research.

According to Neame [4] the benefits of an electronic medical record are numerous. Information is available from every computer that is connected to the database and entries made by multiple providers in different locations can be linked to create a single record for an individual. Data can be checked as it is entered to ensure adequacy and accuracy. The same data can be viewed in different ways and links to knowledge-based tools are also possible.

Although this type of many systems exists they consist of a large area that is too broad for small hospitals and clinics. Pre-existing systems like Practice Fusion [5] costing about \$150 per month, and Report Master [6] costing about \$595 for a single device, which is very expensive for small institutions. They also tend to have a complex user interface and cannot be bought or used by small clinics requiring only limited features, and having a tight budget.

Chapter 3: System Analysis and Design

This project **Patient Report Management System** is developed following **Waterfall model** which is based on a linear sequential flow. This means that any phase in the development process begins only if the previous phase is complete. In this waterfall model, the phases do not overlap. [7]

3.1. System Analysis

This system provides good features for storing patient reports making it easier for the doctor, staff to know their past conditions. This system gives the right to admin only for adding users who can access this system.

3.1.1. Requirement Analysis

i. Functional Requirements

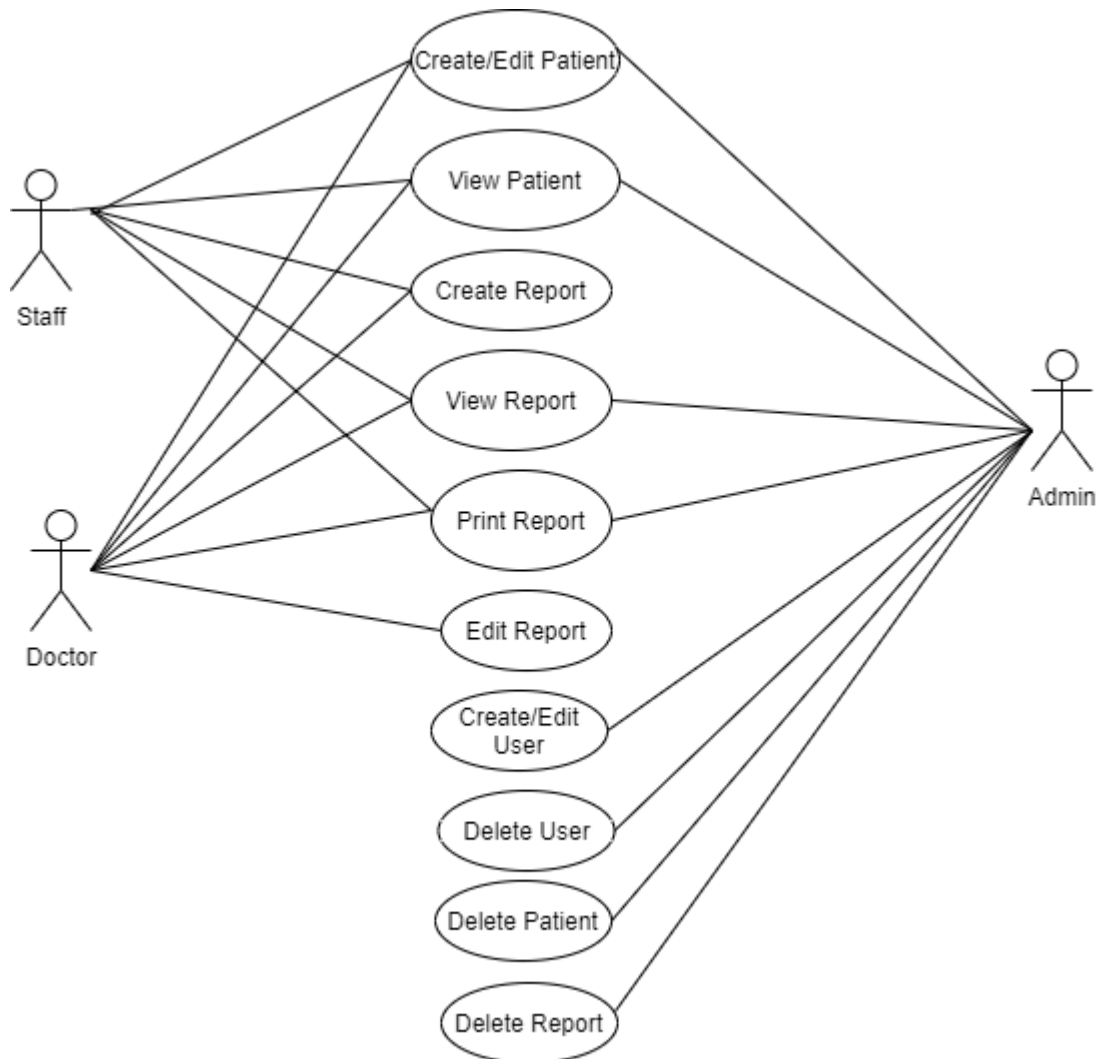


Figure 1: USE-CASE Diagram of Patient Report Management System

Figure 1 shows the case diagram of this project. There are three actors, staff, doctor, and admin. Admin is allowed to check staff, patient, and doctors' information. They can also delete any user, patient, or report. Here every actor can create, view, and edit patient details. They can also refer patients to a doctor, yet only the doctor can edit or write a report.

ii. Non Functional Requirements

Availability:

This system is developed as a web application and can be used online.

Security:

This system is secure, and no information will be available outside of the system for everyone's privacy.

Performance:

This system is designed for smooth performance with optimization and good response.

Reliability:

This system has good privacy features and is reliable for users.

3.1.2. Feasibility Analysis

A feasibility study, as the name suggests, is designed to reveal whether a project/plan is feasible. It is an assessment of the practicality of a proposed project/plan. Feasibility of a new system means ensuring that the new system, which we implemented, is efficient and affordable. There are various types of feasibility to be determined.

i. Technical

The technical requirement for the system is economic, and it does not use any other additional hardware and software. This system can be operated by users with simple knowledge regarding the required technologies.

ii. Operational

The system working is easy to use and learn due to its simple but attractive interface. The user requires only basic training to operate this system.

iii. Economic

The system is economically feasible as many of the tools and resources required are cheap and easily available.

iv. Schedule

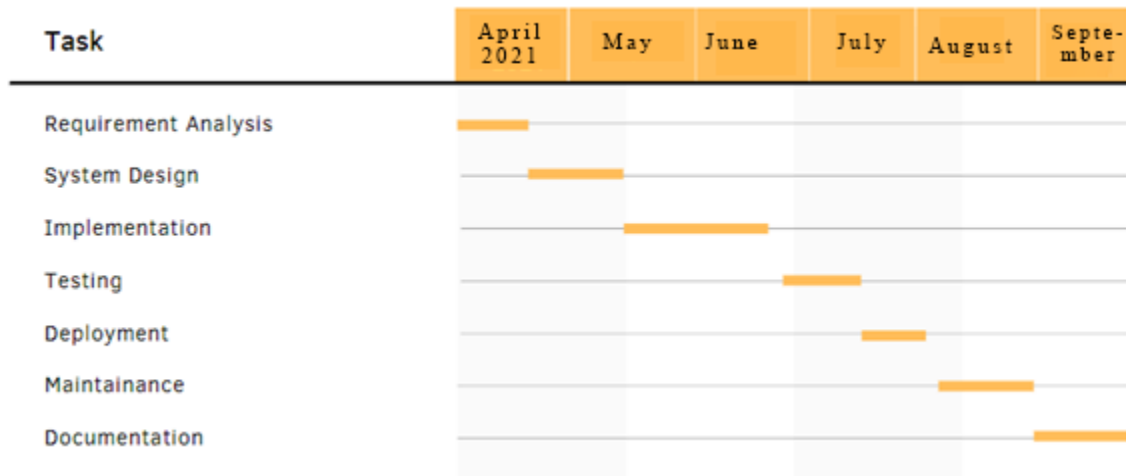


Figure 2: Gantt chart of Patient Report Management System

This project is completed realistically and achieved under a deadline. It was developed within a time limit. Hence, it is feasible in the respective schedule.

3.1.3. Data Modelling (ER-Diagram)

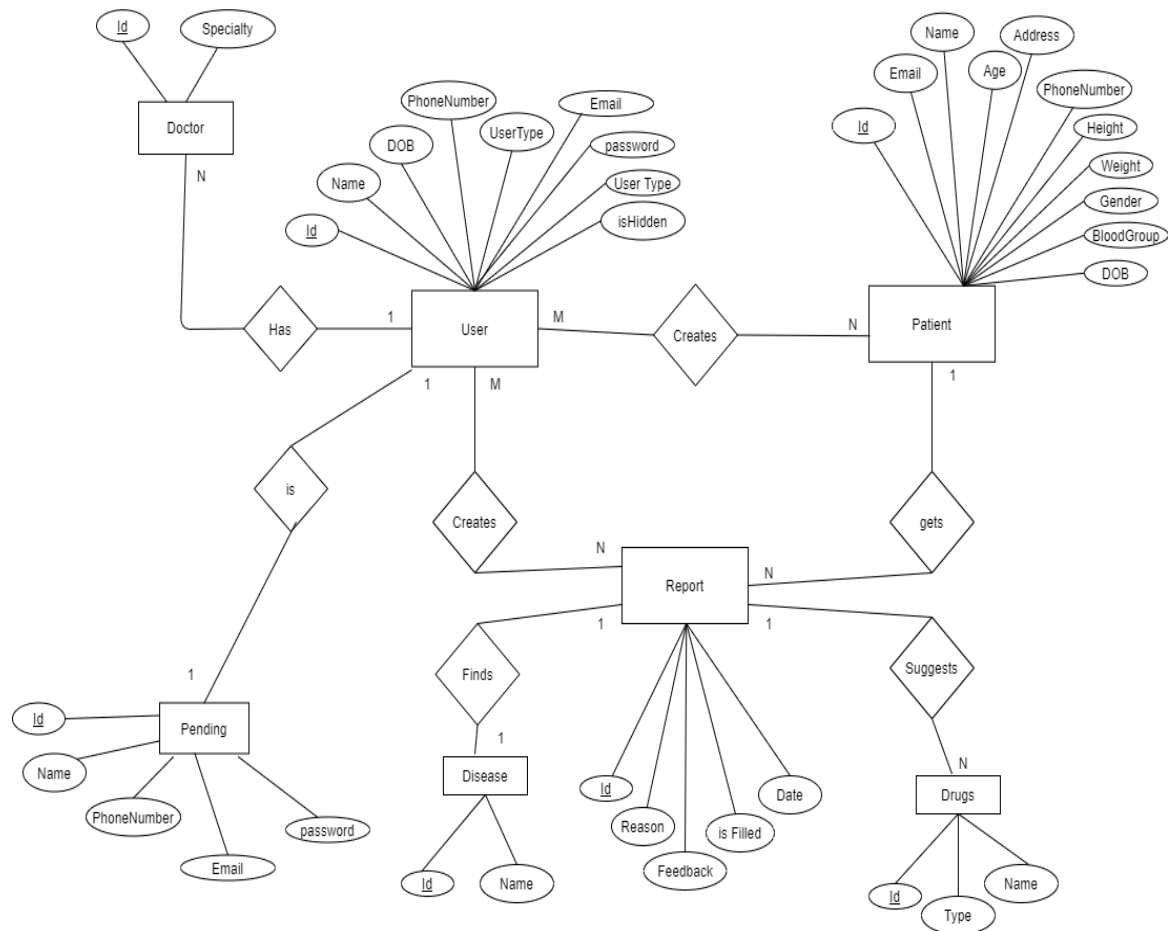


Figure 3: ER Diagram of Patient Report Management System

Figure 3 shows ER diagram of this system named **Patient Report Management System**. This diagram shows five entities named Users, Patient, Report, Disease and Drugs. Here any user can create multiple patients as well as multiple reports of respective patient. A Patient can have multiple reports, a report contains one disease and can suggest/recommend multiple drugs.

3.1.4. Process Modelling (DFD)

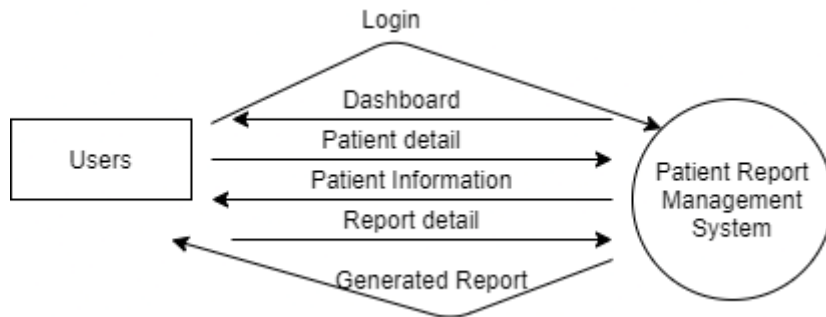


Figure 4: Context Diagram of Patient Report Management System

Figure 4 shows context of this system named Patient Report Management System. This diagram shows two entities named user and management. Here user first login, then system provides them dashboard, the user then provides patient details to the system which the system takes and gives feedback to the user. The report information is then given to the system and the system generates as per users input.

The management can also login which the system gives administrator dashboard and administrator privileges in response.

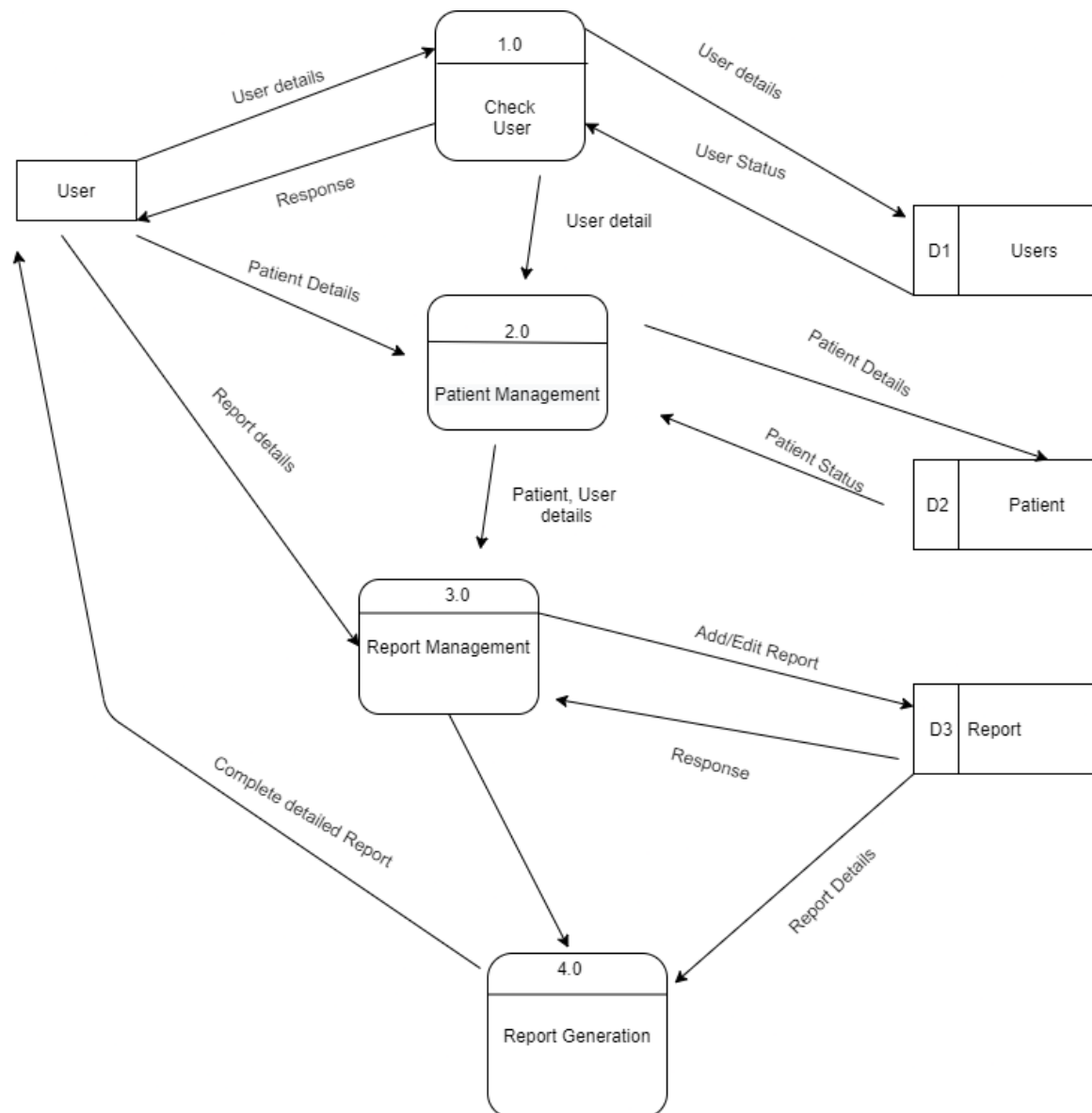


Figure 5: Level- 1 DFD of Patient Report Management System

Figure 5 shows level-1 DFD of the Patient Report Management System. It shows one external entity called user. It also shows three data-store named Users, Patient, and report. Four different processes are also defined respectively, and the data-flow symbol is showing how every one of them is linked.

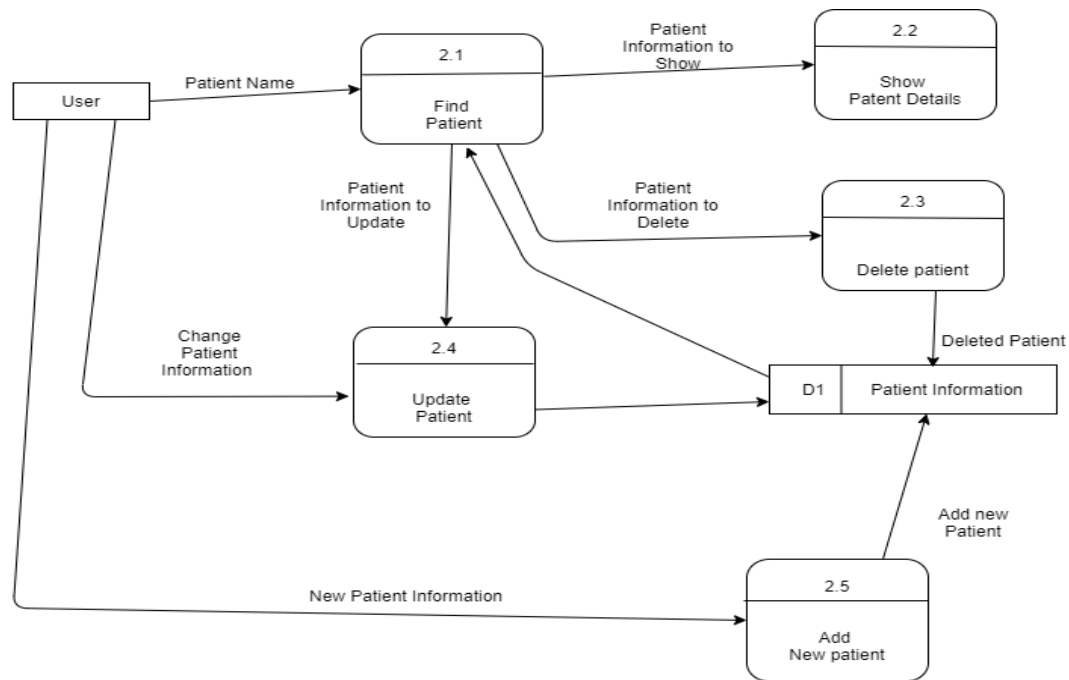


Figure 6: Level-2 DFD of Patient Management in Patient Report Management System

Figure 6 shows the level 2 DFD diagram of the Patient Management process. It shows users can search, view and update patient details. He/she can also add or delete patients in the system.

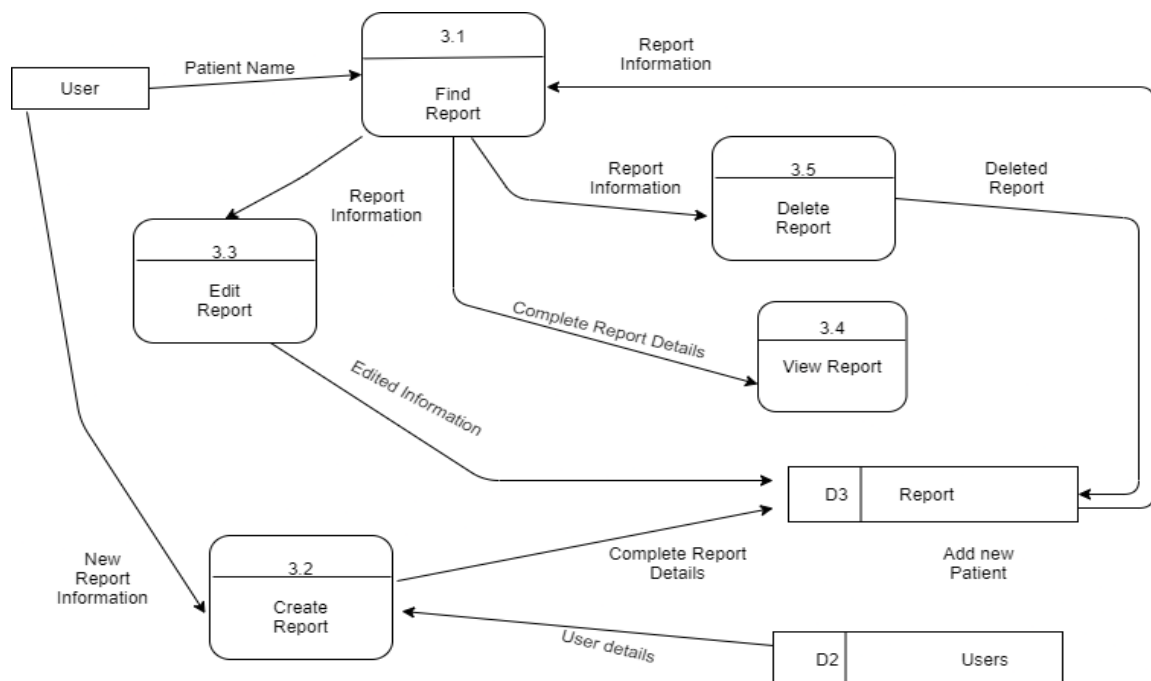


Figure 7: Level-2 DFD of Report Management in Patient Report Management System

Figure 7 shows the level 2 DFD diagram of the Report Management Process. It shows users can search, view and edit report. He/she can also add or delete reports in the system.

3.2. System Design

System design is the phase that bridges the gap between problem domain and the existing system in a manageable way. This phase focuses on the solution domain, i.e. "how to implement?" It is the phase where the SRS document is converted into a format that can be implemented and decides how the system will operate.

3.2.1. Architectural Design

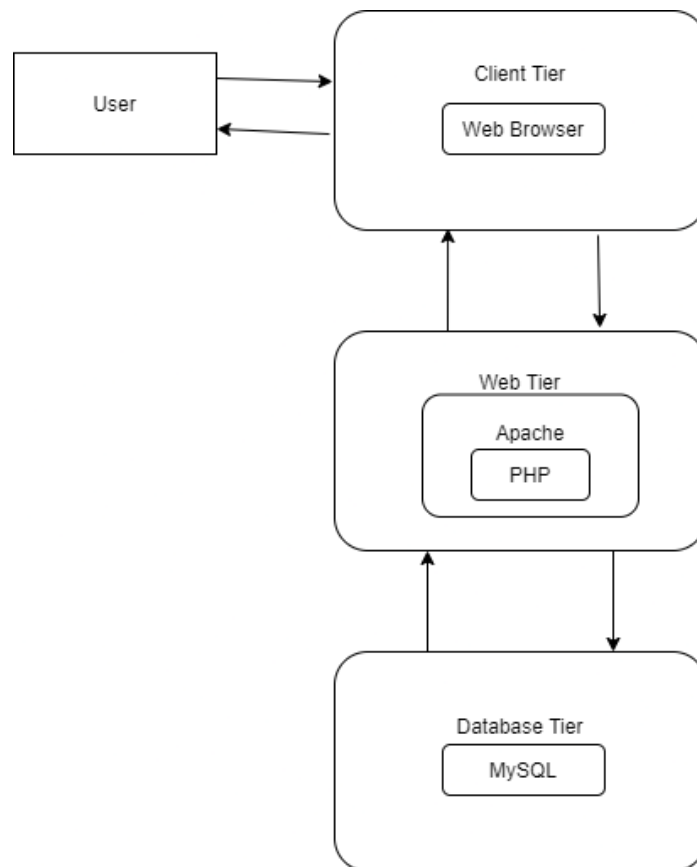


Figure 8: Architectural Design of Patient Report Management System

Figure 6 shows the architectural design of the Patient Report Management System. It shows three tiers called client, web, and database. The user interacts with the system from the client tier through the web browser. Web Tier, developed in PHP acts as a bridge between Client and Database tier. Database tier, developed using MySQL is used as a database.

3.2.2. Database Schema Design

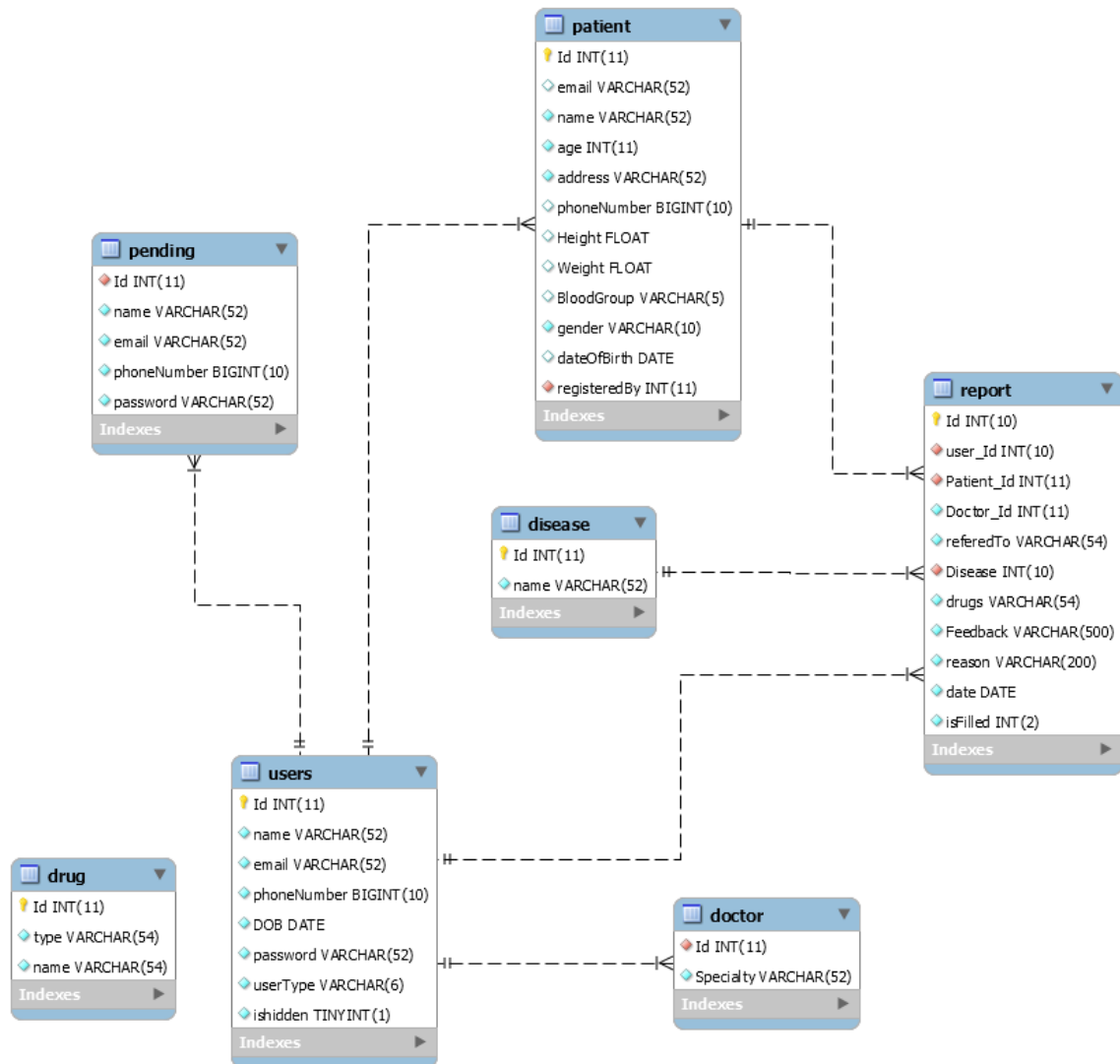
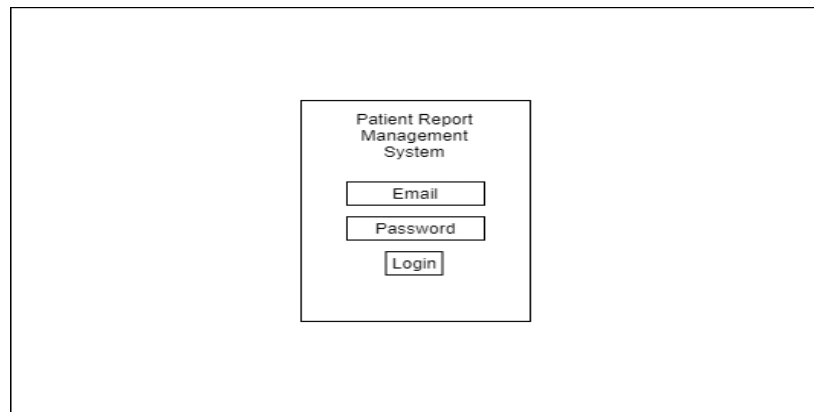


Figure 9: Schema Design of Patient Report Management System

Figure 7 shows the schema diagram of this developed system. It consists of eight tables, also known as entities. Each table contains many attributes, also known as a column, having specific data types. Every table has a primary key named 'id' and every table is connected with one or more tables with the help of a foreign key.

3.2.3. Interface Design

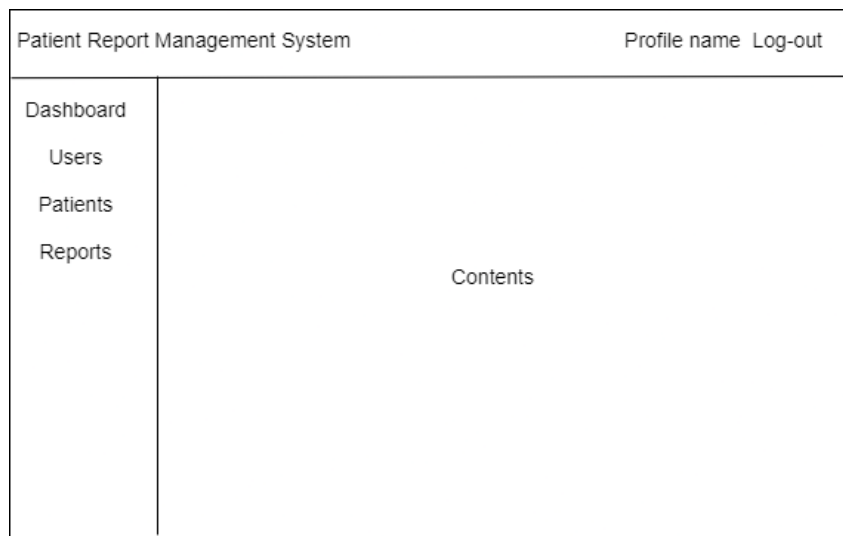


The diagram shows a login interface for the Patient Report Management System. It consists of a central box containing the system name, followed by input fields for Email and Password, and a Login button.

```
graph TD; Title[Patient Report Management System] --> Email[Email]; Email --> Password[Password]; Password --> Login[Login];
```

Figure 10: Login Interface Diagram of Patient Report Management System

Figure 8 shows the Login page interface of the Patient Report Management System. Every actor can login from the same log in page.



The diagram shows the Admin Dashboard interface. It features a top navigation bar with the system name and user profile information. A left sidebar contains navigation links for Dashboard, Users, Patients, and Reports. The main content area is labeled 'Contents'.

| Patient Report Management System | | Profile name Log-out |
|---|----------|----------------------|
| Dashboard Users Patients Reports | Contents | |

Figure 11: Admin Dashboard Interface Design of Patient Report Management System

Figure 9 shows the Admin dashboard interface of the Patient Report Management System. The content field changes with respective pages but top and side navigation remains the same.

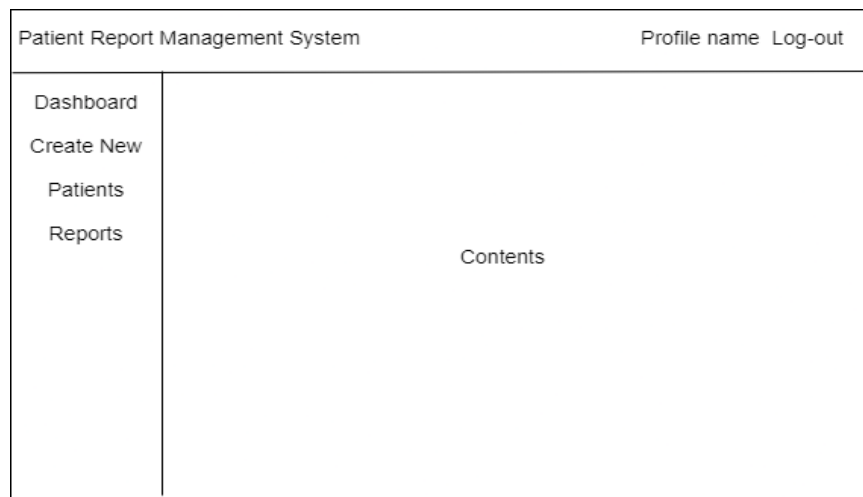


Figure 12: Doctor and Staff Dashboard Interface Design of Patient Report Management System

Figure 10 shows the Doctor and Staff dashboard interface of the Patient Report Management System. The content field changes with respective pages but top and side navigation remains the same.

3.2.4. Physical DFD

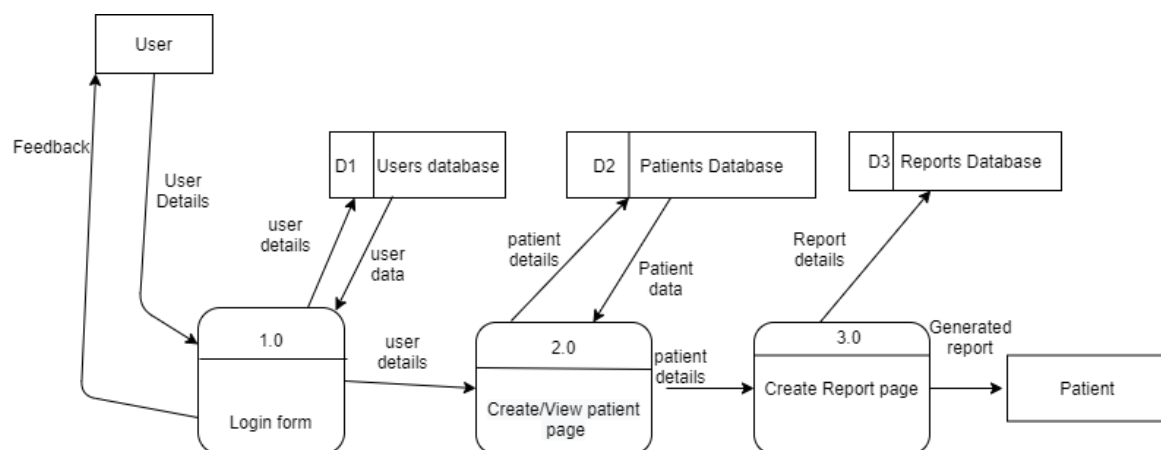


Figure 13: Physical DFD of Patient Report Management System

Figure 10 shows the physical DFD of the Patient Report Management System. It shows one external entity called the user. User first login into the system from the Login page. The user can then create or view the existing patient for patients' page. He/she can then create a report from the report page and provide generated report to the patient.

Chapter 4: Implementation and Testing

4.1. Implementation

4.1.1. Tools Used

• **Diagram Tool:**

The components of the system and the flow of the data and control between these components are demonstrated by diagram tools by using graphs. “Draw.io” and “Canva” are the diagram tool used in the project.

• **Web Development Tool:**

These tools assist in designing web pages with all aligned elements like forms, text, script, graphics, and so on. Visual Studio Code is used as a web development tool in the project.

The different frontend tools used for the completion of the project are:

- HTML 5
- CSS
- Bootstrap
- Javascript
- JQuery

The backend tool used for this project is:

- PHP

The database tool used for this project is:

- MySQL

The Server used for this project is:

- Apache(Xaamp 3.2.4)

4.1.2. Implementation Details of Modules

Login Module:

This module is used for verifying and logging-in registered users. It restricts unauthorized users and only allow authorized and registered users.

Source Code:

```
$usr=$psw="";
$usr=check_input($_POST['email']);
$psw=check_input($_POST['password']);
$pattern = "/^[_a-z0-9-]+(\.[_a-z0-9-]+)*@[a-z0-9-]+(\.[a-z0-9-]+)*(\.[-a-z]{2,})$/i";

if ( !preg_match($pattern, $usr) || !preg_match('/^(?=[A-Za-z])[0-9A-Za-z!@#%]+$/ ', $psw)) {
    echo '<span style="color:red;">Enter Valid Details</span>';
}
else{
    setcookie("id",$usr,time()+(24*24*60*60*60));
    setcookie("pass",$psw,time()+(24*24*60*60*60));

    $sql ="SELECT * FROM users WHERE email='{ $usr}' AND password= '{ $psw}' AND ishidden = 0" ;
    $result = mysqli_query($conn,$sql) or die(mysqli_error($conn));

    if(mysqli_num_rows($result)>0)
    {
        while($row=mysqli_fetch_assoc($result))
        {
            . . . . .
        }
    }
}
```

Figure 14: Login Module of Patient Report Management System

Register Module:

This module is used for registration of new users or patients. This module asks basic personal detail and add/store to the system.

Source Code:

```
if(isset($_POST["cac"])){
    $name=$_POST['name'];
    $email=$_POST['email'];
    $phoneNumber=$_POST['phoneNumber'];
    $dateofbirth=$_POST['dateofbirth'];
    $userType=$_POST['option'];
    $password= $_POST['password'];
    $category= $_POST['doc'];

    $sql ="INSERT INTO users(name, email, phoneNumber, DOB, userType, password)
        | VALUES('$name', '$email', '$phoneNumber', '$dateofbirth', '$userType', '$password')";
    $result = mysqli_query($conn,$sql) or die(mysqli_error($conn));

    if($result){
```

Figure 15: Register Module of Patient Report Management System

Profile Module:

This module is used for viewing and editing personal profile detail. This module shows stored personal details and allows user to edit.

Source Code:

```
$name=$_POST['name'];
$email=$_POST['email'];
$phoneNumber=$_POST['phoneNumber'];

$sql="UPDATE users SET name = '$name', email = '$email', phoneNumber= '$phoneNumber' WHERE Id='$id'"
if($user == "Admin"){
    $dateofbirth=$_POST['dateofbirth'];
    $userType=$_POST['option'];
    $sql ="UPDATE users SET name = '$name', email = '$email', phoneNumber= '$phoneNumber',
        DOB= '$dateofbirth', userType= '$userType' WHERE Id='$id' " ;
}
$result = mysqli_query($conn,$sql) or die(mysqli_error($conn));

if($result){
```

Figure 16: Profile Module of Patient Report Management System

Report Module:

This module is used for creating report for patient. It saves the report details entered by the user and also allows edit if necessary.

Source Code:

```
$reason = $_POST["reason"];
$id = $_POST["id"];
$did = $_SESSION["User_ID"];
$disease = $_POST["disease"];
$feedback = $_POST["feedback"];
$category = "";
$doc ="SELECT * FROM doctor where Id='$uid'";
$docr = mysqli_query($conn,$doc) or die(mysqli_error($conn));
while($row=mysqli_fetch_assoc($docr))
{
    $category= $row["Specialty"];
}
$sql="INSERT INTO report(user_Id,Patient_Id,reason, referedTo, disease, doctor_id, feedback,
    isFilled ) VALUES('$uid','$id','$reason','$category','$disease', '$did','$feedback', '1' )";
$result = mysqli_query($conn,$sql) or die(mysqli_error($conn));

if($result)
{
    $drugs = $_POST["drugs"];
    foreach($drugs as $dis)
    {
        $getReportId= "Select * from report where Disease='$disease' && feedback = '$feedback' &&
            | patient_id='$id' && doctor_id='$did'";
        $result1 = mysqli_query($conn,$getReportId) or die(mysqli_error($conn));
        while($row=mysqli_fetch_assoc($result1))
        {
            $rid= $row['Id'];
            $sql1 = "Insert into refereddrug(report_id,drug_id) values('$rid', '$dis')";
            $result2 = mysqli_query($conn,$sql1) or die(mysqli_error($conn));
        }
    }
}
```

Figure 17: Report Module of Patient Report Management System

4.2. Testing

In this stage, the validity of the program is checked. Testing is the process of debugging of the software that is discovering the errors or bugs and removing them. In course of testing, all algorithms used in the program are verified. Analysis on structure of programs, data flows across modules through all the possible paths and complexity of the system is undertaken.

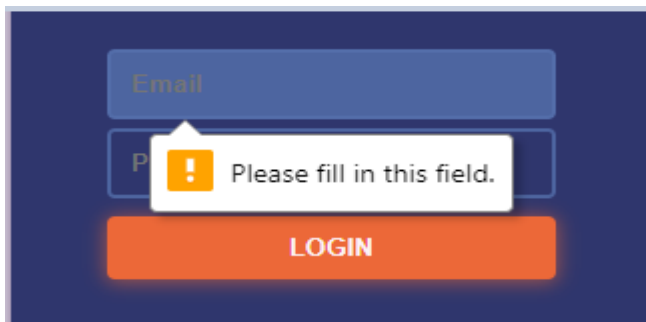
4.2.1. Test Cases for Unit Testing

Test case for logging-in with empty fields:

Input: NULL

Expected Outcome: Fill all fields.

Obtained Outcome:



Remarks: Pass

Test case for logging-in with incorrect details:

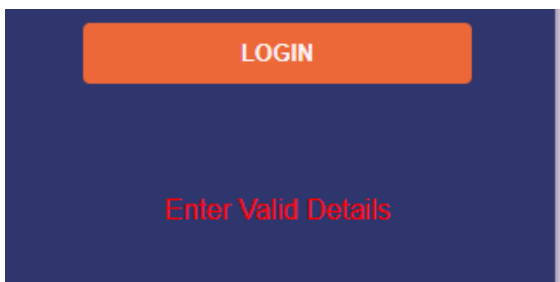
Input: Random email and password.

Email: aasd@gmail.com

Password: aasds

Expected Outcome: Invalid details

Obtained Outcome:



Remarks: Pass

Test case for logging-in with correct details:

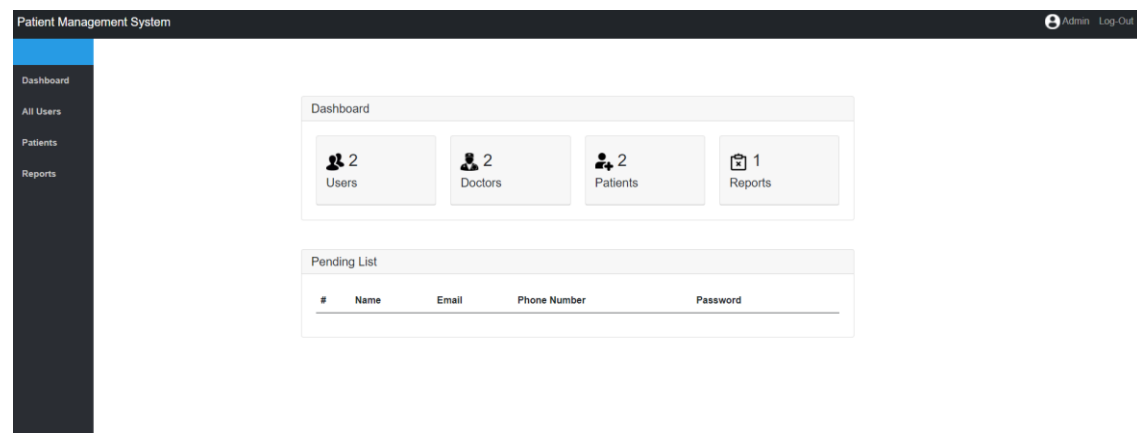
Input: Valid email and password.

Email: admin@gmail.com

Password: admin123

Expected Outcome: Redirect to dashboard

Obtained Outcome:



Remarks: Pass

4.2.2. Test Cases for System Testing

System Testing is a type of software testing that is performed on a complete integrated system to evaluate the compliance of the system with the corresponding requirements. System Testing is carried out on the whole system in the context of either system requirement specifications or functional requirement specifications or in the context of both.

Test case for adding user:

Input: User information

Expected Outcome: User is added

Obtained Outcome:



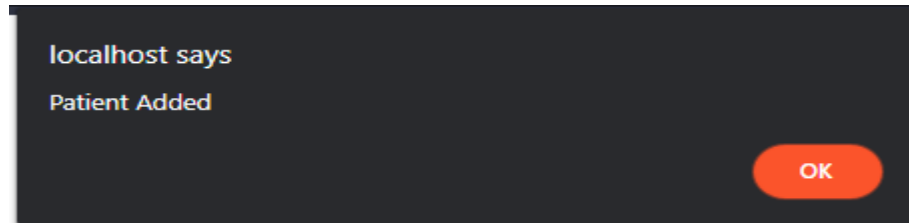
Remarks: Pass

Test case for adding patient:

Input: Patient information

Expected Outcome: Patient is added

Obtained Outcome:



Remarks: Pass

Test case for editing profile:

Input: Users' new information

Expected Outcome: Edit successful

Obtained Outcome:



Remarks: Pass

Test case for searching patient:

Input: Users' name

Expected Outcome: Searched users' detail

Obtained Outcome:

Create New

| ID | Name | Age | Gender | Address | Registered By | |
|----|-------|-----|--------|---------|---------------|------------------------------------|
| 78 | Riyaa | 22 | Male | Boudha | Admin | <div>New ReportDeleteDetails</div> |

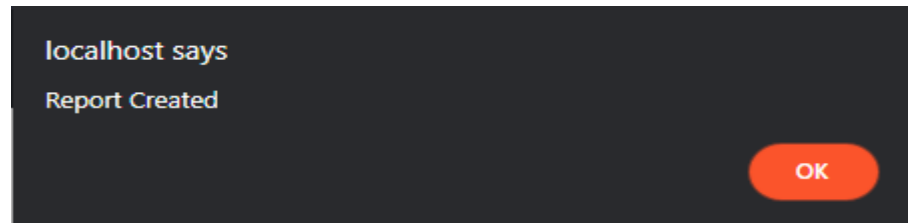
Remarks: Pass

Test case for creating report:

Input: Report information

Expected Outcome: Report Created

Obtained Outcome:



Remarks: Pass

Test case for deleting user:

Input: clicked on 'delete' button

Expected Outcome: User removed from users list

Obtained Outcome:

| ID | Full Name | Email | Phone Number | Date of birth | User Type | |
|----|-----------|-----------------|--------------|---------------|-----------|---|
| 1 | Admin | admin@gmail.com | 123456789 | 2021-05-12 | Admin | <button>View</button> |
| 2 | user1 | user1@gmail.com | 12121212 | 2020-01-13 | Staff | <button>View</button> <button>Delete</button> |
| 3 | user2 | user2@gmail.com | 102350510 | 2000-01-01 | Staff | <button>View</button> <button>Delete</button> |
| 4 | doc1 | doc1@gmail.com | 1234567892 | 2020-12-18 | Doctor | <button>View</button> <button>Delete</button> |
| 11 | Doc2 | doc2@gmail.com | 12121212 | 2000-02-02 | Doctor | <button>View</button> <button>Delete</button> |

Remarks: Pass

Test case for deleting patient:

Input: clicked on 'delete' button

Expected Outcome: Patient removed from patients list

Obtained Outcome:

| ID | Name | Age | Gender | Address | Registered By | |
|----|----------|-----|--------|---------|---------------|--|
| 78 | Riyaa | 22 | Male | Boudha | Admin | <button>New Report</button> <button>Delete</button> <button>Details</button> |
| 79 | patient1 | 22 | Male | asd | Admin | <button>New Report</button> <button>Delete</button> <button>Details</button> |

Remarks: Pass

Test case for deleting report:

Input: clicked on 'delete' button

Expected Outcome: Report removed from reports list

Obtained Outcome:

| Report Id | Name | Age | Address | Condition | Date | | |
|-----------|-------|-----|---------|---------------------|------------|-----------------------------|------------------------|
| 110 | Riyaa | 22 | Boudha | Acute cholecystitis | 2021-09-01 | View Report | Delete |

Remarks: Pass

Chapter 5: Conclusion and Future Recommendations

5.1. Lesson Learnt / Outcome

While working on this project, we have learned a lot of things that are being implemented in real-world projects. Although this project was supposed to be an academic fulfilment, with the help of our teachers' guides and time spent on this project, we have learned many more about software engineering, testing, and database management, rules to create software, time management, and better audience targeting.

Although the project has turned out to be exactly what we had imagined it to be, there are some functions that we would like to add in the forthcoming days and make it more user-friendly and competitive.

5.2. Conclusion

We created our system to be fully interactive, reliable, and efficient. Now system users can see the complete patient and their respective report information. We created a fully functional system that has met our expectations at the end of this project.

5.3. Future Recommendations

Although this project is fully usable and can be used in the real world, it can be polished more with new features and great improvements. However, here are some features that we would love to add start working on:

- i) Send patients their real-time report detail via email.
- ii) Add more features to this current system.

Appendices

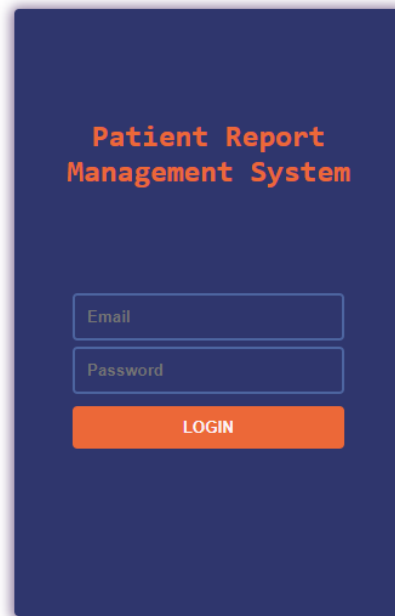


Figure 18: Login Page

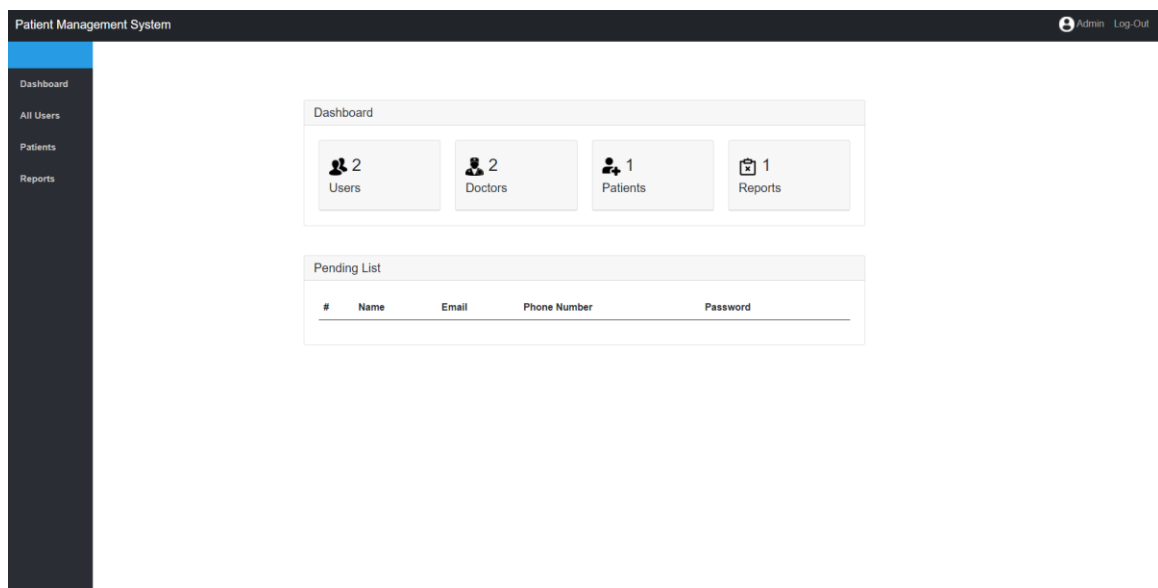


Figure 19: Admin Dashboard Page

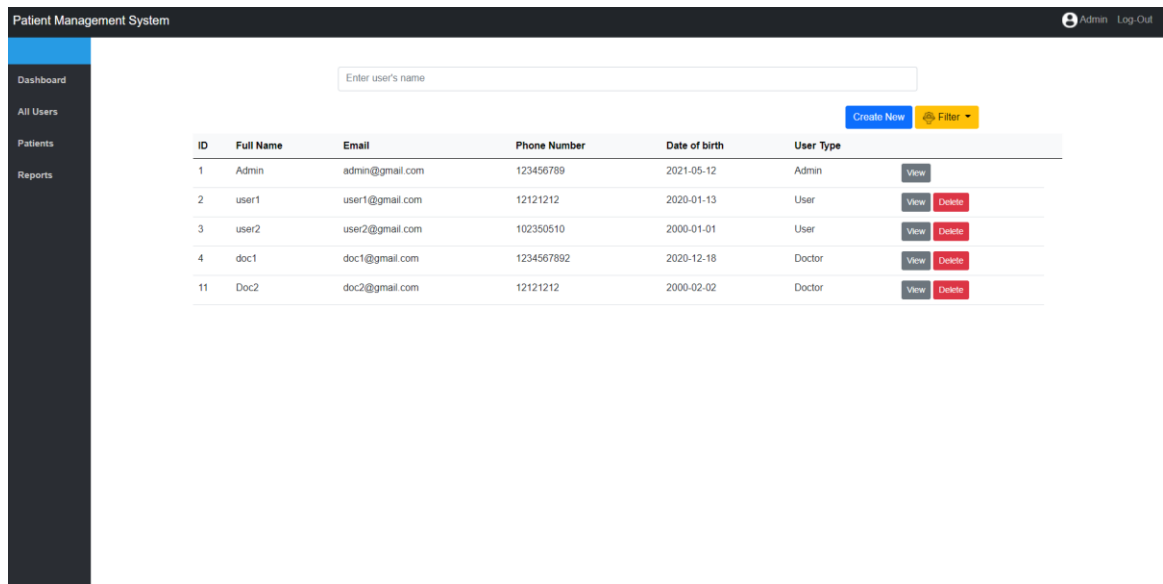


Figure 20: User Add/Edit/Delete Page

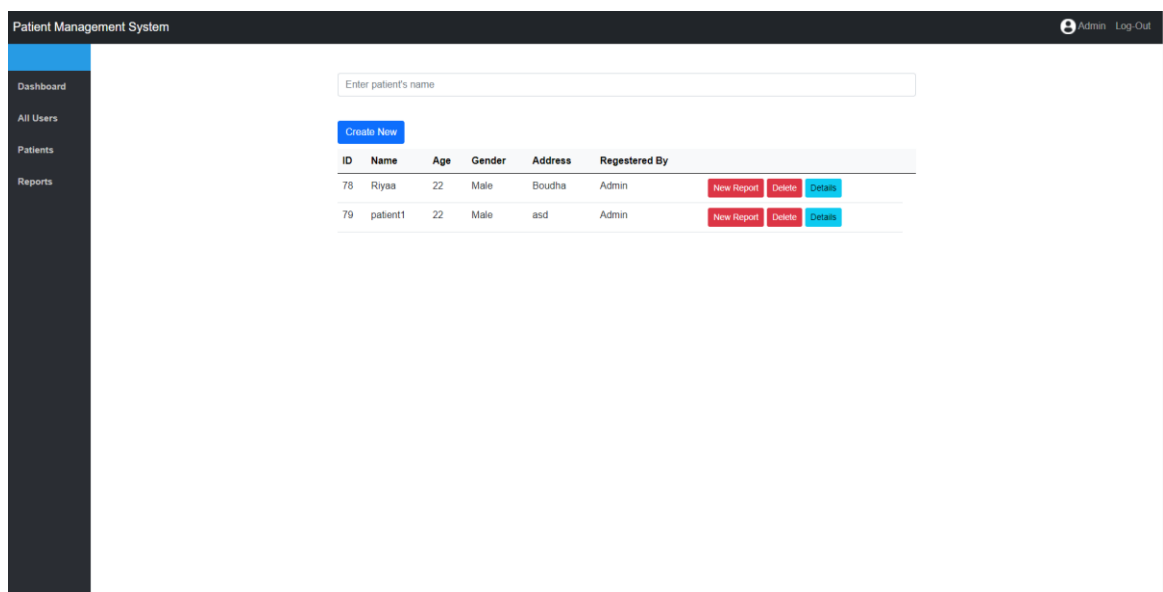


Figure 21: Patient View/Delete Page

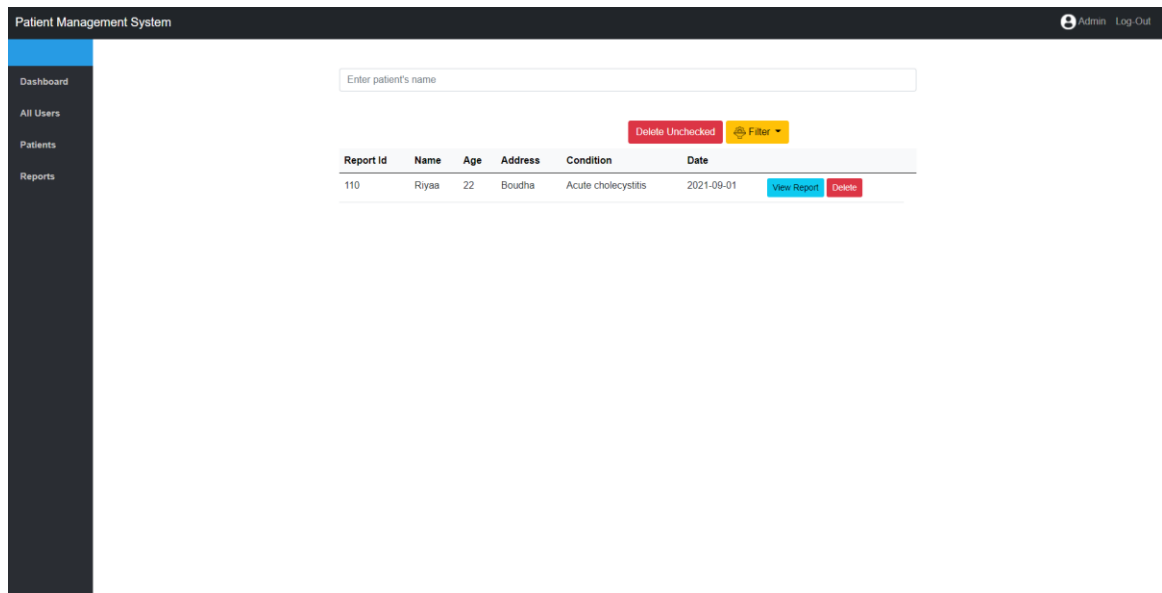


Figure 22: Report View/Delete Page

Edit Profile

Full Name
Admin

Email
admin@gmail.com

Phone Number
123456789

Date of Birth
12-05-2021


Field
Admin

Figure 23: Edit Profile Page

Create New:

| | |
|--|--------------------------------------|
| Full Name | Address |
| <input type="text" value="Full Name"/> | <input type="text" value="Address"/> |
| Gender | Age |
| <input type="text" value="Others"/> | <input type="text" value="Age"/> |

Optional:

| | |
|-------------------------------------|---|
| Height | Weight |
| <input type="text" value="Height"/> | <input type="text" value="Weight"/> |
| Blood Group | Date of Birth |
| <input type="text" value="Other"/> | <input type="text" value="dd-mm-yyyy"/>  |
| E-Mail | Phone Number |
| <input type="text" value="Email"/> | <input type="text" value="Phone Number"/> |

Reason for medical assessment:

Refer to:

Submit

Figure 24: Add Patient Page

Create New Profile




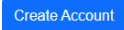
| |
|---|
| Full Name |
| <input type="text" value="First name"/> |
| Email |
| <input type="text" value="Email"/> |
| Phone Number |
| <input type="text" value="Phone Number"/> |
| Date of Birth |
| <input type="text" value="dd-mm-yyyy"/>  |
| Field |
| <input type="text" value="User"/>  |
| Password |
| <input type="text" value="Password"/> |
|  |
|  |

Figure 25: Add User Page

Patient Management System doc1 Log Out

Dashboard
Create New
Patients
Reports

| ID | Name | Age | Gender | Registered By | |
|-----|----------|-----|--------|---------------|----------------------------|
| 111 | patient1 | 22 | Male | Admin | New Report |

Figure 26: Doctors' Dashboard Page

Report

Patient Details

| Medical Report | |
|--|--------------------|
| Report prepared for: Riyaa | |
| Age: 22 | Height: 0 |
| Address: Boudha | Gender: Male |
| Weight: 0 | Blood Group: Other |
| Contact: 0 | |
| Findings: | |
| Doctor's Name: doc1 | |
| Specialty: <input type="text" value="Anesthesiologist"/> | |
| Reason for medical assessment: <input type="text" value="stomach pain"/> | |
| Examination and findings: <input type="text" value="Acute cholecystitis"/> | |
| Medicines referred: <input type="text" value="Deriva cms Gel 15g"/> <input type="text" value="VINTACE-0.025 GEL"/> | |
| Feedback: <input type="text" value="ramro"/> | |
| Date:2021-09-06 07:26:17 | |

print

Figure 27: View Report Page

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