SOFTWARE ENGINEERING LABORATORY (22IS43) TASK EXECUTION SHEET

Name: ABHIJITH R	**USN: 1NT23IS005**	**Date:25/04/2025**
Lab Activity # / Task #: LA 4 TASK 1	**Document name: Software Requirements Specification**	**Submitted details:**

Software Requirements Specification (SRS) for Healthcare Electronic Health Records (EHR) System

1. Introduction

This document defines the **Software Requirements Specification (SRS)** for the **EHR system**, ensuring alignment with stakeholders, legal regulations, and software development standards.

Purpose

The **Electronic Health Records (EHR) system** is designed to:

- Digitize and centralize patient records for streamlined healthcare operations.
- Enhance collaboration among healthcare providers.
- Improve security and compliance with **HIPAA, GDPR** data protection regulations.
- Automate key workflows, including **patient registration, medical history tracking, appointment scheduling, and billing**.

Scope

Core Functionalities

- **Patient Registration** – Storing demographic details.
- **Medical Records Management** – Logging patient history and diagnoses.
- **Appointment Scheduling** – Enabling consultations.
- **Billing & Insurance Processing** – Managing invoices and insurance claims.
- **Prescription Management** – Physicians digitally issuing prescriptions.
- **Analytics & Reporting** – Generating data-driven healthcare insights.

Target Users

- **Doctors & Nurses:** Access and update patient records.

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- **Administrative Staff:** Scheduling, billing, insurance processing.
- **Patients:** Viewing records and managing appointments.

Definitions, Acronyms, and Abbreviations

- **EHR (Electronic Health Records)** – A digital system storing patient health data.
- **EMR (Electronic Medical Records)** – A subset of EHR focused on patient charts.
- **HIPAA (Health Insurance Portability and Accountability Act)** – US regulations for patient data protection.
- **GDPR (General Data Protection Regulation)** – European healthcare privacy law.
- **HL7 & FHIR** – Healthcare data exchange standards.

References

This document follows:

- **IEEE 830.9** – Software Requirements Specification guidelines.
- **HIPAA Compliance Guidelines** – Protecting healthcare data.
- **HL7 & FHIR Standards** – Medical interoperability protocols.

Overview

This SRS document defines:

- **Functional and non-functional requirements**.
- **Verification and validation processes**.
- **Software development model**

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2. Overall Description

Product Perspective

The EHR system integrates with **hospital management software, third-party APIs, and healthcare databases** to streamline **patient data access**.

Product Functions

- **Secure role-based access** for different user types.
- **Data encryption and compliance** with security laws.
- **Interoperability** with external healthcare platforms.

User Characteristics

- Medical professionals need **quick access** to patient records.
- Patients require **user-friendly dashboards** for appointments.

Constraints

- Compliance with **legal and regulatory healthcare policies**.
- Performance optimization for **scalability and uptime guarantees**.

Assumptions and Dependencies

- The system will **integrate with existing hospital infrastructure**.
- **Cloud storage & secure databases** will support medical record management

3. Specific Requirements

Functional Requirements

- **Patient Management** – Registration, data retrieval.
- **Doctor & Nurse Workflow Automation** – Treatment history tracking.
- **Billing & Insurance Processing** – Payment management.
- **Security & Role-Based Access Controls** – Restricting permissions.

Non-functional Requirements

- **Performance** – Optimized system response time.

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- **Security** – HIPAA-compliant encryption & authentication.
- **Usability** – Intuitive interface for non-technical users.
- **Reliability** – Minimum **99% uptime** guarantee.

Interface Requirements

- APIs for **integration with hospital systems**.
- Compatibility with **third-party medical software**.

Verification & Validation (V&V) Checkpoints

- **Unit Testing** – Validating individual system features.
- **Integration Testing** – Ensuring system-wide workflow interaction.
- **Acceptance Testing** – User testing for functionality approval.

4. Quality Targets

Performance Goals

- Efficient **data retrieval and processing speeds**.
- **Scalability support** for expanding healthcare records.

Security Measures

- Encrypted **data storage** and HIPAA-compliant authentication.
- Role-based **access control mechanisms** for user security.

Maintainability

- Support for **future system updates and scalability**.

5. Stakeholder Requirement Analysis

Identifying Stakeholders

- **Healthcare professionals (doctors, nurses, admin staff).**

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- **IT teams (database administrators, developers).**
- **Regulatory authorities (HIPAA compliance officers).**
- **Patients (end-users of healthcare services).**

Requirement Gathering Techniques

- **Interviews & Surveys** – Collecting input from healthcare staff.
- **Prototyping & Mockups** – Early visualization for stakeholder validation.
- **Use Case Analysis** – Mapping healthcare workflows for feasibility assessment.

6. Requirement Verification & Version Control

Verification Process

- **Peer review and validation sessions** with stakeholders.
- **Legal and compliance checks** for HIPAA and GDPR regulations.
- **Testing frameworks for system reliability and functionality**.

7. Requirement Validation Process

Steps for Validation

1. **Stakeholder Review Meetings** – Gather feedback on core functionalities.
2. **Use Case Demonstrations** – Confirm workflows meet healthcare standards.
3. **System Prototyping** – Allow hands-on testing for usability evaluation.
4. **Requirement Refinements** – Modify based on stakeholder input.
5. **Final Approval** – Sign-off from **healthcare teams, compliance officers, and IT engineers**.

Final Sign-off Process

- Healthcare professionals validate medical data accuracy.
- Compliance teams confirm **legal and regulatory adherence**.
- IT teams approve **technical feasibility & performance benchmarks**.

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