

Real-Time Bus ID Verification and Tracking

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This is to certify that this project titled “**Real-Time Bus ID Verification and Tracking**” was found to satisfy the requirement for the award of a “**Bachelor of Sciences in Software Engineering**” degree by the Department of Computer Science, National Textile University.

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We hereby declared that this document is completely written by us, and it is totally our effort and none of anyone from outside of our group has copied it. This Report is purely written technically in accordance with our project.

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Abstract

Efficient and secure transportation is vital for educational institutions, where thousands of students rely on daily commutes. However, current systems face significant challenges, including inefficiencies, security vulnerabilities, and a lack of real-time tracking and communication. Issues such as overcrowding, unauthorized access, and poor resource utilization arise when students board buses without proper verification. Additionally, the absence of real-time bus monitoring and effective communication channels leads to confusion, delays, and suboptimal transport management.

The *Real-Time Bus ID Verification and Tracking* system addresses these challenges by integrating advanced technologies like RFID-based ID verification, live GPS tracking, and automated communication tools. The system ensures only authorized students access transport services, provides real-time visibility of bus locations for students, parents, and administrators, and enables timely updates regarding delays, route changes, or emergencies. It also tracks driver performance, monitors bus occupancy, and generates insights for optimizing route planning and capacity utilization.

By modernizing transport operations, the *Real-Time Bus ID Verification and Tracking* system enhances safety, boosts operational efficiency, and delivers a reliable and user-friendly commuting experience. This solution is an ideal choice for educational institutions aiming to transform their transportation infrastructure with secure and efficient technology.

Table of Contents

Title	Page #
Certification.....	II
Declaration	III
List of Figures	IX
List of Tables	XI
List of Abbreviations	XII
CHAPTER 1.....	1
1 Introduction.....	1
1.1 Real-Time Bus ID Verification and Tracking System.....	1
1.2 Reason to Develop	1
1.2.1 Addressing Unique Institutional Needs	2
1.2.2 Enhancing Safety and Security	2
1.2.3 Bridging Communication Gaps	2
1.2.4 Optimizing Resource Management.....	2
1.2.5 Scalability and Adaptability.....	2
1.3 Problem Statement	2
1.4 Purpose.....	3
1.5 Project Goals	3
1.6 Objectives.....	3
1.7 Project Scope.....	3
1.8 Proposed Solution	4
1.9 Project Scheduling.....	4
CHAPTER 2.....	4
2 Literature Review.....	4
2.1 Related Work.....	4
2.2 Overview of YOLO.....	6
2.2.1 <i>History of YOLO</i>	6
2.2.2 <i>Description and Working of YOLO</i>	8
2.3 Types and Differences in YOLO Versions	9
2.4 Benefits of Using YOLO.....	10
CHAPTER 3.....	11
3 System Requirements.....	11
3.1 Functional Requirements.....	12
3.1.1 Patient Management:	12

3.1.2	Medical Records Management:	12
3.1.3	Nursing Station Functionality:	12
3.1.4	Physician and Clinical Services:	12
3.1.5	Laboratory Information System:	12
3.1.6	Radiology Department Integration:	12
3.1.7	Pharmacy and Dispensary Operations:	12
3.2	Non-Functional Requirements	12
3.2.1	Security:	12
3.2.2	Availability:	13
3.2.3	Scalability:	13
3.2.4	Usability:	13
3.2.5	Maintainability:	13
3.3	Use Case Diagram	13
3.3.1	Use Case of Sign In	14
3.3.2	Use Case of Sign Up	14
3.3.3	Use Case of Bus and Route Management	15
3.3.4	Use Case of Journey Management	16
3.3.5	Use Case of Bus card Management	16
3.3.6	Use Case of Student & Session Management	17
3.3.7	Use Case of Bus Staff Management	17
3.3.8	Use Case of Complaint Management	18
3.3.9	Use Case of Announcement Management	18
3.3.10	Use Case of General Functionalities	19
3.3.11	Use Case of Complete System	20
3.4	Use Case Description.	20
3.4.1	Description of Sign In:	20
3.4.2	Description of Sign Up:	21
3.4.3	Description of Bus and Route Management:	21
3.4.4	Description of Journey Management:	22
3.4.5	Description of Bus Card Management:	22
3.4.6	Description of Session and Student Management:	23
3.4.7	Description of Bus Staff Management:	24
3.4.8	Description of Complaint Management:	24
3.4.9	Description of Announcement Management:	25
3.4.10	Description of General Functionalities:	25

Chapter 4	26
4.1 Agile Software Development Methodology	26
4.2 Selected Methodology: Agile	26
4.3 Reasons for Selecting Agile Methodology	26
4.4 Agile Project Planning and Execution for RT-BIVT	27
Chapter 5	28
5 System Architecture	28
5.1 Architecture	28
5.2 Activity Diagram	29
5.3 Sequence Diagram	34
Chapter 6	36
6 AI-Model and Algorithms	36
6.1 General Disease Detection:	36
6.1.1 Key Concepts of Decision Tree:	36
6.1.2 Steps in Building a Decision Tree	36
6.1.3 Training Epochs	37
6.1.4 Architecture	37
6.1.5 Confusion Matrix	38
6.1.6 Accuracy	38
6.1.7 Activity diagram of program	39
6.2 Fractured Bone Detection:	40
6.2.1 Dataset	40
6.2.2 YOLO Working and Explanation	40
6.2.3 Training Epochs	41
6.2.4 Architecture Diagram:	41
6.2.5 Confusion Matrix:	42
6.2.1 Accuracy	42
6.2.2 Activity Diagrams	42
Chapter 7: System Implementation	44
7.1 System Tools and Technology	44
7.1.1 Django	44
7.1.2 React	45
7.1.3 MySQL	45
7.1.4 VS Code	45
7.2 Module Implementation	46

7.2.1 Dashboard	46
7.3 System Integration and Deployment	50
7.3.1 Frontend-Backend Communication	50
7.3.2 Database Management	52
7.3.3 Deployment	52
Chapter 8	53
8 Screenshots	53

List of Figures

Description	Page #
Figure 1.1 Gantt Chart	4
Figure 2.1 Historical Timeline of Research on HRMS	5
Figure 3.3.1 Use Case of Sign In.....	14
Figure 3.3.2 Use Case of Sign Up	14
Figure 3.3.3 Use Case of Patient Management	15
Figure 3.3.4 Use Case of Doctor Management	15
Figure 3.3.5 Use Case of Admission Management	16
Figure 3.3.6 Use Case of Nursing Care	16
Figure 3.3.7 Use Case of Laboratory and Radiology	17
Figure 3.3.8 Use Case of Dispensary and Medicine Management	18
Figure 3.3.9 Use Case of Patient Payment	18
Figure 3.3.10 Use Case of Payroll System	19

Figure 3.3.11 Use Case of Inventory Management	19
Figure 3.3.12 Use Case of General Functionality	20
Figure 3.3.13 Use Case of Complete System	21
Figure 5.1 Model, View and Template	30
Figure 5.2.1 Activity of Admin Control	31
Figure 5.2.2 Activity of Doctor, Nursing, Laboratory and Radiology Centre	32
Figure 5.2.3 Activity of Dispensary, Pharmacy, HMO Authorization, Cashier	33
Figure 5.2.4 Activity of Complete System	34
Figure 5.3.1 Sequence of Whole System	35
Figure 5.3.2 Sequence of Interaction among APIs and Model	36
Figure 6.1.4.1 Architecture Diagram of Decision Tree	38
Figure 6.1.7.1 Activity Diagram of G.D.D	40
Figure 6.2.1.1 Architecture diagram of working of YOLO.....	37
Figure 6.2.3.1 Activity diagram of YOLO.....	44
Figure 7.3.1.1 Class Diagram of Hospital management System	52
Figure 7.3.1.2 Component Diagram of System	52
Figure 8.1 Main Dashboard.....	54
Figure 8.2 Patient Dashboard.....	54
Figure 8.3 Patient Detail.....	55
Figure 8.4 Patient Appointment.....	55
Figure 8.5 Patient Report.....	56
Figure 8.6 Nurse Vitals.....	56
Figure 8.7 Patient Data Update.....	56
Figure 8.8 Pregnancy Report.....	57
Figure 8.9 Rooms and Beds Allocation.....	57
Figure 8.10 OPD Clinic.....	58
Figure 8.11 Authorization.....	58
Figure 8.12 General Disease AI Model.....	59
Figure 8.13 Patient Vitals Detail.....	59
Figure 8.14 Laboratory.....	60
Figure 8.15 Laboratory Tests.....	60
Figure 8.16 Laboratory Tests Reports.....	61

Figure 8.17 User Management.....	61
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List of Tables

Description	Page#
Table 3.4.1 Description of Sign Up	22
Table 3.4.2 Description of Sign In	22
Table 3.4.3 Description Patient Account Creation	23
Table 3.4.4 Description of Doctor Management	23
Table 3.4.5 Description of Patient Admission	24
Table 3.4.6 Description of Nursing Care	24
Table 3.4.7 Description of Laboratory and Radiology	25
Table 3.4.8 Description of Dispensary and Medicine Management	25
Table 3.4.9 Description of Patient Payment	26
Table 3.4.10 Description of Inventory Management System	26
Table 3.4.11 Description General Functionalities	27
Table 6.1.5.1 Confusion Matrix of General Disease Detection	39

Table 6.2.5.1 Confusion Matrix of YOLO 43

List of Abbreviations

RT-BIVT	Real-Time Bus ID Verification and Tracking
RFID	Radio Frequency Identification
RT-BIVT system	Admin Panel, Driver and Student App's

CHAPTER 1

1 Introduction

Efficient and secure transportation systems are crucial for educational institutions of all sizes, where thousands of students rely on daily commutes. However, many institutions face significant challenges, including inefficiencies, security vulnerabilities, and a lack of real-time tracking and communication. Students often board buses without proper verification, leading to overcrowding, unauthorized access, and inequitable usage of transport resources. Additionally, the absence of real-time monitoring for buses and driver performance, coupled with ineffective communication channels, results in confusion, delays, and poor management of transport operations.

To address these challenges, we propose a RT-BIVT system tailored for educational institutions. This system combines advanced technologies like RFID-based ID verification, live GPS tracking, and automated communication tools to streamline transportation management. It ensures that only authorized students access transportation services, provides real-time visibility of bus locations for students, parents, and administrators, and facilitates timely updates on delays, route changes, or emergencies. Additionally, the system tracks driver performance, monitors bus occupancy, and generates alerts to optimize route planning and capacity utilization.

This innovative solution goes beyond solving existing challenges—it transforms transportation management into a secure, efficient, and user-friendly ecosystem. By integrating modern technologies, the RT-BIVT system enhances safety, improves operational efficiency, and delivers a reliable transportation experience, making it an ideal choice for any educational institution seeking to modernize its transport infrastructure.

1.1 Real-Time Bus ID Verification and Tracking System

The RT-BIVT system is an innovative solution designed to enhance transportation efficiency and safety for educational institutions. It integrates cutting-edge technologies like RFID for ID verification, live GPS tracking, and an advanced communication framework to create a streamlined, user-friendly transportation management ecosystem. This system empowers institutions to optimize bus routes, manage capacity, and monitor driver performance, ensuring a secure and efficient transport experience for students, parents, and administrators.

1.2 Reason to Develop

The development of the RT-BIVT system is driven by several compelling factors, despite the existence of other transportation solutions:

1.2.1 Addressing Unique Institutional Needs

Educational institutions often face specific challenges like unauthorized access, overcrowding, and inefficient communication. Generic transport management systems fail to meet these tailored needs, prompting the creation of a solution that directly addresses the unique requirements of such environments.

1.2.2 Enhancing Safety and Security

Ensuring that only authorized students use transport facilities is crucial for security and fairness. RFID-based verification provides a reliable, real-time solution to mitigate misuse and enhance safety for students and drivers.

1.2.3 Bridging Communication Gaps

A lack of effective communication between transport departments, parents, and students leads to confusion and inefficiency. The proposed system integrates real-time notifications for updates like delays, route changes, and emergencies, ensuring timely and clear communication.

1.2.4 Optimizing Resource Management

Overcrowding or underutilization of buses is a common issue. By integrating occupancy monitoring and route optimization, this system helps administrators allocate resources more efficiently, reducing costs and enhancing comfort.

1.2.5 Scalability and Adaptability

The system is designed to adapt to the specific challenges of any educational institution, whether managing a small fleet or a large-scale transport network. It is scalable, ensuring that institutions can continue to benefit as their transportation needs evolve.

This project is more than a technological upgrade; it is a strategic initiative to modernize transport systems, improve safety, and deliver a seamless experience for all stakeholders in an educational environment.

1.3 Problem Statement

Educational institutions face significant challenges in managing their transportation systems effectively. Common issues include overcrowded or underutilized buses, unauthorized access, inefficient communication, and a lack of real-time tracking. These problems result in confusion, operational inefficiencies, and safety concerns for

students, parents, and administrators. Existing solutions often lack the integration and adaptability required to address these specific institutional needs.

1.4 Purpose

The primary purpose of the RT-BIVT system is to provide a seamless, all-in-one solution for transportation management in educational institutions. By combining secure access verification, live GPS tracking, and advanced communication tools, the system aims to improve operational efficiency, enhance student safety, and streamline communication among all stakeholders.

1.5 Project Goals

- Implement secure ID verification to prevent unauthorized access.
- Provide live bus location tracking for real-time visibility and improved coordination.
- Enable real-time notifications for updates such as delays, route changes, or emergencies.
- Track key metrics like speed, stop intervals, and adherence to schedules.
- Streamline bus scheduling, capacity management, and route planning.
- Ensure an intuitive interface for administrators, parents, and students.

1.6 Objectives

Objectives of the project are as follows:

- Integrate RFID-based ID verification to ensure only authorized users board the buses.
- Provide GPS-enabled tracking for buses accessible to students, parents, and administrators.
- Enable alerts for overcrowding or underutilization to optimize bus capacity.
- Monitor driver behaviour to ensure adherence to safety and efficiency standards.
- Develop a mobile app for notifications and updates to keep all stakeholders informed.

1.7 Project Scope

Although designed for educational institutions, this system can be extended to other domains such as corporate transport, public transit, or private bus fleets. Its modular design allows for customization and scalability, making it suitable for varying transportation requirements and operational complexities.

1.8 Proposed Solution

The system offers a modular and comprehensive approach to transportation management. It features real-time ID verification using RFID, live GPS tracking for buses, occupancy alerts, driver performance monitoring, and mobile apps for seamless communication. By adopting this system, institutions can significantly enhance operational efficiency, reduce resource wastage, and ensure a safer, more reliable transport experience for all users.

1.9 Project Scheduling

Here is the Gantt chart for the RT-BIVT project. This chart visually represents the project timeline, including the start and end dates for each activity. It provides a high-level overview of how the project tasks are scheduled over time, aiding in effective project management and tracking. The timeline of the project is shown by the Gantt chart in Figure 1.1.

Figure 1.1 Gantt Chart

CHAPTER 2

2 Literature Review

In the area of hospital management, the integration of synthetic intelligence (AI) in healthcare systems represents a large development. This bankruptcy evaluations the literature surrounding AI packages in health facility control, focusing on AI-driven diagnostics, patient information management, and operational performance. The relevance of AI in healthcare is comparable to the importance of biometric credentials, which includes handwritten signatures, in record and individual authentication [1].

2.1 Related Work

The evolution and development of AI-pushed health center control systems may be traced again several decades, paralleling the studies trajectory of offline handwritten signature reputation [2]. Since the early integration of facts generation in healthcare, there were continuous efforts to decorate medical institution control thru numerous technological method, inclusive of AI [3].

Below, a timeline is presented to highlight significant milestones in the development of AI applications in hospital management Figure 2.1.

Timeline of Significant Events:

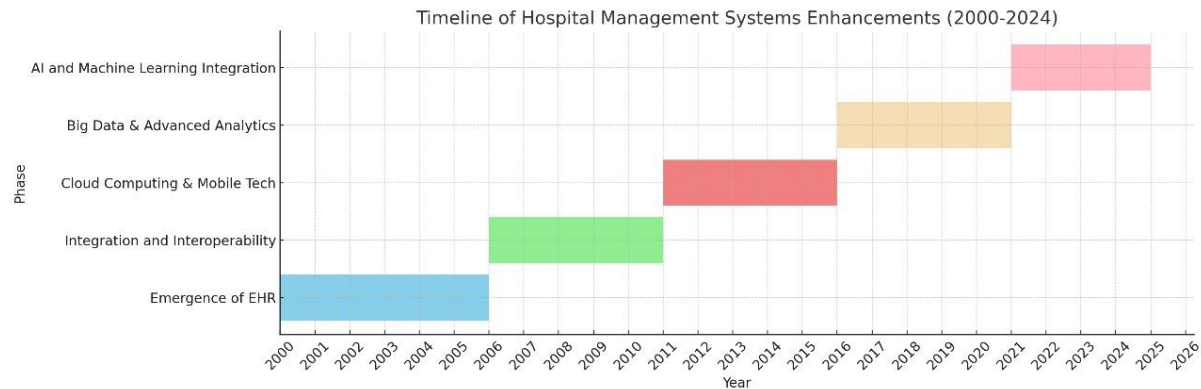


Figure 2.1 Historical Timeline of Research of HRMS

2.1.1 Early 1990s:

The preliminary ranges of IT integration in healthcare start, focusing normally on digital report-maintaining [4].

2.1.2 Late 1990s:

Emergence of virtual equipment for handling patient statistics, scheduling, and primary health facility operations [5].

2.1.3 Early 2000s:

Introduction of extra state-of-the-art clinic information structures (HIS), incorporating database management for large records units [6].

2.1.4 Mid-2000s:

Initial AI implementations in diagnostic equipment, basically in imaging and laboratory tests [7].

2.1.5 Late 2000s:

Expansion of AI packages in predictive analytics for patient care and operational planning [2].

2.1.6 Early 2010s:

Development of AI fashions for precise disease detection, along with the first instances of AI in radiology and pathology [8].

2.1.7 Mid-2010s:

Integration of AI in digital health facts (EHR) for more suitable information analysis and decision assist [9].

2.1.8 Late 2010s:

Widespread adoption of AI for various clinic control functions, such as aid allocation, affected person drift optimization, and customized treatment plans [3].

2.1.9 Early 2020s:

Introduction of superior AI algorithms, which includes deep learning, in diagnostics, appreciably improving accuracy and efficiency [10].

2.1.10 Present:

The Hospital Management Ecosystem and AI-Diagnostics represents the end result of those trends, integrating diverse AI functionalities into a comprehensive, consumer-friendly machine for hospital administration and affected person care [11].

This timeline illustrates the revolutionary integration of AI in clinic control, highlighting how technological advancements have incrementally converted healthcare operations, much like the evolution visible in offline signature popularity research [2]. It presents a ancient context to the development of the Hospital Management Ecosystem and AI-Diagnostics, underscoring its significance as a brand new answer in healthcare era [12].

2.2 Overview of YOLO

2.2.1 History of YOLO

YOLO (You Only Look Once) is a circle of relatives of item detection fashions famend for his or her velocity and accuracy. The evolution of YOLO has substantially impacted the field of computer imaginative and prescient, specifically in actual-time item detection. Here is an in depth records of its development:

- **YOLOv1 (2015):**

Introduced by way of Joseph Redmon, Santosh Divvala, Ross Girshick, and Ali Farhadi in their seminal paper "You Only Look Once: Unified, Real-

Time Object Detection." YOLOv1 proposed a singular approach to object detection via framing it as a unmarried regression trouble. Unlike conventional methods like R-CNN, which worried complicated pipelines with more than one tiers (region proposal, feature extraction, and class), YOLOv1 carried out item detection in a single forward skip through the network. This significantly improved the rate of detection, allowing real-time processing [13].

- **YOLOv2 (2016):**

Also known as YOLO9000, this version introduced numerous enhancements to the authentic version. The improvements protected batch normalization, high-resolution classifier, anchor packing containers, and size clusters. These adjustments stepped forward both the accuracy and speed of the version. YOLO9000 additionally introduced the idea of the usage of both classified and unlabeled facts to increase the detection abilities to over 9000 item categories [14].

- **YOLOv3 (2018):**

YOLOv3 similarly stepped forward the architecture by way of introducing a deeper and extra efficient spine network called Darknet-53. This model additionally applied multi-scale predictions, allowing better detection of objects at special scales. Logistic regression become used for class prediction, enhancing the version's performance on complicated datasets [15].

- **YOLOv4 (2020):**

Developed via Alexey Bochkovskiy, Chien-Yao Wang, and Hong-Yuan Mark Liao, YOLOv4 incorporated a large number of advancements, including mosaic records augmentation, self-antagonistic training, and go-stage partial connections (CSP). These improvements substantially boosted the model's accuracy and efficiency [16].

- **YOLOv5 (2020):**

Although not formally released by the unique authors, YOLOv5, developed by using Ultralytics, became popular for its user-pleasant implementation and enhanced performance. YOLOv5 targeted on ease of training and deployment, making it a popular choice for each researchers and practitioners [17].

- **YOLOv6, YOLOv7, and YOLOv8:**

These subsequent variations persisted to construct on the improvements in their predecessors. Each version brought optimizations in structure, education strategies, and alertness-precise diversifications, in addition solidifying YOLO's recognition as a main item detection framework [18].

2.2.2 Description and Working of YOLO

YOLO's key innovation lies in treating object detection as a unmarried regression trouble. This technique appreciably simplifies the detection pipeline and complements speed. Here is an in depth clarification of the way YOLO works:

1. Input Image Division

The enter photograph is split into an $S \times SS$ instances $SS \times S$ grid. Each grid cell is accountable for detecting gadgets whose center falls in the cell. This division enables the version recognition on unique regions of the image concurrently.

2. Bounding Box Prediction

- Each grid cellular predicts a fixed quantity of bounding boxes (B). For every bounding container, the model predicts the subsequent:
- Four coordinates representing the middle (x, y), width, and peak of the container.
- A self belief rating indicating the presence of an object within the box and the accuracy of the bounding field.

3. Class Prediction

For each grid cell, a hard and fast of class probabilities is predicted. These possibilities suggest the likelihood of each magnificence being gift within the bounding field. The class prediction is unbiased of the wide variety of bounding bins predicted through the cell.

4. Output Tensor

The very last output is a tensor of shape $S \times S \times (B \times 5 \times C) \times S$ times S instances (B times five C) $S \times S \times (B \times 5 \times C)$, in which:

- $S \times SS$ instances $SS \times S$ represents the grid cells.
- $B \times 5B$ times $5B \times 5$ represents the bounding box predictions (4 coordinates + 1 self assurance score).
- CCC represents the wide variety of classes.

The model outputs predictions for each grid mobile, and submit-processing steps (like non-max suppression) are used to filter out and refine those predictions.

2.3 Types and Differences in YOLO Versions

Each version of YOLO has introduced significant improvements and optimizations. Here's a detailed comparison of the different YOLO versions:

YOLOv1

- **Architecture:** Single convolutional community for stop-to-cease predictions.
- **Strengths:** Fast and capable of actual-time detection.
- **Limitations:** Lower accuracy for smaller items due to coarse grid division and the version's incapacity to handle more than one items nicely within a single grid mobile.

YOLOv2 (YOLO9000)

- **Improvements:** Introduced batch normalization, anchor containers, better decision classifier, and size clusters.
- **Strengths:** Better accuracy and speed, able to detecting over 9000 item categories.
- **Limitations:** While advanced, still confronted challenges with very small items and overlapping gadgets in densely packed scenes.

YOLOv3

- **Architecture:** Darknet-53 backbone, multi-scale predictions.
- **Improvements:** Introduced logistic regression for class prediction and used three one-of-a-kind scales for predictions, enhancing the detection of small, medium, and large items.
- **Strengths:** Significantly progressed accuracy and robustness in numerous detection scenarios.
- **Limitations:** Increased computational complexity in comparison to YOLOv2.

YOLOv4

- **Improvements:** Advanced strategies like mosaic statistics augmentation, self-adversarial schooling, and CSPDarknet53 backbone.
- **Strengths:** Achieved state-of-the-art overall performance with a terrific stability among velocity and accuracy.
- **Limitations:** More complex architecture requiring extra computational sources for training.

YOLOv5

- **Developed via:** Ultralytics.

- **Improvements:** Focused on ease of use, higher support for training and deployment, and improvements in each velocity and accuracy.
- **Strengths:** Lightweight, notably efficient, and smooth to teach and set up.
- **Limitations:** Not an legitimate continuation from the unique YOLO authors, leading to a few debate within the community.

YOLOv6, YOLOv7, YOLOv8

- **Improvements:** Continued optimizations in structure, schooling techniques, and application-particular variations.
- **Strengths:** Enhanced adaptability and performance throughout special tasks and devices.
- **Limitations:** Increased complexity and computational necessities, relying at the unique model and application.

2.4 Benefits of Using YOLO

YOLO's innovative approach to object detection offers several significant benefits over traditional methods:

1. Speed

- **Real-time Detection:** YOLO's unmarried-pass detection permits it to technique snap shots in real-time, making it one of the fastest object detection algorithms available. This is critical for packages like autonomous using, robotics, and stay video analysis.

2. Simplicity

- **End-to-End Training:** YOLO simplifies the object detection pipeline with the aid of the usage of a unmarried convolutional network to are expecting bounding boxes and class chances immediately. This reduces the complexity and capability mistakes associated with multi-stage pipelines used by different techniques.

3. Accuracy

- **Enhanced Performance:** With every model, YOLO has integrated new techniques and optimizations that enhance its accuracy. YOLOv4 and YOLOv5, as an example, offer today's overall performance in terms of each precision and don't forget.

4. Single Model for Multiple Tasks

- **Unified Approach:** YOLO can concurrently predict a couple of bounding bins and their respective magnificence chances, casting off the want for separate fashions or complex integration steps.

5. Real-time Applications

- **Low Latency:** YOLO's capability to carry out real-time detection makes it best for packages wherein low latency is essential, such as surveillance systems, independent motors, and augmented truth.

6. Flexibility

- **Adaptability:** YOLO's non-stop development and style of variations make it notably adaptable. It may be tailored to one-of-a-kind tasks and environments, from detecting small gadgets to running in aid-restrained settings.

CHAPTER 3

3 System Requirements

In this bankruptcy, all of the useful requirements of the application and the overall requirement of the stockholders are documented as it's an important a part of a mission or product that allows to satisfy stakeholder's necessities. Now, we can speak system necessities, practical necessities, software program development, and present and selected methodology with the purpose of technique. These sections describe software program methodologies which are present and decided on for this assignment with the glide of machine and alertness detail depicted.

3.1 Functional Requirements

3.1.1 *Dashboard Management:*

Display real-time health facility operations metrics and critical notifications. Provide a summary view of each day appointments, admissions, and discharges.

3.1.1 *Patient Management:*

Enable complete seek capability for patient records. Facilitate appointment scheduling, monitoring, and updates. Manage designated affected person come across histories inclusive of go to notes and treatment records.

3.1.2 *Medical Records Management:*

Securely upload and store patient files and medical documents. Ensure quick retrieval of patient encounter reports and medical histories.

3.1.3 *Nursing Station Functionality:*

Record and monitor patient vitals with alert structures for abnormal readings. Manage and log nursing sports consisting of injections, dressings, and procedures. Handle requisitions for medical substances and song inventory.

3.1.4 *Physician and Clinical Services:*

Support outpatient clinic operations with scheduling and patient waft management. Facilitate the creation of virtual patient stumble upon reviews. Integrate with laboratory and radiology statistics systems for check ordering and result retrieval.

3.1.5 *Laboratory Information System:*

Manage incoming test requests and track pending orders. Record and disseminate laboratory outcomes to applicable departments. Provide functionalities for take a look at reporting, management, and categorization.

3.1.6 *Radiology Department Integration:*

Track radiology requests including X-rays, CT scans, ultrasounds, and ECGs. Manage the workflow from take a look at requests to end result reporting.

3.1.7 *Pharmacy and Dispensary Operations:*

Oversee outpatient and inpatient dispensary features. Manage pharmacy inventory inclusive of drug expiry and utilization reports. Handle buy orders and affirm receipt of medicine.

3.2 Non-Functional Requirements

3.2.1 *Security:*

Implement robust authentication and authorization checks.

3.2.2 *Availability:*

The system should be available 24/7.

3.2.3 *Scalability:*

The system must be scalable to handle an increasing number of users and data.

3.2.4 *Usability:*

User interface should be intuitive and easy to navigate.

3.2.5 *Maintainability:*

The system should be easy to maintain and update with minimal downtime.

3.3 Use Case Diagram

For graphical visualization of actor interaction with the components of the systems, the most appropriate approach is to use case diagrams that graphically represent which actor may perform or access which functionality or component of the system.

3.3.1 Use Case of Sign In

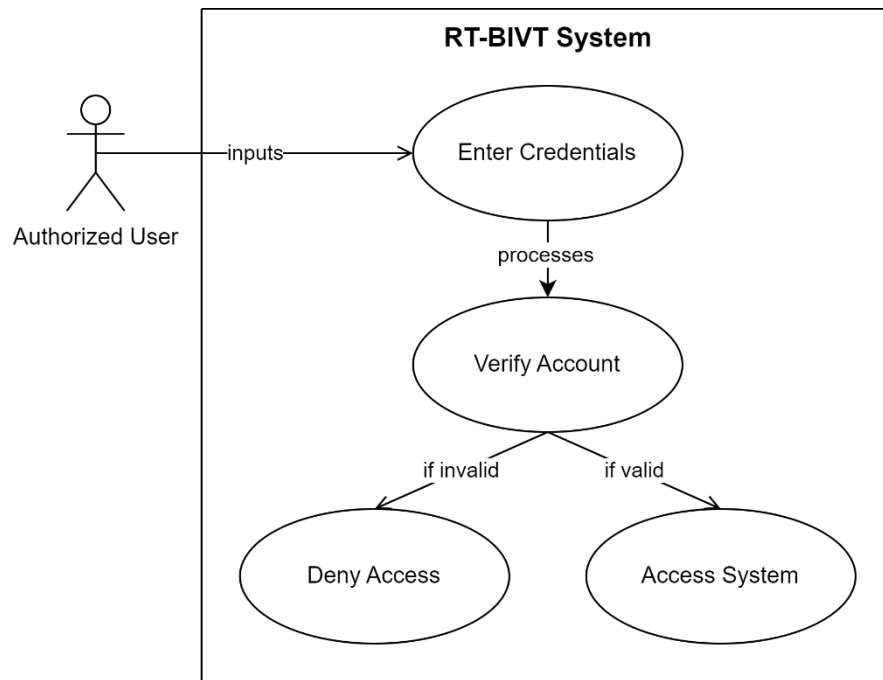


Figure 3.3.1 Use Case of Sign In

3.3.2 Use Case of Sign Up

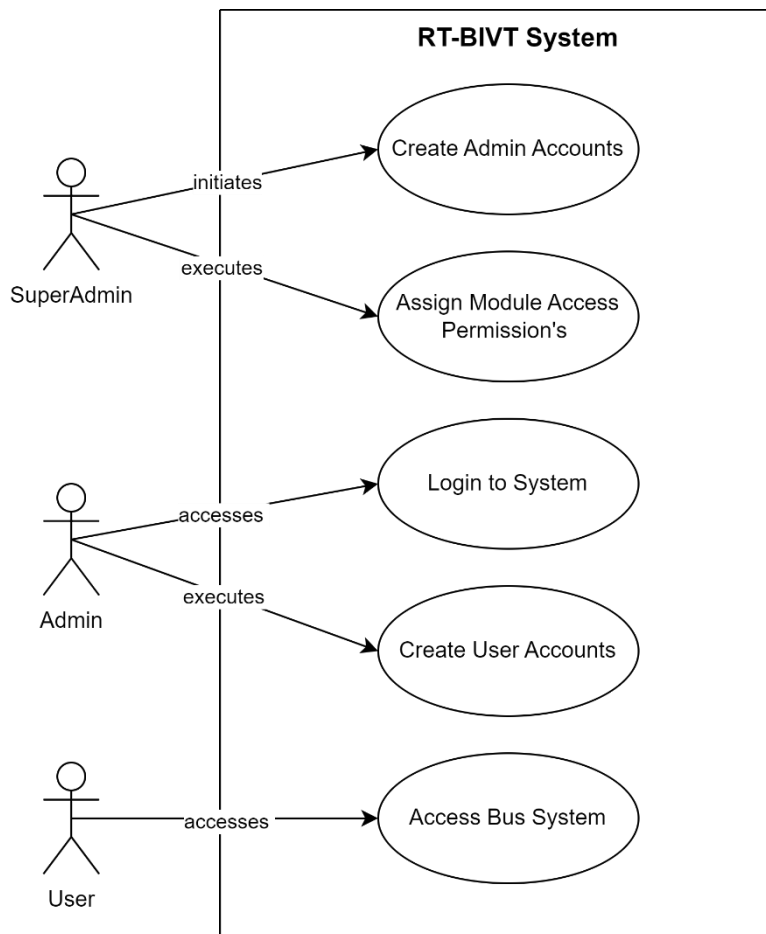


Figure 3.3.2 Use Case of Sign Up

3.3.3 Use Case of Bus and Route Management

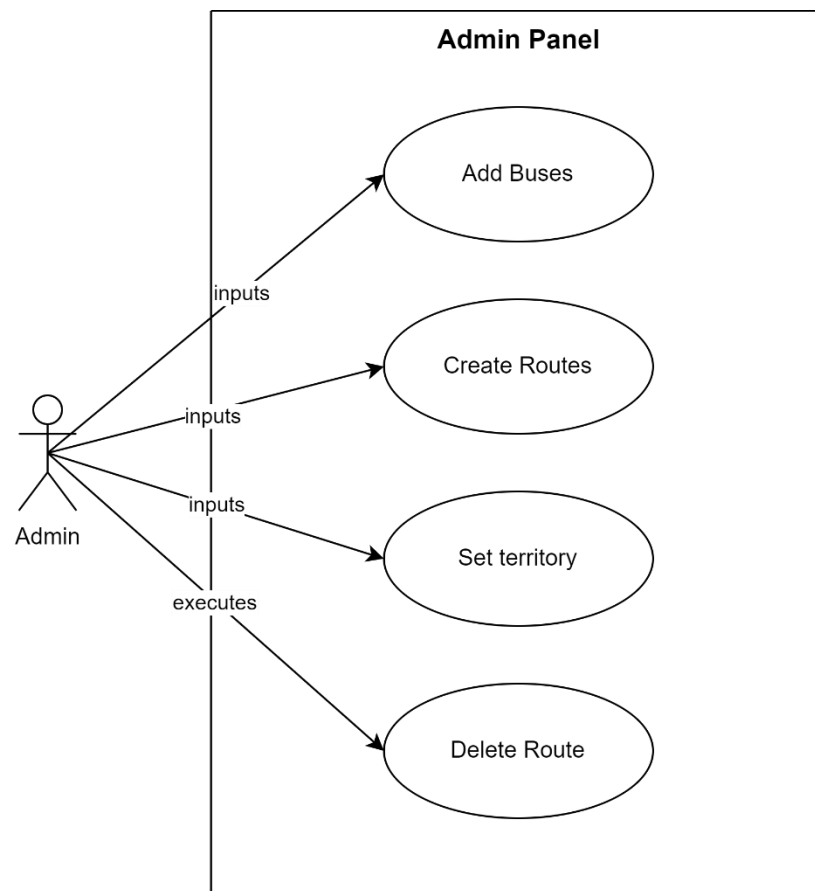


Figure 3.3.3 Use Case of Bus and Route Management

3.3.4 Use Case of Journey Management

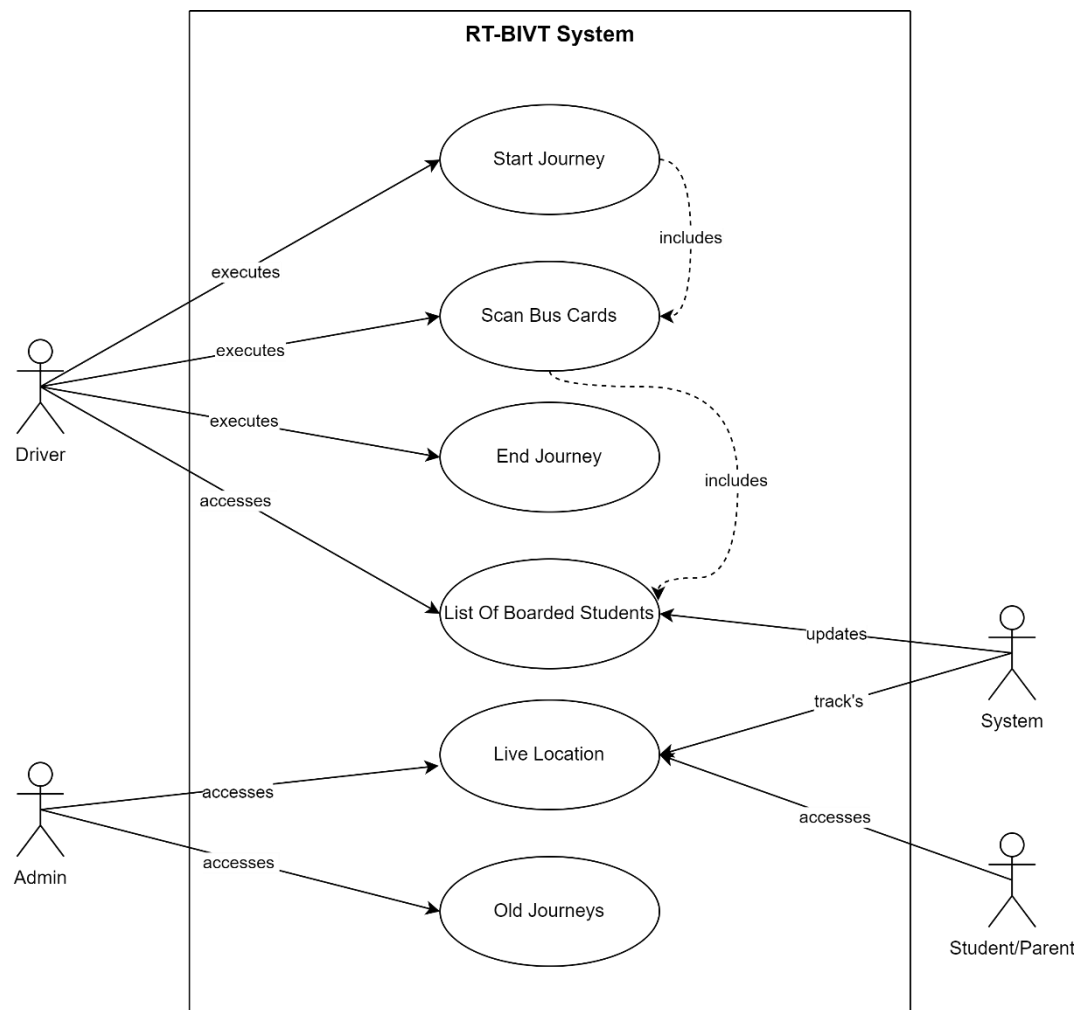


Figure 3.3.4 Use Case of Journey Management

3.3.5 Use Case of Bus card Management

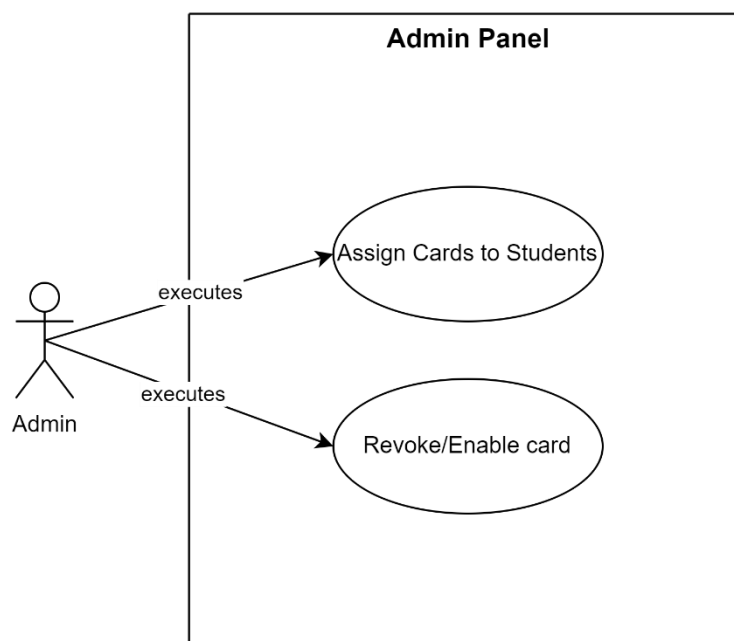


Figure 3.3.5 Use Case of Bus Card Management

3.3.6 Use Case of Student & Session Management

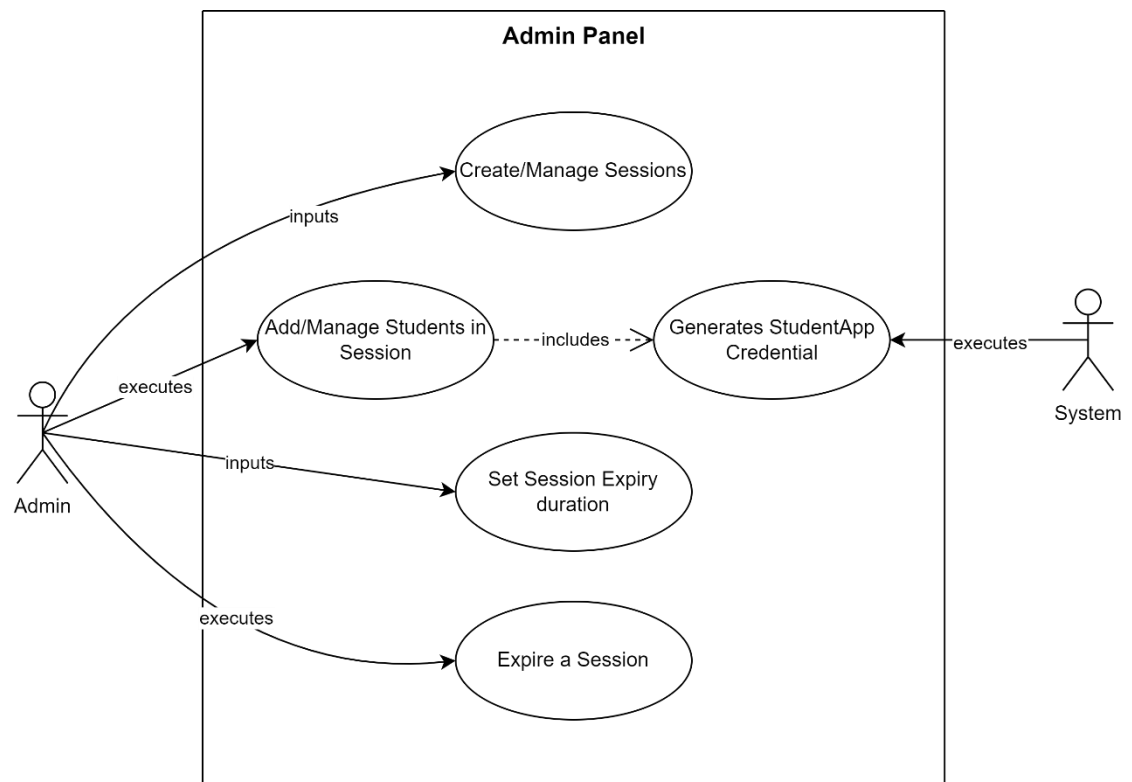


Figure 3.3.6 Use Case of Student & Session Management

3.3.7 Use Case of Bus Staff Management

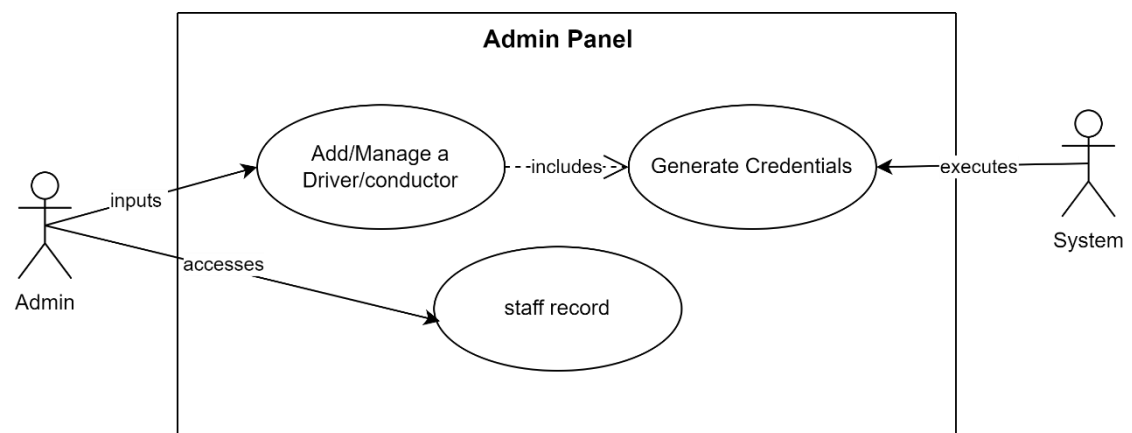


Figure 3.3.7 Use Case of Bus Staff Management

3.3.8 Use Case of Complaint Management

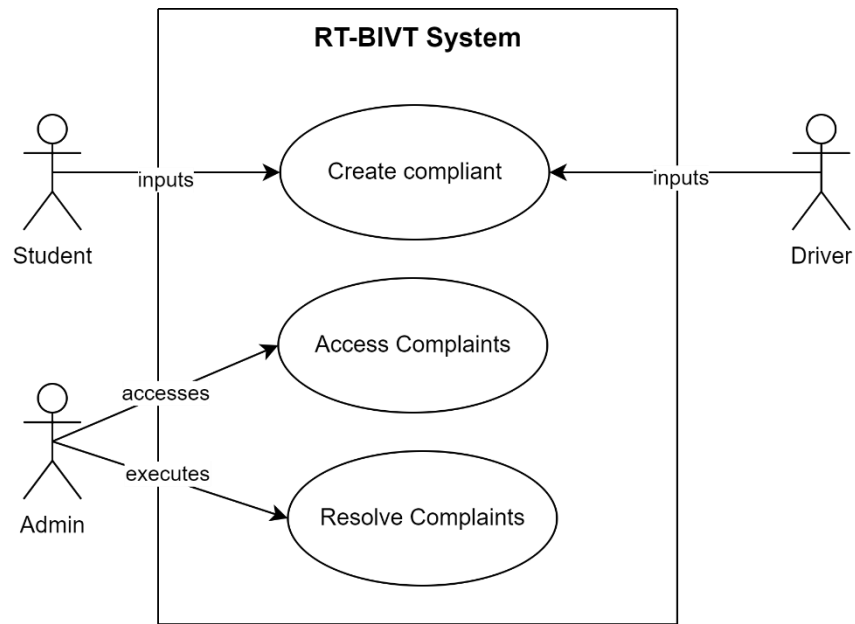


Figure 3.3.8 Use Case of Complaint Management

3.3.9 Use Case of Announcement Management

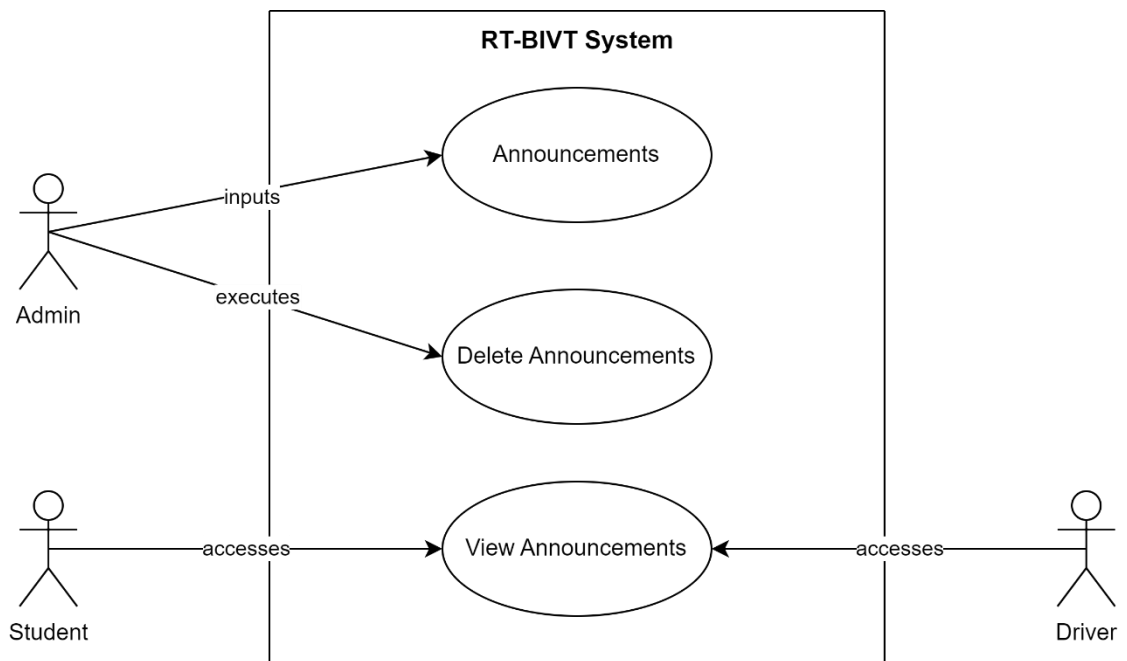


Figure 3.3.9 Use Case of Announcement Management

3.3.10 Use Case of General Functionalities

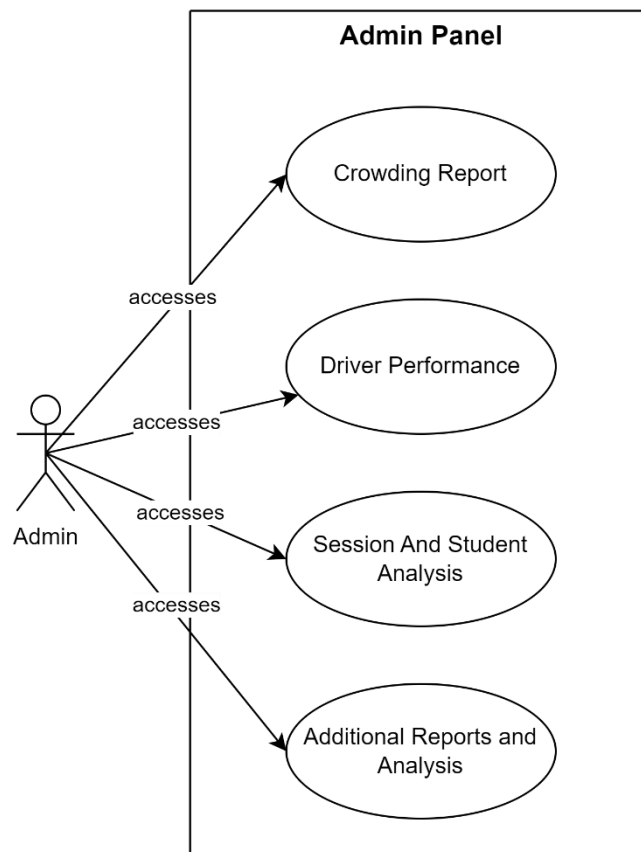


Figure 3.3.10 Use Case of General Functionalities

3.3.11 Use Case of Complete System

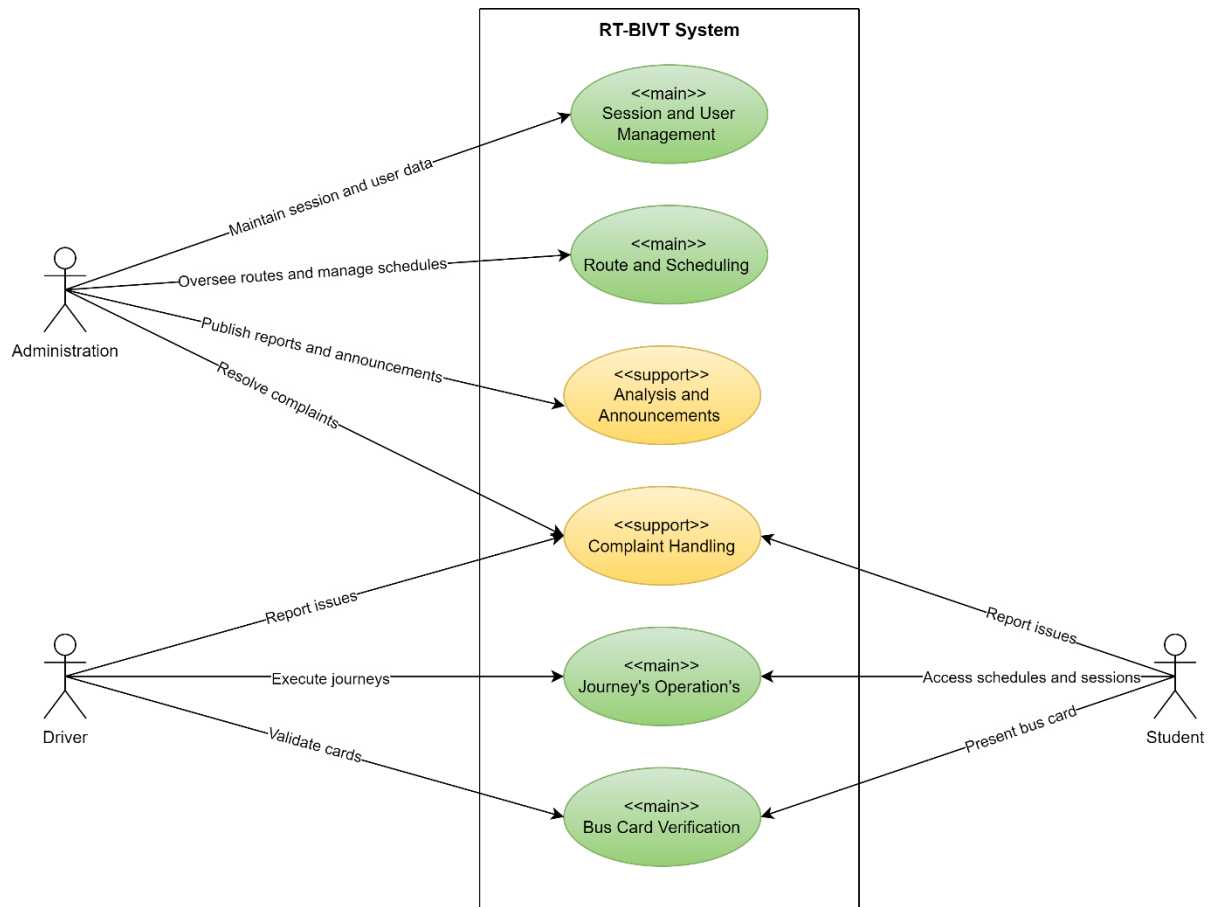


Figure 3.3.11 Use Case of Complete System

3.4 Use Case Description.

Use case description contains every piece of information (use case id, use case name, description, pre- and post-conditions) of each use case.

3.4.1 Description of Sign In:

Field	Details
Use Case Id	01
Use Case Name	Sign In
Actors	Authorized User
Description	Authorized users log in to the RT-BIVT via provided applications. Access is

	denied if the user does not have an account or proper credentials.
Pre-condition	User must have an account and credentials.
Post-condition	User logs into the RT-BIVT system or is denied access.

Table: 3.4.1 Description of Sign In

3.4.2 Description of Sign Up:

Table: 3.4.2 Description of Sign Up

Field	Details
Use Case Id	02
Use Case Name	Sign Up
Actors	Super Admin, Authorized User
Description	A Super Admin has the ability to create admins and assign specific roles and permissions to each. These admins are tasked with managing the creation of user accounts, including those for bus staff and students.
Pre-condition	User must have an account, enough permissions and credentials to access system.
Post-condition	A new user is created with specific roles and permissions to operate with in RT-BIVT.

3.4.3 Description of Bus and Route Management:

Table: 3.4.3 Description of Bus and Route Management

Field	Details
Use Case Id	03
Use Case Name	Bus and Route Management
Actors	Admin
Description	The admin is responsible for adding buses, defining routes, and assigning territories.

Pre-condition	Admin must be authenticated and have enough permissions to manage buses and routes.
Post-condition	The admin effectively oversees the management of buses, routes, and territories.

3.4.4 Description of Journey Management:

Table: 3.4.4 Description of Journey Management

Field	Details
Use Case Id	04
Use Case Name	Journey Management
Actors	Admin, Driver, Student
Description	The driver starts and ends journeys while verifying student bus cards during the trip. The system logs journey-related data and tracks the bus's live location, enabling administration, students, and parents to access journey details and monitor the bus's real-time location.
Pre-condition	The driver must be authenticated and have specified the route and the bus they are assigned to. The student must possess a valid and active bus card.
Post-condition	The driver successfully operates the journeys, while the system tracks and updates the journey details and live bus location. This allows both administrators and students/parents to access the journey information and the live location of the bus.

3.4.5 Description of Bus Card Management:

Table: 3.4.5 Description of Bus Card Management

Field	Details
Use Case Id	05
Use Case Name	Bus Card Management
Actors	Admin
Description	The admin is responsible for assigning and managing student bus cards.
Pre-condition	The admin must be authenticated and have necessary permissions to manage bus cards. Students are required to be registered in the system.
Post-condition	The admin can successfully assign bus cards to students, revoke the cards to prevent further use, and re-enable them when needed.

3.4.6 Description of Session and Student Management:

Table: 3.4.6 Description of Session and Student Management

Field	Details
Use Case Id	06
Use Case Name	Session and Student Management
Actors	Admin, System
Description	The admin can create and terminate sessions, set session expiry, and manage students within the system. When a student is added, the system automatically generates app credentials for them. Expiring or deleting a session will deactivate all bus cards associated with that session.
Pre-condition	The admin must be authenticated and have necessary permissions to manage bus cards. Student data must be accurate and complete for the generation of credentials.
Post-condition	The admin effectively oversees both sessions and student management.

3.4.7 Description of Bus Staff Management:

Table: 3.4.7 Description of Bus Staff Management

Field	Details
Use Case Id	07
Use Case Name	Bus Staff Management
Actors	Admin, System
Description	The admin oversees drivers and conductors. When a new staff member is added, the system automatically generates app credentials for them.
Pre-condition	The admin must be authenticated and have necessary permissions to manage bus staff.
Post-condition	The admin effectively manages bus staff.

3.4.8 Description of Complaint Management:

Table: 3.4.8 Description of Complaint Management

Field	Details
Use Case Id	08
Use Case Name	Complaint Management
Actors	Student, Driver, Admin
Description	Students and drivers are allowed to submit complaints about transportation services and related concerns.
Pre-condition	All users are required to be authenticated. Administrators must also be authenticated and possess the necessary permissions to manage complaints.
Post-condition	Complaints submitted by students and drivers get reviewed and resolved by the authorities.

3.4.9 Description of Announcement Management:

Table: 3.4.9 Description of Announcement Management

Field	Details
Use Case Id	09
Use Case Name	Announcement Management
Actors	Admin, Driver, Student
Description	The admin shares announcements related to transportation.
Pre-condition	All users are required to be authenticated.
Post-condition	The administrator successfully posts announcements.

3.4.10 Description of General Functionalities:

Table: 3.4.10 Description of General Functionalities

Field	Details
Use Case Id	10
Use Case Name	General Functionalities
Actors	Users
Description	The admin can generate reports and analyse valuable information extracted from the data currently stored.
Pre-condition	The admin must be authenticated and have necessary permissions.
Post-condition	Administration makes better decisions and enhances services through the analysis of current transportation data.

Chapter 4

4.1 Agile Software Development Methodology

Agile methodology is an iterative and incremental approach to software development that emphasizes flexibility, collaboration, and customer feedback. Unlike traditional methodologies like the Waterfall model, Agile allows for adaptive planning, evolutionary development, and continual improvement, enabling rapid and flexible responses to change. It is particularly effective in managing the complexity and unpredictability of software projects.

4.2 Selected Methodology: Agile

A software development methodology is a way to improve development work with the help of dividing the development process into distinct phases to make a system with better productivity. It also helps to structure and control the whole system. It involves different methodologies, also called the Software Development Life Cycle, that are stages for software development with a certain set of rules. Generically, we categorized the methodologies into Rapid application development and planned-driven. Waterfall, spiral is planned driven while agile is Rad based.

4.3 Reasons for Selecting Agile Methodology

1. **Flexibility and Adaptability:** Agile allows the project to adapt to changes in requirements and technology swiftly.
2. **Customer Collaboration:** Regular feedback from users ensures that the development aligns with the user's needs and expectations.
3. **Incremental Delivery:** Agile facilitates the delivery of small, workable segments of the project, ensuring a faster time-to-market and continuous improvement.
4. **Risk Management:** Regular reviews and iterations help in early identification and resolution of issues, reducing the overall risk.

4.4 Agile Project Planning and Execution for RT-BIVT

Agile project planning and execution involve the division of the project into sprints, with each sprint aimed at delivering a potentially shippable product increment. The key phases include:

1. **Product Backlog Creation:** Gather and prioritize necessities for the RT-BIVT undertaking, growing a product backlog.
2. **Sprint Planning:** At the start of every dash, pick a hard and fast of capabilities from the product backlog and plan their delivery.
3. **Daily Stand-ups:** Conduct day by day meetings to speak about development, demanding situations, and plan the day's paintings.
4. **Sprint Execution:** Develop, take a look at, and combine features inside the dash.
5. **Sprint Review:** At the quilt of every sprint, reveal the finished paintings to stakeholders and collect comments.
6. **Sprint Retrospective:** Reflect at the sprint to identify successes and regions for development.
7. **Release Planning:** Plan releases based totally at the undertaking progress, stakeholder comments, and marketplace situations.

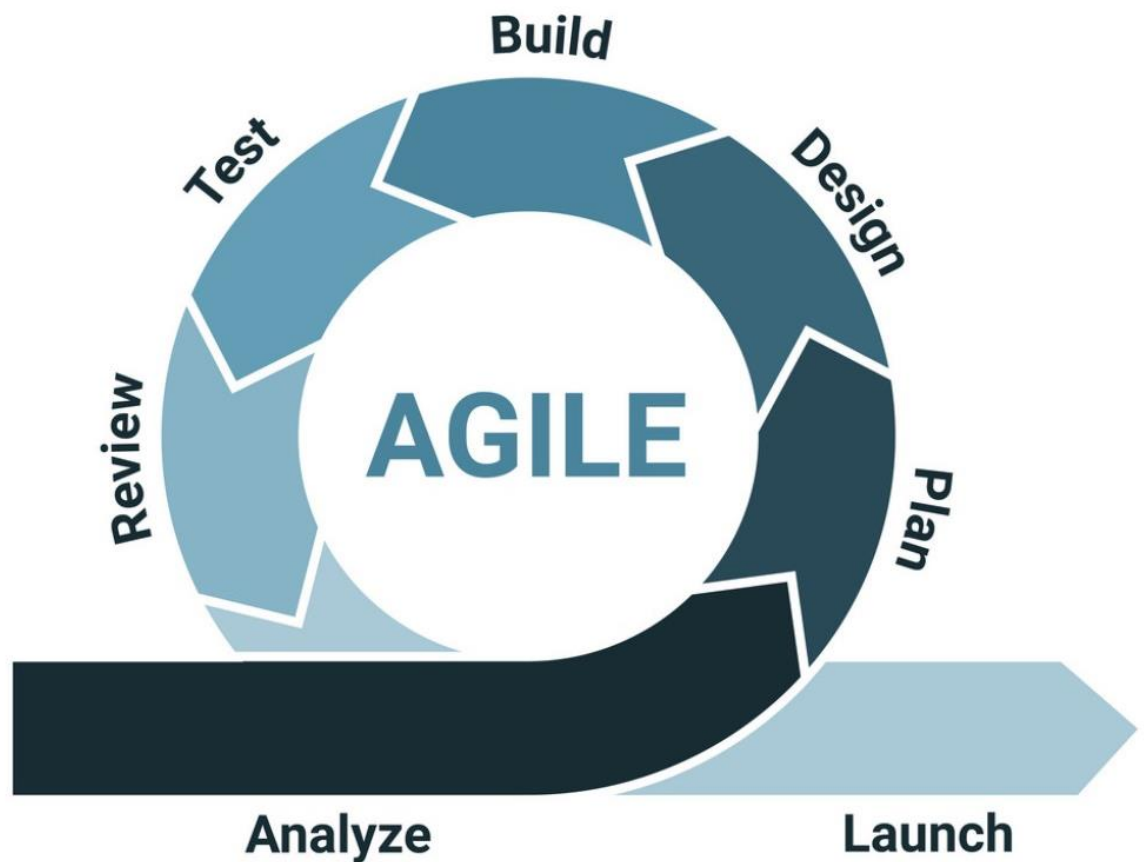


Figure 4.2 Agile Model

Chapter 5

5 System Architecture

5.1 Architecture

In widespread, structure is the manner of product planning, layout, and construction. The design section of the structure comes in the solution phase of the lifestyles cycle as it defines the machine because the primary software program components.

For our task, we've got decided on a Model-View-Template (MVT) structure, appropriate for applications the use of Django and React. This architecture is defined as follows:

- **Model:** Represents the application's information structures, normally mapped to database tables. It is liable for managing facts, processing user inputs, and managing interactions with the database or other statistics assets.

- **View (Django):** In Django, perspectives handle the enterprise common sense and interact with the version to carry statistics and render a template. They act as a bridge among the Model and the Template.
- **Template (React):** Templates are liable for rendering the records acquired from the views in a layout suitable for interaction with the user. In our challenge, this position is fulfilled via React, where components are used to create the user interface. These components may consist of HTML, CSS, and JavaScript documents, creating a dynamic and interactive consumer in revel.

By MVT architecture in this way, the undertaking benefits from improved modularity, maintainability, and scalability. It enables less complicated collaboration between developers, as every element - Model, View, and Template - can be advanced independently. Additionally, keeping apart the user interface (React Templates) from the underlying business common sense and data (Django Model and View) makes the utility extra adaptable to special platforms and technology.

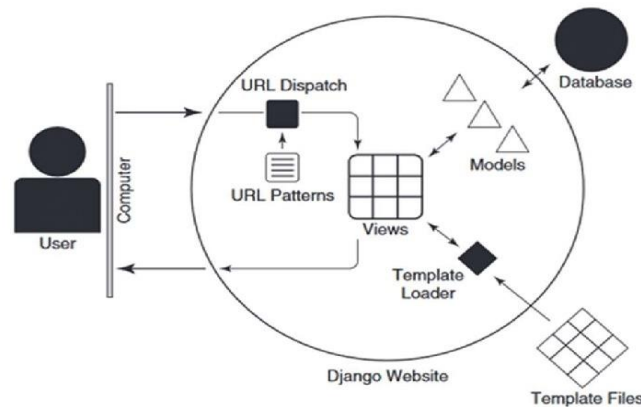


Figure 5.1 Model, View and Template

5.2 Activity Diagram

Activity Diagram shows the flow of the system from one activity to another. An activity is any set of action or set of actions that compare needs to perform any specific task, so mapping the overall actions of the system we can easily estimate the overall flow of the system, and that's where activity diagrams are applicable.

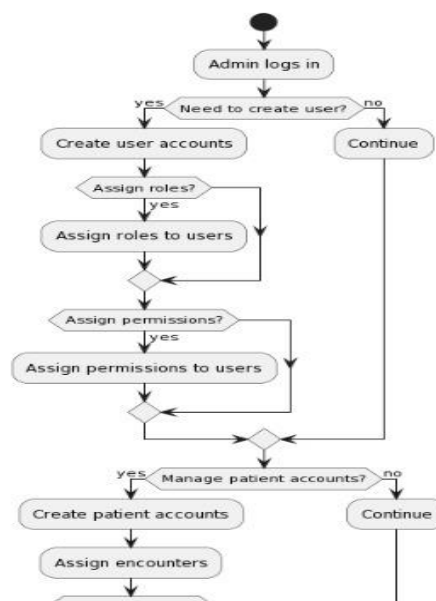


Figure 5.2.1 Activity of Admin Control

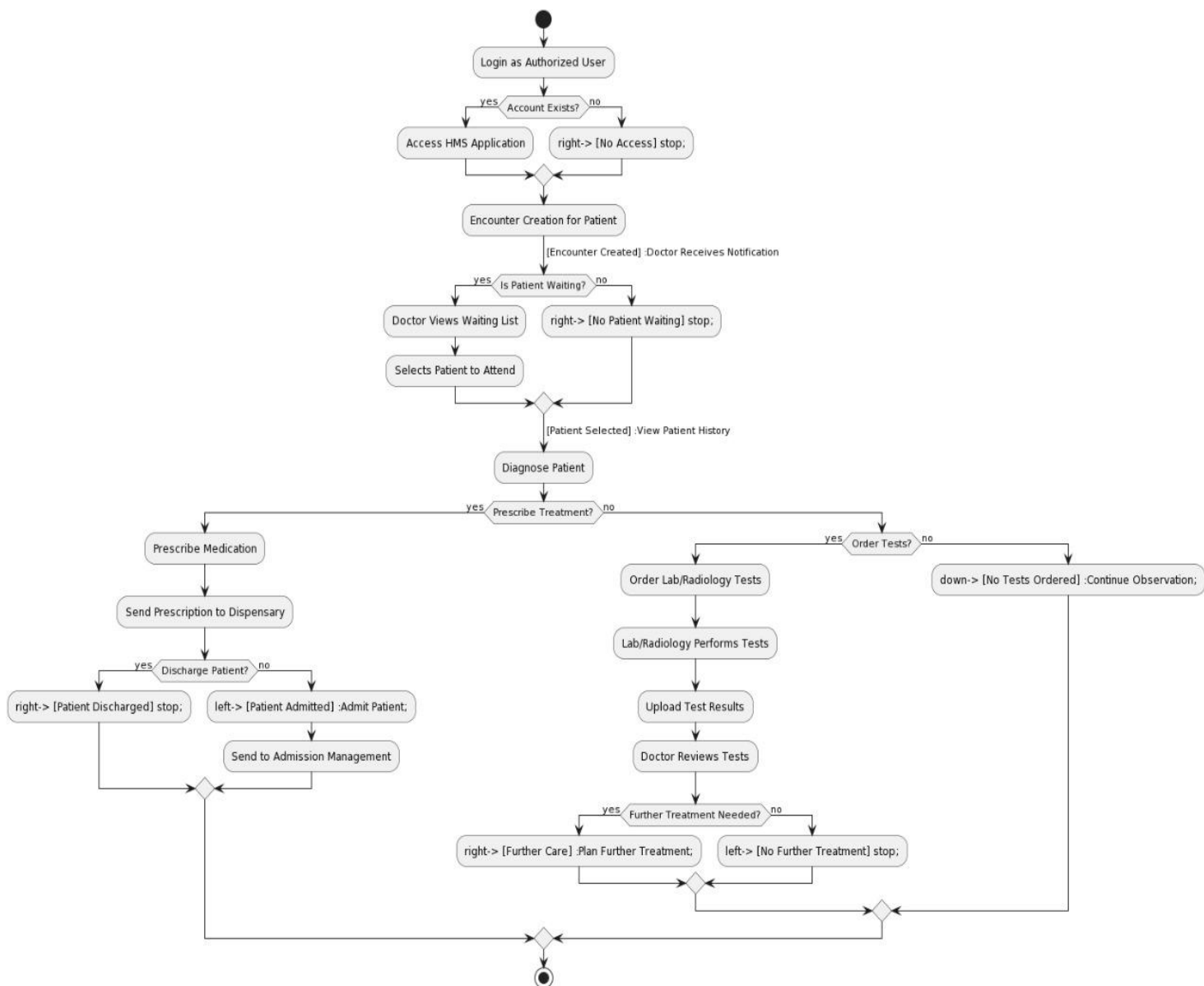


Figure 5.2.2 Activity of Doctor, Nursing, Laboratory and Radiology Centre

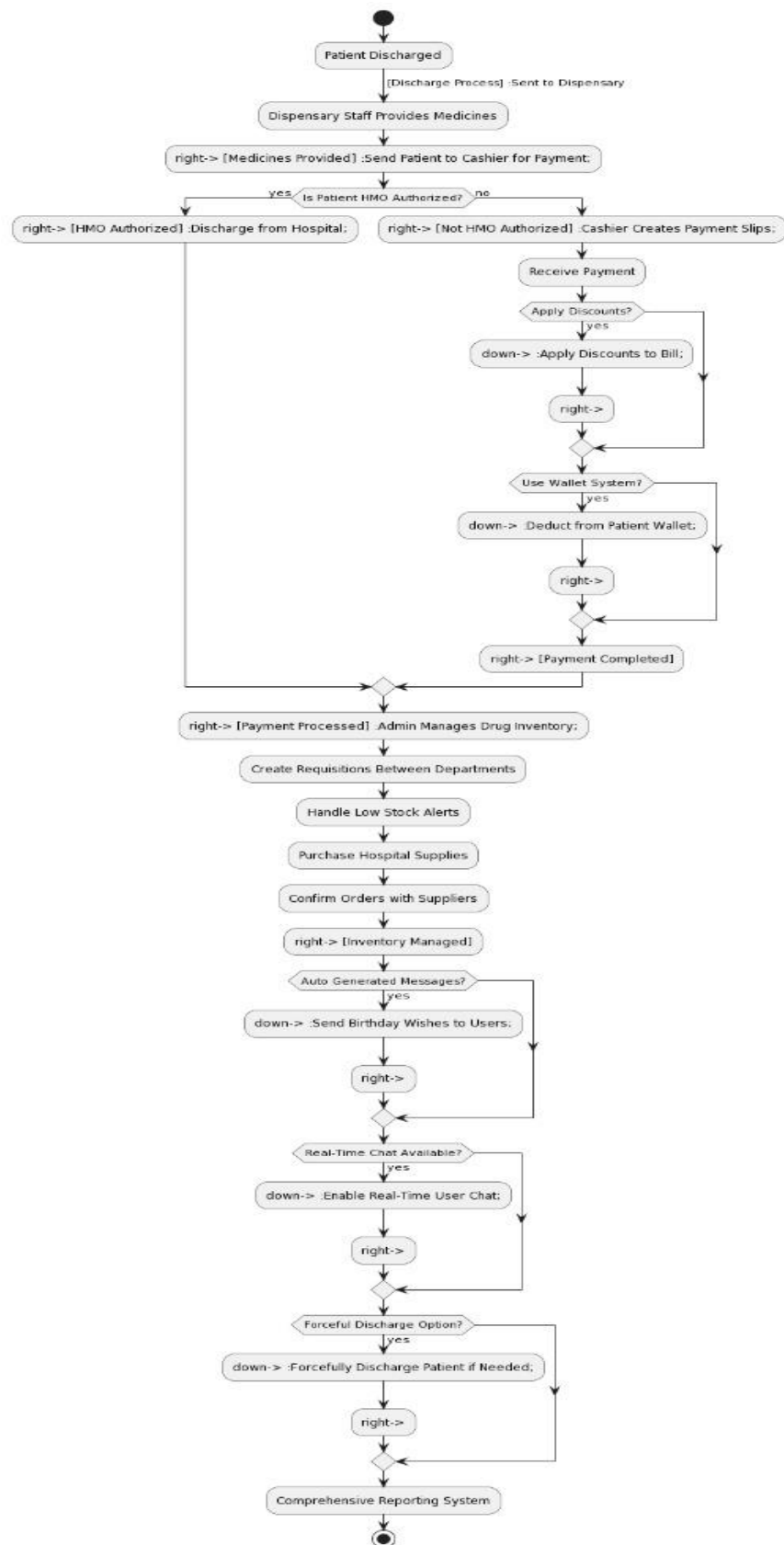


Figure 5.2.3 Activity of Dispensary, Pharmacy, HMO Authorization, Cashier

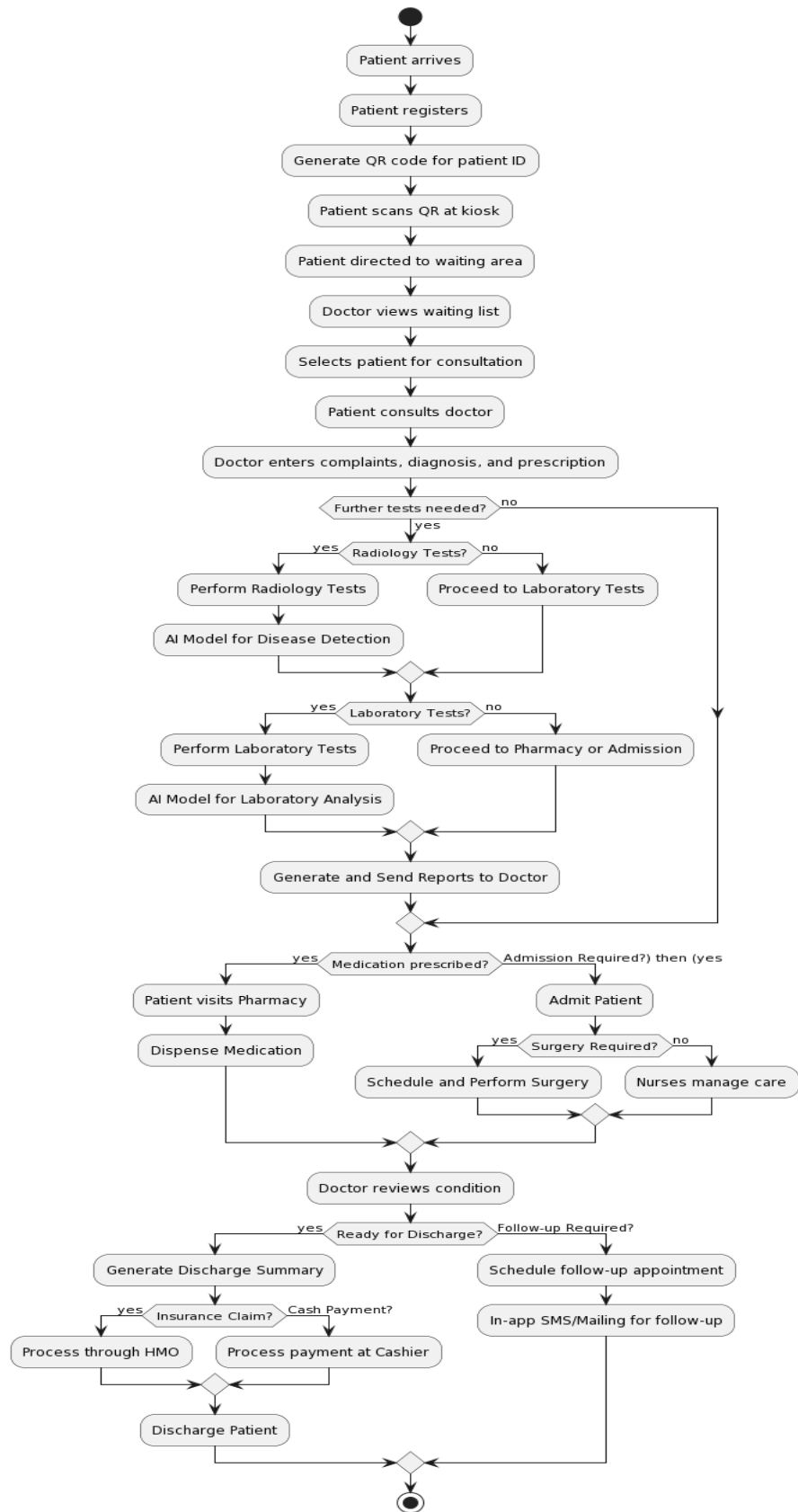


Figure 5.2.4 Activity of Complete System

5.3 Sequence Diagram

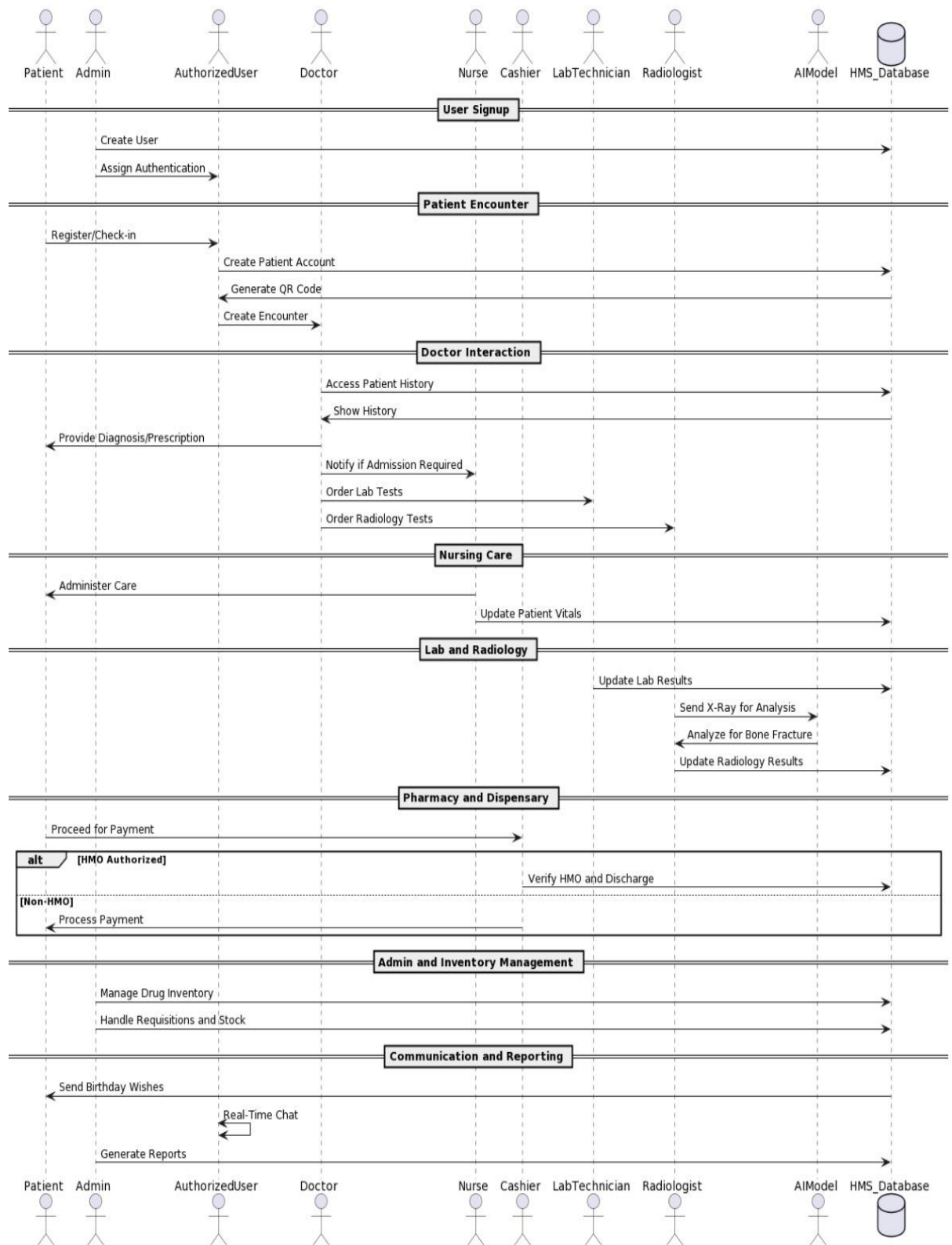


Figure 5.3.1 Sequence of whole system

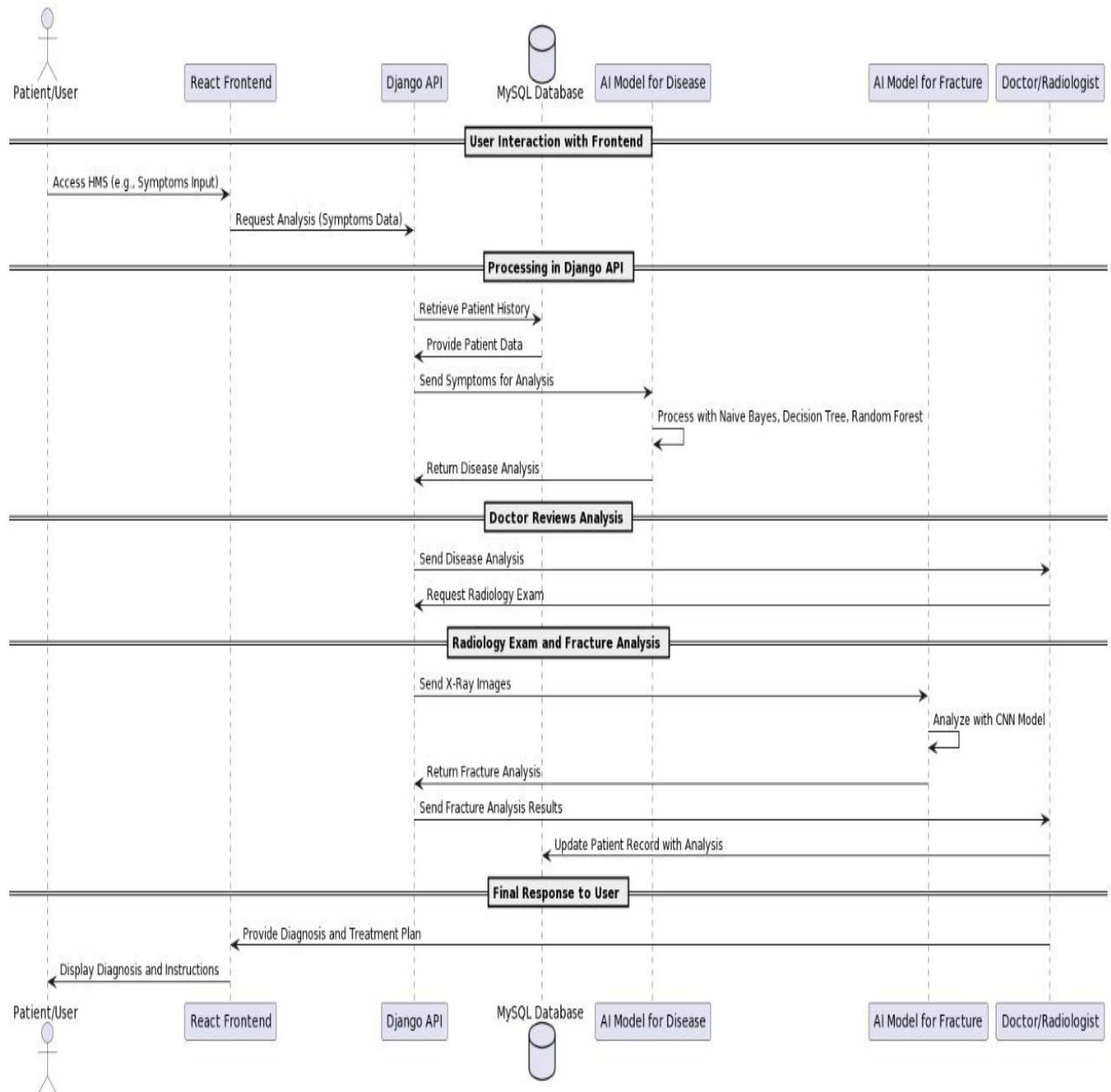


Figure 5.3.2 Sequence of Interaction among APIs and Model

Chapter 6

6 AI-Model and Algorithms

6.1 General Disease Detection:

We integrate the disease detection application that is primarily based at the system learning algorithm that is decision tree. We integrate this matching software for the assist of docs. Doctor will ask the signs and symptoms from patients and supply to that application a good way to are expecting the sickness from the given dataset.

A Decision Tree is a famous system gaining knowledge of set of rules used for classification and regression duties. Here is an in depth clarification of the way a selection tree works, including the important thing standards, steps, and attributes concerned in constructing and the use of a choice tree.

6.1.1 Key Concepts of Decision Tree:

1. **Node:** Each point of decision in the tree.
 - **Root Node:** The topmost node, representing the entire dataset.
 - **Internal Node:** Nodes that represent decisions based on attributes.
 - **Leaf Node:** Terminal nodes that represent the output of the decision.
2. **Edge:** Connects nodes, representing the outcome of a decision.
3. **Attribute/Feature:** A characteristic of the data used to split the nodes.
4. **Gini Index / Entropy:** Measures used to determine the quality of a split. Lower values indicate a better split.
 - **Gini Index:** Measures the impurity of a dataset. Used in CART (Classification and Regression Trees).
 - **Entropy:** Used in ID3 and C4.5 algorithms to measure the disorder in the dataset.

6.1.2 Steps in Building a Decision Tree

1. **Selecting the Best Attribute:**
 - The process begins at the root node. The algorithm evaluates all possible features and selects the one that best splits the data into subsets with the most homogeneous target variable (class label).
 - This selection is based on the impurity measures such as Gini Index, Entropy, or Information Gain.
2. **Splitting the Dataset:**

- Once the best attribute is selected, the dataset is split into subsets. Each subset corresponds to a unique value or range of values of the selected attribute.

3. Creating Sub-nodes:

- Each subset created from the split becomes a new node in the tree. This node will be further split using the same process recursively.

4. Stopping Criteria:

- The splitting process stops when one of the following criteria is met:
 - All the data in the node belongs to a single class.
 - There are no remaining attributes to split the data.
 - A predefined stopping condition such as maximum depth of the tree or minimum number of samples per node is reached.

5. Pruning:

- Pruning is done to improve the tree's generalization ability by reducing its size. It removes branches that have little importance and can lead to overfitting.
- **Pre-pruning:** Stops the tree growth early.
- **Post-pruning:** Removes branches from a fully grown tree.

6.1.3 Training Epochs

During an epoch, the learning algorithms updates the model's parameters based on data. It took approximately 80 epochs to train.

6.1.4 Architecture

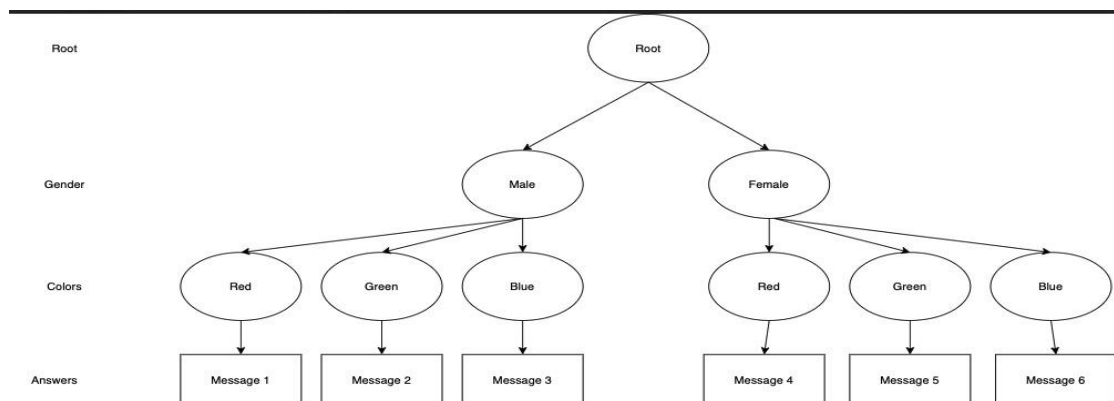


Figure 6.1.4.1 Architecture Diagram of Decision Tree

6.1.5 Confusion Matrix

Figure 6.1.5.1 Confusion Matrix of G.D.D

	Predicted Positive	Predicted Negative
Actual Positive	700	40
Actual Negative	60	635

$$\text{Accuracy} = (700 + 635) / (700 + 635 + 60 + 40)$$

$$\text{Accuracy} = 0.89$$

$$\text{Accuracy} = 0.89 \times 100$$

$$\text{Accuracy} = 89 \%$$

6.1.6 Accuracy

Model accuracy is 89 %.

6.1.7 Activity diagram of program

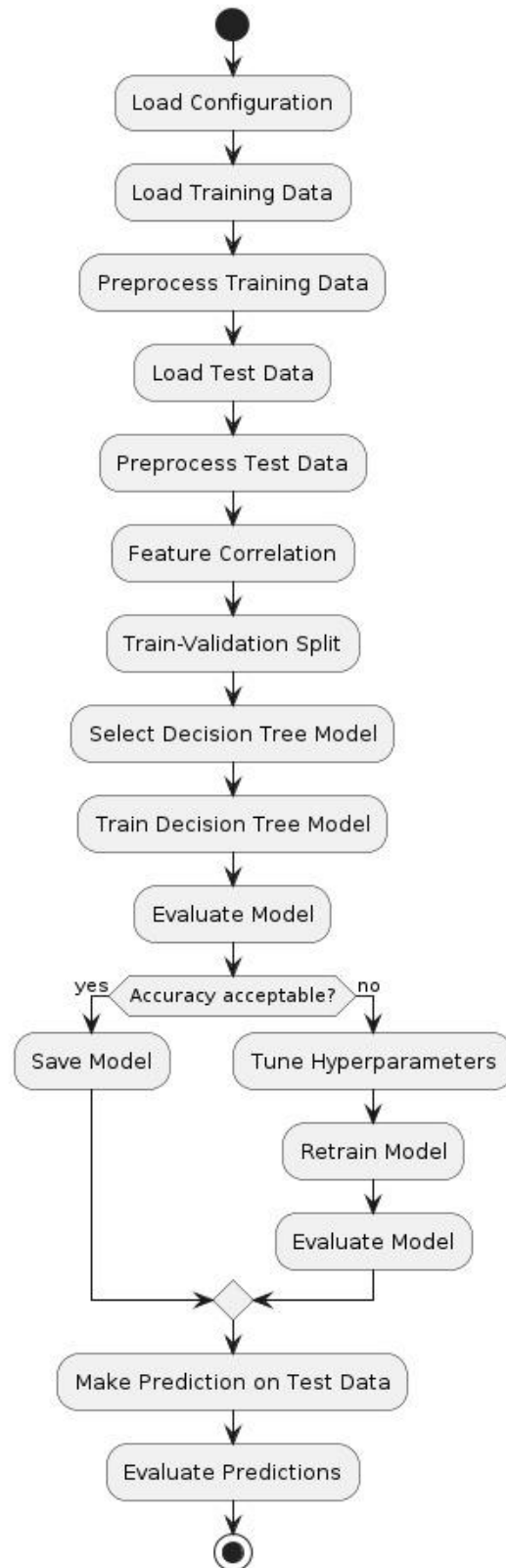


Figure 6.1.1 Activity diagram of program

6.2 Fractured Bone Detection:

We have additionally integrate AI model for detection of fractured bones of wrists. This is done with the help of YOLO set of rules this is used for the detection of objects. Doctor will give the X-Ray image as enter to the model then model will predict, it's far fractured or now not as output.

6.2.1 Dataset

The GRAZPEDWRI-DX is an open dataset containing 20327 annotated pediatric trauma wrist radiograph images of 6091 patients, treated at the Department for Pediatric Surgery of the University Hospital Graz between 2008 and 2018. Several pediatric radiologists annotated the images by placing bounding boxes to mark 9 different classes:

- boneanomaly (276 boxes),
- bonelesion (45 boxes),
- foreignbody (8 boxes),
- fracture (18090 boxes),
- metal (818 boxes),
- periostealreaction (3453 boxes),
- pronatorsign (567 boxes),
- softtissue (464 boxes),
- text (23722 boxes).

6.2.2 YOLO Working and Explanation

YOLO (You Only Look Once) is an object detection algorithm that has gained significant popularity in the field of computer vision. It is both an algorithm and a model architecture designed for real-time object detection tasks. YOLO stands out for its speed and accuracy in detecting objects in images and videos.

1. **Algorithm/Model:** YOLO is both an algorithm and a model architecture. The YOLO algorithm applies a deep convolutional neural network (CNN) model to perform object detection tasks.
2. **Real-Time Object Detection:** YOLO is designed for actual-time item detection, that means it could system pictures or video frames swiftly and hit upon gadgets within them with excessive accuracy.
3. **Single Pass:** Unlike conventional object detection techniques that apply a sliding window approach or vicinity notion networks, YOLO takes a single

bypass thru the enter photograph or frame and without delay predicts bounding packing containers and class probabilities for all items detected.

YOLO Working

1. Grid-based Detection:

- YOLO divides the input image into a grid of cells. Each cellular is chargeable for predicting bounding boxes and sophistication possibilities for objects that fall inside it.

2. Bounding Box Prediction:

- Each grid cell predicts multiple bounding containers (with predefined sizes and styles) along with self belief scores that imply the chance of each box containing an object.

3. Class Prediction:

- Each bounding field predicts elegance chances for the items it incorporates. YOLO makes use of softmax activation to are expecting the opportunity distribution across more than one training.

4. Non-Maximum Suppression (NMS):

- YOLO applies non-maximum suppression to remove redundant or overlapping bounding boxes with decrease self belief rankings, retaining only the maximum assured detections.

6.2.3 Training Epochs

During an epoch, the learning algorithms updates the model's parameters based on data. It took approximately 120 epochs to train.

6.2.4 Architecture Diagram:

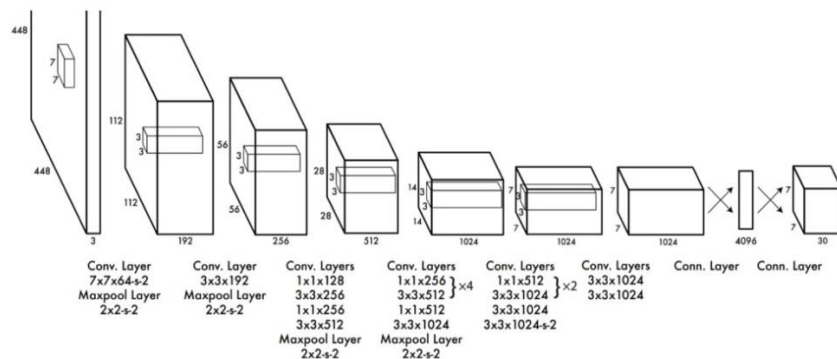


Figure 6.2.1 Architecture Diagram

6.2.5 Confusion Matrix:

Figure 6.2.5.1 Confusion Matrix of Yolo Model

	Predicted Positive	Predicted Negative
Actual Positive	2800	200
Actual Negative	300	2060

$$\text{Accuracy} = (2800 + 2060) / (2800 + 2060 + 300 + 200)$$

$$\text{Accuracy} = 0.81$$

$$\text{Accuracy} = 0.81 \times 100$$

$$\text{Accuracy} = 81 \%$$

6.2.1 Accuracy

Model Accuracy is 81%.

6.2.2 Activity Diagrams

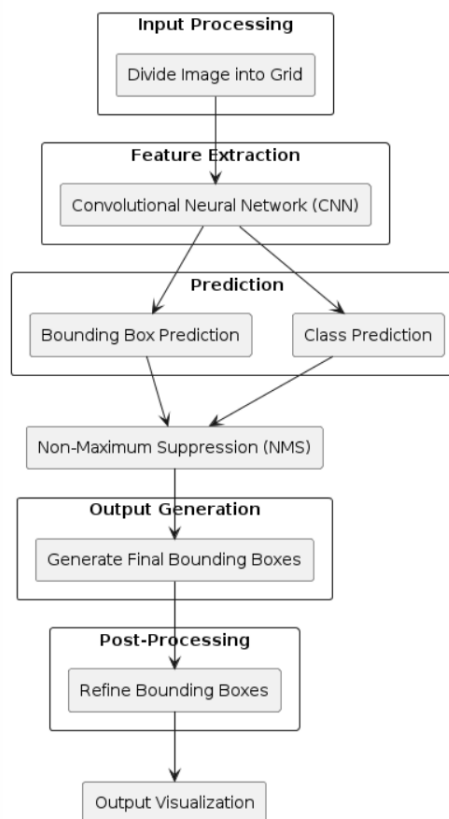


Figure 6.2.2 Activity diagram of working of YOLO

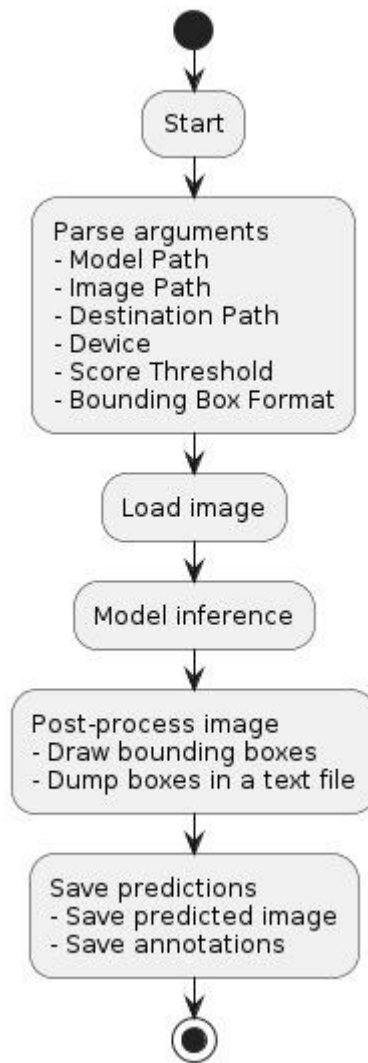


Figure 6.2.3 Activity diagram of program

Chapter 7: System Implementation

After successfully completing the initial phases of development, including requirement analysis, design, and planning, we now proceed to the final stage: the actual implementation of the hospital management system. This chapter provides a comprehensive overview of the tools, technologies, and processes involved in the development of the system. We will detail each module and component, as well as the integration of an AI model for disease detection.

7.1 System Tools and Technology

The tools and technologies used in this project are as follows:

- **Django:** A high-level Python web framework that encourages rapid development and clean, pragmatic design.
- **React:** A JavaScript library for building user interfaces, particularly single-page applications.
- **MySQL:** An open-source relational database management system.
- **VS Code:** A source-code editor made by Microsoft with support for debugging, syntax highlighting, intelligent code completion, snippets, code refactoring, and embedded Git.
- **AI Model (Decision Tree):** Used for disease detection based on user input.

7.1.1 Django

Django is a excessive-stage Python web framework that lets in fast improvement and clean, pragmatic layout. It takes care of much of the problem of net improvement, so developers can cognizance on writing their programs while not having to reinvent the wheel.

- **Routing:** Django's URL dispatcher allows clean, readable URLs.
- **Templating:** The Django template engine facilitates the separation of presentation and business logic.
- **ORM:** Django's Object-Relational Mapping (ORM) system makes it easy to interact with the database.
- **Security:** Django provides built-in protection against many security threats, including SQL injection, cross-site scripting, and cross-site request forgery.

7.1.2 React

React is a JavaScript library for building user interfaces. It enables developers to build complex UIs from small, isolated pieces of code called "components."

- **Component-Based:** React promotes the development of reusable components.
- **Virtual DOM:** React uses a virtual DOM to optimize rendering and improve performance.
- **JSX:** A syntax extension for JavaScript that looks similar to HTML, making it easier to write and understand components.

7.1.3 MySQL

MySQL is a widely used relational database management system. It is known for its reliability, high performance, and ease of use.

- **Data Storage:** MySQL stores data in tables, which are efficient for storing structured data.
- **Query Language:** MySQL uses Structured Query Language (SQL) for accessing and managing data.
- **Transactions:** MySQL supports transactions, ensuring data integrity and consistency.

7.1.4 VS Code

Visual Studio Code, commonly known as VS Code, is a source-code editor developed by Microsoft. It includes support for debugging, syntax highlighting, intelligent code completion, snippets, code refactoring, and embedded Git.

- **Extensions:** VS Code has a rich ecosystem of extensions that enhance its functionality.
- **Terminal:** The terminal allows running commands and scripts directly within the editor.
- **IntelliSense:** Provides smart completions based on variable types, function definitions, and imported modules.

7.2 Module Implementation

7.2.1 Dashboard

The Dashboard module provides an overview of the hospital's operations. It includes various sub-modules for different departments and functionalities.

7.2.1.1 Front-Desk

- Allows searching for patient records.
- Manages patient appointments.
- Displays the history of patient encounters.
- Allows uploading patient-related documents.
- Tracks the number of patient encounters.
- Generates reports on patient registrations.
- Provides reports on ward activities.
- Generates reports on patient encounters.

7.2.1.2 Nursing

- Records patient vital signs.
- Manages injection administration.
- Handles dressing and medical procedures.
- Manages immunization records.
- Manages antenatal clinic activities.
- Handles requisitions for medical supplies.
- Manages nursing inventory.
- Manages patient admissions.
- Generates reports on antenatal care.
- Provides reports on pregnancy cases.

7.2.1.3 Doctors / Department

- Manages outpatient department clinics.
- Handles patient admissions.

- Generates reports on patient encounters.
- Provides reports on patient diagnoses.

7.2.1.4 Laboratory

- Manages pending lab requests.
- Records lab results.
- Manages parameters for test reporting.
- Handles administration of lab tests.
- Manages categories of lab tests.
- Handles requisition of consumables.
- Manages lab inventory.
- Tracks the count of lab tests.
- Records lab test results.

7.2.1.5 Radiology

- Manages pending X-ray requests.
- Manages pending CT scan requests.
- Manages pending ultrasound requests.
- Manages pending ECG requests.
- Records radiology test results.
- Manages parameters for radiology test reporting.
- Handles administration of radiology tests.
- Tracks the count of radiology tests.

7.2.1.6 Dispensary

- Manages outpatient dispensary.
- Manages inpatient dispensary.
- Handles purchase orders.
- Manages requisition for drugs and supplies.
- Manages dispensary inventory.
- Generates reports on dispensary activities.
- Manages the pharmacy store.

- Handles management of drugs.
- Manages consumables inventory.
- Manages store operations.
- Manages vendor information.
- Handles drug purchases.
- Confirms receipt of purchased drugs.
- Generates reports on drug expiry.
- Manages overall inventory.
- Manages consumables inventory.
- Confirms purchases.

7.2.1.7 HMO Authorization

- Manages pending authorizations.
- Generates approval reports.
- Provides summaries of bills.
- Generates payment reports.
- Manages patient bills.
- Manages company-related information.
- Reviews patient bills.
- Generates patient bill reports.
- Manages admissions and discharges.
- Manages hospital services.

7.2.1.8 Cashier

- Manages cashier activities.
- Handles deposits.
- Manages expenses.
- Generates daily cashier reports.
- Provides revenue reports.
- Generates payment reports.

7.2.1.9 Reports

- Generates lab result reports.
- Provides appointment reports.
- Generates diagnosis reports.
- Manages drug inventory reports.
- Manages consumable inventory reports.
- Generates reports on admissions and discharges.
- Tracks patient SMS history.
- Provides payment reports.
- Generates encounter reports.
- Provides dispensary reports.
- Generates revenue reports.
- Manages ward reports.
- Provides antenatal care reports.
- Generates pregnancy reports.
- Tracks birth reports.
- Manages immunization reports.
- Tracks patient encounter count.
- Tracks laboratory test count.
- Tracks radiology test count.
- Provides registration reports.
- Manages expense reports.
- Confirms purchase reports.
- Tracks user login logs.

7.2.1.10 User Management

- Manages vaccine information.
- Handles ward management.
- Manages bed availability.
- Manages user accounts.
- Controls user access permissions.
- Configures patient information.

- Manages patient discharge.
- Handles admissions and discharges.
- Manages admissions.
- Handles database backups.

7.2.1.11 SMS

- Composes SMS messages.
- Tracks SMS history.
- Manages SMS settings.
- Generates SMS reports.

7.2.1.12 Administration

- Manages administrative activities.
- Configures encounter settings.
- Handles database backups.
- Manages antenatal care settings.

7.3 System Integration and Deployment

The health center management system is built the usage of Django for the backend, React for the frontend, and MySQL for the database. The integration of those technology ensures a seamless and efficient workflow.

7.3.1 Frontend-Backend Communication

React additives speak with the Django backend thru RESTful APIs. These APIs cope with diverse requests inclusive of fetching patient data, updating records, and processing bills.

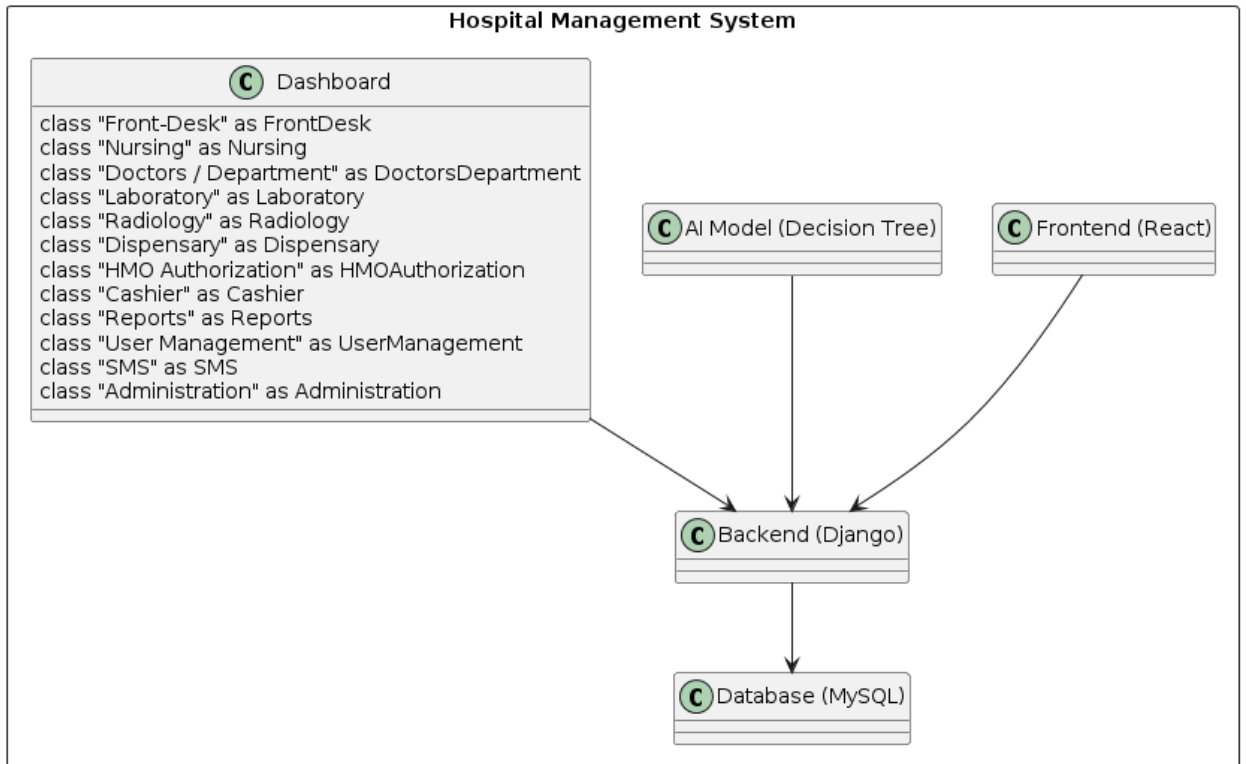


Figure 7.3.1.1 Class Diagram of Hospital Management System

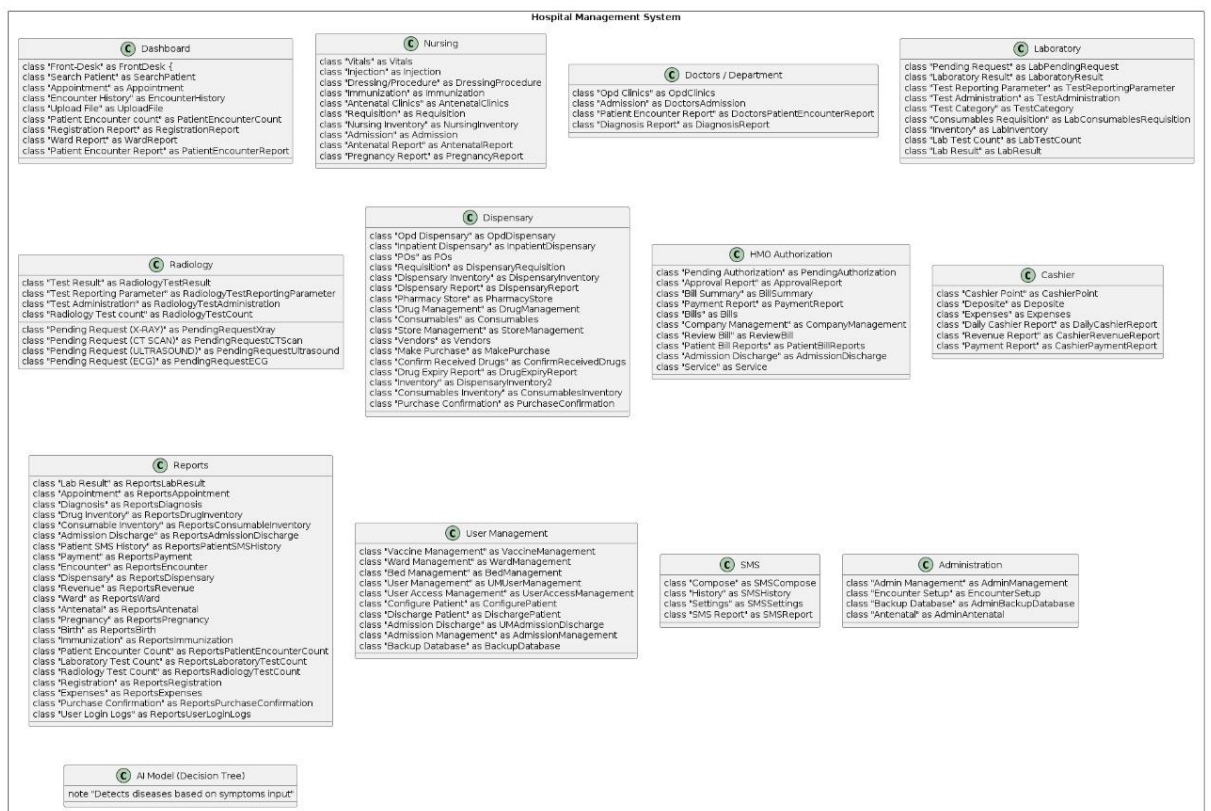


Figure 7.3.1.2 Component Diagram of System

7.3.2 Database Management

MySQL is used to save all the records related to the health facility's operations. Django's ORM makes it smooth to have interaction with the database, ensuring information integrity and consistency.

7.3.3 Deployment

The system is deployed on a cloud platform, making sure excessive availability and scalability. Regular backups are taken to prevent statistics loss, and security features are carried out to shield touchy data.

Conclusion

The implementation of the medical institution management machine entails the integration of numerous tools and technologies to create a complete answer for managing hospital operations. Each module and component is carefully designed and advanced to ensure a seamless and efficient workflow. The integration of an AI model for sickness detection adds a precious function to the device, supplying accurate and timely diagnoses primarily based on affected person input. This chapter provides an in depth assessment of the implementation method, highlighting the important thing components and capabilities of the machine.

Chapter 8

8 Screenshots

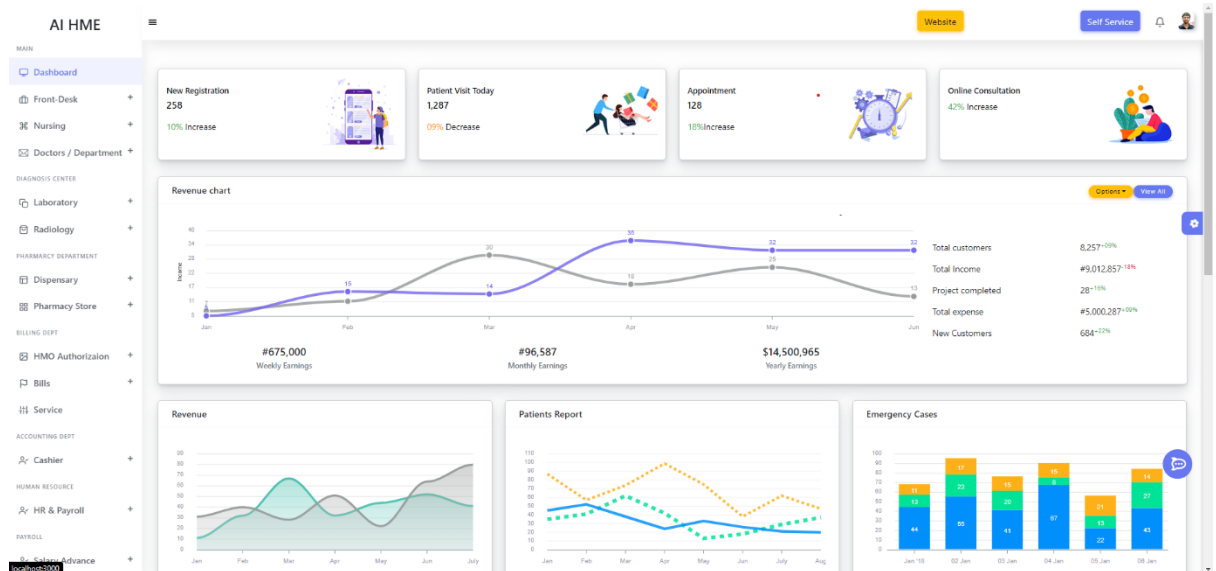


Figure 8.1 Main Dashboard

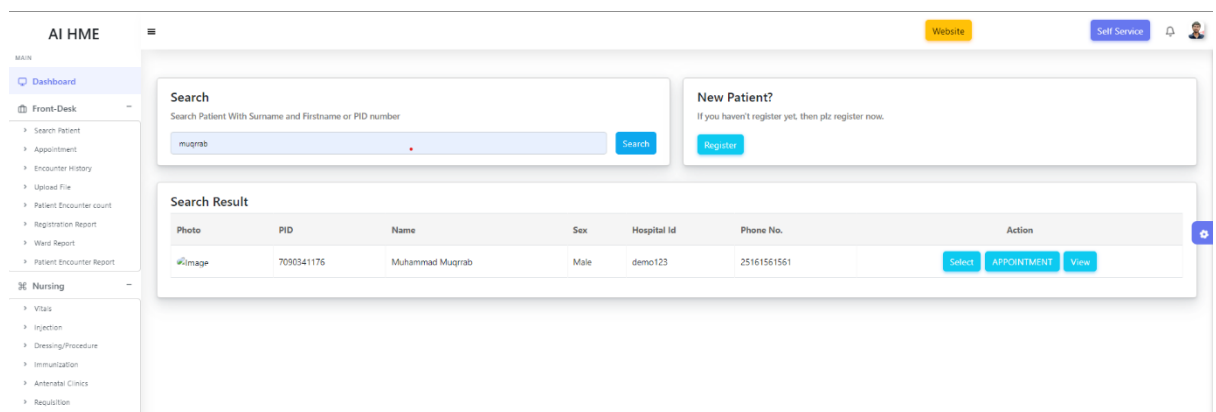


Figure 8.2 Patient Dashboard

AI HME Website Self Service

MAIN

- Dashboard
- Front-Desk
 - Search Patient
 - Appointment
 - Encounter History
 - Upload File
 - Patient Encounter count
 - Registration Report
 - Ward Report
 - Patient Encounter Report
- Nursing
- Doctors / Department
- DIAGNOSIS CENTER
 - Laboratory
 - Pending Request
 - Laboratory Result
 - Test Reporting Parameter
 - Test Administration
 - Test Category
 - Consumables Requisition
 - Inventory
 - Lab Test Count
 - Lab result
 - Radiology

Patient Detail

Muhammad Muqrrab
7090341176

Print

Personal Details

PID No	7090341176
Hospital ID	demo123
Surname	Muhammad
First Name	Muqrrab
Phone	25161561561
Kin	
Address	Fsd
Origin	
Title	Mr
DOB	2023-02-16

Billing Info

#	Company	Plan	Profile No.	Actions
1	Mastared	Standard	123	Delete
2	TEMPORARY CARD	STANDARD	123	Delete
3	Private	Standard	123	Delete

Edit Select Appointment

Figure 8.3 Patient Detail

AI HME Website Self Service

MAIN

- Dashboard
- Front-Desk
 - Search Patient
 - Appointment
 - Encounter History
 - Upload File
 - Patient Encounter count
 - Registration Report
 - Ward Report
 - Patient Encounter Report
- Nursing
- Doctors / Department
- DIAGNOSIS CENTER
 - Laboratory
 - Pending Request
 - Laboratory Result
 - Test Reporting Parameter
 - Test Administration
 - Test Category
 - Consumables Requisition
 - Inventory
 - Lab Test Count
 - Lab result
 - Radiology

Appointments

#	Patient Name	Doctor Name	Speciality	Department	Appointment Date	Appointment Time	Time Available	Appointment Type	Actions
1	Rufus Babatunde	DR ABIODUN	OPD	OPD Clinic	2023-05-23	10:27	10:27	Online	Confirmed
2	MOBOLAJI MATEEN	DR ABIODUN	OPD	OPD Clinic	2023-05-23	10:25	10:25	Online	Confirm Discard
3	MOBOLAJI MATEEN	DR BADRU	OPD	OPD Clinic	2023-05-23	10:20	10:20	Online	Confirmed
4	Server Test	Test doctor	4	Laboratory	2023-05-08	20:59	22:03	Online	Confirm Discard
5	Server Test	Test doctor	4	Test department 1	2023-05-17	06:20	06:23	Online	Confirm Discard
6	AFOLABI ARIFDEEN	Dr Abiodun	OP	OPD Clinic	2023-04-15	10:18	10:18	On-Site	Confirmed
7	Lawal Sikiru	Dr Chuku	OPD	OPD Clinic	2023-04-15	09:58	09:58	On-Site	Confirmed
8	Lawal Sikiru	Dr Chuku	OPD	OPD Clinic	2023-04-15	09:58	09:58	On-Site	Confirmed
9	ola-adigun abiola	dr chuku	OPD	OPD Clinic	2023-04-12	19:06		Online	Confirmed
10	John Ini	Dr Abiodun	OPD	OPD Clinic	2023-04-15	09:00	10:00	On-Site	Confirm Discard
11	OLLUKUN HEPHIZBAH	Dr Chuku	OPD	OPD Clinic	2023-04-01	09:14	09:14	Online	Confirm Discard
12	double info double info	Dr Chuku	GP	OPD Clinic	2023-05-31	19:14	19:14	Online	Confirmed

Figure 8.4 Patient Appointment

AI HME

Website

Self Service

MAIN

Dashboard

Front-Desk

Nursing

Doctors / Department

DIAGNOSIS CENTER

Laboratory

Radiology

Patient Encounter Report

Encounter Date From

mm/dd/yyyy

Encounter Date To

mm/dd/yyyy

Filter

Export

25 Rows

Search

#	Encounter Date & Time	Name Of Patient	Gender	PID	Membership No	Address	Telephone	Next of Kin Phone	Complain	Diagnosis
1	2024-02-03 07:48:51	Ahmad Huzaifa	Male	4468362982	123	123	123			
2	2023-08-22 21:06:25	Test Server	Male	3756994080	Temporary/Test	Sango	080252			1) HIV disease clinical stage 4 without mention of tuberculosis or n 2) Structural anomalies of chromosome Y
3	2023-08-16 12:15:01	Test Alaba	Male	3466254756	Demo/Test20009	Sango	0825			
4	2023-08-16 12:10:26	Test Server	Male	3756994080	Temporary/Test	Sango	080252			
5	2023-08-15 11:59:31	Mojeed Akinola	Male	9140464897	Temporary/Mojeed	1 Akeju St Igando Rd	08136328981	Miss Sofiat/08056918049		
6	2023-08-15 11:55:37	Segun Akin	Male	2393910183	Demo/Test668	Sango	080484854			
7	2023-08-15 11:43:19	Tomiwa Beright	Male	4674951259	Demo.testing	Sango	09059244301			
8	2023-08-15 11:40:01	Demo Server	Male	7274683425	85/demo	Iagos	090			
9	2023-08-10 19:02:50	Azeezat Ajibola	Female	8794980563	test/masteer	Lagos	0810003156			1) Chondromalacia patellae
10	2023-08-08 14:24:16	Demo Server	Male	7274683425	85/demo	Iagos	090			
11	2023-08-03 16:05:25	Azeezat Ajibola	Female	8794980563	test/masteer	Lagos	0810003156			
12	2023-07-31 17:11:01	Test Tofunmi	Male	8300970463	DemoSms1	Km 4, idiroko road ota	9059244301	909		1) Structural developmental anomalies of ear ossicles

Figure 8.5 Patient Report

PID No: 7090341176

Address: Fsd

Hospital ID: demo123

Name: Muhammad Muqrrab

Origin:

Date Of Birth: 2023-02-16

Phone: 25161561561

Title: Mr

Gender: Male

Date	Weight	Height	Body Temperature	Pulse Rate	Blood Pressure	Respiration	Oxygen Level	Remarks	Measured by	Actions
2023-03-15 06:40:50	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>		<div>Save</div>

#	Date(5656765719)	Weight	Height	Body Temperature	Pulse Rate	Blood Pressure	Respiration	Oxygen Level	Remarks	Measured by	Action
1	2023-04-20 11:57:41	52 kg	5.5 m	30 °C	10 bpm	20 mmHg	55	80	good		<div>Delete</div>

Figure 8.6 Nurse Vital

Search

Search Patient With Surname or Firstname or PID number

Search

Search Result

Male | Muhammad Muqrrab | demo123 | 25161561561 |

PID: 7090341176

Upload File

Download File

View File

Delete File

Figure 8.7 Patient Data Update

Pregnancy report

Date From: mm/dd/yyyy Date To: mm/dd/yyyy [Filter](#) [Export](#)

25 Rows

#	Name Of Patient	Encounter Date & Time	Date	Last Pregnancy Month	Last Pregnancy Outcome	CS	Still Birth	Spontaneous Abortion	Induced Abortion	Previous Pregnancy	Children	E.D.D	L.M.P	Height	Pelvic
1	Test Alaba	2023-08-16 12:15:01	2023-08-21	0	0	0			0	0	0	2023-09-09	2023-08-01	1.6	
2	Nusirah Adegoke	2023-04-14 09:58:53	2023-04-04	5	66	55	1	1	1	1	2	2023-03-29	2023-04-06	50	ss
3	Nusirah Adegoke	2023-04-14 09:58:53	2023-04-01	0	0	0	0	0	0	0	0	2023-10-20	2023-01-17	5.4cm	0
4	Onome Maduka	2023-04-07 14:19:25	2023-04-30	1	nil	nil	nil	nil	yes	1	none	2023-06-12	2022-09-06	68	nil
5	Adejoke Kafayat Akinbambo	2023-04-07 12:09:12	2023-04-30	3	nil	nil	nil	1	nil	3	3	2023-11-12	2023-02-05	49	nil
6	Folake Olorundare	2023-04-07 11:56:14	2023-04-30	2	nil	yes	nil	yes	yes	2	2	2023-07-27	2022-10-19	62	nil
7	Taofekat Akinwunmi	2023-04-07 11:51:14	2023-04-30	1	nil	yes	nil	nil	nil	1	1	2023-05-05	2022-07-28	59	nil
8	Oluwabusayo Adegbola	2023-04-07 11:41:25	2023-04-30	1	nil	nil	nil	nil	nil	1	nil	2023-04-08	2022-07-01	59	nil
9	Aboosedo Aijiola	2023-04-07 10:37:00	2023-04-30	1	nil	yes	nil	nil	nil	1	1	2023-04-20	2022-07-13	48	nil
10	Opeyemi Ademola	2023-04-07 10:35:34	2023-04-30	2	nil	nil	nil	2	2	2	2	2023-06-25	2022-09-19	5.2	
11	Temitope Bello	2023-04-07 10:10:18	2022-11-11	9 months	SVD-M/A	NIL	NIL	NIL	NIL	1- M/A	1	2023-04-22	2022-06-01	5FT	gravidly enlarged, mwr, nil are
12	Felicia Aderibigbe	2023-04-07 10:39:07	2022-04-30	3	NIL	NIL	NIL	NIL	NIL	3	3	2023-05-07	2022-07-21	5.8	NIL

Figure 8.8 Pregnancy Reports

AI HME [Website](#) [Self Service](#)

MAIN

- Dashboard
- Front-Desk
- Nursing
 - Vitals
 - Injection
 - Dressing/Procedure
 - Immunization
 - Antenatal Clinics
 - Requisition
 - Nursing Inventory
 - Admission
 - Antenatal Report
 - Pregnancy Report
- Doctors / Department
- DIAGNOSIS CENTER
 - Laboratory
 - Pending Request
 - Laboratory Result
 - Test Reporting Parameter
 - Test Administration
 - Test Category
 - Consumables Requisition
 - Inventory

[Home](#)

Room	Bed	Surname	Firstname	Encounter No.	Actions
Ward A	Bed 1	Beright	Tomiva	2347725472	Fluid Chart Drug Chart Nursing Care
Ward C	Bed 1				
Ward C	Bed 2				
Ward D	Bed 1				
Ward D	Bed 2				
Ward E	Bed 1				
Ward F	Bed 1				
Ward F	Bed 2				
Ward G	Bed 1				
Ward G	Bed 2				
Ward G	Bed 3				

Figure 8.9 Rooms and Bed Allocation

OPD Clinic

Home

S/N	Sex	Surname	Firstname	Encounter No	Encounter Type	Hospital No
1	Male	Huzaifa	Ahmad	7733561004	Walk-in	123

OPD Clinic

>> waiting list

>> In Clinic List

● Mr. Huzaifa Ahmad 2024-02-03 07:48:51

● Mr. Server Test 2023-08-22 21:06:25

show all

Vikas

Archive

Figure 8.10 OPD Clinic

Department Antenatal Immunization

#	Department
1	new department
2	complete access
3	Test department 1
4	Test department 2
5	new department 4
6	admin
7	Matron
8	Laboratory
9	Billing & HMO
10	Nursing
11	OPD Clinic
12	Reception
13	Pharmacy Tech

Add Department

Department Name:

Is Clinical Department?

Is Consultation Department?

Permissions

Select all

Clear all

☐ Search Patient / register

☐ Appointment page

☐ Encounter history page

☐ Upload file page / download file / delete file

☐ Encounter report page

☐ Injection / administer injection

☐ Vitas

☐ Dressing / procedure / administer procedure

☐ Immunization page / confirm immunization

☐ Antenatal clinic

☐ Nursing requisition page

☐ Nursing Admission page

☐ Nursing review page / save / delete

☐ Opd / opd Admission / waiting list

☐ Departments

☐ Doctors Admission page

☐ Pending request page / enter result

☐ Laboratory result page / view results

☐ Test reporting parameter

☐ Test Administration

☐ Test category

☐ Consumables requisition

☐ Inventory

☐ Lab report

☐ Test request

☐ Pending request (x-ray)

☐ Pending request (IT scan)

Website Self Service

Actions

Edit Delete

Edit Delete

Edit Delete

Edit Delete

Edit Delete

Edit Delete

Edit Delete

Edit Delete

Edit Delete

Edit Delete

Figure 8.11 Authorization

AI HIME

MAIN

Dashboard

Front-Desk

Nursing

Doctors / Department

OPD Clinics

Admission

Patient Encounter Report

Diagnosis Report

DIAGNOSTIC CENTER

Laboratory

Pending Request

Laboratory Result

Test Reporting Parameter

Test Administration

Test Category

Consumables Requisition

Inventory

Lab Test Count

Lab Result

Radiology

PHARMACY DEPARTMENT

Dispensary

Attend to Patient Folder is Opened.

OPD Clinic

Back

View Waiting List

Home

7733561004

PID No: 4468362982

Name: Huzarfa Ahmad

Phone: 123

Address: 123

Origin:

Title: Mr

Hospital ID: 123

Date Of Birth: 2024-02-03

Gender: Male

Vitals not found. Add them from Vital page

Patient History

Complain

Diagnosis

Investigation

Procedure

Manual Write-Up

Review Of System

Medical History

Examination

Plan

Prescription

Detect Disease

Your detected disease is: Fungal infection

Detect Disease

modal_skin_eruptions

Submit

Figure 8.12 General Disease AI Model

Vitals not found. Add them from Vital page

Patient History

Complain

Diagnosis

Investigation

Procedure

Manual Write-Up

Review Of System

Medical History

Examination

Plan

Prescription

Detect Disease

Drugs

injections

Fluid

Type...	Route	Dosage	Frequency	Period	Total	Comment
Type...			Stat	1	7	
Type...			Stat	1	7	
Type...			Stat	1	7	
Type...			Stat	1	7	

Add more

Figure 8.13 Patient Vitals Details

Laboratory Pending Requests

Image not uploaded

PID No: 8794980563

Address: Lagos

Hospital ID: Demo/12345

Company: Private

Name: Ajibola Azeizat

Origin: Osun

Date Of Birth: 1994-02-25

Plan: Standard

Phone: 0810003156

Title: Mr

Gender: Female

Plan ID/Membership ID: test/masteer

Tests

WBC	Payment not confirmed
GENOTYPE	Payment not confirmed

Enter Results

Mr. Ajibola Azeizat 2023-08-10

Mr. Tofunmi Test 2023-07-31

Mr. Ajibola Azeizat 2023-07-21

Mr. Ajibola Azeizat 2023-07-20

Mr. Tomiwa Makinwa 2023-07-13

Mrs. Server Demo 2023-07-09

Mr. Ajibola Azeizat 2023-07-09

Mr. Server Test 2023-07-03

Mr. Server Test 2023-07-03

Mr. Server Test 2023-07-02

Mr. Server Test 2023-07-02

Mr. Sunday Matthew 2023-06-29

Mr. Titus Olaolu 2023-06-29

Mrs. Server Demo 2023-06-28

Mr. Server Test 2023-06-28

Mr. Ajibola Azeizat 2023-06-26

Mrs. Server Demo 2023-05-19

Mrs. Olarenwaju Oyindamola 2023-06-18

Mrs. Olarenwaju Oyindamola 2023-06-18

Figure 8.14 Laboratory

Test Administration

Add Single Test

Add Group Test

Type to search

#	Test Name	Test Category	Actions
1	Test group test	SEROLOGY	Delete
2	URINE CULTURE	MICROBIOLOGY	Delete
3	Demo	MICROBIOLOGY	Delete
4	RENAL FUNCTION TEST	CLINICAL CHEMISTRY	Delete
5	DIFFERENTIAL COUNT	HEMATOLOGY	Delete
6	FULL BLOOD COUNT	HEMATOLOGY	Delete
7	LIPID PROFILE	CLINICAL CHEMISTRY	Delete
8	LIVER FUNCTION TEST	CLINICAL CHEMISTRY	Delete
9	ANC ROUTINE	URINALYSIS	Delete
10	SENSITIVITY	BACTERIOLOGY	Delete
11	URINALYSIS	URINALYSIS	Delete
12	FOB	SEROLOGY	Delete
13	WINDAI TEST	SEROLOGY	Delete

Figure 8.15 Laboratory Tests

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