

ClearpathPath Orthodontics:E-Medical System



Submitted by Saad Aslam

Roll. No 043-BSCS-16

Submitted by Muhammad Usman

Roll. No 254-BSCS-16

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Supervised by Sir Atif Ishaq

Assistant Professor

**DEPARTMENT OF COMPUTER SCIENCE
GC UNIVERSITY LAHORE**

Declaration

I, Saad Aslam and Muhammad Usman student of **BS(Hons)** in the subject of **Computer Science** session **2016-2020**, hereby declare that the matter printed in this thesis titled, **ClearPath Orthodontics:E-Medical System** is my own work and has not been printed, published and submitted as research work, thesis or publication in any form in any University, Research Institution etc in Pakistan or abroad.

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Signatures of Deponent

Research Completion Certificate

It is certified that the research work contained in this thesis titled **ClearPath Orthodontics:E-Medical System** has been carried out by **Saad Aslam**. Roll. No **043-BSCS-16** and **Muhammad Usman** Roll no**254-BSCS-16** under my supervision.

Supervisor Name
Designation

Date: _____

Submitted Through

Dr. Syed Asad Raza Kazmi
Director
Department of Computer Science
GC University Lahore

Controller of Examination
GC University Lahore

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Chapter 1

Introduction

1.0.1 Purpose

The purpose of this project is to convert an organization traditional file system into well-organized application. The organization can use this application to enhance their production efficiency and, also reduce cost by saving paper lost. This application will perform data handling. The benefits of this Web Application are that the orthodontics organization will be able to organize their complete system and to provide the departments to manage their work and to link each department with other. Each department will be able to store the record and comments regarding each patient profile which will be used by other departments to move on to the case. The Application will have a Profile Judgement through which organization will be able to judge each patient and doctor's persona based on the profile.

1.0.2 Aims of the Project

The aim is to design a real time Web Application for an Orthodontics Company to handle their production load in a well-mannered way which will eventually increase their efficiency and less error in production. We have assumed that the organization will have organized file system and records of all their employee.

1.0.3 Scope of the Project

The scope of the project is listed below:

- The main objective of our system is to facilitate the user with online control system.
- Business owner can access the data directly from web app.
- The business owner can get graphical as well as textual reports.
- It'll provide customer relationship management.
- Provides data backup and security.
- The online shipment will be done to other countries and cities.
- The marketing department will be involved in the sales management.
- The departments of production will handle the data of their own domain.
- The setup department will control the patient's problem.
- The dental lab will make physical impressions status on the application.
- The finishing department will make report of products on which finishing is done.
- There will be also record of staff or office members.

1.0.4 Requirement Elicitation

1.0.4.1 Interviews

1.0.4.2 Questionnaires

1.0.4.3 Document Analysis

1.0.4.4 Observation

Chapter 2

Requirement Specification

Requirement Specification are the major requirements of a project that are required to bring the project in running state so that the project can be completed successfully. These specifications means the tools and techniques that are necessary to apply in the project so that the project can have efficient output. These requirement specifications are of two types: 1-Functional Requirements 2-Non Functional Requirements

2.1 Functional Requirements

The term function requirements means the functionality of the system. Functional Requirements are the main tasks that are being carried out by the system. It describes that what are the necessary steps a system would take to perform a specific task. System specifications help to define the operational and performance guidelines for a system. It defines how the system is expected to perform and what are the actions it may include to perform the task. System specifications are as follows:

2.1.1 Provide Patient Data

The very first requirement of the system is that doctor will provide patients data .The system will display a form with various fields including patient name,patient age,patient region,requirements of patient,existing condition of patient,current pictures of patients profile including panoramic views,doctors comments and diagnostic form.The doctor will provide all these requirements through the form .

2.1.2 Receive Patient Data

After data being provided by the doctor ,the management will receive patient data and will check that whether the doctor has provided the complete data or not.If the data has been provided completely by the doctor then the management will proceed it for case entry otherwise the management will notify the doctor to provide complete data through comments and change its status to hold.

2.1.3 Case Entry

Management will enter the patient details in a case and will assign it an internal case number.This will be the primary key of the case through which the case will be searched,process and proceed.Case Entry will require patient details as provided by the doctor ,the operator that is entering the case and a priority number called as Case deadline will be assigned to the case.

2.1.4 Prioritize Cases

This section will include that based on status of cases that are to be shipped early are assigned a priority number .Cases are being prioritized due to which cases that have high priority will proceed on first priority and others on second priority.

2.1.5 Picklist

This requirement of system demands that after case entry it will show it to the operators to respective department and operators will have a view of all the available cases to proceed. The cases can be searched to the list by a search bar and can be selected by a selection box. A operator can pick multiple cases at a time.

2.1.6 Assign Cases

In case of modification , off holding a hold case or to assign to another operator , the management will assign the case to the respective operator . The management will also have the authority to pass the case through multiple departments to assign the case to respectiive department because cases are being proceeded in a sequential order.

2.1.7 Process a Case

The operator will select a case to process for treatment . The operator will fill in all the details including the movement of the teeth,single arch or double arch,whether the operator has performed inter proximal reduction or not and any special comments that the operator needs to add to the case timeline so that other operators can follow those comments during treatment of the case.

2.1.8 Case Timeline

Each case must have a case timeline that shows that through each department which operator has done that case,which Quality checker has checked the quality of that case . This makes it easy to figure out the complete history of the case in order to check at any point which operator is currently working on the case and in case of any error to backtrack to check.

2.1.9 Quality Checking

This section pf requirement includes that whenever a operator proceed a case for checking ,the quality checker will receive a notification of the case .QC will select the case ,review the case that whether the operator has filled the details properly and if the case is filled properly then will pass the case for approval and will proceed to the next department otherwise if the operator has not filled the details properly then QC will reject the case and then the case will go back to the operator so that the operator can make the required changes in the case and there is count of how many times a case has been rejected .

2.1.10 Case Approval

2.1.11 Proceed to next Department

Each case is processed to each department start from Scanning,Setup,Editing,Print,Dental Lab,Treatment,Finishing,Shipment/Uploading.A case is processed by a operator and a quality checker in each department so it becomes necessary to store the Identities of these operators seperately in each case timeline.Whenever a case is passed for approval ,then the case is shifted to next department for treatment and in this way the case is processed through all the departments and record is maintained in a case timeline.

2.1.12 Progress Report

This part of the system shows the progress report of the operator.The progress report is generated based on the number of errors if any that will cause in rejections, and total number of cases that the operator has done the entire month. Each operator can check his progress report and management will have the authority to check the progress reports of all the employees to maintain a list that which operator has done the most cases the entire month.

2.1.13 Upload a Case

The operator in uploading department will upload the proposed treatment preview to the doctor. This upload process will include a treatment preview and any special notes that the operator wants to send to the doctor so that the doctor can review the case with the proposed treatment preview or suggest otherwise.

2.1.14 Ready for Shipment

After being processed through the finishing department, the case will come to shipment department. The operator will upload the treatment preview to the doctor so that the doctor can have a look at the proposed setup and then can approve the case or can suggest modification so that the operator can modify the case according to the need of the doctor.

2.2 Non-functional Requirements

2.2.1 User Friendly

The system is user friendly that makes it easier for novices to use a computer. Menu-driven programs, for example, are considered more user-friendly than command-driven systems. Graphical user interfaces (GUIs) are also there to help novice users to interact through the system.

2.2.2 Data Integrity

Data integrity is the maintenance of, and the assurance of the accuracy and consistency of data over its entire life-cycle, and is a critical aspect to the design, implementation and usage of system which stores, processes, or retrieves data. The data maintains accurate , the patient details are not modified and are operators that fill the case details remain as it is throughout all case approval process.

2.2.3 Authorization

Authorization is a security mechanism to determine access levels or operator or management privileges related to system resources including files, services, computer programs, data and application features. This is the process of granting or denying access to a network resource which allows the operators/management access to various resources based on their identity.

2.2.4 Availability

Availability is an important requirement used to assess the performance of systems, accounting for both the reliability and maintainability properties of a component or system. It assures that the system data remains available throughout the working so that the operators can search for the case and can check the case timeline anytime they want.

2.2.5 Confidentiality

The system confidentiality is maintained so that no unauthorized parties access the system or can harm any important data. Only authorized persons are allowed to handle sensitive data. Operators will be allowed less authorization than they can access or manage their own cases and can check their own progress report whereas management will have more authorization and can manage many operators and can check their progress reports.

2.2.6 Performance Requirement

Performance requirements define how well our system performs certain functions under specific conditions. Examples are speed of response, throughput, execution time and storage capacity. This is a very important requirement of our system such that it ensures that our system performs well in all sorts of conditions.

2.2.7 Usability

Usability refers to the quality of a user's experience when interacting with the system .It ensures that operators and management can look for the case more efficiently so that it becomes easy for them to backtrach in case of any error .It also allows operators to maximize their speed in order to acheive target on time because of efficieny of system Usability is about effectiveness, efficiency and the overall satisfaction of the user.

2.2.8 Reliability

Reliability of our system defines that the system will not fail in case of backlog or huge amounts of case being processed at the same time in mutiple departments. The reliability of each component and the configuration of the system consisting of these components determines the system reliability .

2.2.9 Flexibility

Flexibility is an important feature in our system which allows management and operators to do internal and external changes to their dashboard views according to their preferences so that users have much easy when interacting through the system which allows them to use the system more efficiently.

2.2.10 Supportability

Supportability refers to the degree by which the characteristics, design and functions of system meet the standards of the particular organization this system is made for.This also includes maintainence of the system so that it performs well and show optimum results in all manners.

Chapter 3

Project Design

3.1 Methodology

3.2 Process Model

3.2.0.1 Waterfall Model

The waterfall model is a classical life cycle that has been used in our system in order to have linear and sequential approach. In waterfall approach, we have all the details at the start of the project. It is termed as waterfall because the model develops systematically from one phase to another in a downward fashion. This model is composed of different phases where one phase act as the input of the other phase. Every phase has to be completed before the next phase starts and there is no overlapping of the phases.

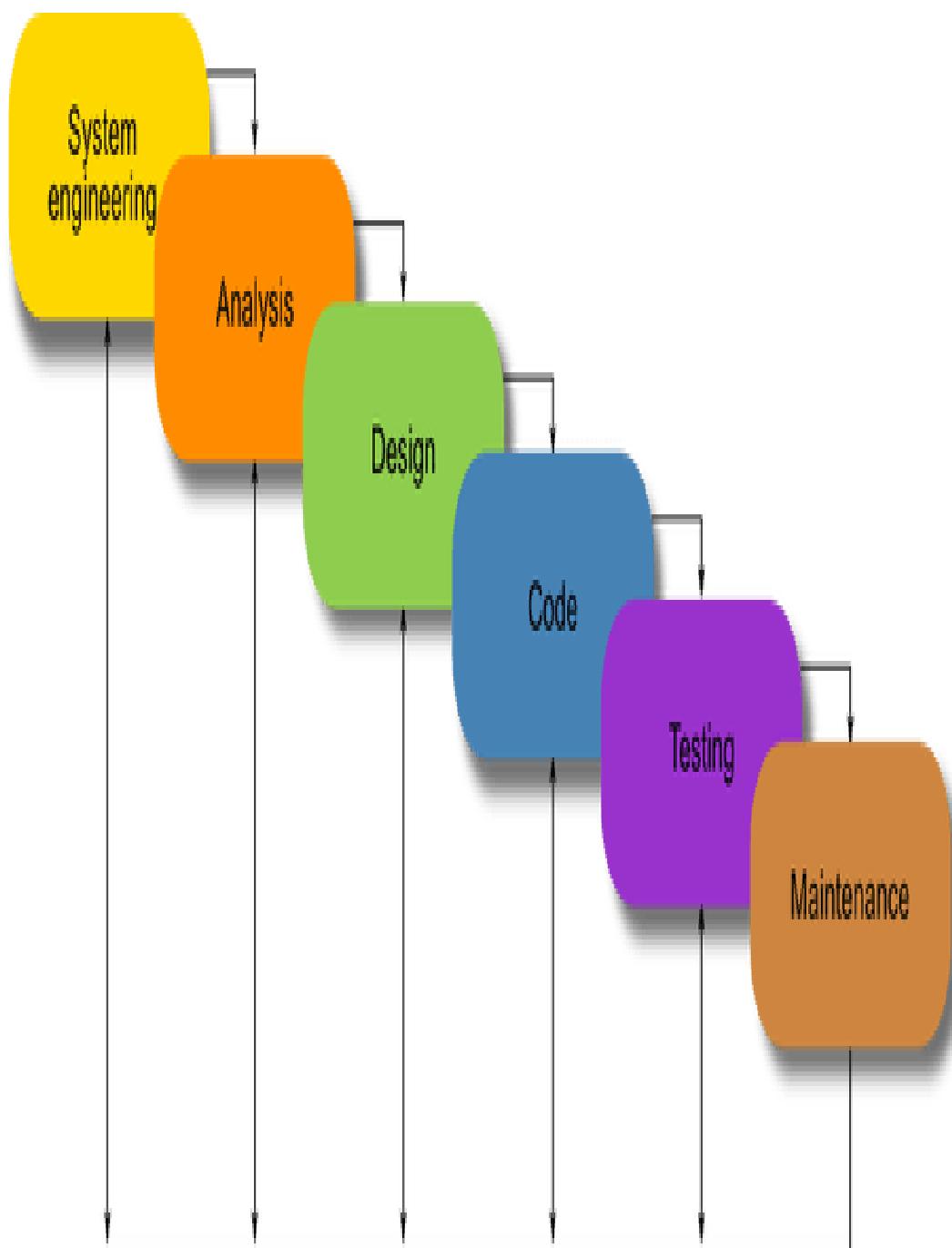


FIGURE 3.1: Waterfall Model

3.3 Use Case Diagram

3.3.0.1 Use Case

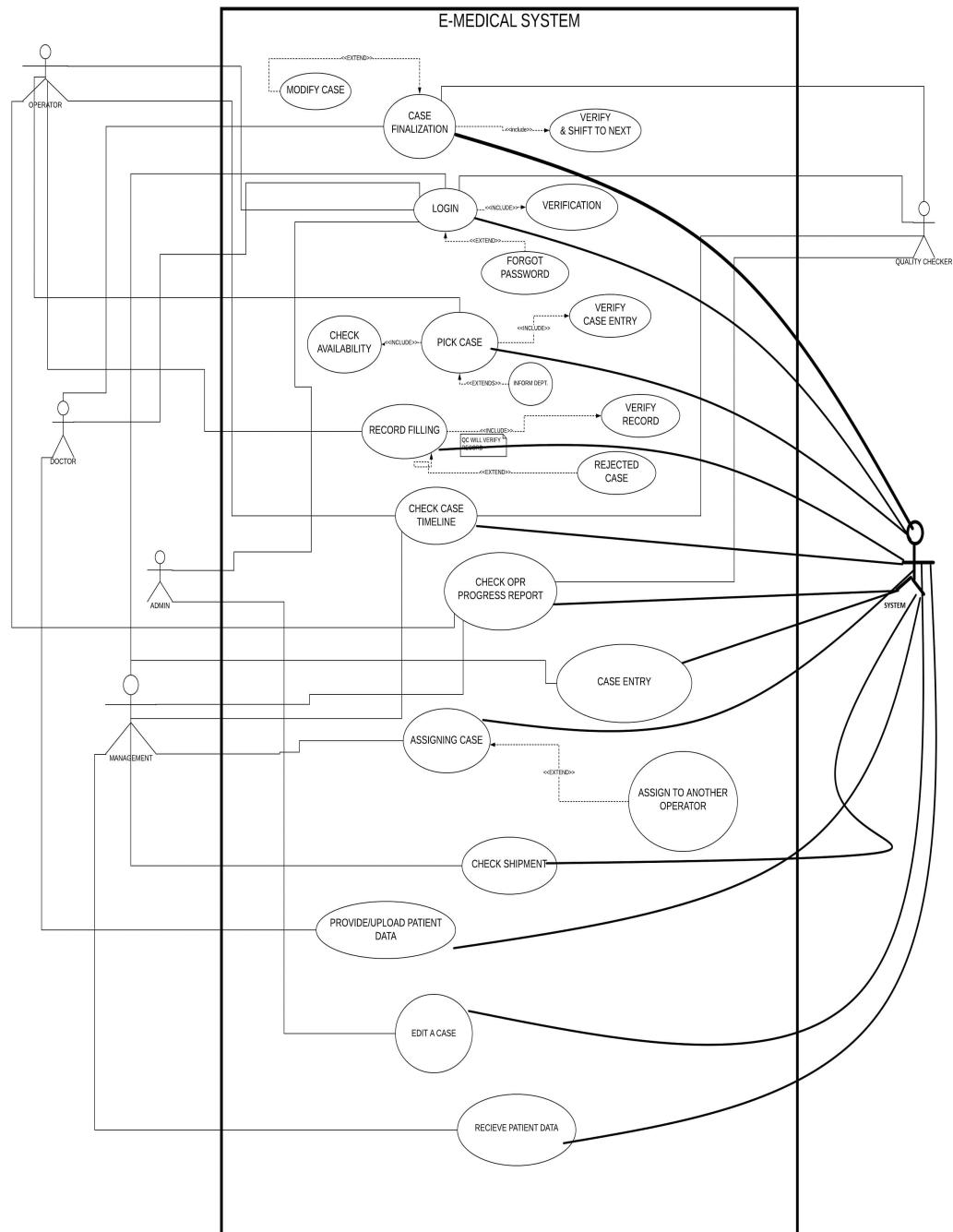


FIGURE 3.2: Use Case

TABLE 3.1: Login

Use Case Name	Login
Description	Login required to use the system
Actor	Management,Operator, Admin,System,Doctor
Precondition	The users must have a account to use
Post Condition	The user will be logged in
Priority	High
Frequency of Use	High
Channel of Actor	System Login Page

TABLE 3.2: Provide Patient Data

Use Case Name	Provide Patient Data
Description	Doctor will provide patient data
Actor	Management, System
Precondition	Doctor must logged in
Post Condition	System will have patient details
Priority	High
Frequency of Use	High
Channel of Actor	Doctor Dashboard

TABLE 3.3: Case Entry

Use Case Name	Case Entry
Description	Enter cases in system
Actor	Management, System
Precondition	Doctor must have provided patient details
Post Condition	Case will add in system
Priority	High
Frequency of Use	High
Channel of Actor	Management Dashboard

TABLE 3.4: Pick a Case

Use Case Name	Pick a Case
Description	To pick a case from list
Actor	Operator, System
Precondition	There must be cases available
Post Condition	Case will add to picklist
Priority	Medium
Frequency of Use	High
Channel of Actor	User Dashboard

TABLE 3.5: Record Filling

Use Case Name	Record Filling
Description	Enter case details
Actor	Operator, System
Precondition	Operator must have picked the case
Post Condition	Case details will add
Priority	Medium
Frequency of Use	High
Channel of Actor	User Dashboard

TABLE 3.6: Case Timeline

Use Case Name	Case Timeline
Description	Will show processing details of case
Actor	Operator, System, Management
Precondition	Case must be processed
Post Condition	Users will be notified by case processing details
Priority	Medium
Frequency of Use	Medium
Channel of Actor	Timeline Page

TABLE 3.7: Progress Report

Use Case Name	Progress Report
Description	Progress of an Operator
Actor	Operator, System, Management
Precondition	Operator must have done some cases
Post Condition	Operator and Management can check progress
Priority	Low
Frequency of Use	Medium
Channel of Actor	Progress Timeline Page

TABLE 3.8: Assign a Case

Use Case Name	Assign a Case
Description	Management will assign case to operator
Actor	Operator, System, Management
Precondition	There must be modification or hold case
Post Condition	Operator will have case entered in their picklist
Priority	Medium
Frequency of Use	Medium
Channel of Actor	Management Dashboard

TABLE 3.9: Edit a Case

Use Case Name	Edit a Case
Description	Edit a case in case of error
Actor	Admin, System
Precondition	There is an issue in case which need to resolve
Post Condition	The case will be edited
Priority	Low
Frequency of Use	Low
Channel of Actor	Admin Dashboard

TABLE 3.10: Case Finalisation

Use Case Name	Case Finalisation
Description	Quality checker will check the case
Actor	Operator, System, Quality Checker
Precondition	Operator must approve case for quality
Post Condition	Case will be rejected or pass
Priority	High
Frequency of Use	High
Channel of Actor	Quality

TABLE 3.11: Case Shipment

Use Case Name	Case Shipment
Description	Ready cases for shipment
Actor	Management, System
Precondition	Case has passed through all departments
Post Condition	Case status will change to ready to ship
Priority	High
Frequency of Use	High
Channel of Actor	Management Dashboard

3.4 Activity Diagrams

3.4.0.1 Activity Diagram-Login

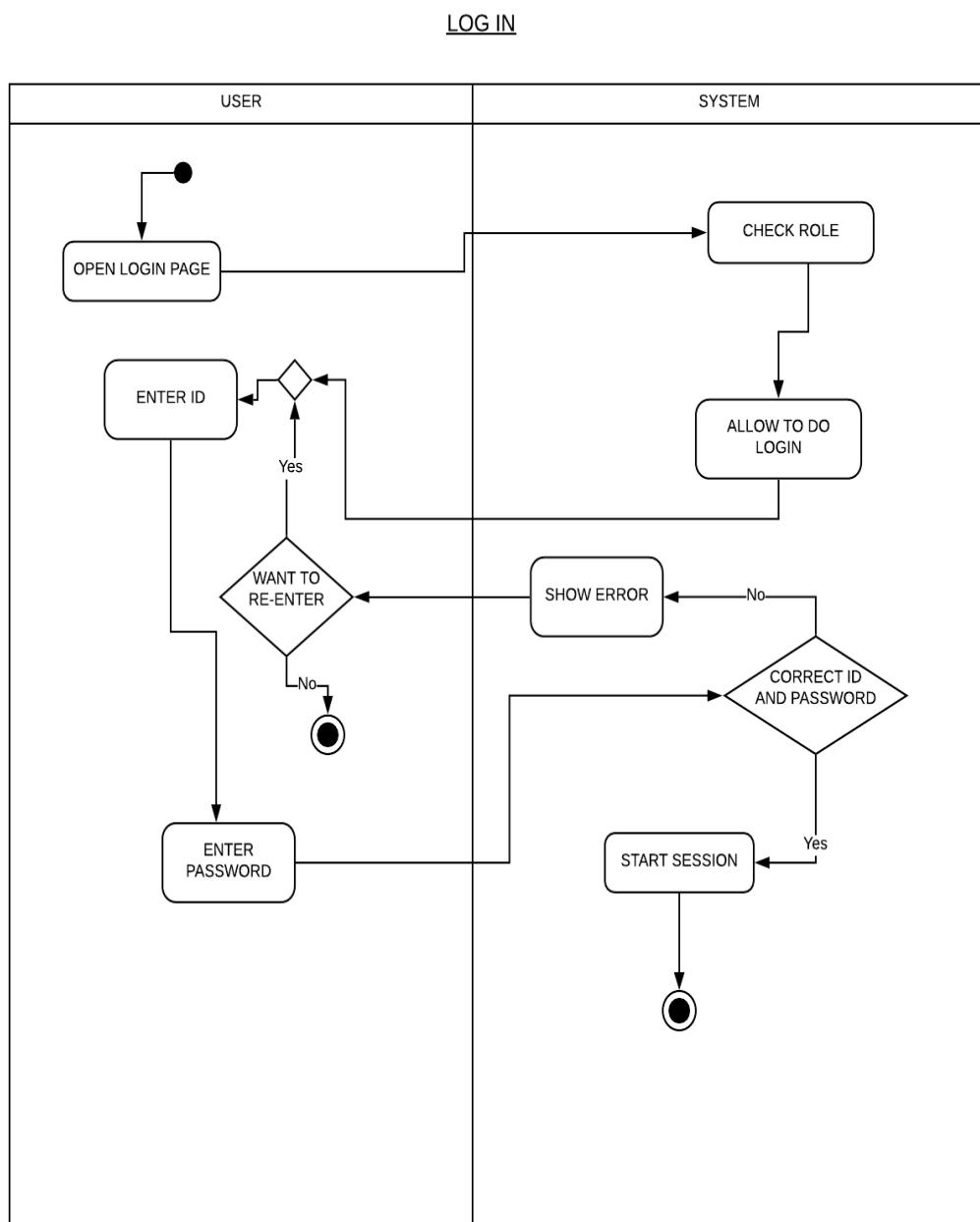


FIGURE 3.3: Login

3.4.0.2 Activity Diagram-Upload Patient Data

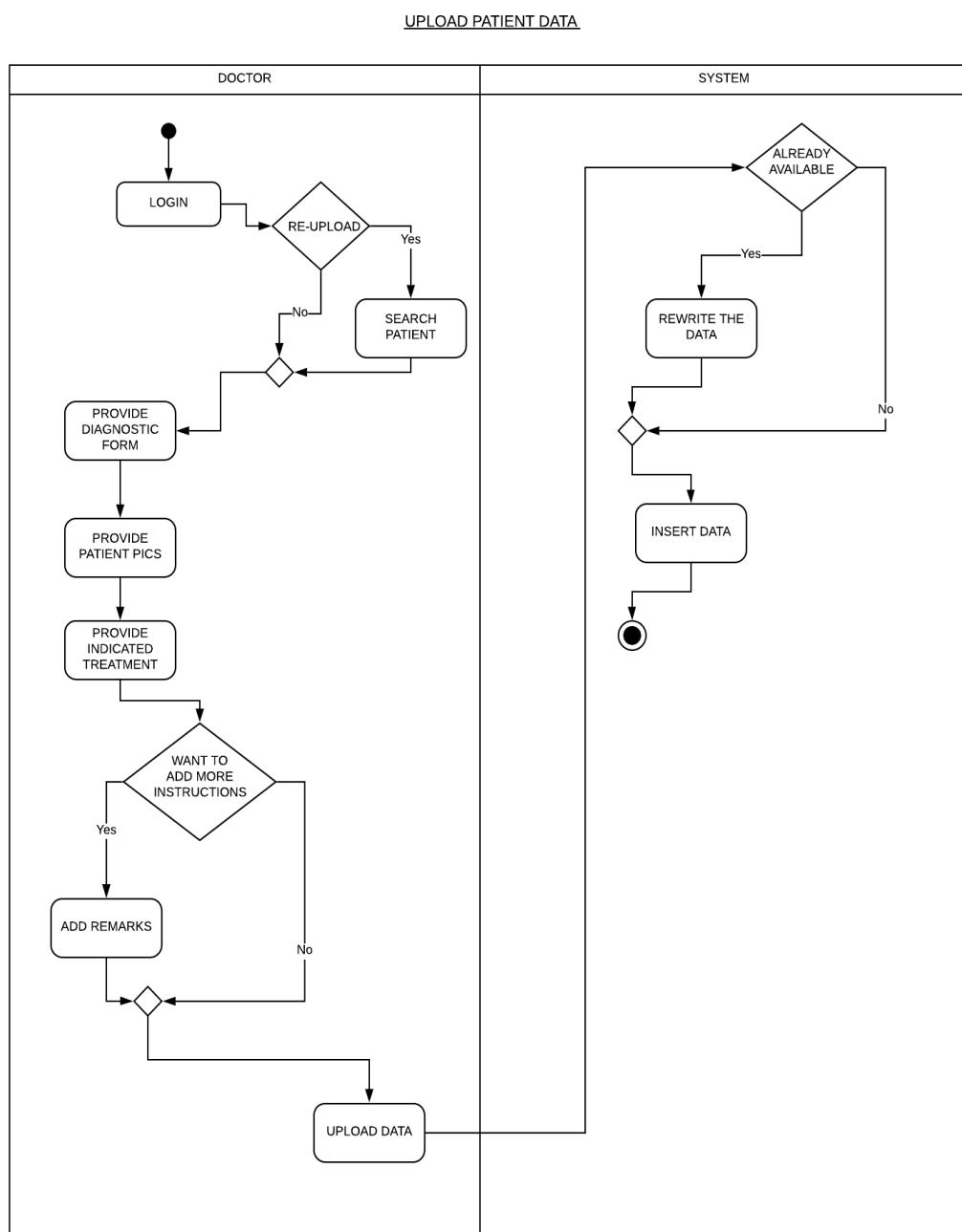


FIGURE 3.4: Upload Patient Data

3.4.0.3 Activity Diagram-Receive Patient Data

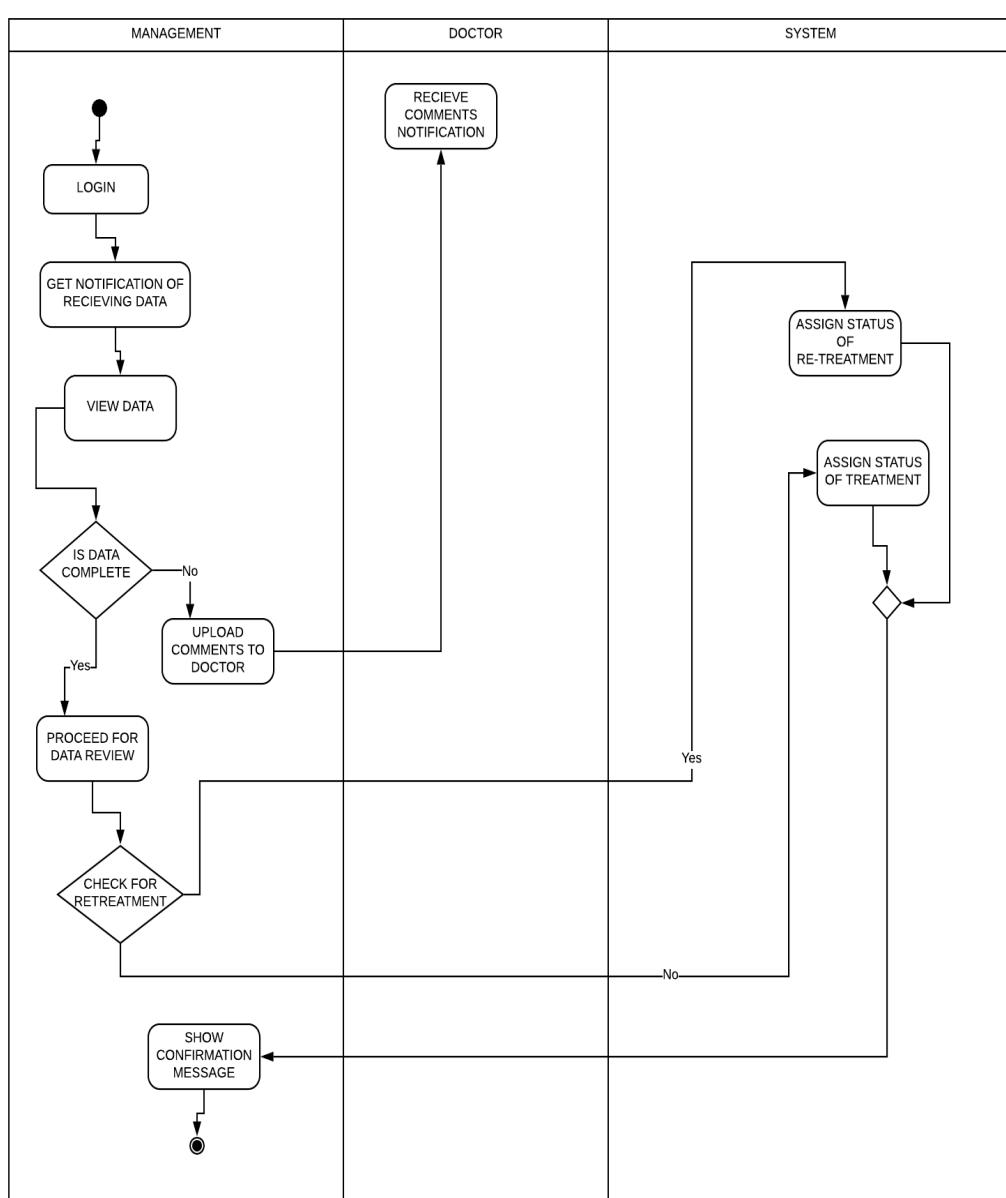


FIGURE 3.5: receive patient data

3.4.0.4 Activity Diagram-Case Entry

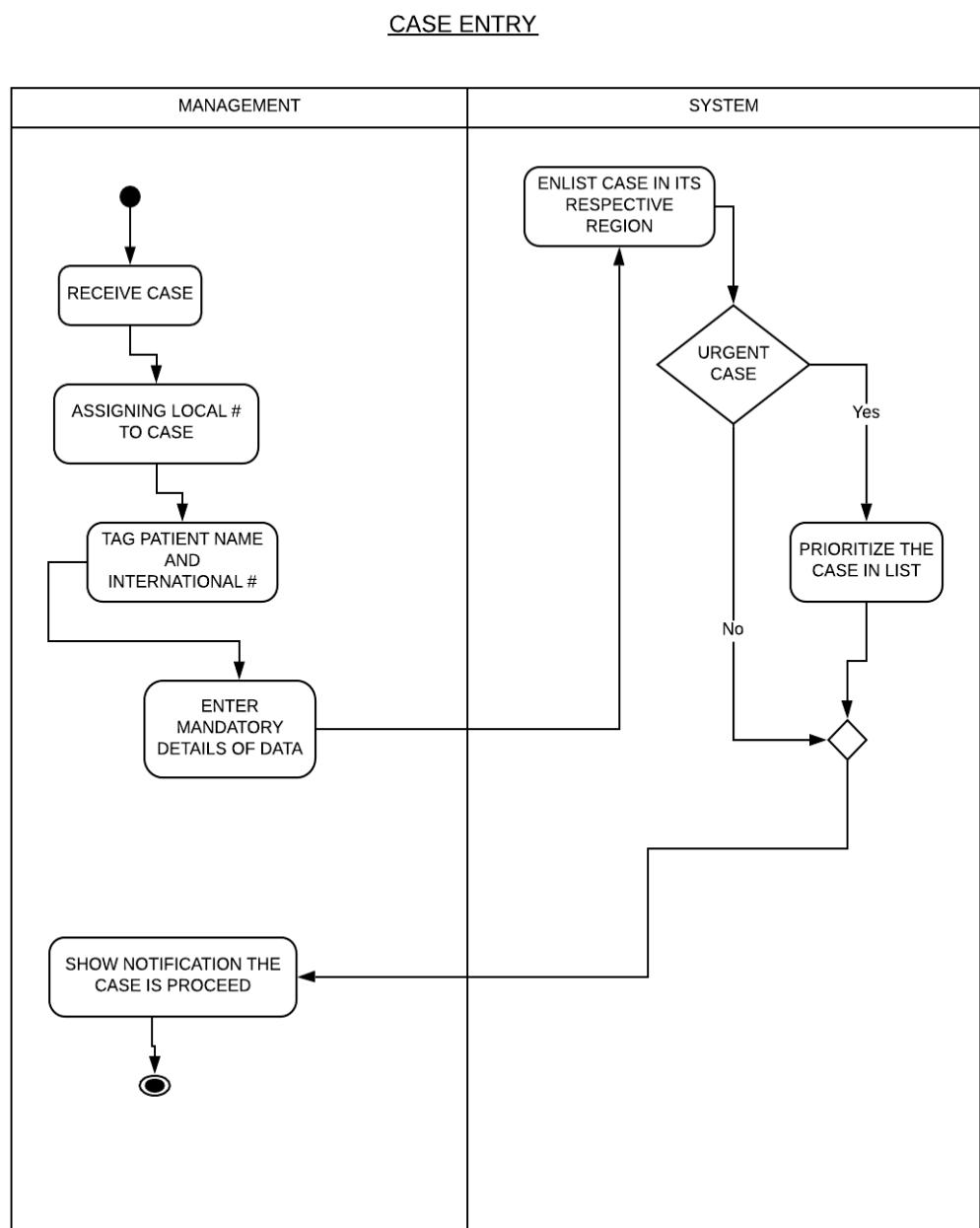


FIGURE 3.6: case entry

3.4.0.5 Activity Diagram-Assigning a Case

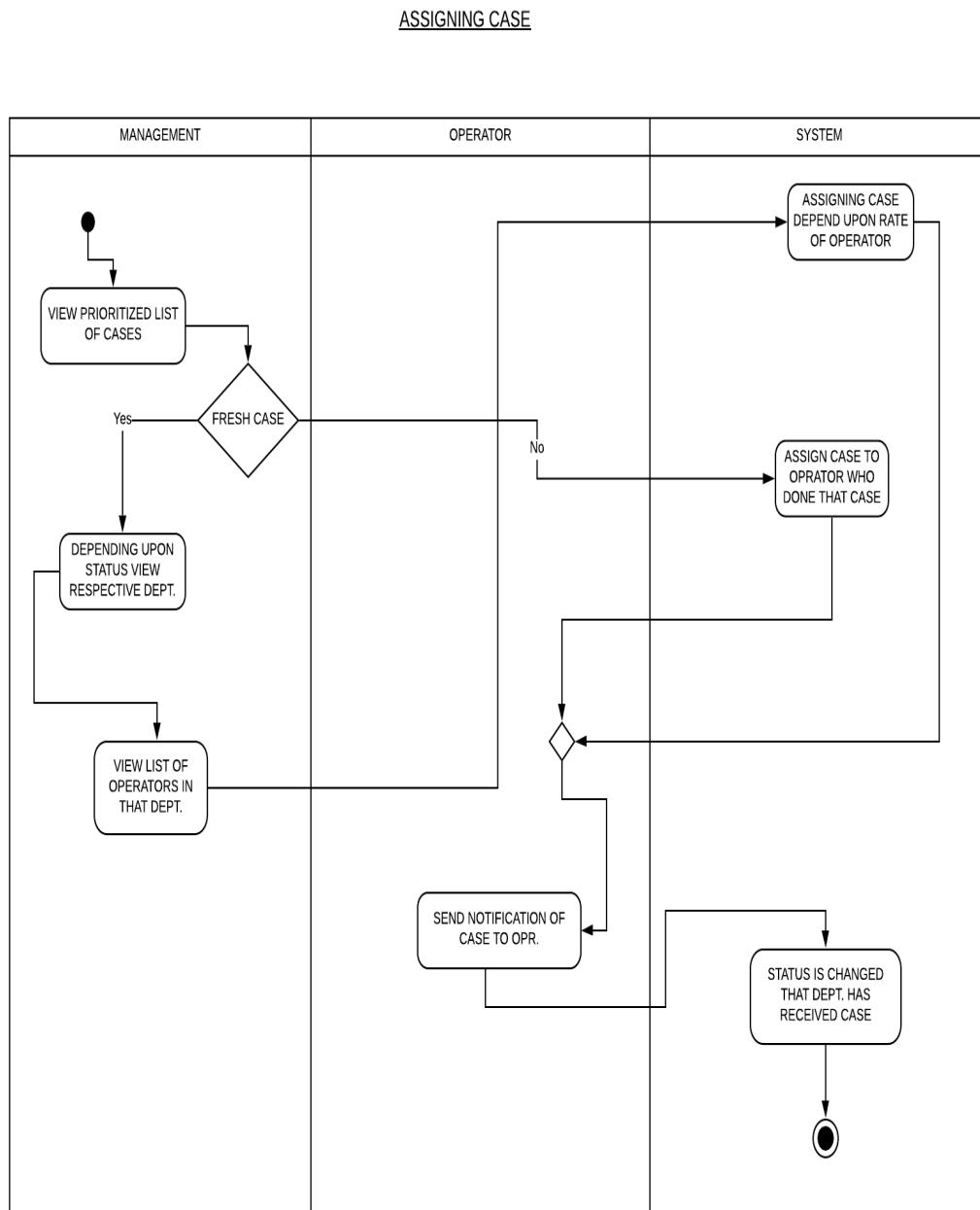


FIGURE 3.7: Assigning a Case

3.4.0.6 Activity Diagram-Pick a Case

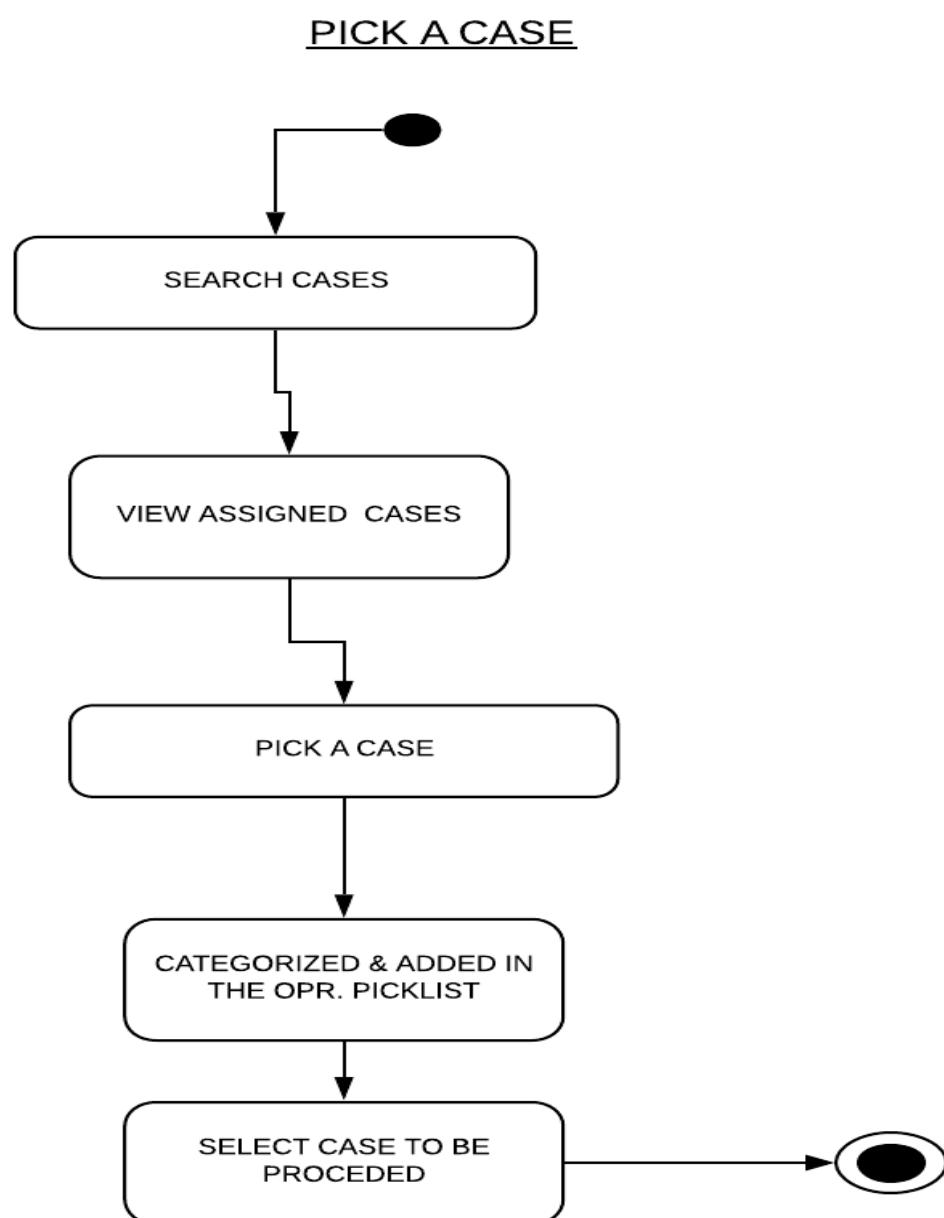


FIGURE 3.8: Pick a Case

3.4.0.7 Activity Diagram-Case Requirements Fulfill

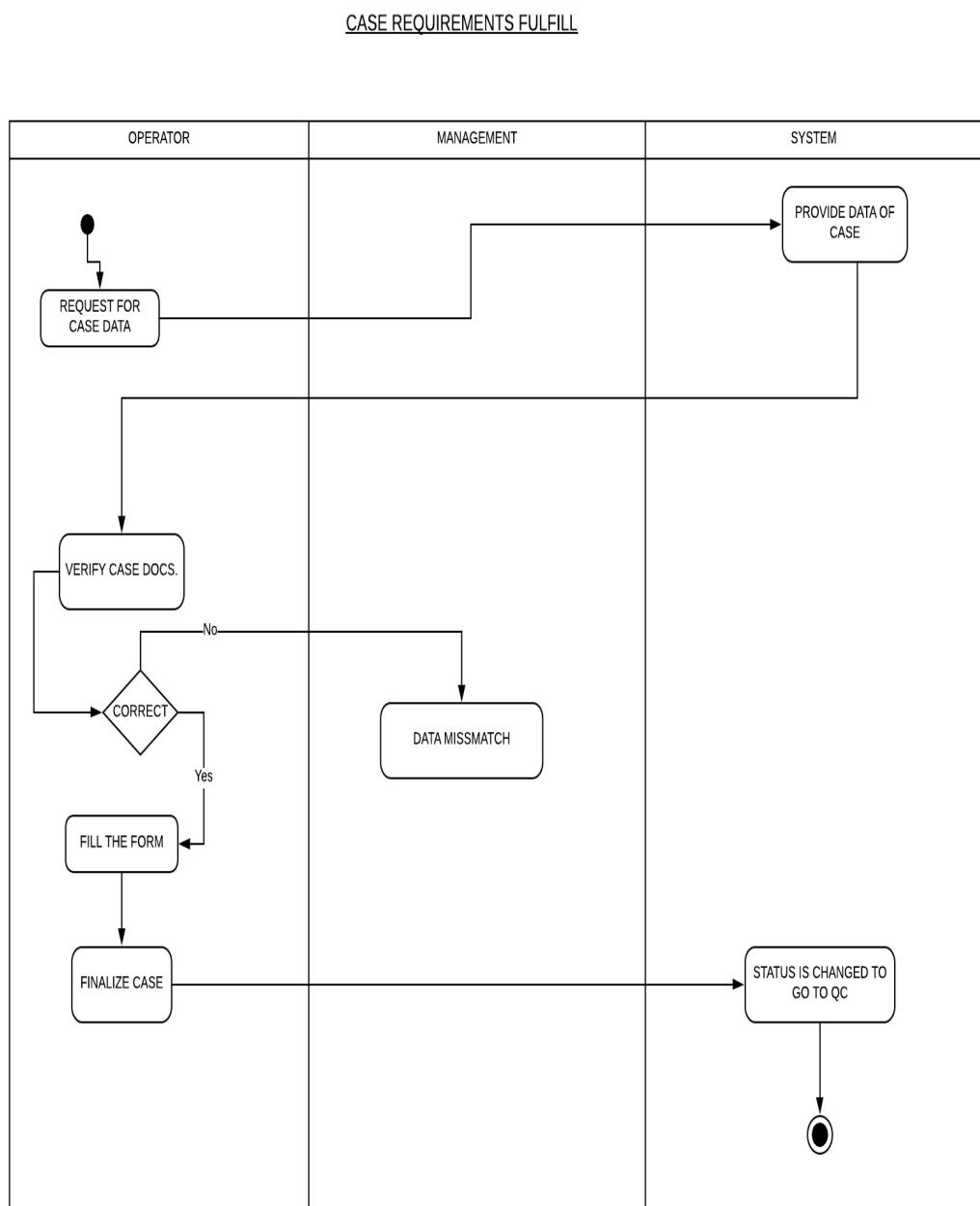


FIGURE 3.9: Case Requirements Fulfill

3.4.0.8 Activity Diagram-Check Case Timeline

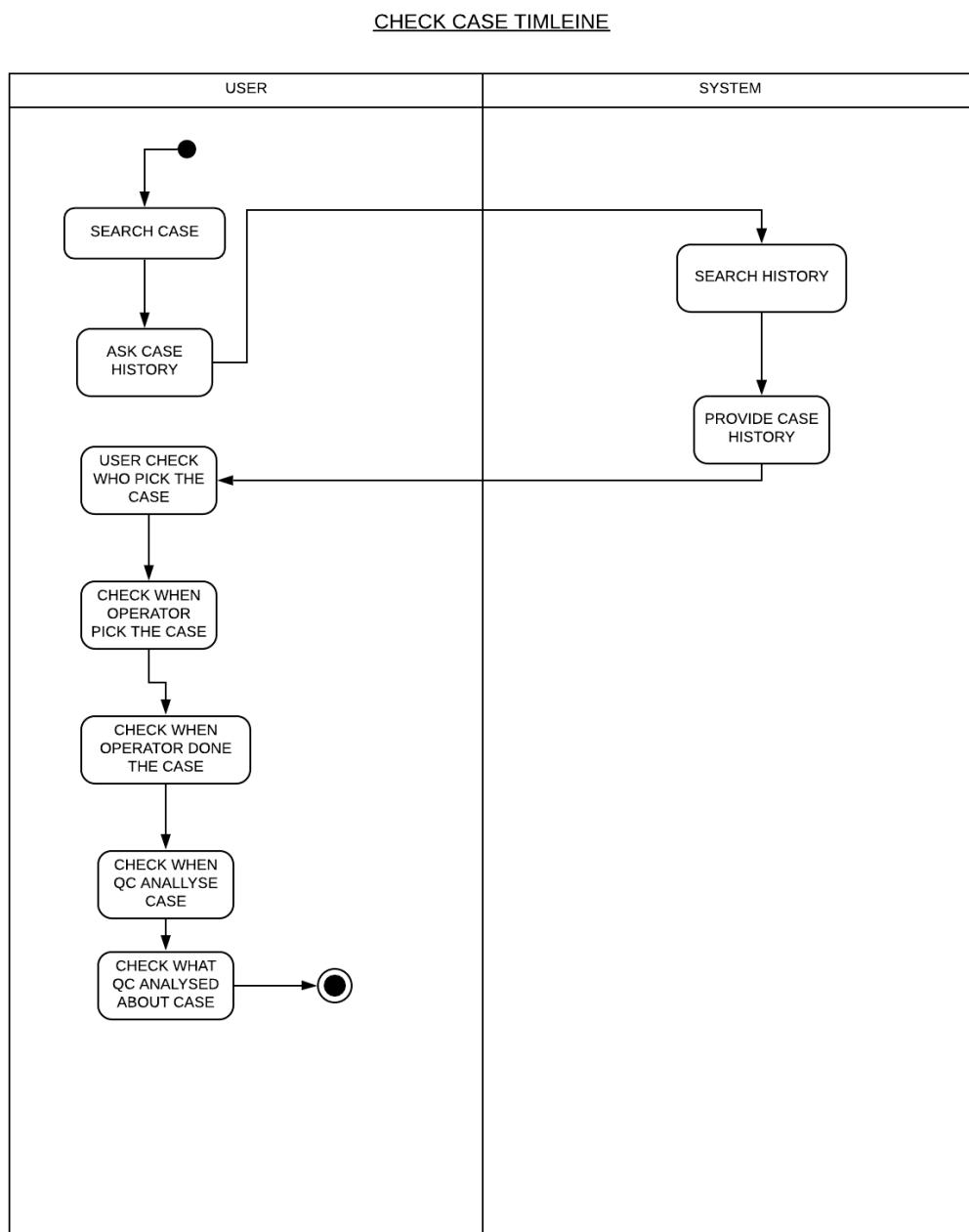


FIGURE 3.10: Check Case Timeline

3.4.0.9 Activity Diagram-Case Approval

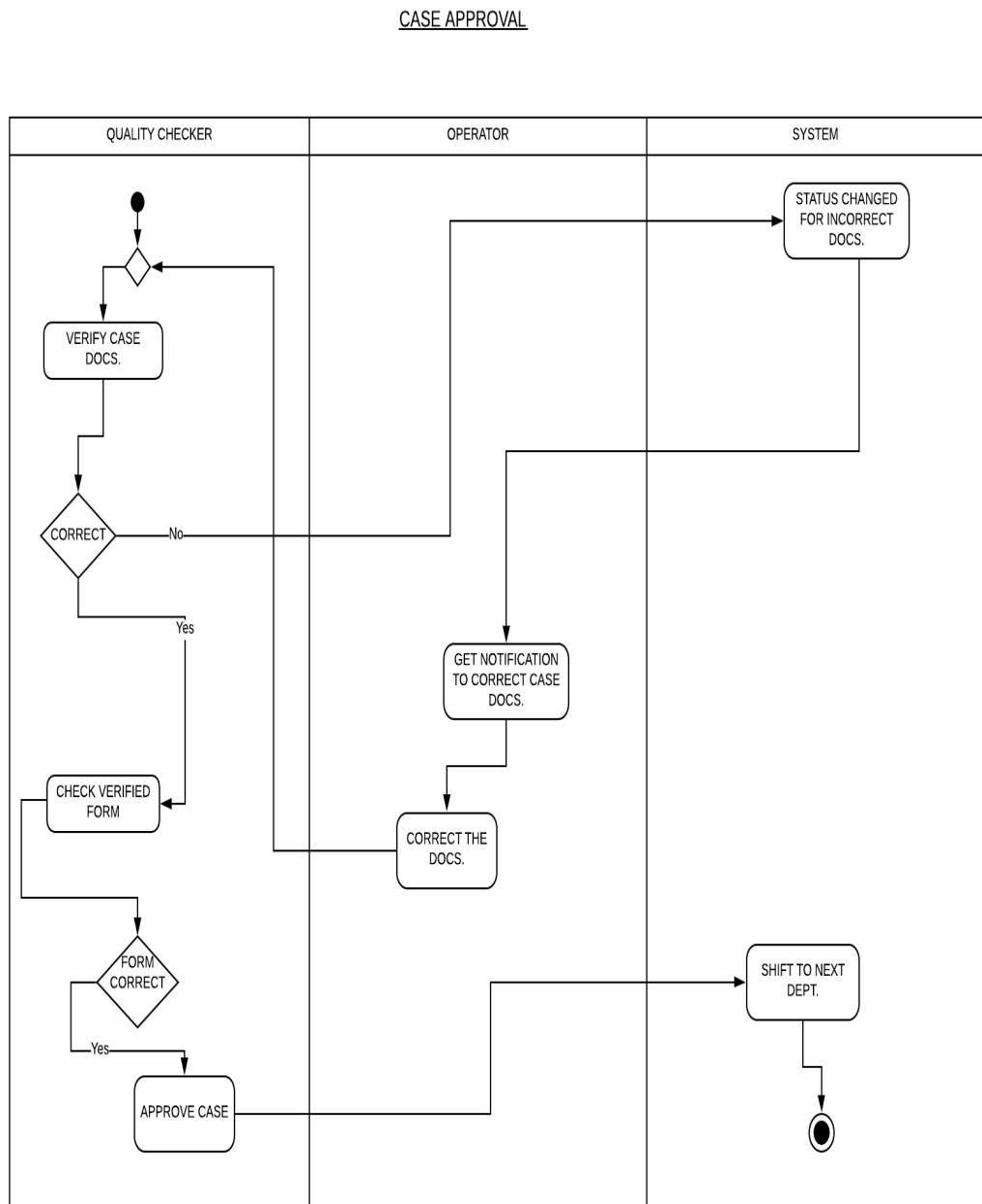


FIGURE 3.11: Case Approval

3.4.0.10 Activity Diagram-Case Editing

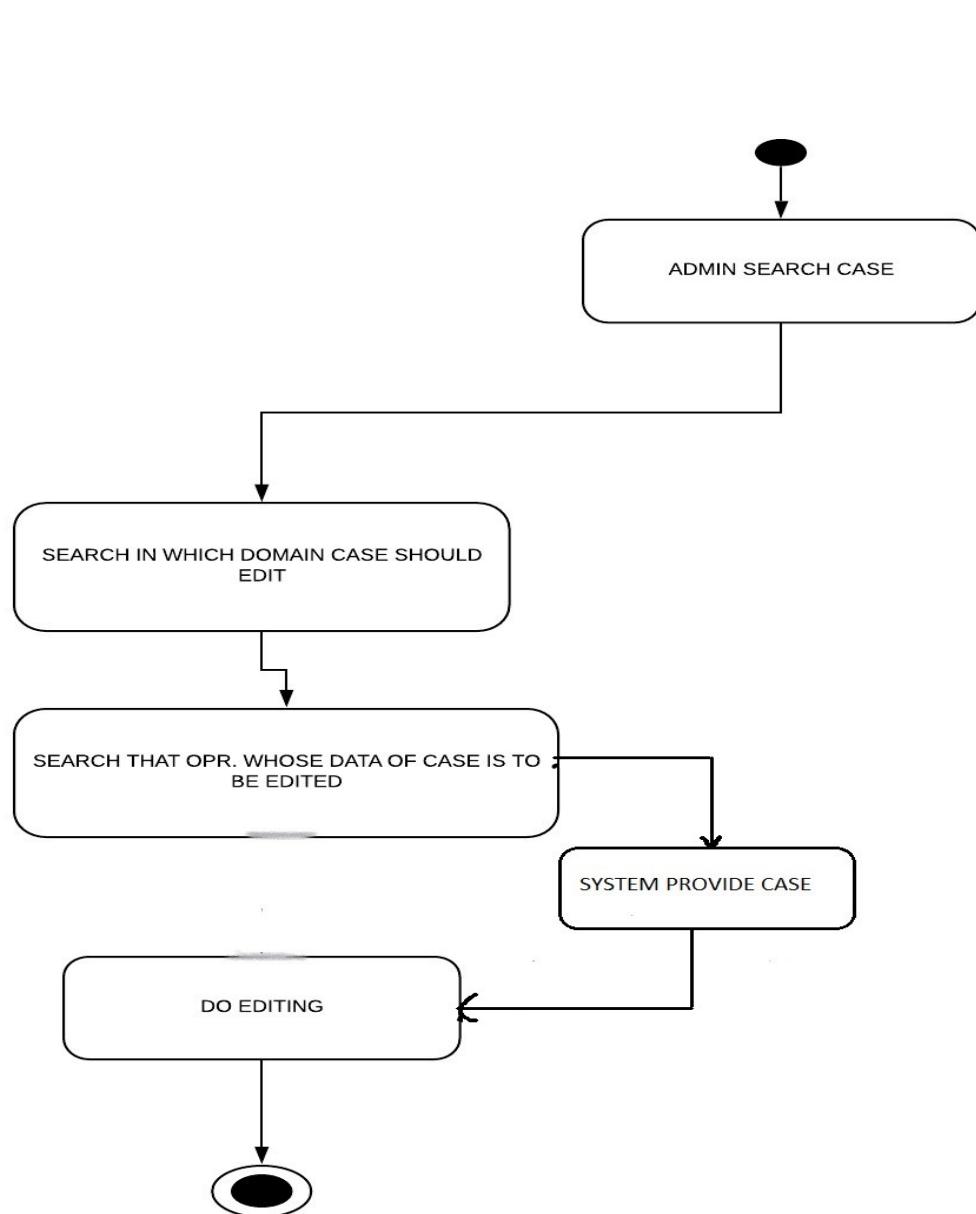


FIGURE 3.12: Case Editing

3.4.0.11 Activity Diagram-Progress Report

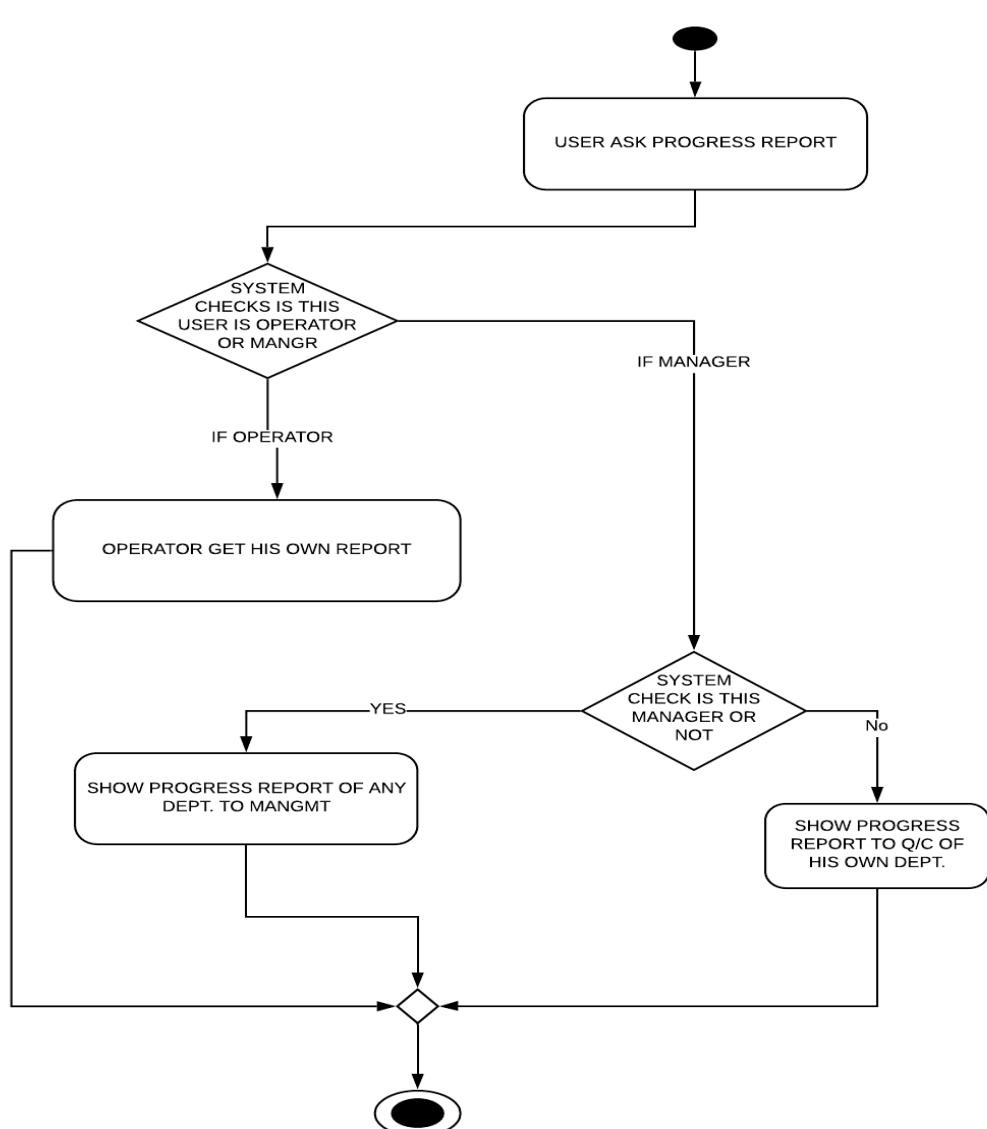


FIGURE 3.13: Progress Report

3.4.0.12 Activity Diagram-Check Shipment

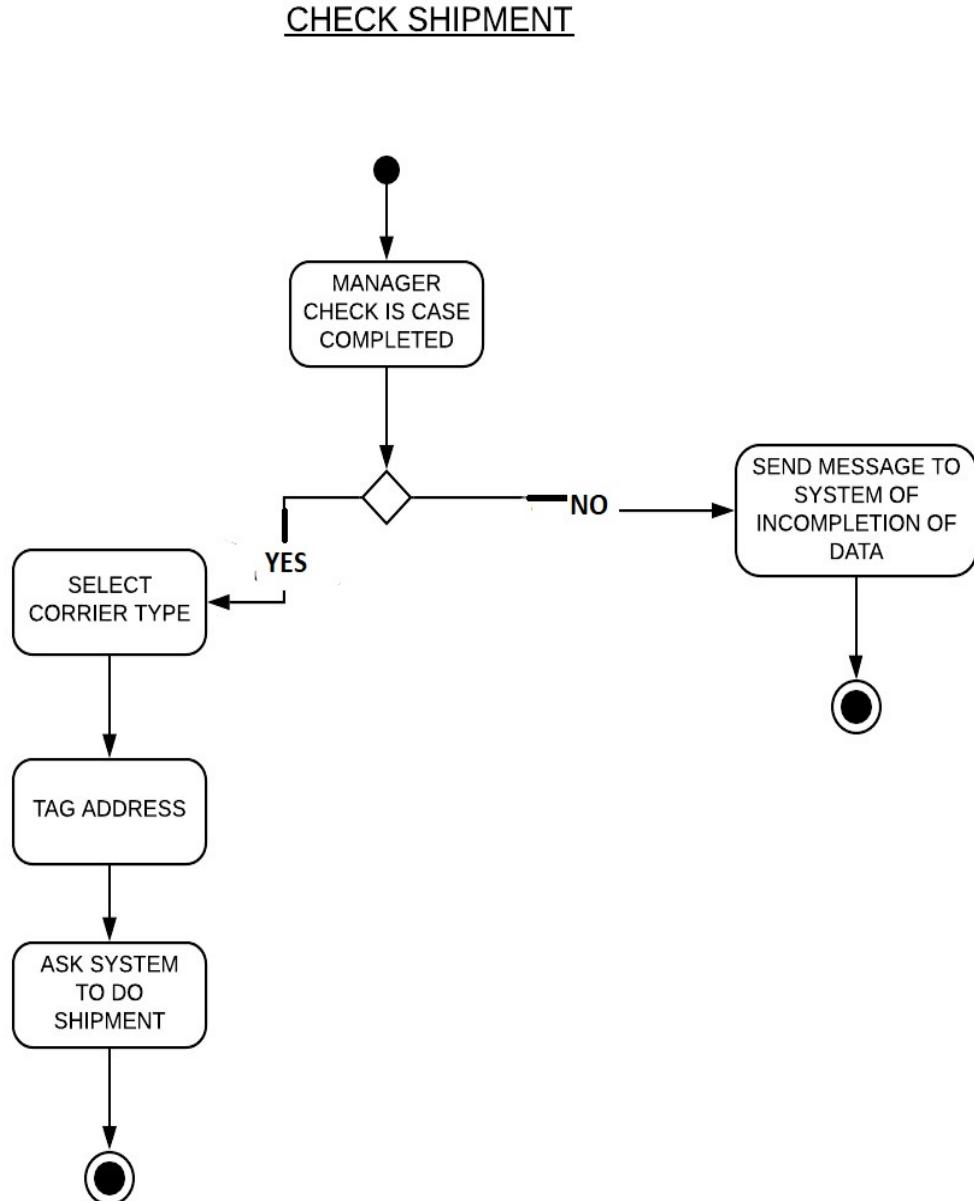


FIGURE 3.14: Check Shipment

3.5 Class Diagram

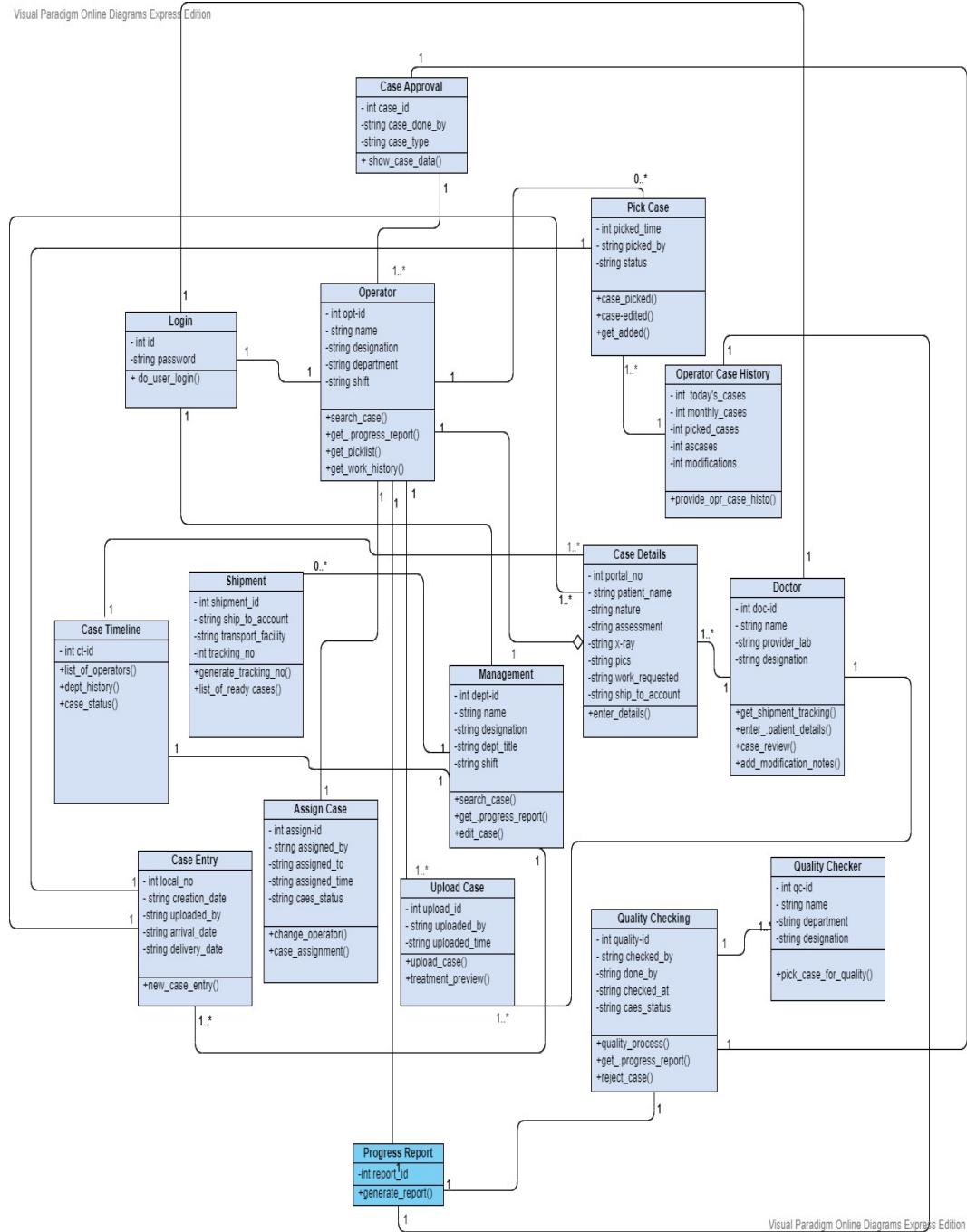


FIGURE 3.15: class diagram

3.6 Collaboration Diagram

3.6.0.1 Collaboration Diagram-Login

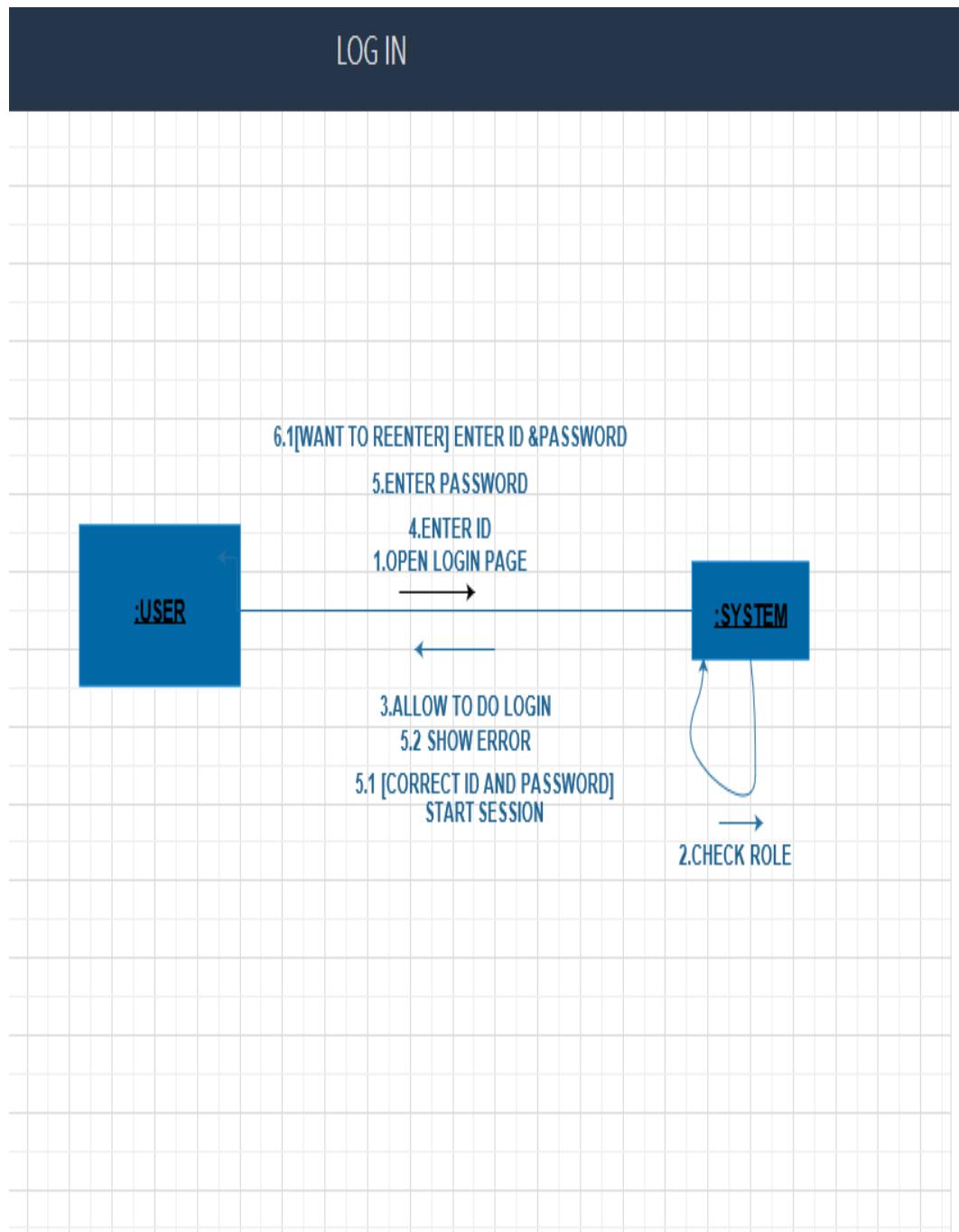


FIGURE 3.16: Login

3.6.0.2 Collaboration Diagram-Upload Patient Data

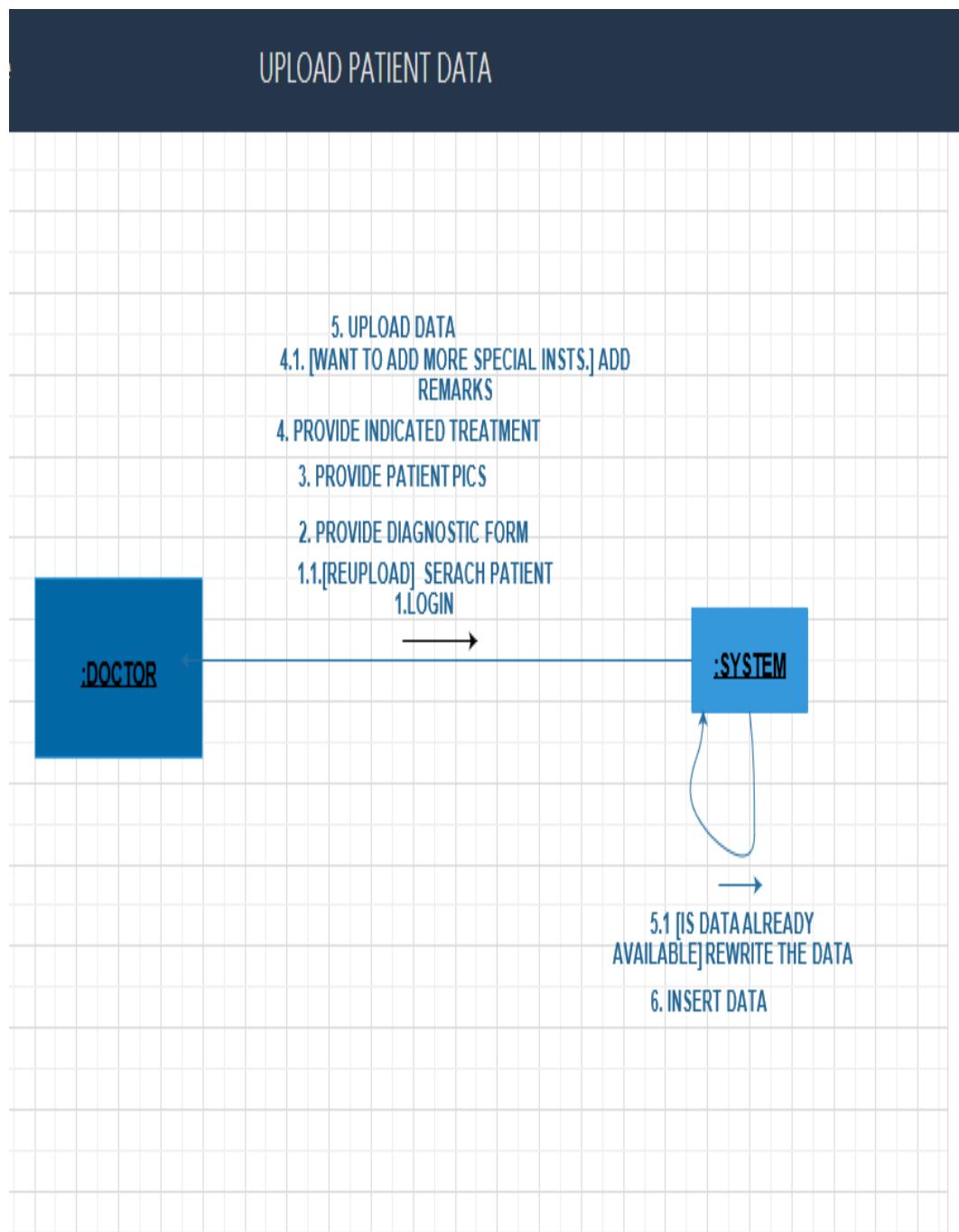


FIGURE 3.17: Upload Patient Data

3.6.0.3 Collaboration Diagram—Receive Patient Data

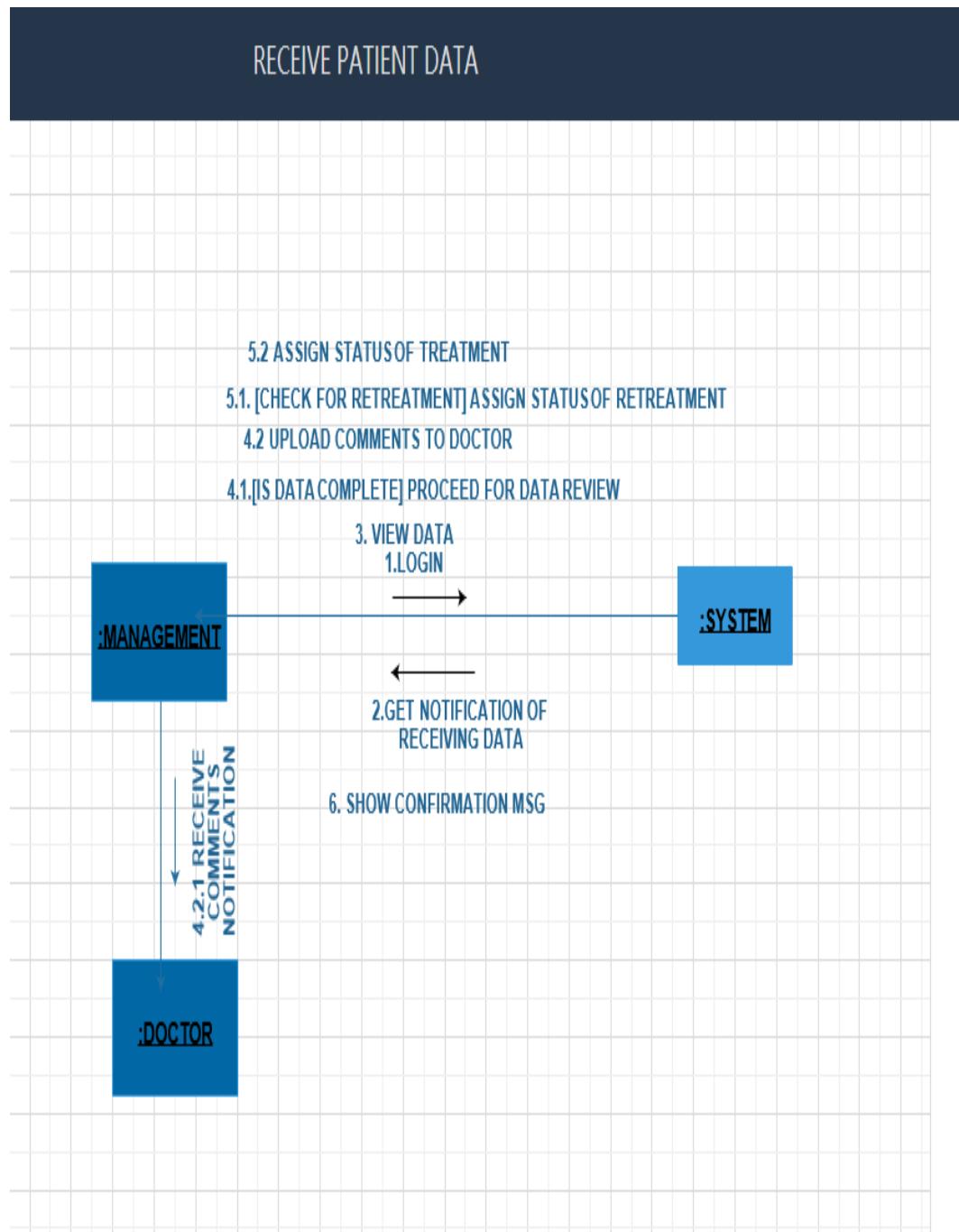


FIGURE 3.18: Receive Patient Data

3.6.0.4 Collaboration Diagram-Case Entry

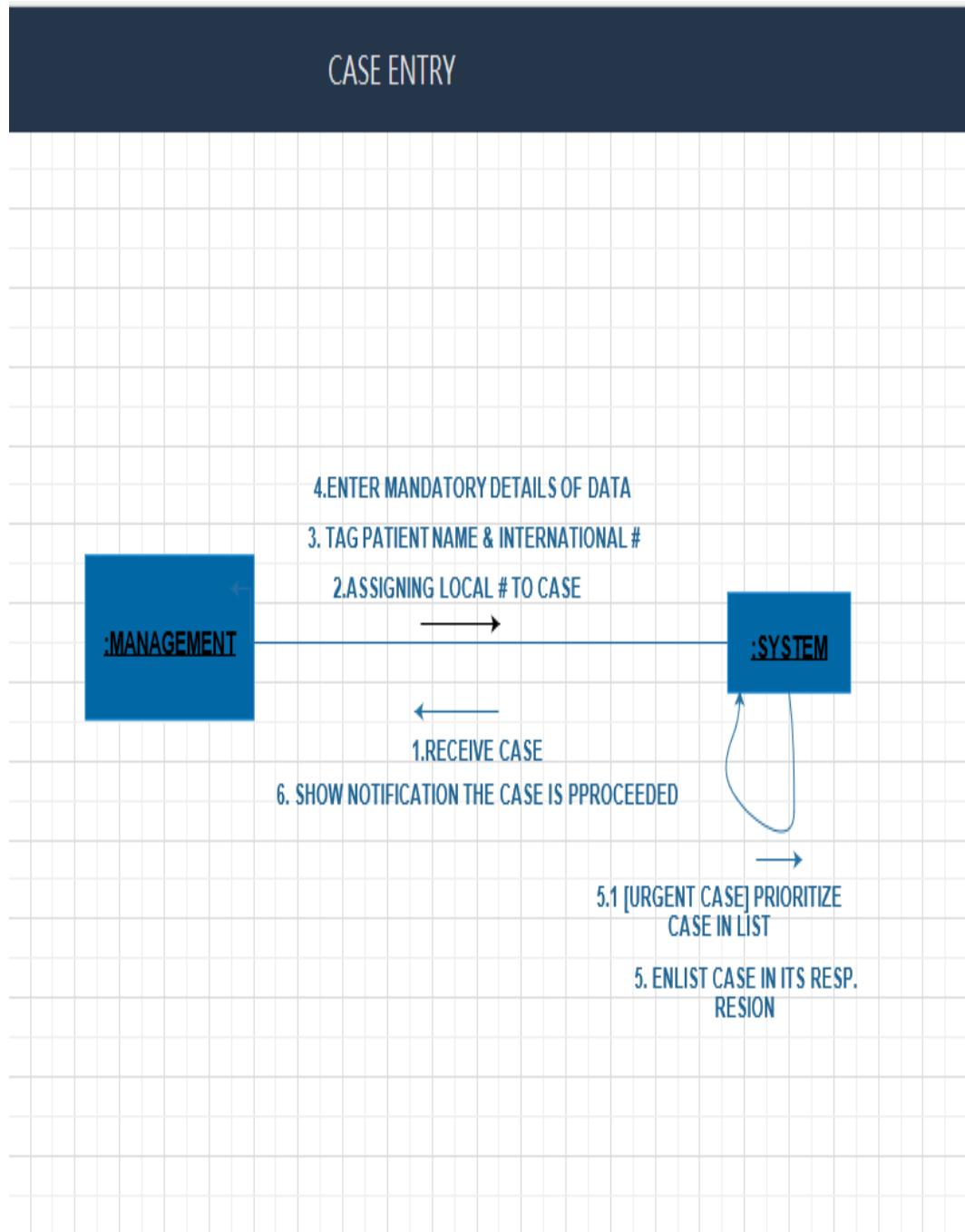


FIGURE 3.19: -Case Entry

3.6.0.5 Collaboration Diagram-Assigning a case

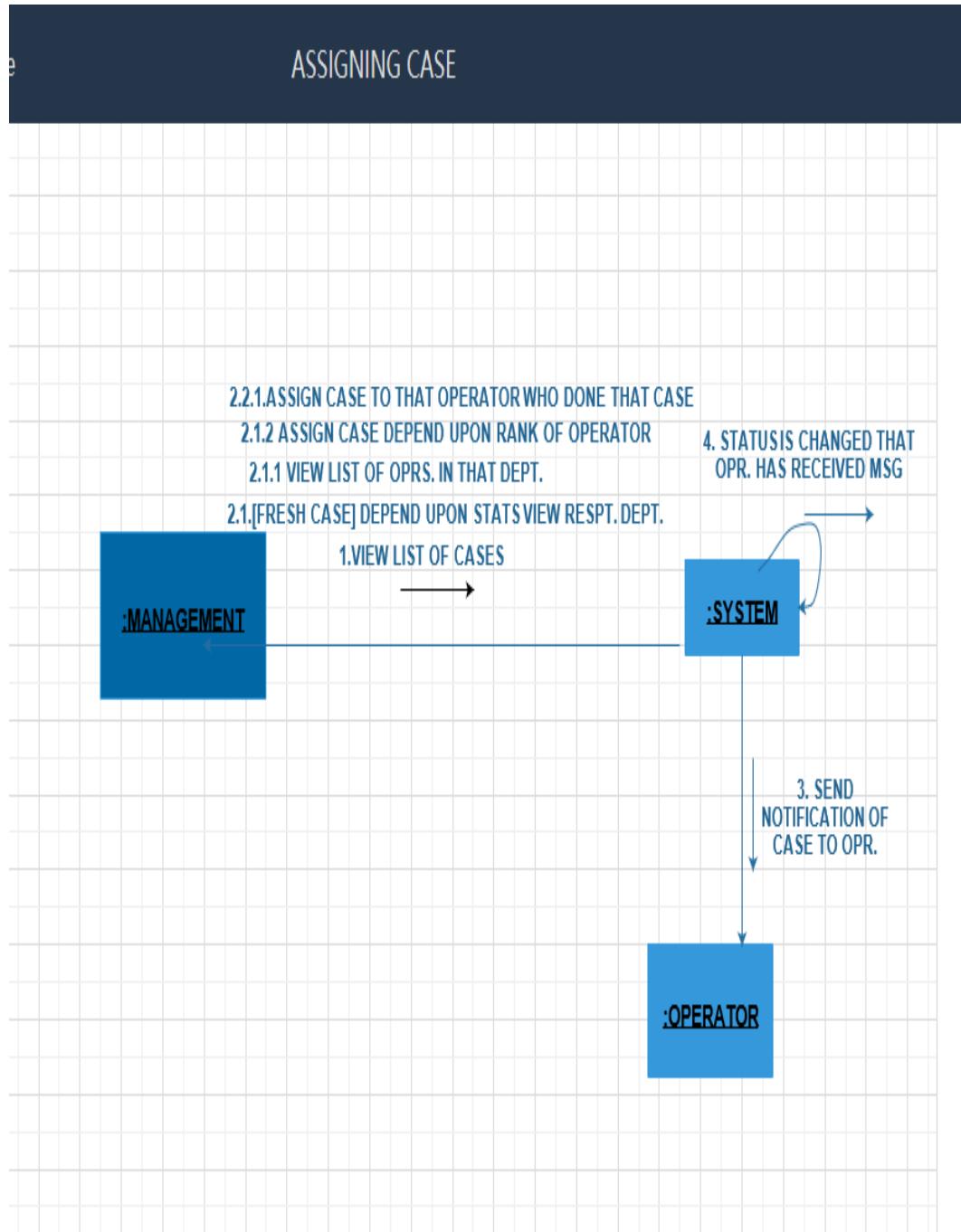


FIGURE 3.20: Assigning a case

3.6.0.6 Collaboration Diagram-Pick a Case

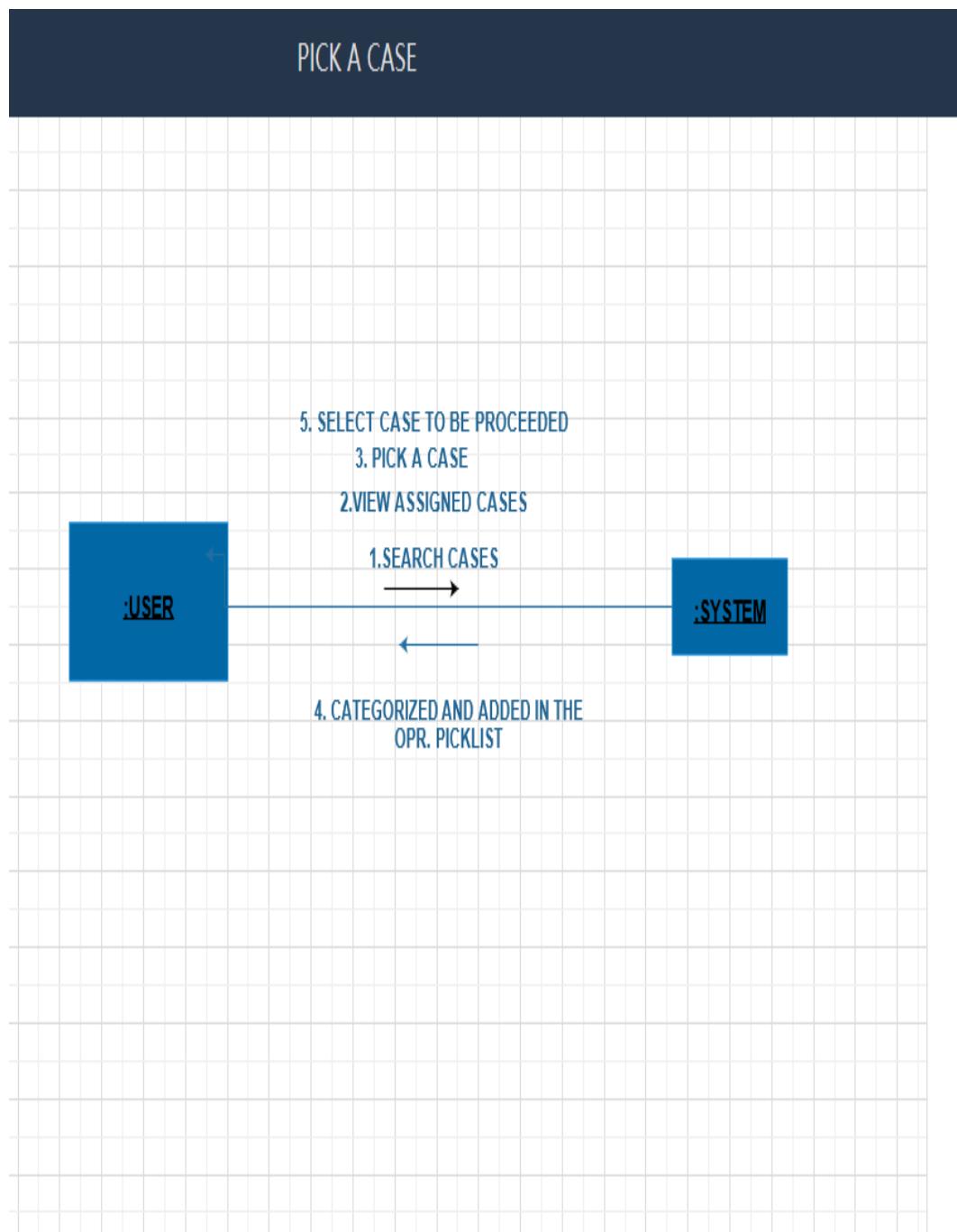


FIGURE 3.21: Pick a Case

3.6.0.7 Collaboration Diagram-Case Timeline

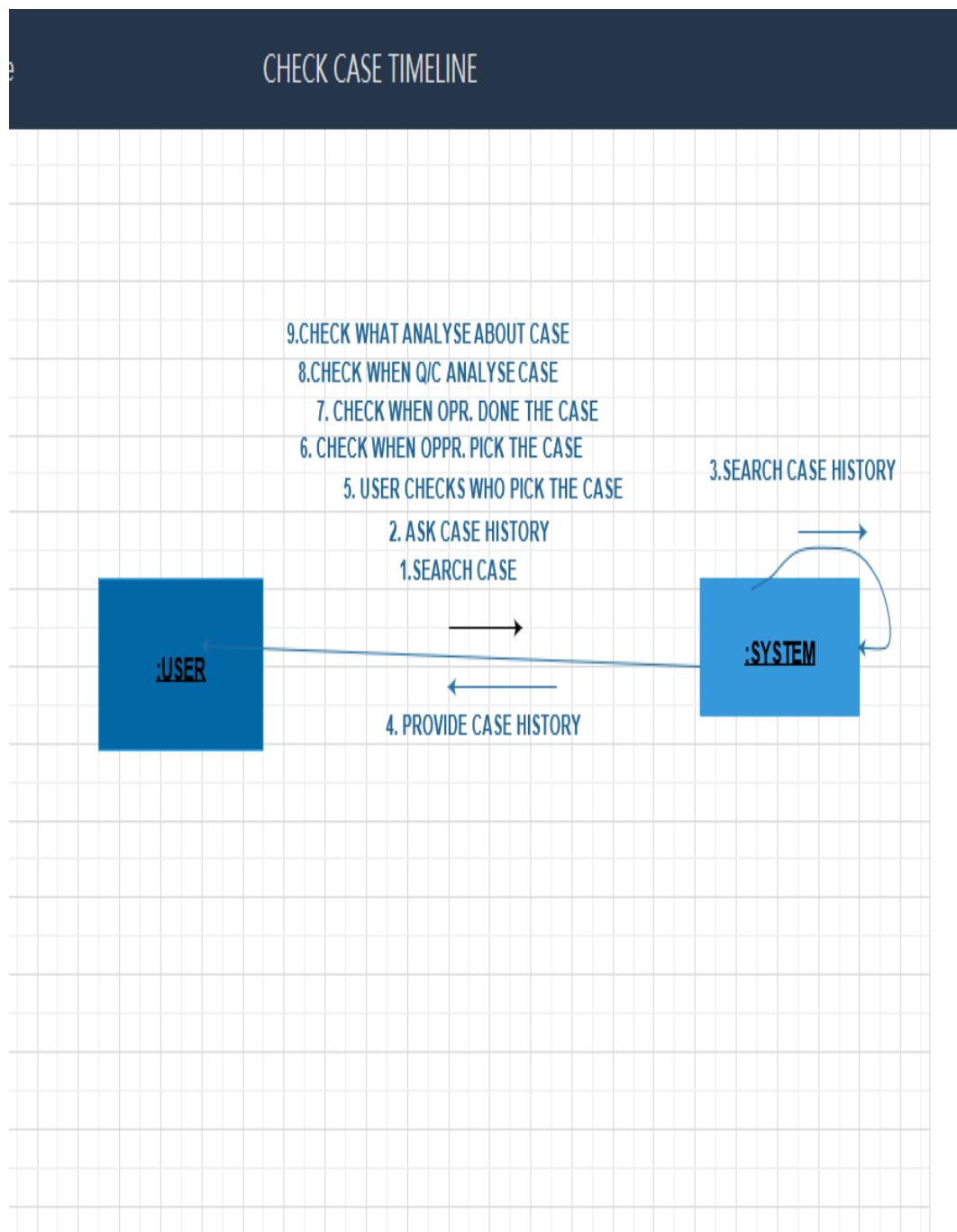


FIGURE 3.22: Case Timeline

3.6.0.8 Collaboration Diagram-CaseRequirementsFulfill

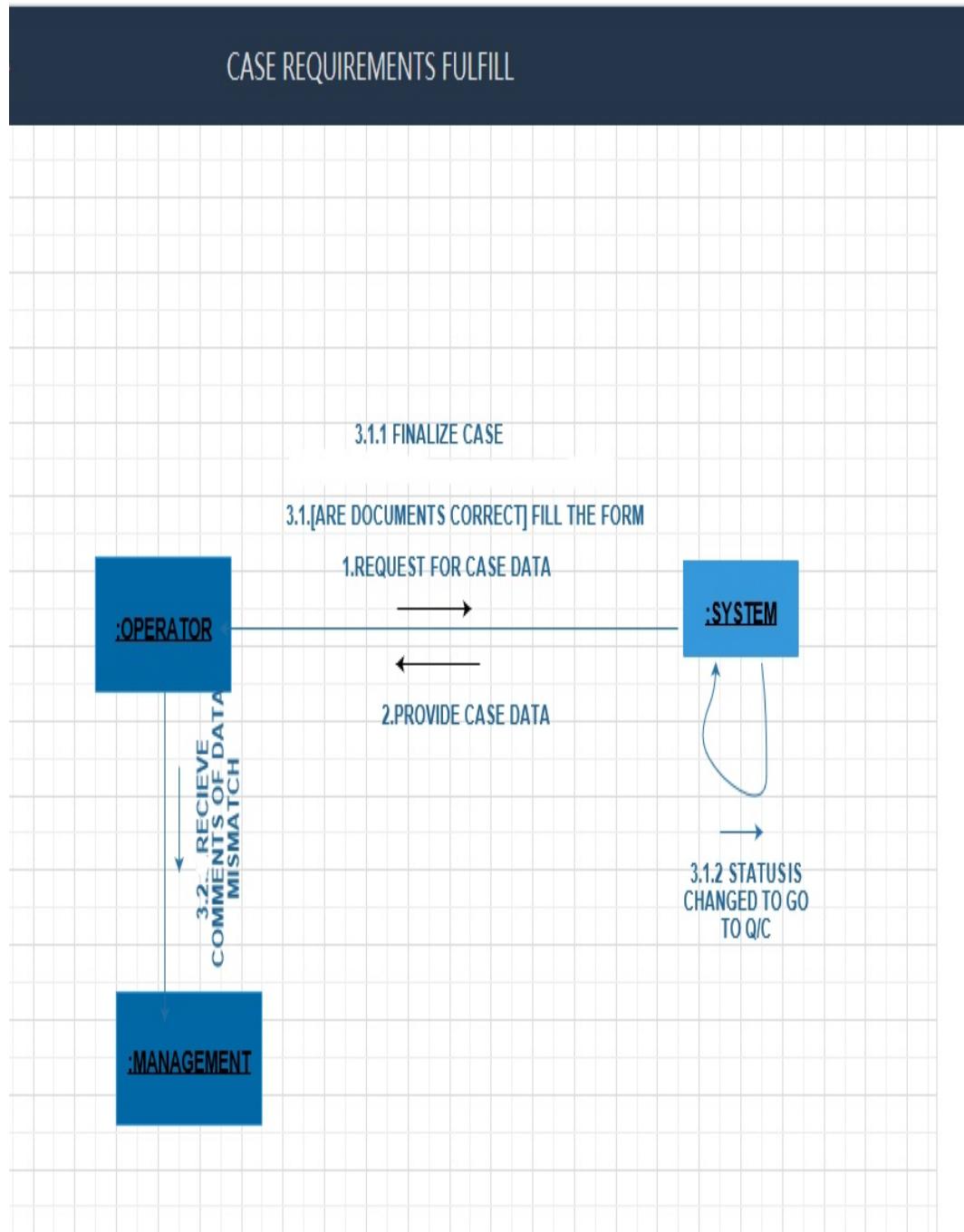


FIGURE 3.23: CaseRequirementsFulfill

3.6.0.9 Collaboration Diagram-Case Approval

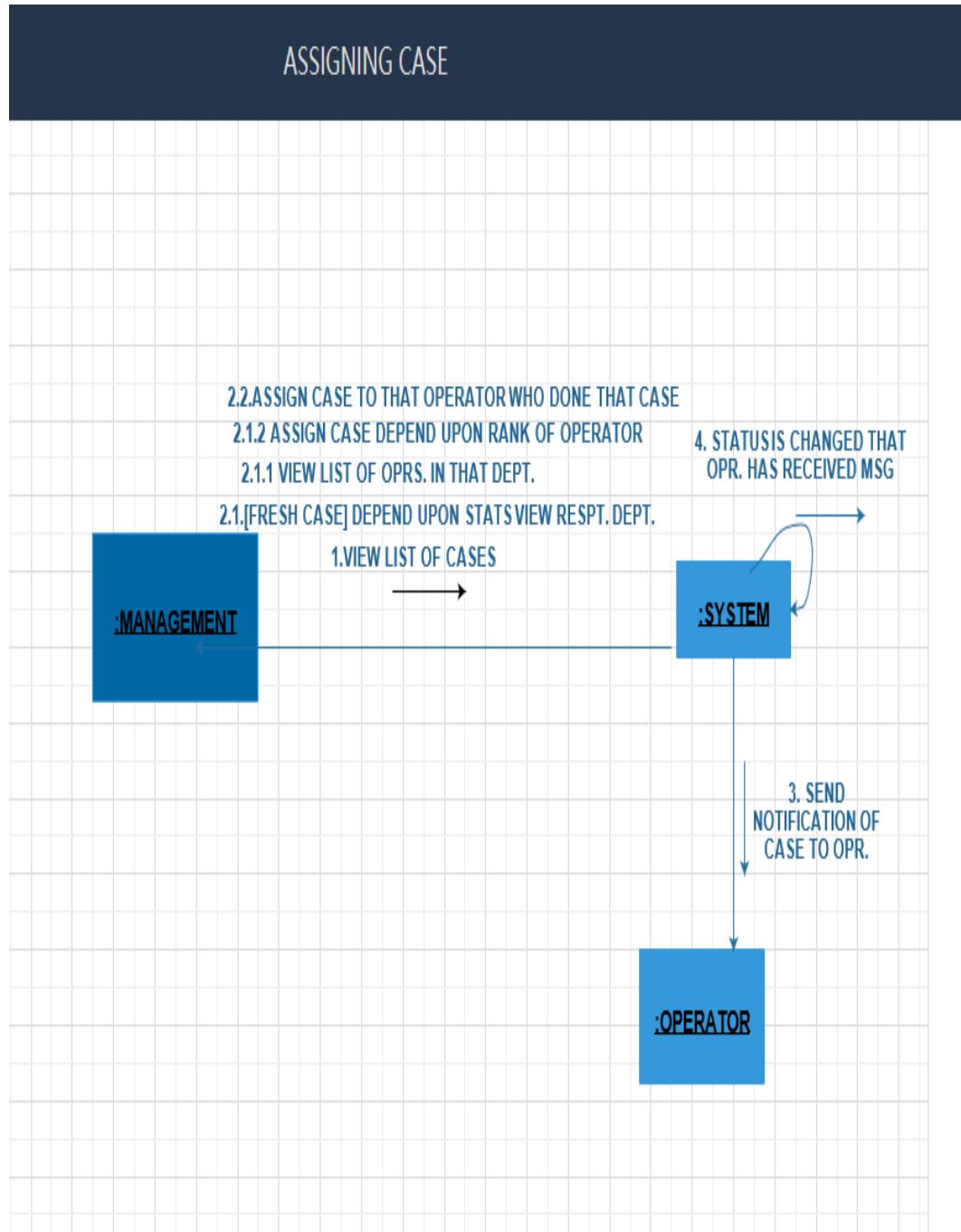


FIGURE 3.24: Case Approval

3.6.0.10 Collaboration Diagram-Case Editing

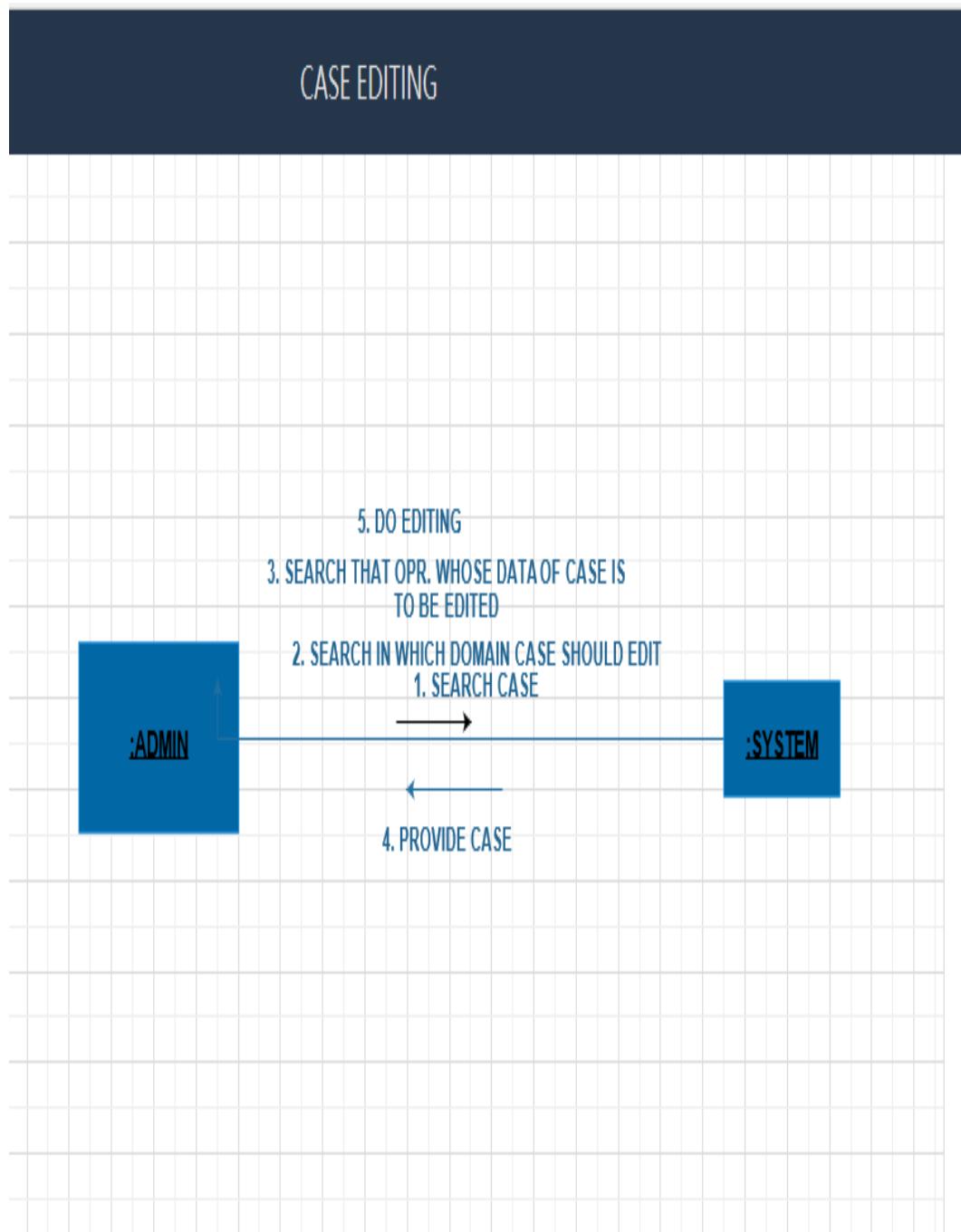


FIGURE 3.25: Case Editing

3.6.0.11 Collaboration Diagram-ProgressReport

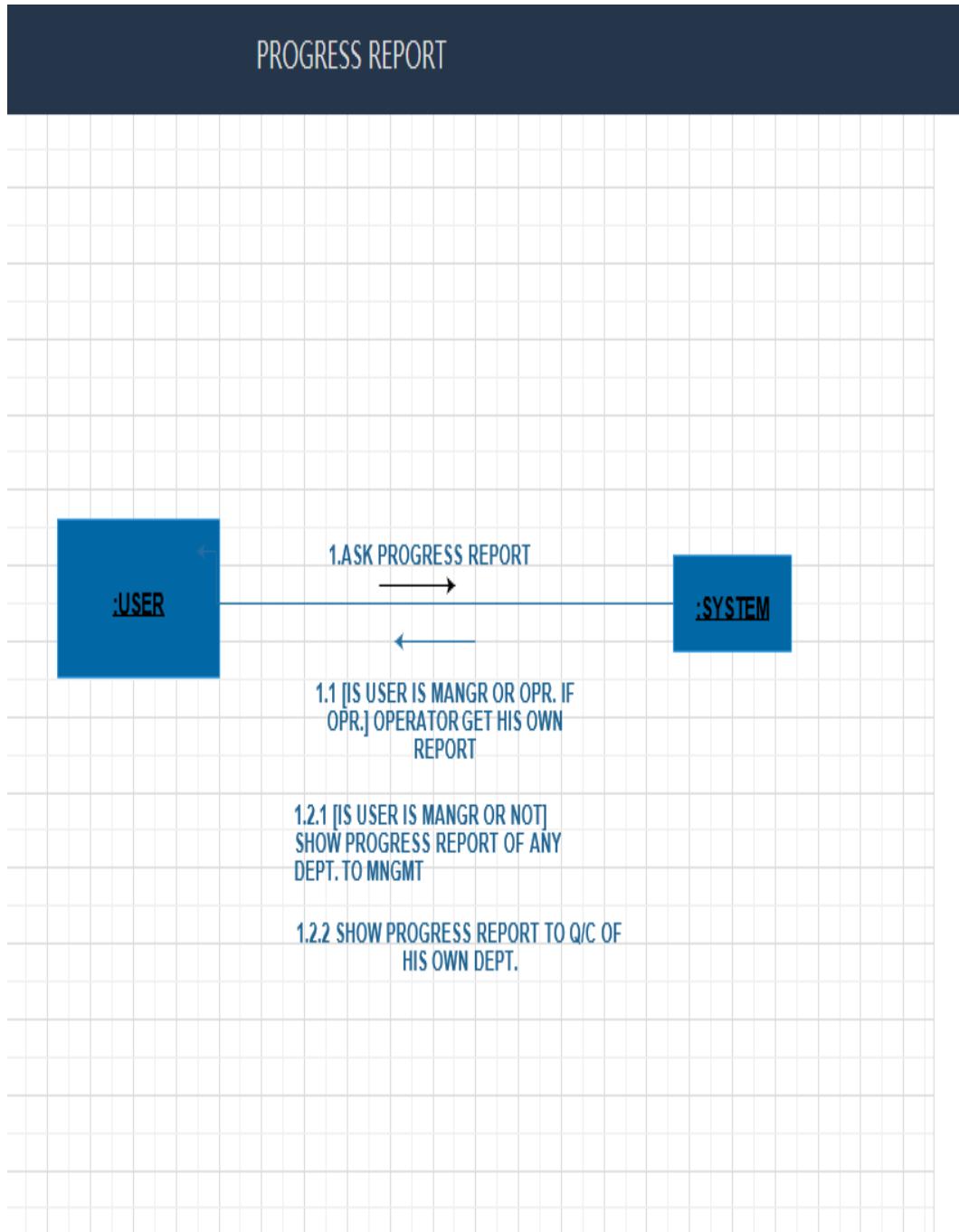


FIGURE 3.26: ProgressReport

3.6.0.12 Collaboration Diagram-Check Shipment

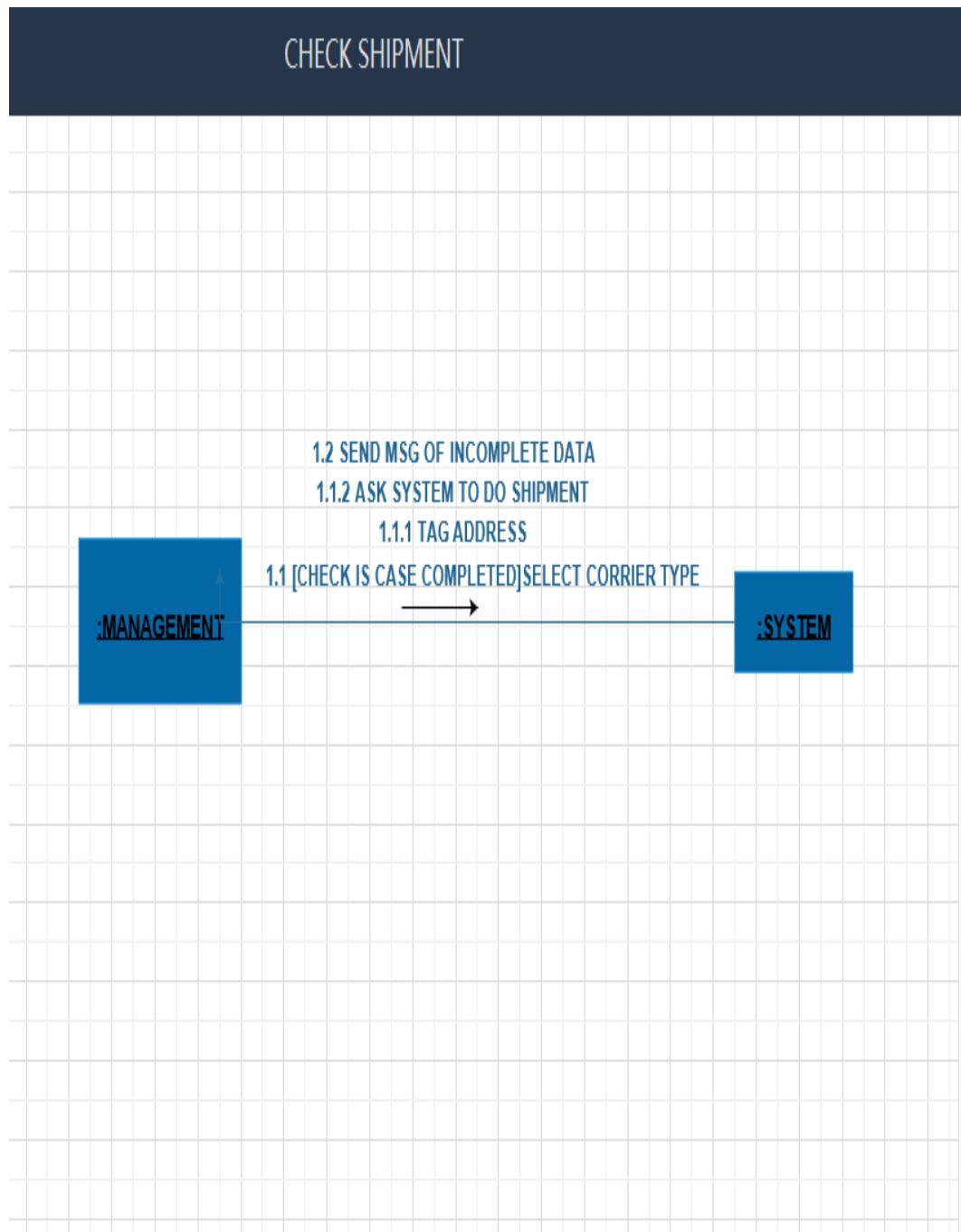


FIGURE 3.27: Check Shipment

3.7 Sequence Diagram

3.7.0.1 Sequence Diagram-LOG IN

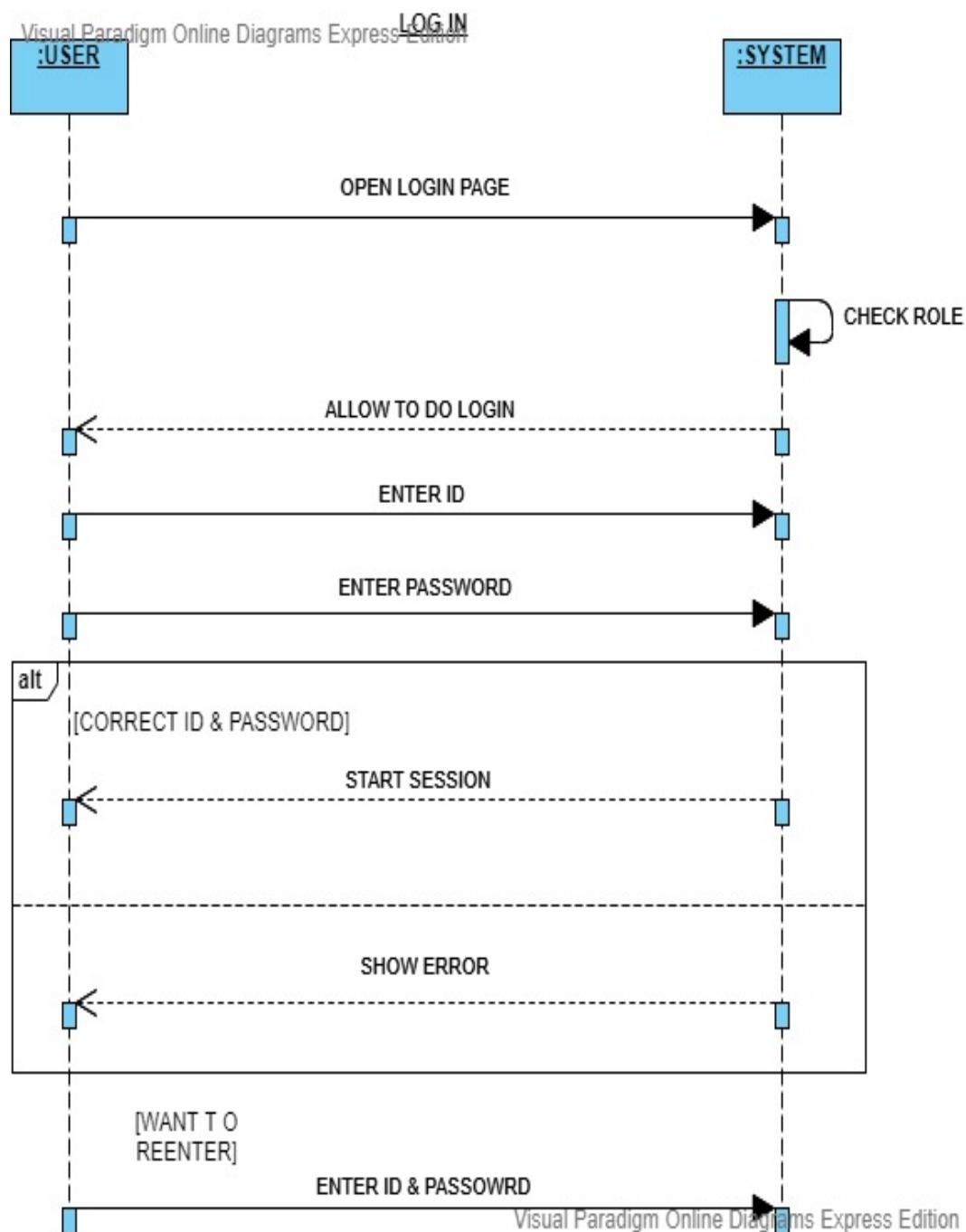


FIGURE 3.28: LOG IN

3.7.0.2 Sequence Diagram-UPLOAD PATIENT DATA

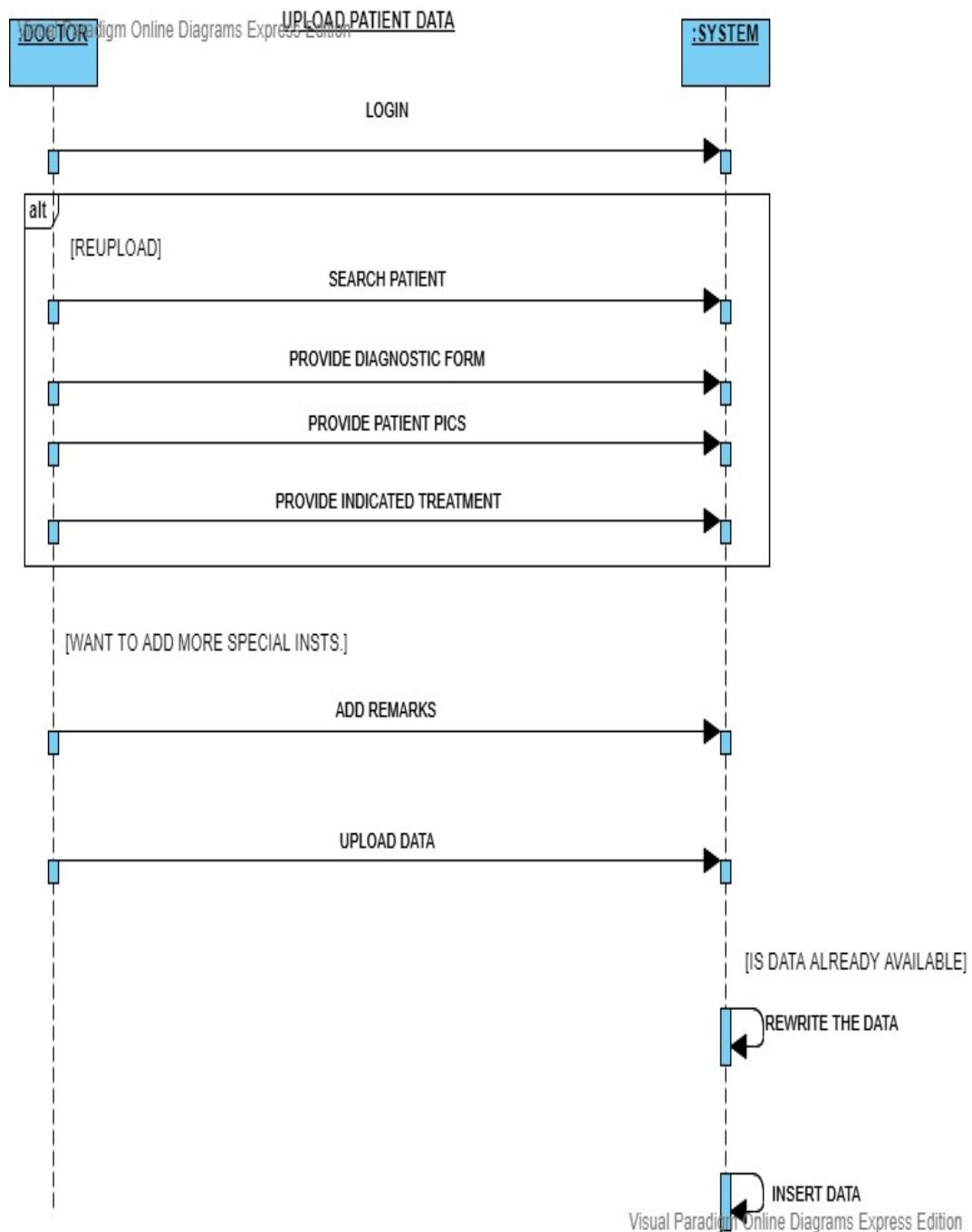


FIGURE 3.29: UPLOAD PATIENT DATA

3.7.0.3 Sequence Diagram-RECEIVE PATIENT DATA

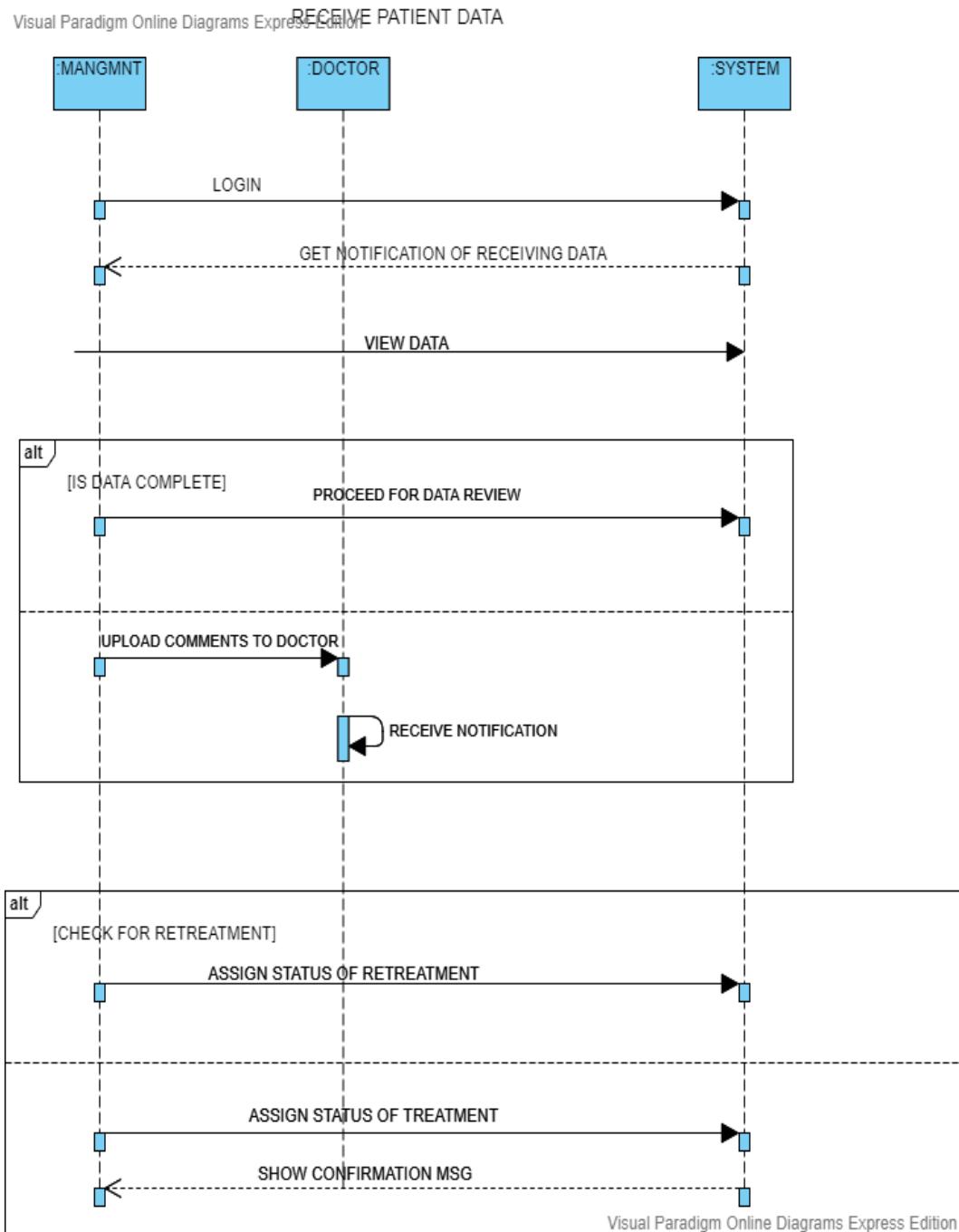


FIGURE 3.30: RECEIVE PATIENT DATA

3.7.0.4 Sequence Diagram-CASE ENTRY

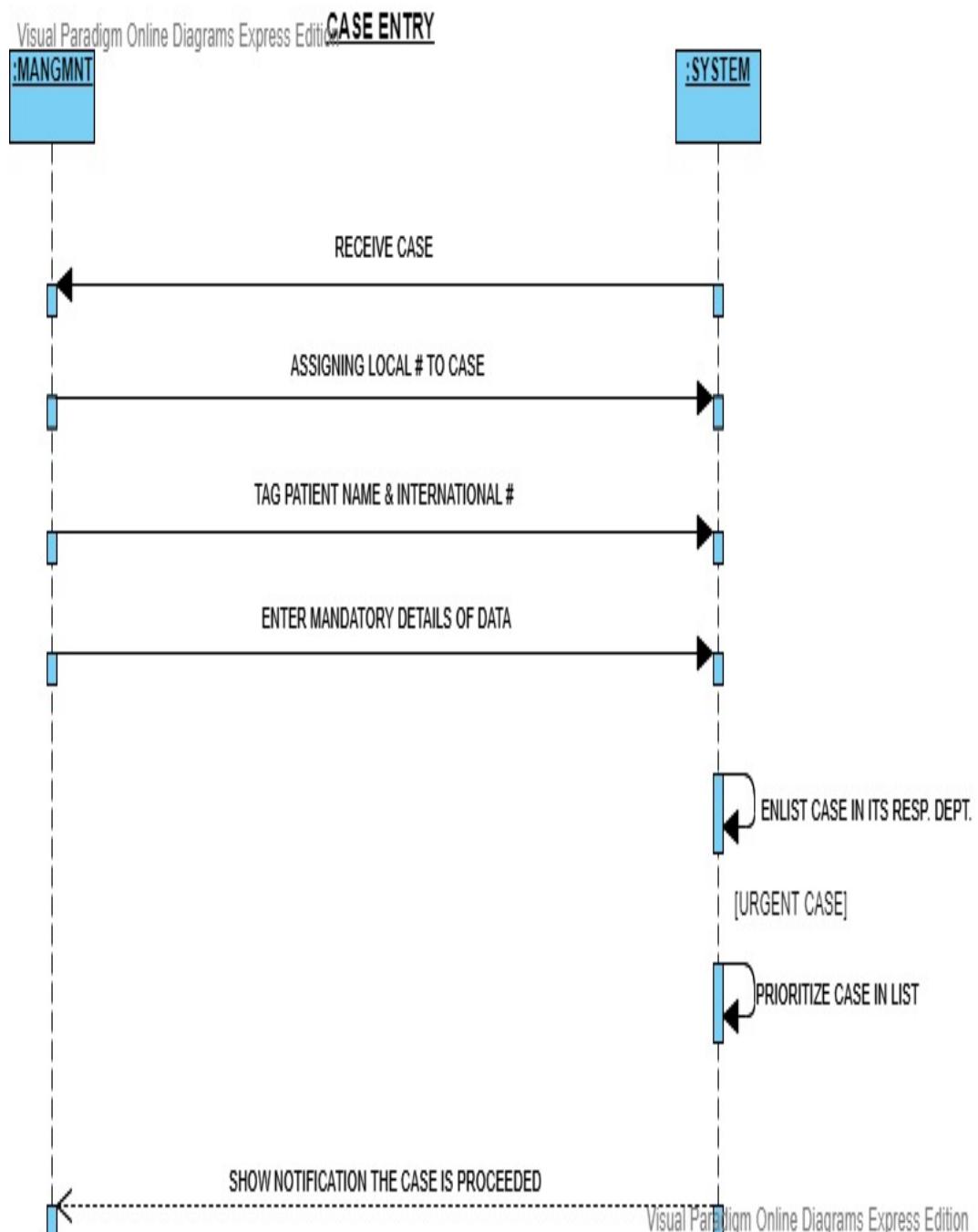


FIGURE 3.31: CASE ENTRY

3.7.0.5 Sequence Diagram-PICK A CASE

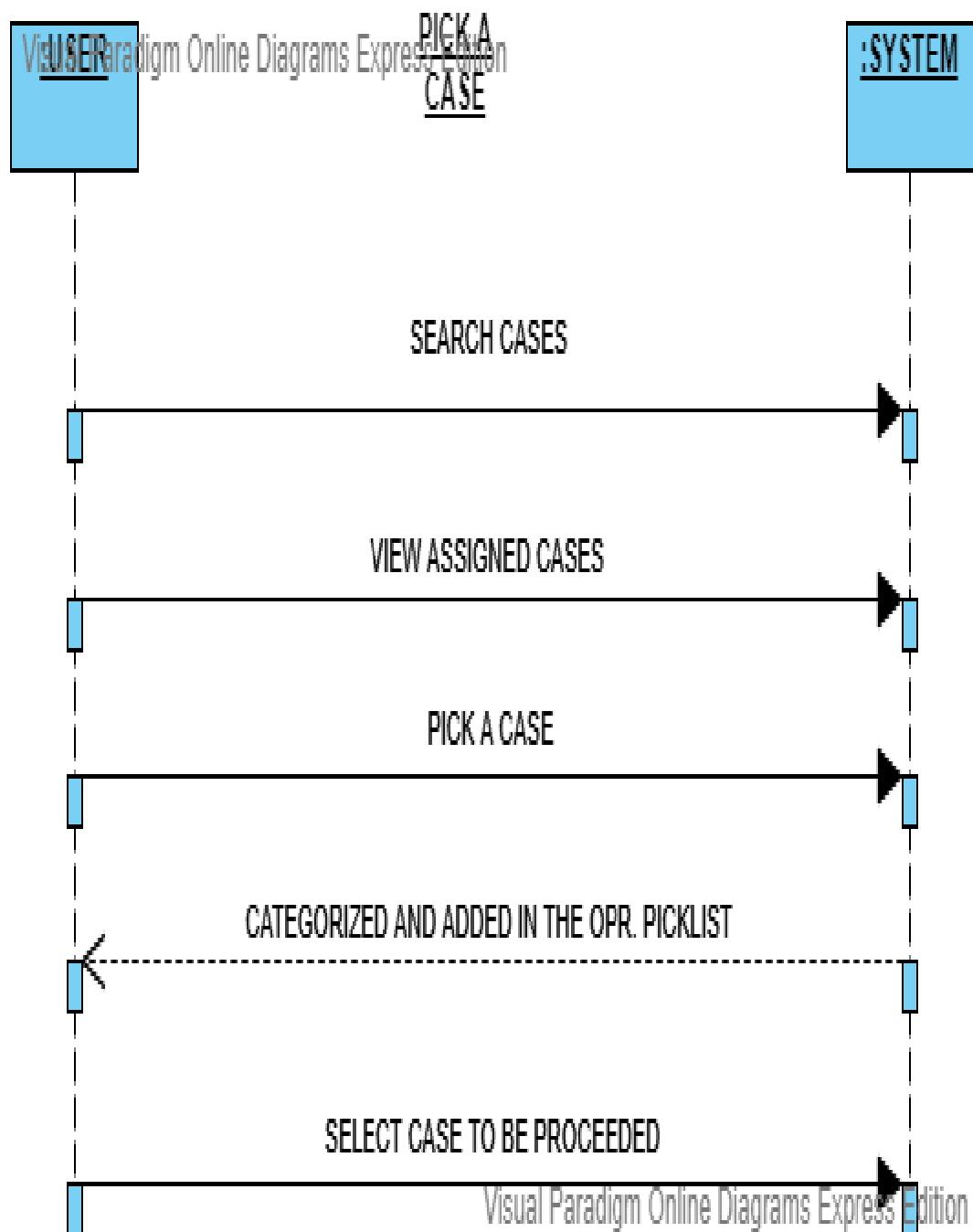


FIGURE 3.32: PICK A CASE

3.7.0.6 Sequence Diagram-ASSIGNING CASE

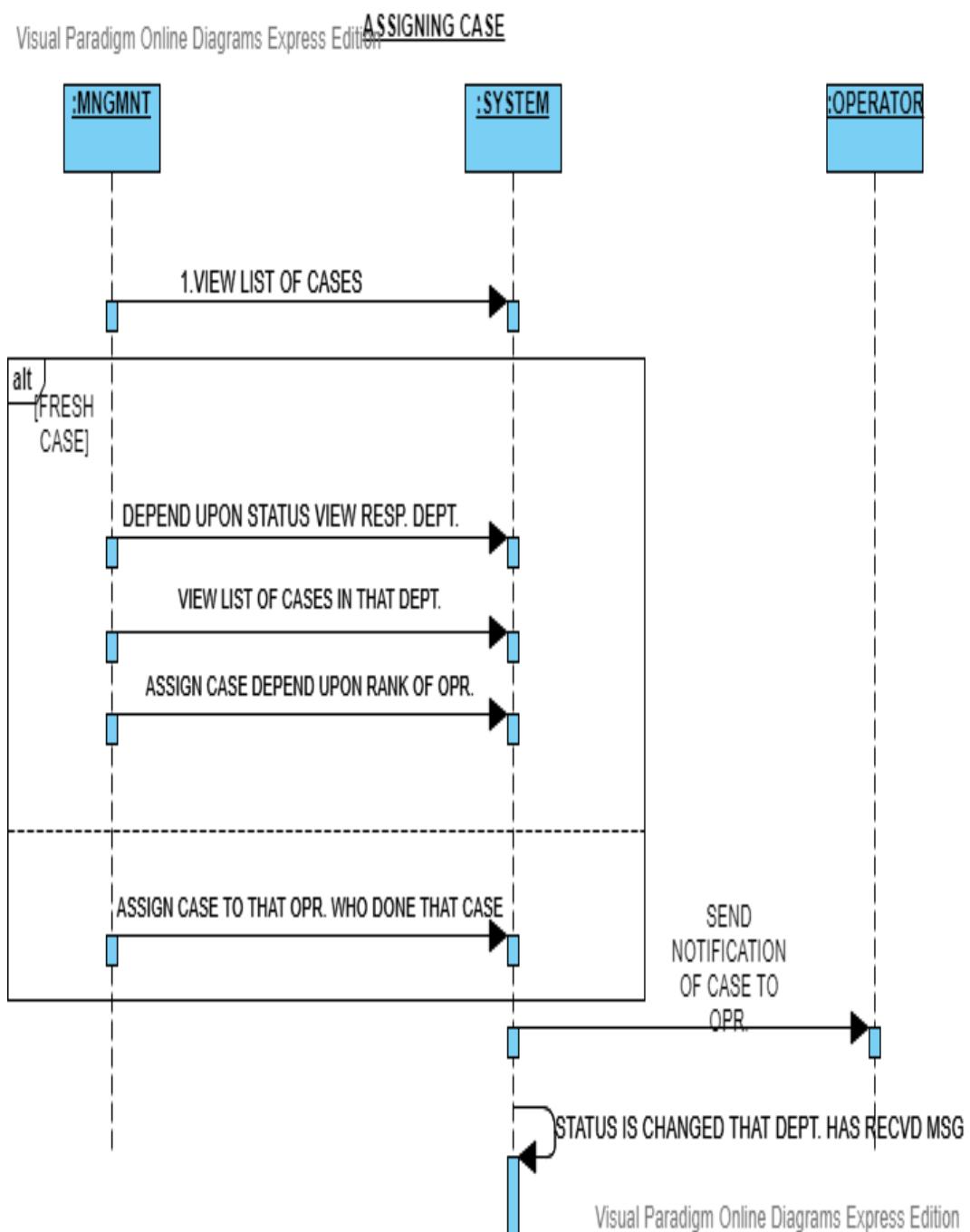


FIGURE 3.33: SE-ASSIGNING CASE

3.7.0.7 Sequence Diagram-CASE REQUIREMENTS FULFILL

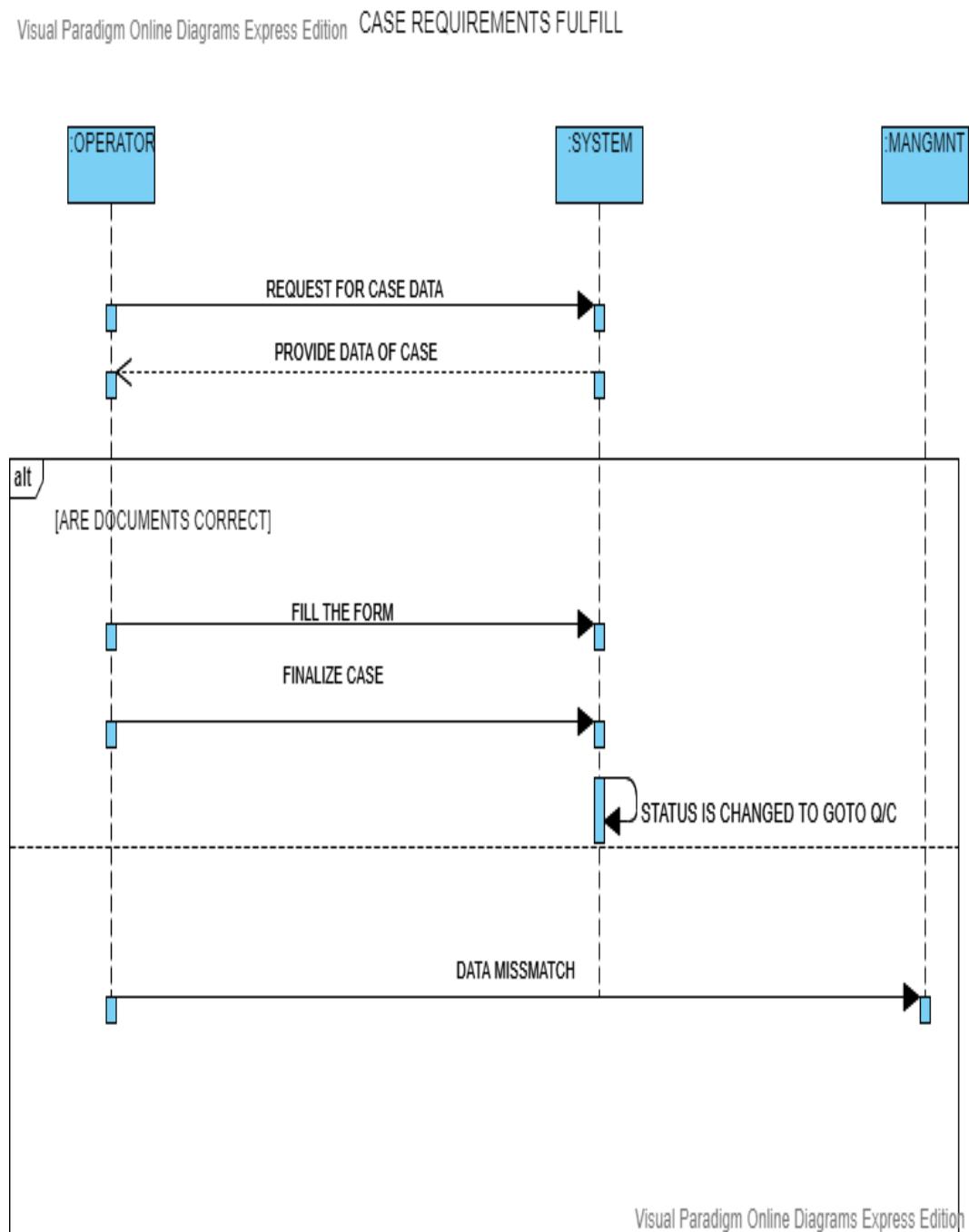


FIGURE 3.34: SE-CASE REQUIREMENTS FULFILL

3.7.0.8 Sequence Diagram-CHECK CASE TIMELINE

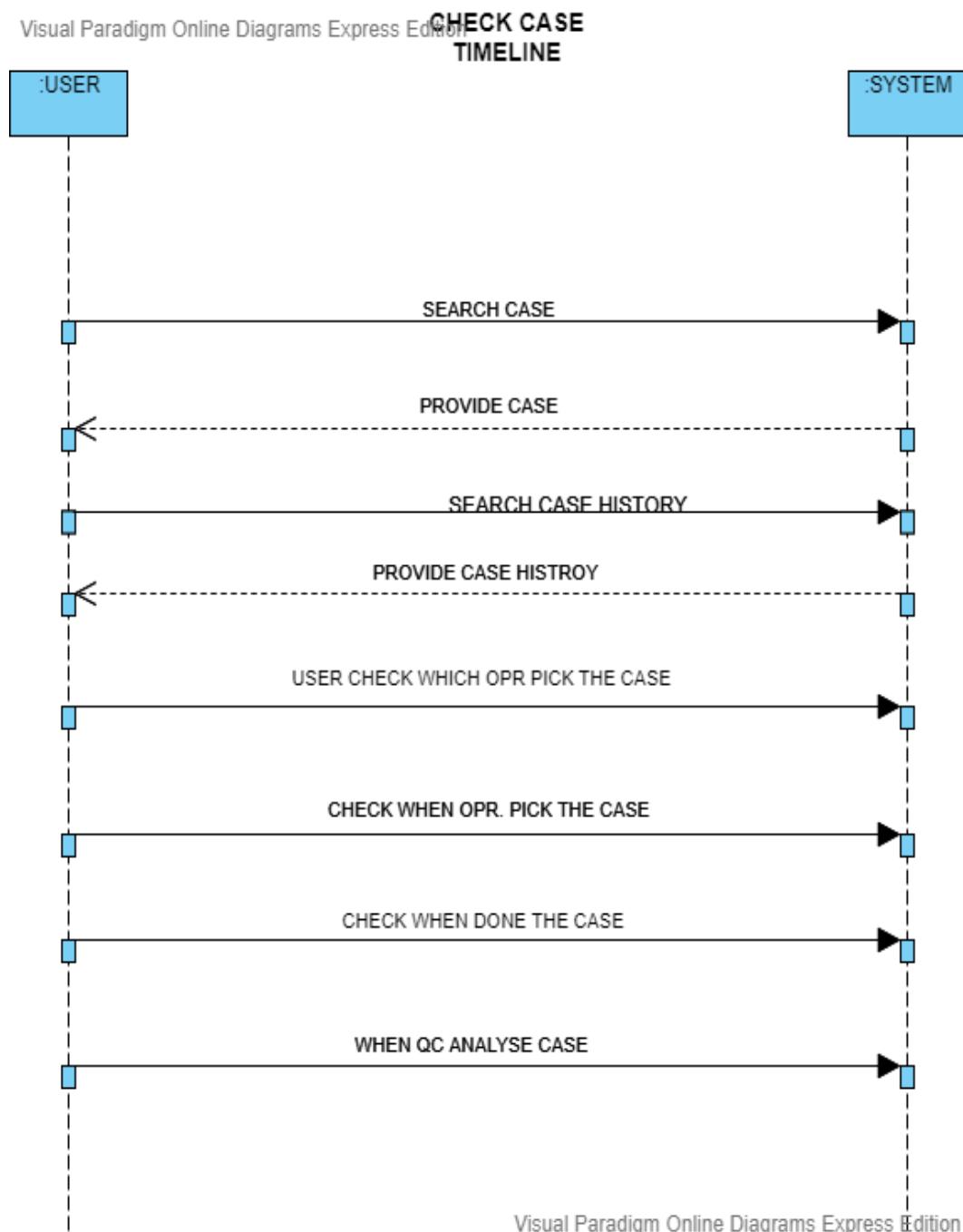


FIGURE 3.35: CHECK CASE TIMELINE

3.7.0.9 Sequence Diagram-CASE APPROVAL

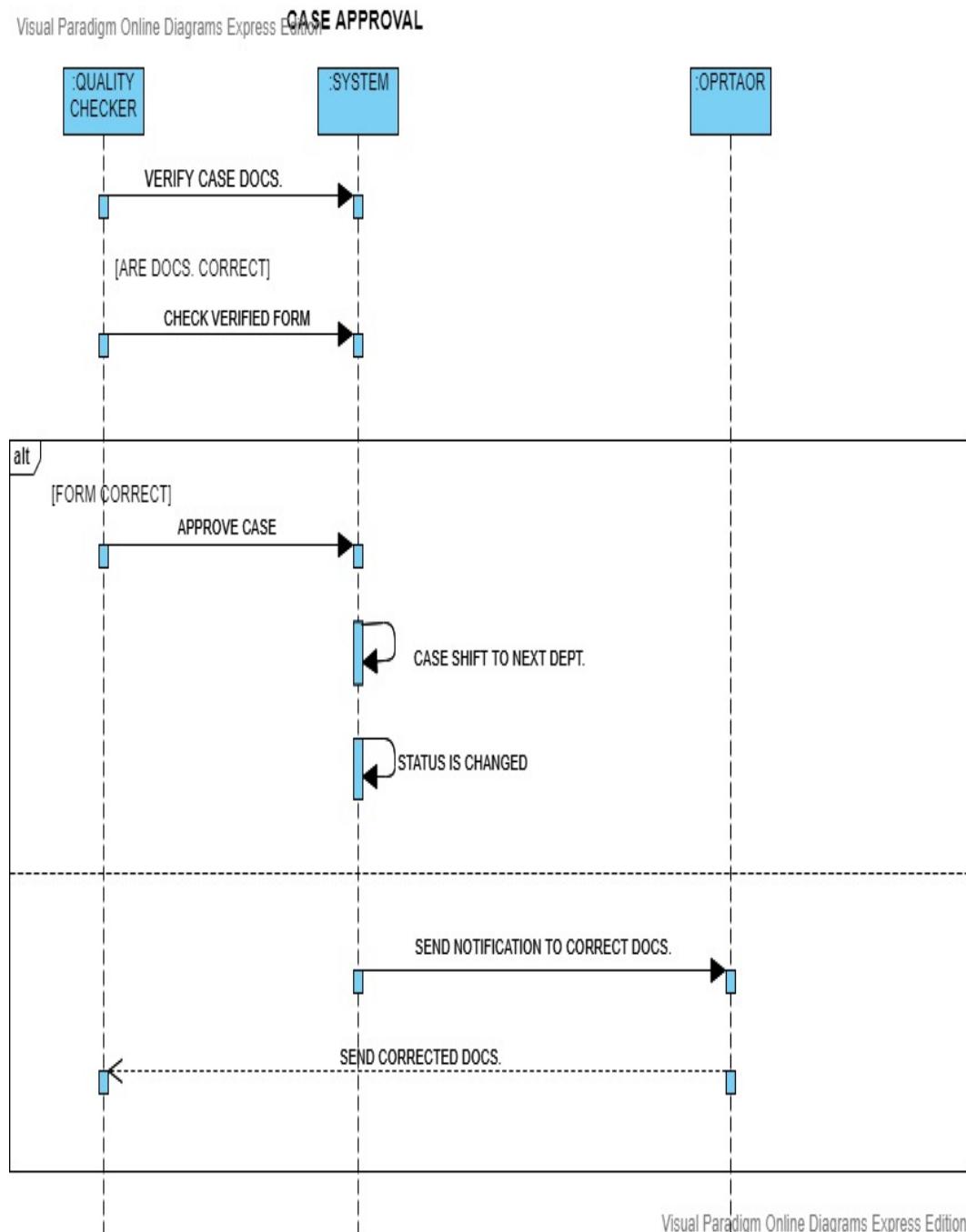


FIGURE 3.36: CASE APPROVAL

3.7.0.10 Sequence Diagramm-CASE EDITING

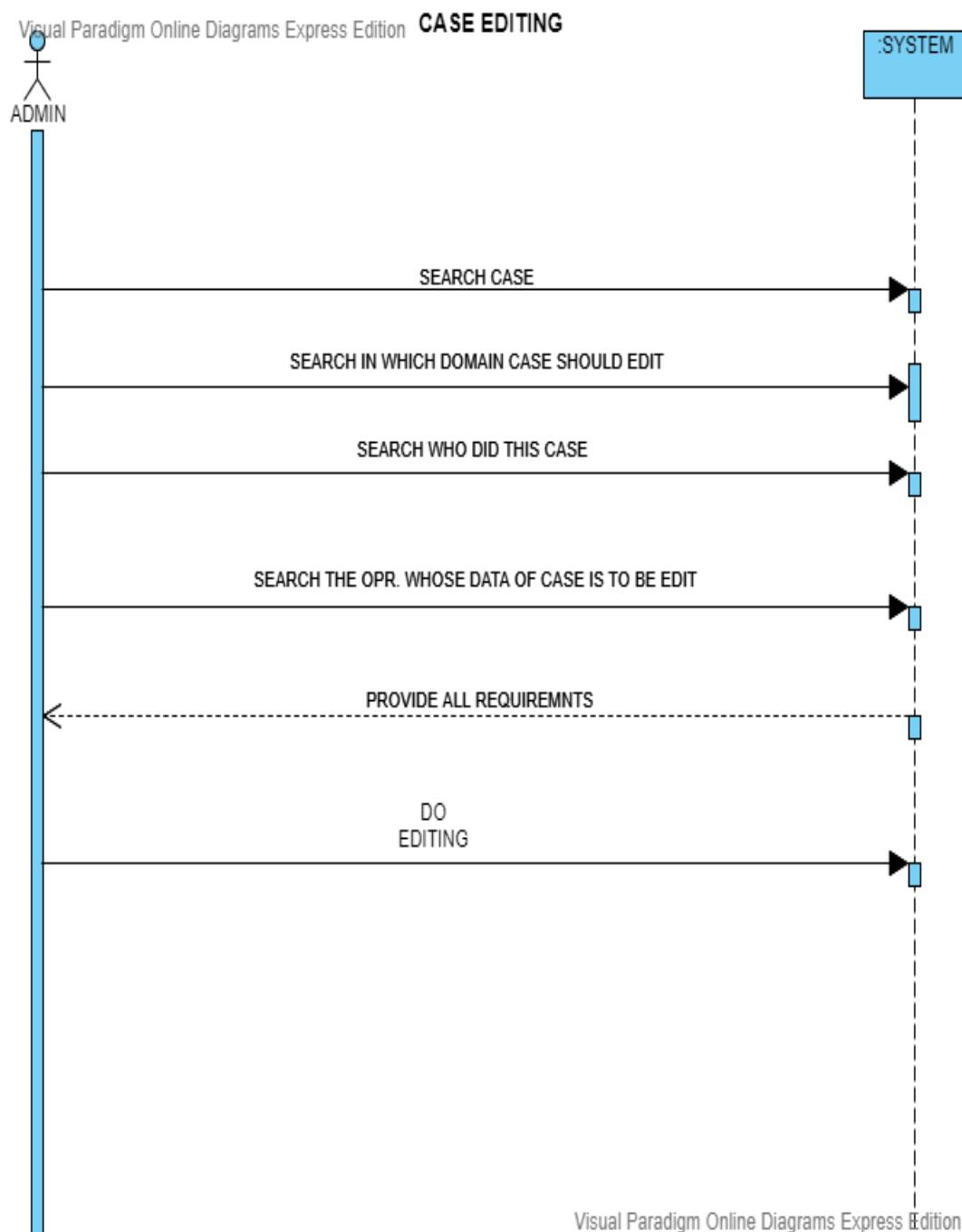


FIGURE 3.37: SE-CASE EDITING

3.7.0.11 Sequence Diagramm-PROGRESS REPORT

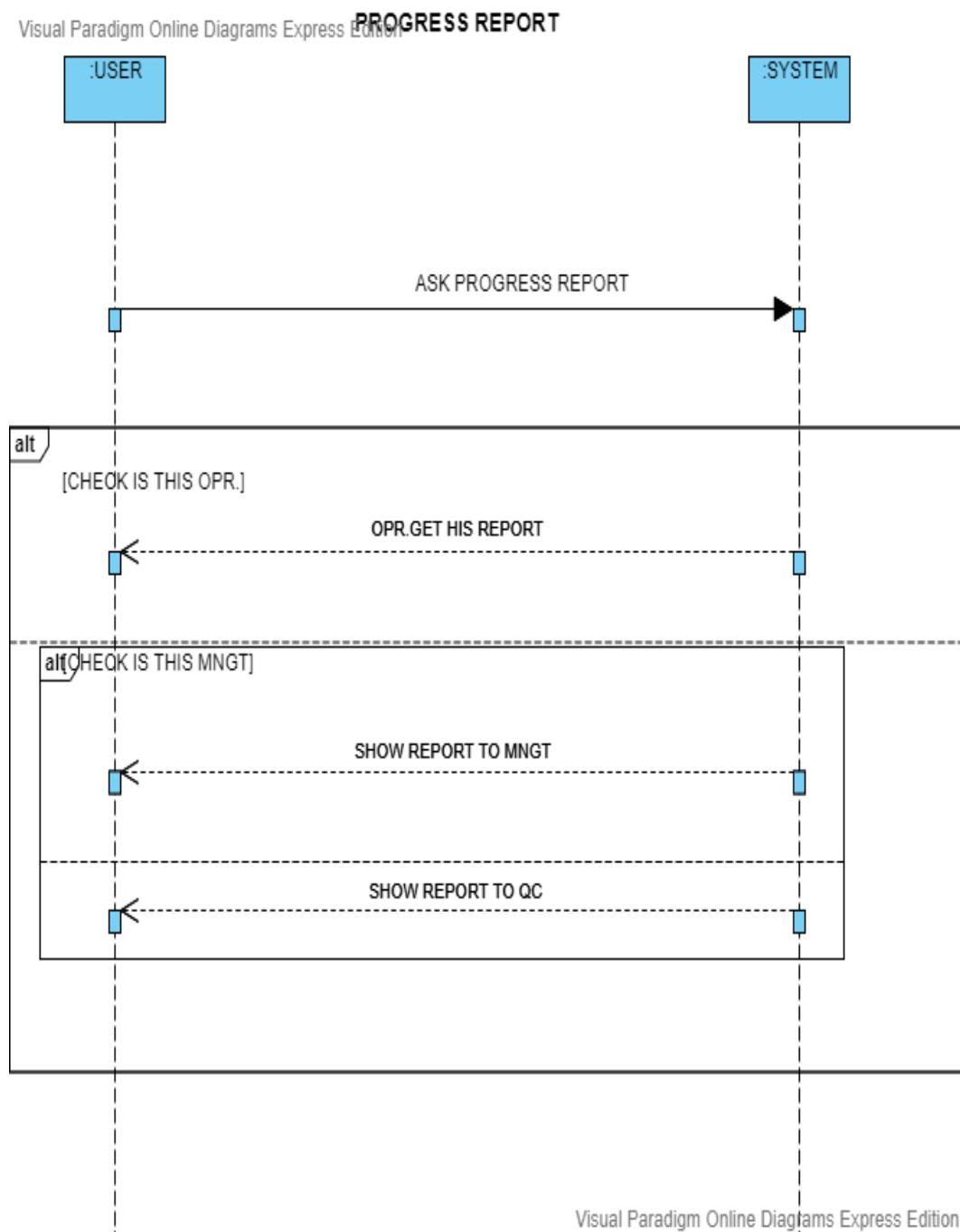


FIGURE 3.38: SE-PROGRESS REPORT

3.7.0.12 Sequence Diagramm-Shipment

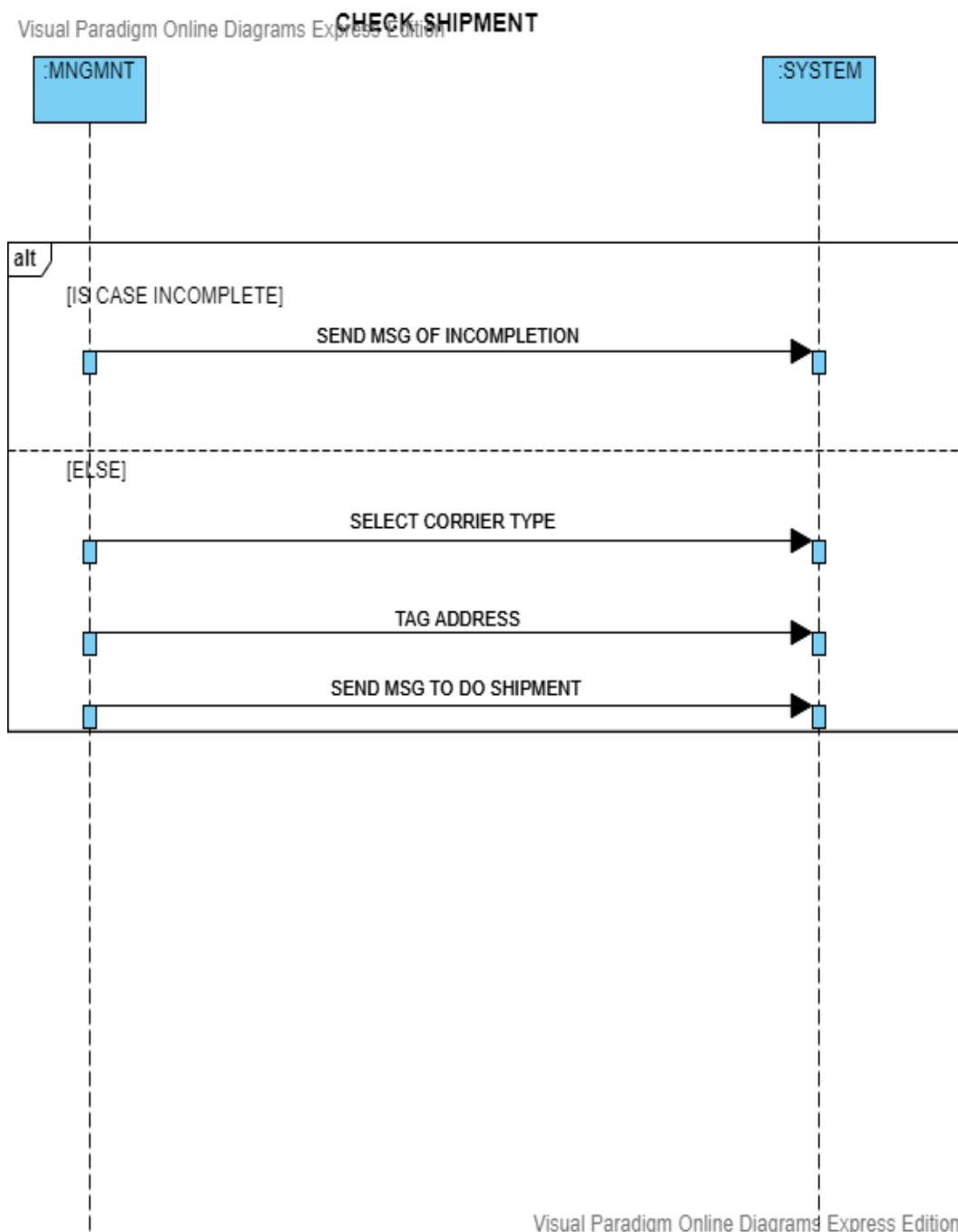


FIGURE 3.39: SE-CASE SHIPMENT

3.8 Data Representation Diagram

3.8.0.1 ER Diagram

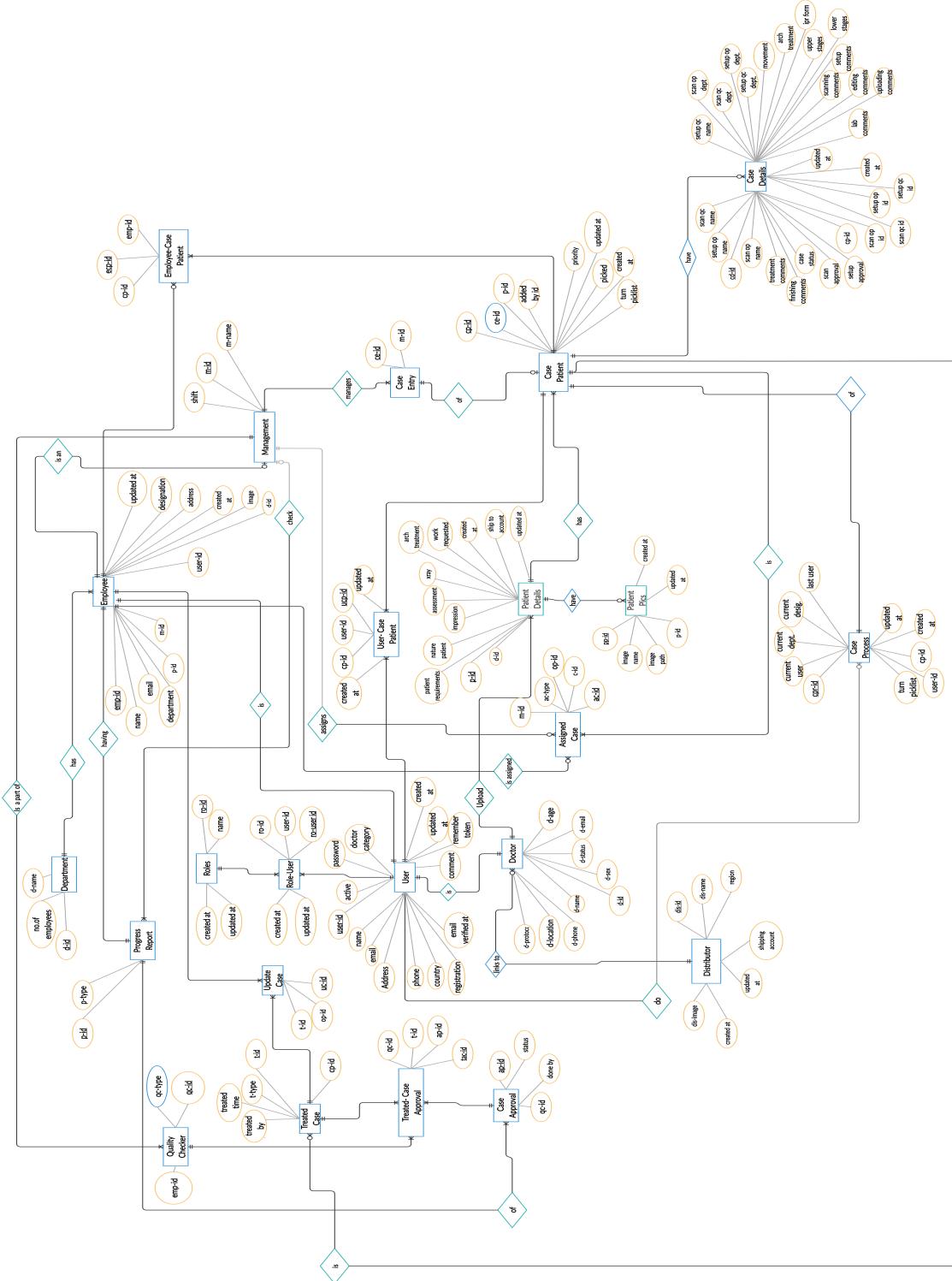


FIGURE 3.40: Entity Relationship Diagram

3.9 Flow Oriented Modeling

3.9.0.1 Data Flow Diagram

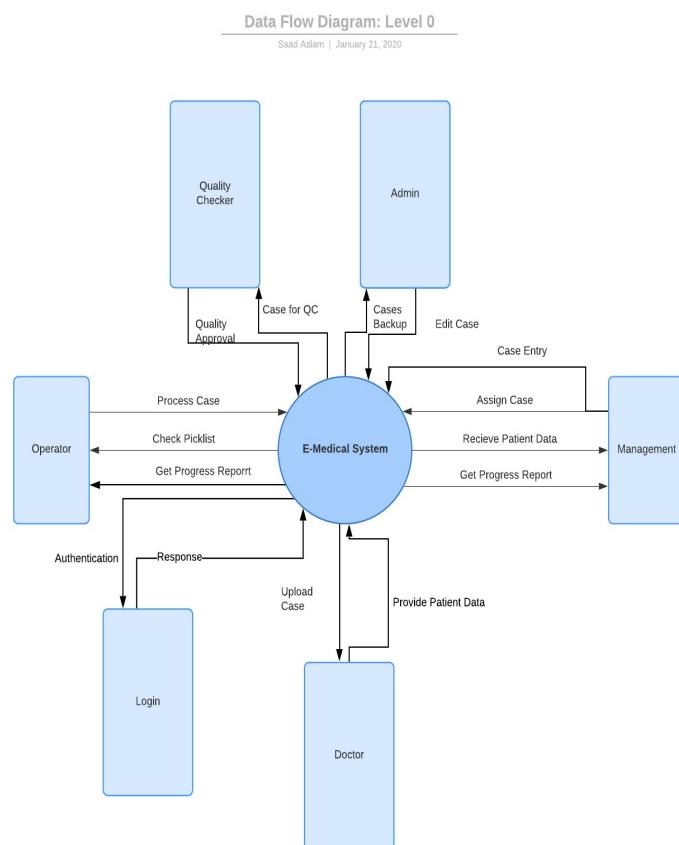


FIGURE 3.41: Data Flow Diagram

Chapter 4

Implementation and Evaluation

● Implementation

In implementation section, we will discuss about the development stages (like create database in SQL, creating tables in database schema, connectivity of php laravel framework to SQL server), system integration and user interface. We are using different coding languages for client side scripting and for server side scripting. Hence this section is fulfilling the development of our project.

4.1 Development Stages

Following are the development stages(create database in SQL, creating tables in database schema, connectivity of php laravel framework to SQL server) which are used to implement Handling Database in SQL Server with our MVC.. The database will store our large amount of data.We can retrieve large amount of data quickly and efficiently. We can store our record at any time. The records in our tables will be secure and safe. We can retrieve data from tables in a very efficient way.

4.1.1 Create Database in SQL

First of all create database in our SQL server. The database will store our large amount of data. We can retrieve large amount of data quickly and efficiently. We can store our record at any time. The tables in our database will hold the records. Following is our database which we created.

4.1.1.1 Creating Tables in Database Schema:

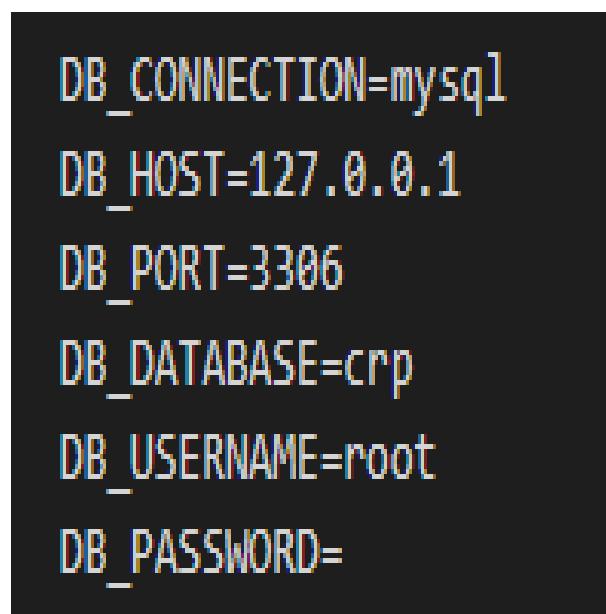
The tables are used to hold the data of our project. The records in our tables will be secure and safe. We can retrieve data from tables in a very efficient way. Following are our tables we have:

Action	Table	Rows	Type	Collation	Size	Overhead
<input type="checkbox"/> casepatient	casepatient	5	InnoDB	utf8mb4_unicode_ci	16 KiB	-
<input type="checkbox"/> case_details	case_details	6	InnoDB	utf8mb4_unicode_ci	16 KiB	-
<input type="checkbox"/> case_patient_user	case_patient_user	2	InnoDB	utf8mb4_unicode_ci	16 KiB	-
<input type="checkbox"/> case_pictures	case_pictures	7	InnoDB	latin1_swedish_ci	16 KiB	-
<input type="checkbox"/> case_process	case_process	5	InnoDB	utf8mb4_unicode_ci	16 KiB	-
<input type="checkbox"/> contact	contact	1	InnoDB	latin1_swedish_ci	16 KiB	-
<input type="checkbox"/> distributor	distributor	2	InnoDB	utf8mb4_unicode_ci	16 KiB	-
<input type="checkbox"/> doctor	doctor	1	InnoDB	utf8mb4_unicode_ci	16 KiB	-
<input type="checkbox"/> employees	employees	13	InnoDB	utf8mb4_unicode_ci	16 KiB	-
<input type="checkbox"/> failed_jobs	failed_jobs	0	InnoDB	utf8mb4_unicode_ci	16 KiB	-
<input type="checkbox"/> files	files	0	InnoDB	utf8mb4_unicode_ci	16 KiB	-
<input type="checkbox"/> images	images	0	InnoDB	utf8mb4_unicode_ci	16 KiB	-
<input type="checkbox"/> messages	messages	166	InnoDB	utf8mb4_unicode_ci	16 KiB	-
<input type="checkbox"/> migrations	migrations	25	InnoDB	utf8mb4_unicode_ci	16 KiB	-
<input type="checkbox"/> password_resets	password_resets	0	InnoDB	utf8mb4_unicode_ci	16 KiB	-
<input type="checkbox"/> patient_contact	patient_contact	1	InnoDB	latin1_swedish_ci	16 KiB	-
<input type="checkbox"/> patient_details	patient_details	18	InnoDB	utf8mb4_unicode_ci	16 KiB	-
<input type="checkbox"/> patient_pictures	patient_pictures	18	InnoDB	latin1_swedish_ci	16 KiB	-
<input type="checkbox"/> posts	posts	0	InnoDB	utf8mb4_unicode_ci	16 KiB	-
<input type="checkbox"/> products	products	0	InnoDB	utf8mb4_unicode_ci	16 KiB	-
<input type="checkbox"/> roles	roles	0	InnoDB	utf8mb4_unicode_ci	16 KiB	-
<input type="checkbox"/> role_user	role_user	0	InnoDB	utf8mb4_unicode_ci	16 KiB	-
<input type="checkbox"/> users	users	4	InnoDB	utf8mb4_unicode_ci	16 KiB	-

FIGURE 4.1: Database Tables

4.1.2 Connectivity of PHP LARAVEL Framework to SQL Server

Laravel interacts with the databases to perform its tasks. We make a front end web Based Application on PHP language and connected it to SQL Server using Xampp. From Admin-site, an Admin can DELETE, UPDATE, VIEW and MODIFY data that is stored in SQL database. We send queries to SQL Server in SQL connection. From a front-end, a user views data as a table which is stored in form of documents in SQL Server. All of the configuration for our database is stored in config/database.php file, in which we configure the system.



```
DB_CONNECTION=mysql
DB_HOST=127.0.0.1
DB_PORT=3306
DB_DATABASE=crp
DB_USERNAME=root
DB_PASSWORD=
```

FIGURE 4.2: Database Connectivity

4.2 System Integration

In this web project, system integration is referred to web integration. For making quality websites integration factor is very important so we are merging all the modules to make a single system. Factors we integrated in domain web are:

1. Analysis of system that it is compatible to be integrated with other parts
2. Architecture is designed by keeping in mind the complexities in integration of system
3. Design of System
4. Testing in Development
5. Operation

4.3 User Interface

User Interface plays a vital role for the victory of the computer program since each user is not an IT individual expert who can get the complexity of the program. So a user can see the front view of the computer program. It creates interactions between user(human) and machine. It bothers most of the users and also it is the part of testing **Human Computer Interaction**. The user can control the system to perform effective operations. Our interface is friendly, easy, effective and enjoyable for the user. Many of the users can interact with this Interface. Following are our web app interfaces.

- Web App Interface:

- Interface of Doctor:

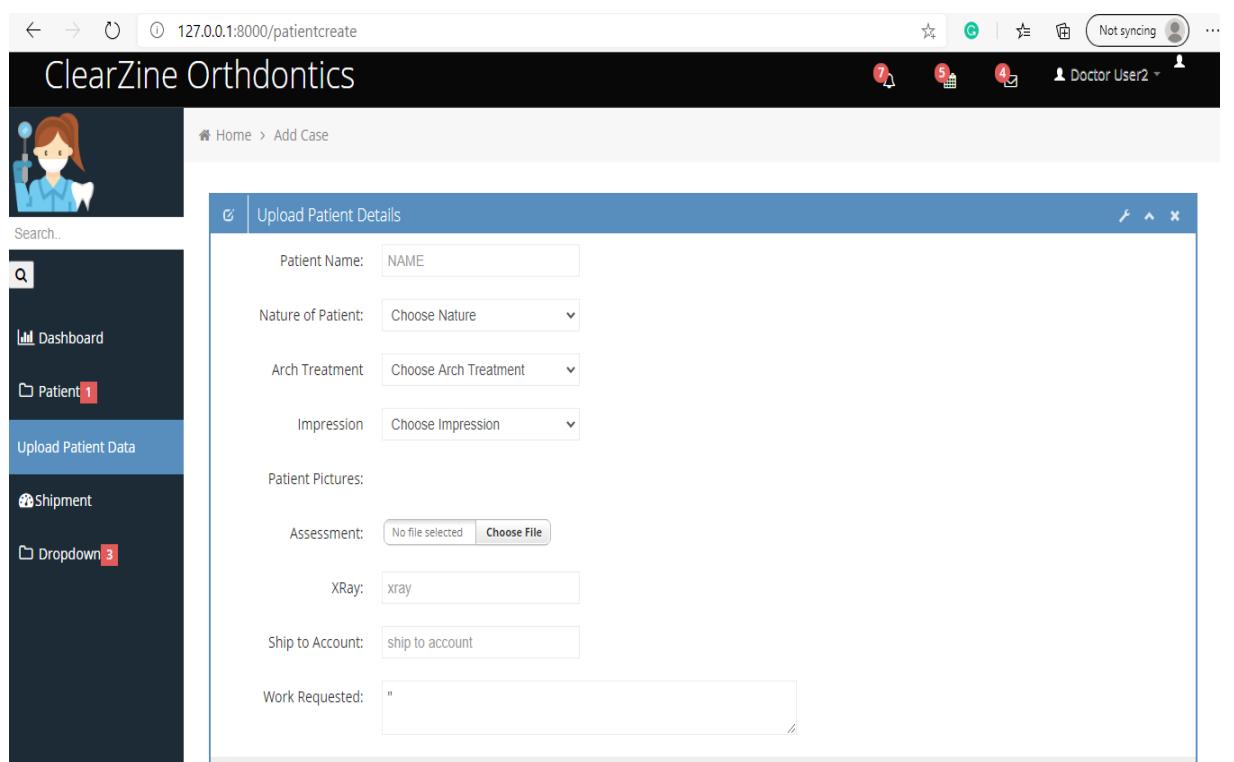


FIGURE 4.3: Doctor's Interface

- **Interface of Doctor:**

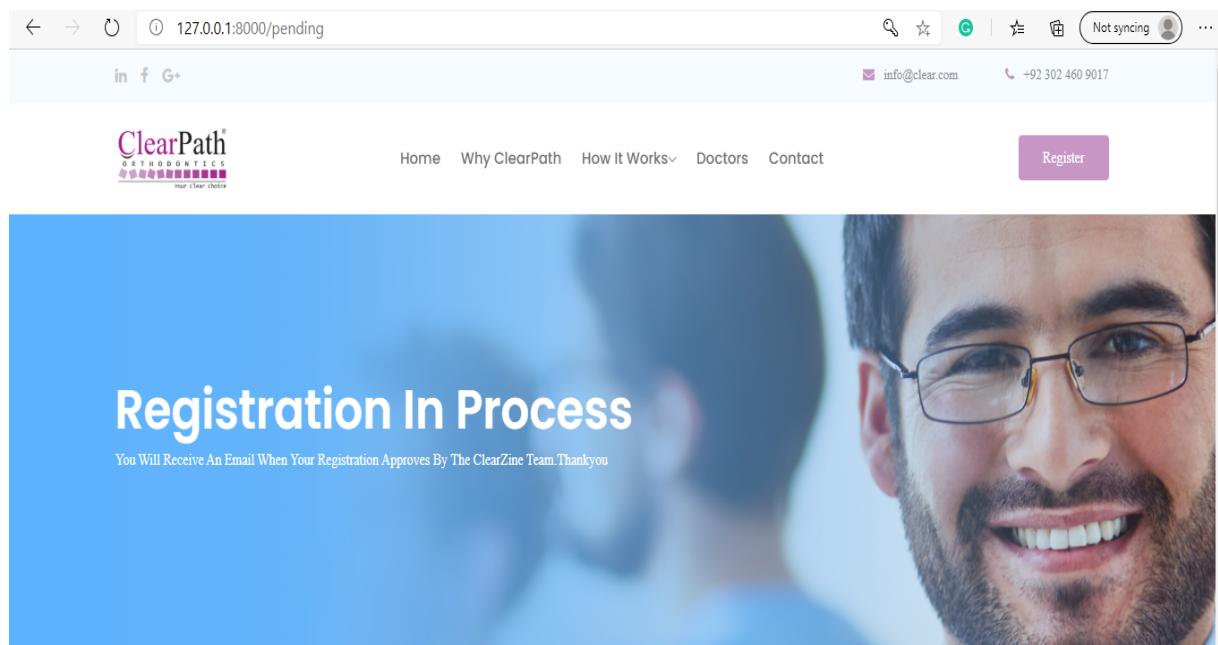


FIGURE 4.4: Doctor's Interface

- **Interface of Doctor:**

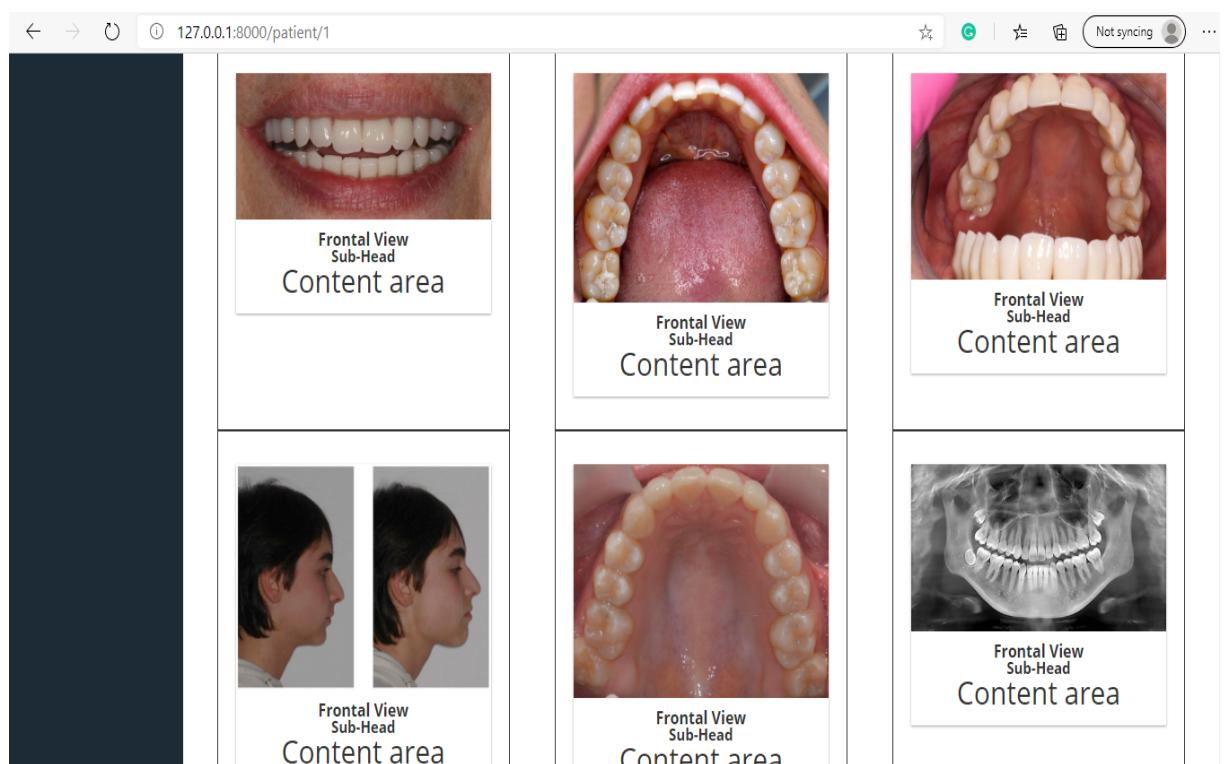


FIGURE 4.5: Doctor's Interface

- Interface of User:

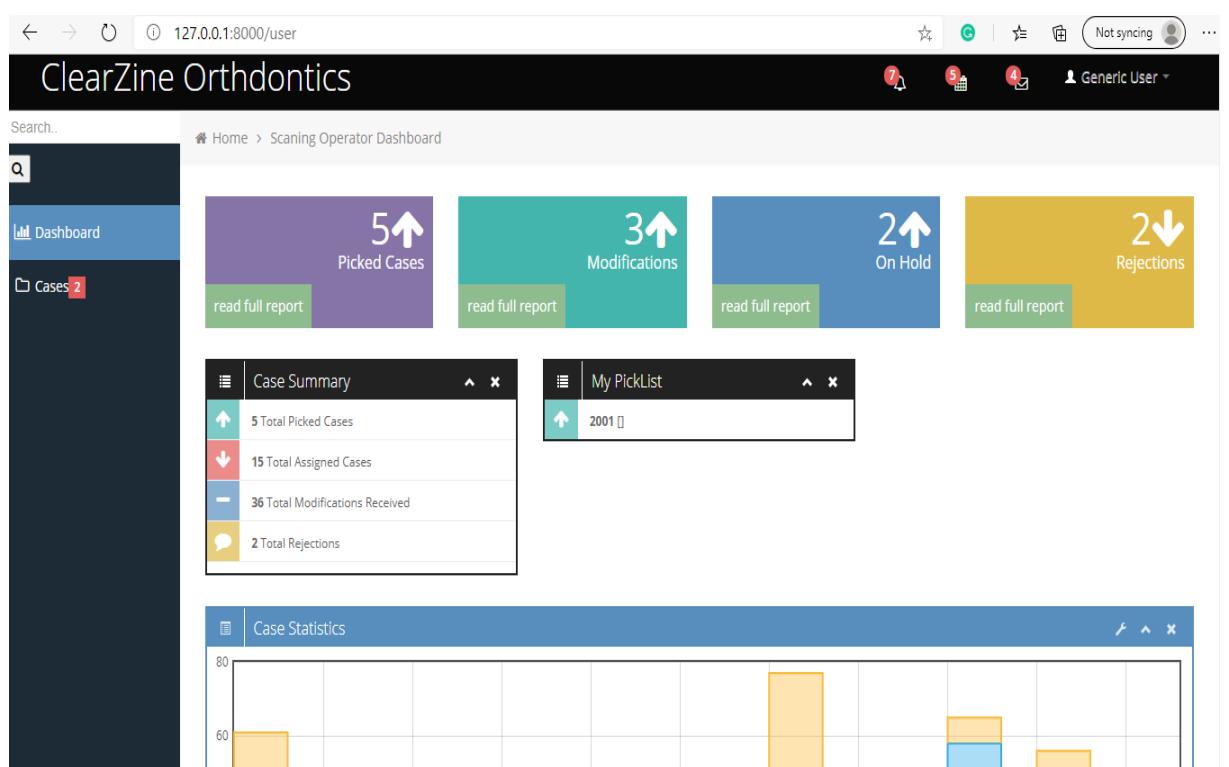


FIGURE 4.6: User's Interface

- Interface of User:

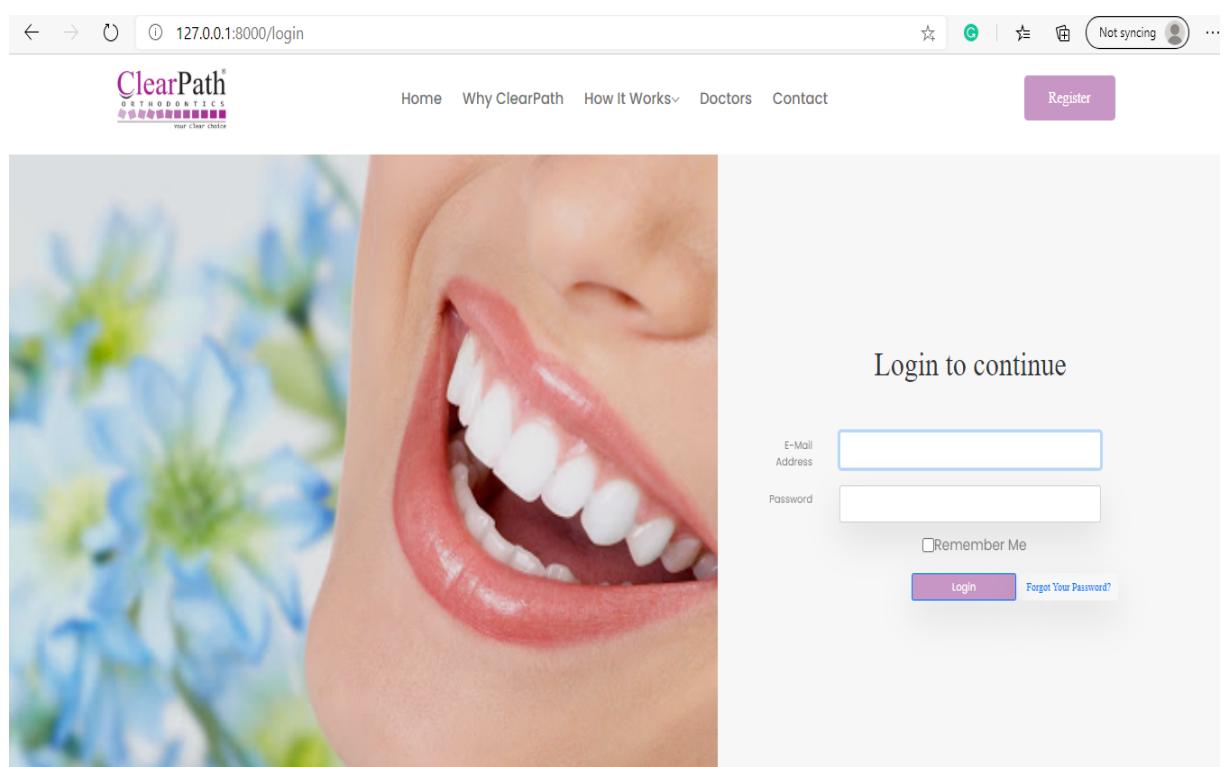


FIGURE 4.7: User's Login Interface

- **Interface of User:**

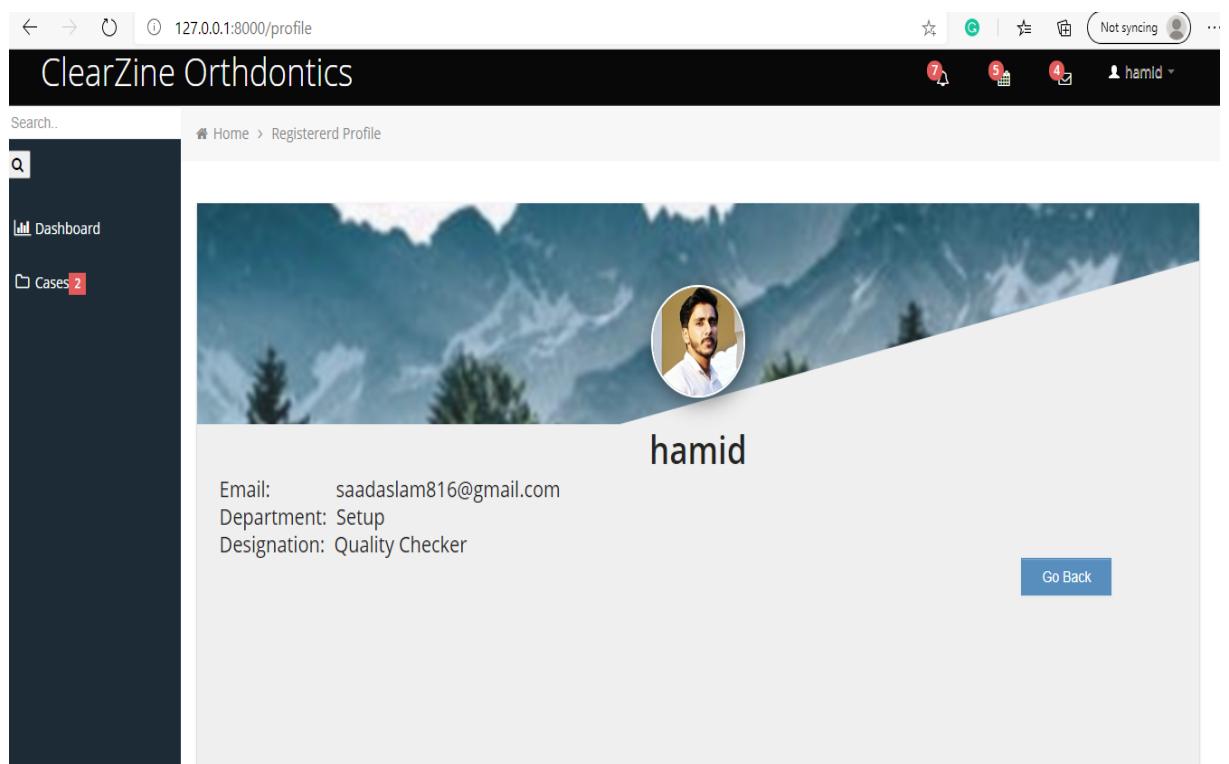


FIGURE 4.8: User's Profile Interface

- **Interfaces of Admin:**

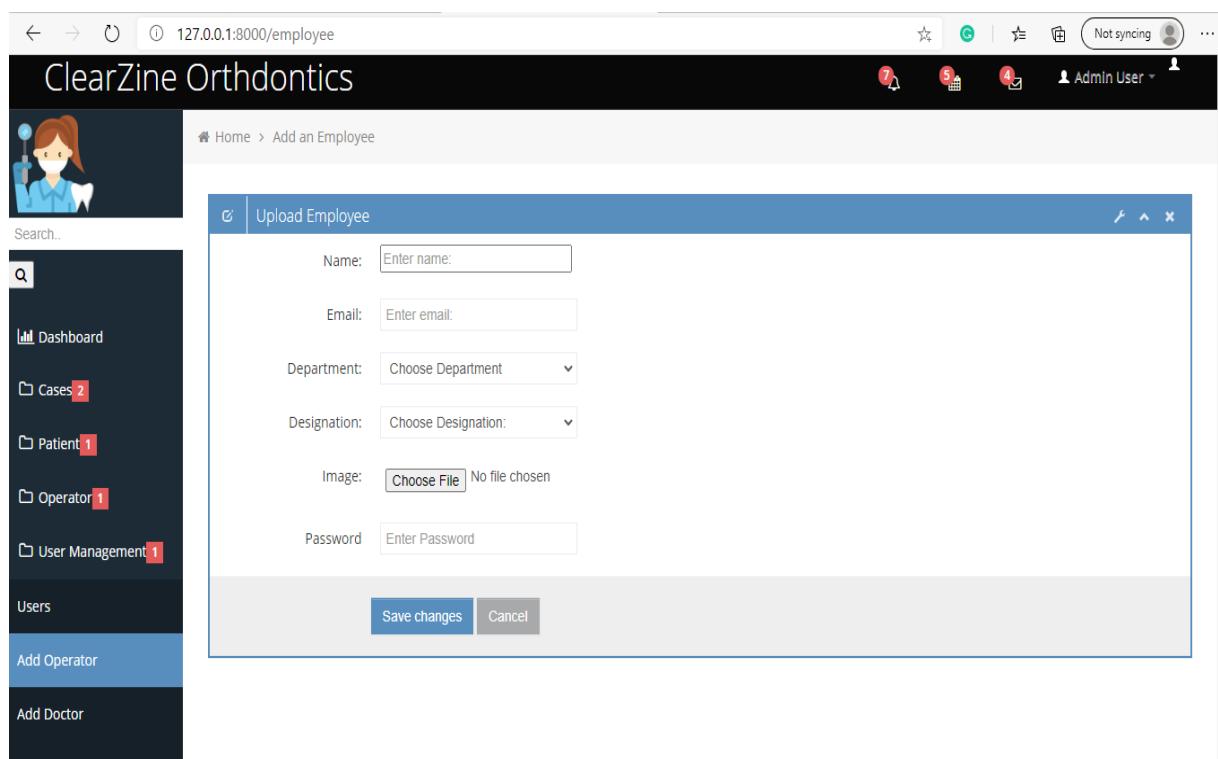


FIGURE 4.9: Admin's Interface

- **Interfaces of Admin:**

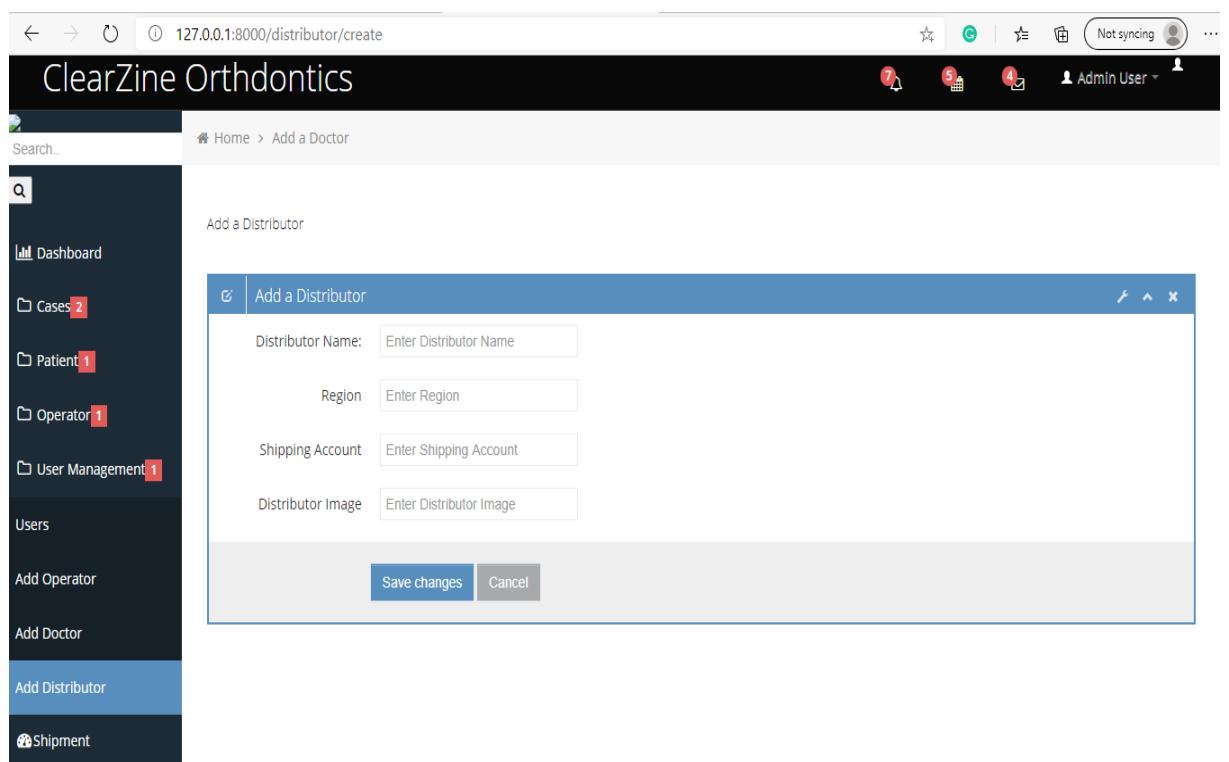


FIGURE 4.10: Admin's Interface

- Interfaces of Admin:

The screenshot shows a web-based administrative interface for managing users. The URL in the browser is 127.0.0.1:8000/admin/users. The left sidebar has a dark theme with white text and includes links for Dashboard, Cases (2), Patient (1), Operator (1), User Management (1), Users, Add Operator, Add Doctor, Add Distributor, Shipment, and Dropdown (3). The 'User Management' link is highlighted. The main content area is titled 'Members' and displays a table of user data. The table columns are User Id, Name, Email, Roles, Actions, and Notification. There are six rows of data:

User Id	Name	Email	Roles	Actions	Notification
1	Admin User	admin@clear.com	admin	Edit Delete	
2	Doctor User	doctor@clear.com	doctor	Edit Delete	
3	Generic User	user@clear.com	user	Edit Delete	
5	fahad	f@clear.com	doctor	Edit Delete	
7	ali	a@clear.com	QC	Edit Pending Delete	[New Registration]
10	Saad	saadaslam2128@gmail.com	user	Edit Delete	

FIGURE 4.11: Admin's Interface

- Interfaces of Admin:

The screenshot shows a web-based administrative interface. On the left, there is a dark sidebar menu with the following items and counts: Dashboard (0), Cases (2), Patient (1), Patient Details (0), Operator (1), User Management (1), Shipment (0), and Dropdown (3). The main content area is titled "Members" and displays a table with the following data:

Patient Name	Nature of Patient	Arch Treatment	Impression	Work Requested	Ship to Account	View More
saad				asasassa	Active	[Search, Edit, Delete]
asa				sasassss	Active	[Search, Edit, Delete]
adsdas				sad	Active	[Search, Edit, Delete]
sadas				asasd	Active	[Search, Edit, Delete]
sadadsa				adad	Active	[Search, Edit, Delete]
aa				a	Active	[Search, Edit, Delete]
as				as	Active	[Search, Edit, Delete]
s				s	Active	[Search, Edit, Delete]
a				aa	Active	[Search, Edit, Delete]
aaa				sss	Active	[Search, Edit, Delete]
aggagfag				sada	Active	[Search, Edit, Delete]

FIGURE 4.12: Admin's Interface

- Interfaces of Quality Checker:

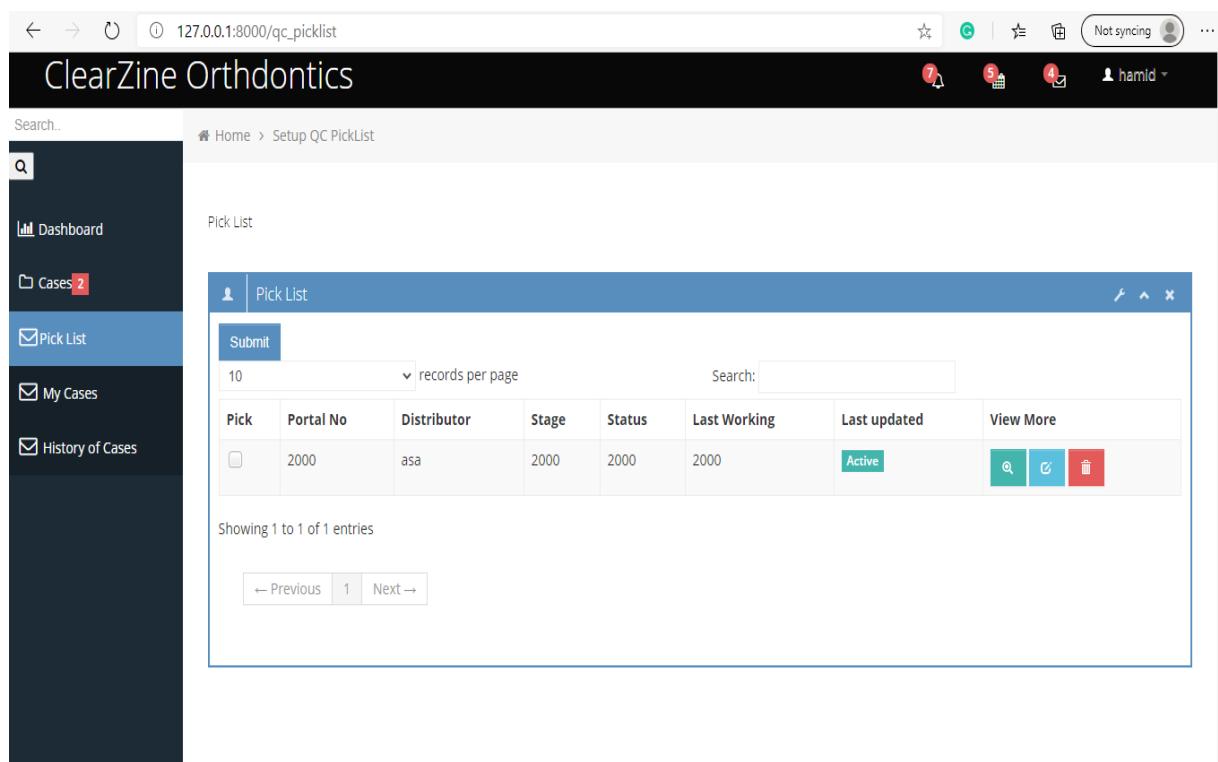


FIGURE 4.13: Quality Checker's Interface

- Interfaces of Quality Checker:

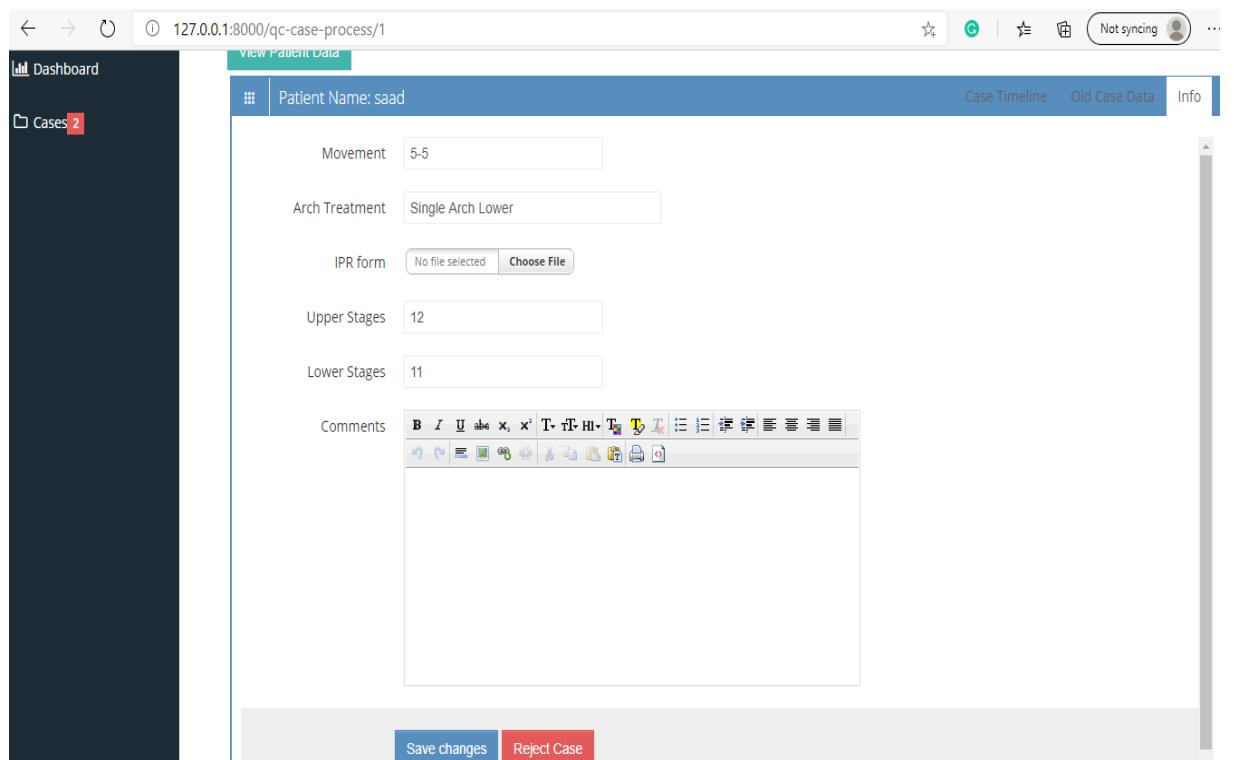


FIGURE 4.14: Quality Checker's Interface

- Interfaces of Client:

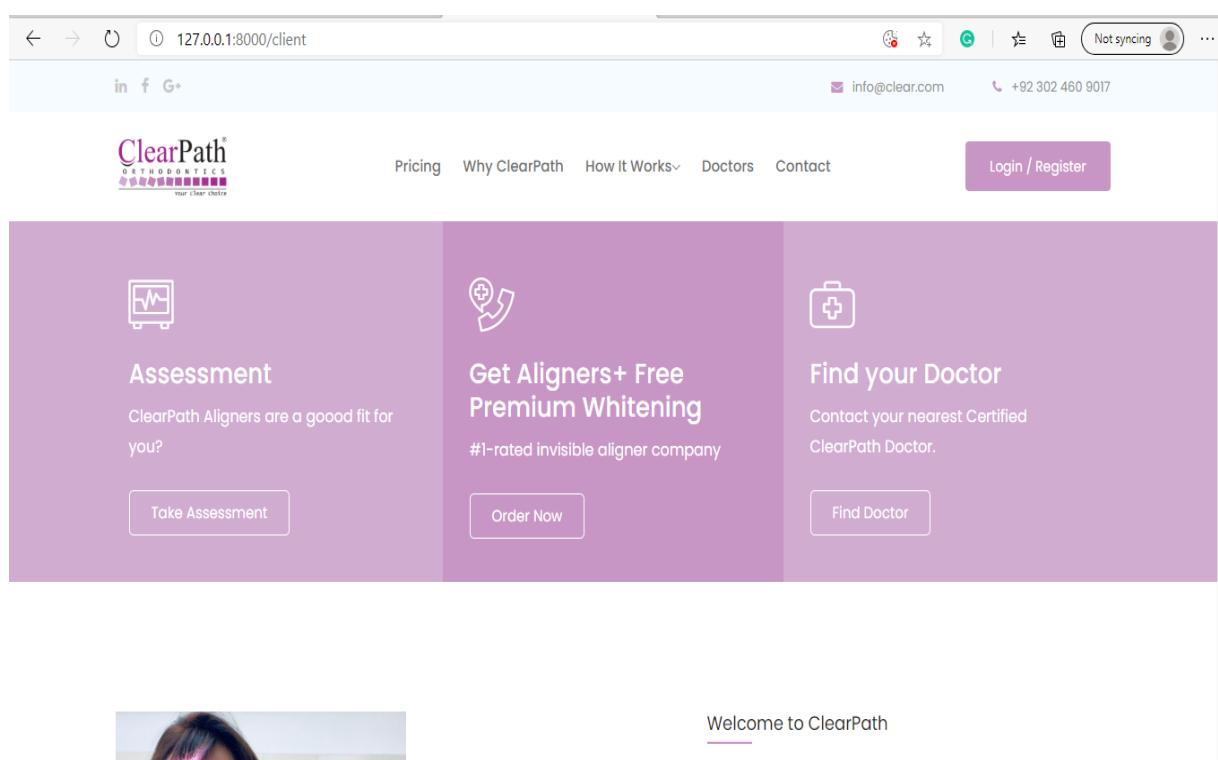


FIGURE 4.15: Client's Interface

- **Interfaces of Client:**

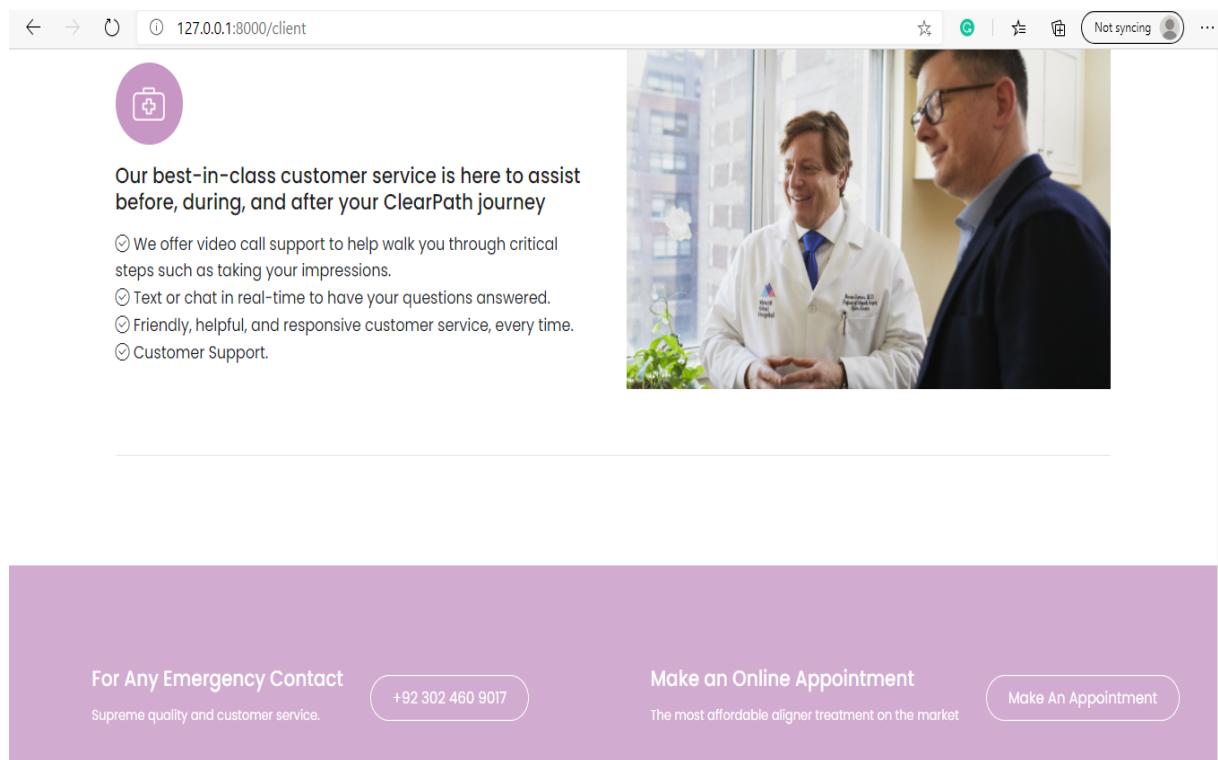


FIGURE 4.16: Client's Interface

- Interfaces of Client:

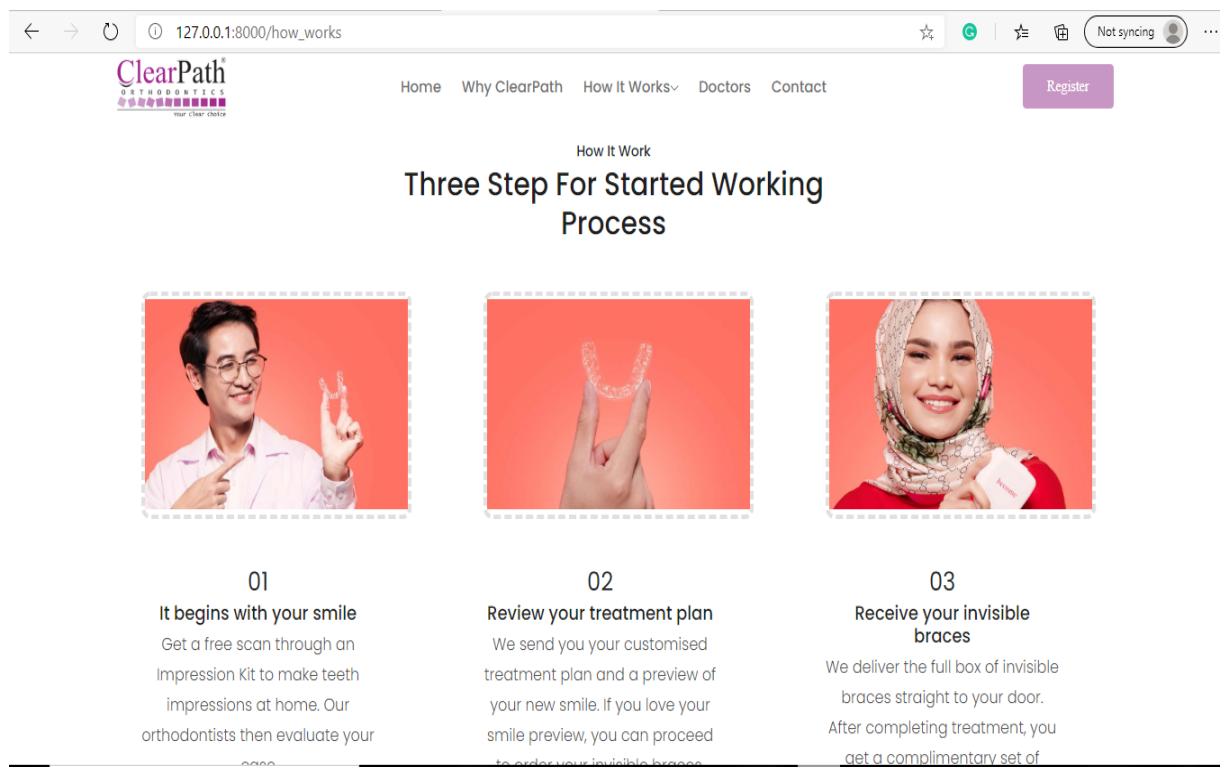


FIGURE 4.17: Client's Interface

- Interfaces of Client:

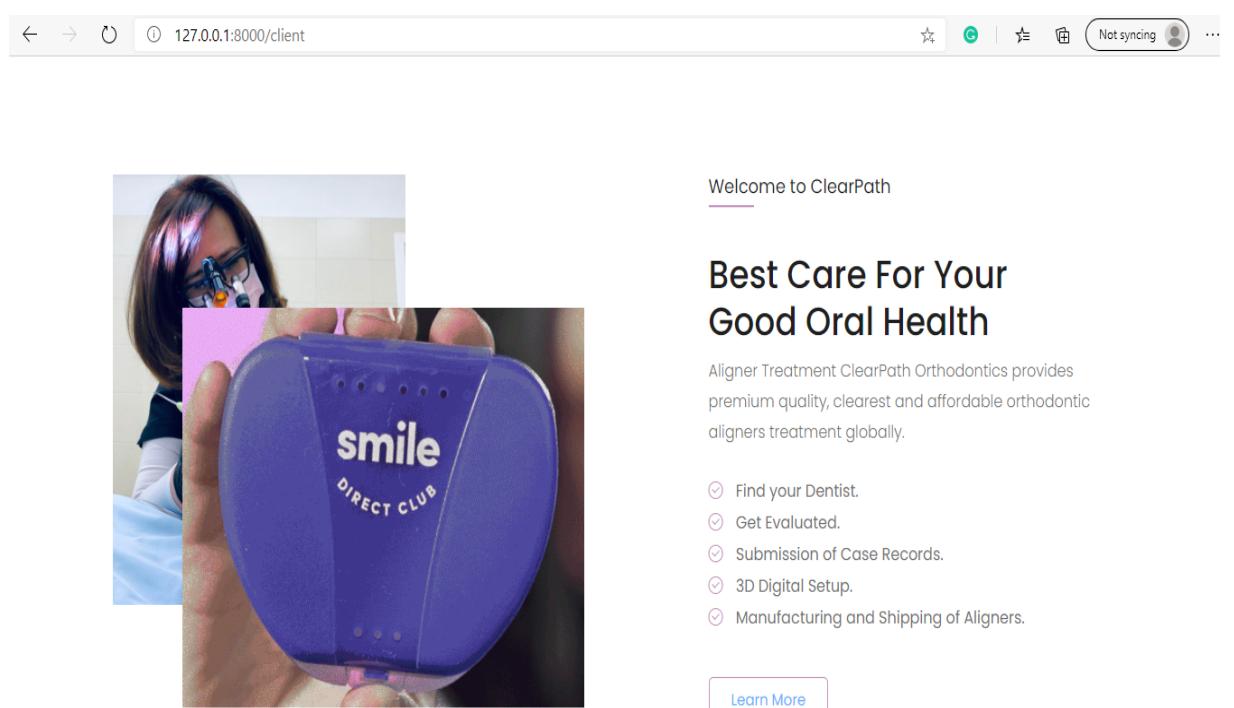


FIGURE 4.18: Client's Interface

- Interfaces of Client:

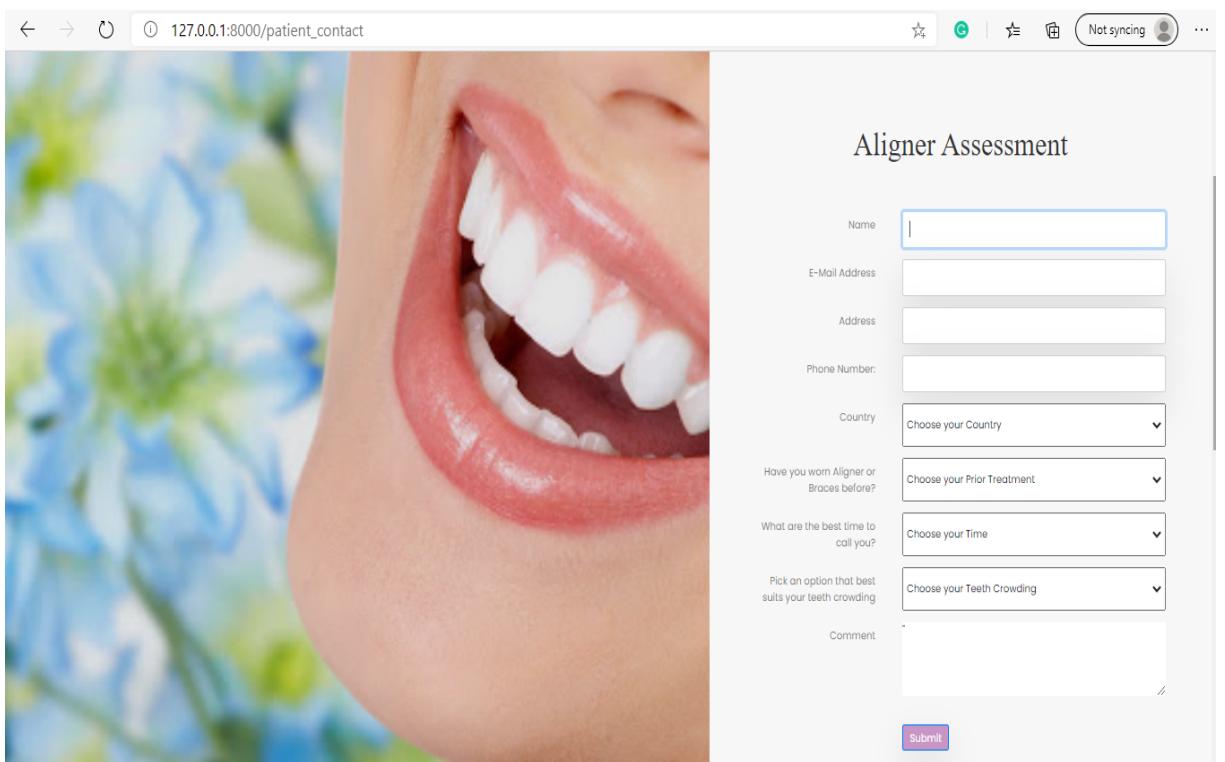


FIGURE 4.19: Client's Interface

- Interfaces of Client:

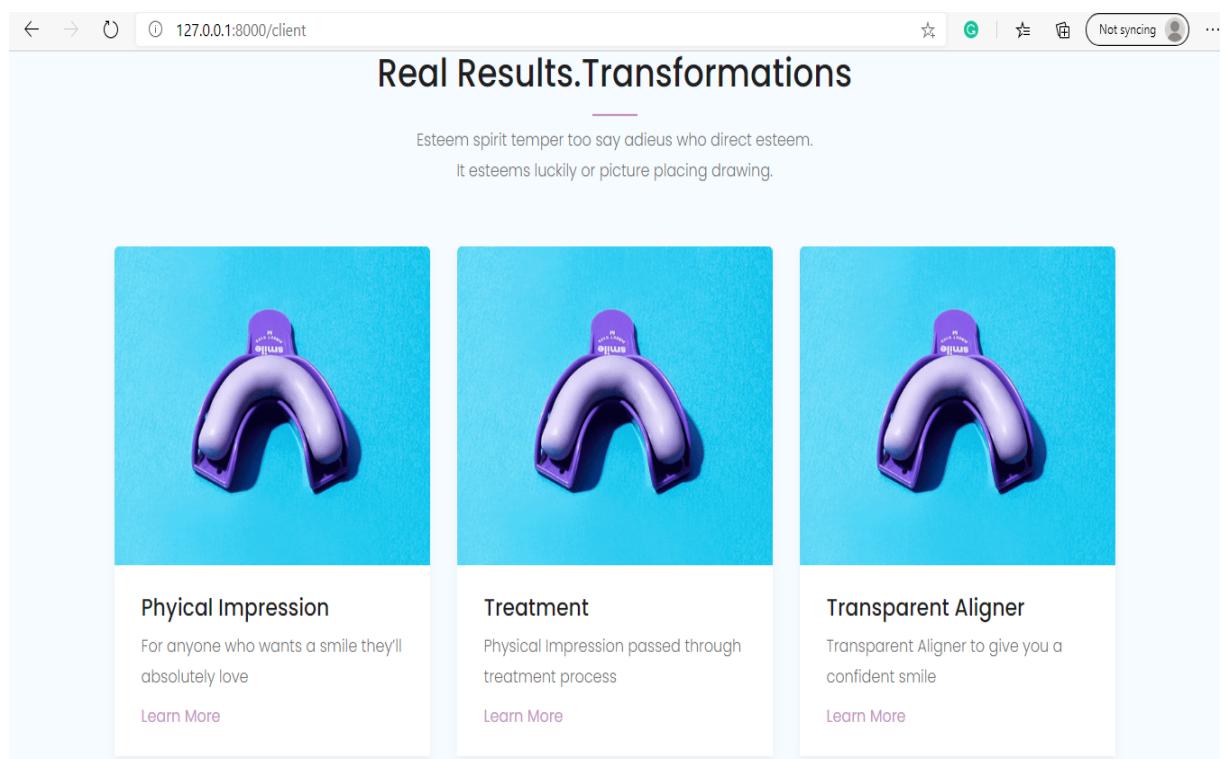


FIGURE 4.20: Client's Interface

- Interfaces of Client:

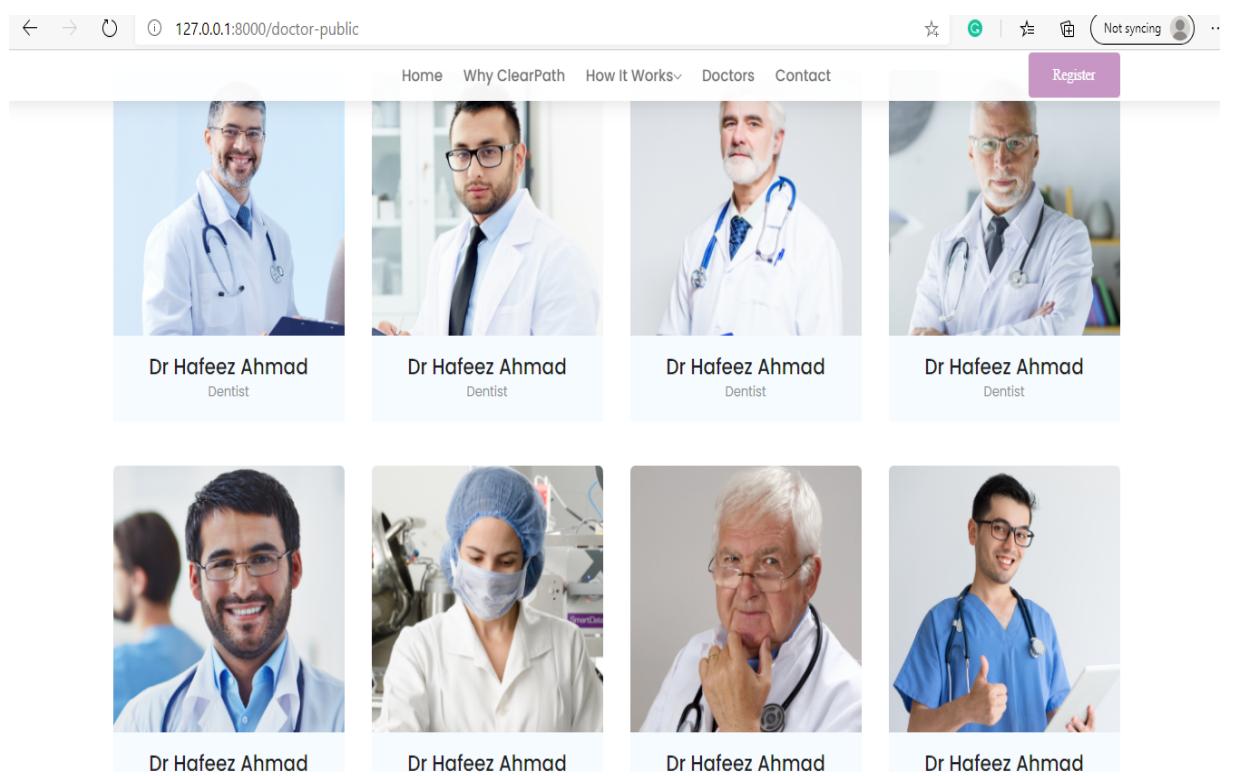


FIGURE 4.21: Client's Interface

- **Interfaces of Client:**

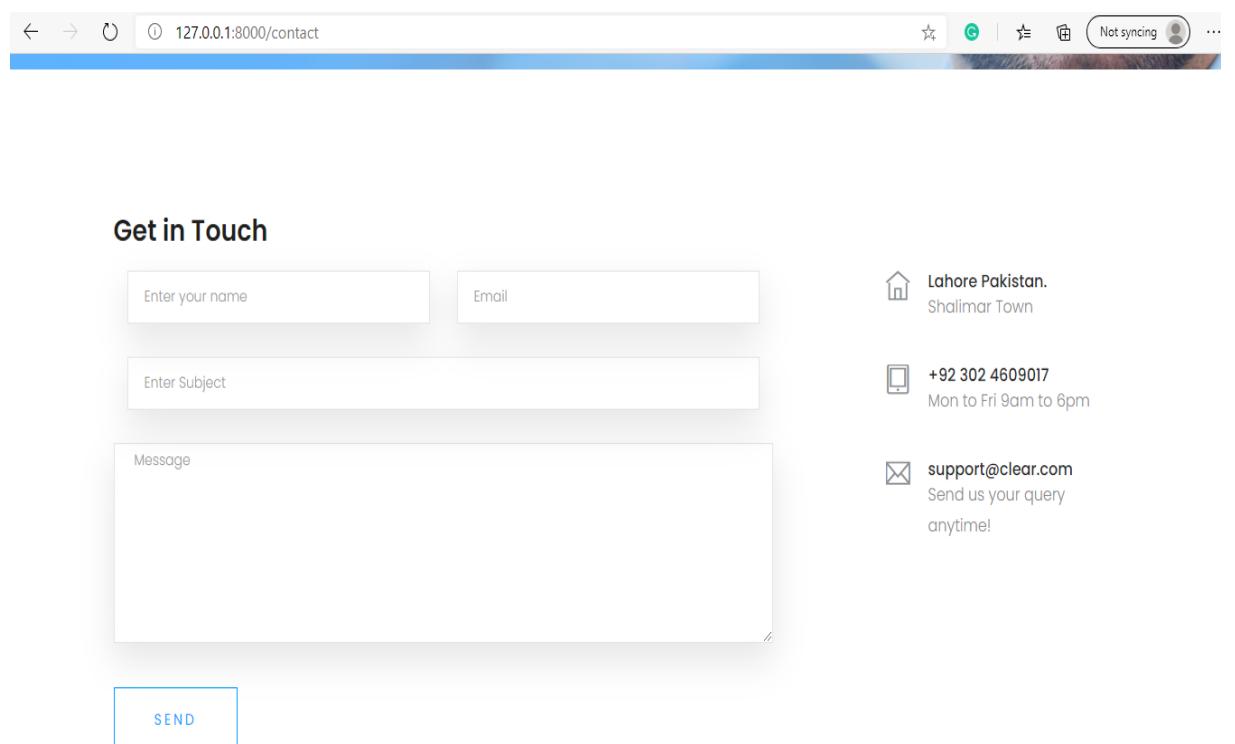


FIGURE 4.22: Client's Interface

- **Interfaces of Client:**

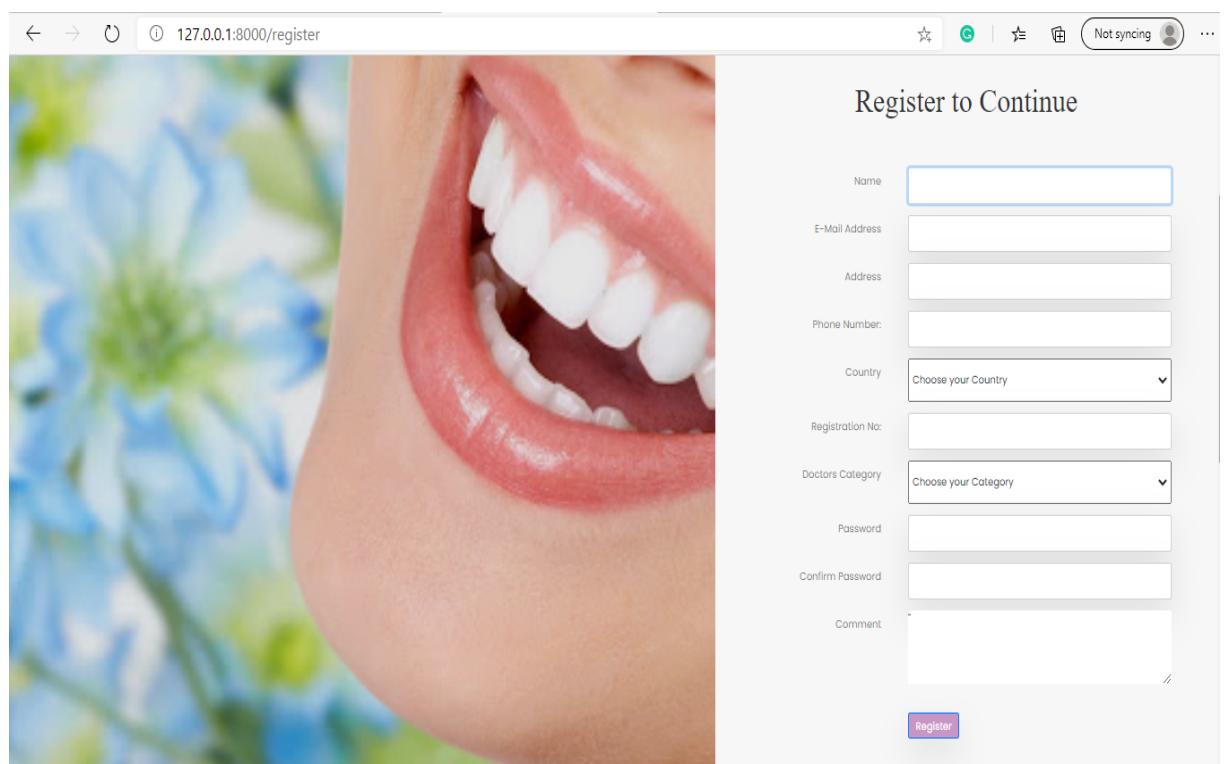


FIGURE 4.23: Client's Interface

• Evaluation

Evaluation is a very important part of **SDLC** because this is the final phase of **SDLC**. As we are using Waterfall model so evaluation step shoud be followed. We can check the working of the system as it should be. We have performed some manual tests on this app. These tests will let us to know about our project's criterias. Test case agianst each use case is given in testing section.

4.4 Testing

4.4.1 Web App Testing

4.4.1.1 User Login

TABLE 4.1: ClearpathERP-TC-01

Test-case ID	ClearpathERP-TC-01
Test-case Name	Login
Test-case Ref.	ClearpathERP-UC-01
Description	Login required to use the system
Precondition	The users must have a account to use
Input	Press the Login button
Expected Result	Login account successfully
Actual Result	Login his account successfully

4.4.1.2 Doctor Provide Patient Data

TABLE 4.2: ClearpathERP-TC-02

Test-case ID	ClearpathERP-TC-02
Test-case Name	Provide Patient Data
Test-case Ref.	ClearpathERP-UC-02
Description	Doctor will provide patient data
Precondition	Doctor must be logged in
Input	Upload Data
Expected Result	Patient's data uploads successfully
Actual Result	Patient's data is uploaded successfully

4.4.1.3 Case Entry By Management

TABLE 4.3: ClearpathERP-TC-03

Test-case ID	ClearpathERP-TC-03
Test-case Name	Case Entry
Test-case Ref.	ClearpathERP-UC-03
Description	Enter cases in system
Precondition	Doctor must provide patient details
Input	Enter the case
Expected Result	Case enters successfully
Actual Result	Case is entered successfully

4.4.1.4 User Pick Case

TABLE 4.4: ClearpathERP-TC-04

Test-case ID	ClearpathERP-TC-04
Test-case Name	Pick a Case
Test-case Ref.	ClearpathERP-UC-04
Description	User will pick a case
Precondition	There must be cases available
Input	Request case
Expected Result	User picks case successfully
Actual Result	Case is picked successfully

4.4.1.5 Record Filling By User

TABLE 4.5: ClearpathERP-TC-05

Test-case ID	ClearpathERP-TC-05
Test-case Name	Record Filling
Test-case Ref.	ClearpathERP-UC-05
Description	User enters case details
Precondition	Operator must have to pick case
Input	Enter details of case
Expected Result	Case details enter successfully
Actual Result	Case details are entered successfully

4.4.1.6 Case Timeline

TABLE 4.6: ClearpathERP-TC-06

Test-case ID	ClearpathERP-TC-06
Test-case Name	Case Timeline
Test-case Ref.	ClearpathERP-UC-06
Description	It will show processing details of case
Precondition	Case must be processed
Input	User request case timeline
Expected Result	User gets Case timeline
Actual Result	User is getting Case Timeline successfully

4.4.1.7 User Progress Report

TABLE 4.7: ClearpathERP-TC-07

Test-case ID	ClearpathERP-TC-07
Test-case Name	Progress Report
Test-case Ref.	ClearpathERP-UC-07
Description	Progress report of an operator
Precondition	Operator must have done some cases
Input	User requests progress report
Expected Result	System provides progress report to user successfully
Actual Result	User is getting progress report successfully

4.4.1.8 Assign A Case To Operator

TABLE 4.8: ClearpathERP-TC-08

Test-case ID	ClearpathERP-TC-08
Test-case Name	Assign a Case
Test-case Ref.	ClearpathERP-UC-08
Description	Management will assign case to operator
Precondition	There must be modification or hold case
Input	Management will assign case
Expected Result	Case assigns to operator successfully
Actual Result	Case is assigned successfully

4.4.1.9 Case Editing

TABLE 4.9: ClearpathERP-TC-09

Test-case ID	ClearpathERP-TC-09
Test-case Name	Edit a case
Test-case Ref.	ClearpathERP-UC-09
Description	Edit a case in case of error
Precondition	There is an issue in case which need to resolve
Input	Admin will request case from system
Expected Result	Admin edits case successfully
Actual Result	Case is edited successfully

4.4.1.10 Case Finalisation

TABLE 4.10: ClearpathERP-TC-10

Test-case ID	ClearpathERP-TC-10
Test-case Name	Case Finalisation
Test-case Ref.	ClearpathERP-UC-10
Description	Quality checker will check the case
Precondition	Operator must approve case for quality
Input	QC opens case
Expected Result	User will reject or pass the case
Actual Result	Case is rejected or passed successfully

4.4.1.11 Case Shipment

TABLE 4.11: ClearpathERP-TC-11

Test-case ID	ClearpathERP-TC-11
Test-case Name	Case Shipment
Test-case Ref.	ClearpathERP-UC-11
Description	Ready cases for shipment
Precondition	Case has passed through all departments
Input	User will press shipment button
Expected Result	Shipment does successfully
Actual Result	Shipment is done successfully

4.5 Requirements

- Visual Studio Code 2010 or above
- XAMPP or WAMPP Server

Supported Operating Systems:

- Windows 8.1 or Windows 10
- Windows Server 2016 or Windows Server 2012 R2

Hardware:

- 1.8 GHz or faster processor
- Board Dual-core or better
- 4GB or RAM recommended
- Hard disk space: min to 50 GB of available space

Chapter 5

Conclusion & Future Work

5.1 Conclusion

Clear Path Orthodontics(E-Medical System) has converted an organization traditional file system into well-organized application. This real time Web Application has handled the production for an Orthodontics Company to load in a well-mannered way. The organization used this application to enhance their production efficiency and, also reduced cost by saving paper lost. This application is performing data handling. This Web Application has provided the departments to manage their work and to link each department with other. The organization have organized file system and records of all their employee.

This system has facilitate the user with online control system. Business owner can access the data directly from web app, he can get graphical as well as textual reports. It is providing data backup and security and online shipment to other countries and cities.

5.2 Future Work

After some updates the system will become more proficient for the user. In our present functionality a user can only view the web page and checks the doctor who can treat him according to his/her requirements on that page. The proficiency of doctor is that he can get the data of patient, then he will upload the data to the system in which the patient will not have any concern during this process. After the processing the patient can get his results by the doctor through emial or via call. As doctor is concened with the production department and patient is not so the patient can also involve in the system's process.

- The patient can register his account, after the verifictaion by the admin.
- The doctor will confirm the the actual patient and it will be verified by the admin then its account will be generated.
- The patient can check his report and activity online by logging into his account.
- The doctor can send data directly to the patient and the results of his report.
- As the patient send data to the doctor, he will review it and then forward it to the production dept., after new proficiency he can send data directly to the system.

5.3 References

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