ML Onto solution for Blood Donation System

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Project Detail

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Abstract

Our project is about Blood Donation Website. A blood donation is basically a process where an individual can voluntarily donate his/her blood for future transfusions. He/she donates his/her blood to the organizations that require that blood for treatment purposes like Hospitals etc. To solve this real-world problem, we adopt machine learning and ontology learning approaches because it makes the system learn by themselves. Blood donation is a very critical process, and this process can be made simple by using the Machine learning approach. In this proposal, we propose an automated blood donation system to ease the emergency and make the blood donation easy process. As the study on the semantic web is progressing, many domain ontologies are being built. Ontologies are built for a variety of reasons, but the main purpose of building ontologies is to provide a specification of a particular domain in an explicit format. Ontologies serve as a common vocabulary for different people i.e., Stakeholders to communicate about a specific domain, providing a framework for capturing and sharing knowledge. Researchers and developers are building ontologies based on their interests. Ontologies provide us with the help of integrating data from different sources by providing a shared understanding of that domain. There are various languages and tools that are used in making ontologies, we have devised a method of manual merging of the ontologies with the help of SPARQL queries for web platforms.

The main goal of creating this system or web application was to allow users to look for blood in blood banks and obtain blood in any situation. By contacting the donor online or at a personal phone number, patients can obtain the blood. We are adding blood donation Centers to our website and users see the available stock of blood of any blood donation Center and can request to them for the blood. The technology for use for implementing of this system is python that will be used for cleaning and training of dataset. We are using different classification algorithms for the training of dataset such as Logistic regression, gradient boosting, decision tree and KNN. Protégé will be used for making the Ontology, react for the frontend development, mongo DB as a Database and node for backend. This system will help the blood donation Centers to keep the record of the blood and can download the reports of bloodstocks and appointments at any time. People can find all the donors (new or old) according to their blood group and can contact them. Donors can easily check if they are viable for donating the blood or not after entering their blood report values. Laboratories will integrate in our system that can confirm the blood report of the users.

1. Chapter 1: Introduction

1.1 Introduction

Accidents and other deadly situations are common in the twenty-first century, particularly in Pakistan. Blood is frequently required in an emergency. And a great number of deaths take place because of timely blood shortages. There are many blood donor societies in Pakistan, but only a few internet platforms may assist in timely blood arrangements and the preservation of priceless lives. In this fast-moving world, manual systems take a lot of time. We can lessen the stress on NGOs and blood banks by employing information technology in this area, and we can assist in identifying donors who will be qualified for donation based on their medical conditions. Our initiative is primarily focused on giving users the option to donate blood as well as obtain blood in an emergency. For the person going through difficult conditions already, that saves a lot of time and effort. Supervised Learning Models based on different factors will be used to classify individuals as donors or non-donors. Ontology will be used in machine learning since it will raise the quality of the data used to train the datasets. We will use Protégé to create the ontology. Because ontology offers a dynamic knowledge basis, it can improve the accuracy of machine learning algorithms.

Our main Aim is to provide the facility of blood to the needy people, especially in urgent situations. Users may also get in touch with the donor if requirements match. Hospitals, Blood banks, and NGOs can all be added by the website administrator. Additionally, they can browse a list of hospitals, blood banks, NGOs, and donors that can be filtered based on location and blood types. They can also send the user various notifications or messages. The blood donation request can also be seen by the admin. Users can also register to the website. Blood can be requested at any time by any user. Additionally, users can access information about various hospitals and blood banks. Every user can access the blood donation request. The request can either be granted or denied.

The main goals that are to be achieved is that each user should be able to request blood. A notification will be sent to the user if the requested blood type is available at any blood bank or NGO. The Admin dashboard allows us to add new Hospitals or Blood banks to our website. Machine learning will be used to categories the donor. The main objectives are that every user can schedule a blood donation appointment with their preferred blood bank or NGO. Appointment information will be sent to the appropriate blood bank or user after the user confirms the appointment. The top of the website and the user's profile will both display each blood request. When classifying the donor, various algorithms will be taken into consideration. Decision Trees and artificial neural networks are these algorithms.

Ontology and Machine learning concepts will be used to determine whether the individual can donate the blood, as well as the closest organization from which he can receive emergency assistance and schedule an appointment if he wants to donate the blood. Ontology and machine learning concepts will be used to accomplish all of this process. We are utilizing Ontology concept because they have the potential to broaden the scope of both cognitive AI and machine learning. Additionally, training dataset quality can be improved by ontology learning.

1.2 Objectives

- Collect all the persons that are willing to save humans life and are motivated to do something for the humanity under a single roof which can be easily accessible nearby to their places.
- Develop a system where people can easily access where they will find the blood they are required.
- Providing a platform to the person who are willing to donate the blood and contribute in helping the Humanity.
- The donor can make appointment when and where they should have to go to donate their blood for the good of humanity.
- The system will motivate people by providing them with the ease of making appointments for the donations of blood and finding the required blood at the time of emergency circumstances at their nearby places.

1.3 Problem Statement

Accidents and other dangerous circumstances are normal in the twenty-first 100 years, especially in Pakistan. Blood is habitually expected in a crisis circumstance. What's more, an extraordinary number of passing's happen because of opportune blood deficiencies. There are many blood donor social orders in Pakistan, however a couple of web stages might aid convenient blood game plans and the safeguarding of extremely valuable lives. In this quick world, manual frameworks take a great deal of time. We can diminish the weight on NGOs and blood banks by utilizing data innovation around here, and we can help with distinguishing givers who will be equipped for gift in light of their ailments. Our drive is principally Centered around giving clients the choice to give blood as well as get blood in a crisis. For the individual going through troublesome circumstances as of now, that saves a great deal of time and exertion. Managed Learning Models in view of various variables will be utilized to characterize people as givers or non-contributors. Cosmology will be utilized in machine learning since it will raise the nature of the information used to prepare the datasets. We will utilize Protégé to make the cosmology. Since cosmology offers a unique information premise, it can work on the precision of machine learning calculations.

One of the obligations of blood banks is to track blood type graphs of different blood givers who utilize the office. However, most times, that poor person yet completely integrated into the advanced clinical records, you see that the records get excessively enormous to oversee in light of the fact that they are essentially gotten written down. So regardless of whether ordinary contributors visit such offices, they will in any case have to go through the conventions of blood passing all the blood donation prerequisites. This is time-wasting for both the blood giver and the blood bank and is a significant blood donation challenge in the country.

The accessibility of blood banks is one issue, and the maintenance of currently accessible blood banks is another significant blood donation challenge in the country. The unfortunate maintenance originates from the unfortunate power supply and maintenance culture. This outcomes in the

unfortunate utilization of autologous blood units which as a rule should be put away in the blood banks for a more drawn out time frame contingent upon when the giver needs it.

The blood banks are very little in number to match the necessities of voluntary blood donation. The most utilitarian blood banks in the nation are found essentially in College Educating Emergency clinics. Furthermore, the miserable news is that few out of every odd state in the nation has a College Educating Emergency clinic. In any event, for those that have, they are possibly a couple of, implying that the inclusion doesn't arrive at most country networks in the state.

Likewise, a portion of the accessible blood banks don't run on a 24-hour premise. Issues that add to this incorporate; power disappointment and low staffing. The inaccessibility of blood banks is one of the significant blood donation challenges. So, in our system we will resolve all the conflicts related to time and resource management as well.

1.4 Assumptions and Constraints

1.4.1 Assumption

Assumptions are given below:

- Throughout the project, waterfall methodology will be used
- In the whole process, all team members will be available
- The solution will write using the MERN Stack technologies
- For the Ontology learning, Protégé and SPARQL Query will be used
- Throughout the project, different skills of team members will be enhanced
- For the implementation, REST Architecture will be used
- For the UML Diagrams, Visio tool will be used
- MVC Architecture will be used for Implementation

1.4.2 Constraints

Constraints are given below:

- Different tasks of the Project must be completed within the deadline
- Throughout the development process, team members must follow defined project scope

1.5 Project Scope (what and what not to consider)

- The user can make a request for the blood at any time.
- All the Requests for blood will be shown to the users of the websites which include Administration, blood donation Centers, and donors.
- All the Blood donation Centers of Lahore city can register them on the Website after providing all the information.
- Before making the appointment, the eligibility of the donor for the blood donation will be checked through ML ontology.
- Users can also update and cancel the appointment and notifications will be sent to the respective donation Center.
- The blood donation Center can generate the report of all the appointments and add or accept.
- The users can see blood donation appointments and all the donations since the account creation.
- All the blood donors will be displayed on the website with blood type and other information
- In the future, this system can be built at the National level by adding all Blood donation Centers in the whole country that will provide ease in emergency cases.

Different tools and technologies will be used to develop the Blood donation website such as

- Editors such as Visual Studio Code and Protégé
- Languages for web development including HTML, CSS, and JavaScript. Frameworks include NodeJS, ReactJS, Bootstrap, and Material UI.
- For making the Ontology model, Protégé will be used
- For sending the Query to the ontology model, Sparql will be used
- MongoDB to store the Data
- Visio for making different diagrams

2. Chapter 2: Requirements Analysis

2.1 Literature Review / Existing system study

"Haemoglobinopathies in India: estimates of blood requirements and treatment costs for the decade 2017-2026," [1]

"And those who saved the life of one, it shall be as if he had saved the life of all mankind". The best one among you is one who is beneficial to others. (Prophet Muhammad P.B.U.H). In this study, it is explore that collecting blood from the donor and making it available for different types of patients (thalassemia patients, cancer patients, etc.) in developing countries is very intense. Number of patients die because a lack of blood supply on time or transfusion with affected blood. Now, Pakistan Health Organizations (PHO) is providing facilities to patients to save their lives in any emergency. Gathering correct data from the person who desires to donate the blood results prevention of hazardous blood that infects the patients.

"Profiling blood donors in Egypt: A neural network analysis, Expert system with Applications," [2]

Blood is needed in emergency as well as routine operations like medical disease (cancer), heart bypass, etc. Different models such as Multi-layer perceptron neural network (MLP) and probabilistic neural network (PNN) models are used for predicting the values. Also, compare the performance of Neutral Networks and traditional techniques like linear discriminant analysis (LDA). World Health Organization (WHO) suggests that blood should be collect by outstanding regular donors through strengthening the blood donation system. This research study fills the different gaps like no communication facility between donor and patient, searching the blood donor by checking their status (Available or Not Available) and blood group type. Profiling the donors is a good and important approach to reach the donors in emergency cases.

"A Research Paper on Blood Donation Management," [3]

Blood shortage has been an ever-serious issue throughout the world. Natural science progresses has raised the blood demand significantly. This issue motivates us to build or grow the system that will help people in an emergency. The drawback of the previously build system was that there was no database storage for registered users like blood donors. In addition, hospitals were not easy to contact the blood donors. The retrieval information process of blood donors is a very hard and tough process and makes it difficult for hospitals to save serious critical lives. The new automated system would provide different facilities (like searching for available donors and user-friendly

interfaces) for donors to make themselves available for blood donation. In the new system, all records are stored in manageable databases.

“A Research Paper on Study of Blood Donation in Pakistan” [4]

The overall number of blood donation facilities in Pakistan is 183, and 3.5 million units of blood are thought to be collected annually. In Pakistan, voluntary blood donation is currently a very unsatisfactory practice. Only 10.6% of people donate blood voluntarily, with the remaining 88.3% coming from family, friends, or replacement donors, according to data gathered in 2013 from 300 blood banks for the WHO global database on blood safety. The estimated blood collection per 1,000 populations is 16.6, and only 16.6 people donate blood on a regular basis.

“People fear for Blood Donation, A study on People attitude towards Blood Donation” [5]

Respondents were questioned to evaluate the cause of either a positive or negative attitude regarding the good results of a blood donation that might later be examined

Positivity might be encouraged and negativity could be reduced. Positive Altruism informed their blood donation philosophy. In 56% of cases, a desire to assist others, along with other favorable family and friend motivation was a source of reinforcement (28%) and (16%) Religious organizations. The unfavorable perception of the Fear of the process and other factors led to the practice of blood donation the idea that blood banks mishandle or sell blood products for financial gains.

“Relationship between religion and blood transfusion habits” [6]

Young people make up the bulk of the population of Pakistan. Our investigation revealed that the study group's average age was 21.84 years, falling within the expected range of 20 to 25 years. Given that the majority of participants were Muslims, the current study did not examine the relationship between religion and blood transfusion habits in great detail. The fundamental importance of religion cannot be overstated if we are to develop a targeted campaign for public and donor awareness. The analysis revealed a distorted representation of the provincial population for ethnicity as well. For best results, efforts must be made to include equal representation in a national research or a KAP initiative divided up by area, as well as the adoption of appropriate directed, effective methods.

“A Research Paper on ontology Learning” [7]

Zhou released a paper in 2007 that provided a thorough overview of the outstanding problems and difficulties in ontology learning and detailed illustrations of the process of ontology learning. They put up a fictitious framework for the process of ontology learning. The following are the paper's concluding facts: I they recommended improvements for ontology learning systems that excluded users from all levels of ontology learning; (ii) they emphasized the significance of knowledge representation in the ontology learning domain; and (iii) they clarified the necessity of moving from coarse relationship classes to fine relationships. After careful examination, we discovered that this review neglected important logic-based methods that are employed to create axioms.

“Predicting donor’s likelihood of donating blood given various factors” [8]

Blood is required for different medical purposes and emergencies, so we have to determine the perfect donors. There are multiple which help us to determine the perfect donors. These factors include the age of donors, weight, and height, the minimum gap between the blood donation is 86 days. The donors should not have had any kind of disease in the past one to two weeks. On this website, only the donors are allowed to donate blood to the users or blood donation Centers that passed the test or have the stated requirements. According to the survey, middle-category people donate a large amount of blood while the highest-educated people donate the least amount of blood. There are also a number of factors available that can be considered in the project to calculate the donor score and the availability of the donor on time.

“Blood Donor Classification Using Neural Network and Decision Tree Techniques” [9]

Data is gathered through an online questionnaire to check that donor will able to donate blood or not when required. Different type of data is gather for the machine learning techniques to categorize the donors into liable or not. Artificial neural networks and decision tree techniques are adapted to predict from the series of questions whether each individual is liable for blood donation or not. From the results, it was observe that the accuracy of the ANN technique is greater than a decision tree. Developing the classification model will improve blood acquisition. Through this donor classification model, they also observe whether the donor will donate the blood or not in the future. This information will improve the blood recruiting process of donors for the blood donation Centers.

2.2 Stakeholder List (Actors)

Stakeholders are the group of people, individuals, or organizations who are directly connected, affected, and linked by the blood donation system project. These actors have their goals and desires regarding the implementation of our project. There are different types of stakeholders who are involved in the Blood Donation System project. Our project stakeholders list is given below:

- Users
  - Blood Donors
  - Request Maker
  - Admin
  - Blood Donation Center
  - Lab
- Customers
- Project Team Members
  - Project Supervisor
  - Project Manager
  - Development Team
    - Front-End Developer
    - Back-End Developer
  - Designer
  - Software Tester

Name	Role	Responsibilities
Mam Sana Rizwan	Project Supervisor	• Determine and validate or verify project scope. • Facilitate alteration requests made by team. • Facilitate impact evaluations of change requests. • Make schedules for deliverables. • Organize and facilitate scheduled change control meetings for team. • Communicate with team leader and team members. • Assign project development activities tasks. • Review all the project documents. • Check performance of team. • Document submission.

Akash Ur Rehman	Team Leader	• Measure and verify project development. • Integrate all the activities with each other performed by team. • Validate change requests made by the team members. • Participate in impact evaluations of change requests. • Communicate results of change requests with team. • Facilitate team members requests for changings. • Update project documents upon approval of all changes. • Assign or distribute tasks to team members. • Communicate with the team and project supervisor. • Make all the documentation includes proposal, requirement specification document, project design. • Develop front-end and back-end integration. • Make test cases and execute on software. • Submit all work to project supervisor
Muhammad Salman	Member-01	• Participate in project development life cycle. • Estimate the need for alterations and communicate them to the project supervisor as necessary. • Communicate with team leader. • Make project proposal document according to requirements. • Make requirement specification document. • Create project design. • Develop front-end interface. • Develop back-end implementation. • Make test cases and execute on software.
Muhammad Abu Hurairah	Member-02	• Participate in project development lifecycle. • Communicate with the team leader. • Make project proposal document. • Make requirement specification document. • Create project design. • Develop front-end interface. • Develop back-end implementation. • Make test cases and execute on software.
	Donor	• Donate blood. • Blood analysis (Check eligibility whether donate blood or not). • Make appointment for donation in Blood Donation Center.
	Request Maker	• Post request for required blood.

	Admin	• Manage users include donors and request makers. • Manage Blood Donation Centers.
	Blood Donation Center	• Manage donor's appointments. • Manage requests.
	Lab	• Can view the requests for report • Add the CBC report details

Table 1:2.2 Stakeholder Register

2.3 Requirement Elicitation

2.3.1 Functional Requirement

FR01- Login

FR01-01	The system will allow the Admin, User and blood donation centers to enter the username or email and password in the “Login” Page of the Blood donation interface
FR01-02	The system will check if the users email and password are valid and available in the database.
FR01-03	The system will allow the user to enter his/her information by clicking on the “Login” button
FR01-04	The system will display the home page after the user’s information confirmed.

Table 2: FR01-Login

FR02- Registration

FR02-01	The system will allow the User and blood donation centers to enter the personal information (Name, Email, Mobile Number etc.) in the “Registration” Page of the Blood donation interface
FR02-02	The system will check if the email or phone Number are already available in the database of system.
FR02-03	The system will generate a new record with the unique id.
FR02-04	The system will allow the user and blood donation center to give their information to the system database by pressing “Register Button”.

FR02-04.1	If the User checks a “User Registration” option, home page will display to user after the information is confirmed.
FR02-04.2	If the user checks a “Blood center registration” option, new form will appear so that center can enter further information (License number, Status etc.)
FR02-05	The system will check if the center license number is already available in the database.
FR02-05	The system will display the message after the blood donation center presses “Submit” Button
FR02-06	Admin will verify the information the blood donation center and approve or deny the request of the centers.

Table 3:FR02-Registration

FR03- Make the Request for Blood

FR03-01	The system will allow the User and blood donation centers to request for the blood.
FR03-02	The system will display the “Blood request form” on the website interface.
FR03-03	The system will allow the blood request maker to enter all the blood information (Blood group, no of bags, Address, Phone Number etc.).
FR03-04	The system will display the confirmation message after the request maker presses “Submit Button”.
FR03-05	The system will display the blood requests to all users profile on the top of interface of the website.

FR03-06	The system will allow all users and blood donation to accept or deny the blood request.

Table 4:FR03 Make the Request for Blood

FR04- Donate Blood

FR04-01	The system will allow the users to donate the blood to any individual by registering to the website.
FR04-02	The system will display the user "Blood donation form" when the user clicks "Make blood donation" option in the profile.
FR04-03	The system will allow the user the enter all the valid information such as Email, Phone Number, Blood group, Age, gender etc.
FR04-04	The system will allow the user to enter the "Next Button" after filling the blood donation form.

Table 05: FR04-Donate Blood

FR05- Check eligibility of User for blood donation

FR05-01	The system will display the "blood Analysis" form to the user after filling the initial form of blood donation for checking the eligibility of blood donation.
FR05-02	The system will allow the user to fill the form by providing valid information (Weight, Smoking, Previous donation etc.)
FR05-03	The system will allow the user to enter the "submit button" after fill out the "Blood Analysis" Form.

FR05-04	The system will display the confirmation message to the users if they are eligible for blood donation and navigate to “Blood center” page.
FR05-05	The system will navigate the user to the home page and send message “Not eligible” if they are not fit for blood donation.

Table 6:FR05- Check eligibility of User for blood donation

FR06- View Blood Donation Centers

FR06-01	The system will display the blood donations to all the users by clicking the “blood donation option”.
FR06-02	The system will display all the information of the blood donation centers such as Phone Number, Email, and Address etc. to the users.
FR06-03	The system will display the “book Appointment” Button if the user fills out the “blood donation form”, otherwise this button will not be display.

Table 7:FR06- View Blood Donation Centers

FR07- Generate Appointment Report

FR07-01	The system will generate the Appointment receipt when user clicks the “Book Appointment” button.
FR07-02	The user can download the receipt the clicking on the “Download button”.
FR07-02	The system will display the appointment details in the user profile.

Table 8:FR07- Generate Appointment Report

FR08- Display User Profile

FR08-01	The system will allow the users and blood donation centers to view their personal information by clicking “View Profile” option.
FR08-02	The system will display the user and blood donation centers dashboard to the respective user.
FR08-03	They can view different options in the dashboard such as “My appointment details”, “Previous donation”, “Blood requests”, and “Profile settings”.

Table 9: FR08- Display User Profile

FR09- View Blood Requests

FR09-01	The system will allow the user and blood donation centers to view all the blood requests shown at the top of the interface/Page.
FR09-02	The system will display all the details of the blood request maker such as Address, phone Number, blood group, Age, Gender, No of bags etc.
FR09-03	The system will allow the users and blood donation centers to accept the request.
FR09-03	The system will send the notification to the request maker if any user or blood donation center accept the request and confirm the blood donation.

Table 10:FR09- View Blood Requests

FR10-Update Personal Information

FR10-01	The system will allow the users and blood donation centers to update their personal information (Name, Email, Mobile Number etc.) in the “Update Profile” Page of the Blood donation interface.
FR10-02	The system will check if the new information is valid and in correct format.

FR10-03	The system will update the record when the users or blood donation centers clicks “update” button.
FR10-04	The system will send the notification to the admin about the changes and particular user.

Table 10:FR10- Update Personal Information

FR11- Delete Personal Information

FR11-01	The system will allow the User and blood donation centers to delete their account and personal information from the Blood donation interface
FR11-02	The system will delete the record of the user and blood donation center from the database when the user clicks “Delete Account” button.
FR11-03	The system will display confirmation message “Delete Successfully!” in the response of the button clicks.
FR11-04	The system will send the notifications to the Admin about the users and blood donation centers who delete their accounts.

Table 11:FR11- Delete Personal Information

FR12- Get User feedback

FR12-01	The system will display feedback window when the user successfully books the appointment or make the blood request.
FR12-02	The system will allow the users to select from the options, such as “Outstanding service”, “Effective service”, “Acceptable service ”, “Poor service”, and “Very Poor service”
FR12-03	The system will allow the users to enter the message or review about the blood donation websites or the services that are provided.

FR12-04	The system will allow the users to submit their feedback by clicking “Submit button”.
FR12-05	The Website will display the “Thank you” note and navigate the user to the home page of the blood donation interface.

Table 12:FR12- Get User feedback.

FR13- Add User information.

FR13-01	The system will allow the blood donation centers to add the information of the blood donors to the blood donation website.
FR13-02	The system will allow the blood donation centers to enter the valid information such as Username, email, Phone number, last donation made, and Blood group etc.
FR13-03	The system will record the information when the blood donation centers presses “Submit” button.
FR13-04	The system will send the confirmation message to the blood donation center on saving the information of the user.
FR13-05	The system will display the newly added information in the different sections of the blood donation center such as previous donors and last donations made.

Table 13:FR13- Add User information.

FR14- Generate Report on bloodstocks.

FR14-01	The system will allow the blood donation centers to generate the report of the available bloodstocks keeping the record all time.
FR14-02	The system will allow the blood donation centers to generate report by clicking “Generate report”

FR14-03	The system will display the report of the bloodstock to the blood donation and can download the report.

Table 14:FR14- Generate Report on bloodstocks.

FR15- Update Blood stock

FR15-01	The system will allow the blood donation centers to update the bloodstocks that is available in the center.
FR15-02	The system will allow the blood donation centers to enter blood stock information such as Blood group, No of bags etc.
FR15-03	The system will allow the centers to update stock information by pressing “Update” button and in response system will update the record of blood stock
FR15-04	The system will send the confirmation message to the relevant blood donation center on updating the bloodstock.

Table 15:FR15- Update Blood stock

FR16- Download Weekly/Monthly Appointment Reports

FR16-01	The system will display all the appointments of the users to the relevant blood donation centers.
FR16-02	The system will allow the blood donation center to download the weekly or Monthly appointment receipts for keeping the record for future.
FR16-04	The system will download the appointment reports when the blood donation center clicks “download” button.

Table 16:FR16- Download Weekly/Monthly Appointment Reports

FR17- Manage NGO's or Blood donation Centers.

FR17-01	The system will allow admin to update the database by adding new NGOs or blood donation center where the NGO's or the organizations have recently collaborated.
FR17-02	The system will provide admin the facility to delete those NGO's or centers from the blood donation website when the have stopped collaborating with the website.
FR17-03	The system will provide the admin with the facility to update the database that consists of only those NGO's or blood donation centers in which the collaborated organizations are working and the donor or the person in need of blood can seek help.

Table 17:FR17- Manage NGO's or Blood donation Centers.

FR18- Add news.

FR18-01	The system will allow admin to add news by clicking on "Add Announcement" button in the "Manage Announcements" and adding important announcements and terms and conditions for the acceptance of the blood request into the database that will be displayed on the system in the news feed.
FR18-02	The system will allow admin to delete news feed from the database by clicking on "Manage Announcements" and then clicking on "Delete Icon" to Delete the active announcement.
FR18-03	The system will allow admin to view news that is currently available on the system by clicking on "Manage Announcements" and then clicking on "View icon" to view the active announcement.
FR18-04	The system will allow admin to update news by clicking on "Update Icon" in the "Manage Announcements" page and then make changes and update the news by clicking on "Saves Changes" and "Update Button".

Table 18:FR18- Add news.

FR19- Handling Blood Requests

FR19-01	The system will allow admin to view request of recipients by clicking on "View Requests" option from the dashboard.
FR19-02	The system will allow admin to download the list by clicking on the "Download button/Icon".

Table 19:FR19- Handling Blood Requests

FR20- Managing User's Personal Information

FR20-01	The system will allow admin to access all the personal information of the user by clicking on "Manage Users" and then selecting a specific user and then "View Icon" to view his personal information.
FR20-02	The system will allow admin to hide user's personal information from other users by clicking on "Hide Users Info".

Table 22:FR20- Managing User's Personal Information

FR21- Managing Campaigns

FR21-01	The system will allow admin too to access all the campaigns information that are currently live on the system by clicking on "Manage Campaigns" from the Dashboard.
FR21-02	The system will allow admin to update the database by adding new campaigns on the system by clicking on "Add new Icon" in the Manage Campaigns page.
FR21-03	The system will allow admin to update the database by updating the Campaign by clicking on "Update Campaigns".
FR22-04	The system will allow admin to delete Campaigns from the system.

Table 23: FR21- Managing Campaigns

FR22- Managing Donor List

FR22-01	The system will allow admin to provide the access to view the donor list from the database.
FR22-02	The system will allow admin to update donor list based on the donors willing and unwilling status into the database.
FR22-03	The system will allow admin to download donor list from the database.

Table 20: FR22- Managing Donor List

FR23- Manage Sponsors

FR23-01	The system will allow admin to manage the sponsors from the database by clicking on "Manage Sponsors" from the database
FR23-02	The admin can edit the sponsors by clicking on "Edit Button" following the details of the sponsors.
FR23-03	The admin can save the updated details by clicking on "Update and Save" button
FR23- 04	The admin can delete the sponsors by clicking on "Delete Button" following the details of the sponsor
FR23- 05	The admin can add new sponsors by clicking on "Add Button".

Table 21: FR23- Manage Sponsors

FR24- Manage Financial donations.

FR24-01	The system will allow admin to manage financial donations by clicking on "Manage funds" page.
FR24-02	The admin can view the persons who donated to the system.
FR24-03	The admin can download the list of the fund's donors by clicking on 'download' button.

Table 22: FR24- Manage Financial donations.

FR25- Manage Job posts.

FR25-01	The system will allow admin to view job posts by clicking on 'View button'.
FR25-02	The system will allow admin to add new job post by clicking on 'Add New Job post' Button.

FR25-03	The system will allow admin to delete the job post by clicking on ‘Delete Button’.
FR25- 04	The system will allow admin to edit the job post by clicking on ‘Edit the job post’ following the name of the job post.

Table 23:FR25- Manage Job posts.

FR26- Managing frequently asked questions.

FR26-01	The system will allow admin to view the frequently asked questions by clicking on ‘Q/A’ button from the dashboard.
FR26-02	The system will allow admin to update Q/A by clicking on ‘Update button’ following the Q/A.
FR26-03	The system will allow admin to delete the Q/A by clicking on delete icon following the Q/A.
FR26-04	The system will allow admin to add new Q/A by clicking on Add New Q/A on the Q/A page.

Table 24:FR26- Managing frequently asked questions.

2.3.2 Non-Functional Requirements

NFR01: Performance

NFR01-01	System should run on the client device that should have at least 1 gb of Ram.
NFR01-02	Average system response time should be greater than 3 seconds.
NFR01-03	Mean time to failure of the system should not be more than 60 seconds in 24 hours.
NFR01-04	Average load of starting pages of the system should be less than 3 seconds.
NFR01-05	User should be able to simultaneously access the system and can also update the database.
NFR01-06	Average time taken by the system to process a request should be less than or equal to 5 seconds

Table 25:NFR01: Performance

NFR02- Security

NFR02-01	The system should provide access to only authorized users via the login module.
NFR02-02	System shouldn't allow to update the database except the authorized users.
NFR02-03	The privacy of the users will be maintained and the users personal information will not be set public if the user itself does not agrees to do so.

Table 26: NFR02- Security

NFR03- Maintainability

NFR03-01	The system should be designed in such a way that it should be easily maintainable.

Table 27:NFR03- Maintainability

NFR04- Usability

NFR04-01	The system should be attractive and easy to use
NFR04-02	The system font size should be set in such a way that the appearance of the system will be soothing and attractive.

Table 28:NFR04- Usability

NFR05-Reliability

NFR05-01	By reducing the mean time to failure, the system will be made reliable to the user.

Table 29:NFR05-Reliability

2.3.3 Requirement Traceability Matrix

Project Name	**ML Ontology Solution for Blood Donation System**
Project Description	In blood donation website, we will focus on helping people to book the appointment for the donation to blood donation Center. We are providing the people with a platform where they can donate their blood in normal situations and emergency scenarios. In this project, develop an automated blood donation system that user can donate blood to anyone in emergency situations and make the blood donation easy process. The main objective of this web Application is that patients can achieve the blood by contacting the donor through the chat or personal contact number.

ID	Requirement Description	Business Needs, Goals, Objectives	Project Objectives		Product Design		Test Case
01	Login	Only authorize person (user) can access to the system.	This requirement will allow the User or blood donation Center or admin to access the system by checking if he/she is a valid registered user in the system.		UC-01		TC-01
02	Register	User can easily access to the system.	This requirement will allow the User or Blood Donation Center to register himself/herself in the system and get a user account/system profile.		UC-02		TC-02
03	Make the Request for Blood	User make and post request easily.	This requirement will allow the User or Blood Donation Center to request for blood by filling the blood request forms.		UC-03		TC-03
04	Donate Blood	User can donate blood easily.	This requirement will allow the User to donate blood by		UC-04		TC-04

			filling the donation forms.				
05	Check Eligibility of User for Blood Donation	User can take blood analysis for donation.	This requirement will allow the User to check eligibility for blood donation by filling the blood analysis forms.		UC-05		TC-05
06	View Blood Donation Centers	System displays registered blood donation Centers.	This requirement will allow the User view the blood donation Center list and make appointments for blood donation.		UC-06		TC-06
07	Generate Appointment Report	Users have appointment receipt in any emergency (System Updates).	This requirement will allow the User to generate the appointment receipt.		UC-07		TC-07
08	Display User Profile	Users see their provided personal details.	This requirement will allow the User or blood donation Center or admin to view the personal details by clicking on the view profile tab.		UC-08		TC-08
09	View Blood Requests	User clearly view posted blood requests at any time.	This requirement will allow the User or blood donation Center to view the blood requests posted by the request maker and make decisions about acceptance or rejection.		UC-09		TC-09
10	Update Personal Information	User can change their personal details easily.	This requirement will allow the User or Blood Donation Center to update himself/herself personal information in the system.		UC-10		TC-10
11	Delete Personal Information	User can easily unregister from Blood Donation System.	This requirement will allow the User or blood donation Center or admin to delete his/herself account.		UC-11		TC-11

12	Get User Feedback	Gather feedback from user.	This requirement will allow the User give the feedback about blood donation website or system.		UC-12		TC-12
13	Add User information	Blood Donation Center add/insert information of user by automated system.	This requirement will allow the blood donation Center to add the information of blood donors to the blood donation website.		UC-13		TC-13
14	Generate Report on bloodstocks	Make a report of available blood stock in the donation Center.	This requirement will allow blood donation Center to generate the report of available bloodstocks in the Center.		UC-14		TC-14
15	Update Blood stock	Blood Donation Center can change blood stock value in the database.	This requirement will allow the blood donation Centers to update the bloodstock by entering new blood information or change the previous information.		UC-15		TC-15
16	Download Weekly/Monthly Appointment Reports	Blood Donation Center can download and store file in the Desktop (PC).	This requirement will allow blood donation Centers to download the appointment details of individual of weekly/Monthly reports.		UC-16		TC-16
17	Manage NGO's or Blood donation Centers	Provide facility to admin can handle NGOs and Blood Donation Centers information.	This requirement will allow an admin to manage NGOs or Blood Donation Centers by adding, deleting or modifying the records in the database.		UC-17		TC-17
18	Add news	Admin can easily post latest news in website.	This requirement will allow the admin to manage news, important announcements,		UC-18		TC-18

			terms, and conditions for the acceptance of the blood request into the database by adding, deleting, modifying that will be displayed on the system interface in the news feed.				
19	Handling Blood Requests	Admin have right to make decisions about user requests.	This requirement will handle the user's requests. The admin can view and download the requests of the users depending upon the validity.		UC-19		TC-19
20	Managing User's Personal Information	Admin have right to handles users and users' information's.	This requirement will allow the admin to manage user's personal information. He/she can view the personal information.		UC-20		TC-20
21	Managing Campaigns	Displaying campaigns in the website. And user view these campaigns easily.	This requirement will allow the admin to manage the campaigns currently active on the website. He can change, delete and add new campaigns on the system.		UC-21		TC-21
22	Managing Donor List	Handle all donors by automated system.	This requirement will allow the admin to view the donor list. He is also providing with the ability to add, edit and delete the donors from the list. He can also download the list as well.		UC-22		TC-22
23	Manage Sponsors	Handle sponsor information in the system database.	The purpose of this requirement is to allow the admin can view, edit and add new sponsors for the system growth.		UC-23		TC-23

24	Manage Financial donations	Financial Donation also perform in the website.	This requirement will allow the admin can view the persons list who donate financially to the system.		UC-24		TC-24
25	Manage Job posts	Latest Job opportunities posts displayed in the website.	This requirement will allow the admin can post the job opportunities available in the organization affiliated to the system. He can also modify and delete the job posts from the system as well.		UC-25		TC-25
26	Managing frequently asked questions	Handle frequently asked questions made by the users.	This requirement will allow the admin can post the frequently asked questions and their solutions on the page for the ease of the users.		UC-26		TC-26

Table 30:2.3.3 Requirement Traceability Matrix

2.4 Use Case Description

<table>
<tr><td colspan="3">UC01-Login</td></tr>
<tr><td colspan="3">Priority: High</td></tr>
<tr><td colspan="3">Actor(s): User (Donor or Recipient), Admin, Blood Donation Center</td></tr>
<tr><td>Brief Description:</td><td colspan="2">The purpose of this use case is to let the User (only in Online Blood Donation System) or blood donation Center or admin to access the system by checking if he/she is a valid registered user in the system.</td></tr>
<tr><td>Pre-Conditions:</td><td colspan="2">● The User (only in Online Blood Donation System) or Blood Donation Center or Admin be registered in the system in order to login the system.</td></tr>
<tr><td colspan="2">Normal Flow of Events:</td><td>Alternative Flows:</td></tr>
</table>

• This use case starts when a registered User (only in Online Blood Donation System) or Blood Donation Center or Admin wants to access his/her user account/system profile. • The User (only in Online Blood Donation System) or Blood Donation Center or Admin opens the system login page. • The User (only in Online Blood Donation System) or Blood Donation Center or Admin fills correctly and completely the text fields, EMAIL ADDRESS or USER NAME and PASSWORD. • The User (only in Online Blood Donation System) or Blood Donation Center or Admin selects the "Sign in" option. • Alternative Path: If each text field is not correctly and completely filled then the system reloads the system login page. • Alternative Path: If the User (only in Online Blood Donation System) or Blood Donation Center or Admin is not already registered in the system, he/she can select the "Create New Account" or "Sign Up" option. • Alternative Path: In case the User (only in Online Blood Donation System) or Blood Donation Center or Admin has forgotten his/her PASSWORD, he/she can select the "Forgot Password?" link open and then the system sends his/her PASSWORD information at his/her Email address. • The User (only in Online Blood Donation System) or Blood Donation Center or Admin gains access to the system. • This use case ends.	• If each text field is not correctly and completely filled, then the system reloads the system login page. • If the User (only in Online Blood Donation System) or Blood Donation Center or Admin is not already registered in the system, he/she can select the "Create New Account" "Sign Up" option. • In case the User (only in Online Blood Donation System) or Blood Donation Center or Admin has forgotten his/her PASSWORD, he/she can select the "Forgot Password?" link open and then the system sends his/her PASSWORD information at his/her Email address.
Exceptions:	
If the User (only in Online Blood Donation System) or Blood Donation Center or Admin does not enter his/her correct EMAIL ADDRESS or USER NAME and PASSWORD then he/she will not be given any access to the system.	
Post Condition(s):	
The User (only in Online Blood Donation System) or Blood Donation Center or Admin has successfully gained access to his/her user account/system profile.	

Use case Cross References:	
Extends:	None
Includes:	None

Table 31:UC01-Login

UC02-Register	
Priority: High	
Actor(s): User (Donors or Recipient), Blood Donation Center	
Brief Description:	The purpose of this use case is to let the User (only in Online Blood Donation System) or Blood Donation Center to register himself/herself in the system and get a user account/system profile.
Pre-Conditions:	• The User (only in Online Blood Donation System) or Blood Donation Center must fill and submit their online registration form in order to get registered in the system. • The User (only in Online Blood Donation System) or Blood Donation Center must not have an existing user account/system profile in the system.
Normal Flow of Events:	**Alternative Flows:**

● This use case starts when an User (only in Online Blood Donation System) or Blood Donation Center wants to get registered in the system. ● The User (only in Online Blood Donation System) or Blood Donation Center first fills the online registration form according to the categories (Register as a User or Register as a Blood Donation Center) by correctly and completely filling each text field (In case of Register as a User (FIRST NAME, LAST NAME, EMAIL ADDRESS, MOBILE NUMBER, PASSWORD, and RETYPE PASSWORD, etc) In case of Register as a Blood Donation Center (CENTER NAME, LOCATION, CITY, EMAIL, CONTACT NUMBER, TIMING, STATUS, CATEGORY, LICENSE NUMBER, PASSWORD, etc) in the registration form. ● Alternative Path: If each text field is not correctly and completely filled then the system reloads the online registration form page. ● The User (only in Online Blood Donation System) or Blood Donation Center submits the online registration form. ● The system confirms by asking the User (only in Online Blood Donation System) or Blood Donation Center, “Are you sure you want to get registered with this information?”. ● The User (only in Online Blood Donation System) or Blood Donation Center confirms by selecting the “Yes” option. ● Alternative Path: The User (only in Online Blood Donation System) or Blood Donation Center cancels registration by selecting “Cancel” option. ● The User (only in Online Blood Donation System) or Blood Donation Center gets registered in the database. ● The system assigns a unique ID to the registered User (only in Online Blood Donation System) or Blood Donation Center. ● This use case ends.	If each text field is not correctly and completely filled then the system reloads the online registration form page. ● The User (only in Online Blood Donation System) or Blood Donation Center cancels registration by selecting the “Cancel” option.

Exceptions:
• The User (only in Online Blood Donation System) or Blood Donation Center cannot get registered in the system without submitting an online registration form. • The User (only in Online Blood Donation System) or Blood Donation Center cannot get registered in the database twice.
Post Condition(s):
The User (only in Online Blood Donation System) or Blood Donation Center has been registered in the system**.**
Use case Cross References:

Extends:	None
Includes:	None

Table 32:UC02-Register

UC03-Make the Request for Blood	
Priority: High	
Actor(s): User (Donor or Recipient) and Blood Donation Center	
Brief Description:	The purpose of this use case is to let the User (only in Online Blood Donation System) or Blood Donation Center to request for blood by filling the blood request forms.
Pre-Conditions:	• The User or Blood Donation Center must be logged in into the system. • The User or Blood Donation Center must select the "Blood Request" option from the navigation bar.
Normal Flow of Events:	**Alternative Flows:**

● This use case starts when an User (only in Online Blood Donation System) or Blood Donation Center wants to post a request for blood in any situation. ● The User (only in Online Blood Donation System) or Blood Donation Center first fills the online blood request form by correctly and completely filling each text field (Included NAME, EMAIL ADDRESS, MOBILE NUMBER, GENDER, BLOOD GROUP, MESSAGE DESCRIPTION and NO OF BAGS, etc). ● Alternative Path: If each text field is not correctly and completely filled then the system reloads the online blood request form page. ● The User (only in Online Blood Donation System) or Blood Donation Center submits the online blood request form. ● The system confirms by asking the User (only in Online Blood Donation System) or Blood Donation Center "Are you sure you want to post a blood request with this information?". ● The User (only in Online Blood Donation System) or Blood Donation Center confirms by selecting the "Yes" option. ● Alternative Path: The User (only in Online Blood Donation System) or Blood Donation Center cancels blood request by selecting the "Cancel" option. ● The User (only in Online Blood Donation System) moves to the my requests page. ● This use case ends.	● If each text field is not correctly and completely filled then the system reloads the online blood request form page. ● The User (only in Online Blood Donation System) or Blood Donation Center cancels blood requests by selecting the "Cancel" option.
Exceptions:	
● The User (only in Online Blood Donation System) or Blood Donation Center cannot post a blood request without submitting an online blood request form.	
Post Condition(s):	

The User (only in Online Blood Donation System) has been moved to the “my requests” page**.**	
Use case Cross References:	
Extends:	None
Includes:	None

Table 33:UC03-Make the Request for Blood

UC04-Donate Blood	
Priority: High	
Actor(s): User (Donor or Recipient)	
Brief Description:	The purpose of this use case is to let the User (only in Online Blood Donation System) to donate blood by filling the donation forms.
Pre-Conditions:	● The User must be logged in into the system. ● The User must select the “Donate Blood” option from the navigation bar.
Normal Flow of Events:	**Alternative Flows:**

• This use case starts when an User (only in Online Blood Donation System) wants to donate blood. • The User (only in Online Blood Donation System) first fills or validate (verify) the online blood donation form by correctly and completely filling each text field (Included FIRST NAME, LAST NAME, EMAIL ADDRESS, MOBILE NUMBER, GENDER, BLOOD GROUP, and AGE, etc). • Alternative Path: If each text field is not correctly and completely filled then the system reloads the online blood donation form page. • The User (only in Online Blood Donation System) submits the online blood donation form. • The system confirms by asking the User (only in Online Blood Donation System) "Are you sure you want to donate blood with this information?". • The User (only in Online Blood Donation System) confirms by selecting the "Yes" option. • Alternative Path: The User (only in Online Blood Donation System) cancels blood donation by selecting the "Cancel" option. • The User (only in Online Blood Donation System) moves to the next page. • This use case ends.	• If each text field is not correctly and completely filled then the system reloads the online blood donation form page. • The User (only in Online Blood Donation System) cancels blood donation by selecting the "Cancel" option.
Exceptions:	
• The User (only in Online Blood Donation System) cannot donate blood without submitting an online blood donation form.	
Post Condition(s):	
The User (only in Online Blood Donation System) has been moved to the check blood eligibility page in the system**.**	
Use case Cross References:	

Extends:	None
Includes:	None

Table 34:UC04-Donate Blood

UC05- Check eligibility of User for blood donation		
Priority: High		
Actor(s): User (Donor or Recipient)		
Brief Description:	The purpose of this use case is to let the User (only in Online Blood Donation System) to check eligibility for blood donation by filling the blood analysis forms.	
Pre-Conditions:	• The User must be logged in into the system. • The User must fill the initial form of blood donation for checking the eligibility of blood donation.	
Normal Flow of Events:		**Alternative Flows:**

● This use case starts when an User (only in Online Blood Donation System) wants to check whether they are eligible for blood donation or not. ● The User (only in Online Blood Donation System) first fills or validate (verify) the online blood donation form by correctly and completely filling each text field. (Included DISEASE, SMOKING, DONATION HISTORY, WEIGHT, GENDER, and AGE, etc). ● Alternative Path: If each text field is not correctly and filled then the system reloads the online blood analysis form page. ● The User (only in Online Blood Donation System) submits the online blood analysis form. ● The system confirms by asking the User. (Only in Online Blood Donation System) "Are you sure you want to check blood with this information?". ● The User (only in Online Blood Donation System) confirms by selecting the "Yes" option. ● The User gets a confirmation message from the system whether they are eligible for blood donation or not. ● Alternative Path: The User (only in Online Blood Donation System) cancels blood analysis by selecting the "Cancel" option. ● The User (only in Online Blood Donation System) navigates to the next page (Blood Donation Center List). ● This use case ends.	● If each text field is not correctly and completely filled, then the system reloads the online blood analysis form page. ● The User (only in Online Blood Donation System) cancels blood analysis by selecting the "Cancel" option.
Exceptions:	
● The User (only in Online Blood Donation System) cannot get blood analysis without submitting an online blood analysis form.	
Post Condition(s):	

The User (only in Online Blood Donation System) has received confirmation messages about blood analysis and moved to the check blood donation list page in the system**.**	
Use case Cross References:	
Extends:	None
Includes:	None

Table 35:UC05- Check eligibility of User for blood donation

UC06-View Blood Donation Centers	
Priority: High	
Actor(s): User (Donors or Recipient)	
Brief Description:	The purpose of this use case is to let the Online User (only in Online Blood Donation System) view the blood donation center list and make appointments for blood donation.
Pre-Conditions:	• The user must be logged in into the system. • The user must fill the blood donation form before making appointments.
Normal Flow of Events:	**Alternative Flows:**

• This use case starts when a registered User (only in Online Blood Donation System) wants to view blood donation center lists and make appointments. • The User (only in Online Blood Donation System) opens the blood donation center lists page. • The User (only in Online Blood Donation System) views the blood donation centers (fields included NAME, ADDRESS, EMAIL ADDRESS, LOCATION, and CONTACT NUMBER, etc). • The User (only in Online Blood Donation System) makes an appointment to either accept or deny. • The system confirms by asking the User (only in Online Blood Donation System) "Are you sure you want to confirm the appointment?". • The User (only in Online Blood Donation System) confirms by selecting the "Confirm" option. • Alternative Path: The User (only in Online Blood Donation System) cancels the appointment by clicking on the "Cancel" option. • The system will send the notification to the blood donation center if any user confirms the appointment. • This use case ends.	• The User (only in Online Blood Donation System) or Blood Donation Center cancels the acceptance requests by clicking on the "Cancel" option.
Exceptions:	
None	
Post Condition(s):	
The User (only in Online Blood Donation System) or Blood Donation Center or Admin has successfully viewed blood donation requests and made appointments about blood donation.	
Use case Cross References:	

Extends:	None
Includes:	None

Table 36:UC06-View Blood Donation Centers

UC07-Generate Appointment Report	
Priority: Medium	
Actor(s): User (Donors or Recipient)	
Brief Description:	The purpose of this use case is to let the User (only in Online Blood Donation System) generate the appointment receipt.
Pre-Conditions:	● The user must be logged in into the system. ● The user must book the appointment..

Normal Flow of Events:	**Alternative Flows:**
● This use case starts when a registered User (only in Online Blood Donation System) wants to generate an appointment receipt. ● The User (only in Online Blood Donation System) opens my appointment page. ● The User (only in Online Blood Donation System) gets the appointment receipt. ● The User (only in Online Blood Donation System) downloads an appointment receipt by clicking on the "Download" button. ● The User (only in Online Blood Donation System) downloads generated appointments on the computer. ● Alternative Path: The User (only in Online Blood Donation System) cancels the appointment receipt by clicking on the "Cancel" option. ● The User moves to the Home Page after the cancel or download option. ● This use case ends.	● The User (only in Online Blood Donation System) or Blood Donation Center cancels the appointment receipt by clicking on the "Cancel" option.

Exceptions:	
None	
Post Condition(s):	
The User (only in Online Blood Donation System) or Blood Donation Center or Admin has successfully generated and downloaded appointments.	
Use case Cross References:	
Extends:	None
Includes:	None

Table 37:UC07-Generate Appointment Report

UC08-Display User Profile		
Priority: Medium		
Actor(s): User (Donors or Recipient), Admin, Blood Donation Center		
Brief Description:	The purpose of this use case is to let the Online User (only in Online Blood Donation System) or blood donation center or admin to view the personal details by clicking on the view profile tab.	
Pre-Conditions:	● The user, admin or blood donation center must be logged in into the system.	
Normal Flow of Events:		**Alternative Flows:**

• This use case starts when a registered User (only in Online Blood Donation System) or Blood Donation Center or Admin wants to view personal details. • The User (only in Online Blood Donation System) or Blood Donation Center or Admin opens the system profile page. • The User (only in Online Blood Donation System) or Blood Donation Center or Admin view the text fields, EMAIL ADDRESS or USERNAME and PASSWORD. • The User (only in Online Blood Donation System) or Blood Donation Center or Admin gains access to view the personal details in the system. • This use case ends.	
Exceptions:	
None	
Post Condition(s):	
The User (only in Online Blood Donation System) or Blood Donation Center or Admin has successfully viewed his/her user account/system profile.	
Use case Cross References:	
Extends:	None
Includes:	None

Table 38:UC08-Display User Profile

UC09-View Blood Request		
Priority: Medium		
Actor(s): User (Donors or Recipient) and Blood Donation Center		
Brief Description:	The purpose of this use case is to let the Online User (only in Online Blood Donation System) or blood donation center to view the blood requests posted by the request maker and make decisions about acceptance or rejection.	
Pre-Conditions:	● The user or blood donation center must be logged in into the system.	
Normal Flow of Events:		**Alternative Flows:**

• This use case starts when a registered User (only in Online Blood Donation System) or Blood Donation Center or Admin wants to view blood requests and make decisions about them. • The User (only in Online Blood Donation System) or Blood Donation Center opens the blood requests page. • The User (only in Online Blood Donation System) or Blood Donation Center view the request maker request posts (fields included NAME, ADDRESS, EMAIL ADDRESS, BLOOD GROUP, AGE, GENDER, NO OF BLOOD BAGS, and CONTACT NUMBER, etc). • The User (only in Online Blood Donation System) or Blood Donation Center either accept the request or deny the request. • The system confirms by asking the User (only in Online Blood Donation System) or Blood Donation Center, "Are you sure you want to accept the request?". • The User (only in Online Blood Donation System) or Blood Donation Center confirms by selecting the "Confirm" option. • Alternative Path: The User (only in Online Blood Donation System) or Blood Donation Center cancels the acceptance requests by clicking on "Cancel" option. • The system will send the notification to the request maker if any user or blood donation center accepts the request and confirms the blood donation. • This use case ends.	• The User (only in Online Blood Donation System) or Blood Donation Center cancels the acceptance requests by clicking on the "Cancel" option.
Exceptions:	
None	
Post Condition(s):	
The User (only in Online Blood Donation System) or Blood Donation Center or Admin has successfully viewed blood donation requests and made decisions (Accept or Deny).	

Use case Cross References:	
Extends:	None
Includes:	None

Table 39:UC09-View Blood Request

UC10-Update Personal Information		
Priority: High		
Actor(s): User (Donors or Recipient), Blood Donation Center		
Brief Description:	The purpose of this use case is to let the Online User (only in Online Blood Donation System) or Blood Donation Center to update himself/herself personal information in the system.	
Pre-Conditions:	• The user and blood donation center must be logged in into the system. • The User (only in Online Blood Donation System) or Blood Donation Center must fill and submit their online updating form in order to get updated in the system.	
Normal Flow of Events:		**Alternative Flows:**

• This use case starts when an User (only in Online Blood Donation System) or Blood Donation Center wants to update personal information in the system. • The User or Blood Donation Center clicks on the update profile option. • The User (only in Online Blood Donation System) or Blood Donation Center first fills the online updating form according to the categories (Register as a User or Register as a Blood Donation Center) by correctly and completely filling each text field (In case of Register as a User (FIRST NAME, LAST NAME, EMAIL ADDRESS, MOBILE NUMBER, PASSWORD, and RETYPE PASSWORD, etc) In case of Register as a Blood Donation Center (CENTER NAME, LOCATION, CITY, EMAIL, CONTACT NUMBER, TIMING, STATUS, CATEGORY, LICENSE NUMBER, PASSWORD, etc) in the updating form. • Alternative Path: If each text field is not correctly and filled then the system reloads the online updating form page. • The User (only in Online Blood Donation System) or Blood Donation Center submits the update form. • The system confirms by asking the User (only in Online Blood Donation System) or Blood Donation Center, "Are you sure you want to update with this information?". • The User (only in Online Blood Donation System) or Blood Donation Center confirms by selecting the "Yes" option. • Alternative Path: The User (only in Online Blood Donation System) or Blood Donation Center cancels update by selecting "Cancel" option. • The User (only in Online Blood Donation System) or Blood Donation Center updated personal information in the database. • The system sends notification to the admin about changes in personal information. • This use case ends.	• If each text field is not correctly and filled, then the system reloads the online updating form page. • The User (only in Online Blood Donation System) or Blood Donation Center cancels update by selecting the "Cancel" option.

Exceptions:
● The User (only in Online Blood Donation System) or Blood Donation Center or Admin cannot get updated personal information in the system without submitting an online updating form.
Post Condition(s):
The User (only in Online Blood Donation System) or Blood Donation Center or Admin has updated personal information in the system**.**
Use case Cross References:

Extends:	None
Includes:	None

Table 40:UC10-Update Personal Information

UC11-Delete Personal Information / Account	
Priority: Medium	
Actor(s): User (Donors or Recipient), Blood Donation Center	
Brief Description:	The purpose of this use case is to let the Online User (only in Online Blood Donation System) or blood donation center or admin to delete his/herself account.
Pre-Conditions:	● The User and Blood Donation Center must be logged in the system.
Normal Flow of Events:	**Alternative Flows:**

• This use case starts when a registered User (only in Online Blood Donation System) or Blood Donation Center or Admin wants to delete his/her user account/system profile. • The User (only in Online Blood Donation System) or Blood Donation Center or Admin opens the personal information details page. • The User (only in Online Blood Donation System) or Blood Donation Center selects the "Delete Account" option. • The system confirms by asking the User (only in Online Blood Donation System) or Blood Donation Center, "Are you sure you want to delete the account?". • The User (only in Online Blood Donation System) or Blood Donation Center confirms by selecting the "Yes" option. • Alternative Path: The User (only in Online Blood Donation System) or Blood Donation Center cancels delete account by selecting "Cancel" option. • The User (only in Online Blood Donation System) or Blood Donation Center deleted personal information or accounts in the database. • The system sends notification to the admin about deletion of personal information or account. • The User (only in Online Blood Donation System) or Blood Donation Center or Admin moves to the home page. • This use case ends.	• The User (only in Online Blood Donation System) or Blood Donation Center cancels delete account by selecting "Cancel" option.
Exceptions:	
None	
Post Condition(s):	
The User (only in Online Blood Donation System) or Blood Donation Center has successfully deleted his/her user account/system profile.	

Use case Cross References:	
Extends:	None
Includes:	None

Table 41:UC11-Delete Personal Information / Account

UC12-Get User Feedback		
Priority: Medium		
Actor(s): User (Donors or Recipient)		
Brief Description:	The purpose of this use case is to let the Online User (only in Online Blood Donation System) give the feedback about blood donation website or system.	
Pre-Conditions:	● The User must be logged in into the system.	
Normal Flow of Events:		**Alternative Flows:**

● This use case starts when a User (only in Online Blood Donation System) or Blood Donation Center wants to give feedback about the system. ● The User (only in Online Blood Donation System) or Blood Donation Center first fills the online feedback form by completely filling each text field (MESSAGE DESCRIPTION, REVIEWS ABOUT SERVICES, EMAIL). ● Alternative Path: If each text field is not correctly and filled then the system reloads the online feedback form page. ● The User (only in Online Blood Donation System) submits the feedback form. ● The system confirms by asking the User (only in Online Blood Donation System) or Blood Donation Center, "Are you sure you want to give feedback with this information?". ● The User (only in Online Blood Donation System) confirms by selecting the "Yes" option. ● Alternative Path: The User (only in Online Blood Donation System) or Blood Donation Center cancels feedback by selecting "Cancel" option. ● The User (only in Online Blood Donation System) gets a "Thank You" message after giving the feedback. ● The User (only in Online Blood Donation System) moves to the home page. ● This use case ends.	● If each text field is not correctly and filled, then the system reloads the online feedback form page. ● The User (only in Online Blood Donation System) or Blood Donation Center cancels registration by selecting the "Cancel" option.
Exceptions:	
● The User (only in Online Blood Donation System) or Blood Donation Center or Admin cannot give feedback in the system without submitting an online feedback form.	
Post Condition(s):	

The User (only in Online Blood Donation System) or Blood Donation Center or Admin has been given feedback about the system**.**	
Use case Cross References:	
Extends:	None
Includes:	None

Table 42:UC12-Get User Feedback

UC13-Add Blood donor's Information	
Priority: Medium	
Actor(s): Blood donation center	
Brief Description:	The purpose of this use case is to allow the blood donation center to add the information of blood donors to the blood donation website.
Pre-condition(s):	• The blood donation centers have assessed the system by entering their valid credentials and entering the information of the blood donors.
Normal Flow of Events:	**Alternative Flows:**

1. This use case starts when the Blood donation centers click on the button for adding the blood donor's information. 2. The Blood donation center first fills in the different text fields for NAME, AGE, ADDRESS, BLOOD GROUP, and CONTACT NUMBER. 3. Blood donation center submit the information by clicking the "Submit Information" Button. 4. Alternative Path: If text fields are not filled with data in the correct format the system will reload the page and highlight the text fields or send the notification where data was entered in the incorrect format. 5. The system confirms by asking the blood donation center, "Are you sure to submit the information?" 6. The center confirms by selecting the "Yes" option. 7. Alternative Path: The blood donation center selects "No" option and cancels information submission. 8. This use case ends.	1. If text fields are not filled with data in the correct format the system will reload the page and highlight the text fields or send the notification where data was entered in the incorrect format. 2. The blood donation center selects "No" option and cancels information submission.
Exceptions:	
None	
Post-condition(s):	
The blood donation center has successfully added the information of the blood donors.	
Use Case Cross References	
Extends:	None
Includes:	None

Table 43:UC13-Add Blood donor's Information

UC14-Generate report of blood stocks		
Priority: Medium		
Actor(s): Blood donation center		
Brief Description:	The purpose of this use case is to allow blood donation center to generate the report of available bloodstocks in the center.	
Pre-condition(s):	• The blood donation centers has assess the blood donation center's interface by entering their credentials.	
Normal Flow of Events:		**Alternative Flows:**
1. This use case starts when the Blood Donation Center clicks on the Available blood stock option. 2. The Blood Donation Center selects "the Generate Report" Option from the "Blood Stock" page. 3. The system confirms by asking the Blood Donation center, "Your blood stock report is generated?" 4. The Blood donation center confirms by selecting the "Yes" option. 5. Alternative Path: The Blood Donation Center selects the "No" option and cancels the stock report. 6. The Blood Donation center confirms the "Yes" option. 7. The blood donation center can view and download the bloodstock report by clicking the "download" button. 8. This use case ends.		1. The Blood Donation Center select the "No" option and cancels the stock report.
Exceptions:		
None		
Post-condition(s):		
The blood donation center has successfully generated the report of available bloodstocks of the blood donors.		
Use Case Cross References		
Extends:	None	
Includes:	None	

Table 44:UC14-Generate report of blood stocks

UC15-Update blood stock		
Priority: High		
Actor(s): Blood donation center		
Brief Description:	The purpose of this use case is to allow the blood donation centers to update the bloodstock by entering new blood information or change the earlier information.	
Pre-condition(s):	• The blood donation centers has assessed the system by entering their credentials for making the changes to the system database.	
Normal Flow of Events:		**Alternative Flows:**
1. This use case starts when the Blood Donation Center wants to update the bloodstock. 2. The Blood Donation Center opens the bloodstock page by selecting the "Blood Stock" option. 3. The Blood Donation Center selects the update choice from the "Bloodstock" page. 4. The Blood Donation center updates the stock by entering the valid information in the text fields. 5. Alternative Path: If given text fields are not filled with information in the correct format the system will reload the form and highlight the text fields where information was entered in the incorrect format. 6. The system confirms by asking, "Are you sure to add/Update this information." 7. The Blood Donation Center confirms by selecting the "Yes" option. 8. Alternative Path: The Blood Donation Center selects "No" option and cancels information submission. 9. This use case ends.		1. Alternative Path: If given text fields are not filled with information in the correct format the system will reload the form and highlight the text fields where information was entered in the incorrect format. 2. The Blood Donation Center selects "No" option and cancels information submission.
Exceptions:		
None		
Post-condition(s):		
The blood donation center has successfully update bloodstocks.		
Use Case Cross References		
Extends:	None	
Includes:	None	

Table 45:UC15-Update blood stock

UC16-Download Appointment Reports	
Priority: Medium	
Actor(s): Blood donation center	
Brief Description:	The purpose of this use case is to allow blood donation centers to download the appointment details of individual of weekly/Monthly reports.
Pre-condition(s):	• The blood donation centers have assessed the system by entering their valid credentials.

Normal Flow of Events:	**Alternative Flows:**
1. This use case starts when the Blood Donation Center clicks on the "Appointment" option. 2. The Blood Donation Center selects the "Generate Appointments Reports" Option from the "Appointment" page. 3. The system confirms by asking the Blood Donation center, "Your Appointment report is generated?" 4. The Blood donation center confirms by selecting the "Yes" option. 5. Alternative Path: The Blood Donation Center selects the "No" option and cancels the Appointment reports. 6. The Blood Donation center confirms the "Yes" option. 7. The blood donation center can view and download the Appointment report by clicking the "download" button. 8. This use case ends.	1. The Blood Donation Center selects the "No" option and cancels the stock report.

Exceptions:
None
Post-condition(s):
The blood donation center has successfully download the appointment reports of individual blood donor or weekly and Monthly reports.
Use Case Cross References

Extends:	None
Includes:	None

Table 46:UC16-Download Appointment Reports

UC17- Manage NGO's or Blood donation centers		
Priority: Medium		
Actor(s): Admin		
Brief Description:	The purpose of this use case is to allow an admin to manage NGOs or Blood Donation Centers by adding, removing, or modifying the records in the database.	
Pre-condition(s):	• The user must register as an admin to the blood donation system. • For removing or modifying the blood donation center, there must be at least one record in the database.	
Normal Flow of Events:		**Alternative Flows:**
1. This use case starts when the admin of the blood donation website wants to manage the NGOs or blood donation centers by adding, changing, or deleting the record in the system database. 2. The admin views all the records of the NGOs or blood donation centers by selecting the choice of "Manage NGOs or Blood Donation centers" in the admin dashboard. 3. The admin selects the "Add a new Record", "Delete an existing record", or "Modify the existing Record" option on the "Manage NGOs or Blood Donation Centers" page. 4. The system confirms by asking, "Are you sure to perform this action". 5. The admin confirms by selecting the "Yes" option. 6. Alternative Path: The Admin selects the "No" option and cancels the changes. 7. The system adds a new record, or removes or modifies an existing record from the system database at the request of the admin. 8. This use case ends.		1. The admin selects the "No" option and cancels the changes.
Exceptions:		
Admin of the system cannot add or delete the records if there is no records in the system database.		
Post-condition(s):		
The admin of the system has successfully removed, modifying, add the new record to the system database.		
Use Case Cross References		
Extends:	None	
Includes:	None	

Table 47:UC17- Manage NGO's or Blood donation centers

UC18- Manage News	
Priority: Medium	
Actor(s): Admin	
Brief Description:	The purpose of this use case is to allow the admin to manage news, important announcements, terms, and conditions for the acceptance of the blood request into the database by adding, removing, modifying that will be displayed on the system interface in the news feed.
Pre-condition(s):	• The admin has assessed the system by providing the valid information.

Normal Flow of Events:	**Alternative Flows:**
1. This use case starts when Admin clicks the "Manage Announcement" option in the dashboard. 2. The admin can add the news, remove news, or update the news or announcements by selecting the option in the "Manage Announcement" page. 3. Admin submits information. 4. Alternative Path: If all text fields are not filled with data in the correct format the system will highlight the text fields where data was entered in the incorrect format or send an error message. 5. The system confirms by asking the admin, "Are you sure to add this information or announcement?" 6. The admin confirms by selecting the "Yes" option. 7. Alternative Path: The Admin selects the "No" option and cancels the announcement submission. 8. This use case ends.	1. If all text fields are not filled with data in correct format the system will highlight the text fields where data was entered in incorrect format or send error message. 2. The admin selects the "No" option and cancels the announcement submission.

Exceptions:
None
Post-condition(s):
The blood donation center has successfully managed the news in the system database.
Use Case Cross References

Extends:	None
Includes:	None

Table 48:UC18- Manage News

UC19- Handling Blood Request	
Priority: Medium	
Actor(s): Admin, User/Recipient	
Brief Description:	The purpose of this use case is that admin and user can view the blood requests. All the users can accept the blood request, but admin can view and download the blood requests only
Pre-condition(s):	• The admin has assessed the system by entering their credentials.

Normal Flow of Events:	**Alternative Flows:**
1. This use case starts when the admin opens the request page. 2. The request can be of two types, The user can send request for the donation of the blood, The user sends request for the blood query i.e. He needs the blood in case of any emergency circumstances. 3. The user can view the request for the donation of the blood by checking the validity report if it is according to the requirements by clicking on "Accept Request". 4. The system prompts the user by showing a dialog box that states. 5. "Are you sure you want to accept the request". 6. The user selects the option according to his choice. 7. In case of blood Query, the user or blood Center can accept the request by checking the validity of the patient's report. 8. This use case ends.	

Exceptions:
• The admin can't accept or reject the request if no requests are selected. • The admin can only view the query if and only if it is sent by the user
Post-condition(s):
The user has successfully received the notification of approval or rejection of the request.
Use Case Cross References

Extends:	None
Includes:	None

Table 49:UC19- Handling Blood Requests

UC20- Managing User's Personal Information	
Priority: high	
Actor(s): Admin, Users	
Brief Description:	The admin can manage the user's personal Information. He/she can view the personal information of the user based on his request.
Pre-condition(s):	The admin must be logged in into the system. The user must have sent request to update his/her personal information.

Normal Flow of Events:	**Alternative Flows:**
1. This use case starts when the admin accesses the user information by opening "Manage Users" and the "Update Request" page. 2. Then the admin clicks on the "Update Requests" page to see the users who have sent request to update their personal information. 3. The admin can edit their personal information or set it to public or private according to user requirements. 4. The admin can save the changes and update them on the database by clicking on "Update and Save button". 5. The system then prompts admin "Are you sure you want to update the user information." 6. The admin the selects "Yes" from the dialog box to save and update the changes. 7. This use case ends.	The admin can select "No" for making no use Information changes to the system.

Exceptions:
The admin can manage user personal information if the request is sent by the user.
Post-condition(s):
A small alert is sent to the admin "Your changes are done successfully".
Use Case Cross References

Extends:	None
Includes:	None

Table 50:UC20- Managing User's Personal Information

UC21- Managing Campaigns

Priority: Medium

Actor(s): Admin

Brief Description:	The admin can manage the campaigns currently active on the website. He can change, delete, and add new campaigns on the system
Pre-condition(s):	The admin must be logged in into the system. .

Normal Flow of Events:	**Alternative Flows:**
1. This use case starts when the admin opens the campaign page. 2. Then admin can open the campaigns page by clicking on "Manage Campaigns" button from the dashboard. 3. The admin can view all the active campaigns in the "Manage Campaigns". 4. The admin can edit the active campaigns by clicking on "Edit Campaigns" button. 5. The campaigns details will be displayed on the screen. 6. The admin can modify the campaign and can update it by clicking on "Update and Save" button. 7. The system prompts admin "Are you sure you want to Update this campaign". 8. The admin confirms it according to his choice and the actions are performed accordingly. 9. The admin can delete the campaign by clicking on "Delete Campaign" icon following the campaign. 10. The system prompts admin "Are you sure you want to delete this campaign". 11. The admin confirms it according to his choice and the actions are performed accordingly. 12. The admin can add new campaigns by clicking on the "Add Campaign Icon" on the screen. 13. The admin creates a new campaign and can post it by clicking on "Add Campaign" button. 14. The system prompts the admin "Are you sure you want to add this campaign". 15. The admin confirms it, and the actions are performed accordingly. Alternative Path:	Alternative Path: The admin can select "Cancel" for making no changes to the campaigns.

16. The admin can select “Cancel” for making no changes to the campaigns. 17. This use case ends.	
Exceptions:	
The detailed page of Campaign screen will only appear if and only if the admin clicks on Edit button. The admin can only modify the campaigns if the changes are required. The prompts will only appear if the admins take an action against the page.	
Post-condition(s):	
An alert is sent to the admin “The action is performed successfully”.	
Use Case Cross References	
Extends:	None
Includes:	None

Table 51:UC21- Managing Campaigns

UC22- Managing Donor List	
Priority: High	
Actor(s): Admin, Donors	
Brief Description:	The admin can view the donor list. He is also provided the ability to add, edit the donor list as well. He can also download the list.
Pre-condition(s):	The admin must be logged in into the system. The user must be logged in into the system
Normal Flow of Events:	**Alternative Flows:**
1. This use case starts when the admin enters the “Manage Donors” page from the dashboard. 2. When the admin Enters the “Manage Donors” page. He can view the list of available donors. 3. The admin can also view the willing and unwilling status of the donor. 4. The admin can remove the donor from the list by clicking on “Remove Donor” Icon following the name of donor (In the case if he/she is unwilling). 5. The system prompts the admin “Are you sure you want to remove this Donor”.	The admin can select No for making no changes to the donor list.

6. The admin chooses one suitable option, and the actions are performed accordingly. 7. Alternative path: 8. The admin can select "No" for making no changes to the donors list. 9. The admin can download the donors list by clicking on the "Download" button. 10. The system prompts admin to provide the path to save the file being downloaded. 11. The admin downloads the file. 12. This use case ends.	
Exceptions:	
• The admin can only delete the donor if there is donor present in the database. • The admin can only remove the donor when he is unwilling to donate the blood. • The admin can only download the donor list if there is at least one donor present	
Post-condition(s):	
• The admin is provided with an alert message "User successfully removed". • The admin provided with a message if the download is completed.	
Use Case Cross References	
Extends:	None
Includes:	None

Table 52:UC22- Managing Donor List

UC23- Manage Sponsors	
Priority: Medium	
Actor(s): Admin, Sponsors	
Brief Description:	The admin can view, edit, and add new sponsors for the system growth.
Pre-condition(s):	• The admin must be logged into the system. • The sponsors must be logged in into the system.
Normal Flow of Events:	**Alternative Flows:**

1. This use case starts when the admin opens the sponsors page. 2. The admin enters the sponsors page by clicking on “Manage Sponsors” button. 3. The admin can view the sponsors while within this page. 4. The admin can edit the sponsors by clicking on “Edit Button” following the details of the sponsors. 5. The admin can save the updated details by clicking on “Update and Save” button. 6. The system prompts the admin “Are you sure you want to perform this action?”. 7. The admin chooses one suitable option, and the actions are performed accordingly. 8. The admin can delete the sponsors by clicking on “Delete Button” following the details of the sponsor. 9. The system prompts the admin “Are you sure you want to remove this Sponsor”. 10. The admin chooses one suitable option, and the actions are performed accordingly. 11. Alternative paths: The admin can select “No” for making no sponsor changes to the website. 12. The admin can add new sponsors by clicking on “Add Button”. 13. This use case ends.	The admin can select “No” for making no sponsor changes to the system.
Exceptions:	
• The admin can only delete sponsors if there is at least one sponsor present. • The admin can only update sponsor information if there is at least one sponsor present.	
Post-condition(s):	
• The Alert is generated for the admins in case of success and failures of the action performed.	
Use Case Cross References	
Extends:	None
Includes:	None

Table 53:UC23- Manage Sponsor

UC24- Manage Financial Donations	
Priority: high	
Actor(s): Admin, Donors	
Brief Description:	The admin can view the persons list who donated financially to the system.
Pre-condition(s):	• The admin must be logged in into the system. • The donor must be logged in into the system.

Normal Flow of Events:	**Alternative Flows:**
1. This use case begins when the admin opens the Funds page. 2. The admin can open the funds page by clicking on the "Funds" icon. 3. The admin can view the persons who donated to the system. 4. The admin can download the list of the fund's donors. 5. The system prompts for where to store the list to be downloaded. 6. The admin specifies the path, and the list is stored. 7. This use case ends.	

Exceptions:
The admin can only download the list if there is at least one fund donor present.
Post-condition(s):
An alert is generated when the list is successfully downloaded.

Use Case Cross References	
Extends:	None
Includes:	None

Table 54:UC24- Manage Financial Donations

UC25- Manage Job Posts
Priority: Medium
Actor(s): Admin, organizations

Brief Description:	The admin can post the job opportunities available in the organization affiliated to the system. He can also modify and delete the job posts from the system as well.
Pre-condition(s):	• The organizations must be affiliated with the system. • The admin must be logged in into the system.

Normal Flow of Events:	**Alternative Flows:**
1. This use case starts when the admin opens the "Job Posts" page. 2. The admin can view the posted jobs on the system within the job posts page. 3. The admin can modify the jobs by clicking on "modify Icon" next to the job post. 4. The admin can modify the job by clicking on "Update and Save button". 5. The system prompts the admin "Are you sure you want to make changes to the job post". 6. The admin chooses from the choice and the actions are performed accordingly. 7. The admin can delete the job and save it by clicking on "Delete button". 8. The system prompts the admin "Are you sure you want to delete the job post". 9. Alternative Paths: The admin can select "No" for making no job posts changes to the website. 10. The admin chooses from the choice and the actions are performed accordingly. 11. This use case Ends.	The admin can select "No" for making no job posts changes to the website.

Exceptions:
• The admin can only update the job post if there is at least one job present. • The admin can only delete the job post if it is selected.
Post-condition(s):
. The admin is notified by alerts on the success of his actions.
Use Case Cross References

Extends:	None
Includes:	None

Table 55:UC25- Manage Job Posts

UC26- Manage Frequently Asked Questions
Priority: Medium

Actor(s): Admin	
Brief Description:	The admin can post the frequently asked questions and their solutions on the page for the ease of the users.
Pre-condition(s):	The admin must be logged in into the system.

Normal Flow of Events:	**Alternative Flows:**
1. This use case starts when the admin enters the Q/A page. 2. The admin can view the available question answers currently live on the system. 3. The admin can edit the available Q/A by clicking on 'Edit Icon' in front of Q/A. 4. The admin can Edit the Q/A and save it by clicking on "Edit button". 5. The system prompts the admin "Are you sure you want to Edit the Q/A". 6. The admin chooses from the choice and the actions are performed accordingly. 7. The admin can add new Q/A by clicking on the "Add button" on the Q/A page. 8. The system prompts the admin "Are you sure you want to add the Q/A". 9. The admin chooses from the choice and the actions are performed accordingly.	The admin can select no for making no changes to the system.

Exceptions:

- The admin can only update the Q/A if there is at least one job present.
- The admin can only delete the Q/A if it is selected.

Post-condition(s):

Alert message is sent to the admin according to the actions he performed.

Use Case Cross References

Extends:	None
Includes:	None

Table 56:UC26- Manage Frequently Asked Questions

2.5 Use Case Diagrams

2.5.1 Login

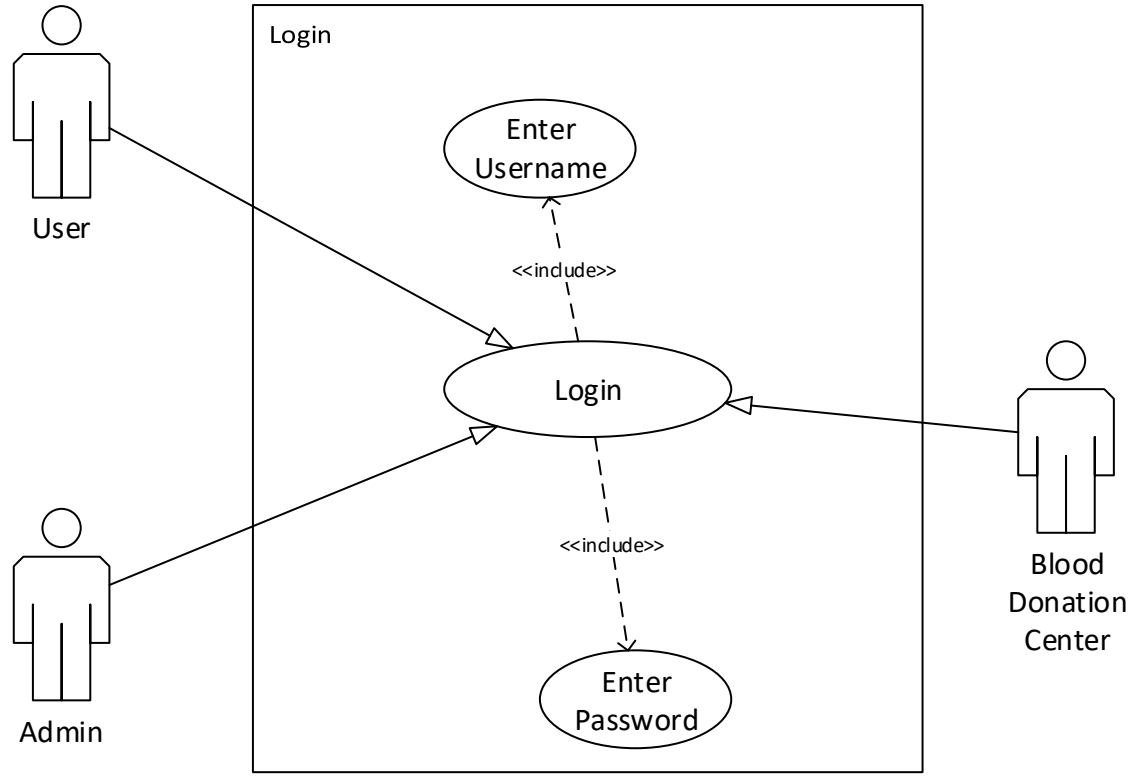

Figure 1: Login

2.5.2 Registration

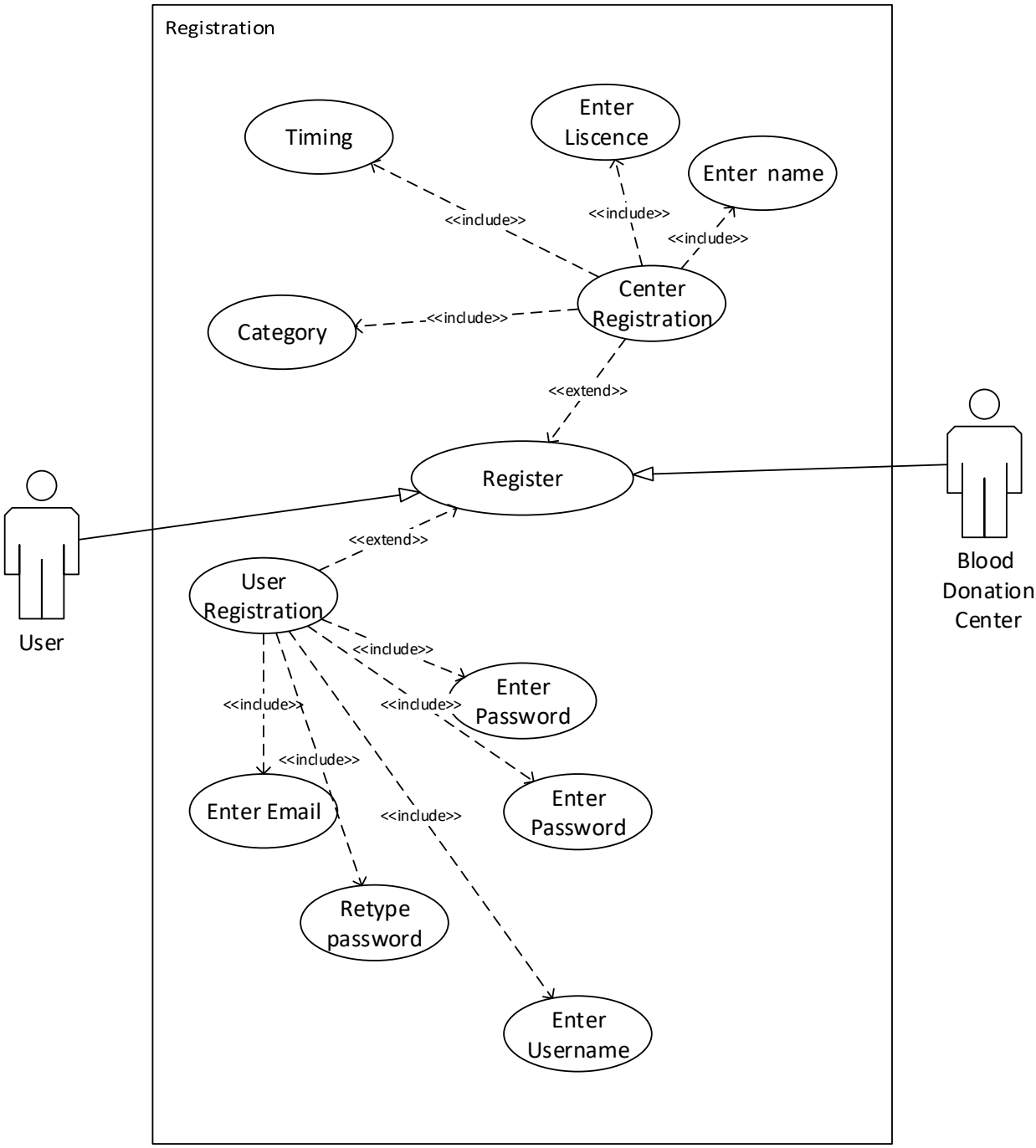

Figure 2: Registration

2.5.3 Make Request for Blood

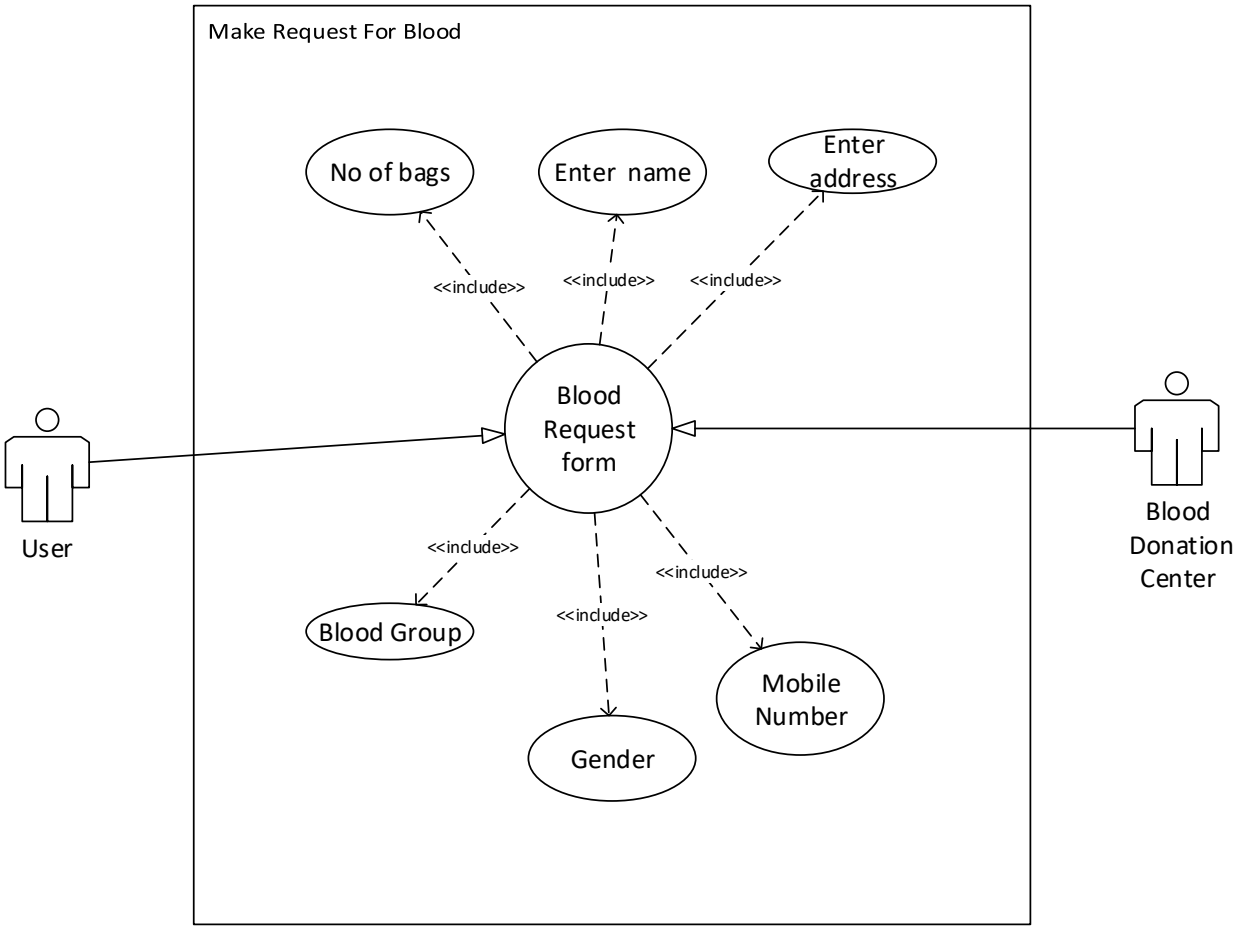

Figure 3: Make Request for Blood

2.5.4 Donate Blood

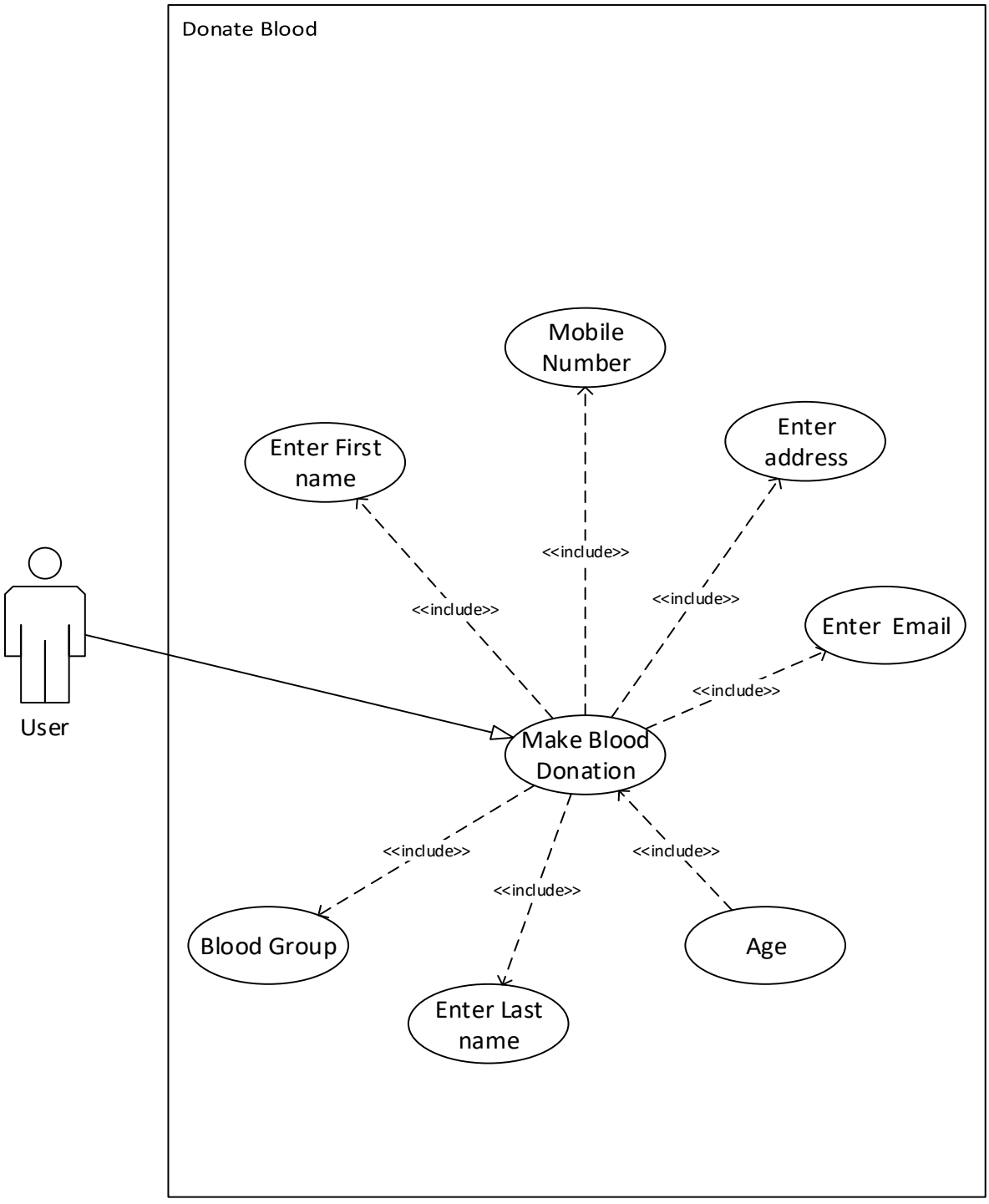

Figure 4: Donate Blood

2.5.5 Check eligibility for blood Donation.

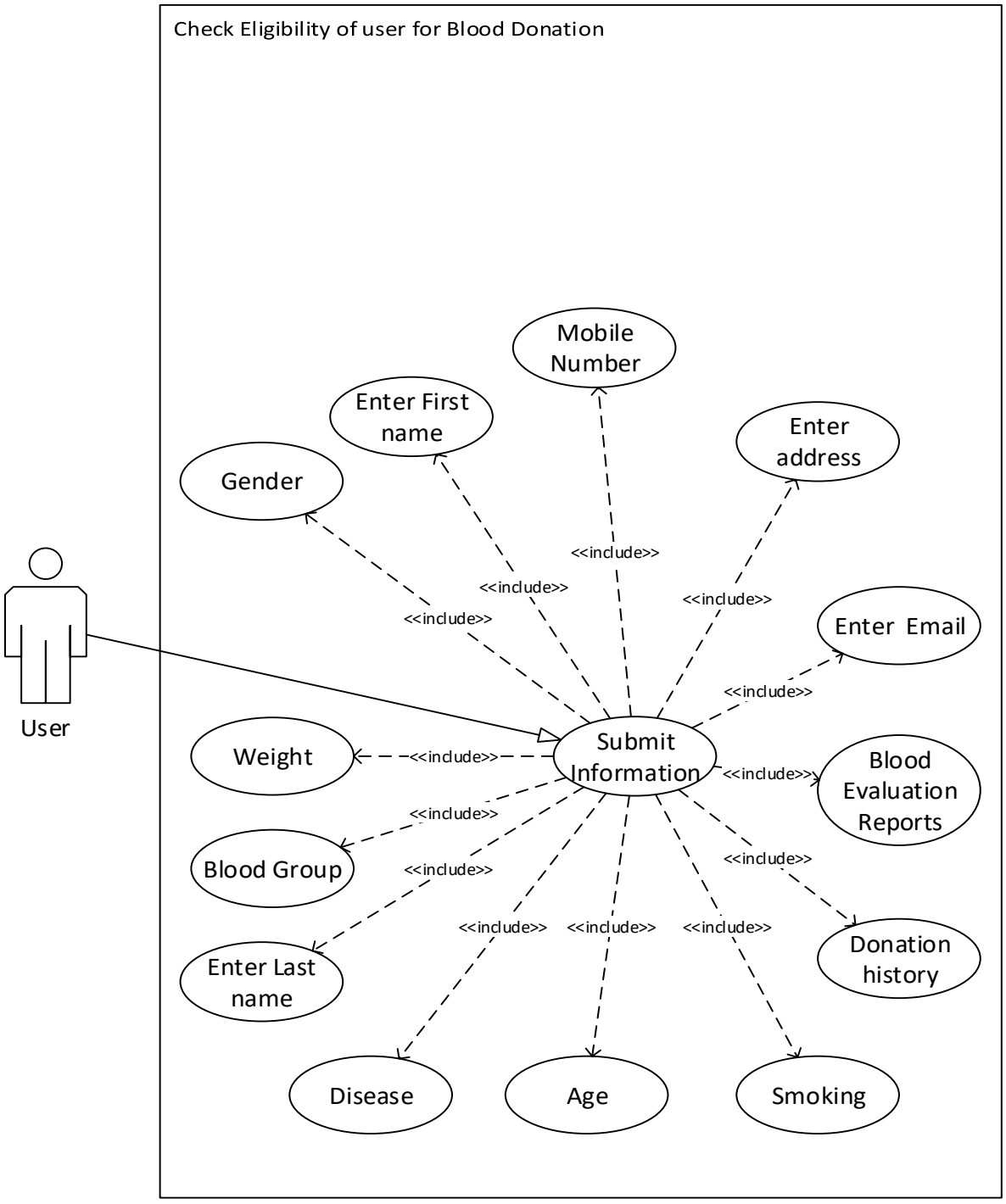

Figure 5 Check Eligibility of the User for Blood Donation

2.5.6 View Blood donation Center's

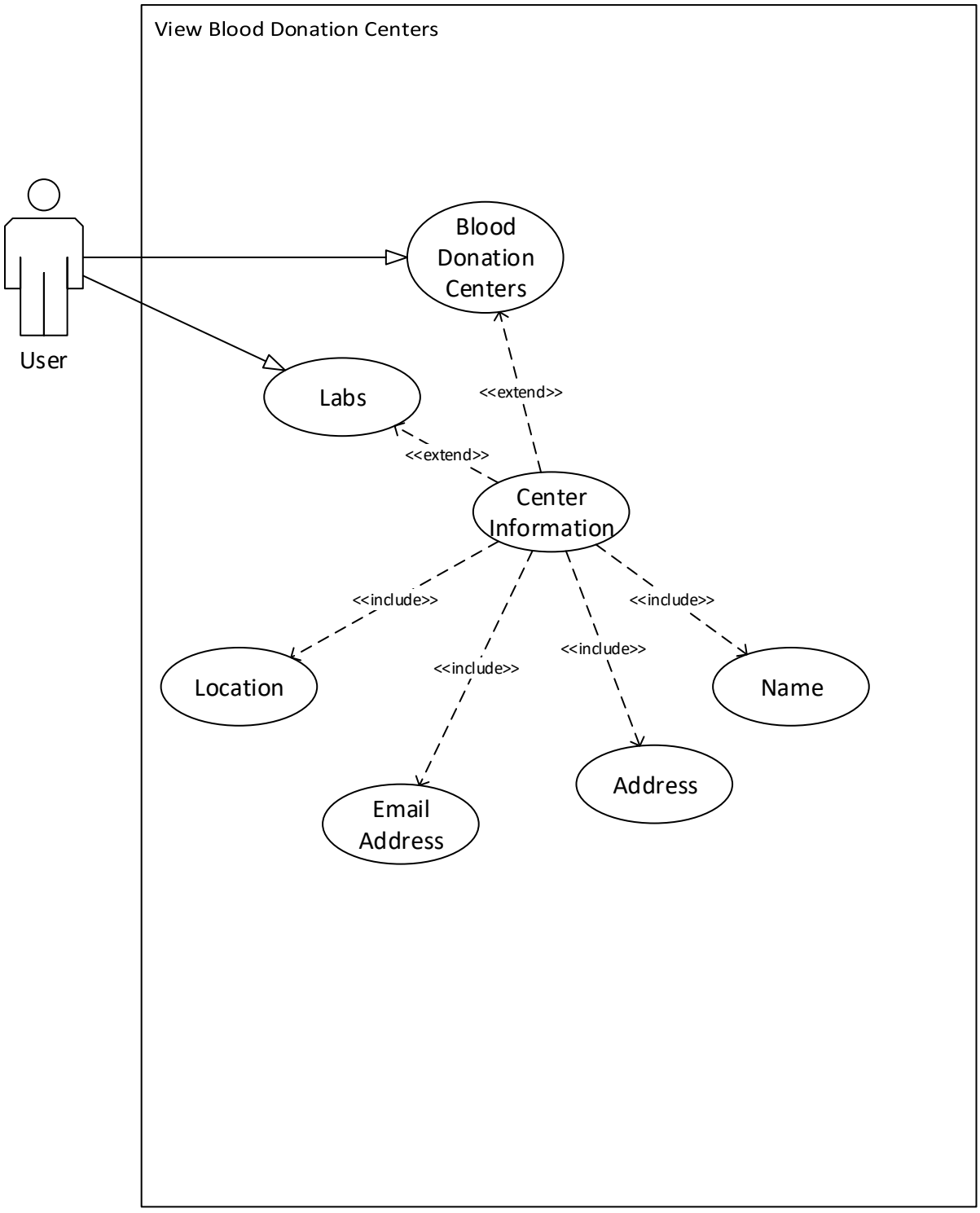

Figure 6 View Blood Donation Center's

2.5.7 Generate Appointment Reports

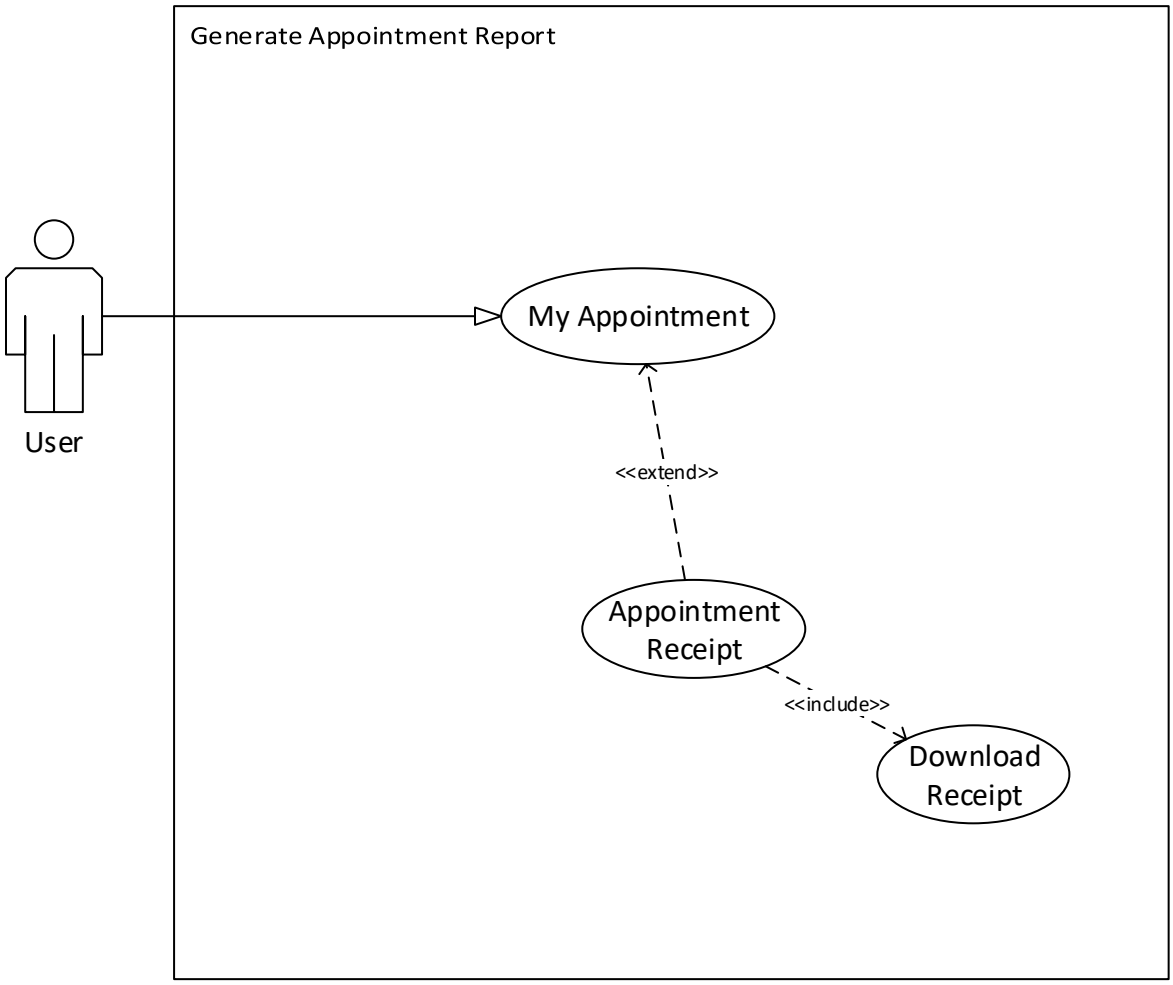

Figure 7: Generate Appointment Report Use case Diagram.

2.5.8 Display user Profile

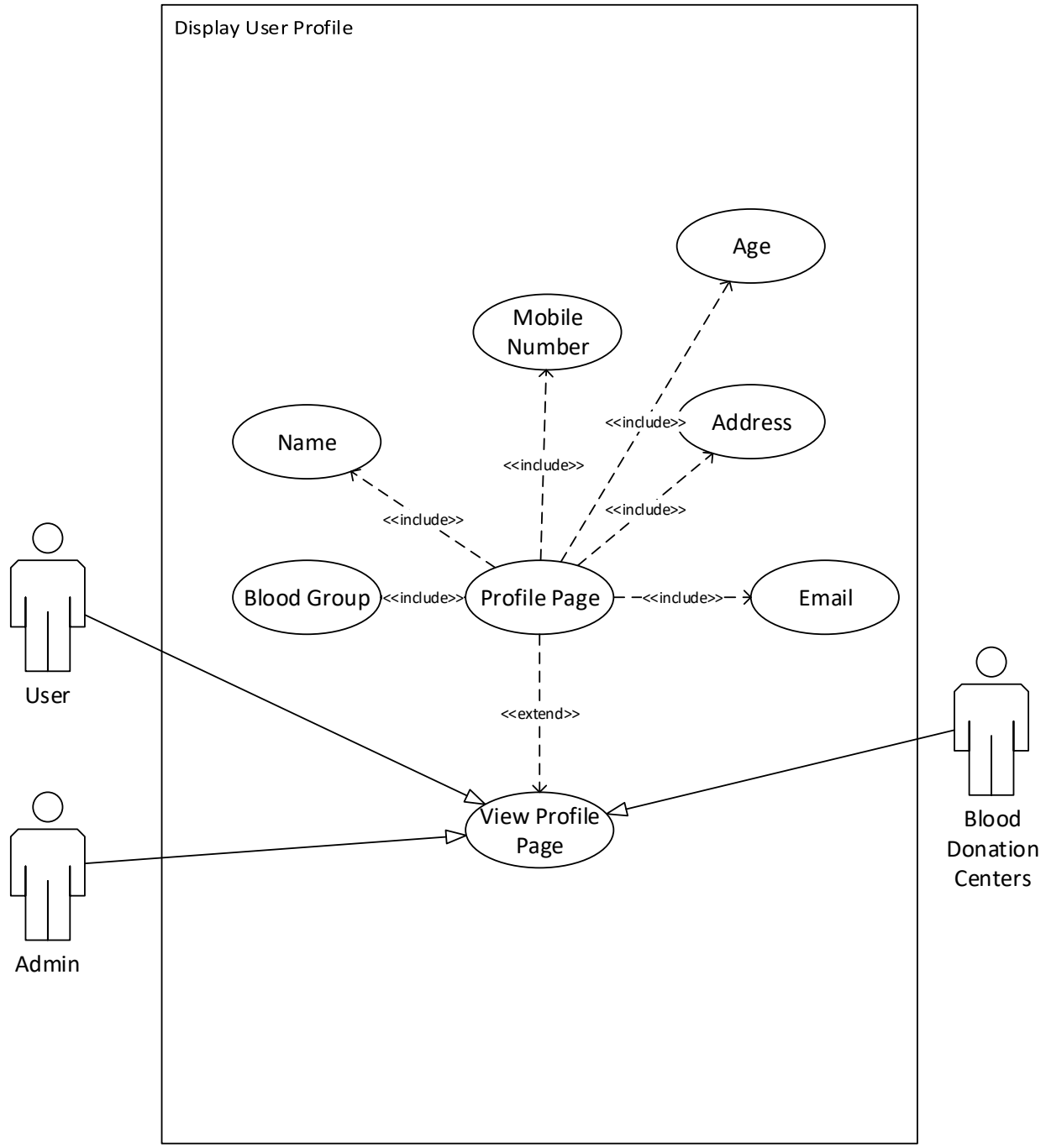

Figure 8: Display User Profile Use Case Diagram

2.5.9 View Blood Requests

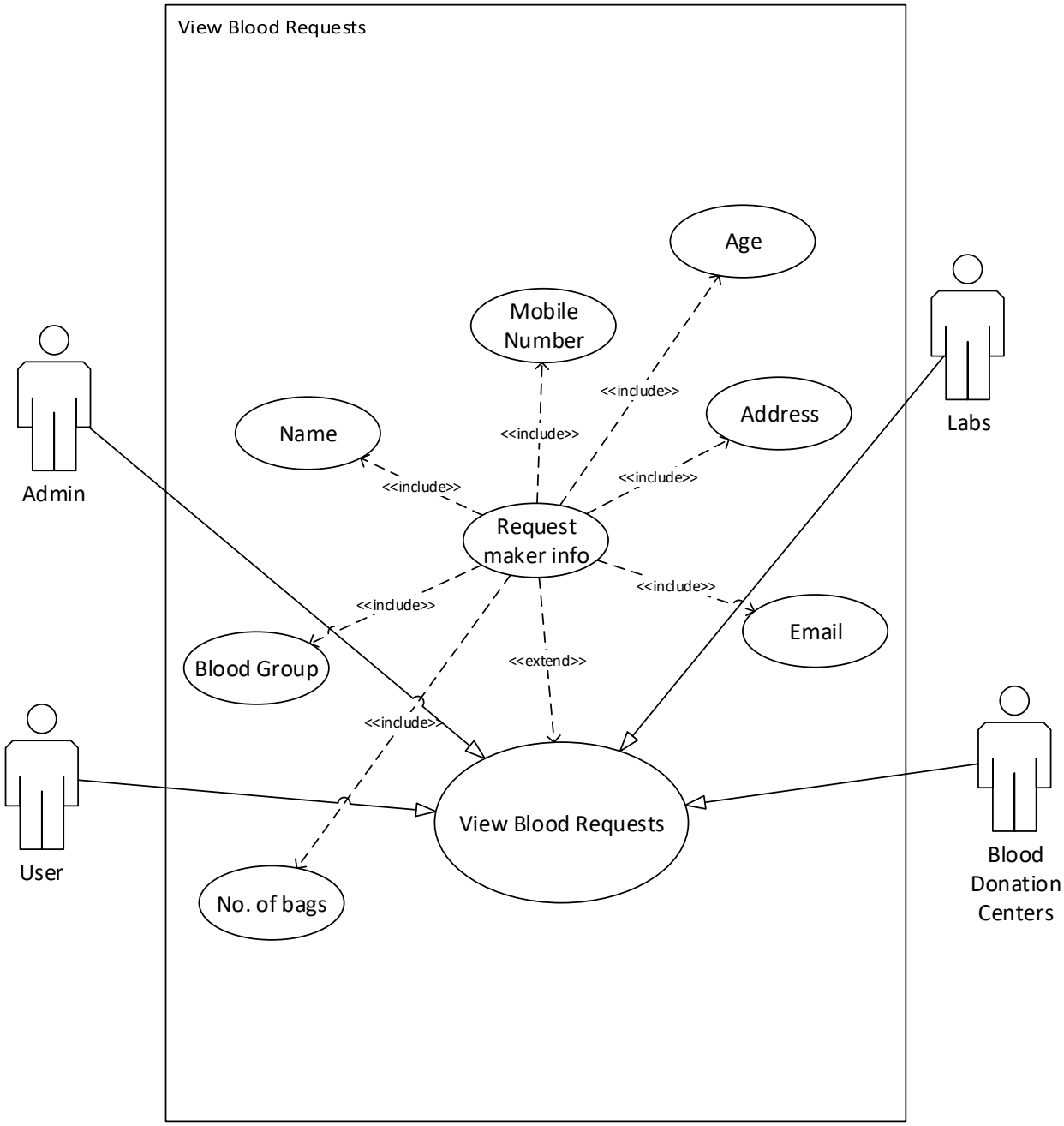

Figure 9: View Blood Requests Use Case Diagram

2.5.10 Update Personal Information

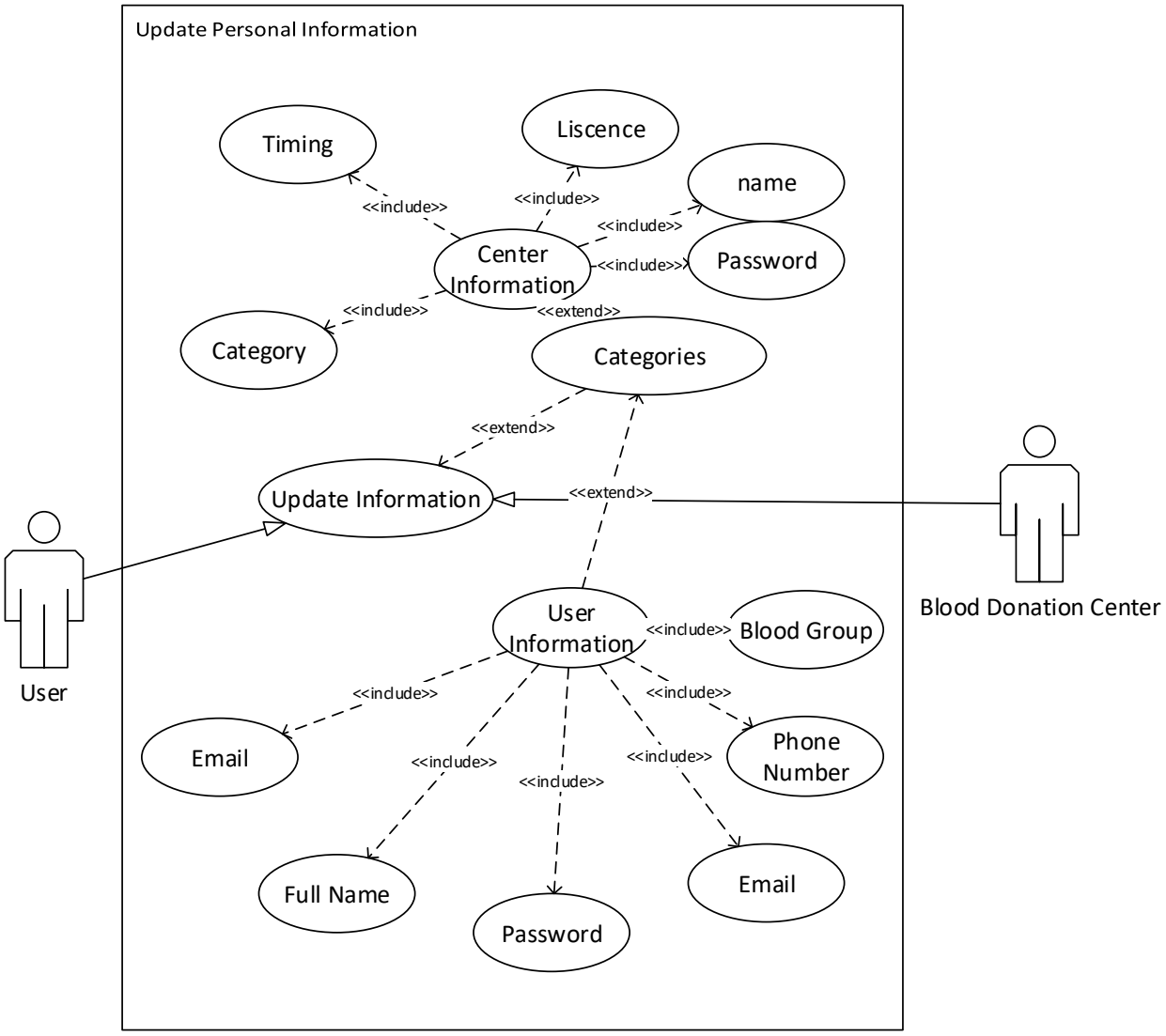

Figure 10: Update Personal Information Use case Diagram.

2.5.11 Delete Personal Information

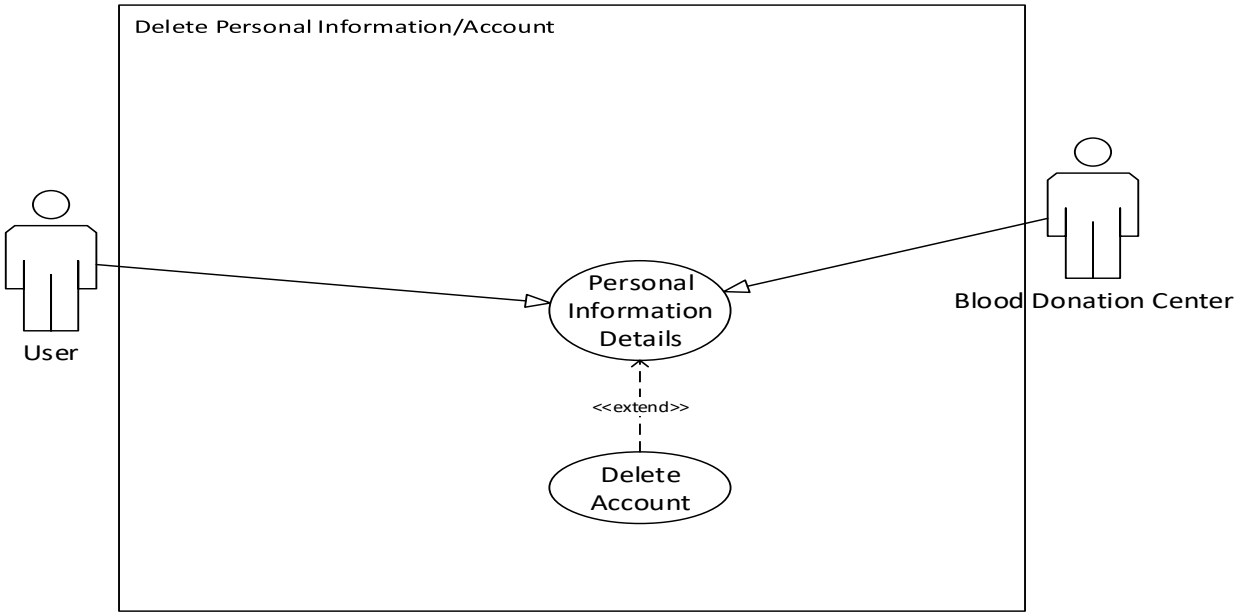

Figure 11: Delete Personal Information Use case Diagram.

2.5.12 Get User Feedback

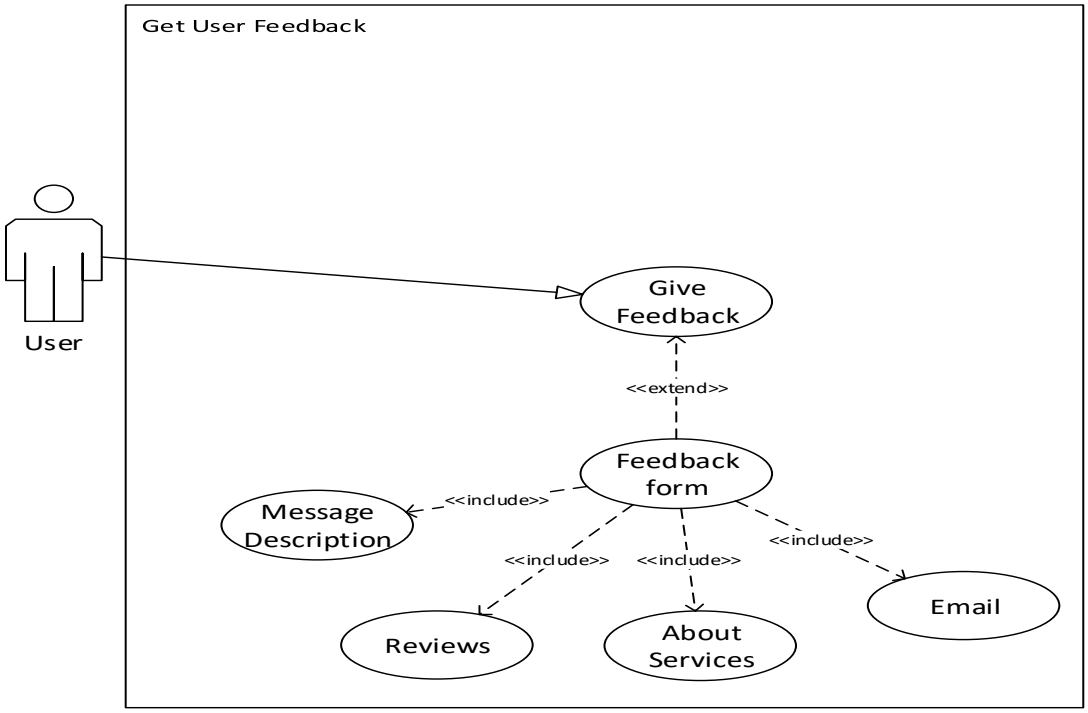

Figure 12: Get User Feedback Use case Diagram.

2.5.13 Add Blood Donor's Information

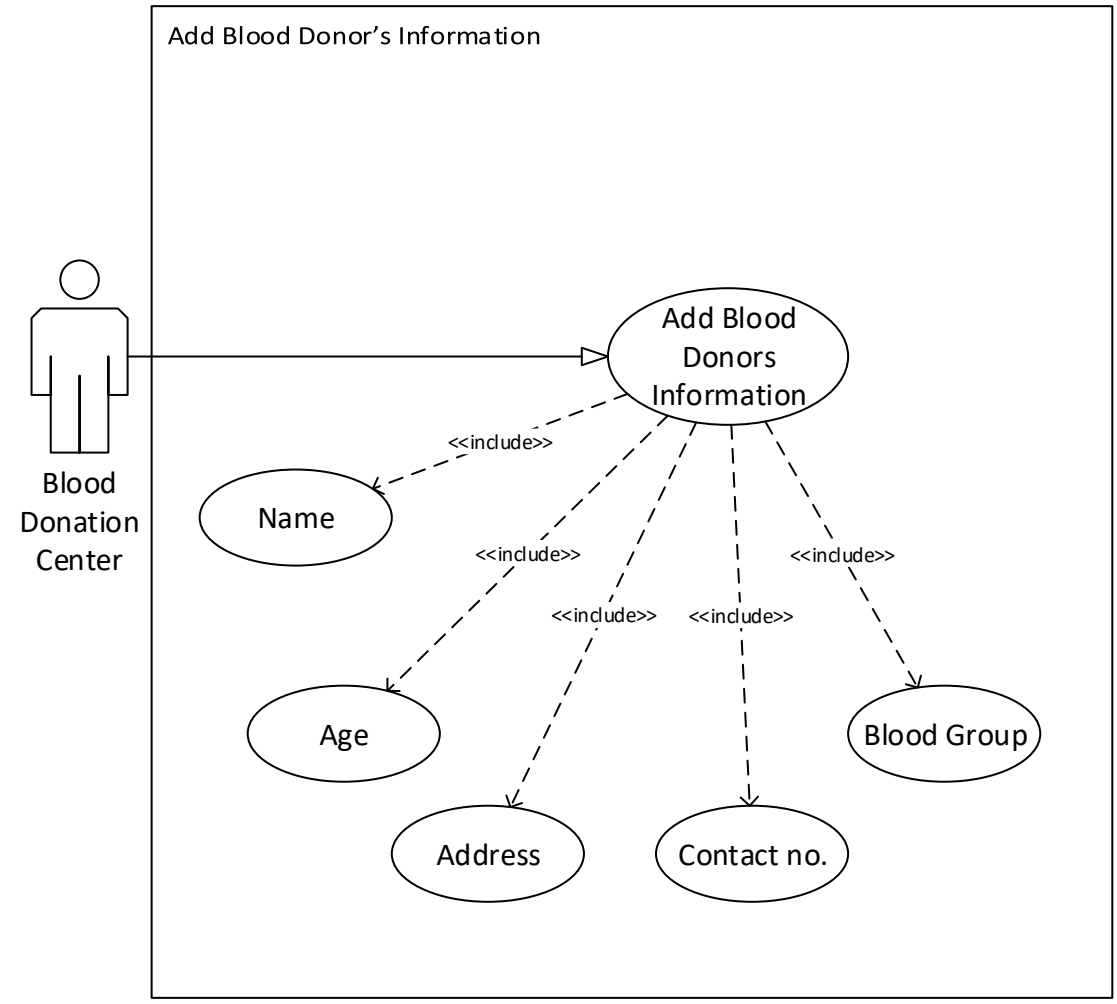

Figure 13: Add Blood Donor's Information Use case Diagram.

2.5.14 Generate Blood Stock Report

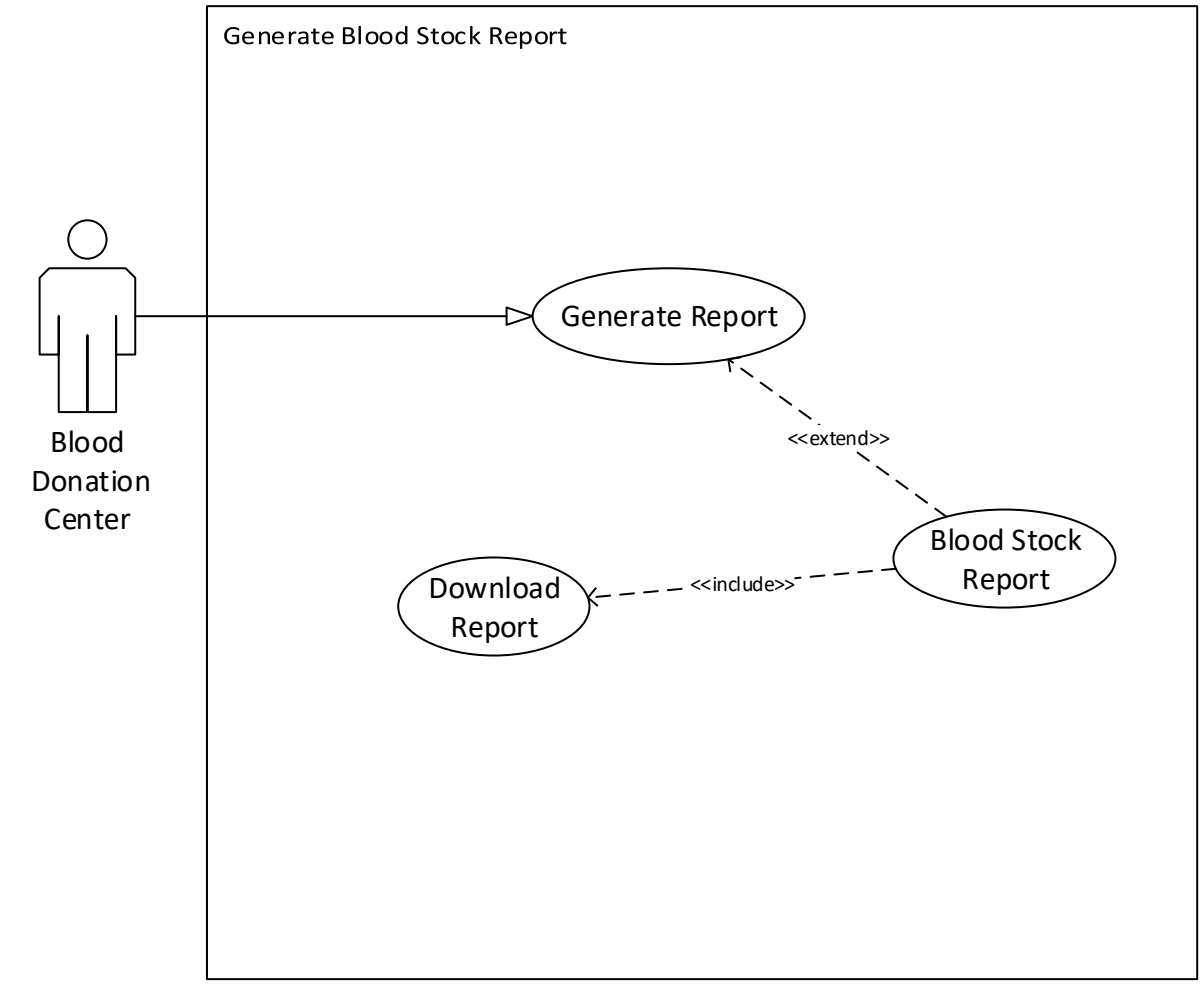

Figure 14: Generate Blood Stock Report Use case Diagram.

2.5.15 Update Blood Stock

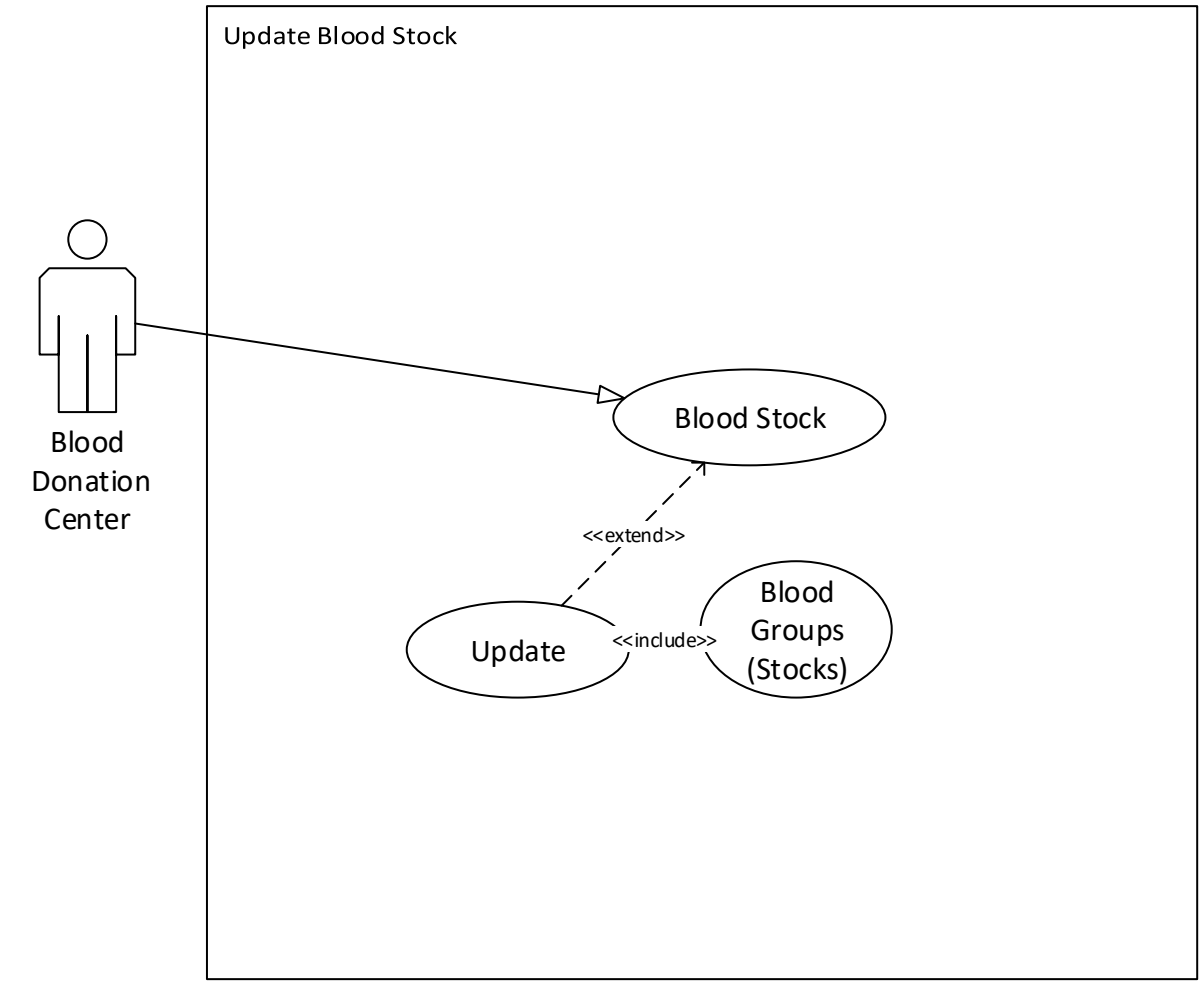

Figure 15: Update Blood Stock Use Case Diagram

2.5.16 Download Appointment Report

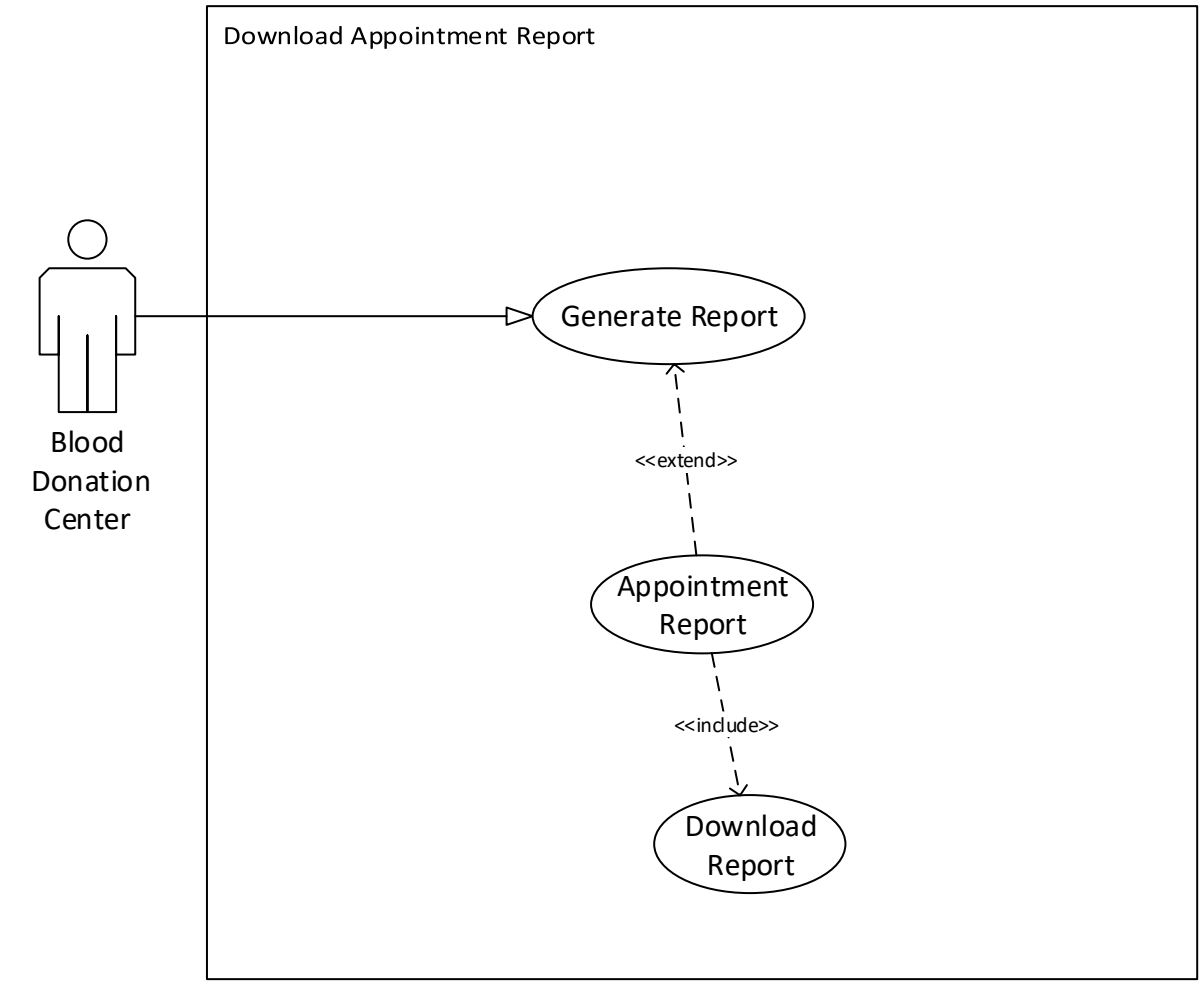

Figure 16: Download Appointment Report Use case Diagram.

2.5.17 Manage NGO’s or Blood Donation Centers

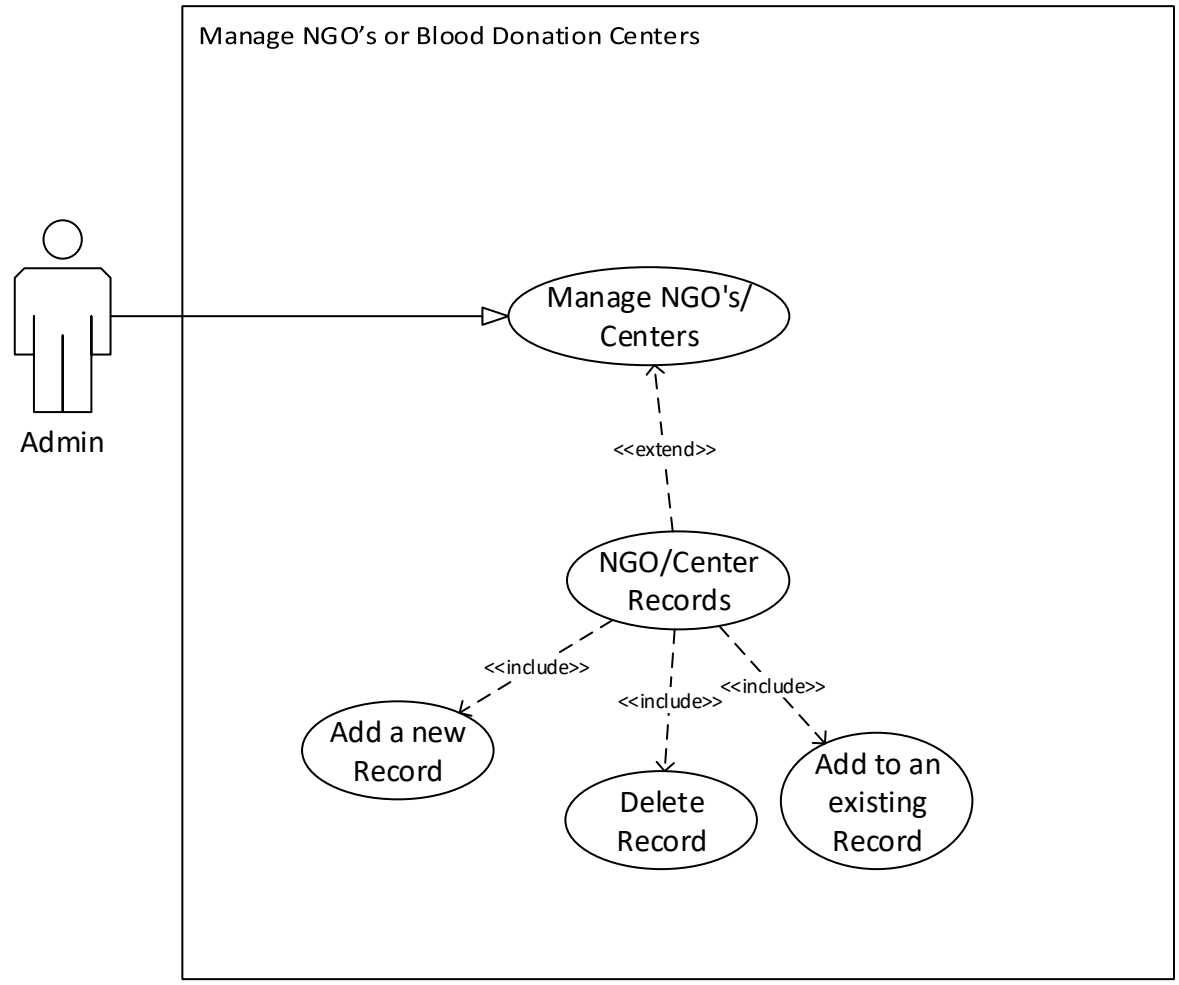

Figure 17: Manage NGO’s or Blood Donation Center’s Usecase Diagram

2.5.18 Manage News

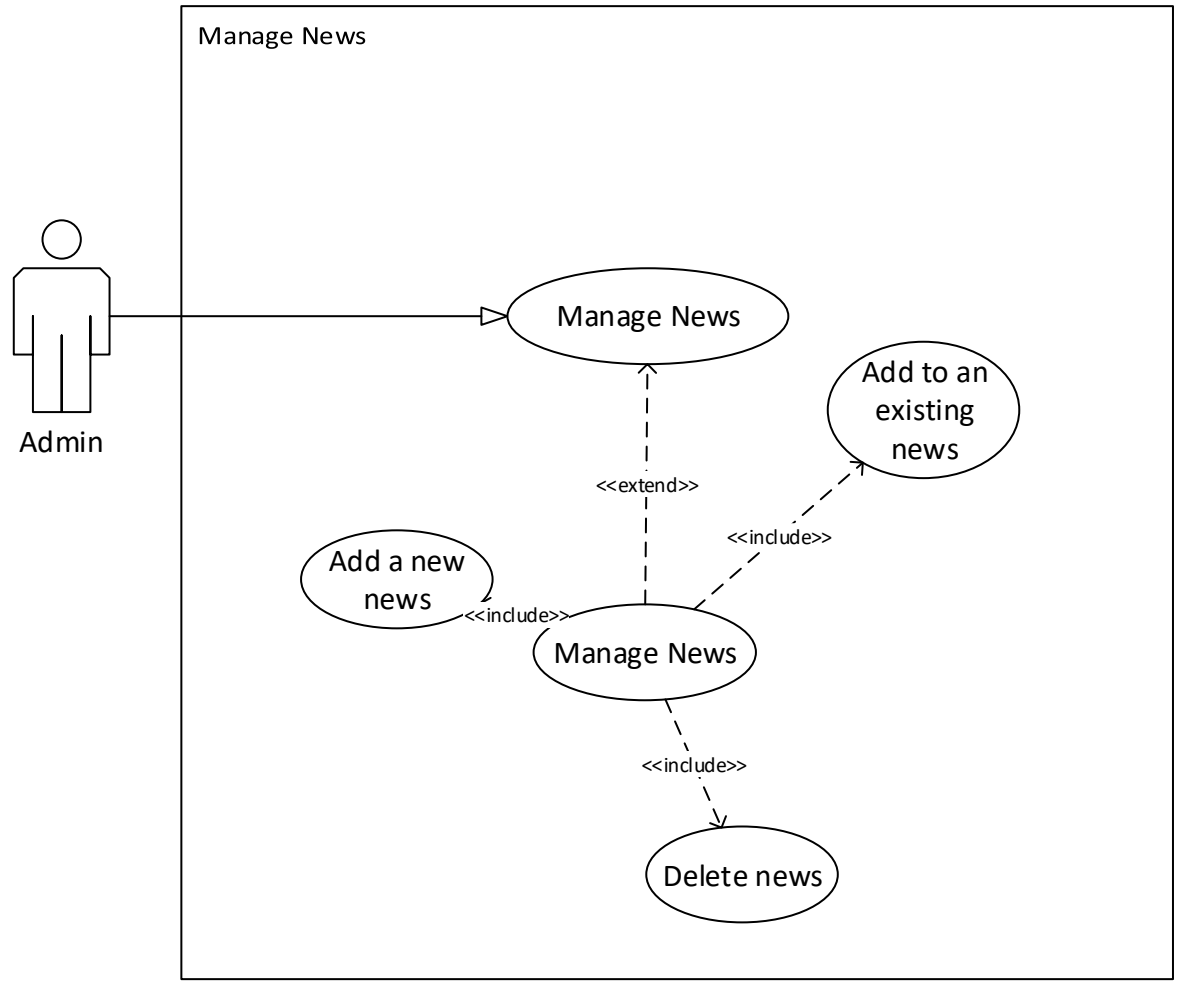

Figure 18: Manage News Use case Diagram.

2.5.19 Handling Blood Requests

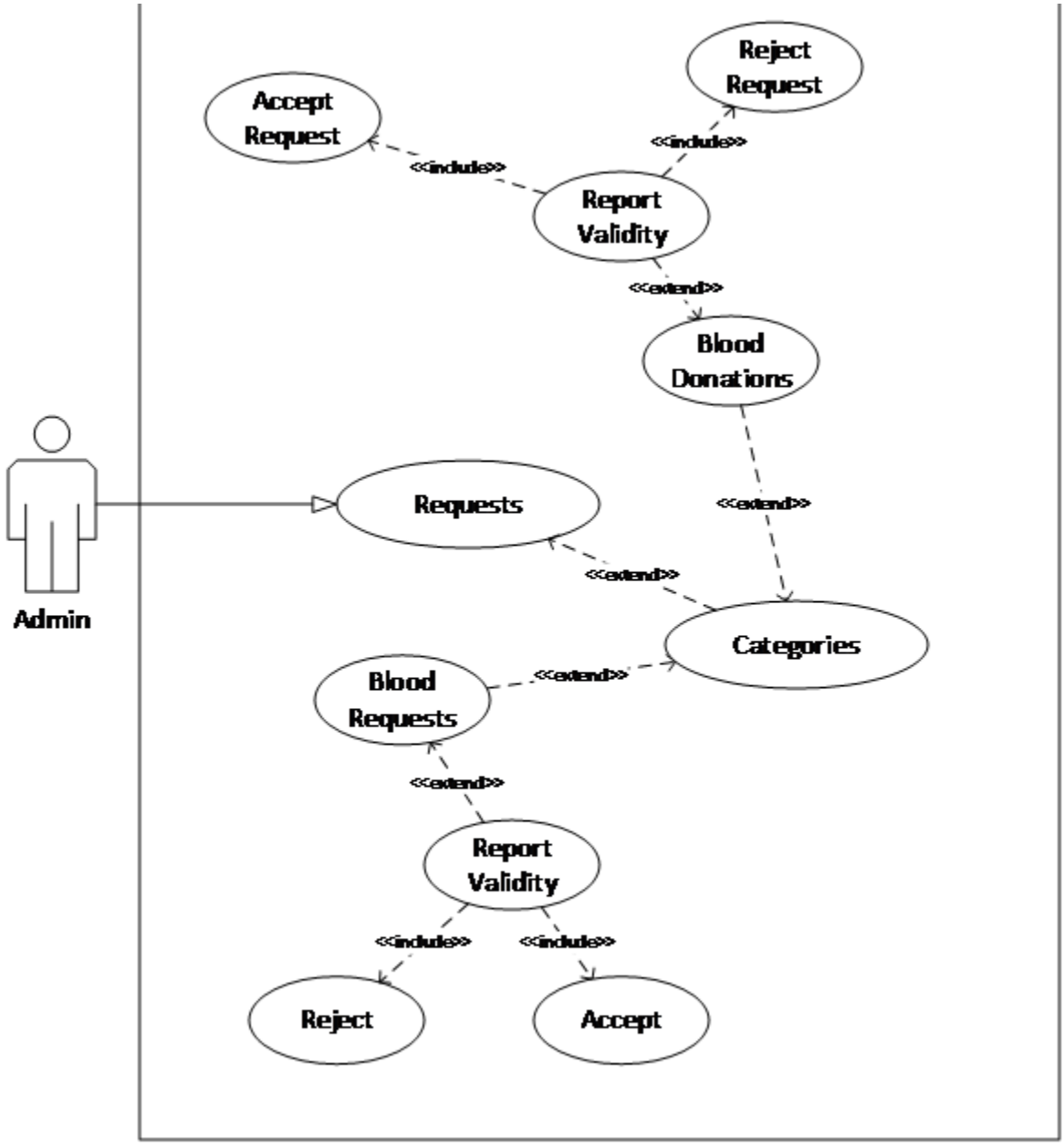

Figure 19: Handling blood requests Use case Diagram.

2.5.20 Manage User's Personal Information

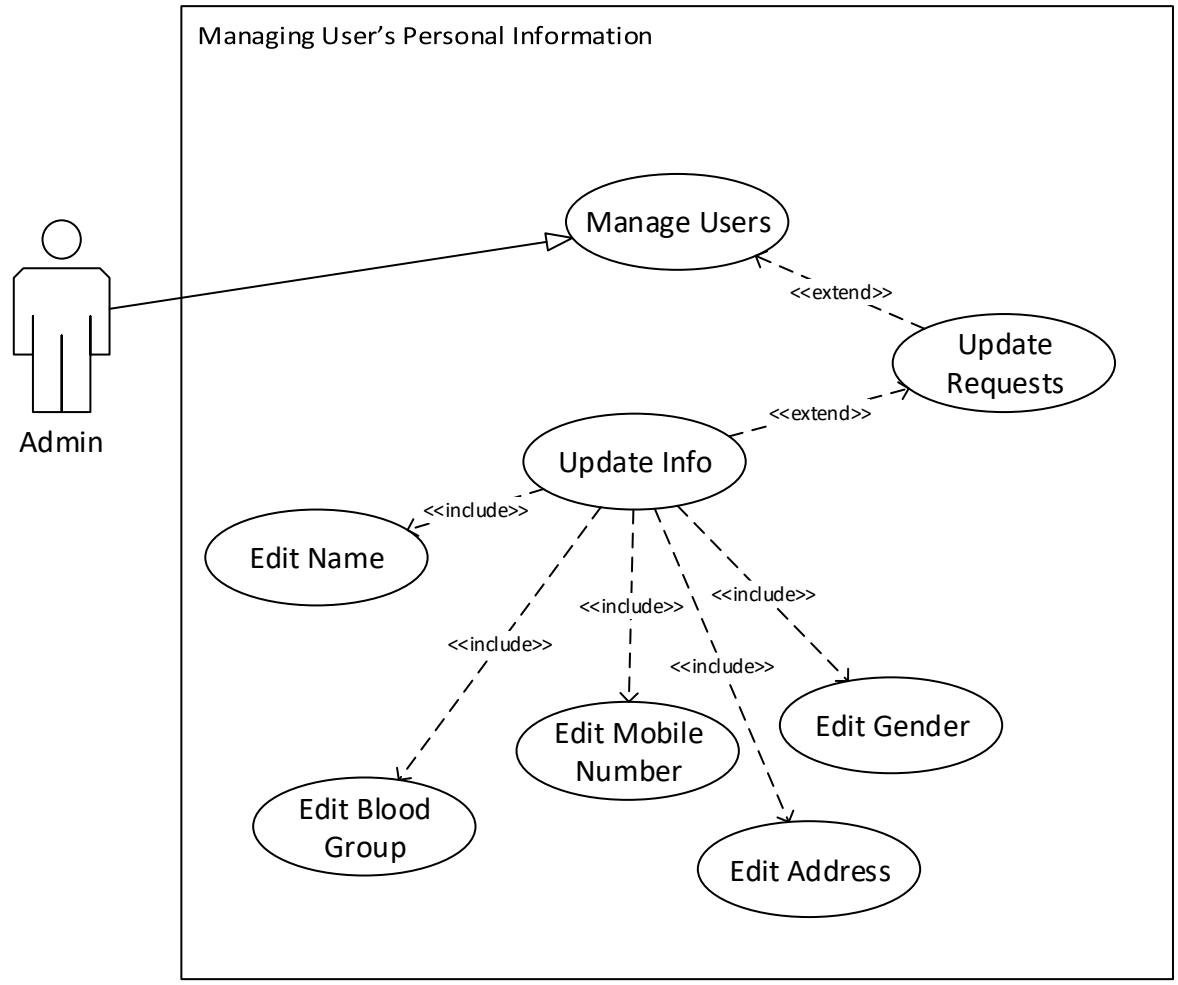

Figure 20: Manage User Personal Information Use case Diagram.

2.5.21 Manage Campaigns

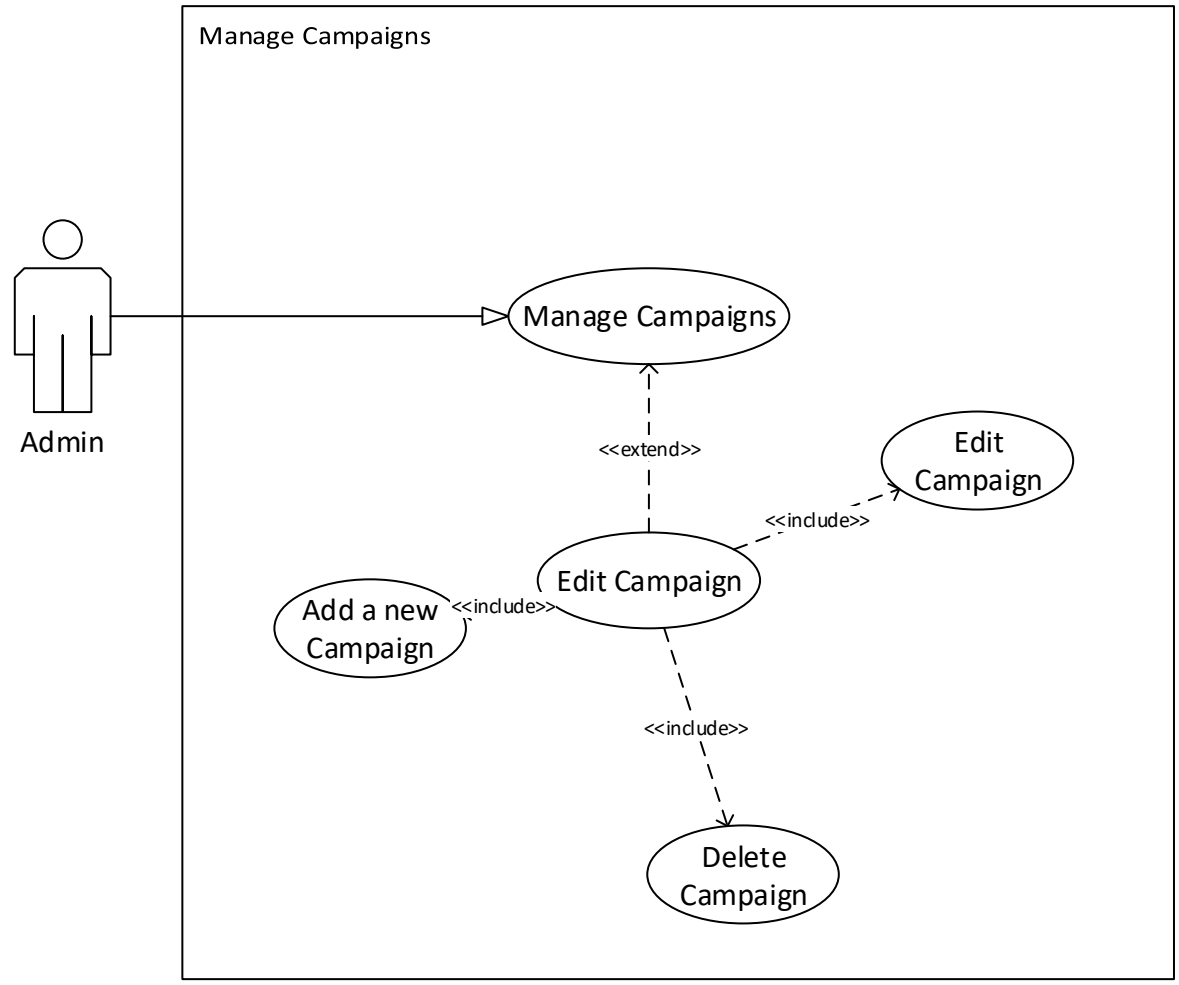

Figure 21: Manage Campaign Use case Diagram.

2.5.22 Manage Donor List

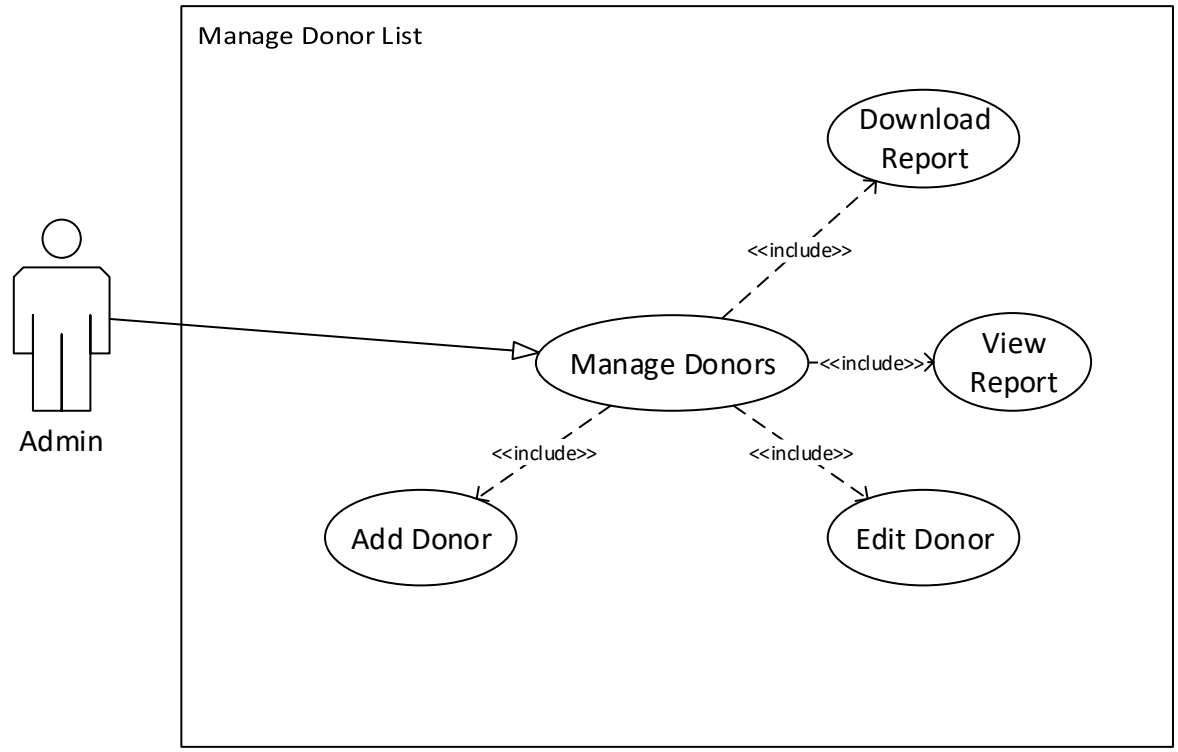

Figure 22: Manage Donor List Use case Diagram.

2.5.23 Manage Sponsors

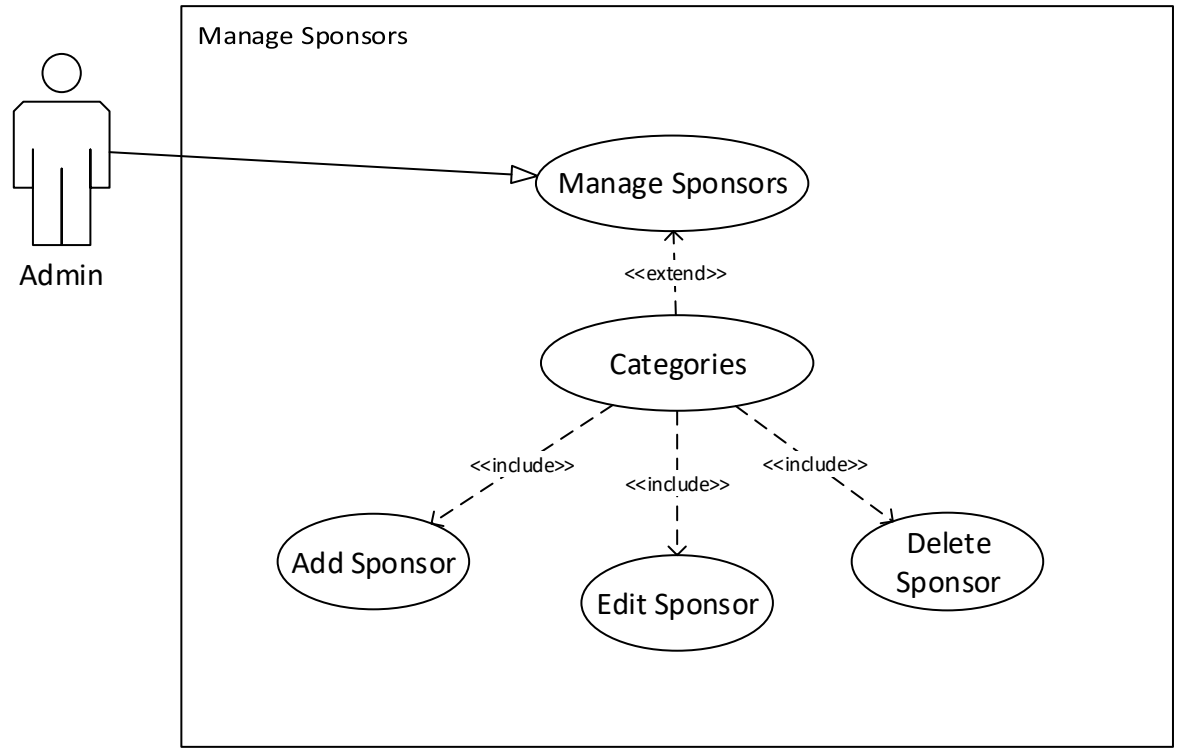

Figure 23: Manage Sponsors Use case Diagram.

2.5.24 Manage Funds

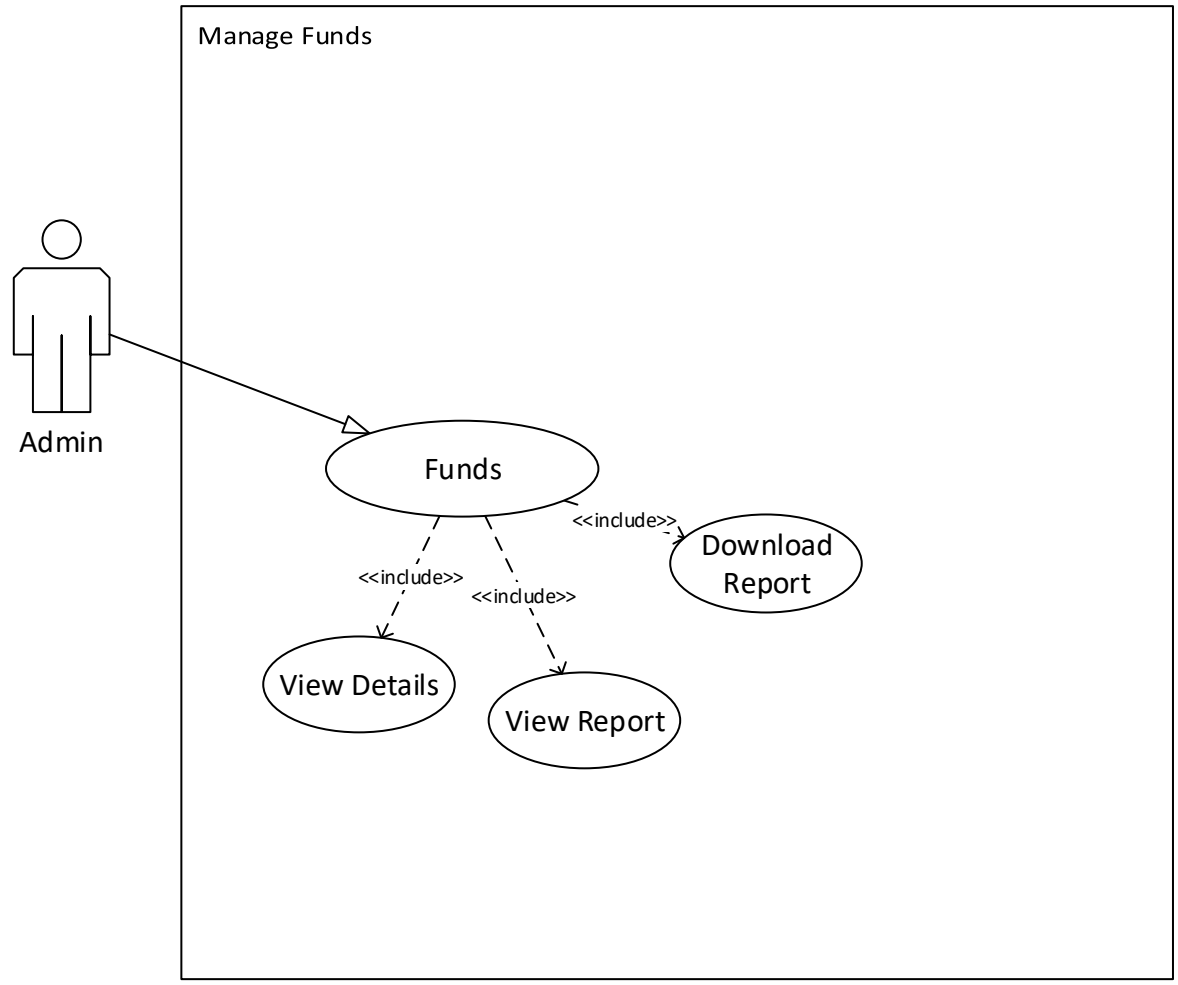

Figure 24: Manage Funds Use case Diagram.

2.5.25 Manage Job Posts

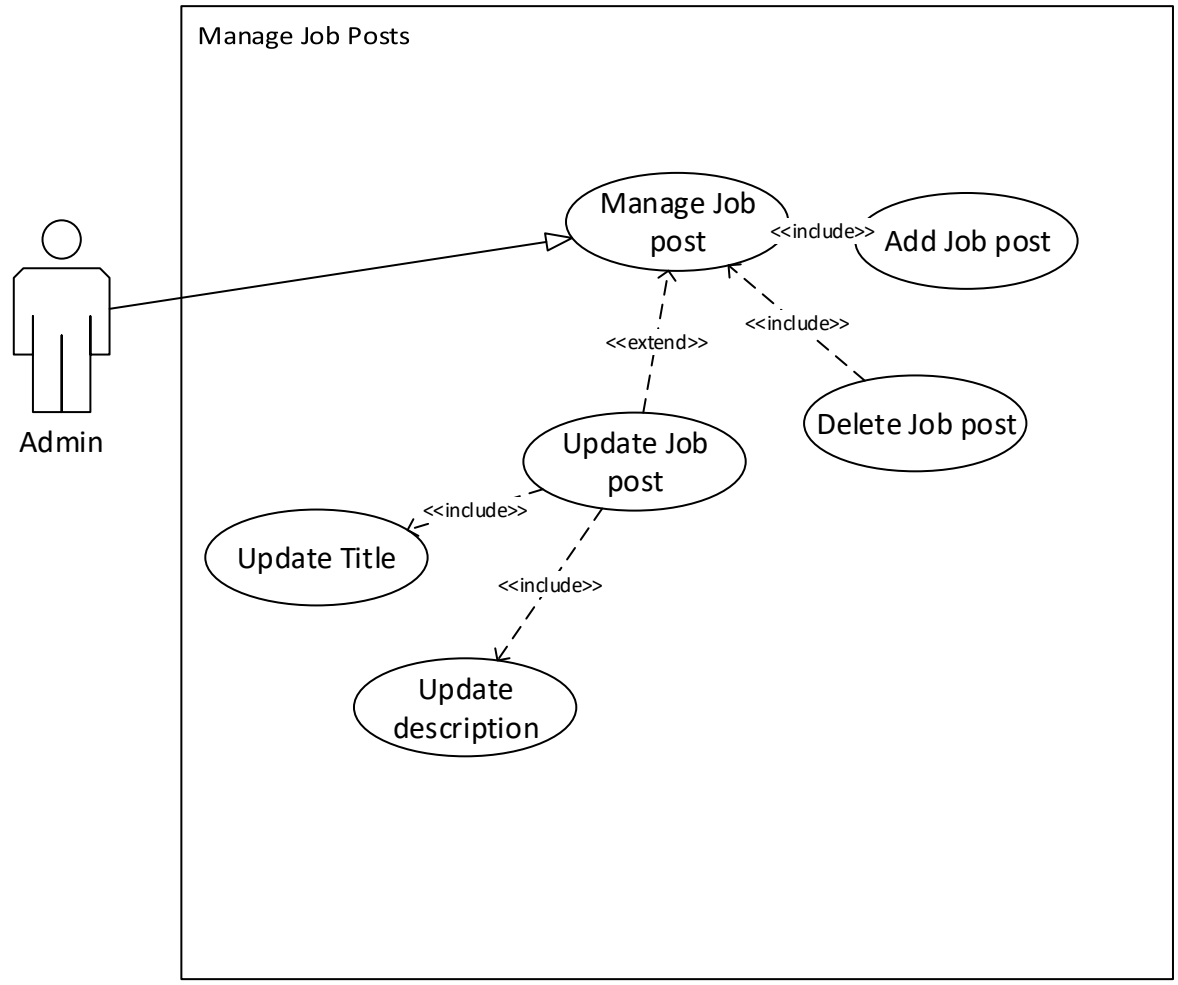

Figure 25: Manage Job Posts Use case Diagram.

2.5.26 Manage Frequently Asked Questions

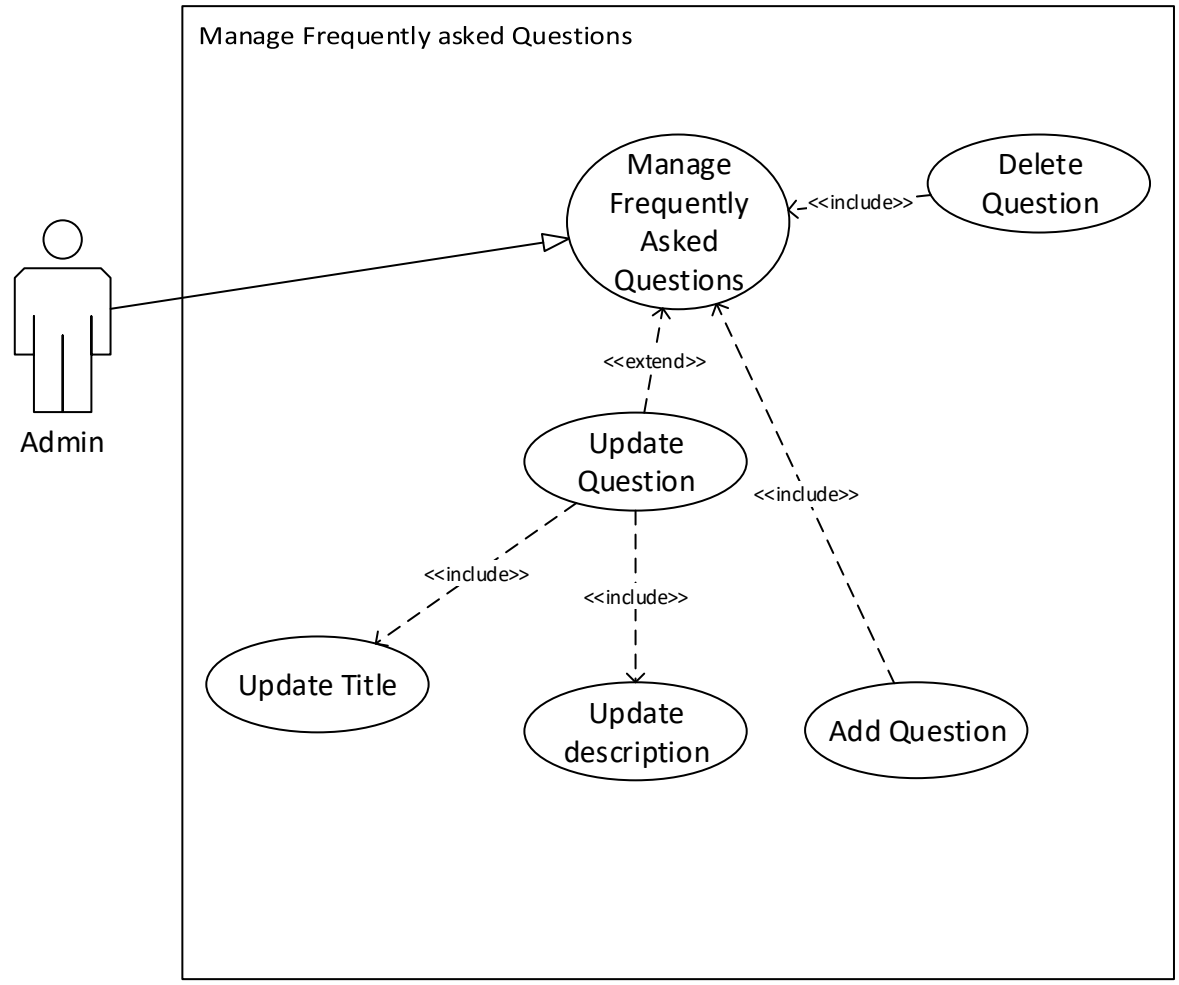

Figure 26: Manage Frequently Asked Questions Use case Diagram.

2.6 Software Development Life Cycle Model

We used agile and prototyping methodologies for our blood donation system. By using the agile model create a system with a continuous iterative and incremental process. Develop our system through divided modules into small chunks. In our system user panel have a blood request module, develop small modules from the blood request module like post blood request, view request makers, search request makers, etc. Similarly, for other modules like making blood donations, checking the eligibility of users for blood donation, make an appointment in available blood donation Center's. Then test every module and improve at each iteration.

Through the prototyping model, create a clear picture of the modules of our system that help in the development phases. By using prototyping, we can easily find the missing functionalities in the modules and what functionalities performed in the future development phases.

We choose the Agile methodology for the project because:

- It is fast and effective development.
- Through this methodology divided big problems into smaller chunks and sprints.
- The maximum number of requirements is clear and understood.
- Testing is performed continuously on each iteration in each development phase.
- Continuously improves features and product quality.
- Make the project visible at any time.
- Reduce errors and bugs due to finding mistakes in the early stages.

3. Chapter 3: System Design

3.1 Work Breakdown Structure (WBS)

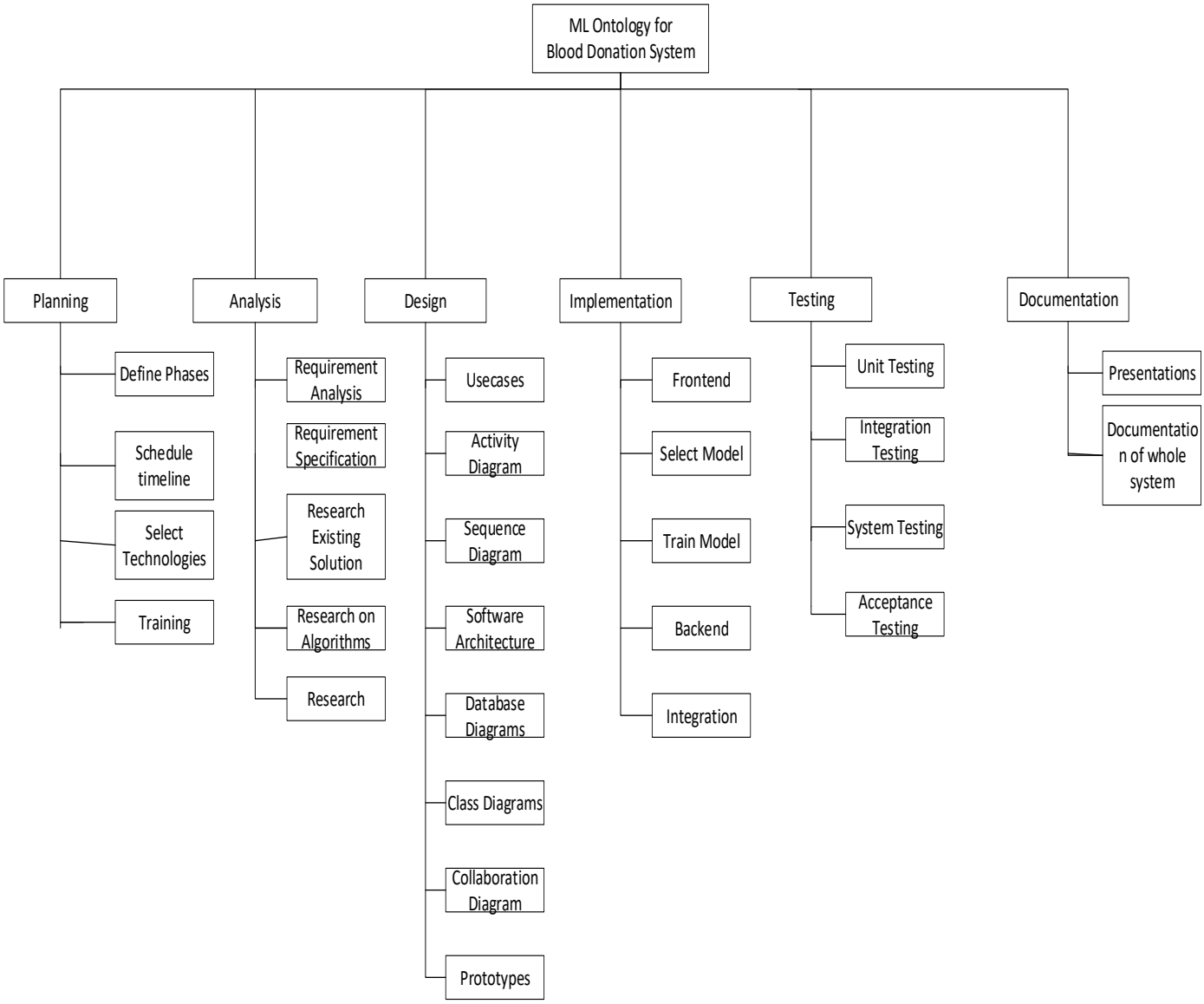

Figure 27 Work Breakdown structure

3.2 Activity Diagram

3.2.1 Login

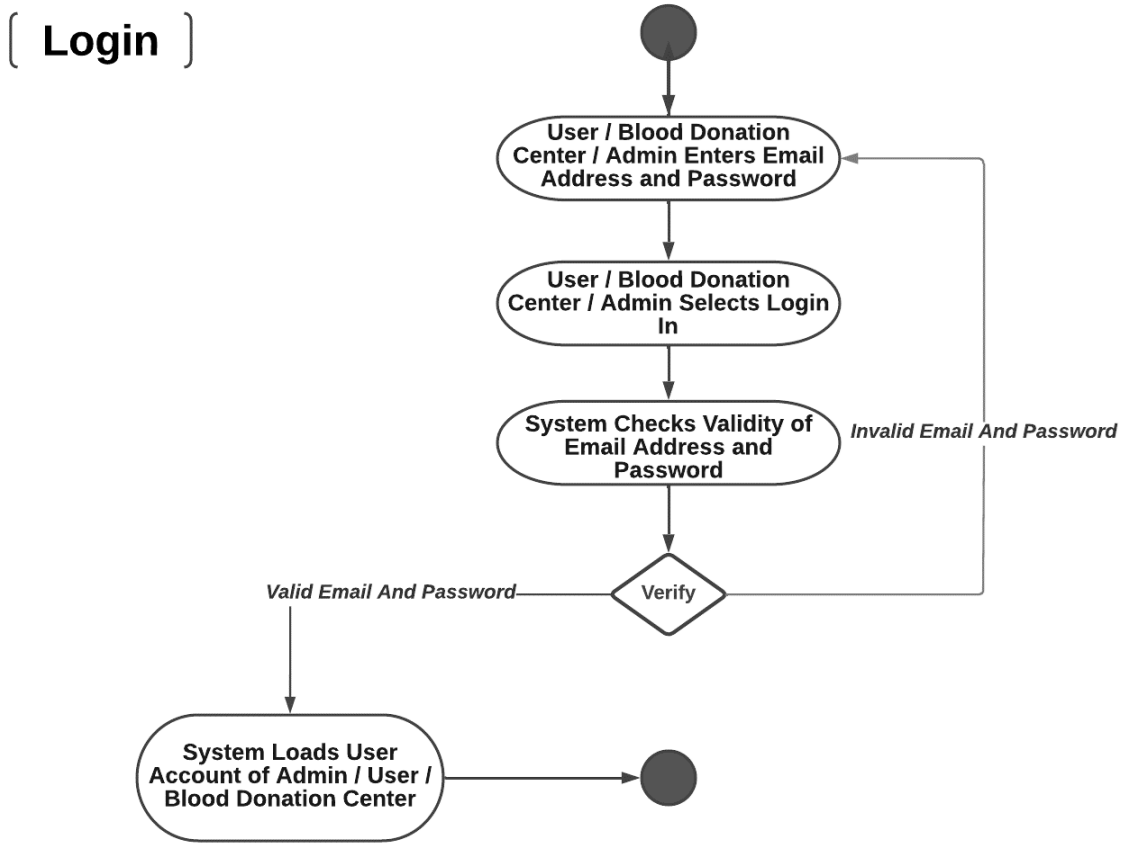

Figure 28: Login

3.2.2 Registration

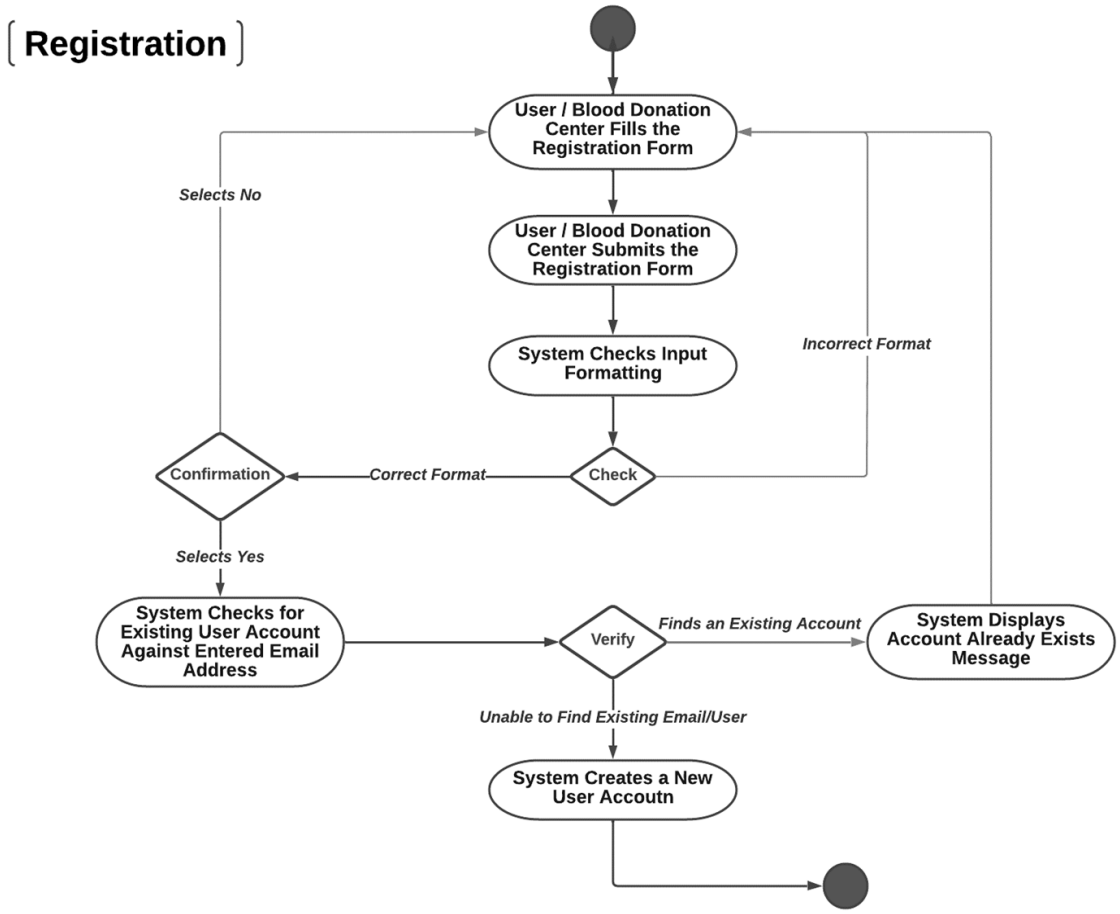

Figure 29: Registration

3.2.3 Make the Request for Blood

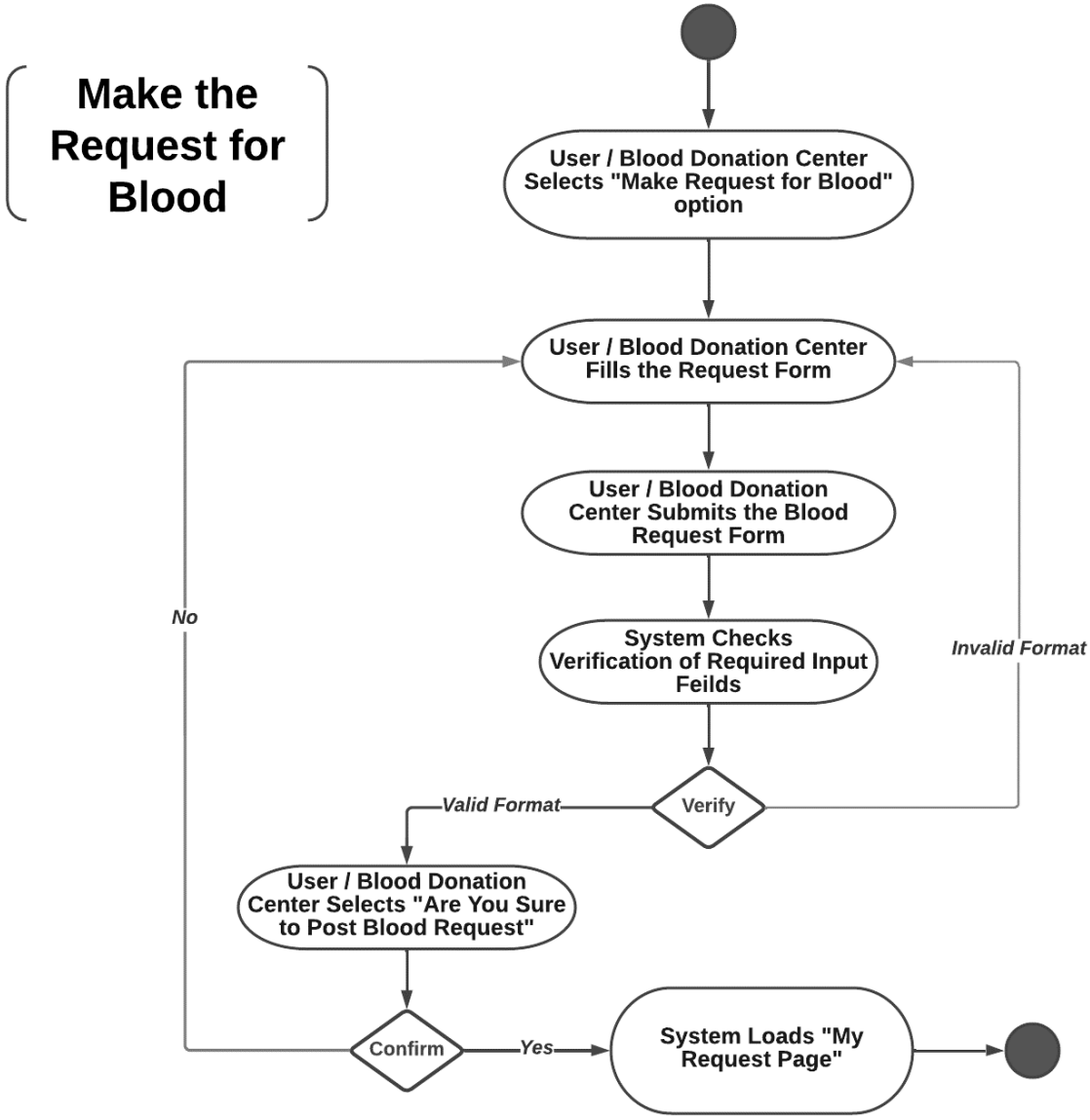

Figure 30: Make the Request for Blood

3.2.4 Donate Blood

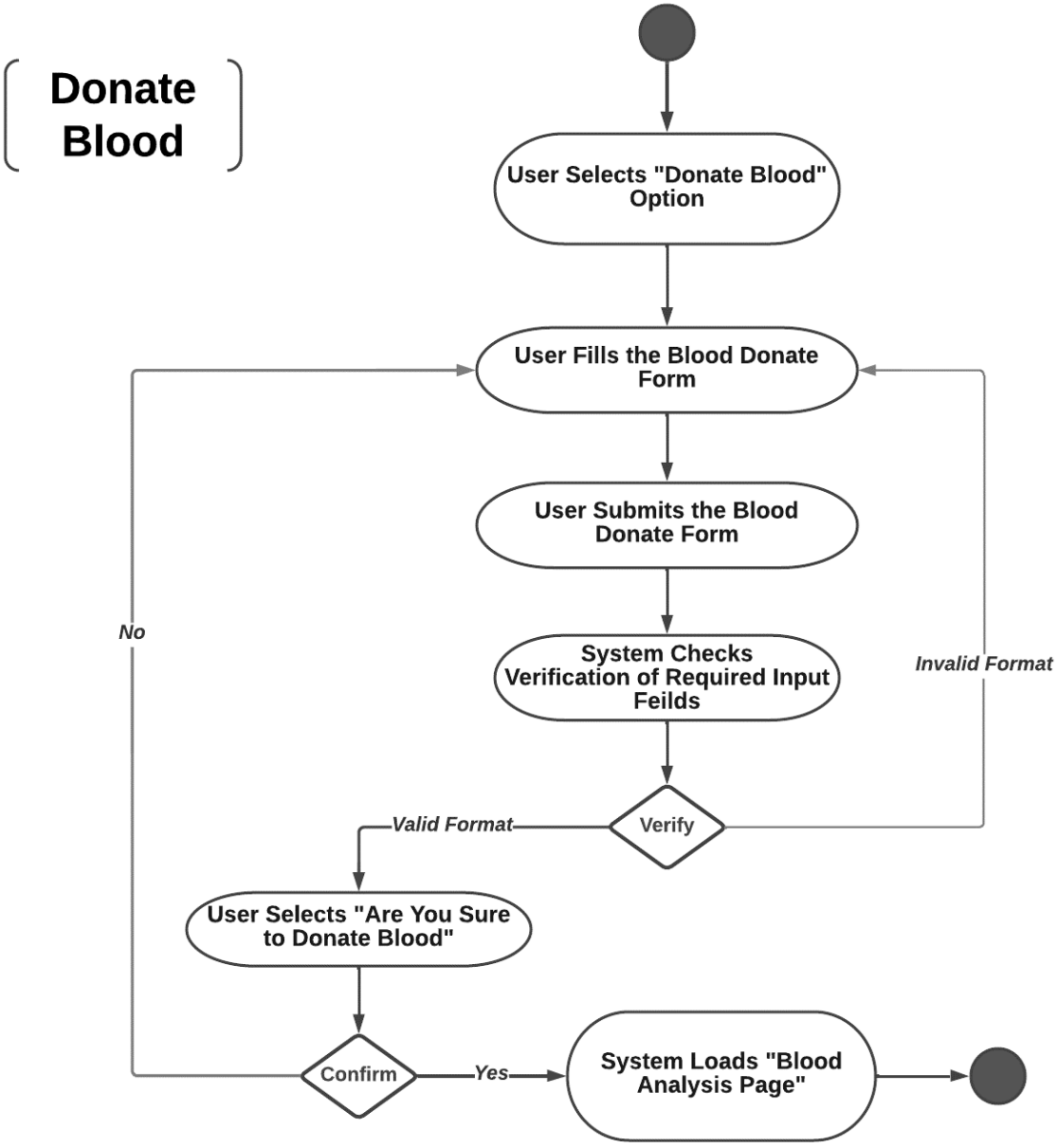

Figure 31: Donate Blood

3.2.5 Check Eligibility of User for Blood Donation

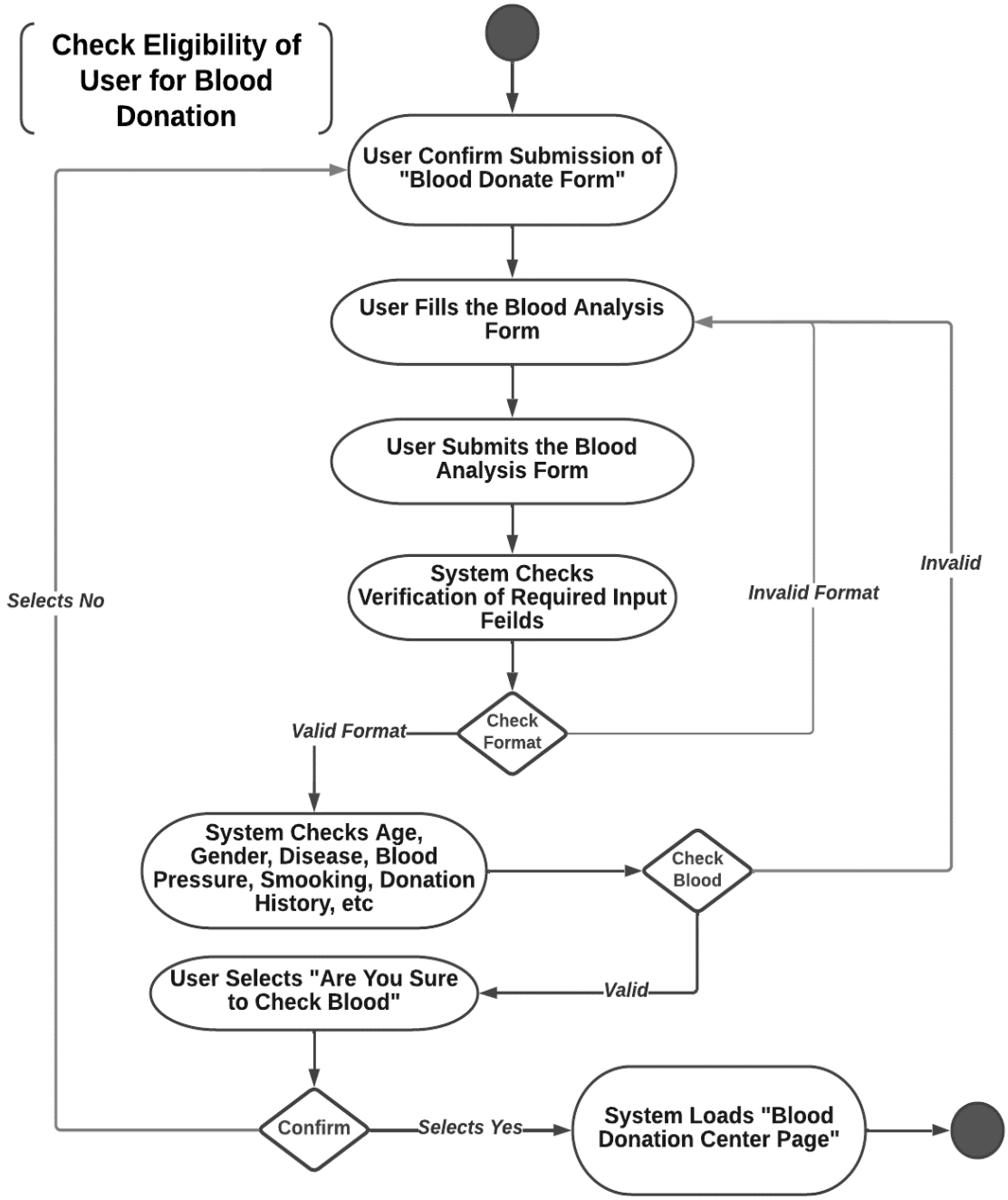

Figure 32 : Check Eligibility of User for Blood Donation

3.2.6 View Blood Donation Center's

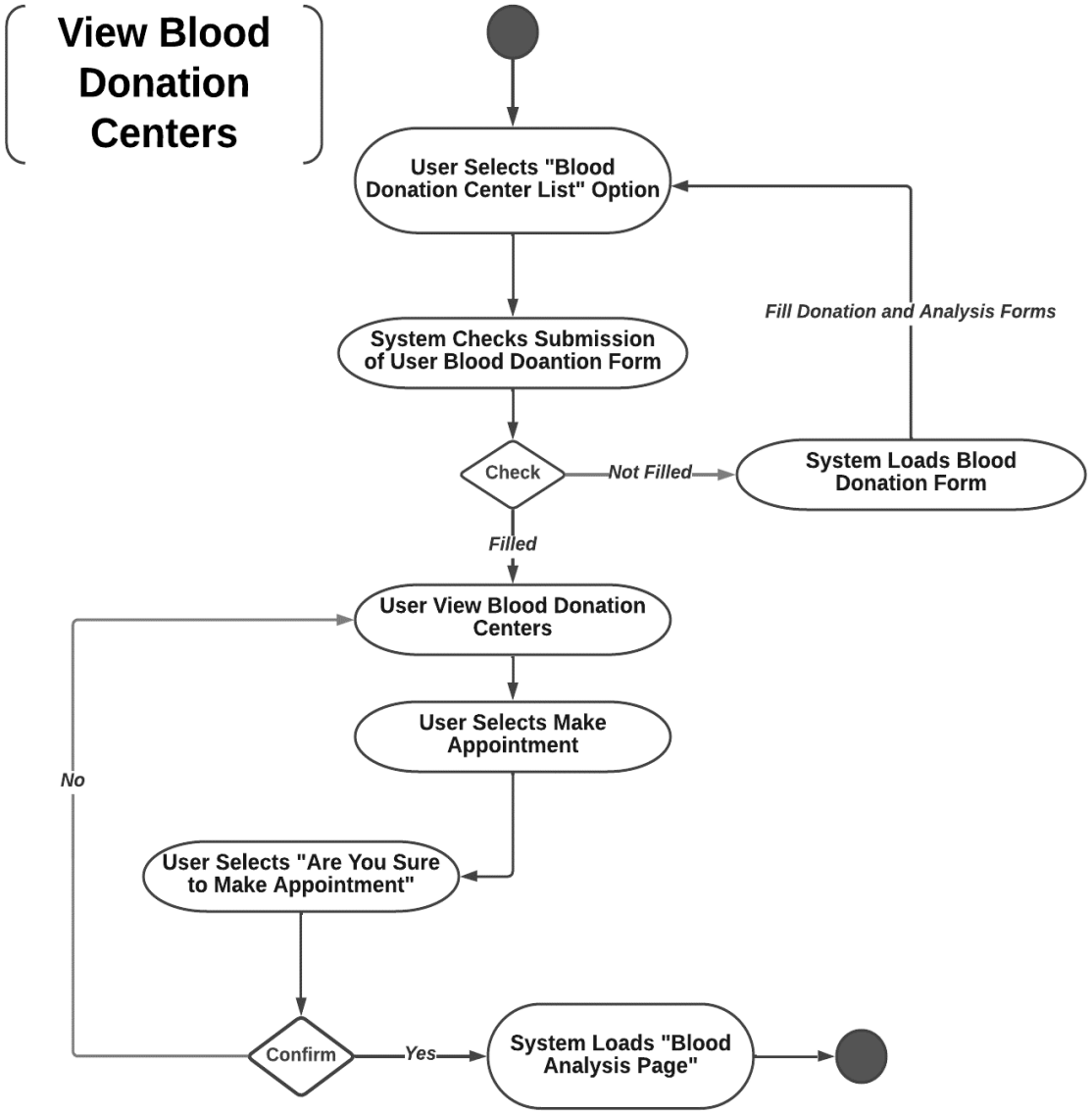

Figure 33 View Blood Donation Center's

3.2.7 Generate Appointment Report

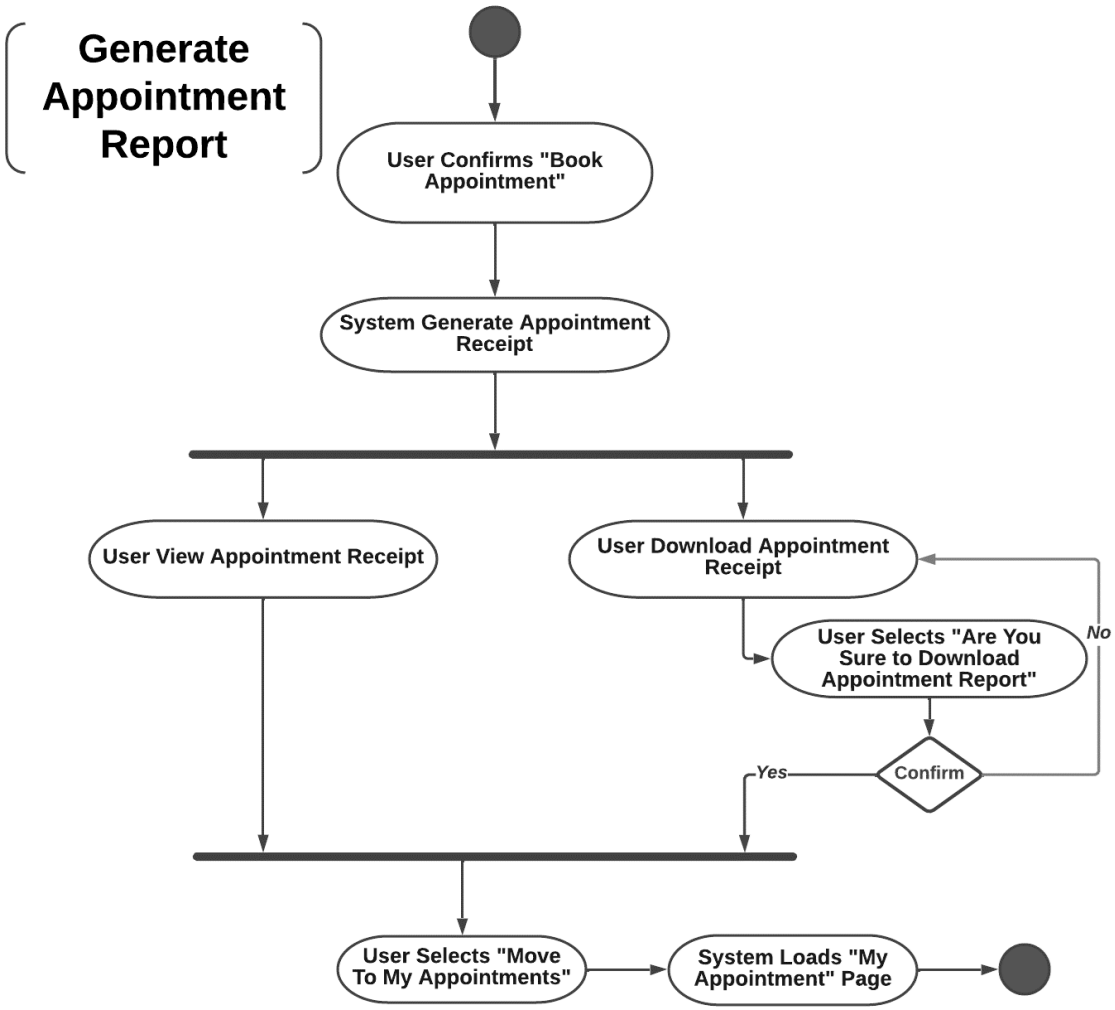

Figure 34 Generate Appointment Report

3.2.8 Display User Profile

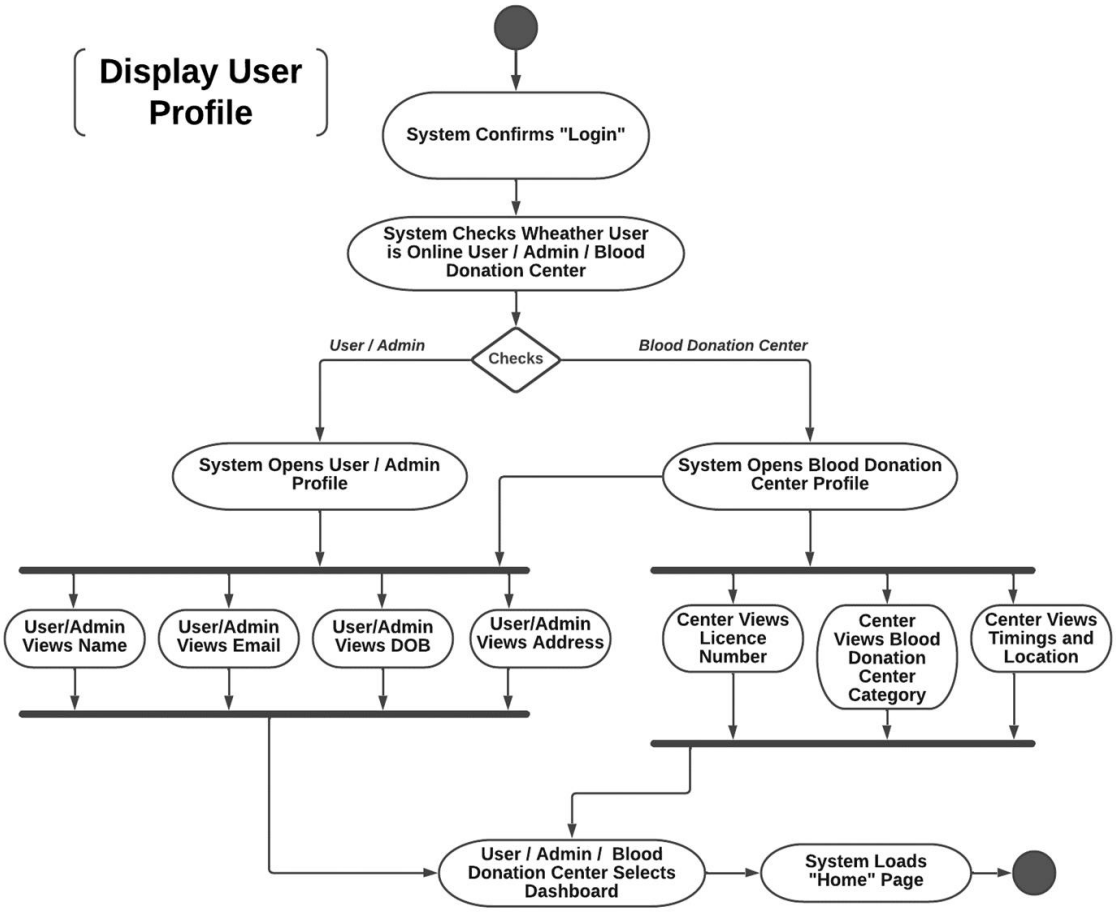

Figure 35 Display User Profile

3.2.9 View Blood Requests

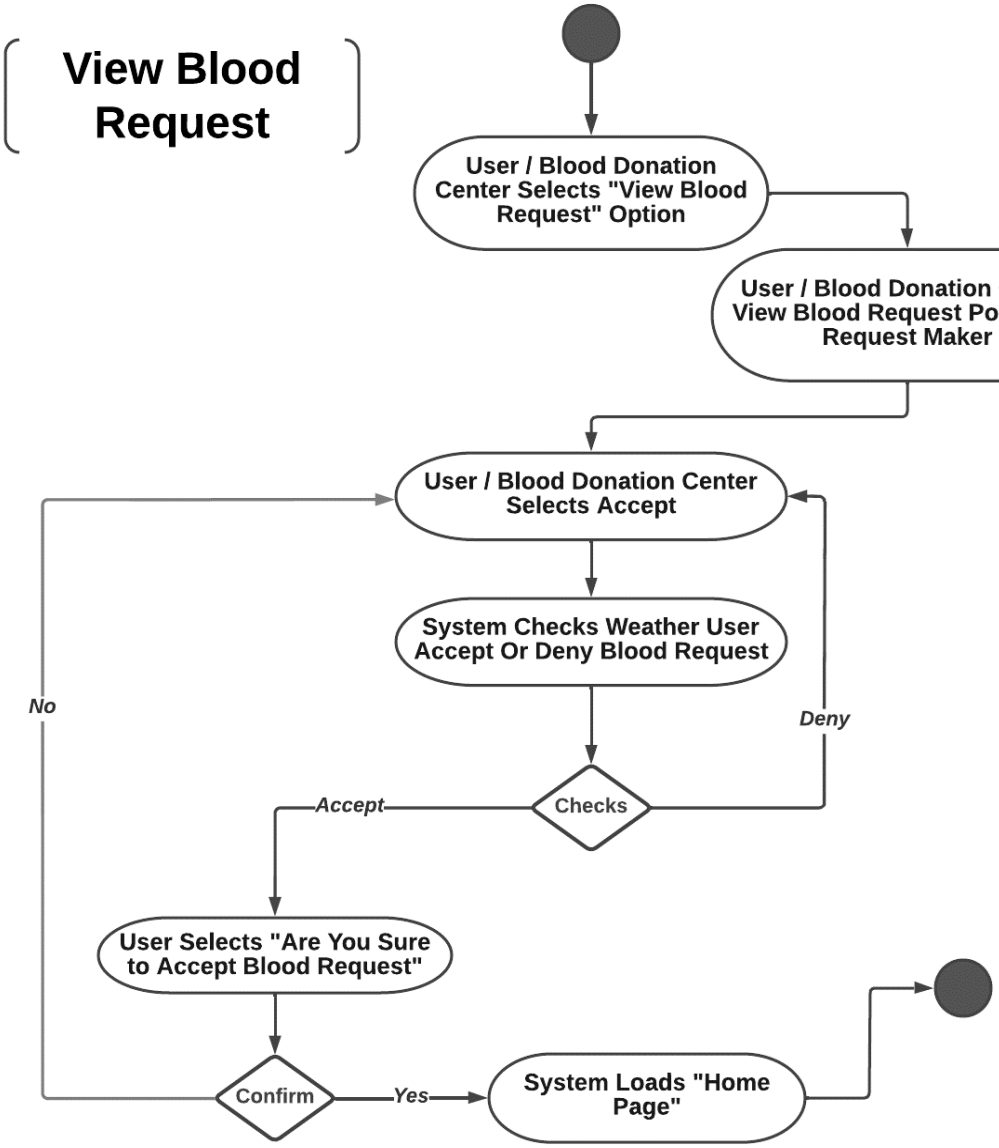

Figure 36 View Blood Requests

3.2.10 Update Personal Information

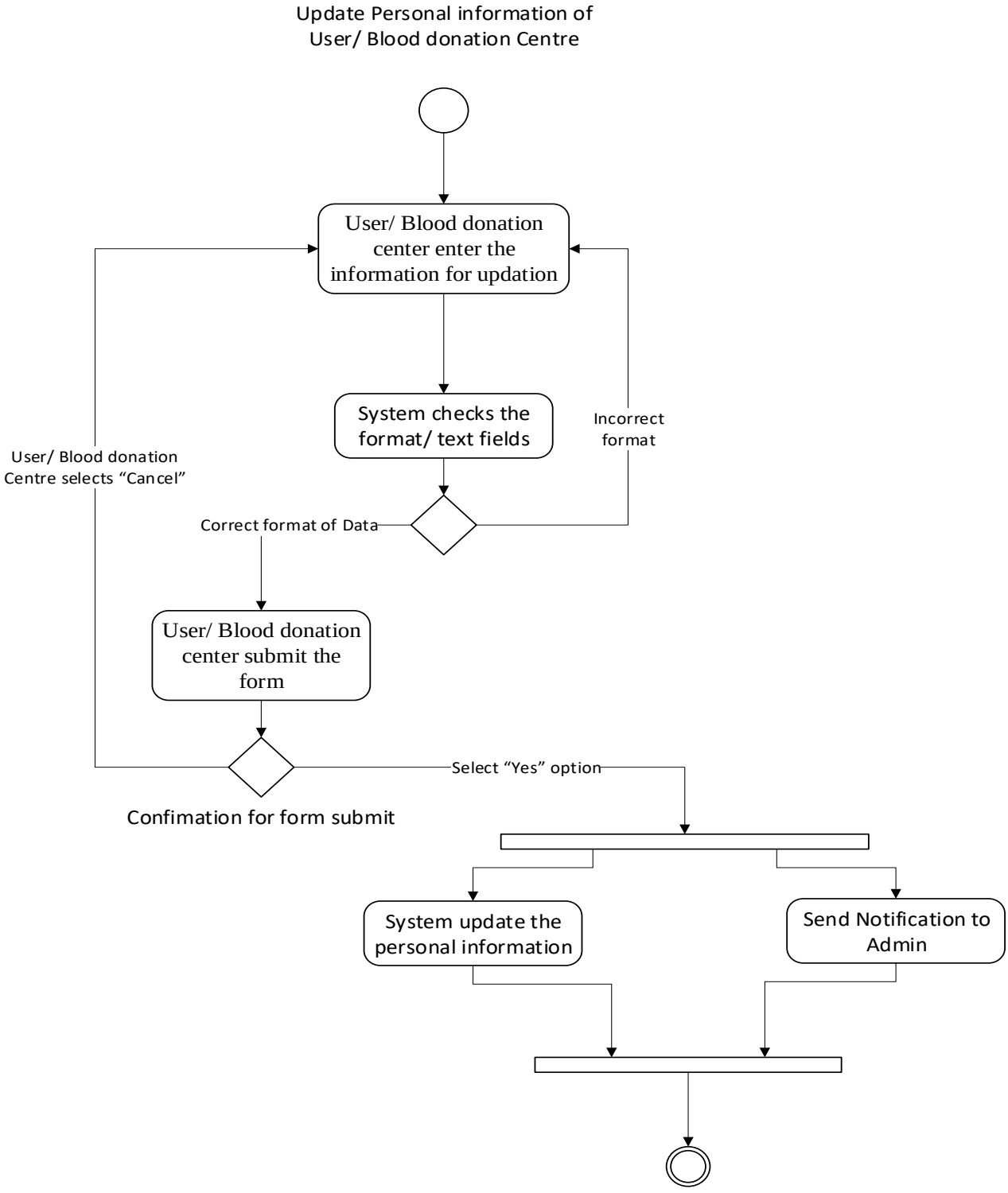

Figure 37 Update Personal Information

3.2.11 Delete Personal Information

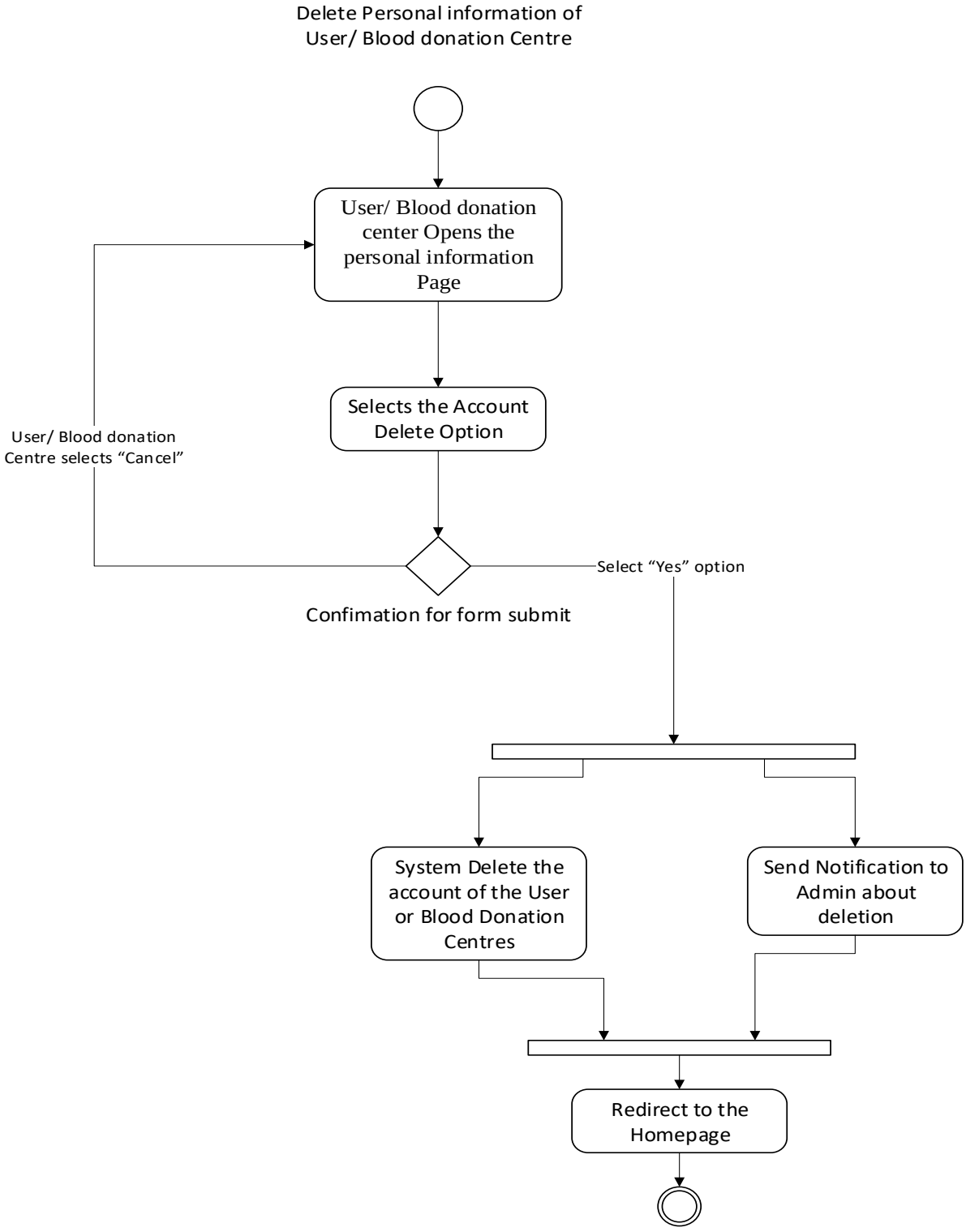

Figure 38 Delete Personal Information

3.2.12 Get User Feedback

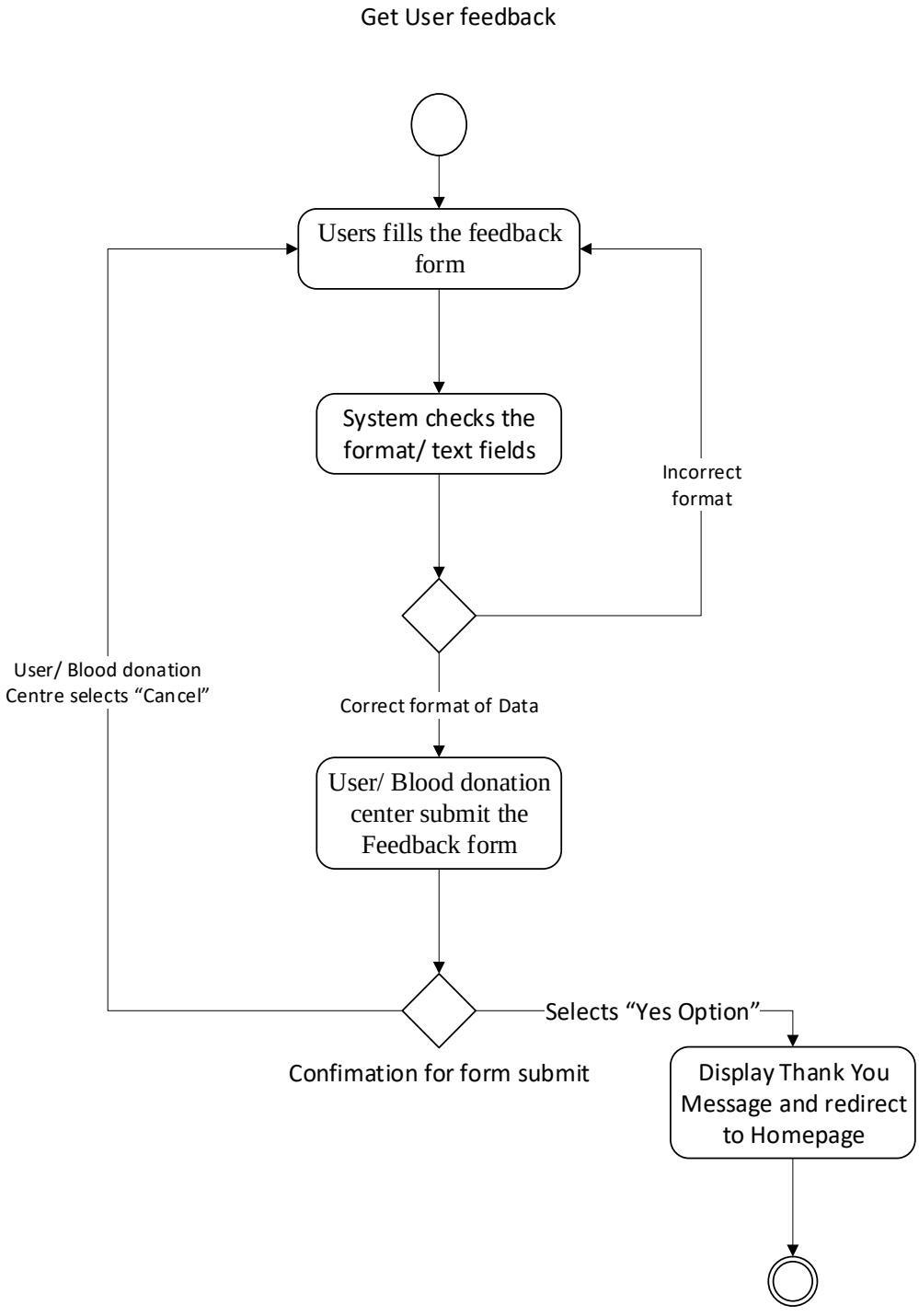

Figure 39 Get User Feedback

3.2.13 Add User Information

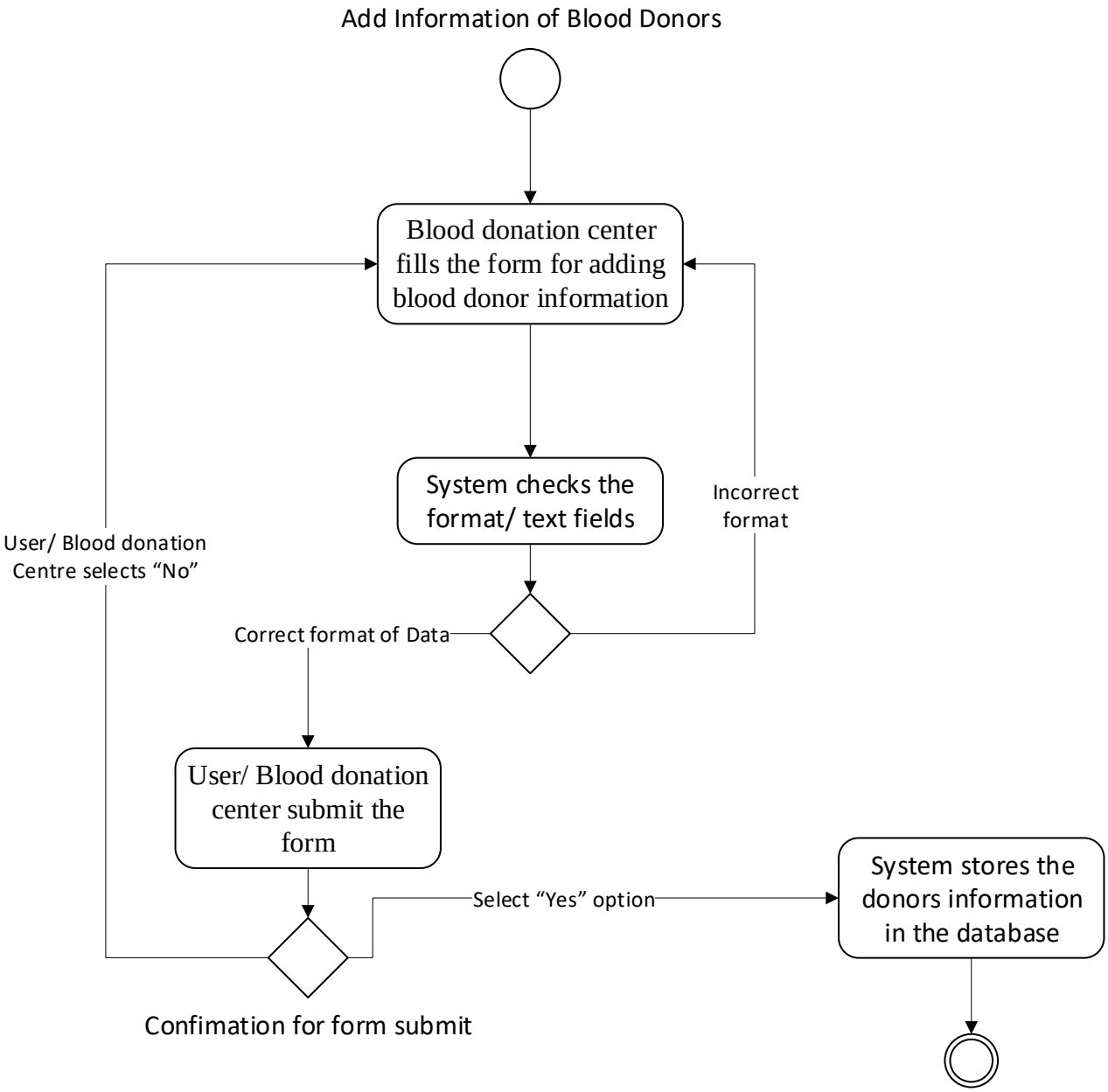

Figure 40 Add User Information

3.2.14 Generate Report on Blood Stocks

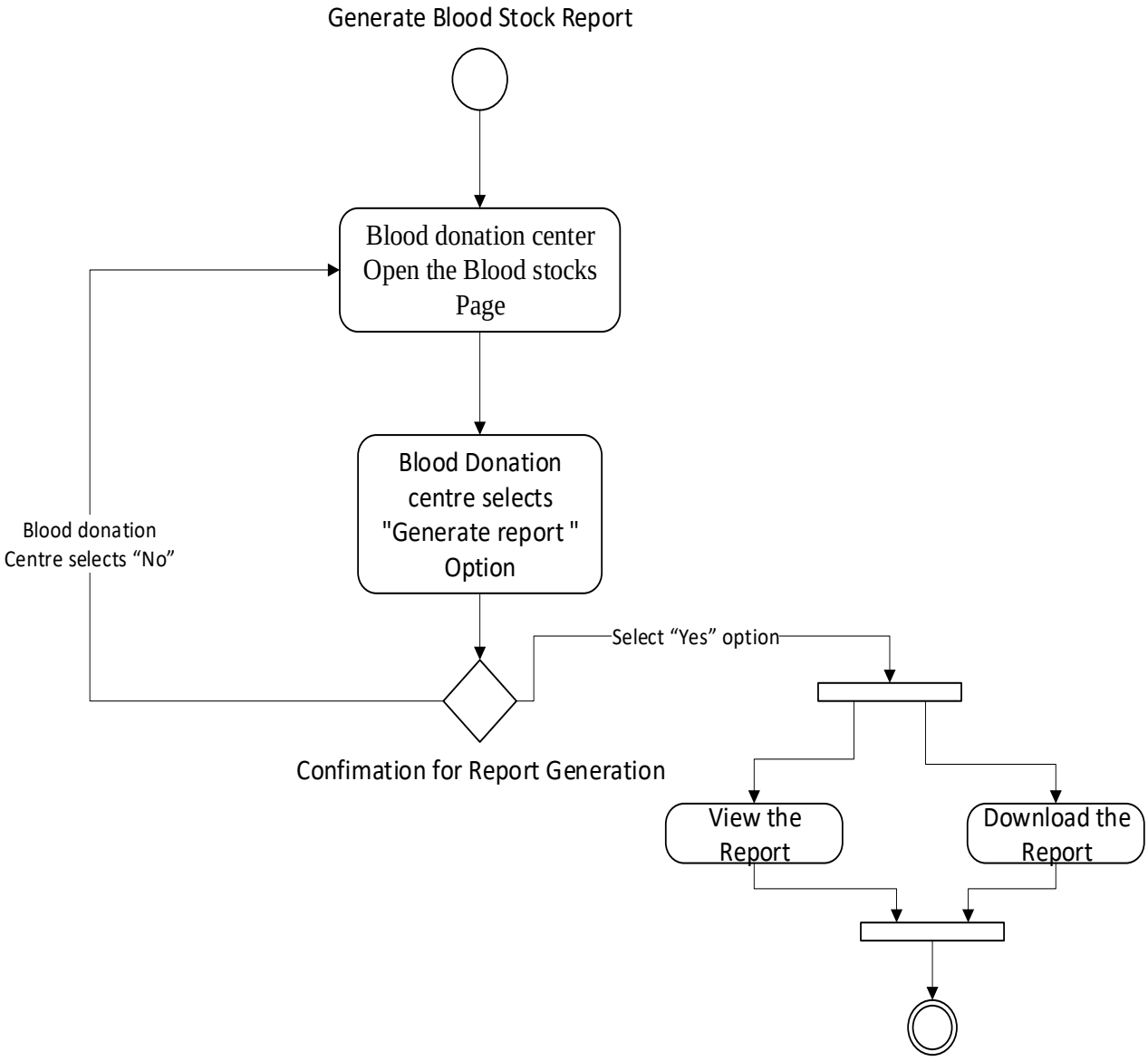

Figure 41 Generate report of Blood Stock

3.2.15 Update Blood Stock

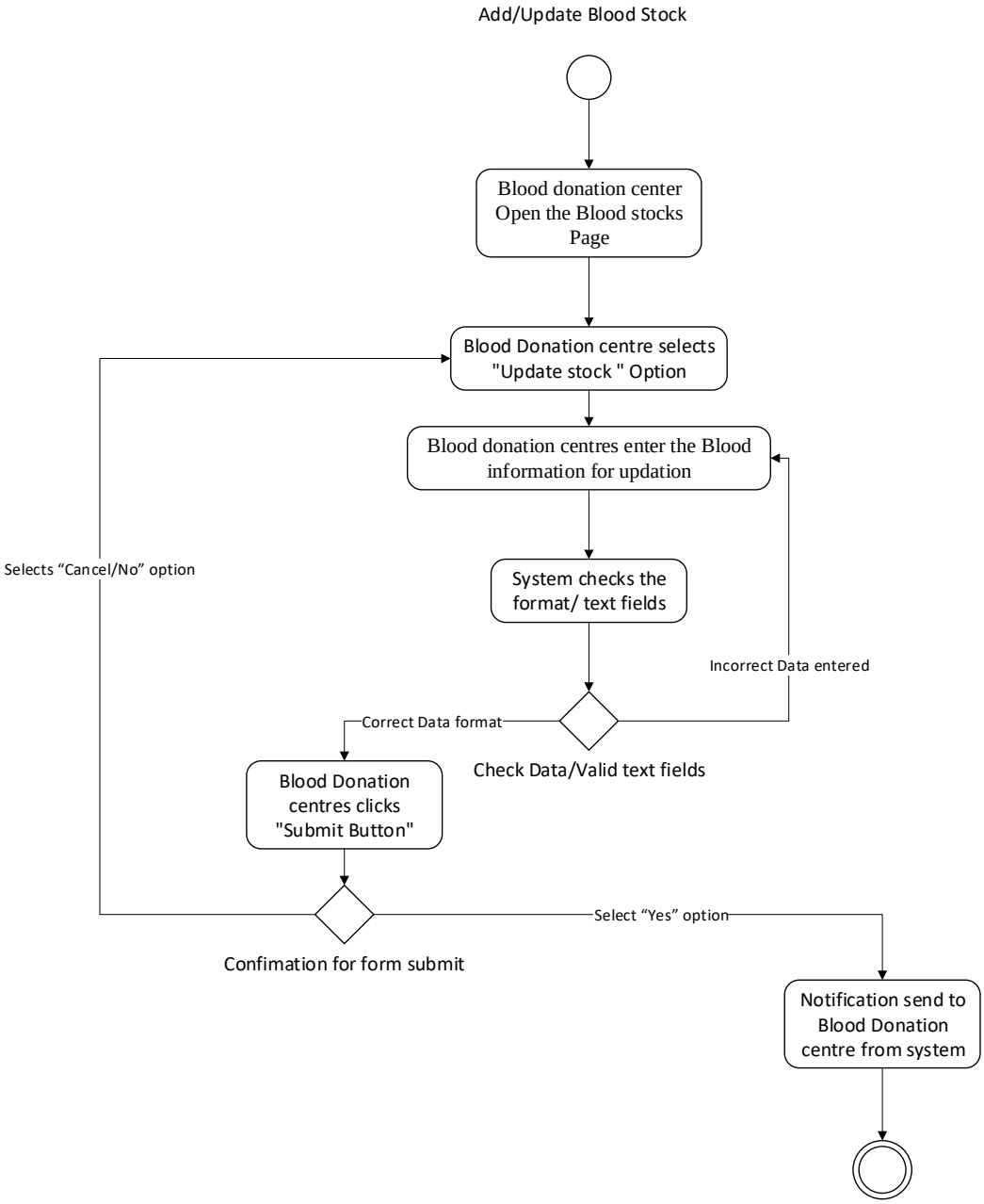

Figure 42 Update blood Stock

3.2.16 Download Weekly/Monthly Appointment Report

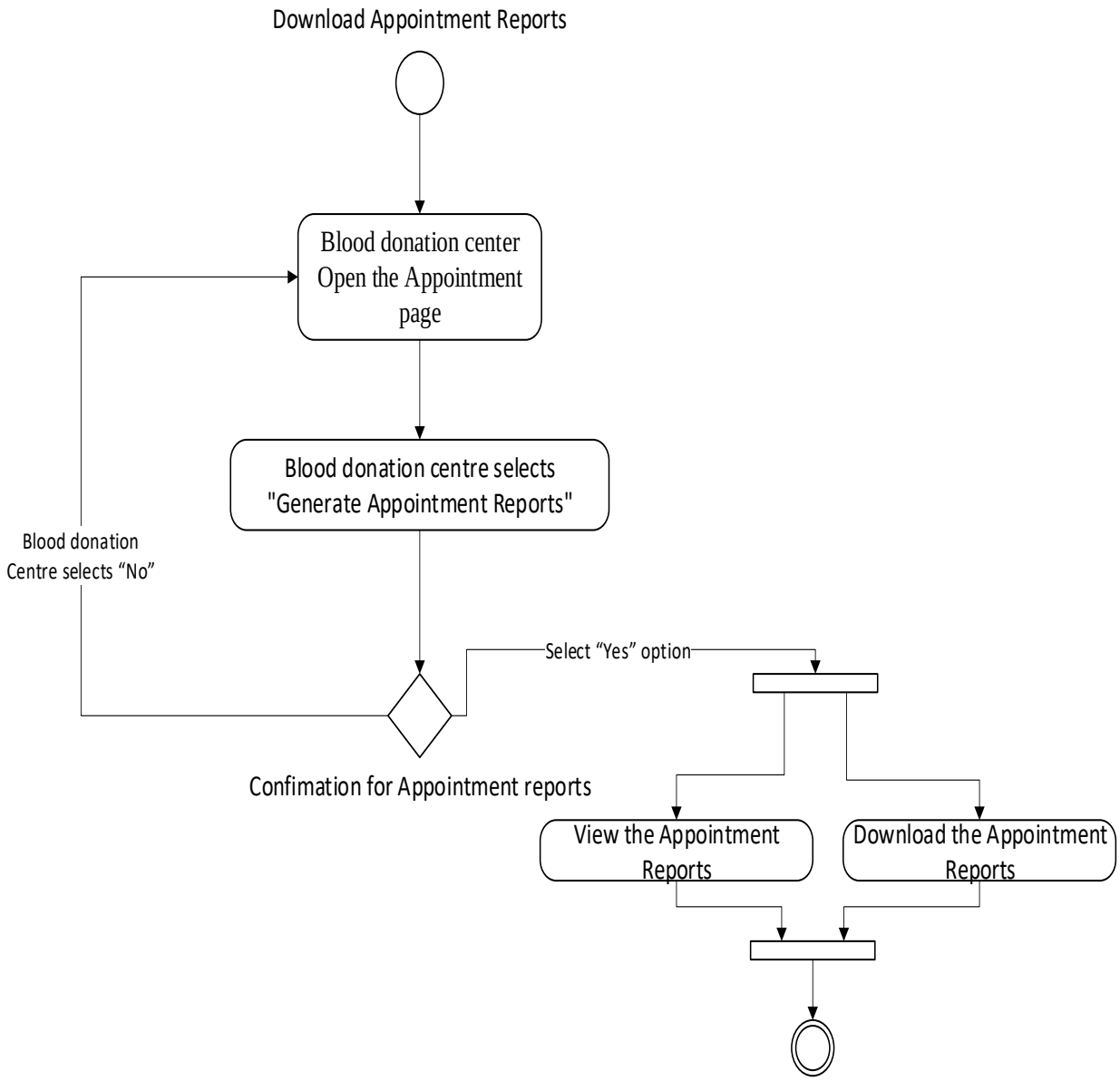

Figure 43 Download weekly Appointment Reports

3.2.17 Manage NGOs or Blood Donation Center's

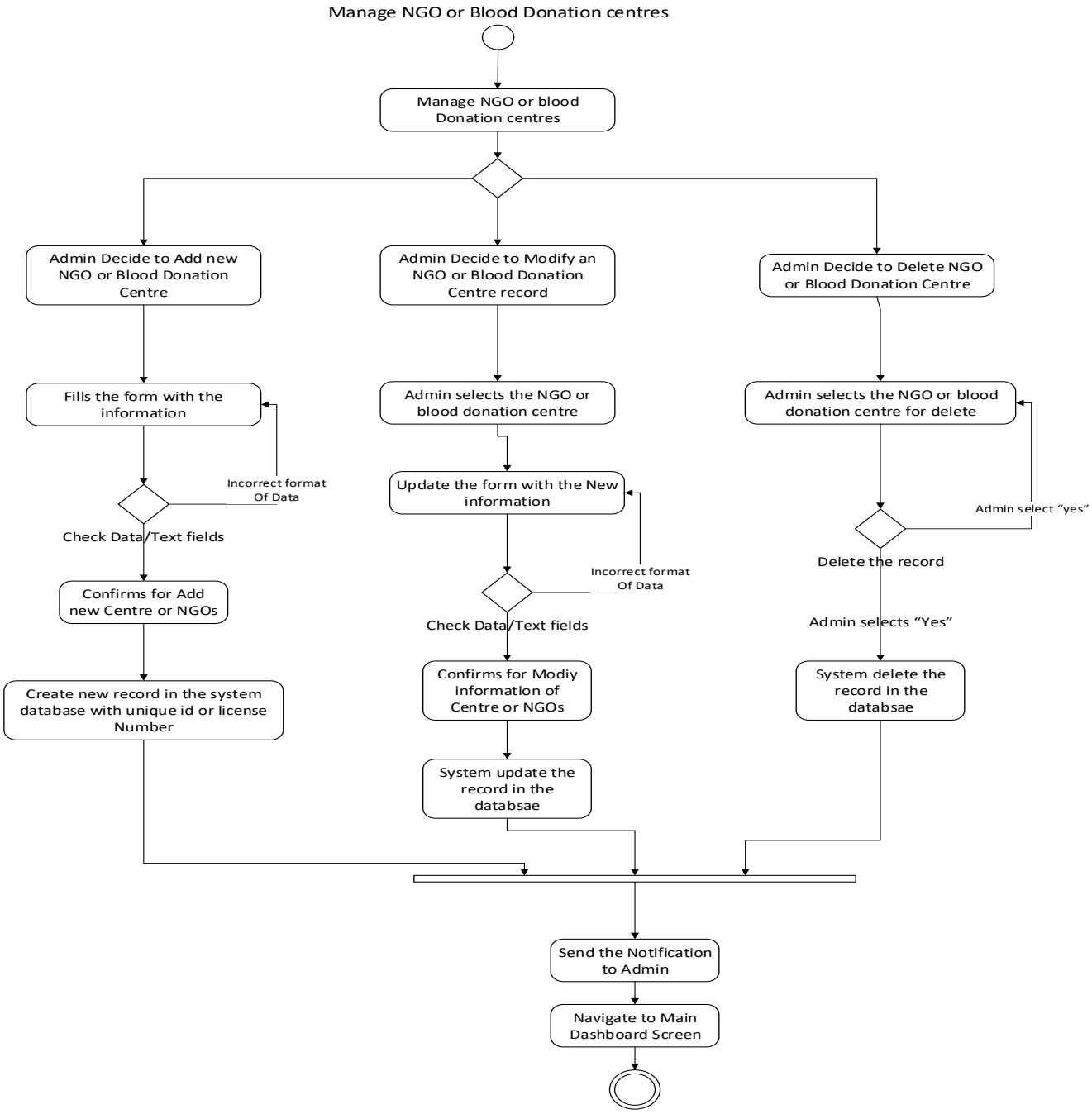

Figure 44 Manage NGO or blood Donation Center requests.

3.2.18 Add News

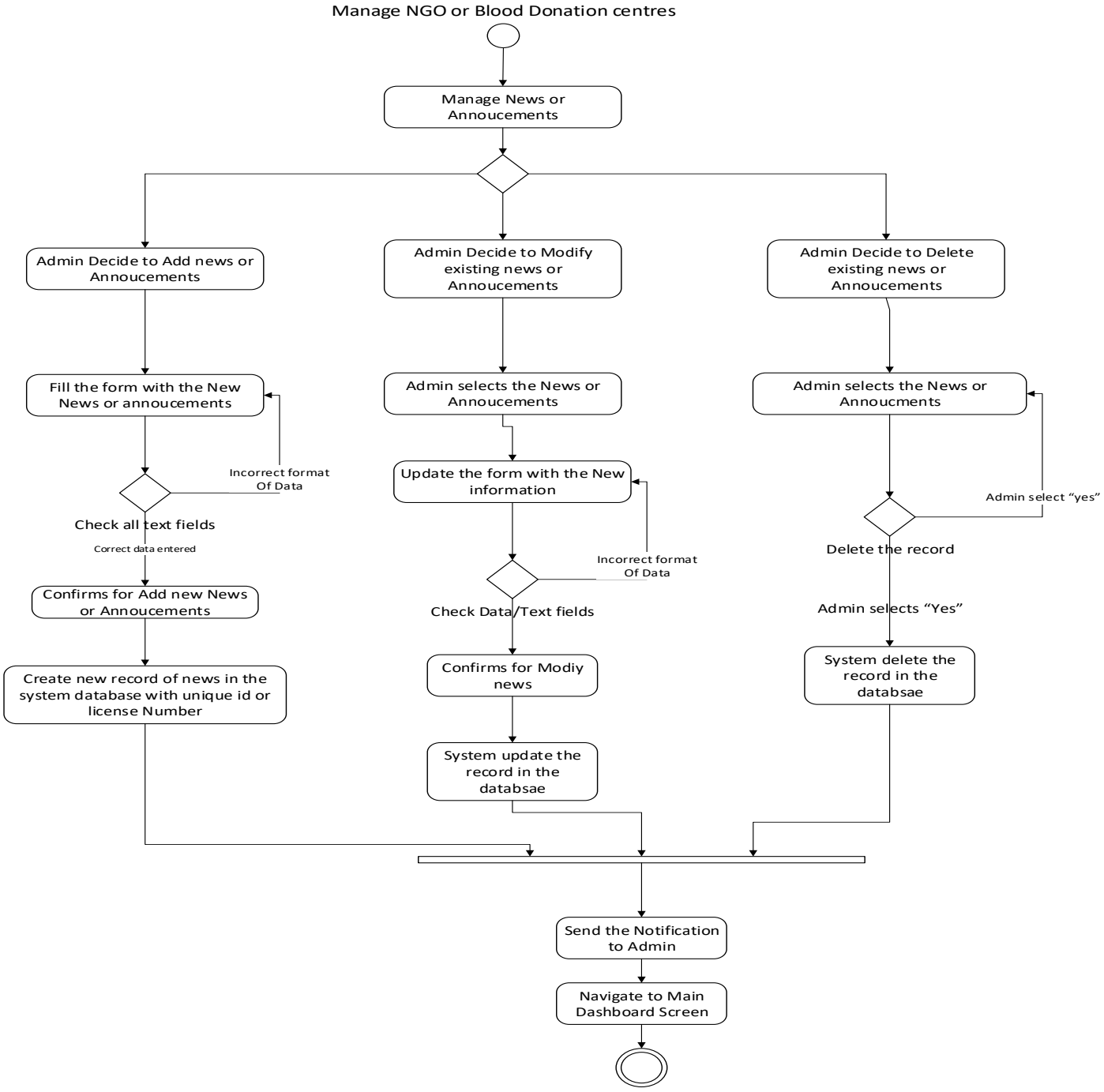

Figure 45 Add News

3.2.19 Manage Job Posts

Figure 46 Manage Job Post Activity Diagram

3.2.20 Manage Campaigns

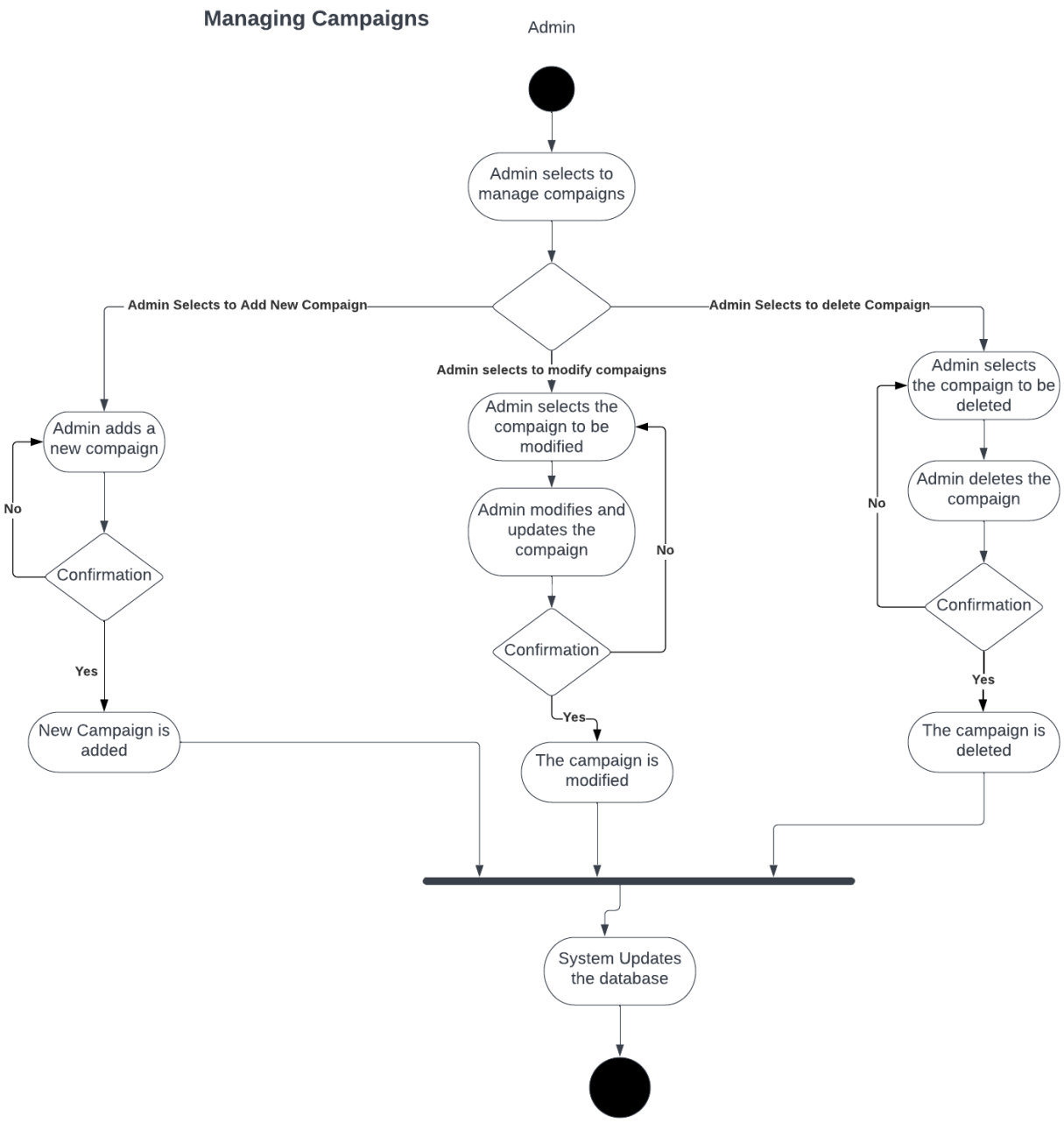

Figure 47 Manage Campaign Activity Diagram

3.2.21 Manage Financial Donations

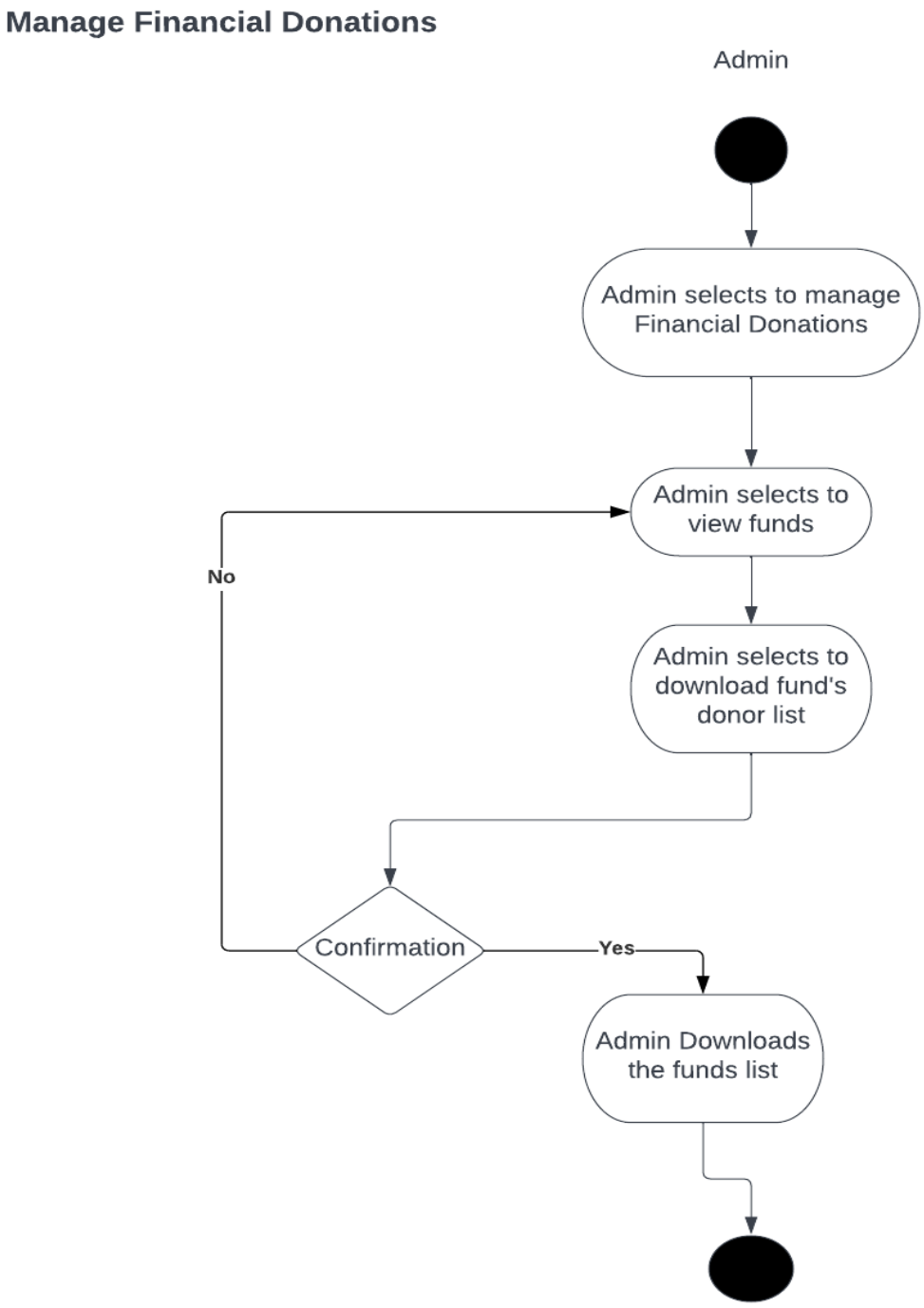

Figure 48 Manage Financial Donation Activity Diagram

3.2.22 Manage Donor List

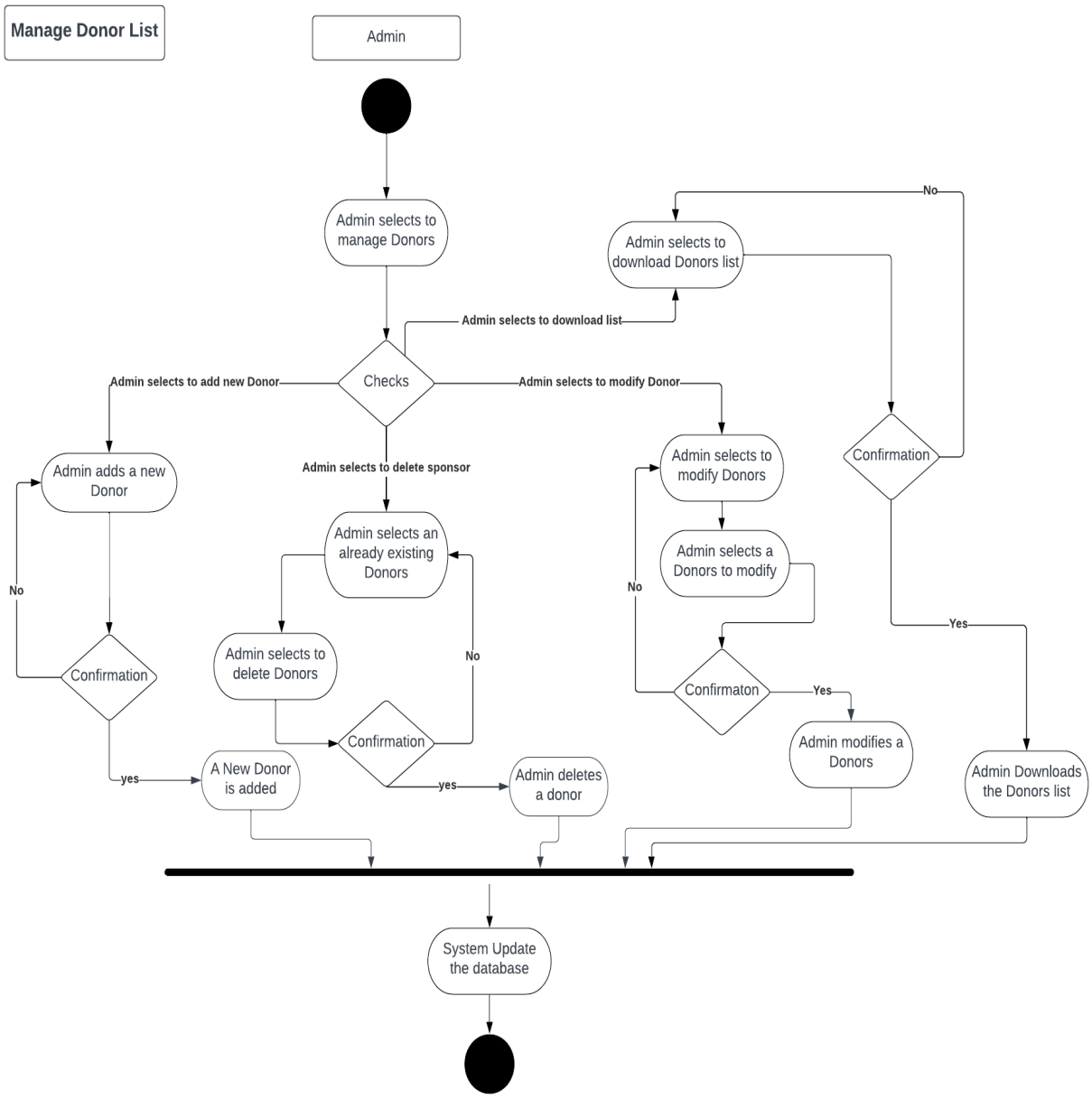

Figure 49 Manage Donor List Activity Diagram

3.2.23 Handling Blood Request

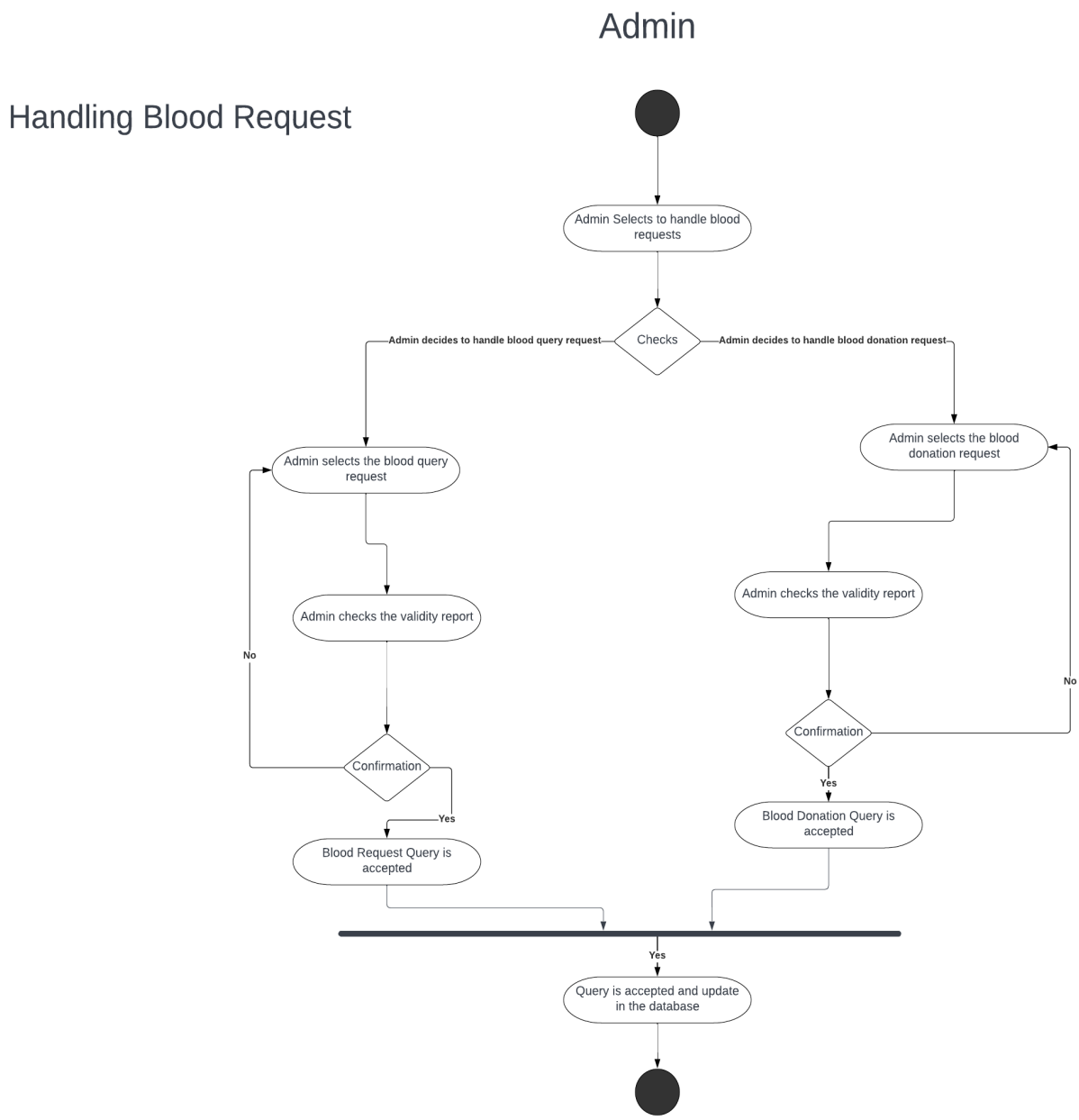

Figure 50 Handling blood Request Activity Diagram

3.2.24 Managing User's Personal Information

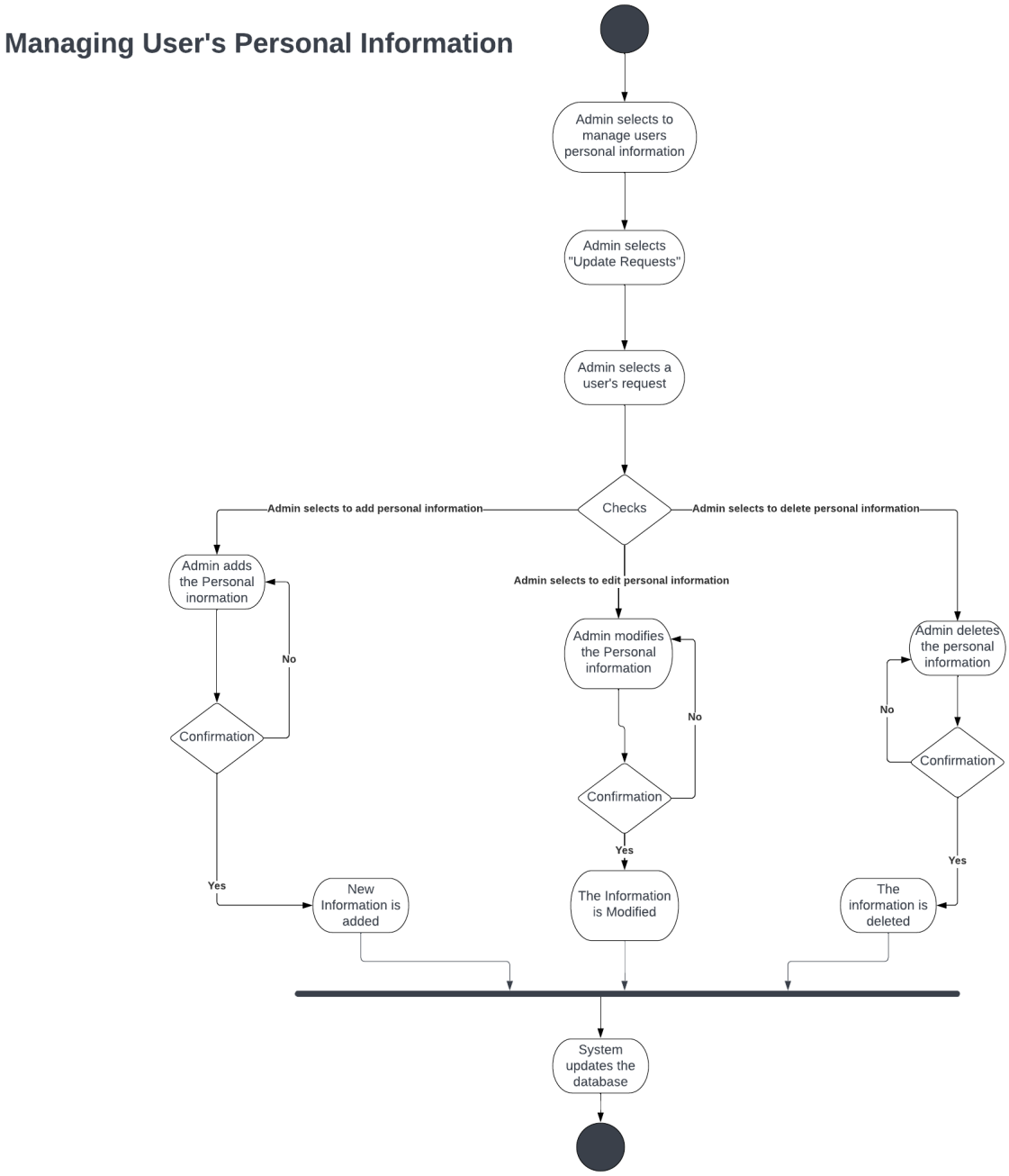

Figure 51 Managing User's Personal Information

3.2.25 Manage Sponsors

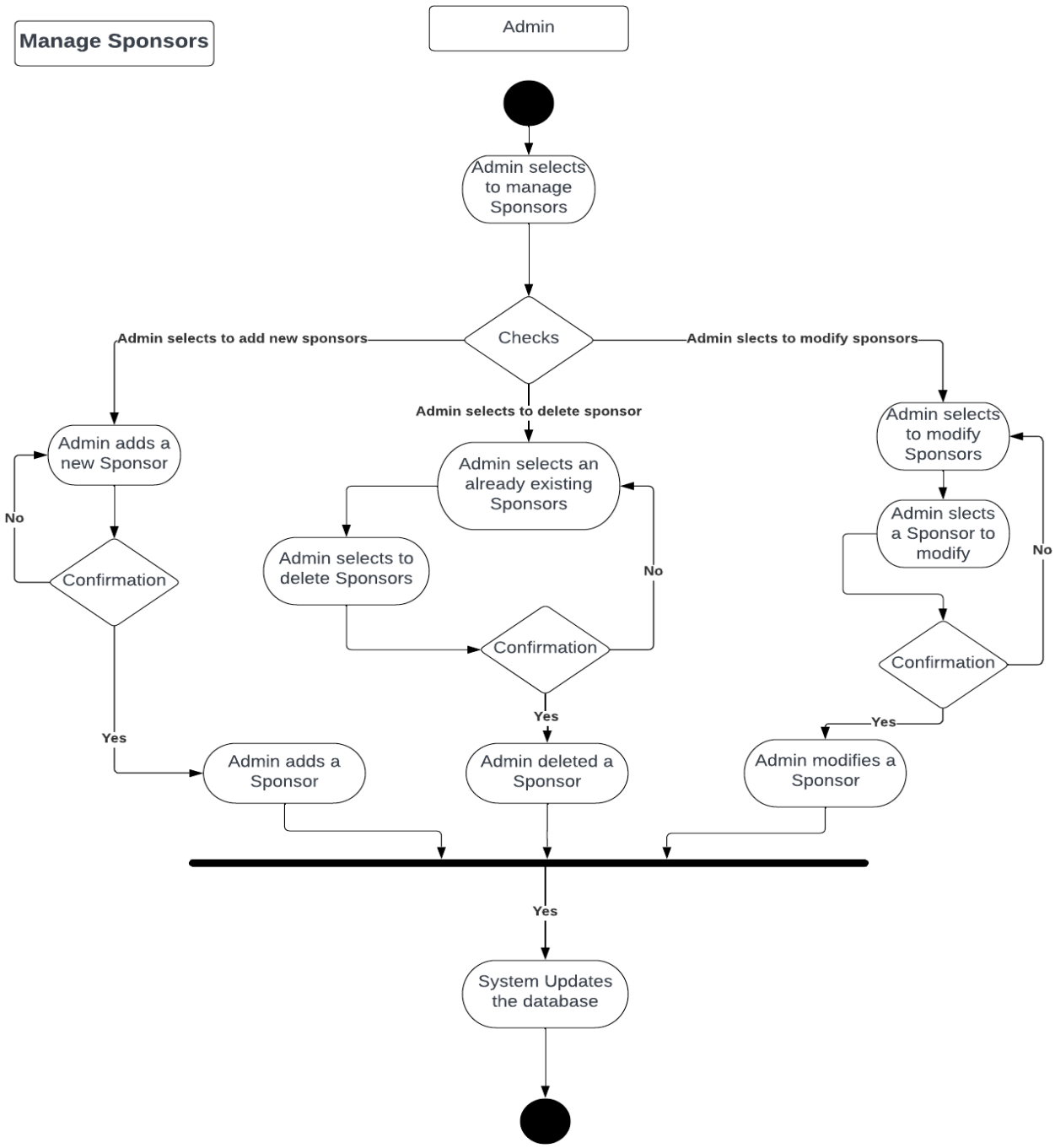

Figure 52 Manage Sponsors

3.2.26 Manage Frequently Asked Questions

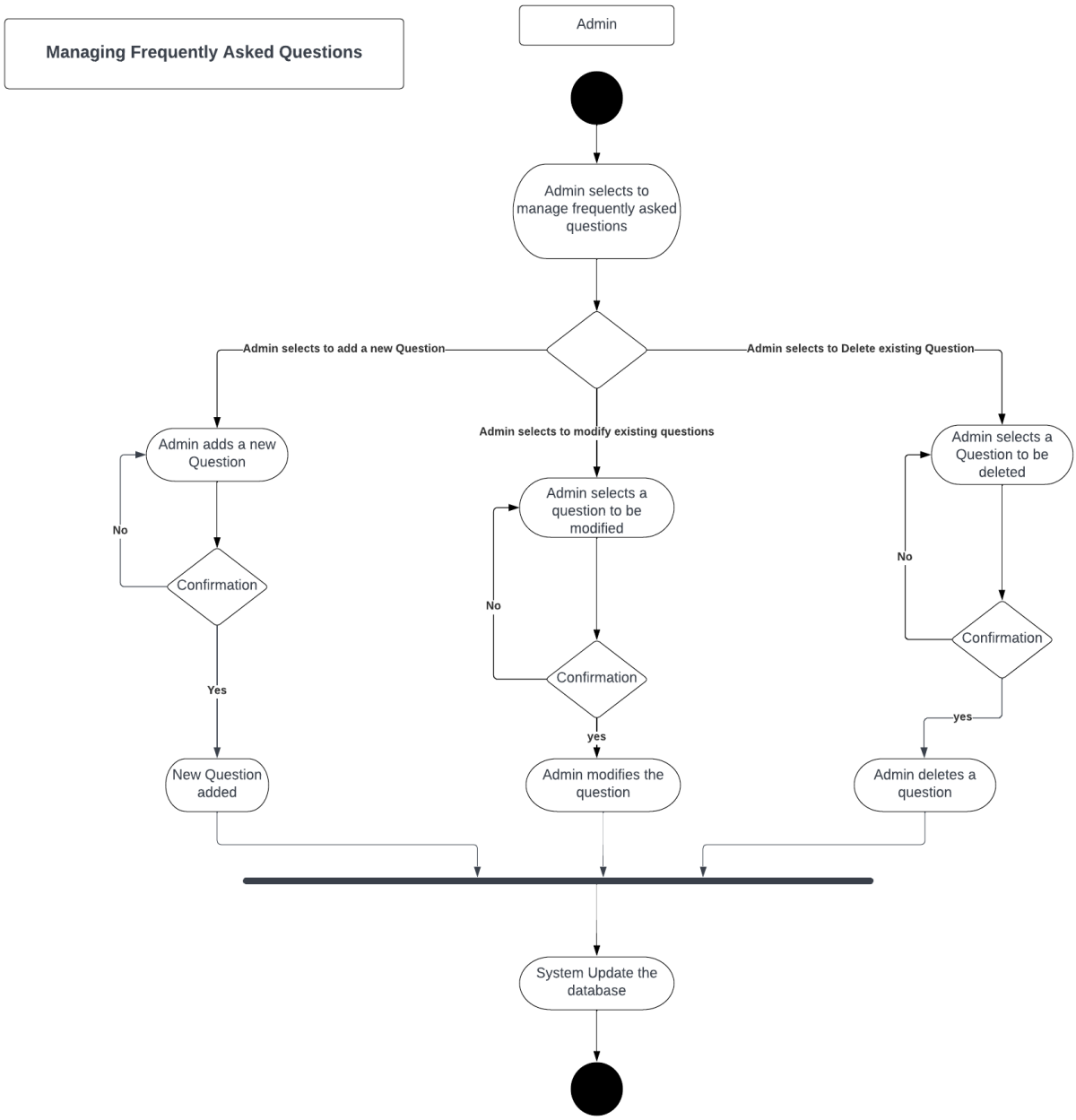

Figure 53 Manage Frequently Asked Questions

3.3 Sequence Diagram

3.3.1 Login

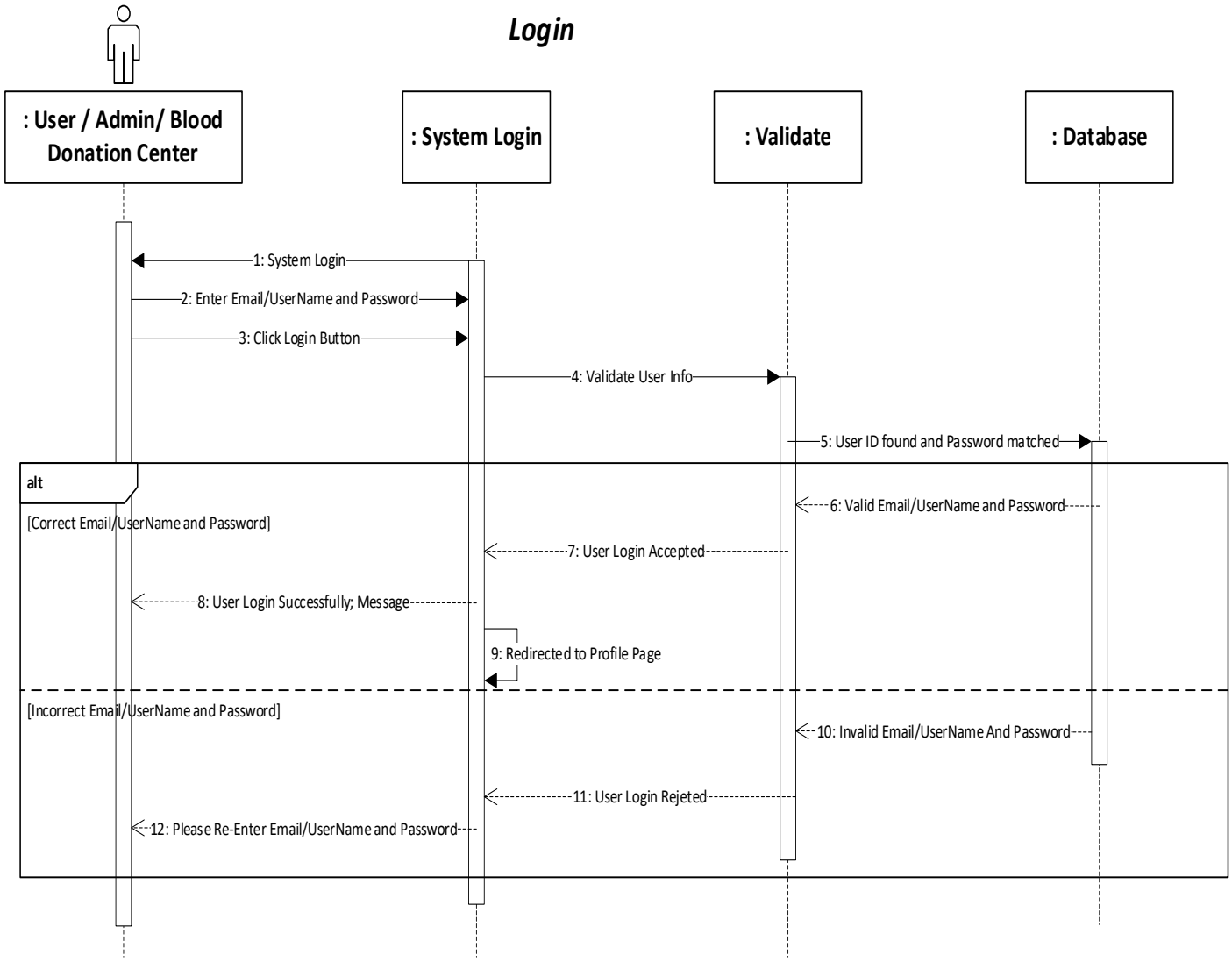

Figure 54 Login Activity Diagram

3.3.2 Registration

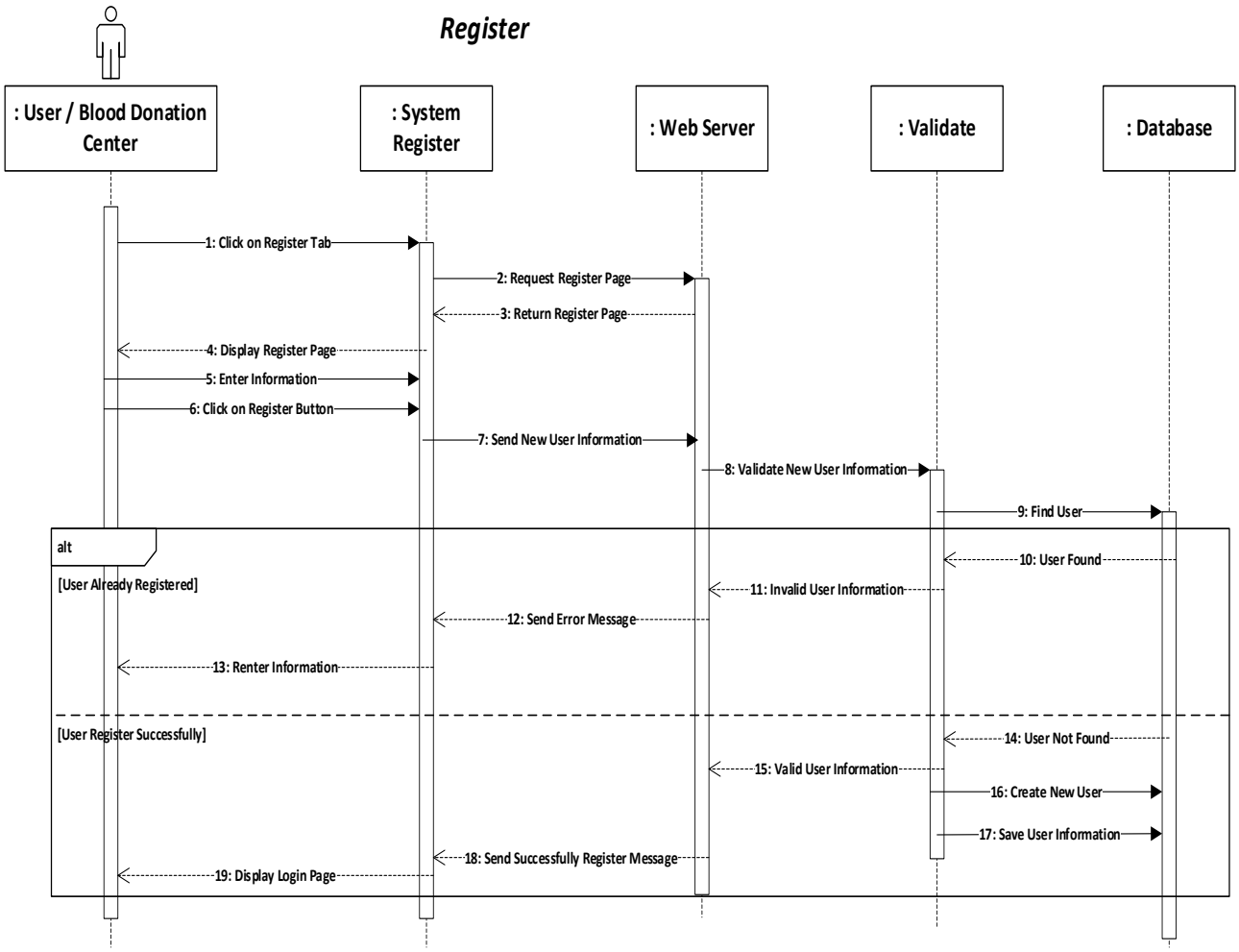

Figure 55 Registration Sequence Diagram

3.3.3 Make the Request for Blood

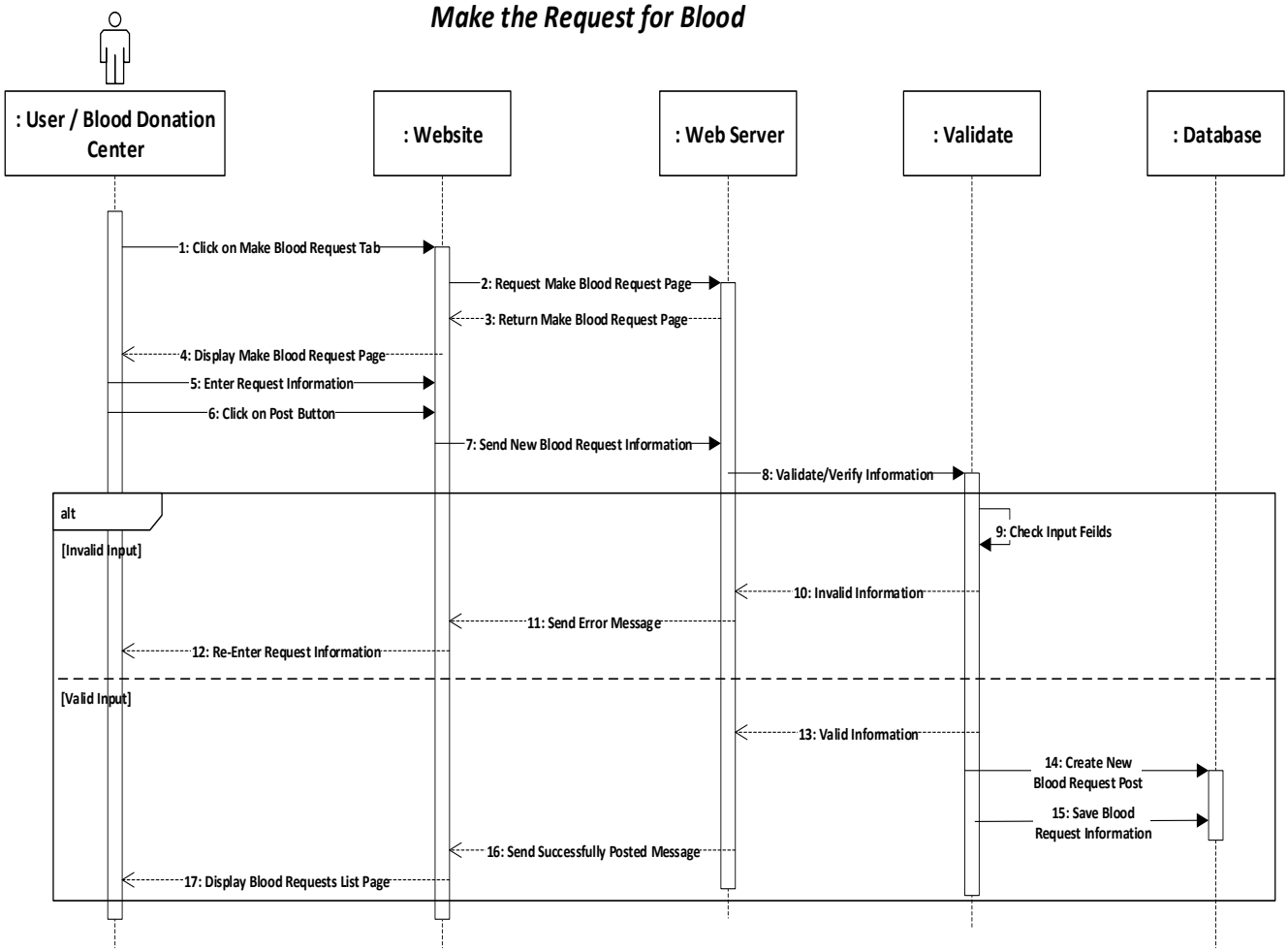

Figure 56 Make the Request for Blood Sequence Diagram

3.3.4 Donate Blood

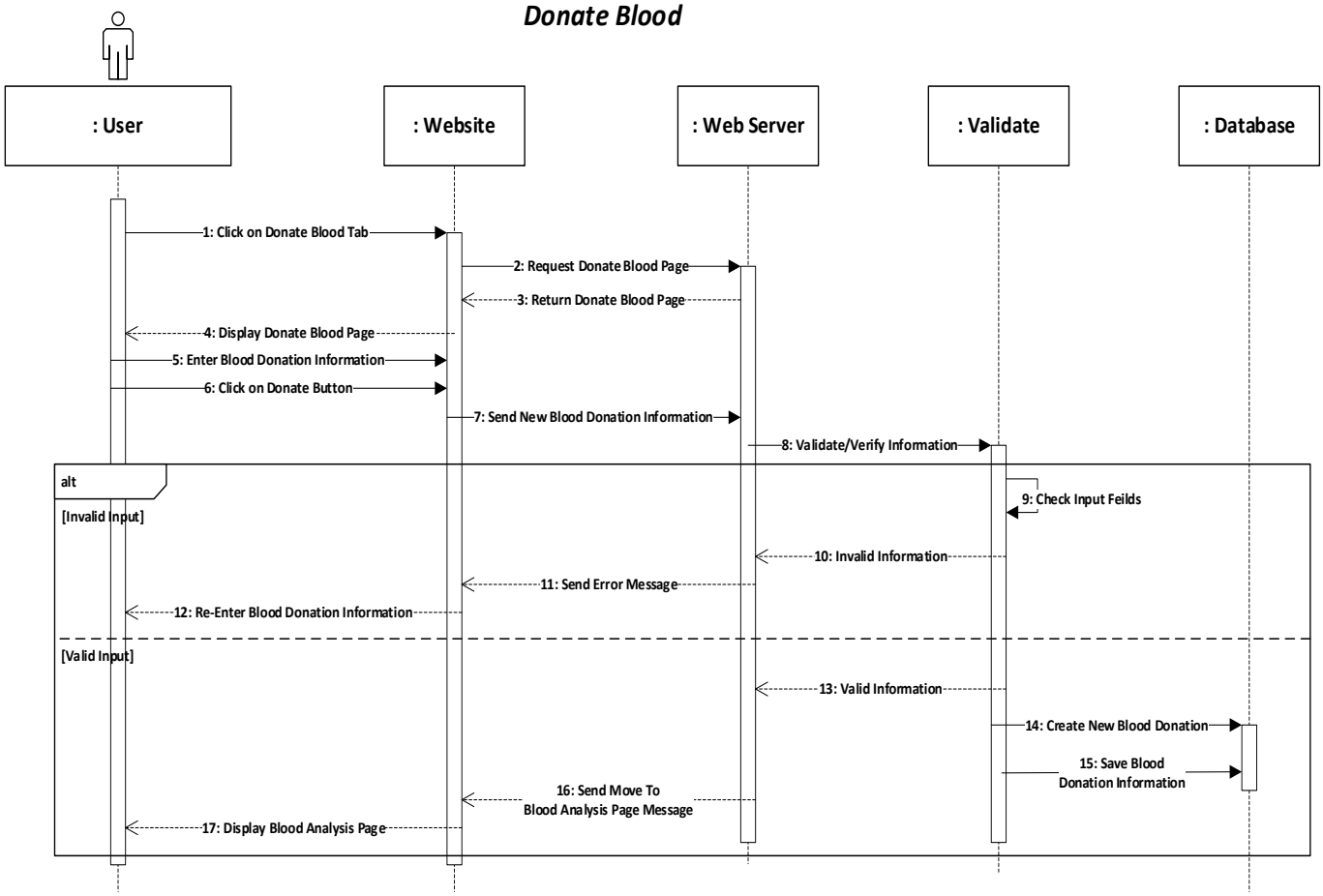

Figure 57 Donate Blood Sequence Diagram

3.3.5 Check Eligibility of User for Blood Donation

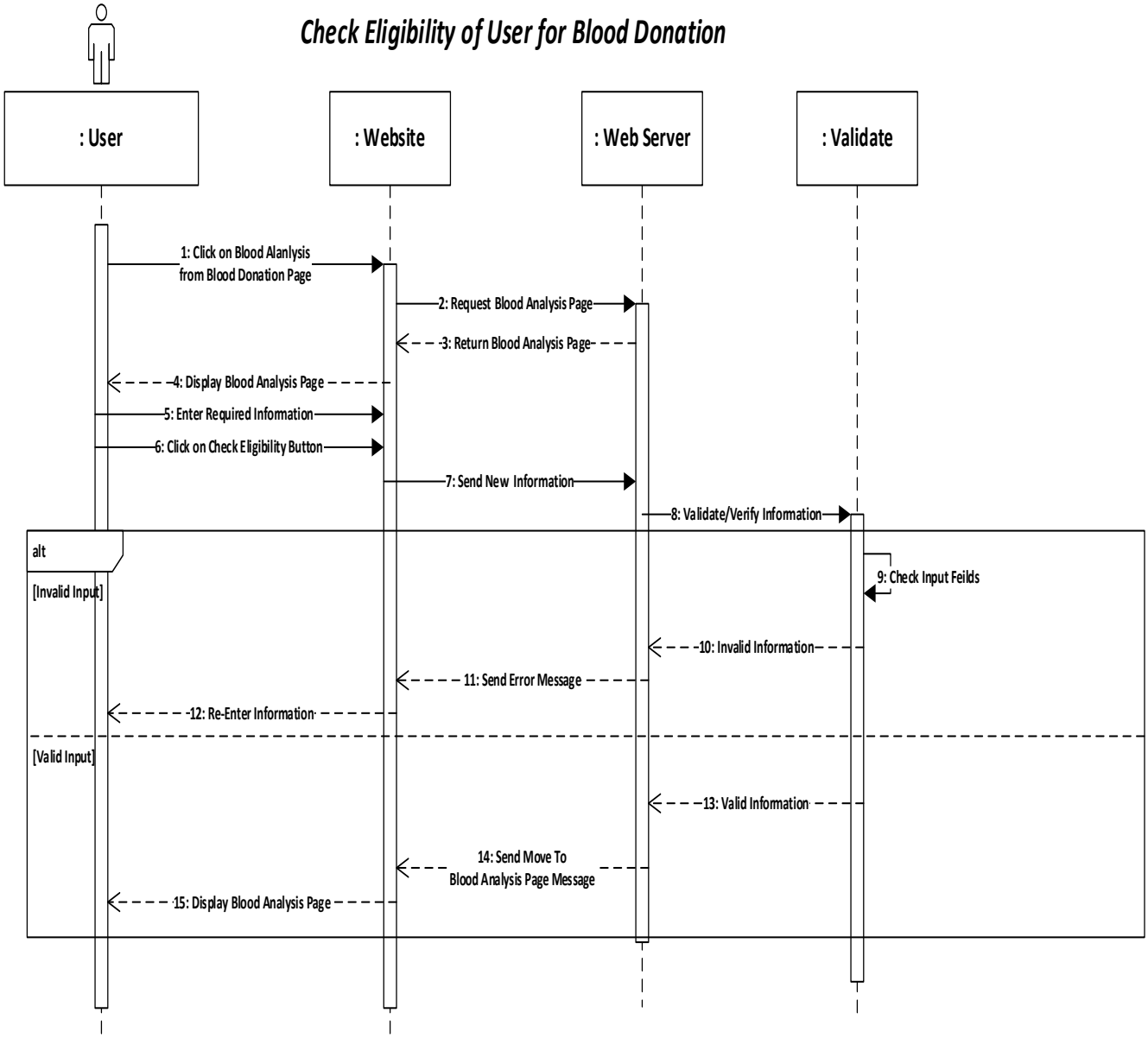

Figure 58 Check Eligibility of User for Blood Donation

3.3.6 View Blood Donation Center's

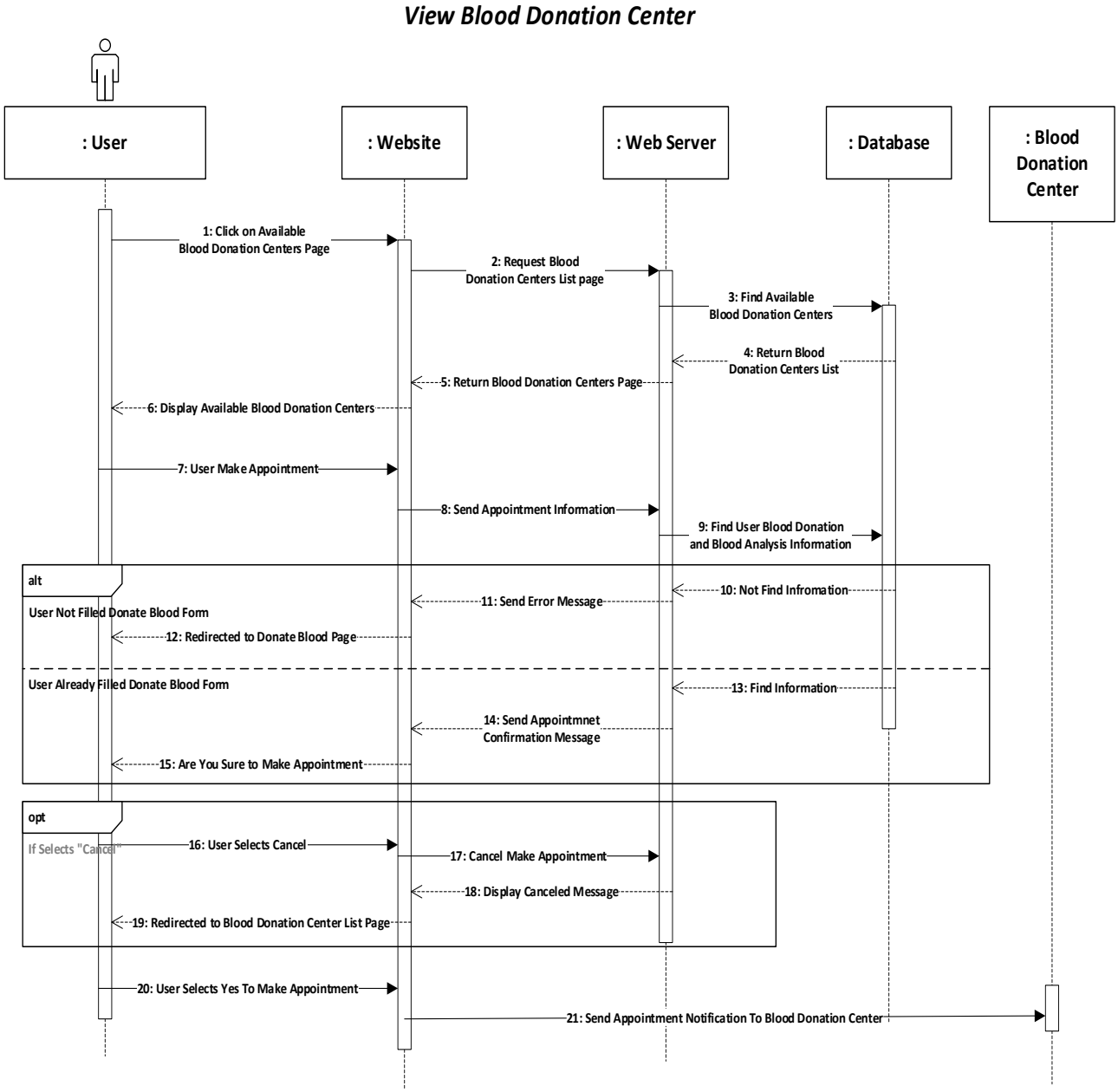

Figure 59 View Blood Donation Center's Sequence Diagram

3.3.7 Generate Appointment Report

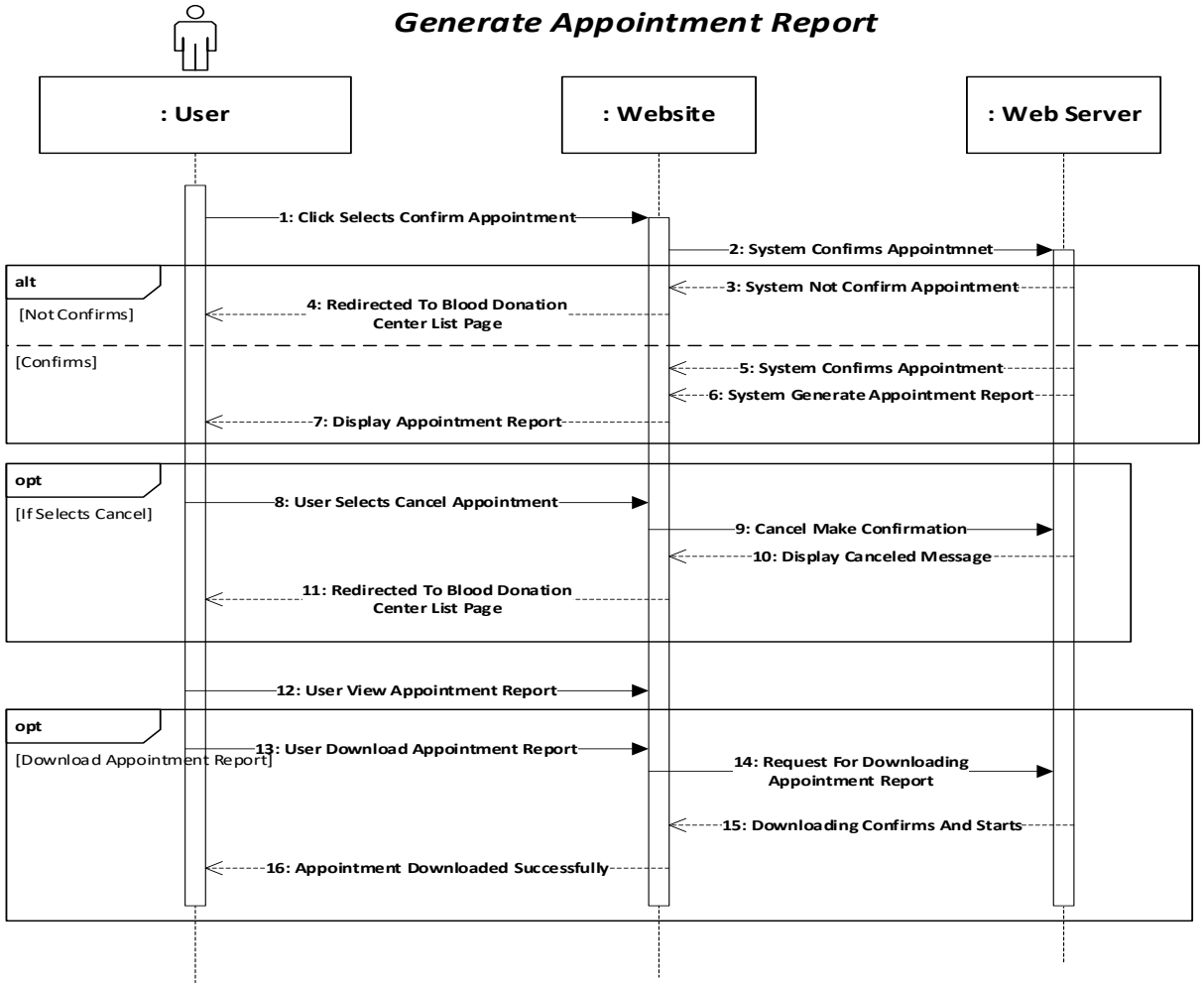

Figure 60 Generate Appointment Report Sequence Diagram

3.3.8 Display User Profile

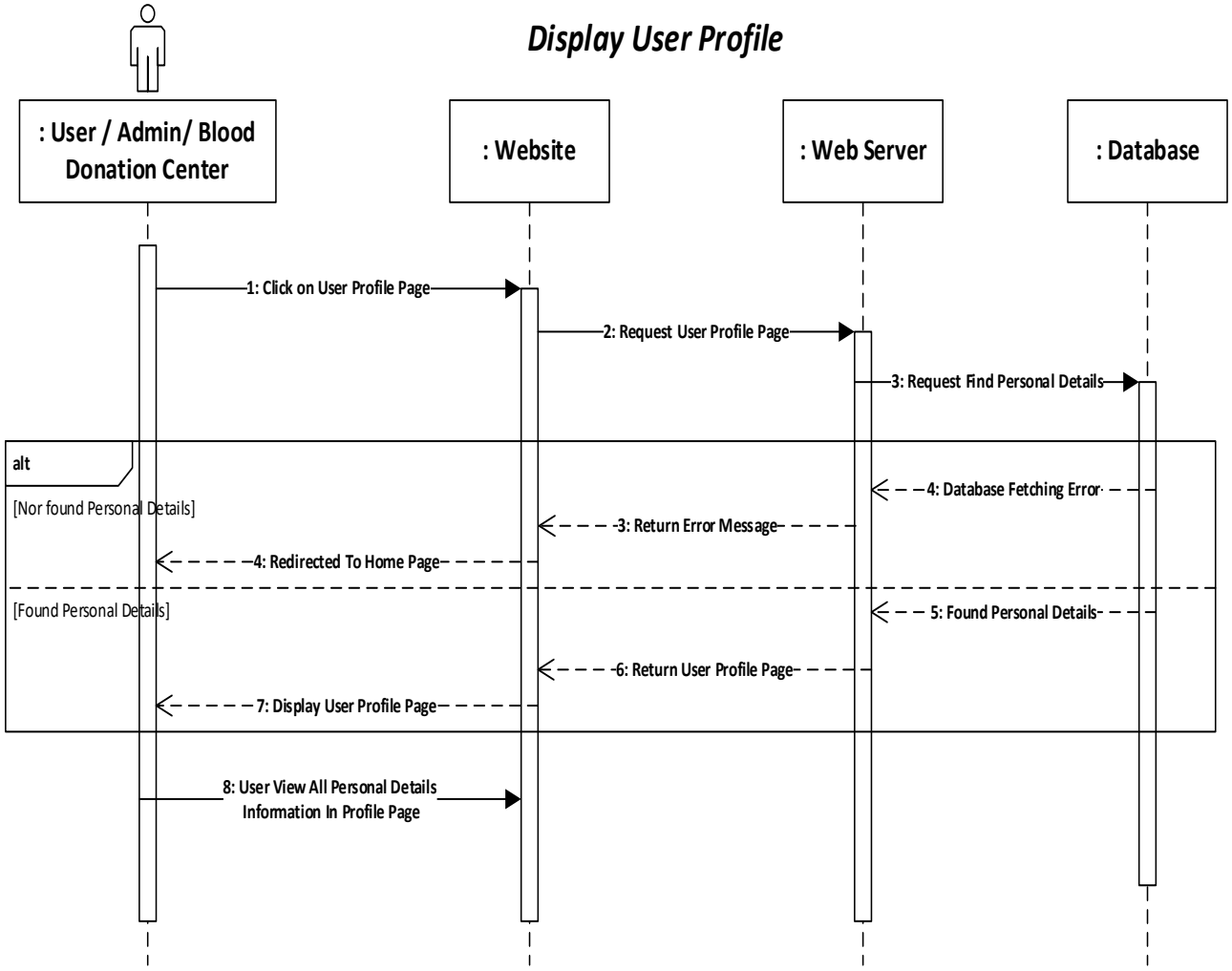

Figure 61 Display User Profile Sequence Diagram

3.3.9 View Blood Requests

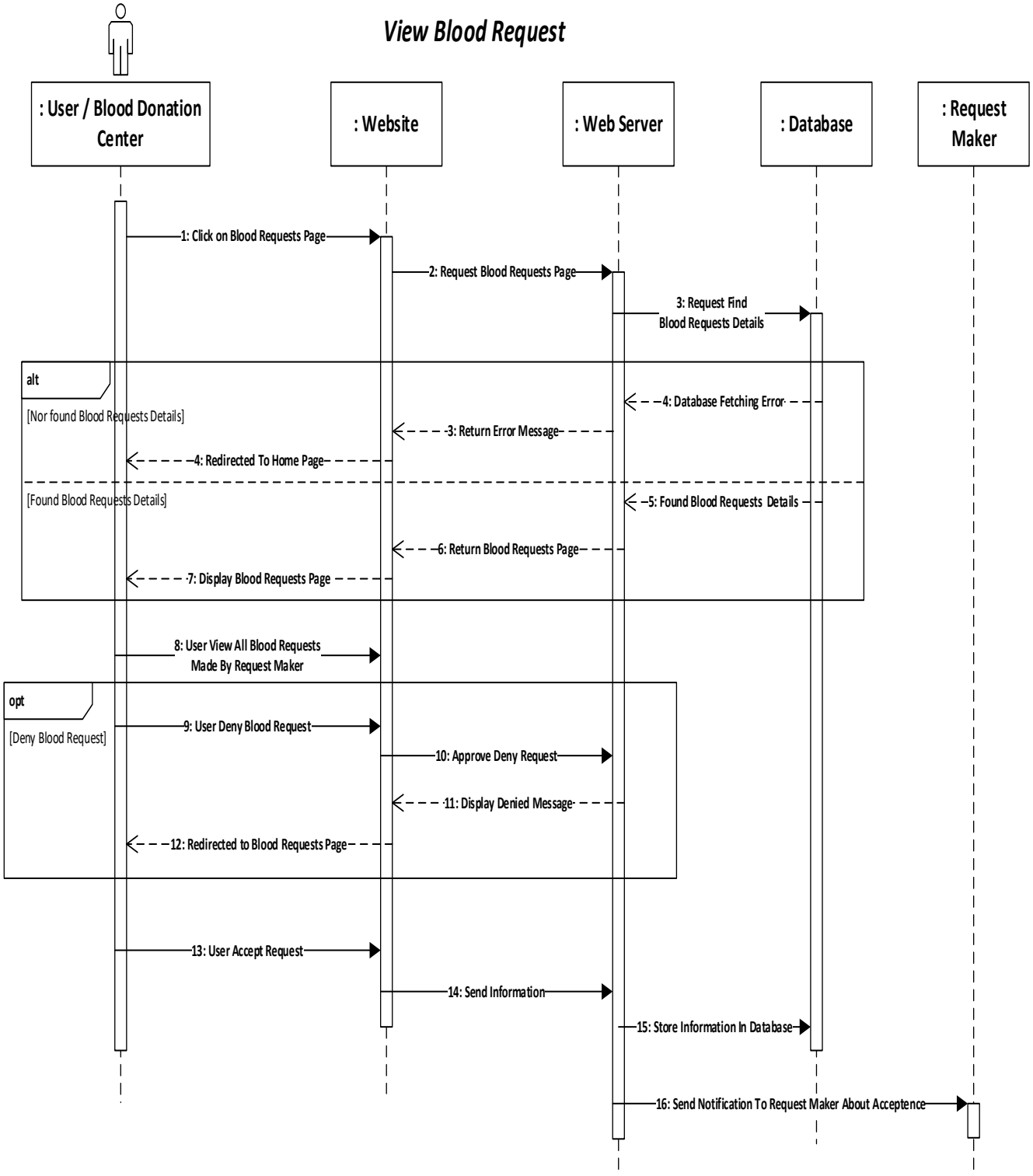

Figure 62 View Blood Request Sequence Diagram

3.3.10 Update Personal Information

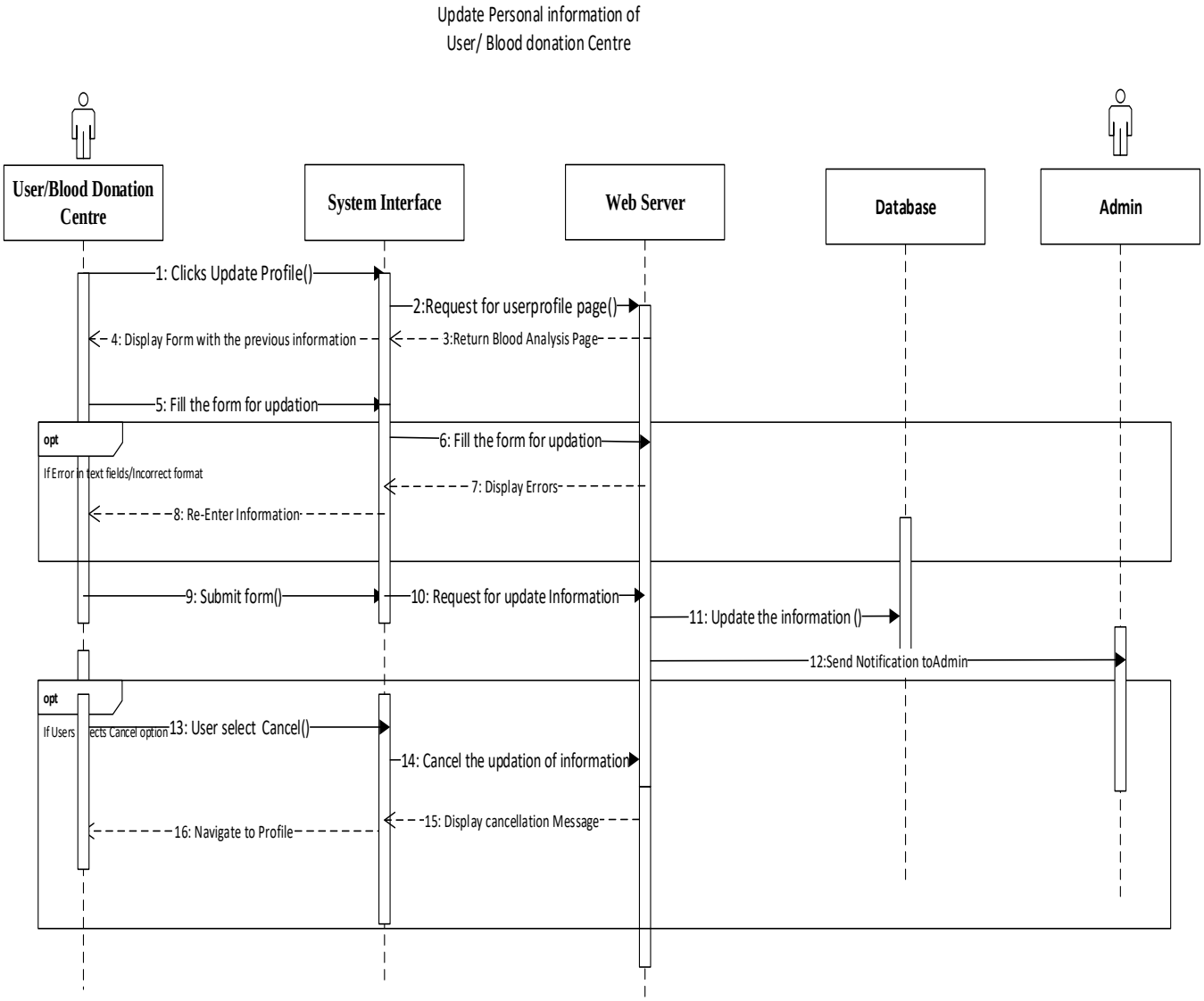

Figure 63 Update Personal Information

3.3.11 Delete Personal Information

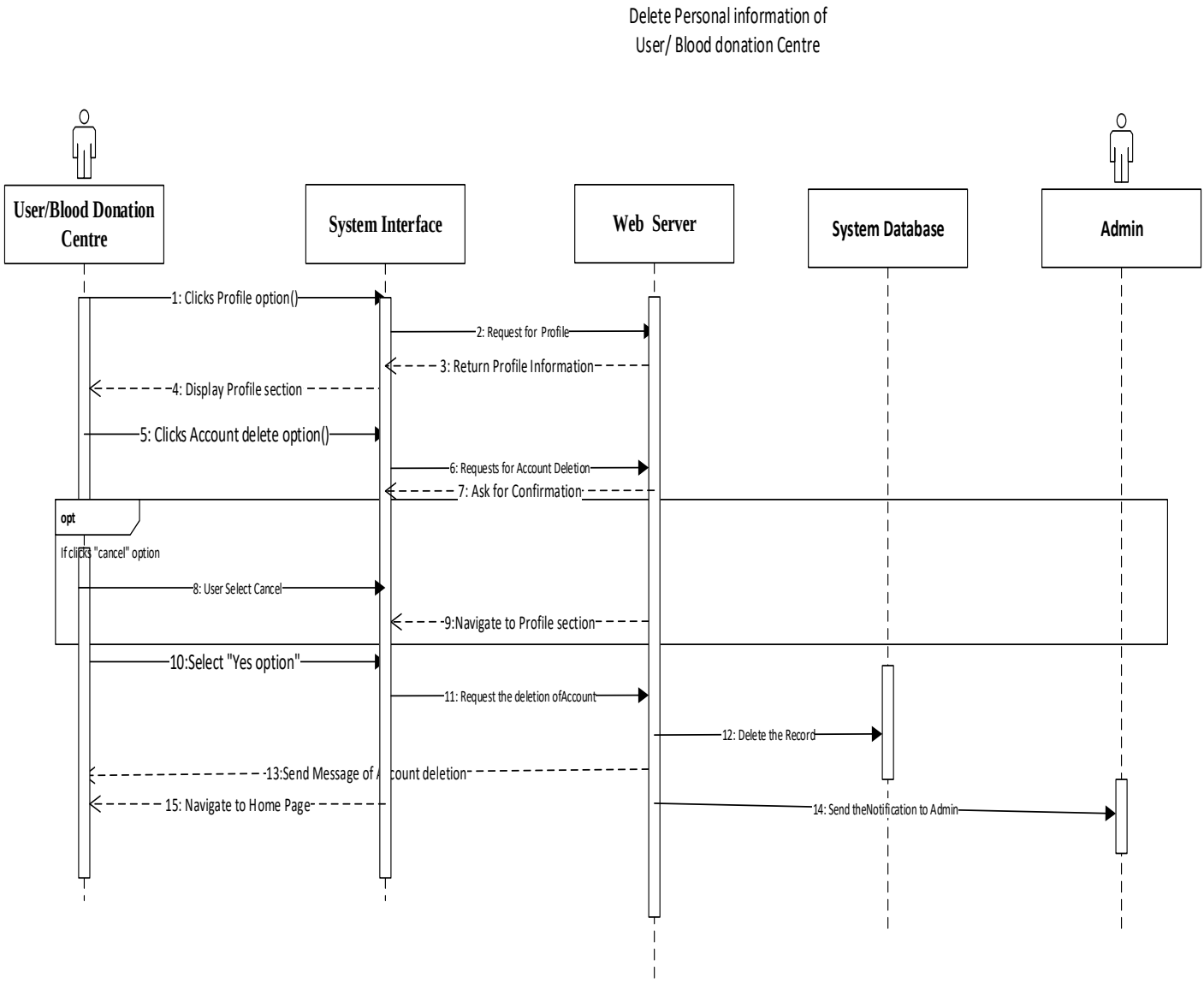

Figure 64 Delete Personal Information

3.3.12 Get User Feedback

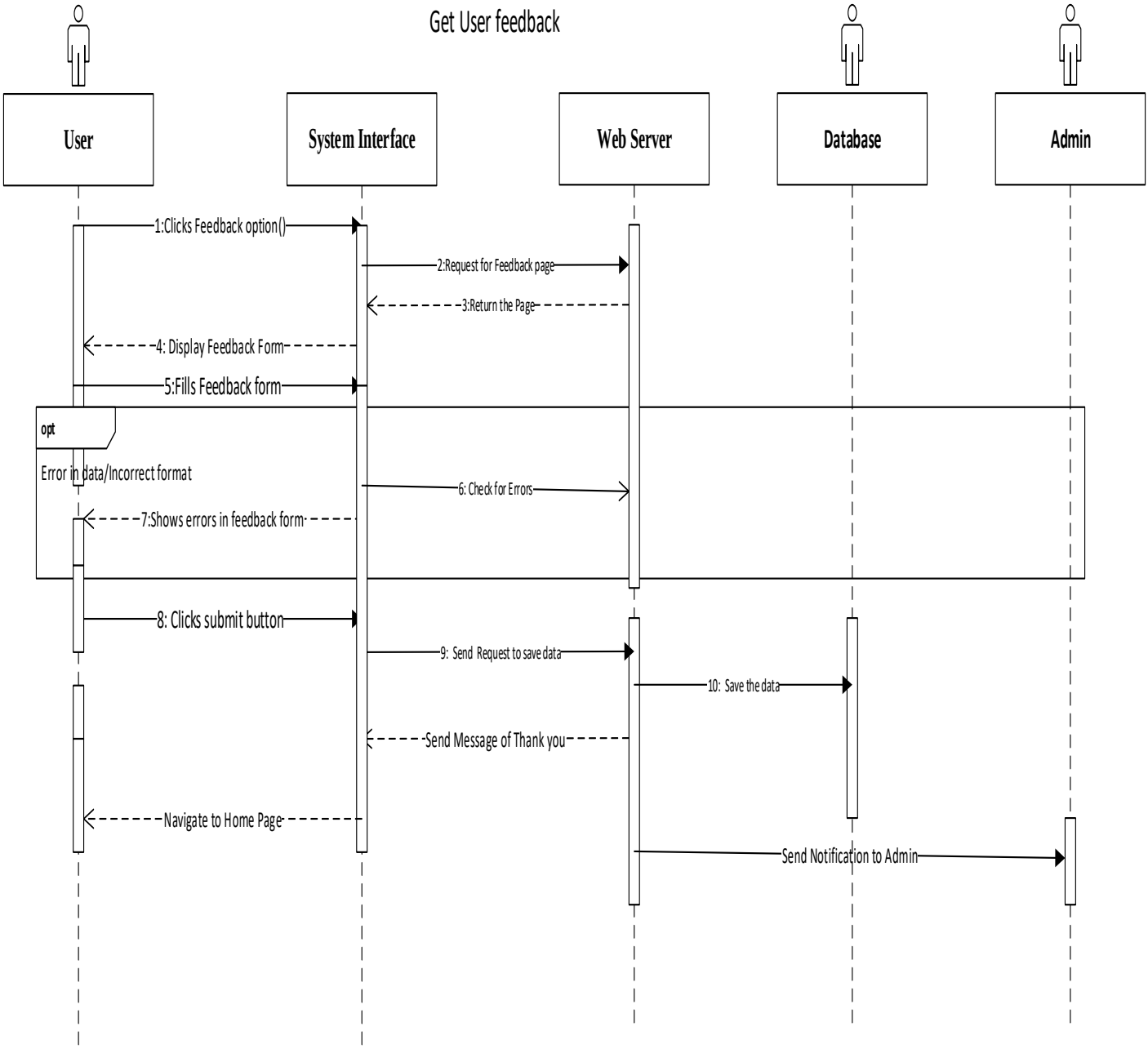

Figure 65 Get User Feedback

3.3.13 Add User Information

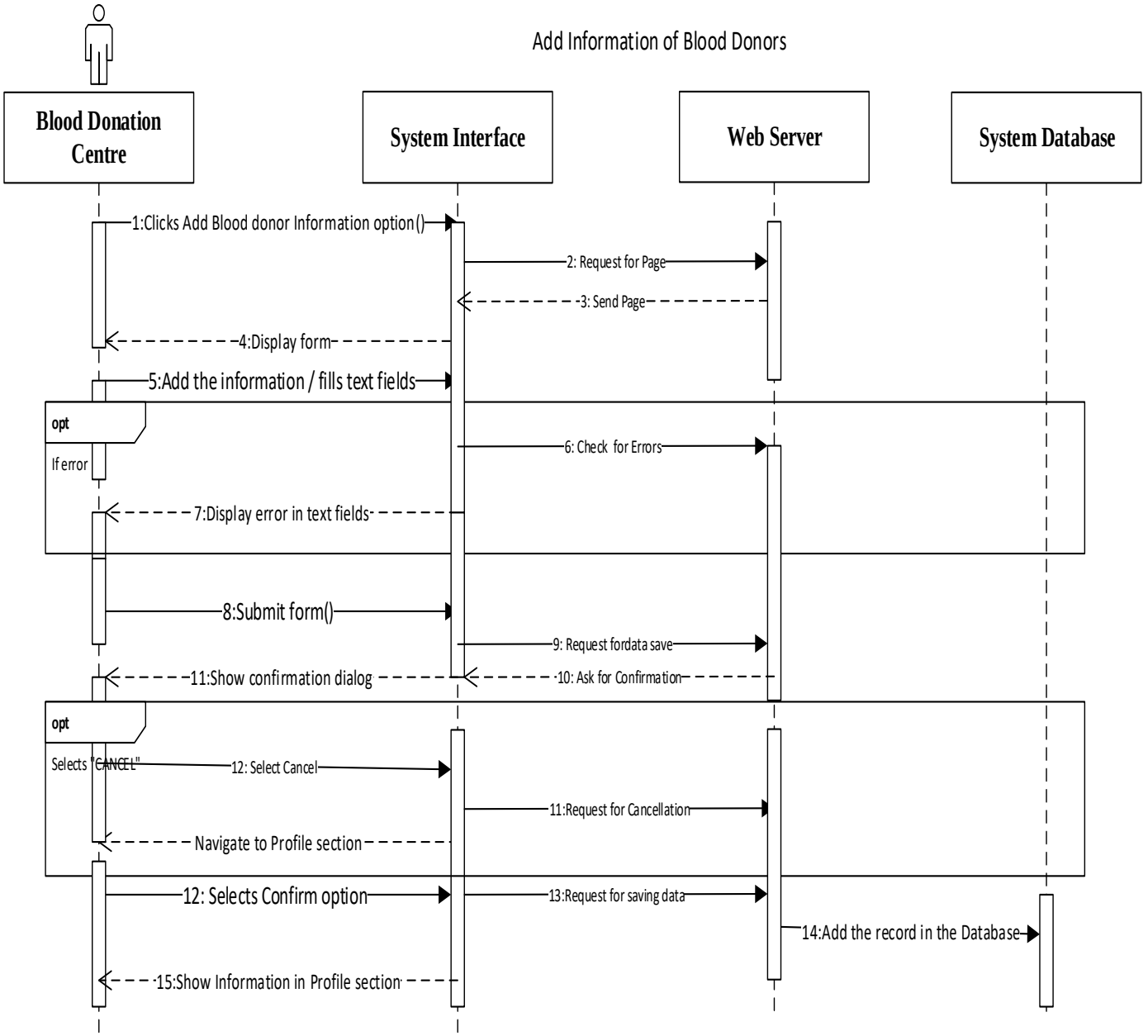

Figure 66 Add Information of blood Donors.

3.3.14Generate Report on Blood Stocks

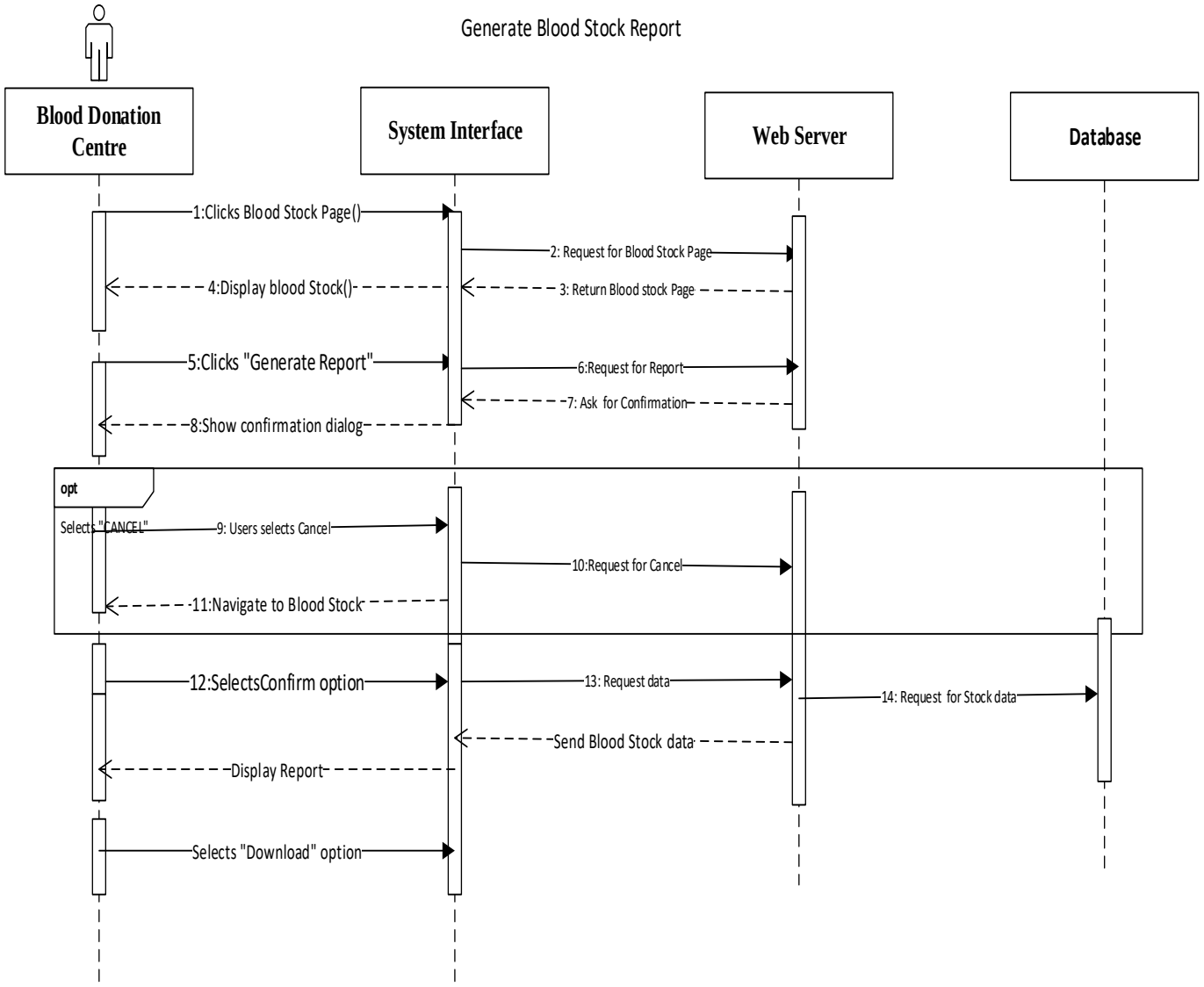

Figure 67 Generate Report on Blood Stock

3.3.15 Update Blood Stock

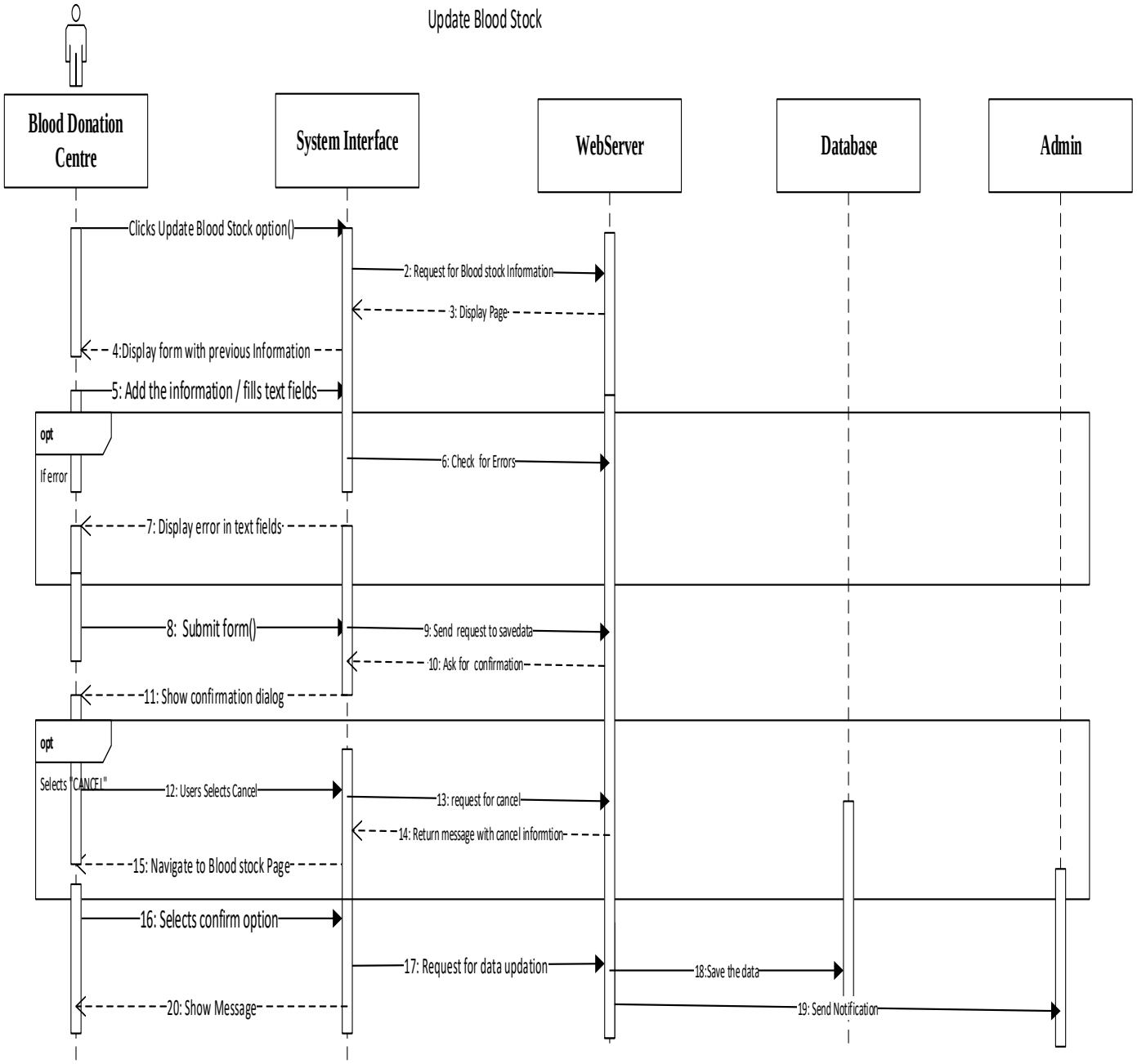

Figure 68 Update Blood Stock

3.3.16 Download Weekly/Monthly Appointment Report

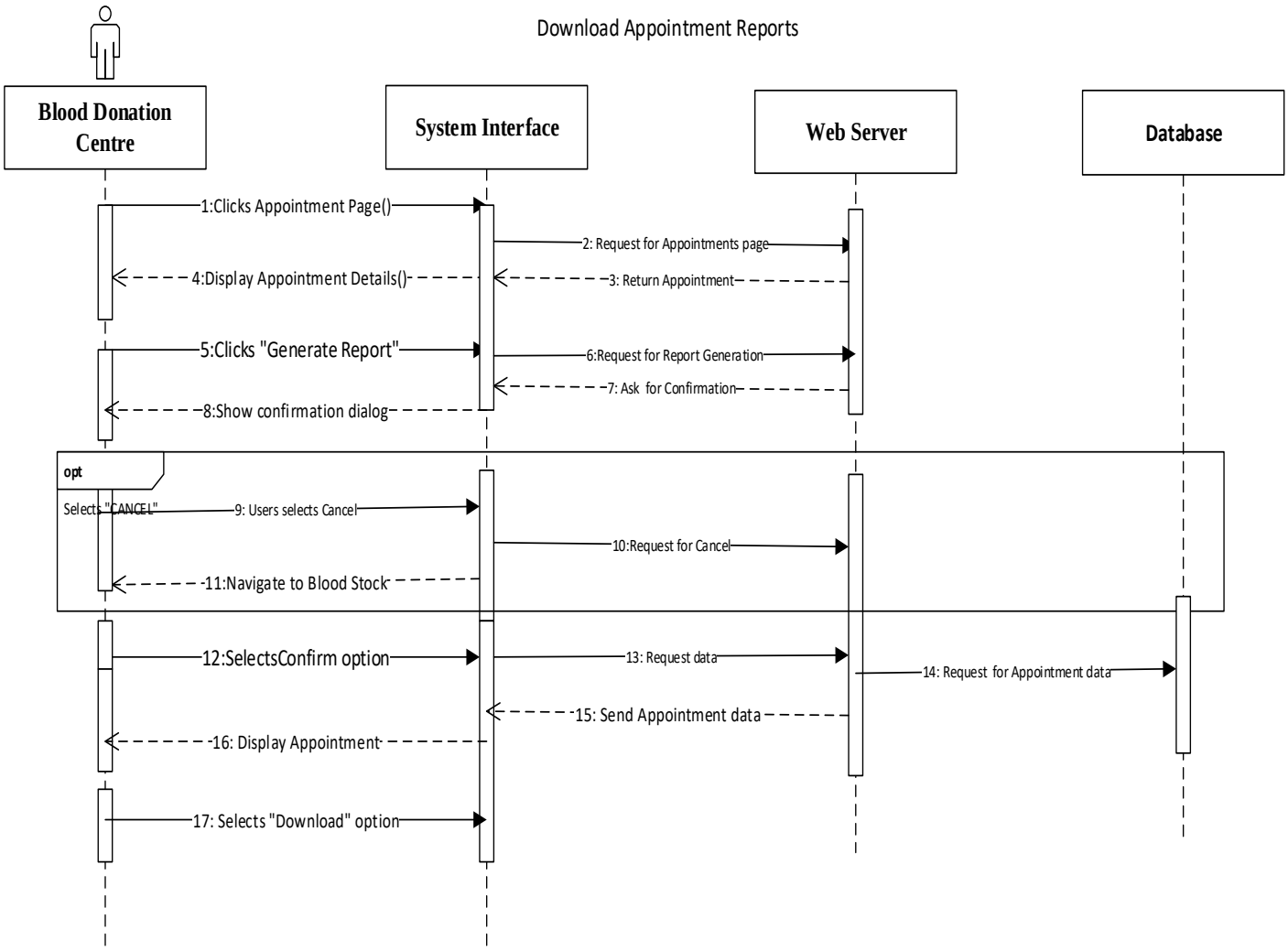

Figure 69 Download Appointment Reports

3.3.17 Manage NGOs or Blood Donation Center's

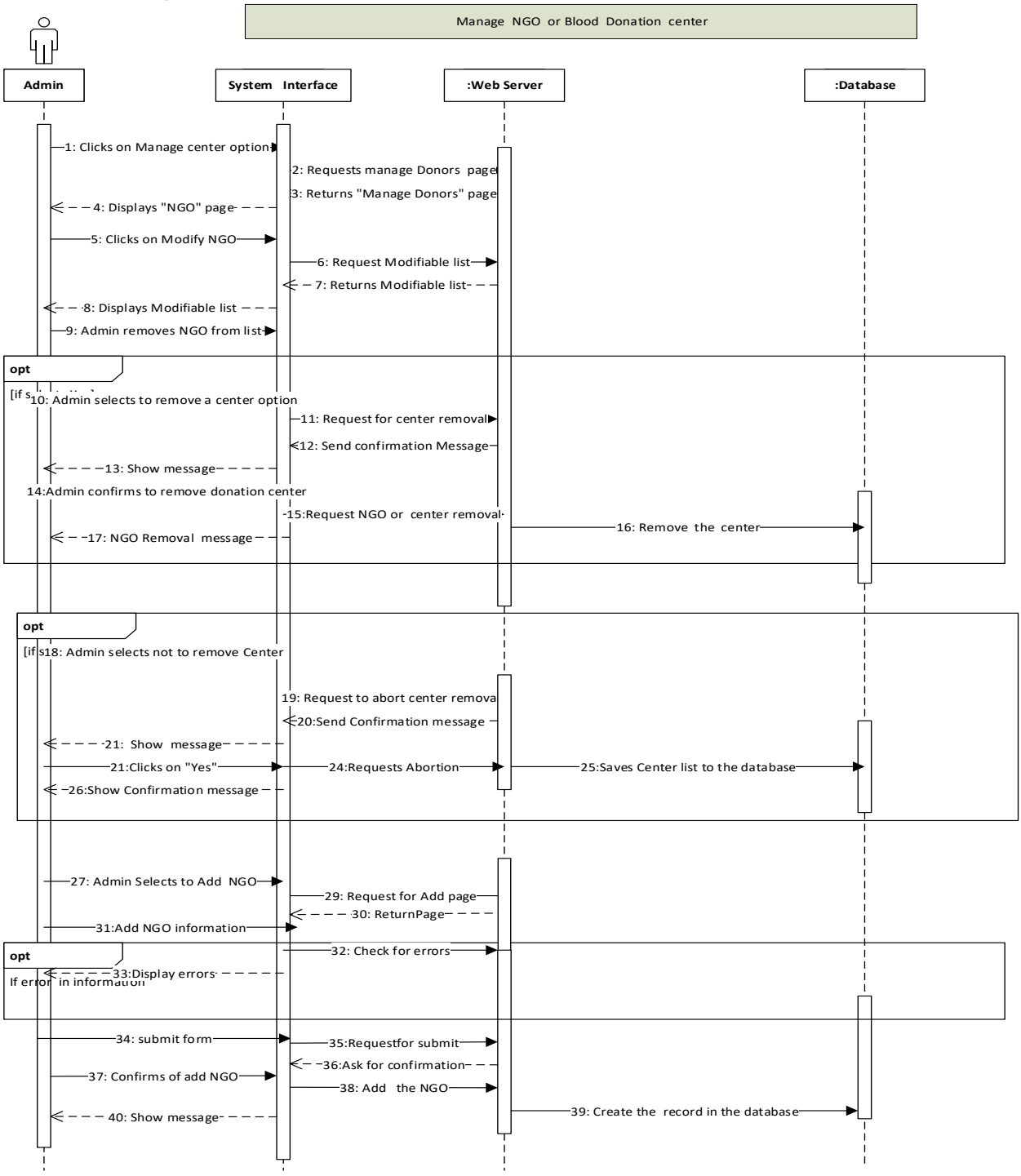

Figure 70 Manage NGO or Blood Donation Center

3.3.18 Manage News

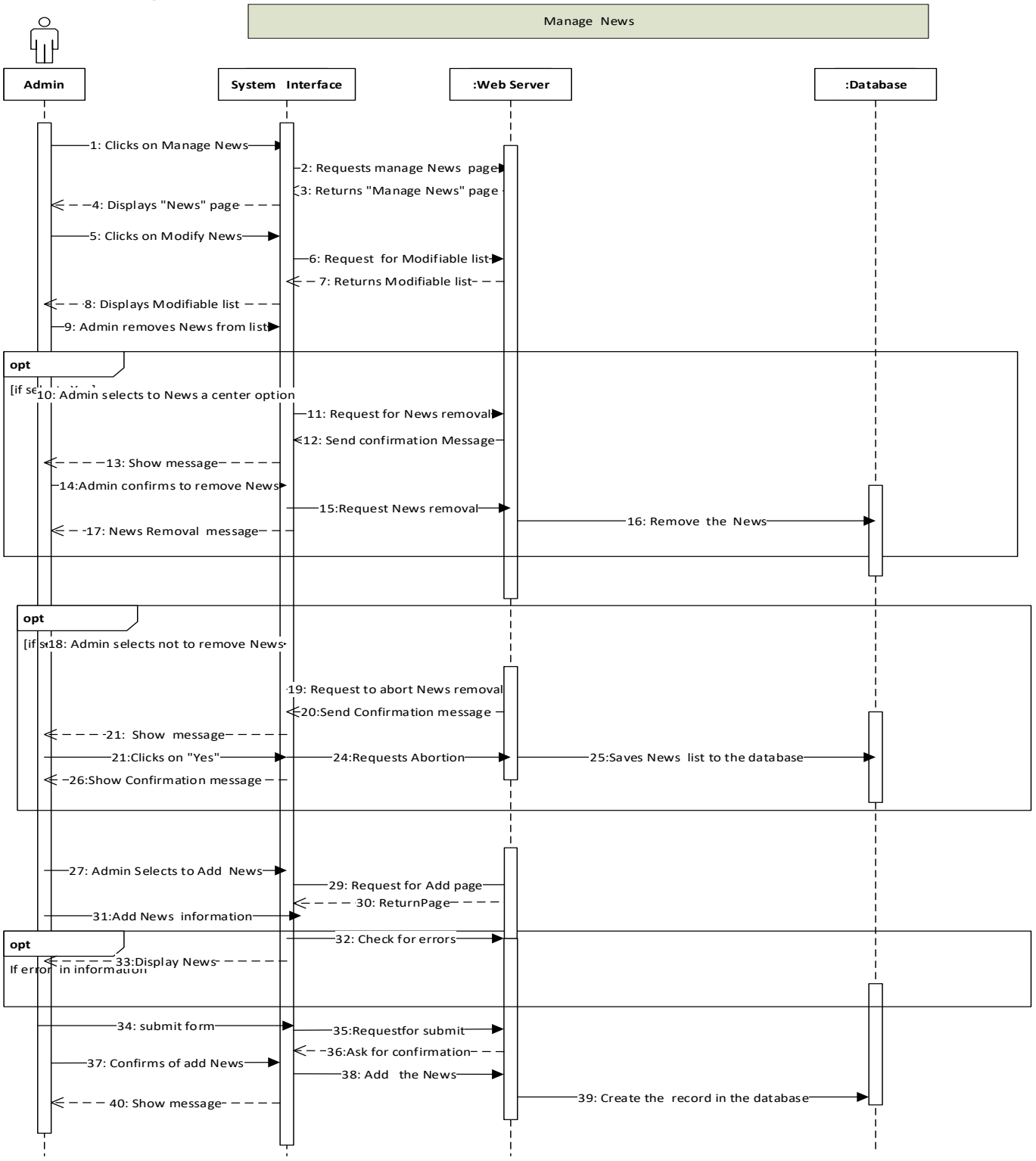

Figure 71 Manage News

3.3.19 Handling Blood Request

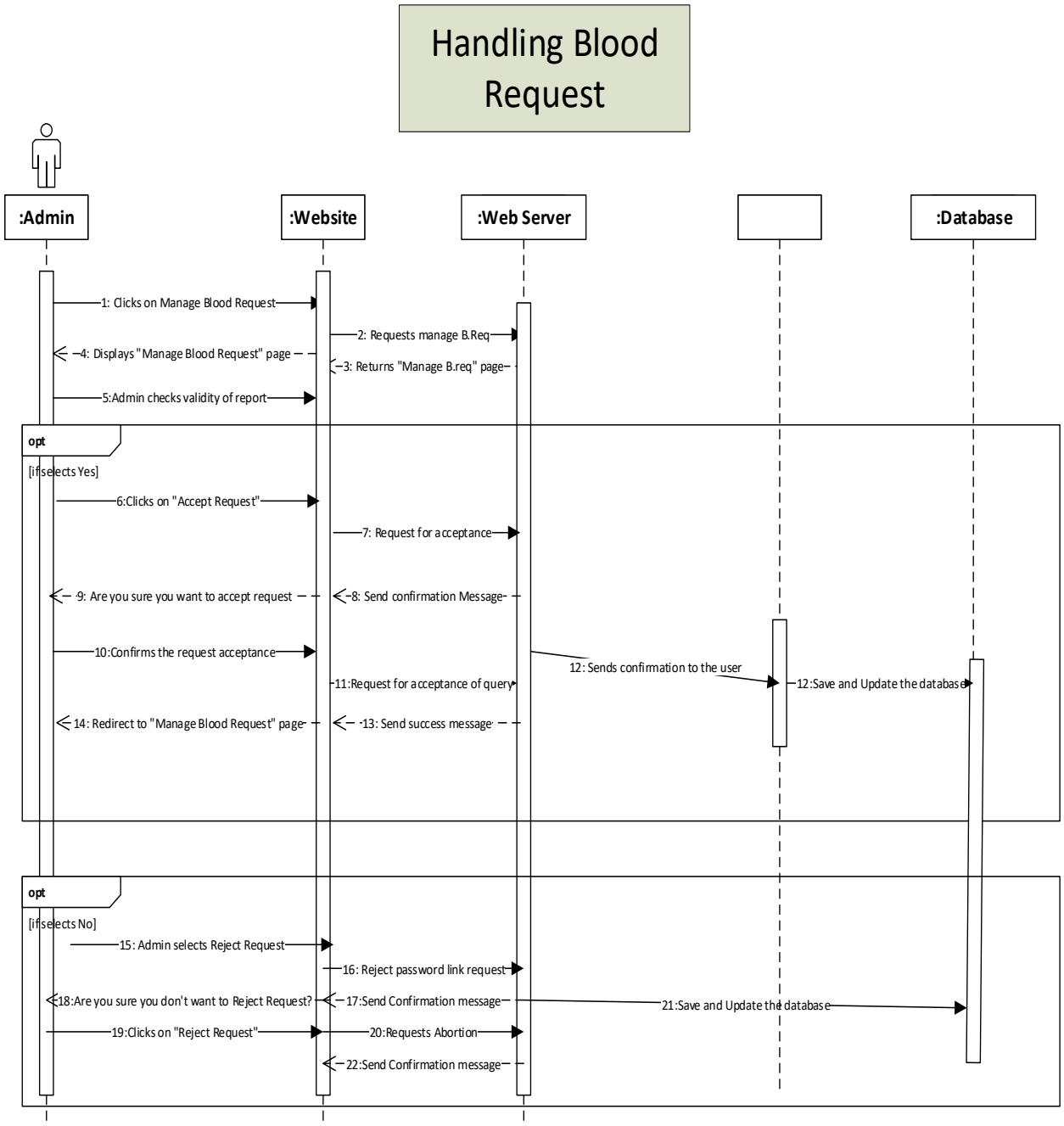

Figure 72 Handling Blood Request

3.3.20 Managing User's Personal Information

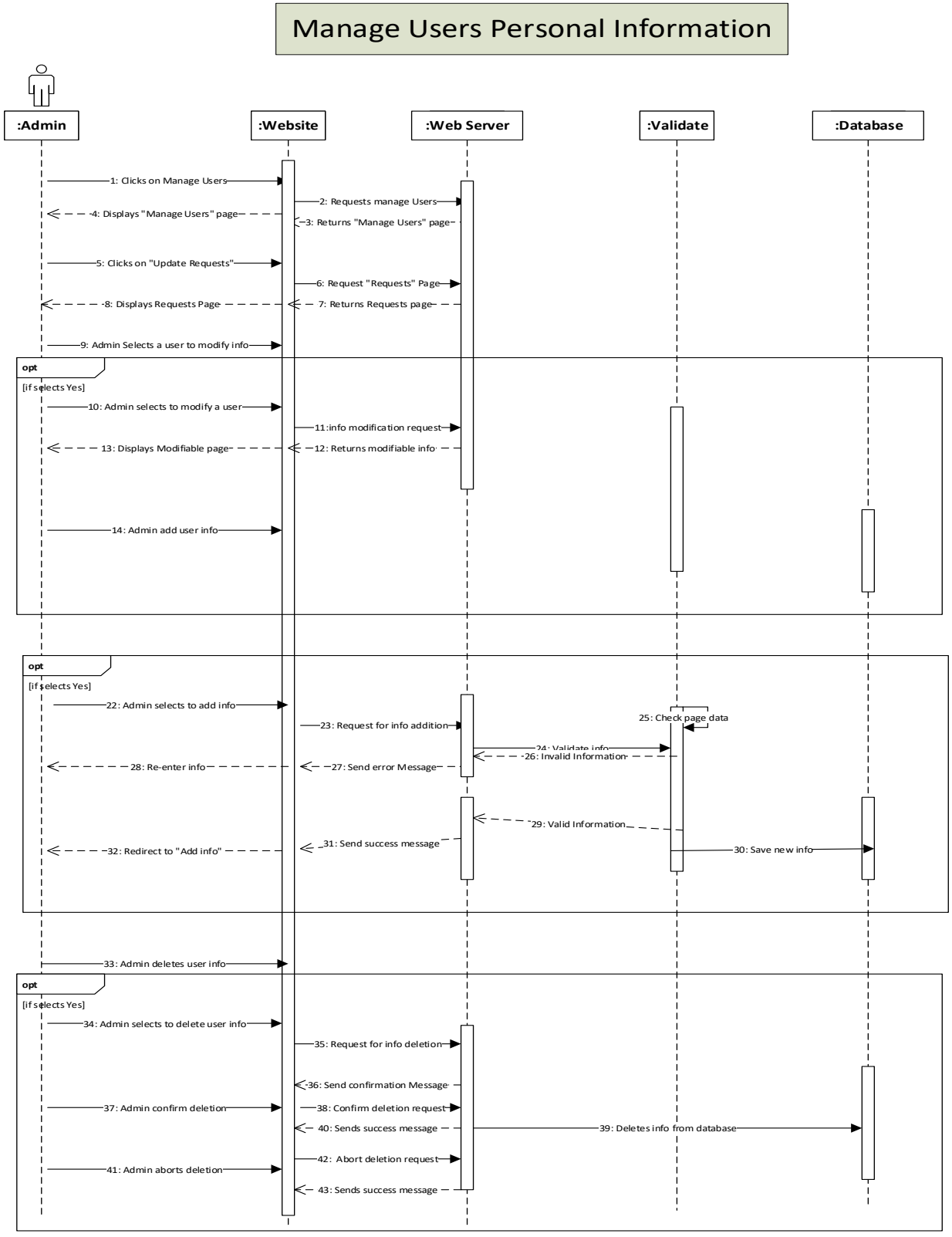

Figure 73 Managing User's Personal Information

3.3.21 Managing Campaigns

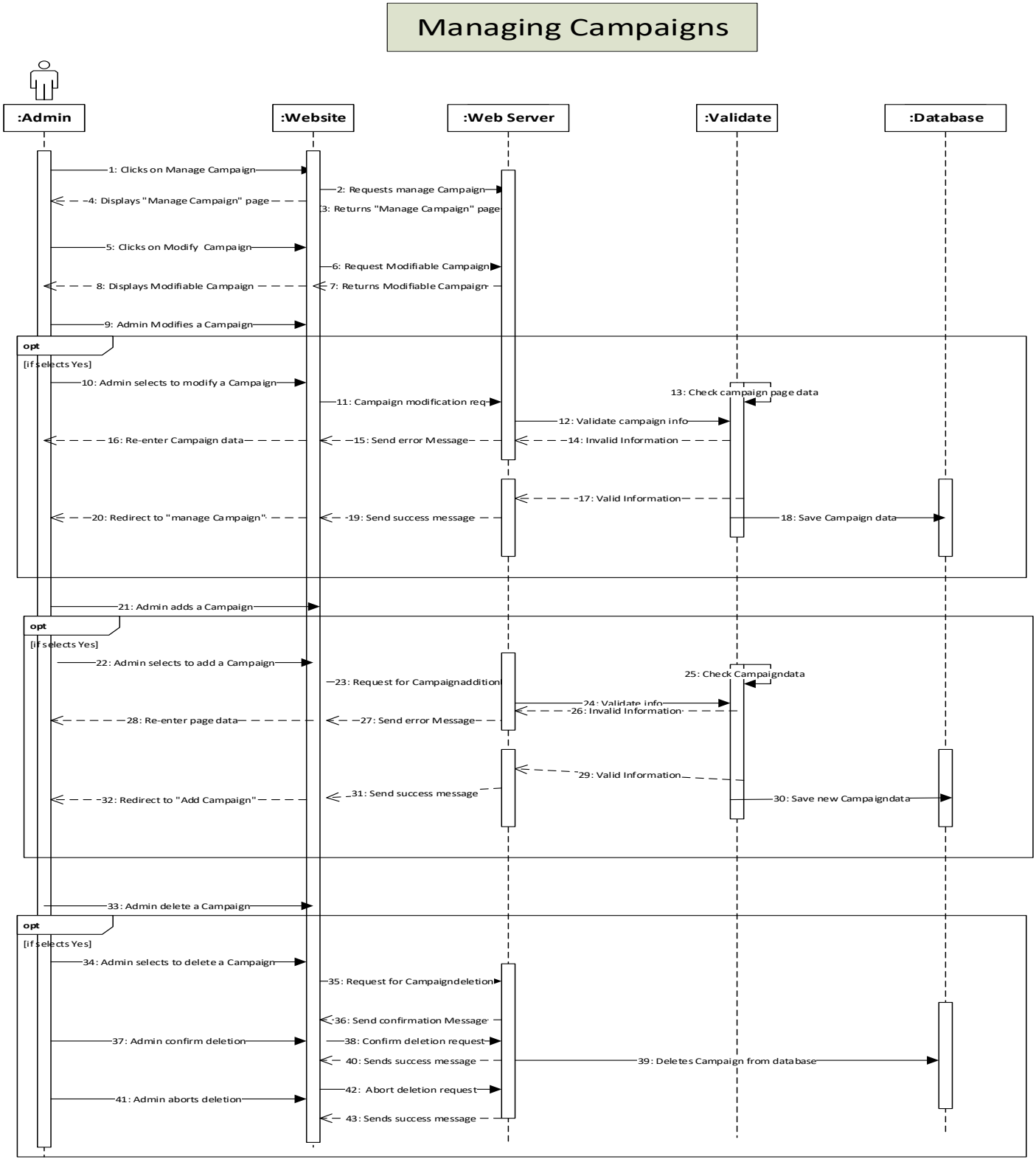

Figure 74 Managing Campaigns

3.3.22 Manage Donor List

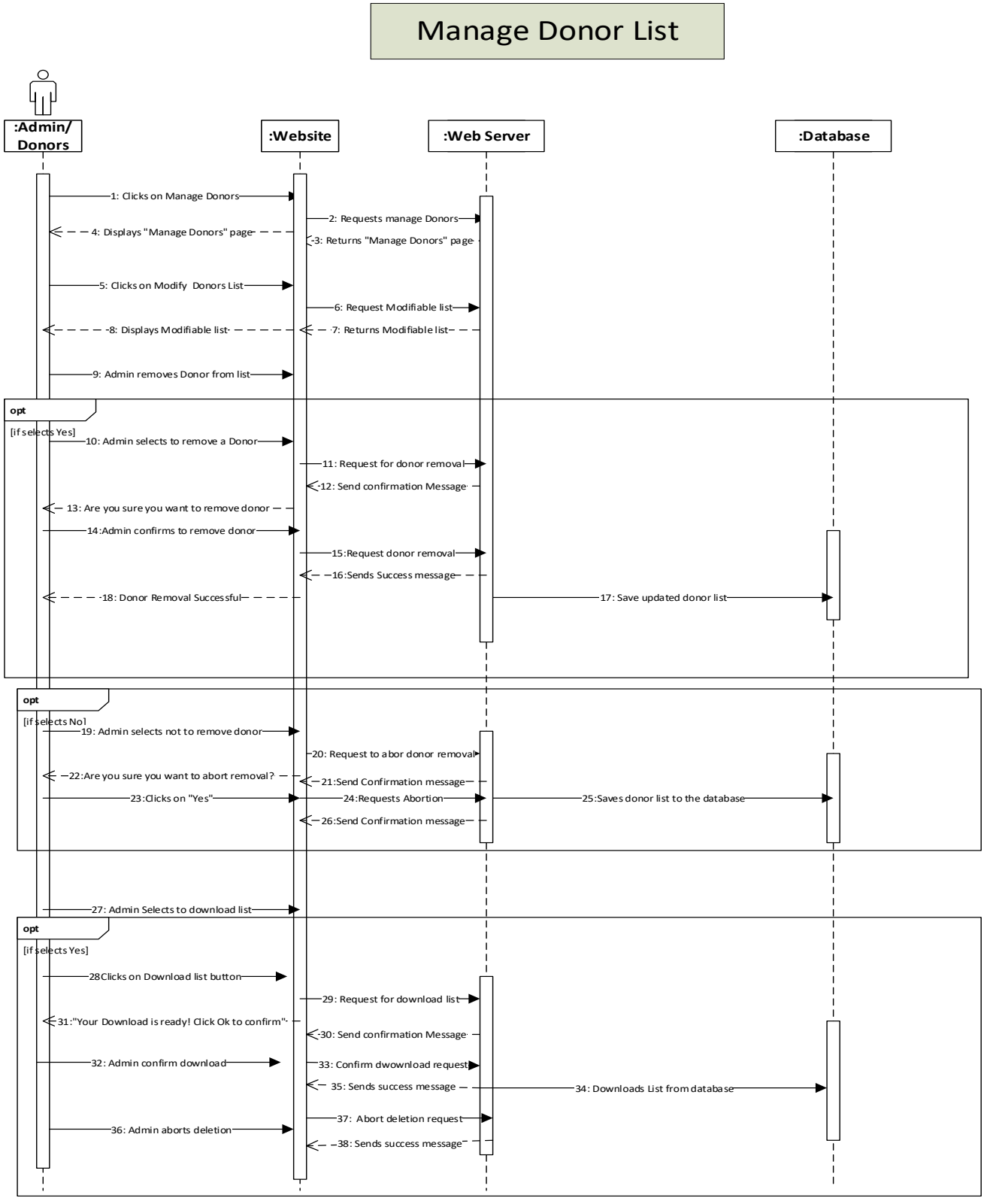

Figure 75 Manage Donor List

3.3.23 Manage Sponsors

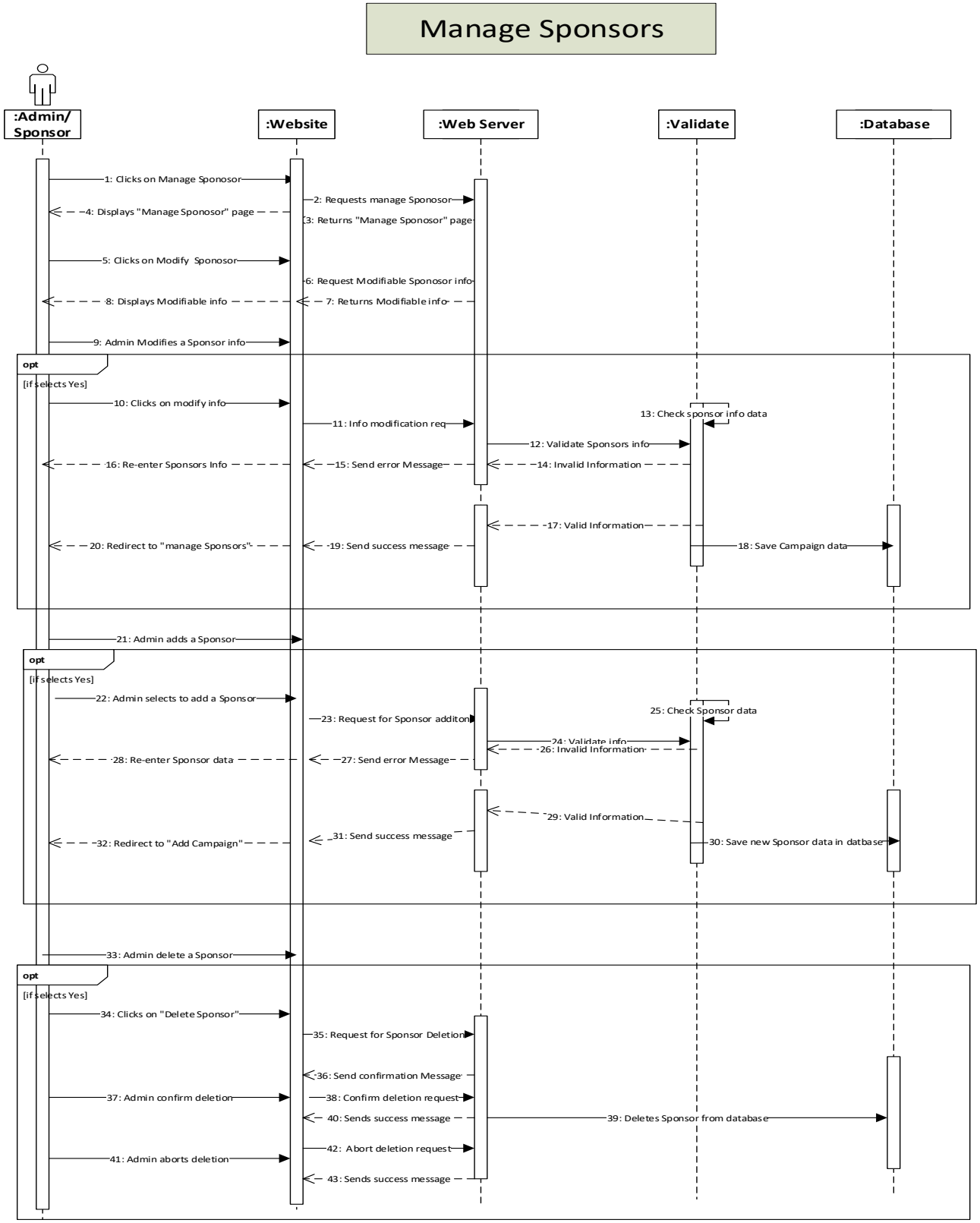

Figure 76 Manage Sponsors

3.3.24 Manage Financial Donations

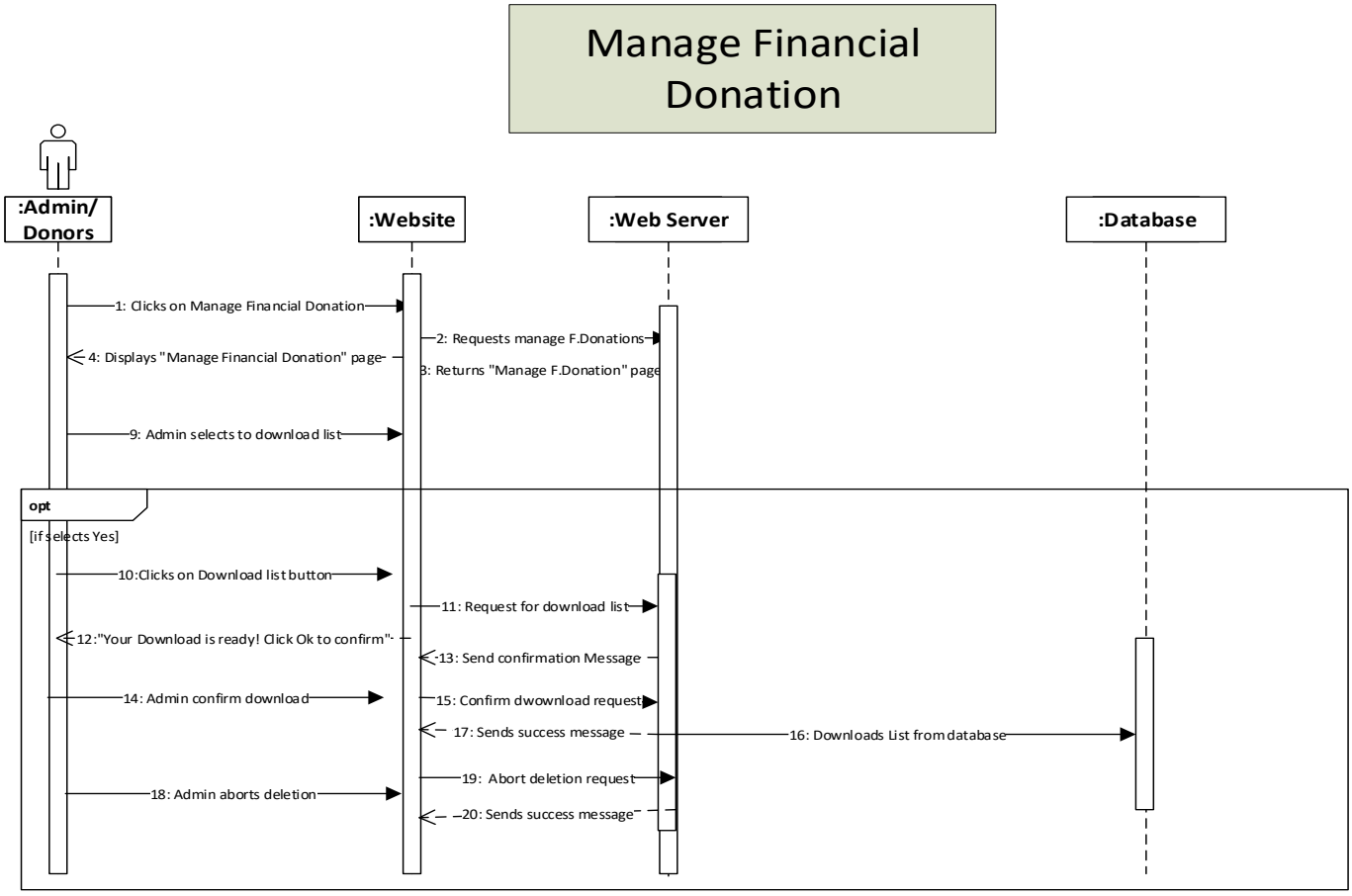

Figure 77 Manage Financial Donations

3.3.25 Manage Job Posts

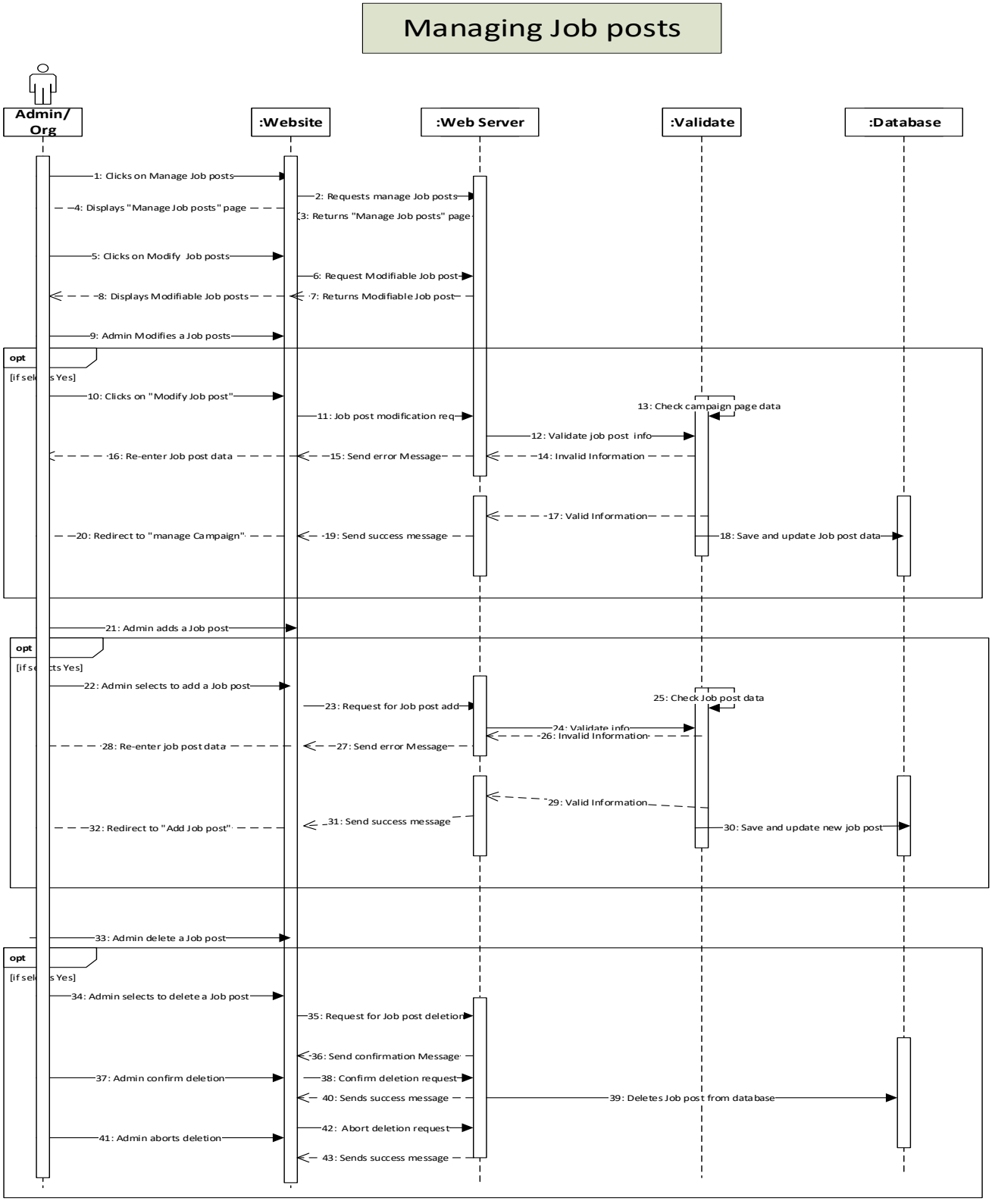

Figure 78 Manage Job Posts

3.3.26 Manage Frequently Asked Questions

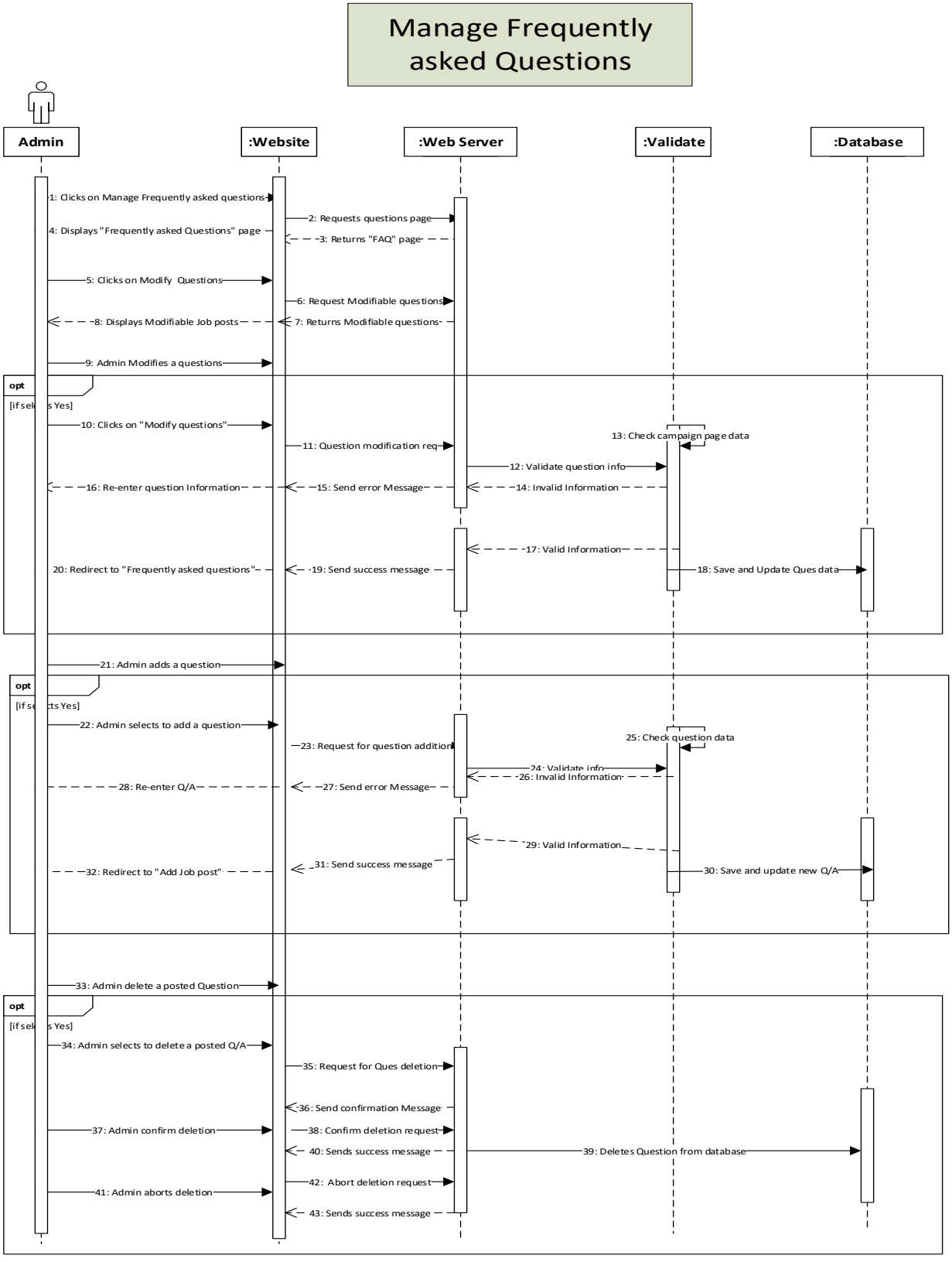

Figure 79 Manage Frequently Asked Questions

3.3 Software Architecture

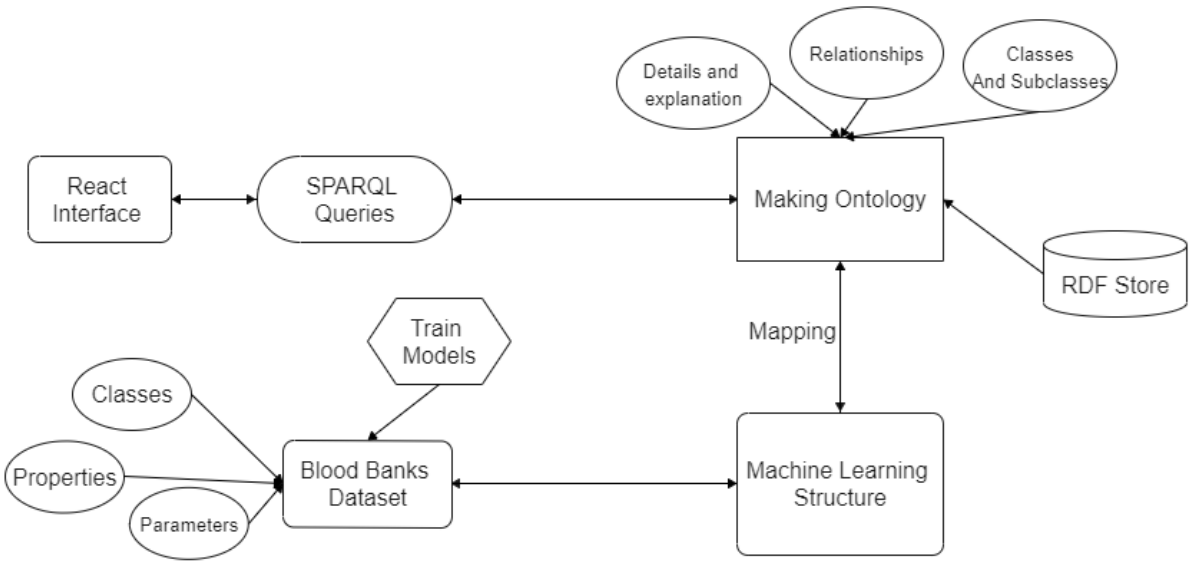

Figure 80 Software Architecture Diagram

3.4 Class Diagram

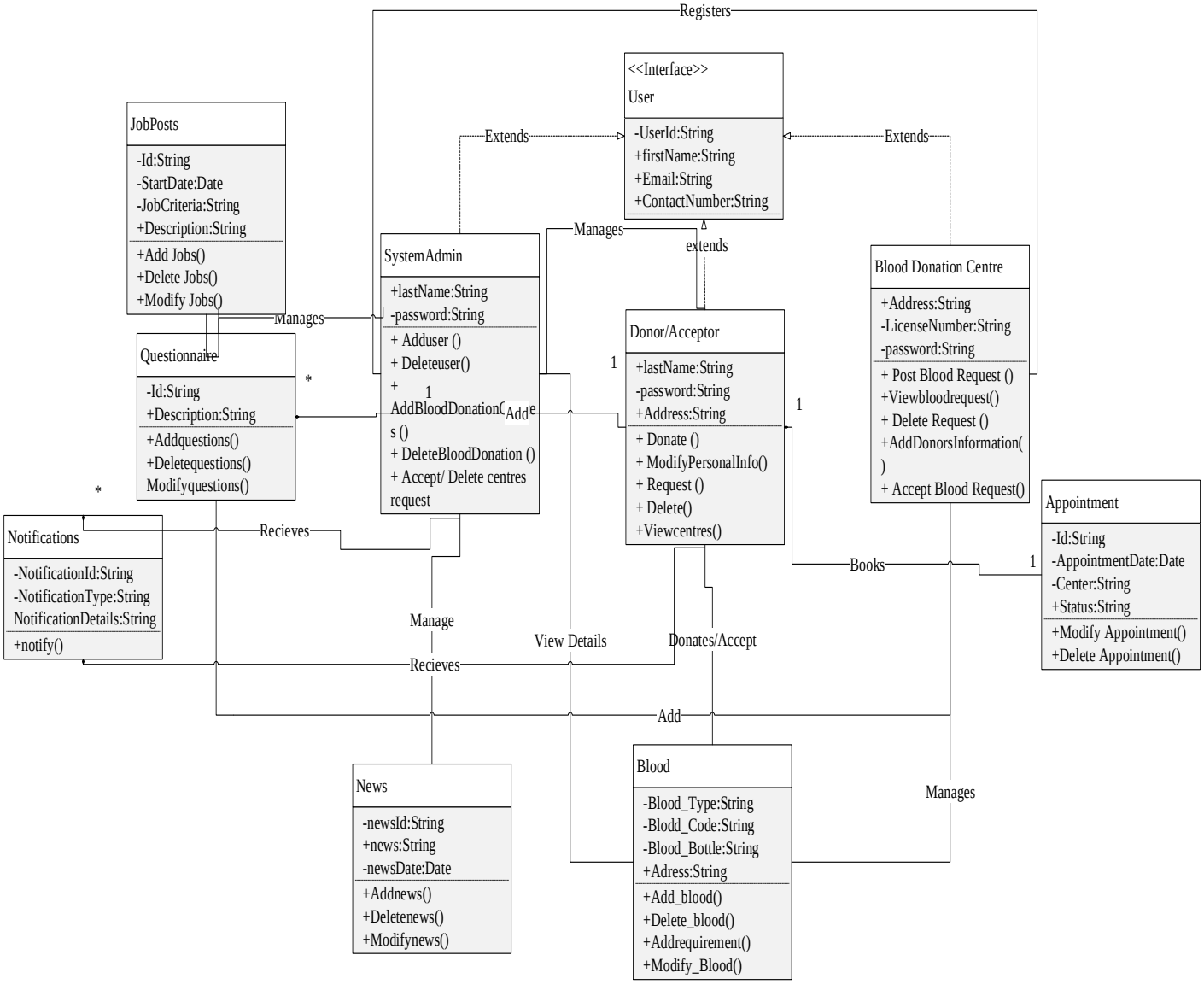

Figure 81 Class Diagram

3.5 Database Diagram

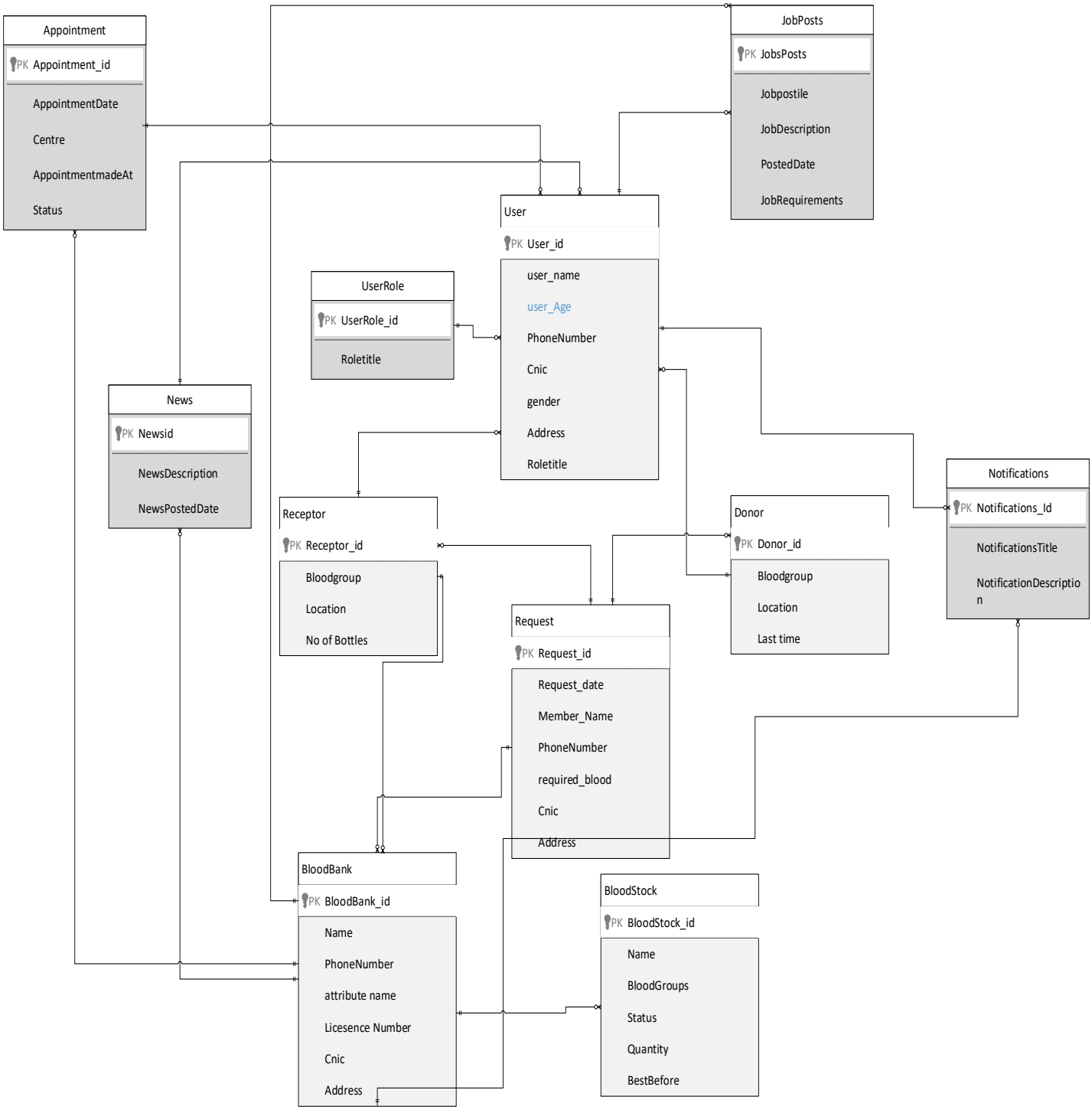

Figure 82 Database Diagram

3.6 Collaboration Diagram

3.6.1 Login

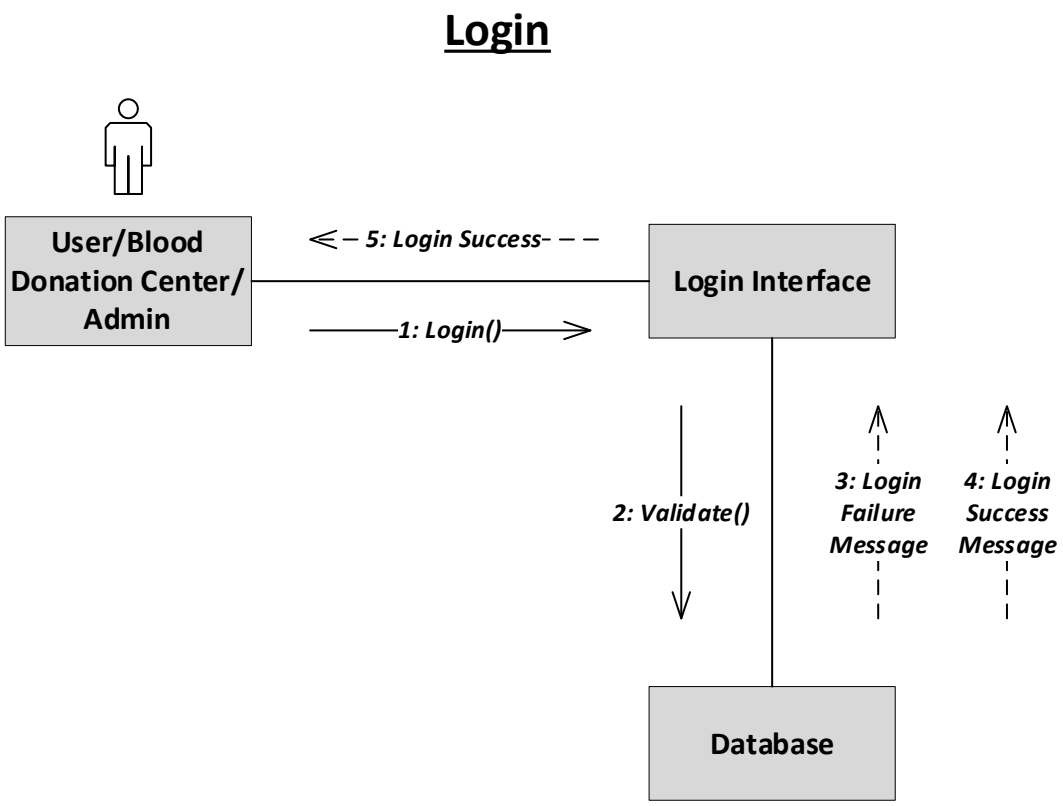

Figure 83 Login Collaboration Diagram

3.6.2 Registration

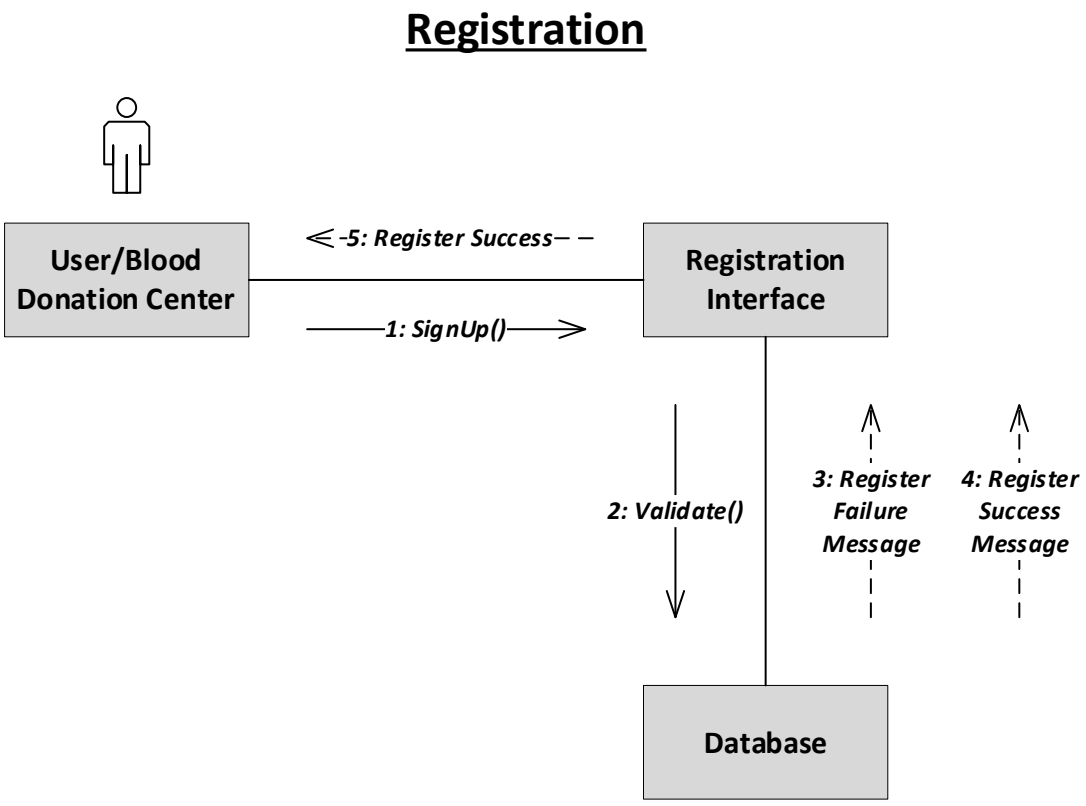

Figure 84 Registration Collaboration Diagram

3.6.3 Make the Request for Blood

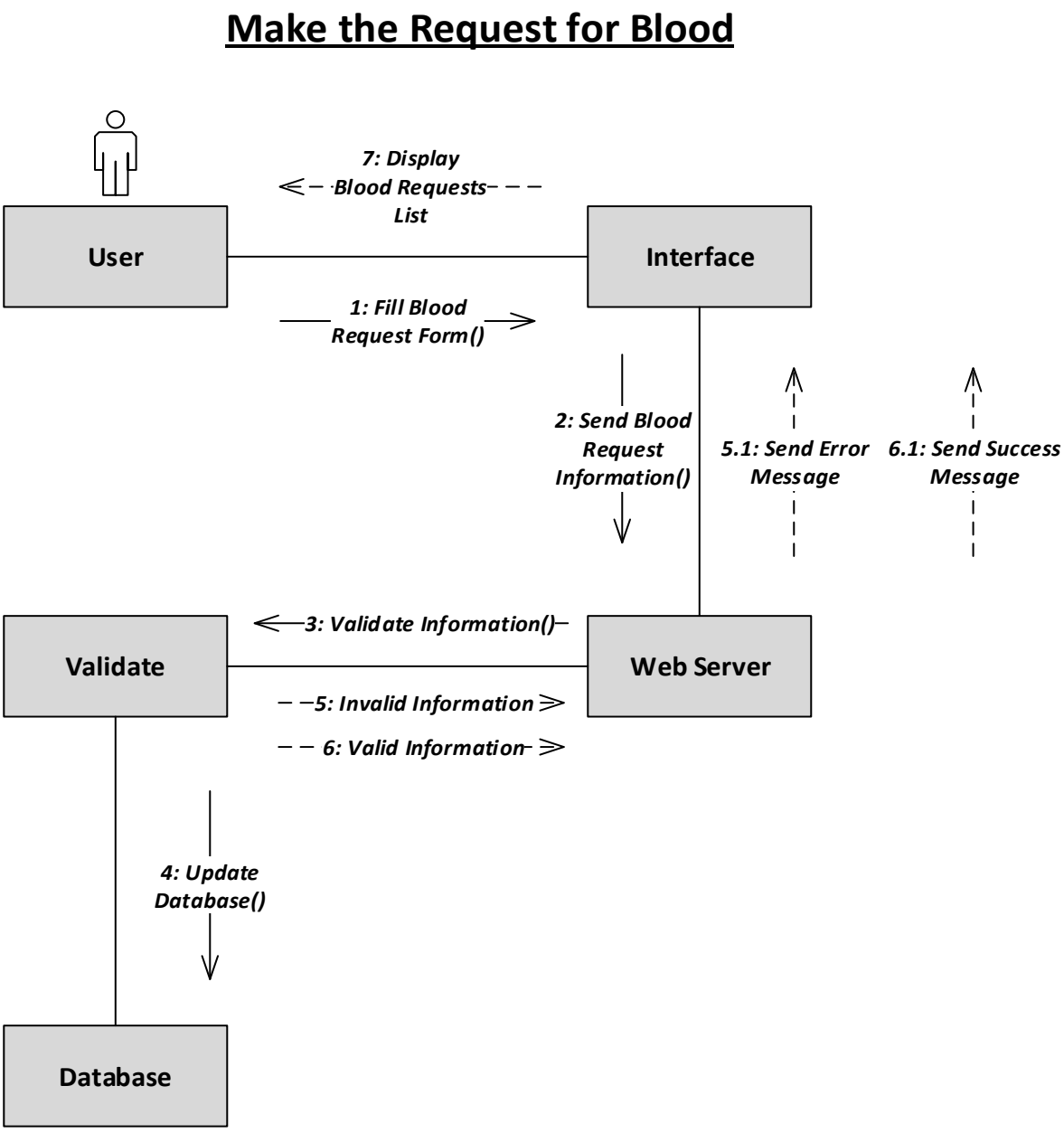

Figure 85 Make the request for blood Collaboration Diagram

3.6.4 Donate Blood

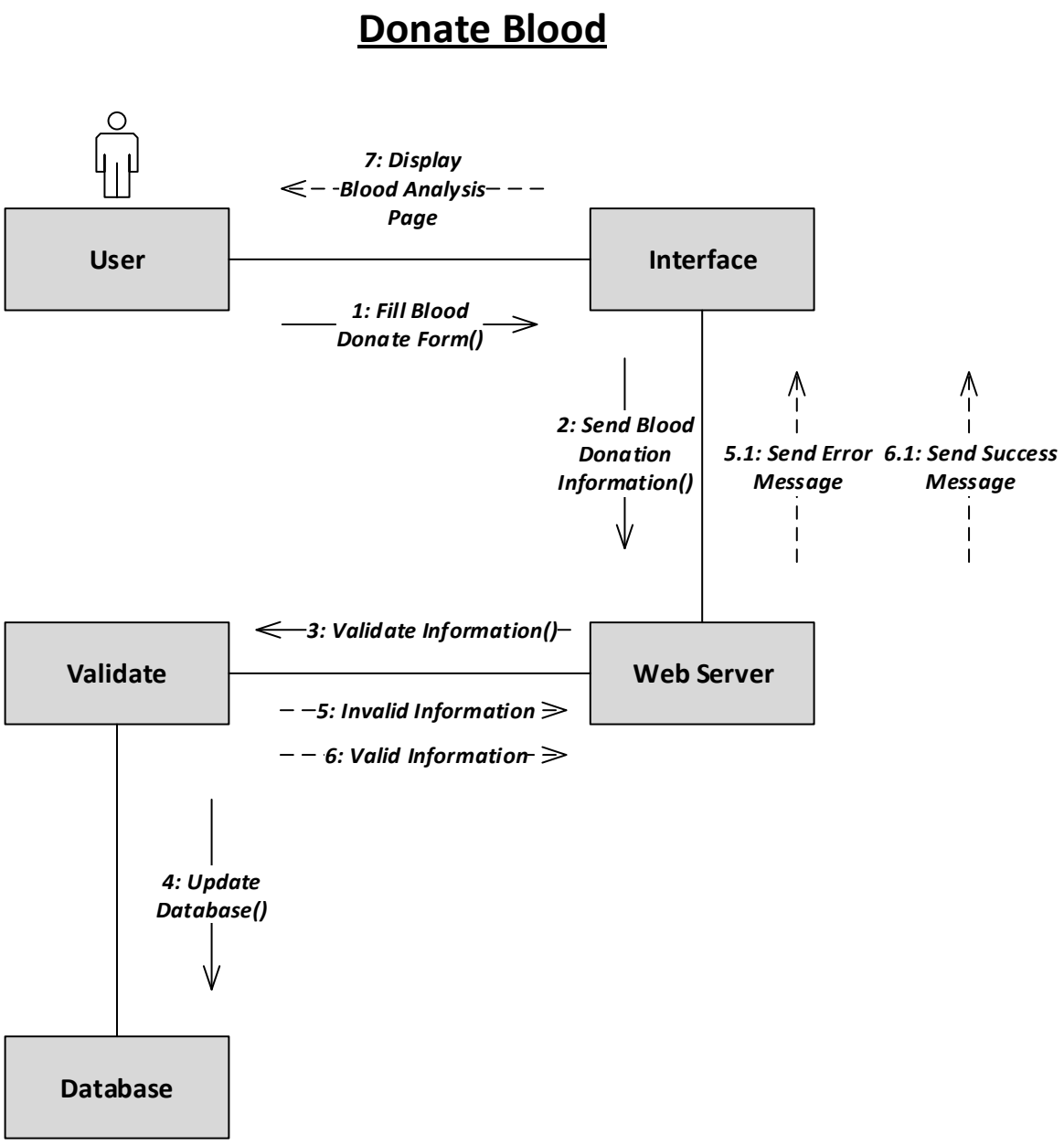

Figure 86 Donate Blood Collaboration Diagram

3.6.5 Check Eligibility of User for Blood Donation

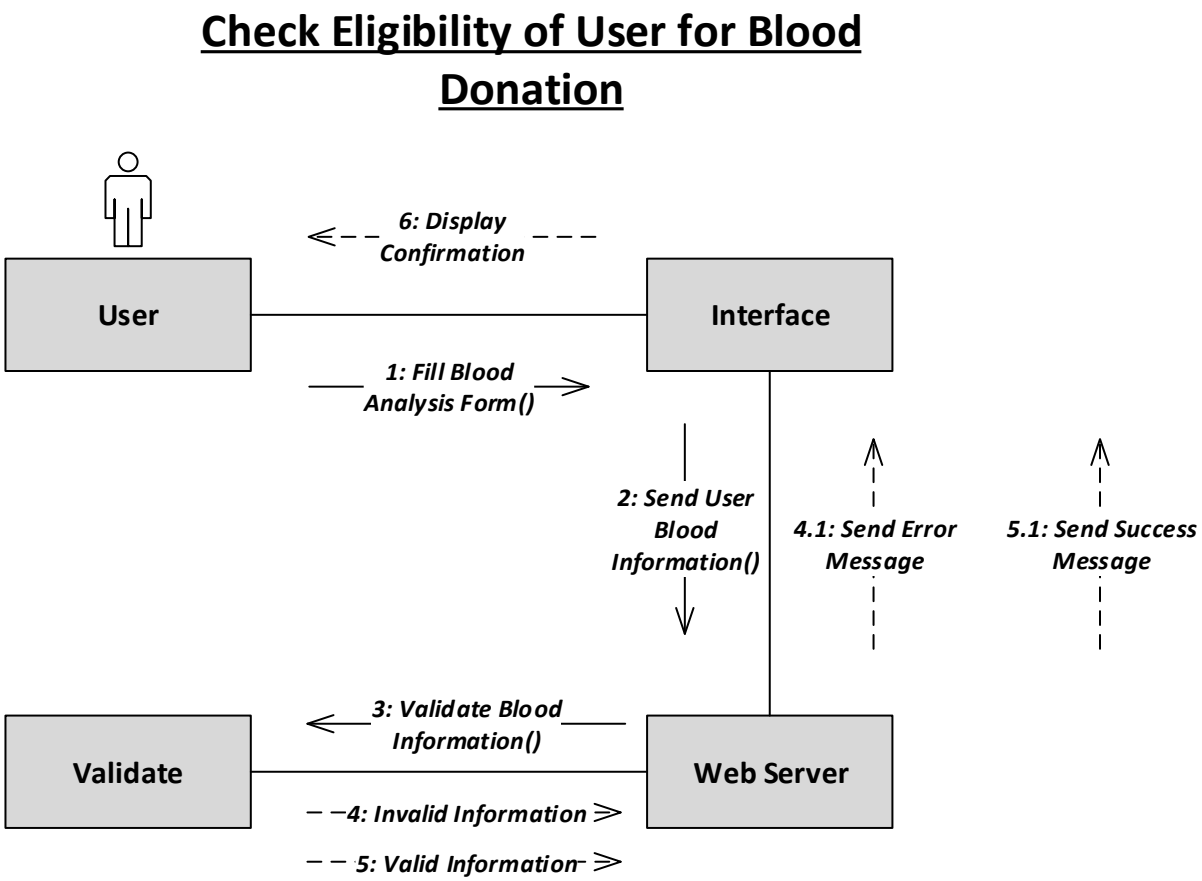

Figure 87 Check Eligibility of User for Blood Donation Collaboration Diagram

3.6.6 View Blood Donation Center's

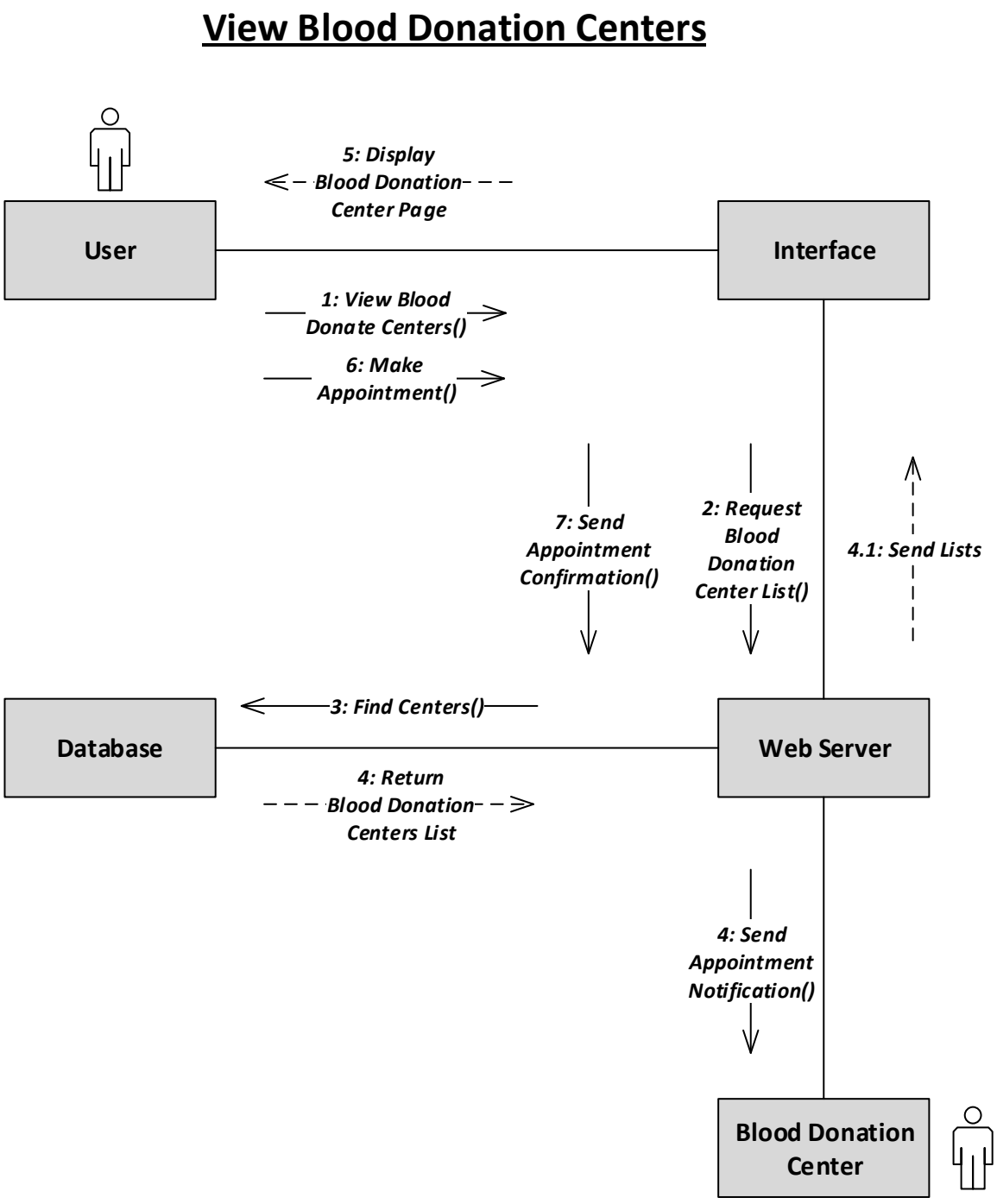

Figure 88 View Blood Donation Center Collaboration Diagram

3.6.7 Generate Appointment Report

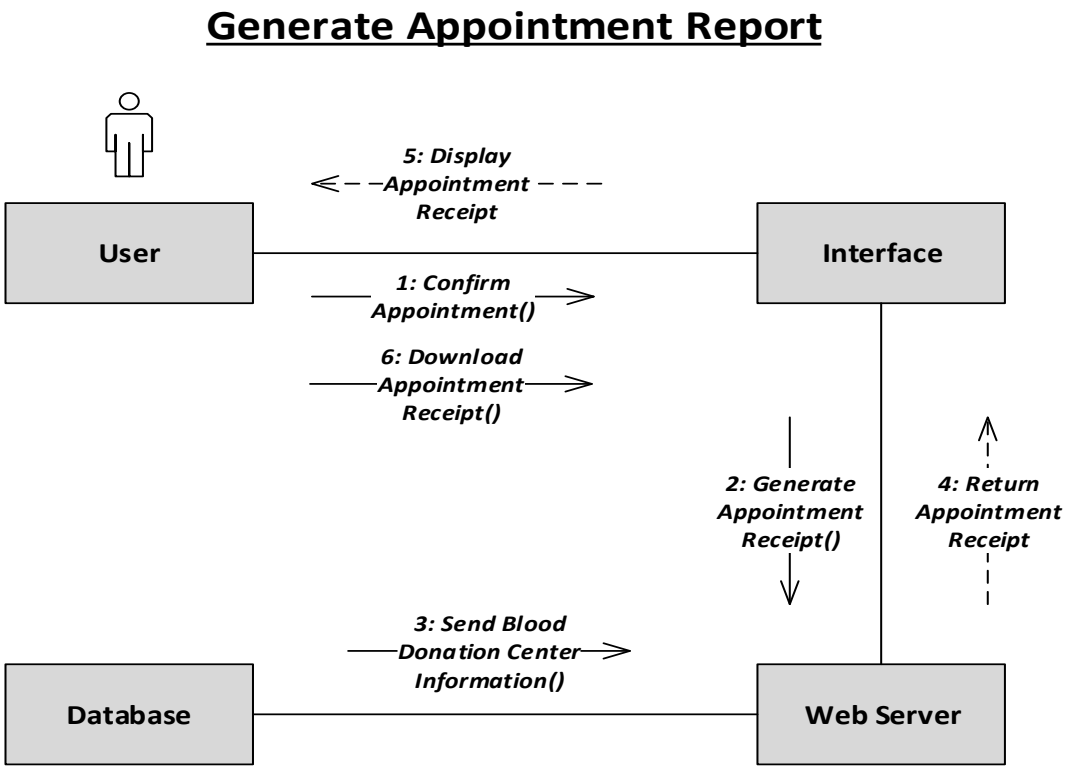

Figure 89 Generate Appointment Report Collaboration Diagram

3.6.8 Display User Profile

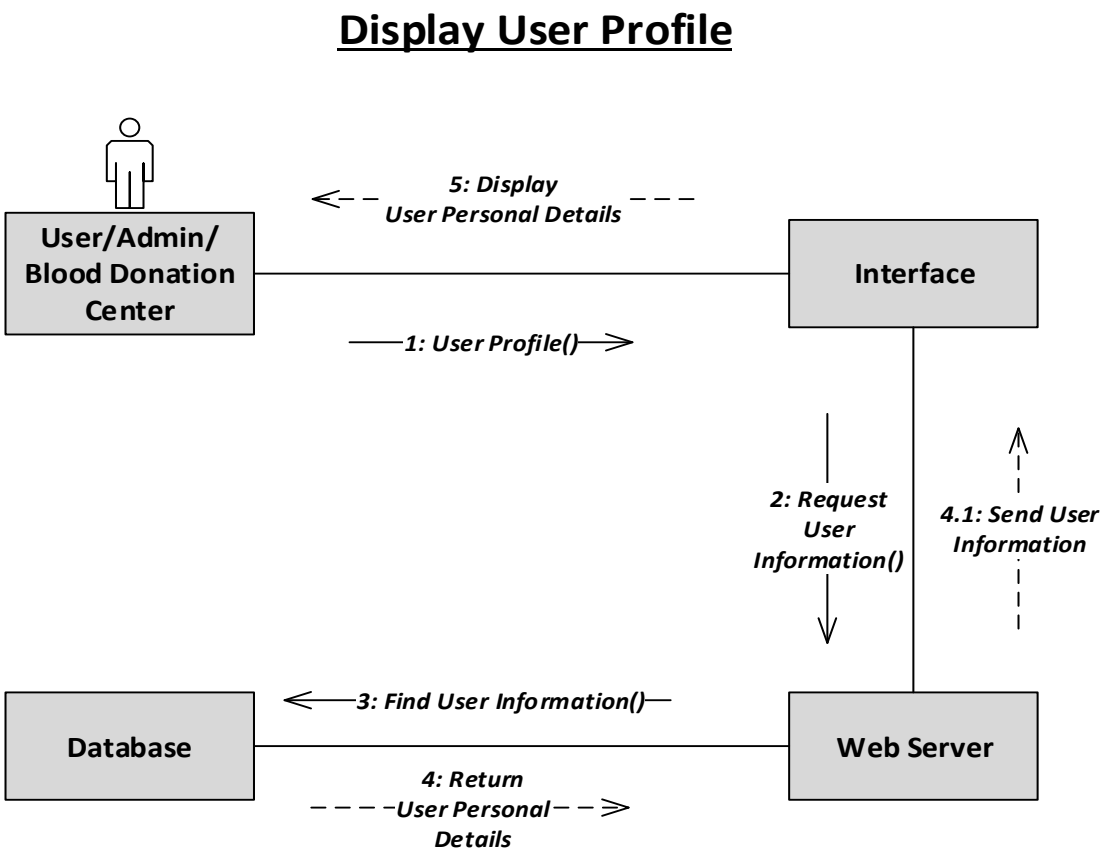

Figure 90 Display User Profile Collaboration Diagram

3.6.9 View Blood Requests

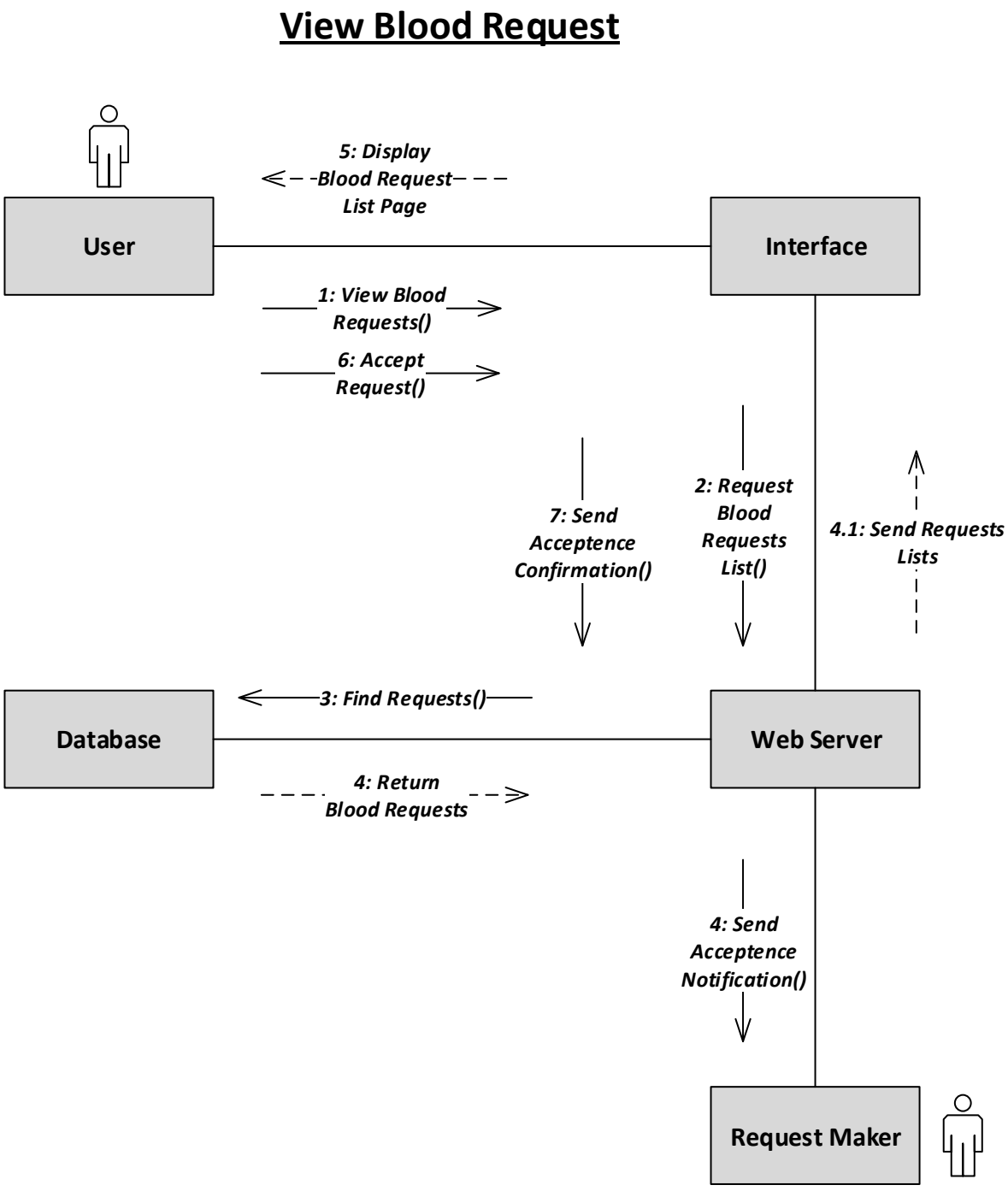

Figure 91 View Blood Request Collaboration Diagram

3.6.10 Update Personal Information

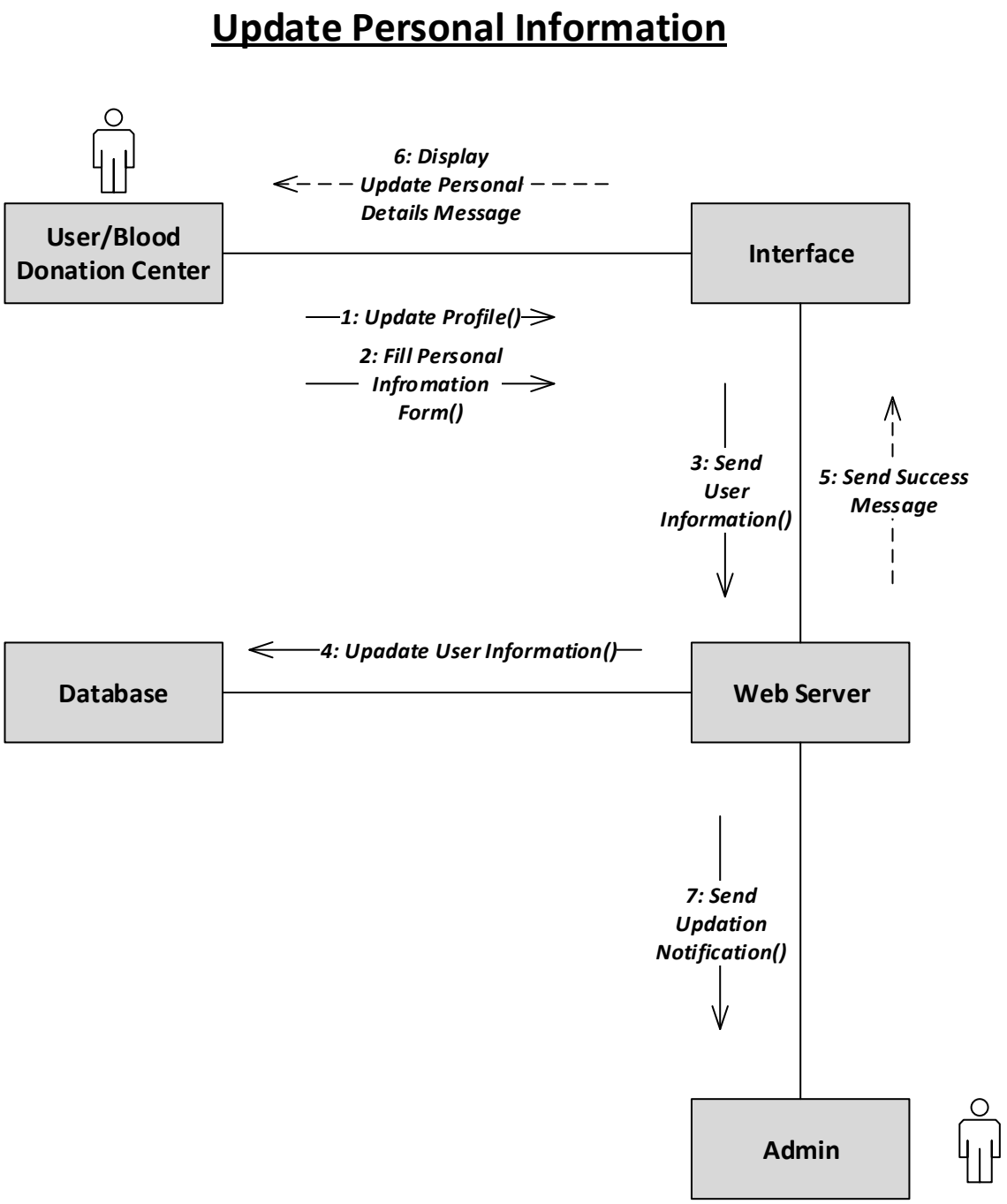

Figure 92 Update Personal Information Collaboration Diagram

3.6.11 Delete Personal Information

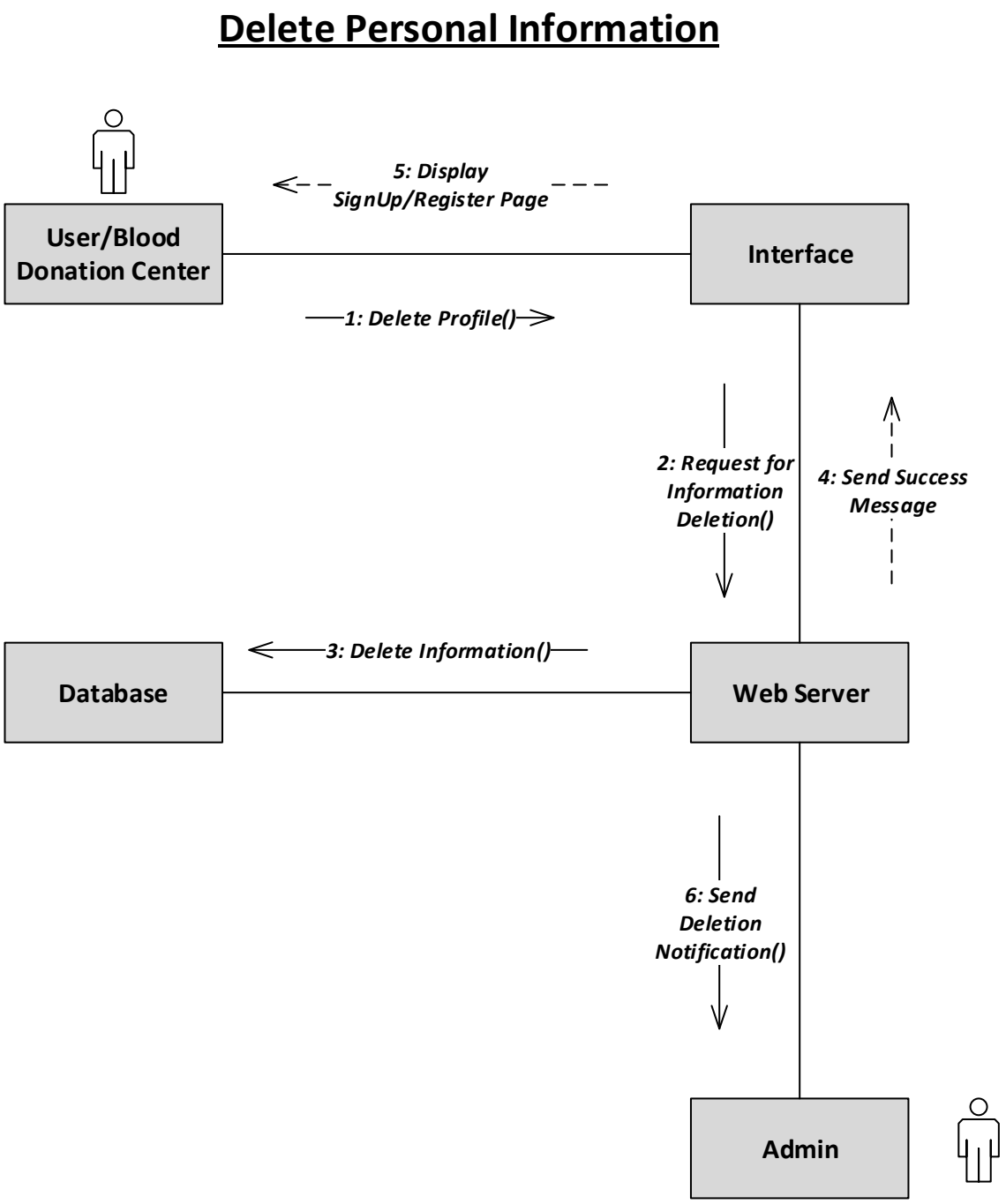

Figure 93 Delete Persona Information Collaboration Diagram

3.6.12 Get User Feedback

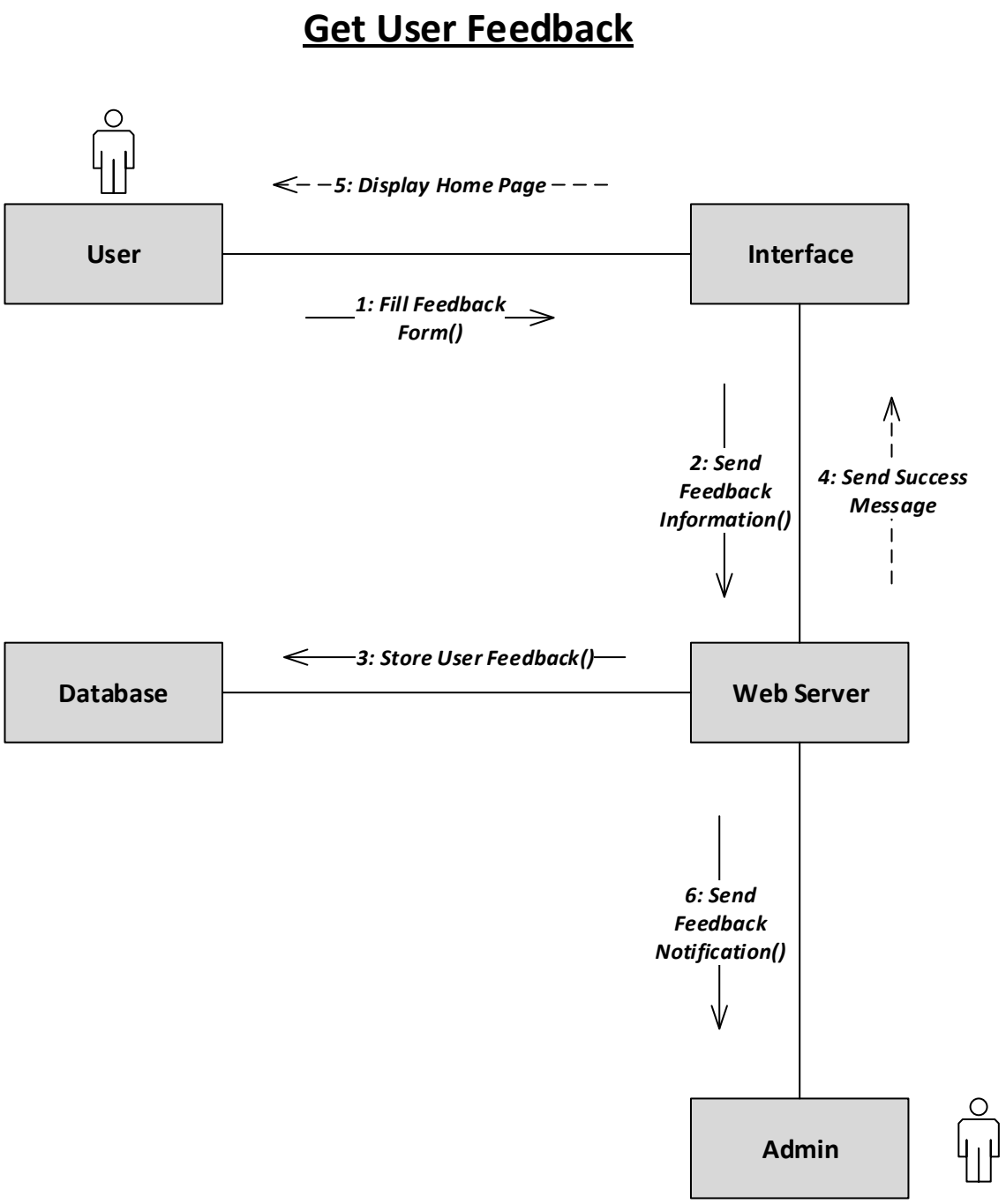

Figure 94 Get User Feedback Collaboration Diagram

3.6.13 Add User Information

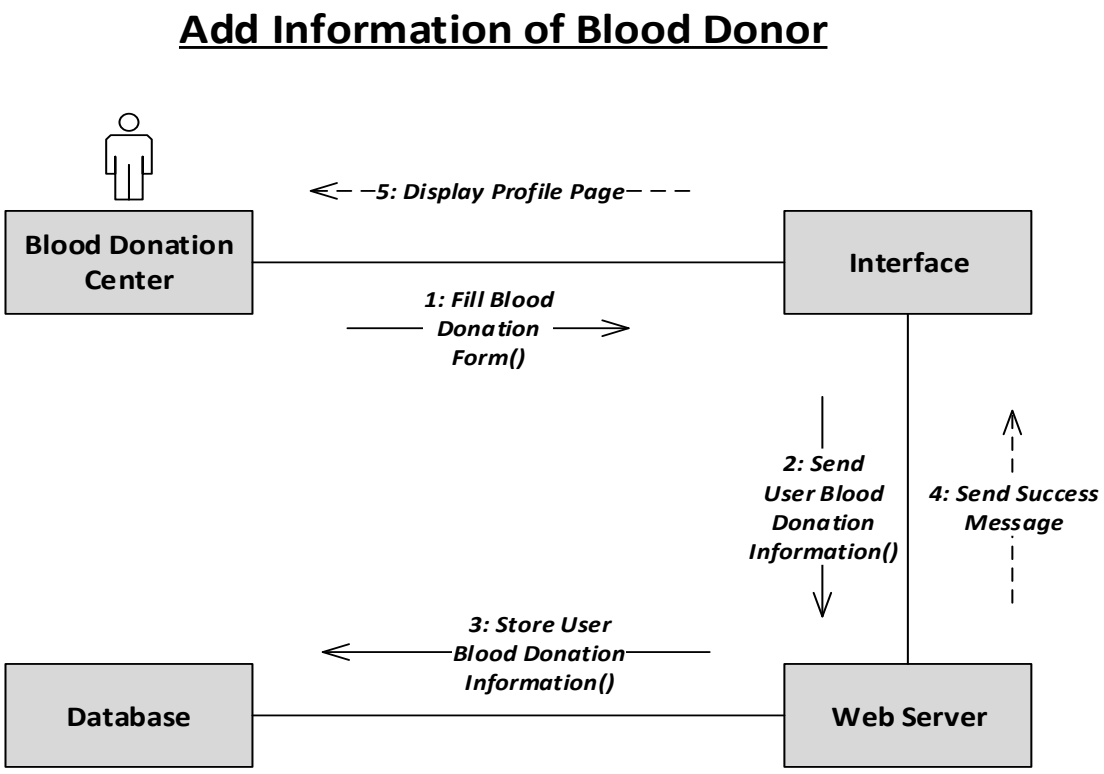

Figure 95 Add User Information Collaboration Diagram

3.6.14Generate Report on Blood Stocks

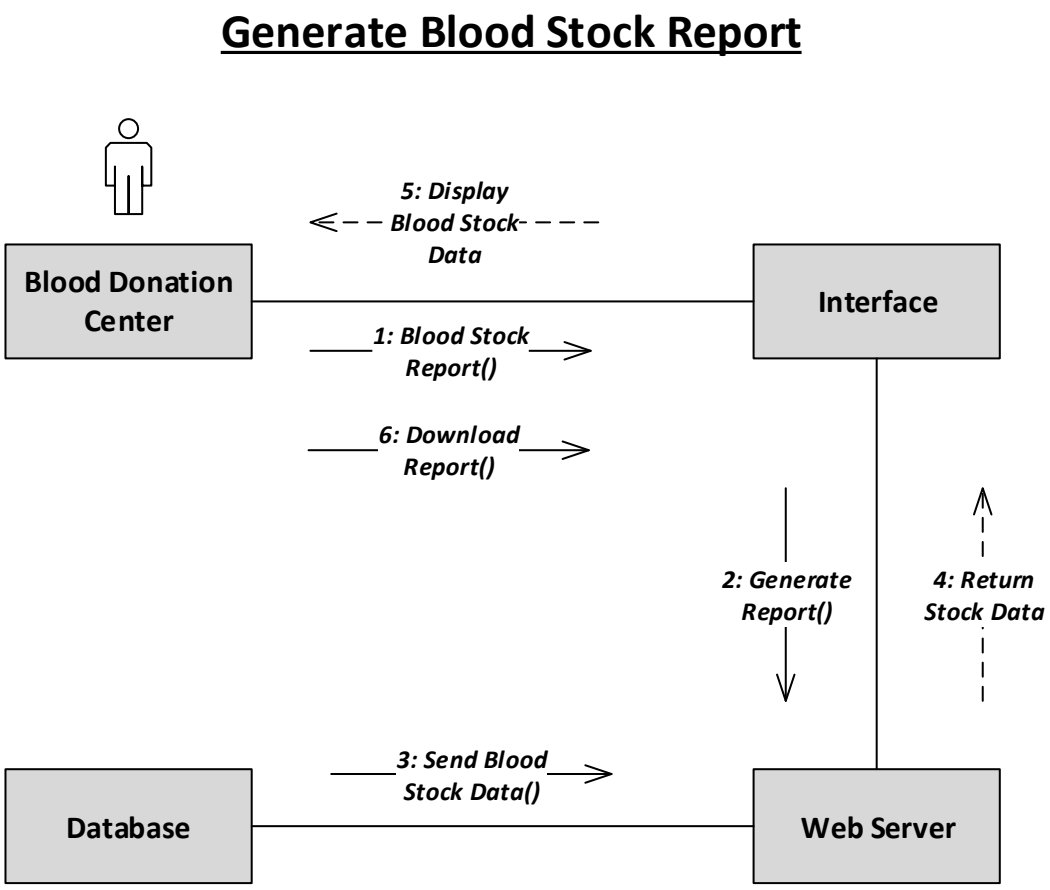

Figure 96 Generate Report on Blood Stock Collaboration Diagram

3.6.15 Update Blood Stock

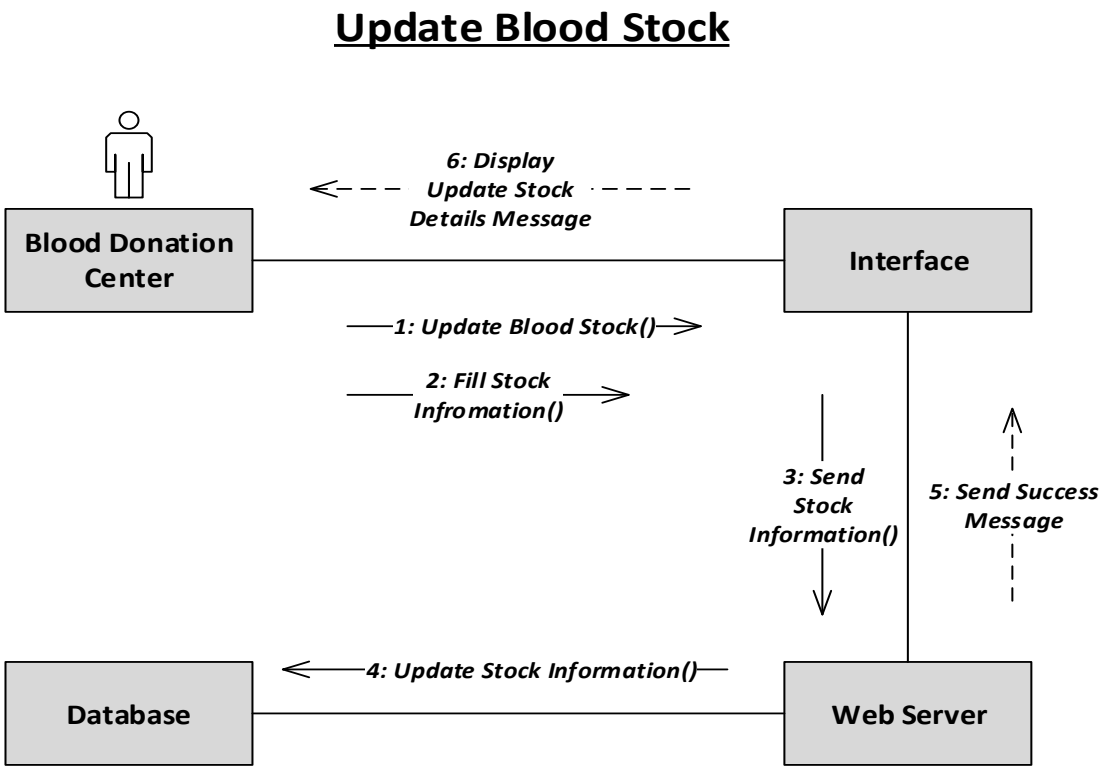

Figure 97 Update Blood Stock Collaboration Diagram

3.6.16 Download Weekly/Monthly Appointment Report

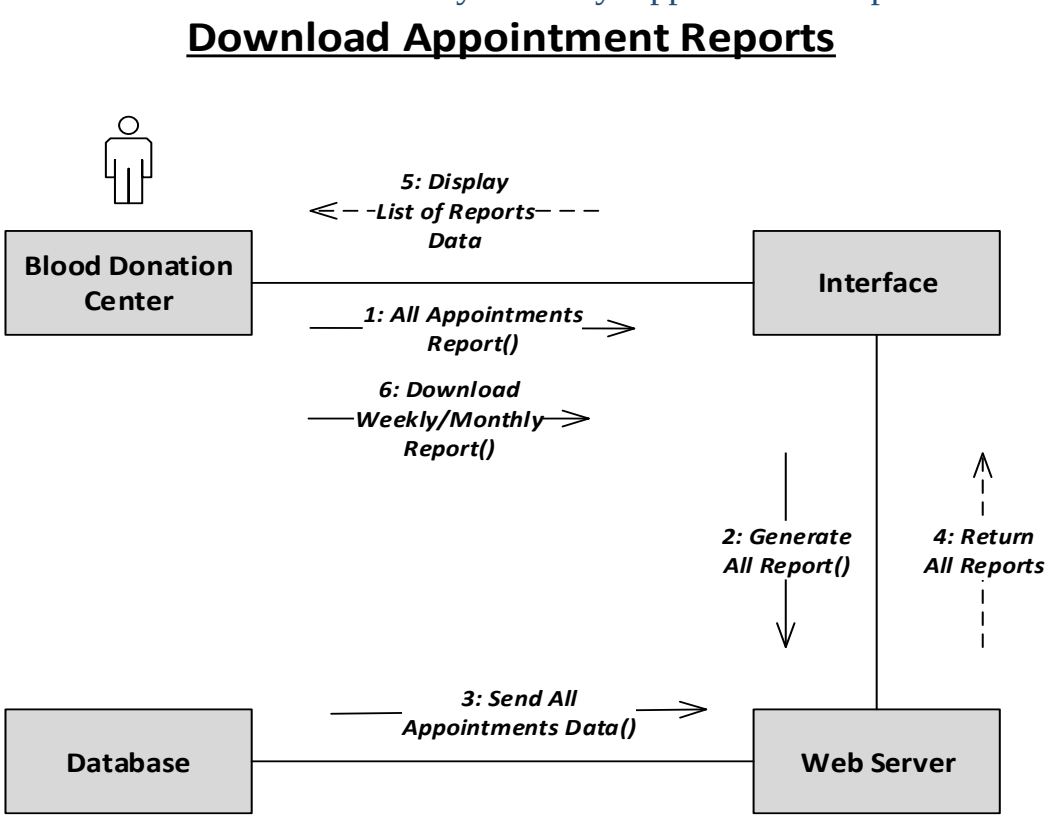

Figure 98 Download Appointment Reports Collaboration Diagram

3.6.17 Manage NGOs or Blood Donation Center's

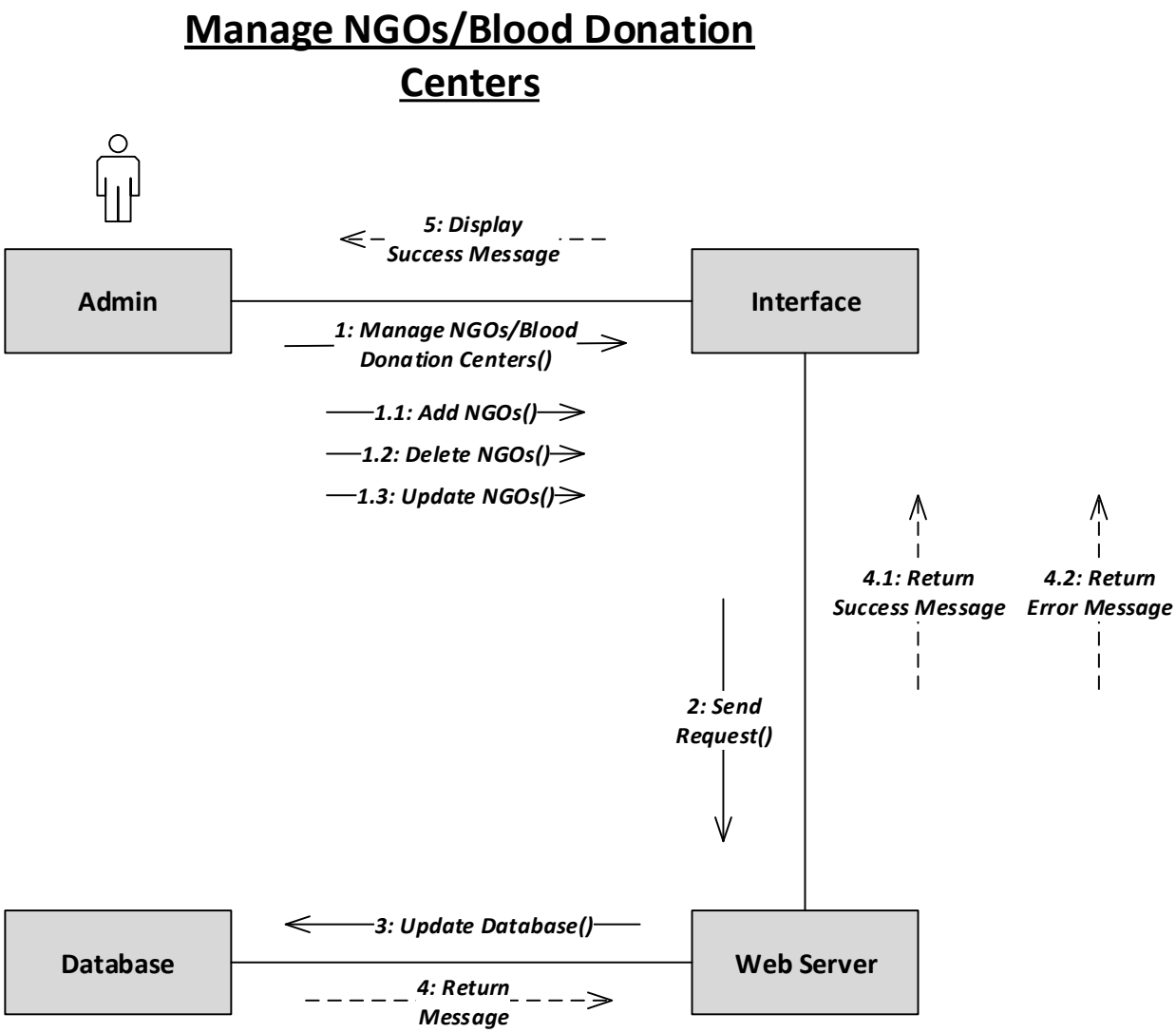

Figure 99 Manage NGO's/Blood Donation Center Collaboration Diagram

3.6.18 Add News

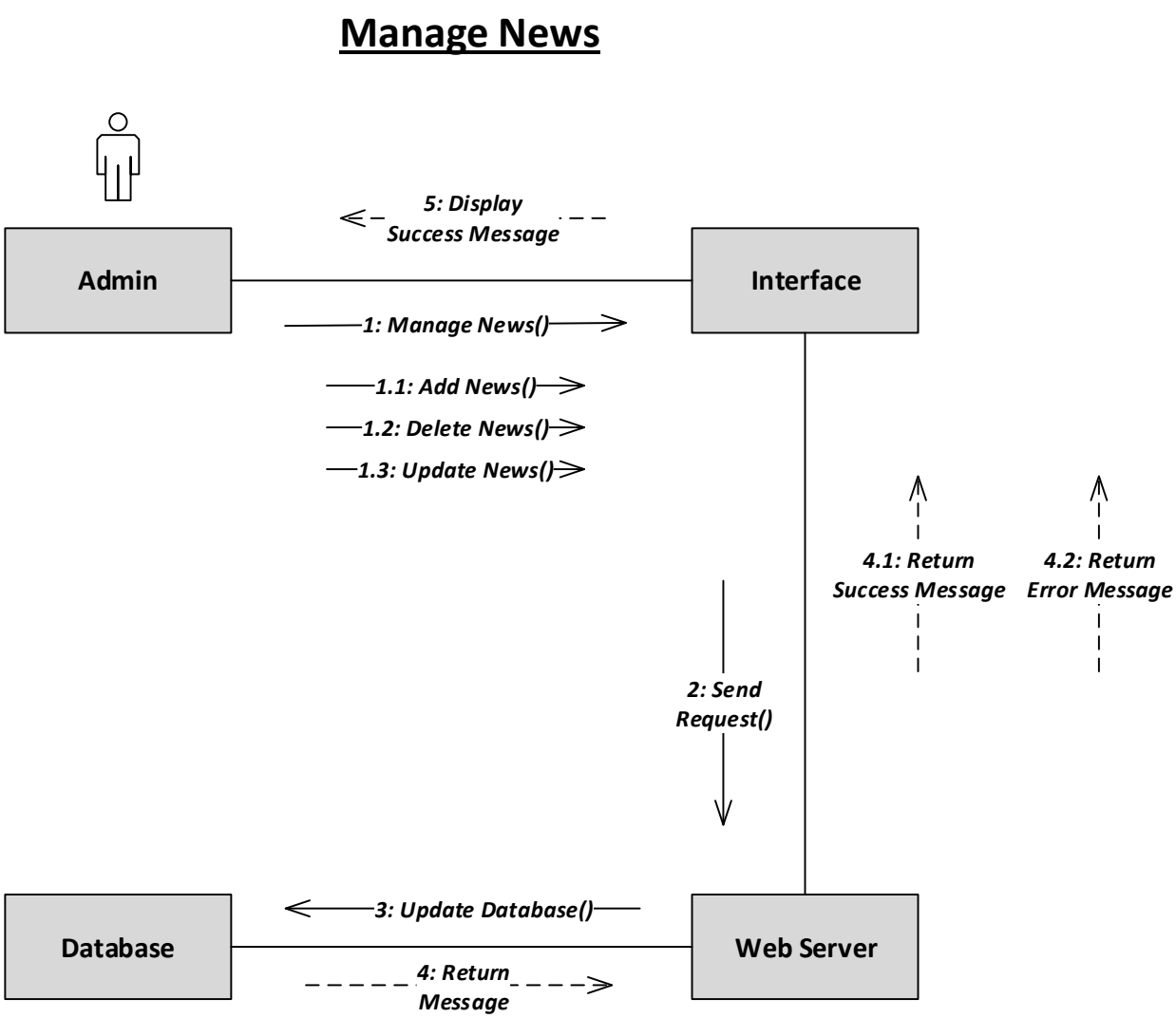

Figure 100 Manage News Collaboration Diagram

3.6.19 Handling Blood Requests

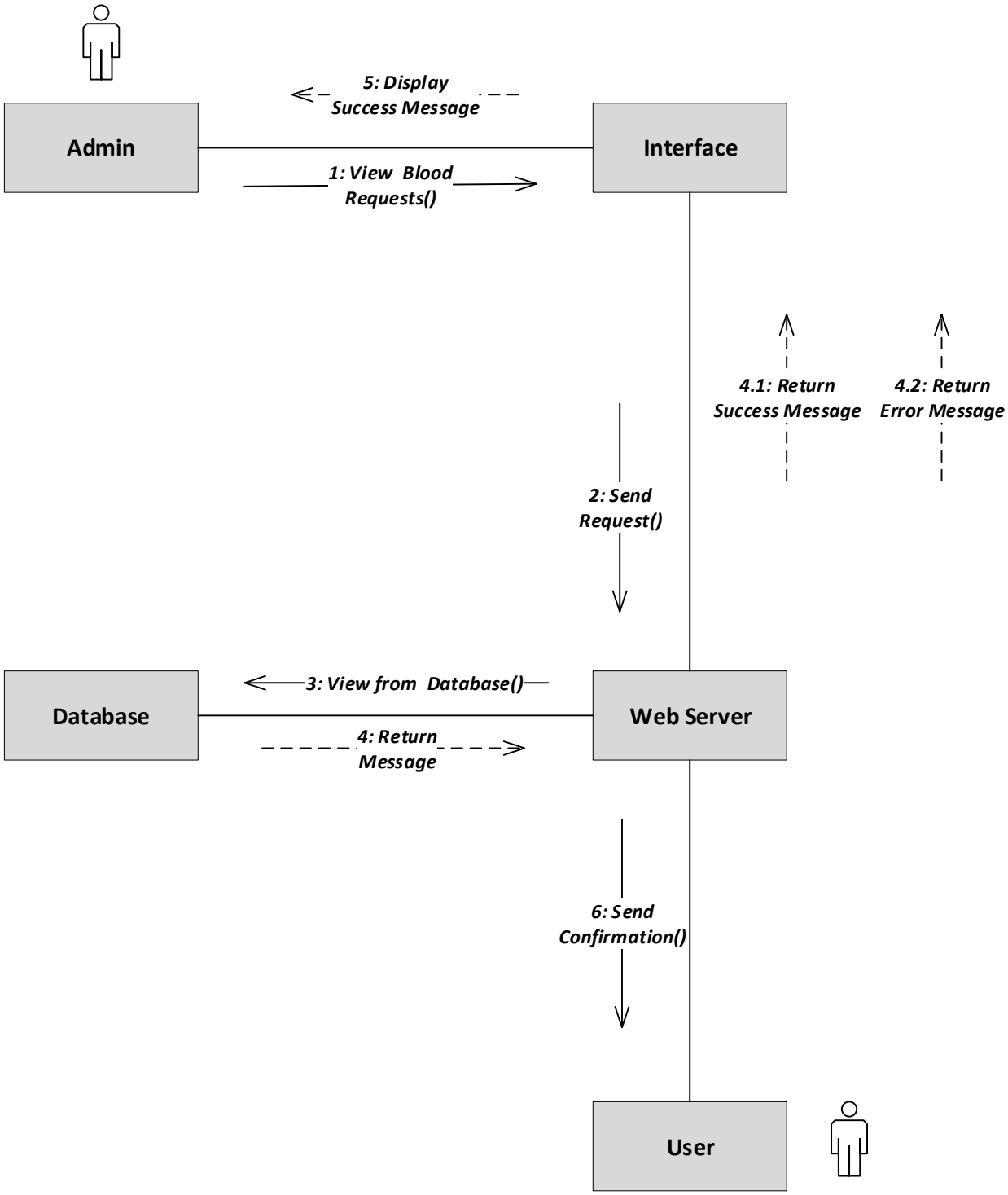

Figure 101 Handling Blood Requests Collaboration Diagram

3.6.20 Managing User's Personal Information

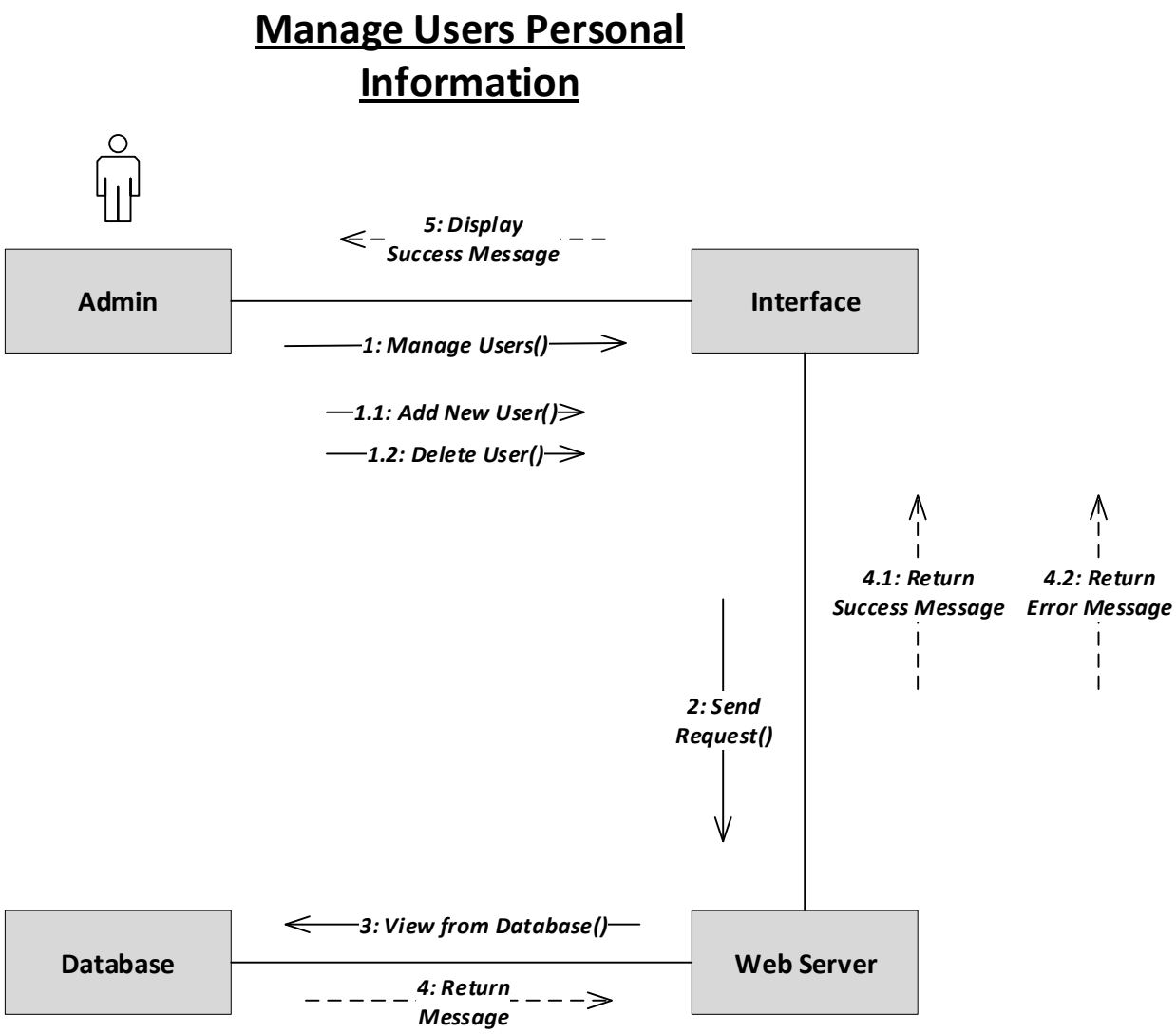

Figure 102 Manage Users Personal Information Collaboration Diagram

3.6.21 Managing Campaigns

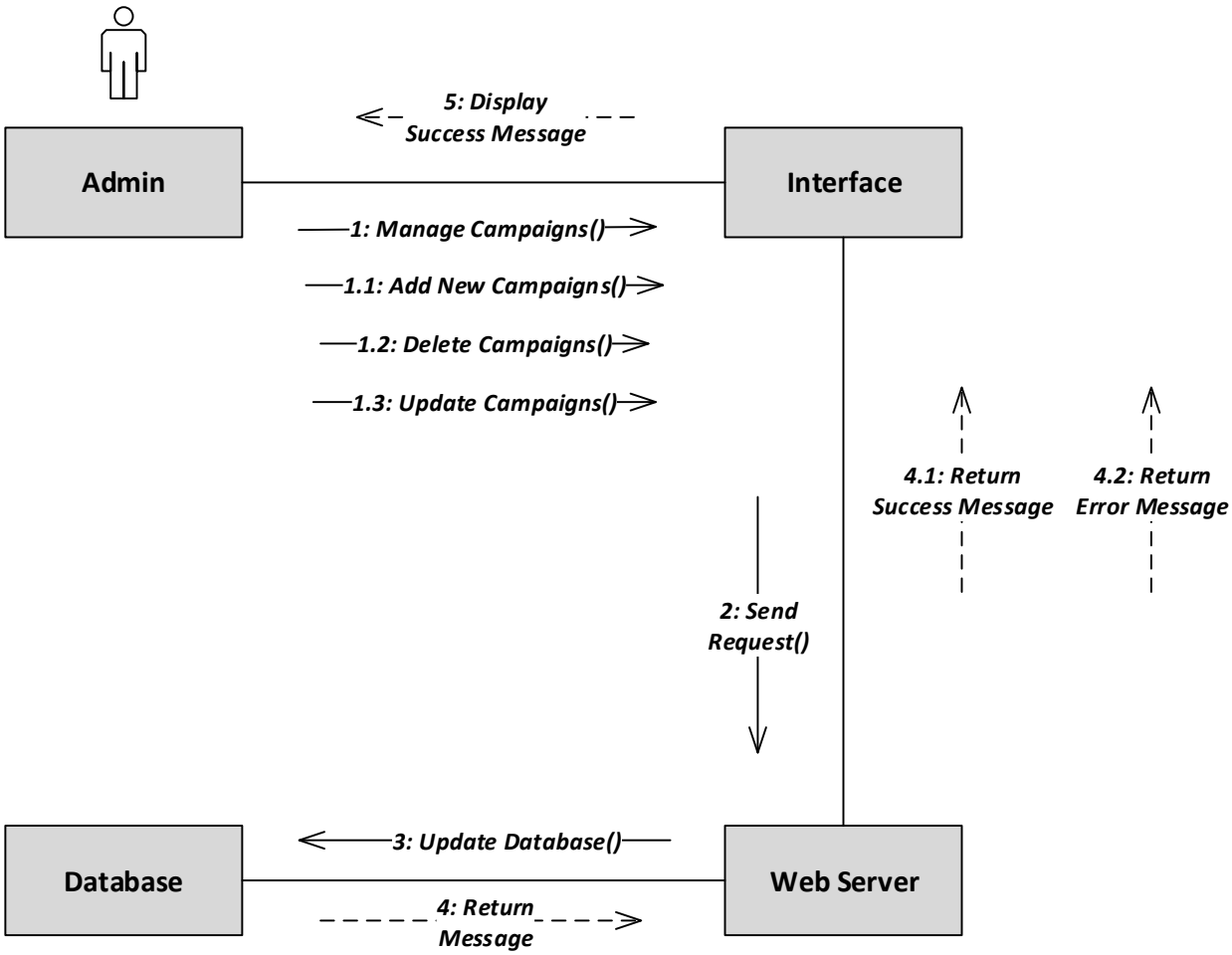

Figure 103 Manage Campaigns Collaboration Diagram

3.6.22 Managing Donors List

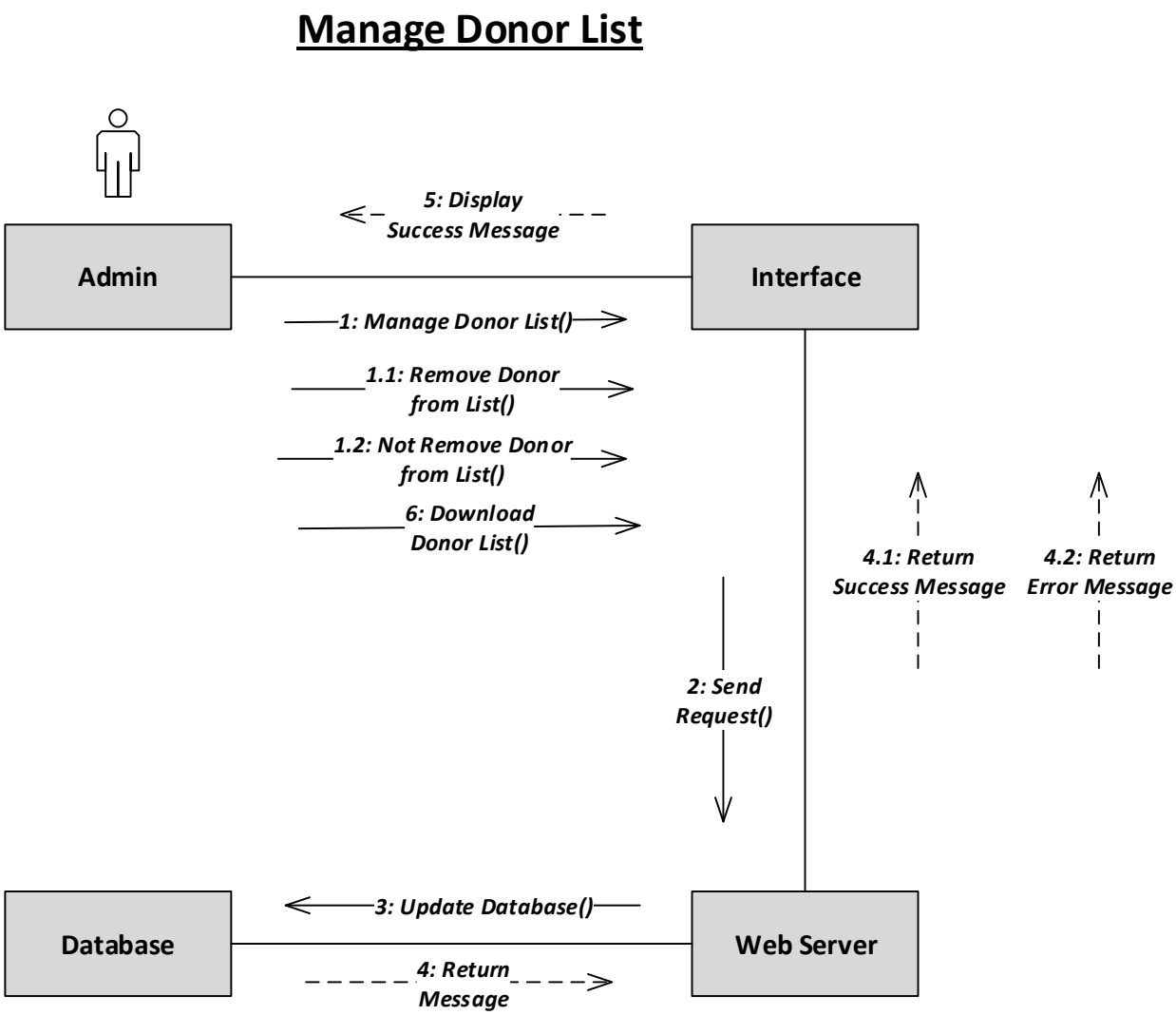

Figure 104 Manage Donor List Collaboration Diagram

3.6.23 Manage Sponsors

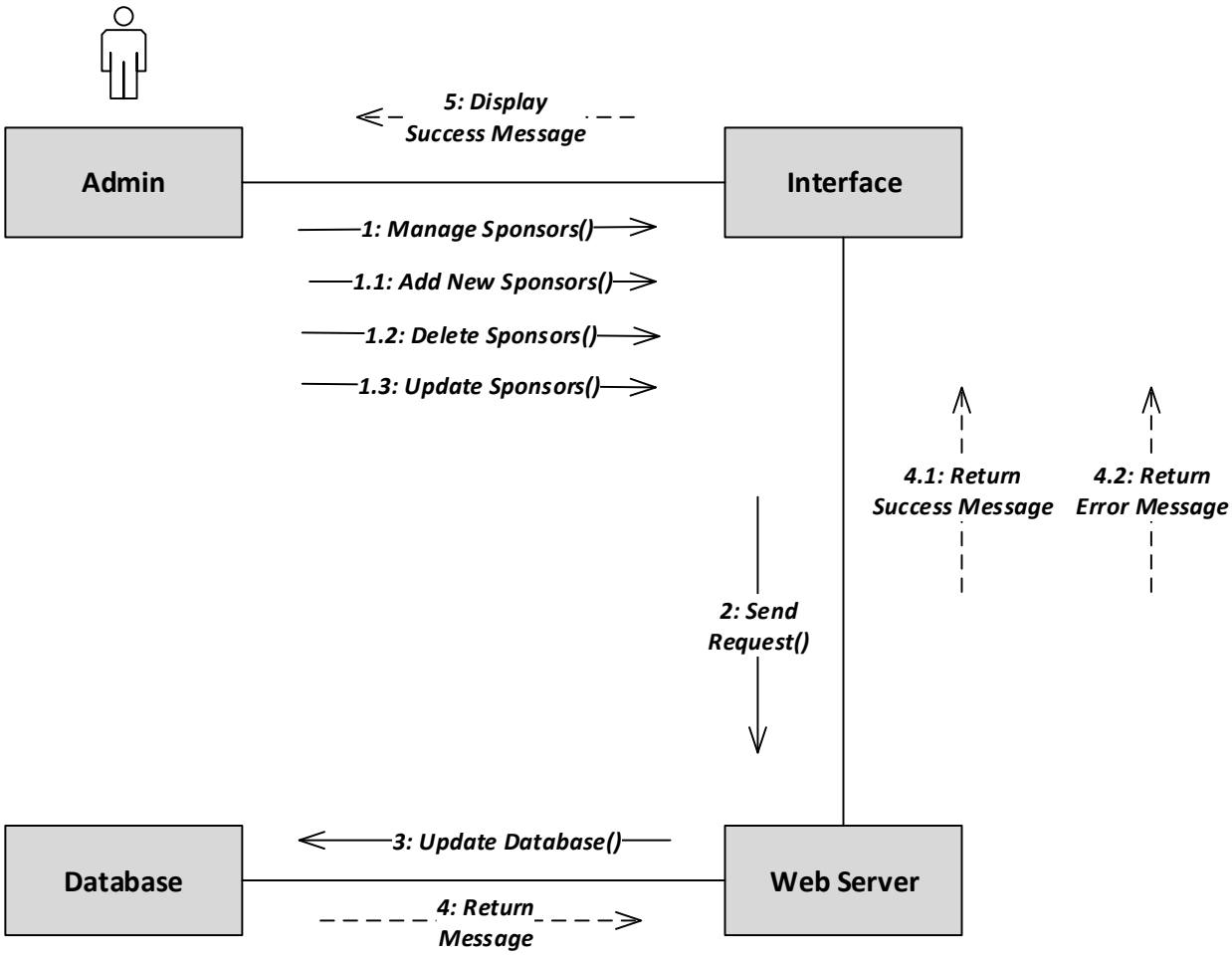

Figure 105 Manage Sponsors Collaboration Diagram

3.6.24Manage Financial Donation

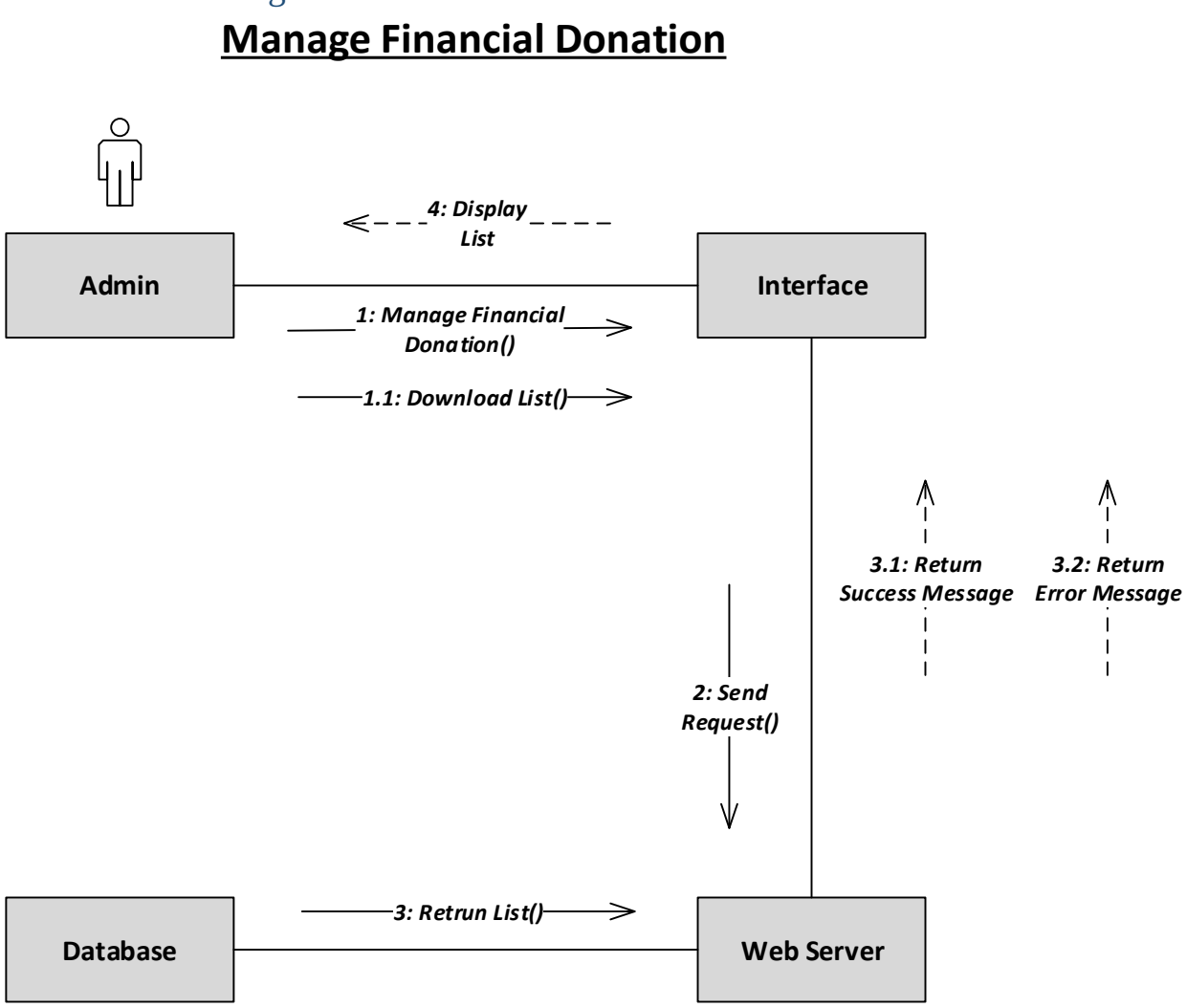

Figure 106 Manage Financial Donation Collaboration Diagram

3.6.25 Manage Job Posts

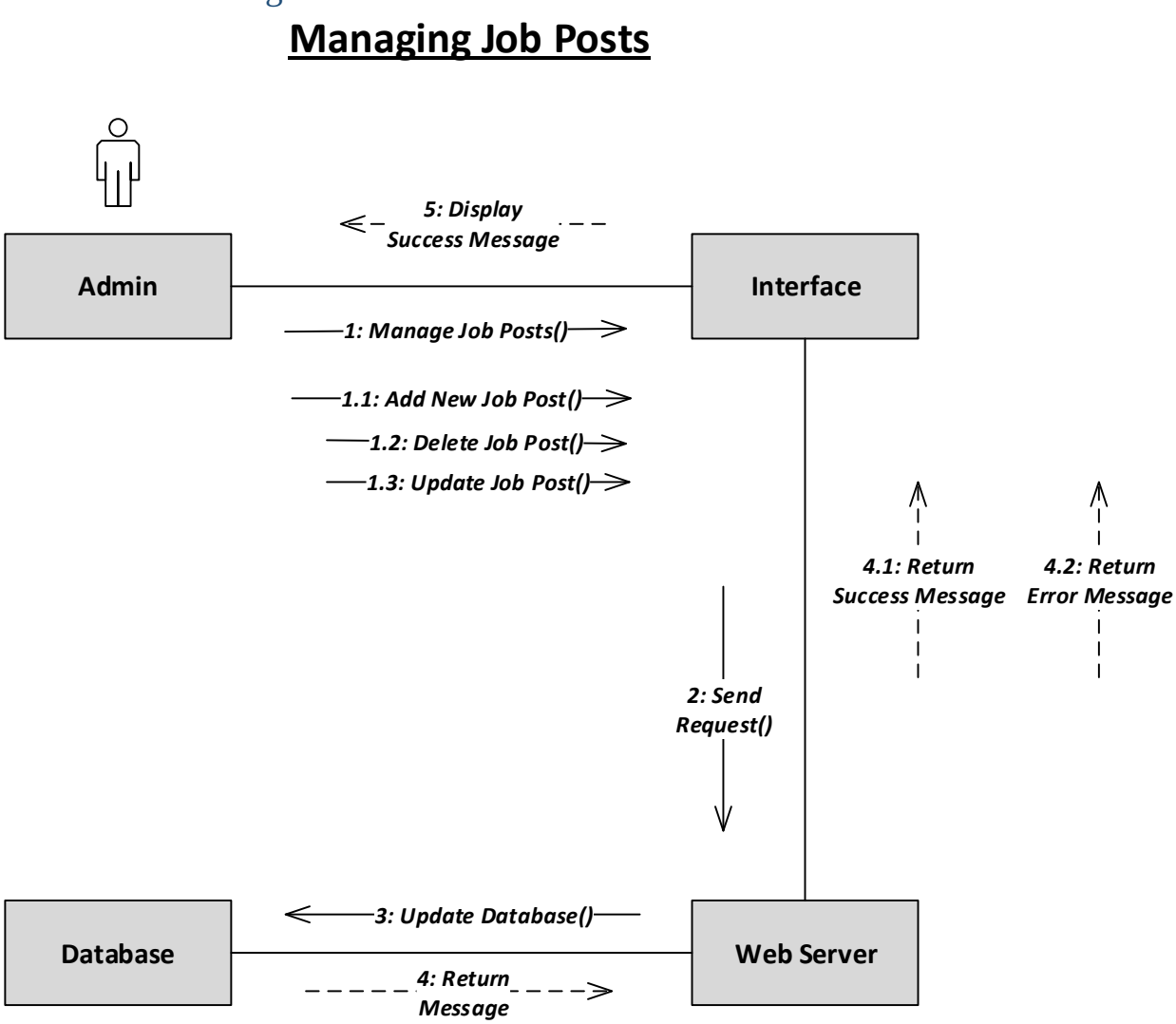

Figure 107 Managing Job Posts Collaboration Diagram

3.6.26 Managing Frequently Asked Questions

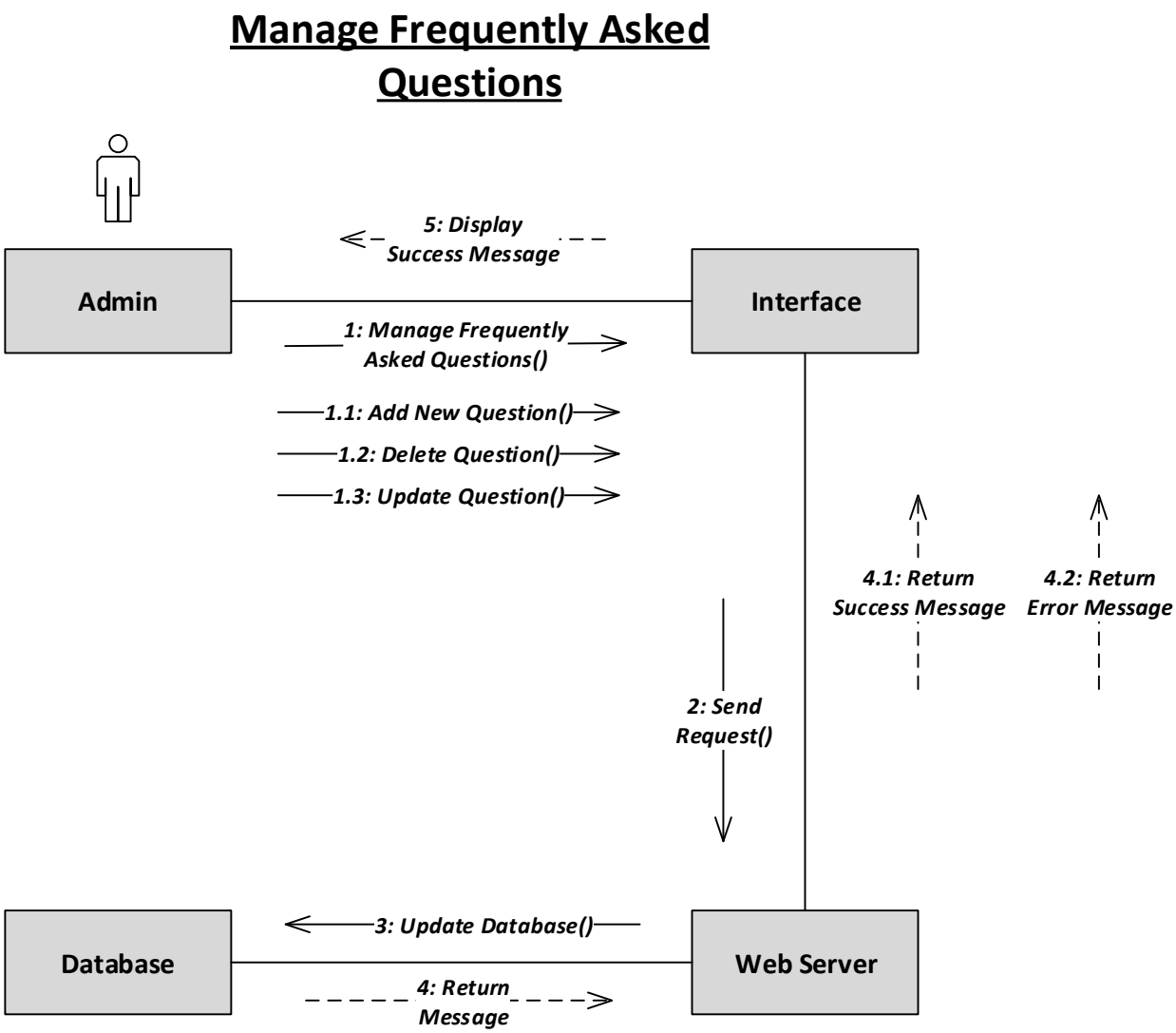

Figure 108 manage Frequently Asked Questions Collaboration Diagram

4. Chapter 4: System Testing

4.1 Test Cases

Test Case 4.1.1 - Login

Test Case ID	Test Case Scenario	Test Case	Preconditions	Test Steps	Post Conditions	Pass/Fail
TC-01	User/Admin Login	Verify whether user is Able to login into the system or not.	The User or Blood Donation Center or Admin be registered in the system in order to login the system.	1. This test case starts when the user enters the required fields in the sign-in form. 2. This User hits the login button 3. This test case ends.	The User (only in Online Blood Donation System) or Blood Donation Center or Admin has successfully gained access to his/her user account/system profile.	Pass

Table 57: Test Case 4.1.1 - Login

Test Case 4.1.2 - Register

Test Case ID	Test Case Scenario	Test Case	Preconditions	Test Steps	Post Conditions	Pass/Fail
TC-02	User/ Admin registration	Verify whether the user is able to register into the system or not.	The User or Blood Donation Center must fill and submit their online registration form in order to get registered in the system.	1. This test case starts when the user fills the form to get access to the system. 2. The form is submitted after correctly filling out the fields. 3. The user hits the register button and Test case Ends	The User (only in Online Blood Donation System) or Blood Donation Center has been registered in the system.	**Pass**

Table 58: Test Case 4.1.2 - Register

Test Case 4.1.3 – Make Request for Blood

Test Case ID	Test Case Scenario	Test Case	Preconditions	Test Steps	Post Conditions	Pass/Fail
TC-03	Making of Blood Request	Verify whether the user can make the blood request or not	The User or Blood Donation Center must be logged in into the system and the User or Blood Donation Center must select the "Blood Request" option from the navigation bar.	**1.**This Test case starts when the user wants to make Blood Request. 2. The user gives his/her complete and valid details and the request of the particular group that he wants to get. 3. The user submits the request. 4. This test case ends	The User (only in Online Blood Donation System) has been moved to the "my requests" page.	**Pass**

Table 59: Test Case 4.1.3 – Make Request for Blood

Test Case 4.1.4 – Donate Blood

Test Case ID	Test Case Scenario	Test Case	Preconditions	Test Steps	Post Conditions	Pass/Fail
TC-04	Blood Donation Request	Verify whether the user can make request for blood donation or not.	The User must be logged in into the system and the User must select the "Donate Blood" option from the	1.This test case starts when the user wants to donate the blood. 2. The Users provides his complete and valid	The User (only in Online Blood Donation System) has been moved to the check blood eligibility page in the system.	**Pass**

			navigation bar.	Information related to his physical health. 3. The User selects submit donation request and the test case Ends.		

Table 60: Test Case 4.1.4 – Donate Blood

Test Case 4.1.5 – Check Eligibility of user for Blood Donation

Test Case ID	Test Case Scenario	Test Case	Preconditions	Test Steps	Post Conditions	Pass/Fail
TC-05	Checking Eligibility for donation	Verify the User to check eligibility for blood donation by filling the blood analysis form.	The User must be logged in into the system and the User must fill the initial form of blood donation for checking the eligibility of blood donation.	1.This test case starts when the user wants to check whether he is eligible for blood donation or not. 2. The user gives information about his physical health. 3.The User confirms and submits the analysis form. 4.This test case Ends.	The User (only in Online Blood Donation System) has received confirmation messages about blood analysis and moved to the check blood donation list page in the system.	**Pass**

Table 61: Test Case 4.1.5 – Check Eligibility of user for Blood Donation

Test Case 4.1.6 – View Blood Donation Center's

Test Case ID	Test Case Scenario	Test Case	Preconditions	Test Steps	Post Conditions	Pass/Fail
TC-06	Viewing Blood Donation Center's	Verify Whether the Online User can view the blood donation Center list and make appointments for blood donation.	The user must be logged in into the system and the user must fill the blood donation form before making appointments.	1. This test case starts when a registered User wants to view blood donation Center lists and make appointments. 2. The User opens the list and views the Blood Donation Center details. 3.The user accepts or denies the appointment. 4. This test case ends.	The User (only in Online Blood Donation System) or Blood Donation Center or Admin has successfully viewed blood donation requests and made appointments about blood donation.	**Pass**

Table 62 :Test Case 4.1.6 – View Blood Donation Center's

Test Case 4.1.7 – Generate Appointment Report

Test Case ID	Test Case Scenario	Test Case	Preconditions	Test Steps	Post Conditions	Pass/Fail
TC-07	Generate Appointment Report	Verify that whether the User can generate the appointment receipt.	The user must be logged in into the system and the user must book the appointment.	1. This test case starts when a registered User wants to generate an appointment receipt. 2. Users opens the appointment page and	The User (only in Online Blood Donation System) or Blood Donation Center or Admin has successfully generated and downloaded appointments.	**Pass**

				gets the appointment report. 3. The User downloads the appointment report. 4.This Test case Ends.		

Table 63: Test Case 4.1.7 – Generate Appointment Report

Test Case 4.1.8 – Display User Profile

Test Case ID	Test Case Scenario	Test Case	Preconditions	Test Steps	Post Conditions	Pass/Fail
TC-08	Displaying User/Admin Profile	Verify that the Online User or blood donation Center or admin to view the personal details by clicking on the view profile tab.	The user, admin or blood donation Center must be logged in into the system.	1. This test case starts when a registered User or Blood Donation Center or Admin wants to view personal details. **2.**The user or blood donation Center or admin opens the profile page. The admin views his personal Information. 3.The User views his personal information and this test case ends.	The User (only in Online Blood Donation System) or Blood Donation Center or Admin has successfully viewed his/her user account/system profile	**Pass**

Table 64: Test Case 4.1.8 – Display User Profile

Test Case 4.1.9 – View Blood Requests

Test Case ID	Test Case Scenario	Test Case	Preconditions	Test Steps	Post Conditions	Pass/Fail
TC-09	Viewing Blood Requests	Verify that the Online User or blood donation Center to view the blood requests posted by the request maker and make decisions about acceptance or rejection.	The user or blood donation Center must be logged in into the system	1. This test case starts when a registered User or Blood Donation Center or Admin wants to view blood requests and make decisions about them. **2.** The user or blood donation Center views the request makers request post with complete details provided by the request maker. 3. The user confirms to accept or deny request. 4. This Test case ends.	The User (only in Online Blood Donation System) or Blood Donation Center or Admin has successfully viewed blood donation requests and made decisions (Accept or Deny).	**Pass**

Table 65: Test Case 4.1.9 – View Blood Requests

Test Case 4.1.10 – Update Personal Information

Test Case ID	Test Case Scenario	Test Case	Preconditions	Test Steps	Post Conditions	Pass/Fail

TC-10	Updating Personal Information	Verify that the Online User or Blood Donation Center to update himself/herself personal information in the system.	The user and blood donation Center must be logged in into the system and the User or Blood Donation Center must fill and submit their online updating form in order to get updated in the system.	1. This test case starts when a User (only in Online Blood Donation System) or Blood Donation Center wants to update personal information in the system. **2.** The user updates his profile information by providing with some newer details. 3. The user confirms to add new information. 4.This test case ends.	The User (only in Online Blood Donation System) or Blood Donation Center or Admin has updated personal information in the system.	**Pass**

Table 66: Test Case 4.1.10 – Update Personal Information

Test Case 4.1.11 – Delete Personal Information

Test Case ID	Test Case Scenario	Test Case	Preconditions	Test Steps	Post Conditions	Pass/Fail

TC-11	Deletion of Personal Information	Verify that the Online User or blood donation Center or admin to delete his/herself account.	The User and Blood Donation Center must be logged in the system	1. This test case starts when a registered User or Blood Donation Center or Admin wants to delete his/her user account/system profile. 2.The user opens the personal Information details page. 3.The user confirms to select to delete his personal Information. 4.This test case ends.	The User (only in Online Blood Donation System) or Blood Donation Center has successfully deleted his/her user account/system profile.	**Pass**

Table 67: Test Case 4.1.11 – Delete Personal Information

Test Case 4.1.12 – Get User Feedback

Test Case ID	Test Case Scenario	Test Case	Preconditions	Test Steps	Post Conditions	Pass/Fail
TC-12	Get User Feedback	Verify That the Online User can give the feedback about blood donation website or system.	The User must be logged in into the system.	1. This test case starts when a User or Blood Donation Center wants to give feedback about the system. **2.**The user fills the online feedback form by filling all the required information. 3.The user confirms and	The User (only in Online Blood Donation System) or Blood Donation Center or Admin has been given feedback about the system.	**Pass**

				submits the feedback Form. 4.This test case ends.		

Table 68: Test Case 4.1.12 – Get User Feedback

Test Case 4.1.13 – Add Blood donor's Information.

Test Case ID	Test Case Scenario	Test Case	Preconditions	Test Steps	Post Conditions	Pass/Fail
TC-13	Add Blood Donor's Information	Verify that whether the Blood Donation Centers can add Blood Donors Information or not.	The blood donation centers have assessed the system by entering their valid credentials and entering the information of the blood donors.	1.This test case starts when the Blood donation Centers click on the button for adding the blood donor's information.	The blood donation center has successfully added the information of the blood donors.	**Pass**

Table 69: Test Case 4.1.13 – Add Blood donor's Information.

Test Case 4.1.1 – Generate Report of Blood Stocks

Test Case ID	Test Case Scenario	Test Case	Preconditions	Test Steps	Post Conditions	Pass/Fail
TC-14	Generating Report of Blood Stocks	Verify that whether the system allows the Blood Donation Center to generate Report of Blood Stocks.	The blood donation centers have assess the blood donation center's interface by entering their credentials.	1.This test case starts when the Blood donation Centers click on the button for the report	The blood donation center has successfully generated the report of available bloodstocks of the blood donors.	**Pass**

				of blood stock.		

Table 70: Test Case 4.1.14 – Generate Report of Blood Stocks

Test Case 4.1.15 – Update Blood Stocks

Test Case ID	Test Case Scenario	Test Case	Preconditions	Test Steps	Post Conditions	Pass/ Fail
TC-15	Updating Blood Stocks	Verify whether the blood donation centers can update the bloodstock by entering new blood information or change the previous information.	The blood donation centers have assessed the system by entering their credentials for making the changes to the system database.	1.This test case starts when the Blood donation Center wants to update the Blood Stock. 2.The Blood donation Center updates the blood stock. 3.The system prompt and the blood donation Center confirms to update blood stocks. 4.This test case ends.	The blood donation center has successfully update bloodstocks.	**Pass**

Table 71: Test Case 4.1.15 – Update blood Stocks

Test Case 4.1.16 – Download Appointment Reports

Test Case ID	Test Case Scenario	Test Case	Preconditions	Test Steps	Post Conditions	Pass/Fail
TC-16	Download Appointment Reports	Verify Whether the Blood Donation Centers can download Weekly/Monthly Appointment Reports.	The blood donation centers have assessed the system by entering their valid credentials	**1.**This test case starts when the Blood donation center wants to generate	The blood donation center has successfully downloaded the appointment reports of	**Pass**

				appointment reports. 2.The Blood donation center views and downloads the appointment report. 3.This test case ends.	individual blood donor or weekly and Monthly reports.	

Table 72: Test Case 4.1.16 – Download Appointment Reports

Test Case 4.1.17 – Manage NGO's or Blood donation centers.

Test Case ID	Test Case Scenario	Test Case	Preconditions	Test Steps	Post Conditions	Pass/Fail
TC-17	Manage NGO's or Blood Donation Centers	Verify that whether admin is able to manage NGO's or Blood Donation Centers by modifying their Information.	The user must register as an admin to the blood donation system. For deleting or modifying the blood donation center, there must be at least one record in the database.	1.This test case starts when the admin of blood donation Center wants to manage the NGO's or Blood donation Centers. 2.The admin modifies or adds the Information in the NGO's. 3.The admin confirms to save and update the changes.	The admin of the system has successfully deleted, modifying, add the new record to the system database.	**Pass**

				4.This test case ends.		

Table 73: Test Case 4.1.17 – Manage NGO's or Blood donation centers.

Test Case 4.1.18 – Manage News

Test Case ID	Test Case Scenario	Test Case	Preconditions	Test Steps	Post Conditions	Pass/Fail
TC-18	Manage News	Verify that whether admin is able to manage news.	The admin has assessed the system by providing the valid information.	1.This test case starts when the admin of blood donation Center wants to manage the announcements and news feed of the system. 2.The admin modifies or adds the Information in the news. 3.The admin confirms to save and update the changes. 4.This test case ends.	The blood donation center has successfully manage the news in the system database.	**Pass**

Table 74: Test Case 4.1.18 – Manage News

Test Case 4.1.19 – Handling Blood Requests

Test Case ID	Test Case Scenario	Test Case	Preconditions	Test Steps	Post Conditions	Pass/Fail
TC-19	Handling Blood Requests	Verify that whether admin can handle blood requests or view the blood requests	The admin must be logged in to the system.	1.This test case starts when the admin of blood donation Center wants to manage requests related to blood donation or blood acceptance. 2.The admin views the request and acts regarding the analysis report.	The user has successfully received the notification of approval or rejection of the request.	**Pass**

				3.The admin confirms to save and update the changes. 4.This test case ends.		

Table 75: Test Case 4.1.19 – Handling Blood Requests

Test Case 4.1.20 – Managing Users Personal Information

Test Case ID	Test Case Scenario	Test Case	Preconditions	Test Steps	Post Conditions	Pass/Fail
TC-20	Managing Users Personal Information	Verify that whether admin can manage users personal Information.	The admin must be logged in into the system and the user must have sent request to update his/her personal information	**1.**This test case starts when the admin wants to view user information. 2. The admin can view the user personal information.	A small alert is sent to the admin "Your changes are done successfully". And the User information is saved	**Pass**

Table 76: Test Case 4.1.20– Managing Users Personal Information

Test Case 4.1.21 – Managing Campaigns

Test Case ID	Test Case Scenario	Test Case	Preconditions	Test Steps	Post Conditions	Pass/Fail

TC-21	Managing Campaigns	Verify that whether admin can manage Campaigns.	The admin must be logged in into the system.	1. 1. This test case starts when the admin of blood donation Center wants to manage the campaigns. 2.The admin modifies or adds the Information in the campaigns. 3.The admin confirms to save and update the changes. 4.This test case ends.	An alert is sent to the admin “The action is performed successfully”.	**Pass**

Table 77: Test Case 4.1.21 – Managing Campaigns

Test Case 4.1.22- Manage Donor List

Test Case ID	Test Case Scenario	Test Case	Preconditions	Test Steps	Post Conditions	Pass/Fail

TC-22	Manage Donor List	Verify that whether admin is able to manage Donor List.	The Donor and the admin must be logged in into the system.	1.This test case starts when the admin of blood donation Center wants to manage the donor list. 2.The admin views the available donor and downloads the donor list. The admin removes a donor from the list. 3.The admin confirms to save and update the changes. 4.This test case ends.	The admin is provided with an alert message "User successfully removed". And the admin is provided with a message if the download is completed.	**Pass**

Table 78: Test Case 4.1.22- Manage Donor List

Test Case 4.1.23 – Manage Sponsors

Test Case ID	Test Case Scenario	Test Case	Preconditions	Test Steps	Post Conditions	Pass/Fail
TC-23	Manage Sponsors	Verify that whether admin is able to manage Sponsors.	The admin must be logged into the system and the sponsors must be logged in into the system.	1.This test case starts when the admin of blood donation Center wants to manage the Sponsors. 2.The admin edit the	The Alert is generated for the admins in case of success and failures of the action performed	**Pass**

				sponsor info and updates it by update and saving the information. 3.The admin confirms to save and update the changes. 4.This test case ends.		

Table 79: Test Case 4.1.23– Manage Sponsors

Test Case 4.1.24 – Manage Financial Donations

Test Case ID	Test Case Scenario	Test Case	Preconditions	Test Steps	Post Conditions	Pass/Fail
TC-24	Manage Financial Donations	Verify that whether admin is able to manage Financial Donations.	The admin must be logged in into the system and the donor must be logged in into the system	1.This test case starts when the admin of blood donation Center wants to manage the Financial Donations. 2.The admin Downloads the list of financial donation and this test case ends.	An alert is generated when the list is successfully downloaded.	**Pass**

Table 80: Test Case 4.1.24 – Manage Financial Donations

Test Case 4.1.25 – Manage Job Posts

Test Case ID	Test Case Scenario	Test Case	Preconditions	Test Steps	Post Conditions	Pass/Fail
TC-25	Manage Job Posts	Verify that whether admin is able to manage Job Posts.	The organizations must be affiliated with the system and the admin must be logged in into the system	1.This test case starts when the admin of blood donation Center wants to manage the Job posts. 2.The admin modifies or adds the Information in the Job Posts. 3.The admin confirms to save and update the changes. 4.This test case ends.	The admin is notified by alerts on the success of his actions.	**Pass**

Table 81: Test Case 4.1.25 – Manage Job Posts

Test Case 4.1.26- Managing Frequently Asked Questions

Test Case ID	Test Case Scenario	Test Case	Preconditions	Test Steps	Post Conditions	Pass/Fail
TC-26	Managing Frequently asked Questions	Verify that whether admin is able to manage FAQ's.	The admin must be logged in into the system	1.This test case starts when the admin of blood donation Center wants to manage the Frequently Asked Questions. 2.The admin modifies or	Alert message is sent to the admin according to the actions he performed	**Pass**

				adds the Information in the Frequently asked Questions. 3.The admin confirms to save and update the changes. 4.This test		

Table 82: Test Case 4.1.26- Managing Frequently Asked Questions

4.2 Unit / Integration / Acceptance Testing

4.2.1. Unit Testing

In Unit testing we test all the modules independently. This kind of testing includes Black box and white box testing.

- **Black Box Testing:**
  In this phase testing the inputs and outputs are generated for the purpose of testing.
- **White Box Testing:**
  In this phase we are testing the design and the code of the system.

4.2.2 Integration Testing

In integration testing, we will combine all the dependent modules and we start to test them.

- **Bottom-up testing:**
  In this we firstly test the base Modules and then at the end we go for testing the last modules of the system
- **Top Down testing:**
  In this phase we test the complete system as a whole and then we go for testing the modules within the system.

4.2.3. Acceptance Testing:

In acceptance testing we check whether our project has conformed to the requirements or not. Acceptance testing is a type of testing used to verify whether a software system meets the requirements specifications. The primary goal of this test is to assess the system's compliance with business requirements and to confirm that it meets the criteria for delivery to end users.

- **Alpha Testing:**
  Software testing known as "Alpha Testing" is done to find issues before a product is made available to the general public or real users. For the user acceptability the alpha test will be performed. Only because it is completed early on, before the closing of project development, is this referred to as alpha testing, before the software is made available in the actual world, this is the last testing phase.

- **Beta Testing:**
  Beta testing is sometimes referred to as "pre-release testing." Beta testing is also known as user acceptance testing (UAT) or end user testing. During this stage of software development, applications are submitted to real-world testing by the software's target audience.
- **Unit Testing:**
  Unit testing is a software development process that examines the smallest testable components of an application, known as units, individually and independently for appropriate operation.
- **Integration Testing:**
  Integration testing, often known as integration and testing (I&T), is a sort of software testing that involves testing the many units, modules, or components of a software program as a whole.

5. Chapter 5: Conclusion

5.1 Problem Faced and Lesson Learned

5.1.1 Problem Faced

During our project we encountered a few problems related to the development of the prototypes and the gathering of modules of our system. There were fewer more problems that were related to the making and creation of diagrams. During diagrams creations there were issue in working with the new tools and new software's. In the development phase we faced problems in the following listed areas.

- Making of ontologies
- Ontologies integration
- API Creation.
- Difficulties in handling middleware
- Difficulties in performing the authentication through API's.
- Difficulties regarding integrating the Blood Centers into the system.
- Difficulties in implementing the new emerging concepts.
- Difficulties in learning new tools
- Difficulties in diving into new technologies.

5.1.2 Lesson Learned

While working on this project we gained knowledge about multiple aspects, some of them are listed below:

- Learnt about how to meet deadlines.
- Team Work.
- Learnt about how to work under short deadlines and managing the scope changes.
- Learnt the new tools and technologies
- Learnt how to cooperate and coordinate with the team members and distribution of the task among the team members.
- Learnt the concepts and made a clear understanding about the project domain.

5.2 Project Summary

People of Pakistan face lot problems due to unavailability of donors in emergencies and find the blood donors in their nearby places. Although multiple websites developed to handle these types of situations and help the people through these applications but there is still need to upgrade these systems. Our project is a website for blood donations. In this project, we suggest an automated blood donation system to facilitate blood donation and relieve emergencies. We employ machine learning and ontology learning methodologies because they enable the system to learn on its own. Blood donation is essentially a process where a person can willingly donate his or her blood for subsequent transfusions. The procedure of giving blood is extremely important, and it can made

simple by employing machine learning. Through machine learning, we can identify which user can donate the blood through analysis of their blood values such as Red blood cells, white blood cells, Platelets etc. Through this system, users can book the appointment for the transfusion to their nearby blood donation Center or hospital. To donate the blood through this website, blood report is compulsory for the people who are willing to donate. This process can facilitate the receptor that they can require blood after the analysis of blood report of donor and there is no need to retest the blood of donor.

The main goal of creating this system or web application was to allow users to look for blood in blood banks and obtain blood in any situation. By contacting the donor online or at a personal phone number, patients can obtain the blood. We are adding the blood donation Centers to our website and users see the available stock of blood of any blood donation Center and can request to them for the blood. The technology for use for implementing of this system is python that will use for cleaning and training of dataset. We are using different classification algorithms for the training of dataset such as Logistic regression, gradient boosting, decision tree and KNN. Protégé will use for making the Ontology, react for the frontend development, mongo DB as a Database and node for backend. This system will help the blood donation Centers to keep the record of the blood and can download the reports of bloodstocks and appointment at any time. People can find all the donors (new or old) according to their blood group and can contact them. Donors can easily check that they are viable for donate the blood or not after entering their blood report values. Laboratories will integrate in our system that can confirm the blood report of the users.

5.3 Future Work

Currently we are focusing on development of the website and in future, we will try to create a Mobile application that will further help the people to use the system conveniently. Also, implement the Machine learning algorithm so that user can check their blood test after providing the blood samples using image classification algorithms. Implementation the Chat system will help the user to connect directly through the website.

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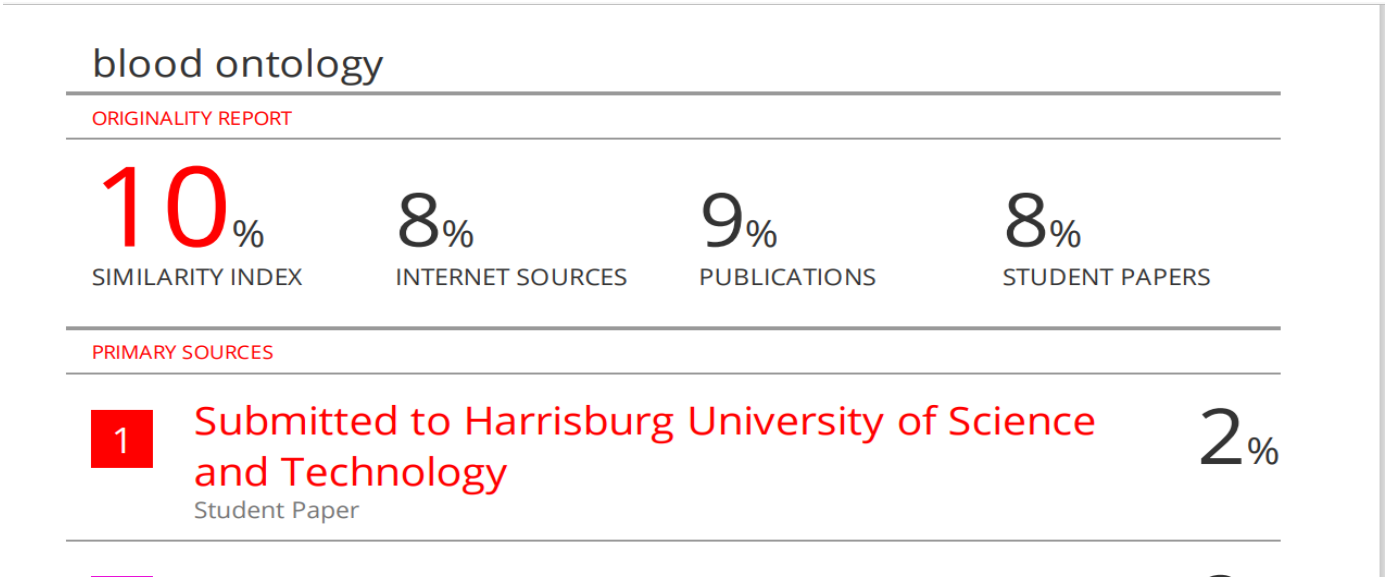
Appendix A



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