

Electronic Healthcare System Requirements Specification

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1.Executive Summary

1.1 Project Overview

Description: This project involves the development of a **Electronic Healthcare System** designed to streamline operations in hospitals and clinics. The system will support a wide range of users, including healthcare providers, patients, administrative staff, legal authorities, emergency responders, IT personnel, and insurance providers. It aims to improve efficiency, enhance patient care, and ensure compliance with healthcare regulations.

Intended Audience: The system is intended for use by:

- **Healthcare Providers:** Doctors, nurses, and laboratory staff.
- **Patients:** Individuals seeking medical care and managing their health records.
- **Administrative Staff:** Personnel managing appointments, billing, and employee records.
- **Legal Authorities:** Prosecutors and other legal entities requiring access to medical records.
- **Emergency Responders:** Personnel needing quick access to patient information during emergencies.
- **IT Personnel:** Staff responsible for system maintenance and troubleshooting.
- **Insurance Providers:** Companies processing insurance claims and verifying coverage.

2. Product/Service Description

In this section, describe the general factors that affect the product and its requirements. This section should contain background information, not state specific requirements (provide the reasons why certain specific requirements are later specified).

2.1 Product Context

Description: The **Electronic Healthcare System** is a standalone system designed to streamline operations in hospitals and clinics. While it is self-contained and can operate independently, it will interface with a variety of external systems to provide comprehensive healthcare services. These integrations are necessary to ensure seamless data exchange and coordination across different healthcare entities.

How the Product Relates to Other Products

- **Standalone but Integrated:** The system is self-contained in that it manages core healthcare operations (e.g., appointment scheduling, medical record management, billing) internally. However, it interfaces with external systems to extend its functionality and provide end-to-end healthcare services.
- **Interdependence:** The system relies on external systems (e.g., pharmacies, insurance providers, laboratories) for specific functionalities, such as prescription management, insurance claim processing, and lab test coordination. These integrations ensure that the system can operate efficiently within the broader healthcare ecosystem.

Interfaces with Related Systems

- **Internal Interfaces:**
 - **Hospital Databases:** The system integrates with internal hospital databases to manage patient records, appointments, and billing information.
 - **Employee Management Systems:** It interfaces with HR systems to manage employee records, training, and payroll.
 - **IT Maintenance Tools:** The system supports tools for system monitoring, maintenance, and troubleshooting.
 - **Mental Health and Nutrition Services:** The system integrates with internal systems to support mental health counseling and nutrition planning, allowing counselors and nutritionists to access patient records and provide personalized care.
- **External Interfaces:**
 - **Pharmacies:** Integration with pharmacies enables prescription management, including automated refill requests and drug interaction checks.
 - **Insurance Providers:** Integration with insurance companies allows for real-time coverage verification and claim processing.
 - **Laboratory Systems:** The system interfaces with laboratories to manage test requests, process results, and notify relevant parties.
 - **Emergency Services:** Integration with emergency services provides real-time access to critical patient information during emergencies.
 - **Legal Authorities:** The system allows secure access to medical records for legal purposes, ensuring compliance with legal and regulatory requirements.
 - **Organ Donation Networks:** Integration with organ donation networks facilitates donor and recipient coordination.

Major Components and Interconnections

Below is a high-level description of the system's major components and their interconnections:

1. **Core System:**
 - Manages **appointments, medical records, billing, and employee management.**
 - Acts as the central hub for all internal operations.
2. **Internal Systems:**
 - **Hospital Databases:** Store patient records, appointments, and billing information.
 - **Employee Management Systems:** Manage employee records, training, and payroll.
 - **IT Maintenance Tools:** Support system monitoring, maintenance, and troubleshooting.
 - **Mental Health and Nutrition Services:** Provide tools for mental health counseling and nutrition planning, integrated with patient records.
3. **External Systems:**
 - **Pharmacies:** Handle prescription management and drug dispensation.
 - **Insurance Providers:** Process claims and verify coverage.
 - **Laboratories:** Manage lab test requests and results.
 - **Emergency Services:** Access critical patient information during emergencies.
 - **Legal Authorities:** Access medical records for legal purposes.

- **Organ Donation Networks:** Coordinate organ donation processes.
- 4. **Mobile Applications:**
 - Provide patients and doctors with mobile access to the system for scheduling, record access, and notifications.

2.2 User Characteristics

User Profiles

1. **Patients:**
 - **Role:** Individuals seeking medical care and managing their health records.
 - **Experience:** Limited experience with healthcare systems; may have varying levels of comfort with technology.
 - **Technical Expertise:** Low to moderate; need an intuitive and user-friendly interface.
 - **Other Characteristics:** May require assistance with scheduling appointments, accessing medical records, and understanding medical terminology.
2. **Doctors:**
 - **Role:** Healthcare providers responsible for diagnosing and treating patients.
 - **Experience:** Extensive experience in healthcare; familiar with medical systems and terminology.
 - **Technical Expertise:** Moderate to high; comfortable using digital tools for managing patient records, prescribing medications, and viewing lab results.
 - **Other Characteristics:** Need quick access to patient data and tools for efficient decision-making.
3. **Nurses:**
 - **Role:** Healthcare providers responsible for patient care and treatment administration.
 - **Experience:** Moderate experience in healthcare; familiar with patient care processes.
 - **Technical Expertise:** Moderate; comfortable using digital tools for updating patient records and managing care tasks.
 - **Other Characteristics:** Need tools for tracking patient vitals, administering medications, and coordinating care.
4. **Pharmacy Staff:**
 - **Role:** Personnel responsible for managing prescriptions and inventory.
 - **Experience:** Moderate experience in pharmacy operations; familiar with prescription management.
 - **Technical Expertise:** Moderate; comfortable using digital tools for managing prescriptions and inventory.
 - **Other Characteristics:** Need tools for verifying prescriptions, checking drug interactions, and managing inventory.
5. **Laboratory Staff:**
 - **Role:** Personnel responsible for processing lab tests and managing test results.
 - **Experience:** Moderate experience in laboratory operations; familiar with lab test processes.
 - **Technical Expertise:** Moderate; comfortable using digital tools for managing test requests and results.

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- **Other Characteristics:** Need tools for scheduling tests, processing results, and notifying relevant parties.

6. Administrative Staff:

- **Role:** Personnel responsible for managing user accounts, generating reports, and handling financial operations.
- **Experience:** High experience in administrative tasks; familiar with healthcare operations.
- **Technical Expertise:** High; comfortable using digital tools for managing accounts, generating reports, and handling finances.
- **Other Characteristics:** Need tools for managing user accounts, generating reports, and ensuring compliance with regulations.

7. Finance Office Staff:

- **Role:** Personnel responsible for managing billing, payments, and financial transactions.
- **Experience:** High experience in financial operations; familiar with billing and insurance processes.
- **Technical Expertise:** High; comfortable using digital tools for managing finances and generating reports.
- **Other Characteristics:** Need tools for managing patient billing, processing insurance claims, and reconciling payments.

1. Procurement Office Staff:

- **Role:** Personnel responsible for managing the purchase of medical equipment, supplies, and services.
- **Experience:** High experience in procurement and supply chain management; familiar with healthcare equipment and supplies.
- **Technical Expertise:** High; comfortable using digital tools for managing purchase orders, tracking inventory, and generating reports.
- **Other Characteristics:** Need tools for creating and managing purchase orders, tracking inventory levels, and ensuring timely delivery of supplies and equipment.

8. Emergency Services Personnel:

- **Role:** First responders requiring quick access to critical patient information during emergencies.
- **Experience:** Moderate experience in emergency response; familiar with healthcare systems.
- **Technical Expertise:** Moderate; comfortable using digital tools for accessing patient data in real-time.
- **Other Characteristics:** Need prioritized access to patient records and tools for updating patient status during emergencies.

9. IT Support Staff:

- **Role:** Personnel responsible for system maintenance and troubleshooting.
- **Experience:** High experience in IT operations; familiar with healthcare systems.
- **Technical Expertise:** High; comfortable using digital tools for system monitoring, maintenance, and troubleshooting.
- **Other Characteristics:** Need tools for monitoring system performance, applying updates, and resolving technical issues.

10. Human Resource Office Staff:

- **Role:** Personnel responsible for managing employee records, training, and payroll.

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- **Experience:** High experience in HR operations; familiar with employee management processes.
- **Technical Expertise:** High; comfortable using digital tools for managing employee records and payroll.
- **Other Characteristics:** Need tools for managing employee records, scheduling training, and ensuring compliance with HR policies.

11. Health Insurance Companies:

- **Role:** Entities responsible for processing insurance claims and verifying coverage.
- **Experience:** High experience in insurance operations; familiar with healthcare billing processes.
- **Technical Expertise:** High; comfortable using digital tools for processing claims and verifying coverage.
- **Other Characteristics:** Need tools for managing insurance claims, verifying coverage, and generating reports.

12. Nutritionists:

- **Role:** Healthcare providers responsible for creating and monitoring personalized diet plans.
- **Experience:** Moderate experience in nutrition and diet planning; familiar with healthcare systems.
- **Technical Expertise:** Moderate; comfortable using digital tools for creating and updating diet plans.
- **Other Characteristics:** Need tools for tracking patient adherence to diet plans and monitoring progress.

13. Mental Health Counselors:

- **Role:** Healthcare providers responsible for providing mental health support and therapy.
- **Experience:** Moderate experience in mental health counseling; familiar with healthcare systems.
- **Technical Expertise:** Moderate; comfortable using digital tools for conducting therapy sessions and tracking patient progress.
- **Other Characteristics:** Need tools for monitoring patient mood logs, providing feedback, and conducting virtual therapy sessions.

14. Organ Donor Coordinators:

- **Role:** Personnel responsible for managing organ donation processes and records.
- **Experience:** Moderate experience in organ donation coordination; familiar with healthcare systems.
- **Technical Expertise:** Moderate; comfortable using digital tools for managing donor and recipient records.
- **Other Characteristics:** Need tools for coordinating organ donation processes and tracking donor and recipient statuses.

2.3 Assumptions

The following assumptions have been made during the development of the **Electronic Healthcare System**. If any of these assumptions change, the requirements may need to be revised accordingly.

1. Hardware and Software Availability:

- The system will run on modern hardware and software platforms, including **Windows**, **macOS**, and **Linux**.
- Hospitals and clinics will have the necessary infrastructure (e.g., servers, network connectivity) to support the system.

2. User Expertise:

- Users (e.g., patients, doctors, nurses, administrative staff) will have basic training to use the system effectively.
- IT support staff will have the technical expertise to maintain and troubleshoot the system.

3. Data Availability:

- Patient records, lab results, and other critical data will be available in digital format and accessible through the system.
- External systems (e.g., pharmacies, insurance providers, laboratories) will provide real-time data exchange capabilities.

4. Regulatory Compliance:

- The system will comply with healthcare regulations such as **HIPAA** (Health Insurance Portability and Accountability Act) and **GDPR** (General Data Protection Regulation).
- Hospitals and clinics will have the necessary processes in place to ensure compliance with these regulations.

5. Integration with External Systems:

- External systems (e.g., pharmacies, insurance providers, laboratories) will provide APIs or other integration mechanisms for seamless data exchange.
- Emergency services and legal authorities will have secure access to the system as needed.

6. System Performance:

- The system will operate in environments with reliable internet connectivity and sufficient bandwidth to support real-time data access and updates.
- The system will handle peak usage without significant performance degradation.

7. Security:

- Hospitals and clinics will implement necessary security measures (e.g., firewalls, encryption) to protect the system from unauthorized access.
- Users will follow security protocols (e.g., multi-factor authentication, password policies) to ensure data security.

8. Procurement and Supply Chain:

- The procurement office will have access to reliable suppliers for medical equipment and supplies.

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- Inventory levels will be tracked in real-time, and reorder alerts will be acted upon promptly.

9. User Adoption:

- Patients, doctors, nurses, and other users will adopt the system and use it as their primary tool for managing healthcare operations.
- Training and support will be provided to ensure smooth adoption.

10. Mobile Applications:

- Patients and doctors will have access to smartphones or tablets to use the mobile applications.
- The mobile applications will be compatible with **Android** and **iOS** platforms.

2.4 Constraints and Dependencies

The following constraints and dependencies affect the requirements for the **Electronic Health Record System**:

Constraints

1. Regulatory Compliance:

- The system must comply with healthcare regulations such as **HIPAA** (Health Insurance Portability and Accountability Act) and **GDPR** (General Data Protection Regulation).
- This constraint affects the design of security features, data encryption, and audit trails.

▪ Data Security and Privacy:

- The system must ensure the security and privacy of patient data at all times.
- This constraint requires the implementation of end-to-end encryption, multi-factor authentication, and secure access controls.

▪ System Performance:

- The system must handle at least **100,000 concurrent users** without performance degradation.
- Response times for critical operations must not exceed **2 seconds**.
- This constraint affects the design of the system's architecture and database.

▪ Integration with Legacy Systems:

- The system must operate in parallel with existing legacy systems during the transition period.
- This constraint requires the system to support data migration and interoperability with older systems.

▪ Budget and Resource Limitations:

- The development and implementation of the system are subject to budget and resource constraints.
- This constraint may limit the scope of certain features or require prioritization of requirements.

▪ User Training and Adoption:

- The system must be easy to use, with minimal training required for new users.
- This constraint affects the design of the user interface and the development of training materials.

▪ Mobile Application Compatibility:

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- The system must support mobile applications for **Android** and **iOS** platforms.
- This constraint affects the design and development of the mobile applications.

Dependencies

- **Integration with External Systems:**
 - The system depends on integration with external systems such as **pharmacies, insurance providers, laboratories, emergency services, legal authorities, and organ donation networks**.
 - These integrations are necessary for functionalities like prescription management, insurance claim processing, lab test coordination, and emergency response.
- **Data Availability:**
 - The system depends on the availability of patient records, lab results, and other critical data in digital format.
 - If data is not available or accessible, the system's functionality may be impacted.
- **Third-Party APIs:**
 - The system depends on third-party APIs for integration with external systems (e.g., pharmacies, insurance providers, laboratories).
 - If these APIs are not available or do not function as expected, the system's functionality may be limited.
- **IT Infrastructure:**
 - The system depends on the availability of modern IT infrastructure (e.g., servers, network connectivity) in hospitals and clinics.
 - If the infrastructure is not available or insufficient, the system's performance may be affected.
- **Regulatory Approvals:**
 - The system depends on obtaining necessary regulatory approvals (e.g., HIPAA compliance certification).
 - If approvals are delayed or denied, the system's deployment may be impacted.
- **User Adoption:**
 - The system depends on the adoption and active use by patients, doctors, nurses, and other users.
 - If users do not adopt the system, its effectiveness may be limited.
- **Development of Specific Modules:**
 - Certain modules (e.g., **Emergency Services Integration, Organ Donation Coordination**) must be completed before other modules can be built or deployed.
 - This dependency affects the development timeline and prioritization of tasks.
- **Data Migration from Legacy Systems:**
 - The system depends on the successful migration of data from existing legacy systems.
 - If data migration is not completed on time or encounters issues, the system's deployment may be delayed.

3. Requirements

3.1 User Requirements

These requirements define the specific actions and functionalities that users need to perform within the system to fulfill their roles effectively:

Procurement Office

- The procurement office staff shall be able to log in securely to the system.
- The procurement office shall have a dashboard displaying inventory levels, pending requests, and order statuses.
- The procurement office shall be able to view and analyze procurement needs based on hospital supply usage trends.
- The procurement office shall be able to place purchase requests for medical supplies and equipment.
- The procurement office shall have access to supplier information and order history.
- The procurement office shall be able to track order fulfillment status in real-time.
- The procurement office shall receive automatic alerts for low stock levels.
- The procurement office shall be able to generate reports on procurement activities and expenditures.

Health Insurance Companies

- Health insurance companies shall be able to securely log into the system.
- Health insurance companies shall have access to patient medical billing records.
- Health insurance companies shall be able to verify patient coverage details in real-time.
- Health insurance companies shall be able to process and approve claims through the system.
- Health insurance companies shall have access to reports on processed claims and outstanding payments.
- Health insurance companies shall be able to request clarifications or dispute claims through a structured request system.
- The system shall enforce strict access controls to ensure health insurance companies can only access necessary billing and coverage-related data.

Laboratory Staff

- Laboratory technicians should be able to securely log into the system.
- Laboratory technicians should have a dashboard to view and manage pending test requests.
- Laboratory technicians should be able to schedule patients for tests based on priority.
- Laboratory technicians should be able to conduct tests and record results in patient records.
- Laboratory technicians should be able to upload and attach scanned or machine-generated test reports.
- Laboratory technicians should be able to notify doctors when test results are available.
- Laboratory technicians should be able to notify patients when their results are ready.
- Laboratory technicians shall have all their actions logged for security and audit purposes.

Organ Donor Coordinator

- Organ Donor Coordinator should be able to register new organ donors in the system.
- Organ Donor Coordinator should be able to match donors with recipients based on medical compatibility.
- Organ Donor Coordinator should be able to receive notifications when a matching donor-recipient pair is found.
- Organ Donor Coordinator should be able to track the real-time transport status of organs.
- Organ Donor Coordinator should be able to generate reports on organ donation statistics.

Finance Office

- The Finance Office should be able to manage patient billing by generating invoices for medical services and treatments.
- The Finance Office should be able to process payments and accept various payment methods (cash, credit card, insurance, online transactions).
- The Finance Office should be able to handle insurance claims by verifying insurance coverage and processing claims with insurance providers.
- The Finance Office should be able to track hospital expenses and revenue for financial reporting.
- The Finance Office should be able to generate financial reports on billing, payments, outstanding balances, and overall financial performance.

Doctors

- Doctors should be able to securely log into the system.
- Doctors should have a dashboard that displays their appointments, messages, and tasks.
- Doctors should be able to view and update patient records easily.
- Doctors should be able to manage and reschedule appointments conveniently.
- Doctors should be able to prescribe medications electronically without complications.
- Doctors should be able to review and integrate lab results seamlessly.

Emergency Staff

- Emergency staff shall have instant access to patient emergency medical records, including allergies and ongoing treatments.
- Emergency responders shall receive automatic navigation to the emergency location with traffic-aware routing.
- Emergency responders shall be able to communicate directly with hospital staff while transporting a patient.
- Emergency staff shall receive automatic alerts if a patient has infectious diseases or special care requirements.
- Emergency staff shall be able to submit digital post-incident reports immediately after handling a case.

Mental Health Counselor

- Counselors shall have secure access to patient therapy records and mental health history.
- Patients shall be able to schedule therapy sessions via mobile or web platforms.
- Patients shall have access to an emergency mental health hotline.
- Patients shall have the option to participate in anonymous mental health support forums.
- Counselors shall be able to flag high-risk patients and notify emergency services.

Administrative Staff

- Administrative staff shall be able to manage hospital user accounts and set access permissions.
- Staff shall be able to schedule and modify patient appointments across all hospital departments.
- Staff shall have access to real-time hospital occupancy data and resource tracking.
- Administrative users shall be able to generate hospital performance and patient visit reports.
- Administrative staff shall receive system notifications for scheduled hospital maintenance.

Nutritionist

- Nutritionist should be able to log in securely.
- Nutritionist should be able to create and update personalized meal plans for patients.
- Nutritionist should be able to track patient progress over time (e.g., weight, BMI, dietary adherence).
- Nutritionist should be able to calculate nutritional needs based on patient data (e.g., age, gender, activity level).
- Nutritionist should have access to an intuitive interface for easy navigation.
- Nutritionist should be able to access patient data and generate reports quickly.
- Nutritionist should be able to share patient data and recommendations with other healthcare providers.
- Nutritionist should be able to receive referrals from physicians.
- Nutritionist should have access to educational resources for patients (e.g., articles, videos).
- Nutritionist should ensure that patient data is secure and accessible only to authorized personnel.

Nurses

- Nurse should be able to log in securely.
- Nurse should be able to access and update patient medical records, including vitals and medication history.
- Nurse should be able to document patient symptoms, observations, and progress.
- Nurse should be able to receive alerts for critical patient conditions (e.g., abnormal vitals).
- Nurse should be able to schedule and manage patient appointments.
- Nurse should be able to request and track lab tests and imaging reports.
- Nurse should have access to an intuitive interface for easy navigation.
- Nurse should be able to generate reports on patient health status and care plans.
- Nurse should be able to communicate and share patient information securely with physicians and specialists.

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- Nurse should ensure that patient data is secure and accessible only to authorized personnel.

Pharmacy Staff

- Pharmacy staff should be able to log in securely.
- Pharmacy staff should be able to process prescriptions efficiently and check for drug interactions.
- Pharmacy staff should be able to track and manage inventory in real-time.
- Pharmacy staff should be able to communicate with doctors for prescription clarifications.
- Pharmacy staff should be able to issue medications to patients in a timely manner.
- Pharmacy staff should be able to receive automatic alerts for low-stock or expired medications.
- Pharmacy staff should be able to generate reports on dispensed medications and inventory levels.
- Pharmacy staff should have access to patient medication history to avoid duplicate or conflicting prescriptions.
- Pharmacy staff should ensure compliance with pharmacy regulations and patient safety guidelines.
- Pharmacy staff should have access to an intuitive and efficient interface for quick access to necessary information.

IT Support Office

- IT Support should be able to monitor system performance in real time.
- IT Support should be able to perform remote troubleshooting and diagnostics.
- IT Support should be able to log all technical issues and generate automated reports.
- IT Support should receive alerts for potential system failures or performance drops.
- IT Support should be able to apply patches and software updates remotely.
- IT Support should have the ability to manage user permissions and roles.

Patients

- Patients should be able to schedule, modify, and cancel appointments through the system.
- Patients should have secure access to their medical records and test results.
- Patients should be able to request prescription refills through the system.
- Patients should receive automated reminders for upcoming appointments and medication.
- Patients should have access to telemedicine consultations through the platform.
- Patients should be able to provide feedback and rate their care experience.

Human Resource Office

- HR staff should be able to manage employee records and payroll through the system.
- HR staff should be able to track employee performance and training progress.
- HR staff should be able to generate automated reports on employee attendance and leave.
- HR staff should have the ability to update job roles, departments, and employee status.
- HR staff should be able to manage recruitment, including applications and interviews.
- HR staff should receive notifications for compliance deadlines, such as certifications.

3.2 Functional Requirements

Procurement Office

Req#	Requirement	Comments	Priority
FR_PO_01	The system shall enable the procurement office to create and manage purchase orders for medical supplies.	Ensures efficient procurement processes.	1
FR_PO_02	The system shall integrate with hospital inventory management to track stock levels.	Provides real-time inventory visibility.	1
FR_PO_03	The system shall notify procurement staff of low stock items automatically.	Reduces risk of supply shortages.	1
FR_PO_04	The system shall store supplier details and allow procurement staff to manage supplier contracts.	Streamlines supplier interactions.	1
FR_PO_05	The system shall generate and track purchase requisitions.	Ensures purchase request traceability.	1
FR_PO_06	The system shall provide reporting tools for procurement analysis (e.g., spending trends, supplier performance, order efficiency).	Facilitates data-driven decisions.	2

Health Insurance Companies

Req#	Requirement	Comments	Priority
FR_HIC_01	The system shall provide health insurance companies with real-time access to patient billing records.	Ensures efficient claim processing.	1
FR_HIC_02	The system shall allow health insurance companies to verify policy coverage details.	Prevents errors in claim approvals.	1
FR_HIC_03	The system shall enable health insurance companies to submit and process insurance claims electronically.	Streamlines claim management.	1
FR_HIC_04	The system shall generate financial reports on approved and pending claims.	Provides transparency and accountability.	2
FR_HIC_05	The system shall enable health insurance companies to request additional documentation or dispute claims through a structured request process.	Allows better claim resolution.	1

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FR_HIC_06	The system shall enforce access control mechanisms to restrict health insurance companies to billing and coverage-related data only.	Ensures compliance with privacy laws.	1
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Laboratory Staff

Req#	Requirement	Comments	Priority
FR_LAB_01	The system shall manage lab test requests and results, including scheduling and dissemination.	Ensures efficient lab operations.	1
FR_LAB_02	The system shall automatically notify relevant parties when new lab results are posted.	Reduces delays in medical decisions.	1
FR_LAB_03	The system shall support uploading, digital storage, and access to imaging files (X-rays, MRIs, CT scans).	Enables secure record management.	1

Organ Donor Coordinator

Req#	Requirement	Comments	Priority
FR_ORG_01	The system shall allow organ donor coordinators to register new donors with personal and medical details.	This ensures that donor information is properly stored and accessible for matching purposes.	1
FR_ORG_02	The system shall send automated alerts to the coordinator when a matching donor-recipient pair is found.	Automated notifications ensure quick decision-making and reduce delays in transplant procedure.	1
FR_ORG_03	The system shall generate monthly and yearly organ donation reports	Reports provide valuable insights for hospital administration and regulatory compliance.	3
FR_ORG_04	The system shall integrate with national donor databases to check donor-recipient compatibility.	Integration with national databases improves accuracy in organ matching and reduces manual work.	1

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Finance Office

Req#	Requirement	Comments	Priority
FR_FIN_01	The system shall allow billing staff to create and process patient bills.	This makes sure all medical services are billed correctly, with itemized details for easy tracking.	1
FR_FIN_02	The system shall send automated reminders to patients with outstanding balances.	Helps patients remember to pay their bills by sending reminders through email, SMS, or app notifications.	2
FR_FIN_03	The system shall allow billing staff to apply discounts or financial aid for eligible patients.	Lets staff give discounts or financial aid to patients who qualify and keeps records for future reference.	2
FR_FIN_04	The system shall log all billing transactions with timestamps for auditing purposes.	Saves a record of every payment with the date, time, and user details to prevent fraud and track transactions.	1

Doctors

Req#	Requirement	Comments	Priority
FR_DOC_01	The system shall allow doctors to access and update patient medical records in real-time	Ensures doctors have up-to-date patient information, improving diagnosis and treatment accuracy. Real-time updates help in emergencies and prevent medical errors.	1
FR_DOC_02	The system shall facilitate doctors in electronically prescribing medications, with automatic updates to pharmacy records.	Reduces prescription errors and speeds up the medication process by ensuring pharmacies receive accurate prescriptions instantly.	1
FR_DOC_03	The system shall enable doctors to view and interpret laboratory results directly linked to patient profiles.	Provides quick access to test results, allowing faster diagnosis and treatment decisions without delays in communication.	1

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Emergency Staff

Req#	Requirement	Comments	Priority
FR_ES_01	The system shall provide emergency responders with a real-time patient health summary upon dispatch.	Reduces treatment delays.	1
FR_ES_02	The system shall integrate with GPS navigation to provide optimized ambulance routing.	Ensures rapid response.	1
FR_ES_03	The system shall allow hospitals to pre-register incoming emergency cases and prepare resources accordingly.	Improves patient care efficiency.	1
FR_ES_04	The system shall support voice-activated commands for hands-free emergency report logging.	Enhances safety during transit.	2
FR_ES_05	The system shall provide a digital emergency response checklist for responders to ensure protocol compliance.	Reduces human error.	2
FR_ES_06	The system shall enable responders to send real-time patient condition updates to hospital ER staff.	Prepares hospital teams for arrival.	2

Mental Health Counselor

Req#	Requirement	Comments	Priority
FR_MH_01	The system shall allow patients to book and manage their mental health counseling appointments.	Enhances accessibility.	1
FR_MH_02	The system shall provide encrypted video conferencing for virtual therapy sessions.	Ensures privacy.	1
FR_MH_03	The system shall allow counselors to maintain and update digital therapy notes for each patient.	Supports effective treatment tracking.	2
FR_MH_04	The system shall integrate with insurance providers for mental health coverage verification.	Ensures financial accessibility.	2
FR_MH_05	The system shall provide an automated mental health risk assessment questionnaire for patients.	Helps in early detection.	3
FR_MH_06	The system shall allow counselors to schedule group therapy sessions.	Encourages peer support.	3

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Administrative Staff

Req#	Requirement	Comments	Priority
FR_AD_01	The system shall allow administrative staff to create, modify, and deactivate user accounts.	Maintain controlled system access.	1
FR_AD_02	The system shall provide a centralized scheduling interface for managing patient appointments.	Improves hospital workflow efficiency.	1
FR_AD_03	The system shall enable real-time tracking of hospital inventory and emergency supply levels.	Prevents shortages and optimizes resources.	1
FR_AD_04	The system shall generate automated reports on hospital operations and patient statistics.	Supports data-driven decision-making.	2
FR_AD_05	The system shall allow secure storage and retrieval of hospital policies and patient consent forms.	Ensures compliance with legal requirements.	2

Nutritionist

Req#	Requirement	Comments	Priority
FR_NUT_01	The system shall allow the nutritionist to view and update patient dietary information, medical history, and allergies.	Provides essential patient information for personalized dietary recommendations.	1
FR_NUT_02	The system shall allow the nutritionist to create, modify, and track personalized diet plans.	Enables continuous monitoring and adjustment of patient diets.	1
FR_NUT_03	The system shall allow the nutritionist to assess dietary habits, calculate nutritional intake, and suggest improvements.	Helps identify deficiencies or excesses in a patient's diet.	2
FR_NUT_04	The system shall enable collaboration between the nutritionist and other healthcare professionals.	Ensures full patient care through integrated nutritional recommendations.	1
FR_NUT_05	The system shall allow the nutritionist to schedule and conduct in-person or virtual consultations.	Provides flexibility in patient-nutritionist interactions.	2
FR_NUT_06	The system shall generate reports on patient progress and diet adherence.	Supports decision-making by tracking dietary interventions.	3

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FR_NUT_07	The system shall ensure compliance with medical guidelines and privacy regulations.	Protects patient data and ensures adherence to medical best practices.	1
FR_NUT_08	The system shall allow the nutritionist to provide patients with educational materials and recommend meal plans.	Enhances patient knowledge and encourages healthy eating habits.	2
FR_NUT_09	The system shall allow the nutritionist to receive patient feedback on dietary plans.	Helps adjust meal plans based on patient preferences and difficulties.	2
FR_NUT_10	The system shall send reminders, track meal adherence, and enhance patient engagement.	Improves compliance with dietary recommendations.	2

Nurses

Req#	Requirement	Comments	Priority
FR_NUR_01	The system shall allow the nurse to view and update patient medical records.	Provides access to essential patient health information.	1
FR_NUR_02	The system shall allow the nurse to document patient symptoms, vitals, and medication history.	Ensures accurate patient tracking for better treatment.	1
FR_NUR_03	The system shall generate alerts for abnormal patient vitals and other critical conditions.	Helps in timely intervention for patient safety.	1
FR_NUR_04	The system shall allow the nurse to schedule, modify, and manage patient appointments.	Enables efficient patient flow and scheduling.	2
FR_NUR_05	The system shall allow the nurse to request and track lab tests and imaging reports.	Facilitates faster diagnostics and better decision-making.	2
FR_NUR_06	The system shall enable communication and data sharing with physicians and specialists.	Ensures coordinated care and reduces communication gaps.	1
FR_NUR_07	The system shall generate reports on patient health status, treatment plans, and medical history.	Supports data-driven decision-making.	3

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FR_NUR_08	The system shall ensure compliance with medical guidelines and privacy regulations.	Protects patient data and ensures adherence to best practices.	1
FR_NUR_09	The system shall allow nurses to provide patients with educational materials and post-care instructions.	Enhances patient knowledge and compliance with treatment plans.	2
FR_NUR_10	The system shall send automated reminders for medication, follow-ups, and tests.	Improves patient adherence to treatment schedules.	2

Pharmacy Staff

Req#	Requirement	Comments	Priority
FR_PHA_01	The system shall allow pharmacy staff to securely access patient prescriptions.	Ensures only authorized personnel handle prescriptions.	1
FR_PHA_02	The system shall verify prescriptions and check for potential drug interactions before dispensation.	Enhances patient safety and reduces medication errors.	1
FR_PHA_03	The system shall allow pharmacy staff to process and update prescription records.	Keeps track of medication issuance and avoids duplication.	1
FR_PHA_04	The system shall provide real-time tracking of pharmacy inventory.	Helps maintain an accurate stock of medications.	1
FR_PHA_05	The system shall generate automatic reorder alerts when stock levels are low.	Prevents shortages and ensures medication availability.	2
FR_PHA_06	The system shall allow pharmacy staff to communicate securely with doctors for prescription clarifications.	Reduces errors and ensures correct medication dispensation.	2
FR_PHA_07	The system shall generate reports on dispensed medications, stock levels, and expiry dates.	Supports regulatory compliance and efficient inventory management.	3
FR_PHA_08	The system shall allow pharmacy staff to issue medications and update patient records accordingly.	Ensures accurate tracking of medication distribution.	1

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FR_PHA_09	The system shall provide alerts for potential duplicate or conflicting prescriptions.	Prevents adverse drug reactions.	2
FR_PHA_10	The system shall ensure compliance with pharmacy regulations and patient safety guidelines.	Protects patient health and ensures legal adherence.	1

IT Support Office

Req#	Requirement	Comments	Priority
FR_IT_01	The system shall monitor system performance in real time.	Ensures proactive system monitoring and stability.	2
FR_IT_02	The system shall enable remote troubleshooting and diagnostics.	Allows IT support to resolve issues efficiently.	2
FR_IT_03	The system shall log all technical issues and generate automated reports.	Facilitates tracking and resolution of recurring issues.	2
FR_IT_04	The system shall provide alerts for potential system failures or performance drops.	Helps prevent downtime and system disruptions.	1
FR_IT_05	The system shall allow remote application of patches and software updates.	Ensures timely maintenance and security compliance.	2
FR_IT_06	The system shall provide IT Support with the ability to manage user permissions and roles.	Ensures controlled system access and security.	1

Patients

Req#	Requirement	Comments	Priority
FR_PT_01	The system shall allow patients to schedule, modify, and cancel appointments.	Ensures flexibility and accessibility for patients.	2
FR_PT_02	The system shall provide patients with secure access to their medical records and test results.	Protects patient privacy while enabling self-care.	1
FR_PT_03	The system shall allow patients to request prescription refills.	Simplifies medication management for patients.	2
FR_PT_04	The system shall send automated reminders for upcoming appointments and medication.	Helps patients stay on track with their care plans.	2

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FR_PT_05	The system shall provide access to telemedicine consultations through the platform.	Enhances healthcare accessibility.	3
FR_PT_06	The system shall allow patients to provide feedback and rate their care experience.	Supports continuous improvement in healthcare services.	3

Human Resource Office

Req#	Requirement	Comments	Priority
FR_HR_01	The system shall allow HR staff to manage employee records and payroll.	Ensures proper employee data management and payroll accuracy.	1
FR_HR_02	The system shall enable HR staff to track employee performance and training progress.	Supports employee development and performance reviews.	2
FR_HR_03	The system shall generate automated reports on employee attendance and leave.	Improves tracking and analysis of workforce availability.	2
FR_HR_04	The system shall allow HR staff to update job roles, departments, and employee status.	Ensures accurate and up-to-date employee classifications.	1
FR_HR_05	The system shall facilitate HR in managing recruitment, including applications and interviews.	Streamlines the hiring process for efficiency.	3
FR_HR_06	The system shall provide HR staff with notifications for compliance deadlines (e.g., certifications).	Helps ensure timely adherence to regulatory requirements.	2

3.3 Non-Functional Requirements

3.3.1 Product Requirements

3.3.1.1 Usability Requirements

- New users should require no more than 2 hours of training to use basic system functionalities effectively.
- The system should provide a comprehensive help section with at least 50 indexed help frames

Electronic Healthcare System Requirements Specification

- The system shall ensure that all user interfaces are intuitive and accessible to users with minimal training.
- The system shall support multilingual interfaces to accommodate diverse user bases.
- The system shall provide a mobile-friendly experience, with dedicated apps for Android and iOS.
- The system shall provide a high-contrast, simplified interface for emergency responders, optimized for use in high-stress environments.

3.3.1.2 Performance Requirements

- The system shall handle at least 100,000 concurrent users without performance degradation.
- Response times for all critical operations shall not exceed 2 seconds.
- The system shall support at least 50,000 simultaneous emergency requests to ensure scalability.

3.3.1.3 Availability

- The system shall provide data backup and disaster recovery solutions to ensure data integrity and availability.
- The system should average 10,000 hours between failures. on average, the system should operate flawlessly for about 10,000 hours before encountering a problem
- The system should have a downtime probability of less than 0.1%.
- The system should not have more than one failure per 14 months.
- The system must be available 99.9% of the time, as previously stated.
- The system shall perform daily backups of all critical data, with backups stored in a secure, offsite location. Data recovery shall be possible within 1 hour of an outage.

3.2.1.4 Security

- The system shall implement end-to-end encryption for all data transmissions.
- The system shall use multi-factor authentication for users.
- The system shall automatically log out users after 15 minutes of inactivity to prevent unauthorized access.
- The system shall ensure all data related to emergency mental health interventions is securely encrypted and stored for a minimum of 6 years to comply with medical privacy laws.

3.2.1.5 Speed

- The system must process at least 1000 transactions per second during peak usage.
- The response time for user interactions should not exceed 1 second under normal conditions.
- Screen refreshes should occur in no more than 2 seconds.

3.2.1.6 Size

- Minimum Starting Capacity of 1 TB (1000 GB). For initial operations and accommodate the storage of detailed medical images and other large data files.
- For hardware installations, the system should be efficient enough to run on servers without requiring more than 4 ROM chips.

3.2.1.7 Robustness

- The system should be capable of restarting within 5 minutes after any failure.
- Less than 0.005% of system events should result in failures.
- The likelihood of data corruption during failures should be less than 0.001%

3.2.1.8 Portability

- The system should be deployable on all major operating systems including Windows, macOS, and Linux.
- The system shall also be accessible via **mobile applications** on **iOS** and **Android** platforms, ensuring seamless functionality across both desktop and mobile devices.

3.2.1.9 Scalability

- The system shall be scalable to accommodate an increasing number of users, data volume, and transaction intensity.
- The system shall be capable of integrating multiple hospitals and clinics without system downtime.

3.2.1.10 Maintainability

- The system shall be easy to maintain and update, with capabilities for modular upgrades and patches.
- The system shall provide comprehensive logging and monitoring tools to facilitate troubleshooting and system analysis.

3.3.2 Organizational Requirements

- The system shall integrate with the organization's existing Enterprise Resource Planning (ERP) system for procurement and financial tracking.
- The system shall include a training program for all users, with documentation available in both digital and printed formats.
- The system shall provide role-based training modules tailored to procurement staff, insurance companies, and laboratory technicians etc.
- The system shall generate monthly performance reports for review by the system's administrative team.

Electronic Healthcare System Requirements Specification

- The system shall enforce the organization's role-based access control (RBAC) policy, ensuring users only access data relevant to their roles.

3.3.3 External Requirements

3.3.3.1 Legislative Requirements:

- The system shall comply with GDPR (General Data Protection Regulation) for data protection and privacy.
- The system shall adhere to HIPAA (Health Insurance Portability and Accountability Act) for the secure handling of patient data.

3.3.3.2 Data Retention and Archiving:

- The system shall comply with legal data retention policies, retaining patient records for a minimum of 6 years and financial records for 7 years.
- The system shall provide secure archiving solutions for long-term data storage, ensuring data integrity and accessibility.

3.3.3.3 Industry Standards:

- The system shall comply with ISO 27001 for information security management.
- The system shall adhere to ISO 13485 for medical device quality management.