

IITG Hospital Management System

Group Project Report

April 30, 2025

1 Introduction

This report documents the development of the IITG Online Hospital Portal, a web-based healthcare management system designed to streamline medical services for students, faculty, and staff at the Indian Institute of Technology Guwahati. The system provides role-based access to various stakeholders with distinct functionalities.

2 System Architecture

2.1 Technical Stack

- Frontend: HTML5, CSS3, Vanilla JavaScript
- Backend: PHP 8.1
- Database: MySQL 8.0
- Server: Apache 2.4
- Security: SHA-256 hashing, Prepared Statements

2.2 Database Design

The relational database comprises 15 normalized tables with proper constraints:

Figure 1: Entity-Relationship Diagram of Core Entities

Key Features:

- Patient supertype with student/professor/dependent subtypes
- Transaction-safe prescription management
- Inventory tracking with atomic updates
- Appointment scheduling system

3 Implementation Details

3.1 Doctor Module (Varshith)

- Slot management with conflict detection
- Patient queue visualization
- Prescription workflow:
 1. Medicine search with stock validation
 2. Dosage scheduling (morning/afternoon/night)
 3. Automated bill generation

- Database optimization:

```
CREATE INDEX idx_doctor_email ON Doctor(email);
```

- Appointment system:
 - Slot availability checking
 - Conflict resolution
 - Calendar integration

3.2 Store & Technician Module (Yaswanth)

- Inventory management:
 - Real-time stock updates
 - Low-quantity alerts
 - Batch processing of orders
- Bill processing:
 - Transaction rollback mechanism
 - Store-specific pricing
- Technician interface:
 - Test report verification
 - Equipment maintenance logging

3.3 Student ,Professor, Professor Dependent Module (Sujeeth)

- Medical history tracking:
 - Prescription archive
 - Test report repository
- Profile management:
 - Academic integration
 - Emergency contact system

Booked slots:

- A table of contents showing the booked slots

4 Results & Testing

4.1 Validation Tests

- Prescription integrity test (1000 iterations)
- Concurrent booking simulation (50 users)
- Inventory consistency check
- Role-based access validation

5 Group Contributions

5.1 Varshith(230150023)

- Designed part of database schema and relationships
- Implemented doctor dashboard and prescription system
- Test Booking (blood test,etc-)
- Developed transaction management core
- Developed appointment scheduling
- CSS Styling

5.2 Yaswanth(230150009)

- Designed part of database schema and relationships
- Built store inventory management system
- Developed technician interface
- Implemented billing subsystem
- Created stock alert mechanism
- CSS Styling

5.3 Sujeeth(230150013)

- Implemented student, professor, professor dependent portal
- Created medical history tracker
- Created the interface to see the booked slot checking system
- Integrated academic database
- CSS Styling

6 Challenges & Solutions

Challenge	Solution
Concurrent slot booking	Implemented row-level locking
Medicine stock sync	Atomic transactions with rollback
Cross-module integration	Standardized API endpoints
Security vulnerabilities	Prepared statements + input sanitization

7 Conclusion

The system successfully automates hospital operations transaction . Future work includes mobile app integration and AI-powered diagnosis suggestions.

References

- [1] PHP Documentation, <https://www.php.net/manual/en/>
- [2] MySQL 8.0 Reference Manual, Oracle Corporation