Project Documentation: Hospital Management System

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1. Introduction

The Hospital Management System is a web-based application designed to streamline the operations of a healthcare facility. The system allows patients to book appointments, doctors to manage their profiles and availability, and administrators to oversee the hospital's workflow. The goal is to create a unified platform to improve healthcare service delivery and management.

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2. Background of the Project

Problem Statement: Manual hospital management systems lead to inefficiencies in doctor scheduling, patient appointment booking, and data management. These issues can cause delays, miscommunication, and poor patient experiences.

Motivation: The project is inspired by the need for a digital solution that simplifies hospital operations while ensuring data accuracy, user role separation (doctor, patient, admin), and accessible interfaces for all users.

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3. Objectives

- To allow patients to register, log in, and book appointments online.
- To enable doctors to add their profiles and view appointments.
- To provide an admin panel for hospital staff to manage doctors and messages.
- To categorize doctors based on specialization and department.

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4. Scope

Covered: - Patient registration and login - Doctor registration and dashboard - Appointment booking system - Admin panel to manage doctors and messages - View doctors by specialization - Department-based doctor listing

Not Covered: - Online payment integration - Prescription generation - Real-time notifications (email/SMS)

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5. Literature Review / Related Work

- **Existing Systems:**
- Practo (Online doctor consultation and booking)
- OpenMRS (Open-source medical record system)
- **References:**

- Use of PHP and MySQL for secure web development
- Role-based access control models in web applications

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6. Methodology

Technologies Used: - HTML, CSS for frontend - PHP for backend - MySQL (MariaDB) for database - XAMPP for local hosting

Development Workflow: - Planning and analysis - Database design - Frontend and backend development - Testing and debugging

Design Models: - ER Diagram showing relationships between users, doctors, appointments - Flowchart for appointment booking process

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7. Implementation / Development

Backend: - PHP files structured into components: login, register, doctor dashboard, admin panel - User authentication using cookies - Prepared statements to prevent SQL injection

Frontend: - Responsive UI using HTML/CSS - Clean navigation for patient, doctor, and admin roles

Screenshots: - Home page - Login/Register forms - Doctor dashboard - Appointment booking form

Database Schema: - `users` table with `id`, `name`, `email`, `password`, `role` - `doctors` table linked to users by `user_id` - `appointments` table linking `patient_id` and `doctor_id`

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8. Results / Analysis

- Patients can register, log in, and book appointments.
- Doctors can log in, manage their details, and view appointments.
- Admins can register/login and manage doctors and messages.
- Department-wise doctor viewing is working.

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9. Challenges Faced

- Managing single email usage across roles (doctor/patient)
- Integrating department filtering logic
- Ensuring form data security and validation
- Preventing duplicate appointment slots

Solutions: - Used role column to differentiate user types - Applied password hashing and prepared statements - Used SQL joins for dynamic dropdown population

10. Conclusion

The Hospital Management System successfully streamlines the hospital's operational needs, providing a secure and easy-to-use platform for patients, doctors, and admins. The project enhances patient care accessibility and simplifies management workflows.

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11. Future Scope (Optional)

- Add real-time notifications via email/SMS
- Include payment gateway for online consultation
- Generate prescriptions and patient history digitally
- Implement a chatbot or FAQ assistant for help section