**An integrated and comprehensive healthcare system/application for Hospital of Holy Cross: Inventory, Room Assignment and Billing Management**

An

Application Development Project

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**CHAPTER I**

**INTRODUCTION**

**Project Context**

The healthcare industry plays a pivotal role in ensuring the well-being of individuals and communities. However, hospital often face challenges in managing their operations efficiently due to the complexity and volume of tasks involved. These challenges include keeping track of medical supplies, assigning patients to appropriate rooms, and generating billing information. Without an integrated system, these tasks are often handled manually or through disparate systems, leading to inefficiencies, errors and delays that can compromise patient care.

The Integrated and Comprehensive Healthcare System/Application for the Hospital of Holy Cross seeks to address these challenges by providing a centralized platform for managing inventory, room assignments and billing. This system will enable hospital staff access real-time information, automate routine tasks, and ensure seamless coordination across departments.

By leveraging modern technologies, the system aims to improve operational efficiency, enhance decision-making, and support the hospital’s goal of delivering high-quality healthcare services. Moreover, it aligns with industry standards for data security and privacy, ensuring that sensitive patient and hospital information is safeguarded.

This project not only aims to address the immediate needs of the Hospital of Holy Cross but also sets a foundation for future scalability and integration with other healthcare systems, making it a vital tool in the digital transformations of healthcare operations.

**Objectives**

To develop an integrated healthcare system that enhances the efficiency of hospital operation at the Hospital of Holy Cross

Specific Objectives:

1. User Authentication:

* Implement a secure login system with role-based access control

1. Inventory Management:

* Allow staff to track and manage medical supplies and equipment in real-time

1. Room Assignment:

* Enable efficient patient-to-room assignments based on availability and medical condition

1. Billing Management:

* Automate the generation of accurate bills with options for discounts and insurance

1. Reporting and Analytics:

* Provide comprehensive reports on inventory, room usage, and billing

1. Notifications:

* Alert staff on critical inventory levels and room unavailability

1. Compliance:

* Ensure data security and adherence to healthcare regulations

**Scope and Limitations**

**Scope**

* Inventory Management:
* Tracking, updating, and reporting on medical supplies
* Room Assignment:
* Real-time updates on room occupancy and availability
* Billing Management:
* Comprehensive billing, discounts, and reporting
* User Roles:
* Role-specific functionalities
* Reports:
* Exportable analytics on system performance and usage

**Limitations**

* Initial Focus:
* The project will focus solely on inventory, room assignment, and billing, excluding other hospital functions like laboratory management.
* Concurrent Users:
* The system is designed for up to 200 concurrent users, with future scalability options
* Third-party integrations:
* While interoperability is planned, integration with external systems (e.g., insurance databases) may require additional development

**Definition of Terms**

* Inventory Management:
* The process of monitoring and controlling hospital supplies and equipment
* Room Assignment:
* Allocation of patients to hospital rooms based on availability and medical requirements
* Billing Management:
* Systematic generation of patient invoices for services rendered
* Role-based Access Control:
* A security mechanism that restricts system access based on user roles
* HIPAA:
* Health Insurance Portability and Accountability Act, a U.S. regulation for protecting medical information
* Interoperability:
* The ability of the system to work seamlessly with other healthcare applications
* Scalability
* The system’s capacity to handle increased user load and expanded functionalities without performance degradation

**CHAPTER II**

**REQUIREMENTS SPECIFICATION**

**Hardware and Software Requirements**

**Hardware Requirements**

* Server Specifications:
* Processor: Intel Xeon or equivalent, 2.5GHz or higher
* RAM: 16 GB minimum
* Storage: SSD, 500 GB minimum
* Network: Gigabit Ethernet
* Client-Side Devices:
* Desktop/Laptop: Intel Core i5 or equivalent, 8 GB RAM
* Tablets/Smartphones: Android 10+ or iOS 14+

**Software Requirements**

* Server-Side:
* Operating system: Linux or Windows Server 2019
* Database: MySql
* Web Server: Node.js Express.js
* Client-Side:
* Browser: Chrome, Firefox, Edge
* Framework: Vue.js for front-end
* Other Software
* PDF Generator for reports
* CSV Export Tools

**Functional Requirements**

* User Authentication
* Inventory Management
* Room Assignment
* Patient Information Management
* Billing Management
* Reporting and Analytics
* Notifications
* Role-based Access Control

**Non-Functional Requirements**

Operational Requirement

* System should operate 24/7 with minimal downtime (99.9% uptime)
* Backup and recovery mechanisms in place for data integrity

Performance Requirement

* System should support up to 200 concurrent users
* Data retrieval and page loading times should not exceed 2 seconds

Security Requirement

* Data encryption for sensitive information
* Regular security audits and updates to prevent vulnerabilities

**Chapter III**

**Design and Development Methodologies**

**System Design**

Database Design

Architectural Diagram/ Block Diagram

DFD Level 0

UML Use-case Diagram

Sample Mock-up

**(Name of your chosen methodology)**

**(Phases of your chosen method)**

**Testing**- Indicate all the testing activities you performed and why it is being performed

**ISO 25010 Evaluation**

Respondents Profile

Likert Scale

Evaluation Instrument

**CHAPTER IV**

**DEVELOPMENT, TESTING AND EVALUATION RESULT**

**Presentation of the System Output**

**Testing Results**

**ISO 25010 Evaluation Result**

**CHAPTER V**

**CONCLUSION AND RECOMMENDATION**

**Conclusion**

**Recommendation**

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**Sample Accomplished ISO 25010 Evaluation Form**

**Picture During Development, Testing & Evaluation**