Healthcare Management System

INFO5100 Group 1 AED Final Project:

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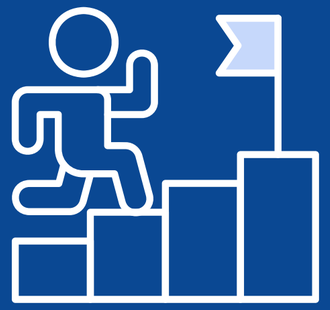
Problem Statement

The healthcare industry faces significant challenges in achieving **seamless integration** and **collaboration** among its **stakeholders**, including doctors, patients, labs, pharmacies, administrators, insurers, and government bodies.
Key issues include:

- **Fragmented Stakeholder Interaction**: Inefficient communication among stakeholders disrupts coordination.
- **Data Management Issues:** Errors and delays in handling patient data hinder workflows.
- **Financial Inefficiencies**: Outdated systems cause discrepancies in billing and insurance claims.
- **Administrative Burdens:** Managing employees and cross-network data is complex and error-prone.
- **Government Fund Allocation Challenges:** Inefficient processes hinder transparent and effective fund utilization.

Challenges



- **Fragmented Systems:** Poor integration among stakeholders leads to inefficiencies and delays.
- **Data Management Issues**: Scattered patient data causes errors and hinders secure access.
- **Workflow Gaps:** Manual processes and poor communication create bottlenecks.
- **Financial Complexity:** Inefficient billing and claims processes delay reimbursements.
- **Security Risks**: Weak authentication and non-compliance expose sensitive data.
- **Limited Scalability**: Systems struggle with growing demands and lack advanced technology.

Our Approach & Solution

THE NEED AND COMPONENTS FOR A **CENTRALIZED** SOLUTION

- **Unified Database**: A secure, real-time platform for all Administrator to manage and access data.
- **Streamlined Workflows**: Automated processes for scheduling, prescriptions, billing, and fund allocation.
- **Enhanced Collaboration**: Seamless communication for coordinated healthcare delivery.
- **Privacy and Security:** Advanced measures to safeguard sensitive information.

Unified DB

Automated Workflow

Fund Management

Privacy and Security

Analytics and Insights

Key Stakeholders

- Doctors : Contributes to the Patient Analysis and prescriptions
- Lab Assistants : Contributes to the lab test reportings
- Accountants : Responsible for scheduling appointment and billing
- Patients : Contributes to the maintanence of personal data
- Insurance Agents : Responsible for policy planning, creating members
- Insurance Managers : Approving Insurance requests
- Government Officers (Aid) : Approving Govt Aid and Funds
- Pharmacists : Viewing medicines availability

Workflow

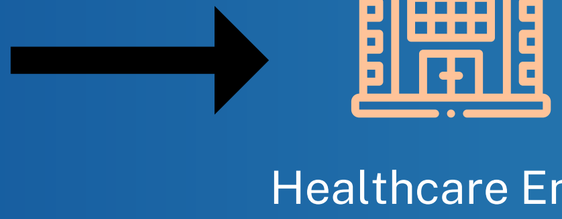
System Admin

Healthcare Admin

Government Admin

Insurance Admin

Pharmacy Admin



Healthcare Enterprise

Government Enterprise

Insurance Enterprise

Pharmacy Enterprise

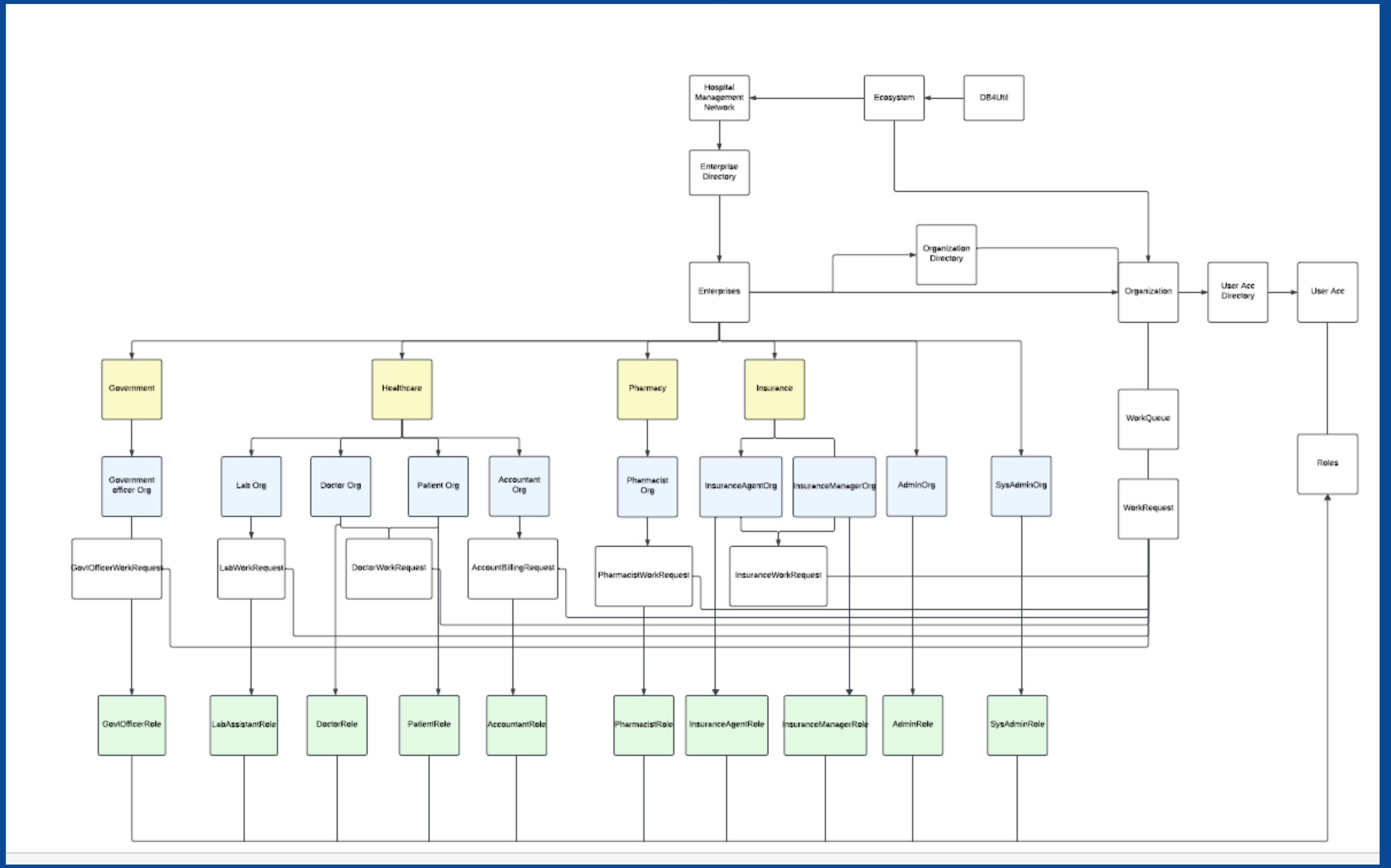
Lab, Accountant,
Doctor, Patient

Government
Officer

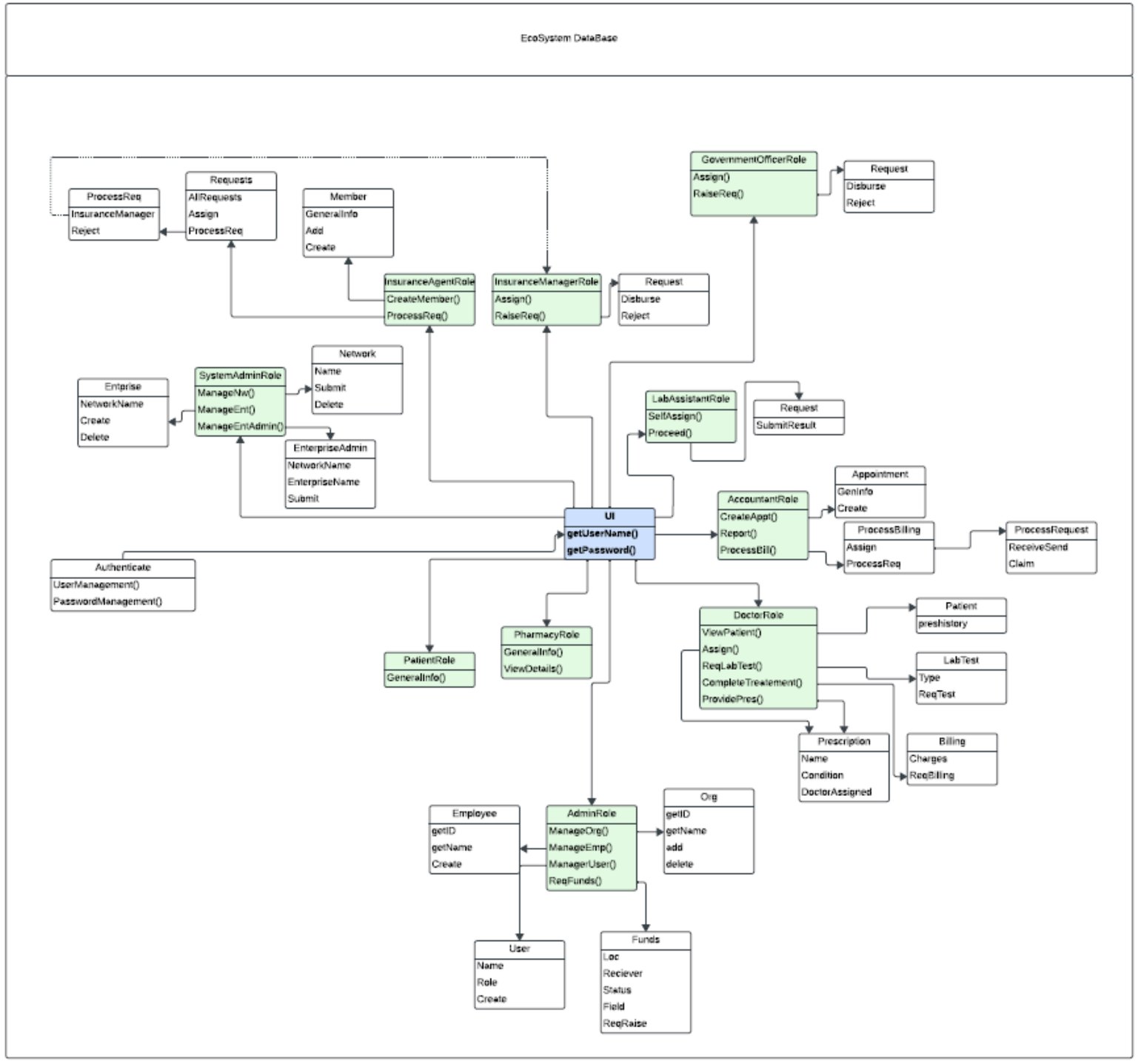
Insurance Agent
and Manager

Pharmacist

UML Diagram


Hospital Management Network
Ecosystem
DB4Util
Enterprise Directory
Organization Directory
Enterprises
Organization
User Acc Directory
User Acc
Government
Healthcare
Pharmacy
Insurance
WorkQueue
Roles
Government officer Org
Lab Org
Doctor Org
Patient Org
Accountant Org
Pharmacist Org
InsuranceAgentOrg
InsuranceManagerOrg
AdminOrg
SysAdminOrg
WorkRequest
GovtOfficerWorkRequest
LabWorkRequest
DoctorWorkRequest
AccountBillingRequest
PharmacistWorkRequest
InsuranceWorkRequest
GovtOfficerRole
LabAssistantRole
DoctorRole
PatientRole
AccountantRole
PharmacistRole
InsuranceAgentRole
InsuranceManagerRole
AdminRole
SysAdminRole

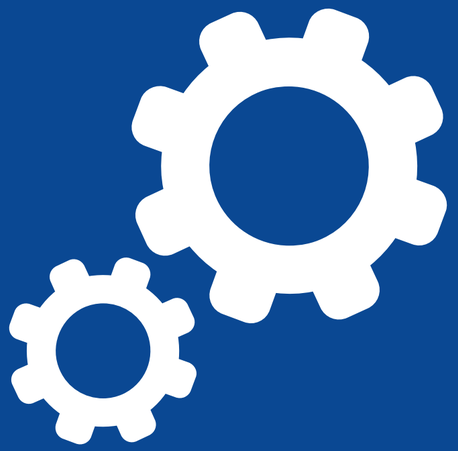
High-level Diagram



Our Ecosystem

- **Integration**: Connects doctors, patients, lab assistants, pharmacists, accountants, and external entities like insurance agents and government bodies.
- **Centralized Database:** Secure and unified storage for healthcare data.
- **Interoperability**: Seamless integration with external platforms like insurance and government programs.
- **Key Modules:** Includes appointment scheduling, lab/pharmacy management, and billing/claims processing.
- **Collaboration & Efficiency:** Streamlines workflows and enhances healthcare delivery.

Use Cases



- In App Patient consulation and Lab Test Results
- Accountant Appointment booking and billing via email
- Doctor can send prescription in app and maintain patient history
- Patient can choose to pay with Insurance and bill is sent via email
- Patient can view pharmacy medicines available in app for availability
- Governemnt Officer can approve or reject funds sent by hospital for Government funding for the hospital.

Key Features

- **Role-Based Access**: Tailored tools and permissions for each stakeholder.
- **Centralized Data Management**: Secure, unified storage for healthcare data.
- **Automated Workflows**: Streamlined task assignments and communication.
- **Integrated Billing and Insurance:** Simplified financial operations and claims processing.
- **Patient Portals**: Access to medical histories, prescriptions, and appointments.
- **Scalability and Interoperability**: Supports growth and connects with external systems.

Future Scope

- **AI-Powered Analytics:** Predictive tools for diagnosis, resource allocation, and risk assessment.
- **IoT Integration**: Real-time health monitoring through wearable devices.
- **Telemedicine Support**: Virtual consultations and remote prescription management.
- **Blockchain Security**: Enhanced data transparency and secure record sharing.
- **Global Healthcare Collaboration**: Cross-border integration with international health systems.
- **Customized Modules**: Tailored solutions for specialized healthcare services.

Thank You