

Electronic Healthcare System Requirements Specification

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1.Executive Summary

1.1 Project Overview

Description: This project involves the development of an **Electronic Healthcare System** designed to streamline patient care and medical record management. The system will support a wide range of users, including healthcare providers, patients, and emergency responders. 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, and laboratory staff.
- **Patients:** Individuals seeking medical care and managing their health records.
- **Emergency Responders:** Personnel needing quick access to patient information during emergencies.
- **IT Personnel:** Staff responsible for system maintenance and troubleshooting.

2. Product/Service Description

2.1 Product Context

Description: The **Electronic Healthcare System** is a standalone system designed to manage patient medical records and support healthcare delivery. While it is self-contained, it will interface with external systems such as pharmacies and laboratories to ensure seamless data exchange and coordination.

How the Product Relates to Other Products

- **Standalone but Integrated:** The system manages core healthcare operations (e.g., appointment scheduling, medical record management, prescription management) internally but interfaces with external systems for extended functionality and provide end-to-end healthcare services.
- **Interdependence:** The system relies on external systems (e.g., pharmacies, laboratories) for specific functionalities, such as prescription management and lab test coordination.

Interfaces with Related Systems

- **Internal Interfaces:**
 - **Hospital Databases:** The system integrates with internal hospital databases to manage patient records.
 - **IT Maintenance Tools:** The system supports tools for system monitoring, maintenance, and troubleshooting.

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- **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.
 - **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.
 - **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**.
 - Acts as the central hub for all internal operations.
2. **Internal Systems:**
 - **Hospital Databases:** Store patient records, appointments.
 - **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.
 - **Laboratories:** Manage lab test requests and results.
 - **Emergency Services:** Access critical patient information during emergencies.
 - **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.
 - **Functionalities:**
 - **Patients:** Schedule appointments, access medical records, log mood, request prescription refills, and receive reminders.
 - **Healthcare Providers:** View patient records, update treatment plans, conduct virtual therapy sessions, and receive alerts for critical conditions.

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. 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.

4. 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.
- **Other Characteristics:** Need tools for scheduling tests, processing results, and notifying relevant parties.

5. 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.

6. IT Support:

Role: Team responsible for system maintenance and troubleshooting.

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- **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.

7. 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.

8. 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.

9. 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) will have basic training to use the system effectively.
- IT support will have the technical expertise to maintain and troubleshoot the system.

3. Data Availability:

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- Patient records, lab results, and other critical data will be available in digital format and accessible through the system.
- External systems (e.g., pharmacies, laboratories) will provide real-time data exchange capabilities.
- 4. **Regulatory Compliance:**
 - The system will comply with healthcare regulations such as **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.
 - Inventory levels will be tracked in real-time, and reorder alerts will be acted upon promptly.
- 9. **User Adoption:**
 - Patients, doctors, 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 Healthcare System**:

Constraints

1. **Regulatory Compliance:**

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- The system must comply with healthcare regulations such as **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:**
 - 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, laboratories, emergency services**, and **organ donation networks**.
 - These integrations are necessary for functionalities like prescription management, 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.

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- **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, 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:

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.
- Patients should be able to log their mood daily through the system using a simple interface (e.g., a mood scale or emoji-based system).
- Patients should be able to view their mood history and trends over time.
- Patients should receive reminders to log their mood if they haven't done so in a specified period.
- Patients should have the option to share mood tracking data with their counselor for better care coordination.

Doctors

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- 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.

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.

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.

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.

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- 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.

Emergency Staff

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

Mental Health Counselor

- Counselors should have secure access to patient therapy records and mental health history.
- Counselors should be able to update patient therapy notes and progress reports securely.
- Counselors should be able to manage and view scheduled therapy sessions via a web or mobile platform.
- Counselors should receive notifications for upcoming sessions and cancellations.
- Counselors should be able to flag high-risk patients and notify emergency services when necessary.
- Counselors should receive alerts when a patient contacts the emergency mental health hotline.
- Counselors should be able to conduct virtual therapy sessions via secure video conferencing.
- Counselors should be able to send secure messages to patients regarding therapy sessions, reminders, or follow-ups.
- Counselors should have the ability to assign resources and reading materials to patients through the platform.
- Counselors should have access to analytics on patient progress and treatment outcomes.
- Counselors should be able to generate reports on patient sessions and submit documentation as needed.
- Counselors should be able to view and analyze patient mood tracking data over time.
- Counselors should receive alerts if a patient's mood tracking data indicates a significant decline or risk.
- Counselors should be able to use mood tracking data to adjust therapy plans and provide personalized care.

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).

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- 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.

IT Support

- IT Support should be able to add new users (e.g., patients, doctors) to the system.
- IT Support should be able to update user information (e.g., roles, permissions).
- IT Support should be able to deactivate or delete users when necessary.
- IT Support should have the ability to manage user permissions and roles.
- IT Support should be able to monitor system performance in real time.
- IT Support should receive alerts for potential system failures or performance drops.
- IT Support should be able to apply patches and software updates remotely.

3.2 *Functional Requirements*

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
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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

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

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

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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

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

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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
FR_NUT_07	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_08	The system shall send reminders, track meal adherence, and enhance patient engagement.	Improves compliance with dietary recommendations.	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

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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
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

Req#	Requirement	Comments	Priority
FR_IT_01	The system shall allow IT Support to add new users (e.g., patients, doctors, nurses).	Ensures new users can be registered and granted appropriate access.	1
FR_IT_02	The system shall allow IT Support to update user information (e.g., roles, permissions).	Ensures user data remains accurate and up-to-date.	1
FR_IT_03	The system shall allow IT Support to deactivate or delete users when necessary.	Ensures outdated or unauthorized users are removed from the system.	1
FR_IT_04	The system shall provide IT Support with the ability to manage user permissions and roles.	Ensures controlled system access and security.	1
FR_IT_05	The system shall monitor system performance in real time and provide alerts for potential issues.	Ensures proactive system monitoring and stability.	2
FR_IT_06	The system shall allow IT Support to apply patches and software updates remotely.	Ensures timely maintenance and security compliance.	2

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
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
FR_PT_07	The system shall allow patients to log their mood daily using a simple interface (e.g., mood scale).	Enables patients to track their emotional well-being over time.	2
FR_PT_08	The system shall allow patients to view their mood history and trends over time.	Helps patients and counselors monitor emotional health patterns.	2
FR_PT_09	The system shall send reminders to patients to log their mood if they haven't done so in a specified period.	Encourages consistent mood tracking for better mental health monitoring.	2
FR_PT_10	The system shall allow patients to share mood tracking data with their counselor for better care coordination.	Facilitates personalized care and timely interventions based on mood trends.	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.

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- The system should provide a comprehensive help section with at least 50 indexed help frames
- 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.

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- 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.

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- The system shall generate monthly performance reports for review by the system's administrative team.
- 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.

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.