Use Cases & Domain Model

Course Instructor

Dr. Atif Jilani

Submitted By

Aamina Bokhari_22I-2474

Ahmad Javed_21I-1108

Umama Saif_22I-2558

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Department of Software Engineering

FAST – National University of Computer & Emerging Sciences

Use Cases:

Use Case 1

Use Case ID: UC-01

Use Case Name: Register Donors

Scope: BloodFlow Pro Blood Management System

Level: User Goal

Primary Actor: Donor

Stakeholders and Interests:

1. Donor wants to register as a doner and donate blood.
2. Admin require details, about donors, for managing donations.

Preconditions:

Donor has the access of the BloodFlow Pro system.

Post Conditions:

Donor is registered on the BloodFlow Pro system.

Main Success Scenario:

Actor Action	System Response
The donor opens the registration form.	System opens the registration form
. The donor provides personal information (name, contact information, blood type, etc.).	The system verifies the entered data.
	. If the information provided is correct, the system adds the donor as a registered user.
	The system produces a profile for each registered donor.
	The system sends the donor a notice verifying the successful registration.

Extensions:

3a. If the information is invalid,

1. system prompts the donor to try again.

2.user corrects the invalid fields.

3.system re-checks the information.

7a:Doner already registered

1.system checks the user infp match in the database.

2.if match found ,system prompt the donor to login instead of register

7b. Technical issues:

If system experience technical issues during registration:

1.System displays a message informing the user to try again later.

Special Requirements:

The system must provide data security and privacy.

Technology and Data Variations List:

Data entered: Name, contact details, blood type, etc.

Frequency of Occurrence: Regularly as new donors register Frequently.

Open Issues:

Unable to Register Donor,Upon submitting the donor registration form, an error occurs,

Use Case 2

Use Case ID: UC-02

Use Case Name: Records Blood Donation

Scope: BloodFlow Pro Blood Management System

Level: User Goal

Primary Actor: Donor

Stakeholders and Interests:

Donor: Wants to donate blood and have the donation recorded correctly.

Blood Bank staff: Need to record and manage blood donation information.

Preconditions:

Donor is a registered user in the BloodFlow Pro system.

Donors agree to donate blood.

Post Conditions:

Donor's blood donation is successfully recorded in the system.

Main Success Scenario:

Actor Action	System Response
1. The doner selects the blood donation recording tool option.	System asks for donor ID
Doner enters donor ID	System retrieves the information of doner
2. Donor enters donation event information (date, time, and location).	
	3. The system identifies the donor using the donor ID.
	4. The system conducts a health screening to ensure that the donor fits the qualifying criteria.
	5. The system stores information on the blood provided (amount, kind, etc.).
	6. The system adjusts the inventory based on the donation
	7. The system creates a report on the blood donation activities.
	8. The system sends a notification to the donor with their donation information.

Extensions:

4a. If donor does not meet eligibility criteria, system notifies the donor and does not proceed with the recording of donation .

5a.Donation event cancellation:

1)If user decides to cancel the donation event:

2)System cancels the recording process and returns to the dashboard.

Special Requirements:

System must do accurate recording of donation details.

Technology and Data Variations List:

Data entered: Donation event details, donor ID, donation information.

Frequency of Occurrence: Every time a donor makes a donation.

Open Issues: Handling of Cancelled Donations notifying stakeholders doner cancels a recorded blood donation event.

Use Case 3

Use Case ID: UC-03

Use Case Name: Inventory Management

Scope: BloodFlow Pro Blood Management System

Level: User Goal

Primary Actor: healthcare provider

Stakeholders and Interests:

1. Healthcare provider: want to manage and update blood inventory.

2.Donor: Donation decisions may require access to current inventory.

Preconditions:

1.Blood Bank Employee is signed in the BloodFlow Pro system.

Post Conditions:

Blood inventory is successfully updated.

Main Success Scenario:

Actor Action	System Response
1Admin selects the option of “Manage inventory”	System displays the dashboard of inventory management.
2. The views the current inventory levels and items.	System prompts for options to add,update and remove inventory items.
3.if The admin selects the add ,remove or update	System asks to enter details (quantity,blood type,etc)
Admin enters data	System applies filters to find validates , and updates the inventory.

Extensions:

2a. If inventory is low, the system alerts the employee for restocking.

Special Requirements:

System must ensure accurate and real-time inventory management.

Technology and Data Variations List:

Data managed: Inventory items, quantities, expiration dates, etc.

Frequency of Occurrence: Inventory is managed regularly

Open Issues: Handling of ìExpired Blood Units

Use Case 4

Use Case 4: Match Donor

Use Case ID: UC-04

Use Case Name: Donor Matching Algorithm

Scope: BloodFlow Pro Blood Management System

Level: Sub-Function

Primary Actor: Admin

Stakeholders and Interests:

1.Admin: Needs to match donors with recipients accurately.

2.Healthcare Providers: Need accurate matching for patient transfusions.

Preconditions:

Blood Bank Employee is registered on the BloodFlow Pro system.

Postconditions:

1. Matching donors are successfully identified for recipients users.

Main Success Scenario:

Actor Action	System Response
Healthcare Provider selects “Match Doner” option.	System prompts for recipient users blood type and urgency status.
Healthcare provider enters recipient’s relevant information.	System processes a donors database and evaluates compatibility based on medical criteria and generates a list of donors..
the healthcare provider chooses the doner from the provided list.	System notifies the selected doner and healthcare provider.

Extensions:

4a. If no matching donors are found, system informs the staff.

Special Requirements:

System must do fast and accurate matching based on multiple criteria.

Technology and Data Variations List:

Data used: Recipient details, donor profiles, compatibility criteria.

Frequency of Occurrence: When a recipient user requires blood.

Open Issues: When the system cannot find any matching donors based on the recipient's criteria, it should notify healthcare providers or administrators about the unavailability of donor matches.

Use Case 5

Use Case ID: UC-05

Use Case Name: send Blood Donation Reminders

Scope: BloodFlow Pro Blood Management System

Level: User Goal

Primary Actor: User

Stakeholders and Interests:

1.doner: interested to receive timely reminders for upcoming blood donation appointments.

Preconditions:

1.Doner is signed in into the BloodFlow Pro system.

Post Conditions:

Users get reminder notifications for scheduled blood donation appointments.

Main Success Scenario:

Actor Action	System Response
.Doner selects the option of “Blood donation Reminders” .	System displays the reminder interface settings.
User sets the preferred reminder frequency and method of receiving reminders(email,sms)	
User confirms and save the reminder settings.	System saves the reminder settings
	System creates reminders according to donors appointments
	When the scheduled time is reached the system sends a customized reminder notification to users selected method.Reminder includes date, time and location of donation appointment.
Doner receives the reminder notification.	
Doner acknowledges the reminder through the system interface.	

Extensions:

5a. User decides not to get reminders:

1. User selects the option to turn off reminders.

2. System disables reminder notifications for the user.

7a. User does not acknowledge the reminder:

1. System resends the reminder notification after a specified interval.

2. User receives the repeated reminder notification.

Special Requirements:

The system must have the user's contact information (email, phone number) to send reminders.

Reminders should be sent at a time when the user is likely to see and respond to them

Technology and Data Variations List:

User's preferred reminder settings (frequency, method).

Frequency of Occurrence: it is based on the user's appointment frequency.

Open Issues: None

Use Case 6

Use Case ID: UC06

Use Case Name: Collaboration with Healthcare Providers

Scope: The BloodFlow Pro system and its interactions with healthcare provider systems.

Level: User Goal

Primary Actor: Healthcare Provider (e.g., hospital staff, transfusion specialist)

Stakeholders & Interests:

- Healthcare Providers: Need to request blood products and access accurate, up-to-date blood inventory information.
- Blood Bank: Interest in fulfilling blood requests efficiently and reducing communication overhead.
- Patients: Interest in timely and accurate blood transfusions for care.

Preconditions:

- Healthcare provider has an established system or method for managing blood requests.
- BloodFlow Pro has an API or integration mechanism in place.

Post Conditions:

- Healthcare providers can submit blood product requests directly through BloodFlow Pro.
- Blood bank receives and processes these requests with real-time updates.
- Blood inventory displayed to healthcare provider is always accurate.

Main Success Scenario:

Actor Action	System Response
Healthcare provider logs into BloodFlow Pro interface.	System authenticates the provider and displays relevant options.
Provider searches for required blood type and quantity.	System displays matching results from the blood bank inventory, including expiration dates.
Provider places order for blood product(s).	System sends a notification to the blood bank and marks the product(s) as reserved.
Blood bank confirms order and updates inventory status.	System updates the provider with the confirmation and adjusted inventory information.

Extensions:

- a. In case of a match, BloodFlow Pro suggests the best donors to the blood bank for quick processing.

Special Requirements:

- Secure Data Transfer: Compliant with healthcare data privacy standards (consider HIPAA or regional equivalents).
- API stability: Robust API to support frequent communication between systems.

Technology & Data Variations List:

- **Healthcare System Types:** BloodFlow Pro needs to be adaptable to different EMR/EHR systems used by hospitals.
- **Data Formats:** Ability to handle data variations from different healthcare sources.

Frequency of Occurrence: Depends on blood transfusion needs in the area. Could be multiple times daily.

Open Issues:

- How will emergency requests (outside of normal workflow) be handled?
- What level of customization is needed for different healthcare provider systems?

Use Case 7

Use Case ID: UC07

Use Case Name: Personalized Blood Inventory Notifications

Scope: Feature within BloodFlow Pro to alert users of matching blood

Level: Sub-Function

Primary Actor: BloodFlow Pro User (potential donor, patient family, etc)

Stakeholders & Interests:

- User: Wants timely notifications when matching blood is needed.
- Blood Bank: Interest in fulfilling needs faster, improving blood utilization
- Healthcare Providers: May benefit from faster donor matches for critical patients,

Preconditions:

- User has registered on BloodFlow Pro and provided their preferences
- Blood bank inventory is actively managed and updated in BloodFlow Pro.

Post Conditions:

- The user receives timely notifications when their preferred blood type is available.
- User can potentially donate blood or take relevant action (e.g., contact a patient's family).

Main Success Scenario:

Action	System Response
Sets blood type and location preferences in profile.	System stores the user's preferences.
Records a blood donation or receives a blood request.	System triggers the blood matching algorithm, considering the user's preferences.
Identifies a potential match based on blood type and location.	System sends a push, SMS, or email notification to the user about the matching blood.

Extensions:

- a. Users can set their notification frequency (e.g., immediate, daily digest)
- b. The system suggests nearby blood donation centers or blood drives relevant to the user

Special Requirements:

- **Reliable Push Notifications:** If using in-app or SMS
- **Scalability:** If user base grows, matching and notifications must remain efficient

Technology & Data Variations List:

- **Notification Methods:** App notifications, SMS, email support.
- **Location Data:** May need to integrate location services

Frequency of Occurrence: Depends on matching blood availability & user preferences.

Open Issues:

- How to handle notification overload for users in high-demand blood type areas?
- How accurate does the matching algorithm need to be?

Use Case 8

Use Case ID: UC08

Use Case Name: Donation History Tracking

Scope: BloodFlow Pro's donor profile management features

Level: User Goal

Primary Actor: Blood Donor

Stakeholders & Interests:

- Donor: Wants to track their donation history and milestones.

- Blood Bank: May use donation history for outreach and retention programs
- Healthcare Providers: Could access donation history with patient consent for healthcare insights.

Preconditions:

- Donor has a registered profile on BloodFlow Pro
- Donor has at least one recorded donation in the system.

Post Conditions:

- Donor can view their donation history in a clear, organized format.
- Donation history is potentially shareable by the donor.

Main Success Scenario:

Action	System Response
Logs into BloodFlow Pro.	System authenticates the donor and shows their profile.
Accesses "Donation History" section.	System fetches and displays past donations with dates, blood type, and amount donated.

1.

Extensions:

- a. Generate certificates or printable reports of donation history
- b. Donation history ties into the gamification/reward system.

Special Requirements:

- Search/Filtering Options: Donors should be able to find specific donations easily.
- Data Retention: Consider how long donation history must be stored per regulations.

Technology & Data Variations List:

- Visualization Types: Graphs, charts, simple summary formats.

Frequency of Occurrence: Depends on how often individuals donate

Open Issues:

- What level of detail is needed about prior donations (e.g., donation location)?
- How will data privacy be ensured when potentially integrating history into other features?

Use Case 9

Use Case ID: UC09

Use Case Name: Gamification Features

Scope: BloodFlow Pro reward system

Level: Sub-Function

Primary Actor: Blood Donor

Stakeholders & Interests:

- Donor: Interested in rewards and recognition for donations
- Blood Bank: Wants to increase donor engagement and retention
- Communities: May have an interest in promoting blood donation

Preconditions:

- Donor is a registered BloodFlow Pro user
- BloodFlow Pro has a defined rewards system (badges, points, etc.).

Post Conditions:

- Donor earns rewards based on their donation activities.
- Rewards are visible and provide a sense of achievement.

Main Success Scenario:

Action	System Response
Completes a blood donation.	System verifies the donation and updates the donor's profile.
Checks for gamification rules (milestones, etc.).	System awards points or badges as per the rules.
Receives a notification about the earned award.	System displays the badge or points in the donor's profile, potentially with a leaderboard

Extensions:

- a. Social Sharing: Donors can share badges/achievements.
- b. Challenges: Limited time challenges or blood drive-specific goals
- c. Tiered Rewards: Different reward levels based on total donations.

Special Requirements:

- Attractive Rewards: Rewards need to be motivational for donors
- Fraud Prevention: Measures against abusing the system to gain rewards

Technology & Data Variations List:

- Visual Presentation: Badges, leaderboards, progress bars
- Reward Distribution Logic: Algorithm to calculate and assign rewards

Frequency of Occurrence: Ideally tied to each donation, and ongoing for challenges/leaderboards

Open Issues:

- What types of rewards are most appealing to donors? (Tangible vs. virtual)
- How to balance gamification with the altruistic nature of blood donation?

Use Case 10

Use Case ID: UC10

Use Case Name: Volunteer Management

Scope: BloodFlow Pro features for volunteer coordination

Level: User Goal

Primary Actor: Volunteer

Stakeholders & Interests:

- Volunteer: Wants to find opportunities and track participation
- Blood Banks/Organizers: Need efficient volunteer recruitment and management
- Communities: Benefit from volunteer support at blood drives

Preconditions:

- Volunteer has registered on BloodFlow Pro
- Organizations can list blood donation events on the platform.

Post Conditions:

- Volunteer is signed up for volunteer opportunities that match their interests and availability.
- Volunteer can track their participation history.
- Organizations receive sign-ups and can manage volunteer rosters.

Main Success Scenario:

Action	System Response
Logs into BloodFlow Pro.	System authenticates the volunteer and shows relevant options.
Searches for volunteer opportunities (with location/interest filters).	System displays matching events based on the volunteer's preferences.
Selects an event and registers for specific tasks.	System registers the volunteer and notifies the event organizers.

Extensions:

- **a.** Volunteer skill matching: Suggests events based on skills/interests
- b. Volunteer communication tools: In-app messaging with organizers.
- c. Post-event recognition: Volunteers earn points or recognition based on hours.

Special Requirements:

- Event Listings: Clear format for organizations to post events.
- Volunteer Tracking: Ability for organizers to view who signed up

Technology & Data Variations List:

- Calendar Integration: For volunteers to sync event dates
- Volunteer profiles: May include skills, interests, preferred locations.

Frequency of Occurrence: Depends on the frequency of blood drives and volunteer needs

Open Issues:

- How will no-shows or late cancellations by volunteers be handled?
- What level of communication tools are needed to facilitate organizer-volunteer interaction?
- Are there liability considerations the app should address regarding volunteer safety/management?

Use Case 11

Use Case ID: UC11

Use Case Name: Blood Drive Organization

Scope: BloodFlo Pro Blood Bank Management System

Level: User Goal

Primary Actor: Community Organizer

Stakeholders & Interests:

- Community organizer wants to organize a blood drive event
- Participants want to register for the blood drive event

Preconditions:

1. Community organizer has access to the system
2. Details for blood drive event are prepared

Post Conditions:

Blood drive event is created and participants can register in the event.

Main Success Scenario:

Community Organizer logs into the system and selects “Create New Blood Drive Event” from the options.	System takes event details from the organizer.
Organizer enters the event details.	System validates the given information.
	If validation results are as expected, the system creates the blood drive event.

Extensions:

1. If event details are not correct system prompts for correct information.
2. If the event date is not given, the system suggests alternative dates.

Special Requirements:

1. Event details should satisfy safety requirements.
2. Participants should be able to view the event details and register.

Technology & Data Variations List:

- Integration with location services for real time event mapping.
- Notification system for event updates.

Frequency of Occurrence: Periodic

Open Issues: Handling cancellations and replacements for registered users.

Use Case 12

Use Case ID: UC12

Use Case Name: Send Emergency Alerts

Scope: BloodFlo Pro Blood Bank Management System

Level: User Goal

Primary Actor: Emergency Response Coordinator

Stakeholders & Interests:

- The Emergency Response Coordinator wants to send alerts for urgent blood needs.
- Donors want to receive alerts for urgent blood needs in their registered area.

Preconditions:

1. System access has been provided to the Emergency Response Coordinator.
2. Urgent Blood need or shortage of blood for any blood type is identified and analyzed.

Post Conditions:

Donors are notified about urgent blood needs in their registered area.

Main Success Scenario:

Emergency Response Coordinator logs into the system and selects “Send Emergency Alerts” from the options.	System takes the details for alerts.
Coordinator enters the alerts details.	System validates the provided information.
	If validation is successful, system sends emergency alerts to the donors registered in the area provided and users receive notifications.

Extensions:

1. If validation is not successful, the system asks the user to enter the correct information.
2. If no donors are registered in the specified area , the system suggests alternative blood resources,i.e. Blood banks.

Special Requirements:

1. Emergency alerts should reach all registered donors in an area.
2. Donors should have an option to respond to the notification.

Technology & Data Variations List:

1. Geolocation services to locate donors in an area.
2. Integration with SMS and push notifications to send alerts.

Frequency of Occurrence: Infrequent but critical.

Open Issues: Confirmation of received alerts from donors.

Use Case 13

Use Case ID: UC13

Use Case Name: Separate Blood Components

Scope: BloodFlo Pro Blood Bank Management System

Level: User Goal

Primary Actor: Blood Bank Technician

Stakeholders & Interests:

1. Blood bank technician wants to separate blood components (i.e. plasma, RBCs, WBCs)
2. Inventory manager wants to keep a record of all inventory items

Preconditions:

1. Blood units are available in the inventory.
2. Technicians are provided access to the system.

Post Conditions:

Blood unit is separated into components and inventory is updated accordingly.

Main Success Scenario:

Blood bank technician logs into the system and selects “Separate Blood Components” from the options.	System displays the available blood units in the inventory.
Technician chooses a blood unit for the separation process.	System prompts for component selection.
Technician chooses the required components.	System separates the blood components according to the requirement.
Technician confirms the separation results.	System updates the inventory with the separated components.

Extensions:

1. If the Blood unit is not suitable for the separation process, the system analyzes and sends a message to the technician .
2. If a required component is not available, the system suggests alternatives based on the technician requirements.

Special Requirements:

1. Safety protocols must be obeyed
2. Component separation should be recorded effectively for traceability purposes.

Technology & Data Variations List:

1. Barcode scanning for identification of blood units.
2. Integration with lab equipment for automated blood component separation.

Frequency of Occurrence: As needed

Open Issues: Handling of unsuitable blood units.

Use Case 14

Use Case ID: UC14

Use Case Name: Make donor loyalty program

Scope: BloodFlo Pro Blood Bank Management System

Level: User Goal

Primary Actor: Donor

Stakeholders & Interests:

1. Donor wants to participate in the loyalty program.
2. Admin of the loyalty program wants to manage and update regarding events and rewards.

Preconditions:

1. Donor has donated blood multiple times to various blood drive organizations.
2. Loyalty program is enabled.

Post Conditions:

Donors are enrolled in the loyalty program and receive rewards upon frequent donations to various organizations.

Main Success Scenario:

Donor logs into the system and navigates to the loyalty program section.	System displays information about the loyalty program.
Donor selects “Enroll in Loyalty program”.	System checks the eligibility of the donor. If eligible, the system registers the donor in the loyalty program.
Donors receive confirmation messages and details about rewards.	

Extensions:

If donor is ineligible for the loyalty program, system send notification to the donor and also suggest ways to become eligible for the program.

Special Requirements:

1. Loyalty program should offer meaningful rewards.
2. System should track and update donor’s progress.

Technology & Data Variations List:

1. Integration with reward management system for distribution of rewards.
2. Database to store and update the donor’s progress.

Frequency of Occurrence: Permanent for eligible donors.

Open Issues: Managing the list of available rewards.

Use Case 15

Use Case ID: UC15

Use Case Name: Feedback

Scope: BloodFlo Pro Blood Bank Management System

Level: User Goal

Primary Actor: Donor

Stakeholders & Interests:

1. Donor wants to provide feedback regarding the donation experience.
2. Blood bank administrator receives and analyze the donor's feedback.

Preconditions:

1. Donor has donated blood through the system.
2. Feedback system is accessible to the donor.

Post Conditions:

Donor's feedback is stored in the system successfully.

Main Success Scenario:

Donor select the “Feedback” option.	System displays the options regarding feedback.
Donor chooses the desired option.	System displays the specified form for feedback.
Donor enters the feedback details.	System records the feedback.
Donor receives confirmation message.	

Extensions:

1. If donor wants to skip feedback, system allows for it.
2. If negative feedback is encountered system prompts the user to enter more details.

Special Requirements:

1. Feedback should be anonymous to promote honest feedback.
2. System should categorize feedback.

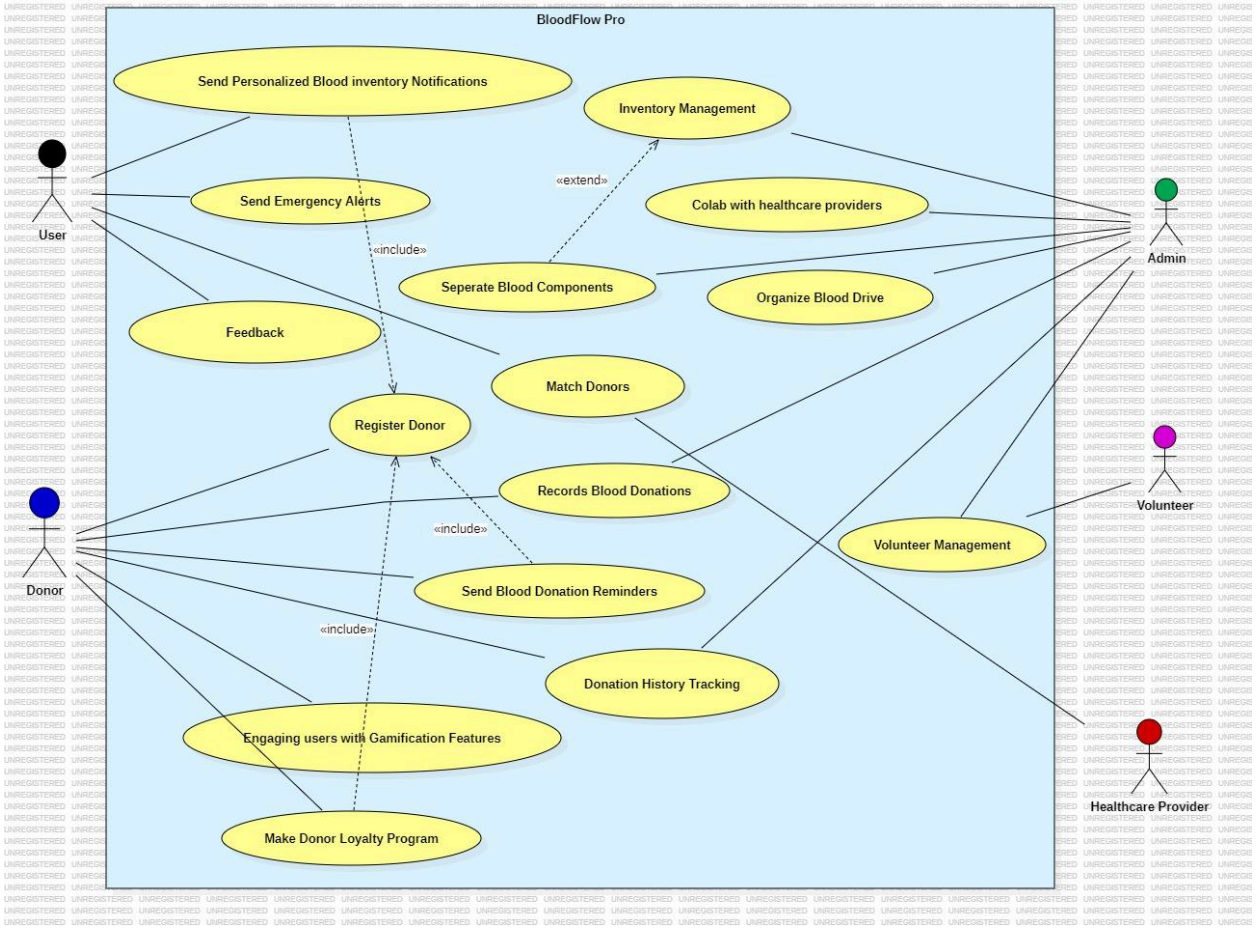
Technology & Data Variations List:

1. Database to organize and store the feedbacks.
2. Integration with analytical tools for feedback analysis.

Frequency of Occurrence: After each donation

Open Issues: Surety of privacy and confidentiality.

Use case Diagram



Domain Model