



**YEDITEPE UNIVERSITY  
FACULTY OF ENGINEERING**

**ISE 402 - CSE 344  
INTERDISCIPLINARY PROJECT  
EARTHQUAKE MANAGEMENT SYSTEM**

**by**

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# **1 Introduction**

## **1.1 Purpose Of The Document**

This comprehensive document serves the purpose of providing detailed information regarding the structure of the Disaster Management software. It covers all aspects, including the frontend (mobile application), database, and the interactions between these components. The document is designed to offer a clear understanding of the software's architecture through the use of relevant diagrams and explanations. By presenting a holistic overview of the system's design and functionality, this document aims to facilitate effective communication and collaboration among stakeholders involved in the development, maintenance, and utilization of the Disaster Management software. This document will also guide us through the software implementation phase. thanks to the diagrams we have already created, it will be easy to code our project.

## **1.2 Purpose Of The System**

The proposed system aims to revolutionize disaster management through an intuitive and accessible mobile application where all management tasks can be performed. Designed for authorized personnel within designated authorities, the system provides access to key information required for effective emergency response. Key users of the system include emergency personnel, stakeholders involved in disaster management and the general public within the authorized scope.

### **1.2.1 The New System**

The system offers users a comprehensive feature set equipped with the following capabilities:

1. Automatic determination and presentation of emergency material locations and quantities: Using advanced algorithms and data analysis, the system automatically determines the optimal locations for emergency supplies and calculates the required quantities. This information is made available to relevant personnel, ensuring that resources are available on time and to those who need them.
2. Emergency equipment requests: Emergency equipment requests: Users located in the emergency zone identified by the system can submit emergency equipment requests through the mobile app. This feature facilitates the efficient allocation of resources to meet the specific needs of the affected areas.
3. Access to emergency supply information: Access to emergency supplies information: The system allows users to view the locations and contents of units where emergency supplies are stored. This feature promotes effective resource management and coordination by providing transparency and awareness of available resources before and after an earthquake.
4. Automated determination and availability of search and rescue resources: Automatic identification and availability of search and rescue resources: Using intelligent algorithms,

the system determines the locations and appropriate quantities of search and rescue vehicles and personnel required. This information is automatically provided to the relevant personnel, speeding up search and rescue operations.

5. Controlled access to search and rescue unit contents: Controlled access to search and rescue unit content: Before an earthquake occurs, the system limits access to content while allowing public access to search and rescue unit locations. Only authorized personnel are authorized to view detailed content. However, after an earthquake, the content of search and rescue units located within the emergency zone becomes publicly accessible. This ensures transparency and effective use of resources.
6. Automatic identification and availability of medical personnel: The system uses intelligence capabilities to identify the locations and quantities of medical personnel required in emergency situations. This information is quickly communicated to the relevant personnel, ensuring efficient distribution and management of health resources.
7. Animal-related services: Similar to human healthcare, the system extends its function to cover animal welfare-related services in emergencies. It automatically determines the actions and resources needed to meet the needs of animals affected by disasters, ensuring a comprehensive response capability.
8. Access to gathering areas and building information query service: Through the system, users can easily find the nearest gathering space according to their registered residence. There is also a building information query service that provides access to basic information about the buildings around them.

The overall objective of the proposed system is to provide comprehensive preparedness, coordination and response capabilities before, during and after emergencies. By leveraging technology and providing key information to authorized stakeholders, the system aims to increase the efficiency and effectiveness of disaster management operations. In conclusion, while we cannot prevent disasters from occurring, we can minimize their impact.

### **1.3 Structre Of The Document**

This software design report is structured to provide a comprehensive understanding of the software architecture of the Disaster Management application. To ensure easy navigation and accessibility, the document starts with a cover page and a well-organized table of contents.

Successive sections of the document are dedicated to presenting relevant diagrams illustrating various aspects of the software architecture. Each diagram is accompanied by detailed descriptions that facilitate a clear understanding of the system structure. These diagrams cover key components such as the mobile application (front-end), the database and the interaction between these elements.

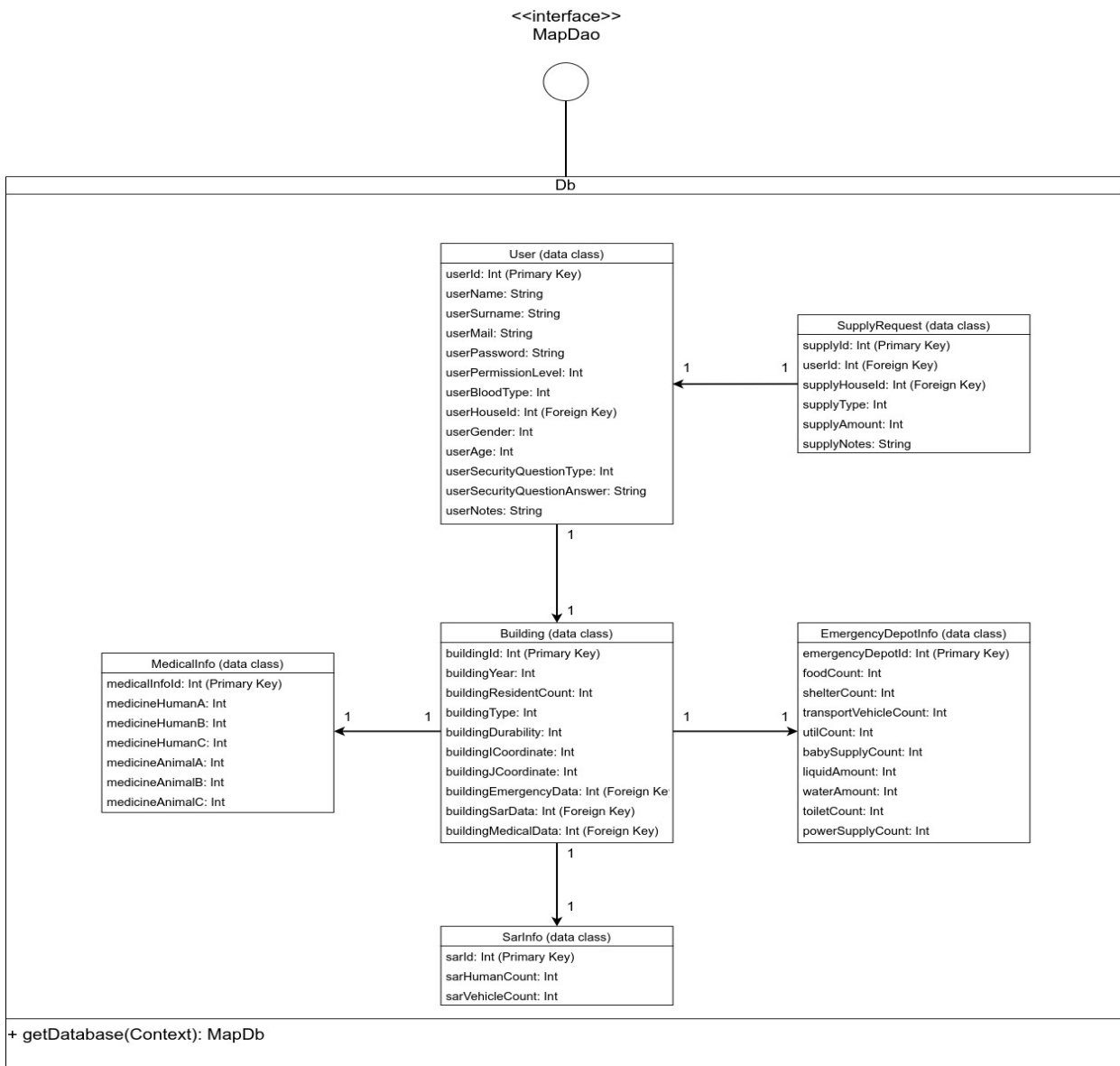
Following the diagram presentations, the document concludes with a glossary and references page. The glossary provides concise definitions of key terms and acronyms used throughout the report, guaranteeing a shared understanding of terms among readers. The references page lists the

sources of information consulted during the document preparation process and provides a path for further clarification and research.

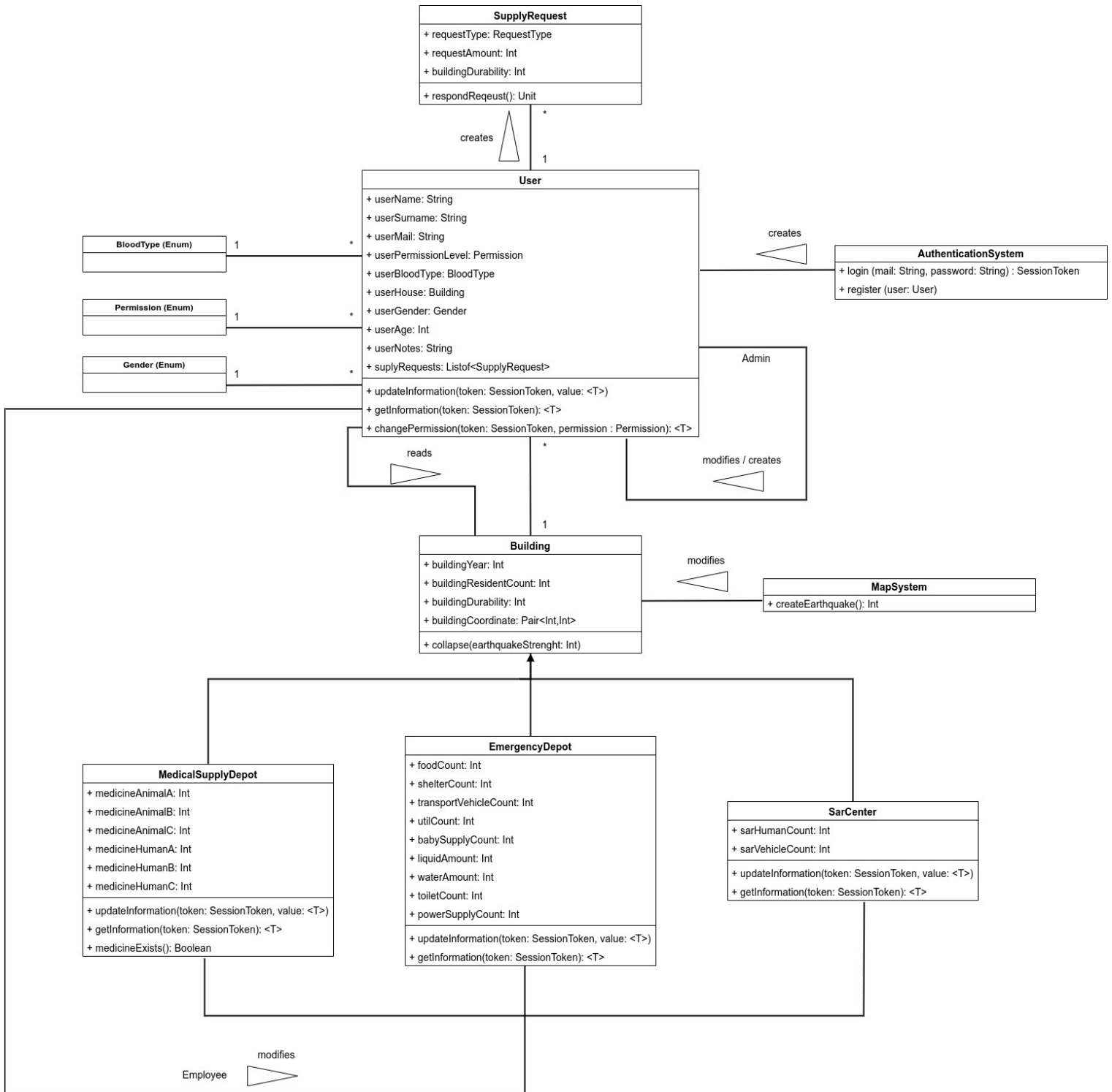
The structured format of this software design report aims to facilitate effective understanding and navigation for stakeholders involved in the development, maintenance, and use of the Disaster Management application. By providing clear diagrams, explanations and reference materials, this document serves as a valuable resource in understanding software architecture and developing effective communication and collaboration among team members.

## 2 Detailed Design Class Diagram

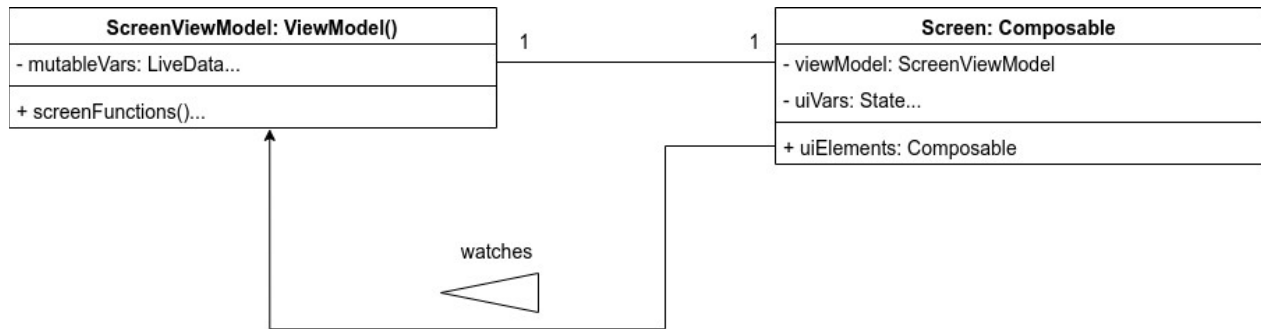
### 2.1 Database Diagram



## 2.2 Class Model Diagram



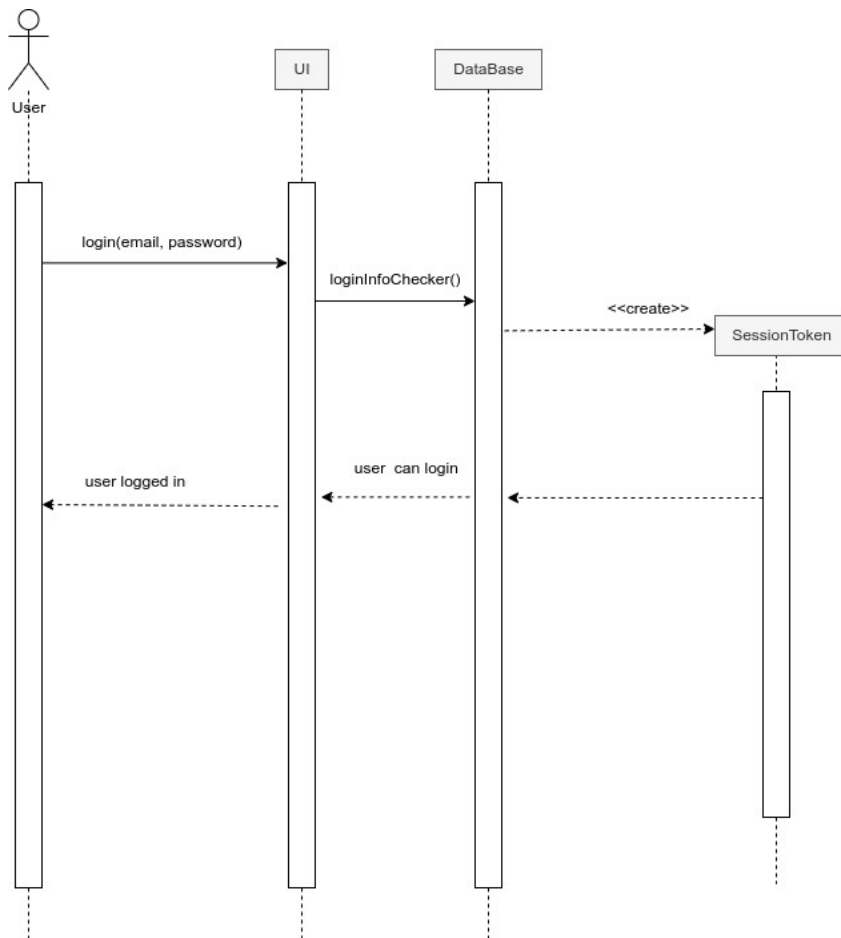
## 2.3 UI Class Model Diagram



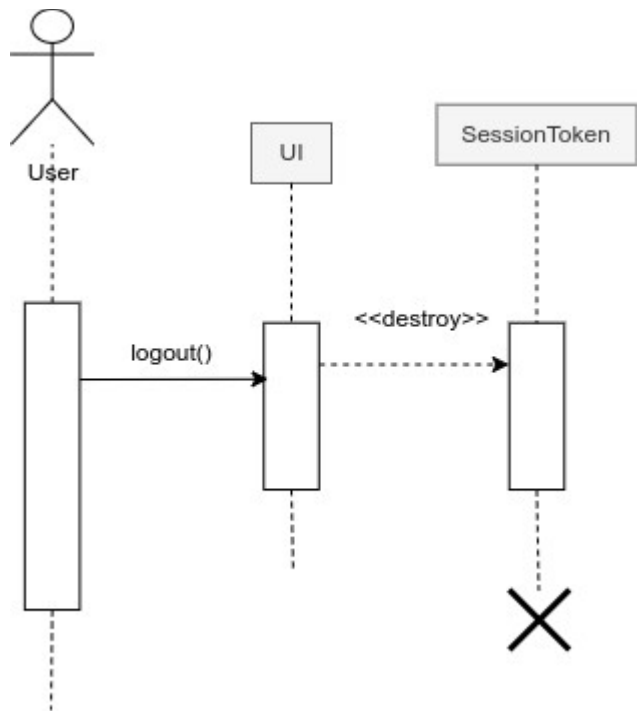
## 3 Dynamic Models

### 3.1 Sequence Diagrams

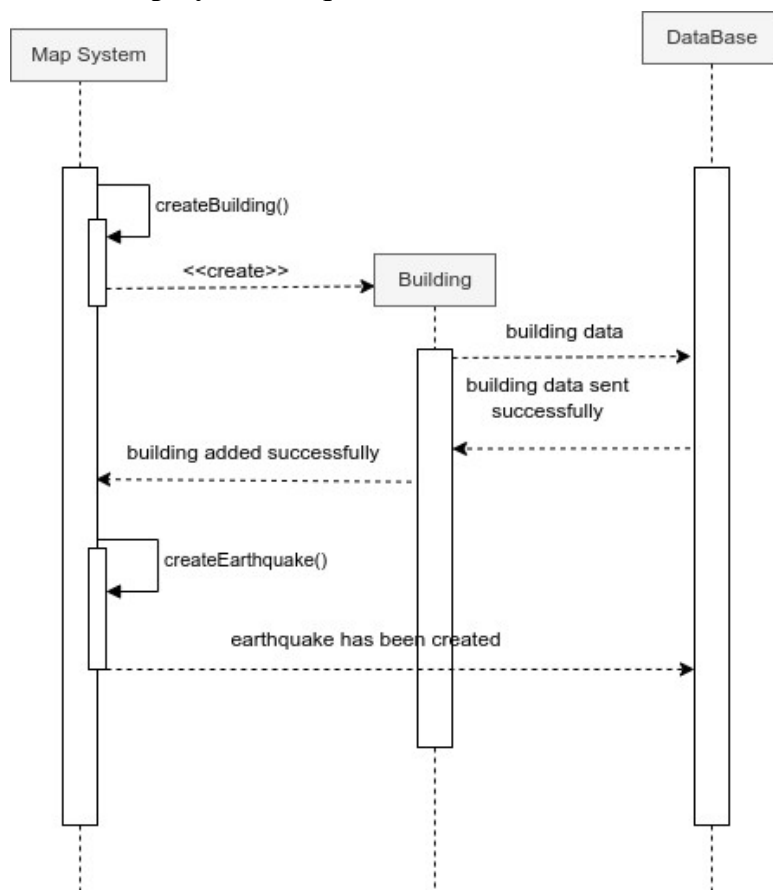
- Login Sequence



- **Logout Sequence**

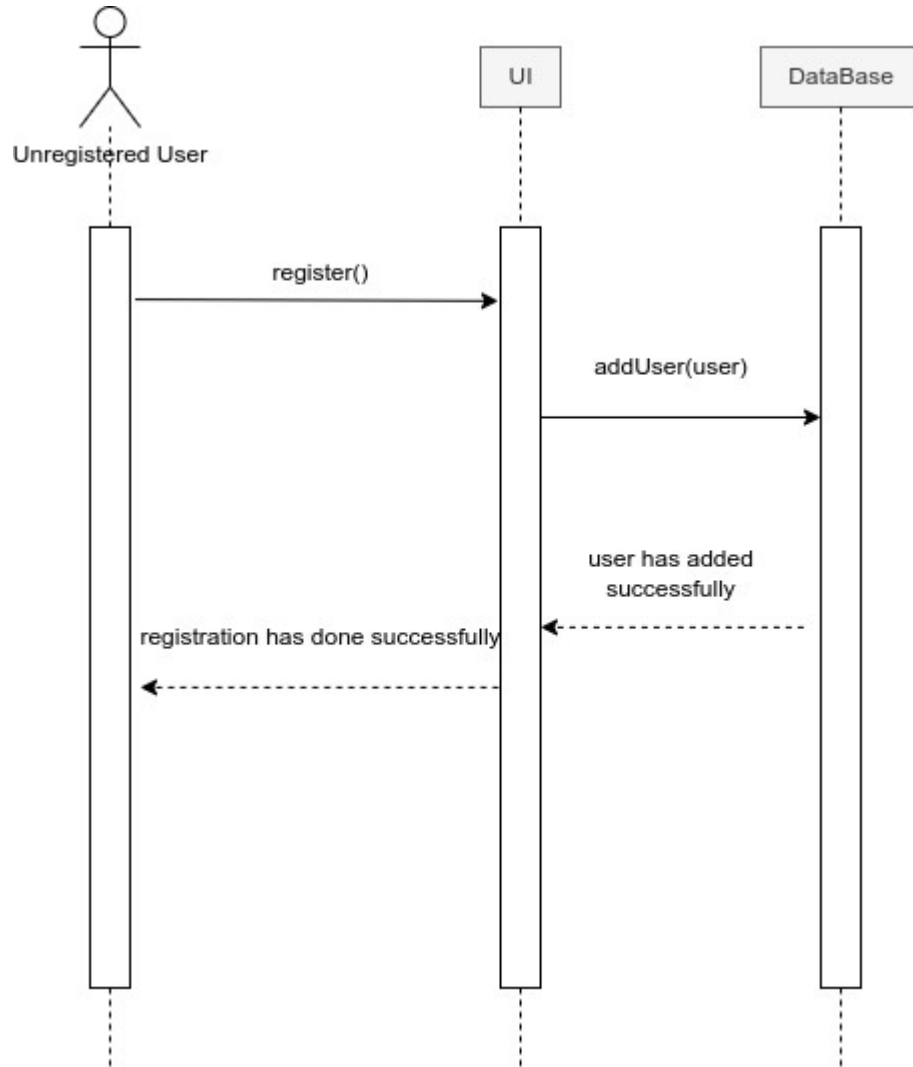


- **Map System Sequence**

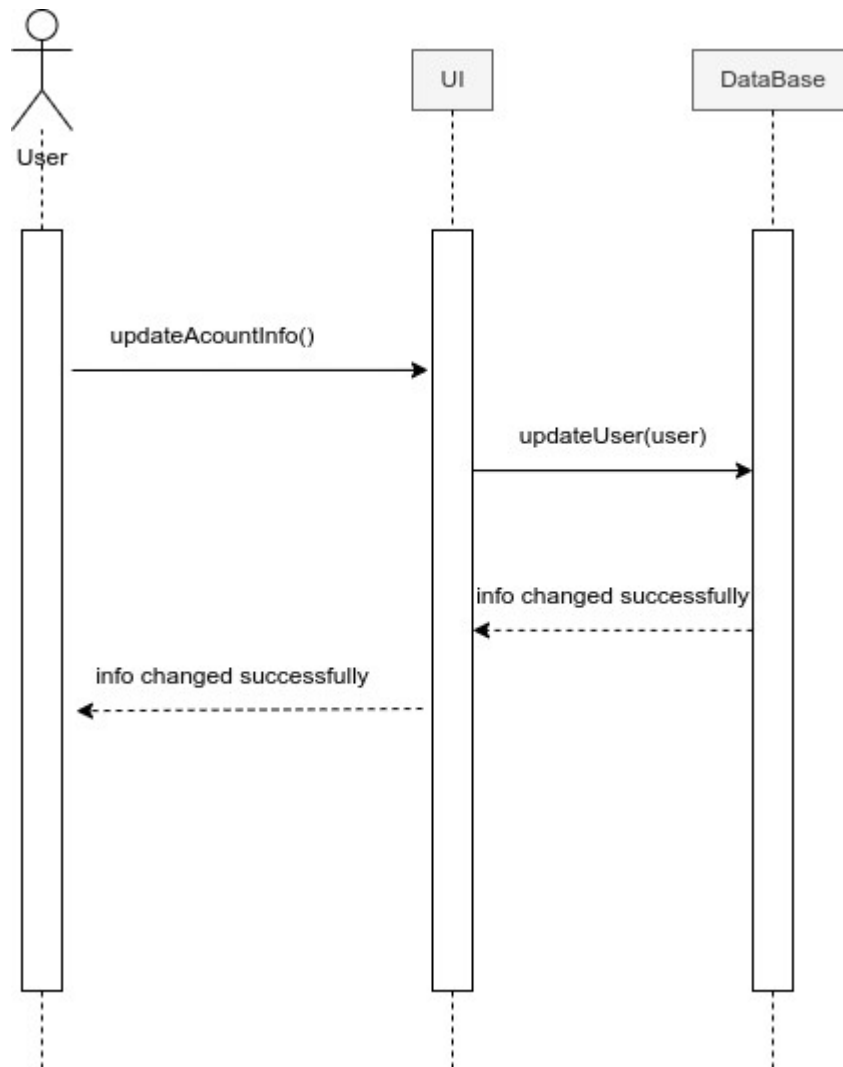




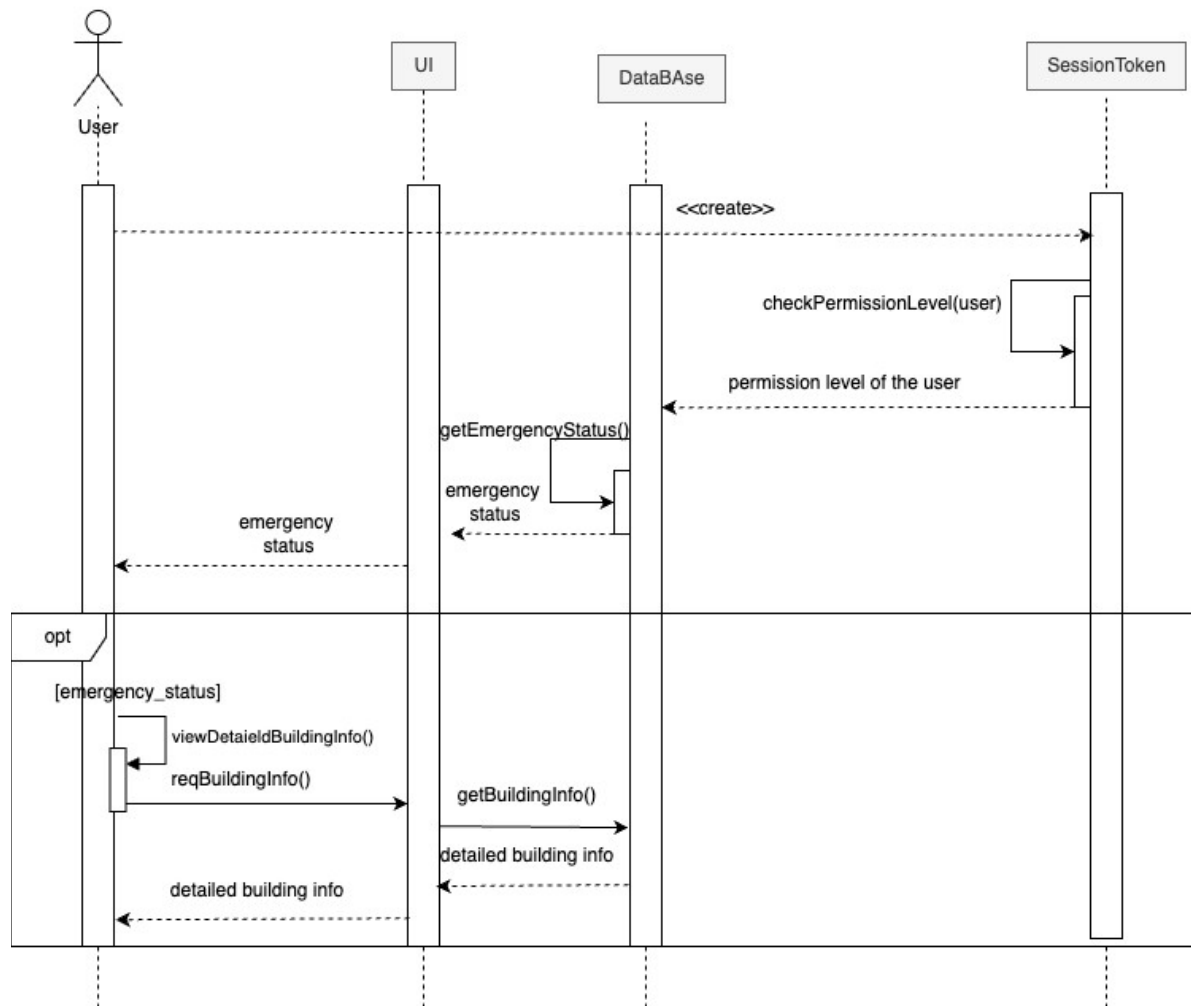
- **Register Sequence**



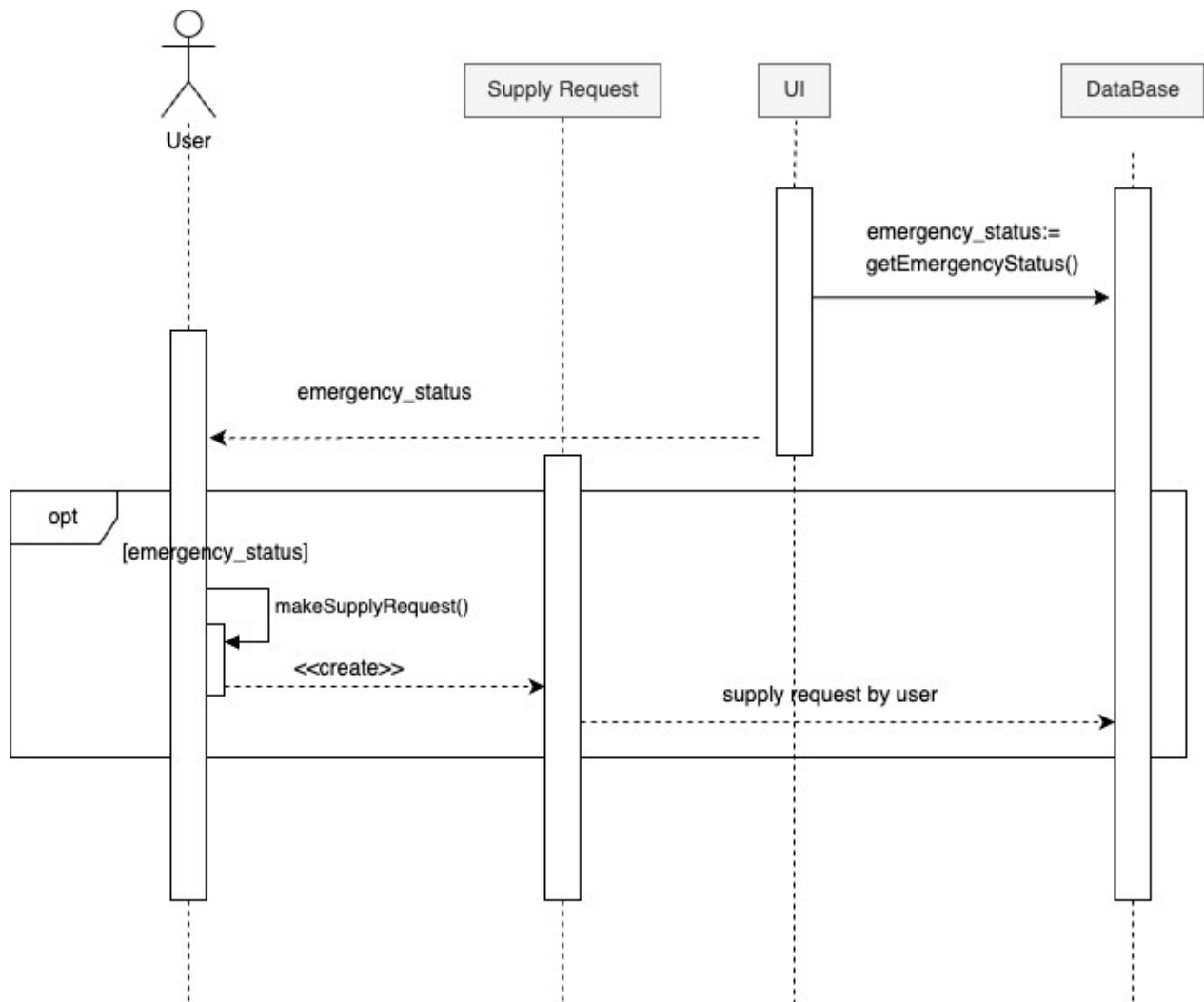
- **Change Account Info Sequence**



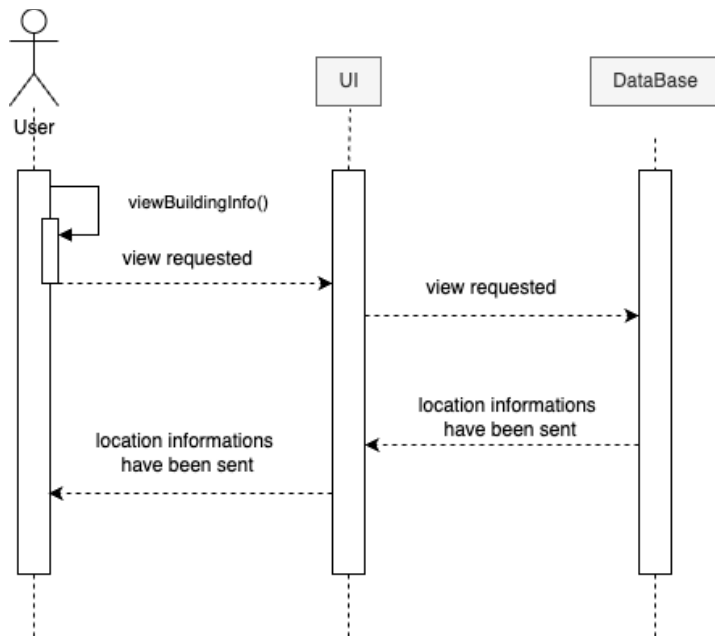
- **View Detailed Building Info Sequence**



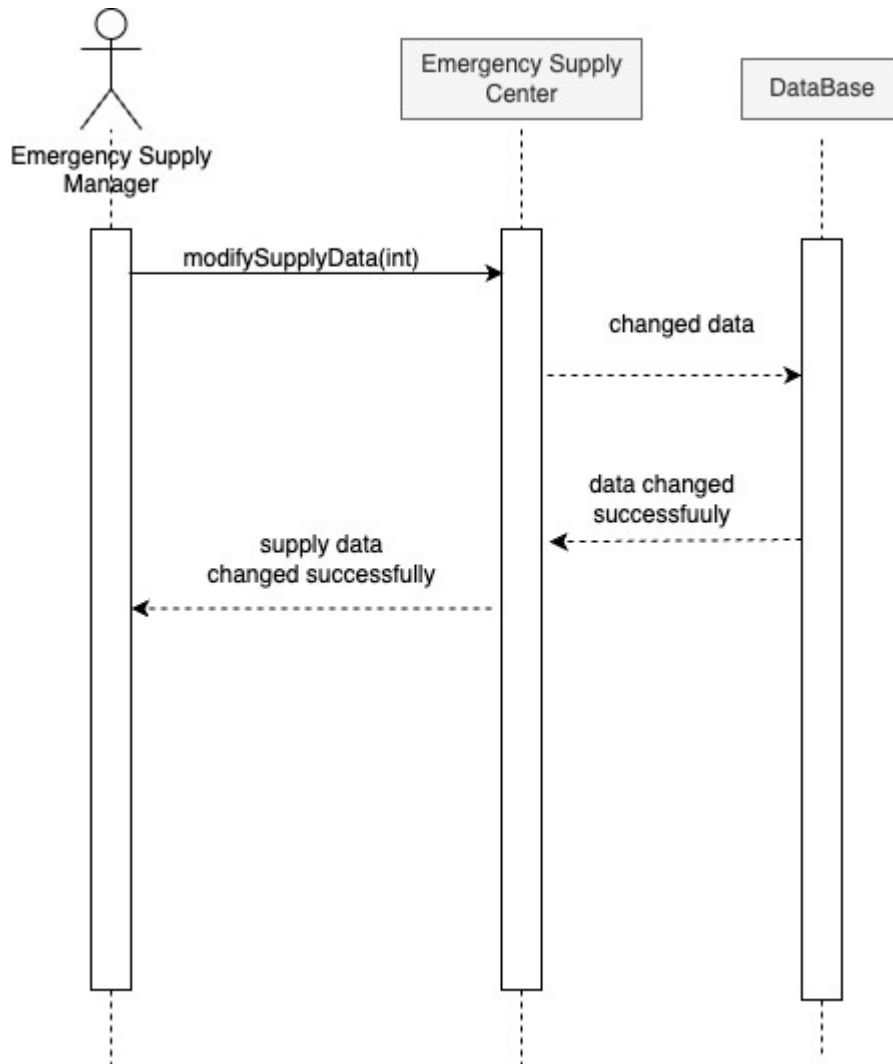
- **Create Supply Request Sequence**



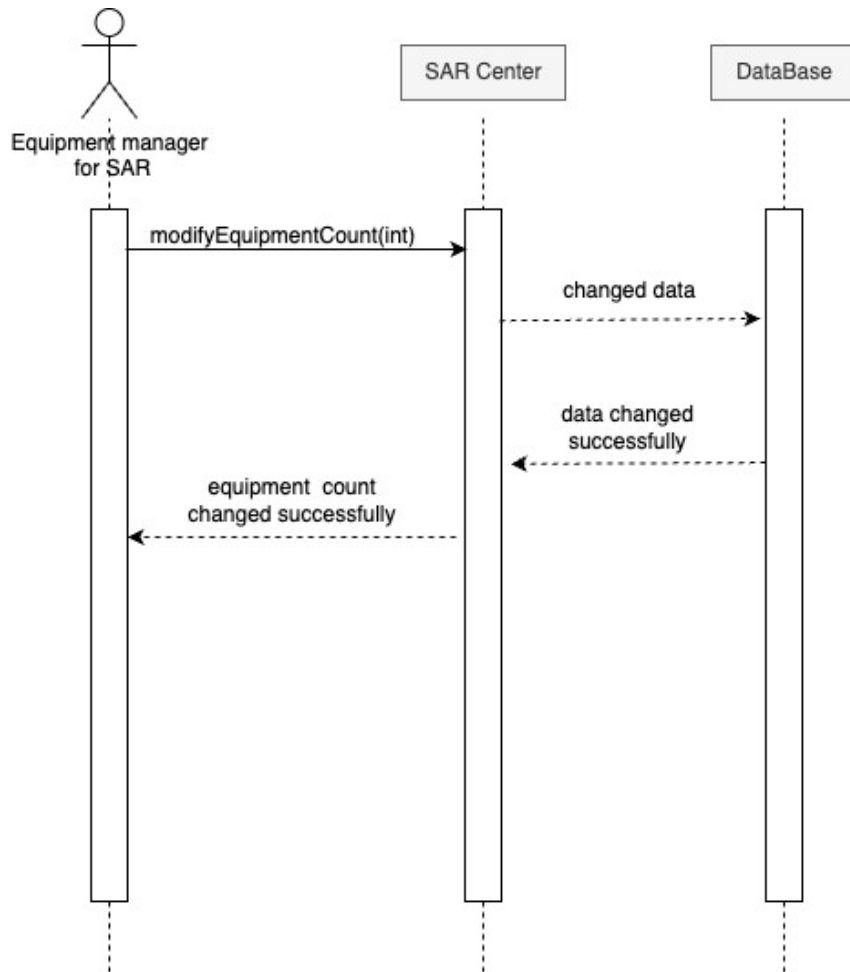
- **View Resident Building Information**



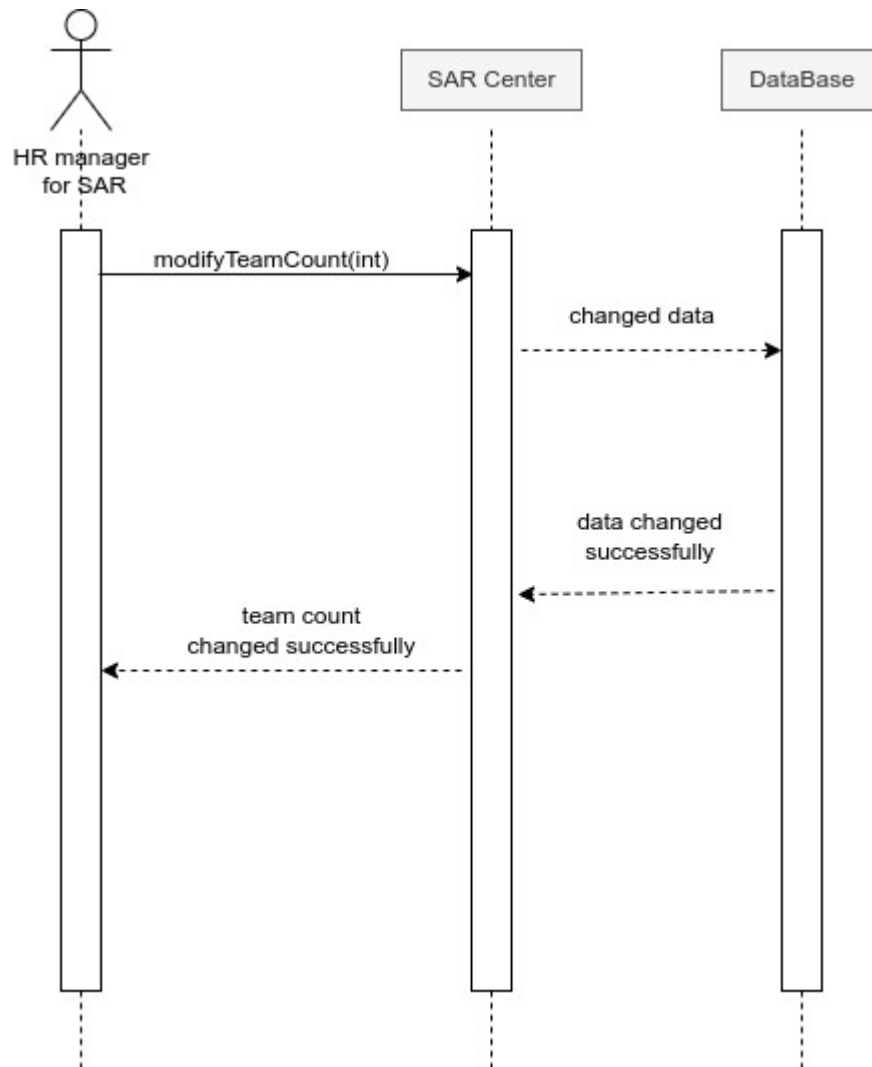
- **Emergency Supply Manager Modify Supply Data Sequence**



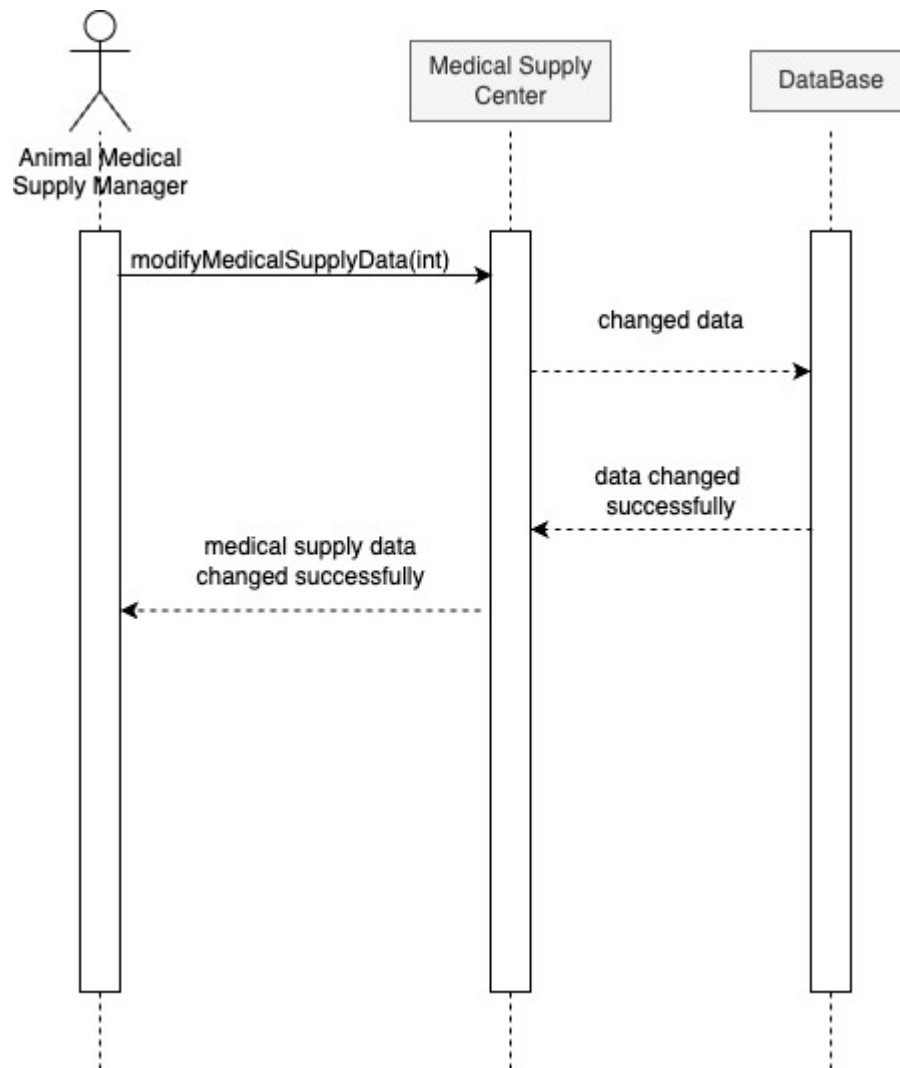
- **Equipment Manager For SAR Modify Equipment Data**



- **HR Manager For SAR Modify Team Data**

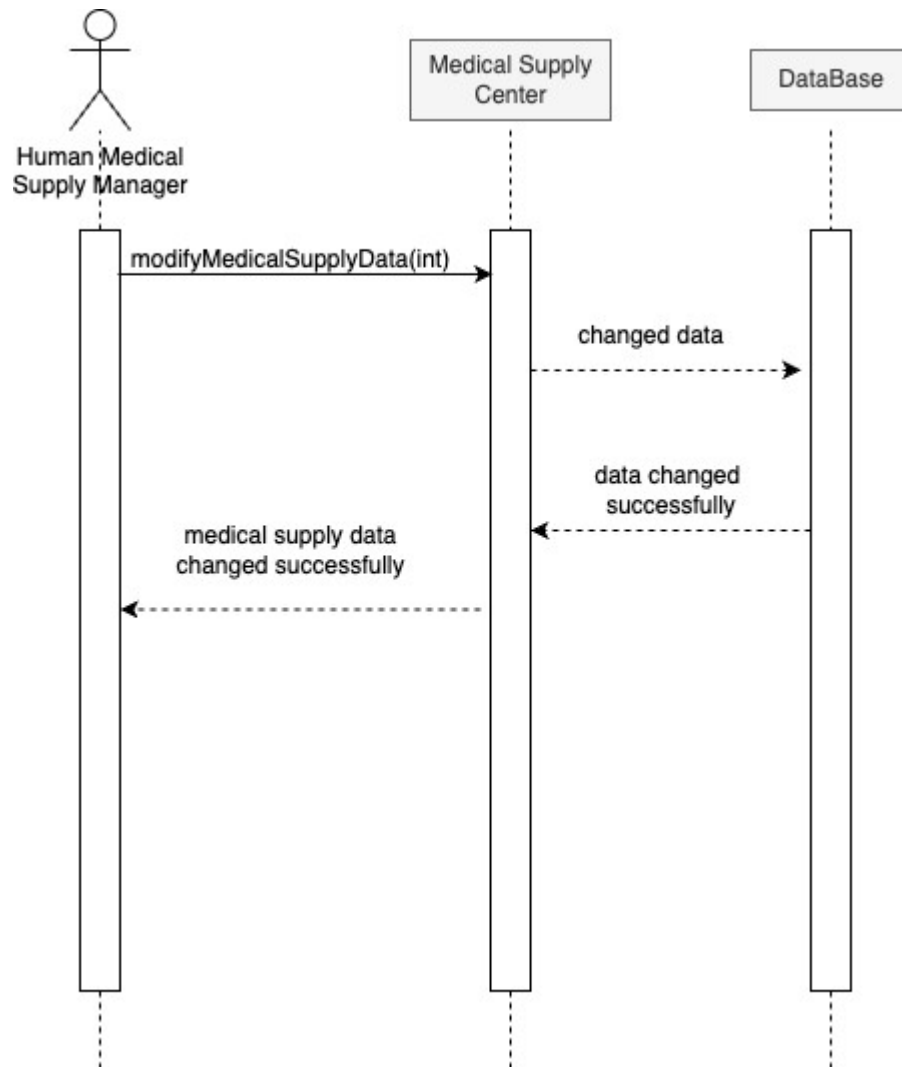


- **Animal Medical Supply Manager Modify Animal Data**

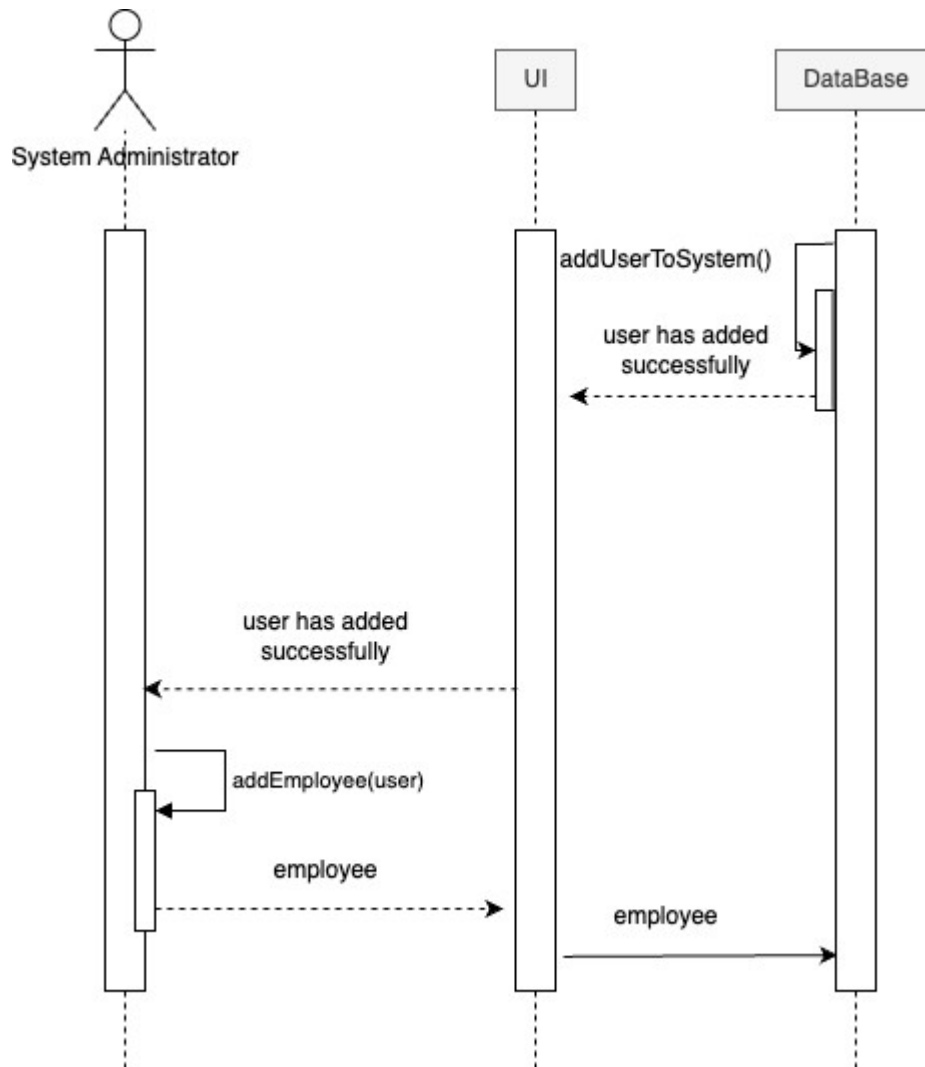




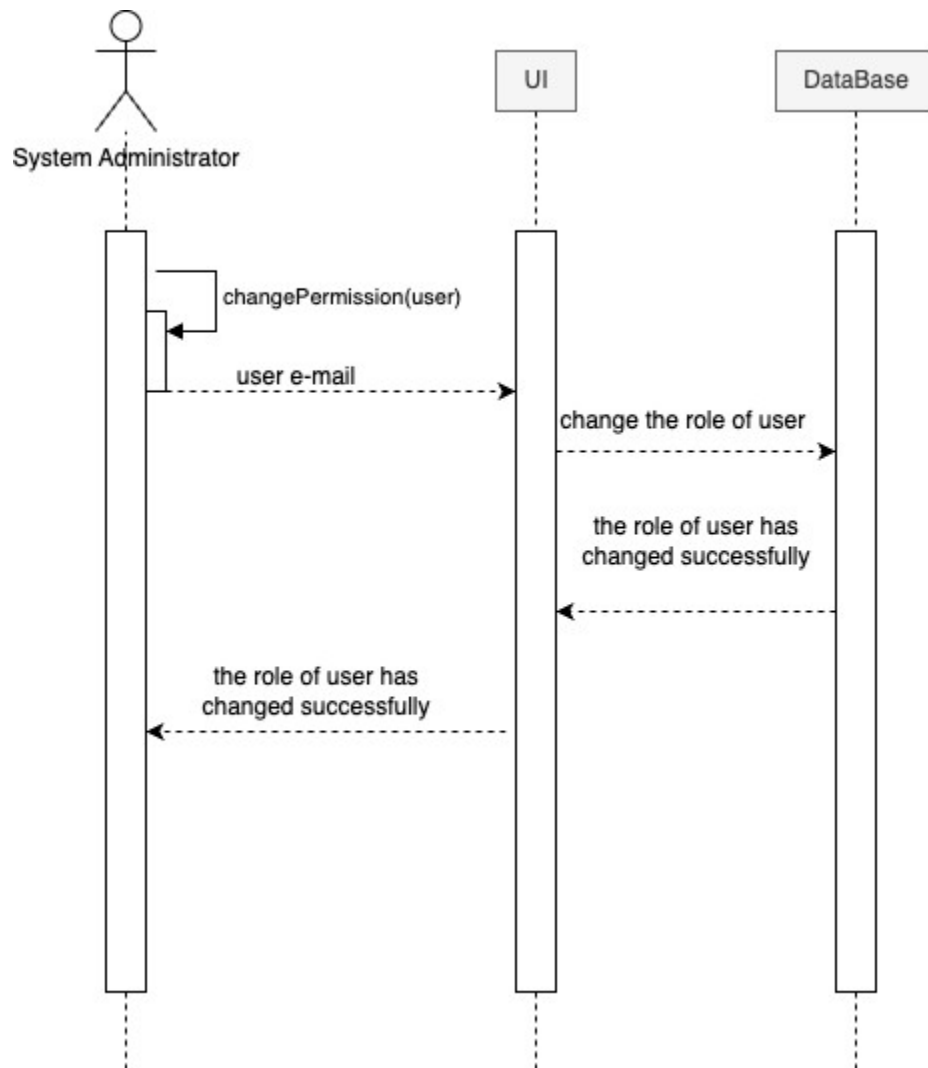
- **Human Medical Supply Manager Modify Human Data**



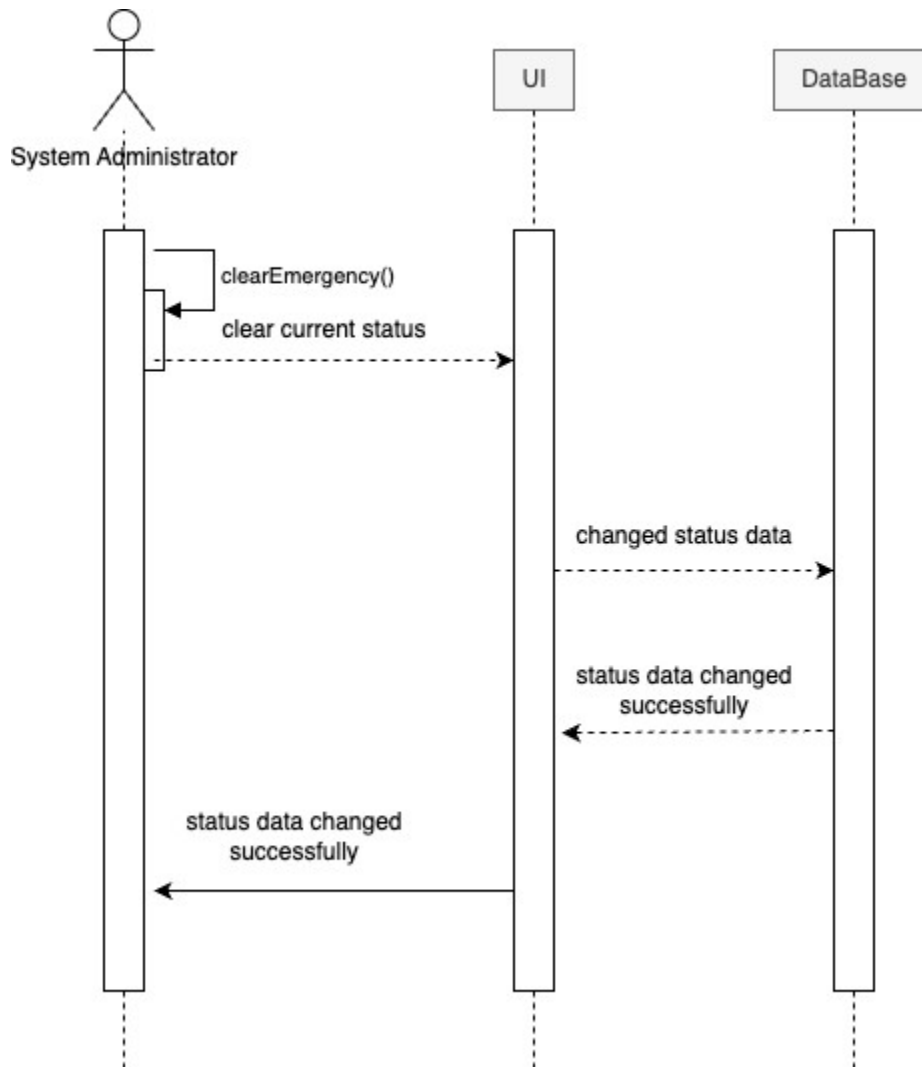
- **System Administrator Add Employee**



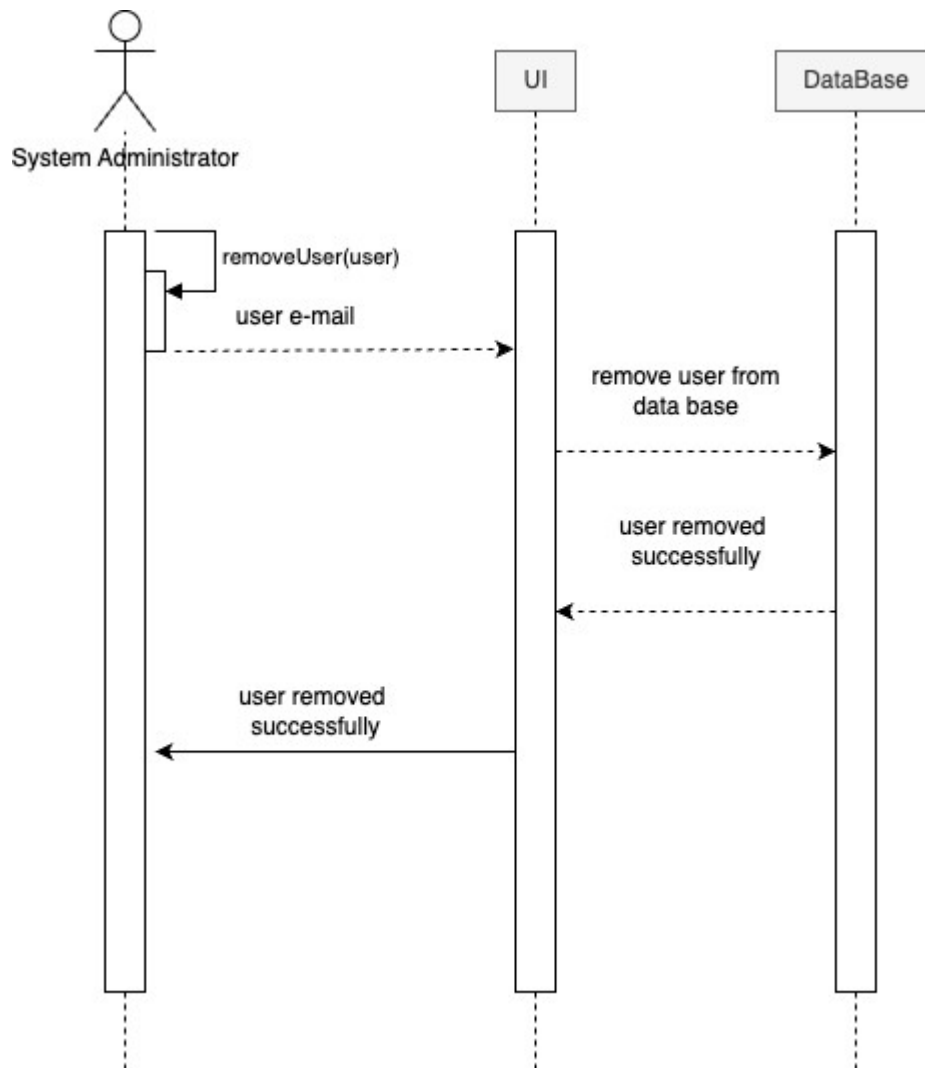
- **System Administrator Change User Permission**



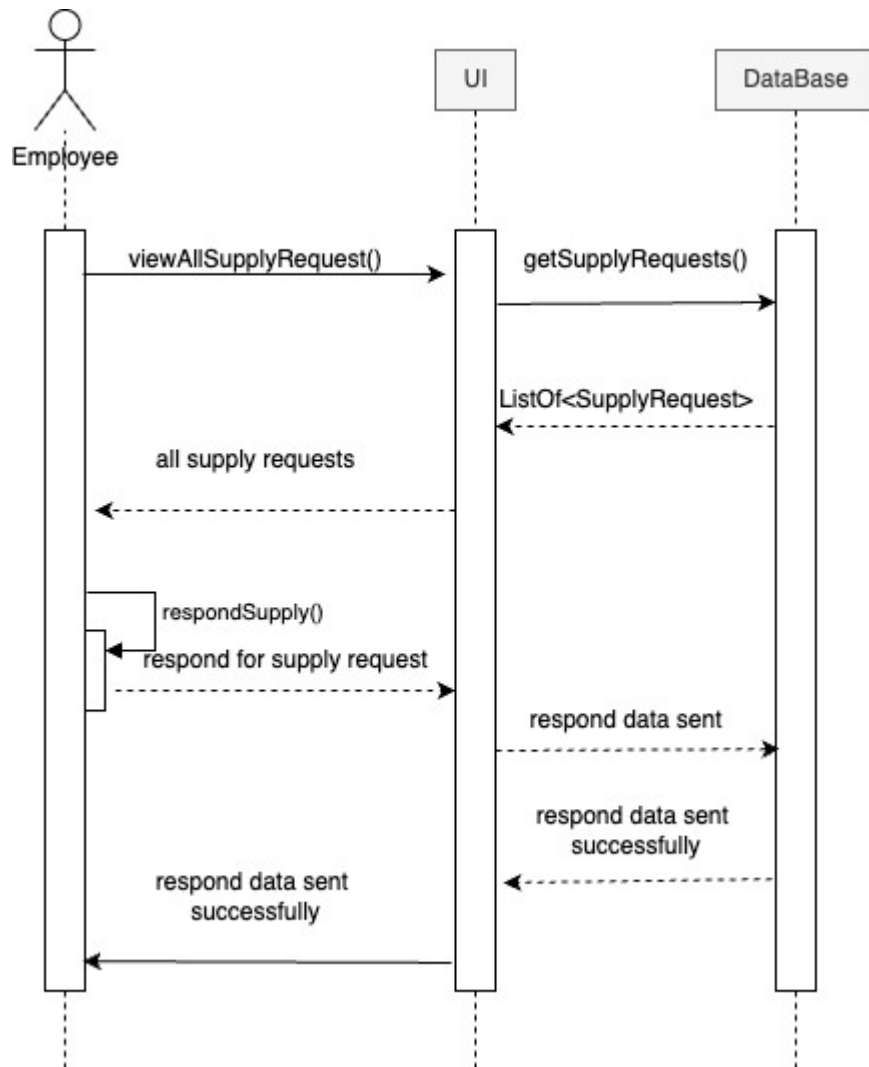
- **System Administrator Clear Emergency**



- **System Administrator Remove User**



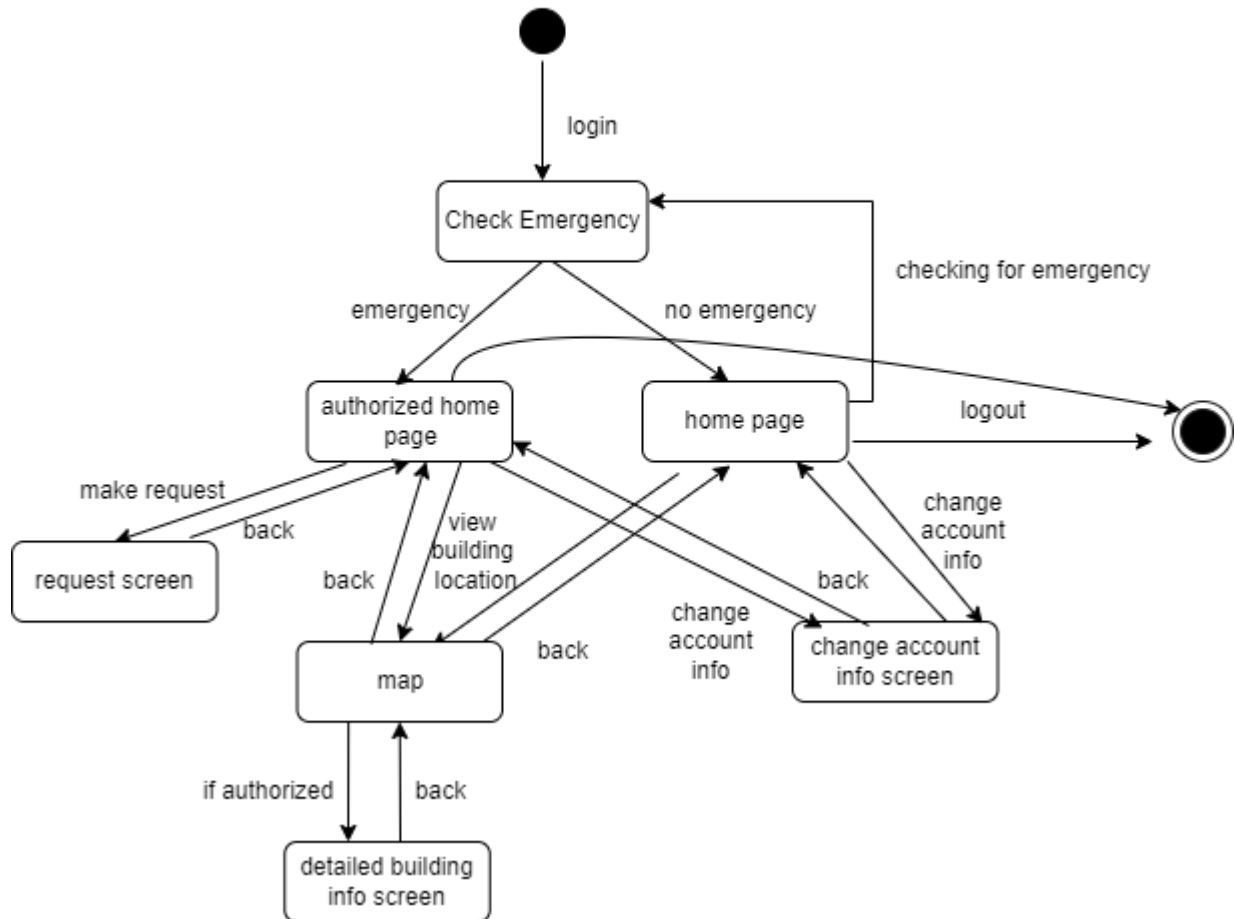
- Employee View Supply Requests



### 3.2 State Diagrams

- User State Diagram

STATE DIAGRAM FOR USER

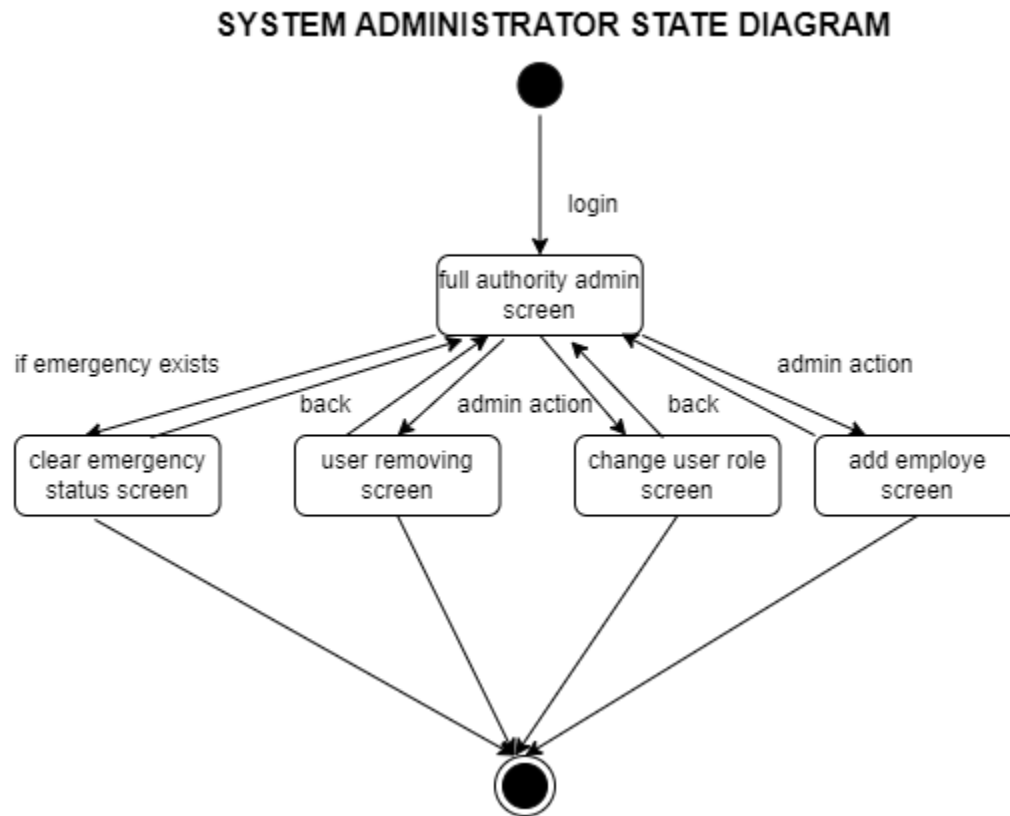


- Employee State Diagram



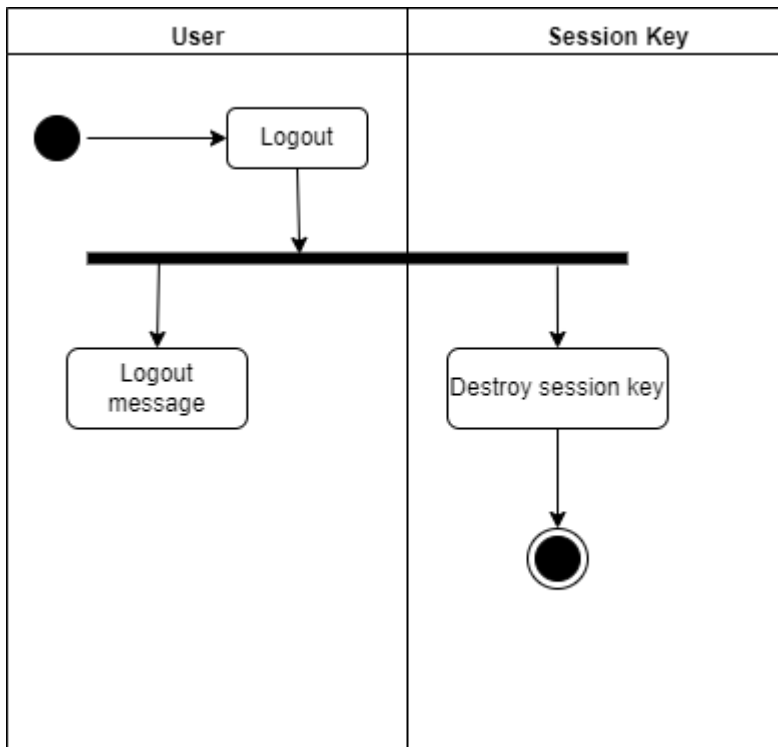


- **System Administrator State Diagram**

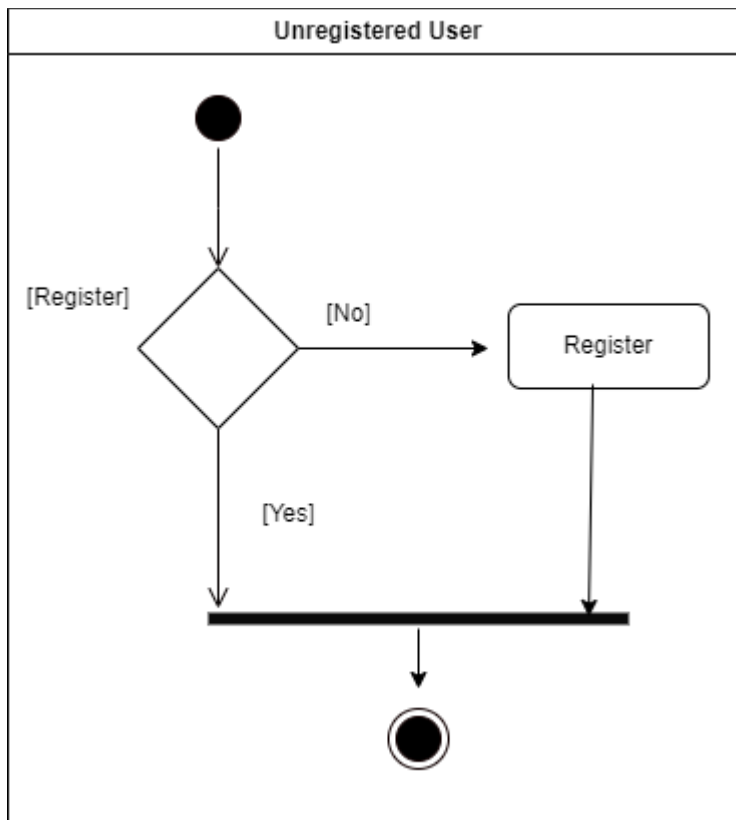


### 3.3 Activity Diagrams

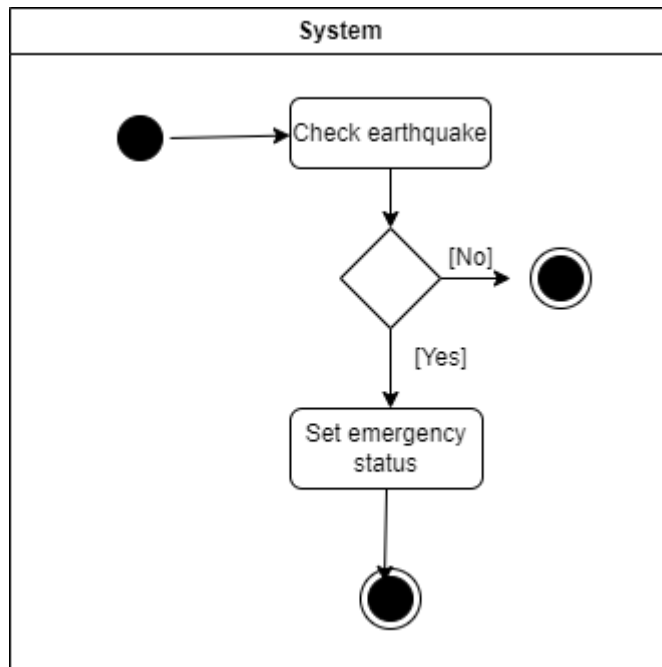
- Logout Activity Diagram



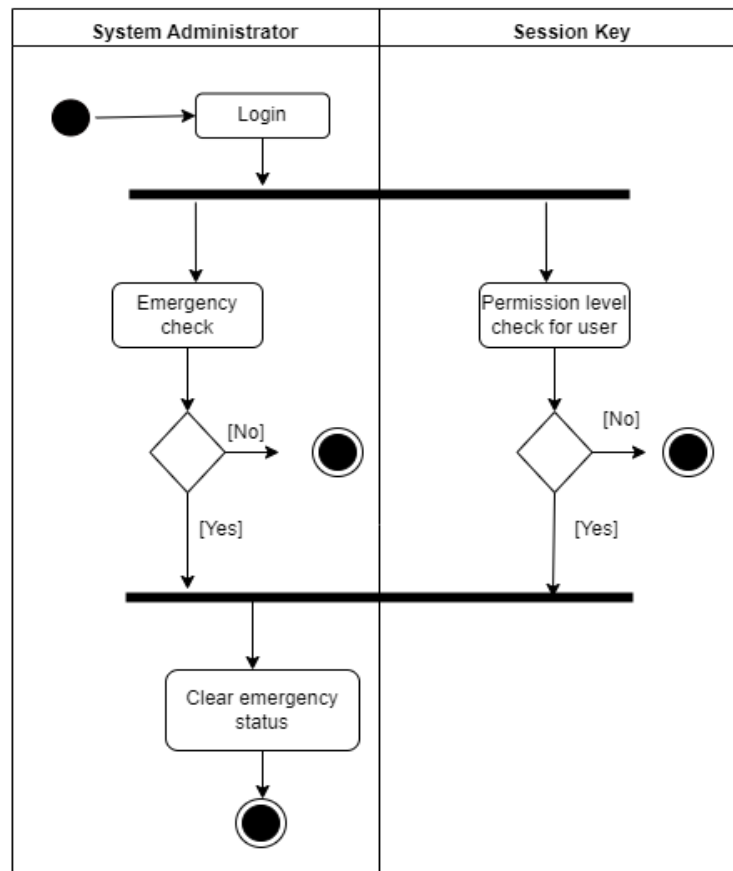
- Unregistered User Activity Diagram



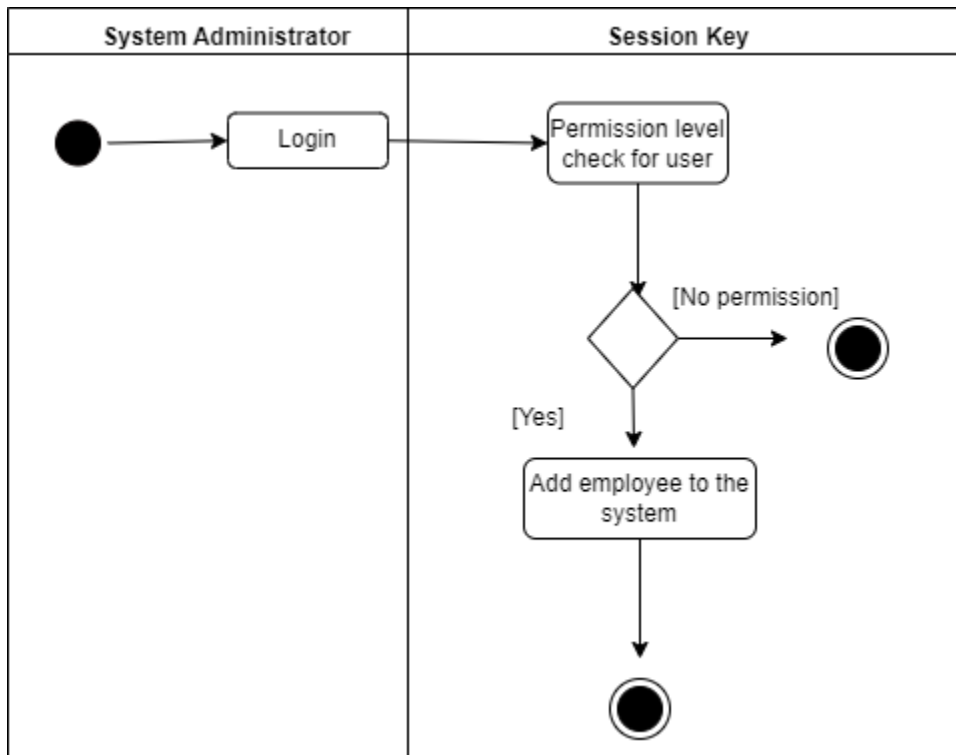
- **Check Emergency Activity Diagram**



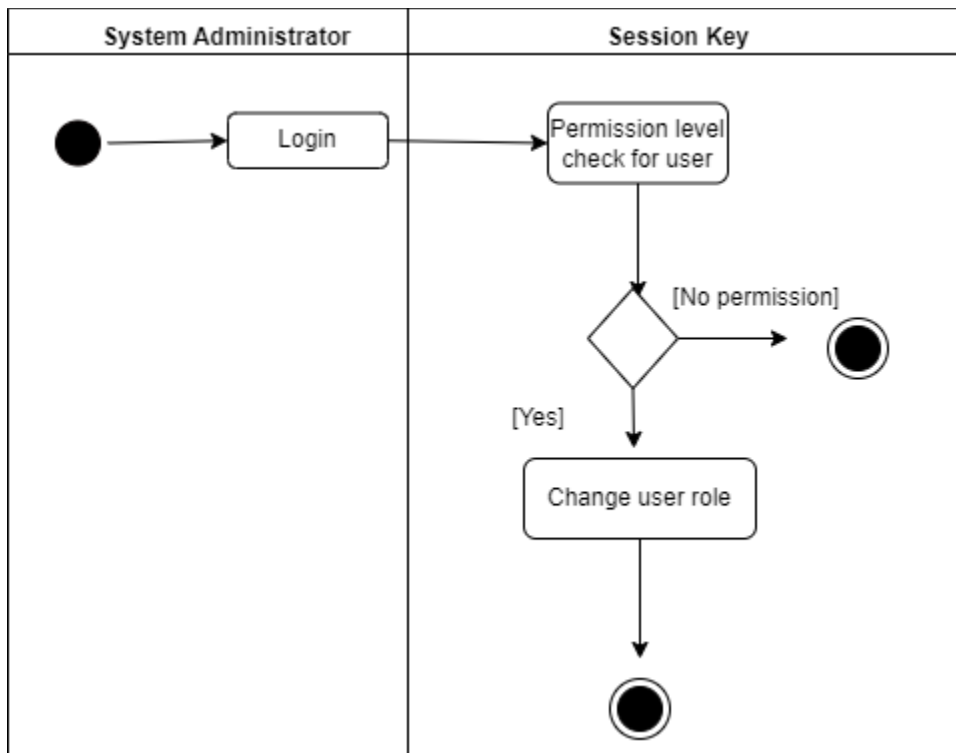
- **Clear Emergency Activity Diagram**



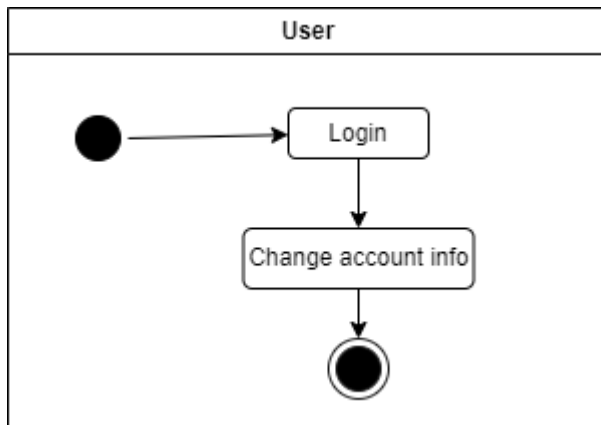
- **Add Employee Activity Diagram**



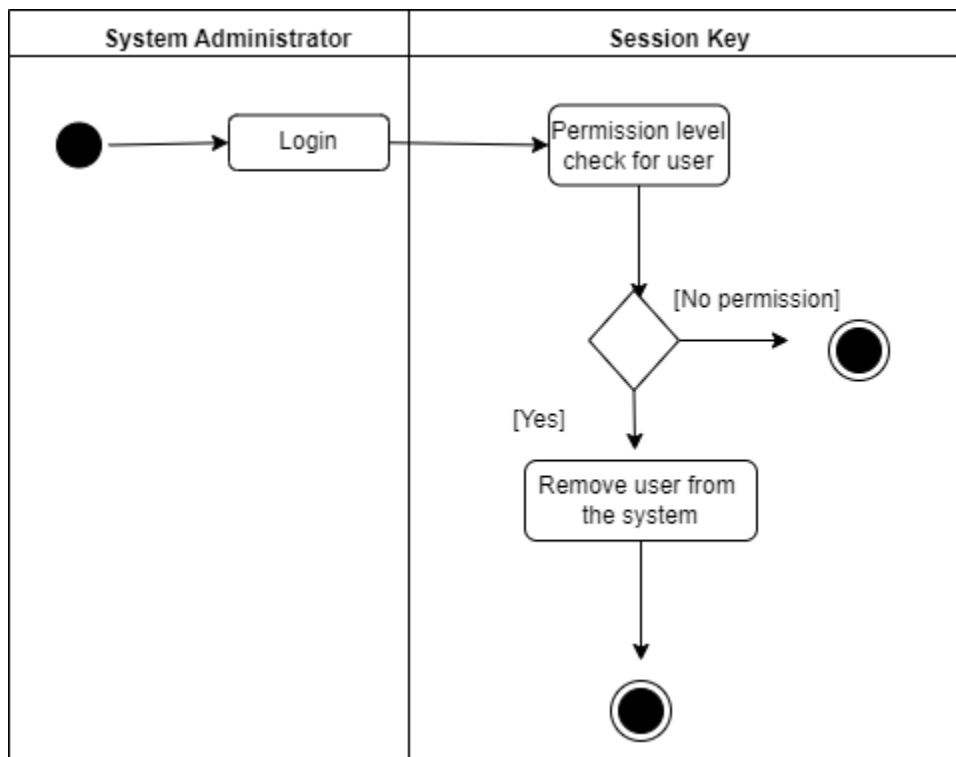
- **Change User Role Activity Diagram**



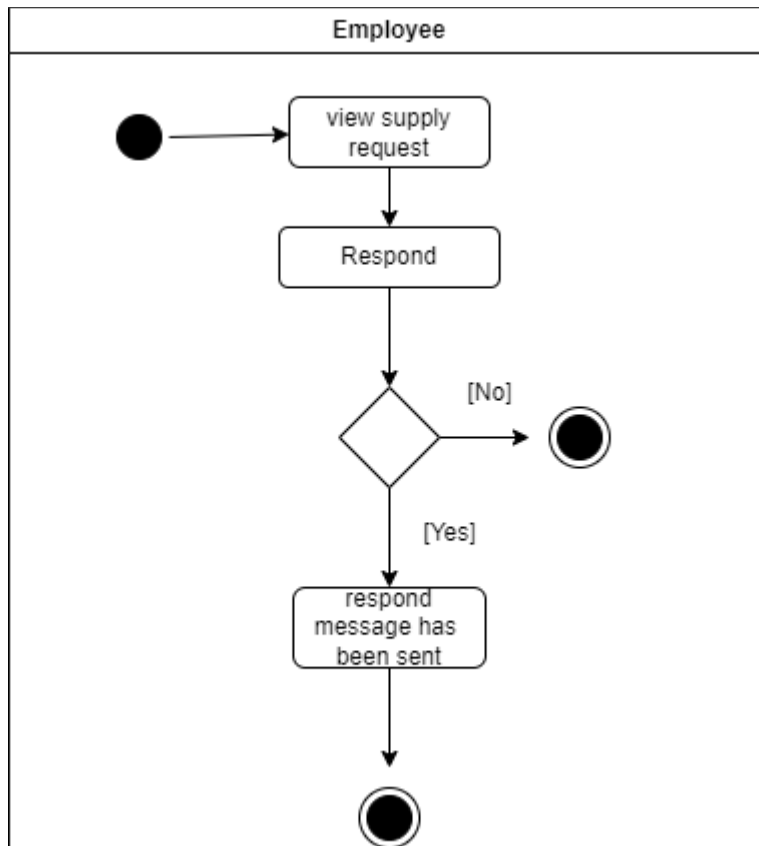
- **Change Account Info Activity Diagram**



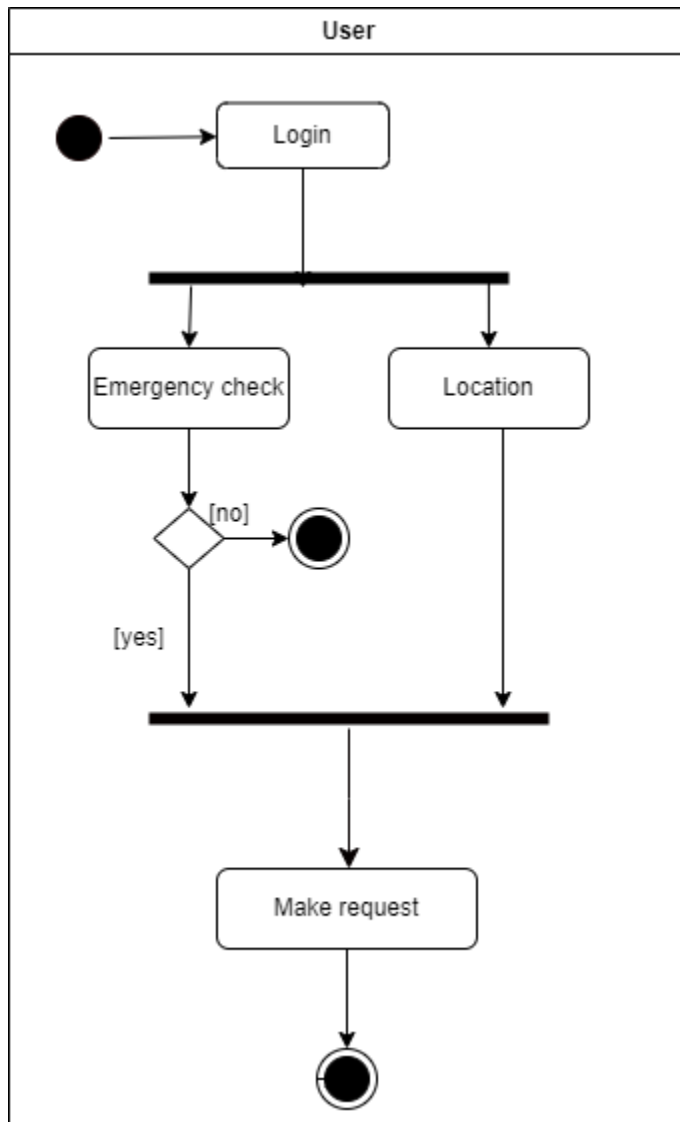
- **Remove User From System Activity Diagram**



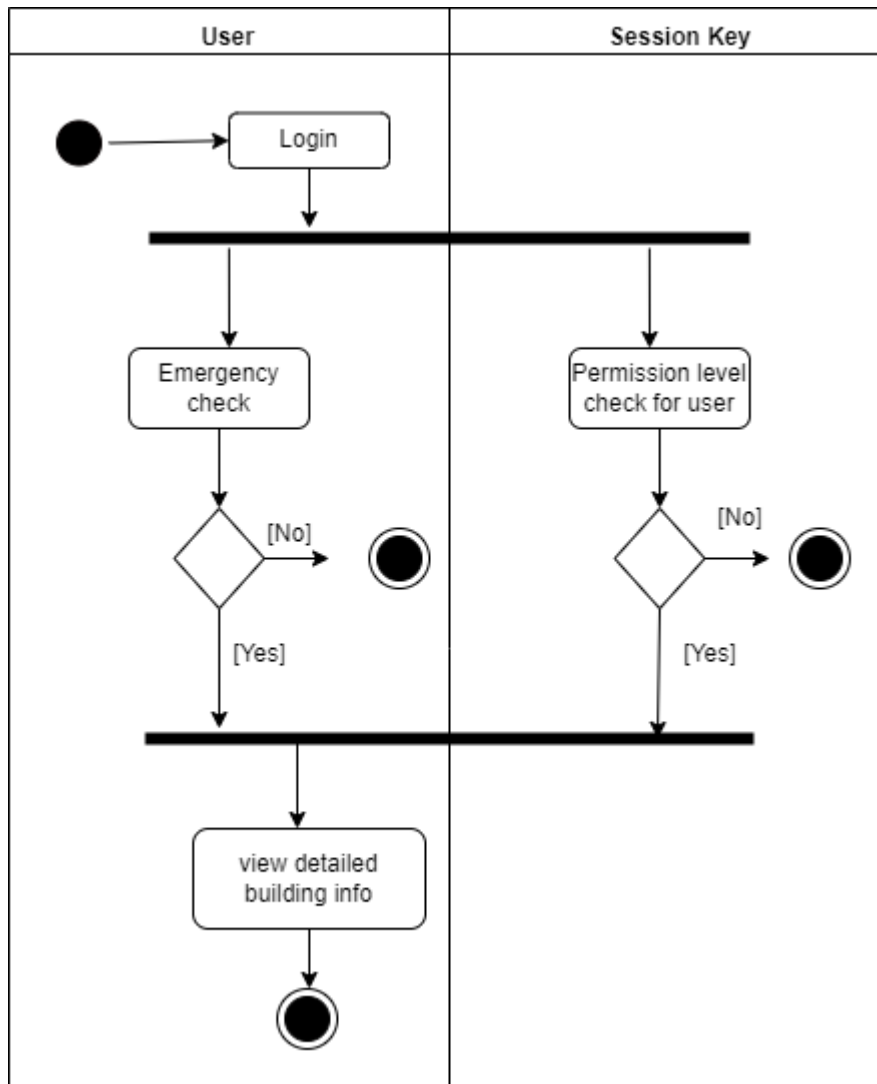
- **View And Respon To Supply Request Activity Diagram**



- **Make Supply Request Activity Diagram**

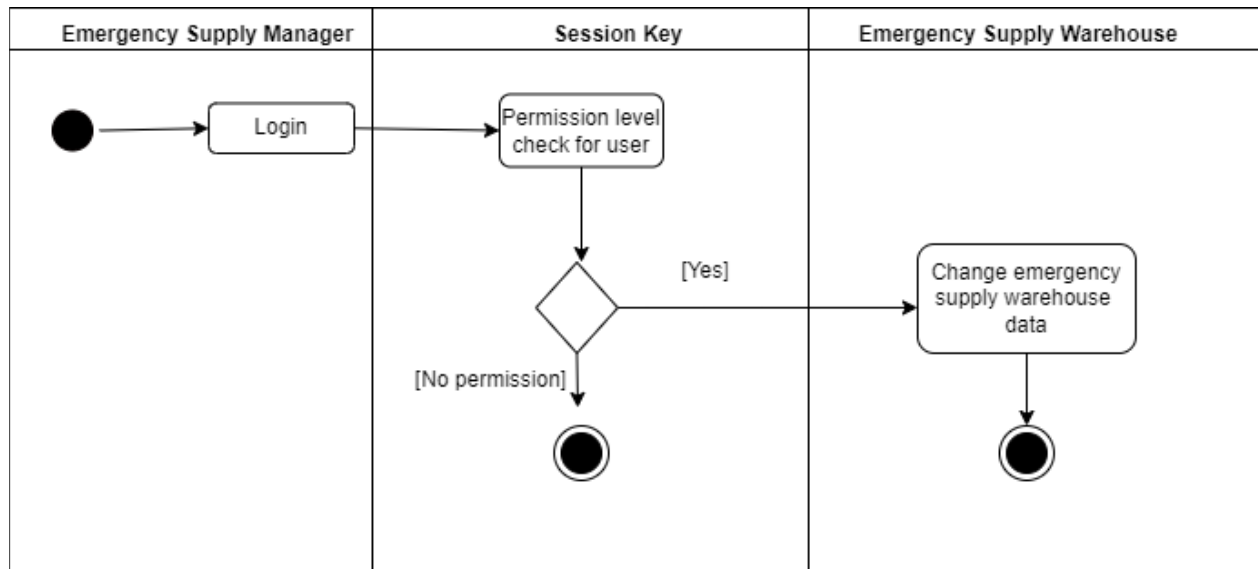


- **View Detailed Building Info Activity Diagram**

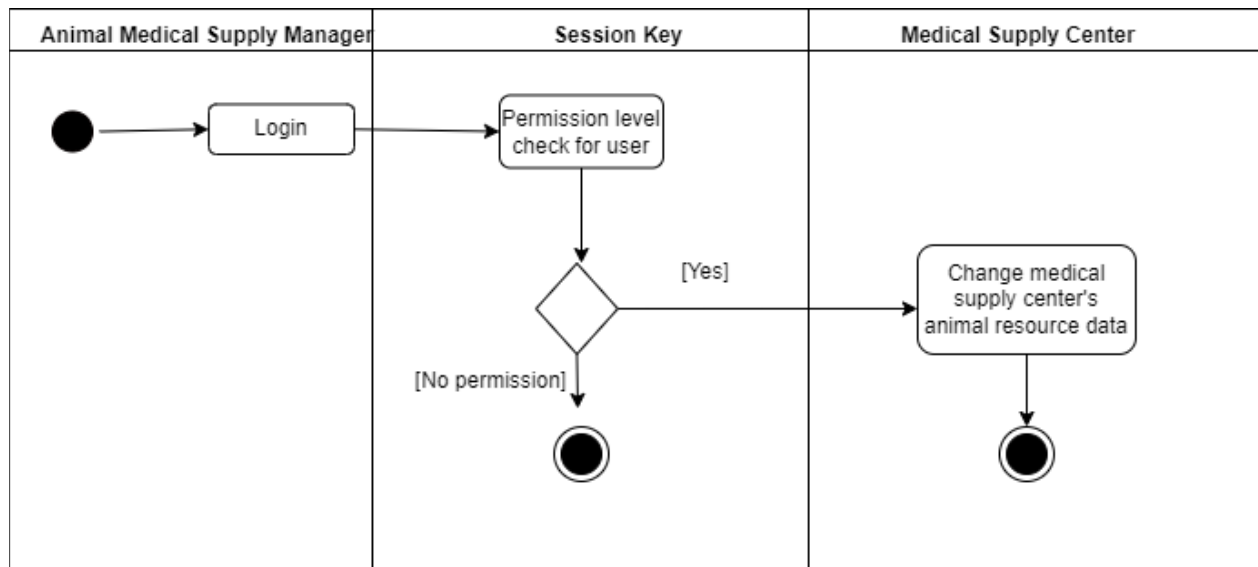




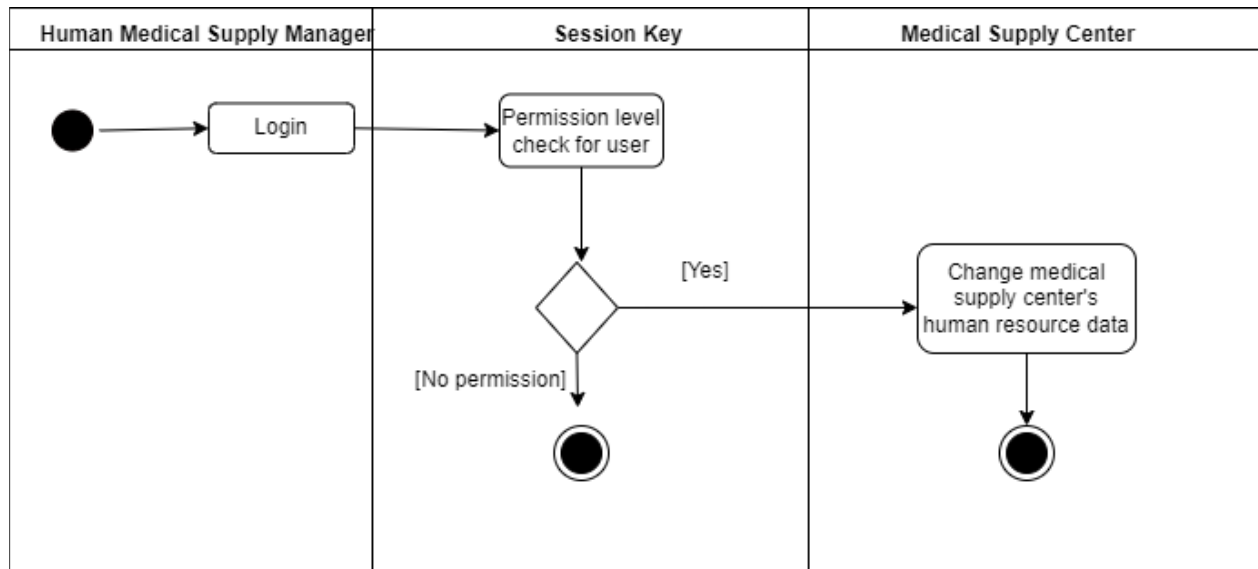
- Emergency Supply Warehouse Modify Data Activity Diagram



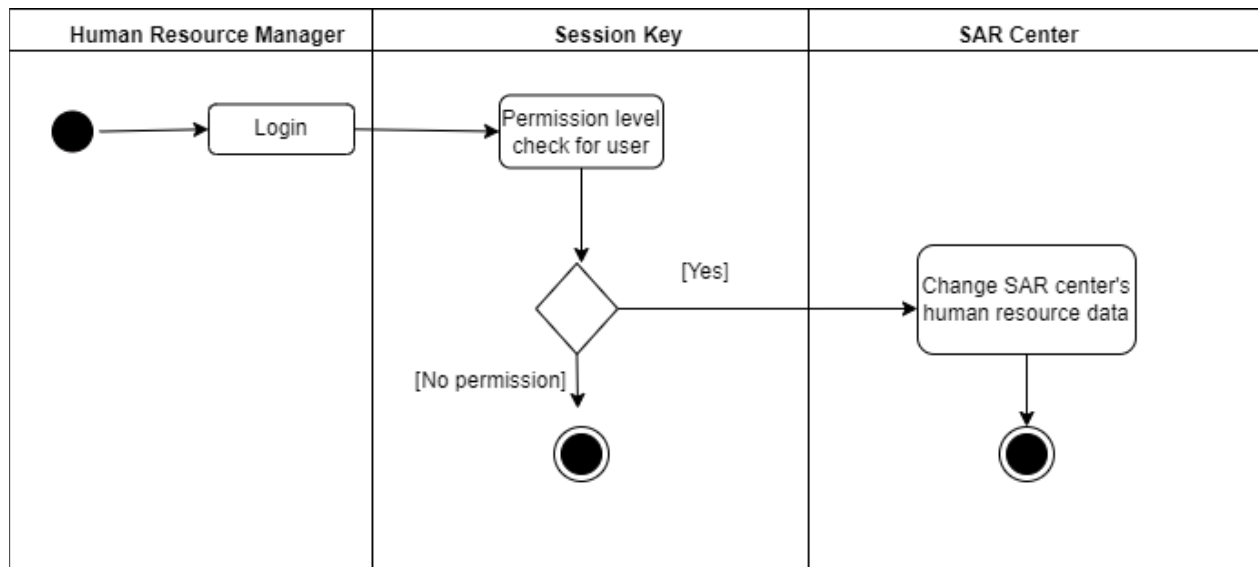
- Medical Supply Center Modify Animal Data Activity Diagram



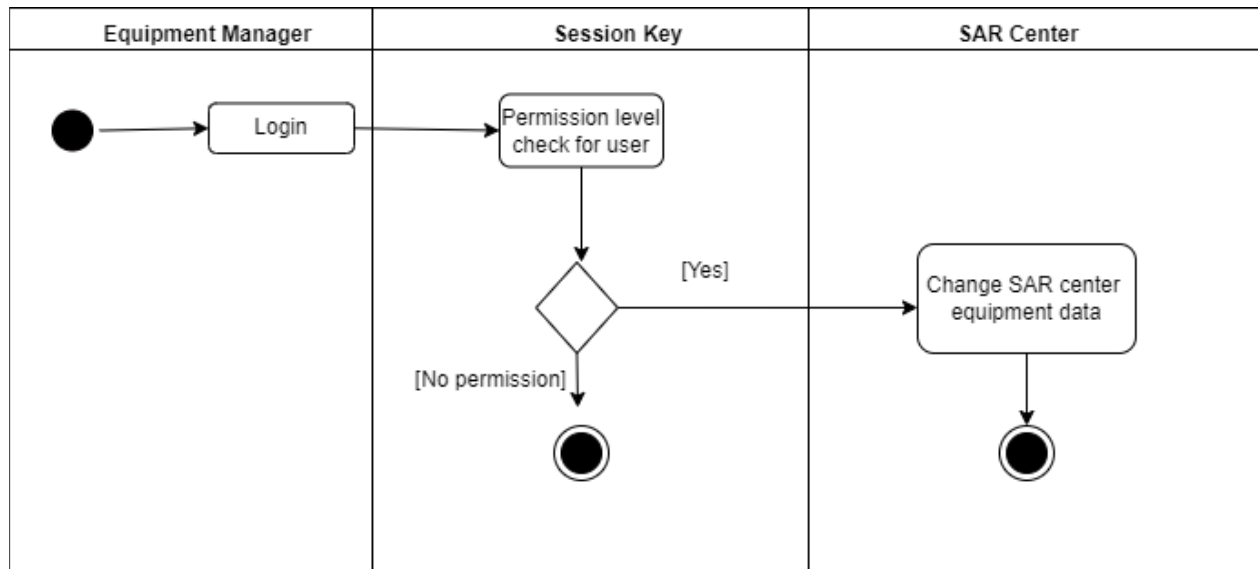
- **Medical Supply Center Modify Human Data Activity Diagram**



- **SAR Center Modify Team Data Activity Diagram**

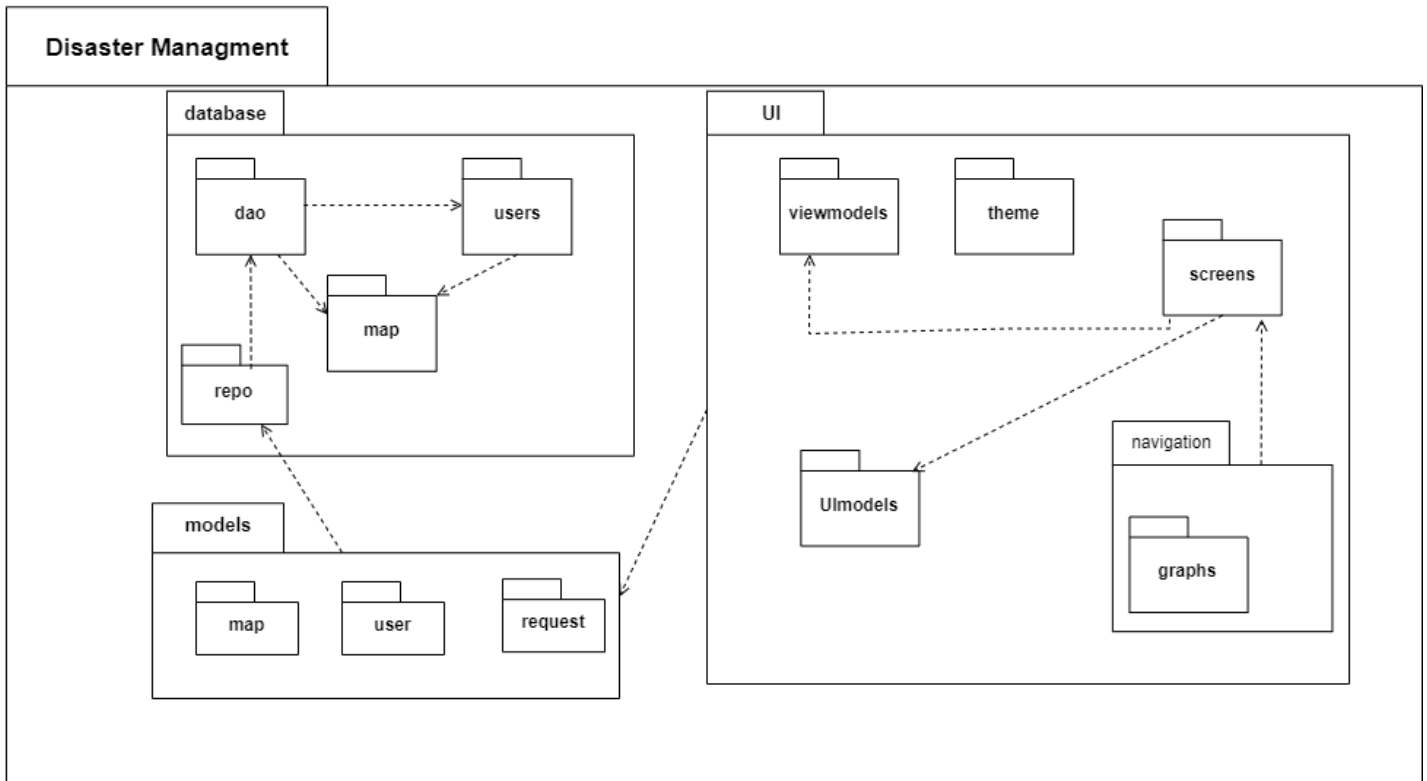


- **SAR Center Modify Vehicle Data Activity Diagram**

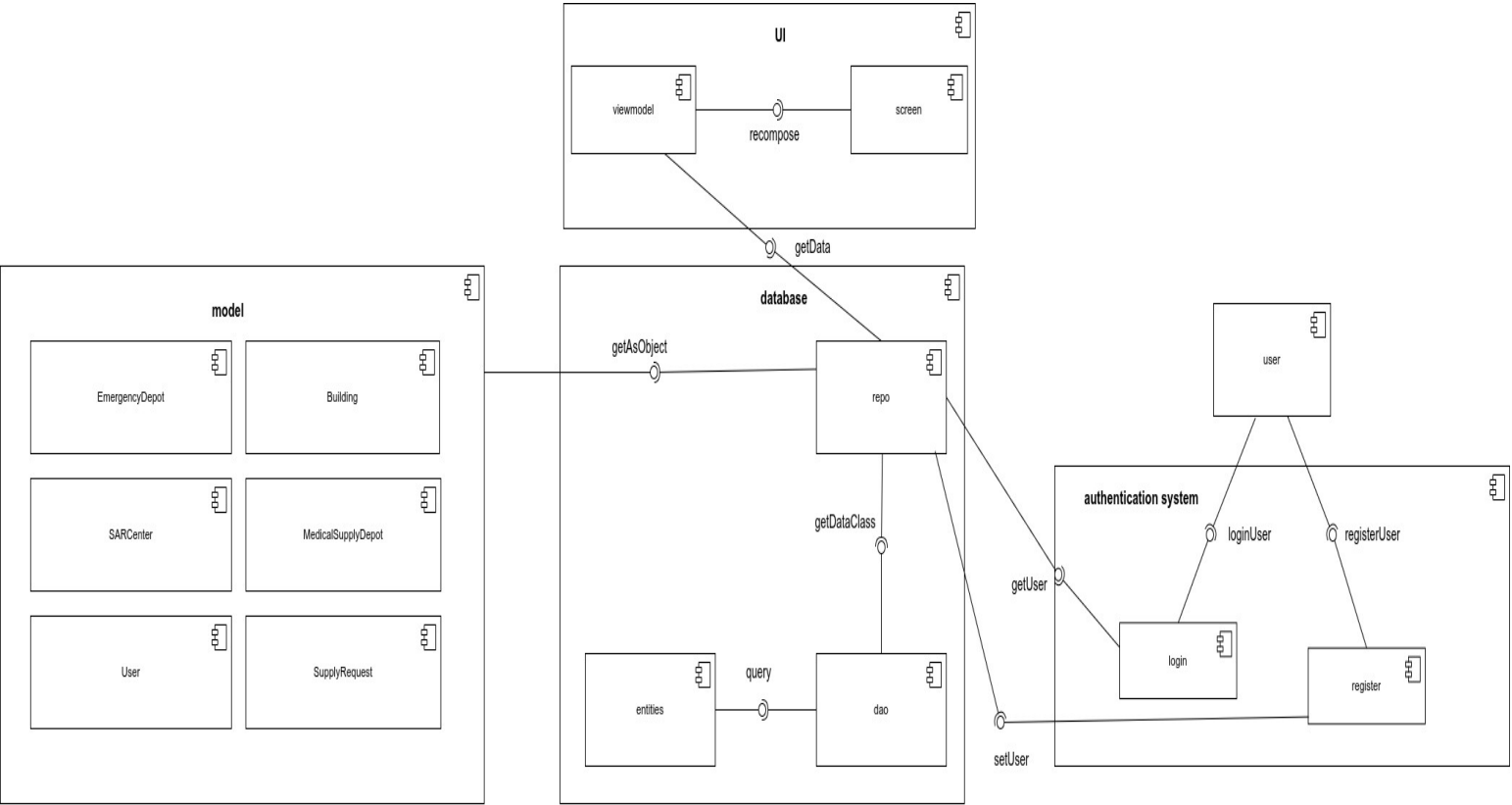


## 4 Software Architecture

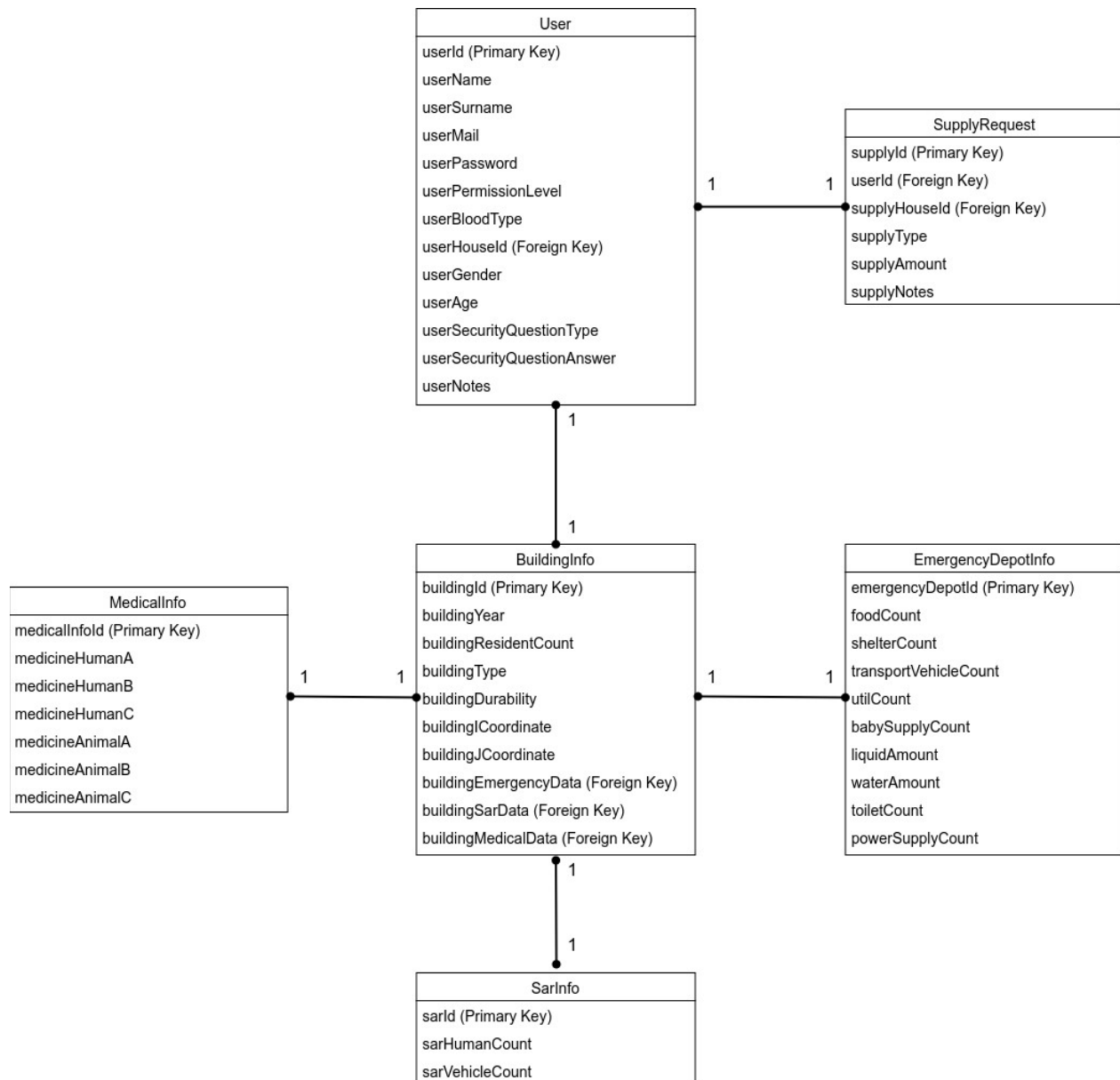
### 4.1 UML Package Diagram



4.2 UML Component Diagram



## 5 Entity Relationship Diagram



## 6 Glossary & References

1. Android Official Developer Documentation, Google LLC, <https://developer.android.com>
2. LETHBRIDGE, T. (2004). *EBOOK: Object-Oriented Software Engineering: Practical Software Development Using UML and Java*. McGraw Hill
3. CSE 344 Lecture Slides, Pearson
4. Jetpack Compose ile Android Uygulama Geliştirme Kursu | 2023, Kasım Adalan, Udemy