

# **Supreme Hospital Management System**

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## 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 (8 People)

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

## Time Resources

Time allotted for this project is 8 months

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

## Technical Resources

| Resource                        | Purpose                                                               |
|---------------------------------|-----------------------------------------------------------------------|
| <b>Laptops/Desktops</b>         | For development, testing, and hospital user access.                   |
| <b>Servers or Cloud System</b>  | To host the Hospital Management System securely.                      |
| <b>Database Software</b>        | To store patient records, billing, reports (e.g., MySQL, SQL Server). |
| <b>Development and BA Tools</b> | For coding and BA                                                     |
| <b>Testing Tools</b>            | For checking system quality                                           |
| <b>Backup Tools</b>             | 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       | 7500000 |
| Hardware & Infrastructure | Servers, computers                | 2500000 |
| Training & Support        | Manuals, trainers, helpdesk staff | 2500000 |
| Maintenance & Upgrades    | Bug fixes and improvements        | 2500000 |

## **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