Software Requirements Specification

for

Electronic Health Record Monitoring System for Hospitals

Version 1.0 approved

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0.1 Document Revision History

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0.1 Draft	08/04/2024	Initial outline created	Team
0.2 Draft	11/04/2024	Added introduction and scope sections	D. Izardar
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1 Introduction

1.1 Purpose

The purpose of this document is to define the requirements for the Electronic Health Record (EHR) Monitoring System for Hospitals. This system will provide a centralized platform for managing patient health records, ensuring data integrity, and facilitating efficient healthcare delivery.

1.2 Document Conventions

- Requirements are numbered following the format: FR-XXX for functional requirements and NFR-XXX for non-functional requirements
- Priority levels: High (H), Medium (M), Low (L)
- Keywords are **bolded** for emphasis

1.3 Intended Audience and Reading Suggestions

This document is intended for:

- **Developers**: Focus on sections 2 and 3 for system requirements
- **Project Managers**: Review entire document for project scope
- **Stakeholders**: Focus on sections 1 and 4 for business objectives

1.4 Project Scope

The EHR Monitoring System will:

- Digitize patient health records
- Provide secure access to authorized medical personnel
- Enable real-time monitoring of patient vitals
- Generate reports and analytics
- Integrate with existing hospital systems

2 Overall Description

2.1 Product Perspective

The system will serve as a standalone application that interfaces with:

- Hospital Management Systems
- Laboratory Information Systems
- Pharmacy Management Systems
- Medical devices through IoT integration

2.2 Product Features

Key features include:

- Patient registration and profile management
- Electronic medical records management
- Prescription and medication tracking
- Appointment scheduling
- Analytics dashboard

2.3 User Classes and Characteristics

- **Doctors**: Need full access to patient records and prescription authority
- **Nurses**: Need access to patient vitals and medication records
- **Administrators**: Need system configuration and user management access
- **Patients**: Need limited access to view their own records

2.4 Operating Environment

- **Server**: Linux/Windows Server, MySQL/PostgreSQL
- **Client**: Web browsers (Chrome, Firefox, Edge), Mobile apps (iOS/Android)
- **Network**: Secure hospital intranet with VPN access

3 System Features and Requirements

3.1 Functional Requirements

- **FR-001**: The system shall allow authorized medical staff to create and update patient records (Priority: H)
- **FR-002**: The system shall maintain a complete history of all patient interactions, including doctor notes, prescriptions, lab reports, and diagnoses (Priority: H)
- **FR-003**: The system shall generate real-time alerts for abnormal vital signs based on predefined thresholds (Priority: H)
- **FR-004**: The system shall support role-based access control to ensure appropriate data visibility and modification rights (Priority: H)
- **FR-005**: The system shall allow patients to securely access and view their own medical records via a patient portal (Priority: M)
- **FR-006**: The system shall enable doctors to electronically prescribe medications and automatically notify the pharmacy system (Priority: H)
- **FR-007**: The system shall allow integration and data synchronization with third-party laboratory and diagnostic systems (Priority: H)

- **FR-008**: The system shall allow uploading and viewing of scanned documents, such as lab test results and medical images (Priority: M)
- **FR-009**: The system shall enable scheduling and management of patient appointments, including reminders and calendar integration (Priority: M)
- **FR-010**: The system shall generate customizable reports for doctors, hospital administrators, and stakeholders (Priority: M)
- **FR-011**: The system shall log all user activity for auditing purposes, including login, access, and modification events (Priority: H)
- **FR-012**: The system shall allow nurses to record and update patient vitals periodically (Priority: H)
- **FR-013**: The system shall automatically synchronize patient data collected from connected IoT medical devices (Priority: M)
- **FR-014**: The system shall support emergency access mode for authorized staff during critical situations, bypassing usual access controls with justification logging (Priority: H)
- **FR-015**: The system shall allow for bulk import and export of patient data in standard formats (e.g., CSV, HL7, FHIR) (Priority: L)

3.2 Non-Functional Requirements

- **NFR-001: Regulatory Compliance**
  The system shall fully comply with HIPAA and other applicable healthcare data protection regulations. (Priority: High)
- **NFR-002: System Availability**
  The system shall maintain a minimum uptime of 99.95%, excluding scheduled maintenance periods, measured monthly. (Priority: High)
- **NFR-003: Scalability and Concurrent Usage**
  The system shall efficiently support at least 1000 concurrent users without degradation in performance and be scalable to support future growth. (Priority: Medium)
- **NFR-004: Data Security**
  All patient and sensitive data shall be encrypted at rest and in transit using industry-standard encryption protocols such as AES-256 and TLS 1.2+. (Priority: High)
- **NFR-005: Performance Response Time**
  The system shall provide a response time of less than 2 seconds for 95% of user interactions under normal load conditions. (Priority: High)
- **NFR-006: Backup and Disaster Recovery**
  The system shall perform daily automated backups and support a disaster recovery time objective (RTO) of 4 hours and recovery point objective (RPO) of 1 hour. (Priority: High)

- **NFR-007: Audit Logging and Monitoring**
  The system shall maintain detailed audit logs for all user access and data modification activities, retained for a minimum of 1 year. (Priority: High)
- **NFR-008: System Maintainability**
  The system shall be designed to allow routine maintenance, upgrades, and patches with minimal downtime (less than 15 minutes per deployment). (Priority: Medium)
- **NFR-009: Accessibility Compliance**
  The system shall meet WCAG 2.1 AA accessibility standards to ensure usability for people with disabilities. (Priority: Medium)
- **NFR-010: Browser and Device Compatibility**
  The system shall be fully functional across major browsers (Chrome, Firefox, Safari, Edge) and support responsive design for desktops, tablets, and smartphones. (Priority: Low)

4 External Interface Requirements

4.1 User Interfaces

- Web-based dashboard with responsive design
- Mobile application for on-the-go access
- Administrative console for system management

4.2 Hardware Interfaces

- Integration with medical devices via HL7/FHIR standards
- Barcode scanners for patient identification

4.3 Software Interfaces

- REST API for integration with other hospital systems
- HL7/FHIR compatibility for health data exchange

5 Other Non-Functional Requirements

5.1 Performance Requirements

- Response time for record retrieval ¡ 2 seconds
- System should handle 1000 transactions per minute

5.2 Security Requirements

- Multi-factor authentication for sensitive operations
- Regular security audits and penetration testing

- Data backup and disaster recovery procedures

6 Other Requirements

6.1 Appendices

- Glossary of terms
- References to relevant standards (HIPAA, HL7, FHIR)
- Change management process