

Case Study: Hospital Management System (HMS)

1. Introduction

1.1 Background

Many small hospitals still use manual systems for managing patient records, doctor management, appointments, and billing. This leads to:

- Lost patient data
- Appointment conflicts
- Billing errors
- Slow administrative processes

To solve these problems, a simple **Hospital Management System (HMS)** will be developed.

1.2 Objective

The objective of this system is to:

- Digitize hospital operations
- Improve efficiency
- Reduce errors
- Provide accurate reporting

1.3 Problem Statement

Hospital currently uses:

- Paper files
- Manual appointment booking
- No centralized system

This causes:

- Lost records
- Appointment conflicts

- Billing errors



1.4 Goal

Create a digital system to:

- Register patients
- Schedule appointments
- Manage doctor availability
- Generate bills

1.5 Scope (Simple Version Only)

Included:

- Patient registration
- Doctor management

- Appointment booking
- Basic billing

2. Stakeholders

Stakeholder	Role
Admin	Manages doctors and reports
Receptionist	Manages patients, appointments, billing
Doctors	View appointments
Hospital Management	Reviews reports

3. Functional Requirements

1. The system shall allow users to log in with role-based access.
2. The system shall allow adding, editing, and deleting patient records.
3. The system shall allow adding and updating doctor information.
4. The system shall allow booking and canceling appointments.
5. The system shall generate and print bills.
6. The system shall generate daily appointment reports.
7. The system shall allow searching patients by name or ID.

4 . Non-Functional Requirements

- System response time must be less than 3 seconds.
- Data must be securely stored.
- Only authorized users can access system modules.
- The system must be user-friendly.
- The system must maintain data integrity.

Feature-Based Product Backlog For Hospital Mangement System

ID	Feature	User Story	Priority
F1	Patient Management	As a receptionist, I want to add, edit, and delete patient records so that patient information is accurate and updated.	High
F2	Doctor Management	As an admin, I want to add and update doctor data so that the system maintains correct doctor information.	High
F3	Appointment Management	As a receptionist, I want to book and cancel appointments so that patients can meet doctors efficiently.	High
F4	Billing System	As a receptionist, I want to generate and print bills so that patients can complete their payments.	High
F5	Reports	As an admin, I want to view daily appointment reports so that I can monitor hospital performance.	Medium
F6	User Login	As a system user, I want to log in as admin or receptionist so that access is restricted based on role.	Medium
F7	Search Function	As a receptionist, I want to search for patients by name or ID so that I can quickly find their records.	Medium

Sprint 1 – F6 User Login

Product Backlog Item:

F6 – As a system user, I want to log in as admin or receptionist so that access is restricted based on role.

Sprint Backlog

Task	Responsible Role	Team Member
Design login UI	Frontend Developer	Sara
Design user table in database	Database Engineer	Omar
Implement authentication logic	Backend Developer	Ahmed
Implement role-based authorization	Backend Developer	Ahmed
Test login scenarios	QA Tester	Mariam
Sprint review	Scrum Master	Youssef

Sprint 2 – F1 Patient Management

🎯 Sprint Goal: Manage patient records

Product Backlog Item:

F1 – Add, edit, delete patient records.

Sprint Backlog

Task	Responsible Role	Team Member
Design patient database schema	Database Engineer	Omar
Develop Add Patient feature	Backend Developer	Ahmed
Develop Edit/Delete Patient feature	Backend Developer	Ahmed
Implement patient search	Backend Developer	Ahmed
Test patient module	QA Tester	Mariam
Sprint review	Scrum Master	Youssef

Sprint 3 – F2 Doctor Management

🎯 Sprint Goal: Manage doctor data

Product Backlog Item:

F2 – Add and update doctor data.

Sprint Backlog

Task	Responsible Role	Team Member
Design doctor database schema	Database Engineer	Omar
Develop Add/Edit Doctor feature	Backend Developer	Ahmed
Connect doctor module with system	Backend Developer	Ahmed
Test doctor module	QA Tester	Mariam
Sprint review	Scrum Master	Youssef

Sprint 4 – F3 Appointment Management

Sprint Goal: Enable appointment scheduling

Product Backlog Item:

F3 – Book and cancel appointments.

Sprint Backlog

Task	Responsible Role	Team Member
Design appointment table	Database Engineer	Omar
Implement Book Appointment	Backend Developer	Ahmed
Implement Cancel Appointment	Backend Developer	Ahmed
Add conflict validation logic	Backend Developer	Ahmed
Integration testing	QA Tester	Mariam
Sprint review	Scrum Master	Youssef

Sprint 5 – F4 Billing System

🎯 Sprint Goal: Implement billing functionality

Product Backlog Item:

F4 – Generate and print bills.

Sprint Backlog

Task	Responsible Role	Team Member
Design billing database schema	Database Engineer	Omar
Implement bill calculation logic	Backend Developer	Ahmed
Develop bill UI	Frontend Developer	Sara
Implement print function	Backend Developer	Ahmed
Test billing module	QA Tester	Mariam
Sprint review	Scrum Master	Youssef

Sprint 6 – F5 Reports

🎯 Sprint Goal: Implement reporting

Product Backlog Item:

F5 – View daily appointment report.

Sprint Backlog

Task	Responsible Role	Team Member
Develop report query	Backend Developer	Ahmed
Design report UI	Frontend Developer	Sara
Test report accuracy	QA Tester	Mariam
Sprint review	Scrum Master	Youssef

Sprint 7 – F7 Search Function

🎯 Sprint Goal: Advanced search functionality

Product Backlog Item:

F7 – Search patient by name or ID.

Sprint Backlog

Task	Responsible Role	Team Member
Implement search by name	Backend Developer	Ahmed
Optimize search query	Database Engineer	Omar
Test search scenarios	QA Tester	Mariam
Sprint review	Scrum Master	Youssef

Use Case Diagram

Actors

- Admin
- Receptionist
- Doctor

Main Use Cases

1. **Log in**
2. **Manage Patient Records**
 - Add Patient
 - Edit Patient
 - Delete Patient
3. **Manage Doctor Information**
 - Add Doctor
 - Update Doctor Information
4. **Manage Appointments**
 - Book Appointment
 - Cancel Appointment
5. **Generate Bill**
6. **Print Bill**
7. **Generate Daily Appointment Report**
8. **Search Patient**
 - Search by Name
 - Search by ID

