

Supreme Hospital Management System

Monisha Moudivender • 14 July 2025

Situation:

- **Specialized Departments:** Cardiology, Gynecology, Orthopedics, Pediatrics, ENT, and OPD.
- **Doctor:** Doctors are assigned to only one department at a time and has a visiting time and day in a week.
- **Reception system:** Patient details and fees are entered at reception using a system; patients are tracked via IDs.
- **Patient visit:** Patients visit either by choosing a doctor manually or getting admitted through the hospital.
- **Tests and prescriptions:** Doctors prescribe tests, reports are generated, and prescriptions are issued based on test results.
- **Admission process:** Based on doctor advice and availability of wards.
- **Discharge:** Happens after post-treatment and full payment of charges.
- **Roles in system:**
 - Admin manages doctor schedules.
 - Lab In-Charge uploads reports.
 - Pharma In-Charge manages medicine data and bills.
 - Reception handles all payments centrally.
 - Patients do not access the system directly

Problems:

- **Limited Ward Availability:** No admission if ward is full could delay critical care.
- **Manual Doctor Selection:** Can lead to confusion or mismatch.
- **Centralized Reception Overload:** All payments routed through a single point risk of bottlenecks or delays.
- **No Appointment Booking System :** Patients walk in or manually choose doctors; no automation or scheduling system is described.
- **Dependency on Physical Documents:** Prescriptions, reports, and discharge are described in manual terms.

Opportunities:

- **Implement Online Appointment & Token System:**

Automate doctor selection and scheduling.

Reduce manual work.

- **Ward Management System:**

Track ward availability in real-time.

- **Decentralize Payment Gateways:**

Allow lab, pharmacy, and ward counters to accept payments (integrated with CBS).

- **Digital Discharge Summary:**

Generate auto-discharge summary once treatment closes and payments complete.

- **Analytics and Reports:**

For admin to analyze patient visit, doctor efficiency, and billing issues.

Goals of the Hospital Management System

- **Improve Operational Efficiency**

Automate patient registration, doctor scheduling, billing, and report generation to reduce manual workload and errors.

- **Show Patient Flow**

Enable easy handling of OPD visits, test prescriptions, admissions, surgeries, and discharges through a structured system.

- **Centralized Data Management**

Maintain a single patient ID to track all interactions, payments, prescriptions, reports, and treatments in one system.

- **Accurate Billing and Payment Tracking**

Integrate a Centralized Billing System (CBS) to track all payments and ensure that dues are cleared before discharge.

Project Objectives

- **To computerize hospital operations**
Replace manual work with a digital system to save time and reduce human errors.
- **To manage patient records**
Store and retrieve patient details, medical history, reports, and billing information using a unique ID.
- **To improve test and report management**
Allow doctors to prescribe tests and lab in-charge to upload reports directly into the system.
- **To automate billing and payment process**
Track all hospital payment using a Centralized Billing System.
- **To monitor ward availability**
Check room availability in real-time and manage patient admissions.
- **For accurate discharge process**
Generate discharge sheet only after full treatment and payment.
- **To support future upgrades**
Build the system in a way that new features can be added later.

Success Criteria of the Hospital Management System

- **All hospital functions are working digitally**

Patient registration, consultation, lab reports, billing, admission, and discharge can all be done using the system.

- **Patient data is accurate and safely stored**

Every patient has a unique ID, and their medical history, reports, and billing details are stored.

- **Billing system works without errors**

All payments are recorded, and discharge happens only after full payment

- **All departments are integrated**

Lab, pharmacy, admin, and reception are connected in the system

- **Ward and doctor availability in real-time**

Admin or reception can check available beds and doctor schedules through the system.

- **Reports and test results are share**

Doctors and patients can receive lab reports without delay or errors.

- **Users are satisfied with the system**

Positive feedback from hospital staff and management.

Methods/Approach:

BA contribution in SDLC:

Enterprise Analysis: Gap Analysis, Risk analysis, Business case, Business process model, Feasibility study

Requirement Gathering

- Identify stakeholders using RACI MATRIX
- Meet hospital staff: doctors, admin, reception, lab, and pharmacy.
- Understand current problems and how each department works.
- Gather requirements using Brainstorming, Interviews, Questionnaires, Observation, Document Analysis, Prototyping

Requirement Analysis

- Analyze the collected information.
- Document functional (Patient registration, Doctor scheduling) and non-functional requirements (Data security, User role management, System performance).
- Prioritize features using MoSCoW technique.
- Create Use Case Diagrams, Sequence Diagram, Data Flow Diagrams, BRD, FRD, SRS, Mockups, Wireframes
- Finalize scope and get approval.

Design:

- Work with technical team to design:
- Database structure (patient, doctor, reports, bills)
- User interface layout (screens for reception, lab, pharmacy, admin)
- Prepare RTM,End User manual

Coding:

- Clarify doubts of team
- Communicate requirements using UML diagrams(Patient registration,lab reports,bill)
- Update RTM,End User manuals

Testing:

- Prepare Test cases
- Update RTM,End User manual
- Assist client in UAT

Deployment and Implementation:

- Forward RTM,End User manual to client
- Conduct training sessions for users
- Assist deployment and implemenetation

Why Waterfall Model is Good for Hospital Management System Project

The Waterfall Model is best for projects like the Hospital Management System, where requirements are stable, documentation is important, and a structured, step-by-step process helps ensure safety, accuracy, and successful delivery.

Requirements Are Clear from the Beginning

Hospital workflows (like registration, billing, admission, discharge) are well known and fixed. Waterfall works best when the scope and requirements do not change frequently.

Sequential process Suits Hospital Setup

Waterfall follows clear phases: Requirements , Design , Development , Testing , Deployment. This helps in planning each step properly without confusion.

Easy to Manage and Track Progress

Since Waterfall follows a linear approach, it's easier to track project progress using timelines, documents, and milestone reviews.

Strong Documentation is Required

Hospitals need detailed documentation for legal, audit, and medical purposes (e.g., patient records, test reports, billing).

Waterfall ensures proper documentation at every phase.

Testing Can Be Done Thoroughly

Testing is done after development is completed, allowing testers to validate the full system as one unit it is important for a critical system like HMS where patient data and billing must be accurate.

Works Well for First-Time System Implementation

If the hospital is moving from a manual system to a digital one for the first time, Waterfall helps with a controlled, low-risk rollout.

Resources Required for Hospital Management System Project

Human Resources (10 People)

Role	Responsibility
Business Analyst	Gathers requirements, creates documentation, and connects users with developers.
Project Manager	Plans the project, manages timeline, budget, and team coordination.
Developers	Build the HMS modules (registration, billing, lab, pharmacy, etc.).
UI/UX Designers,DB Arch,NW Arch	Design user-friendly screens for hospital staff.
Testers (QA)	Test the system for errors and verify that it meets all requirements.
Hospital Staff	Provide business knowledge: doctors, nurses, admin, reception, pharmacy.

Time Resources

Time allotted for this project is 8 months

Activity	Estimated Timeframe
Requirement Gathering	3 eeks
Design & Planning	4 weeks
Development	3 Months
Testing	2 Months
Training and deployment	4 weeks

Technical Resources

Resource	Purpose
Laptops/Desktops	For development, testing, and hospital user access.
Servers or Cloud System	To host the Hospital Management System securely.
Database Software	To store patient records, billing, reports (e.g., MySQL, SQL Server).
Development and BA Tools	For coding and BA
Testing Tools	For checking system quality
Backup Tools	For saving patient data securely in case of failure.

Financial Resources

Budget allotted for this project is 15000000

Purpose	Cost Area	Cost
Software Development Cost	Developers, licensing tools, salary	10000000
Hardware & Infrastructure	Servers, computers	2500000
Training, test	Manuals, trainers, tools, database	1000000
Maintenance & Upgrades	Bug fixes and improvements	1500000

Risks in Hospital Management System Project

1. Requirement Risk
2. User Resistance
3. Data Security Risk
4. Integration Risk
5. Stakeholder management Risk
6. Budget Overrun
7. Testing Risk
8. Legal Compliance Risk

Dependencies in Hospital Management System

1. Stakeholder Availability
2. IT Infrastructure
3. Third-Party Software
4. Data Availability
5. Role-Based Access Setup
6. Decision Approvals
7. Training Completion



THANK YOU