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Software Design Specifications For **Save A Beat (for blood donation)**



**Version [1]
Team Members**

This Software Design Specification was prepared and provided as a deliverable for [Course Name, number, term], and it will be used by [name of end user].

This document is based in part on the IEEE Recommended Practice for Software Design Descriptions.

[Team Members]

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1. Introduction

This document, the Software Design Specification (SDS), offer a general description of the design components and characteristics for the Save A Beat System which is a mobile and web application used to better organize the process of blood donation management. This SDS is an interface between what has been presented in the SRS document and technical specifics important for development and integration. It ranges from design components, data structures, user interfaces, algorithms and processing workflows that when put in place make the system to function as is intended.

1.1 Purpose

The Save A Beat System's Software Design Specification presented in this report presents a clear design that will enhance the creation of a system that effectively coordinates blood donation between the blood banks, the hospitals, and the donors. It is also useful to the development team by providing detail on what technology specifications are required to bring the system to its final state, both for the development team and the supervisor and/or client. This paper focuses on fulfilments capacity to translate requirements into comprehensible design specifications to enable the system meet the users' needs satisfactorily and coherently.

1.2 Scope

This SDS covers all the structural and functional aspects that exist in the system which comprises data structures and algorithms, user interface components and layouts, processes or flows, error-handling plan or technique. The document proves to be a one-stop-shop for the development process to come up with the secure platform that will allow efficient management of blood donations by the user. This paper discusses how the SDS guarantees that all functional requirements are considered while seeking to produce a dependable system that fosters effective cooperation in a blood donation setting.

1.3 Definitions, Acronyms, and Abbreviations

Terminology	Definition
Response Time	The time it takes for the <i>Save A Beat</i> system to respond after a user initiates a request.
Throughput	The number of user requests the system can process per unit time.
Fault Tolerance	The ability of the system to overcome an abnormal condition or proceed to a known good state when an undesirable condition is detected..
Usability	The ease with which users (Blood Banks, Hospitals, and Donors) can use the <i>Save A Beat</i> platform to efficiently accomplish tasks
Database	A structured and organized collection of data, stored within the <i>Save A Beat</i> system, for

	managing donor information, blood inventories, requests, and communications.
Maintainability	The ease with which the system can be modified to meet evolving requirements or fix issues.
Availability	The degree to which the <i>Save A Beat</i> system is accessible to intended users when needed.
Portability	The system's ability to be used across different environments, including iOS and Android devices.
Data Flow Diagram (DFD)	This covers a diagram displaying how data flows within the system.
Pseudocode	Commenting to describe an overall shape of a program.

Table 1: Definitions

Acronyms	Meaning
SRS	Software Requirement Specification
IEEE	Institute of Electrical and Electronics Engineers
ID	Identification Number
PC	Personal Computer
SPMP	Software Project Management Plan
iOS	iPhone Operating System
SQL	Structured Query Language
UI	User Interface
DFD	Data Flow Diagram

Table 2: Acronyms

1.4 References

- [1] IEEE Std 830-1998, "IEEE Recommended Practice for Software Requirements Specifications," IEEE, 1998.
- [2] Pressman, Roger S., "Software Engineering: A Practitioner's Approach," McGraw-Hill Education (9th edition), 2014, ISBN-10: 0078022126, ISBN-13: 978-0078022128.
- [3] Pohl, Klaus, "Requirements Engineering: Fundamentals, Principles, and Techniques," Springer-Verlag Berlin Heidelberg, 2010, ISBN-10: 3642127808, ISBN-13: 978-3642127800.
- [5] **Save A Beat System SRS Document:** <file:///C:/Users/esraa/Downloads/AIG1-SRS.pdf>

2. System overview

Save A Beat System is a mobile and web application for better blood donation facilities required recon between blood banks, hospitals, and donors. It offers real-time accessibility of blood supply, blood request and blood inventories that prompt and effective health care response. For the donor side, the system provides simple account creation, appointments for donating blood, a record of their donations and donation campaign alerts. It is used by the blood banks to store the blood inventory, schedule the next donation campaigns and quickly attend to the early orders from hospitals while the same to the hospitals where they can also post the blood requests and follow up their status.

With interfaces designed for users to perform their tasks and highly secure, Save A Beat makes data safe while making it easy to access. This is a centralized database coupled with features of real time communication to inform users on any new urgent requests or new campaigns. Save A Beat presents the aspect of efficiency in its process and information management of donor relations, as well as donor safety, securing a progressive approach to blood donation and its reception.

Common Functionalities:

In the Save A Beat System, almost all the user roles have similar basic functionalities which include blood banks, hospitals, and donors. Every user, is allowed to use his account and password to access the system, and in the event of forgetting the password, then he or she can easily click on the “Forgot My Password” button and regain access easily. Also, the user’s profile is visible for other users, and each user has the capabilities of editing their profile. For donors, the possibility to change personal data and the details connected with the donated blood, health conditions, etc., are available; blood banks are connected with inventory and its changes; as for hospitals, they are free to change the details of their requests when needed. These shared functionalities also enable the individual user to always privately own his or her account and any information that is related to it or that is contained in the Account Profile Territory, thus also enhancing the general and personal safety of the users across the platform.

Donor Functionalities:

- Sign In / Sign Up: donor can create new accounts or securely log in to the system.
- See and modify their details of contact information, personal health facts and conditions.
- See donation details such as previous donation dates and previous type of donation.
- Sign up for future donation drives, blood drives and related events and parties.
- Organize book and schedule donation drop off appointments.
- View the guidelines and requirements for donation.
- Get notified about upcoming donation programs and events.
- Look up the support services through the live chat support or find the FAQ section for help.

Blood banks Functionalities:

- Sign In / Sign Up: Blood bank staff can create new accounts or securely log in to the system.
- Manage Inventory: Update and monitor blood stock levels, including adding and removing units as needed.
- Manage Emergency Requests: Quickly respond to urgent blood requests from hospitals or other facilities.
- Add New Donation: Log details of each new blood donation, including donor information and blood type.
- Manage Campaigns: Organize, track, and manage ongoing blood donation campaigns.
- Add New Campaign: Set up new blood donation events with details like date, location, and target donations.

Hospital Functionalities:

- Hospitals can Sign Up and Log in to the Save A Beat app using the hospital name and password
- Hospitals can create blood Request efficiently
- Hospitals can Track and Monitor their blood requests
- Hospitals can View their Previous Requests and History
- Hospitals can Update/Delete a blood request easily
- Hospitals can view and update their profile.

3. Design Considerations

This section describes many of the Save A Beat issues which need to be addressed or resolved before attempting to devise a complete design solution.

3.1 Assumptions and Dependencies

The following is a list of several assumptions and dependencies that must be considered with respect to our software:

- Related software or hardware
- Operating systems
- End-user characteristics
- Possible and/or probable changes in functionality

3.1.1 Related software or hardware

Our system Save A Beat is a mobile application, which is can be run on any iOS or Android mobile device. Our software is designed to be a user-friendly interface and a well-designed database to insure the maintenance and security of our application. The database will be created using MySQL, where the application database will be stored and updated immediately. Also. The backend frameworks will be used is NetBeans must be installed to building the system.

3.1.2 Operating systems

Our application is compatible with iOS and Android mobile phones. The source code will be written in java programming language. The development team will be work on Mac OS and Windows 11.

3.1.3 End-user characteristics

Save A Beat has three users: Blood Banks, Hospital, Donors. To attain the access into the system, user must sign in with their ID and password. Every user has their own account into the application, enable them to log in and log out of the system easily.

However, if the user forgets his password they will press “Forget Password?” and a message will be sent to their email with a link to reset their password. Moreover, to maintain the security of the system an OTP message will be sent to their mobile phones.

3.1.4 Possible and/or probable changes in functionality

There might be some minor design change that might occur in the future to improve our system. The original design of the system will be enhanced. However, because of time constraints, the need to manage the project's complexity, and the need to prevent disruptions to the development workflow, they will be restricted to being relatively modest.

3.2 General Constraints

Certain constraints and limitation on our system design phase should be considered:

- Hardware or software environment
- Interface/protocol requirements
- Data repository and distribution requirements
- Security requirements (or other such regulations)
- Verification and validation requirements (testing)

3.2.1 Hardware or software environment

Our application is compatible with iOS and Android mobile devices. The iPhones must have iOS 16 or later, and Android phones must have Android version 14 or later. The development team will use Windows 11.

3.2.2 Interface/protocol requirements

Our application overall design and structure will focus on smooth communication between users and the system so, the system will handle different types of errors by displaying error messages to the user clarify the error reason.

Also, the interfaces in the system will be consistent for all main pages by using:

- unified fonts and color.
- input constraints.
- buttons have consistent shapes, sizes, and colors across screens.
- provide consistent feedback for user actions, such as displaying spinners, success messages and error notifications.

3.2.3 Data repository and distribution requirements

All information will be stored securely in a MySQL Workbench database. SQL will be used to retrieve the necessary data.

3.2.4 Security requirements (or other such regulations)

Save A Beat has security as a top priority. Sensitive data, such as user ID, blood type, user full name, password and medical history, will be securely protected. So, the system forces the user to enter a strong password and tell the user if the password is weak so he can't continue until entering a strong password.

Every time the user wants to change his password a link will be sent to his email to modify their password securely.

3.2.5 Verification and validation requirements (testing)

The main objective of verification phase is to test for any bug and identify failure that occurs or might occur in early stage so it can be fixed.

The validation makes sure the app fits the needs of users, like donors, recipients, and blood banks, through user feedback. It also includes performance testing to ensure the app works well under heavy use, security testing to protect user data, and compliance testing to follow regulations.

4. User Interface Design

4.1 Overview of User Interface

Describe the functionality of the system from the user's perspective. Explain how the user will be able to use your system to complete all the expected features and the feedback information that will be displayed for the user.

Hospital homepage interface has the following options:

- My Profile
- Blood Request
- Blood Request History
- Blood Request Tracking
- Blood Request Update or Delete
- Contact Support
- The hospital can view and edit their information in their profile
- The hospital can request blood whenever they need
- The hospital can view their blood request history which includes many useful information
- The hospital can track and monitor their blood request to be up to date with their requests
- The hospital can update or delete the created request in only 20 minutes after the request creation.
- The hospital can contact the support team for any help.
- The hospital can sign out from the app.

Donor homepage interface has the following options:

Donor:

The Donor homepage interface includes the following options:

- Donation History
- Donation Booking
- Upcoming Campaigns and Events
- profile and health information
- Contact Support: Available services include live chat support, frequently asked questions, donation information, and donation centers nearby.
- Profile and Health Information: My Profile – allows understanding of and changing general information, blood type and fitness information.
- Donation History: Previous donations can be viewed with dates, types, and points which were earned.
- Donation Booking: Donations can also be selected based on date, center and type of donations.
- Upcoming Campaigns and Events: Sign up for today and future campaigns.
- Support & Resources: The visitor will be able to find live chat, answers to often asked questions, how to donate, and location of the donation centers.

4.2 Interface Design Rules

The **Eight Golden Rules** will guide the design of the **Save A Beat** platform to ensure the interfaces are logical, intuitive, and well-organized for all users. These rules will focus on providing a smooth, efficient, and user-friendly experience for blood banks, hospitals, and donors.

1. **Strive for Consistency:** Maintain a consistent design across all interfaces (colors, fonts, layouts, and commands) to make navigation intuitive for all users.
2. **Enable Frequent Users to Use Shortcuts:** Provide shortcuts for common tasks (e.g., updating inventory, processing requests) to speed up interactions for experienced users like admins and hospitals.
3. **Offer Informative Feedback:** Ensure that every action (such as submitting a blood request or updating inventory) is followed by clear feedback, such as confirmation messages or status updates.
4. **Design Dialogs to Yield Closure:** After completing actions, provide clear indications of success or failure.
5. **Offer Simple Error Handling:** Prevent errors when possible, and provide clear, simple steps to correct mistakes when they occur, like fixing incorrect donation details or adjusting blood requests.
6. **Permit Easy Reversal of Actions:** Allow users to easily undo actions, such as reversing a blood inventory update or canceling a donation appointment.
7. **Support Internal Locus of Control:** Empower users to feel in control of the system, such as allowing donors to schedule/reschedule appointments and admins to manage blood inventory without limitations.
8. **Reduce Short-Term Memory Load:** Keep the interface simple by auto-filling user data (e.g., donor history), so users don't need to remember or re-enter information.

4.3 Screen Images

This section outlines the different user interfaces within the **Save A Beat** platform and details the specific functionalities available to each user.

4.3.1 Homepage Interface

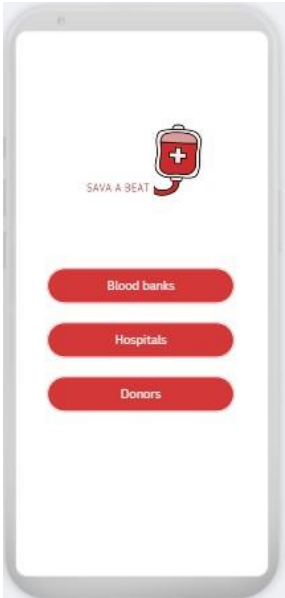


Figure 1 Homepage Interface

The Home interface of the Sava a Beat app allows users to select their role—Hospital, Donor, or Blood Bank—and is then redirected to the corresponding interface based on their choice.

4.3.2 Common Interface

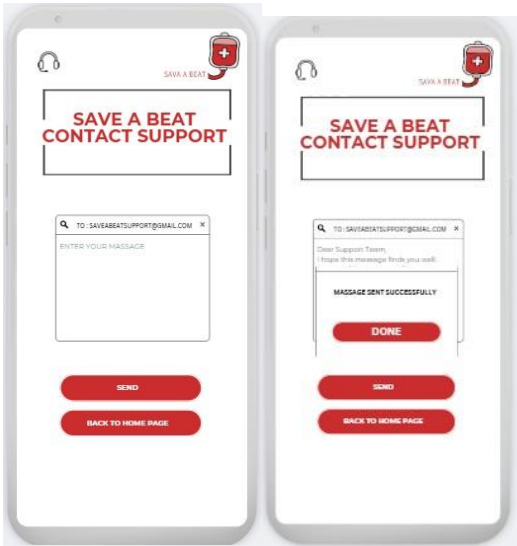


Figure 2Contact support

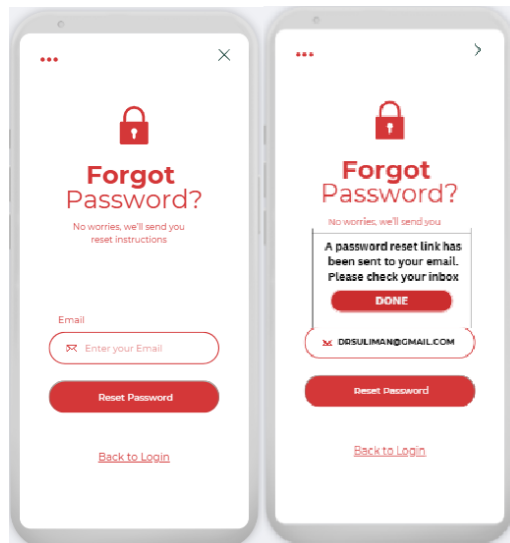


Figure 3Forgot password

In figure 2: Contact Support An interface that allows users to send a message directly to the support team for assistance.

In figure 3: Forgot Password A feature that enables users to reset their password by receiving a reset link via their registered email address.

4.3.3 Blood Banks Interface

The Blood Bank interface serves as the central tool for managing blood inventory and coordinating with hospitals for blood requests. It is designed to give Blood Bank staff an efficient and intuitive way to oversee operations.

4.3.3.1 Homepage Interface

This **Blood Bank Homepage Interface** is designed to optimize workflow, allowing staff to quickly navigate between add new donation, update inventory table, manage requests, manage campaigns efficiently.

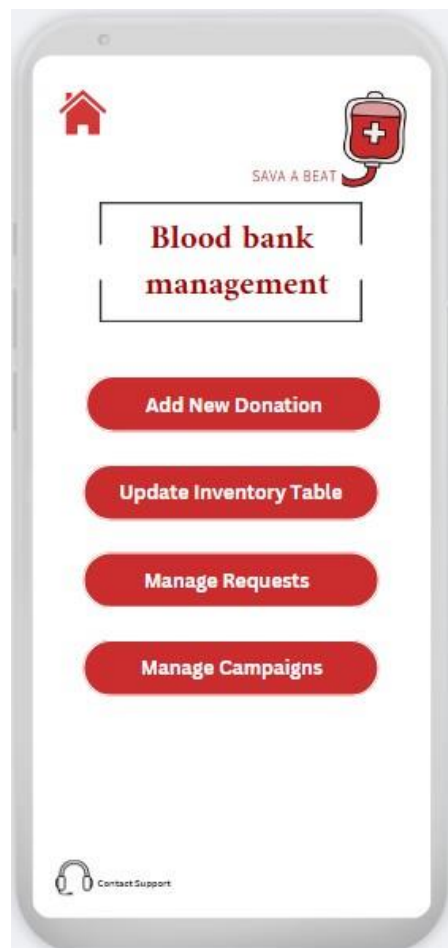


Figure 4 Blood bank management

4.3.3.2 Add New Donation Interface

This interface is for blood bank staff to add donations received from donors to the inventory.

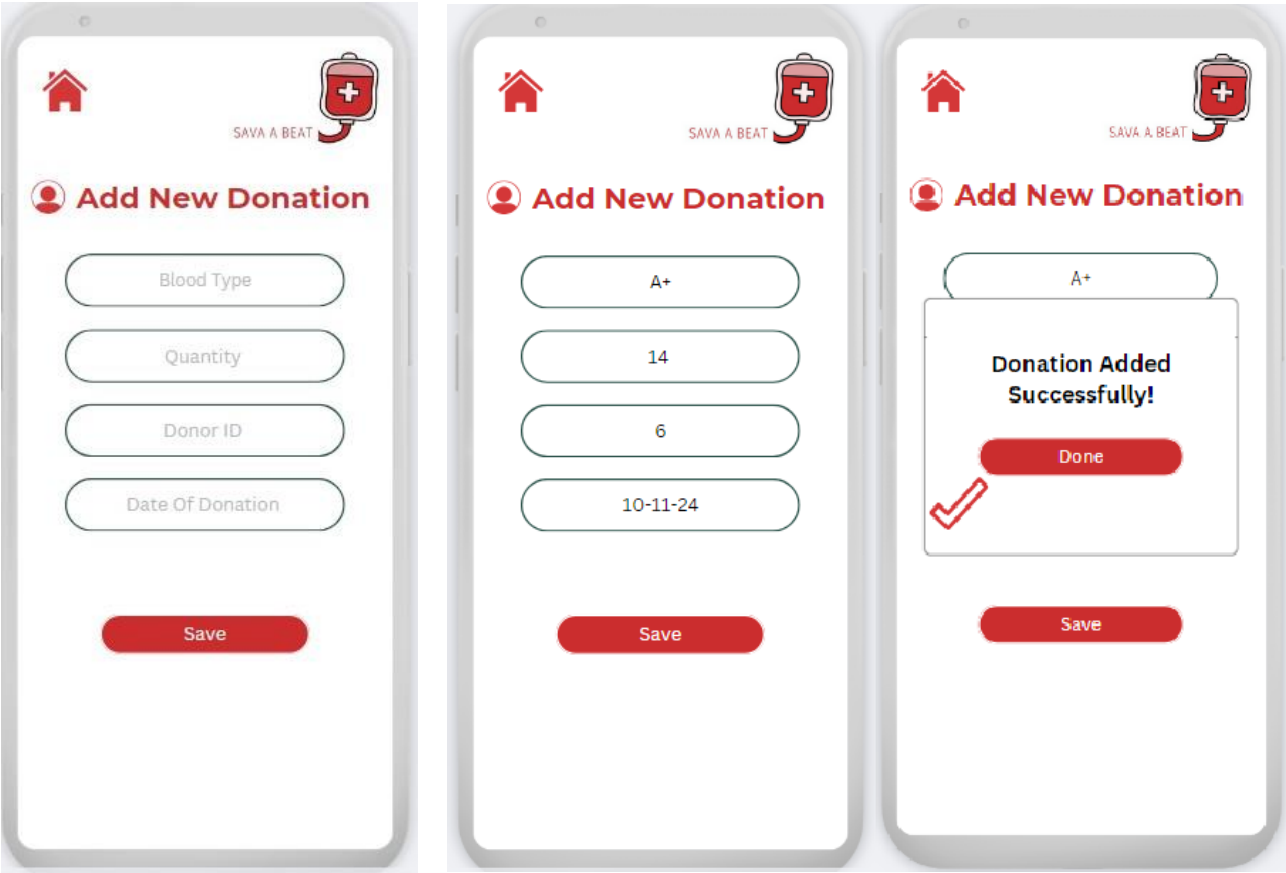


Figure 5Add new donation

4.3.3.3 Update Inventory Table Interface

The **Update Inventory Table Interface** provides blood bank staff with an efficient way to manage and update the current stock of blood. This interface ensures that blood inventory levels are accurate, and allows for actions such as marking blood units as used, dispatched, expired, or updating the stock levels based on new donations.

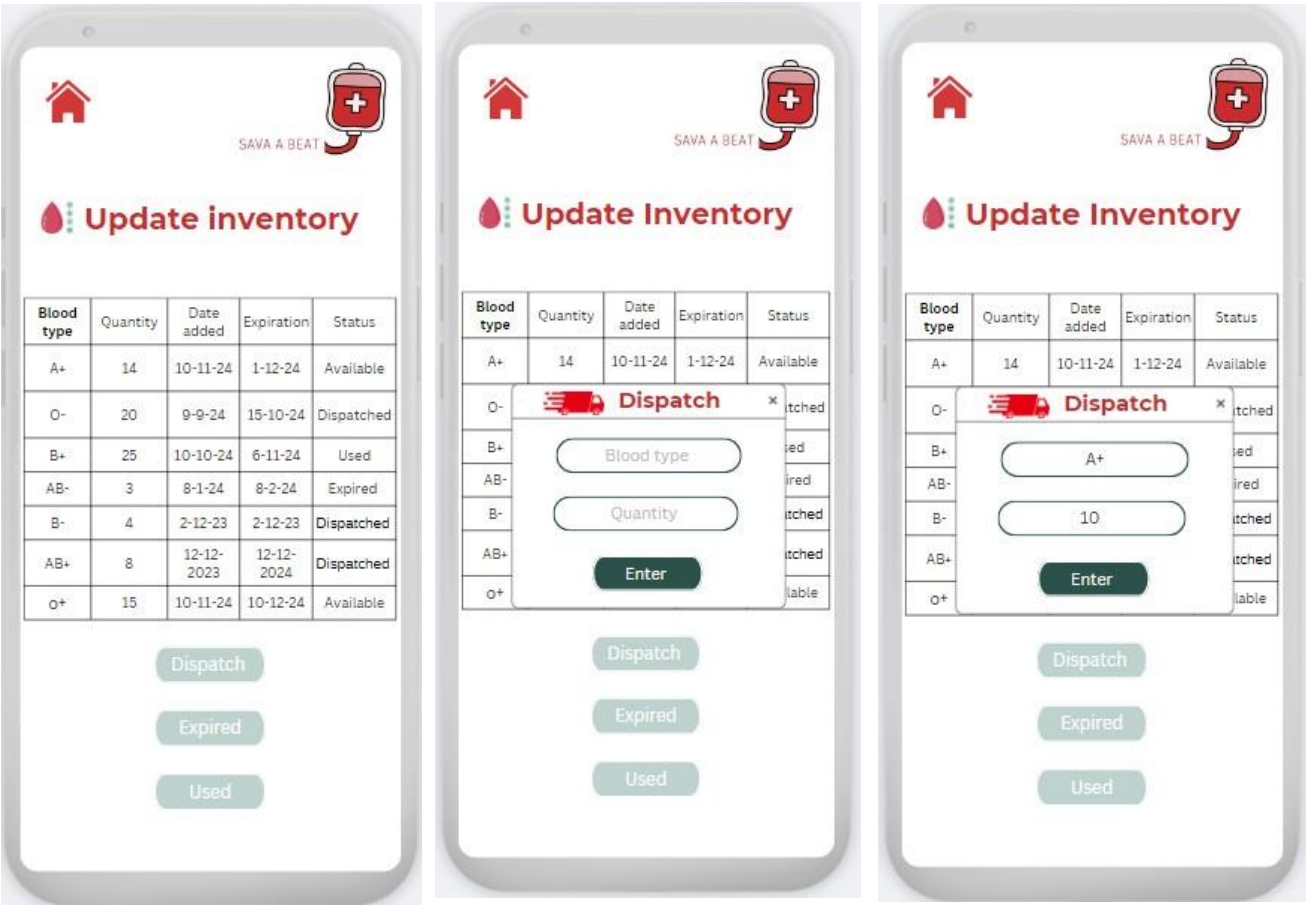


Figure 6Update Inventory

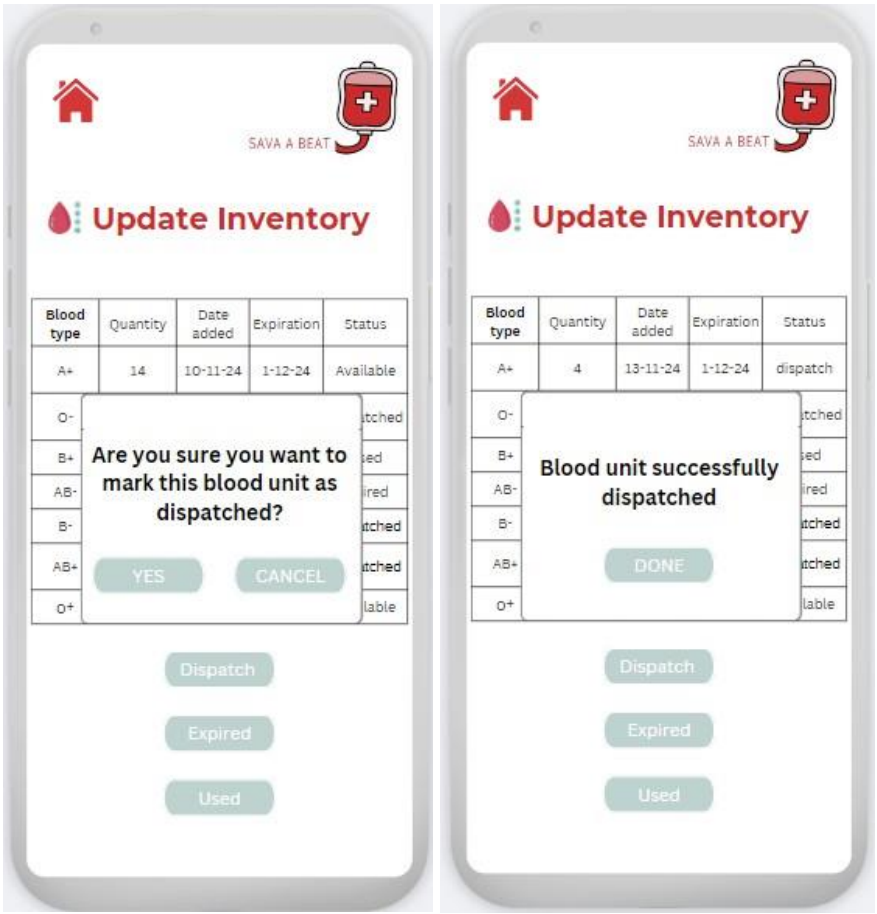


Figure 7Update Inventory

4.3.3.4 Manage Request Interface

The **Manage Request Interface** allows blood bank staff to oversee and manage incoming blood requests from hospitals. This interface helps prioritize urgent requests, approve or reject them based on inventory availability, and track their status. It is crucial for efficient blood distribution, ensuring that hospitals receive the blood they need in a timely manner.

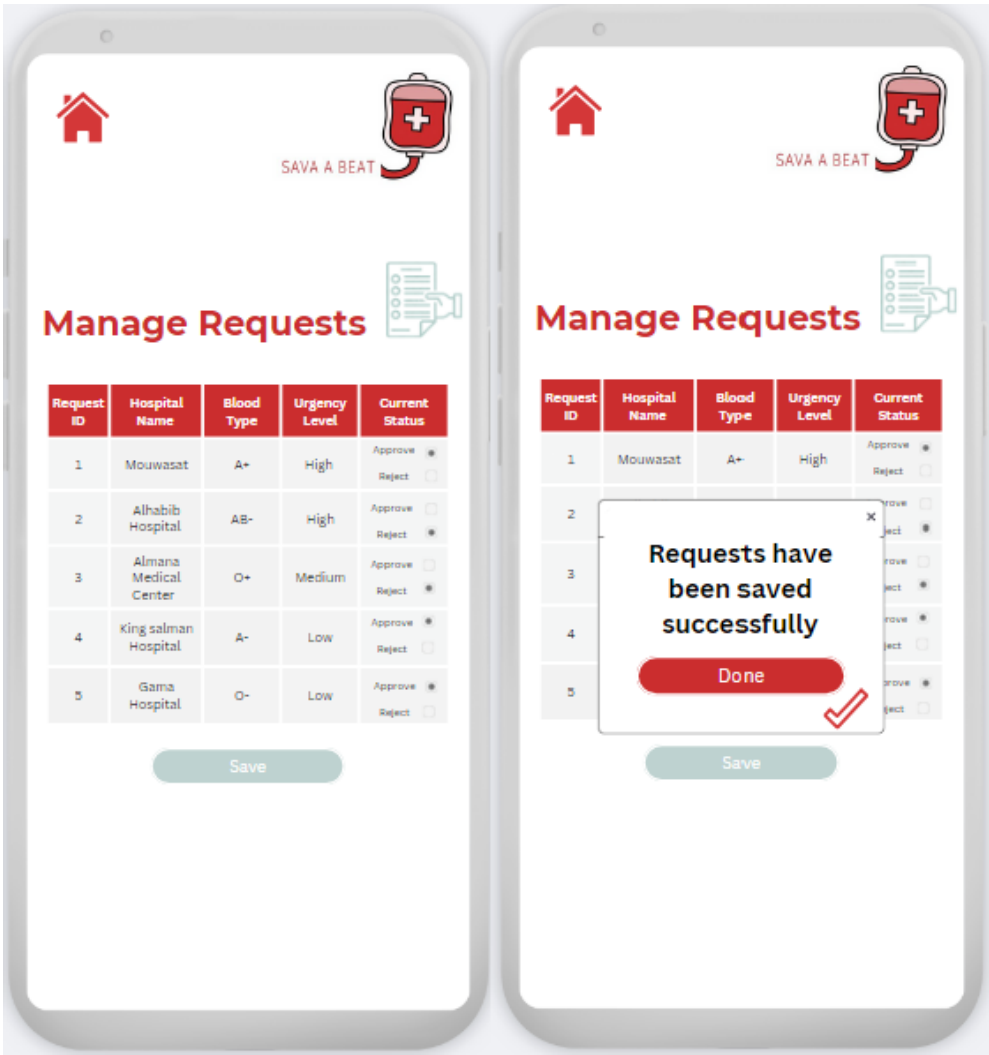


Figure 8Manage requests

4.3.3.5 Manage Campaign

The **Manage Campaign Interface** is designed for blood bank staff to create, manage, and monitor blood donation campaigns. These campaigns are crucial for raising awareness about blood donation events and encouraging donors to participate. The interface provides staff with the tools to track campaign performance, send notifications to donors, and manage related logistics.



Figure 9 Manage Campaign

If the user clicks to any campaign that appear in manage campaign interface campaign summary will be available:

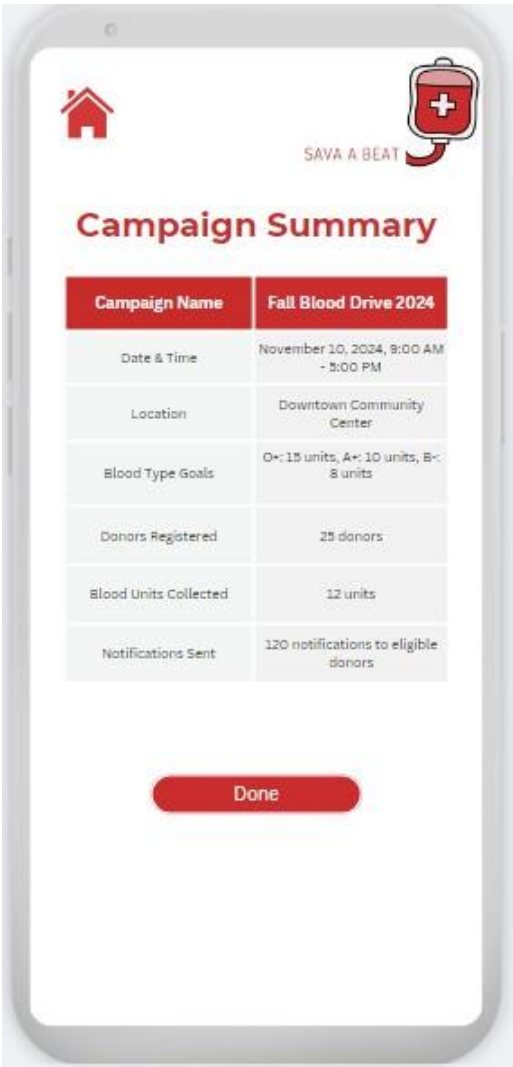


Figure 10 Campaign Summary

4.3.3.5.1 Add Campaign Interface

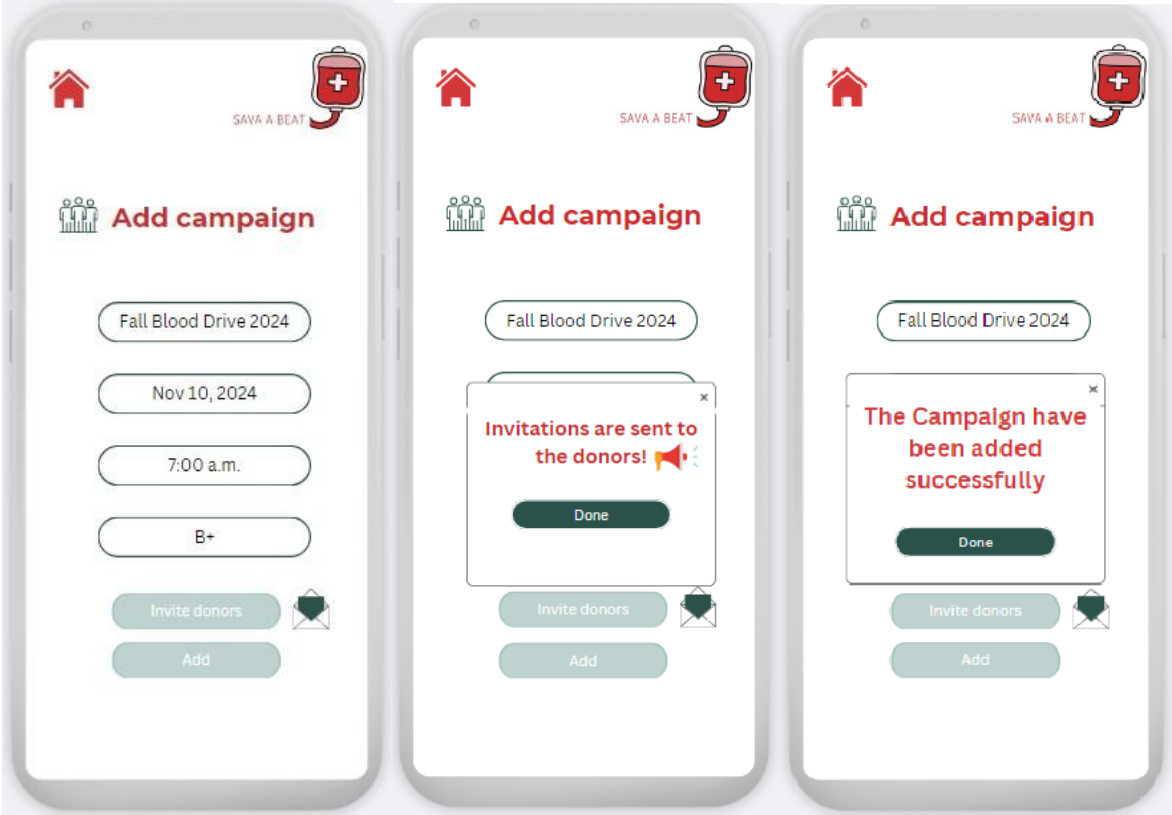


Figure 11 Add campaign

4.3.4 Donor Interface

4.3.4.1 Donor log in

Donors will sign in using their User ID and password. If they forget their password, they can click on "Forgot my password" to reset it.

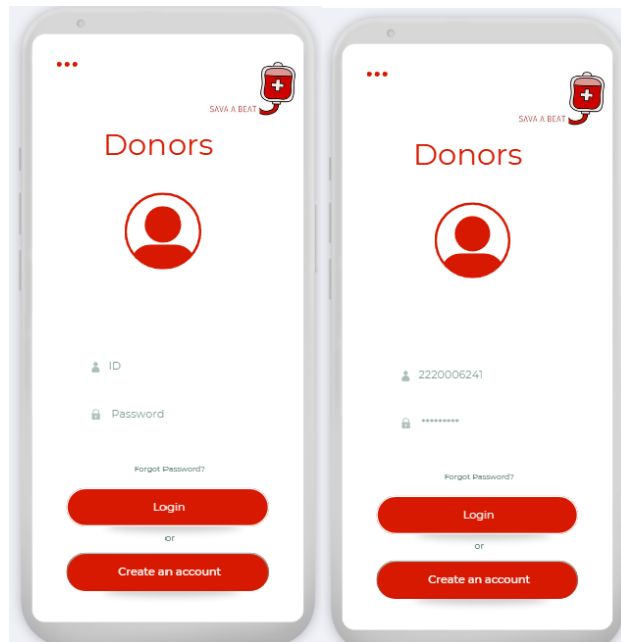


Figure 12 Donor Log in

4.3.4.2 Donor sign up

The Sign Up Interface enables the new users who want to become donors to provide their basic information including; name, phone number, email address, blood type and password. Correct syntax validation guarantees that all the fields are checked for accuracy which enhances the registration process of any person seeking to access the system.

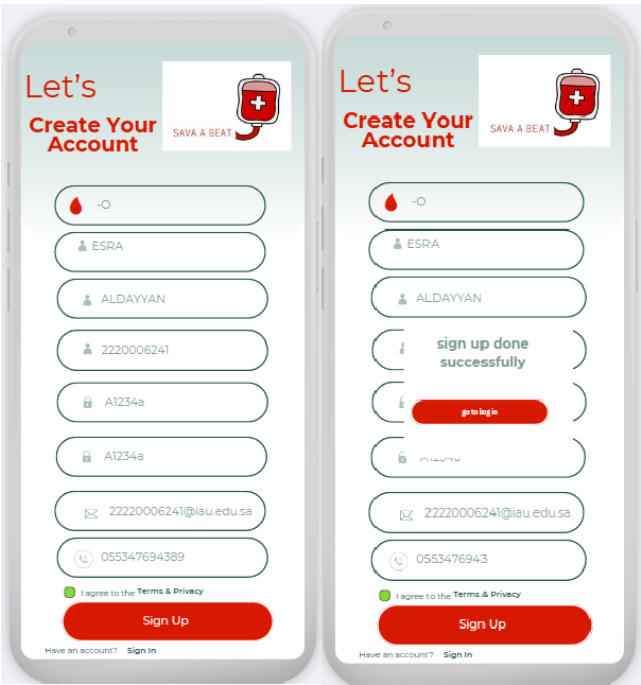


Figure 13 Donor Sign up

4.3.4.3 Donor home dashboard

The donor interface lets the donor edit their profile, view the donation history, set donation preferences and view the calendar of upcoming campaigns.

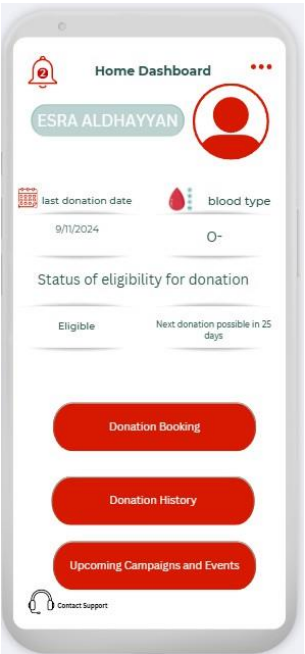


Figure 14 Donor Home Dashboard

4.3.4.2 Profile and health information

On the home dashboard, the donor can view their name, blood type, and donation eligibility status. Additionally, the dashboard provides easy access to three key sections through interface options

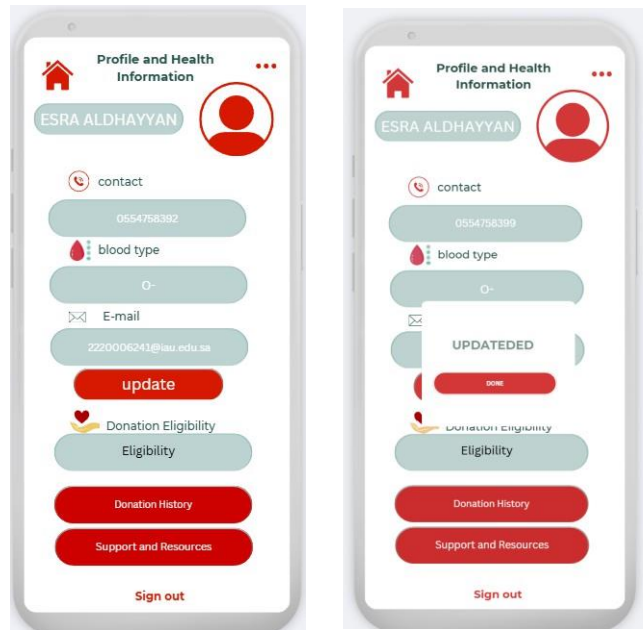


Figure 15 Profile Health and information

4.3.4.3 Donation History

Donors can view their past donations, including dates, types, and points earned.

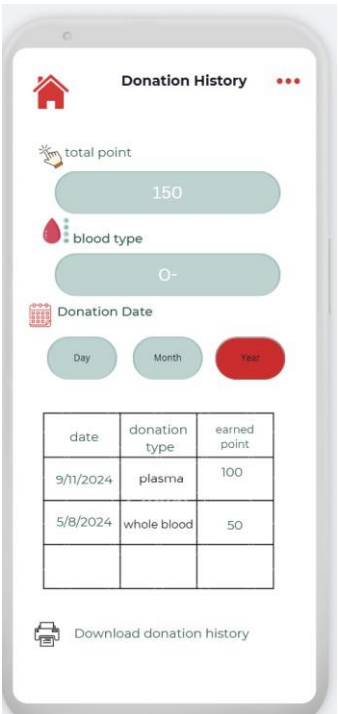


Figure 16 Donation History

4.3.4.4 Support and Resources

Users are able to use live chat to get one on one support, visit the frequently asked questions page, see donation information, or even find where donation centers are located near them.



Figure 17 Support and Resources

4.3.4.4.1 Live chat

Live chat for immediate help with donation-related questions



Figure 18 Live chat

4.3.4.4.2 Where you can find us

This interface will display a map that shows all hospitals that you can donate there

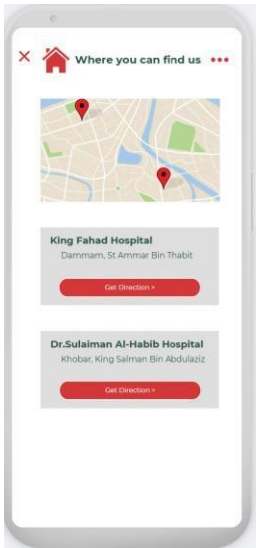


Figure 19 Where you can find us

4.3.4.4.3 Donation Guidelines

Contain clear and elaborate guidelines to the appropriate and safe process of blood donation.

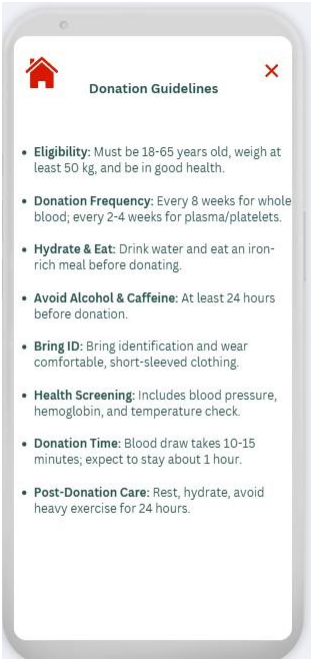


Figure 20 Donation guidelines

4.3.4.4.4 Frequently asked questions

Frequently asked questions (FAQ) section that allows the readers to get the information concerning blood donation, eligibility and the process of donating blood.

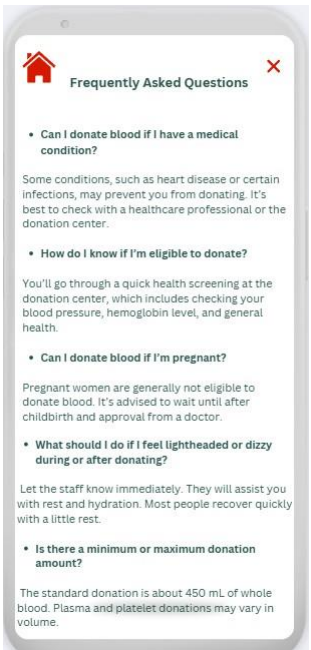


Figure 21 Frequently asked questions

4.3.4.5 Upcoming Campaigns and Events

A list of the current and future campaigns and events for blood donation with an ability to sign up for these events or read more details on each event.

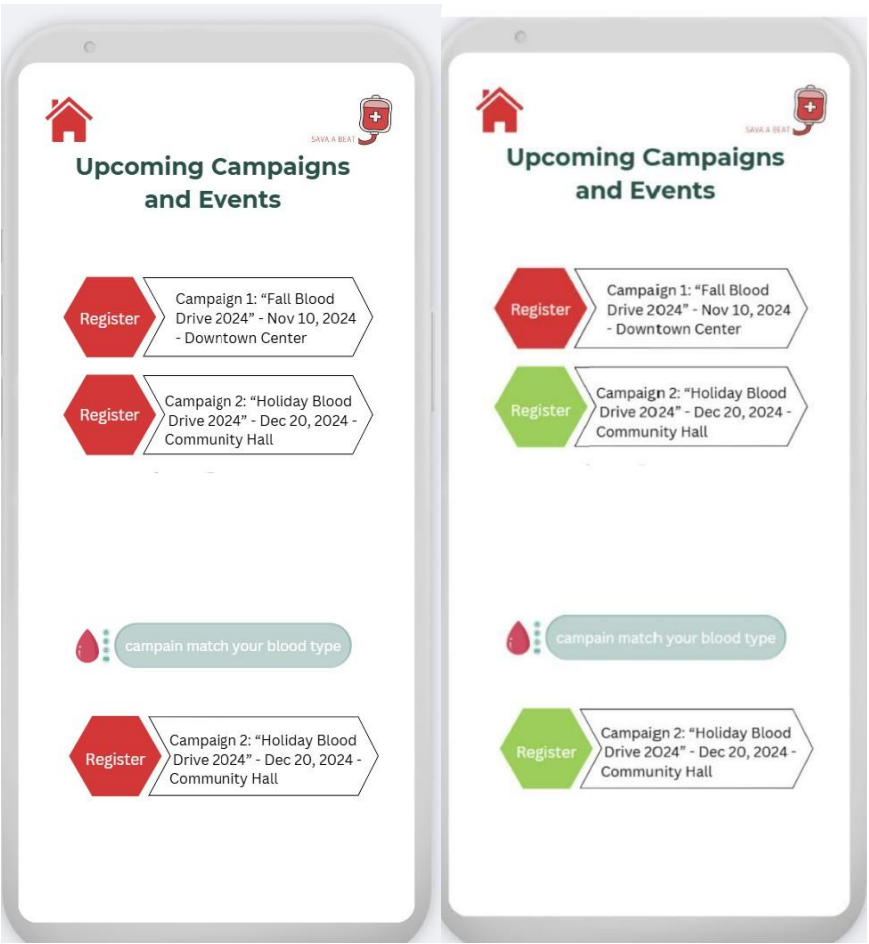


Figure 22 Upcoming Campaigns and Events

4.3.5 Hospital interfaces

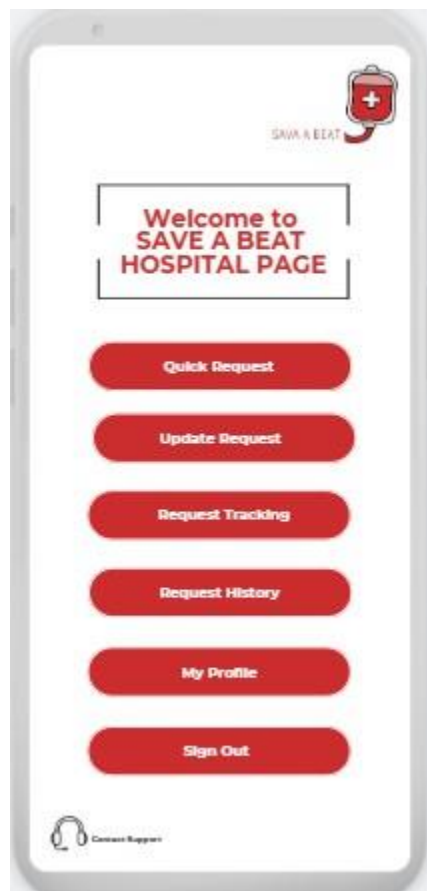


Figure 23 Hospital Interface

The hospital homepage provides a clear and simple navigation system for hospitals to let the hospitals effectively to place a new request, Request Tracking, Request History, the hospital profile, request update, contact support to ease the modification and deletion process, and Sign Out button to sign out from the app.

4.3.5.1 Sign up/ Log in interface

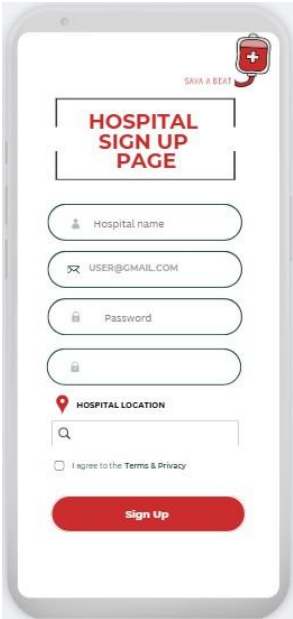


Figure 24 Hospital Sign Up

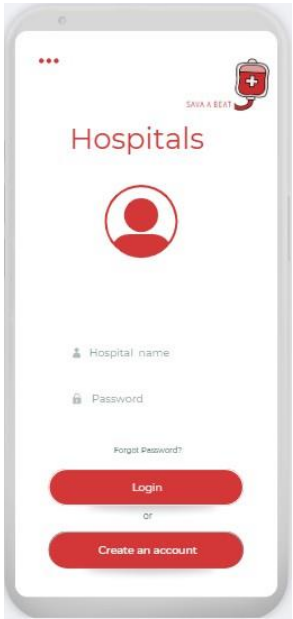


Figure 25Hospital Sign in

Sign up interface main purpose is to collect all the necessary information from the hospital to create a secure account while ensuring compliance with legal requirements (through the Term & Privacy)

The log in interface is designed to provide a secure and straightforward way to access their account.

4.3.5.2 Create blood request

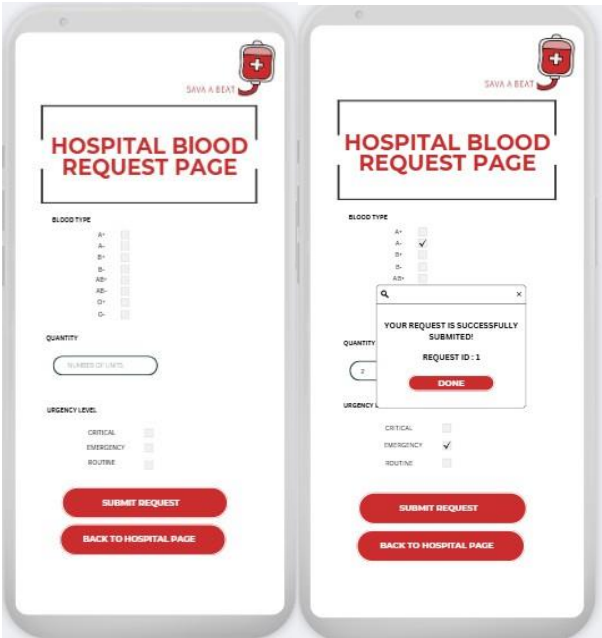


Figure 26Create Blood Request

The Quick Request interface is streamlined to ensure that hospital staff can make requests with minimal steps. Blood Type, the user selects the blood type(s) they need for the request. Quantity, the user specifies how many units of blood, Urgency Level, the user selects how urgent the request is. Submit Request Button Sends the request data to the system for processing. Back to Hospital Page Allows the user to return to the hospital home page.

4.3.5.3 Track the blood request interface



Figure 27Track blood request

The Request Tracking Interface is designed to help hospitals easily monitor the status and progress of their requests, offering a clear visual representation (through the timeline) of the different stages. The interface provides convenient navigation back to the main dashboard. The combination of the Request ID field, visual timeline, and easy navigation makes this interface crucial to ensure hospitals can track and manage their requests efficiently.

4.3.5.4 Request History interface

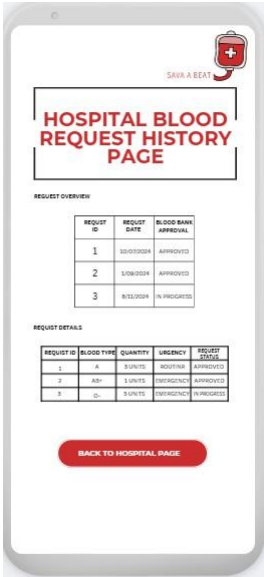


Figure 28Request History

The Hospital Blood Requests History interface includes components that allow hospitals to easily review their request history, get more detailed information about each request, and navigate smoothly within the app.

4.3.5.5 My profile interface



Figure 29Hospital profile

The hospital profile interface enables the hospital to view and edit their information easily.

4.3.5.6 Update/Delete Blood Request interface



Figure 30Update/Delete Blood Request

This interface is to ease the process of modifying a request in case needed. The hospital can also delete a request by clicking the specified button if needed.

4.4 Screen Objects and Actions

A discussion of screen objects and actions associated with those objects.

Object	Type	Action
Main Homepage Interface		
Blood Bank	Link	Directs the user to the Blood Bank Log-in interface
Hospitals	Link	Directs the user to the Hospital Log-in interface
Donors	Link	Directs the user to the Blood Bank Log-in interface
Common Interfaces		
Forgot password interface		
Email	Text field	The user types the email address to reset the password
Reset Password	Button	Sends a message to the entered email to reset the password
Back to Login	Link	Redirects the user to the Log in interface
Contact Support interface		
Message area	Component (Text area)	The user can write the message to the support team
Send	Button	If the user types the message, it displays a message otherwise it displays error message
Back to home page	Button with link	Redirects the user to the homepage they belong to
Blood Bank Interface		
Homepage Interface		
Add New Donation	Link	The Blood Bank is redirected to "Add New Donation" interface where blood bank staff can log new donations.
Update Inventory Table	Link	The Blood Bank is redirected to "Update Inventory" interface where the blood bank

		staff can manage and adjust blood stock levels.
Manage Request	Link	The Blood Bank is redirected to "Manage Request" interface where blood bank staff can review, approve, or reject blood requests from hospitals.
Manage Campaign	Link	The Blood Bank is redirected to "Manage Campaign" interface where blood bank staff can create and monitor blood donation campaigns.
Contact Support	Link	The Blood Bank is redirected to Contact Support Interface
Add New Donation Interface		
Blood Type	Text Field	Blood banks can enter blood type (e.g., A+, B-, O+) for donations or stock updates.
Quantity	Text Field	Blood banks can enter the amount of blood donated (e.g., in units or liters).
Donor ID	Text Field	Enter the unique identifier for the donor, linking the donation to their profile
Date of Donation	Text Field	Blood banks can enter the date the donation was made. YYYY MM-D
Save	Button	Click to save the donation details and update the inventory
Update inventory Interface		
Inventory Table	Table	Displays the current inventory of blood stocks by type, quantity, and expiration date, allowing staff to view and manage stock levels.

Dispatched	Button	When clicked, a dialog appears with fields for blood type and quantity. The user enters the details and clicks Save to update the inventory and mark the blood as dispatched. Clicking Cancel closes the dialog without changes.
Expired	Button	The Blood Bank is redirected to a dialog with fields for blood type and quantity. The user enters the expired blood details and clicks Save to remove it from inventory. Clicking Cancel closes the dialog without changes.
Used	Button	The Blood Bank is redirected to a dialog appears with fields for blood type and quantity. The user enters the used blood details and clicks Save to update the inventory. Clicking Cancel closes the dialog without changes.
Manage Request Interface		
Request List	Table	Displays a list of incoming blood requests, including details such as blood type, quantity, urgency, and requesting hospital.
Approve, Reject	Radio Button	Click approve to accept the request or click reject to reject (choose one only)
Save	Button	Message appears showing that Requests have been saved successfully
Manage Campaign Interface		
Search	Text Field	Allows the user to search for campaigns by year.

		When a year is entered, it filters and displays campaigns from that specific year.
Add Campaign	Button with Link	The Blood Bank is redirected to Add Campaign Interface
Add Campaign Interface		
Campaign Name	Text Field	The Blood Bank can enter the campaign name
Date	Text Field	The Blood Bank can enter the Date
Time	Text Field	The Blood Bank can enter the time
Blood Target	Text Field	The Blood Bank can enter the Blood Target
Invite Donors	Button	Message appears showing the Invitations are sent to the donors!
Add	Button	Message appears showing the Campaign have been added successfully
Hospital Interfaces		
Hospital Homepage interface		
Quick Request	Link	The hospital is redirected to Quick Blood Request Interface
Update Request	Link	The hospital is redirected to Blood Request Update Interface
Request Tracking	Link	The hospital is redirected to Blood Request Tracking Interface
Request History	Link	The hospital is redirected to Request History Interface
My Profile	Link	The hospital is redirected to My Profile Interface
Sign Out	Button	The hospital exits the app.
Contact Support	Link	The hospital is redirected to Contact Support Interface
Hospital's Quick Blood Request interface		

Blood Type	Component (Check Box)	The Hospital can Check the needed blood types
Quantity	Text Field	The hospital can enter the blood quantity
Urgency Level	Component (Check Box)	The Hospital can Check the Urgency level of the request
Submit Request	Button	Message appears showing the request Id
Back to Hospital Page	Button with Link	The hospital is redirected to the hospital homepage
Hospital's Update Blood Request interface		
Request id	Text Field	The hospital can enter the request id they want to Update/Delete
Blood Type	Component (Check Box)	The Hospital can Check the new Updated blood type
Quantity	Text Field	The hospital can enter the blood quantity
Urgency Level	Component (Check Box)	The Hospital can Check the Urgency level of the request
Submit Request	Button	Message appears showing the new request information
Delete Request	Button	Message appears for successfully deleting the request
Back to Hospital Page	Button with Link	The hospital is redirected to the hospital homepage
Hospital's Request Tracking interface		
Request id	Text Field	The hospital can enter the blood request to track
Request Timeline	Component (Timeline)	Only visual representation of request state
Back to Hospital Page	Button with Link	The hospital is redirected to the hospital homepage

Hospital's Request History interface		
Request Overview	Component (Table)	Showing The Request id, Date and approval.
Request Details	Component (Table)	Showing The Request id, Blood Type, Urgency Level, Quantity, and approval.
Back to Hospital Page	Button with Link	The hospital is redirected to the hospital homepage
Hospital's Profile interface		
Hospital Name	Text Field	It contains the hospital name/ can be edited
Hospital Password	Text field	It contains the hospital name/ can be edited
Hospital Location	Component (Map)	Showing the hospital exact location / can be edited
Save changes	Button	Message appears saving the updated information
Back to Hospital Page	Button with Link	The hospital is redirected to the hospital homepage
Donor Interfaces		
Donor home dashboard		
Profile and Health Information	Link	The donor is redirected to his/her profile which contains tabs of personal data and possible health conditions that may make him/her ineligible for donating.
Donation Booking	Link	Launches the donation scheduling page through which donors can select the next appointment for their donation according to the time and place and type.

Donation History	Link	Provides a detailed history of past donations, including dates, locations, and point
Upcoming Campaigns and Events	Link	Enables the user to see the calendar or list form of future donor campaigns, events or drives near me and to support the nearby community activities pertinent to the blood type.
Profile and Health Information		
Donor Name	Text	Display / edit Donor name
Contact	Text	Display / edit Donor Contact information
Blood Type	Text	Display/edit from the following blood type (e.g., A+, B-, O+).
E-mail	Text	Display / edit Donor email
Update	Button	Update the information after change
Donation Eligibility	Text Label	Illustrate to the user if he eligible for donation or not
Donation History	Button with link	The donor is redirected to the Donation History page
Support and Resources	Button with link	The donor is redirected to the Support and Resources page
Sign out	Button	The donor exits the app.
Total Point	Text Label	Show the earned point based on type of donation

Blood Type	Text Label	Show the blood type of the donor
Donation Date	Table	Show the date, donation type, earned point of previous donation.
Download donation history	Button	Download / print the donation history
Support and Resources	Text	
Live chat	Button with link	Redirect the donor to Live chat page
FAQs (Frequently Asked Questions)	Text Button with link	Redirect the donor to FAQs page
Donation Guidelines	Button with link	Redirect the donor to Donation Guidelines page
Where you find us	Button with link	Redirect the donor to Where you find us page
Timestamp	Text Label	Show the time of send/receive message
Chat Bubble	Text display	Displays received messages from the assistant
Input Field	Text input	Allows the user to type a message to respond
Send Button	Button	Sends the typed message when clicked, triggering a new chat bubble with the user's message.
Location Name and Address Box	Text Label	Displays the name and address of each hospital, allowing users to identify the locations.
Get Direction Button	Button	Redirects the user to a Google map that provides directions to the selected hospital.
List of Questions	Text Label	Answering all donor concern

Exit label	Button	Allow the user exit and go back to Support and Resources
Donation Guidelines		
List of Guidelines	Text Label	Informing the donor with the list of guidelines he must obey
Exit label	Button	Allow the user exit and go back to Support and Resources
Upcoming Campaigns and Events		
List of upcoming events	Text Label	Shows the upcoming Campaigns and Events to the donor.
Register Button	Button	By clicking the buttons, it will book to attend the event (green means booked)

Table 3: Screen Objects and Actions

4.5 Other Interfaces

4.5.1 Common Error Interfaces



Figure 31forgot password(invalid email)

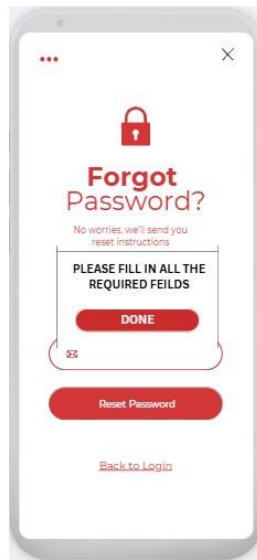


Figure 32forget password(required field)

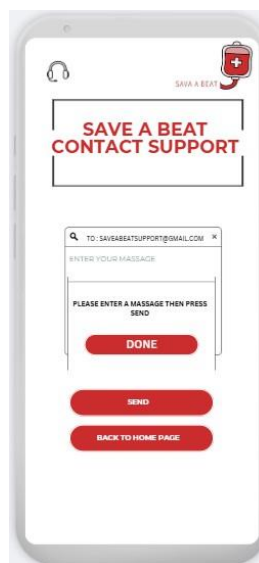


Figure 33contact support

In figure 31,32: If the user enters an email address that does not exist in the system, or if they input numeric values instead of a valid email format, or if the fields left empty an error message will appear.

In figure 33: If the user attempts to send a message through the "Contact Support" interface without typing any content in the message field, an error message will be triggered, prompting the user to enter a message before submitting.

4.5.2.1 Donor Error Interfaces

4.5.2.1.1 Invalid blood type

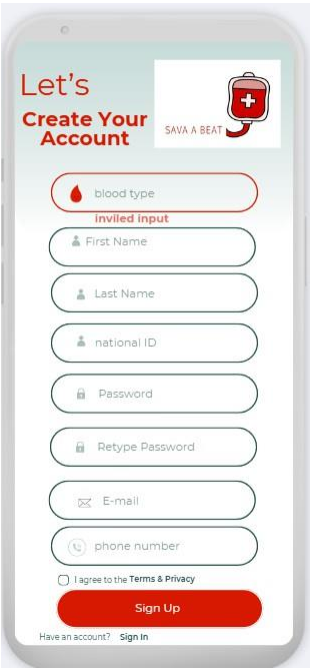


Figure 34invalid blood type

If the donor enters unexacting blood type

4.5.2.1.2 Phone number or ID more than 10 digit

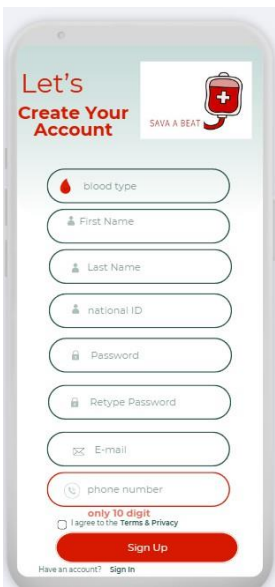


Figure 36invalid phone number

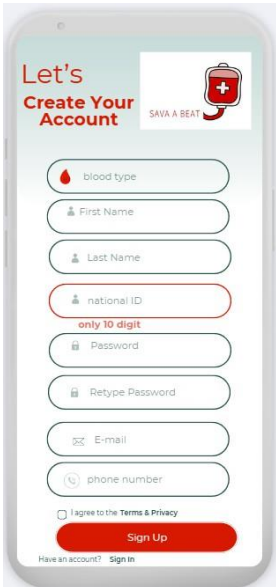


Figure 35invalid ID

In figure 35: donor add more than 10 digits for phone number

In figure 36: donor add more than 10 digits for id

4.5.2.1.3 Unmatched password

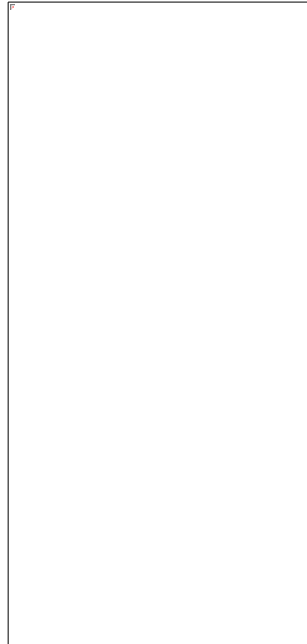
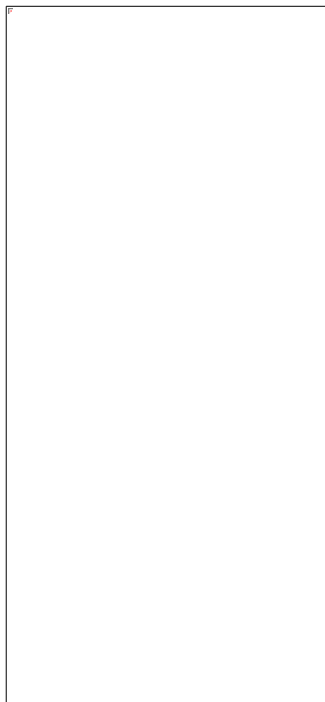


Figure 37 unmatched

if the donor enter unmatched password an error message will appear

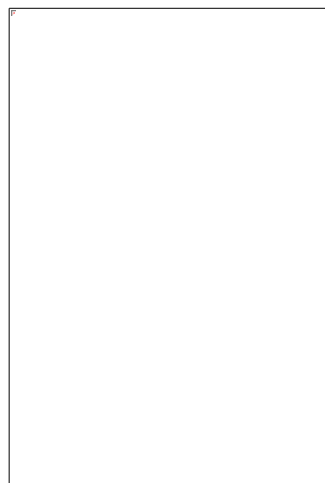
4.5.2.1.4 Terms and privacy agreement



*Figure 38*terms and conditions

*If the donor has not checked the check box for agree for terms and conditions*³⁹

4.5.2.1.5 Fully booked



*Figure 40*fully booked

Error message appear if the select date is fully booked

4.5.2.1.6 wrong id /password



Figure 41wrong id /password

4.5.3 Blood Bank Error Interfaces

4.5.3.1 Add Donation Error Interfaces

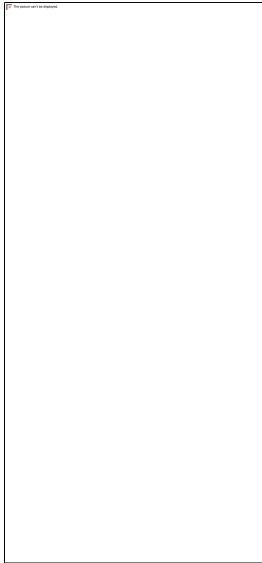


Figure 42invalid blood type

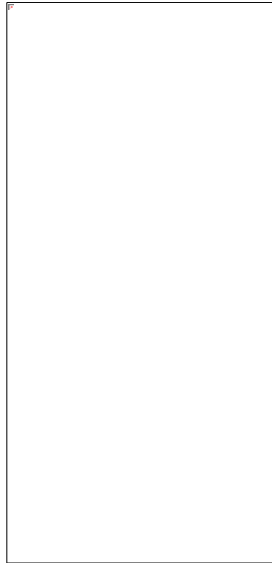


Figure 43invalid number



Figure 44invalid ID

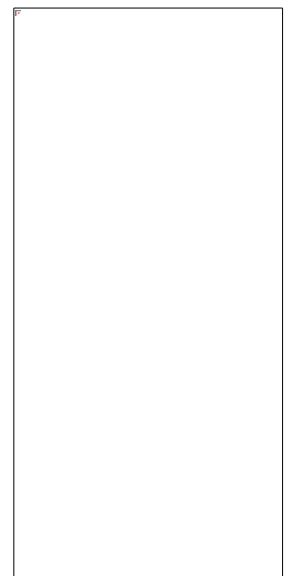


Figure 45invalid date

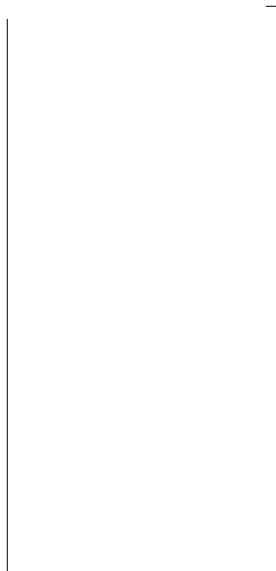


Figure 46:error massage

- In the figure 42 , if the staff enters a number instead of a blood type
- In the figure 43 , if the staff enter a text instead of a number
- In the figure 44 , if the staff enter a short id instead of 10 digits national id
- In the figure 45 , if the staff enter doesn't enter the date as the format (year-month-day)
- In the figure 46 , if the staff enters a donor id that is not eligible to donate blood

4.5.3.2 Update Inventory Error Interfaces

- In the figure 47 , if the staff enters a text instead of a number
- In the figure 48 , if the staff enters a character instead of entering a blood type

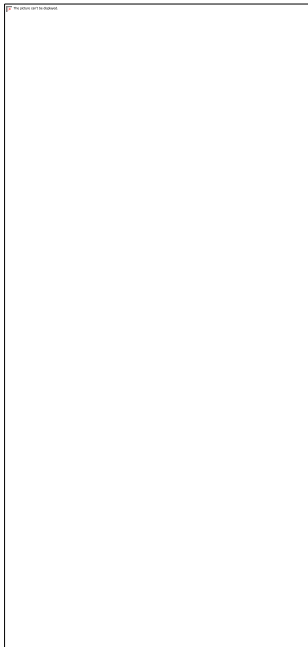


Figure 48invalid blood

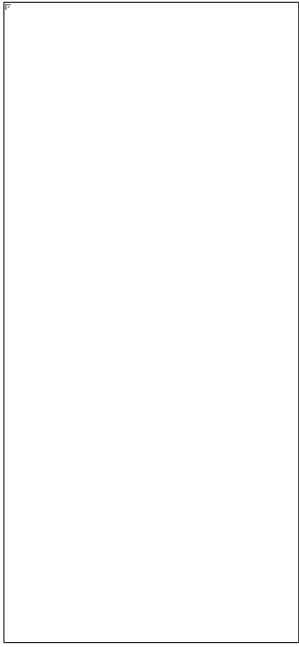


Figure 47invalid number

4.5.3.3 Add Campaign Error Interface

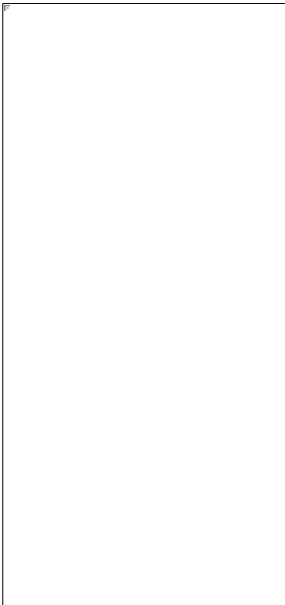


Figure 51invalid date

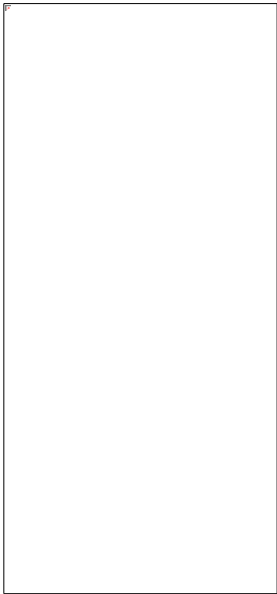


Figure 49invalid time

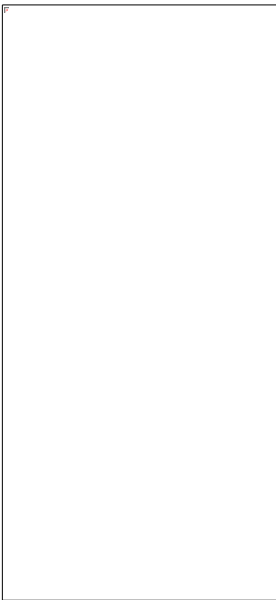


Figure 50invalid blood type

- In the figure 51 , if the staff enters an invalid date not in the format required
- In the figure 49 , if the staff enters a text instead of writing the time
- In the figure 50 , if the staff enter a number instead of a blood type

4.5.4 Hospital Error Interface

4.5.4.1 Sign up Error Interface

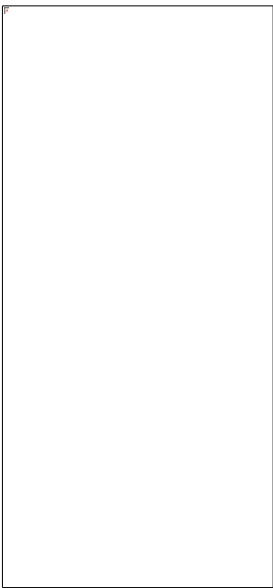


Figure 55:hospital sign in



Figure 54:invalid email

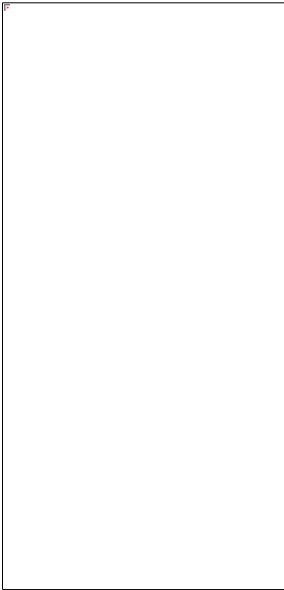


Figure 53:invalid hospital name

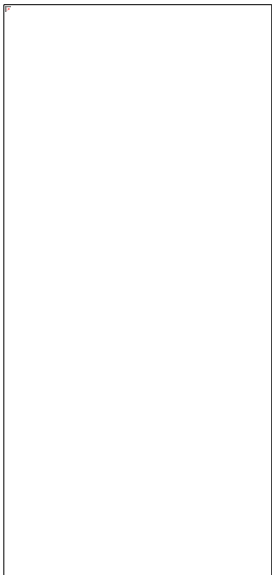


Figure 52:fill all entity

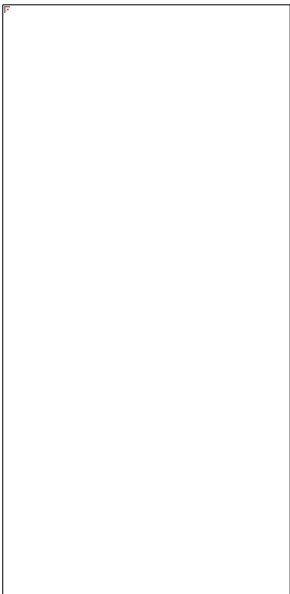


Figure 57:password error

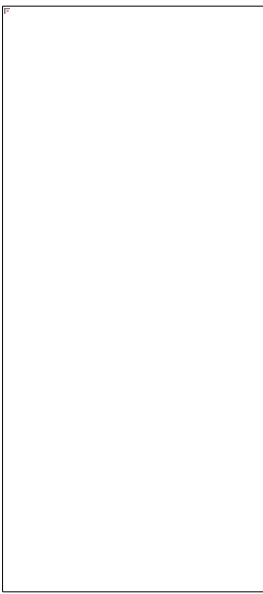


Figure 56:mismatch password

In Figure 52: if the user dose not fill all the required fields error message appears.

In Figure 54: if the user enters email in the wrong format error message appears.

In Figure 53: if the user types numeric values instead of text in hospital name error message appears.

In Figure 57: if the user enters invalid password (does not follow the rules) error message appears.

In Figure 56: if the user retype wrong password error message appears.

4.5.4.2 Log in Error Interface

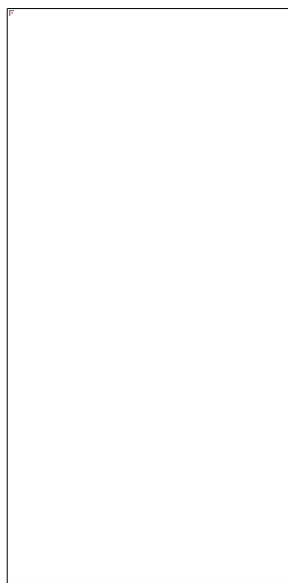


Figure 60log in hospital

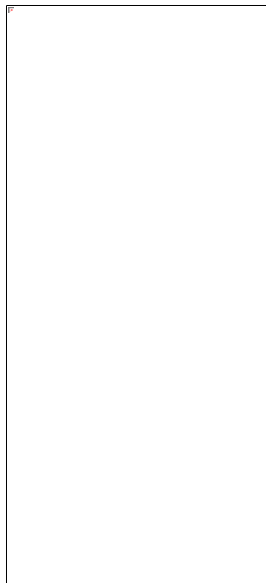
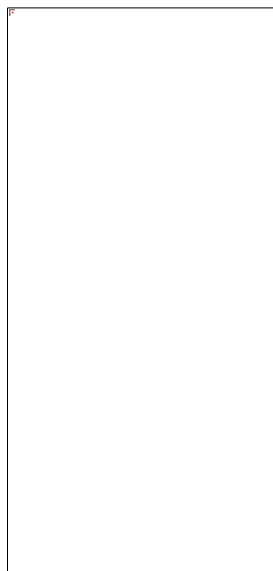


Figure 58fill all entity



*Figure 59invalid
name/password*

In figure 59: if the user enters an invalid name or password, an error message appears

In figure 58: if the user leaves an empty field, an error message appears

4.5.4.3 Blood Request Error Interface

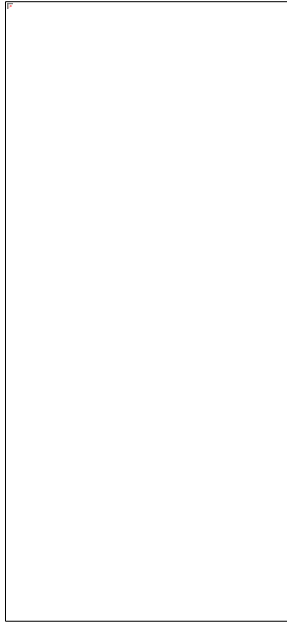


Figure 61 mismatch quantity

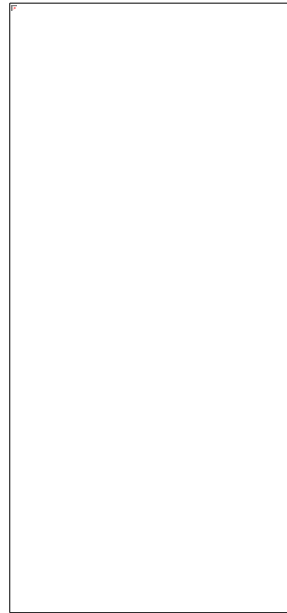


Figure 62 fill all entity

In Figure 61: if the user enters an invalid data type text value instead of numeric in quantity error message appears.

In Figure 62: if the user dose not fill all the required fields error message appears.

4.5.4.4 Request Tracking Error Interface



Figure 63:invalid request id

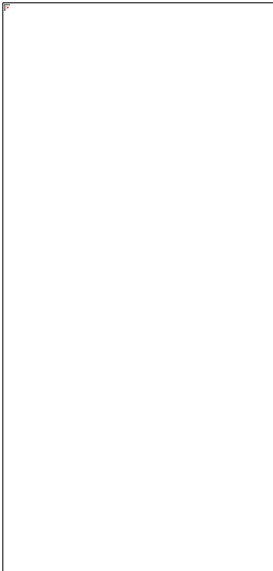


Figure 64:mismatch request id

In Figure63: if the user types invalid Request id (does not exist in the system) error message appears.
In Figure64: if the user types invalid Request id (Text instead of numeric) error message appears.

4.5.4.5 Request Update Error Interface

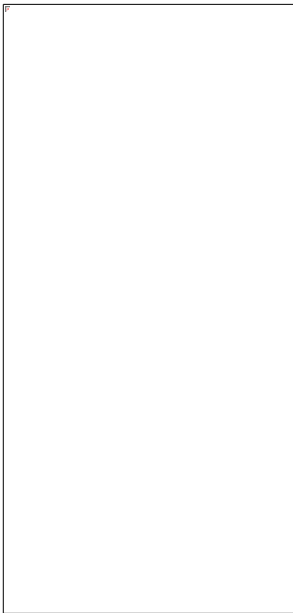


Figure 66invalid request id

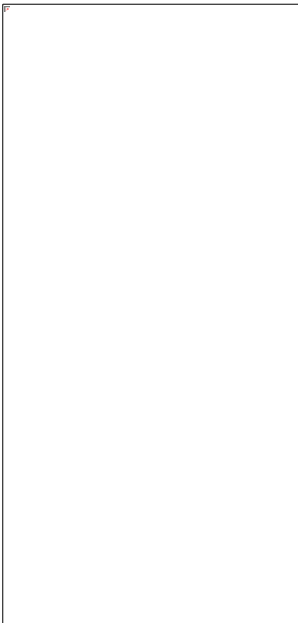


Figure 65invalid quantity

In Figure 66: if the user types invalid Request id (does not exist in the system or text instead of numeric) error message appears.

In Figure65: if the user enters an invalid data type text value instead of numeric in quantity error message appears

4.5.4.6 Request History Error Interface

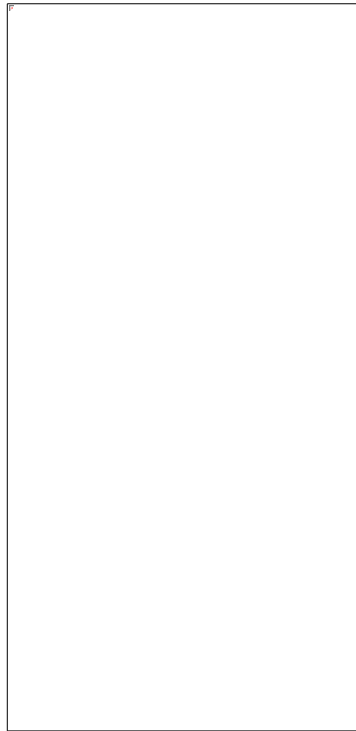


Figure 67request error

In figure 67: if the hospital did not create any request and clicks the request history interface an error message appears.

5 System Architecture

This section provides the architecture of Save a Beat system. It covers the architectural design approach, the overall system and the subsystems architectures.

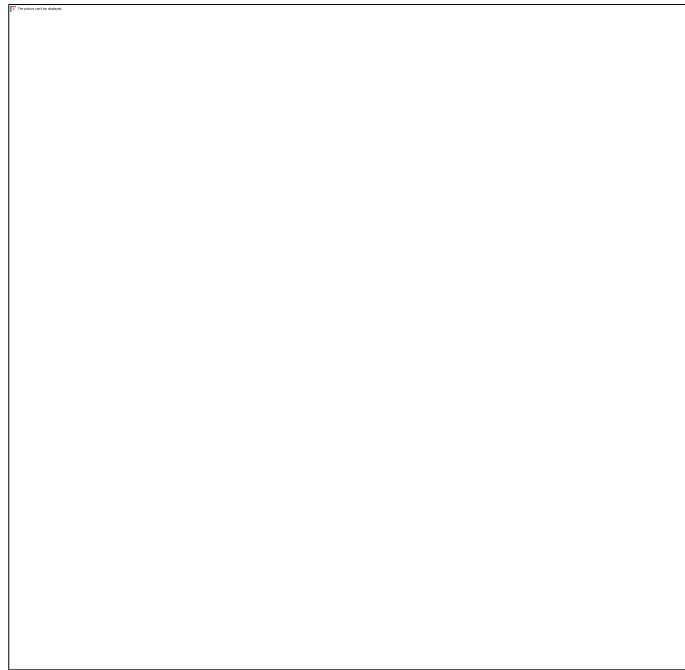


Figure 68save a beat architectural

5.1 Architectural Design Approach

The "Save A Beat" system utilizes a Layered Architecture approach to maintain clear separation between different components and facilitate efficient troubleshooting, scalability, and security. The system is divided into three main layers:

- **User Interface Layer:** This layer oversees user interactions, providing a clean, intuitive interface to simplify operations for various stakeholders like hospitals, blood banks, and donors.
- **Application Services Layer:** Serving as an intermediary, this layer manages user inputs and translates them into system actions. It coordinates data handling by processing requests, interfacing with the database layer, and ensuring efficient service delivery.
- **Data Layer:** This layer manages access to the MySQL database, allowing for the storage, retrieval, and secure update of user and operational data, including donation records and blood inventory.

5.2 Architectural Design

- **User Interface Layer:** Through a graphical user interface (GUI), this layer displays relevant data to users and collects their input, which is then processed in the Application Services Layer. The interface has been optimized for simplicity and accessibility, catering to users with varying levels of technical experience.
- **Application Services Layer:** This layer connects the User Interface Layer with the Data Layer. It interprets user actions from the interface and performs necessary functions by interfacing with the data layer. It ensures seamless data processing, enabling smooth interactions across the system.
- **Data Layer:** Accessing the MySQL database, this layer handles CRUD (Create, Read, Update, Delete) operations. The database is organized to store sensitive information such as donor details,

blood inventory, and secure operational records. It processes data requests from the Application Services Layer and returns the required results

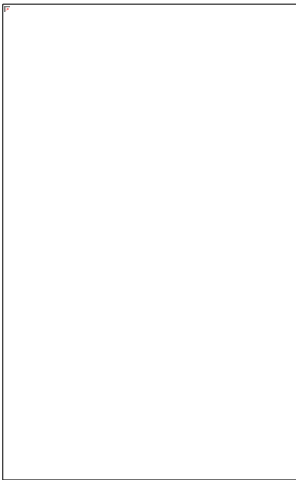


Figure 69Layered Software Architecture

5.3 Subsystem Architecture

This section describes in details the functions and major processes for the projected Save A Beat system. It defines how data is processed and how the application stored that data. It demonstrates the logical architecture by providing data flow diagrams (DFDs) to define the processes, data flows, and data stores at different levels. Moreover, this section depicts the association between each and every user with the system.

5.3.1 General overview of the system

The following figure represents the context level of the "Save A Beat" data flow diagrams. It illustrates an overview of how the system will operate by showing how the platform will interact with its environment and exchange data with its end users, including blood banks, hospitals, and donors. It also clarifies the system’s boundaries, highlighting the key interactions such as blood inventory management, emergency blood requests, donation scheduling, and notifications for donors.

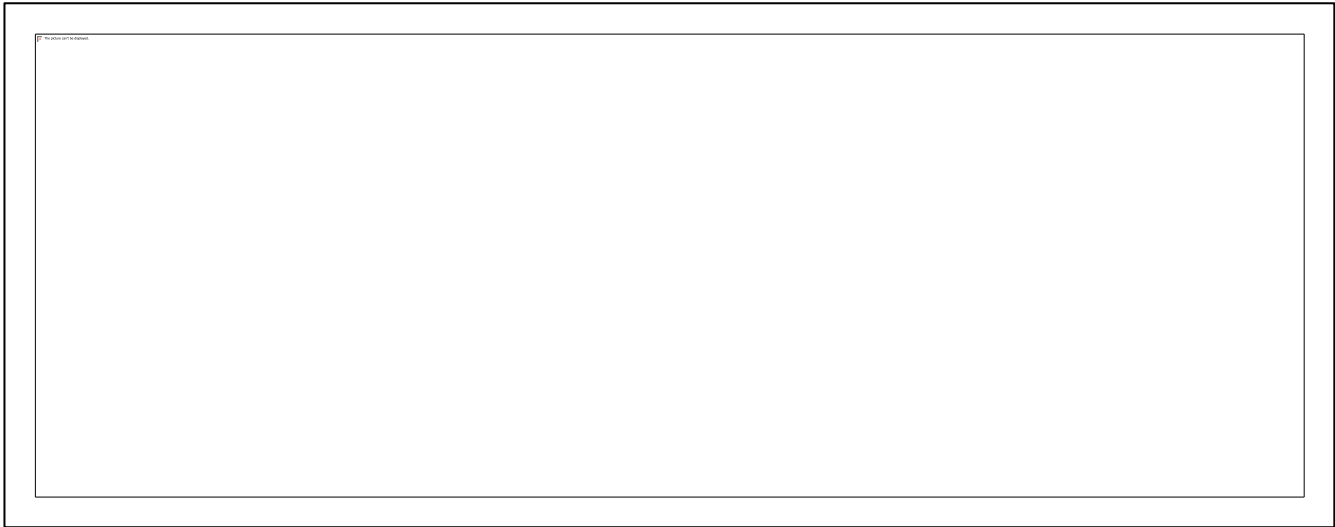


Figure 70Context DFD of the save a beat System

5.3.2 User’s Subsystem

The DFD illustrates the common functionalities of the 3 primary responsibilities. Both can access the system through username and password and change their passwords if they forget it.

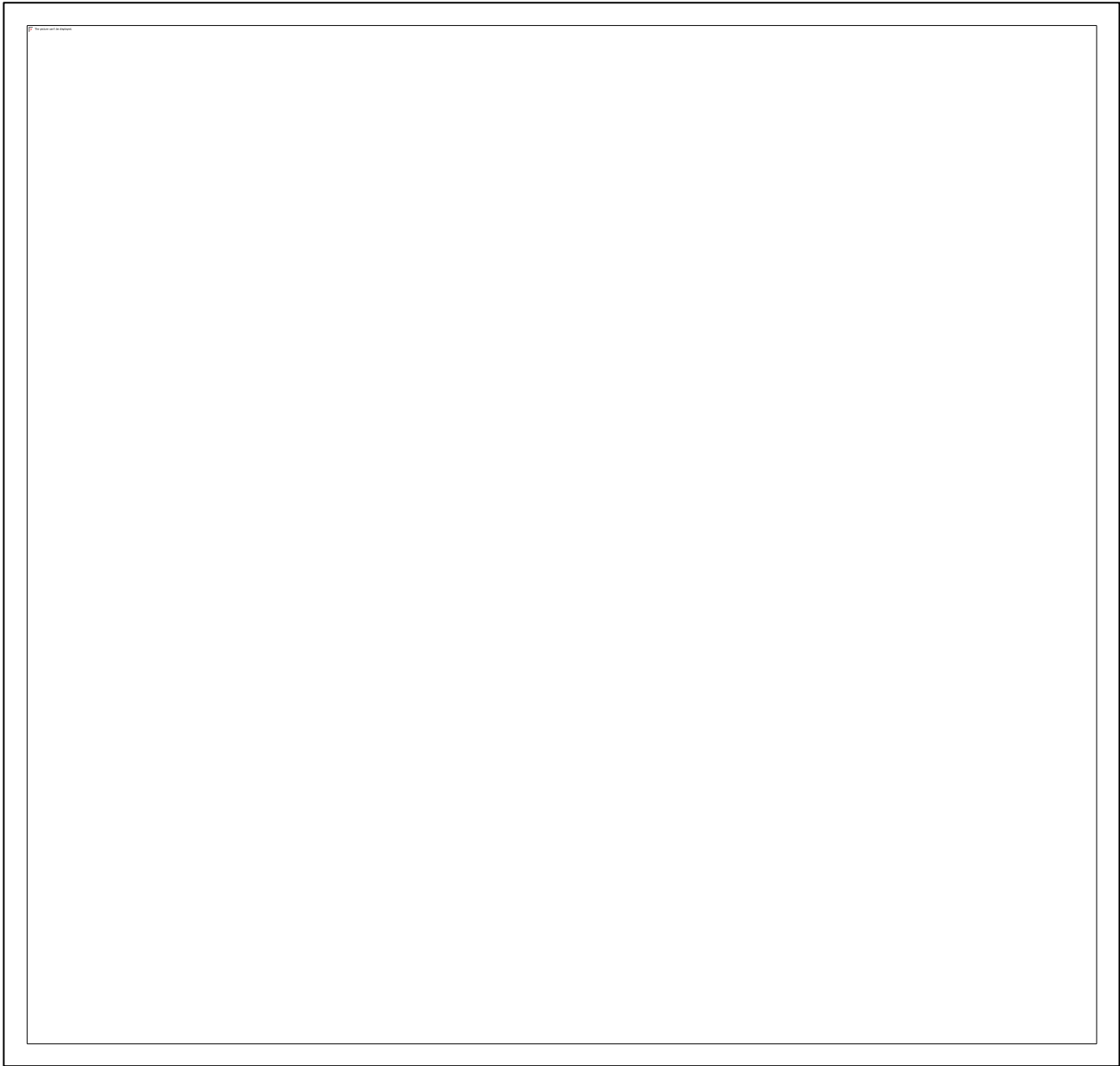


Figure 71User Subsystem

5.3.3 Blood Bank Subsystem

This diagram illustrates the flow of data within the **Blood Bank Subsystem** of the "Save A Beat" platform. It shows how the blood bank manages inventory, processes blood donations, and handles requests from hospitals.

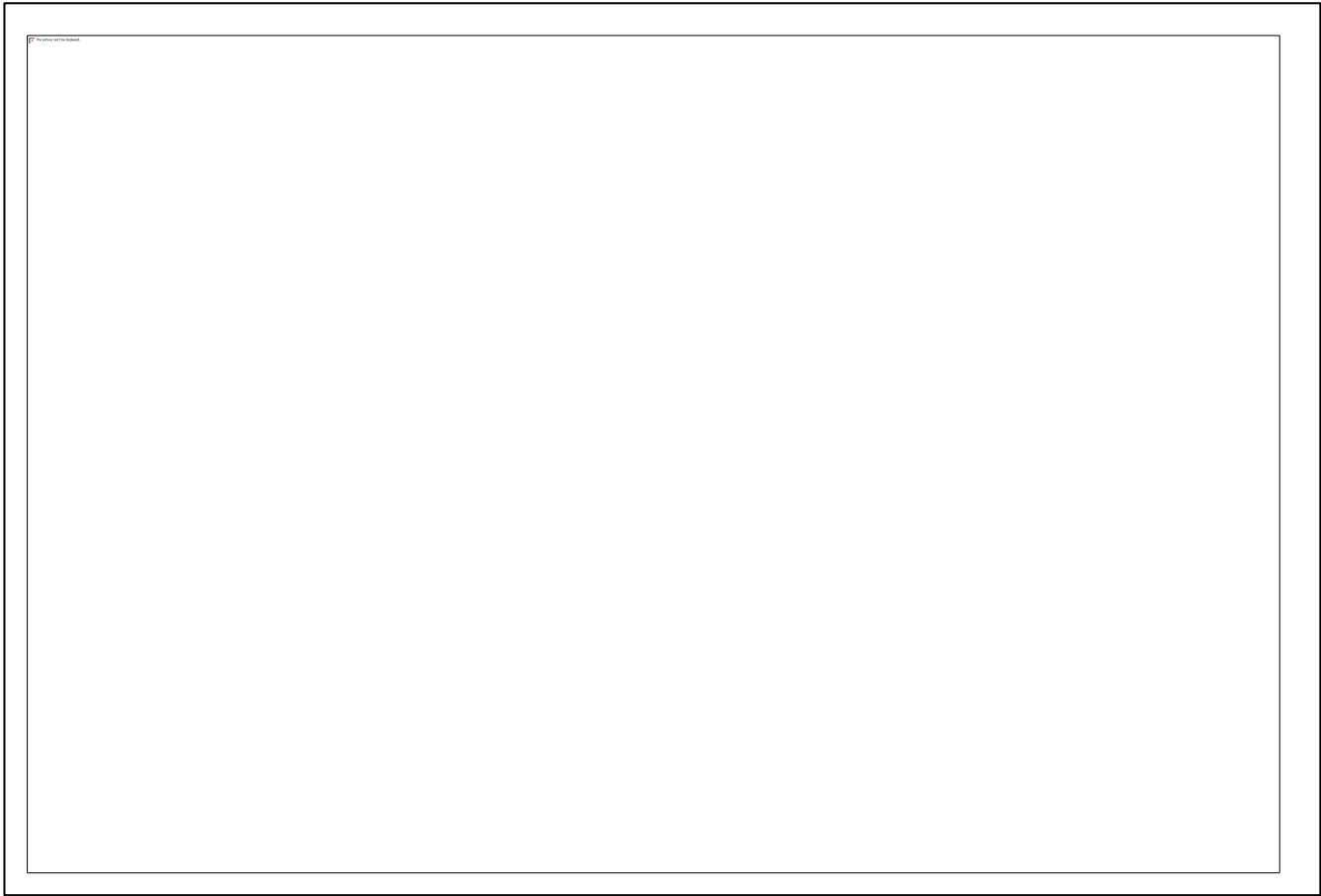


Figure 72blood bank Subsystem

5.3.4 Hospital Subsystem

This diagram illustrates Data Flow Diagram (DFD) for the Hospital Subsystem of the "Save A Beat" platform, which involves creating, tracking, viewing, updating, and deleting blood requests.



Figure 73hospital Subsystem

5.3.5 Donors Subsystem

This diagram illustrates the flow of data within the **Donors Subsystem** of the "Save A Beat" platform. It shows how the Donors subsystem is structured the subsystem involves creating account, view profile, Supports and Resources, Booking, donation history and Upcoming Campaigns and Events

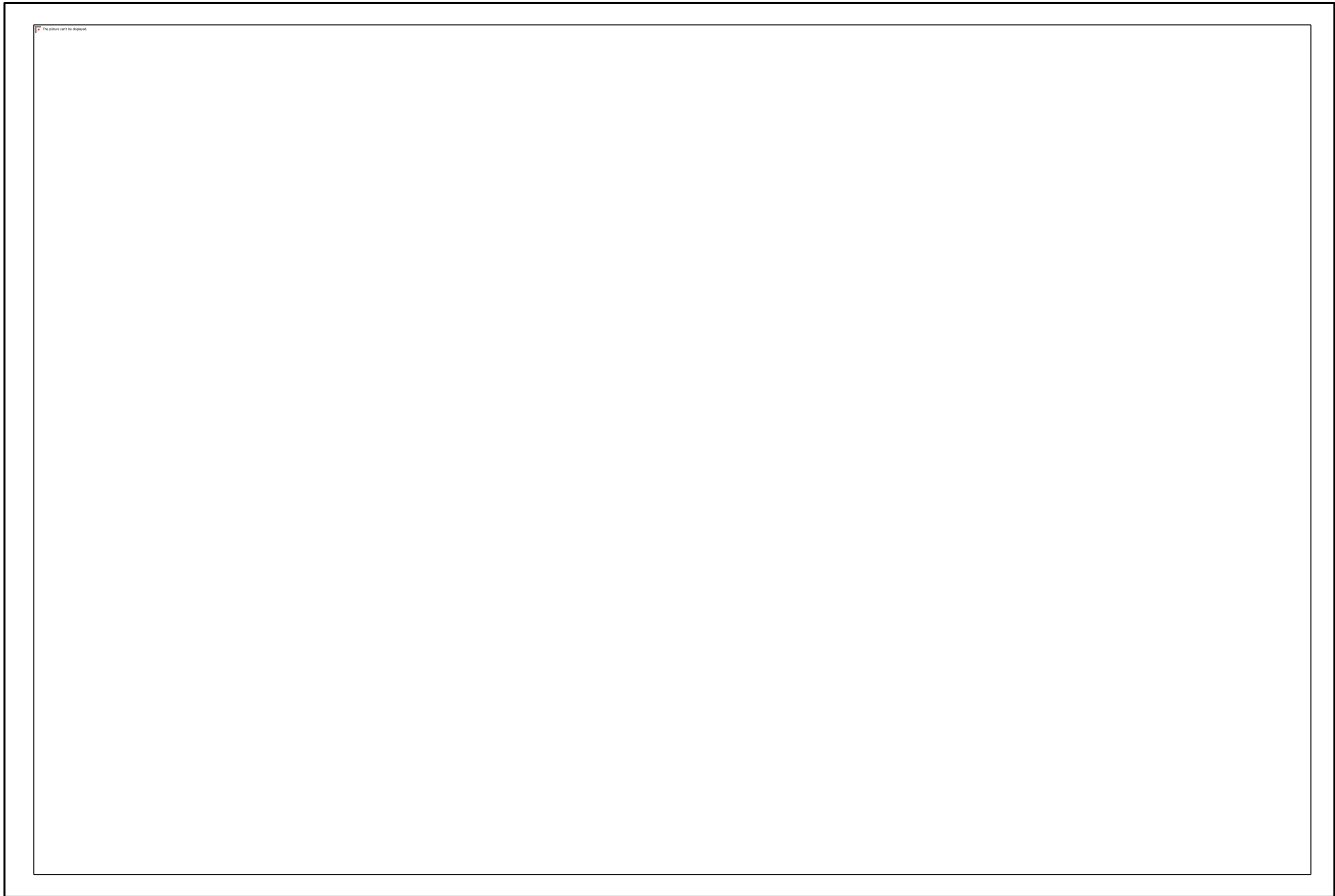


Figure 74Donor Subsystem

6. Data Design

6.1 Data Description

Explain how the information domain of your system is transformed into data structures. Describe how the major data or system entities are stored, processed and organized. List any databases or data storage items.

Entity	Field	Type	PK	FK	Constraints
Donor	Donor ID	INT(10)	✓		NOT NULL, UNIQUE
	First Name	VARCHAR(30)			NOT NULL
	Last Name	VARCHAR(30)			NOT NULL
	E-mail	VARCHAR(70)			NOT NULL, UNIQUE
	Phone Number	INT(10)			NOT NULL
	Password	VARCHAR(70)			NOT NULL
	Blood Type	ENUM('A+', 'A-', 'B+', 'B-', 'AB+', 'AB-', 'O+', 'O-')			NOT NULL
Donation	Blood type	ENUM('A+', 'A-', 'B+', 'B-', 'AB+', 'AB-', 'O+', 'O-')			NOT NULL
	Donation type	VARCHAR(70)			NOT NULL
	Donor ID	INT(10)		✓	NOT NULL, UNIQUE
	Date of donation	Date			NOT NULL

Table 4: Data Description for Donor

Entity	Field	Type	PK	FK	Constraints
HOSPITAL	Hospital Name	VARCHAR(30)	✓		NOT NULL, UNIQUE
	Hospital E-mail	VARCHAR(70)			NOT NULL, UNIQUE
	Hospital Location	VARCHAR(100)			NOT NULL
	Hospital Password	VARCHAR (50)			NOT NULL
Blood Request	Blood type	VARCHAR (8)			NOT NULL
	Quantity	Int			NOT NULL

	Urgency	ENUM('CRITICAL ','ROUTINE ','EMERGENCY ')			NOT NULL
--	---------	---	--	--	----------

Table 5: Data Description For Hospital

Entity	Field	Type	PK	FK	Constraints
Blood Bank	Blood Bank Name	VARCHAR (30)	✓		NOT NULL, UNIQUE
	E-mail	VARCHAR (70)			NOT NULL
	Phone Number	INT (10)			NOT NULL
	Password	VARCHAR (50)			NOT NULL
Blood Requests	Blood Type	ENUM('A+', 'A-', 'B+', 'B-', 'AB+', 'AB-', 'O+', 'O-')			NOT NULL
	Quantity	INT			NOT NULL
	Urgency	ENUM ('Low', 'Medium', 'High')			NOT NULL
Blood Inventory	Blood Type	ENUM('A+', 'A-', 'B+', 'B-', 'AB+', 'AB-', 'O+', 'O-')			NOT NULL
	Quantity	INT			NOT NULL
	Date	DATE			NOT NULL
	Expiration	DATE			NOT NULL
	Status	ENUM ('Available', 'Used', 'Expired', 'Dispatch')			NOT NULL
Campaign	Campaign Name	VARCHAR(50)			NOT NULL
	Date	DATE			NOT NULL
	Time	TIME			NOT NULL
	Blood Target	VARCHAR (3)			NOT NULL

Table 6: Data Description For Blood Bank

6.2 Data Dictionary

Entity	Field	Description
Donor	Donor ID	Unique identification number for each donor.
	First Name	First name of the donor.
	Last Name	Last name of the donor
	E-mail	Donor’s email, must be in the correct format.
	Phone Number	Donor’s phone number, must not be empty.
	Blood Type	Blood type of the donor, chosen from a predefined list.
Donation	Blood type	Blood type of the donor, chosen from a predefined list.
	Donation type	Type of donation (e.g., whole blood, platelets, plasma).
	Donor ID	Unique identification number for each donor.
	Date of donation	Date on which the donation occurred.

Table 7: Data Dictionary For Donor

Entity	Field	Description
HOSPITAL	Hospital Name	Unique Hospital Name for each hospital.
	Hospital Email	Hospital Email, must be in the correct format
	Hospital Location	Must be a valid location
	Hospital Password	Must be a valid password that will be used to log in to the hospital account
Blood Request	Blood type	The blood type/types needed (A+,O..)
	Quantity	Number of blood units needed
	Urgency	The urgency level of blood request(ROUTINE,CRITICAL,..)

Table 8: Data Dictionary For Hospital

Entity	Field	Description
Blood Bank	Blood Bank Name	The unique name of the blood bank.
	Email	The official email address of the blood bank for

		communication and notifications.
	Phone Number	The contact number of the blood bank for inquiries and emergency communication.
	Password	The secure password used by the blood bank for logging into the system.
	Location	The physical address or geographical location of the blood bank.
Inventory	Blood type	The type of blood (e.g., A+, B-, O+).
	Quantity	The number of blood units available for a specific blood type.
	Date	The date when the blood was added to the inventory.
	Expiration	The expiration date of the blood unit.
	Status	The current status of the blood unit (e.g., available, dispatched, expired).
Blood Request	Blood type	The type of blood requested (e.g., O+, AB-).
	Quantity	The quantity of blood requested.
	Urgency	The urgency level of the blood request (e.g., high, medium, low).
Campaign	Campaign Name	The name of the blood donation campaign.
	Date	The date of the campaign event.
	Time	The scheduled time for the campaign event.
	Blood Target	The target number of blood units expected to be collected during the campaign.

Table 9: Data Dictionary For Blood Bank

6.3 Database Description

The **Save A Beat System** database is structured to efficiently manage information about Donors, Blood Banks, Hospitals, Donations, Blood Requests, Campaigns, and Blood Inventory. Below is a detailed description of how the database is organized, including tables, their attributes, and relationships between them.

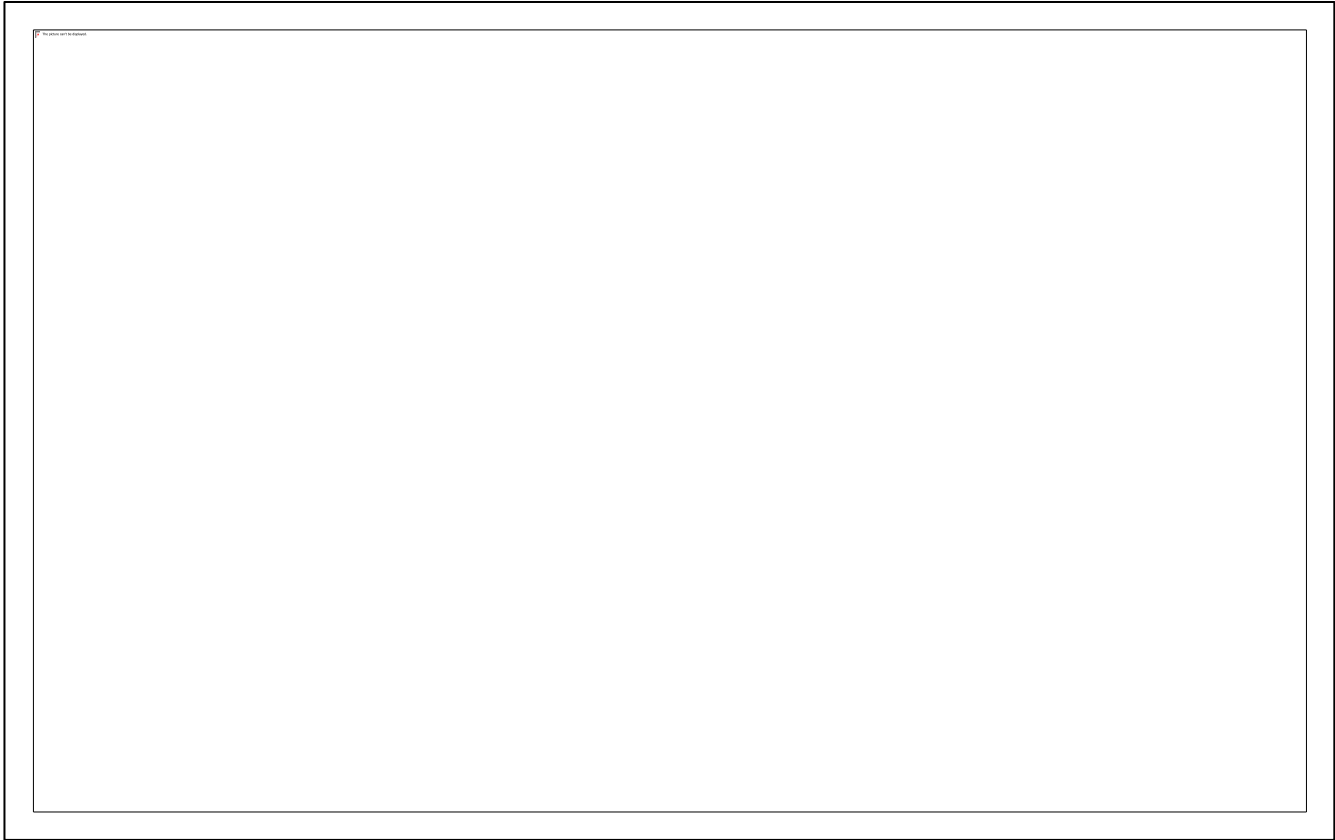


Figure 75save a beat Entity-Relationship diagram

7. Component Design

The functional requirements of the Save A Beat are included in this section's pseudocode.

7.1 Common functions

7.1.1 Forgot password:

```
Function ForgotPassword() {  
    Enter Registered Email Address  
    WHERE Email Address is valid and exists in the system  
        Send Password Reset Link to the provided email  
        Display message: "A password reset link has been sent to your email. Please check your inbox."  
    Else  
        For reasons of user-friendliness, the following Error message should be displayed:  
        "Please enter a valid email address."  
}
```

7.1.2 Contact support:

```
Function ContactSupport()  
{ Enter Message in the Contact Support Field WHERE Message Field is NOT EMPTY  
Send Message to Support Team Display message: "Your message has been sent successfully"  
Else  
For reasons of user-friendliness, the following Error message should be displayed: "Please enter a  
message before pressing send."  
}
```

7.2 Donor Functions

7.2.1 create account

```
Function DonorCreateAccount() {  
    Enter (Donor name, Email, Password, Phone number, blood type,ID)  
  
    IF "Sign up" button is clicked THEN  
        Display "Account is created successfully"  
        Redirect to Log in Interface  
    ELSE  
        Display "Invalid Input. Please try again."  
}
```

7.2.2 Donor Log In

```
Function DonorLogin() {  
    Enter the donor id and password  
    IF "Log In" button is clicked THEN  
        Redirect to Donor Homepage  
    ELSE
```

Display "Incorrect Donor Name or Password. Please try again."

IF "Create Account" button is clicked THEN
Redirect to Create Account Interface

}

7.2.3 Update profile

```
Function UpdateProfile() {  
    Enter new profile details  
    If User clicks "UPDATE" then  
        if invalid input then  
            Display "Unable to project the input data, please check your entries!!"  
        Else  
            Save updated profile details  
            Display "updated"  
    If "Cancel" clicked then  
        Discard changes  
    If Back arrow clicked then  
        Redirect View Profile interface.  
}
```

7.2.4 View Donation History

```
Function ViewDonationHistory() {  
    Display donor's past donations  
    If Back arrow clicked then  
        Redirect to Donor Homepage  
}
```

7.2.5 Register for Upcoming Donation Campaigns

```
Function RegisterForCampaigns() {  
    if User clicks 'Register,' then  
        change the color to green  
    If Back arrow clicked then  
        Redirect to Donor Homepage  
}
```

7.2.6 View Donation Guidelines and Requirements

```
Function ViewDonationGuidelines() {  
    Display guidelines and requirements for donation
```

```
If Back arrow clicked then
  Redirect to Donor Homepage
}
```

7.2.7 Book and Schedule Donation Appointments

```
Function BookAppointment() {
  Enter preferred date and location
  Select donation location
  If User clicks "Booking" then
    If date is full
      Display "this day is full please choose another day"
Else
  Display "booking done successfully"
  If Back arrow clicked then
    Redirect to Donor Homepage
}
```

7.2.8 Live Chat Support

```
Function LiveChatSupport() {
  If User clicks "Start Chat" then
    Open live chat window
    Display welcome message: "Hello,I am siyo, how can i help you today? "
    While chat is active {
      If User clicks "Send" then
        Send message to support team
        Display user message in the chat window
      If Support replies then
        Display support message in the chat window
      If User clicks "End Chat" then
        Close chat window
    }
  If Back arrow clicked then
    Redirect to Donor Homepage
}
```

7.3 Blood Bank Functions

7.3.1 Blood Bank Login

```
FUNCTION BloodBankLogin(){

  Enter the blood bank name and password

  IF "Log In" button is clicked THEN
```

```
    Redirect to Blood Bank Homepage
ELSE
    Display "Incorrect Blood Bank Name or Password. Please try again."

IF "Create Account" button is clicked THEN

    Redirect to Create Account Interface}
```

7.3.2 Create account

```
FUNCTION BloodBankCreateAccount(){

Enter (Blood bank name, Email, Password, Phone number, Address)

IF “Sign up” button is clicked THEN

    Display “Account is created successfully”

    Redirect to Log in Interface

Else

    Display “Invalid Input. Please try again.”}
```

7.3.3 Add new donation

```
FUNCTION AddNewDonation(){

    Enter the Donor’s details (donorID, bloodType, quantity, Date)

IF user clicks “save” THEN

    Display message "Donation added successfully"

ELSE

    Display an Error message "Donor is not eligible"}
```

7.3.4 Update inventory table

```
FUNCTION ManageInventory() {

IF User clicks "Dispatch" THEN

    Redirect the user to a dialog with fields for blood type and quantity.

    If User clicks “Enter” THEN
```

Display" Blood unit successfully dispatched”

ELSE IF User clicks "Expired" THEN

Redirect the user to a dialog with fields for blood type and quantity.

If User clicks “Enter” THEN

Display" Blood unit is successfully marked as expired”

ELSE IF User Clicks "Used" THEN

Redirect the user to a dialog with fields for blood type and quantity.

If User clicks “Enter” THEN

Display Message "Blood unit is successfully marked as used "}

7.3.5 Manage Requests

FUNCTION ManageEmergencyRequest() {

Update the requests by either clicking “Approve” or “Reject” in each request

If User clicks “Save” THEN

Display message " Requests have been saved successfully "}

7.3.6 Manage Campaign

FUNCTION ManageCampaign() {

User search for a campaign by year

If User clicks a campaign from the search result THEN

Redirect User to Campaign Summary interface

If User clicks “done” THEN

Redirect User to Manage Campaign interface

If User clicks “Add Campaign” THEN

Redirect to Add Campaign Interface

Enter details of campaign (Name of campaign, Date, Time, Blood type goal)

If User clicks “Add” THEN

Display Message “The Campaign have been added successfully”

If User clicks “Invite donors” THEN

Display Message “Invitations are sent to the donors!”

7.4 Hospitals Functions

7.4.1 Create blood request function

FUNCTION BloodRequest()

IF bloodType IS SELECTED AND quantity IS SPECIFIED AND urgencyLevel IS SELECTED THEN

Send blood request (bloodType, quantity, urgencyLevel) TO System

Display Success Message DISPLAY message "Blood request submitted successfully REQUEST ID : "

IF quantity IS INVALID THEN DISPLAY error message "MISMATCH DATA TYPE IN QUANTITY."

ELSE

DISPLAY error message "Please complete all fields"

END IF

END FUNCTION

7.4.2 blood request history function

FUNCTION ViewBloodRequestHistory()

IF THERE IS PREVIOUS REQUEST THEN

DISPLAY a summary of all previous requests (Request ID, Request Date, Request Approval)

DISPLAY detailed information for each individual request (e.g., Blood Type, Quantity, Urgency Level, Status)

ELSE

DISPLAY “THERE IS NO BLOOD REQUEST”

IF Back_to_hospital_page Clicked THEN

Redirect to HospitalHomepage()

END FUNCTION

7.4.3 blood request Track function

```
FUNCTION TrackRequest()  
  DISPLAY "Enter Request ID to track"  
  IF RequestID EXISTS IN system THEN  
    DISPLAY visual timeline with stages of the request (Requested, Approved, Processed, Delivered)  
  ELSE  
    DISPLAY error message "PLEASE ENTER VALID REQUEST ID".  
  END IF  
  IF Back_to_hospital_page Clicked THEN  
    Redirect to HospitalHomepage()  
END FUNCTION
```

7.4.4 blood request Update function

```
FUNCTION UpdateBloodRequestForm()  
  IF requestID DOES NOT EXIST IN system THEN  
    DISPLAY error "Invalid Request ID"  
  END IF  
  DISPLAY current request details: Blood Type(s), Quantity, Urgency Level  
  IF quantity CONTAINS non-numeric characters OR quantity IS NOT comma-separated  
properly THEN  
    DISPLAY error "Please enter valid quantity"  
  IF SubmitRequestButtonClicked THEN  
    // Submit and process the updated request  
    DISPLAY message "Request updated and processing"  
  END IF  
  IF DeleteRequestButtonClicked THEN  
Delete the specified request  
    DISPLAY message "Request deleted successfully"  
  IF BackToHospitalPageButtonClicked THEN  
    RedirectToHospitalHomepage()  
END FUNCTION
```

7.4.5 Sign up function

```
FUNCTION CreateHospitalAccount()  
  DISPLAY "Enter Hospital Name"  
  "Enter Hospital Email"  
  "Enter Password"  
  "Retype Password"  
  "Enter Hospital Location"  
  "Agree to Terms and Privacy"  
  IF hospitalName IS EMPTY OR hospitalEmail IS EMPTY OR hospitallocation IS EMPTY THEN  
    DISPLAY error "Please fill in all required fields".  
  ELSE IF hospitalName CONTAINS NUMERIC OR SPECIAL_CHARACTERS THEN
```

```
    DISPLAY error "DATA TYPE MISMATCH IN HOSPITAL NAME".  
IF email IS EMPTY OR NOT IS_VALID_EMAIL_FORMAT(email) THEN  
    DISPLAY error "Please enter a valid email address".  
    IF password IS EMPTY OR LENGTH(password) < 8 THEN  
        DISPLAY error "Password must be at least 8 characters long."  
IF retypedPassword IS EMPTY OR retypedPassword != password THEN  
    DISPLAY error "Passwords do not match."  
IF location IS EMPTY THEN  
    DISPLAY error "Please fill in all required fields".  
IF NOT termsAndPrivacyCheckbox IS TRUE THEN  
    DISPLAY error "Please fill in all required fields".  
IF SignUpButtonClicked THEN  
    CreateHospitalAccountInSystem(hospitalName, email, password, location)  
    DISPLAY message "Hospital account created successfully. You can now log in."  
END IF  
END FUNCTION
```

7.4.5 Log in function

```
Function HospitalLogIn() {  
    Enter Hospital Name and Password  
    WHERE Hospital Name and Password are NOT EMPTY  
        WHERE Hospital Name and Password are CORRECT  
            Redirect to Hospital Homepage  
        Else  
            For reasons of user-friendliness, the following Error message should be displayed:  
            "Please enter a valid hospital name and password."  
        Else  
            For reasons of user-friendliness, the following Error message should be displayed:  
            "Please fill in all the fields."  
    }  
}
```

8. Detailed System Design

The following section will provide an in-depth analysis of the **Save A Beat system's** components and subsystems. It will cover each component's classification, definition, responsibilities, constraints, composition, interactions, processing requirements, resource usage, and outputs. To clarify the relationships between components, sequence diagrams will be included to illustrate information flow and interactions.

8.1 Classification

The following section will highlight each component's classification.

Component	Classification
Common Interface	
Forgot Password	Function
Contact Support	Function
Donor Interface	
Donor	Class
create account	Function
Update Profile	Function
ViewDonationHistory	Function
ViewDonationGuidelines	Function
RegisterForCampaigns	Function
BookAppointment	Function
LiveChatSupport	Function
Blood Bank Interface	
BloodBank	Class
BloodBankLogin	Function
BloodBankCreateAccount	Function
AddNewDonation	Function
ManageInventory	Function
ManageEmergencyRequest	Function
ManageCampaign	Function
Hospital interface	
Hospital	Class
Create Blood Request	Function
View Blood Request History	Function
Track blood Request	Function
Update/Delete blood request	Function
Sign out	Function

Table 10: Save A Beat System Component Classification

8.2 Definition

Component	Definition and Responsibilities
Common Interface	
Forgot Password	A feature that enables users to reset their password by receiving a reset link via their registered email address.
Contact Support	An interface that allows users to send a message directly to the support team for assistance.
Donor Interface	
create account	Enables donors to sign up by entering first name, last name, blood type, phone, email, user ID and password. Inputs are checked; phone numbers must be 10 digits, blood type should be accurate, emails must be in the right format, and passwords must be consistent. If the details provided are authenticated, the account is then developed and carefully saved.

Update Profile	It enables the donors to change their personal details as they wish, this includes; phone contact, blood type, and email contact.
ViewDonationHistory	This function helps the donor to get all of his previous blood donation record in the donor's record book. It shows record of its donations, by date, type of donation, and gain point
ViewDonationGuidelines	The function allows the donors to have some general information about rules and regulatory concerning blood donation. It includes information on the requirements for the organisation to qualify for a donation, how it should prepare for the process and how it can protect itself from risks associated with donation.
RegisterForCampaigns	This function enables the donor to register to the certain blood donation campaigns or drives. It empowers the donor to participate in a campaign and an event, by providing details of the place, time and need.
BookAppointment	This function enables the donor to get an appointment of where, when and how to donate through a blood bank or hospital. It helps to book appointment by displaying available time and appointment confirmation.
LiveChatSupport	This function is as a companion service that offers timely assistance to the donors as they seek clarifications, and raise queries. It provides a chat option whereby the donors receive help in regard to donation process inquiry.
Blood Bank Interface	
BloodBankLogin	The function verifies the blood bank's login credentials. By entering the Blood Banke name and password.
BloodBankCreateAccount	The function registers a new blood bank by collecting its details(Blood bank name,Email,Phone,password,Address).
AddNewDonation	The function Records new blood donations by logging donor details, blood type, quantity, and date of donation. Updates the inventory with the new stock and adjusts inventory levels.
ManageInventory	The function allows blood bank staff view, add, and update blood units in the inventory. Tracks each unit by blood type, expiration date, and current stock level to maintain accurate records.
ManageEmergencyRequest	The function Handles urgent blood requests from hospitals, allowing staff to prioritize and fulfill emergency needs.
ManageCampaign	The function Facilitates the creation of new donation campaigns by defining campaign details, such as name, location, date, and goals. Enables staff to advertise campaigns within the system and attract potential donors.
Hospital	
Create request	This interface enables the hospital to quickly submit request for blood by providing informations like blood type,quantity,urgency level.

Track Request	This interface let the hospital track and monitor the status and progress of their request by providing the request id they want to track then timeline shows the stages of the request
View request history	This interface let the hospital review thier requestd , get more detailed information about each request.
Update/Delete request	This interface let the hospital modify or delete a request by providing the request id and the request information (blood type, quantity, urgency level) .

Table 11: Save A Beat System Component Definition

8.3 Responsibilities

Component	Primary Responsibilities	Roles	Services Provided
Common components			
Forgot password	allow users who have forgotten their password to reset it and regain access to their account	Ensuring that the hospital can continue using the system without unnecessary friction.	Allows users to initiate a password reset process by entering their registered email address .
Contact support	allows users to reach out to the support team for assistance with issues.	Provides users with a form to submit their questions or issues.	ensures that users can quickly resolve problems and get the assistance they need.
Donor Interface			
Create account	Allows donors to register by providing essential details to access the system.	Ensures accurate donor registration for system use.	Enables users to enter and validate details such as name, contact info, blood type, and password.
Update Profile	Allows donors to edit and update their personal details, contact information	Ensures donor information accuracy	Update information , links to donation history ,links to Support and Resources lastly links to sign out
ViewDonationHistory	Displays a list of past blood donations, including dates, donation types, and point	It aids in tracking the donations for the sake of the transparency and motvation	Historical donation record
ViewDonationGuidelines	Updates the donors with the blood donation policies and procedures, donor prerequisites and safety measures.	Informs donors of eligibility and safety	Donation eligibility and preparation
RegisterForCampaigns	allows the donor to register to participate in blood donation campaigns by providing a donors access to campaign information	Engages donors in campaigns and events	Campaign participation

	and qualification criteria.		
BookAppointment	Facilitates booking of donation appointments by showing available slots and confirming the chosen date and time and donation type	Streamlines scheduling for donation	Appointment scheduling
LiveChatSupport	Serves as a means of exhibiting timely responses to the Donor's concerns as well as providing support as regards their questions on blood donating.	Provides immediate support to donors	Immediate assistance and information through live chat
Blood Bank Interface			
Add New Donation	Manages donor profiles, eligibility and donation history	Ensures data security and donor eligibility	Links donors to campaigns and donations
Manage Inventory	Maintains accurate, real-time blood inventory	Ensures safe and efficient blood supply	Adds, updates, and monitors blood units; provides inventory data to requests and alerts
Manage Requests	Processes hospital requests for blood	Fulfills urgent and routine blood requests	Reviews, fulfills, and tracks requests; updates inventory and notifies hospitals
Manage Campaign	Organizes blood donation campaigns and tracks participation	Supports blood collection goals through outreach	Creates and monitors campaigns, Invite donors; sends an invitation.
Hospital interface			
Hospital			
Create Blood Request	Allows users (hospital) to initiate a new blood donation request. Captures key information such as blood type needed, urgency.	Ensures efficient request creation with the required information.	Initiates a request for specific blood type and quantity , and urgency level. Sends the request to blood bank
View Blood Request History	Displays the full details of a particular blood request, including the requestor, urgency,	provides critical insights into past requests, helping with operational efficiency, reporting, auditing,	View details of specific requests (blood type, quantity, urgency,

	required blood type, quantity, and status	and forecasting future needs.	View request history and status
Track blood Request	llows users to track the status of a blood request in real-time. Provides updates on progress,	ensures that hospital staff, blood bank can stay informed and manage the request efficiently.	Tracks the updates and current status of each request. Displays the estimated time of arrival for the requested blood.
Update/Delete blood request	Allows users to make modifications to an existing blood request (change the blood type, update urgency level, adjust quantity) or cancel the request entirely.	ensure that the system remains current, inventory, resources are allocated efficiently.	Edit or cancel an existing request based on changing circumstances. Ensures request details remain up to date.

Table 12: Save A Beat System Component Responsibility

8.4 Constraints

The constraints will be covered in this section. Each component's constraints, pre- and post-conditions are detailed in the table below.

Component	Constraint	Pre-Condition	Post-Condition
Common interface			
Forgot password	User must provide a valid, registered email address.	The user is on the Forgot Password page and provides an email.	A reset link is sent to the user's registered email address.
Contact support	Message input must not exceed 500 characters.	The user is logged in or on the Contact Support page.	Support request is submitted, and confirmation is displayed.
Donor Interface			
create account	Donor must input valid details (e.g., 10-digit phone number, valid email, matching passwords)	Donor is on the registration page and has the necessary information to register.	Donor account is successfully created and saved in the system.

Update Profile	Donor must input valid information (e.g., valid contact number, email format).	Donor is logged in and navigates to the profile update section.	Donor profile is saved with updated details.
ViewDonationHistory	None	Donor is logged in and selects the option to view donation history	Donation history, if available, is displayed on the screen.
ViewDonationGuidelines	None	Donor is logged in and selects the option to view donation guidelines	Donation guidelines are displayed to the donor
RegisterForCampaigns	Donor must meet eligibility criteria for the campaign.	Donor is logged in and selects a campaign to register for.	Donor is successfully registered for the campaign if eligibility is met
BookAppointment	Appointment slots must be available, and donor must meet donation eligibility criteria.	Donor is logged in and chooses one of the available appointments	Donor appointment is successfully made and the details recorded in the appointment calendar and scheduled message sent to the donor.
LiveChatSupport	Such dedicated lines, or Live support, should have persons available to help or automatic replies.	The donor is logged in and, they start a live chat session.	Donor receives support or information in real-time through the chat interface.
Blood Bank Interface			
Manage Inventory	Only authorized staff can make changes; dialog boxes (for dispatched, expired, used status updates) must be filled with accurate data.	Inventory data is accessible, and blood units requiring updates are identified.	Inventory accurately reflects changes in stock for dispatched, expired, or used blood units.
Add donation	All fields (Blood Type, Quantity, Donor ID, Date of Donation) must be completed. Date format is required to be YYYY-MM-DD.	Staff has selected to add a new donation and has donation details ready for entry.	New donation is saved in the system, and inventory updates automatically with new stock.
Manage Requests	Staff must select either approve or reject per request; changes only saved once confirmed.	A list of blood requests from hospitals is ready for review.	Requests are marked approved or rejected, and request status is saved in the system.
Add Campaign	Fields for Campaign Name, Date, Time, and Blood Target are	Staff has selected "Add Campaign" with details	New campaign details are saved, and

	required; date and time must be valid; donor invitations are optional but trigger notifications if selected.	of the new campaign ready for entry.	invitations are sent to donors, if applicable.
Manage Campaign	Search function requires a valid year input; staff must be authorized to create or modify campaigns.	Campaign information is available, and staff is ready to create a new campaign or search existing ones.	Search shows campaigns by year, or a new campaign is successfully created and saved in the system.
Hospital interface			
Create blood request	Hospital must fill in all the fields with the correct data type. (quantity must be numeric value).	The hospital must be logged in. The hospital must provide all the required information.	The system processes the blood request.
View blood request history	None	The hospital must be logged in. The hospital must have made at least one previous blood request to view the tables	The system displays the hospital requests history including both summary and detailed tables.
Track blood request	The hospital must enter a valid request ID (exists and numeric value)	The hospital must be logged in. The hospital must enter a valid request ID	The system shows the request timeline which shows the stages of the request.
Update/Delete blood request	The hospital must enter a valid request ID to change or delete. The quantity must be numeric value.	The hospital must be logged in. The hospital must enter a valid request ID	Changes to the request will be processed. If delete is entered the system will delete the request.
Profile interface	that hospital should enter valid data (correct format, type) in all the fields (Hospital name, email, password)	The hospital must be logged in. Valid Data Format.	the system should store the new values (hospital name, email, password, and location) in the database.

Table 13: Save A Beat System Component Constraints

8.5 Composition

Component	Purpose	Meaning
Common interface		
Forgot password	Allows users to recover their account credentials if they forget their password.	Provides a way for users to reset their password via email or security questions,

		improving user experience and accessibility.
Contact support	Offers users a way to reach out for help or report issues.	Ensures users can get assistance with any issues related to their account, the application, or general inquiries.
Donor Interface		
create account	Let donors sign up by entering their details.	It must guarantee that donors can obtain a valid account to securely access relevant specific systems.
Update Profile	Allows donors to edit and update personal details, contact information.	Ensures that donor information is accurate and up-to-date for communication
ViewDonationHistory	Provides a log of past donations, including dates and type and point	lets the donors to maintain their records of their donations for personal record and to make them want to donate more because of the point.
ViewDonationGuidelines	Lists conditions to donating blood, blood donation safeties measures and how to prepare for the process.	Enlighten blood donors on required procedures to undertake towards blood donation, and the qualification required to be a blood donor.
RegisterForCampaigns	Allows donors to sign up for specific blood donation campaigns and events	Engulfs the donor in campaign activities helps in sustaining the blood supply.
BookAppointment	Enables donors to schedule a blood donation appointment	Helps to coordinate the delivery of donations and it is easy for the donors to make a contribution.
LiveChatSupport	offer direct live help to any of the donors that may have questions or concerns	Avails direct assistance, hence increase in satisfaction and overall interaction of the donors.
Blood Bank Interface		
Add New Donation	Redirects to the "Add New Donation" interface for logging new donations.	Enables accurate recording of donations, ensuring up-to-date inventory records.
Update Inventory	Redirects to the "Update Inventory" interface for managing blood stock levels.	Allows staff to maintain accurate stock information by marking units as dispatched, expired, or used.
Manage Request	Opens the "Manage Request" interface for reviewing, approving, or rejecting blood requests from hospitals.	Facilitates effective handling of blood requests, balancing supply with urgent needs from hospitals.

Manage Campaign	Redirects to the "Manage Campaign" interface for creating and tracking donation campaigns.	Supports campaign organization and management, helping to increase blood supply through donor engagement.
Hospital interface		
Create blood request	Opens blood request form to enable the hospital staff to create quick request	Facilitates the creation of new blood requests for patient needs.
View blood request history	Provides access to the history of blood requests made by the hospital, allowing staff to view an overview and detailed information about these requests.	Helps staff review past requests for better tracking and reference.
Track blood request	Allows tracking of blood requests, enabling staff to monitor the status and details of each request.	Enables staff to follow up on and track the status of each request.
Update/Delete blood request	Enables staff to update or delete blood requests, ensuring accurate and current information is maintained.	Ensures the accuracy of the blood request system by allowing modifications or deletions.
Profile	Provides access to view and manage user profile information, allowing staff to update personal details.	Allows staff to update their account information.

Table 14: Save A Beat System Component Composition

8.5 Uses/Interactions

8.5.1 Blood Bank Interfaces

8.5.1.1 Login Interface

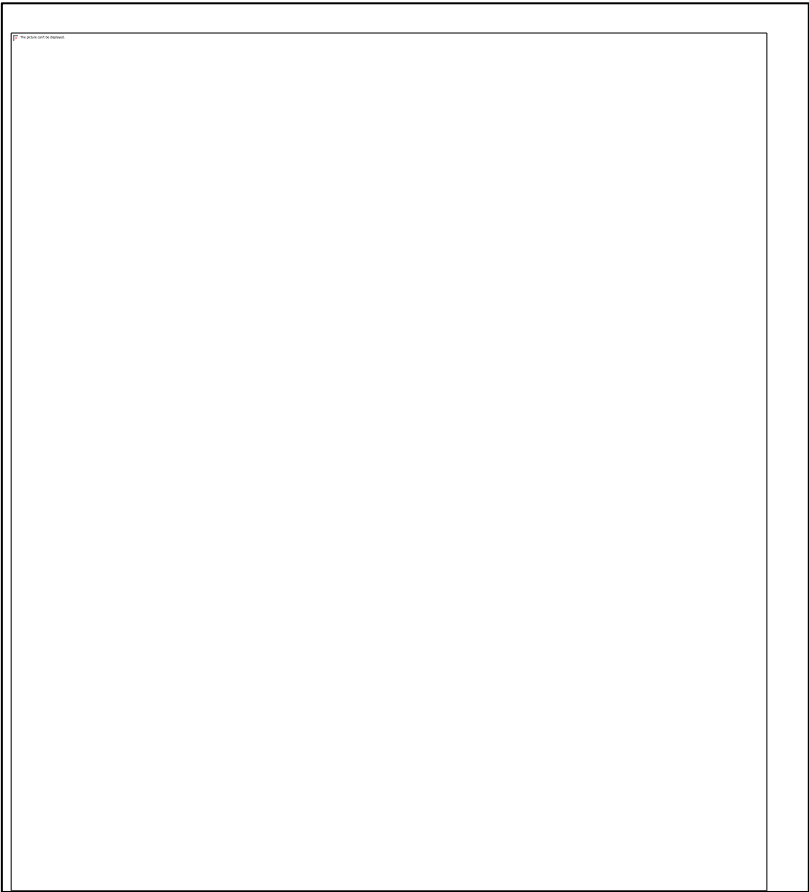


Figure 76Login Interface Sequence Diagram

8.5.1.2 Add Donation Interface

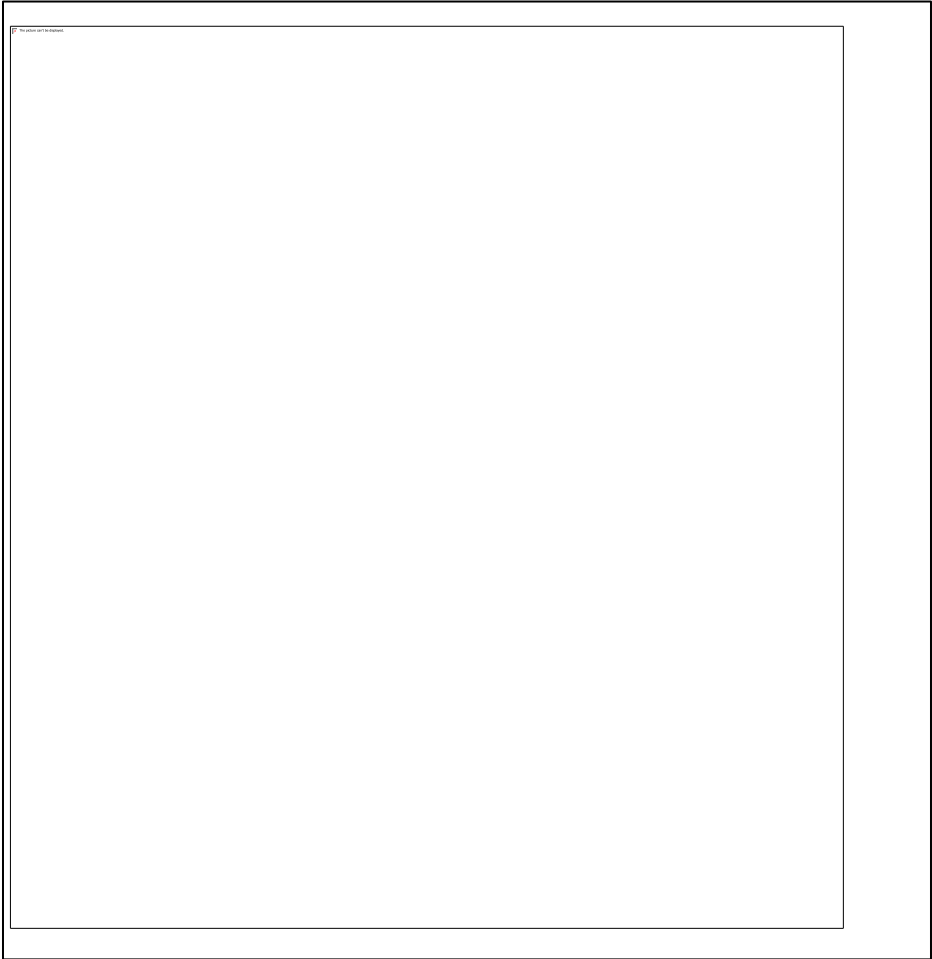


Figure 77dd Donation Interface Sequence Diagram

8.5.1.3 Manage Inventory Interface

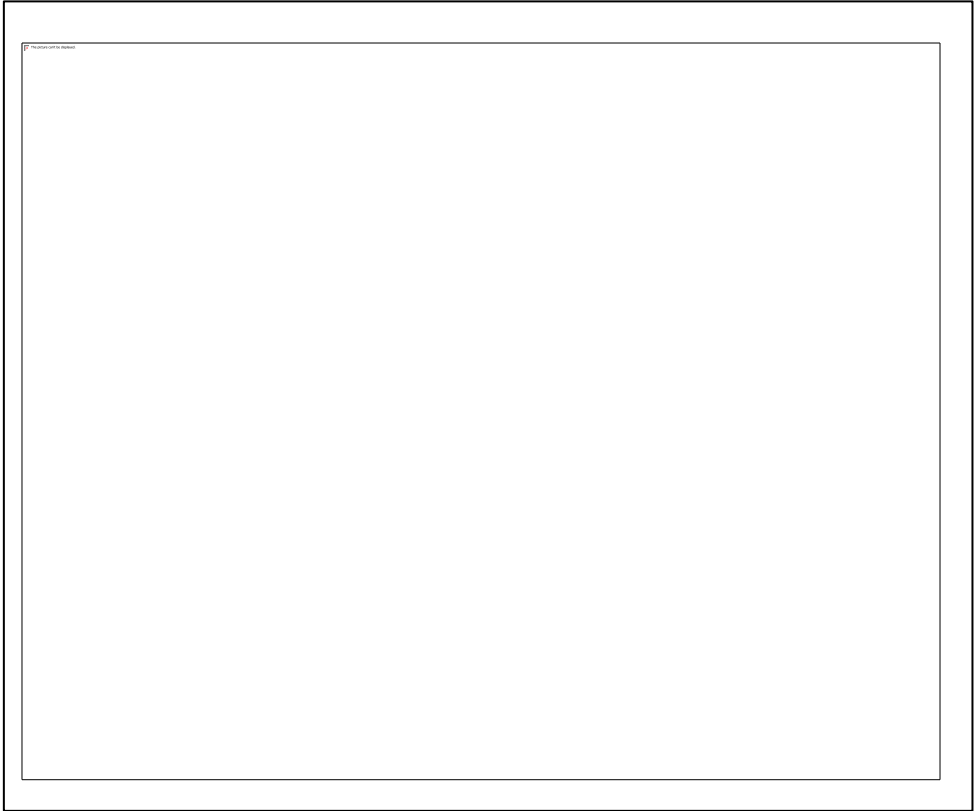


Figure 78Manage Inventory Sequence Diagram

8.5.1.4 Manage Request Interface

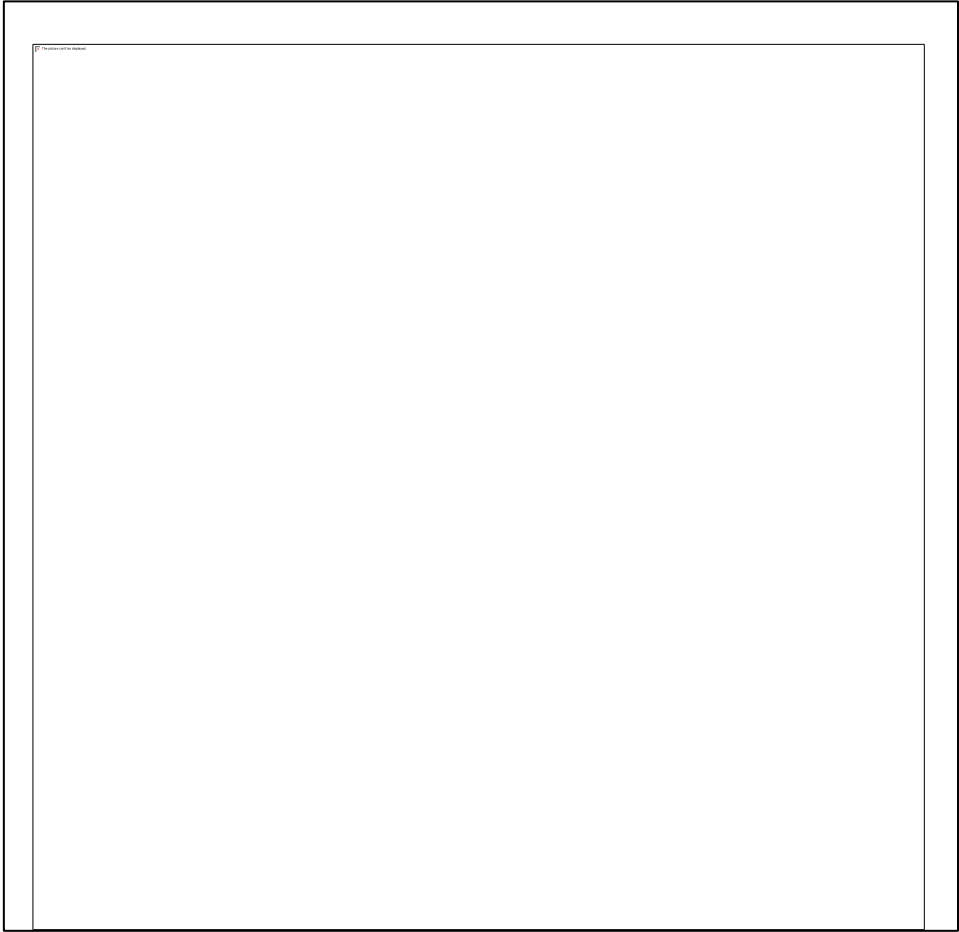


Figure 79Manage Request Sequence Diagram

8.5.1.5 Manage Campaign Interface

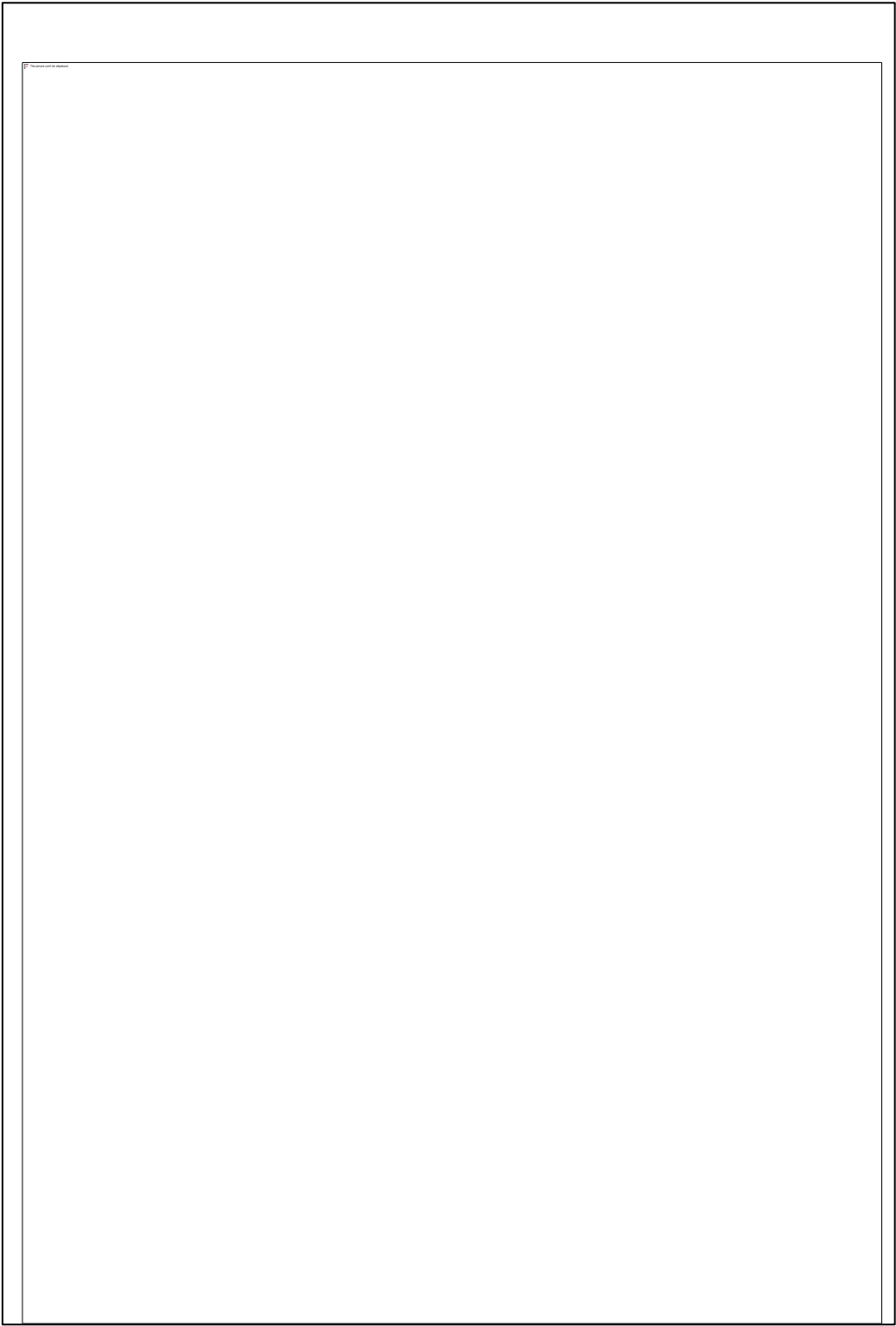


Figure 80Manage Campaign Sequence Diagram

8.6.1 Hospital interfaces

8.6.1.1 Hospital Create request



Figure 81Hospital Create request Sequence Diagram

8.6.1.2 Hospital Blood request history interface

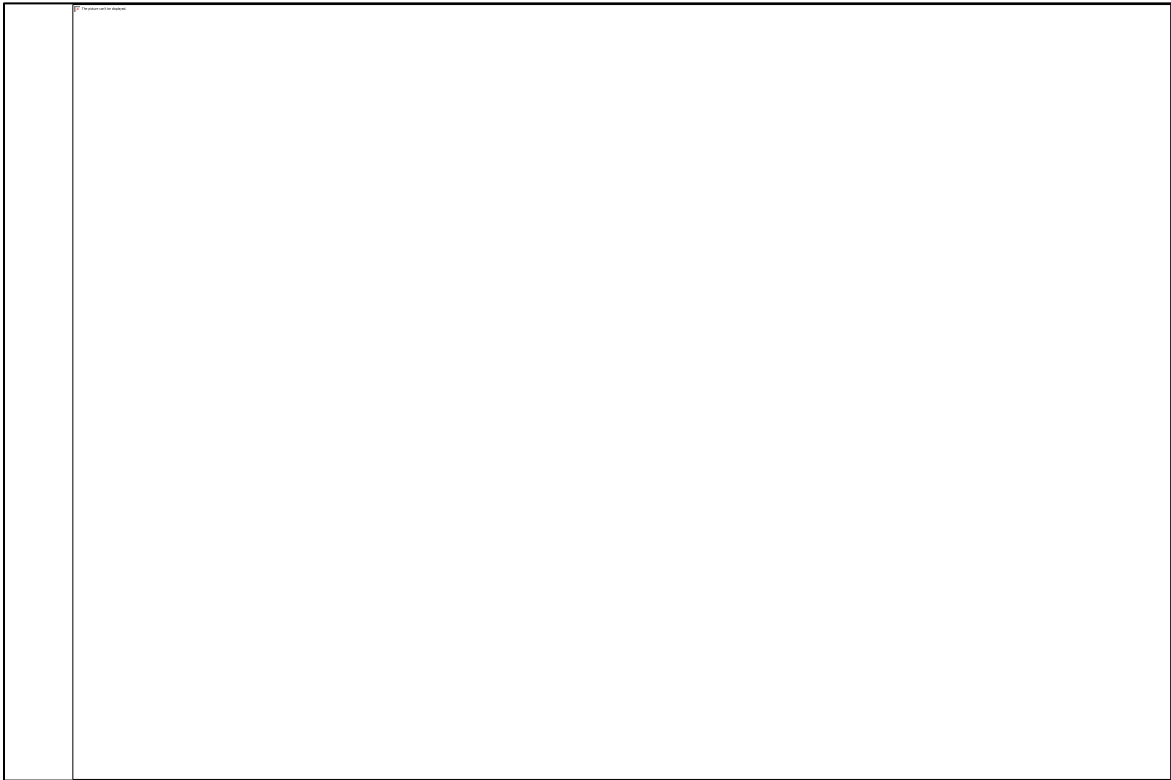


Figure 82Hospital Blood request history Sequence Diagram

8.6.1.3 Hospital Blood request track interface

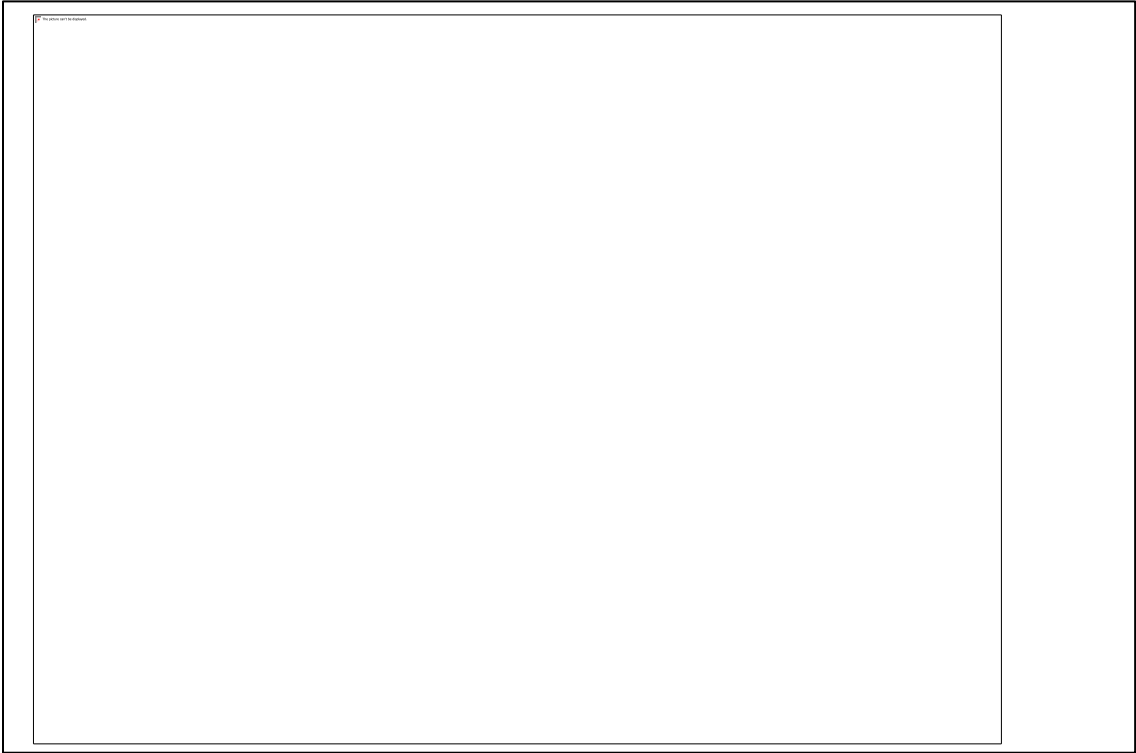


Figure 83Hospital Blood request track Sequence Diagram

8.6.1.4 Hospital Blood request update/Delete interface

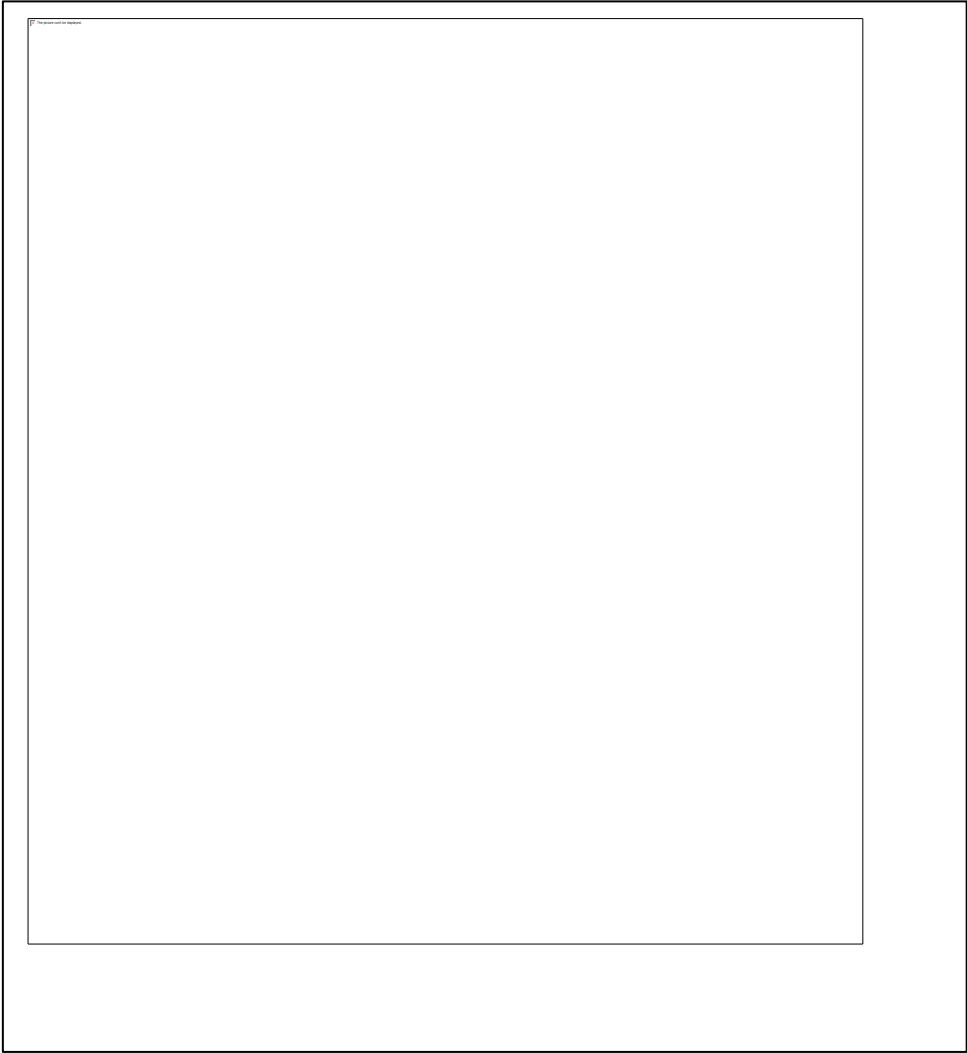


Figure 84Hospital Blood request update/Delete Sequence Diagram

8.6.1.5 Hospital homepage interface

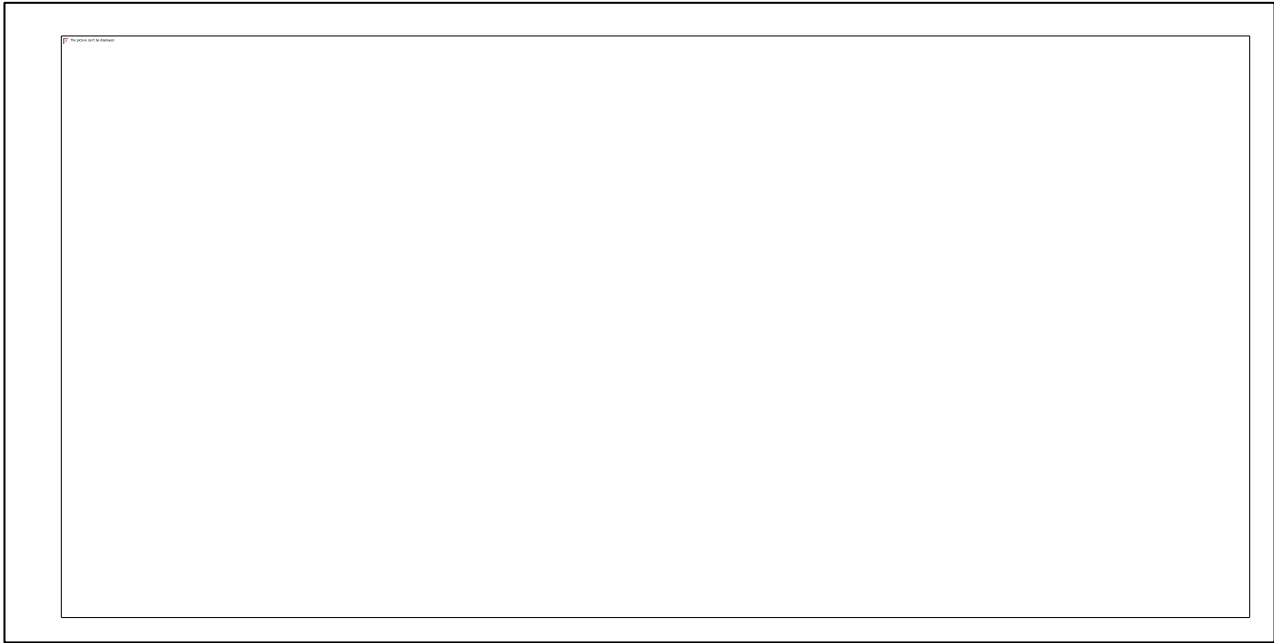


Figure 85Hospital homepage Sequence Diagram

8.6.1.6 Hospital Sign up interface

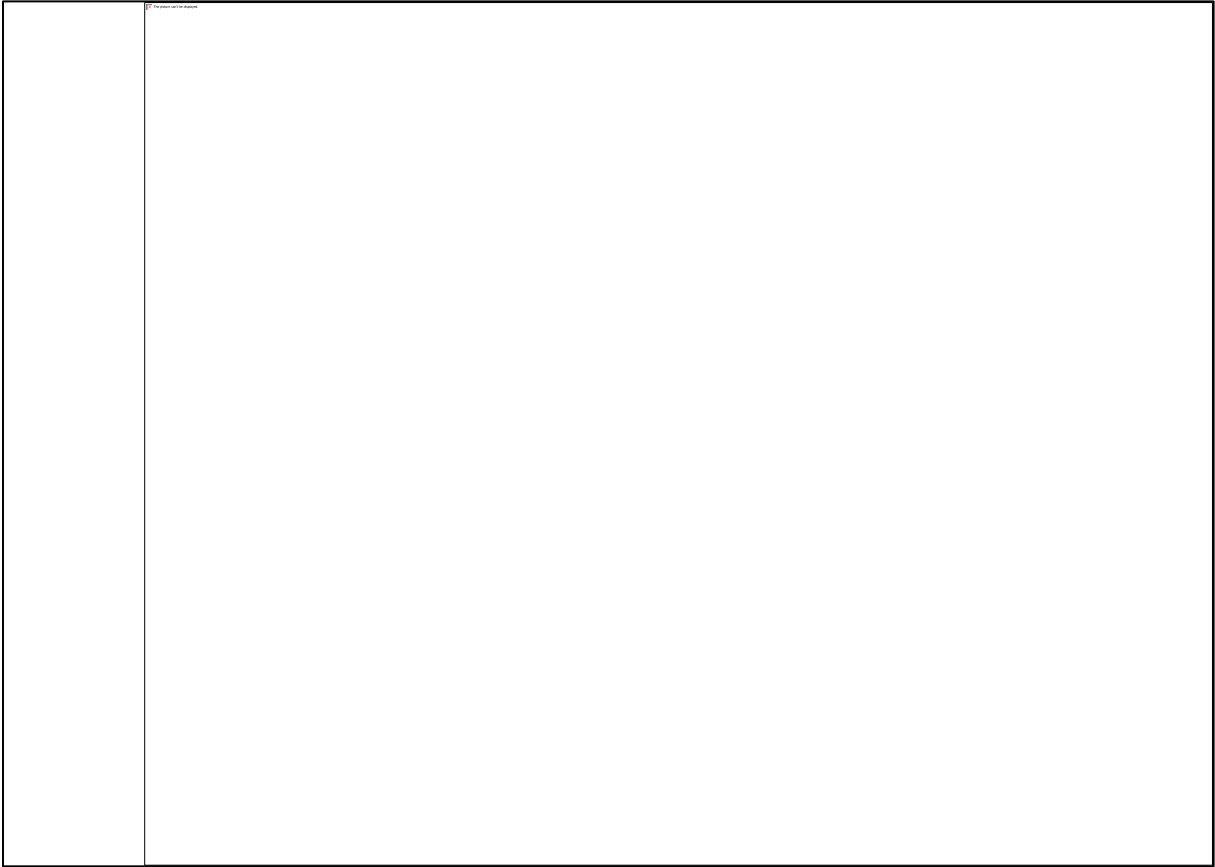


Figure 86Hospital Sign up Sequence Diagram

8.6.1.7 Hospital log in interface



Figure 87 Hospital log in Sequence Diagram

8.6.2 donor interfaces

8.6.2.1 create account

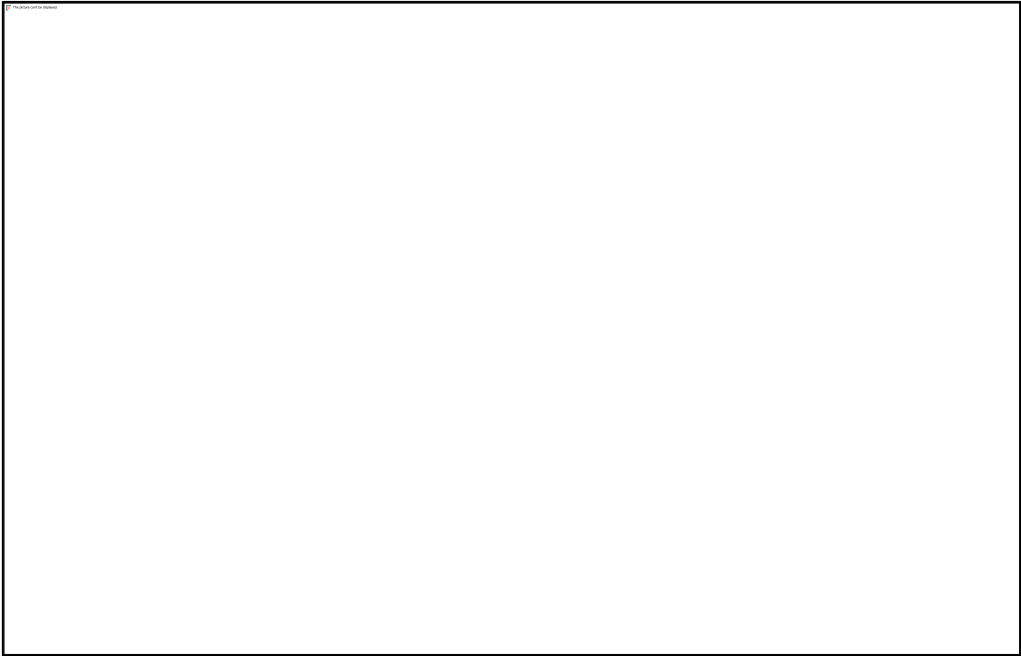


Figure 88create account Sequence Diagram

8.6.2.2 update account information

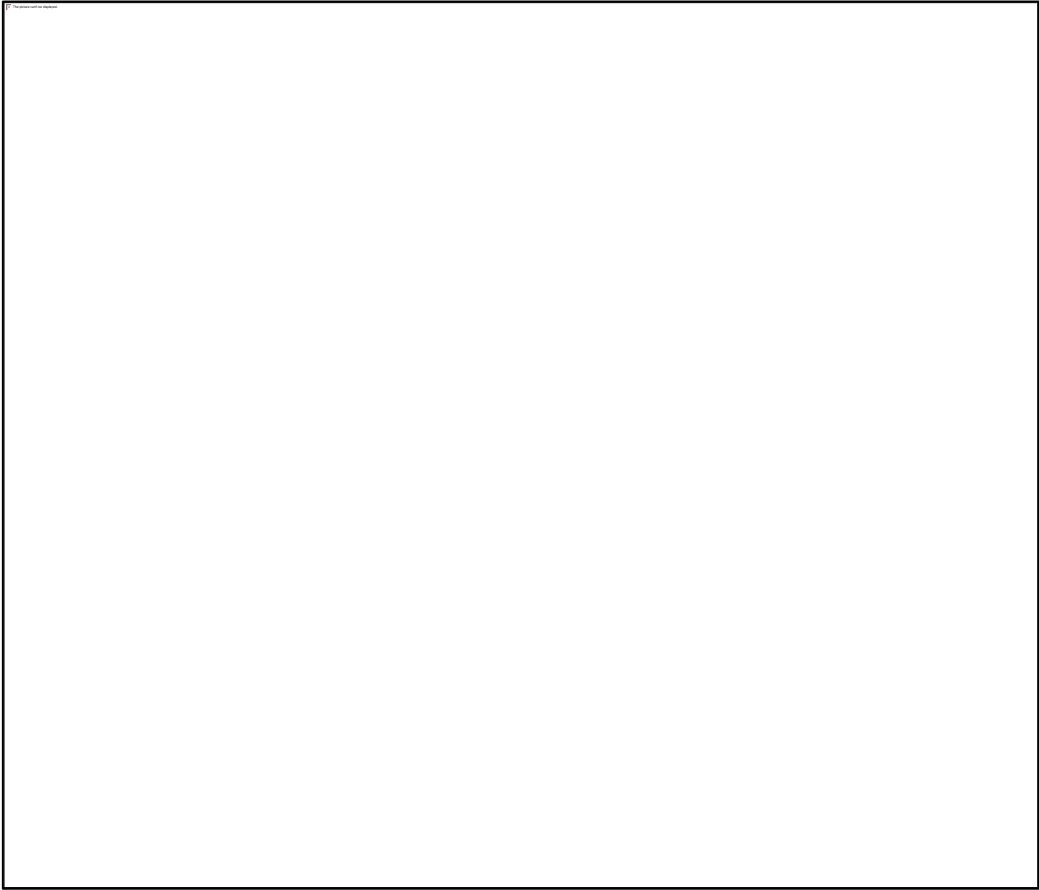


Figure 89update account information Sequence Diagram

8.6.2.3 Donation Booking

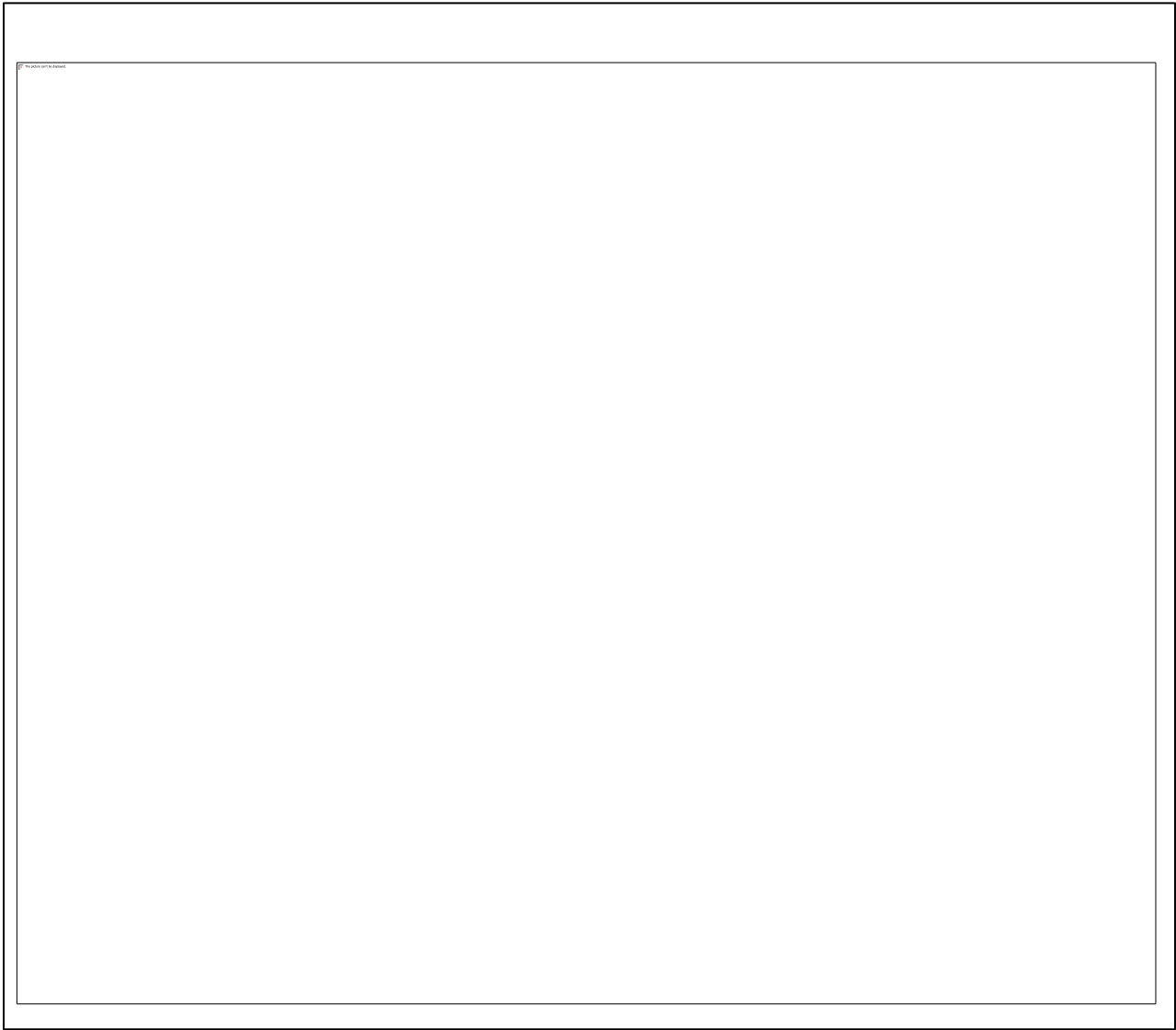


Figure 90 Donation Booking Sequence Diagram

8.6.2.4 Support and Resources

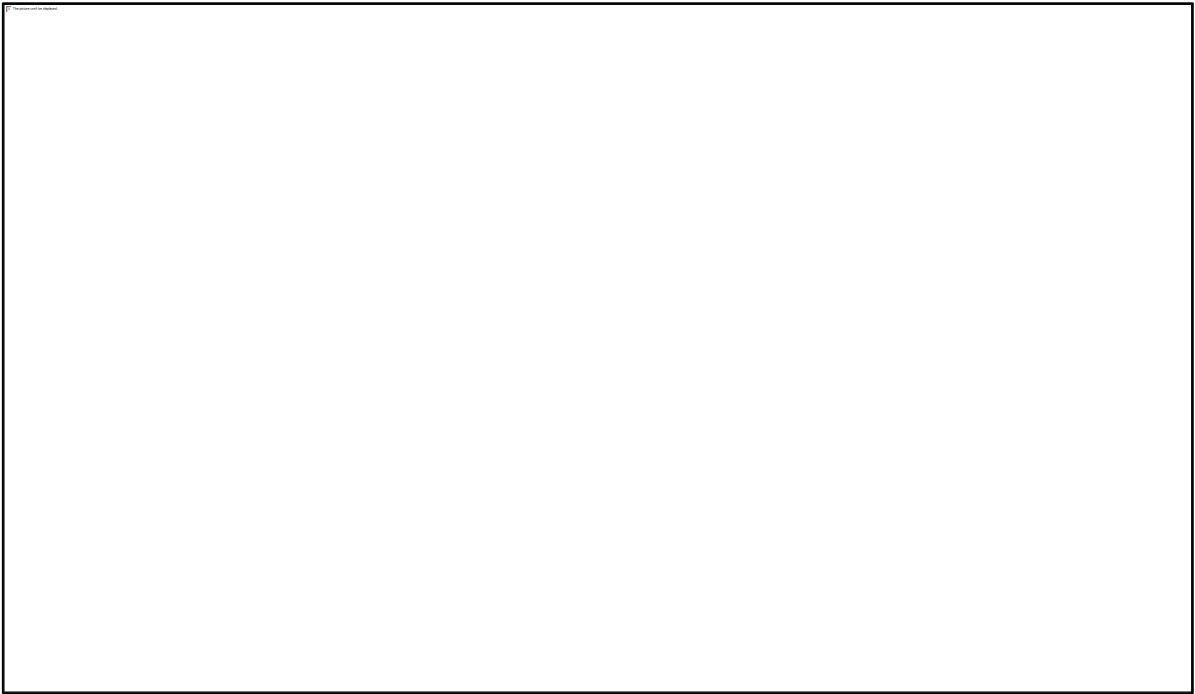


Figure 91Support and Resources Sequence Diagram

8.6.2.5 Live Chat

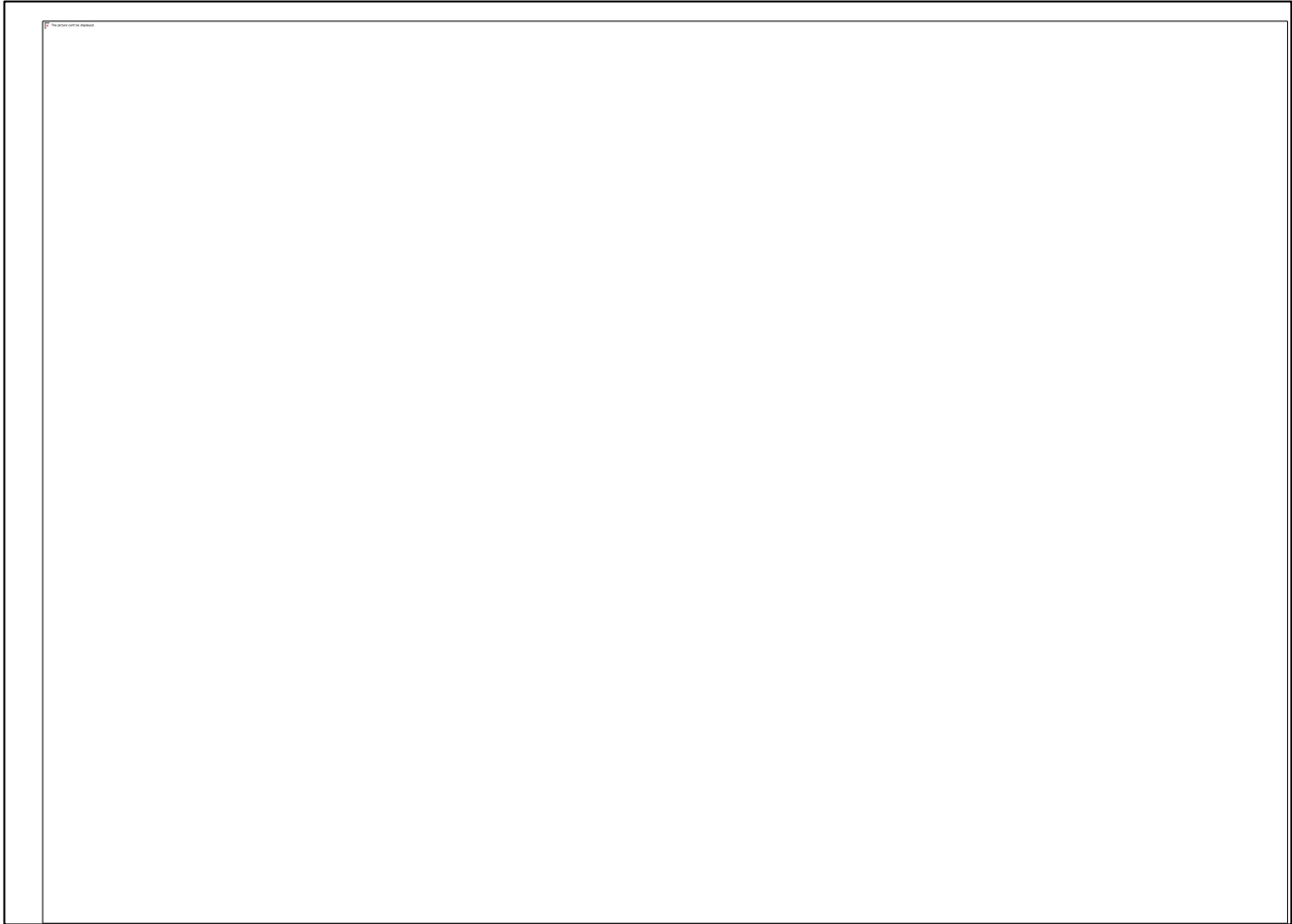


Figure 92Support and Resources Sequence Diagram

8.6.2.6 Where you can find us



Figure 93Support and Resources Sequence Diagram

8.6.2.7 donor log in

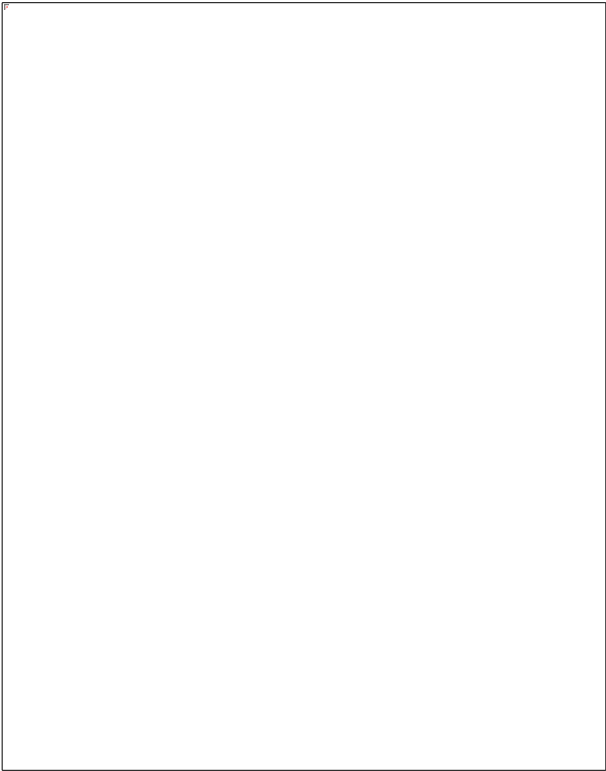


Figure 94donor log in Sequence Diagram

8.6 Resources

Table 15:Save A Beat System's Resource Specification

Type	Resource
Memory Storage	Minimum of 3GB free storage for efficient system operation, including data processing and updates.
Databases	MySQL database for storing user information, donation history, and inventory data.
Operating Systems	iOS 17 or later and Android 14 or later, to leverage advanced security and performance features.
Networking	Supports real-time communication with load balancing for high-traffic scenarios.
Libraries	Includes libraries for maps, notifications, and real-time updates, optimized for low-memory devices

The table below shows possible race condition scenarios in the Save A Beat system as well as the way to address them.

Table 16:save A Beat System's Race Conditions

Race Condition	Solution
Donor cannot view the most recent notifications	Reloading the application would mean the connections are new and therefore eliminates the problem.
Hospital updates a blood request list	To ensure data integrity then the operations which take place in a database are implemented as transactions and use proper locks.

Stated below are potential deadlock situations in the Save A Beat system and suggestions of how to go about the situation.

Table 17:Save A Beat System's Deadlock Situations

Deadlock Situation	Description	Solution
Poor or no Wi-Fi connection	Users cannot view things such as inventory or be notified of changes due to unreliable connectivity.	I Inform users to make a stable connection before moving with the ongoing activity, if it does not meet the required one..
API overload during peak times	Many users are using the system concurrently, which caused the overload on the API and deadlocks appeared.	Apply rate limiting and use load balancer in order to handle the request effectively.

8.7 Processing

A description of every system component with its inputs/output and any abnormal conditions were demonstrated in the 3.2 section of the Requirements Specifications (SRS) document.

8.8 Interface/Exports

The developers of the **Save A Beat** system must take into account several critical factors, including gaining a comprehensive understanding of the system's overall functionality. Additionally, they need to have a thorough knowledge of the individual components within each **Save A Beat** subsystem, such as inputs, outputs, pre-conditions, post-conditions, and constraints. The earlier section 8.1,8.2 and 8.3 emphasizes the importance of categorizing, defining, and specifying the responsibilities of each interface element in the system. Furthermore, sections 8.4 discuss the pre-conditions, post-conditions, and constraints of each system component in detail. Lastly, section 8.6 introduces sequence diagrams to illustrate the flow of information and operations within the system.

8.9 Detailed Subsystem Design

Hospital 8.9.1

8.9.1.1 hospital homepage

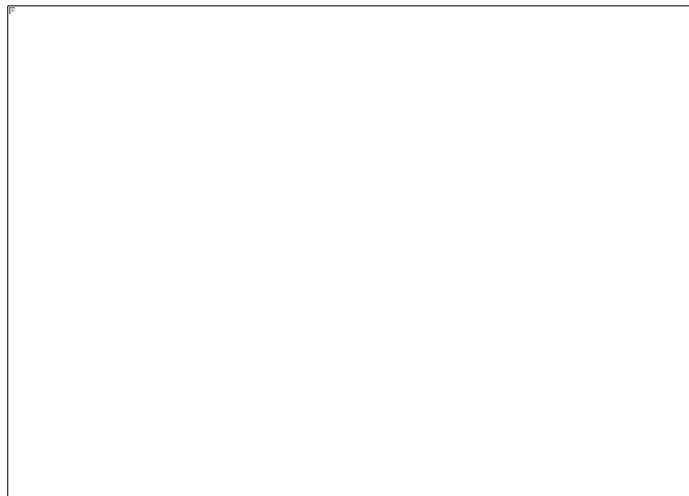


Figure 95hospital homepage flowchart

8.9.1.2 Create request

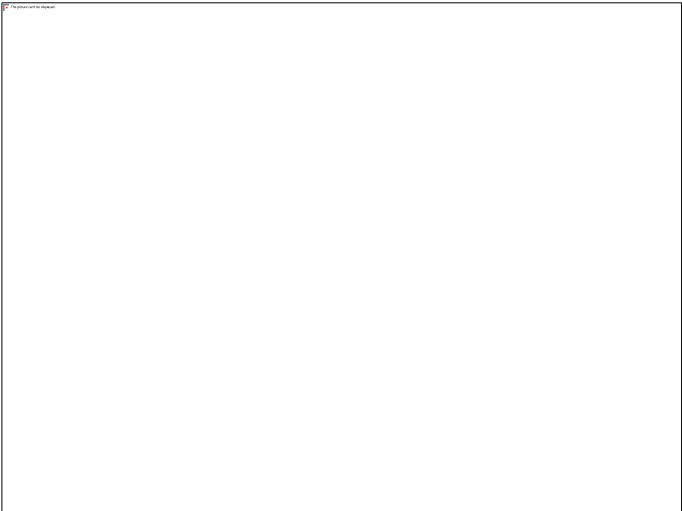


Figure 96 create request flowchart

8.9.1.3 Track request

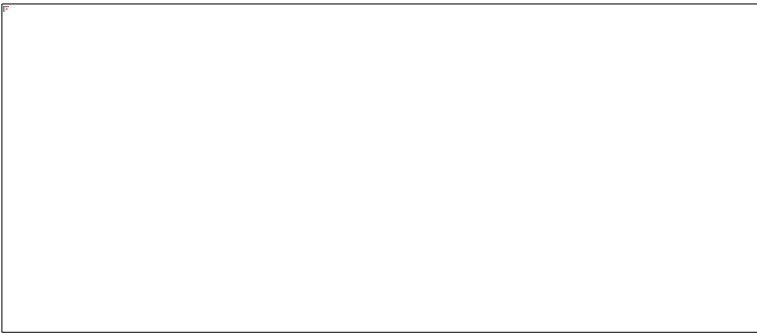


Figure 97 Track request flowchart

8.9.1.4 hospital login



Figure 98 hospital login flowchart

8.9.2 donor

8.9.2.1 donor start

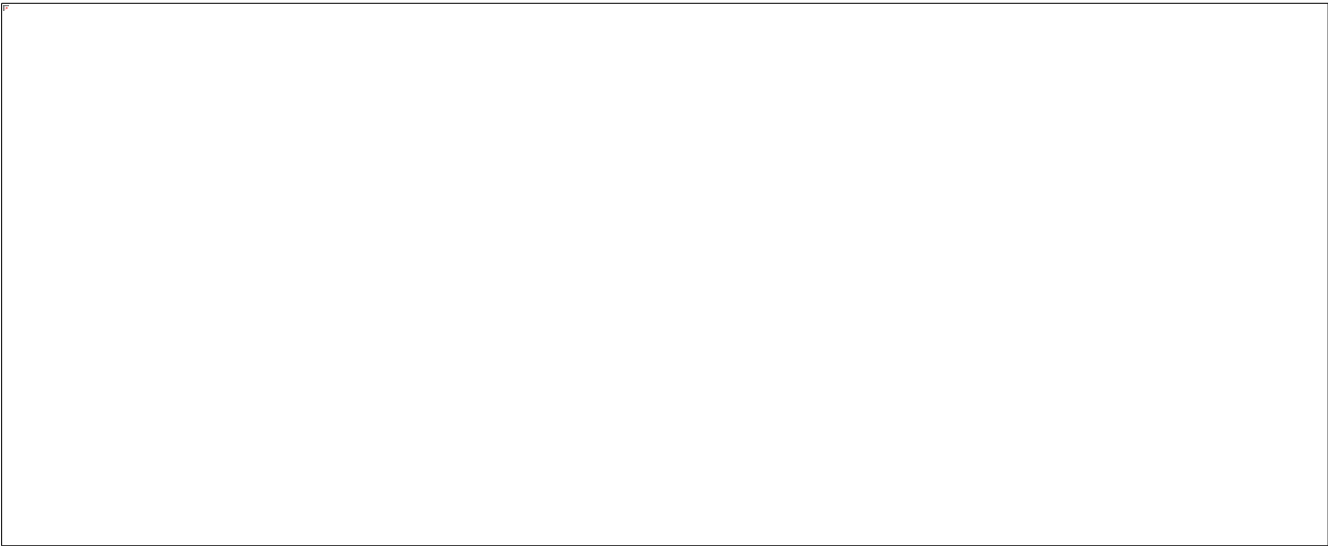


Figure 99donor start flowchart

8.9.2.2 donation booking

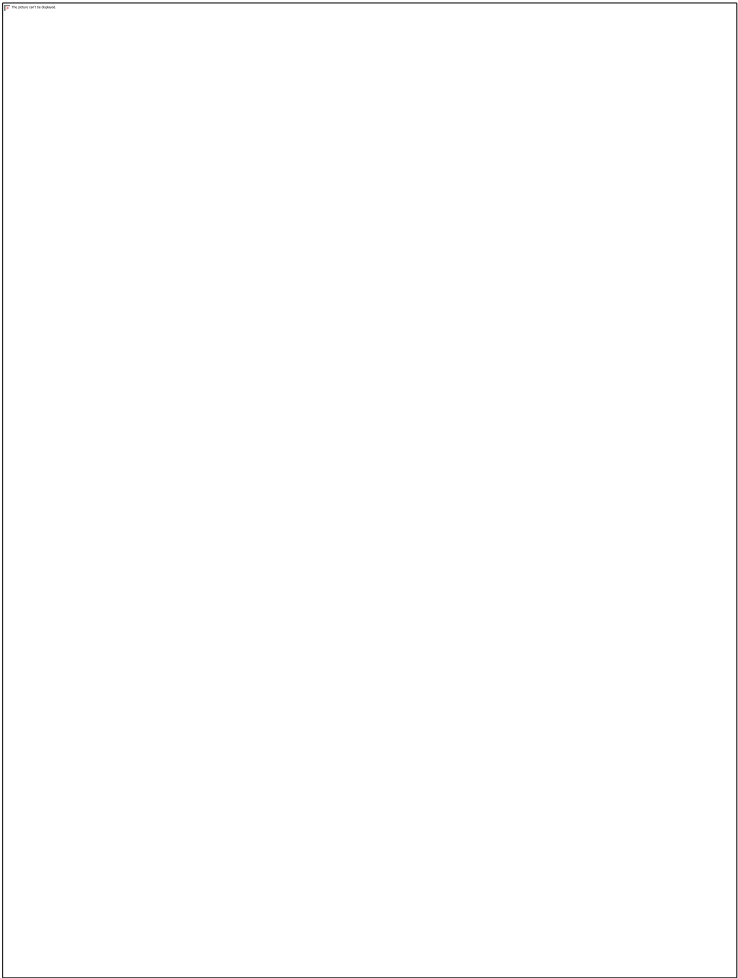


Figure 100 donation booking flowchart

8.9.2.3 donation history

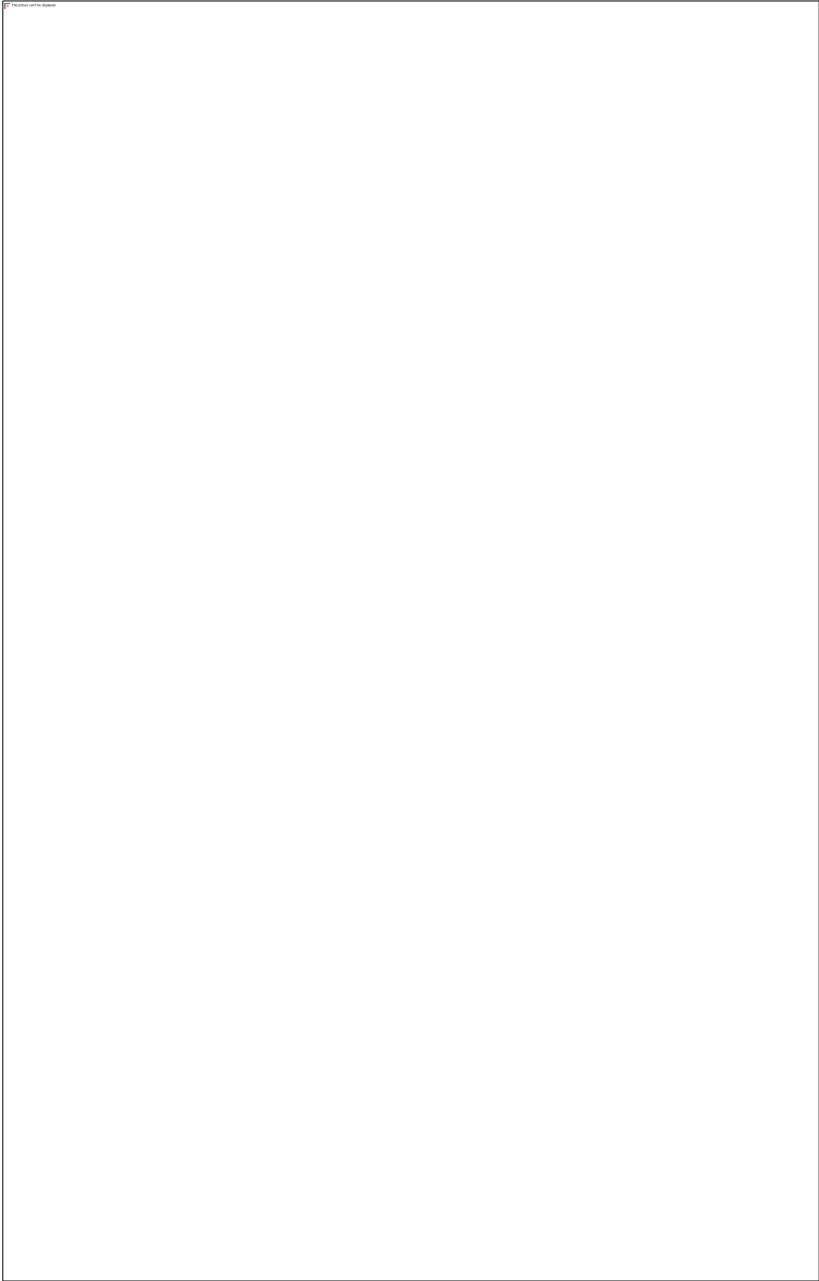


Figure 101donation history flowchart

8.9.3 Blood Bank



Figure 102blood bank flowchart

9. Other Design Features

Donor donation guidelines and FAQ interfaces will help and fascinate donor donation by providing perverse answer to their question

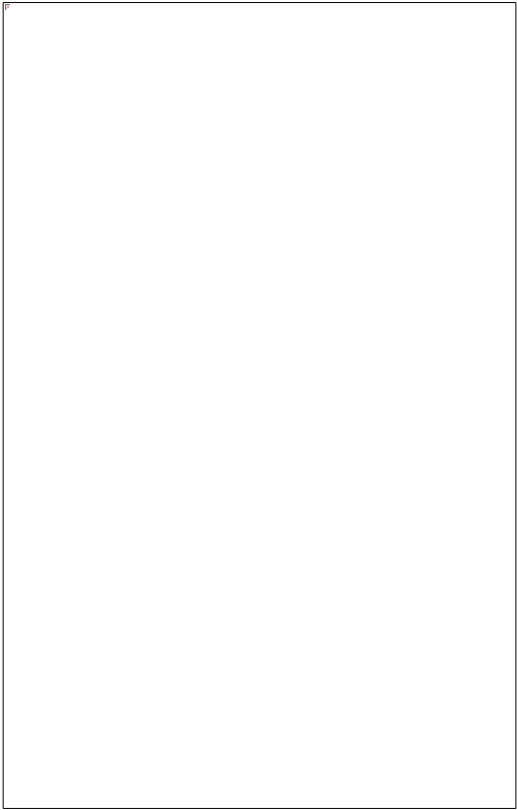


Figure 103 donation guidelines



Figure 104 FAQ

Also, we have notification that remind the donor of the important event

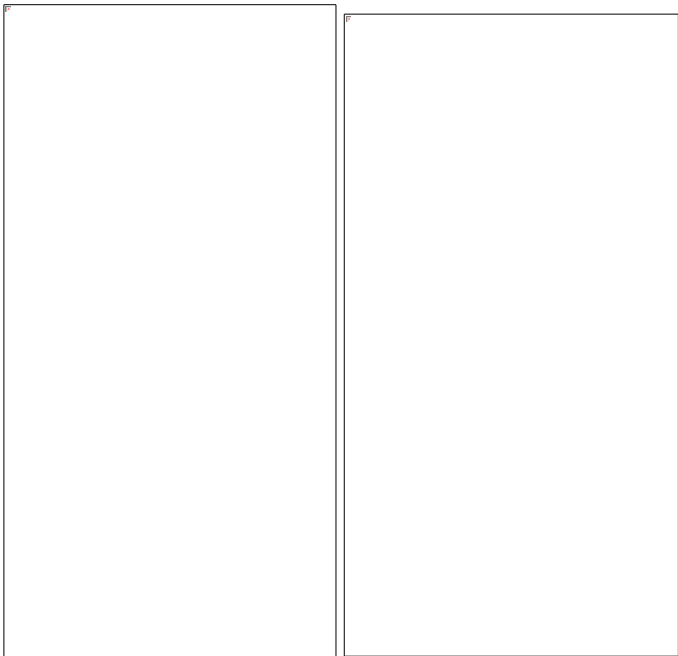


Figure 105 donor notification

10. Requirements Traceability Matrix

Associated ID in SRS		Technical Assumptions and/or Customer needs	Functional Requirements	User	Associated ID in SDS	System Components
Common Functionalities	3.1.1.1 3.1.1.2 3.1.1.3.1	The system must allow users to log in securely using valid credentials.	log in	Donors ,Blood Banks, Hospitals	7.4.5 7.2.2 7.3.1	Log in
	3.2.2.2.1	Staff must be able to record donations accurately in the system.	Enable staff to add new blood donation.	Blood Bank Staff	7.3.3	Add Donation
	3.2.2.2.2	Real-time updates for inventory actions must be supported.	Allow staff to mark blood unit as dispatched, expired or used.	Blood Bank Staff	7.3.4	Update Inventory
Blood Bank functionalities	3.2.2.2.4	Blood requests from hospitals must be processed and tracked efficiently.	Enable staff to manage hospital requests for blood.	Blood Bank Staff	7.3.5	Manage Request
	3.2.2.2.5	Campaigns must be manageable to ensure sufficient blood supply.	Allow staff to add new blood donation campaigns and view campaigns summary.	Blood Bank Staff	7.3.6	Manage Campaigns
	3.2.4.1	Hospitals must be able to create an account securely and provide	The hospital creates an account by providing the necessary data	Hospital staff	7.4.2	Sign up

		necessary data for verification and system registration. The system must validate the provided information to prevent errors or fraudulent entries.				
3.2.4 Hospital functionalities	3.2.4.3	Hospital staff must be able to place a blood request quickly and efficiently by entering relevant details such as blood type, quantity, urgency, and delivery date. The system should validate the data entered to avoid errors. The request should be automatically assigned a unique ID for tracking and referencing	The hospital places a request for blood	Hospital staff Donor's	7.4.1	Create Blood Request
	3.2.4.4	Hospital staff must be able to view the history of previous blood requests, including details	The hospital views the previous requests details		7.4.2	Blood Request History

	3.2.4.5	Hospital staff must be able to track the real-time status of specific blood requests using a unique request ID.	The hospital tracks the progress of a specific request id		7.4.3	Blood Request Tracking
	3.2.4.6	<ul style="list-style-type: none"> Hospital staff must be able to update or delete an existing blood request, if necessary, by entering required information The system must validate the changes to ensure they are within permissible limits 	The hospital can Update/Delete a blood request by entering the required information		7.4.4	Update/Delete Blood Request
	3.1.1.1.2	Users need a secure, simple, and fast registration process with internet access and a valid email or phone number	The system must allow users to register by providing personal information (e.g., name, email, phone number, password) and store it securely in the Donors DB.		7.2.1	Create your account
	3.1.1.1.6	Users need a simple way to book donations quickly, with clear updates, as long as they have internet access and a valid profile.	The system should let donors book a donation slot, check availability, and confirm		7.2.7	Donation Booking

			their booking easily			
Donor's functionalities	3.1.1.1.5	Users need a simple way to update their profile, requiring internet access and secure data handling.	The system should allow donors to update their personal information securely and easily.	Donor's	7.2.3	Profile and health information (update is within it)
	3.1.1.1.3	Users can reset their password whenever they want when forgot it in a secure way.	The system should allow donors to reset their password securely through verification steps.		7.2.2	Forgot password (Reset password is within it)

Table 18: Requirements Traceability Matrix