





**EAST WEST UNIVERSITY**

**Department of CSE**

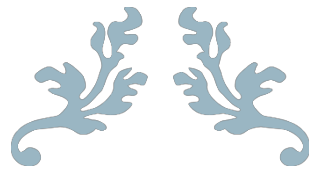
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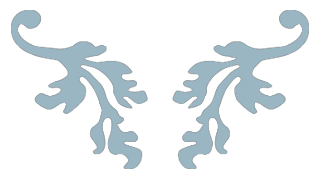
**Heart2Blood**  
**Blood Donation Management System**

**Section : 02      Semester : Fall2024**



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## **Abstract**

The Blood Donation Management System is a platform designed to streamline the process of blood donation and manage critical resources efficiently. It connects blood donors, recipients, and organizations, enabling seamless communication and resource allocation. The system includes modules for user authentication, donor and recipient profile management, blood requests, rare blood type tracking, and contact features like phone numbers. Features such as real-time search for blood donors by group and location, along with a donor rating mechanism, enhance transparency and usability. This project aims to improve the efficiency of blood donation drives, foster community involvement, and save lives by making blood resources easily accessible.

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# Chapter 1: Introduction

This chapter is a part of the “Blood Donation Management System” (BDMS) and aims to specify the purpose of this document and its intended audience.

## 1.1 Purpose

This document is the Software Requirements Specification (SRS) for the “Blood Donation Management System” (BDMS). It contains detailed functional, non-functional, and support requirements and establishes requirements baseline for the system's development. The requirements outlined in this SRS are independent, uniquely numbered, and systematically organized. This SRS acts as the official communication bridge between the user requirements and the developer team and serves as a reference point for all stakeholders involved in the project. It will evolve over time as users and developers collaborate to validate, clarify, and expand its content.

## 1.2 Intended Audience

This SRS is intended for various audiences, including donors, recipients, administrators, and project stakeholders such as project managers, designers, developers, and testers.

- **Donors:** Individuals who donate blood and can use the system to manage their profiles and monitor donation history.
- **Recipients:** Individuals seeking blood, who will use the system to find compatible donors and send requests.
- **Project Managers:** Will utilize this SRS to define milestones, plan delivery schedules, and track development progress.
- **Designers:** Will use the SRS to create the system's design while ensuring that the system meets the needs outlined by stakeholders.
- **Developers:** Will rely on the SRS as a guideline for building and testing the software to align it with the requirements.
- **Testers:** Will use this SRS to derive test cases and ensure the system fulfills its documented requirements at every stage of development.

## 1.3 Conclusion

This analysis of the audience has enabled us to focus on the primary users of this system. This document will help all stakeholders involved in the project to better understand the objectives, ensuring clarity and alignment throughout the development process.

## Chapter 2: Inception

In this chapter, the inception phase of the SRS for the BDMS will be discussed in detail.

### 2.1 Introduction

Inception is the foundational phase of requirements engineering. It defines how the project starts and identifies the scope and nature of the problem to be solved. The goal of this phase is to identify and address the various needs and conflicting requirements of the stakeholders. This groundwork involves the following activities:

- Identifying stakeholders
- Recognizing multiple viewpoints
- Collaborating to resolve conflicts
- Asking initial context-free questions

#### 2.1.1 Identifying Users

Users are individuals or groups directly or indirectly affected by the system. The identified stakeholders for the Blood Donation Management System are:

- **Donor:** Individuals willing to donate blood. They maintain profiles, track donation frequency, and respond to requests from recipients.
- **Recipient:** Individuals who search for compatible blood donors and submit requests.
- **System Administrator:** Oversees the management of the system, ensuring smooth operation and addressing technical or operational issues.

#### 2.1.2 Recognizing Multiple Viewpoints

Each user group demands unique features and services from the system. The following summarizes these perspectives:

Donor's Viewpoint:

- Easy profile creation and updates.
- Transparent donation history tracking.

Recipient's Viewpoint:

- Ability to search for donors by blood group and area.
- Request submission and contact options.
- Feedback and rating system for donor interactions.

Administrator's Viewpoint:

- Full access to manage system functions, users, and notifications.
- Maintain system logs and user activity.

### **2.1.3 Working towards Collaboration**

To address stakeholder needs and resolve conflicts, the following steps were followed:

1. Identify common and conflicting requirements.
2. Categorize requirements based on priorities.
3. Conduct voting among stakeholders to finalize high-priority features.
4. Establish a finalized requirements list based on consensus.

Common Requirements:

- Web-based interface for accessibility.
- The application can be accessed from any computer or mobile phone that has internet access.
- Role-based access control (e.g., donor, recipient, admin).
- Allow any user to search for blood.

Conflicting Requirements:

- Strong authentication required for sensitive data access.
- Whether users need to register before searching for donors.

Final Requirements:

- Secure and user-friendly system.
- Web-based interfaces.
- Allow valid users to login and logout.
- Accessible via internet.
- Allow search for donors.
- Role-specific access controls for donors, recipients, and administrators.
- Notifications for reminders, requests, and updates.
- Online feedback and rating system for interactions.
- Allows user payment method to donate fund or pay transportation fee.
- Allows user to contact with admin through Email, if needed.



- Allows user to see different Hospitals, Social Organizations and Blood Banks and their address and phone number for contact.

#### 2.1.4 Asking the First Questions

Key initial questions were posed to stakeholders to better understand their needs and expectations:

- **Donors:** "How frequently do you donate blood?" and "What information would you like displayed in your profile?"
- **Recipients:** "What challenges do you face while finding donors?" and "What features would make the process easier?"
- **Administrators:** "What data should be prioritized for the system dashboard?" and "What security measures are essential?"

These questions provided a clearer picture of system requirements and stakeholder priorities.

## 2.2 Conclusion

The inception phase provided a strong foundation for understanding the scope of the Blood Donation Management System. By identifying stakeholders, analyzing viewpoints, and addressing conflicts, we have outlined a preliminary vision for the project. Continued communication with stakeholders will ensure clarity and alignment as the project progresses.

## Chapter 3: Elicitation Phase

### 3.1 Introduction

Requirements Elicitation is an essential part of requirements engineering that focuses on gathering requirements from users, and other stakeholders. Challenges faced during this process include understanding stakeholder needs, formulating relevant questions, and dealing with limited

communication due to time constraints. Despite these obstacles, the requirements were successfully gathered in an organized and systematic manner.

## **3.2 Eliciting Requirements**

The goal of this phase is to combine problem-solving, elaboration, negotiation, and specification techniques to ensure requirements are accurately captured. Collaborative efforts between stakeholders were critical during this process. The following tasks were performed to elicit the requirements:

1. **Collaborative Requirements Gathering**
2. **Quality Function Deployment (QFD)**
3. **Usage Scenarios**
4. **Elicitation Work Products**

## **3.3 Collaborative Requirements Gathering**

Various approaches to collaborative requirements gathering were used, tailored to the specific context of the project. The steps taken include:

- Meetings were conducted with stakeholders such as donors, recipients, and administrators to understand their expectations from the Blood Donation Management System (BDMS).
- Stakeholders were asked about the problems they face with existing solutions and their desired features in the new system.
- Based on these discussions, the final requirements were compiled and documented.

## **3.4 Quality Function Deployment**

Quality Function Deployment (QFD) is a structured method for translating user needs into technical requirements. This technique ensures maximum user satisfaction throughout the development process. The following requirements were identified using QFD:

### **3.4.1 Normal Requirements**

These represent standard goals and objectives explicitly stated during stakeholder discussions. The fulfillment of these requirements ensures basic satisfaction:

1. Accessible via the Internet.
2. Search for donors by blood group and location.
3. Allow administrators to verify donor and recipient profiles.

4. Support donor registration and login/logout functionalities.
5. Role-based access control for users (donors, recipients, administrators).
6. Enable recipients to request blood from donors.
7. Provide administrators with tools to monitor and manage blood donation data.
8. Help feature to guide users through the platform.
9. Maintain a centralized database for all donor, recipient, and blood bank information, hospitals, social organizations.
10. Enable donors and recipients to communicate via call.

### **3.4.2 Expected Requirements**

These are implicit and essential features that stakeholders expect, even if they are not explicitly requested:

1. Error-free software.
2. Strong authentication system to protect sensitive user data.
3. A user-friendly interface for donors and recipients.
4. Automated notifications for important updates (e.g., blood requests, reminders).
5. Backup system to ensure data integrity.
6. Flexible payment options for donations, including credit cards and mobile banking.
7. Real-time updates on donor availability and blood request status.

### **3.4.3 Exciting Requirements**

These go beyond basic expectations and aim to delight stakeholders with innovative features:

1. Intuitive user interface with appropriate error messages and tooltips.
2. Ratings and feedback system for donors and recipients to improve accountability.
3. No ambiguous feature.
4. Recipients can share their Feedback.
5. App will show the nearest donors.

## 3.5 Usage Scenarios

### Authentication

1. **Sign Up:**  
Users, including donors, recipients, and administrators, must sign up to access the system. A registration form will require details like Name, Email, Password and User type. Syntax errors will be checked during registration.
2. **Sign in:**  
Registered users can log in using their username and password. Failed login attempts will trigger temporary blocks to prevent unauthorized access. Forgotten passwords can be reset through email verification.
3. **Sign out:**  
Users can log out manually, or the system will automatically log out inactive accounts after a set time. The system will record log-out timestamps.

### Search and View

1. **Search by Blood Group and Location**  
Recipients can search for donors based on blood group and geographic area. The system will display a list of matching donors with contact options.
2. **Rare Blood Holders**  
A separate section will highlight donors with rare blood types.
3. **Blood Bank and Hospital Information**  
Users can view blood banks and hospitals location with their contact information.

### Communication

1. **Contact with Donors and Recipients**
  - Donors and recipients can communicate through call.
2. **Feedback and Ratings**  
Users can provide feedback and rate their interactions to improve trust and accountability.

## **Blood Requests and Donations**

1. **Request Blood**  
Recipients can send requests by creating a patient profile. The system will notify the donor and track the request status.
2. **Donate Blood**  
Donors can accept requests, manage donation history, and update their profile and availability.

## **Payment Methods**

1. **Donated Funds**  
Users can contribute funds to support the platform's operation or transportation costs for blood delivery.
2. **Transportation Fees**  
Recipients may pay transportation fees for the Donors. Flexible payment options, including online banking and mobile wallets, will be supported.

## **System Features**

1. **Notifications**  
Automated notifications will keep users updated on blood requests, emergencies, and other important events.
2. **Administration**  
Administrators will have access to system logs, user management tools, and analytics to monitor platform performance.

## **Contact**

1. **Helpline:**  
If any user wants an immediate help he/she can always use helpline within the office hours. If the user is accessing through mobile, then the number will be loaded in the phone. If she/he is accessing through PC, the helpline contact no. will be displayed.
2. **Emailing:**  
User can contact the admin via email. By selecting the option from the system, he/she can enter the message and send the email to the dedicated email for the users.
3. **Follow on Social Media:**  
Any user can follow the website on various social media such as Facebook and twitter. If a user wants to follow it on Facebook, he/she has to login to Facebook and like the page to start following. If he/she wants to follow on twitter he/she has to sign in to twitter and go to the twitter profile.

### 3.6 Conclusion

The elicitation phase allowed us to define the system's core requirements through collaboration with stakeholders. Using techniques like QFD, collaborative gathering, and usage scenarios, we translated customer needs into a comprehensive set of system requirements. This foundation ensures that the BDMS will meet user expectations while addressing their challenges effectively.

## Chapter 4: Scenario-Based Modeling

### 4.1 Introduction

Scenario-based modeling describes the system from the user's perspective. It defines how users interact with the system to achieve specific goals and serves as a foundation for creating other modeling elements like use case diagrams, activity diagrams, and sequence diagrams. For the **Blood Donation Management System (BDMS)**, scenario-based modeling helps illustrate the functionalities provided to donors, recipients, administrators, and other stakeholders.

## 4.2 Use Case Scenario

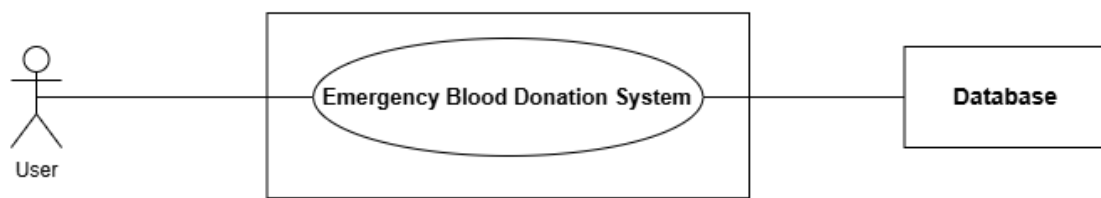
The use case scenarios describe the major activities performed by the users in the BDMS. Below is a summary of the key use cases:

Level 0	Level 1	Level 2
Blood Donation Management System	Authentication	Sign In
		Sign up
		Sign out
	Homepage	Search by Blood Group & Area
		View Rare Blood Holders
		View Blood Bank and Hospitals
		View Social Organizations
		View Patient Profiles List
	View Profile	View Profile
		Update Profile
	Patient Details	Blood Request
		Update Patient Information
		View Donor Information
		Contact with Recipient
		Donor Rating & Feedback
		Cancel Blood Request
	Payment	Donate Fund
		Pay Transportation Fee
	Contact	Helpline
		Follow on Social media
		Email
	Feedback	Give Feedback

### 4.3 Use Case Diagram

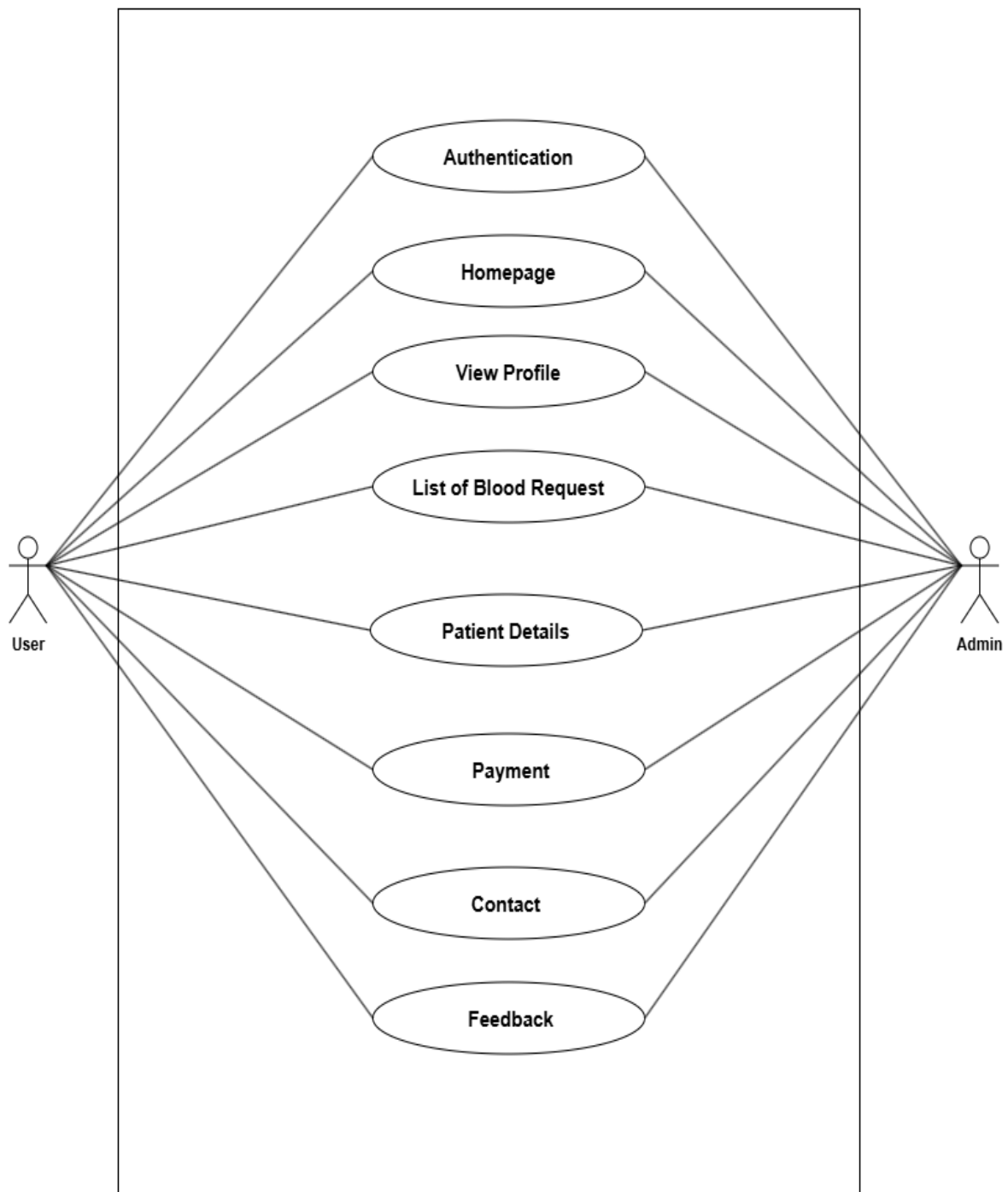
The following use case diagram represents the primary functionalities of the BDMS:

#### 4.4 Use Case Diagram

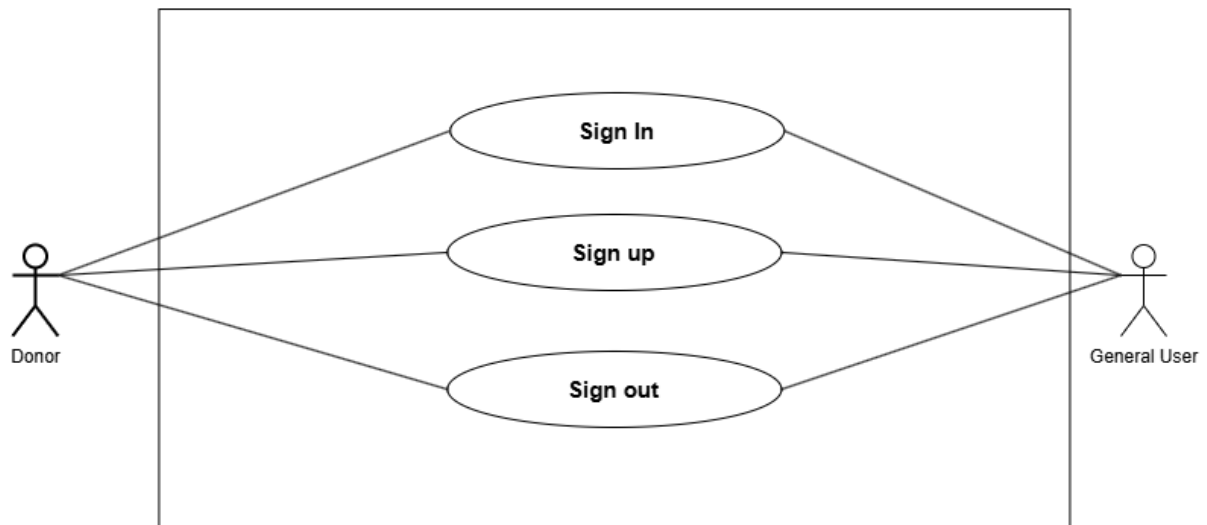


**Figure 1 : Level 0 for Emergency Blood Donation System**

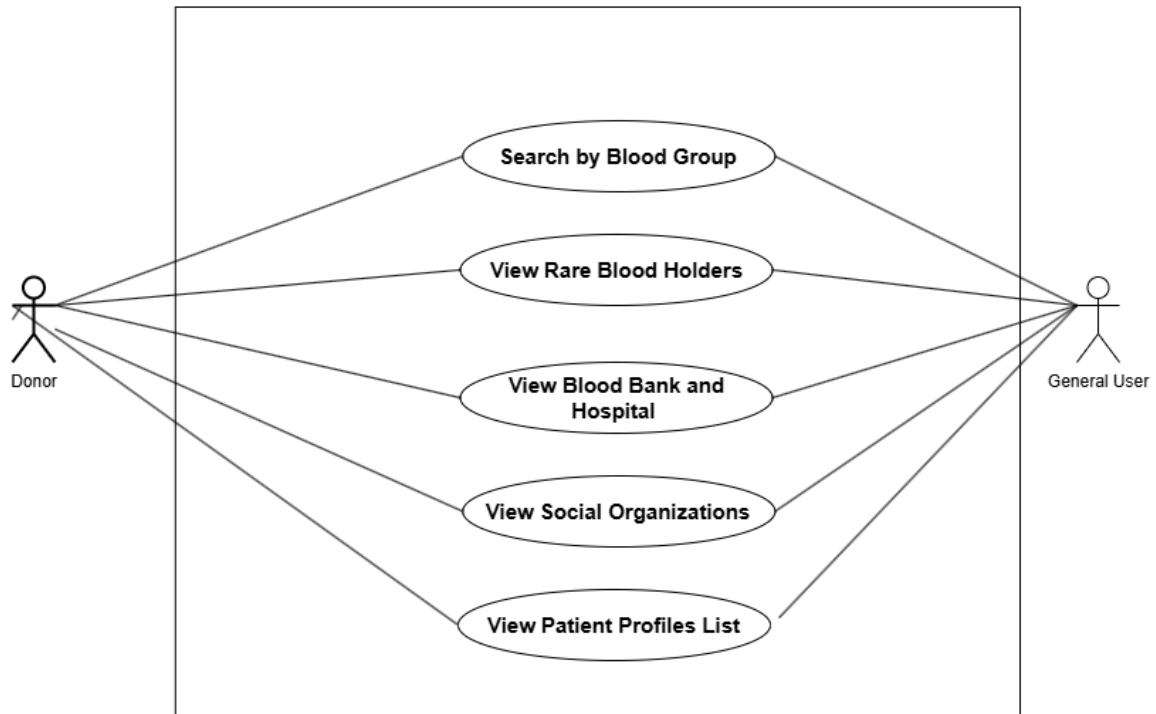




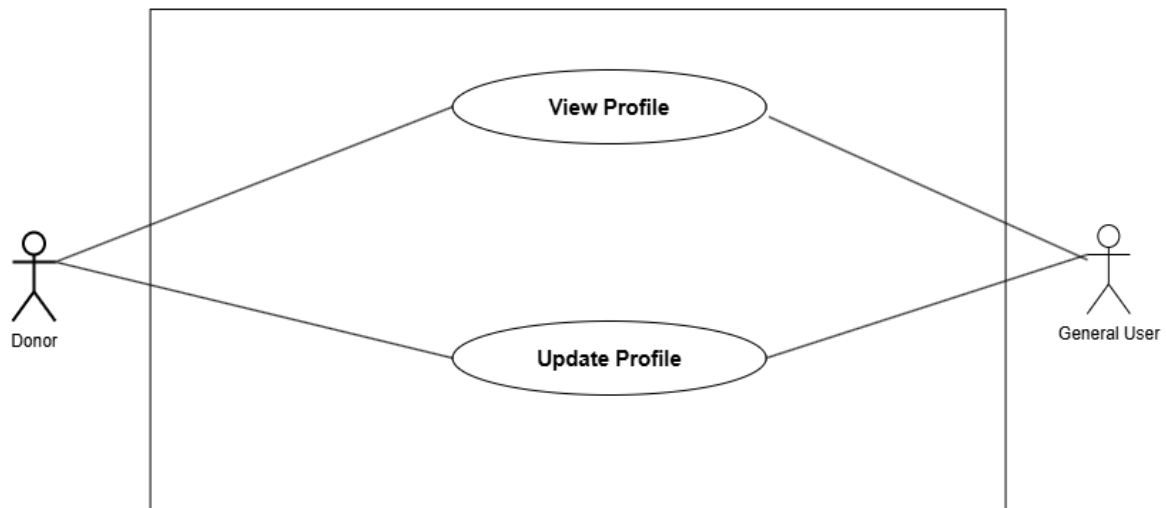
**Figure 2 : Level 1 for Blood Donation Management System**



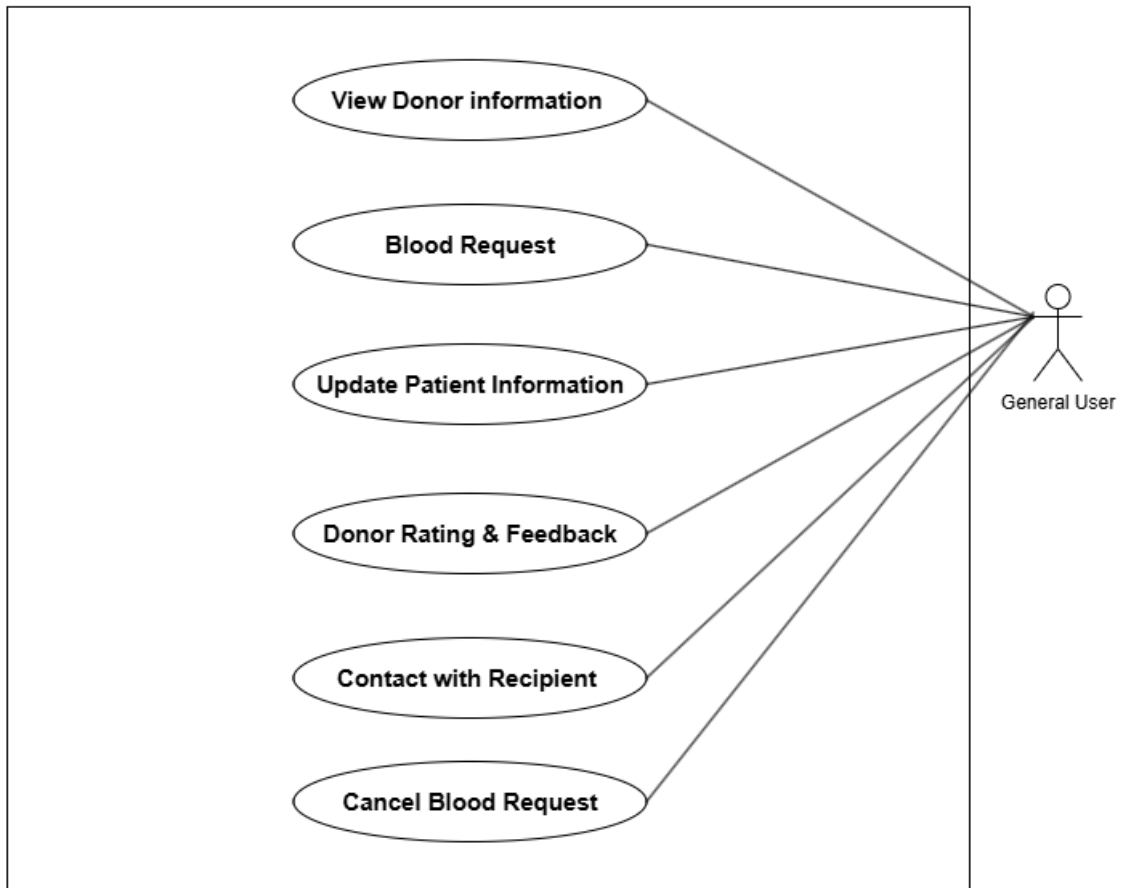
**Figure 3 : Level 2.1 for Blood Donation Management System**



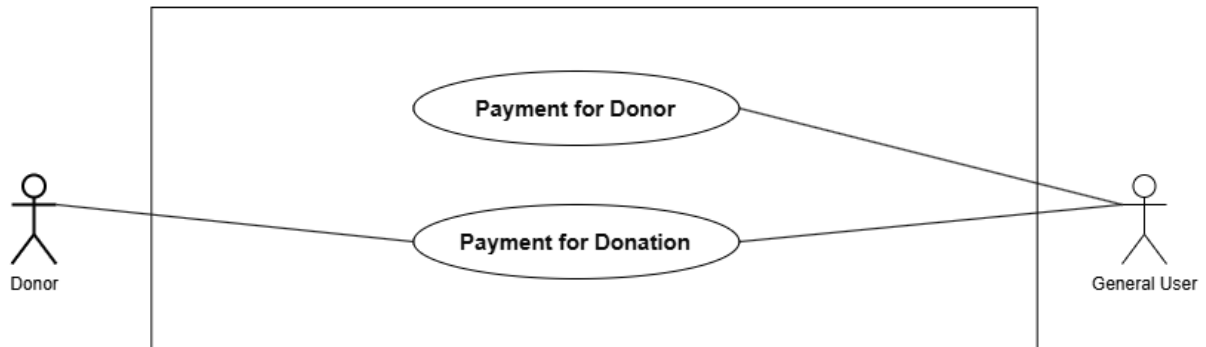
**Figure 4 : Level 2.2 for Blood Donation Management System**



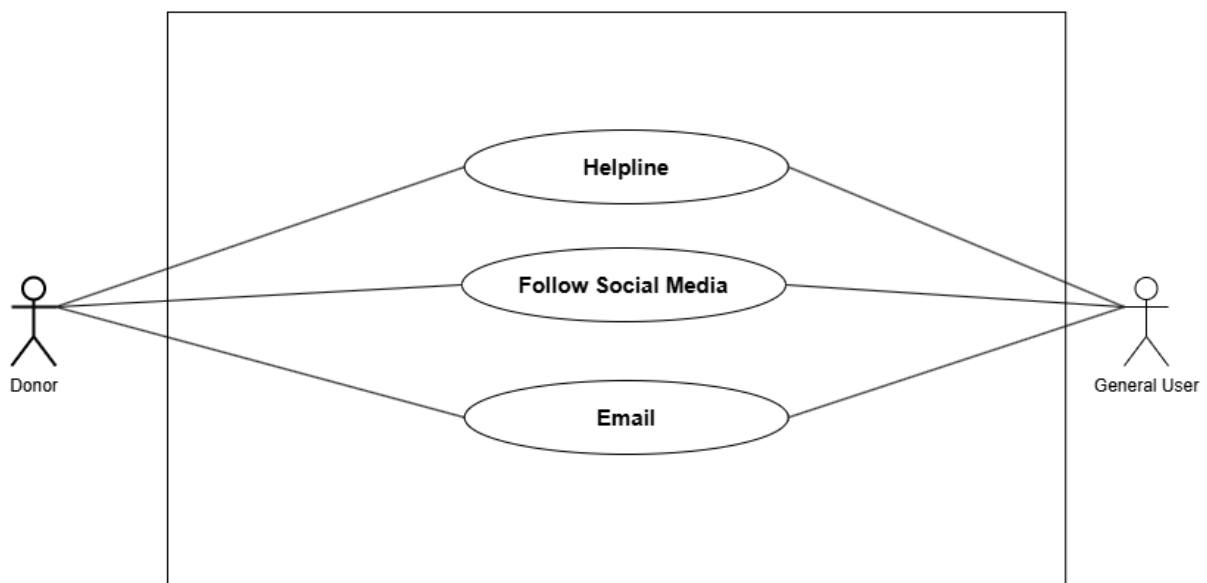
**Figure 5: Level 2.3 for Blood Donation Management System**



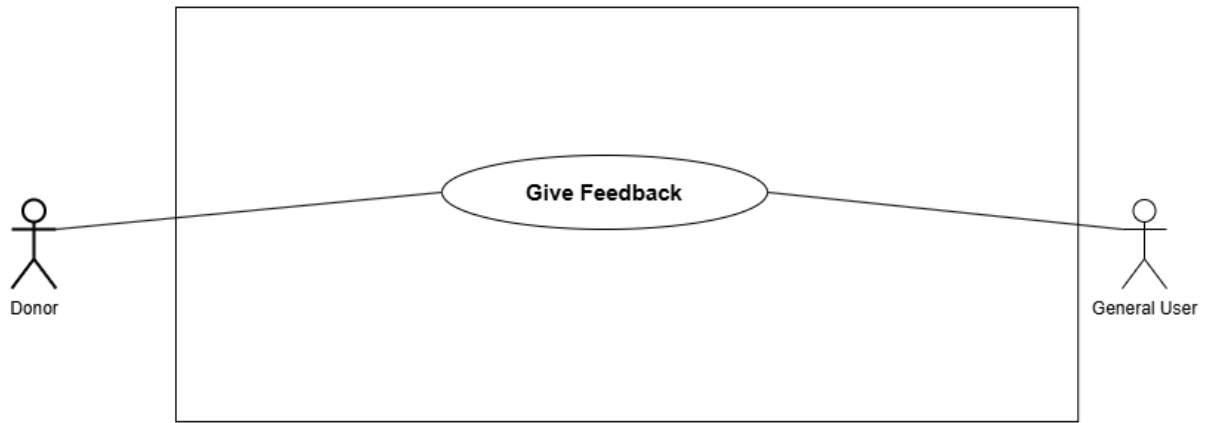
**Figure 6 : Level 2.4 for Blood Donation Management System**



**Figure 7 : Level 2.5 for Blood Donation Management System**



**Figure 8 : Level 2.6 for Blood Donation Management System**



**Figure 9 : Level 2.7 for Blood Donation Management System**

## 4.5 Activity Diagram and Swimlane Diagram of generated Use Cases:

### 4.5 Activity Diagram and Swimlane Diagram of generated Use Cases:

#### Use case 1: Sign Up Activity Diagram:

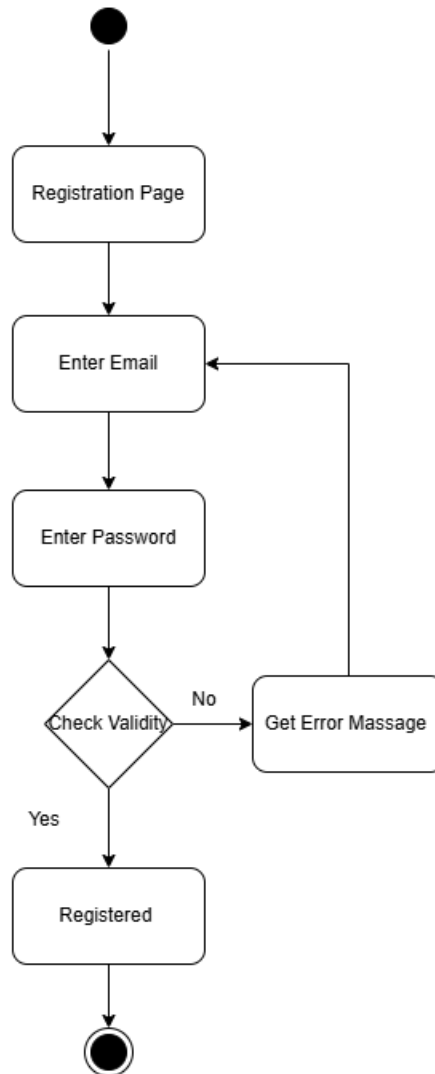
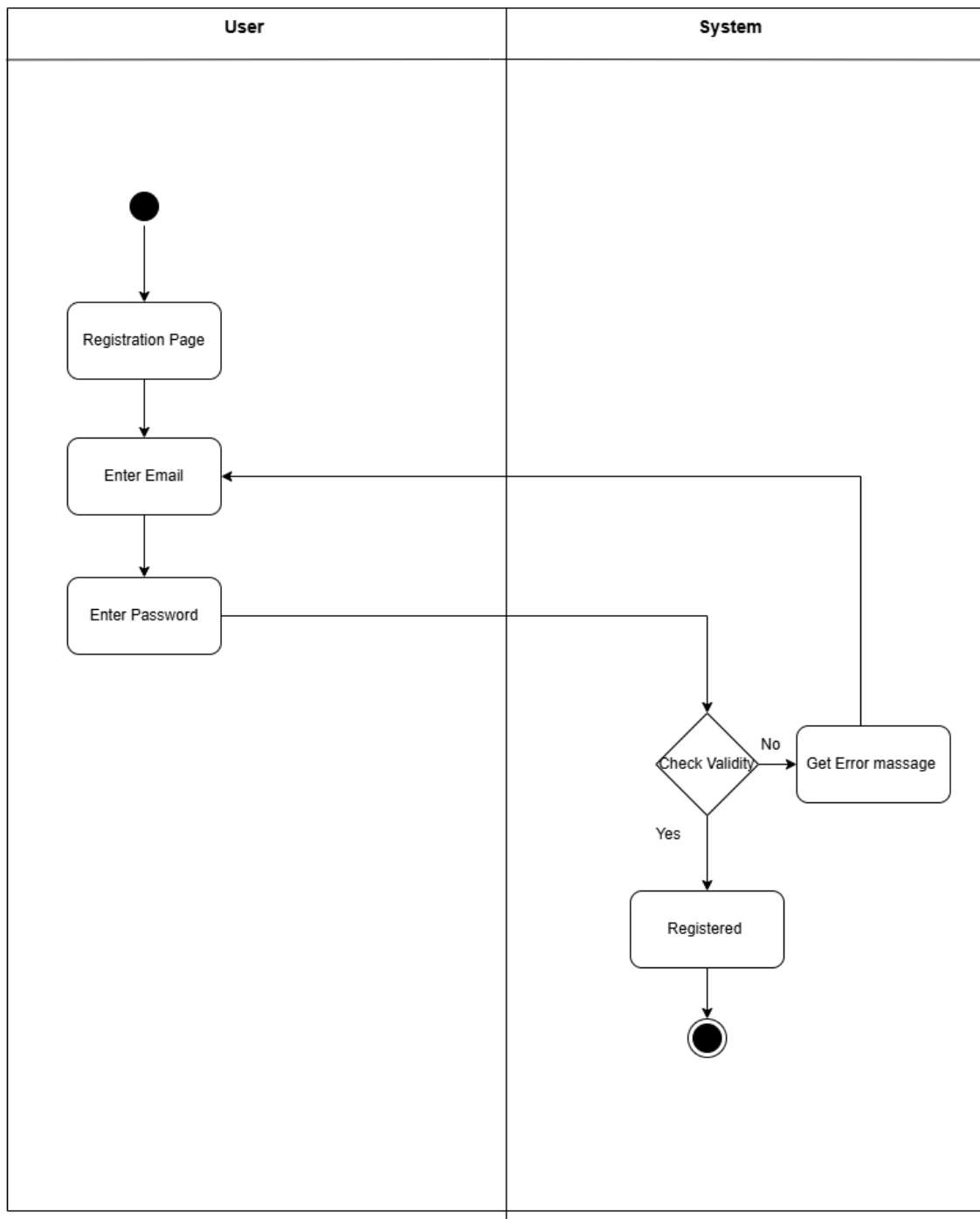


Figure 10 : Activity Diagram for Sign Up

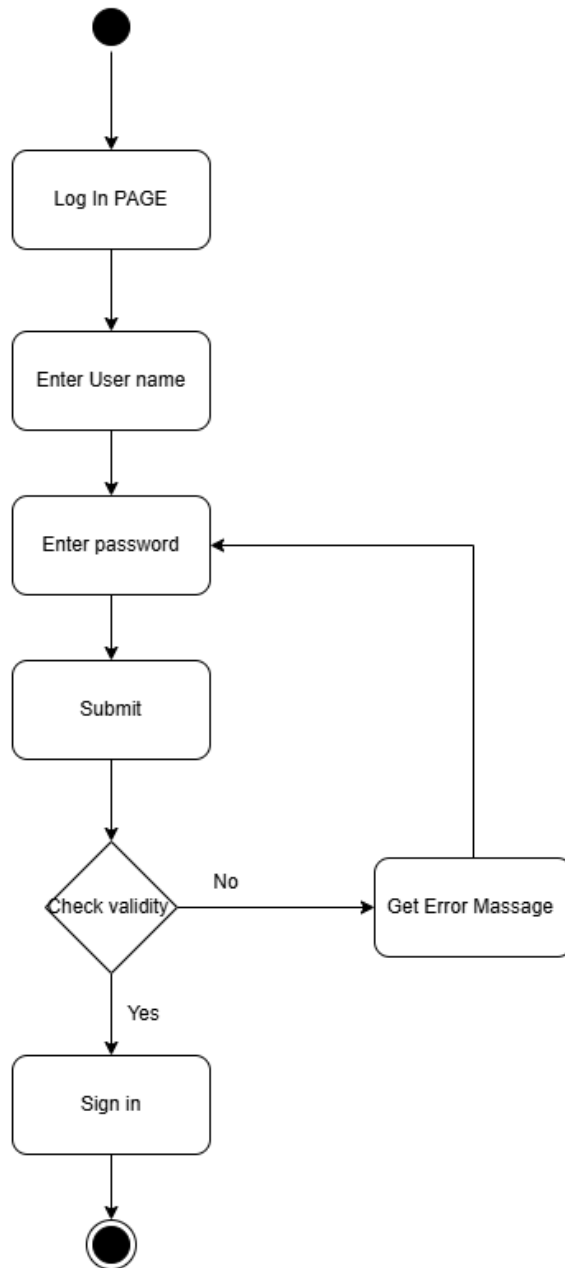
**Swimlane Diagram:**



**Figure 11: Swimlane Diagram for Sign Up**

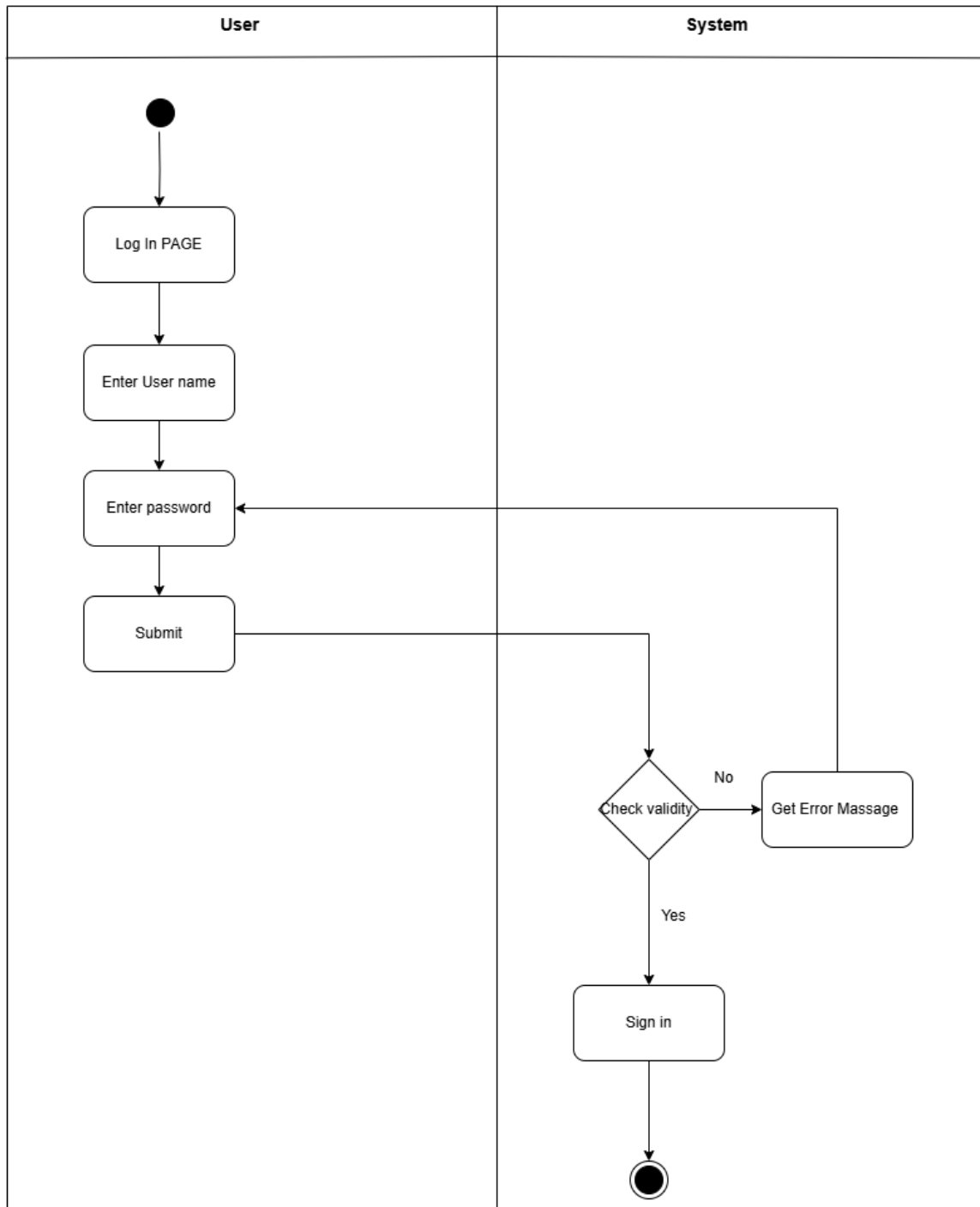


**Use case 2: Sign In**  
**Activity Diagram:**



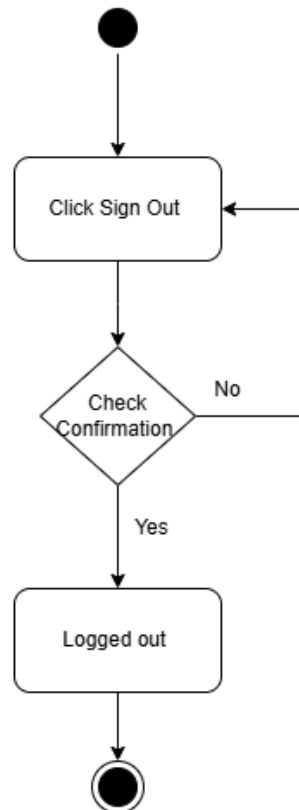
**Figure 12 : Activity Diagram for Sign In**

**Swimlane Diagram:**



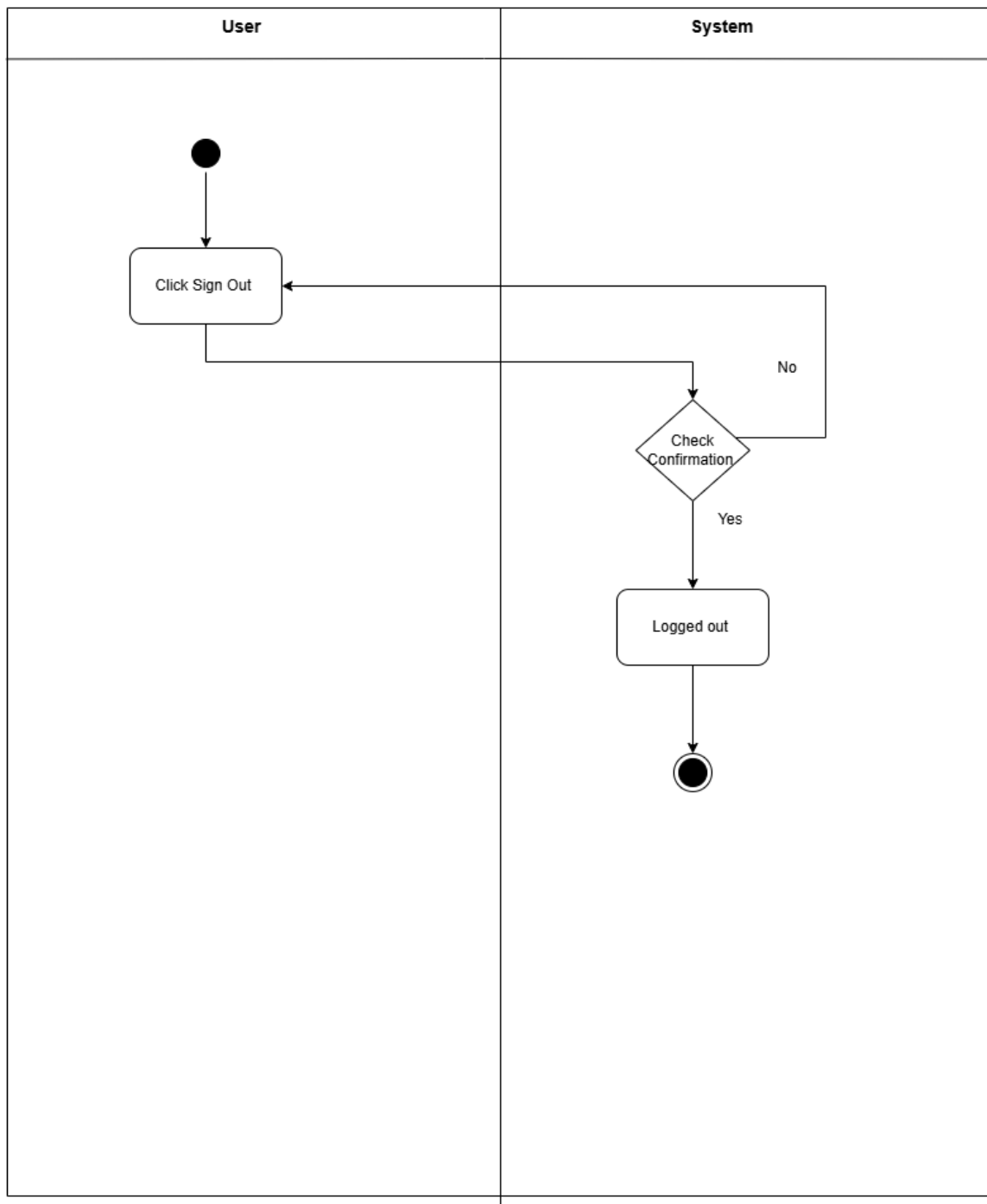
**Figure 13 : Swimlane Diagram for Sign In**

**Use case 3: Sign Out**  
**Activity Diagram:**



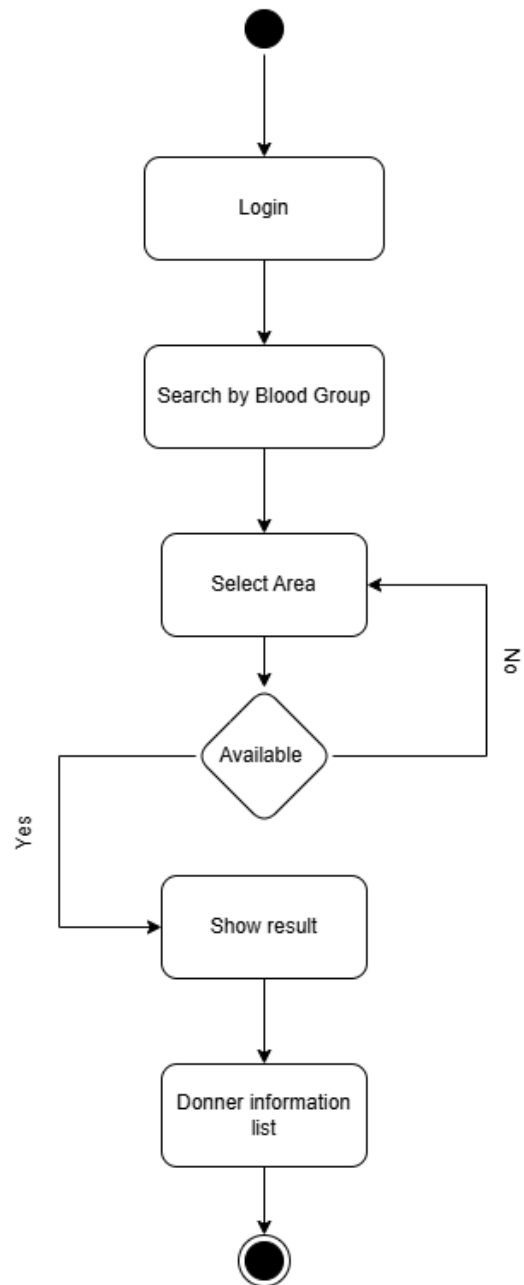
**Figure 14 : Activity Diagram for Sign Out**

**Swimlane Diagram:**



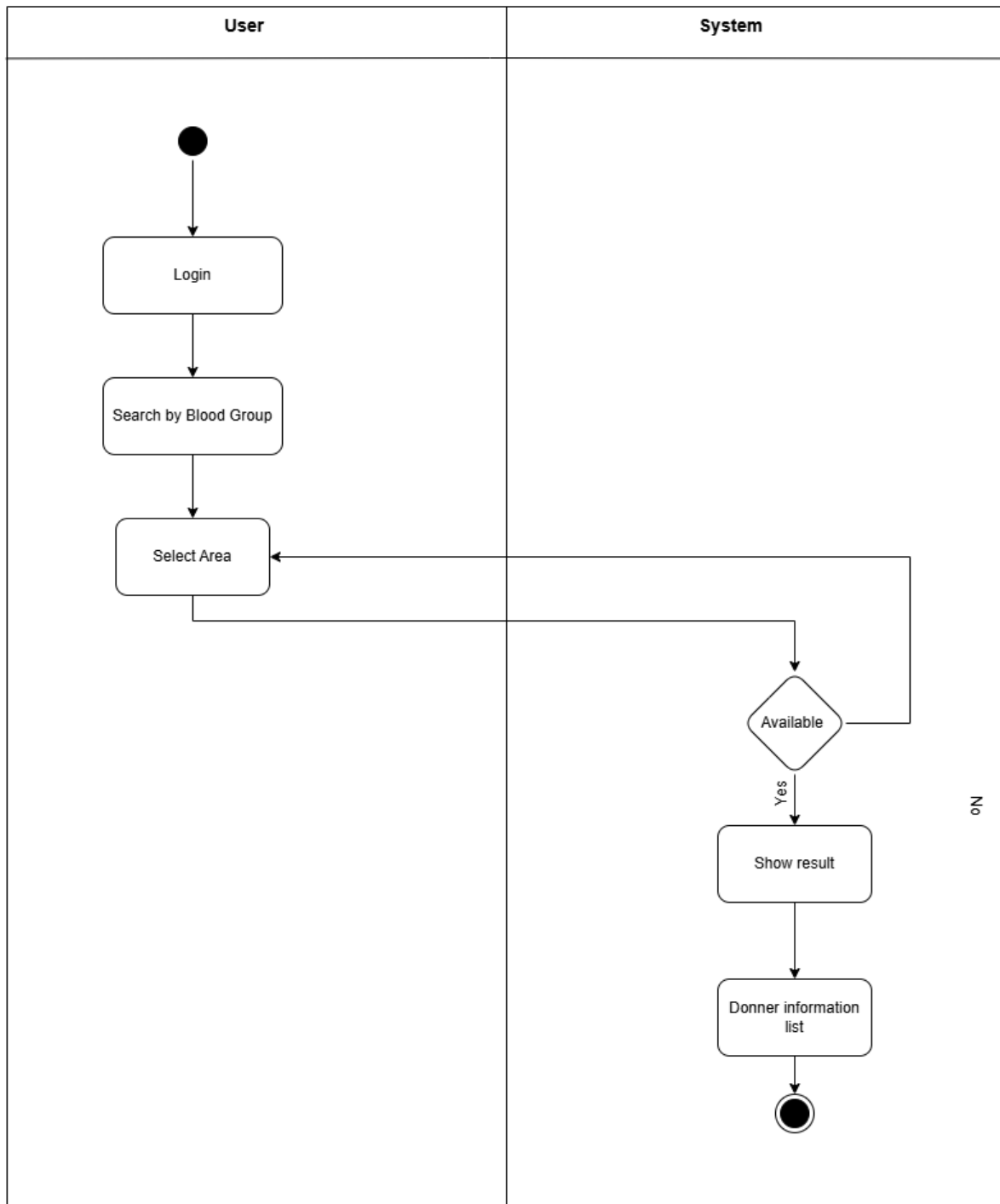
**Figure 15 : Swimlane Diagram for Sign Out**

**Use case 4: Search**  
**Activity Diagram:**



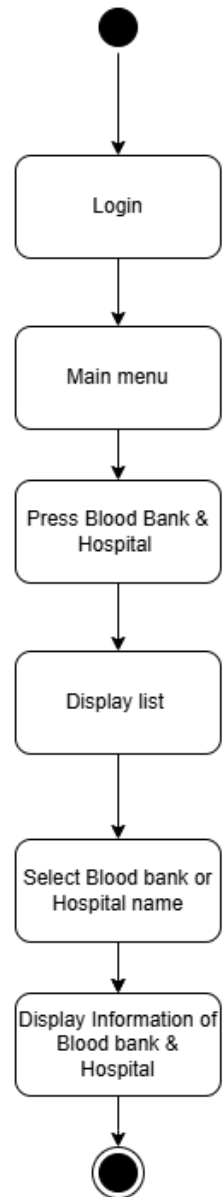
**Figure 16 : Activity Diagram for Search**

**Swimlane Diagram:**



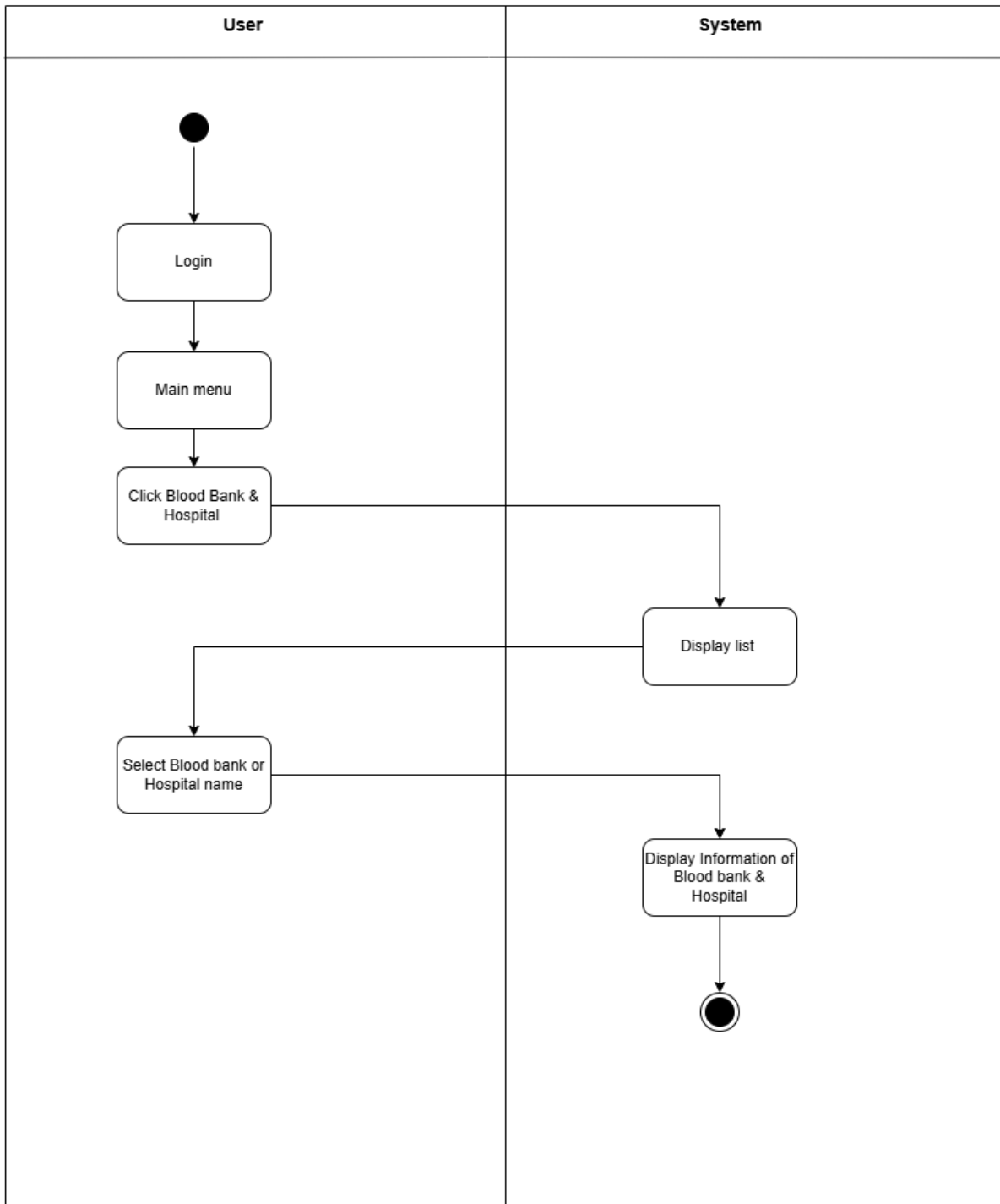
**Figure 17 : Swimlane Diagram for Search**

**Use case 5: Blood Bank & Hospital**  
**Activity Diagram:**



**Figure 18 : Activity Diagram for Blood Bank & Hospital**

**Swimlane Diagram:**



**Figure 19 : Swimlane Diagram for Blood Bank & Hospital**

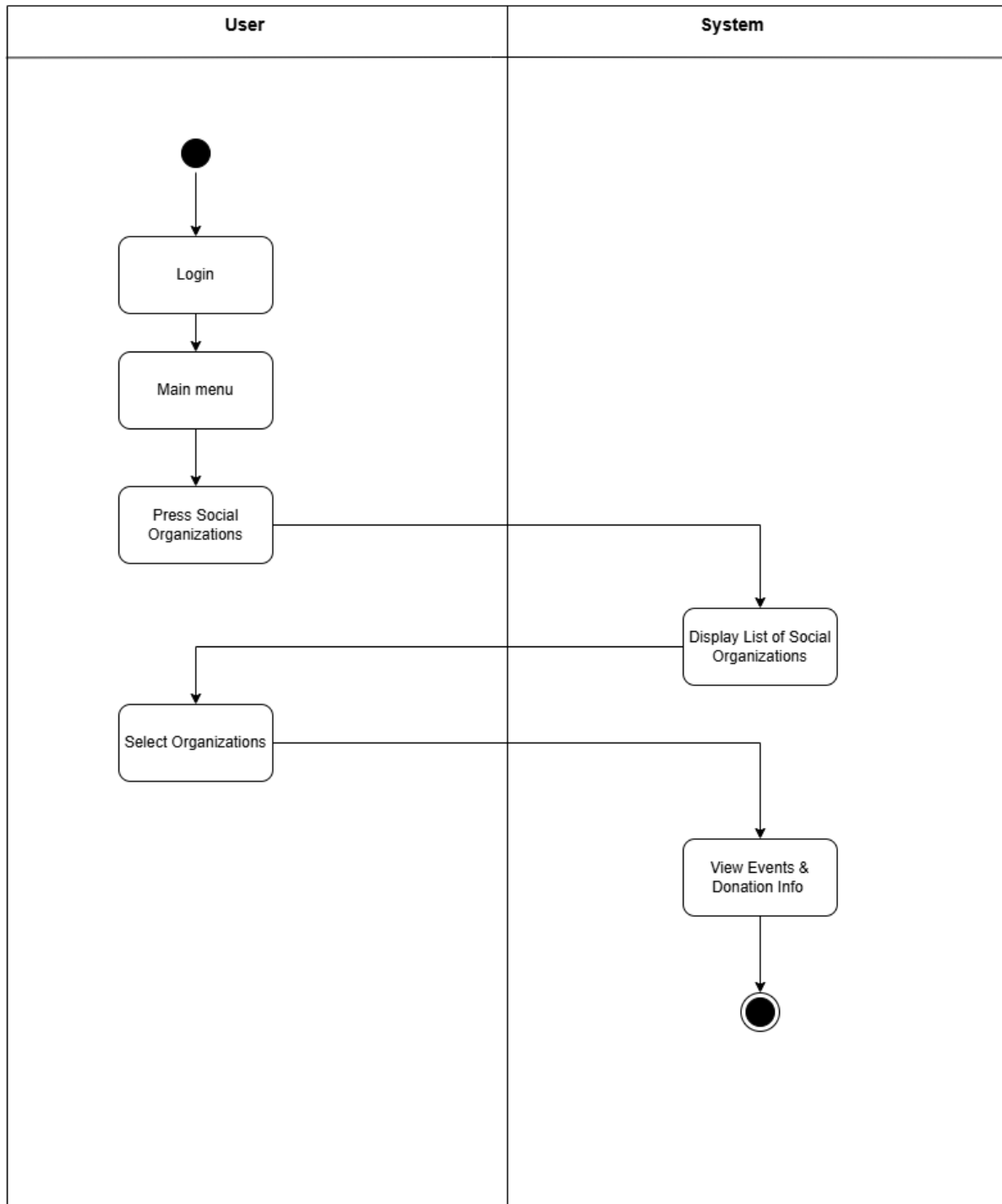


**Use case 6: Social Organizations**  
**Activity Diagram:**



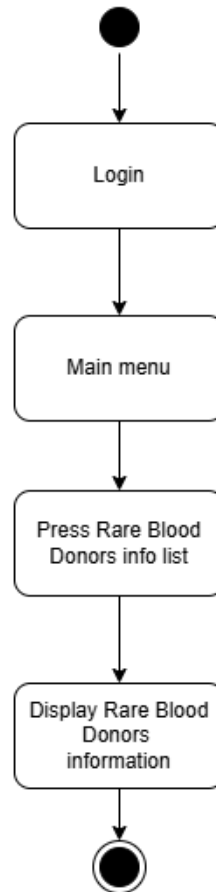
**Figure 20 : Activity Diagram for Social Organizations**

**Swimlane Diagram:**



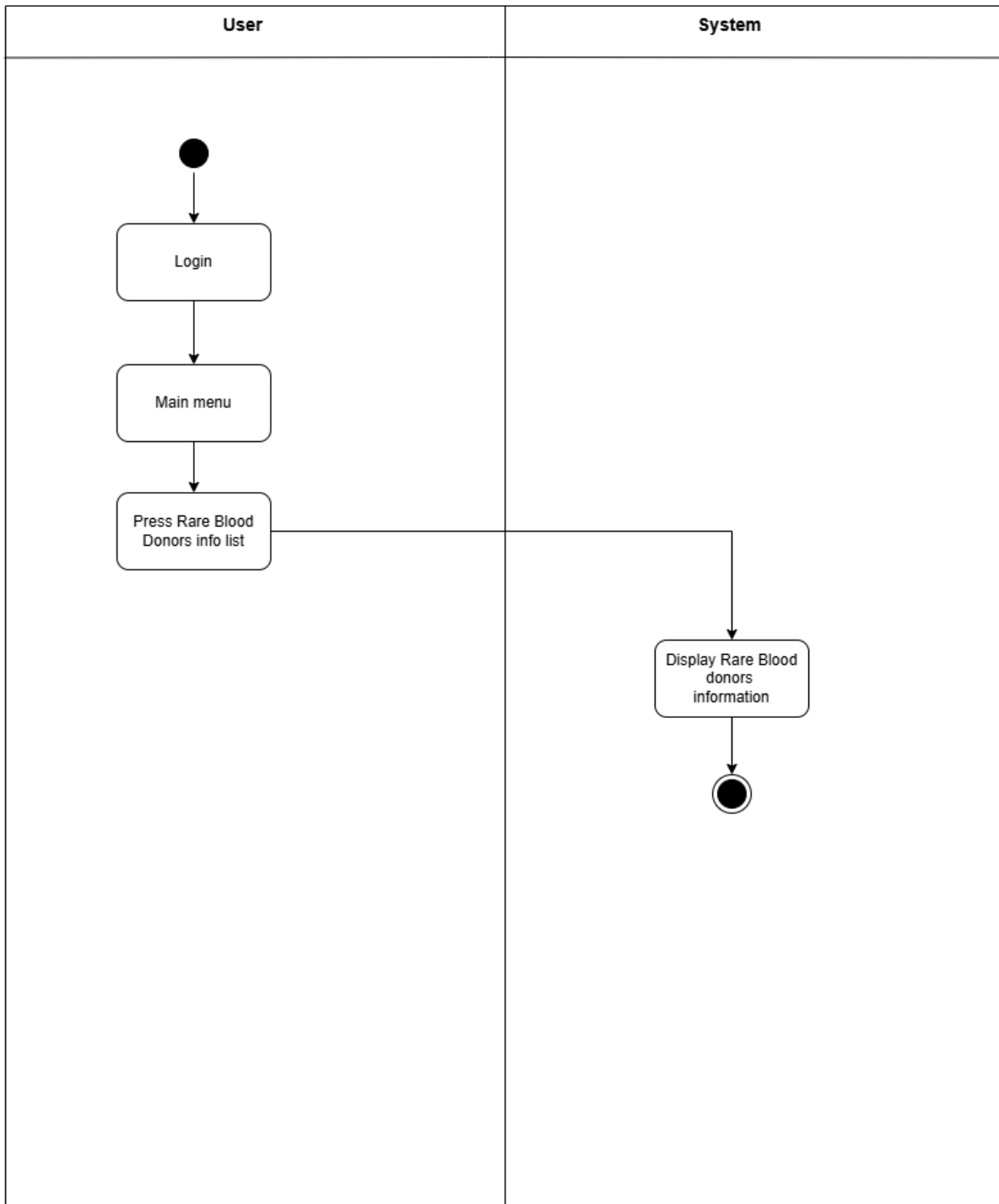
**Figure 21 : Swimlane Diagram for Social Organizations**

**Use case 7: Rare Blood Donors Info List**  
**Activity Diagram:**



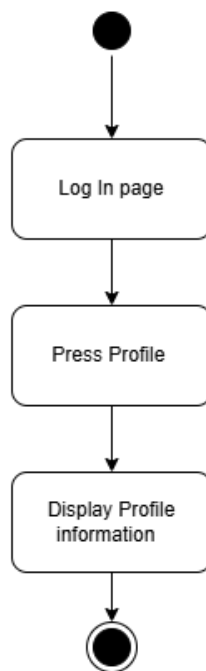
**Figure 22 : Activity Diagram for Rare Blood Donors Info List**

**Swimlane Diagram:**



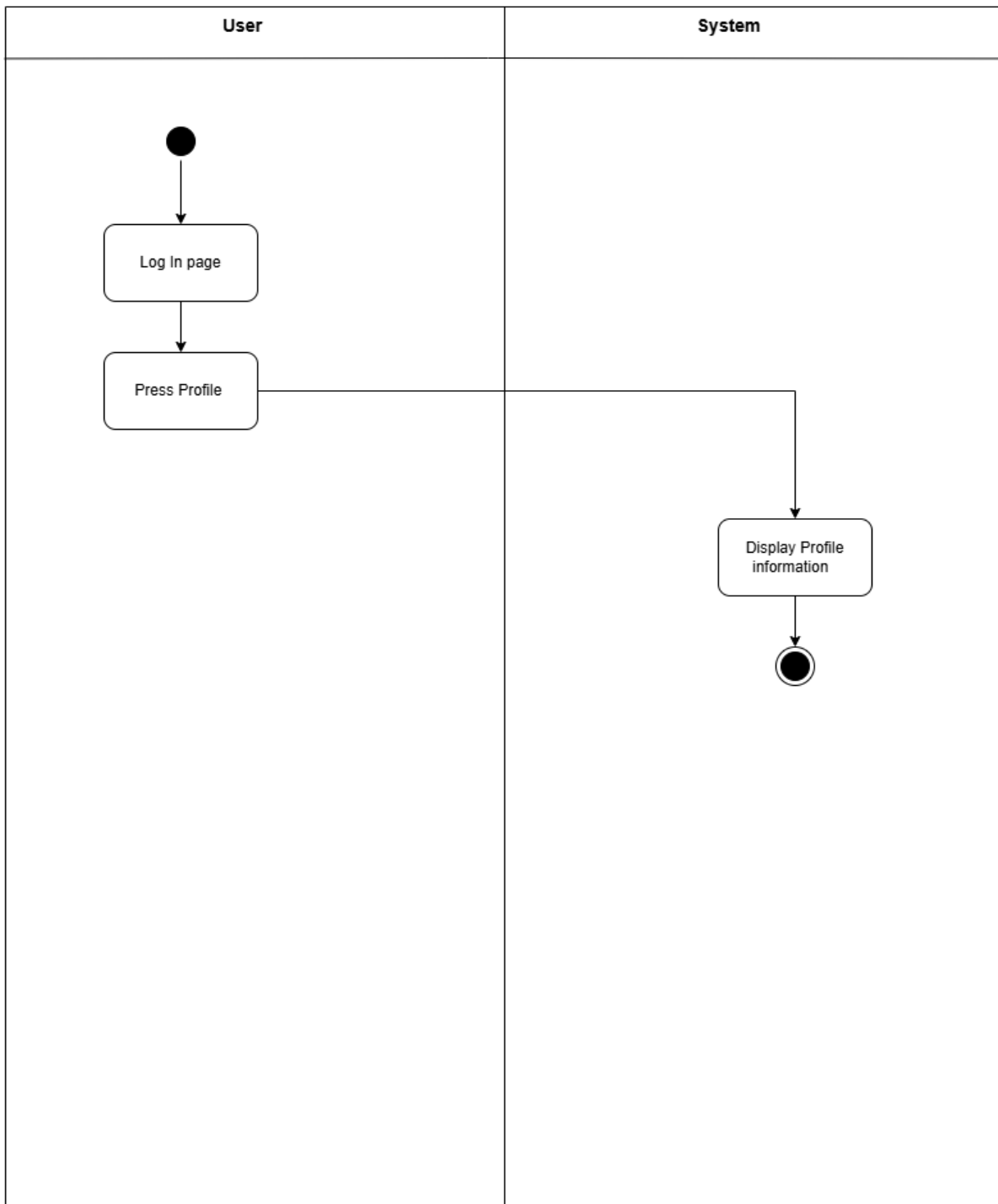
**Figure 23 : Swimlane Diagram for Rare Blood Donors info list**

**Use case 8: Profile  
Activity Diagram:**



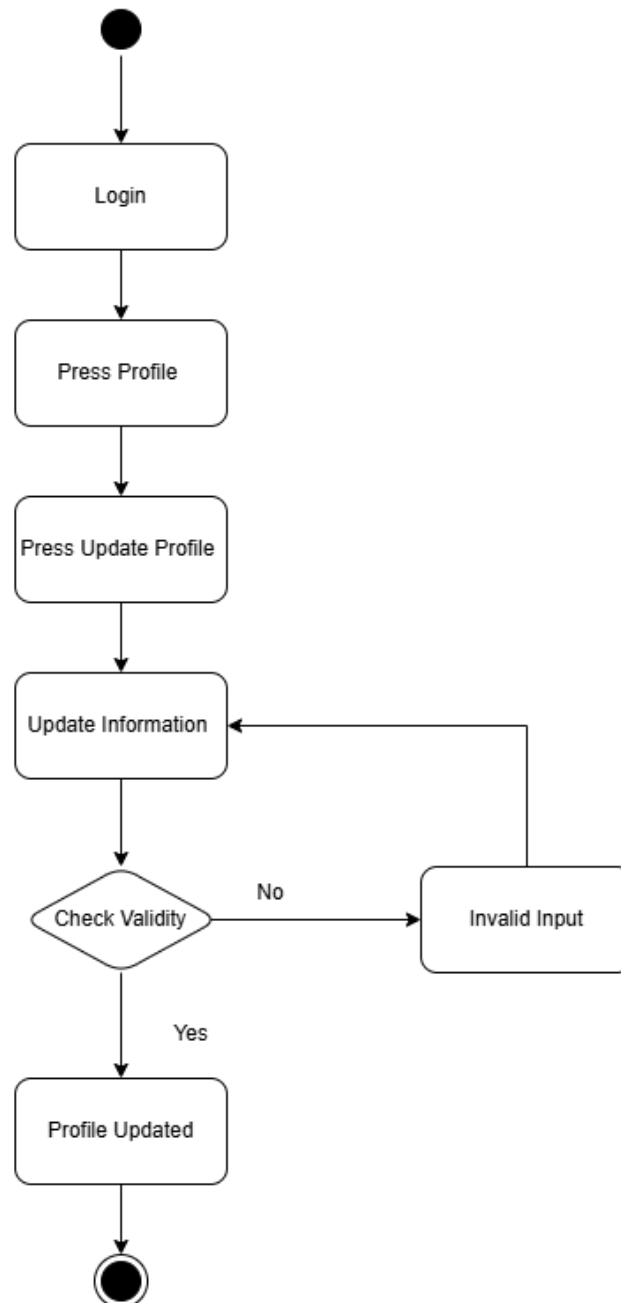
**Figure 24 : Activity Diagram for Profile**

**Swimlane Diagram:**



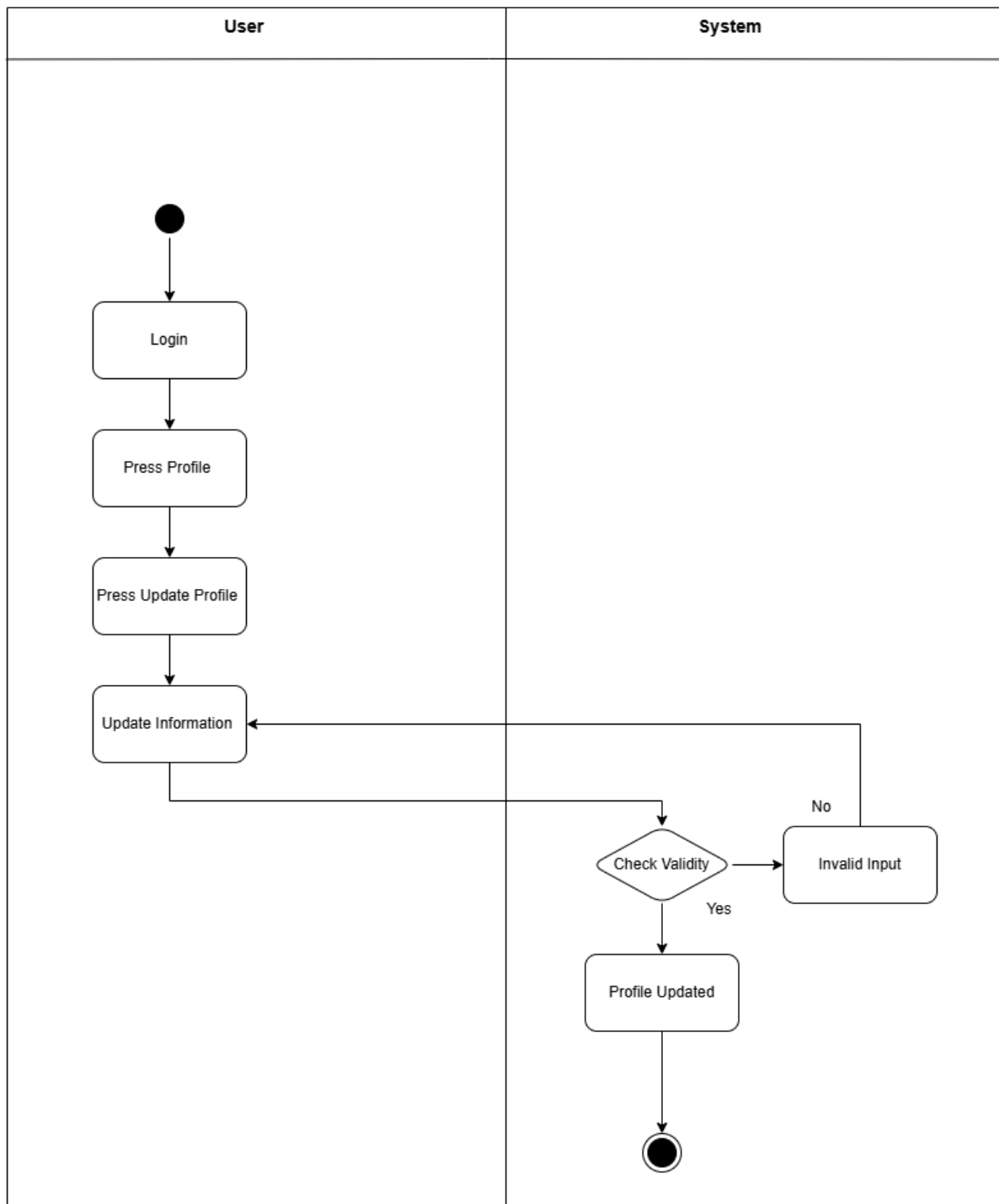
**Figure 25 : Swimlane Diagram for Profile**

**Use case 9: Update Profile**  
**Activity Diagram:**



**Figure 26 : Activity Diagram for Update Profile**

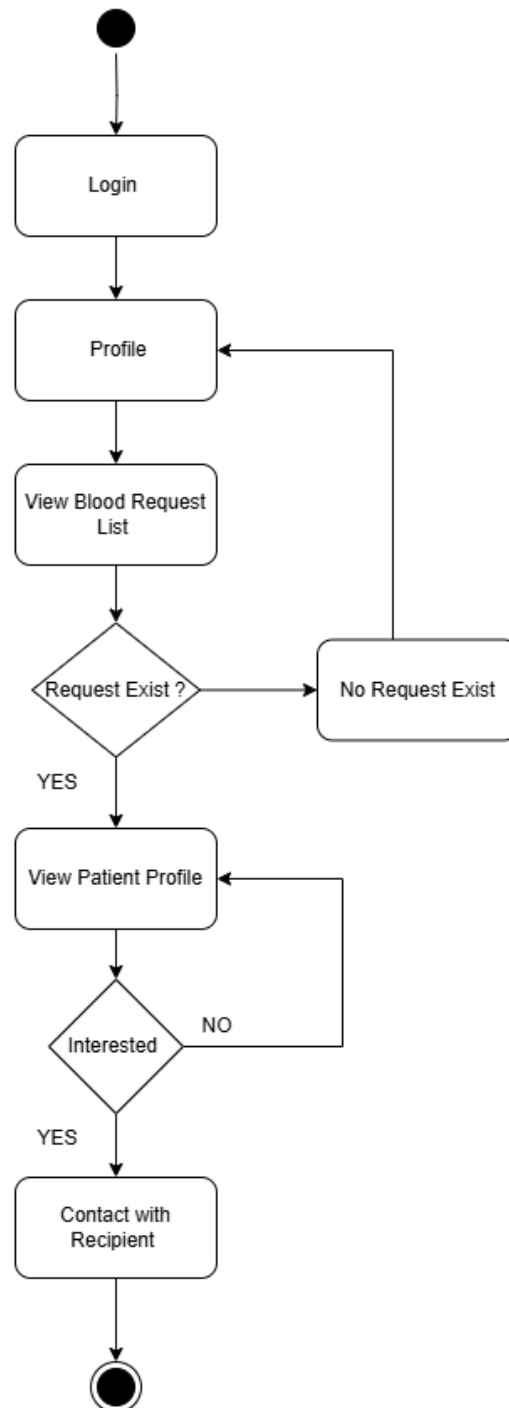
**Swimlane Diagram:**



**Figure 27 : Swimlane Diagram for Update Profile**

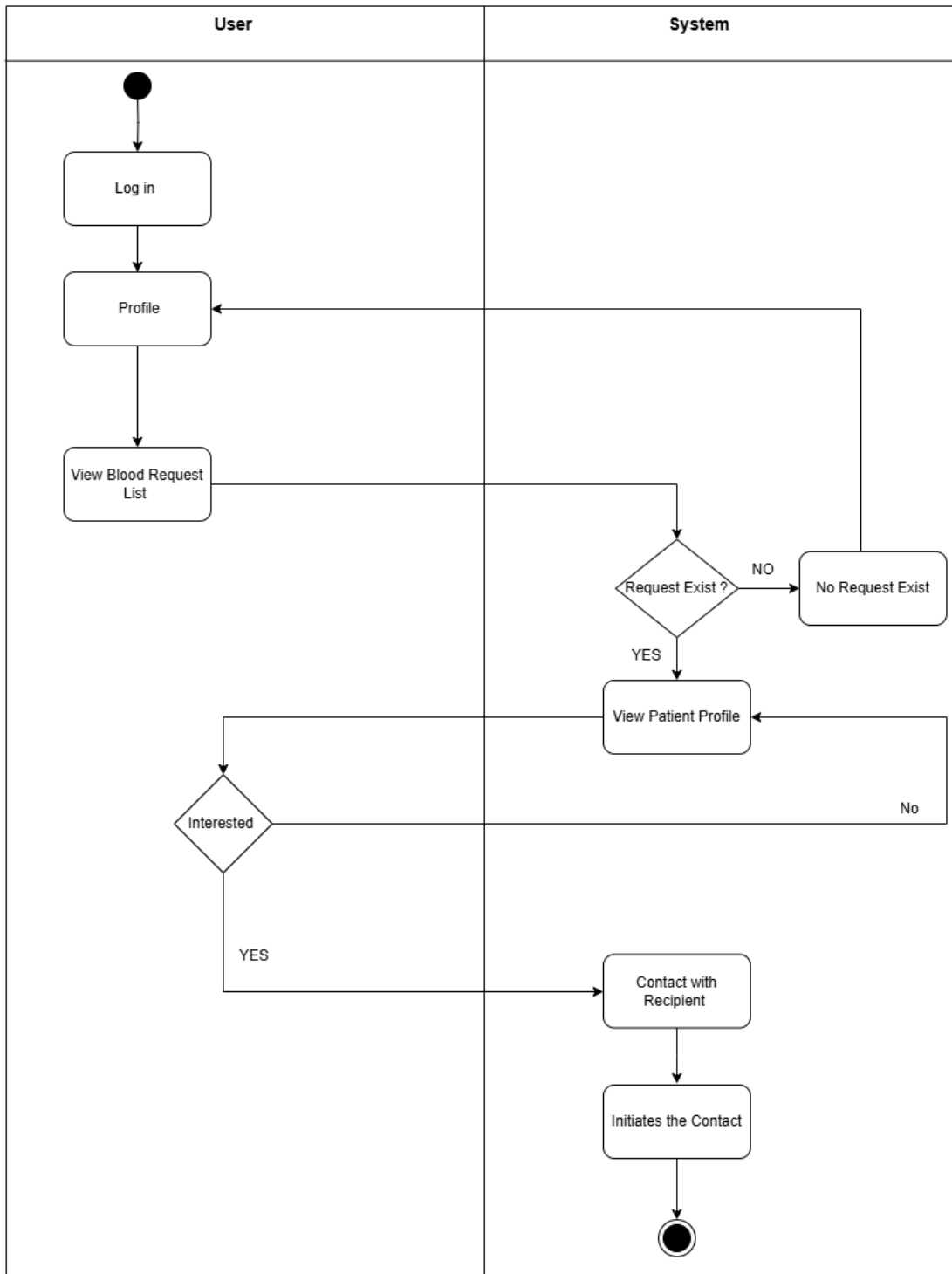


**Use case 10: Contact with Receipt**  
**Activity Diagram:**



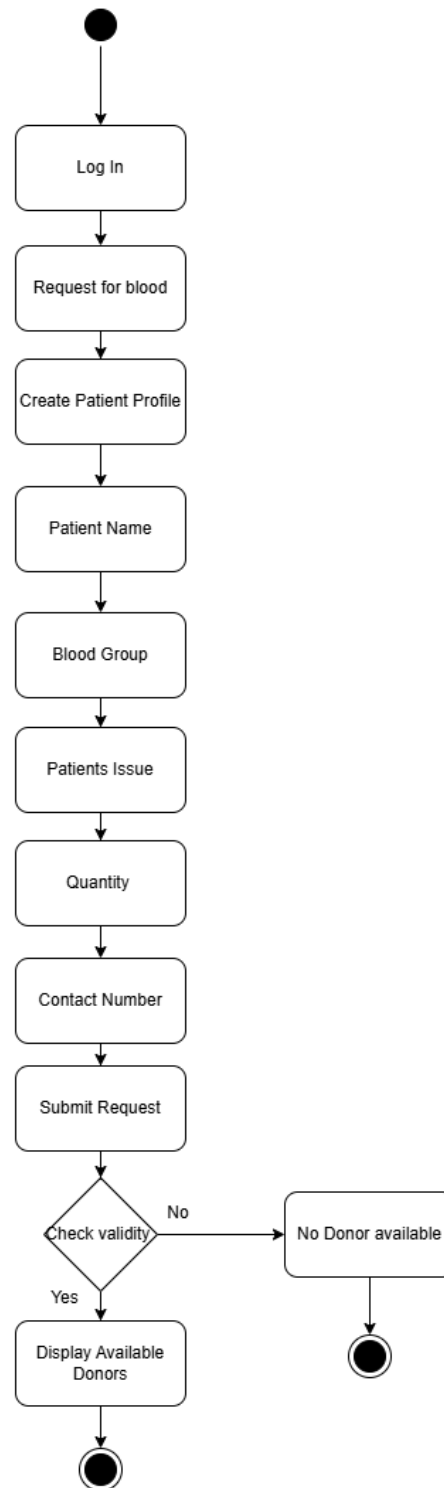
**Figure 28 : Activity Diagram for Contact with Receipt**

**Swimlane Diagram:**



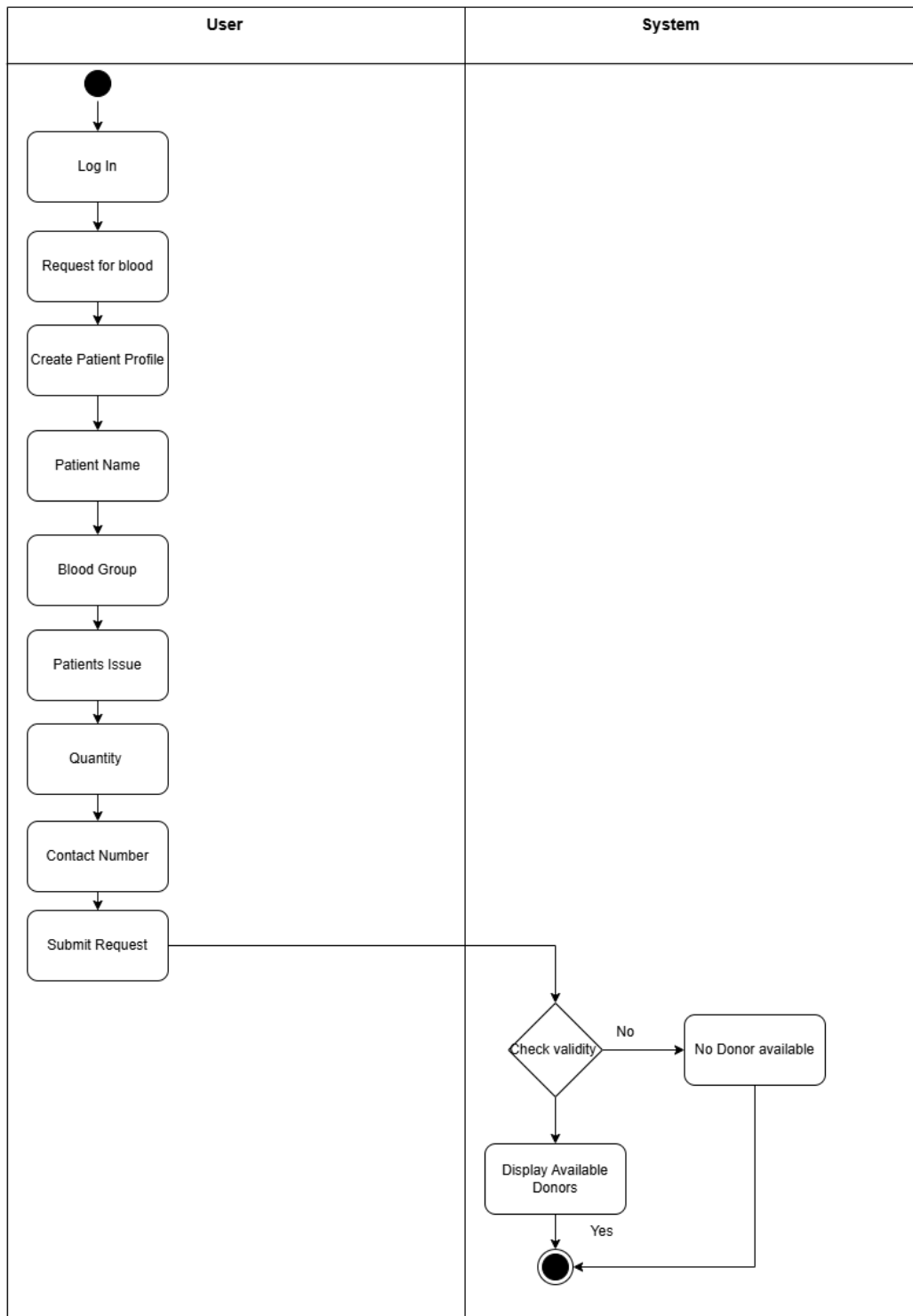
**Figure 29 : Swimlane Diagram for Contact with Recipient**

**Use case 11: Blood Request  
Activity Diagram:**



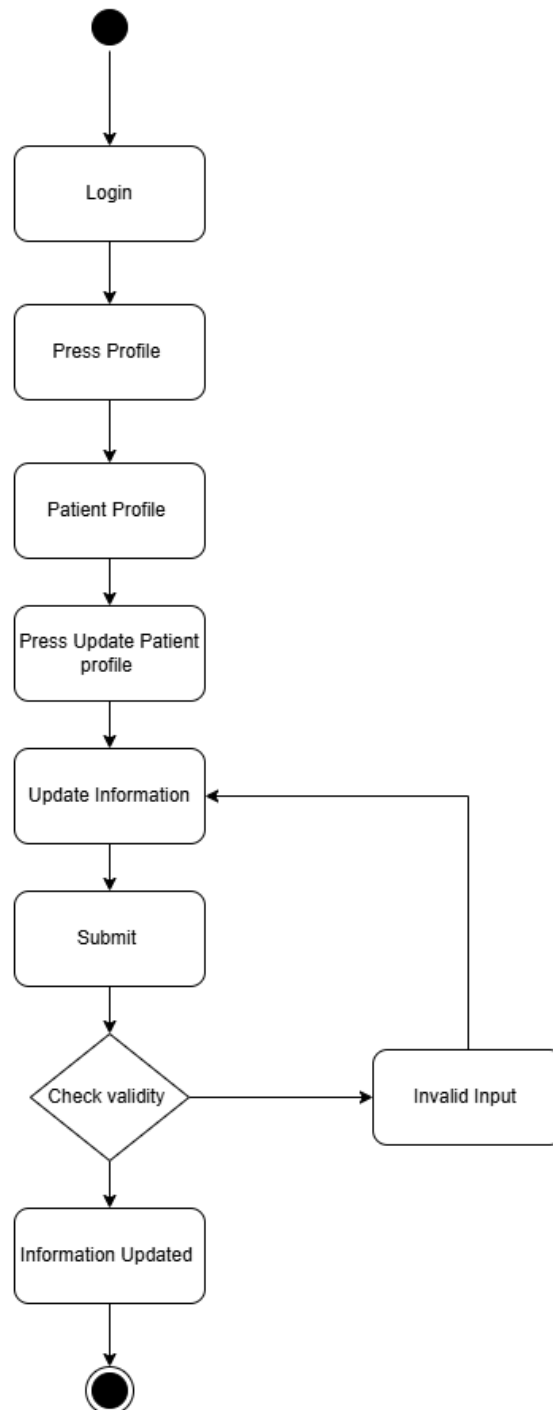
**Figure 30 : Activity Diagram for Blood Request**

**Swimlane Diagram:**



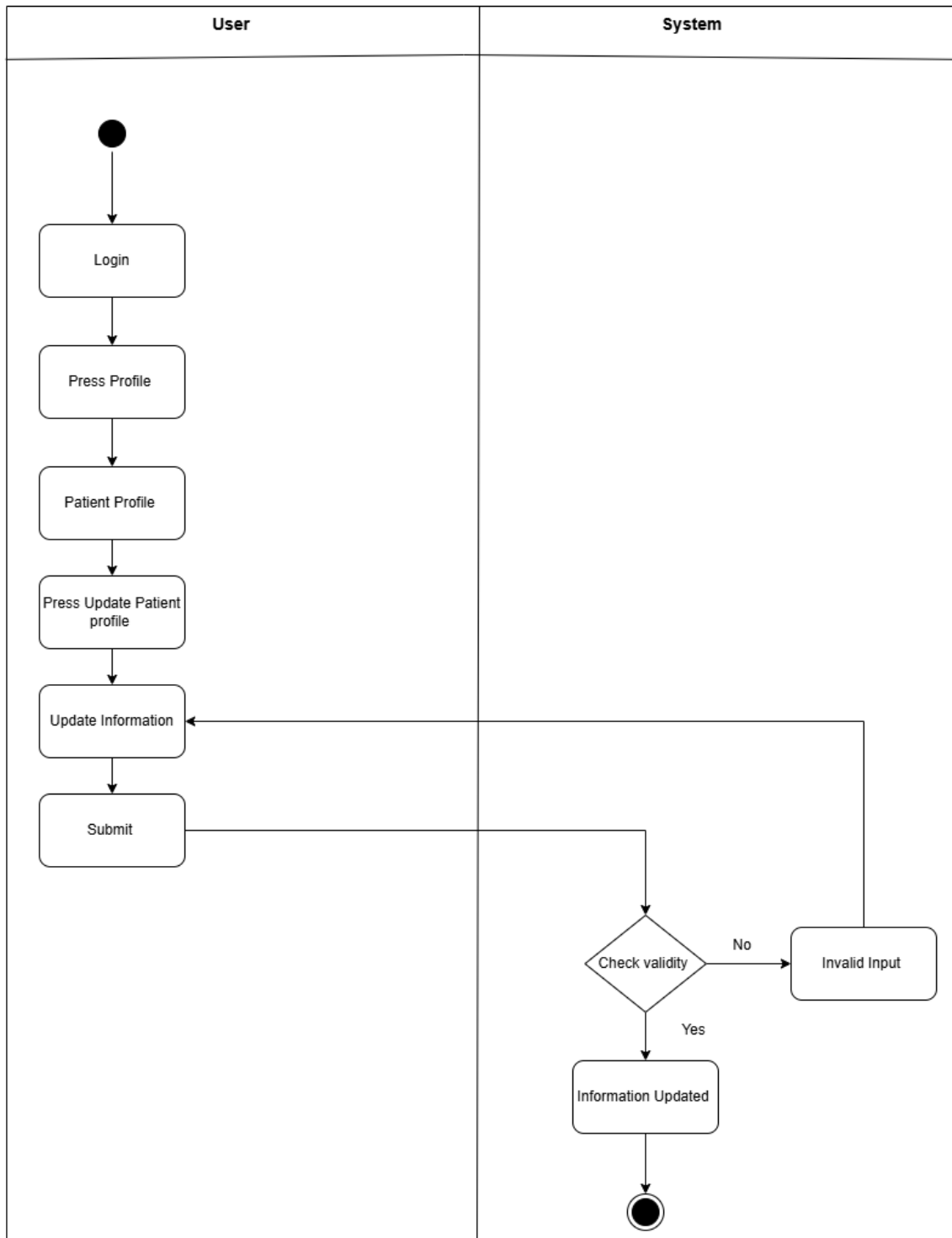
**Figure 31 : Swimlane Diagram for Blood Request**

**Use case 12: Update Patient Information  
Activity Diagram:**



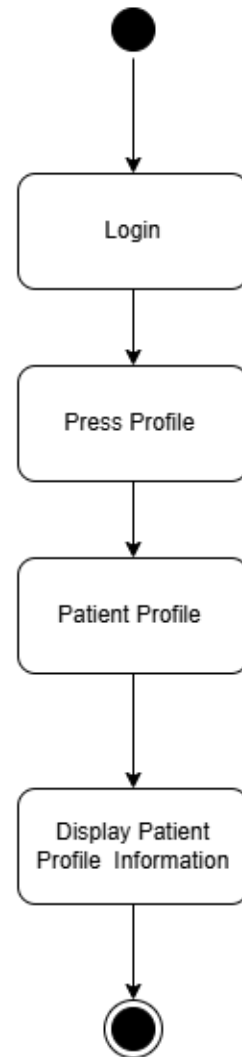
**Figure 32 : Activity Diagram for Update Patient Information**

**Swimlane Diagram:**



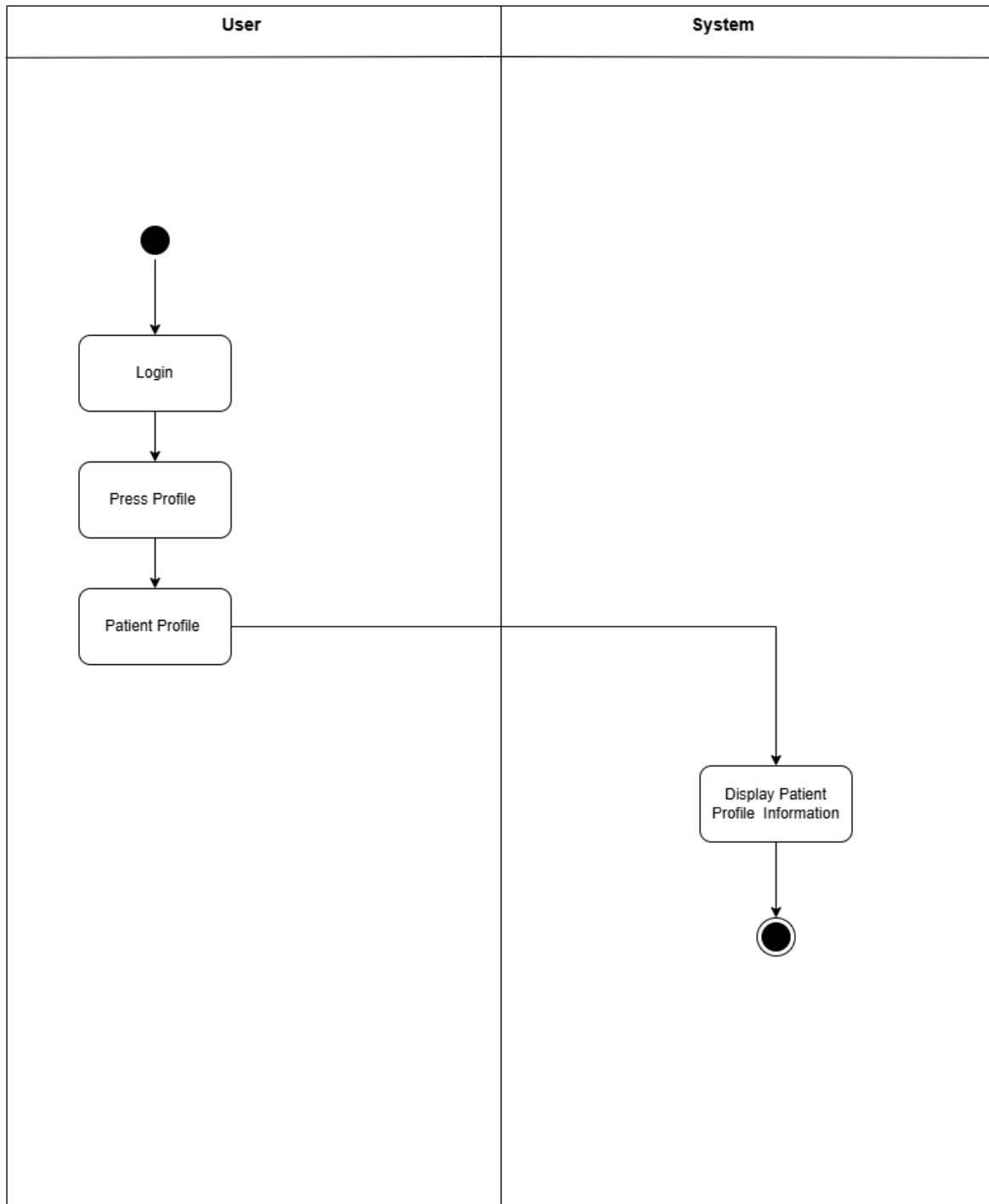
**Figure 33 : Swimlane Diagram for Update Patient Information**

**Use case 13: Visit Patient Profile**  
**Activity Diagram:**



**Figure 34 : Activity Diagram for Visit Patient Profile**

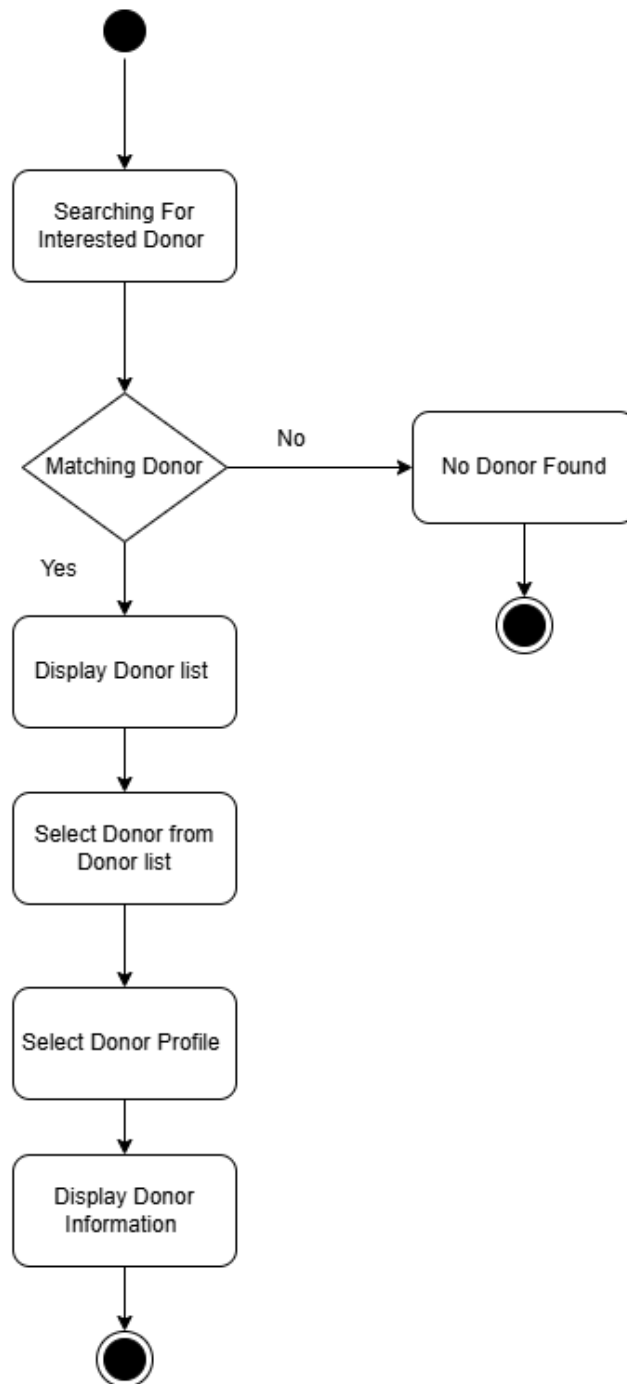
**Swimlane Diagram:**



**Figure 35 : Swimlane Diagram for Visit Patient Profile**

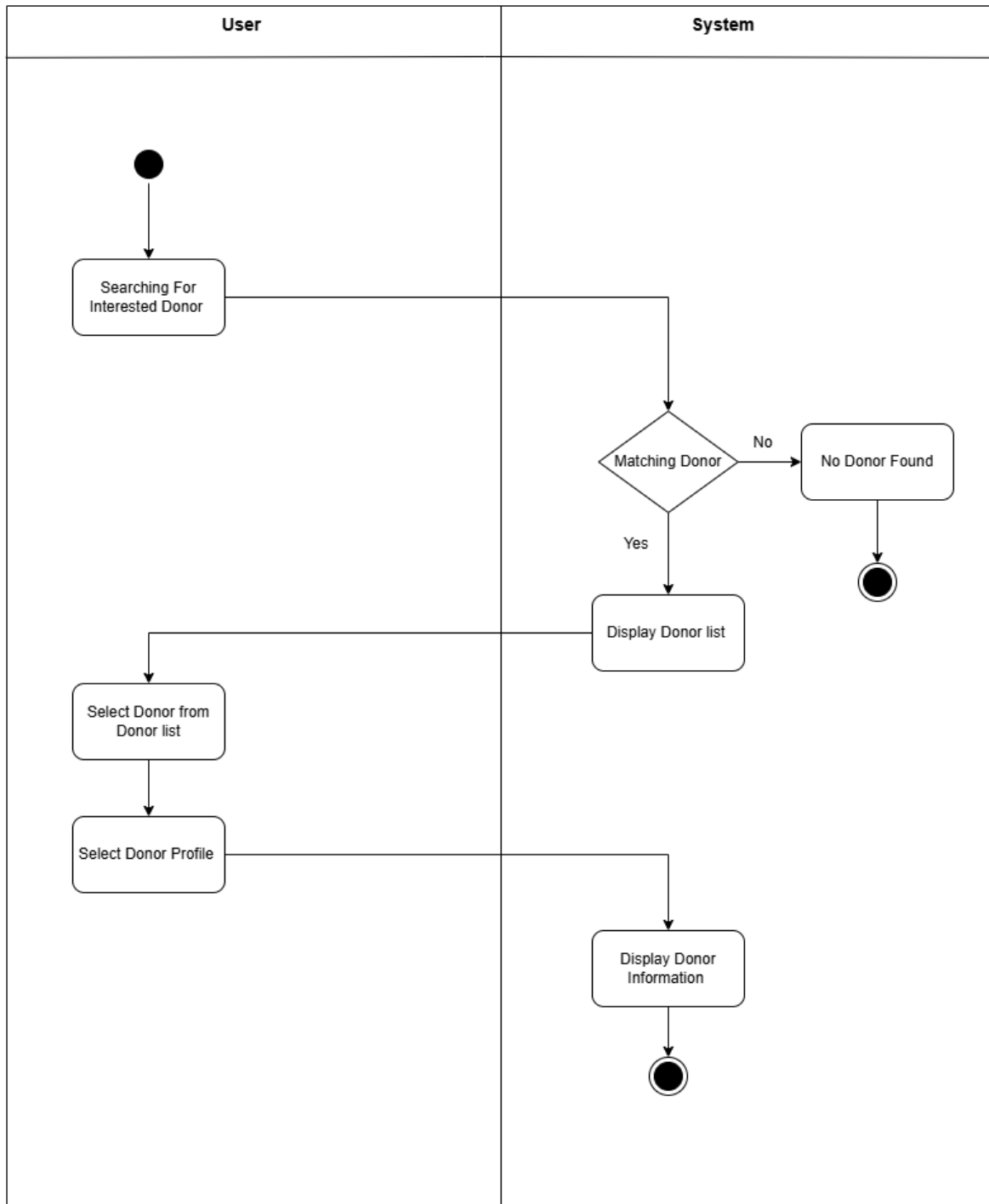


**Use case 14: Visit Donor Profile**  
**Activity Diagram:**



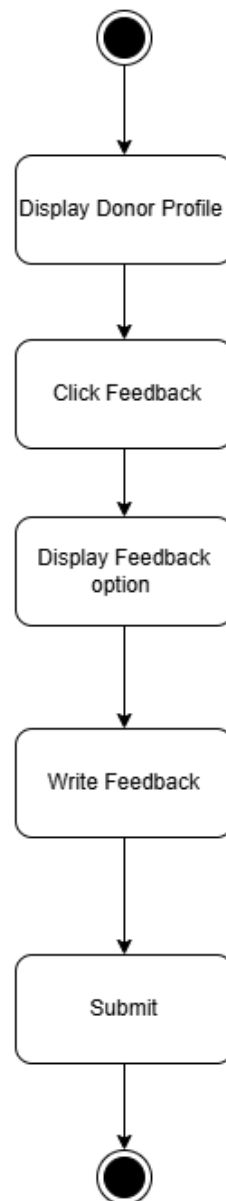
**Figure 36 : Activity Diagram for Visit Donor Profile**

**Swimlane Diagram:**



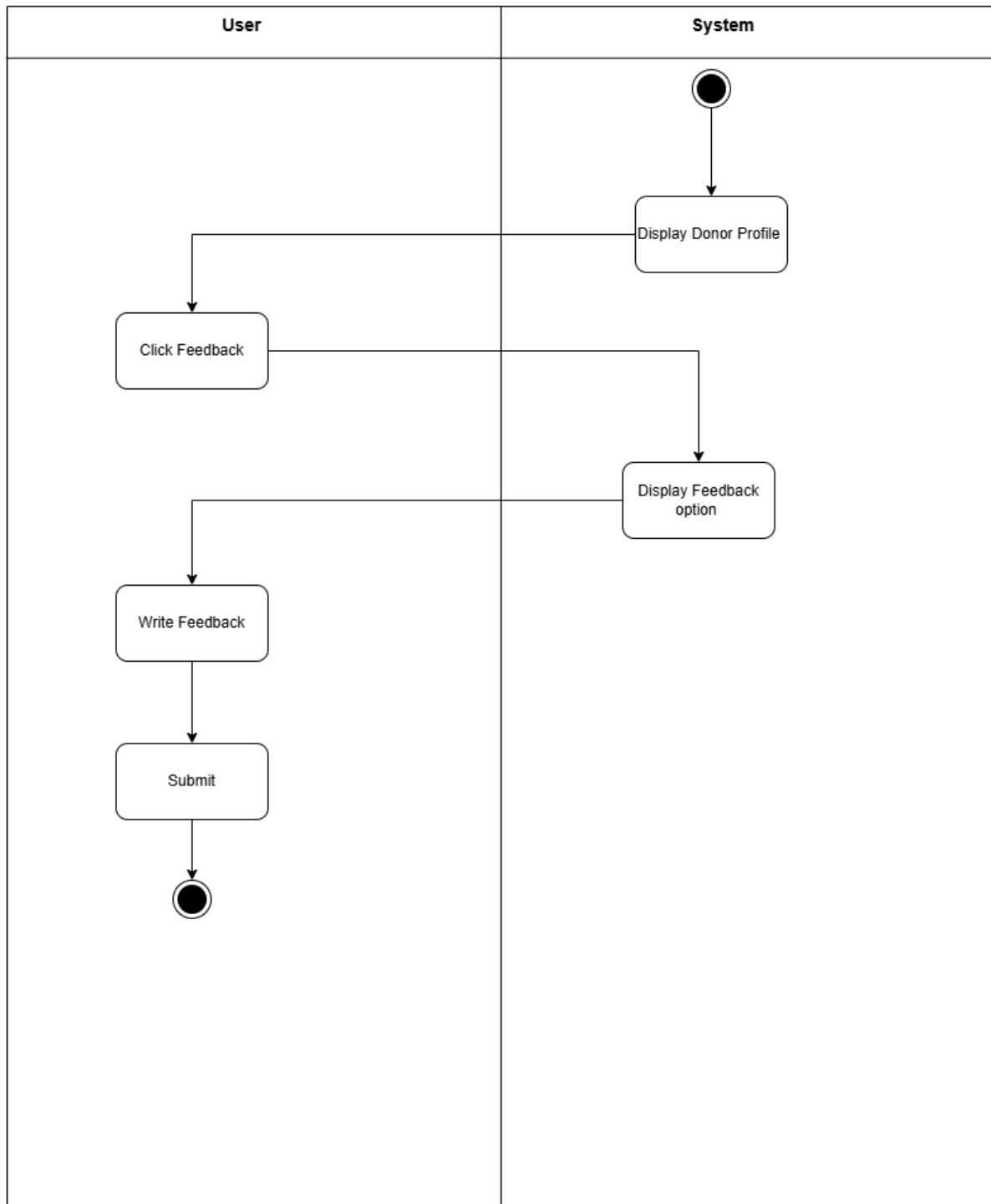
**Figure 37 : Swimlane Diagram for Visit Donor Profile**

**Use case 15: Donor Rating & Feedback  
Activity Diagram:**



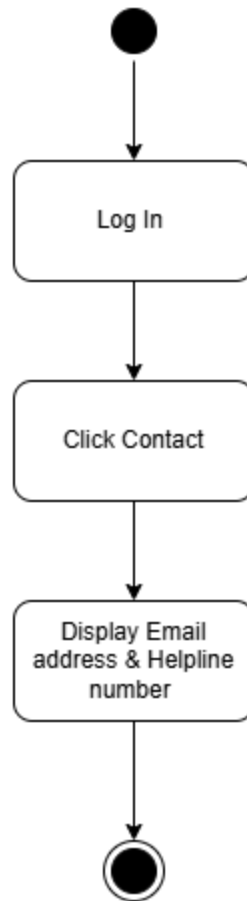
**Figure 38 : Activity Diagram for Donor Rating & Feedback**

**Swimlane Diagram:**



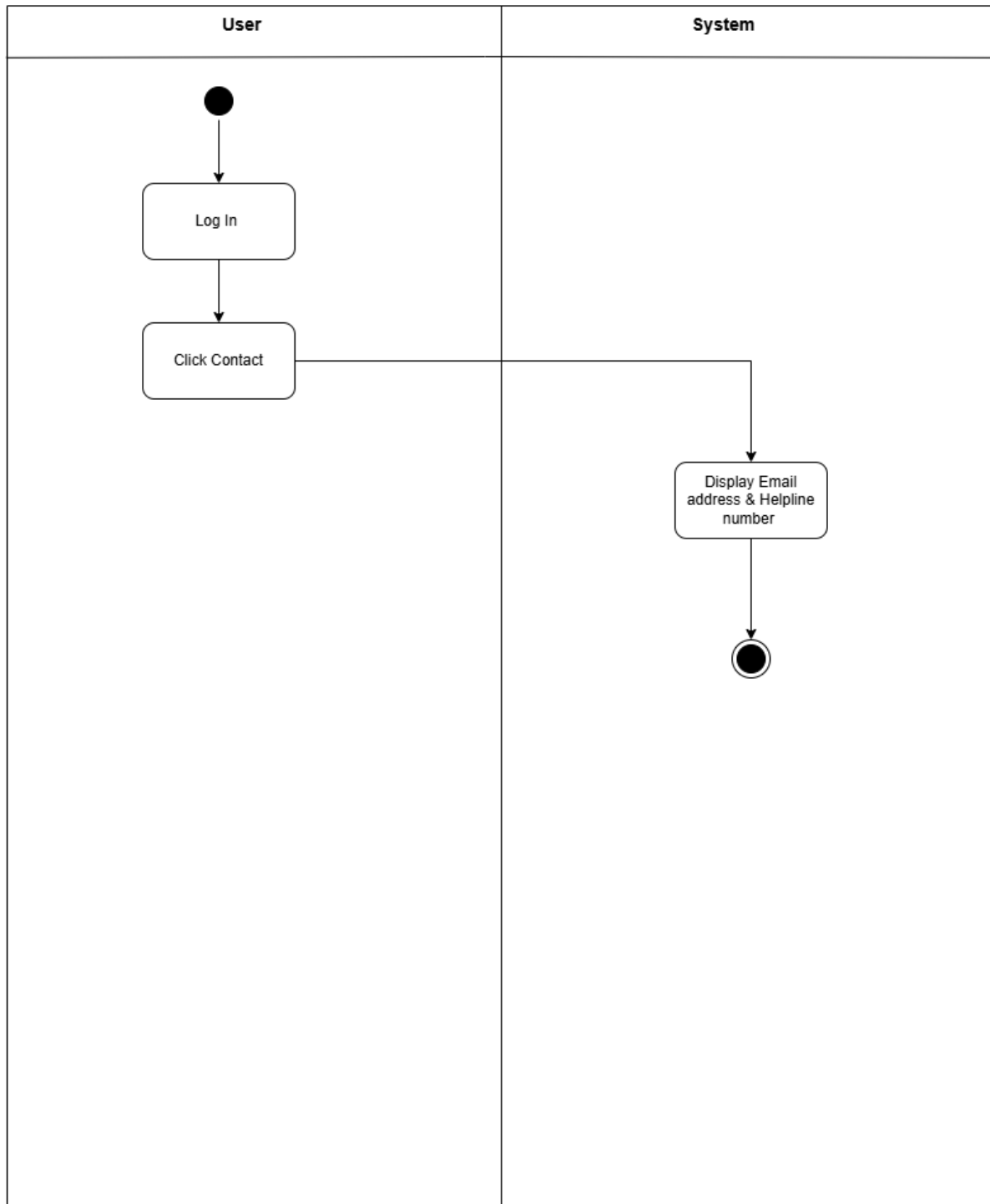
**Figure 39 : Swimlane Diagram for Donor Rating & Feedback**

**Use case 16: Contact**  
**Activity Diagram:**



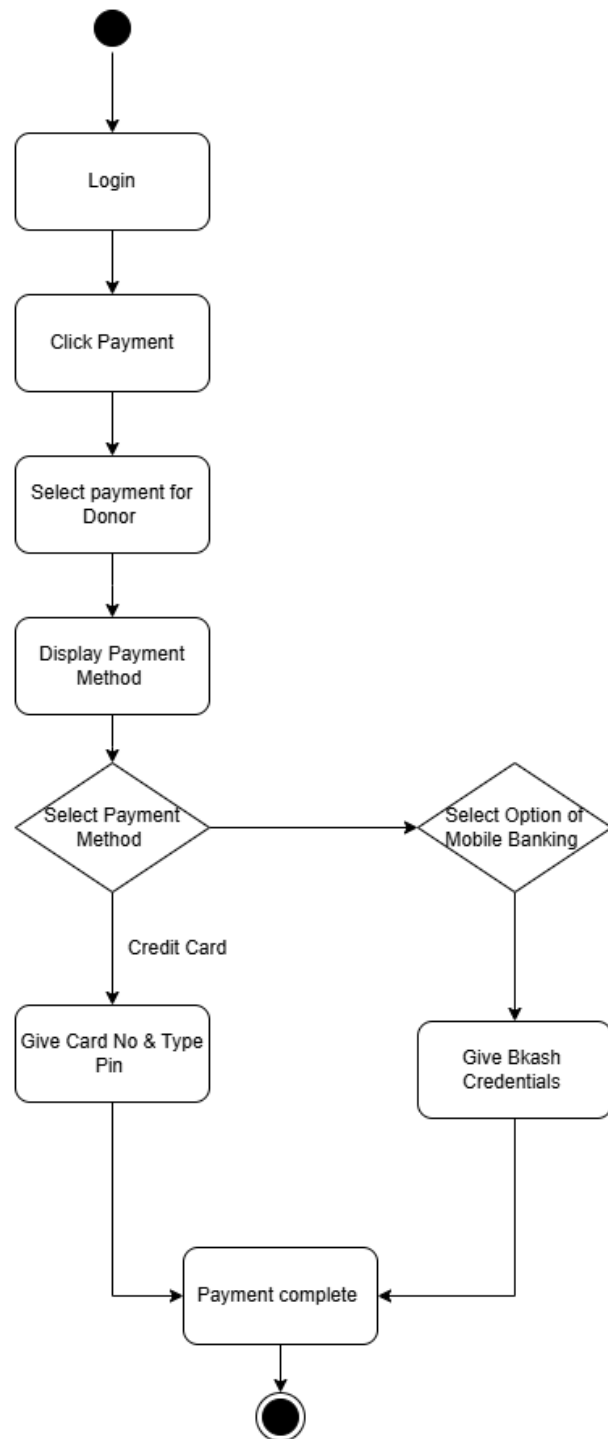
**Figure 40 : Activity Diagram for Contact**

**Swimlane Diagram:**



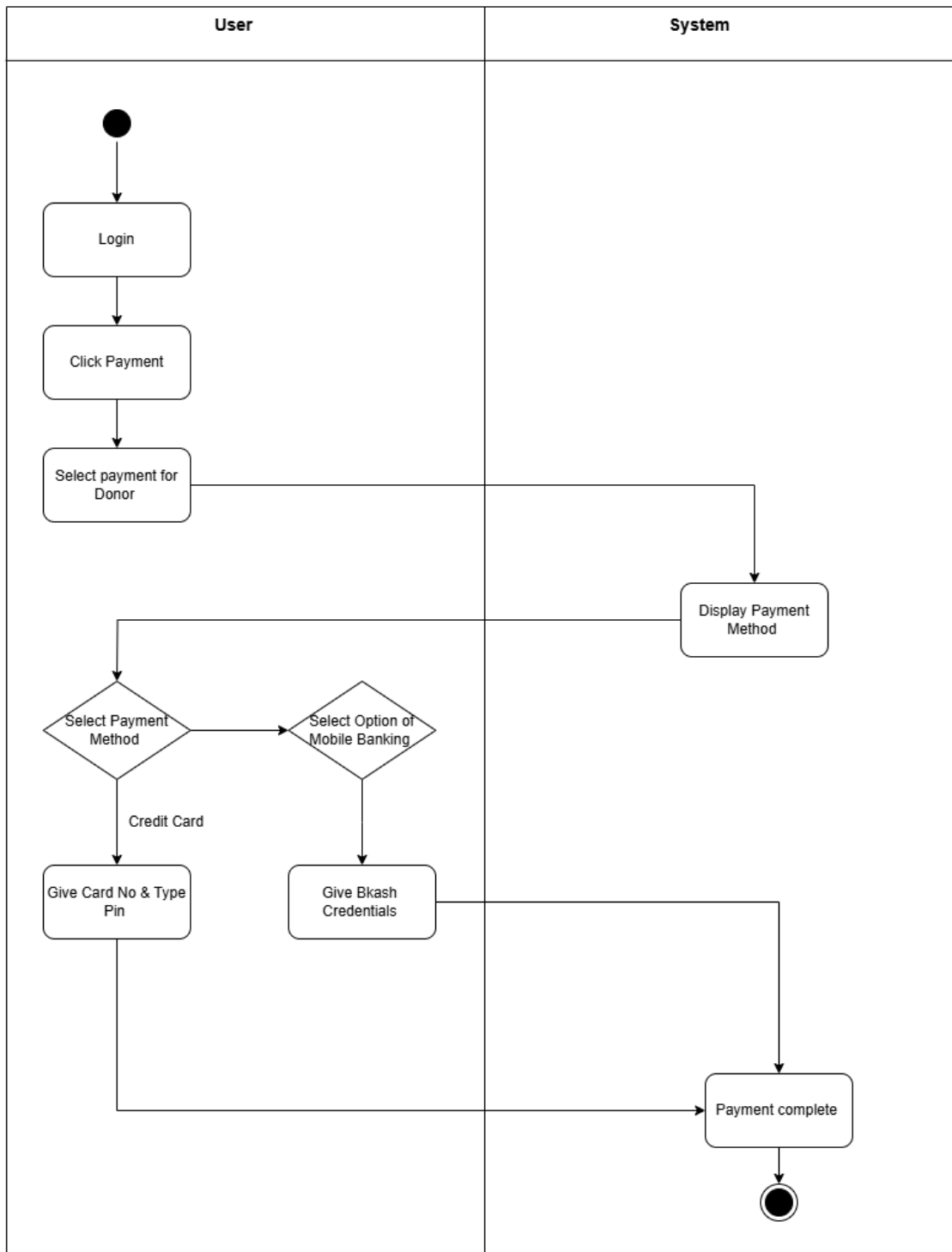
**Figure 41 : Swimlane Diagram for Contact**

**Use case 17: Payment For Donor  
Activity Diagram:**



**Figure 42 : Activity Diagram for Payment For Donor**

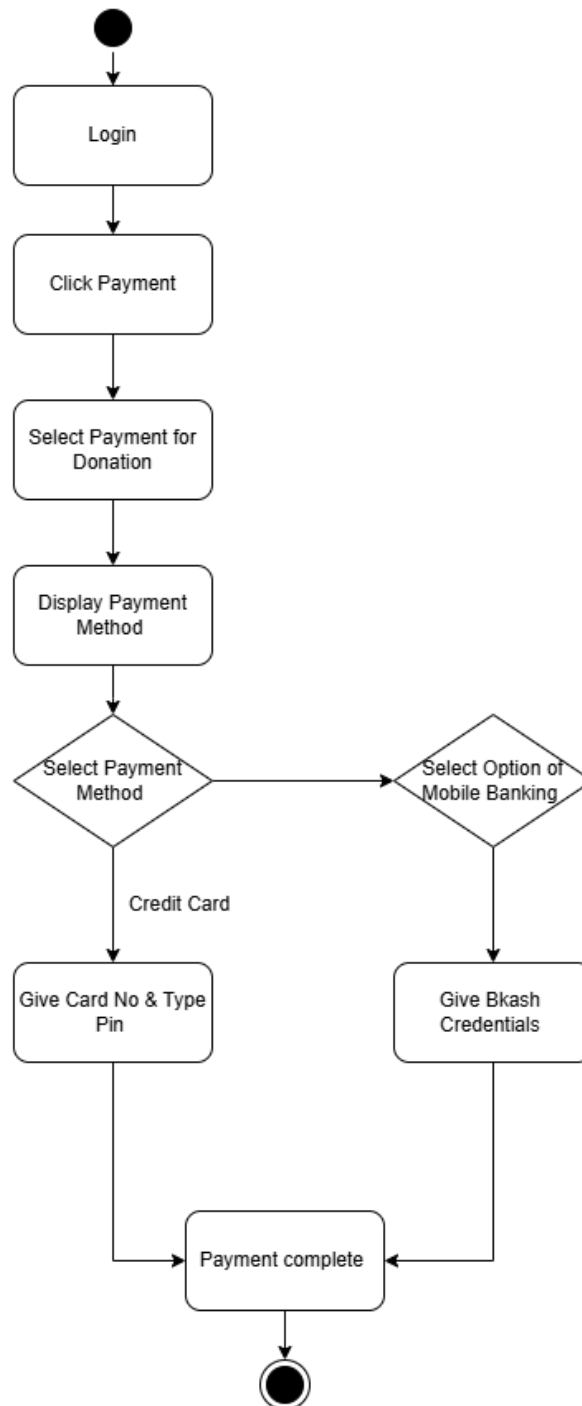
**Swimlane Diagram:**



**Figure 43 : Swimlane Diagram for Payment For Donor**

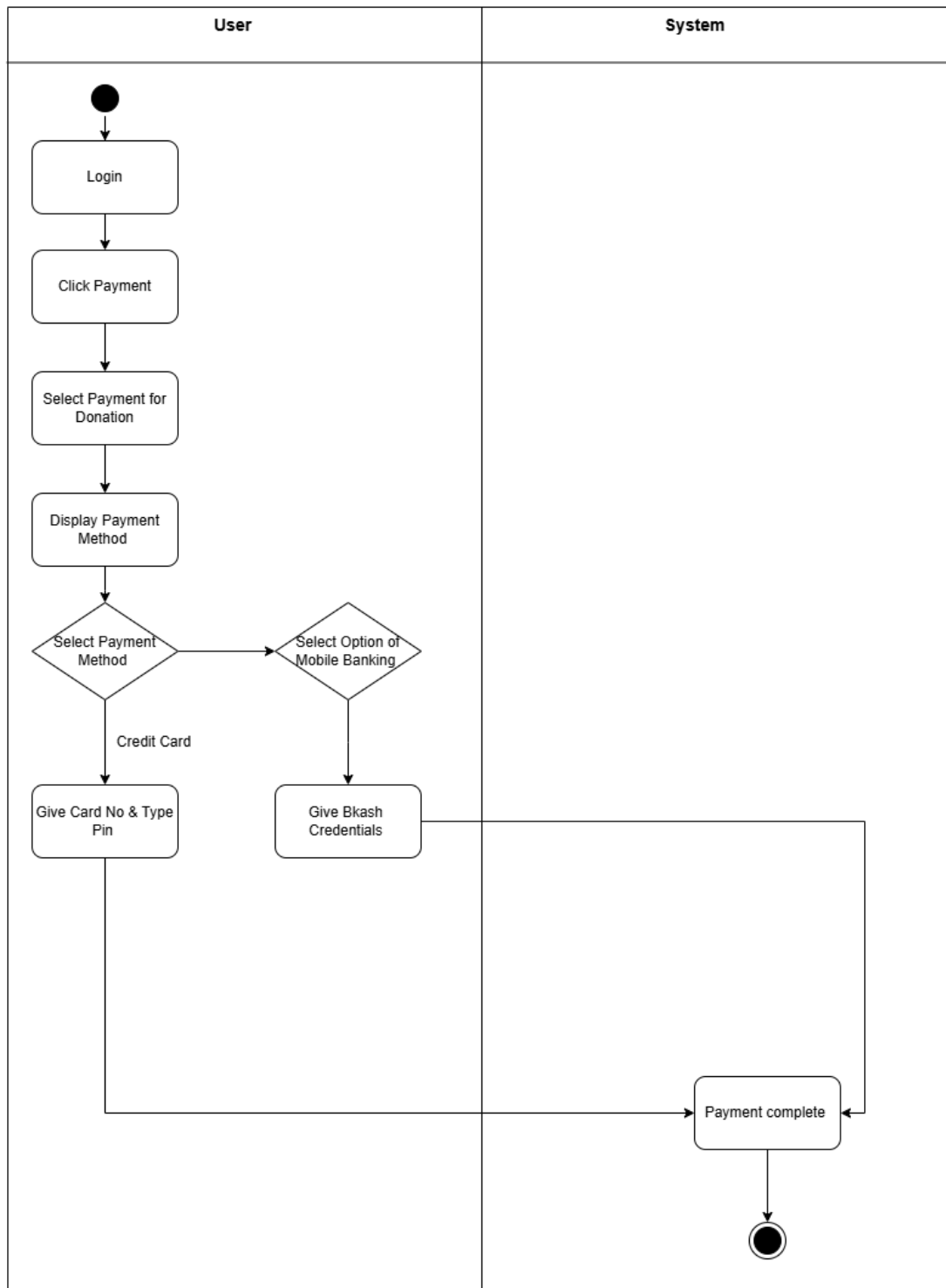


**Use case 18: Payment For Donation  
Activity Diagram:**



**Figure 44 : Activity Diagram for Payment for Donation**

**Swimlane Diagram:**



**Figure 45 : Swimlane Diagram for Payment For Donation**

## Chapter 5: Class Diagram

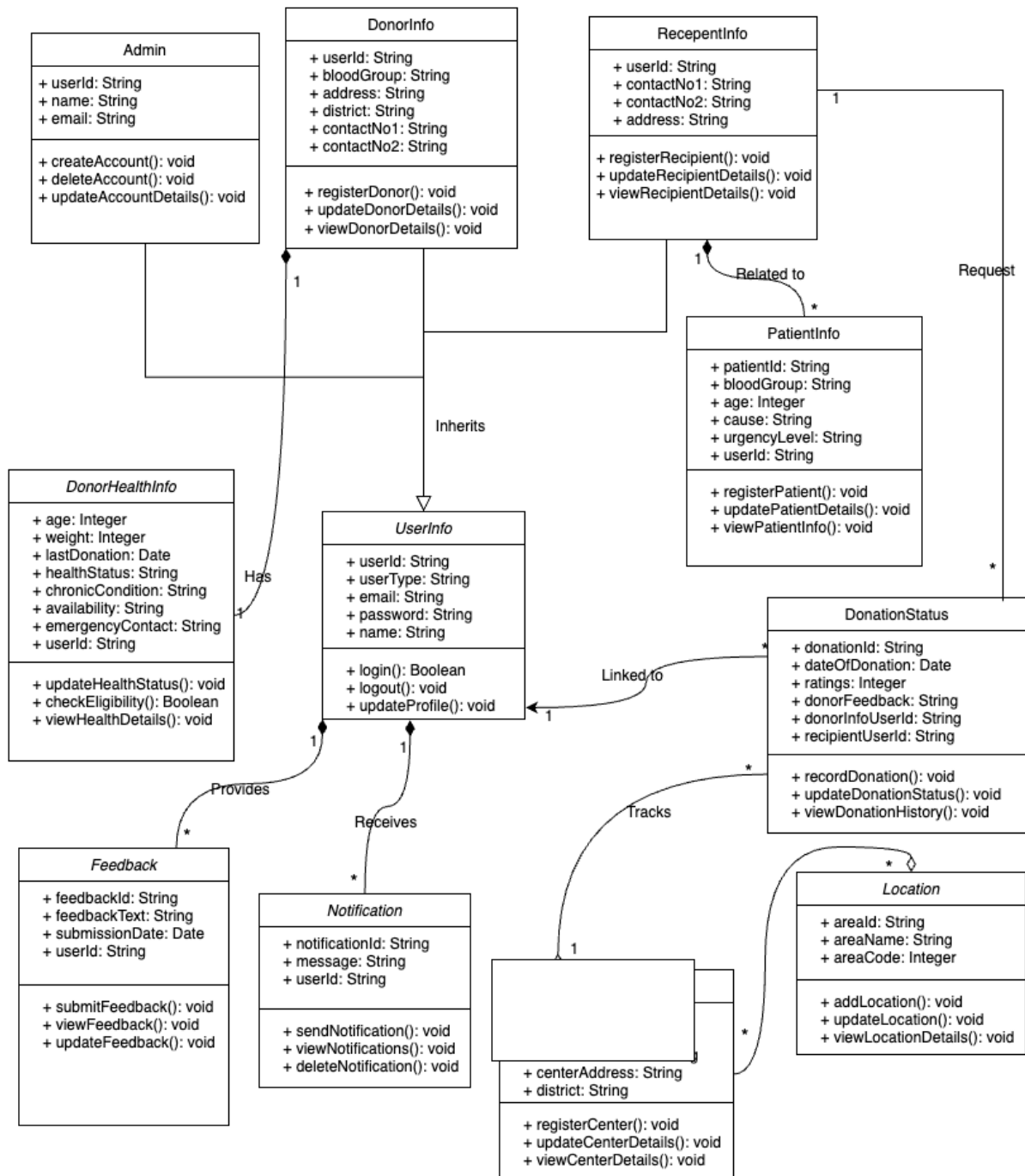


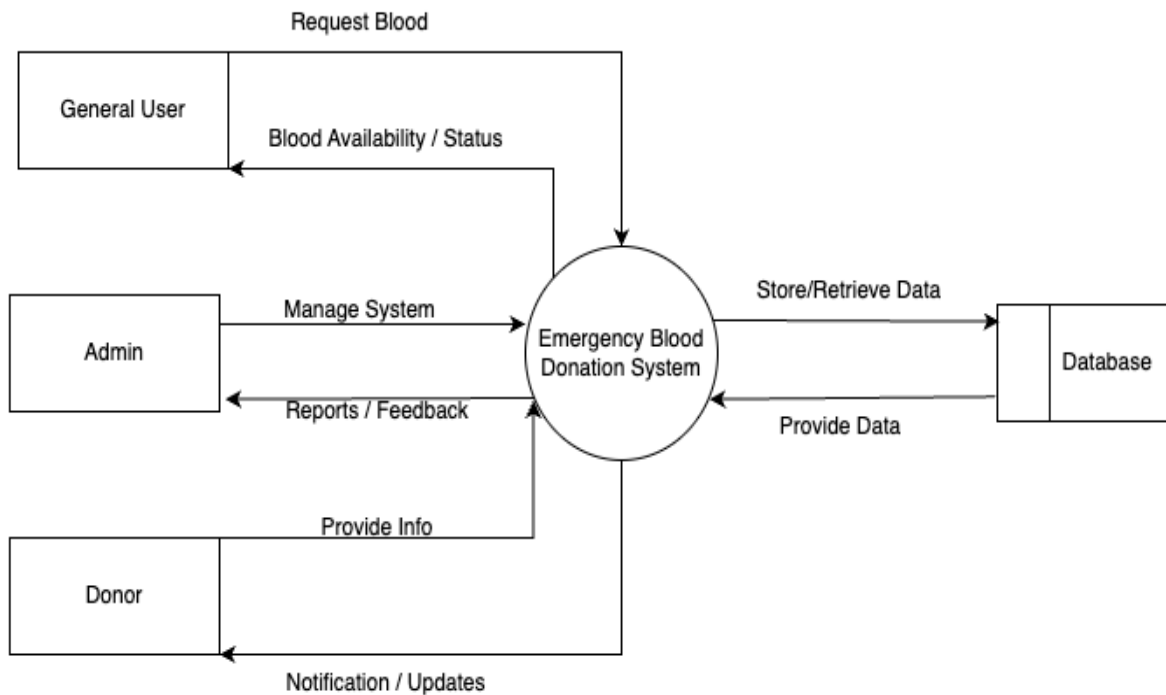
Figure 46: UML Class Diagram of Blood Donation Management System

## Chapter 6: Flow-Oriented Model

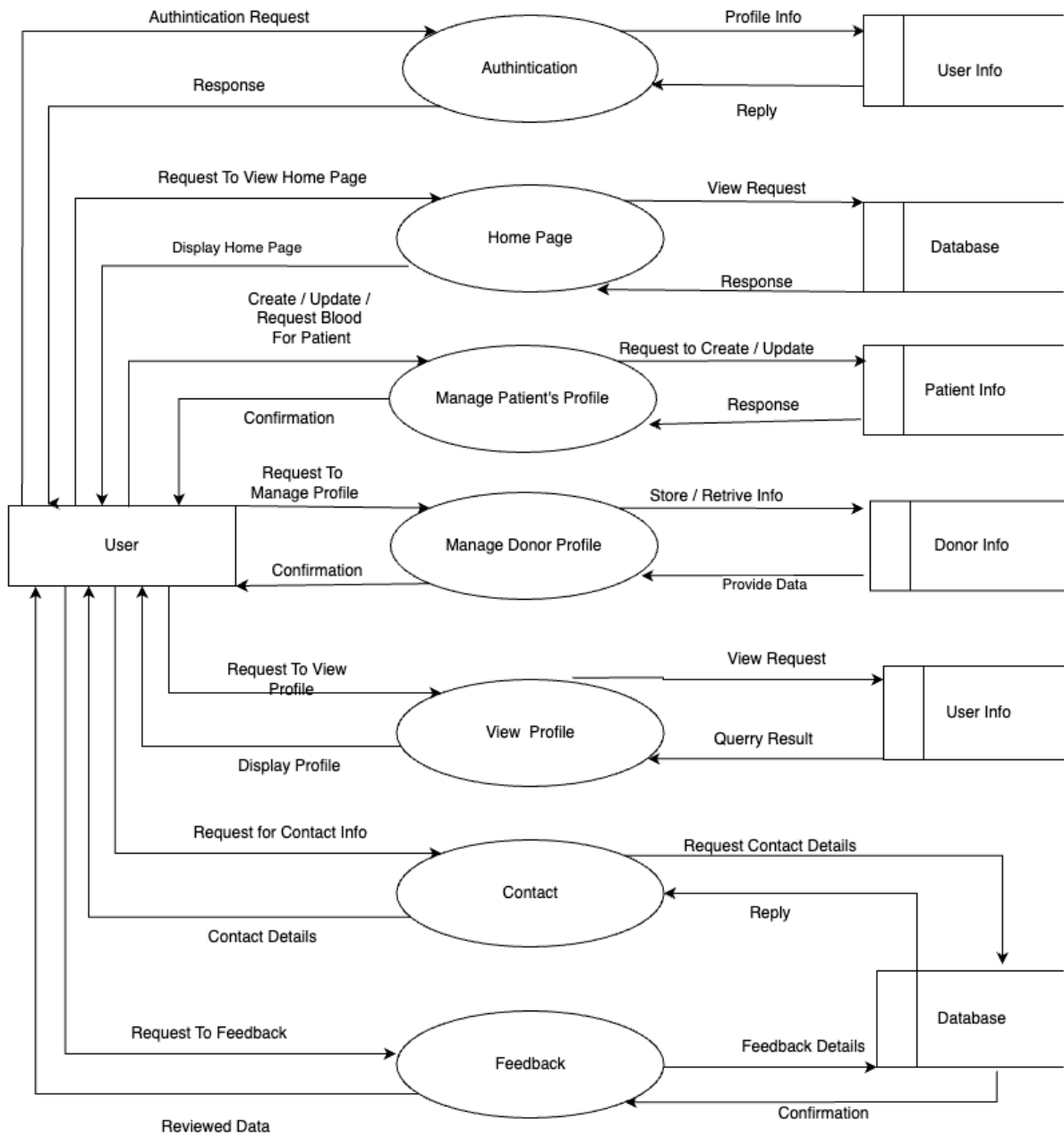
### 6.1 Introduction

Although data flow-oriented modeling is perceived as an outdated technique by some software engineers, it continues to be one of the most widely used requirements analysis notations in use today. It provides additional insight into system requirements and flow

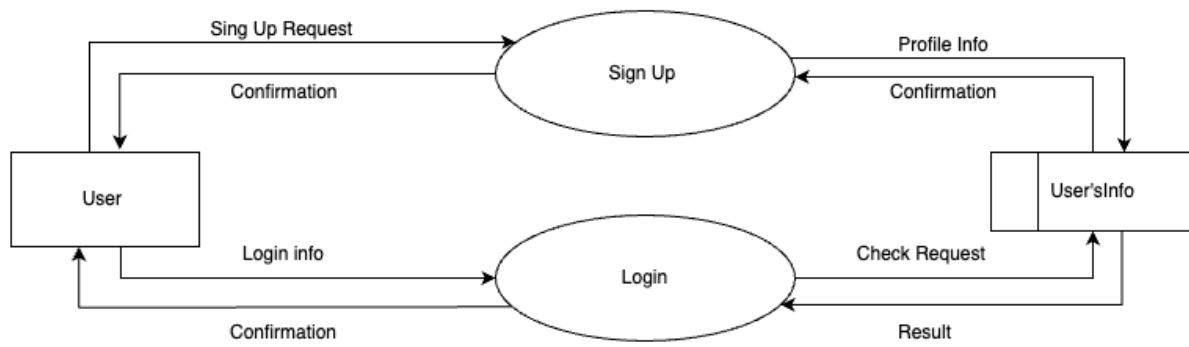
### 6.2 Data Flow Diagram (DFD)



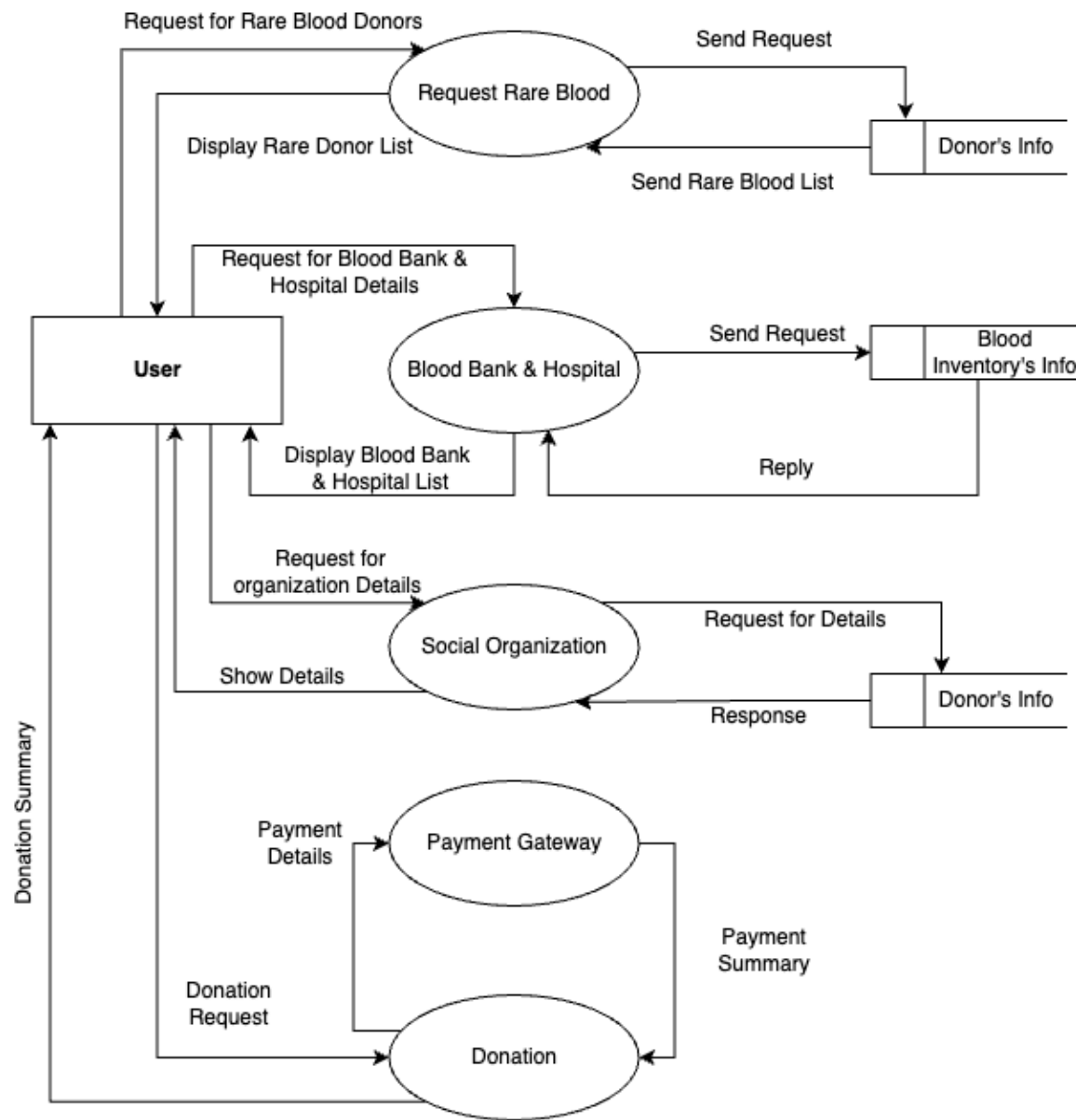
**Figure 47: Data Flow Diagram (Level-0)**



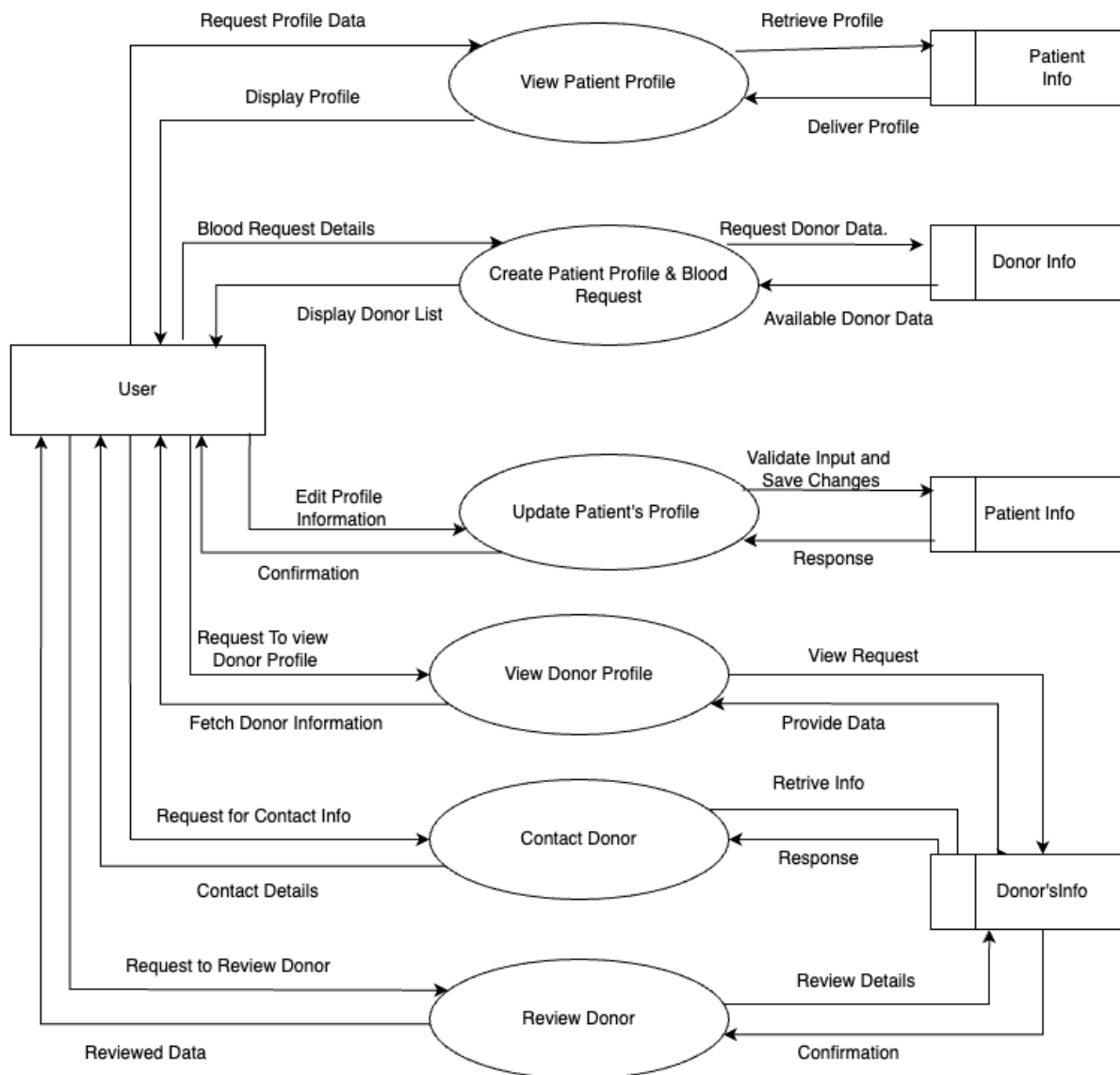
**Figure 48: Data Flow Diagram (Level-1)**



**Figure 49: Data Flow Diagram Authentication (Level - 2.1)**

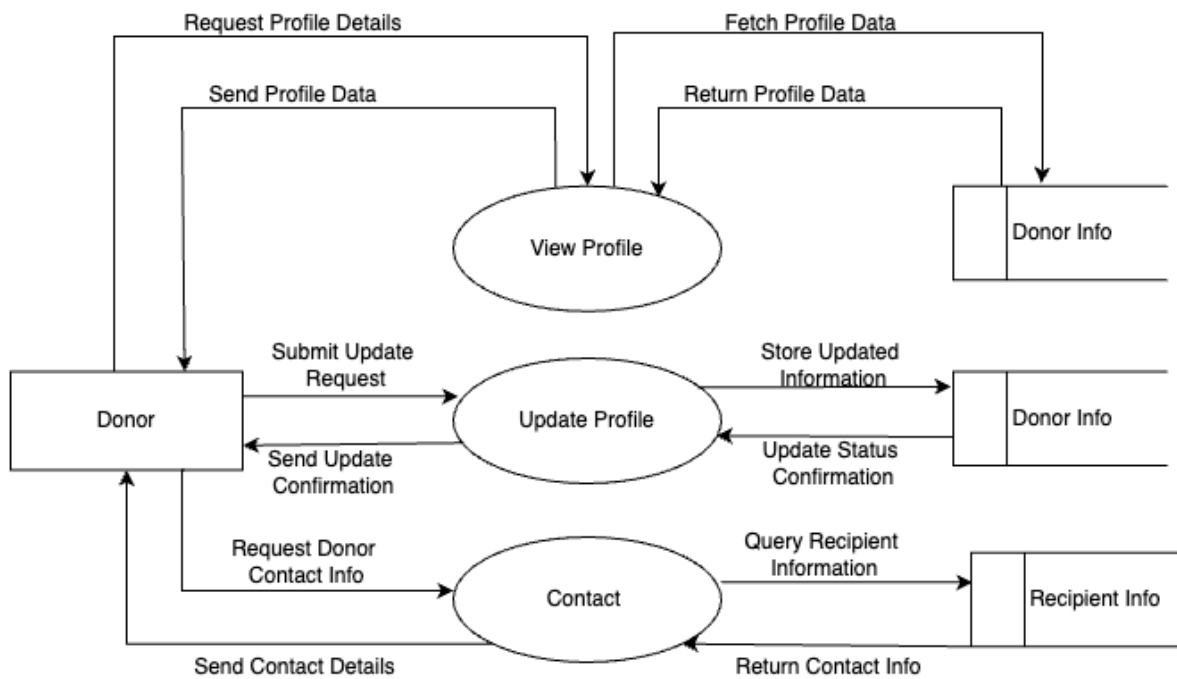


**Figure 50: Data Flow Diagram Homepage (Level-2.2)**



**Figure 51: Data Flow Diagram Manage Patient Profile (Level-2.3)**





**Figure 52: Data Flow Diagram Donor's Option (Level - 2.4)**

## Chapter 7: Behavioral Model

### 7.1 State Machine Diagram

State diagram represents active states for each class the events (triggers)

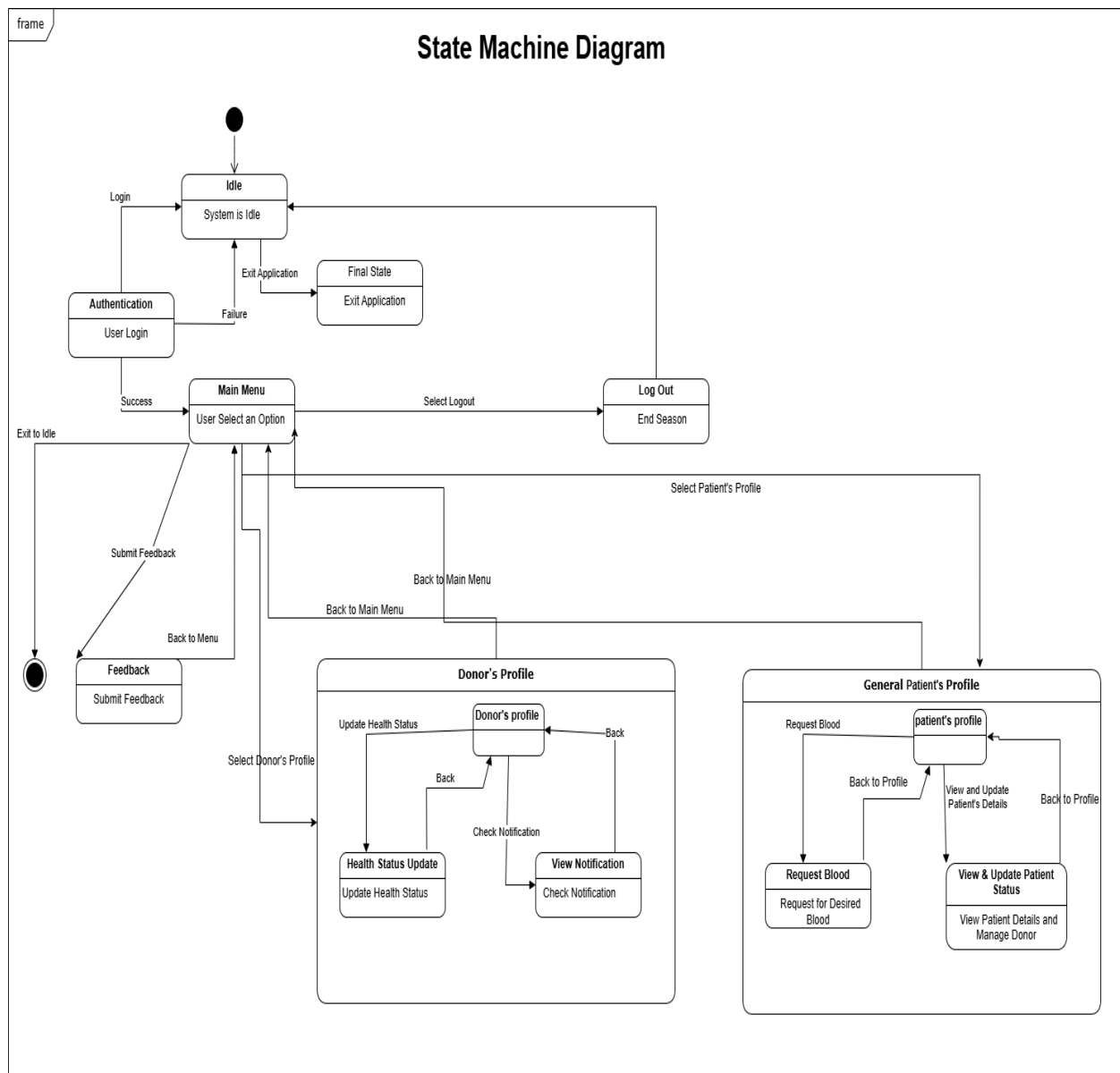
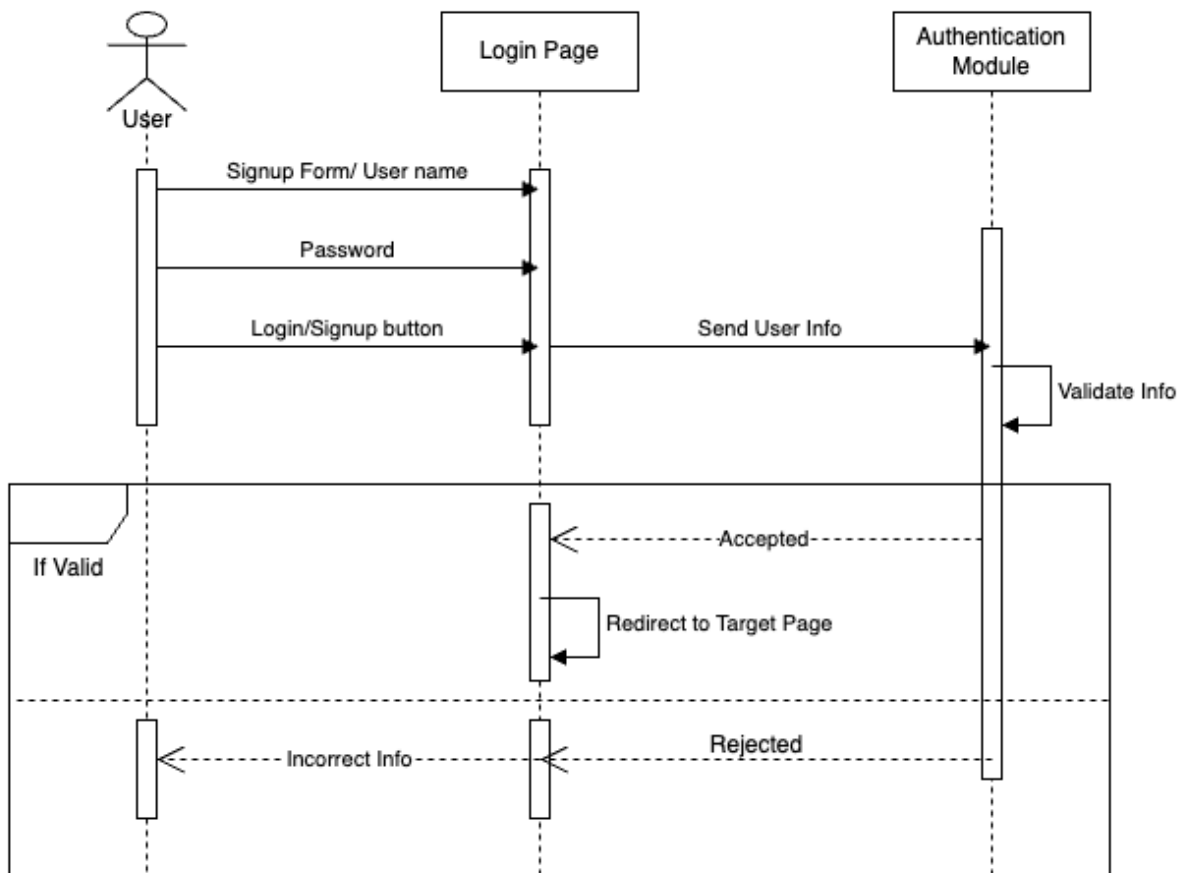


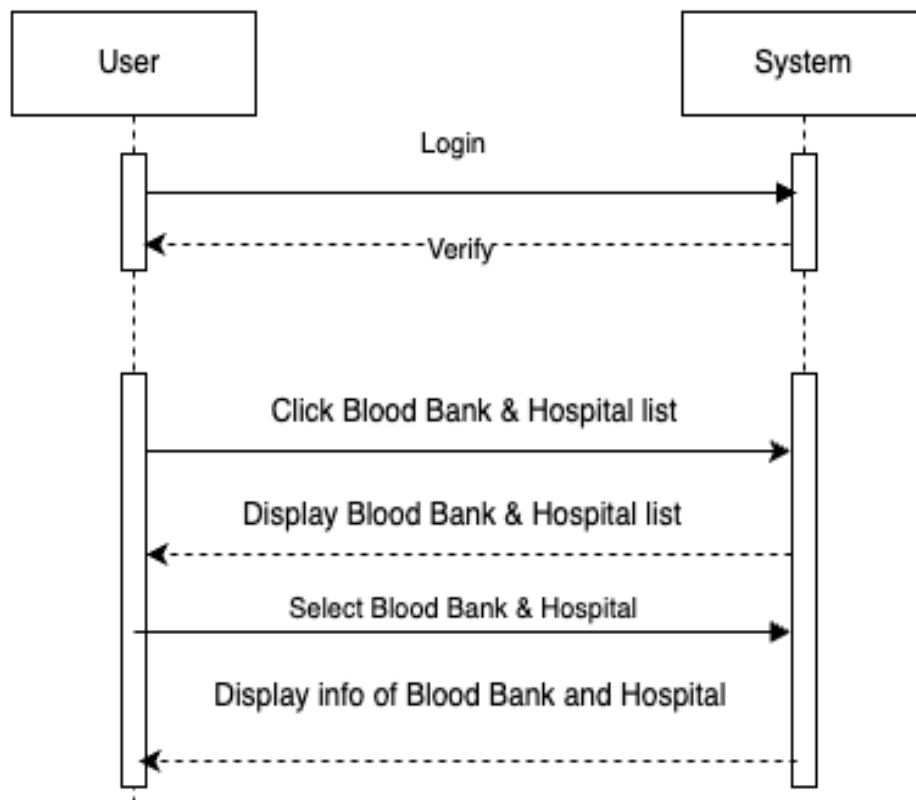
Figure 53: State Machine Diagram

## 7.2 Sequence Diagram

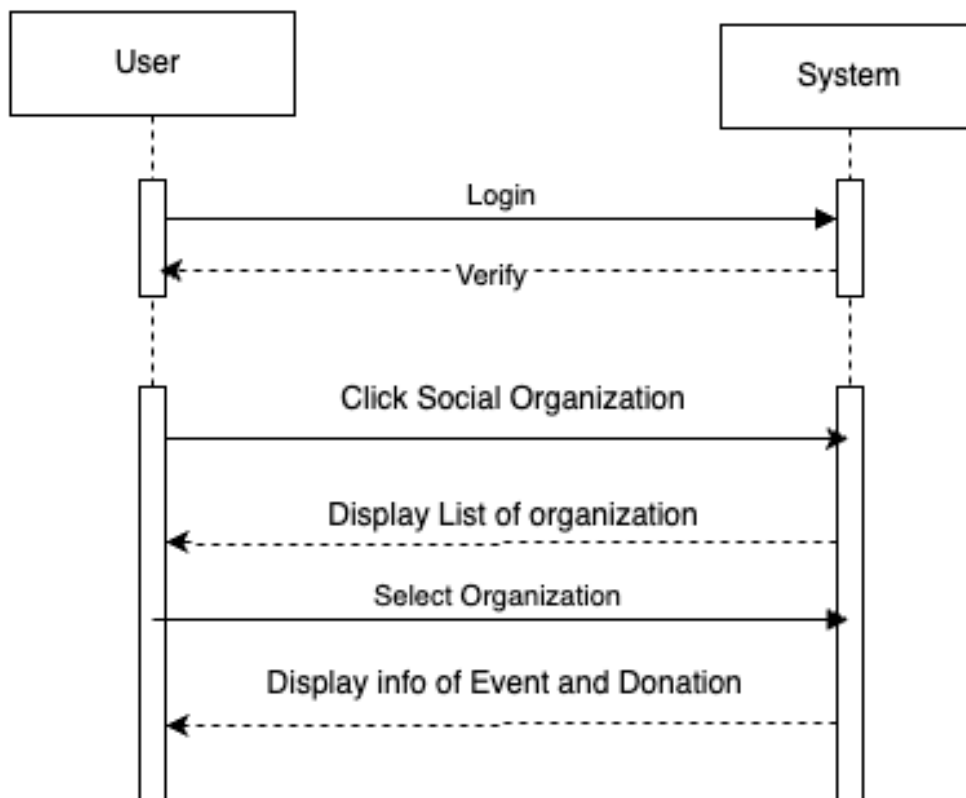
Sequence diagram indicates how events cause transitions from object to object.



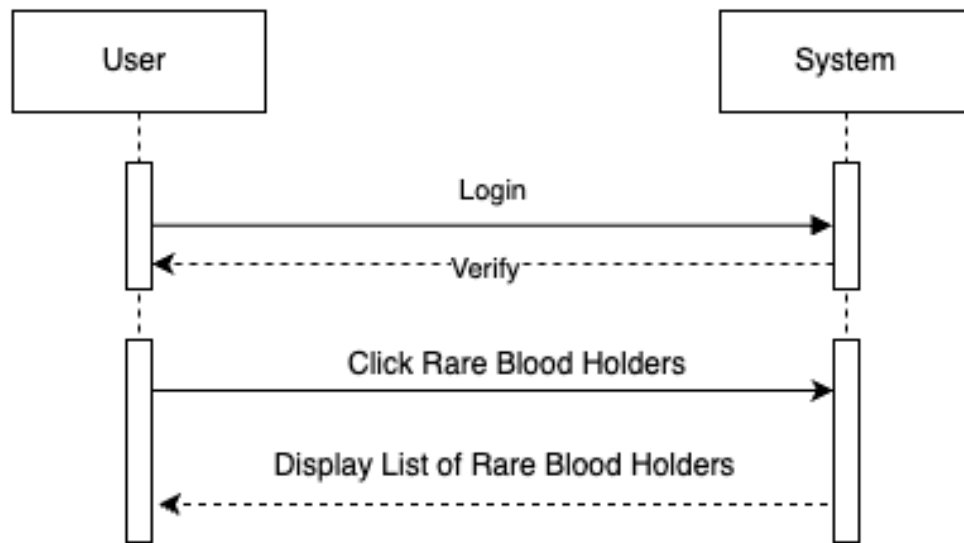
**Figure 54: Sequence diagram (Authentication)**



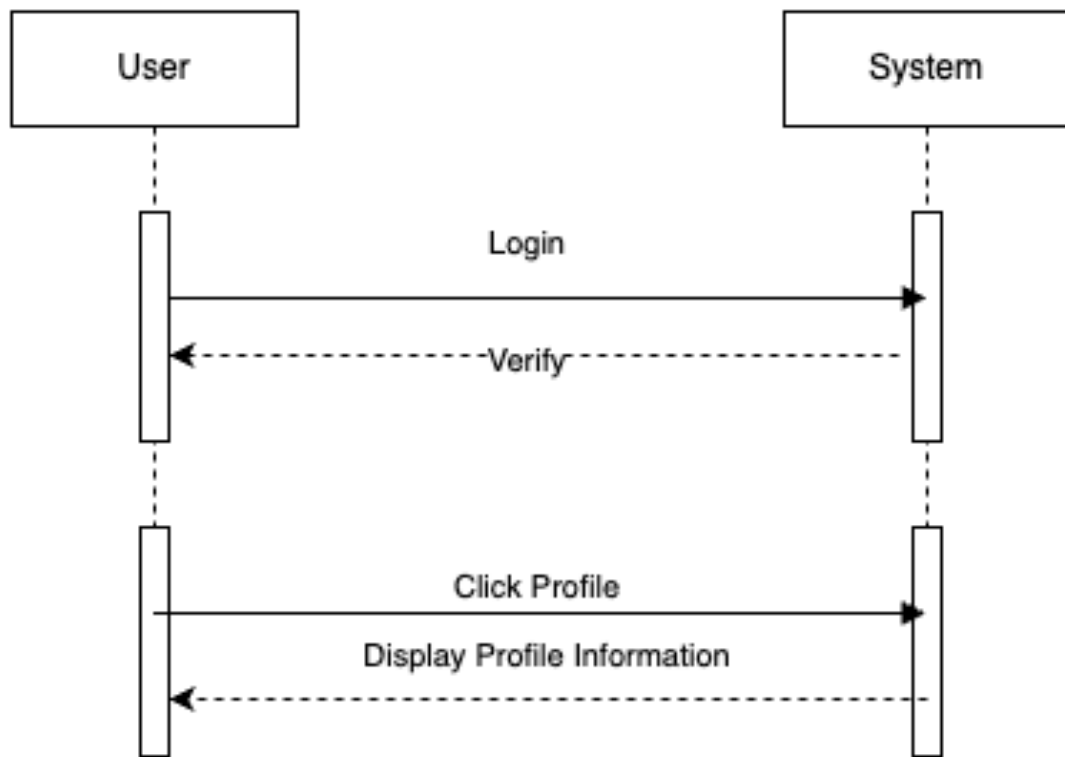
**Figure 55: Sequence diagram (Blood bank and Hospital)**



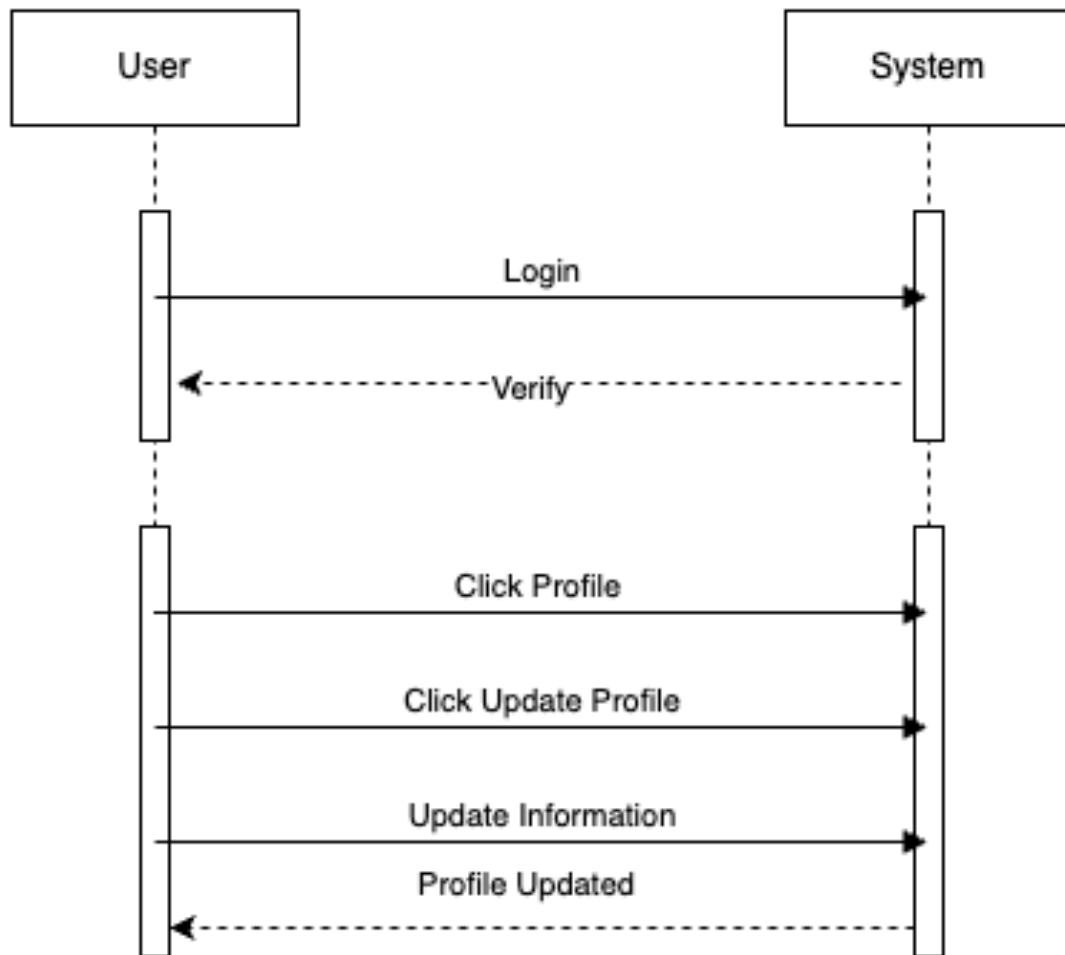
**Figure 56: Sequence diagram (Social Organization)**



**Figure 57: Sequence diagram (Rare Blood list )**

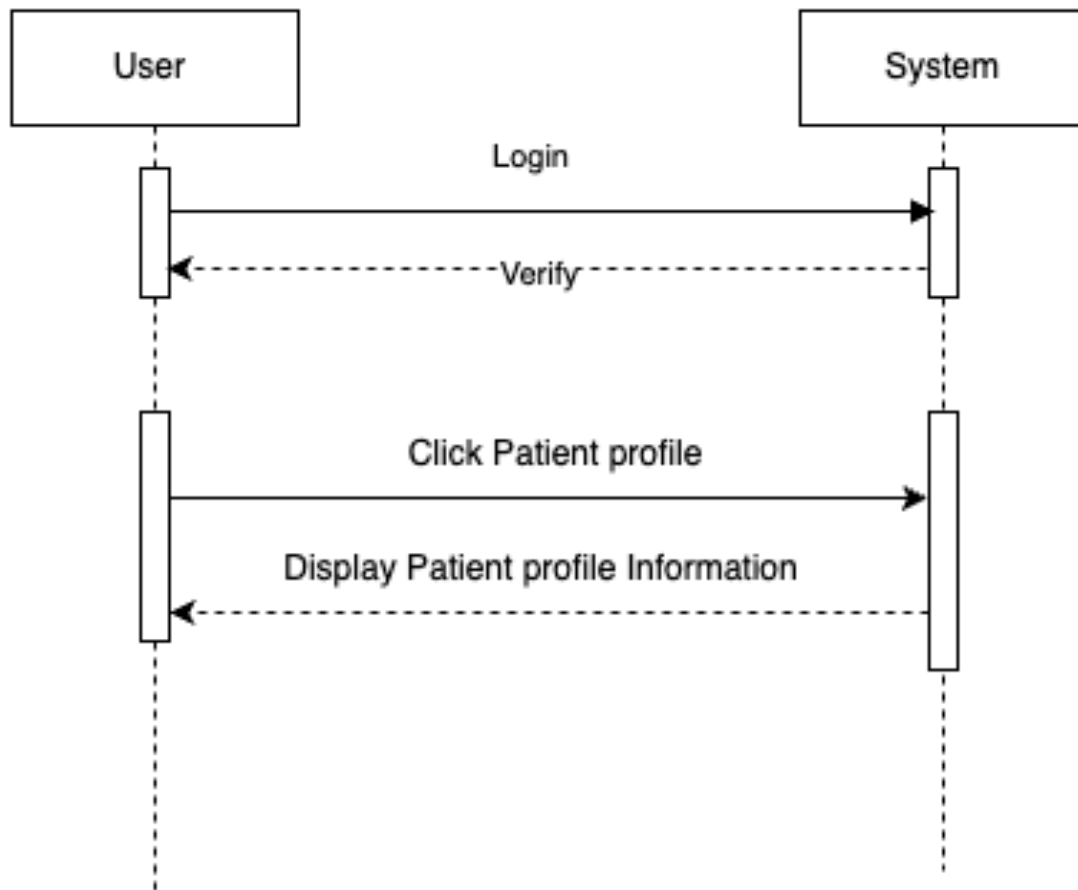


**Figure 58: Sequence diagram (Profile)**

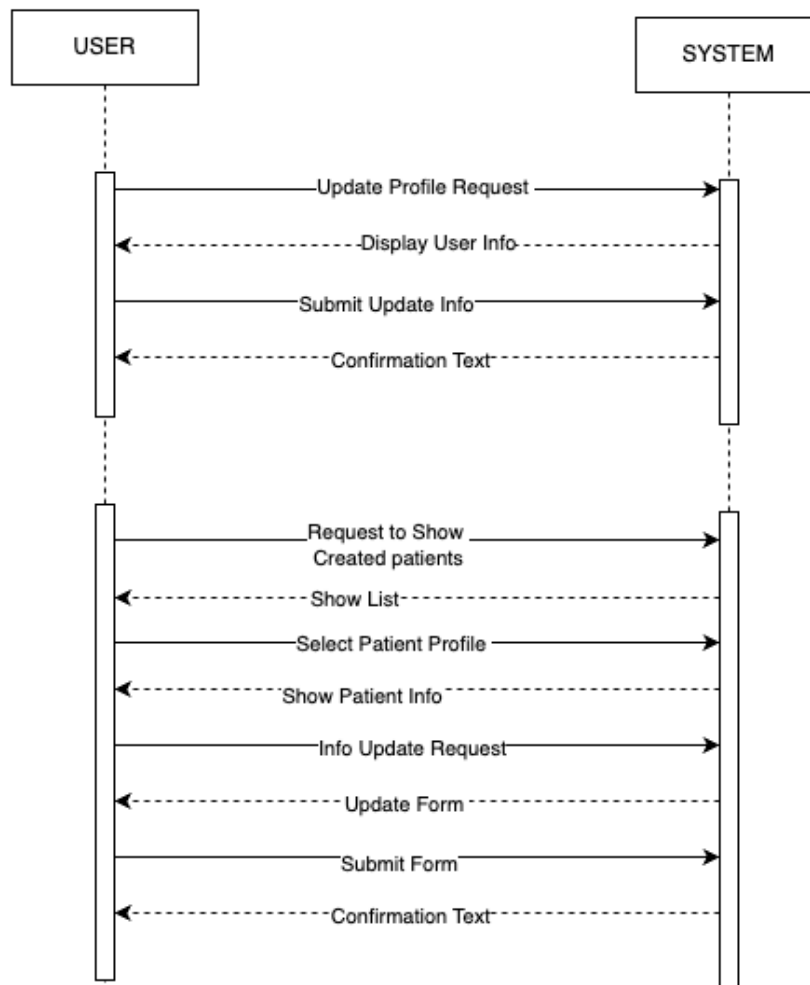


**Figure 59: Sequence diagram (Update Profile)**

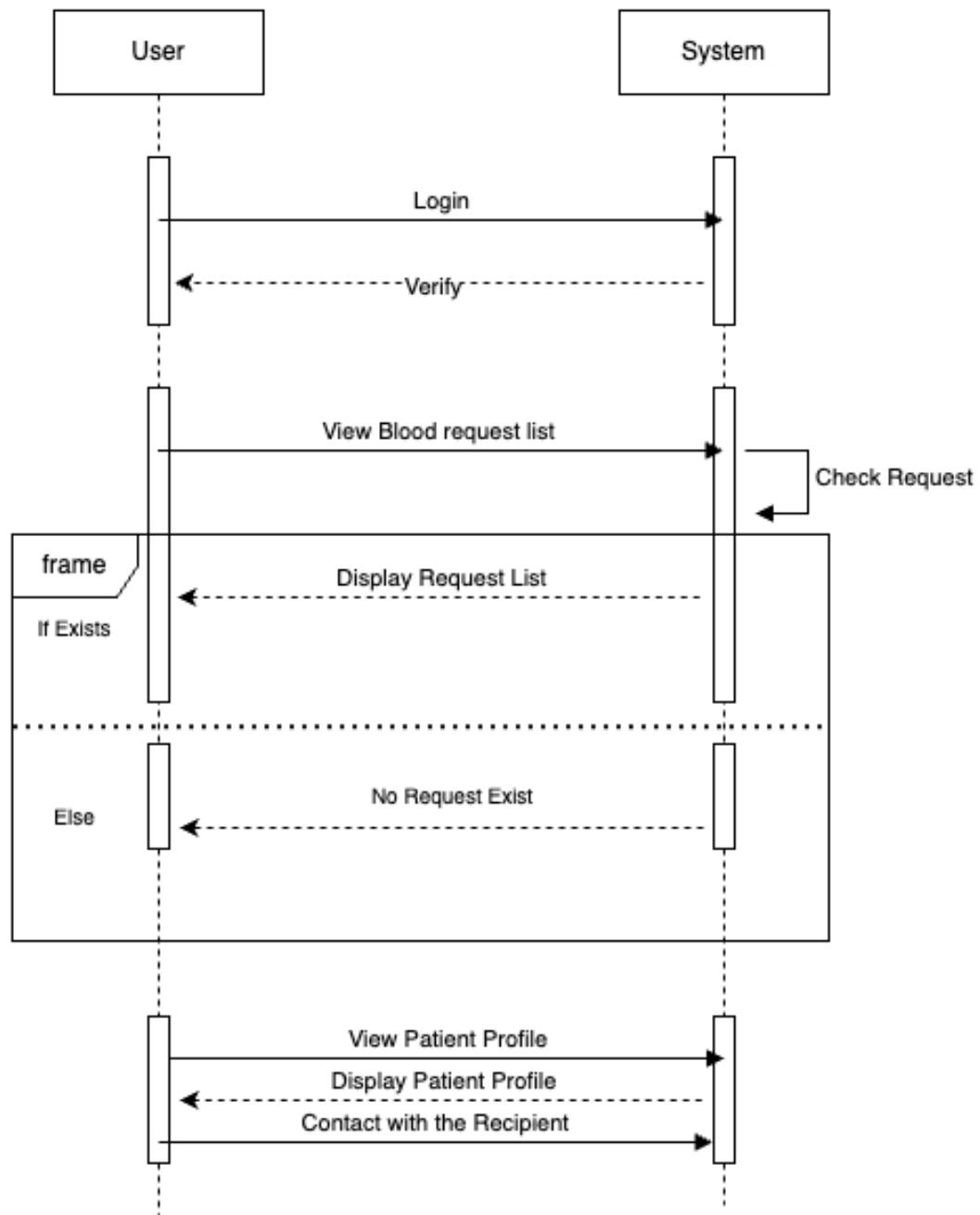




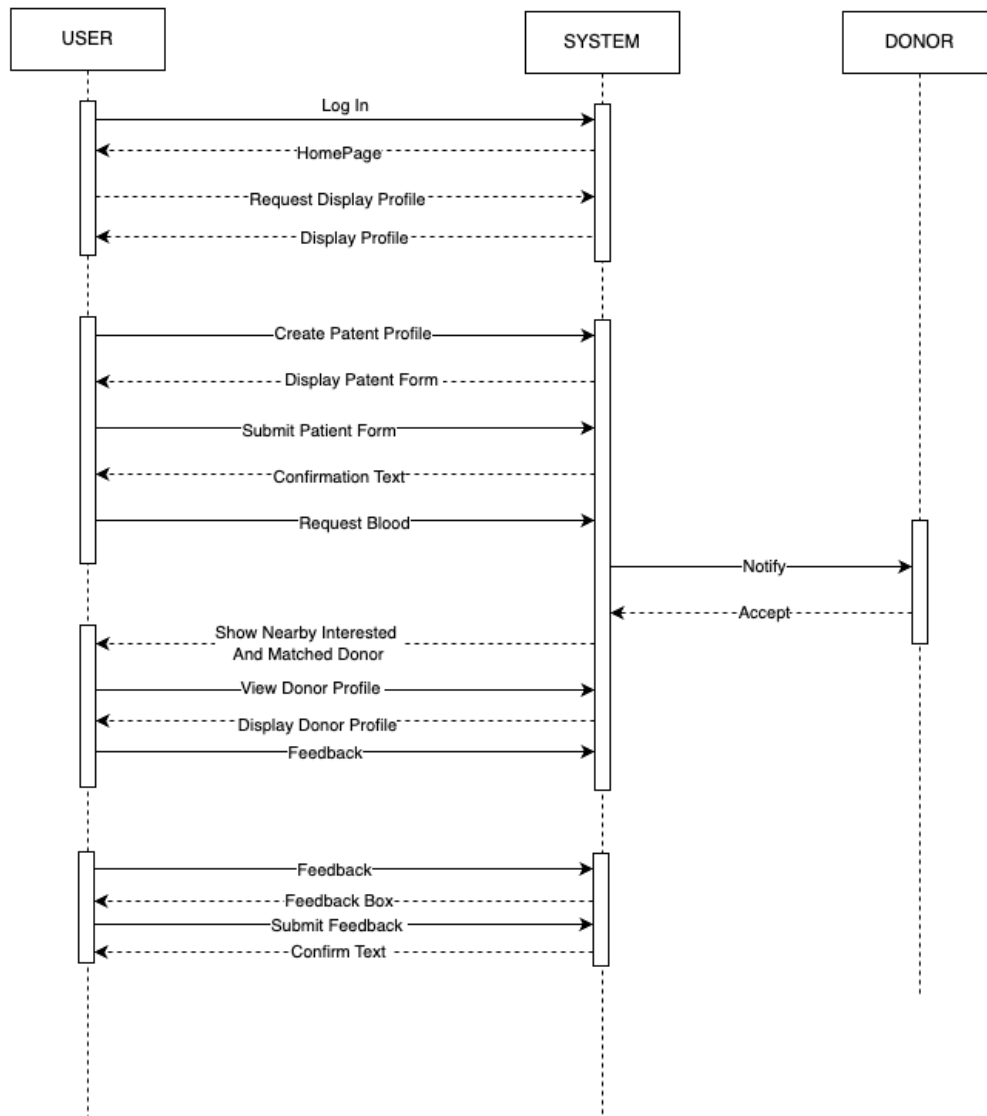
**Figure 60: Sequence diagram (Patient Profile)**



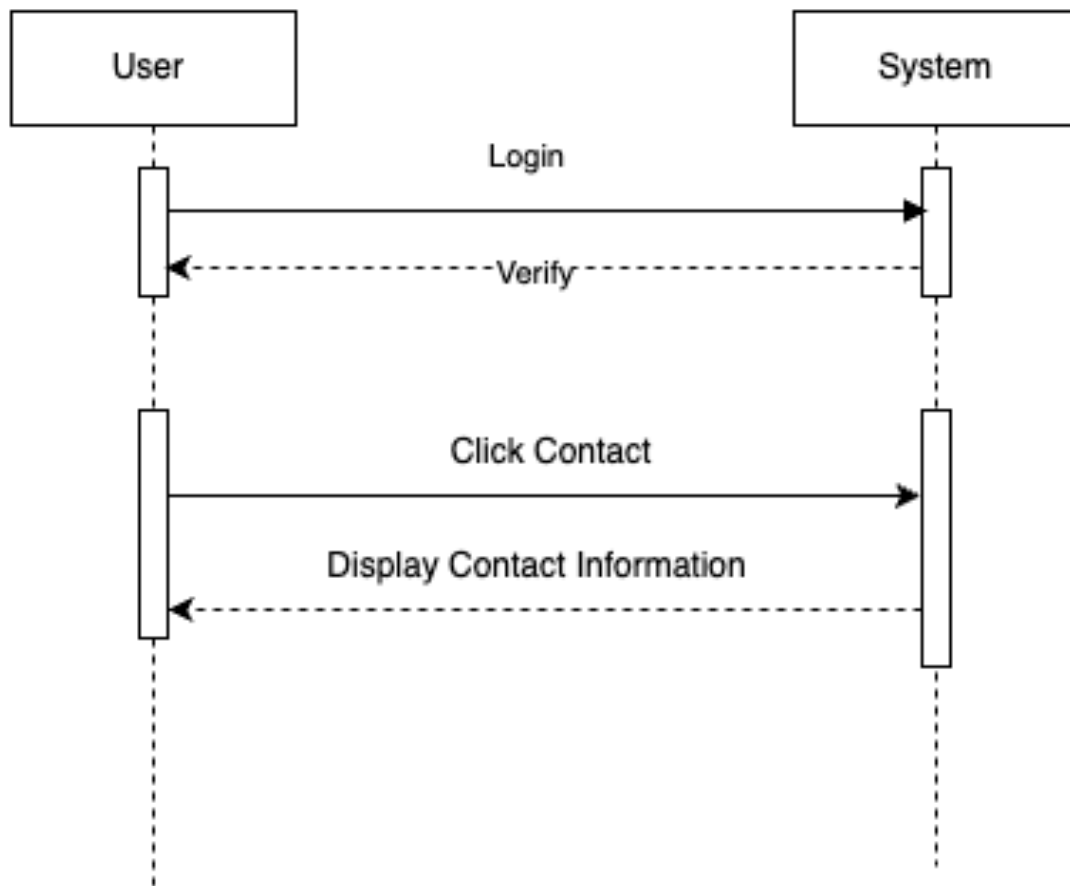
**Figure 61: Sequence diagram (Update Recipient and Patient Information)**



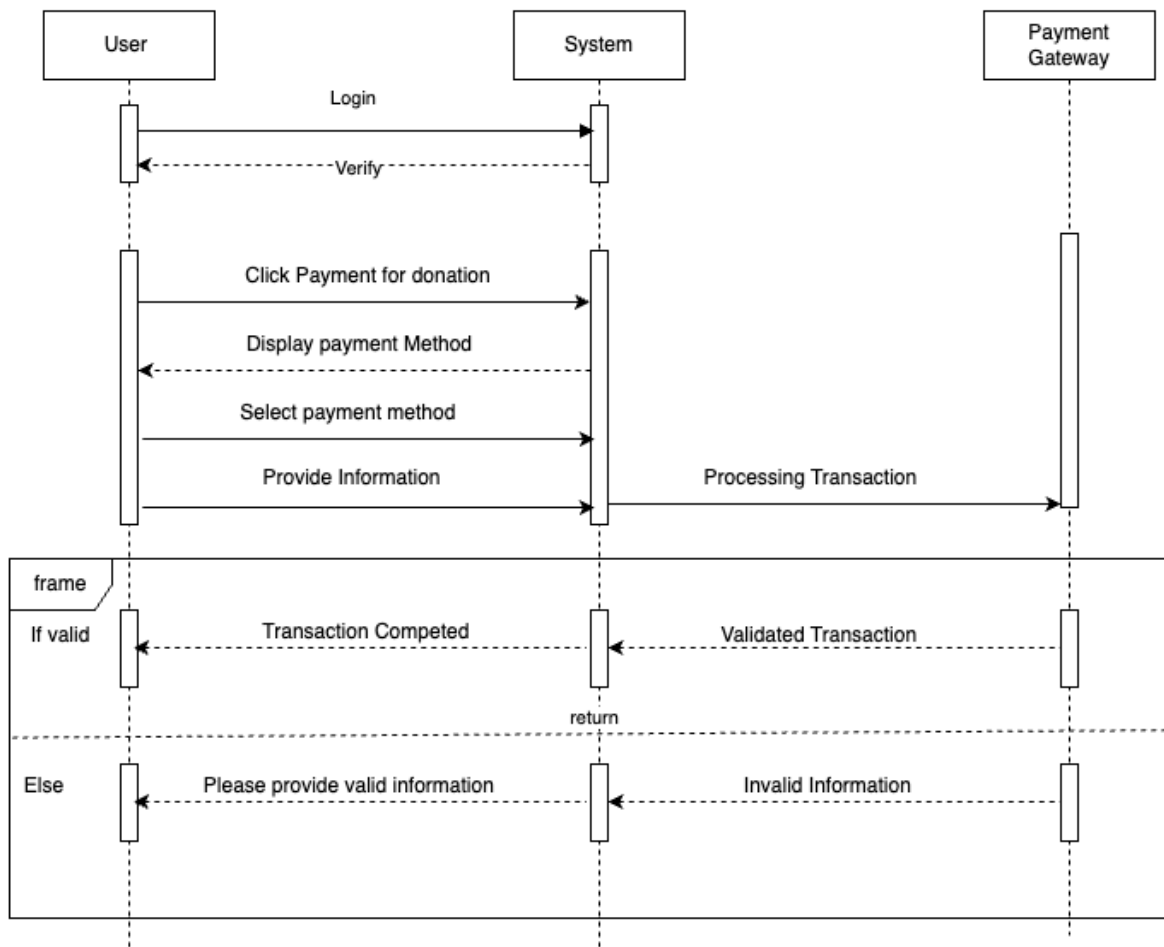
**Figure 62: Sequence diagram (Contact with the Recipient)**



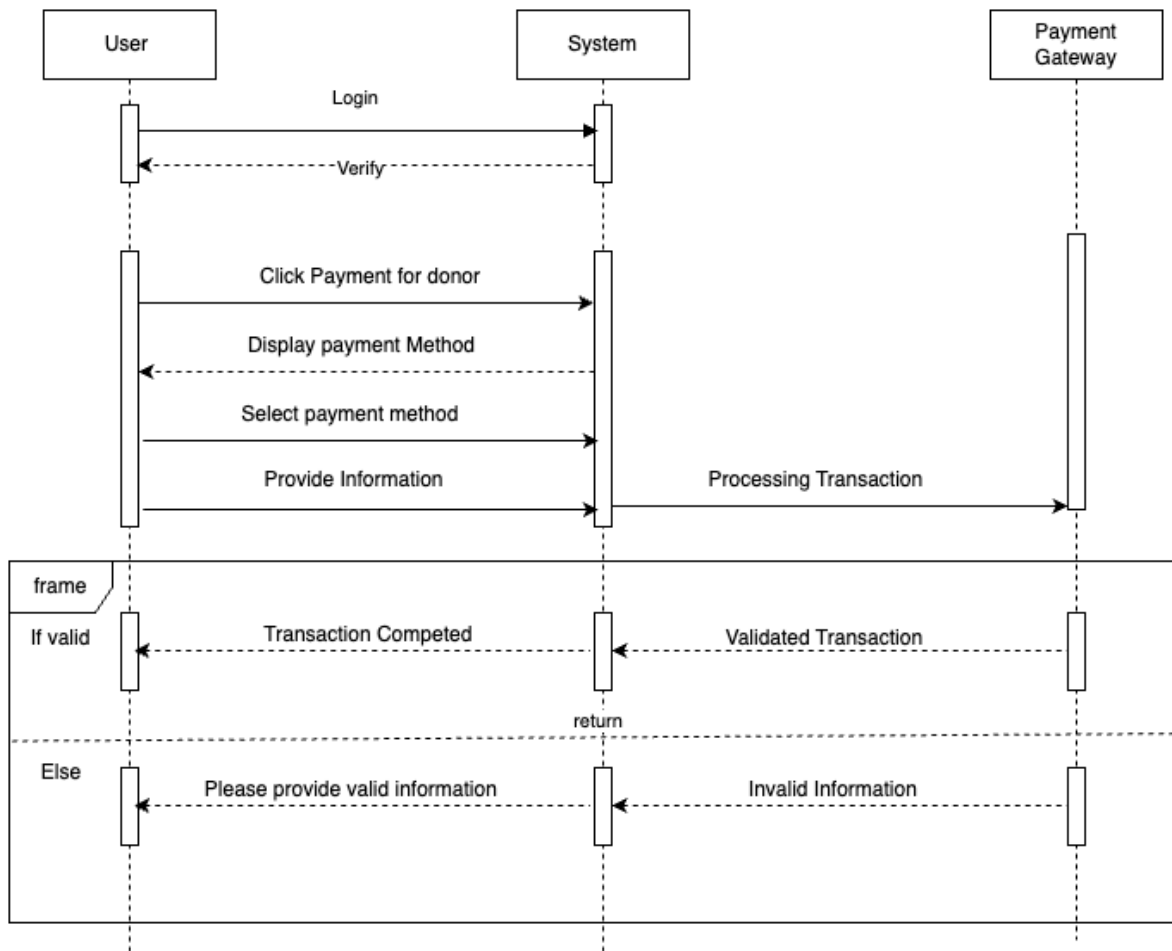
**Figure 63: Sequence diagram (Request Blood and Visit Donor Profile and Give Feedback )**



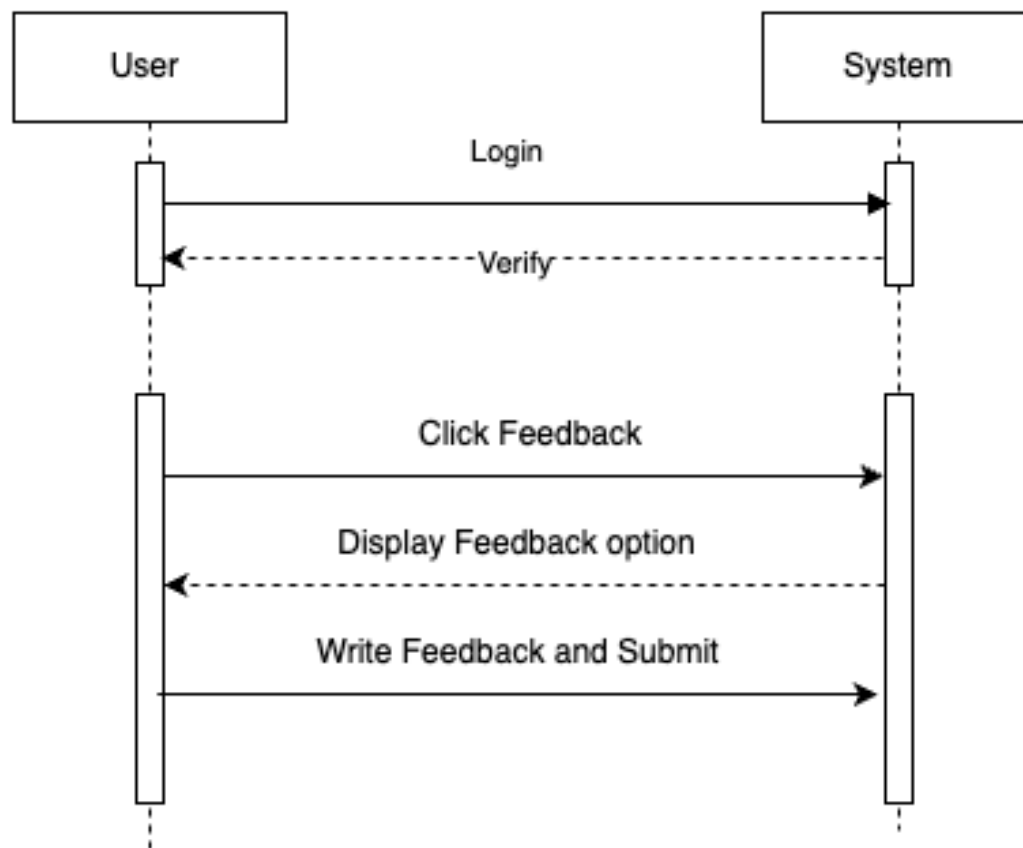
**Figure 64: Sequence diagram (Contact)**



**Figure 65: Sequence diagram (Payment for Donation)**



**Figure 66: Sequence diagram (Payment for Donor)**

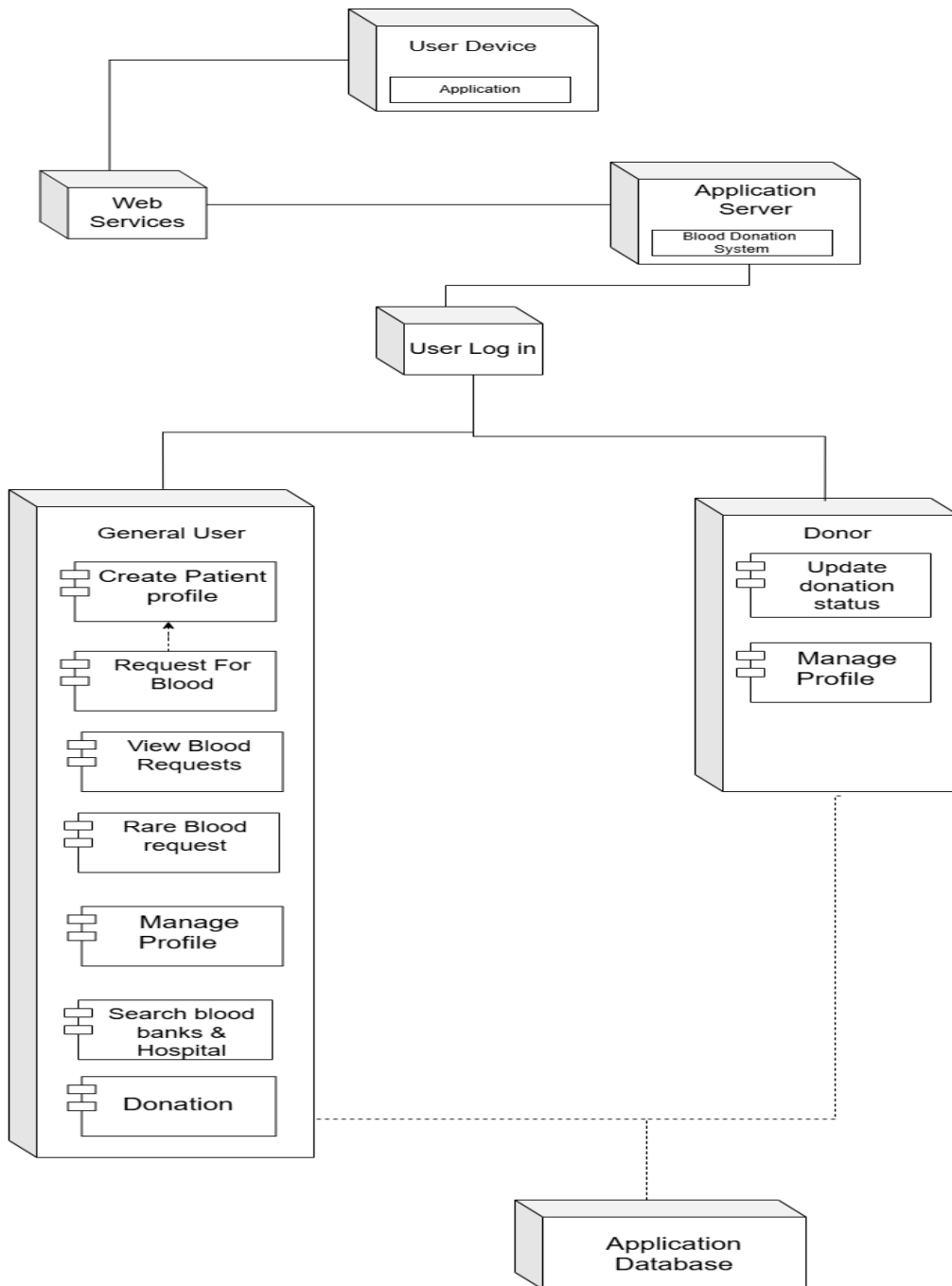


**Figure 67: Sequence diagram (Feedback)**



## Chapter 8: Deployment Diagram

**Deployment diagram For  
Blood Donation Management System**



**Figure 68 :Deployment Diagram of Blood Donation Management System**

## Chapter 9: Conclusion

From this SRS report on the Blood Donation Management System, readers will gain a clear and comprehensive understanding of the overall system designed to manage blood donation and distribution efficiently. This document provides a structured foundation that can be effectively used throughout the software development lifecycle. By following the guidelines and specifications outlined in this SRS, it will be straightforward to implement and manage the entire project. The document is also designed to assist future developers and students who wish to work on similar systems. We have made every effort to eliminate ambiguities and dependencies, ensuring an effective and well-documented SRS for a robust and user-friendly Blood Donation Management System.