



Introduction To Software Engineering

Technical Report for “Health History” project:

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System Vision Document

1. Problem Description:

Most healthcare providers today rely on paper-based records or disconnected digital systems that store patient data in silos across clinics and hospitals. This fragmentation leads to critical delays in accessing medical history, especially during emergencies, increases the risk of medication errors, and hinders coordinated care. Patients often struggle to share their full health records with new doctors, and clinicians waste valuable time chasing incomplete information.

In addition, existing electronic medical record (EMR) systems are often complex, slow, or not interoperable, making them impractical for fast-paced environments like emergency rooms. There is a clear need for a simple, fast, secure, and unified system that gives authorized professionals instant access to a patient's complete medical history using a single identifier—such as the national ID.

The Health History system addresses this need by providing a centralized, privacy-first EMR platform designed for efficiency, accuracy, and life-saving speed in critical moments.

2. System Capabilities:

The Health History system will include the following main capabilities:

- Allow authorized healthcare professionals to retrieve a patient's full medical record using national ID as a unique identifier.
- Enable secure user authentication with role-based access (Doctor, Patient, Admin).
- Store and display core medical data: diagnoses, medications, allergies, lab results, and clinical notes.
- Support patient consent management for record sharing (with emergency override protocols).
- Maintain audit logs of all record accesses and modifications for security and compliance.
- Provide a clean, intuitive interface optimized for clinical workflows—even under time pressure.

- Ensure fast performance: load records in under 2 seconds, even on modest internet connections.
- Guarantee 99.9% data accuracy and 99% system availability for reliability in emergencies.
- Note: Imaging (X-rays, MRI) and hospital system integration are out of scope for v1 but planned for future FHIR-compliant updates.

3. Business Benefits

- Improve patient outcomes by reducing diagnostic delays and medication errors.
- Enhance trust through strong data privacy, encryption, and transparent consent controls.
- Streamline clinical workflows, saving doctors' time and reducing administrative burden.
- Support national digital health initiatives by aligning with ID-based health infrastructure.
- Create a scalable foundation for future integrations (e.g., labs, pharmacies, telemedicine).
- Demonstrate compliance readiness with local health data protection regulations.

Stakeholder Identification

Stakeholder Category	Examples / Specific Stakeholders	Their Interests in the System
Internal Operational	Developers, Testers UI/UX Designers Database Administrators	<ul style="list-style-type: none"> - Build a secure, bug-free system - Design a simple interface for stressed clinicians - Efficiently manage patient records, users, and logs
Internal Executive	CEO / Product Owner Chief Technology Officer (CTO) Head of Product Management Marketing & Business Development Team	<ul style="list-style-type: none"> - Launch a secure, compliant EMR product that will gain rapid adoption and supports future monetization. - Ensure scalability, security, and high performance (<2s response, 99% uptime). - Deliver features that meet real clinical needs (e.g., emergency access, consent management). - Drive user growth, build brand trust, and enable partnerships with clinics or health authorities.
External Operational	Doctors & Nurses Patients Hospital Staff	<ul style="list-style-type: none"> - Access accurate records instantly in emergencies - Control who sees their health data - Reduce paperwork and duplicate tests
External Executive	Ministry of Health / Regulators Hospital Administrators Legal & Compliance Officers	<ul style="list-style-type: none"> - Ensure compliance with health data laws - Evaluate system for potential institutional adoption - Protect patient privacy and prevent data breaches

Functional Requirements:

1. User Registration & Authentication:

- Users (doctors, admins) must register using verified credentials (e.g., national ID).
- Users must securely log in and log out.

2. Patient Record Access:

- Authorized users must retrieve a patient's full medical history by entering their national ID.
- The system must display core data: diagnoses, medications, allergies, lab results, notes.
- All record access must be logged with timestamp, user ID, and purpose.

3. Consent & Privacy Management:

- Patients must be able to grant or revoke consent for specific doctors to view their records.
- In emergencies, doctors may request temporary override access with mandatory justification.

4. Record Management (for Doctors):

- Doctors must be able to add or update clinical notes, prescriptions, and test results.
- All changes must be version-tracked and attributed to the editing user.

5. Admin Functions:

- Admins must manage user accounts (create, disable, assign roles).
- Admins must monitor system logs and generate audit reports.

6. Performance & Reliability:

- The system must load a patient record in under 2 seconds.
- It must remain available 99% of the time, even during peak usage.

Requirements Elicitation Techniques

1- Interviews:

Short interviews were conducted with doctors, nurses, and patients to understand real-world challenges in accessing medical records. This helped identify the need for:

- Instant access during emergencies using national ID
- Simple, distraction-free interface for high-stress environments
- Strong privacy controls with clear consent mechanisms
- Reliable performance even on slow hospital Wi-Fi

2- Document Analysis:

Reviewed national health data policies and existing EMR systems to ensure alignment with legal and technical standards.

3- Questionnaires:

Distributed to medical students and clinic staff to prioritize features (e.g., “Is allergy visibility more critical than lab history in emergencies?”).

4- Use Case Workshops:

Collaborative sessions with clinical advisors to map out emergency vs. routine access workflows.