



UNIVERSITY
OF ESWATINI

CSC392 Practices in Software Engineering

Miniproject-03

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HOSPITAL MANAGEMENT SYSTEM – PROJECT PLAN

INTRODUCTION

The Hospital Management System (HMS) project aims to digitalize hospital operations, enhancing patient care, streamlining administrative workflows and ensuring accurate record-keeping.

BACKGROUND

Currently, patient data, billing and scheduling are handled manually, leading to inefficiencies and errors.

OBJECTIVE

Develop a centralized system to manage patient records, appointments, billing, inventory and reporting.

PROJECT MANAGER

Ntsiki Mabuza

SUMMARY

This system will support doctors, nurses, administrative staff and patient with secure efficient access to hospital services.

USER/CLIENT INVOLVEMENT

User Representative: Hospital administrative team, department heads, IT support.

Responsibilities:

- Provide detailed workflow information and access to legacy records.
- Allocate domain experts for requirement gathering sessions.
- Arrange periodic feedback meetings.
- Facilitate environment setup for development and testing.

RISKS

Identified Risks:

- Resistance to change by hospital staff.
- Data migration challenges.
- Delays in user feedback cycles.
- Cybersecurity threats.

Mitigation Strategies:

- Conduct user training and change management workshops.

- Pilot migration of data before full implementation.
- Setup strict security protocols and encryption measures.

STANDARDS, GUIDELINES AND PROCEDURES

Development Standards: Follow ISO/IEC 12207 Software Life Cycle Processes.

Coding Standards: Adopt industry-recognized coding standards e.g Google Java Style Guide.

Documentation: IEEE standard for software documentation.

Compliance: Ensure HIPAA (Health Insurance Portability and Accountability Act) compliance.

ORGANIZATION OF THE PROJECT

Project Team Structure:

- Project leader/manager
- System Architect
- System Designer

Training Requirements:

- Developers – Hospital operations orientation
- Users – System usage training upon deployment

PROJECT PHASES

Life Cycle Model: Waterfall with iterative prototyping for user interfaces.

Phases:

1. Requirement Gathering (4 weeks)
2. System Design (3 weeks)
3. Development (8 weeks)
4. Testing (4 weeks)
5. Deployment and Training (2 weeks)
6. Maintenance and Support (ongoing)

Milestones:

- Completion of Requirement Specification
- Approval of system design
- End of module development
- Successful User Acceptance Testing (UAT)

Critical Paths: Requirement validation and user feedback cycles.

REQUIREMENT ANALYSIS AND DESIGN

Methods:

- Interviews, observations and workshops with hospital staff.
- Entity-Relationship (ER) diagrams for database modelling.
- UML diagrams for system behavior.

Tools:

- Visual Paradigm (Design Modeling)
- Lucidchart (Diagrams)
- JIRA (Requirement Tracking)

IMPLEMENTATION

Languages: Java (backend), MYSQL (database)

Tools:

- Eclipse IDE
- GitHub for version control
- Docker for containerization

TESTING

Environment: Dedicated testing server replicating hospital network conditions.

Equipment: Test workstations, mobile devices for mobile app testing.

Testing Plan:

- Unit Testing (Developers)
- Integration Testing (Test Engineers)
- System Testing (QA Team)

Testing Procedures:

- Black-box and White-box testing techniques
- Security and stress testing

RESOURCES

Human Resources: 1 project manager, 1 system architect and 1 system design

Software Resources: Licensed development tools, database servers and reporting tools

Hardware Resources: Application servers, backup servers and client terminals.

QUALITY ASSURANCE

Objective:

It is to ensure that the hospital management system meets the specified quality standards including functionality, performance usability, security and compliance (HIPAA standards) .

Organization

Quality assurance team

- QA Manager reports to project manager
- Test engineers
- External auditor

Procedures

1. Quality Planning:

- Define measurable quality targets
- Create a quality metrics document

2. Process Assurance

- Conduct regular review such as design review, code review, test plan review.
- Enforce adherence to agreed software standards

3. Product assurance

- Unit testing
- Intergration testing
- System testing
- User acceptance testing

4. Audits and inspections

- Internal audits scheduled at end of each major phase
- Random code inspections to detect technical debt esrly

5. Tools used

- JIRA for defect tracking
- Selenium and postman for automated testing

6. Documentation

- Test reports
- Audit logs
- Defect density and resolution report

CHANGES MANAGEMENT

Its objective is to manage all changes systematically to prevent scope creep, minimize disruption and ensure system stability

Change management procedures:

1. Change request submission

Any stakeholder or team member may submit a change request form through the change management system.

2. Change review and impact analysis

A CBB evaluates change request impact on:

- Cost
- Schedule
- Scope
- Quality
- risk

3. Approval or rejection

- Based on impact analysis, a CBB will approve, reject or defer changes.

4. Change implementation:

- Approved changes are prioritized and assigned to the appropriate team
- Changes are implemented in isolated branches

5. Verification

- QA tests the changes separately before merging into the main codebase.

GANTT CHART-HOSPITAL MANAGEMENT SYSTEM

TASK	DURATION	START	END	DEPENDENCIES
Project initiation	1 week	Day 1	Day 5	
Requirement gathering	4 weeks	Day 6	Day 30	Project initiation
System design	3 weeks	Day 31	Day 50	Requirement gathering
Database design	2 weeks	Day 31	Day 45	Requirement gathering

Frontend development	4 weeks	Day 51	Day 80	System design
Backend development	5 weeks	Day 51	day 85	System design, database design
Module integration	2 weeks	Day 81	Day 95	Frontend & Backend development
Testing	4 weeks	Day 96	Day 125	Module integration
User training	1 week	Day 126	Day 130	Testing
deployment	1 week	Day 131	Day 135	User training
Post-deployment support	Ongoing	Day 136 +	Ongoing	Deployment

Note: 1 week = 5 working days