

Hospital Management System

App Dev Project Report

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This document provides an overview of the design, development, and implementation of the Hospital Management System created as part of the IIT Madras BS Degree App Development Project.

1. Student Details

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About Me: I am a passionate developer focused on building IoT, AI, VR/AR, and full-stack applications with emphasis on intelligent systems and backend engineering.

2. Project Details

Project Title: Hospital Management System

Problem Statement:

To create a fully functional hospital management system capable of handling administrative workflows, doctor scheduling, patient records, and appointment management using a secure, modular, and scalable architecture.

Approach:

The application follows a modular Flask architecture separating concerns into admin, provider, and patient modules. SQLAlchemy handles ORM mapping, Jinja2 templates build the UI, and role-based access ensures proper segregation of functionalities. Unique ID generation improves tracking and consistency.

3. AI / LLM Declaration

I have used ChatGPT only for doubt clarification and documentation formatting. All coding and debugging were done manually.

4. Technologies and Frameworks Used

- Flask – Backend web framework
- SQLAlchemy – ORM for DB
- SQLite – Application database
- Jinja2 – Templating engine
- WTForms – Form validation
- Flask-Login – Session & authentication
- Bootstrap 5 – Frontend styling

5. Database Schema

The database includes models for Account, AccessLevel, Clinic, Provider, Recipient, Appointment Sessions, TimeSlots, and ClinicalNotes. The system follows one-to-many and many-to-one relationships across the modules.

6. API & Route Overview

Routes are grouped into modules:

- identity – Authentication
- governance – Admin operations
- clientele – Patient operations
- provision – Doctor operations

Each route implements a clean separation of responsibilities.

7. Architecture & Features

The application is structured into:

- models/ – SQLAlchemy ORM
- routes/ – Blueprints
- templates/ – HTML/Jinja2 UI
- static/ – CSS, JS assets

Core Features:

- ✓ Authentication & RBAC
- ✓ Admin Dashboard
- ✓ Doctor Availability System
- ✓ Patient Appointment Booking
- ✓ Unique ID Generation ✓ Clinic & Session Management

8. Video Presentation

Video Link:

https://drive.google.com/file/d/1WEmXTuI0C1P1aohMBWWpl_K_LYyOZnSW/view?usp=sharing

9. GitHub Repository

https://github.com/future-genius/hospital_management_system_app.git