# Business Requirements Document (BRD)

PROJECT NAME: User Project

PROJECT DESCRIPTION: Hospital Management System

1. Business Need

The current operational environment within the hospital faces significant challenges related to manual processes, disparate data systems, and inefficient information flow. These issues lead to extended patient wait times, potential medical errors due to incomplete records, delays in billing and claims processing, and a lack of real-time insights for effective resource management and strategic decision-making. The absence of a unified, integrated system also hinders compliance efforts and impacts overall patient satisfaction and operational profitability.

This project aims to implement a comprehensive Hospital Management System (HMS) to centralize patient information, streamline administrative and clinical workflows, improve data accuracy, enhance communication among departments, and provide robust reporting capabilities. This will ultimately lead to improved patient care outcomes, increased operational efficiency, reduced costs, and a more compliant and competitive healthcare facility.

2. Business Requirements

The Hospital Management System (HMS) must support the following high-level business capabilities:

* **Patient Management:** Comprehensive patient registration, admission, discharge, transfer (ADT), medical record management, and appointment scheduling.
* **Clinical Management:** Support for doctor's consultations, nursing care, lab order management, radiology order management, and electronic health records (EHR).
* **Pharmacy Management:** Prescription management, inventory control, and drug dispensing.
* **Billing and Financial Management:** Patient billing, insurance claims processing, payment collection, and financial reporting.
* **Resource Management:** Bed management, equipment tracking, and staff scheduling.
* **Reporting and Analytics:** Generation of various operational, clinical, and financial reports for decision-making.
* **User and Access Management:** Secure user authentication, role-based access control, and audit trails.

3. Requirement (1, 2, 3 ... n) & 4. Description

* **BR.1: Patient Registration and Admission**

**Description:** The system shall allow administrative staff to register new patients, capturing demographic information (name, address, DOB, contact, emergency contact), insurance details, and primary physician. It shall also facilitate the admission process by assigning unique patient IDs, capturing admission details (date, time, reason, attending physician, ward/room assignment), and maintaining a log of all admissions.

* **BR.2: Appointment Scheduling**

**Description:** The system shall provide functionality for scheduling, rescheduling, and canceling patient appointments with specific doctors or departments. It must display doctor availability, allow for blocking time slots, send automated reminders to patients via SMS/email, and manage waiting lists.

* **BR.3: Electronic Health Records (EHR)**

**Description:** The system shall maintain a comprehensive electronic health record for each patient, encompassing medical history, diagnoses, treatment plans, medication history, allergies, lab results, radiology reports, vital signs, and progress notes. Physicians and authorized medical staff must be able to securely access, view, and update these records.

* **BR.4: Prescription and Pharmacy Management**

**Description:** The system shall enable doctors to electronically prescribe medications. This includes drug dosage, frequency, and duration. The pharmacy module shall receive these prescriptions, manage drug inventory (stock levels, expiry dates), dispense medications, and automatically update patient medication records. It must also alert for potential drug interactions or allergies.

* **BR.5: Billing and Claims Processing**

**Description:** The system shall generate detailed invoices for all patient services (consultations, procedures, medications, lab tests, room charges). It must support various payment methods, track outstanding balances, and facilitate the electronic submission of insurance claims based on standard coding (e.g., ICD-10, CPT) with proper documentation.

5. Scope and Impacted Users

**In-Scope:**

* Patient Registration and Admission/Discharge/Transfer
* Outpatient and Inpatient Appointment Scheduling
* Electronic Health Records (EHR) management
* Doctor's Consultation and Clinical Documentation
* Nursing Care Management (e.g., vital signs, medication administration)
* Laboratory Order and Result Management
* Radiology Order and Report Management
* Pharmacy Inventory and Dispensing
* Billing, Invoicing, and Payment Processing
* Insurance Claims Management
* Basic Reporting and Analytics
* User Authentication and Role-Based Access Control

**Out-of-Scope (for initial phase):**

* Advanced HR & Payroll Management
* Advanced Supply Chain & Procurement beyond Pharmacy inventory
* Integration with external EMR/EHR systems not specified
* Complex financial accounting (e.g., general ledger, asset management)
* Integration with specialized medical devices (e.g., imaging machines)
* Patient portal with self-service features (may be a future phase)

* Telemedicine capabilities

**Impacted Users:**

* **Patients:** Through improved service, reduced wait times, and accurate records.
* **Administrative Staff:** Front desk, admissions, billing, records management.
* **Medical Staff:** Doctors, nurses, specialists, technicians (Lab, Radiology).
* **Pharmacy Staff:** Pharmacists, pharmacy assistants.
* **Management:** Hospital administrators, department heads.
* **IT Support Staff:** For system maintenance and troubleshooting.

6. Business Rules and Validation

* **Patient ID Uniqueness:** Each patient must be assigned a unique identifier upon registration.
* **Mandatory Fields:** Fields such as Patient Name, Date of Birth, Gender, Contact Number, and Emergency Contact must be mandatory for patient registration.
* **Age Validation:** A patient's Date of Birth must ensure a valid age (e.g., non-negative).
* **Appointment Overlap:** A doctor cannot be scheduled for two different appointments at the same time slot.
* **Prescription Authorization:** Only licensed medical practitioners can generate and authorize prescriptions.
* **Drug Allergy Check:** The system must automatically check for patient drug allergies against prescribed medications and issue an alert.
* **Inventory Thresholds:** Alerts must be triggered when pharmacy drug stock levels fall below predefined reorder thresholds.
* **Billing Code Compliance:** All billing codes (e.g., ICD-10, CPT) must conform to current regulatory standards and be validated against an approved master list.
* **Payment Authorization:** All financial transactions must require appropriate authorization based on user roles.
* **Medical Record Confidentiality:** Access to patient medical records is strictly limited by role-based permissions and requires explicit audit trails for all access and modifications.

7. Screen Illustration (Non Mandatory)

This section would typically include visual mockups, wireframes, or screenshots of key user interfaces, demonstrating the layout, fields, and flow for critical functionalities such as Patient Registration, Appointment Scheduling, EHR Viewing, and Billing. As this is a plain text document, such illustrations cannot be provided here.

8. Report Format (Non Mandatory)

This section would detail the structure and content of essential reports. Examples of reports include:

* **Patient Census Report:** Daily count of admitted patients by ward/department.
* *Example Content:* Patient ID, Name, Ward, Room No., Admission Date, Attending Physician.
* **Appointment Schedule Report:** Daily/weekly schedule for specific doctors or departments.
* *Example Content:* Doctor Name, Date, Time, Patient Name, Service Type.

* **Outstanding Bills Report:** List of all unpaid patient invoices.
* *Example Content:* Invoice No., Patient Name, Total Amount, Paid Amount, Balance Due, Due Date.
* **Drug Inventory Report:** Current stock levels, reorder alerts, and expiry dates for pharmacy items.
* *Example Content:* Drug Name, Batch No., Current Stock, Reorder Level, Expiry Date.
* **Laboratory Pending Test Report:** List of pending lab orders by patient.
* *Example Content:* Patient Name, Test Name, Order Date, Status.

These reports would be designed with clear headings, data fields, and appropriate aggregation (e.g., totals, averages) to meet business analytical needs.

9. Impact on mobile applications

The implementation of the HMS is expected to have a significant positive impact on potential future mobile applications or dedicated mobile access:

* **Doctor's Mobile Access:** Physicians will be able to securely access patient EHRs, view lab results, radiology reports, and make quick notes or update prescriptions directly from their mobile devices during rounds or off-site.
* **Nurse's Mobile Charting:** Nurses can use mobile devices (tablets/smartphones) for bedside charting, recording vital signs, administering medications, and updating patient progress notes in real-time, improving accuracy and efficiency.
* **Management Dashboards:** Hospital administrators and managers could access key performance indicators (KPIs), operational dashboards (e.g., bed occupancy, patient wait times), and financial summaries on their mobile devices.
* **Patient Portal Integration (Future):** While not in scope for the initial phase, the HMS would lay the foundation for a future patient mobile app allowing patients to view appointments, lab results, medication lists, and potentially make payments.
* **Emergency Response:** Mobile access could facilitate faster access to critical patient information in emergency situations.

10. Key Success Factors

* **User Adoption:** High acceptance and consistent usage of the system by all target users (doctors, nurses, administrative staff).
* **Data Accuracy and Integrity:** Ensuring all patient, clinical, and financial data entered into the system is accurate, complete, and consistent.
* **Workflow Efficiency Improvement:** Measurable reduction in manual processes, patient wait times, and processing delays across departments.
* **Enhanced Patient Experience:** Positive feedback from patients regarding smoother processes, faster service, and improved communication.
* **Regulatory Compliance:** The system successfully supports adherence to healthcare regulations (e.g., data privacy, billing standards).
* **System Stability and Performance:** The HMS operates reliably, with minimal downtime and acceptable response times for all users.
* **Training Effectiveness:** Comprehensive and effective training programs enable users to fully

utilize system capabilities.

11. Assumptions, Dependencies and Constraints (Non Mandatory)

**Assumptions:**

* Adequate budget and resources (human, technical) will be allocated for the entire project lifecycle.
* Hospital management and staff will actively participate in requirements gathering, testing, and training.
* Existing network infrastructure is capable of supporting the new system's performance requirements.
* Availability of accurate historical patient data for potential migration, if required.
* All necessary third-party software licenses and hardware will be procured in a timely manner.

**Dependencies:**

* Availability of key subject matter experts (SMEs) from clinical, administrative, and financial departments for system design and validation.
* Successful integration with existing essential systems (e.g., financial accounting, if outside initial scope).
* Availability of a stable and secure IT infrastructure (servers, network, security protocols).
* Cooperation and data sharing from existing legacy systems, if any.

**Constraints:**

* **Budget:** Project implementation must adhere to the approved budget of [Specify Amount].
* **Timeline:** The initial rollout of the core modules must be completed within [Specify Duration, e.g., 12 months].
* **Regulatory Compliance:** The system must comply with all relevant healthcare regulations and data privacy laws (e.g., HIPAA, GDPR, local health authority mandates).
* **Existing Hardware:** The system must be compatible with a reasonable proportion of existing hardware where feasible, to minimize new capital expenditure.
* **Data Security:** High standards of data security and confidentiality must be maintained at all times.

12. User Acceptance Criteria

* **Patient Registration:** New patient registration, admission, discharge, and transfer processes can be completed by administrative staff within [X minutes/seconds] with 100% data accuracy.
* **Appointment Scheduling:** 95% of appointments can be successfully scheduled, rescheduled, and canceled, with automated reminders sent out successfully. Doctor availability is accurately reflected.
* **EHR Access and Update:** Authorized medical staff can retrieve and update a patient's full EHR within [X seconds] and all changes are accurately saved and auditable.
* **Prescription Processing:** Doctors can electronically prescribe medications, and pharmacy staff can dispense them accurately and efficiently, with automated allergy/interaction alerts functioning correctly.
* **Billing Accuracy:** All invoices generated are 100% accurate, reflecting services rendered and applied discounts/insurance benefits. 99% of insurance claims are submitted successfully without rejection due to system errors.
* **Reporting:** Key operational and clinical reports (e.g., patient census, outstanding bills) can be

generated on demand within [X seconds/minutes] and provide accurate data.

* **Security:** Only authorized users can access specific system functionalities and data based on their assigned roles, as verified by security audits.

13. Risks and Impact

* **User Resistance:**

* **Impact:** Low user adoption, decreased productivity, potential system bypass, failure to achieve project benefits.

* **Data Migration Challenges:**

* **Impact:** Inaccurate or incomplete historical patient data, operational delays during cutover, patient safety risks.

* **Integration Complexities:**

* **Impact:** Delays in project timeline, data synchronization issues, errors in information flow between modules or external systems.

* **Budget Overrun:**

* **Impact:** Project cancellation, compromised scope, financial strain on the hospital.

* **Security Breach:**

* **Impact:** Compromised patient data, regulatory fines, reputational damage, loss of patient trust.

* **Performance Issues:**

* **Impact:** Slow system response times, user frustration, operational bottlenecks, inability to handle peak loads.

* **Lack of Clear Requirements:**

* **Impact:** Delivery of a system that does not meet business needs, extensive rework, project delays.

14. Risks and Impact (to be filled by Business)

* **Operational Disruption during Transition:**

* **Impact:** Temporary slowdown in patient services, increased manual workload during cutover, potential patient dissatisfaction.

* **Mitigation (Business):** Develop detailed cutover plans, conduct extensive user training, provide strong change management support, establish clear communication protocols for staff and patients.

* **Inadequate Staff Training and Proficiency:**

* **Impact:** Errors in data entry, inefficient use of the system, reliance on legacy manual processes, increased support requests.

* **Mitigation (Business):** Allocate sufficient time and resources for comprehensive, role-based training. Designate super-users for on-site support. Implement post-go-live performance monitoring and refresher training.

* **Resistance from Medical Staff (Doctors/Nurses):**

* **Impact:** Low adoption of EHR, continued use of paper records, frustration among clinical staff, inability to realize clinical efficiency gains.

* **Mitigation (Business):** Involve key clinical leaders early in the project. Demonstrate clear benefits for patient care and workflow. Provide tailored training and ongoing support. Emphasize ease of use

and reduced administrative burden.

15. Risks and Impact (to be filled by EIS SAP Team)

* **Technical Integration Challenges with Legacy Systems:**

* **Impact:** Delays in data synchronization, data inconsistencies, system errors, extended implementation timeline.

* **Mitigation (EIS SAP Team):** Conduct thorough technical assessment of legacy systems, define clear APIs and data transfer protocols, utilize middleware solutions, conduct rigorous integration testing in controlled environments.

* **Performance and Scalability Issues:**

* **Impact:** Slow system response times, system crashes during peak load, user frustration, inability to support future growth.

* **Mitigation (EIS SAP Team):** Conduct load and stress testing, optimize database queries, ensure robust hardware infrastructure and network bandwidth, design for scalability (e.g., cloud-native architecture, distributed systems).

* **Data Security Vulnerabilities:**

* **Impact:** Unauthorized access to patient data, compliance breaches, legal repercussions, reputational damage.

* **Mitigation (EIS SAP Team):** Implement robust encryption protocols (data at rest and in transit), conduct regular security audits and penetration testing, enforce strong access controls (RBAC), ensure compliance with industry security standards (e.g., ISO 27001).

* **Resource Availability (Technical Expertise):**

* **Impact:** Project delays due to lack of specialized skills (e.g., SAP integration, specific module expertise), increased costs for external consultants.

* **Mitigation (EIS SAP Team):** Clearly identify required skill sets, conduct internal training, allocate sufficient resources, engage reputable consulting partners for specialized expertise.

16. References (Non Mandatory)

* Hospital Strategic Plan 2024-2028

* Existing Manual Workflow Documents (Patient Registration, Billing Procedures)

* [Local/National] Healthcare Regulatory Guidelines (e.g., HIPAA for US, GDPR for EU, Specific Ministry of Health Guidelines)

* Clinical Policy and Procedure Manuals

* Industry Best Practices for Hospital Management Systems (e.g., HIMSS recommendations)

* Vendor Documentation for Proposed HMS Solution (if applicable)

17. Solution Overview

The proposed solution is a modular, integrated Hospital Management System designed to centralize and streamline key operational and clinical processes. It will be a web-based application, accessible via standard web browsers, ensuring ease of deployment and maintenance. The system will be built on a robust and scalable database architecture, capable of handling large volumes of patient data securely. Key modules will include Patient Management, EHR, Appointment Scheduling, Pharmacy, Laboratory, Radiology, and Billing. The system will feature role-based access control to ensure data security and

compliance with privacy regulations. Emphasis will be placed on intuitive user interfaces to minimize training time and maximize user adoption. Integration points with existing financial systems (if required) will be established using industry-standard APIs. The system will provide comprehensive reporting and analytics capabilities to support operational efficiency and strategic decision-making.

18. (to be filled by EIS SAP Team)

This section is reserved for the EIS SAP Team to provide technical architecture details, specific integration strategies, proposed SAP module functionalities relevant to the project (e.g., integration with SAP S/4HANA for finance, SAP Patient Management), infrastructure requirements, data migration plan, security architecture, and high-level development approach. This will also include estimates for implementation effort, timelines, and resource allocation from a technical perspective.