

Clinic Management System

Course: Information Systems — CMPn325

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Level: Level 2 Computer

Term: First Term: 2025–2026

Abstract

The Clinic Management System is a web-based application designed to streamline clinic operations through a centralized digital platform. The system provides secure access through user authentication, including sign up and login functionality, and offers separate dashboards for patients, doctors, and administrators.

Patients can request appointments with doctors and view their medical information. Doctors can manage their schedules, view their assigned patients, and add prescriptions. The administrator oversees the entire system, with the ability to add and manage doctors, patients, appointments, and prescriptions. The system enhances efficiency, reduces human error, and improves communication within the clinic.

4. System Development Life Cycle (SDLC)

4.1 Investigation

- The investigation phase identifies existing problems in clinic operations and determines the need for digital transformation.

- Identify issues in patient registration, appointment scheduling, and record management.
- Understand user needs for patients, doctors, and administrators.
- Determine system goals and required enhancements.

Feasibility Study

The feasibility study evaluates whether the system can be developed and implemented effectively.

a. Technical Feasibility

- The system can be developed using web technologies (frontend, backend, relational database).
- No special hardware is required beyond standard clinic computers and internet access.

b. Operational Feasibility

- Doctors, patients, and staff can easily use the system.
- The system reduces paperwork, minimizes errors, and improves workflow.

c. Economic Feasibility

- Development cost is justified by long-term savings in clinic operations.
- The system reduces manual labor and administrative overhead.

d. Schedule Feasibility

- The timeline for development is realistic and follows SDLC phases.

4.2 Analysis

- During this phase, system requirements are collected and analyzed to build a functional model of the clinic workflow.

Functional Requirements

Input Requirements

- Patient registration via sign up.
- Login credentials for authentication (JWT).
- Appointment requests submitted by patients.
- Prescription details entered by doctors.
- Doctor, patient, medicine, and appointment data entered by admin.

Output Requirements

- Patient dashboard displaying appointments and prescriptions.
- Doctor dashboard displaying scheduled appointments and patient details and prescriptions.
- Admin dashboard showing management tools.

Processing Requirements

- Authenticate users using **JWT tokens**.
- Authorize access based on user roles (patient, doctor, admin).
- Process patient appointment requests.
- Allow doctors to create prescriptions.
- Allow admin to add/edit doctors, patients, appointments, prescriptions
- Update dashboards dynamically.

Storage Requirements

- Relational database storage (Oracle DB)

Control Requirements

- Role-based access control using JWT.
- Audit logging for all data changes.
- Encryption of sensitive patient data.
- Input validation mechanisms to ensure data integrity.

Non-Functional Requirements:

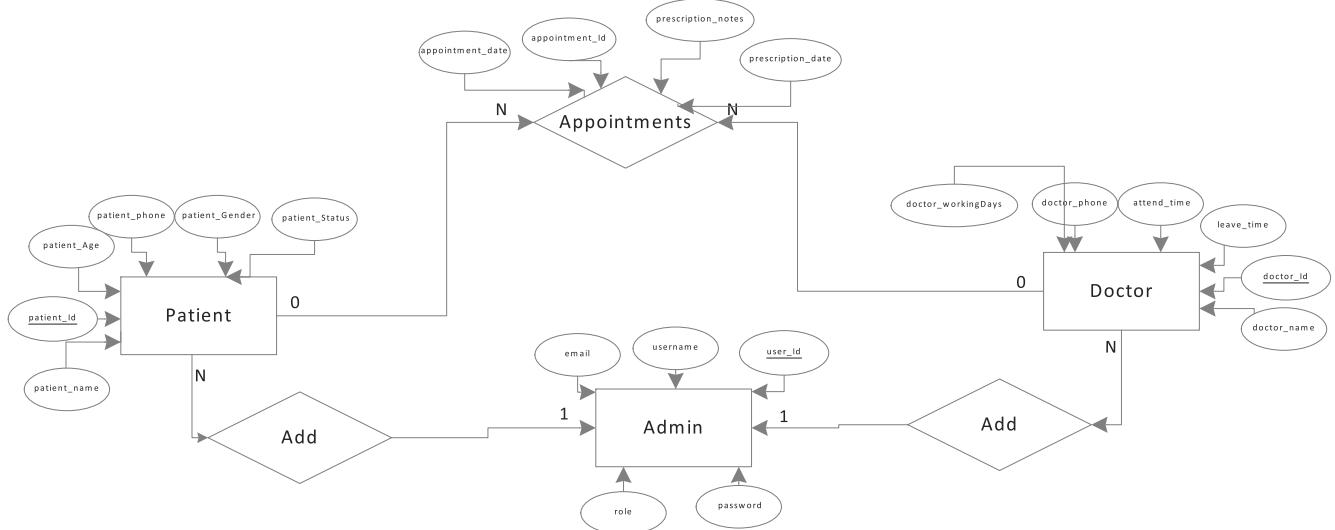
- Security, data validation, and encryption
- High performance and system reliability
- User-friendly interface

4.3 Design

User Interface Design:

- Login / Signup pages
- Patient dashboard (appointments, prescriptions)
- Doctor dashboard (appointments, patients, prescriptions)
- Admin dashboard (full management tools)

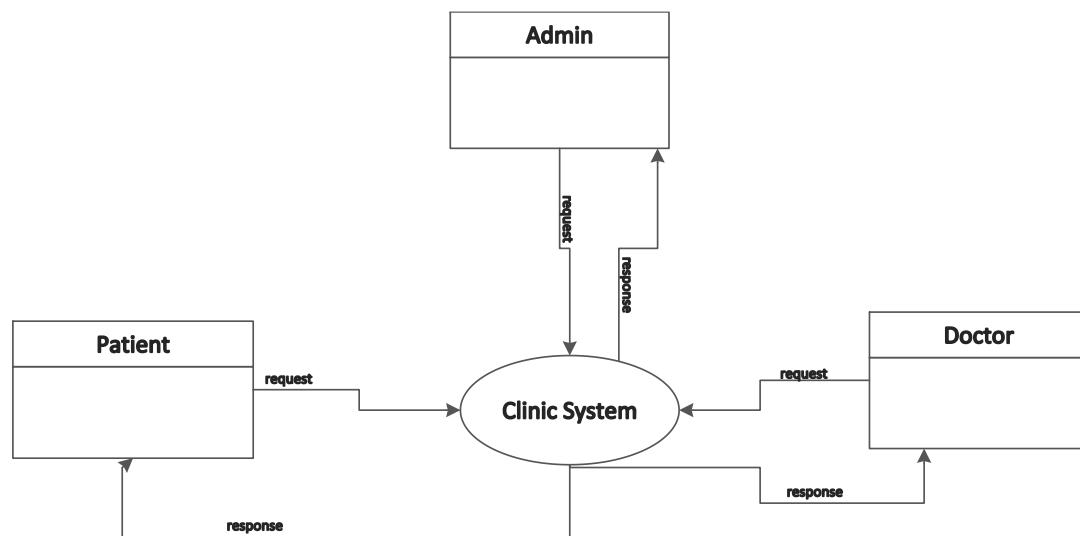
Data Design (ERD):



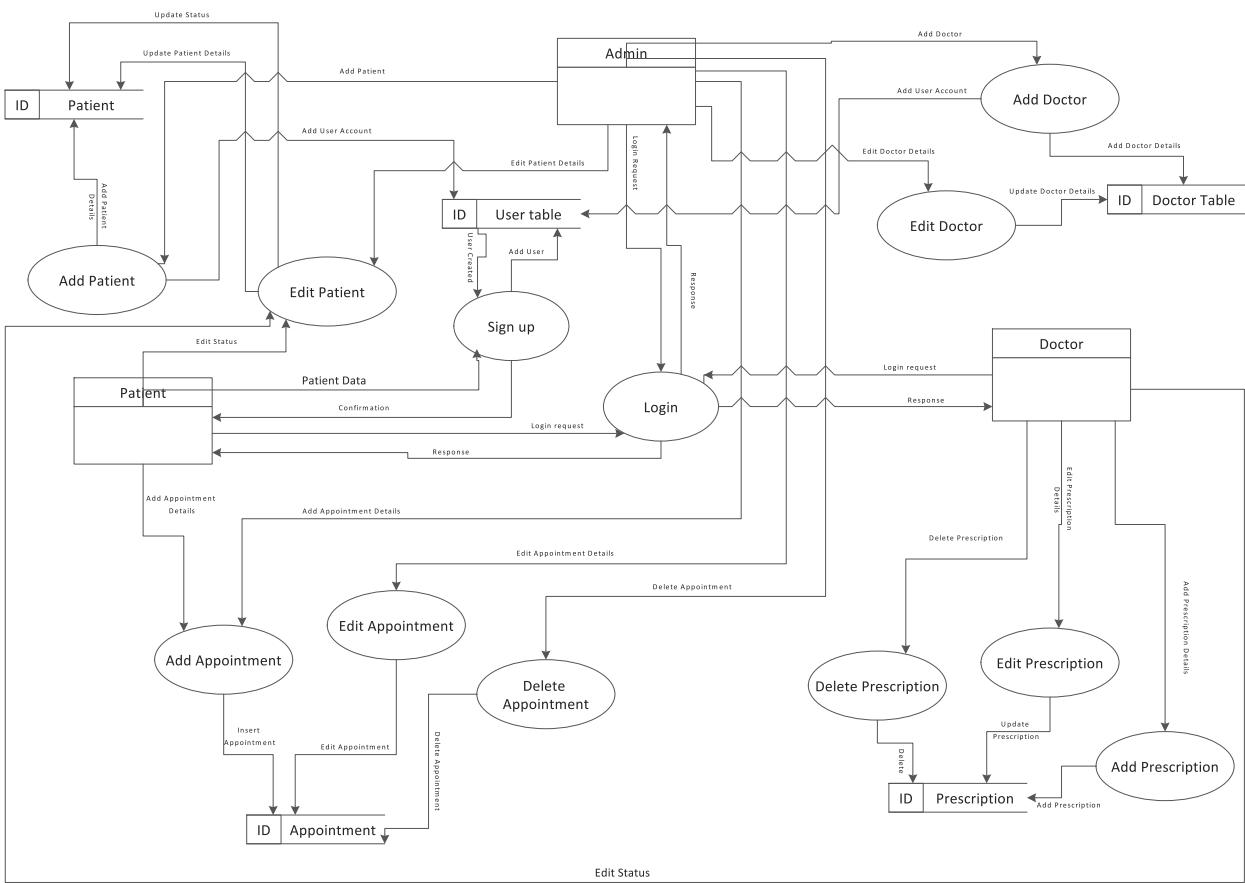
Process Design

- Patient booking workflow
- Doctor prescription workflow
- Admin management workflow
- DFD Levels 0, 1, 2 for modeling data flow

DFD Level 0:

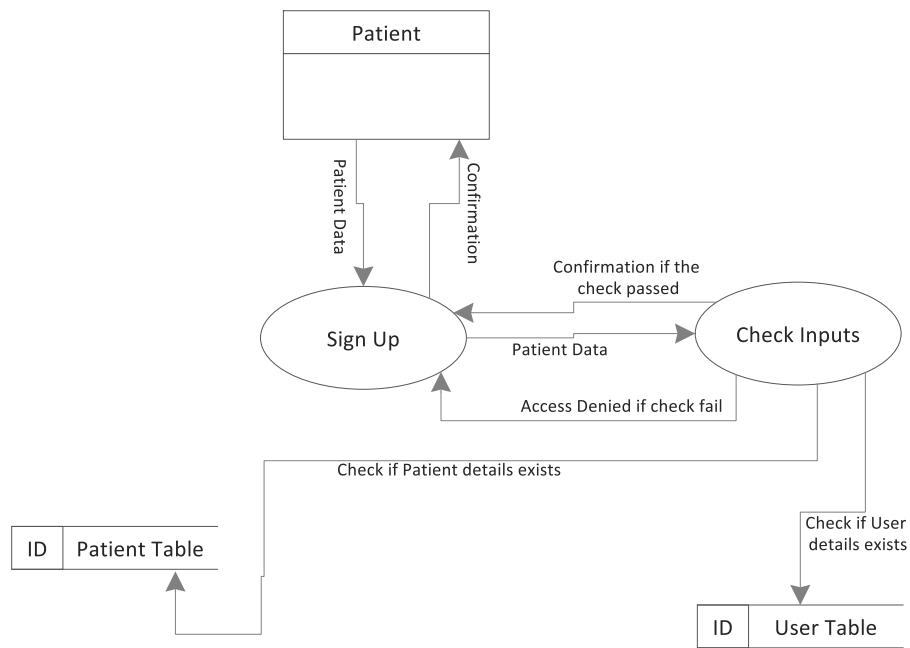


DFD Level 1:

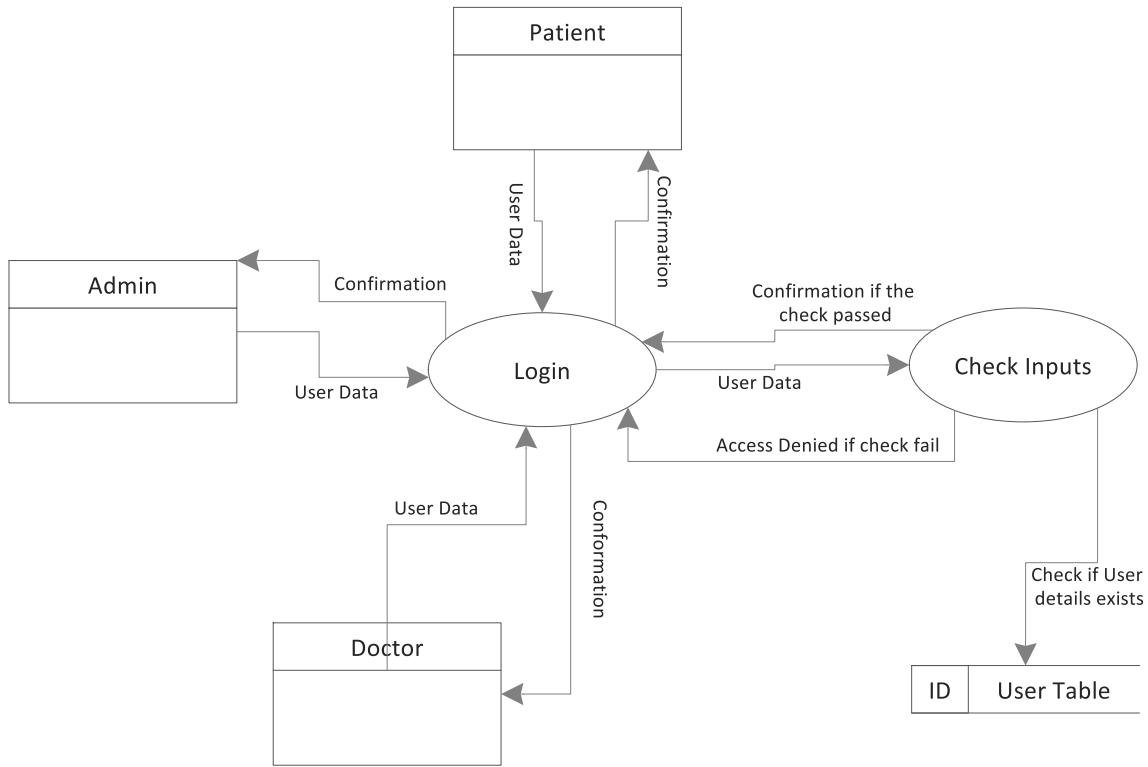


DFD Level 2:

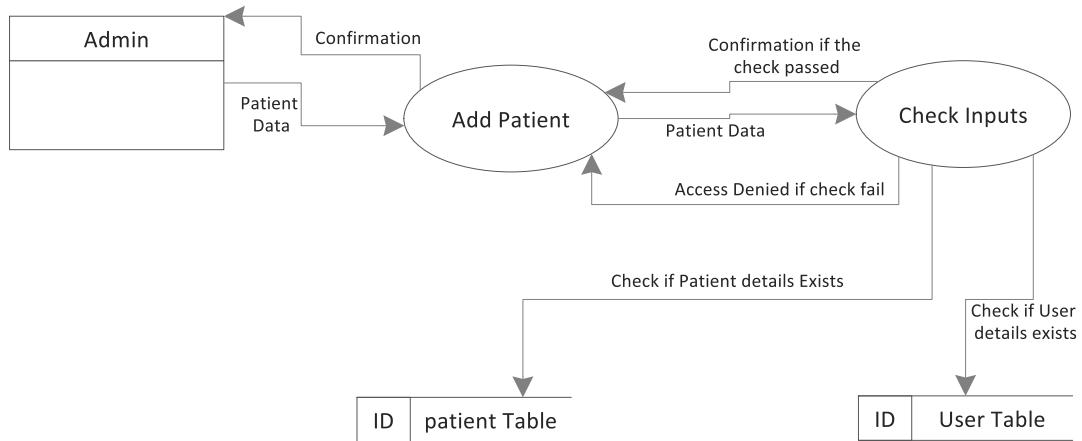
Sign up:



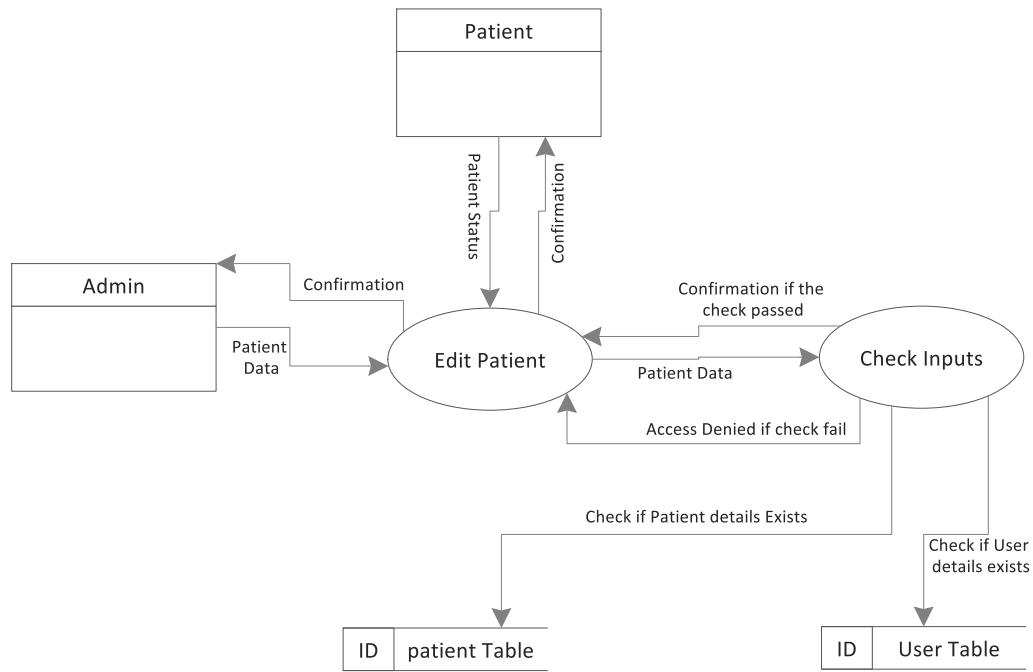
Login:



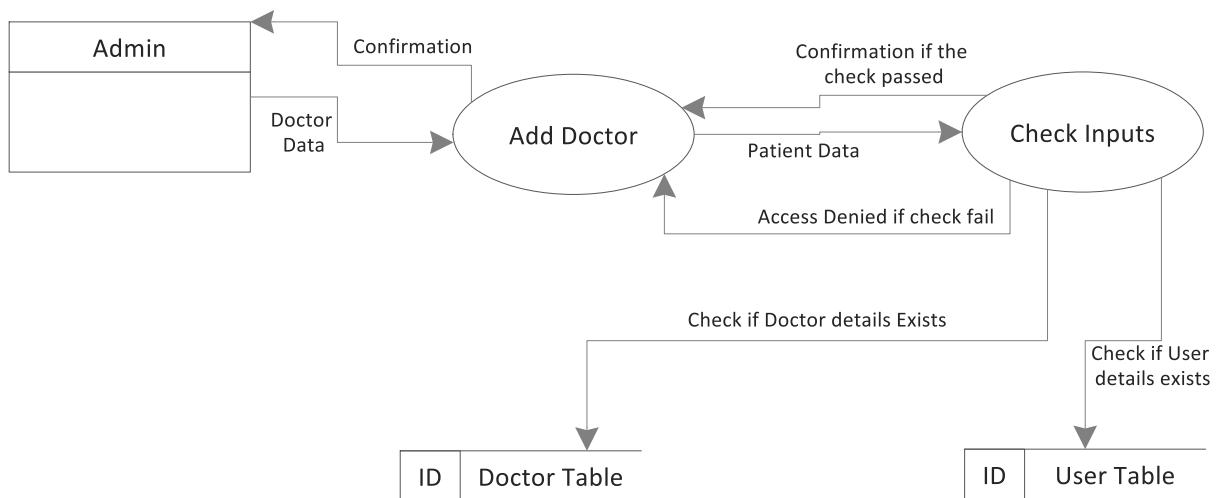
Add Patient:



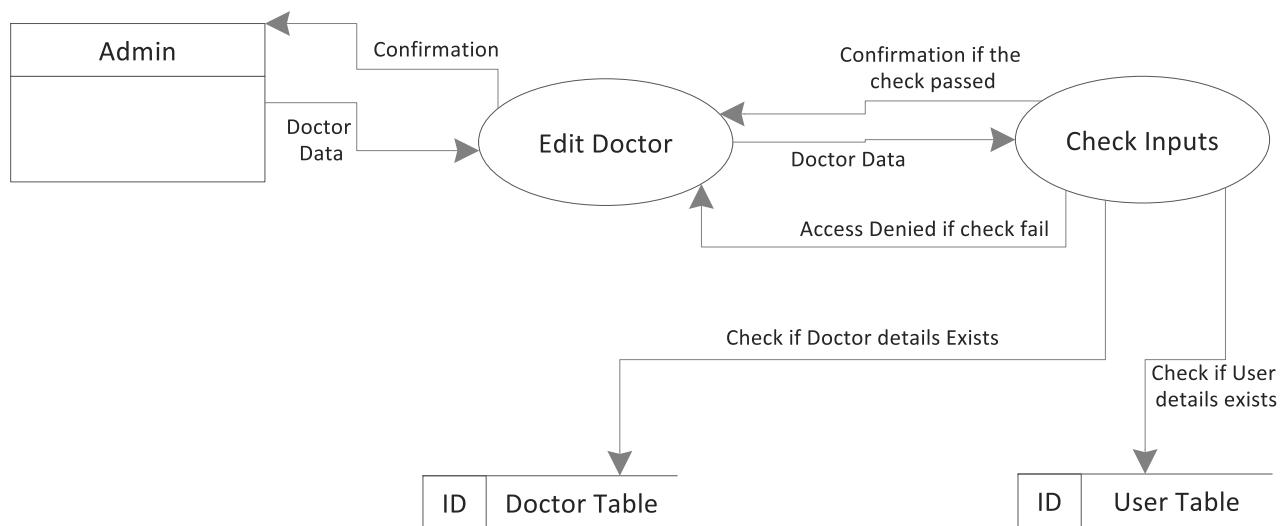
Edit Patient:



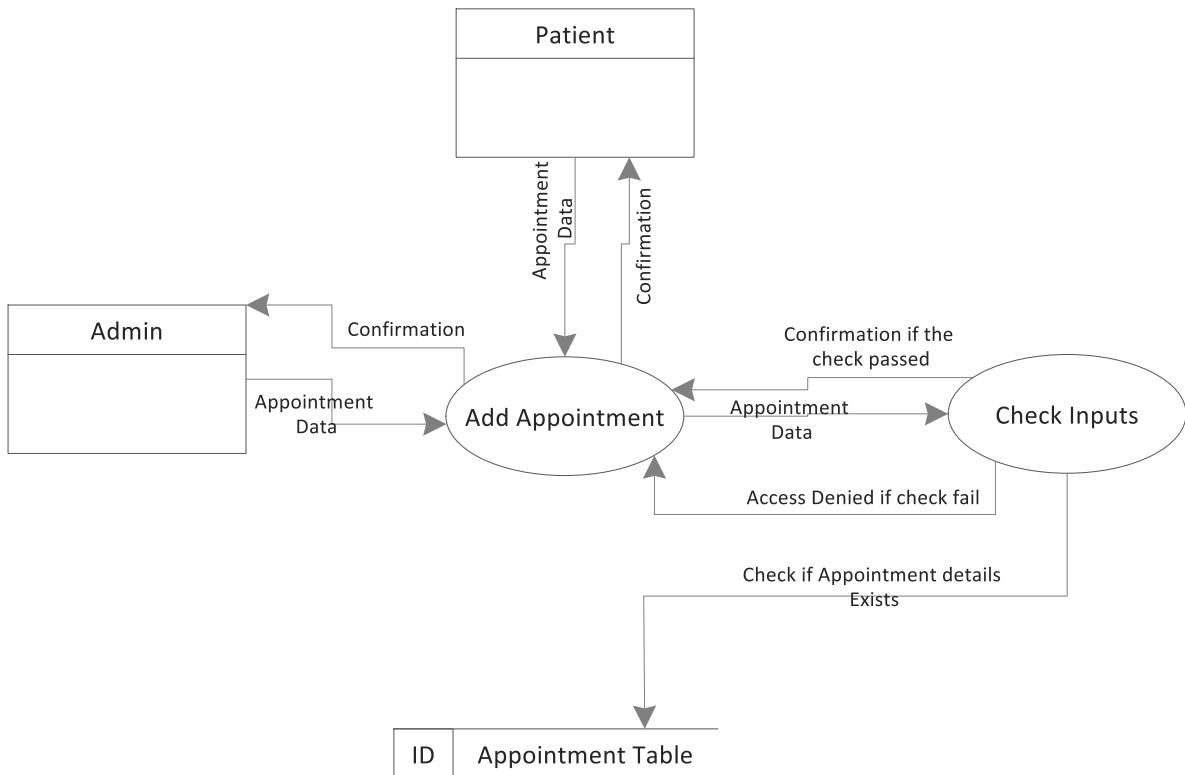
Add Doctor:



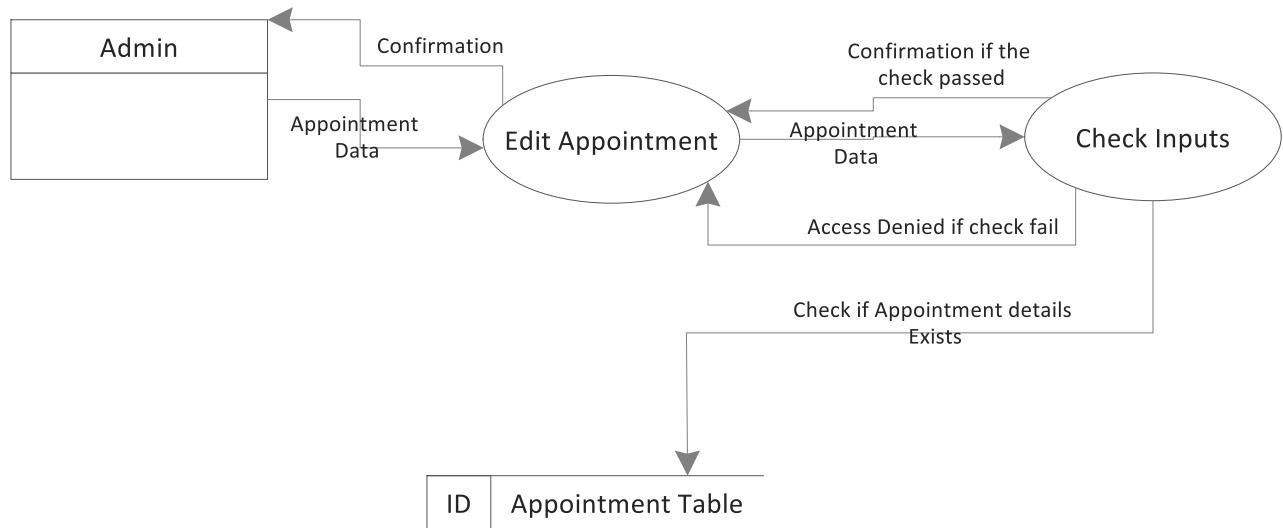
Edit Doctor:



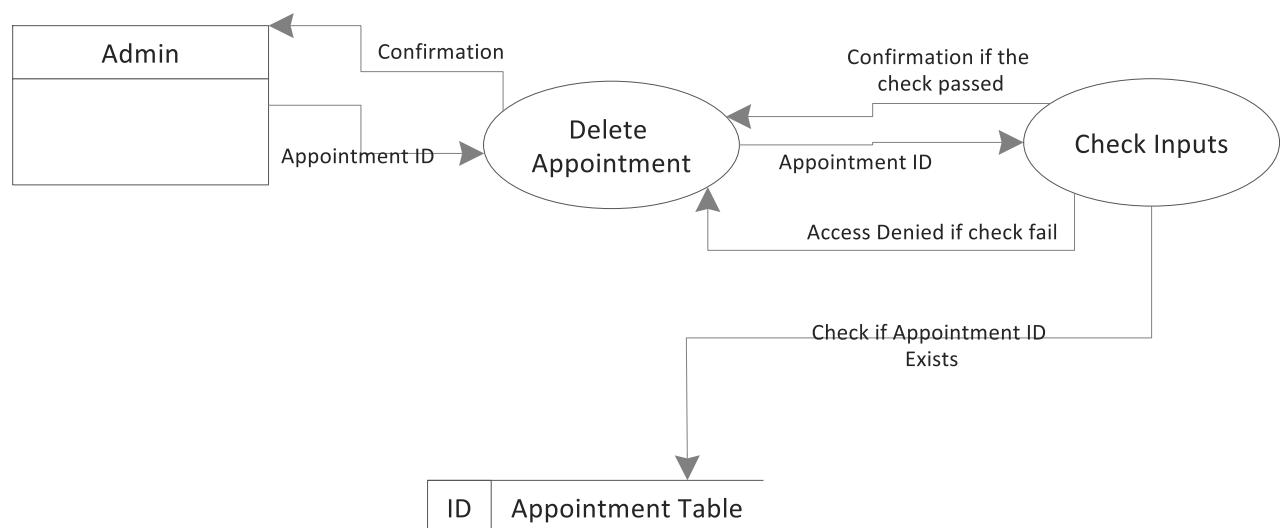
Add Appointment:



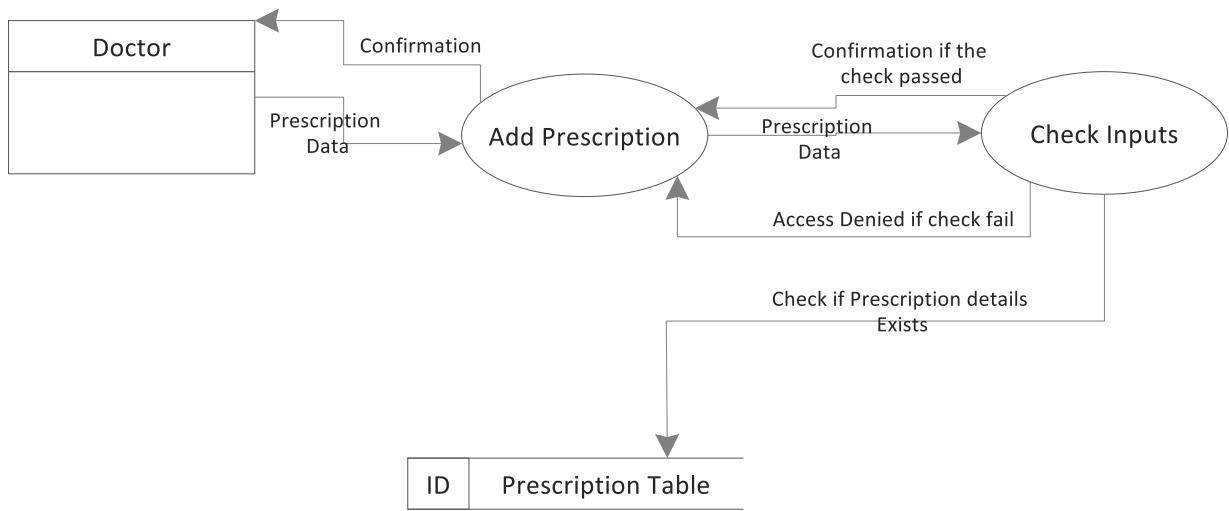
Edit Appointment:



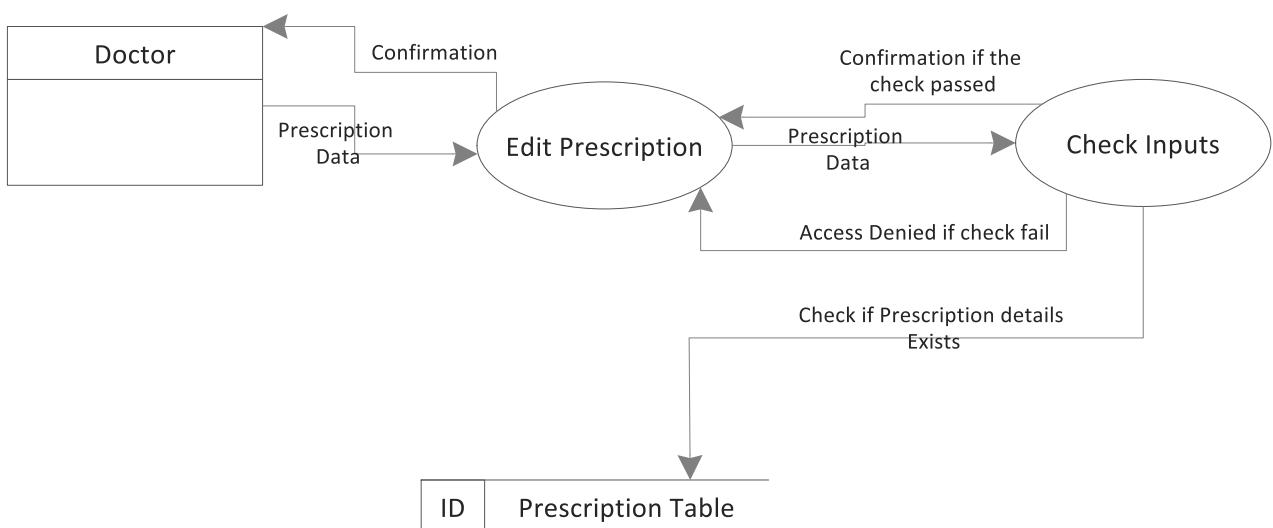
Delete Appointment:



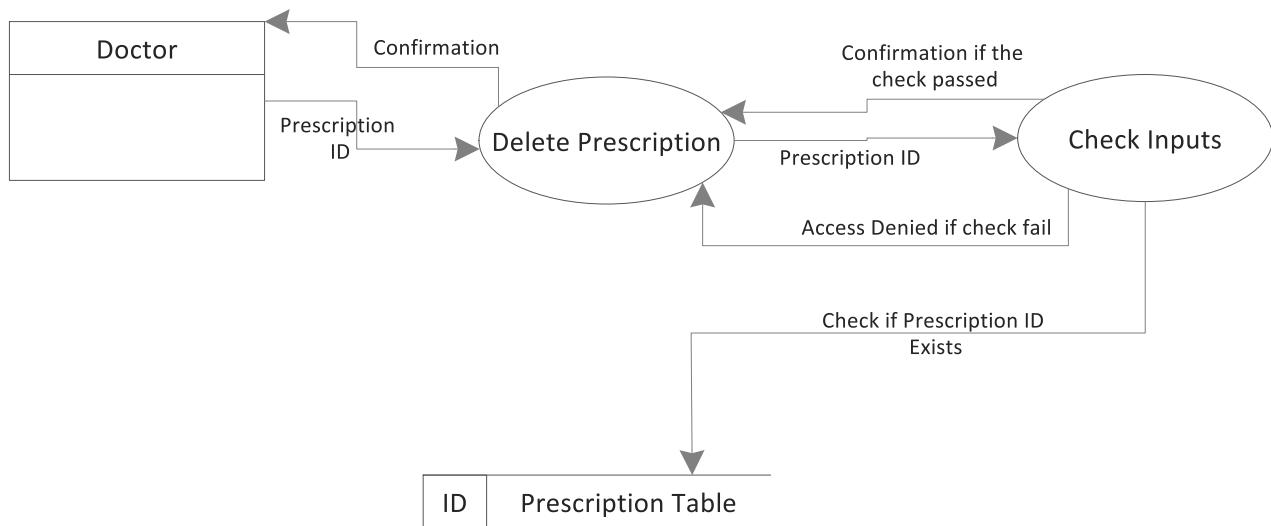
Add Prescription:



Edit Prescription:



Delete Prescription:



Process Design

- User signup and login using **JWT authentication**.
- Patient adds appointment.
- Admin adds appointments.
- Doctor adds prescriptions for patients.
- Admin manages doctors, patients, appointments, prescriptions
- Dashboards update dynamically based on user role.

4.4 Implementation

Tasks:

- Build frontend and backend modules
- Implement authentication and authorization
- Develop dashboards for all user roles
- Create database tables and relationships
- Integrate system modules using REST APIs

Technologies Used:

- Programming languages (React + Vite, Tailwind.css, Spring boot (Java))

- Relational database (Oracle)
- JWT for secure authentication

4.5 Maintenance

- Fixing bugs and errors
- Adding new features based on user feedback
- Enhancing performance and security
- Regular database backups

5. Outline of Systems Study

5.1 Objectives of the Study

- Identify issues in patient registration and appointment handling.
- Collect user requirements to build a digital information system.
- Implement secure role-based access for all users.

6. Detailed Results of Systems Study

6.1 Current System Description

The Clinic Management System provides separate dashboards for patients, doctors, and admins. Access is secured through authentication.

- Patient Dashboard: View appointments, prescriptions, and request new appointments.
- Doctor Dashboard: View appointments, patients, and add/edit prescriptions.
- Admin Dashboard: Manage doctors, patients, appointments, and prescriptions.

7. System Specifications

- **User Interface:** Dashboards for patients, doctors, and admins, login/sign up pages.
 - **Database:** Relational tables with relationships, primary/foreign keys (Oracle DB).
 - **Software:** Backend + frontend, REST APIs, JWT authentication.
 - **Hardware:** Server for app and database.
 - **Personnel:** Admins, doctors, staff, developers.
 - **Documentation:** User manuals and system administrator guides.
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8. Testing & Acceptance Criteria

- Users can sign up and log in securely with JWT.
 - Patients can request appointments successfully.
 - Doctors can add prescriptions for their patients.
 - Admin can manage all users, appointments.
 - Dashboards reflect real-time data updates.
 - Data security and validation are enforced.
-

9. Output Screenshots:

Signup & Login

The screenshot shows a "Sign Up" form titled "Sign Up" with a subtitle "Create your account to access the healthcare portal". The form includes fields for Username (john123), Email (john@example.com), Password (*****), Patient Name (John Doe), Phone (01012345678), Gender (Male/Female), and Age (Age). A "Done" button is at the bottom right.

Sign Up

Create your account to access the healthcare portal

Username

john123

Email

john@example.com

Password

Patient Name

John Doe

Phone

01012345678

Gender

Male/Female

Age

Done

The screenshot shows a "HealthCare+ Portal" login form titled "HealthCare+ Portal" with a subtitle "Sign in to access your healthcare dashboard". It features fields for Username (JohnDoe) and Password (*****), a blue "Sign In" button, and links for "Don't have an account?" and a "Signup" button.

HealthCare+ Portal

Sign in to access your healthcare dashboard

Username

JohnDoe

Password

Sign In

Don't have an account?

Signup

Patient Dashboard:

The dashboard features a header with the HealthCare+ patient portal logo and a "patient" status indicator. A "Navigation" sidebar includes a "Dashboard" link. The main area displays a "Welcome, patient1" message and a summary of upcoming appointments and recent prescriptions.

Welcome, patient1
Your health dashboard and upcoming appointments.

Status: don't know [Edit Status](#)

[+ Add Appointment](#)

Upcoming Appointments

Appointment Id: 1 Dr: doc1	08/12/2025 1:30:00 PM
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Recent Prescriptions

Appointment Id: 1 Dr. doc1 08/12/2025 12:00:00 AM Notes: test
--

A modal window titled "Add Appointment" is displayed over the dashboard. It contains a red banner stating "The Clinic is Open from 7:00 AM to 11:59 PM". The form includes fields for "Appointment Date" (a date input field) and "Select Doctor" (a dropdown menu). At the bottom are "Cancel" and "Add" buttons.

Add Appointment

The Clinic is Open from 7:00 AM to 11:59 PM

Appointment Date
mm/dd/yyyy --:-- --

Select Doctor
Select a doctor

[Cancel](#) [Add](#)

Doctor Dashboard:

 HealthCare+
doctor Portal

Navigation
Dashboard

Welcome, Dr. doc1

+ Add Prescription

Appointments
1 Total doctor appointments

Patients
1 Assigned to you

Prescriptions
1 Total prescriptions

Doctor Appointments

Id: 1
Patient name: patient1

Total prescriptions

Doctor Appointments

Id: 1
Patient name: patient1
Date: 08/12/2025 1:30:00 PM

Your Patients

Patient name: patient1
Patient phone: 01012345678
Status: don't know

Edit Status

Your Prescriptions

Patient: patient1
Appointment Id: 1
Date: 2025-12-08
Notes: test

Edit Delete

 HealthCare+
doctor Portal

Navigation
Dashboard

Welcome, Dr. doc1

Appointments
1 Total doctor appointments

Patients
1 Assigned to you

Prescriptions
1 Total prescriptions

Doctor Appointments

Id: 1
Patient name: patient1

Total prescriptions

Doctor Appointments

Id: 1
Patient name: patient1
Date: 08/12/2025 1:30:00 PM

Your Patients

Patient name: patient1
Patient phone: 01012345678
Status: don't know

Edit Status

Your Prescriptions

Patient: patient1
Appointment Id: 1
Date: 2025-12-08
Notes: test

Edit Delete

HealthCare+
doctor Portal

Total prescriptions

Doctor Appointments

Id: 1
Patient name: patient1
Date: 08/12/2025 1:30:00 PM

Your Patients

Patient name: patient1
Patient phone: 01012345678
Status: don't know

Your Prescriptions

Patient: patient1
Appointment id: 1
Date: 2025-12-08
Notes: test

Edit Status

Add Prescription

Date
mm/dd/yyyy

Notes
Enter notes

Patient
Select patient

Appointment
Select appointment

HealthCare+
doctor Portal

Total prescriptions

Doctor Appointments

Id: 1
Patient name: patient1
Date: 08/12/2025 1:30:00 PM

Your Patients

Patient name: patient1
Patient phone: 01012345678
Status: don't know

Your Prescriptions

Patient: patient1
Appointment id: 1
Date: 2025-12-08
Notes: test

Edit Status

Edit Prescription

Patient
patient1

Date
12/08/2025

Notes
test

Appointment
ID: 1 - patient1 (08/12/2025 1:30:00 PM)

Admin Dashboard:

 HealthCare+
admin Portal

Navigation
Dashboard

Admin Dashboard

Manage your healthcare system efficiently

Doctors

3 total

- doc2 - 01200158856 - 2:00 PM to 5:00 PM [MONDAY, WEDNESDAY, FRIDAY]
[Edit](#)
- doc1 - 01225641451 - 7:30 AM to 2:00 PM [TUESDAY, MONDAY, WEDNESDAY]
[Edit](#)
- Hadeer - 01122445660 - 11:00 AM to 5:00 PM [MONDAY, TUESDAY]
[Edit](#)

Patients

3 total

- patient3 - Status: mmm - Phone: 0122356478
[Edit](#)
- patient1 - Status: don't know - Phone: 01012345678
[Edit](#)

 HealthCare+
admin Portal

Navigation
Dashboard

Hadeer - 01122445660 - 11:00 AM to 5:00 PM [MONDAY, TUESDAY]
[Edit](#)

Patients

3 total

- patient3 - Status: mmm - Phone: 0122356478
[Edit](#)
- patient1 - Status: don't know - Phone: 01012345678
[Edit](#)
- patient2 - Status: stomach - Phone: 0122564857
[Edit](#)

Appointments

2 total

- ID: 1 - Patient: patient1 - Date: 08/12/2025 1:30:00 PM with Dr.doc1
[Edit](#) [Delete](#)
- ID: 21 - Patient: patient2 - Date: 17/12/2025 3:27:00 PM with Dr.doc2
[Edit](#) [Delete](#)

Add doctor

Username

Email

Password

Doctor Name

Phone

Working Days

Edit doctor

Doctor Name

Phone

Working Days
 MONDAY TUESDAY WEDNESDAY THURSDAY FRIDAY SATURDAY SUNDAY

The Clinic is Open from 7:00 AM to 11:59 PM

Attend Time

Leave Time

HealthCare+ Admin Portal

Navigation

Dashboard

Patients

3 total

patient3 - Status: mmm - Phone: 01225641451

patient1 - Status: don't know - Phone: 01225641451

patient2 - Status: stomach - Phone: 0122564857

Appointments

2 total

ID: 1 - Patient: patient1 - Date: 06/12/2025

ID: 21 - Patient: patient2 - Date: 17/12/2025 3:27:00 PM with Dr.doc2

Add patient

Username

Email

Password

Patient Name

Phone

Gender

HealthCare+ Admin Portal

Navigation

Dashboard

Patients

3 total

patient3 - Status: mmm - Phone: 01225641451

patient1 - Status: don't know - Phone: 01225641451

patient2 - Status: stomach - Phone: 0122564857

Appointments

2 total

ID: 1 - Patient: patient1 - Date: 06/12/2025

ID: 21 - Patient: patient2 - Date: 17/12/2025 3:27:00 PM with Dr.doc2

Edit patient

Patient Name

Phone

Gender

Age

Patient Status

HealthCare+
admin Portal

Hedder - 01122445680 - 11:00 AM to 5:00 PM [MONDAY, TUESDAY]

Add appointment

The Clinic is Open from 7:00 AM to 11:59 PM

Patient
Select Patient

Doctor
Select Doctor

Date & Time
mm/dd/yyyy --:-- --

Cancel Save

HealthCare+
admin Portal

Hedder - 01122445680 - 11:00 AM to 5:00 PM [MONDAY, TUESDAY]

Edit appointment

The Clinic is Open from 7:00 AM to 11:59 PM

Patient
Select Patient

Doctor
Select Doctor

Date & Time
12/08/2025 01:30 PM

Cancel Save

Schema:

