

Smart Interface for Bone Marrow Donation for treating Aplastic Anemia

Problem statement:

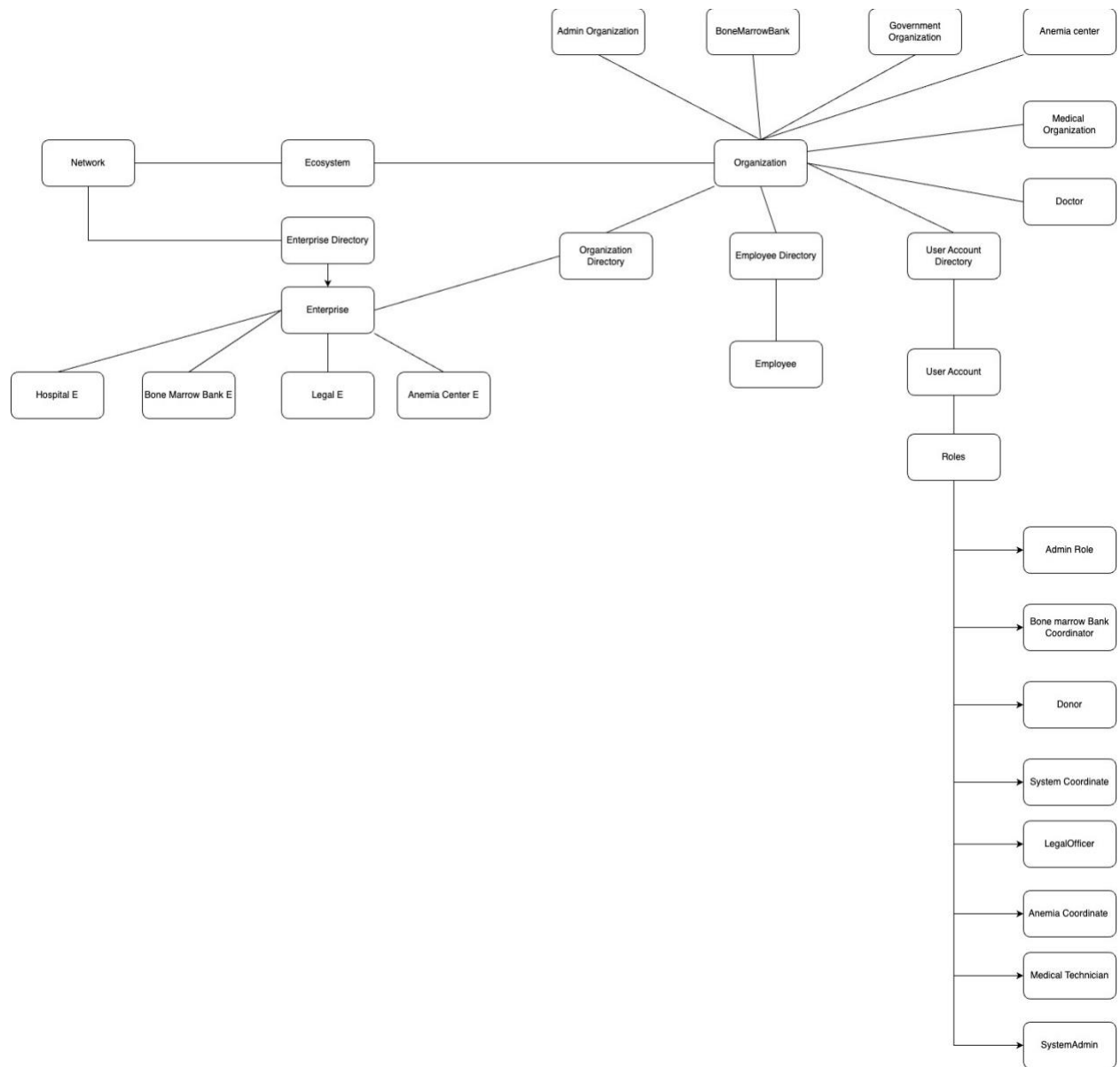
Bone marrow donation is a life-saving procedure for patients suffering from conditions such as aplastic anemia, leukemia, and other blood-related disorders. Despite its critical importance, the current system faces several challenges that hinder its effectiveness. Key issues include poor communication and coordination between stakeholders such as hospitals, bone marrow banks, and anemia centers, resulting in delays in finding suitable donors and matching them with patients in need. Additionally, the absence of a centralized and integrated platform creates fragmented workflows, making it difficult for organizations to share data and collaborate efficiently.

Another significant challenge is the identification and inclusion of potential donors with anemia. Anemia, though not always a contraindication for bone marrow donation, is often overlooked due to a lack of clear medical guidelines and evaluation protocols. This limits the donor pool, excluding individuals who might still be eligible to donate safely. Furthermore, the system struggles with role-based accountability, making it unclear who is responsible for various tasks, from donor recruitment and sample storage to patient-donor matching and legal compliance. These gaps lead to inefficiencies, missed opportunities, and, ultimately, lives lost due to procedural delays.

Solution:

we focus on developing a centralized and role-based application to address the inefficiencies in the bone marrow donation process. By using advanced technologies such as AI for donor-patient matching and anemia assessment and integrating seamless communication tools, the platform will enhance collaboration among stakeholders, streamline operations, and expand the donor pool. This approach ensures timely, efficient, and ethical management of bone marrow donations, ultimately saving more lives and improving healthcare outcomes.

Component diagram:



Ecosystems hierarchy:

Enterprises:

Hospital Enterprise – Healthcare services, treatment procedures

Bone Marrow Bank – Database for donors, samples

Legal Enterprise – Medical and Organizational policies

Anemia Center – Treating Anemia conditions

Organizations:

Admin Organization –

Bone Marrow Bank – Collection, storage and distribution of bone marrow

Government Organization – officers to ensure legal compliance

Anemia Center – Doctors for Anemia operations

Medical Organization – coordinates with specialists and technicians

Doctor Organization – Selects doctors required for the treatment

Roles:

Admin Role - Managing the ecosystem

Bone Marrow Bank Coordinator – Coordinating Banks activities

Donor – Providing samples, medical history

System Coordinator – Overseeing system-level operations

Legal Officer – Handling legal compliance and documentation

Anemia Coordinator – Anemia related operations, treatment schedules

Medical Technician – Doctors, nurses and support staff

Patient – Patient medical history