1. Introduction

1.1. **Purpose**
This document defines the requirements for the Healthcare Management System (HMS) , which aims to improve healthcare efficiency, patient care, and data-driven decisions. It will manage the registration and login processes for both patients and employees (e.g., administrative staff, nurses, and doctors).

1.2. **Document Conventions**

- **HMS** - Healthcare Management System
- **GUI** - Graphical User Interface
- **PHID** - Patient Healthcare Identification Number
- **EHR** - Electronic Health Record
- **Employee ID** - Unique Identifier for employees (e.g., doctors, nurses, administrative staff)

1.3. **Project Scope**
The HMS will automate patient management, employee management (staff login, registration), resource allocation, and notifications, replacing manual processes with an automated system to improve operational efficiency.

1.4. **References**

- Dean, R. (1996). *The Healthcare Information Systems Directory.*
- World Health Organization (WHO).(2021). *Guidelines for Health Information Systems.* World Health Organization.

2. Overall Description

2.1 **Product Perspective**
The Healthcare Management System (HMS) for Atsbi Wenberta District automates registration and login processes for both patients and employees (e.g., healthcare providers). This feature is designed to ensure secure access and smooth operation of the system. The system is also scalable for future integration with EHR and medical billing systems.

2.2 **User Classes and Characteristics**

- **Healthcare Administrator**: Manages operations, staff, and patient care; requires full system access, including managing employee registration and patient registration.
- **Doctor/Physician**: Accesses patient records, orders tests, coordinates care, and can log into the system securely.
- **Nurse**: Manages patient care, monitors conditions, and can log into the system securely to access assigned patient data.
- **Patient**: Views personal health records, schedules appointments, and logs into the system for personalized care management.
- **IT Support**: Maintains the system's infrastructure, security, and updates.
- **Billing & Finance Staff**: Manages billing, insurance, and payments.
- **Medical Record Technician**: Maintains patient records, ensuring security and accessibility.

2.3 **Operating Environment**

- **Operating Systems and Versions**:
    - **Servers**: Secure servers running on Linux (Ubuntu 20.04 LTS).
    - **User Devices**: Windows 10+, macOS 10.15+, iOS, and Android.
    - **Geography**: Users are in Atsbi Wenberta District, with servers located in Ethiopia.
    - **Infrastructure**: Hosted by the local IT department for data security and system maintenance.
    - **Software**: PostgreSQL for databases, Apache/Nginx web servers, and Java-based application servers.

2.4 **Assumptions and Dependencies**

- User competency assumes familiarity with IT systems.
- Stable power supply, backup solutions, and internet connectivity are required for system operations.
- Data privacy complies with Ethiopian data protection laws.
- System integration assumes compatibility with existing healthcare systems (e.g., labs, EHR).

3. System Features

3.x System Features for Login, Employee, and Patient Registration

3.1 Login Management

- **Description**: The system requires users (patients, doctors, nurses, administrative staff) to log in using their unique credentials (username and password). There will be different login roles based on user type, ensuring secure and role-based access.
- **Rationale**: Ensures secure access to the system by enforcing authentication based on user roles.
- **Dependencies**: Requires integration with a secure user authentication system, e.g., OAuth or token-based authentication.

3.2 Employee Registration

- **Description**: The system allows administrators to register employees (doctors, nurses, administrative staff). During registration, essential details such as name, role, department, qualifications, and contact details are captured.
- **Rationale**: Provides a centralized system for managing employee records and ensures appropriate role-based access for healthcare operations.
- **Dependencies**: Requires the establishment of roles and permissions to assign specific privileges to different types of employees.

3.3 Patient Registration

- **Description**: The system allows administrative staff to register new patients by capturing necessary details such as name, date of birth, address, contact information, medical history, and identification numbers. Additionally, a unique Patient ID will be generated for each patient.
- **Rationale**: Ensures that all patient information is captured and stored securely for future reference.
- **Dependencies**: Requires stable database systems for storing patient information securely.

3.4 Functional Requirements for Login, Employee Registration, and Patient Registration

3.4.1 Login Functional Requirements

- **FR1**: User Authentication
    - **Description**: Users must provide a valid username and password to log into the system. Users will be authenticated based on their role (e.g., doctor, nurse, administrative staff).
    - **Response to Errors**: If the username or password is incorrect, the system will display an error message and allow the user to try again.

3.4.2 Employee Registration Functional Requirements

FR1: Employee Information Capture

- **Description**: The system must allow administrators to capture employee details such as full name, job role, department, and contact information.
- **Response to Errors**: If required fields are missing, the system will display an error message prompting the user to complete the registration.

FR2: Role-based Access Control

- **Description**: The system must allow the administrator to assign roles (doctor, nurse, admin staff) to employees during the registration process.
- **Response to Errors**: If the role is not selected or is invalid, the system will prompt the user to select a valid role.

3.4.3 Patient Registration Functional Requirements

FR1: Patient Information Capture

- **Description**: The system must allow administrative staff to input essential patient details such as full name, date of birth, medical history, and contact information.
- **Response to Errors**: If required fields are left empty, the system must display an error message and prompt the user to complete the registration.

FR2: Unique Patient ID Generation

- **Description**: Upon registration, the system must automatically generate a unique Patient ID for each patient.
- **Response to Errors**: If a duplicate ID is found or an invalid ID is generated, the system must notify the user and generate a new ID.

FR3: Data Validation

- **Description**: The system must validate the entered patient details (e.g., date of birth, phone number).

- **Response to Errors**: If invalid data is entered (e.g., incorrect date format), the system will prompt the user to correct it.

4. Data Requirements

4.1 **Logical Data Model**

- **Patient**: Includes patient details such as full name, contact information, medical history.
- **Employee**: Includes employee details such as name, job role, department, contact information, and credentials for login.
- **Appointment**: Stores appointment information (e.g., Patient ID, Doctor ID, Appointment Date).
- **Login**: Stores login credentials (username, password) for all users.

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5. External Interface Requirements

5.1 **User Interfaces**

- **Login Screen**: A secure login screen for both patients and employees, where credentials are entered and validated.
- **Employee Registration Screen**: A user interface where administrative staff can enter employee details and assign roles.
- **Patient Registration Screen**: A user interface for registering patients, capturing essential details and generating a unique Patient ID.