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Table of Contents

Chapter 1: Introduction of WIMB System.....	5
1.1 Purpose	5
1.2 Definition.....	5
1.3 Overview.....	6
Chapter 2: Inception of WIMB System	7
2.1 Introduction.....	7
2.2 Identifying Stakeholders.....	9
2.3 Our questions to the stakeholders	11
2.4 Recognizing multiple viewpoints	11
2.5 Working towards collaboration	12
2.6 Conclusion	14
Chapter 3: Elicitation of WIMB System.....	15
3.1 Introduction.....	15

3.2 Eliciting Requirements	15
3.3 Collaborative Requirements Gathering.....	15
3.4 Quality Function Deployment	17
3.5 Case Scenario: Where Is My Blood (WIMB)	19
Chapter 4: Scenario Based Model of WIMB System.....	20
4.1 What is use-case diagram?	20
4.2 Use-case diagrams and scenario	21
Level 1 (WIMB)	21
Level 1.1 (Authentication)	23
Level 1.2 (Search).....	27
Level 1.3 (Rating and Comment)	29
Level 1.4 (Update)	31
Level 1.5 (Account Management)	33
4.3 Activity Diagram	35
4.4 Swim lane Diagram	43

Chapter 5: Data Base Model of WIMB System.....	52
5.1 Data Modeling Concept.....	52
5.2 Data Identification and define Attributes	52
5.3 Create data relationship diagram	54
5.4 ER diagram	56
5.5 Table or Schema generation	57
Chapter 6: Class Base Model	59
6.1 Class Based Modeling Concept	59
6.2 Identifying Analysis Classes	59
6.3 Class Diagram	62
5.4 Class Responsibility Collaboration (CRC)	63
Chapter 7: Behavior Model of WIMB System.....	66
7.1 State Diagram.....	67
7.2 sequence Diagram	69
Chapter 8: Conclusion.....	71
Table of Figure.....	73

Reference	74
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Chapter 1: Introduction of WIMB System

This section gives overview of everything included in this SRS document. Also, the purpose for this document is described here.

1.1 Purpose

The document is about the Software Requirement Specification (SRS) for the Where is My Blood (WIMB) System. The purpose of this document is to give a detailed description of the requirements for the WIMB System. This software requirements specification document enlists all necessary requirements that are required for the project development. To derive the requirements we need to have clear and thorough understanding of the products to be developed. This has been prepared after detailed communications with the project team and stakeholders. It includes a set of use cases that describe interactions the users will have with the system. It will also explain the system constraints, interface and interactions between the system and the users.

1.2 Definition

Term	Definition
WIMB	Where is My Blood, the name of the project
Web Interface	The medium via the users use the system
Developer	Works for developing the system both at present and future

1.3 Overview

The remainder of this document includes eight chapters and appendixes. The second and third chapters introduce different types of stakeholders and their interaction with the system. The chapters also provide the requirements specification in detailed terms and a description of the different system interfaces.

The fourth one provides an overview of the system functionality and system interaction with other systems based on the scenario of WIMB.

The fifth and sixth chapters show the interaction of data within the system using various functionalities. Different specification techniques are used in order to specify the requirements more precisely for different audiences.

The seventh chapter describes the behavior of the software.

The eighth chapter shows web-based requirements of the system.

The Appendixes in the end of the document include the necessary tools we have needed to develop the SRS of WIMB.

Chapter 2: Inception of WIMB System

2.1 Introduction

Inception is the beginning phase of requirements engineering. This phase helps to get orientation and to make a first draft about the project planning.

The inception phase is not responsible to describe the requirements completely and in detail, to restrict the problem field and also not to develop solutions. It defines how does the Where Is My Blood (WIMB) system get started and what is the scope and nature of the problem to be solved. The goal of the inception phase is to identify concurrence needs and conflict requirements among the stakeholders of the WIMB system. To establish the groundwork we have worked with the following related to the inception phases:

- Planning meeting
- Identifying Stakeholders
- Recognizing multiple viewpoints
- Working towards collaboration factors
- Our questions to the stakeholders

2.2 Planning Meeting

At an early stage in the project, several stakeholders and subject matter experts should be convened to discuss the project and make the product plan. We should choose stakeholders based on the nature and complexity of our WIMB project and its product deliverable. Depending on the size of the project and its complexity, the meeting may take several days or weeks.

2.3 Identifying Stakeholders

Stakeholder refers to any person or group who can affect or is being affected by the system directly or indirectly. Stakeholders include end-users who interact with the system and everyone else in an organization that may be affected by its installation. Stakeholder identification is the process used to identify all stakeholders for a project. It is important to understand that not all stakeholders will have the same influence or effect on a project, nor will they be affected in the same manner. It should be done in a methodical and logical way to ensure that stakeholders are not easily omitted. The following questions help us to identify stakeholders of our WIMB project:

- Who uses the system?
- Who is affected by the outputs of the project?
- Who evaluates/approves system?
- Who maintains the system?
- Who has knowledge (specialist) about the system?
- Whose work will affect my project? (During the project and also once the project is completed).

On the basis of the above questions on Stakeholders, we identified following stakeholders for our WIMB project:

Blood Donor : The owners blood donor interact with the software and make important decisions about the WIMB system. They are one of the most important stakeholders in our system.

Blood Donne: They are the largest part of our system. They are the most beneficiaries of the output of the project.

Internet Service Provider (ISP): They provide internet service for our system.

Domain Hosting Service Provider: A domain hosting service is a type of internet hosting

service that allows individuals and organizations to make their website accessed via the World Wide Web and provides space on a server as well as providing internet connectivity, typically in a data center.

Developers: We have selected developers as stakeholders because they develop this system and work for further development. If occurs any system interruption, they will find the problem and try to solve it.

2.4 Our questions to the stakeholders

We set our questions for the stakeholders in a way so that they could give their opinions and requirements for the WIMB system. The questions help us to gather requirements and modify them according to the system. Our questions also focus on the measurable benefits and successful implementation of the project.

2.5 Recognizing multiple viewpoints

We have collected the following view points by discussing with owners of various restaurants, regular restaurant going people as well as fast food eaters.

1. Blood Donner's viewpoints:

- Web-Based Interfaces
- Allow the system to be accessed via the Internet
- The system can be accessed from any computer that has Internet connection
- Maintain a database for storing restaurants' and food's information
- Database must be secured
- Take decision in the situation of any changes of the system.

2. Donne's viewpoints:

- Allow the system to be accessed via Internet
- Easy access and user friendly interface
- Allow any user to get information from the system
- Get appropriate or desired results by searching for food or restaurant

2.6 Working towards collaboration

We have asked our stakeholders for their requirements of our WIMB project and found out that each of them has their own requirements. Some of the requirements are common as well as conflicting. So we need to follow the steps given below to merge the requirements:

- ✓ Find out the common and conflicting requirements.
- ✓ Divide the requirements into different categories.
- ✓ Identify the special requirements that the stakeholders have.
- ✓ Identify all the requirements according to the stakeholder's priority points and prioritize them through voting.
- ✓ Take final decision about the requirements.

Common requirements

By asking questions to the stakeholders we have found out some common requirements that are given below:

- ✓ The total system should be web based.
- ✓ Users should be able to access for searching blood and doner from any computer or mobile that has internet access.
- ✓ It should have user friendly interface.
- ✓ A specific website for information related to doner and blood.
- ✓ A database containing all necessary information about doner and blood.

Conflicting requirements

We have found out the following requirements that are conflicting each other:

- ✓ Easy access and strong security.
- ✓ Allow any user to use the system but allow appropriate users to rate and give comments about restaurants.
- ✓ Registration system is allowed in the WIMB system.

Final requirements

We have finalized the requirements of different stakeholders for the system by categorizing and prioritizing them:

- ✓ Web based interfaces
- ✓ User friendly interface
- ✓ Allow all users to access the system
- ✓ Allow the valid users to access the system to rate and comment about the restaurants
- ✓ Error free system.
- ✓ Access the system via internet
- ✓ A specific website for information related to WIMB system
- ✓ Anyone can visit and use the website but only the valid user will be able to login into the system.
- ✓ A database containing all necessary information about doner and blood items.
- ✓ Doners locations and blood group are displayed according to search by users.

2.7 Conclusion

Inception phase helped us to achieve the concurrence among all stakeholders on the lifecycle objectives for the WIMB project. The inception phase is of significance primarily for new development efforts, in which there are significant requirements risks which must be addressed before the project can proceed.

Chapter 3: Elicitation of WIMB System

3.1 Introduction

Elicitation is a task that helps the customer to define what is required. To complete the elicitation step we face many problems like problems of scope, problems of volatility and problems of understanding. However, this is not an easy task. To overcome these problems in this WIMB project, we have worked with the Eliciting requirements activity in an organized and systematic manner.

3.2 Eliciting Requirements

Requirements elicitation combines elements of problem solving, elaboration, negotiation and specification. It requires the cooperation of a group of end-users and developers to elicit requirements. To elicit requirements in the WIMB project, we completed the following three activities:

- Collaborative Requirements Gathering
- Quality Function Deployment
- Usage Scenarios

3.3 Collaborative Requirements Gathering

The goal is to identify the problem, propose elements of the solution, negotiate different approaches, and specify a preliminary set of solution requirements in an atmosphere that is conducive to the accomplishment of the goal. To better understand the flow of events as they occur, we present a brief scenario that outlines the sequence of events that lead up to the requirements gathering meeting, occur during the meeting, and follow the meeting.

There are three problems that are encountered as elicitation occurs.

i) Problems of the scope: The boundary of the problem is well defined.

ii) Problems of the understanding:

- what is needed from the project?
- the capabilities and limitation of the computing environment
- the domain of the problem

The users sometimes have trouble communicating their needs with the system engineers. They specify problems that are sometimes ambiguous and not verifiable.

iii) Problems of the volatility: Requirements change overtime. This is due to dynamic environment. The problem of volatility is an important aspect.

Many different approaches to collaborative requirements gathering have been proposed. Each makes use of a slightly different scenario. We completed following steps to do it.

- We made a meeting with some blood doners to gather requirements for our WIMB project.
- We asked questions about the problems they face while searching.
- Finally we made our final requirements from this collaborations for the WIMB project.

3.4 Quality Function Deployment

Quality function deployment (QFD) is a quality management technique that translates the needs of the users into technical requirements for software. QFD concentrates on maximizing user satisfaction from the software engineering process. According to our WIMB project, the following requirements are identified by QFD.

3.4.1 Normal Requirements

1. Accessible via the Internet
2. User friendly interface
3. Searching by blood group without any account
4. Individual login account
5. Allow any visitor to view the Where is My blood web app
6. Show the location of a doner in a map
7. Provide recent offers and food items with necessary description of different restaurants
8. Give reliable search facility for the users
9. View the top rated doners in a location
10. Users can search blood group by the blood group name, desired location or both.
11. Create easy, user-friendly and attractive web-interface
12. It is needed a registration system
13. Registered users can rate and comment on any doner
14. All the dates and time will be reserved automatically.

3.4.2 Expected Requirements

1. Authentication system
2. The app will be supported in smartphone
3. The system will automatically delete the incomplete profile.
4. The user interface of the system shall be easy to use and shall make use of drop-down boxes, radio buttons, and other selectable fields wherever possible instead of fields that require the user to type in data.

3.4.3 Exciting Requirements

1. Advertisement facility (for future implementation if not possible within this fixed time period)

3.5 Case Scenario: Where Is My Blood (WIMB)

WIMB is a web-based application where users will find necessary information of the blood doner in a place which will help the users in their decision making. Users will find information like the location, contact info as well as availability.

Users can search their wanted blood group from wide range of blood corners enlisted in the site. These blood corners are grouped using there geological location (like, Dhanmondi, Gulshan, Bonani etc.). Users can select their search option like “0+” and the site will show the best place for 0+ around the users’ location. Users will be able to rate any blood doner. They can also comment on doner. The doner with higher ratings will be in the higher position in search result.

The doner will be enlisted in the application. The most exciting feature of the site will be the integration of map in the site. If a user log in, s/he will see the best places for bloods donors around his/her location. It will also show the right path to go to a blood doner.

Chapter 4: Scenario Based Model of WIMB System

4.1 What is use-case diagram?

A use case diagram is a graphic depiction of the interactions among the elements of a system. A use case is a methodology used in system analysis to identify, clarify, and organize system requirements. In this context, the term "system" refers to something being developed or operated, such as a mail-order product sales and service Web site. Use case diagrams are employed in UML (Unified Modeling Language), a standard notation for the modeling of real-world objects and systems. A use-case diagram looks something like a flowchart. A use case diagram contains some components.

- The actors, usually individuals involved with the system defined according to their roles.
- The use-cases, which the specific roles are played by the actors within and around the system.
- The relationships between and among the actors and the use cases.

In WIMB system the use-case diagram represents the whole process and activities done before admission test.

For scenario-based modeling a complete scenario is needed to describe the system (WIMB) in words. Then actors are to be identified from the scenario.

These actors are of two types.

- Primary actor
- Secondary actor

Primary actor: The actors those both produce and consume information of a system.

Secondary actor: The actors those either produce or consume information of a system.

The identified actors of this pre-admission system are:

- Visitor
- Registered User
- Blood
- Admin
- Google API
- Database

4.2 Use-case diagrams and scenario

In this section use-case diagram and scenario are described elaborately.

Each use-case diagram contains its name, level number, primary and secondary actors. The scenario of the first use-case diagram is provided in previous chapter (page 14) as it represents the whole scenario of the pre-admission system.

Level 1 (WIMB)

Use Case Name: Where Is My Food (WIMB)

Goal in context: To build an online application that will help the user to find out the nearby blood doner as well as search information about the restaurant such as blood group, age and will be able to rate and comment about the doner.

Primary Actors: Visitor, Registered User, Blood group, Admin.

Actor (Visitor): Actions and replies have been described in the subsequent levels

Actor (Registered User): Actions and replies have been described in the subsequent levels

Actor (Blood): Actions and replies have been described in the subsequent levels

Actor (Admin): Actions and replies have been described in the subsequent levels.

Secondary Actors: Google API, Temporary Database, Permanent Database.

Actor (Google API): Actions and replies have been described in the

subsequent levels **Actor (Temporary Database):** Actions and replies have been described in the subsequent levels

Actor (Permanent Database): Actions and replies have been described in the subsequent levels

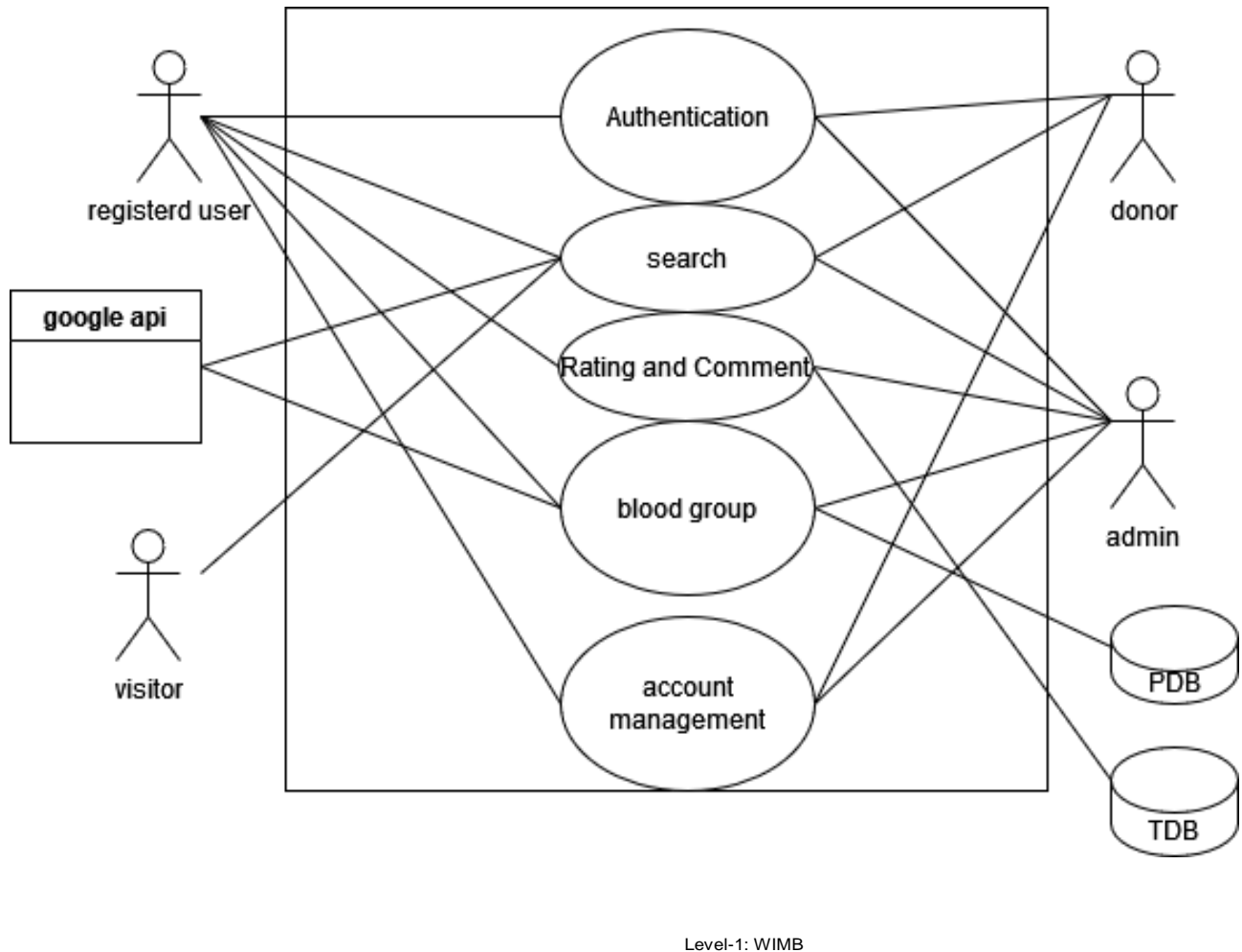


Figure 1: Usecase Diagram for WIMB

Level 1.1 (Authentication)

Use Case Name: Apply

Goal in context: To ensure security.

Actors: Registered User, Restaurant owner, Admin, Permanent Database.

Actor (Registered User, Restaurant owner, Admin):

Action: provide user information
Reply: Accept or reject.

Actor (Permanent Database):

Action: store user information
Reply: Send Notification.

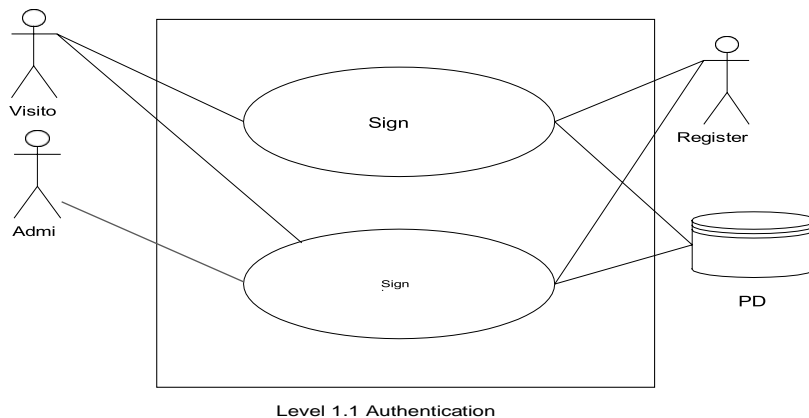


Figure 2: Usecase Diagram for Authentication

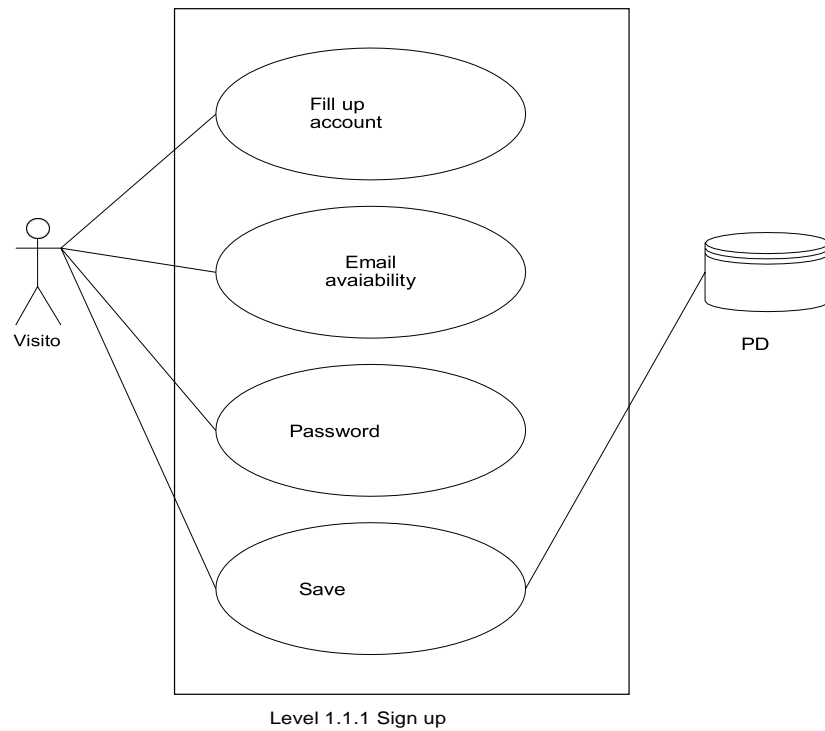
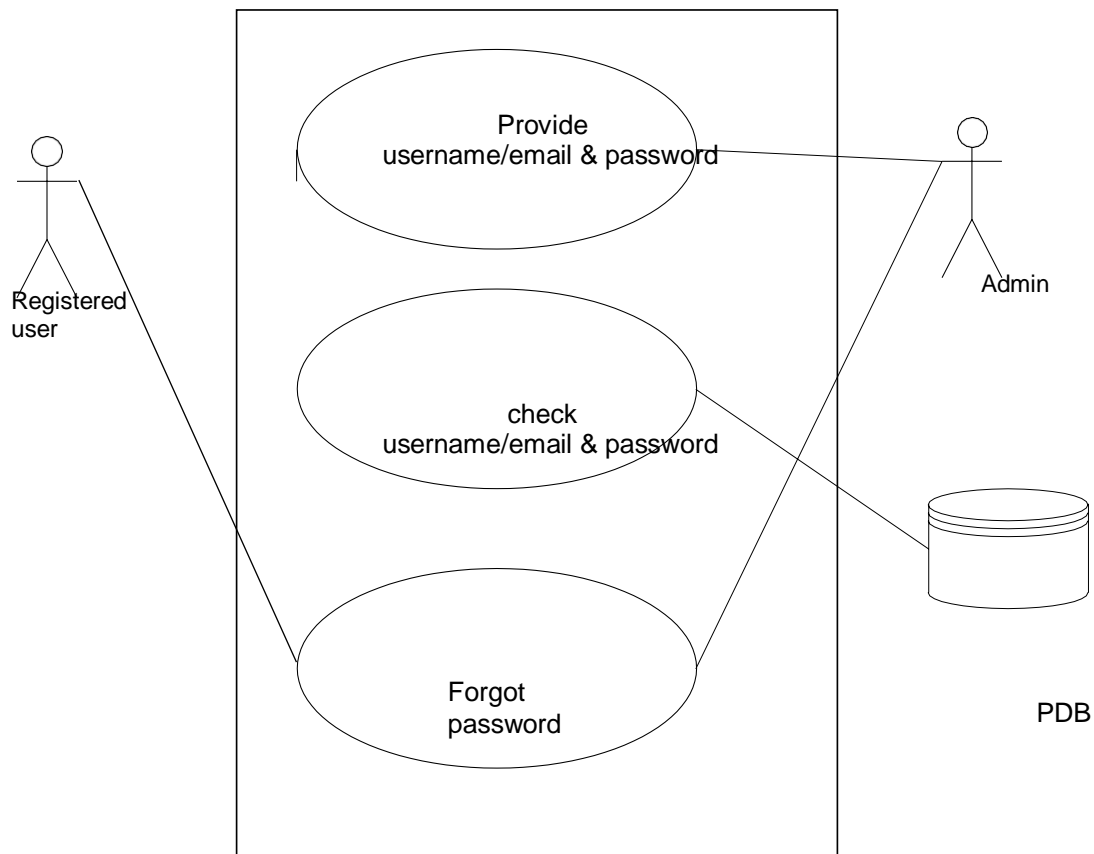
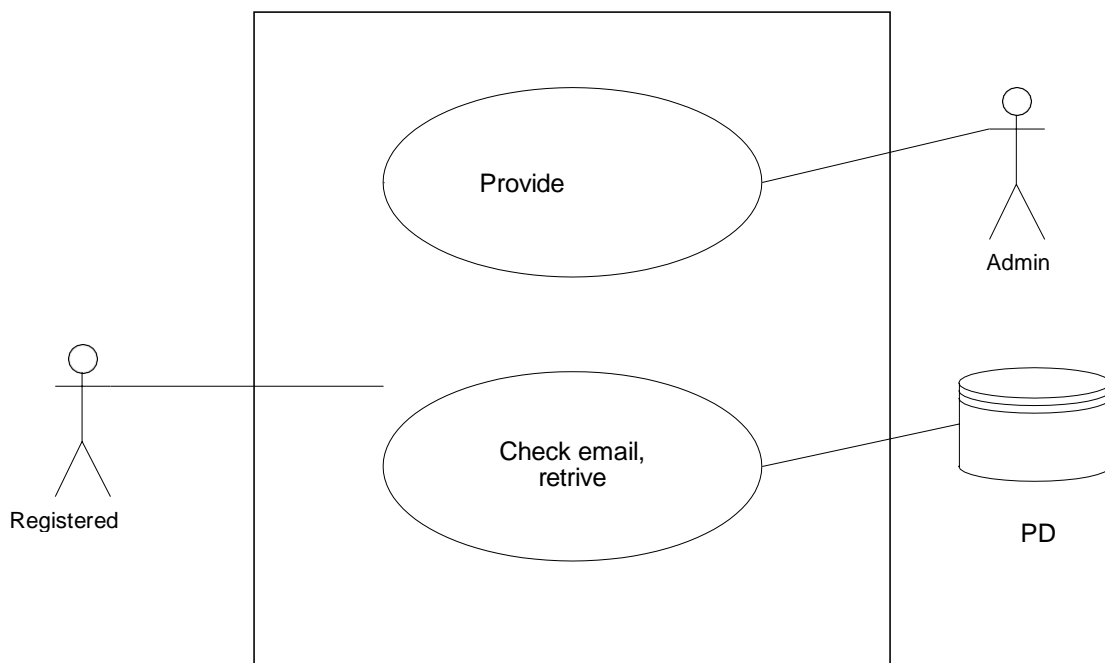


Figure 3: Usecase Diagram for Sign Up



Level 1.1.2 Sign in

Figure 4: Usecase diagram for sign in



Level 1.1.2.1 Forgot password

Figure 5: Usecase Diagram for Forgot Password

Level 1.2 (Search)

Use Case Name: Search

Goal in context: To search information about blood.

Actors: Registered User, Admin, visitor, Google API, Permanent Database.

Actor (Registered User, Admin, Visitor):

Action: search.

Reply: Get search result.

Actor (Permanent Database, Google API):

Action: Retrieve data

Reply: Show search
result.

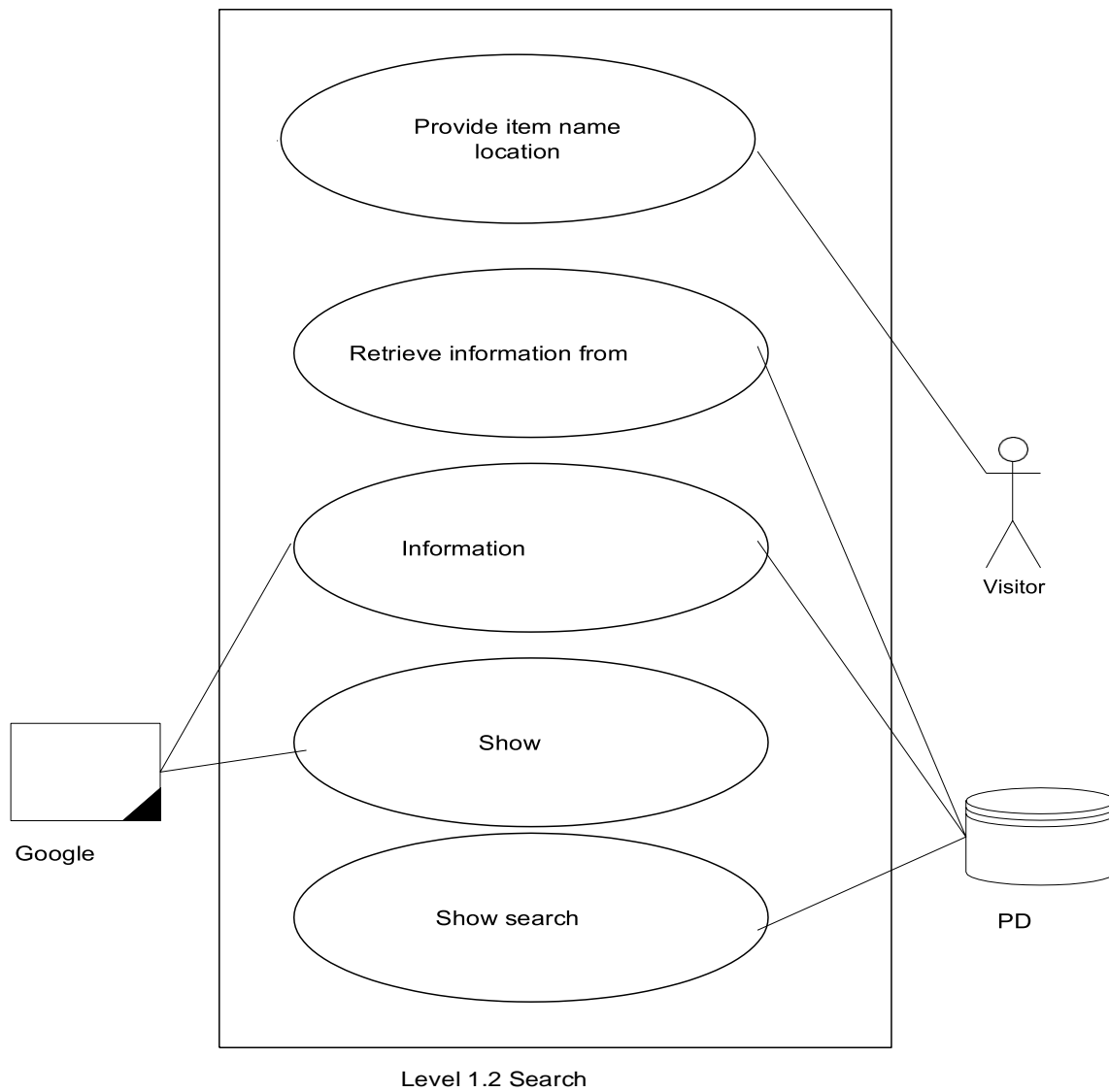


Figure 6: Usecase diagram for

Level 1.3 (Rating and Comment)

Use Case Name: Rating and Comment

Goal in context: To rate and comment on donor.

Actors: Registered User, Admin, Permanent Database, Temporary Database.

Actor (Registered User):

Action: rate and comment.

Reply: Get notification.

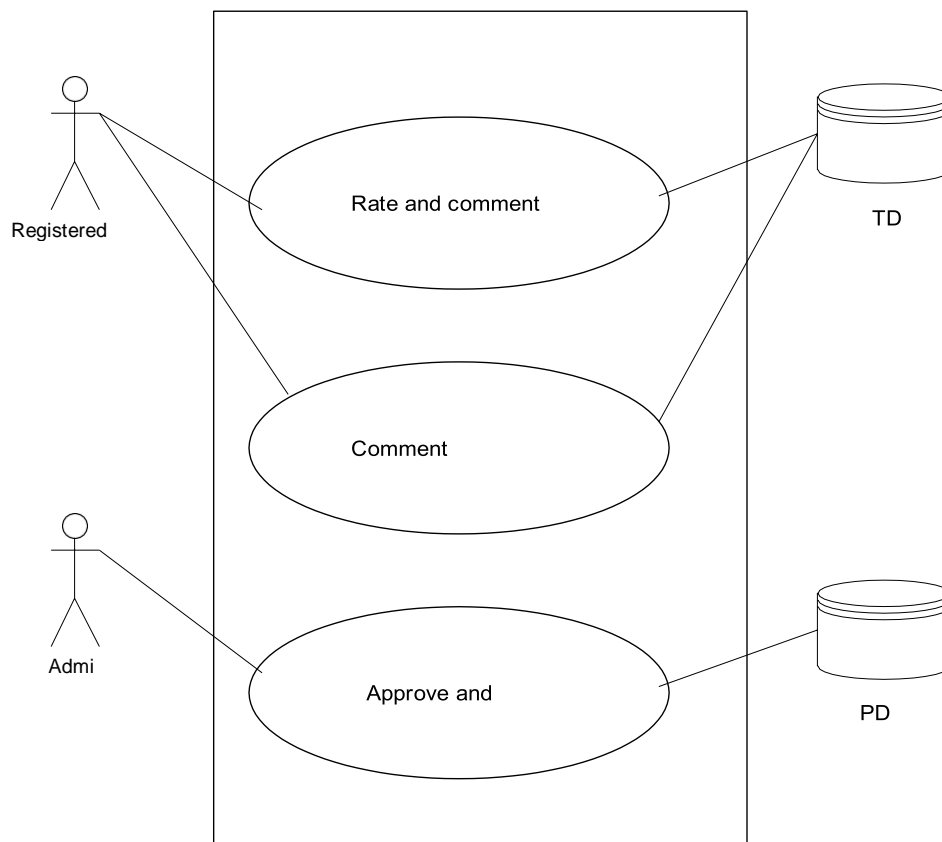
Actor (Permanent Database, Temporary Database):

Action: Store ratings and comment

Reply: Provide information.

Actor (Admin):

Action: Approve and publish. Reply: Get notification.



Level 1.3 Rating and Comment

Figure 7: Usecase diagram for rating and comment

Level 1.4 (Update blood donation date)

Use Case Name: Update blood donation date

Goal in context: To update last blood donation date

Actors: Blood doner , Permanent Database.

Actor (Restaurant Owner):

Action: Update last blood donation date.

Reply: Get notification.

Actor (Permanent Database):

Action: Store or update information

Reply: Provide notification.

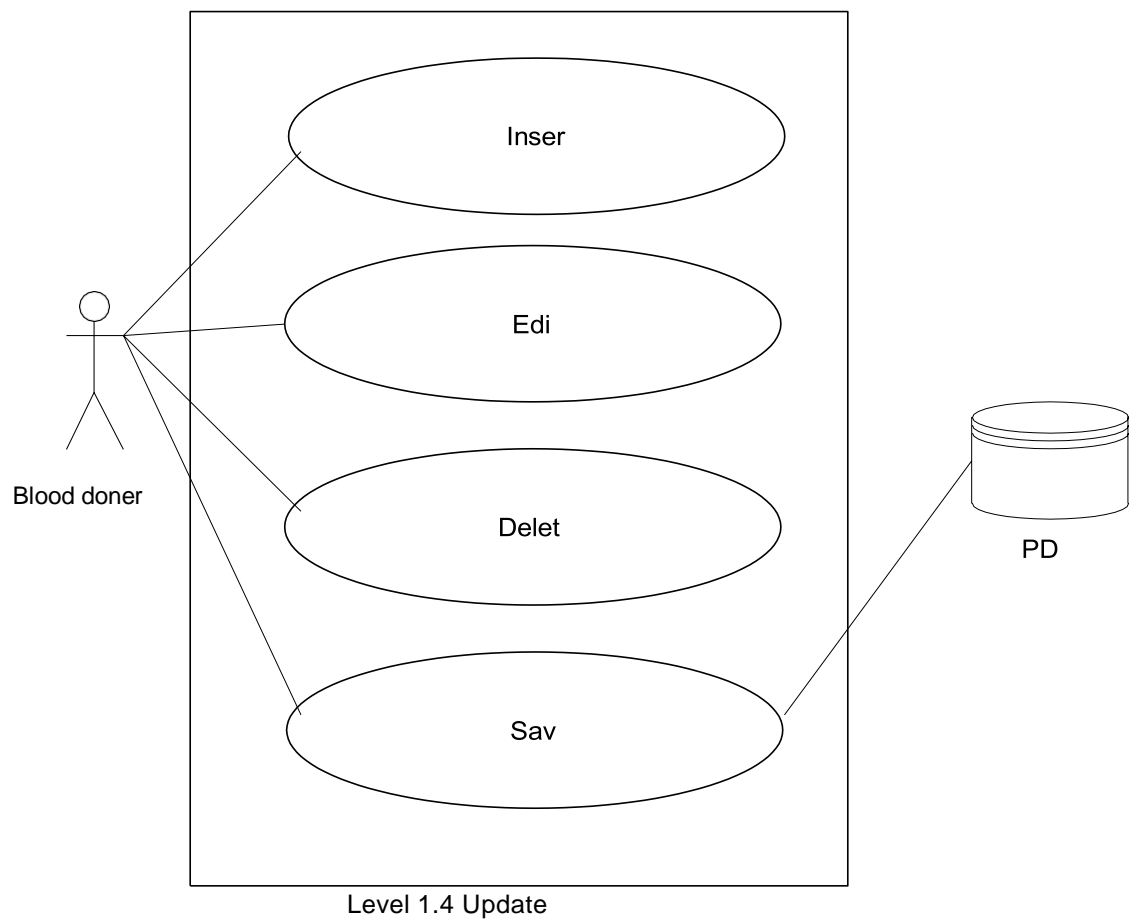


Figure 8: Usecase diagram for update

Level 1.5 (Account Management)

Use Case Name: Account Management

Goal in context: To manage user account.

Actors: Registered User, Admin, Doner, Permanent Database.

Actor (Registered User, Admin, Doner):

Action: Provide user
information. Reply: Get
notification.

Actor (Permanent Database):

Action: Store information
Reply: Provide information and notification.

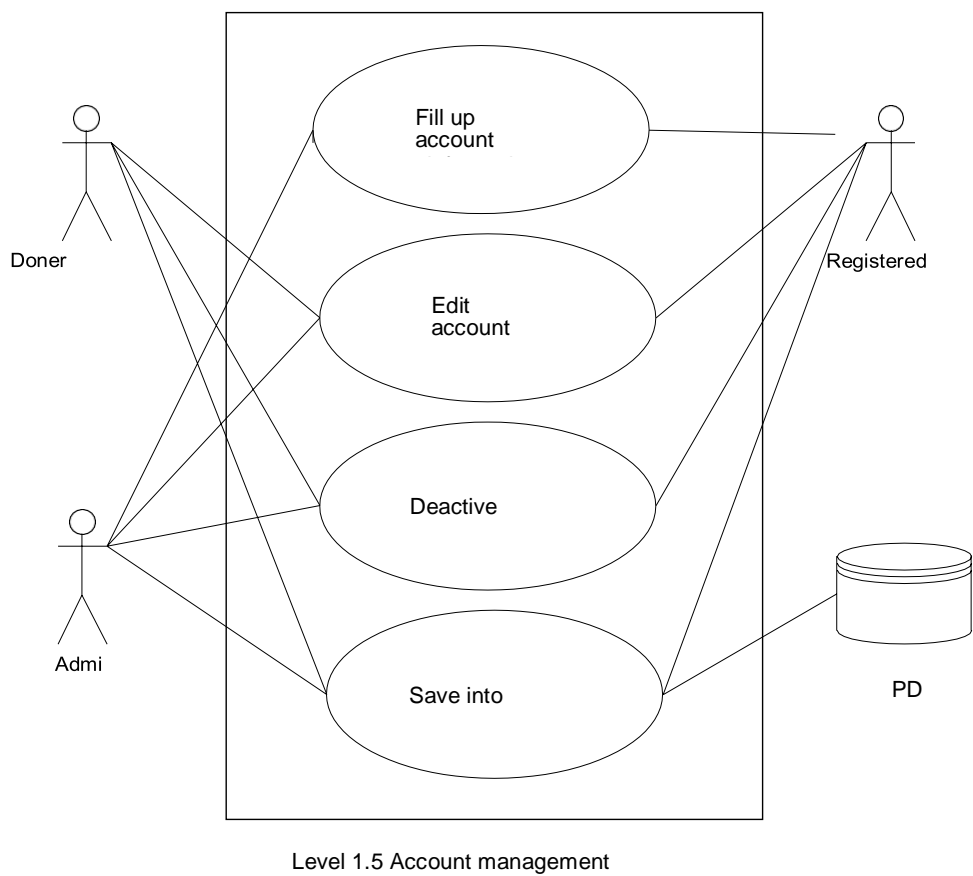


Figure 9: Usecase diagram for account management

4.3 Activity Diagram

Level-1: Activity diagram for WIMB

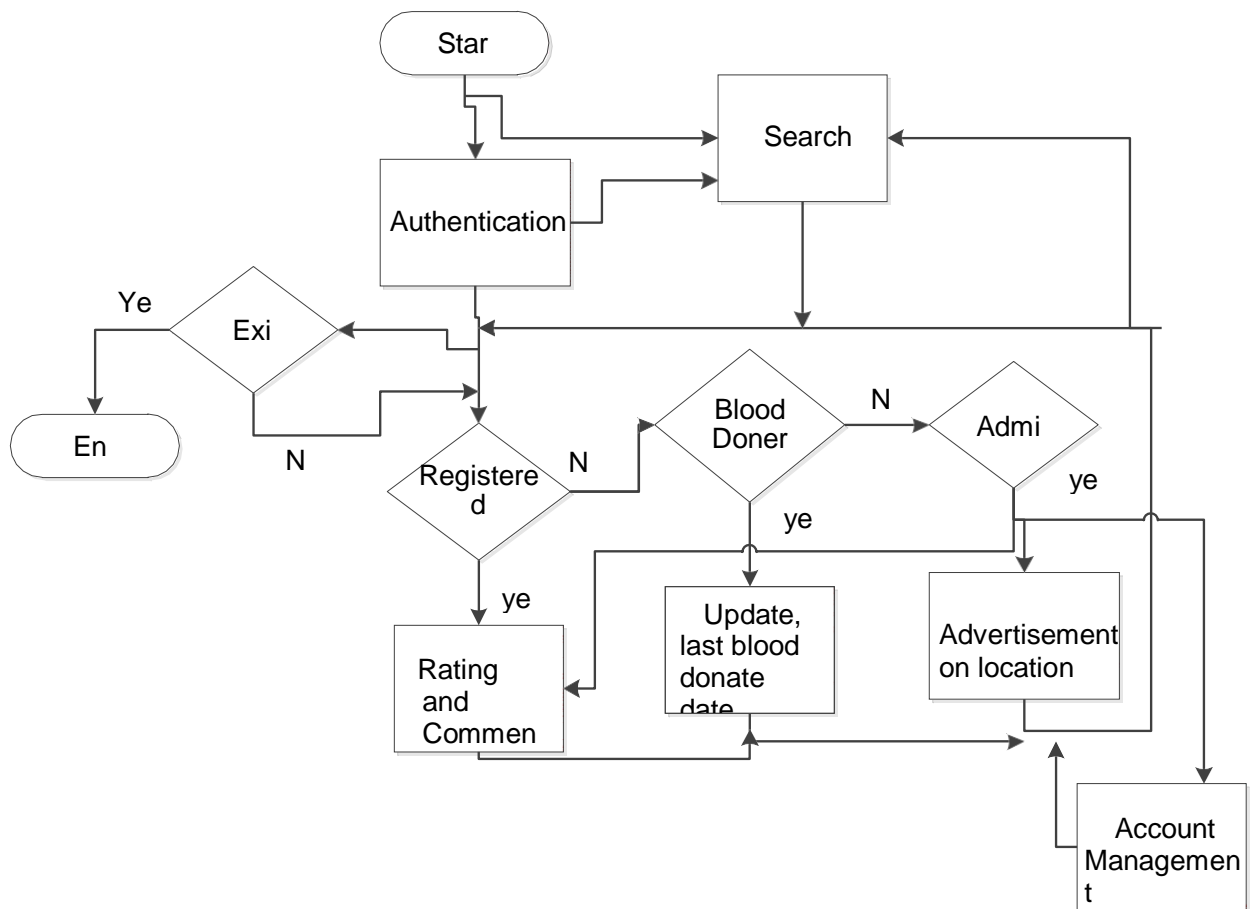


Figure 10: Activity diagram for WIMB

Level-1.2: Activity Diagram for search

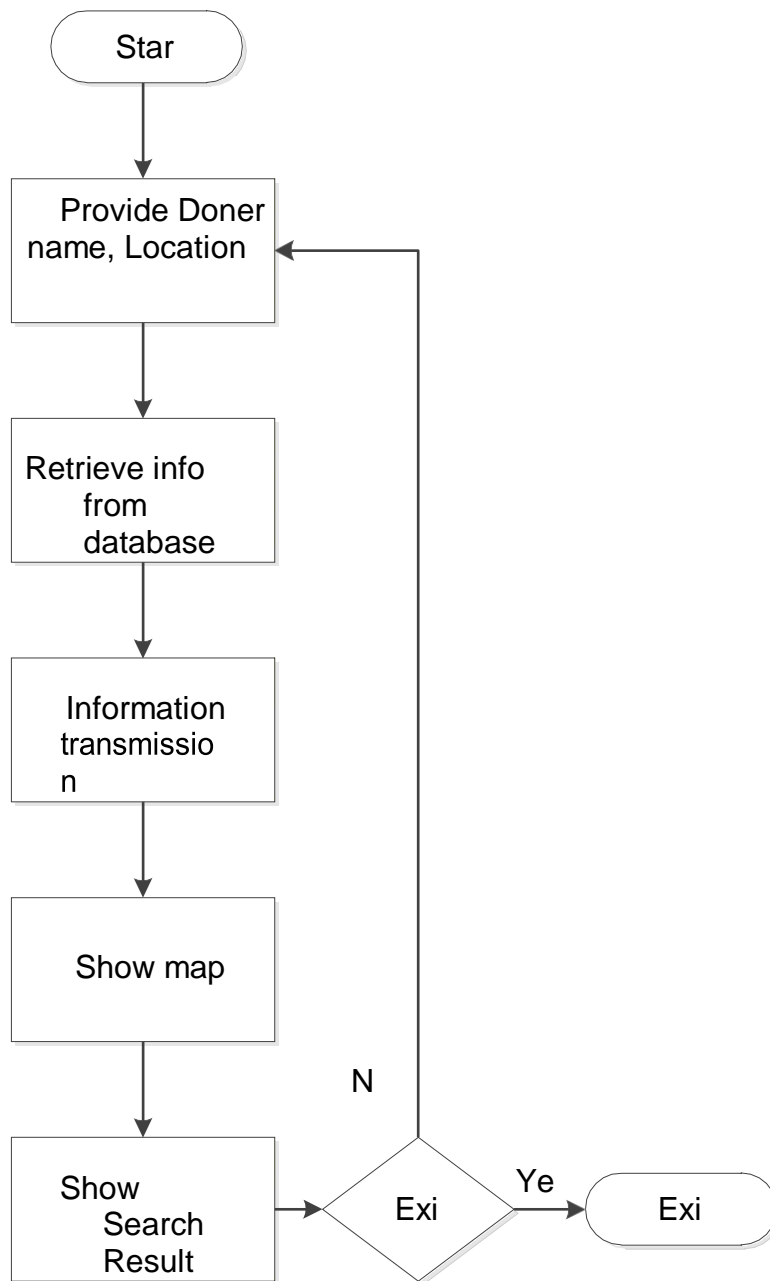


Figure 11: Activity diagram for search

Level-1.3: Activity diagram for rating and comment

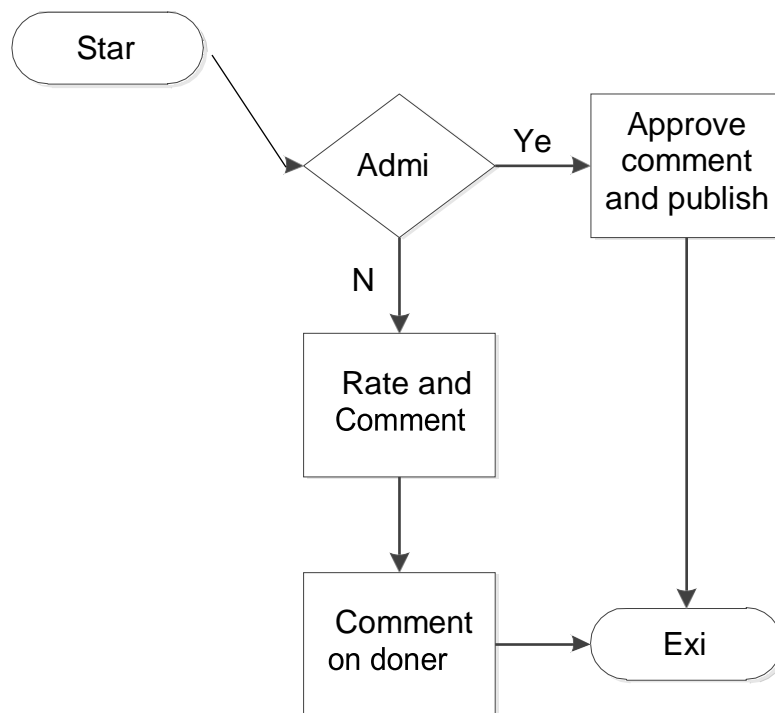
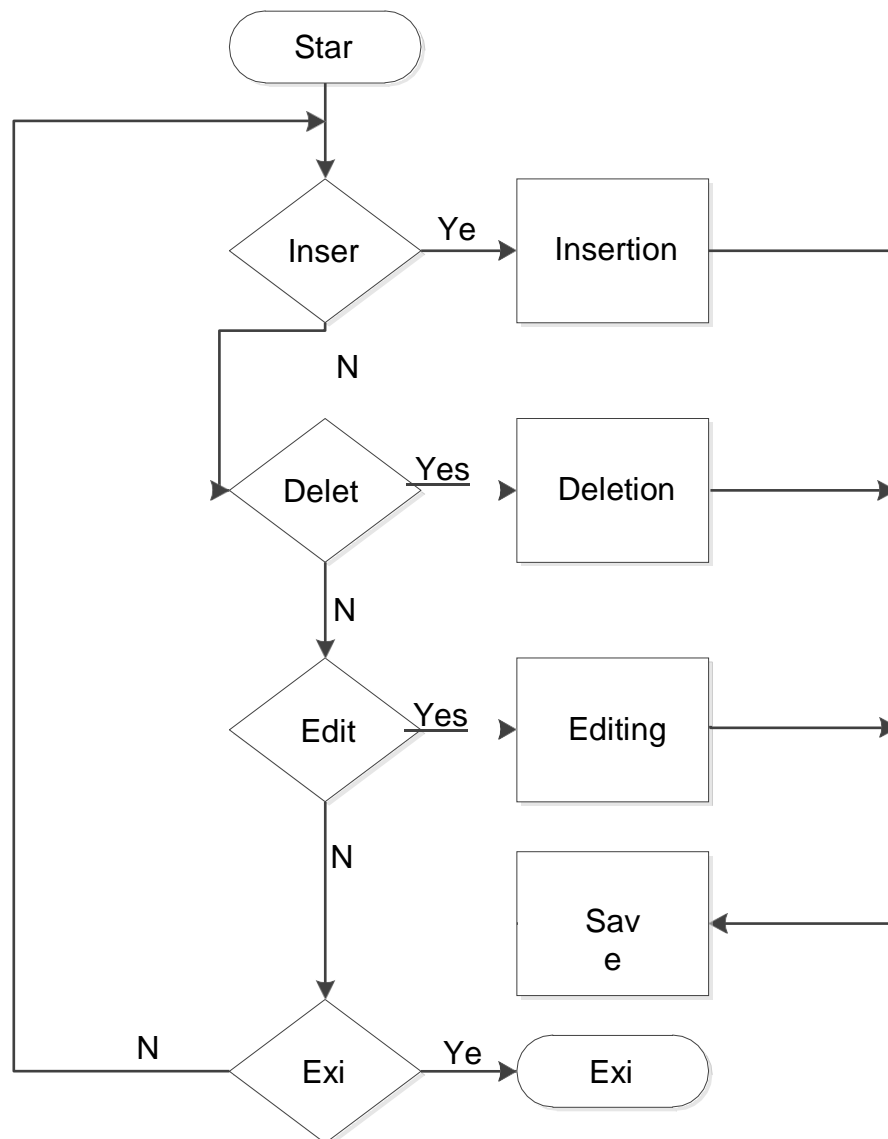


Figure 12: Activity diagram for rating and comment

Level-1.4: Activity diagram for Update



+

Figure 13: Activity diagram for update

Level-1.5: Activity Diagram for account management

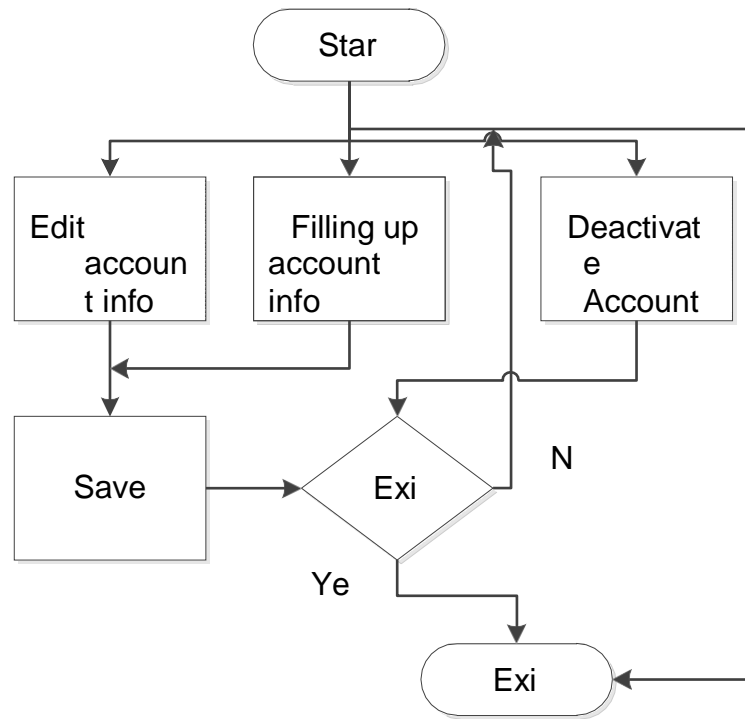


Figure 14: Activity diagram for account management

Level-1.1.1: Activity diagram for sign up

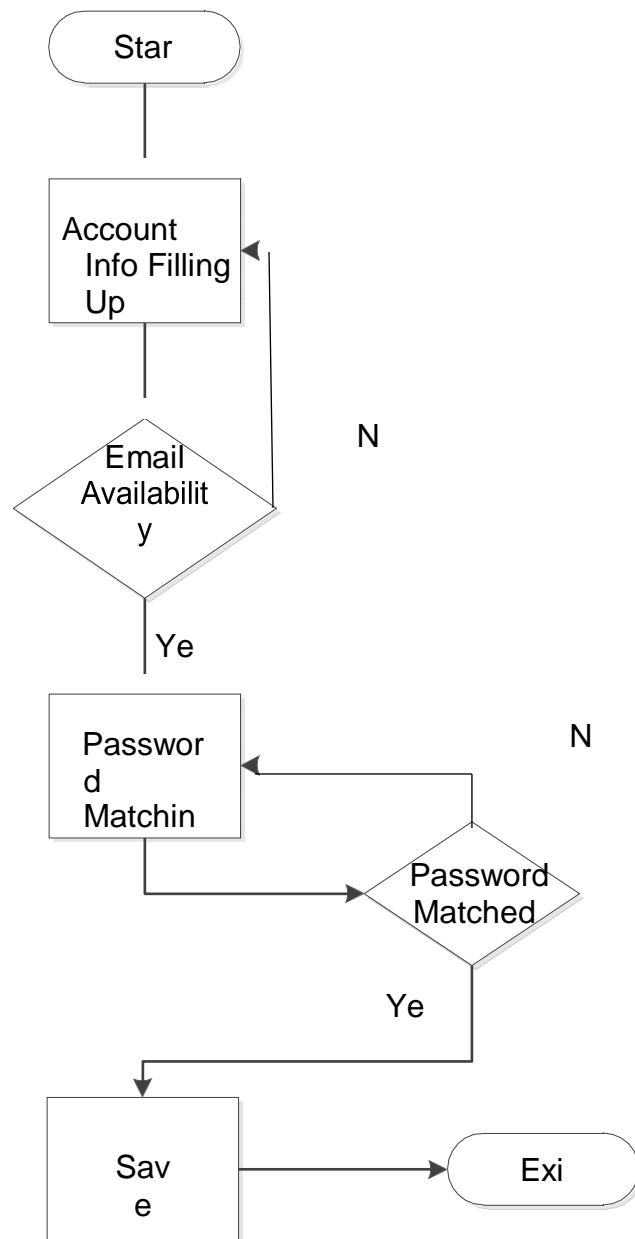


Figure 15: Activity diagram for sign up

Level-1.1.2: Activity diagram for sign in

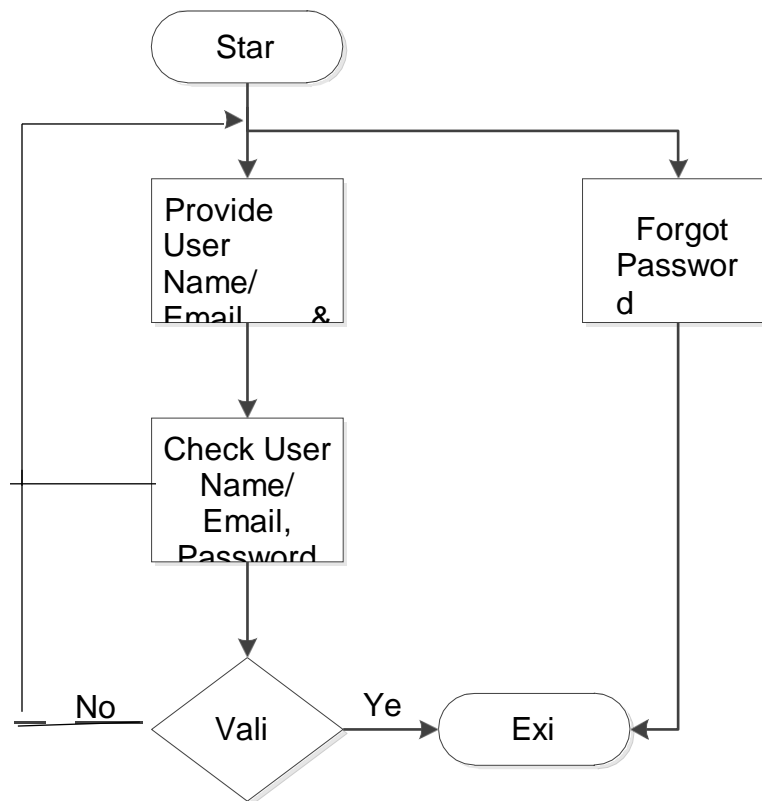


Figure 16: Activity diagram for sign in

Level-1.1.2.1: Activity diagram for forgot password

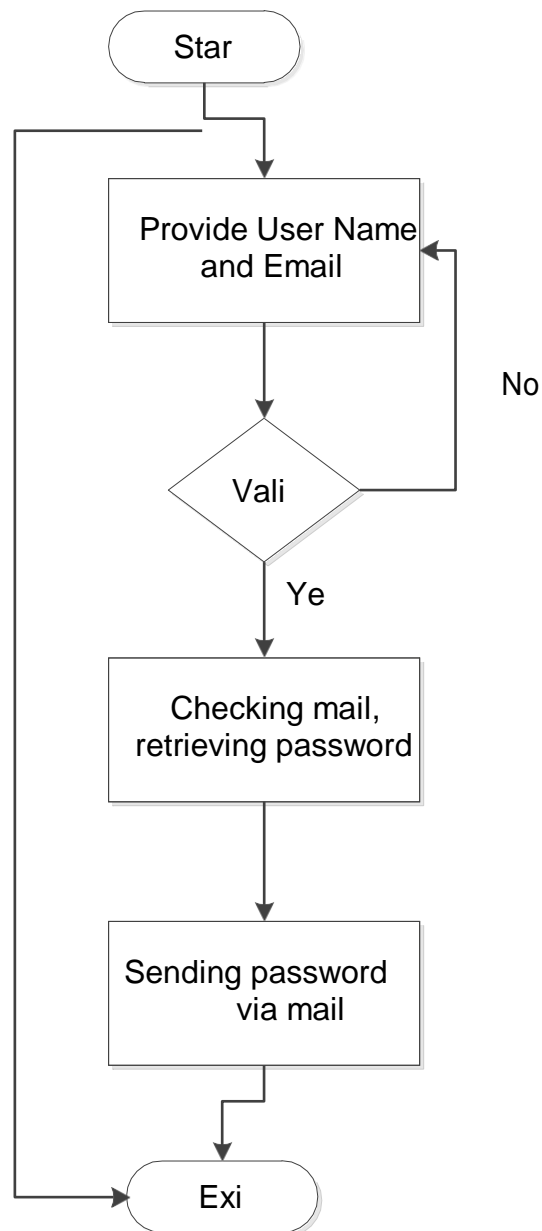


Figure 17: Activity diagram for forgot password

4.4 Swim lane Diagram

Level-1: Swim lane diagram on WIMB

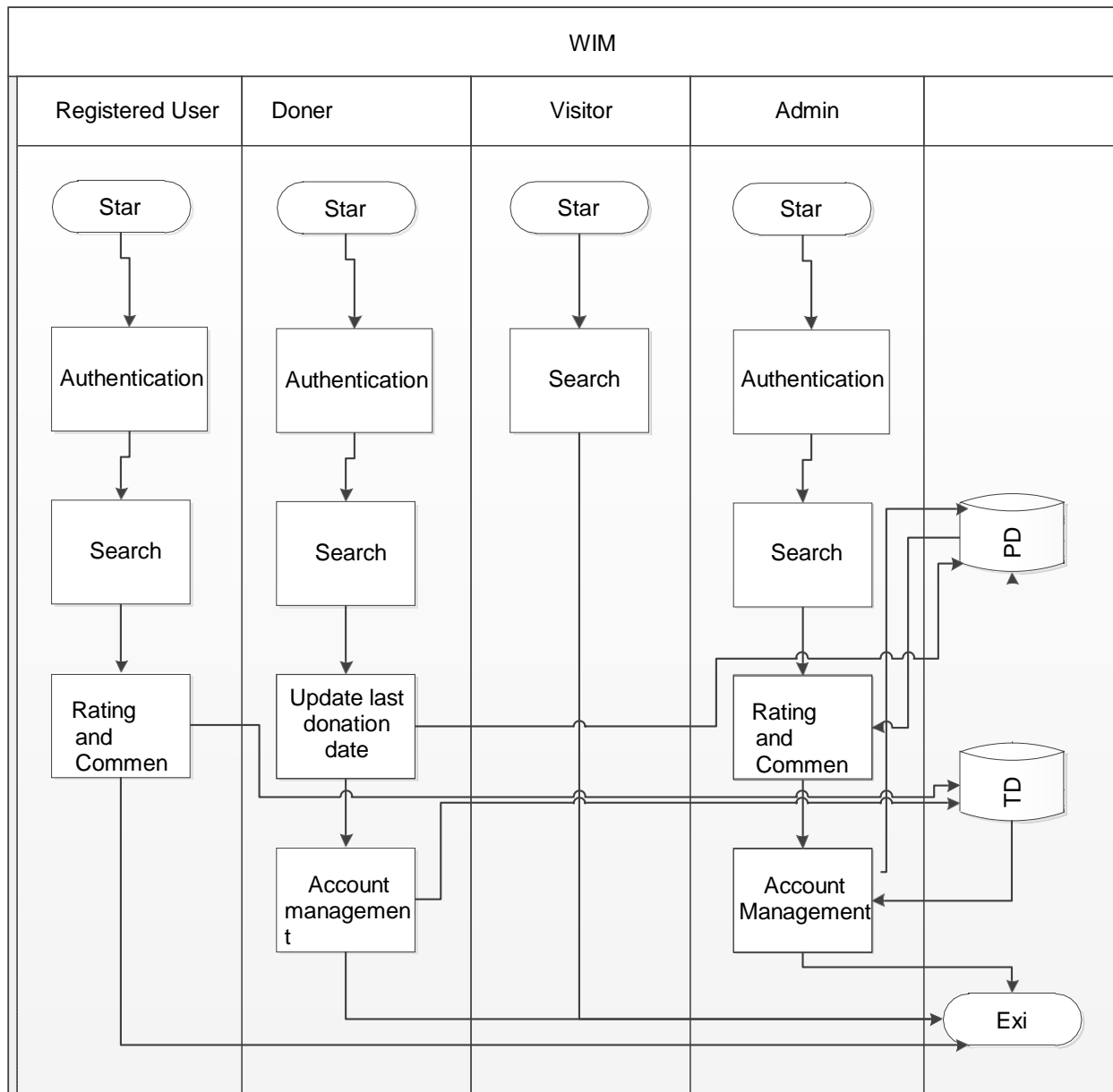


Figure 18: Swim lane diagram on WIMB

Level-1.2: Swim lane diagram for search

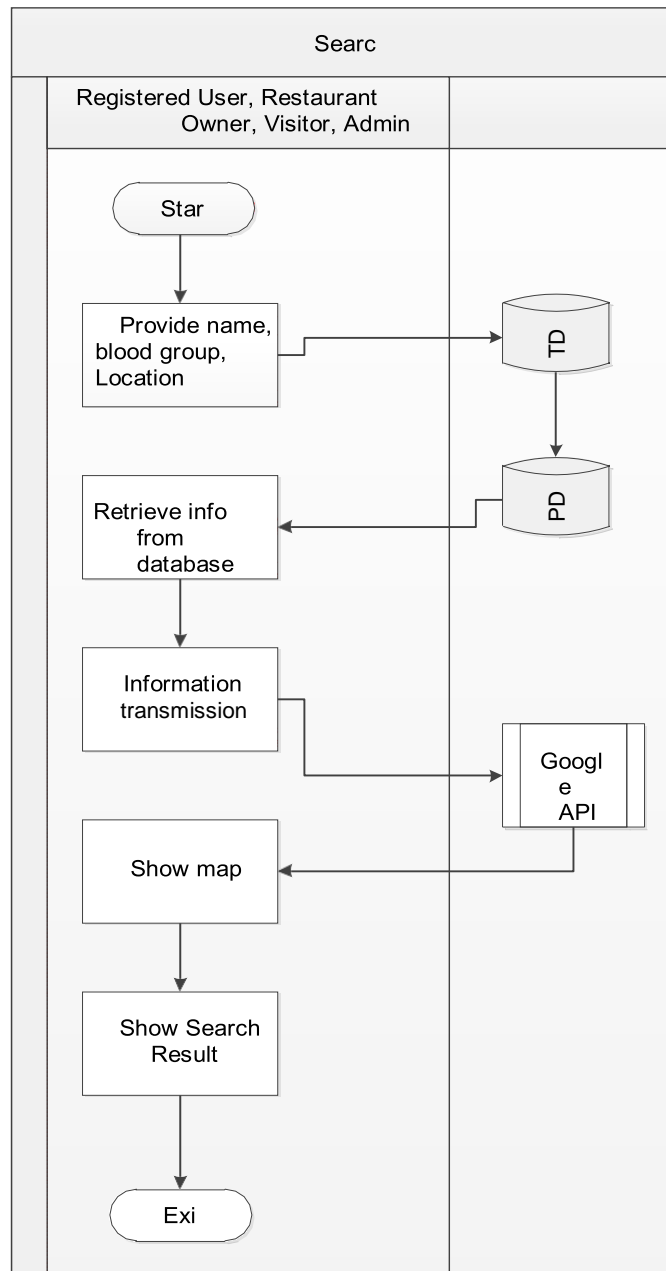


Figure 19: Swim lane diagram on search

Swim lane diagram on sign up

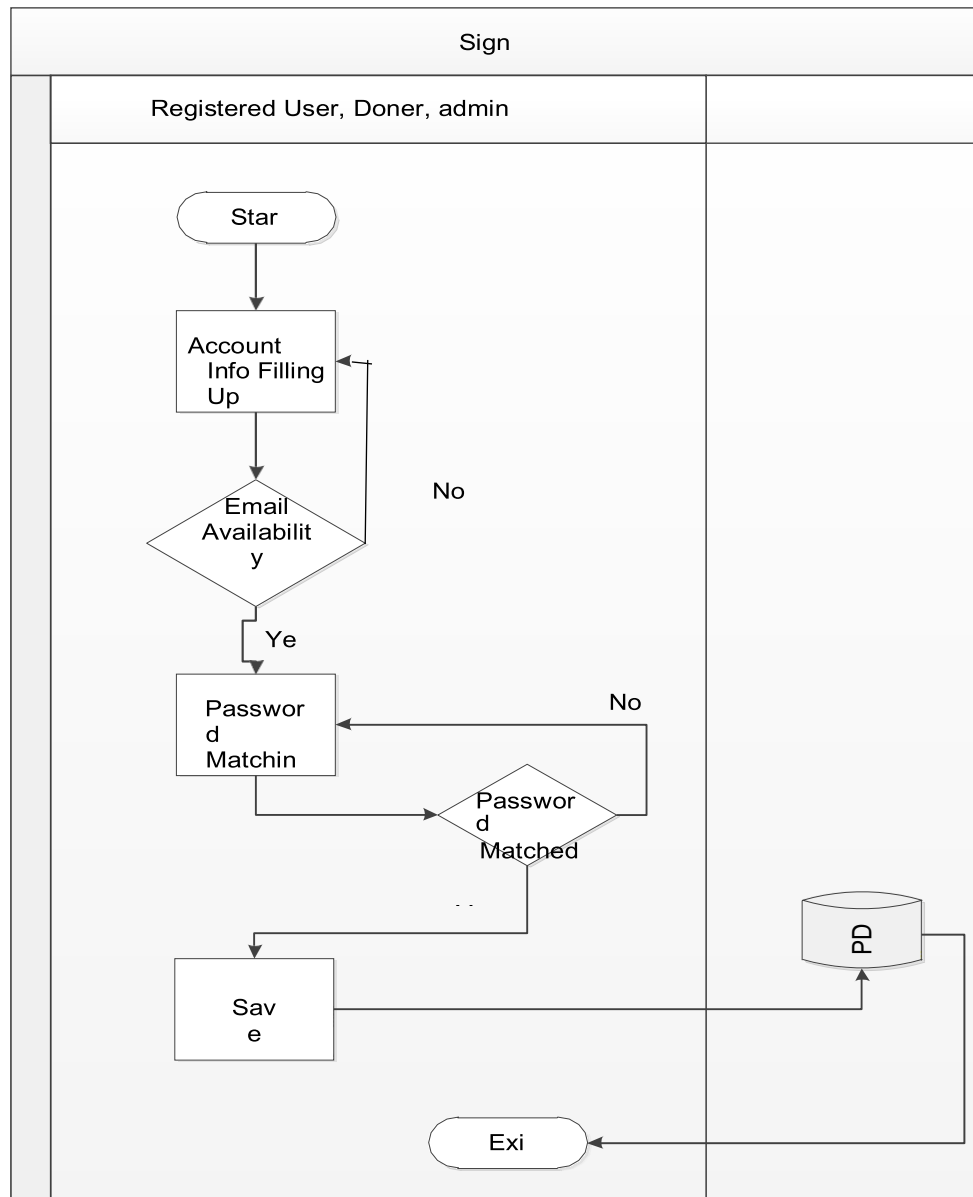


Figure 20: Swim lane diagram on sign up

Level-1.3: Swim lane diagram on rating and comment

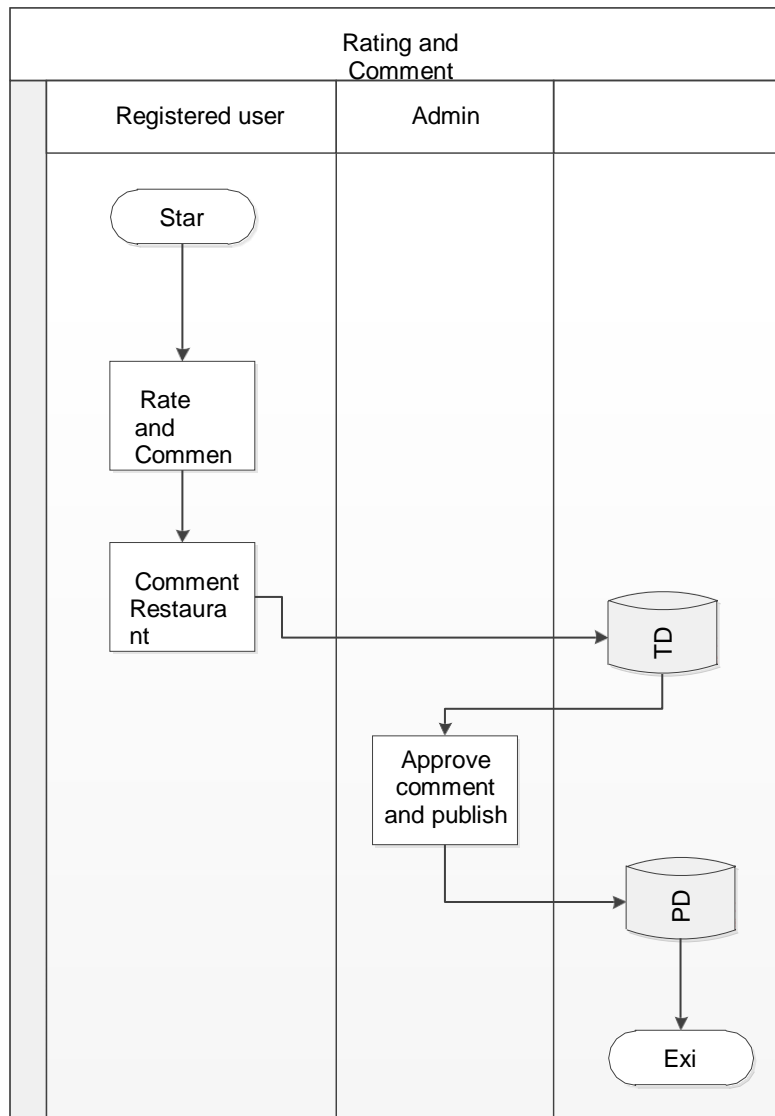


Figure 21: Swim lane diagram on rating and comment

Level-1.4: Swim lane diagram on Update

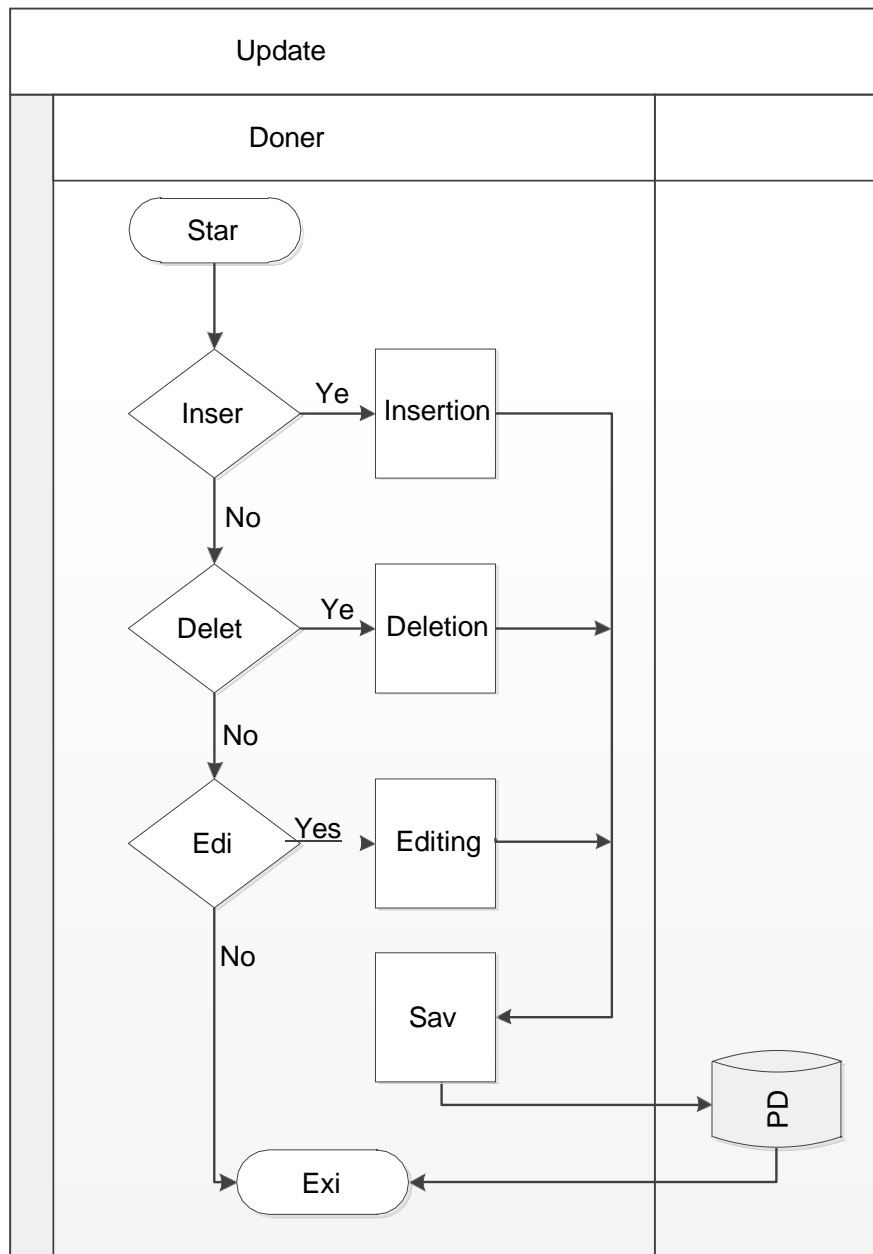


Figure 22: Swim lane diagram on rating and comment

Level-1.5: Swim lane diagram for account management

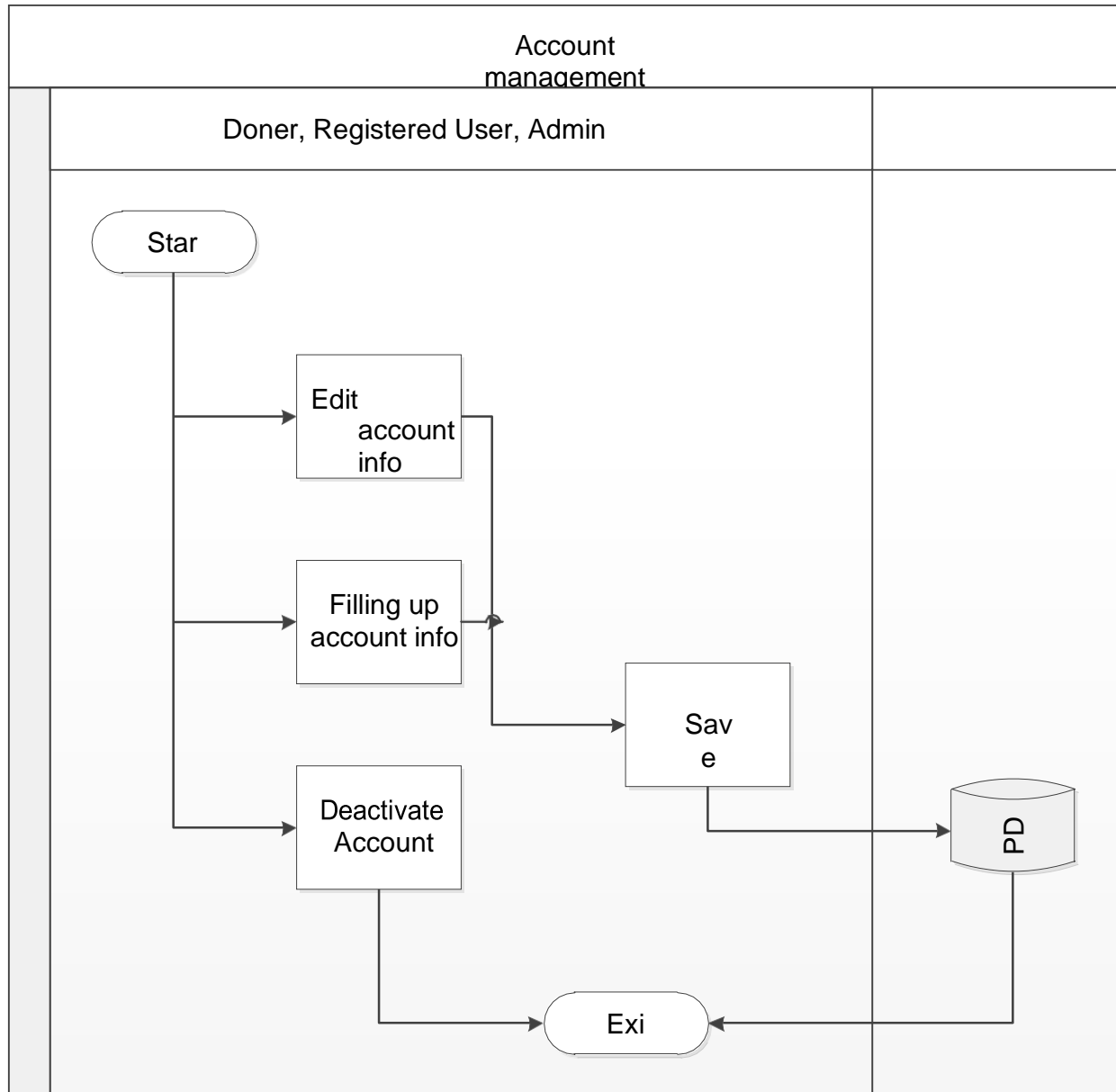


Figure 23: Swim lane diagram on account management

Level-1.1.1: Swim lane diagram on sign up

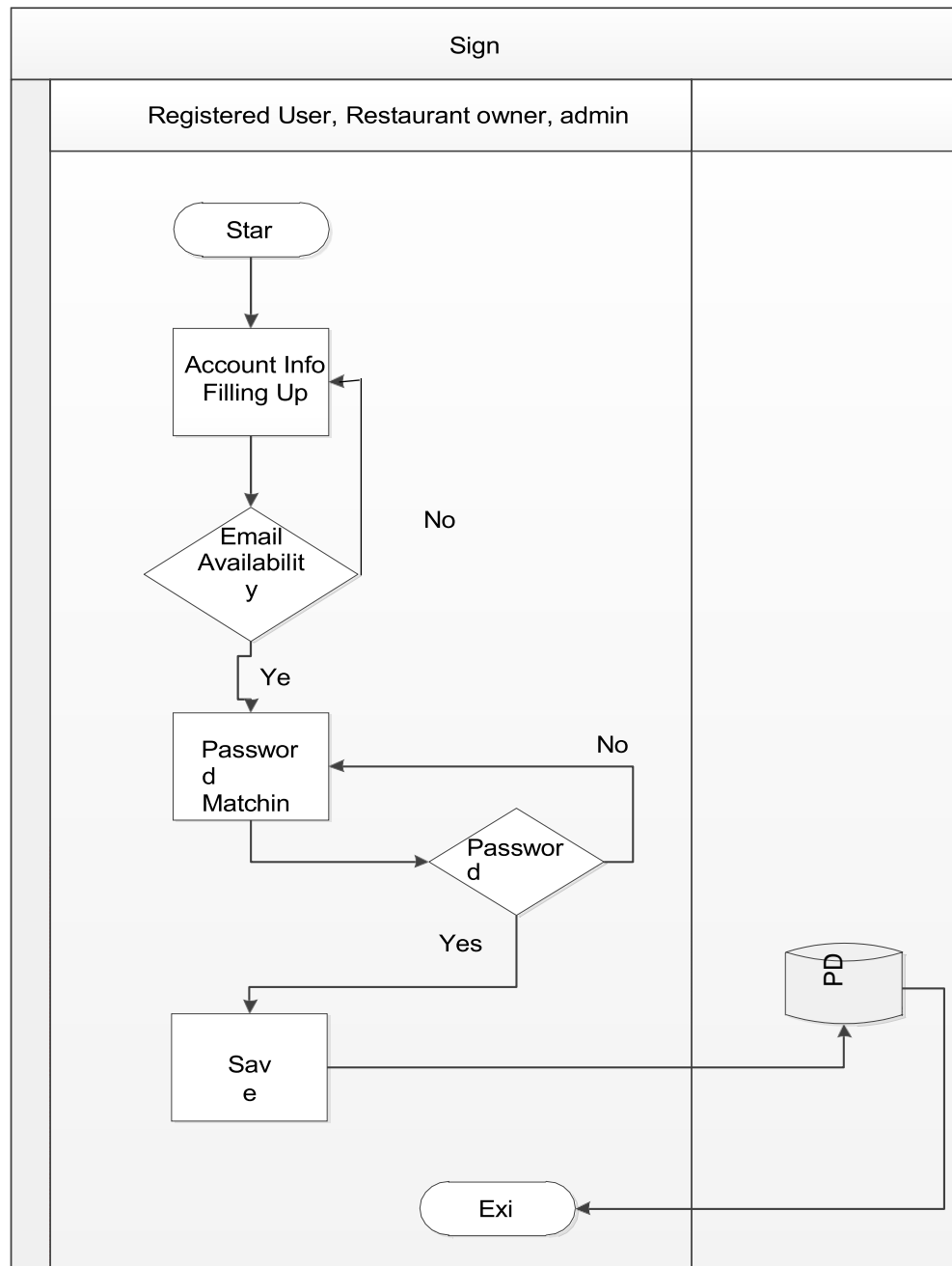


Figure 24: Swim lane diagram on sign up

Level-1.1.2: Swim lane diagram on sign in

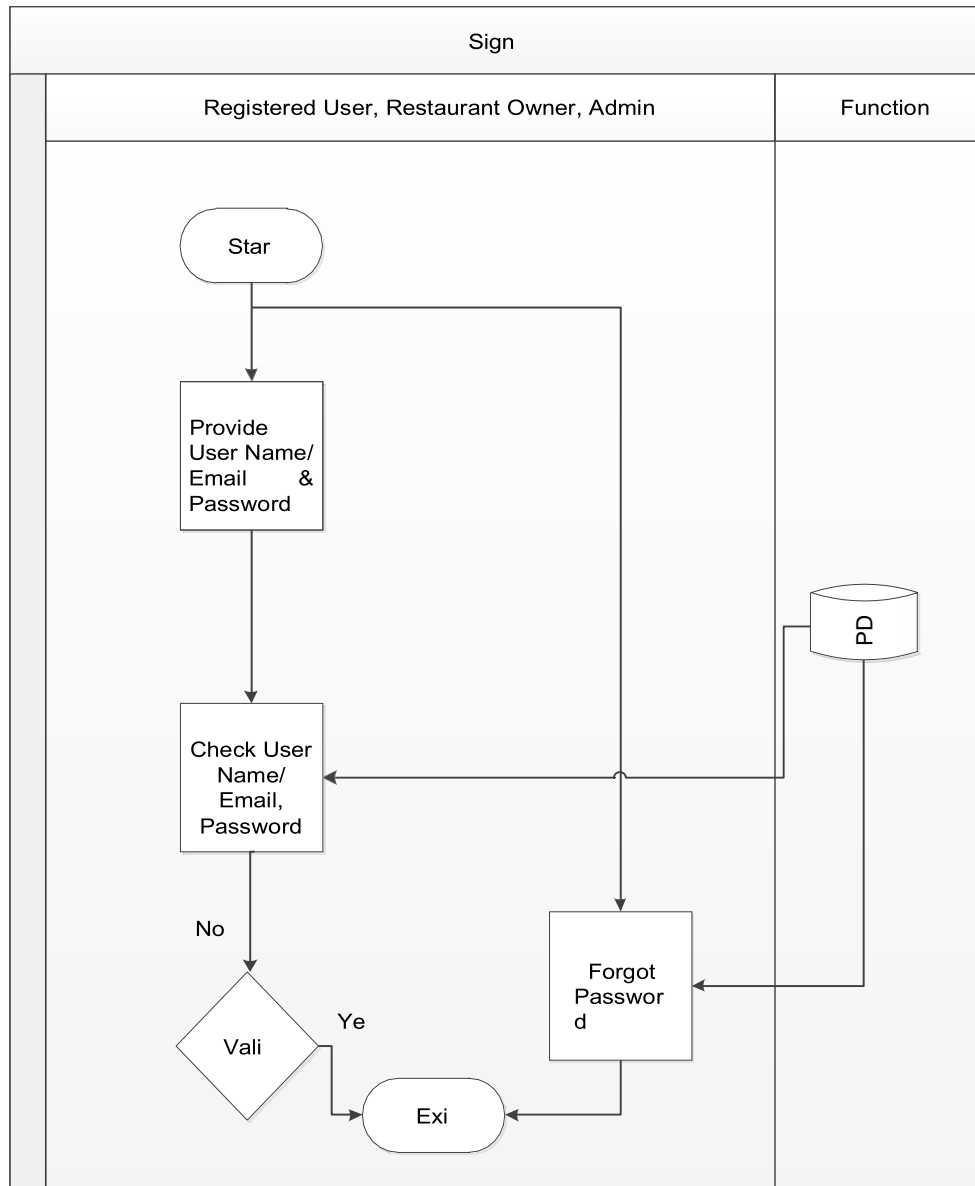


Figure 25: Swim lane diagram on sign in

Level-1.1.2.1: Swim lane diagram on forgot password

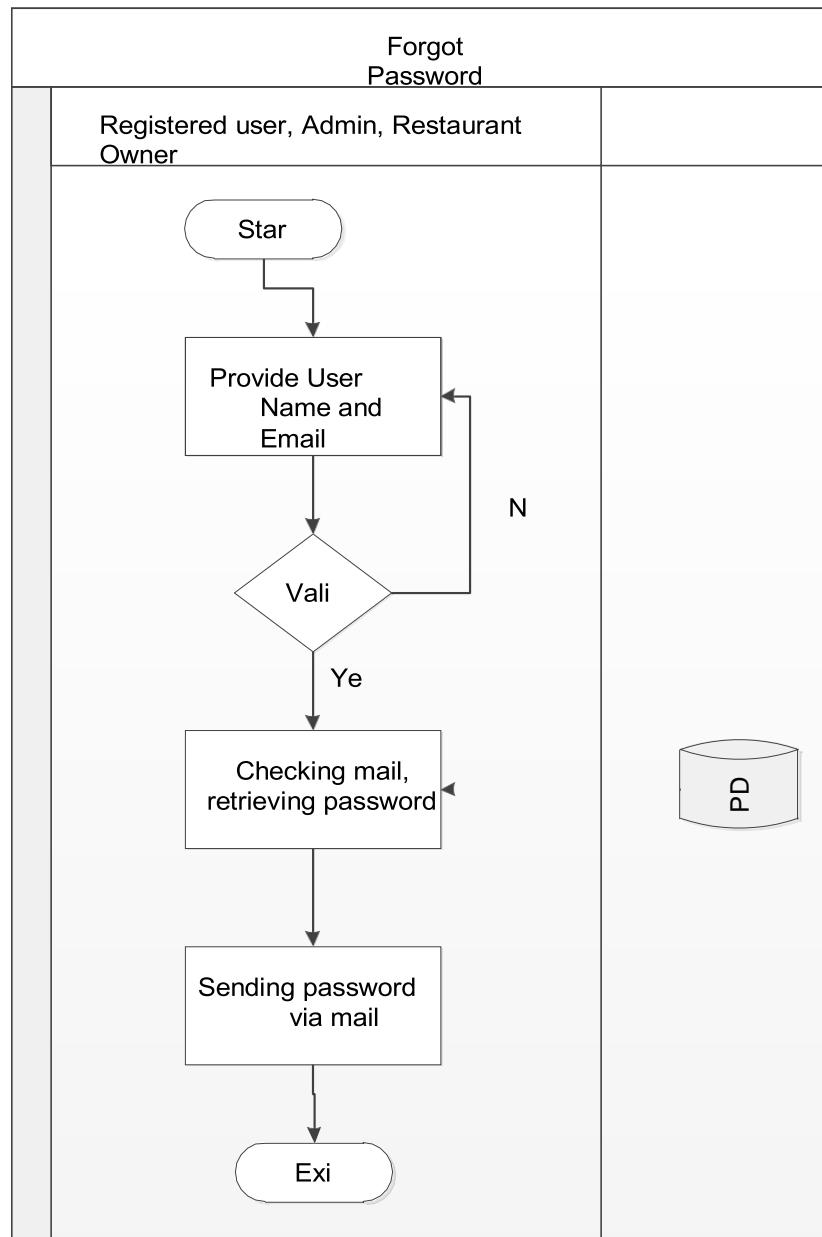


Figure 26: Swim lane diagram on forgot password

Chapter 5: Data Base Model of WIMB System

5.1 Data Modeling Concept

Data modeling is the formalization and documentation of existing processes and events that occur during application software design and development. Data modeling techniques and tools capture and translate complex system designs into easily understood representations of the data flows and processes, creating a blueprint for construction and/or re-engineering. In fact, the data model simply describes the structure of data entities and their relationships.

WIMB software requirements include the need to create, extend or interface with a database, so we need to create a data model as part of overall requirements modeling. In our WIMB System, we have done the following activities as our Data Model.

- Data Identification and Define Attributes
- Create Data Relationship Diagram
- ER Diagram
- Table or Schema Generation

5.2 Data Identification and define Attributes

A data object is a representation of information which has different properties or attributes that must be understood by software. We found following data objects in WIMB System.

1. Data Object: Doner

2. Attributes:

- User ID
- Email
- Password
- Name

- Location
- Comment
- Rating
- Age
- Blood Group
- Contact No

3. Data Object: Register User

Attributes:

- User ID
- Email
- Password
- First Name
- Last Name
- Comment
- Rating

4. Data Object: Admin

Attributes:

- First Name
- Last Name
- User ID
- Email
- Password

5. Data Object: Blood

Attributes:

- Blood Id
- Blood Type
- Amount
- Hemoglobin

- Plasma
- RBC Content
- Platelet Content

6. Data Object: Comment and Rating

Attributes: Comment

- Rate
- Date and Time

5.3 Create data relationship diagram

Data Relationship Diagram shows the interaction between various type data within the system.

The Data Relationship Diagram of WIMB System is given below.

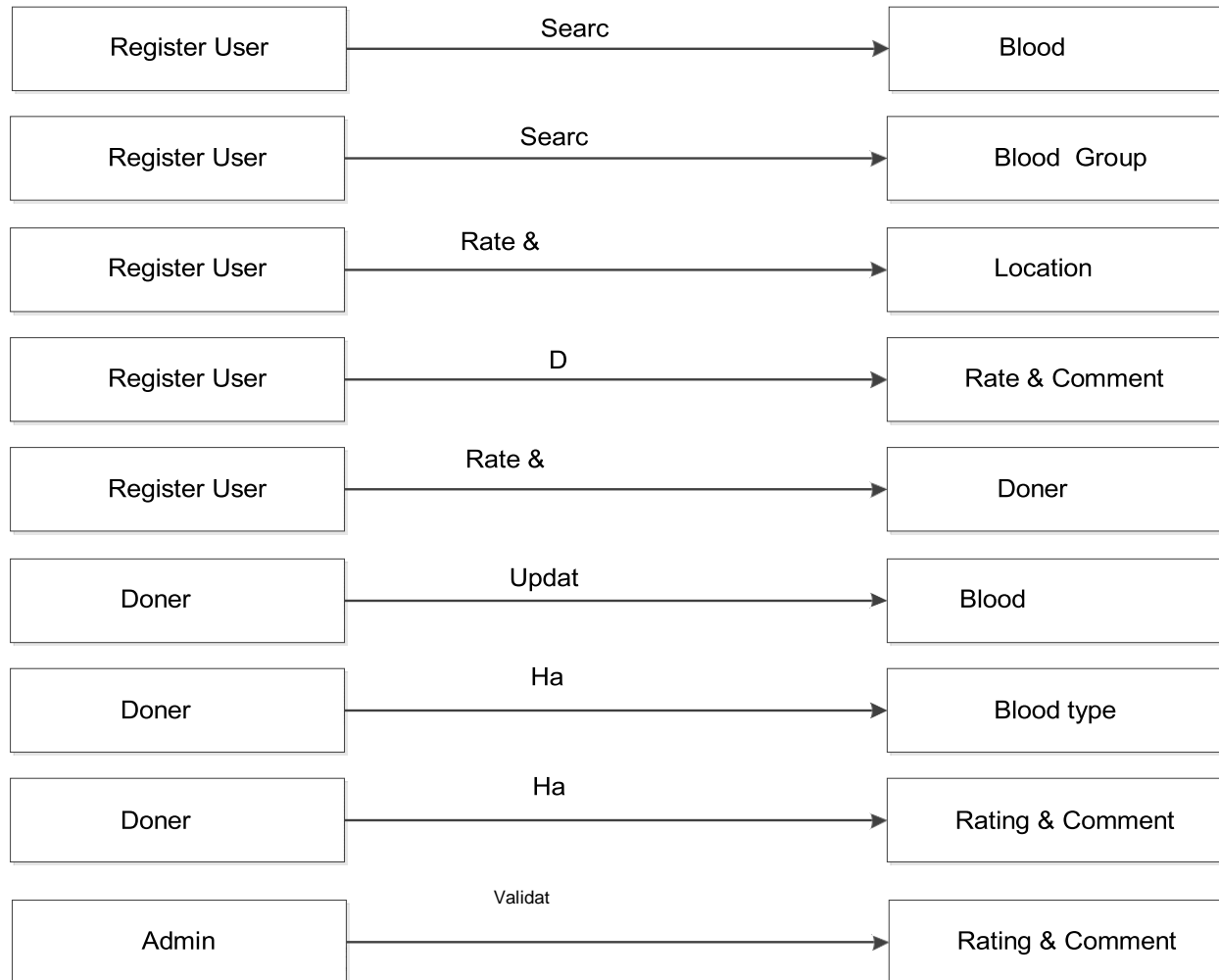


Figure 27: Data relationship diagram

5.4 ER diagram

ER Diagram shows the total picture of the interaction of data and it facilitates to construct schema and database designing for the WIMB System.

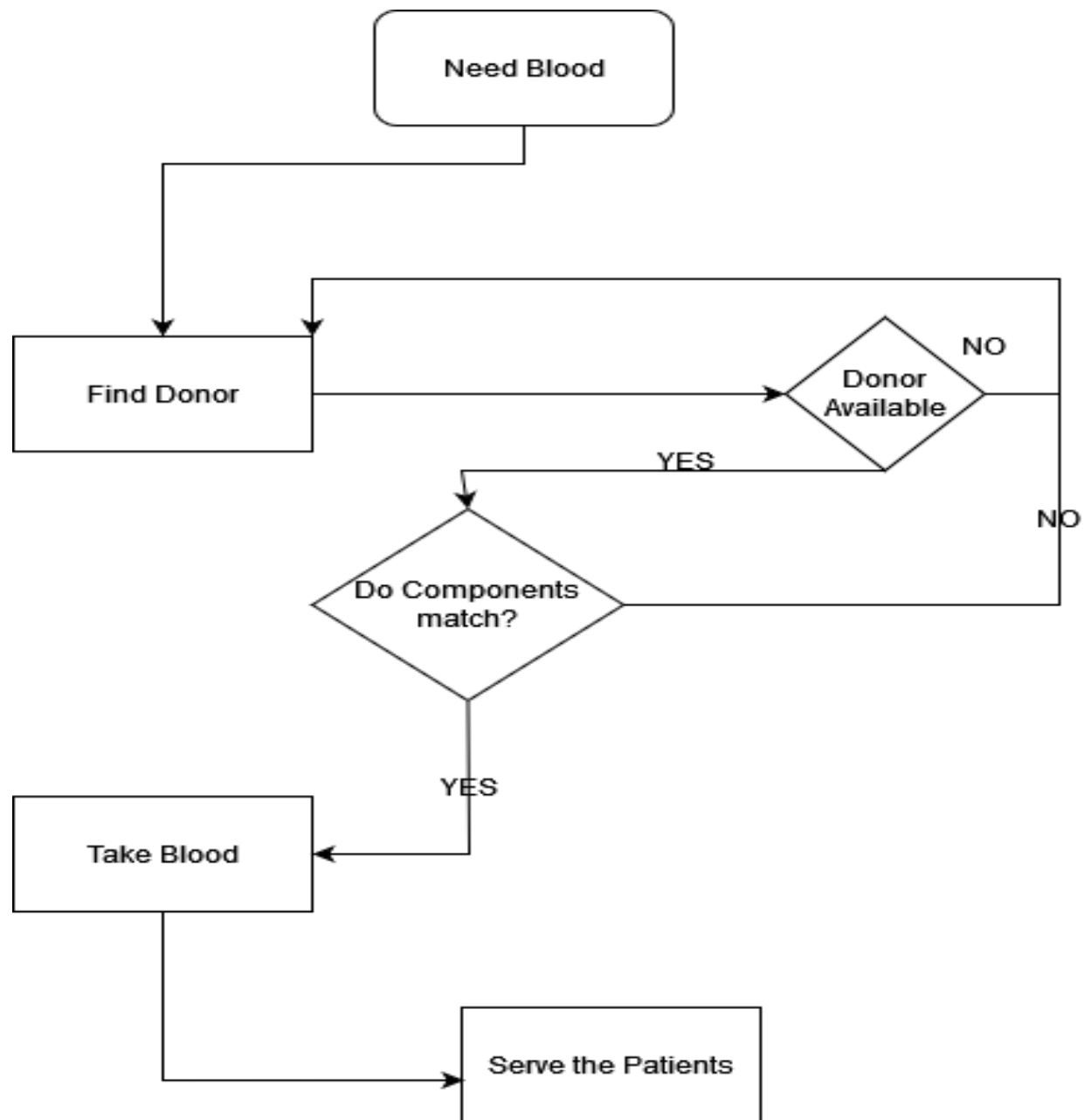


Figure 28: ER diagram for WIMB System

5.5 Table or Schema generation

1. Table Name: User

Attributes	Type
<u>User ID</u>	String
Email	String
Password	String

Table 1: for User

2. Table Name: Register User

Attributes	Type
First Name	String
Last Name	String

Table 2: for Registered User

3. Table Name: DONER

Attributes	Type
Name	String
Location	String
Blood Group	String
<u>Donor ID</u>	String

Table 3: For Doner

4. Table Name: Blood

Attributes	Type
Blood Group	String
Blood Type	String
<u>Blood ID</u>	String

Table 4: For Blood

5. Table Name: Comment and Rating

Attributes	Type
Comment	Text
Rate	Integer
Date and Time	Date

Table 5: For rating and comment

6. Table Name: Admin

Attributes	Type
First Name	String
Last Name	String

Table 6: For Admin

Chapter 6: Class Base Model

6.1 Class Based Modeling Concept

Class-based modeling represents the objects that the system will manipulate, the operations that will be applied to the objects, relationships between the objects and the collaborations that occur between the classes that are defined.

6.2 Identifying Analysis Classes

Step 1: Identifying and categorize all nouns

External Entities: Google API, Admin, Registered User, Visitor, Doner, Blood ,Location, Rating & Comment, Name, Database

Things: Blood Item, Name, Location, Rating & Comment, Google Map

Occurrence or events: Rating & Comment, Authentication

Roles: Admin, Register User, Blood, Google API

Places: Restaurant Location

Structures: Google API, Google Map, Authentication, Database

Step 2: Selection of potential class

Selection characteristics

- 1.Retained information
- 2.Needed services
- 3.Multiple attributes
- 4.Common attributes
- 5.Common operations
- 6.Essential requirements

Potential Class	Accepted/Rejected
Doner	✓
Registered User	✓
Visitor	✗
Admin	✓
Blood	✓
Database	✓
Google API	✓
Location	✗
Blood Type	✗
Rating & Comment	✗
Google Map	✗
Doner Name	✗
Blood Group	✗
Authentication	✓

Table 7: For Class identification

6.3 Class Diagram

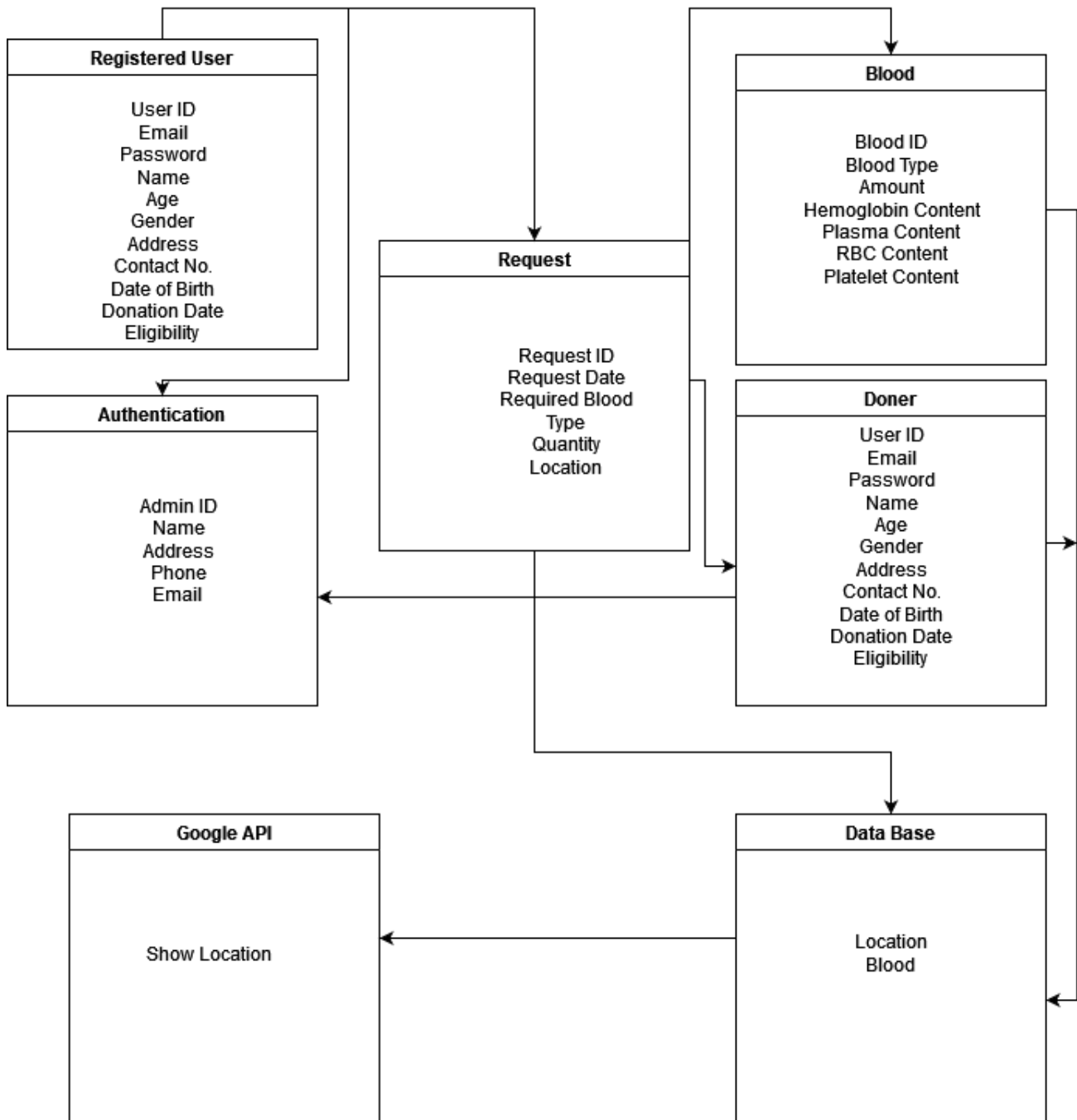


Figure 29: Class diagram for WIMB System

5.4 Class Responsibility Collaboration (CRC)

Class Name: Restaurant	
Responsibility	Collaborator
Update Blood Information	1. Authentication 2. Location 3. Blood
Update last date	
Set Location	

Table 8: For Doner

Class Name: Registered User	
Responsibility	Collaborator
Rate	Authentication
Comment	Blood
Search	Doner
Update Information	

Table 9: For Registered User

Class Name: Admin	
Responsibility	Collaborator
Validate	Authentication
Search	Blood

Table 11: For Admin

Class Name: Authentication	
Responsibility	Collaborator
Authenticate User	Admin
	Registered User
	Doner

Table 13: For Authentication

Class Name: Google API	
Responsibility	Collaborator
Show Location	Doner Location
	Blood

Table 14: For Google API

Class Name: Database	
Responsibility	Collaborator
Set Location	Google API Doner Blood

Table 15: For Database

Chapter 7: Behavior Model of WIMB System

Behavioral model describes the control structure of a dynamic system. This can be things like:

- Sequence of operations
- Object states
- Object interactions

The behavioral model indicates how software will respond to external events or stimuli. We represent behavioral model through two diagrams:

- State Diagram
- Sequence Diagram

EVENTS	INITIATOR	COLLABORATION
Update Doner Information	Doner	Database
Search Blood	Register User, Admin	Database
Comment	Register User	Database
Rating	Register User	Admin, Database
Validate Comment	Admin	Database

Table 17: Event identification

7.1 State Diagram

State diagram represents active states for each class and events that cause changes between the active states. We illustrate our state diagram. We consider two different characterization of state:

- The state of each class as the system perform its function
- The state of the system as observed from the outside as the system performs its function.

The state of the class takes on both active and passive state.

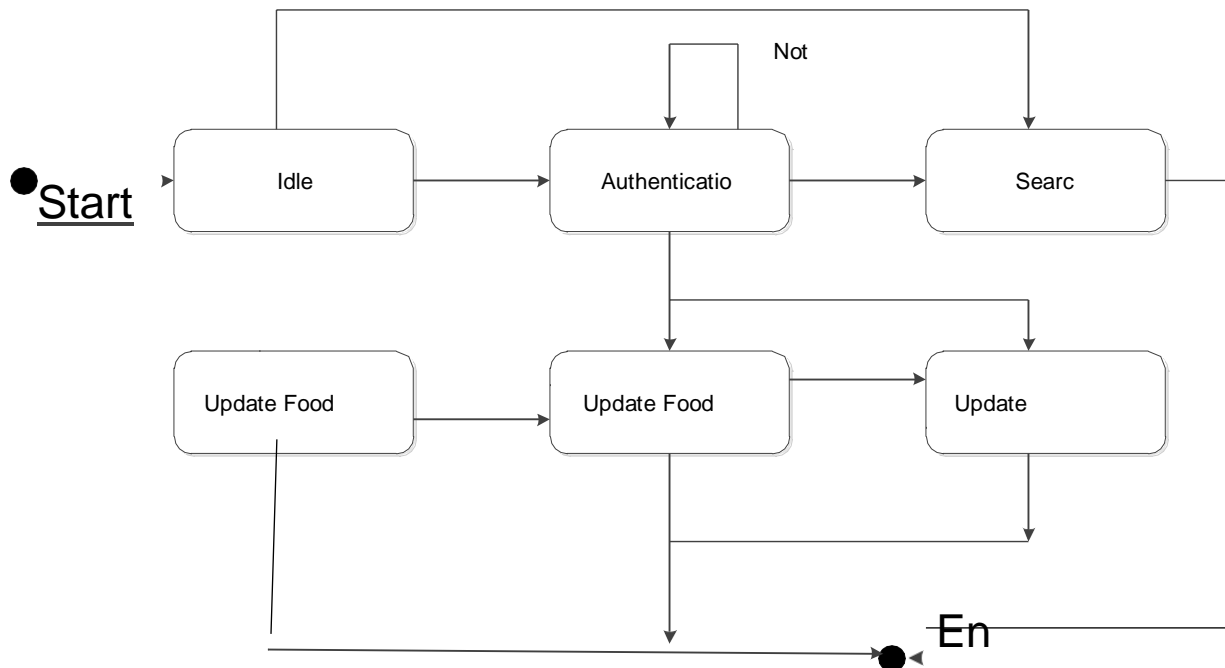
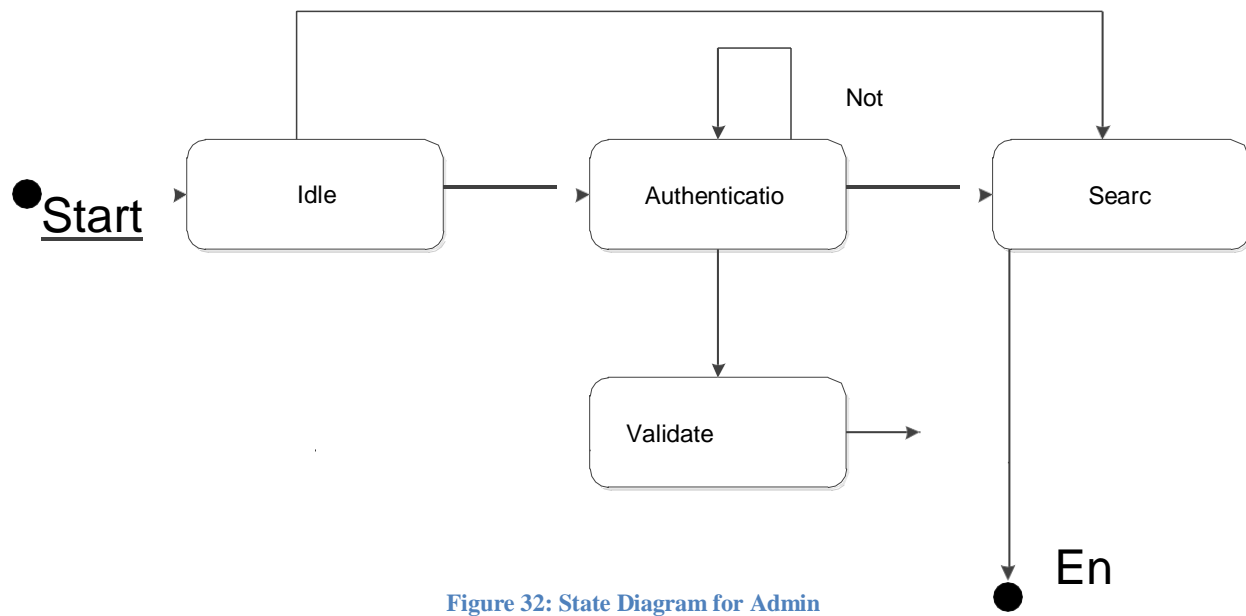
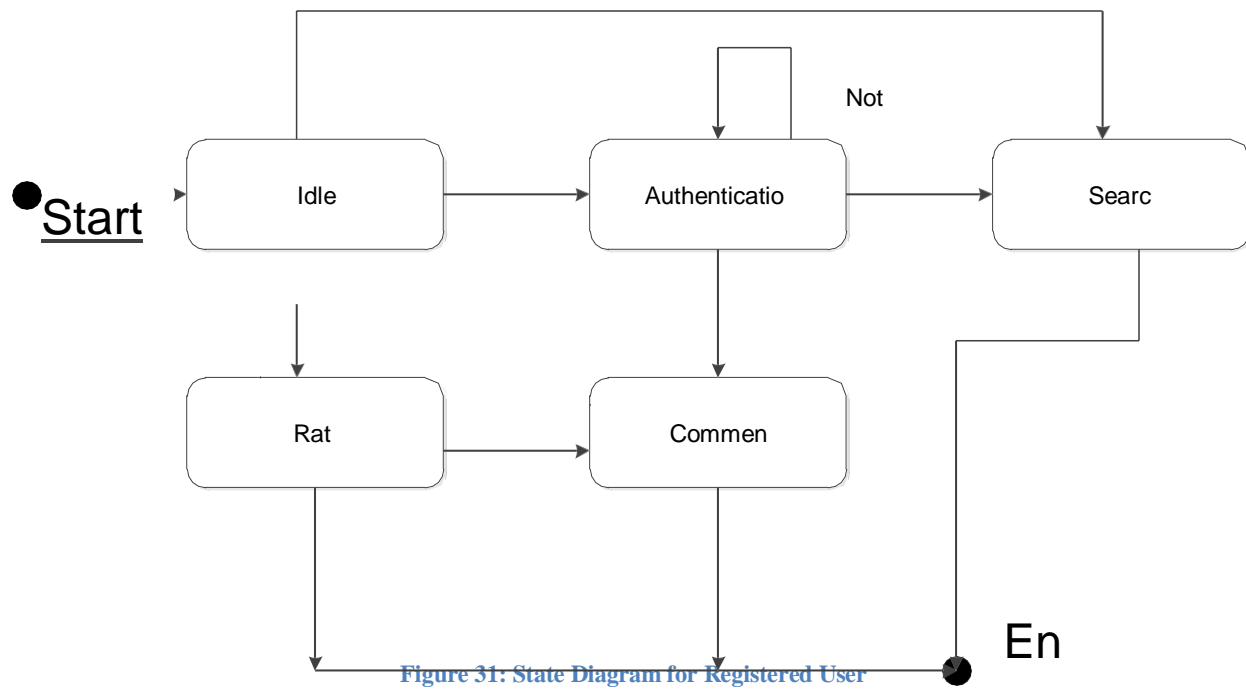


Figure 30: State diagram for Blood Doner



7.2 sequence Diagram

Sequential model indicates how events cause transition from object to object. We have identified every event by examining use case. Being modeler, we have created the sequence diagram. It represents how events cause flow from one object to another as a function of time.

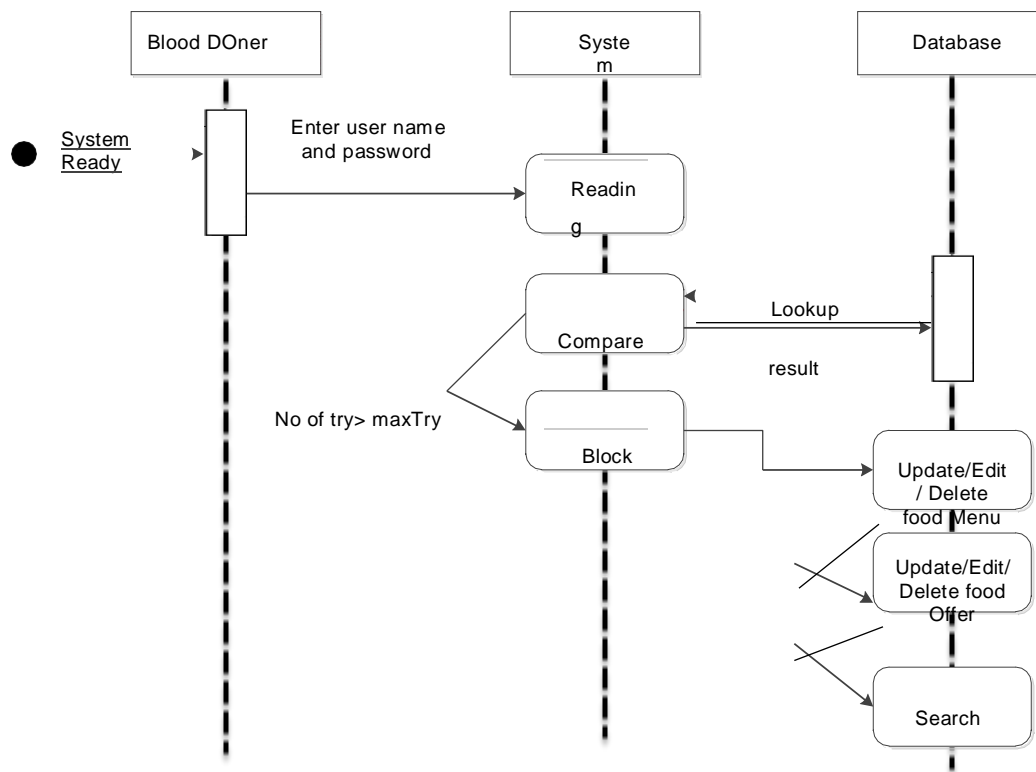


Figure 33: Sequence Diagram for Blood Doner

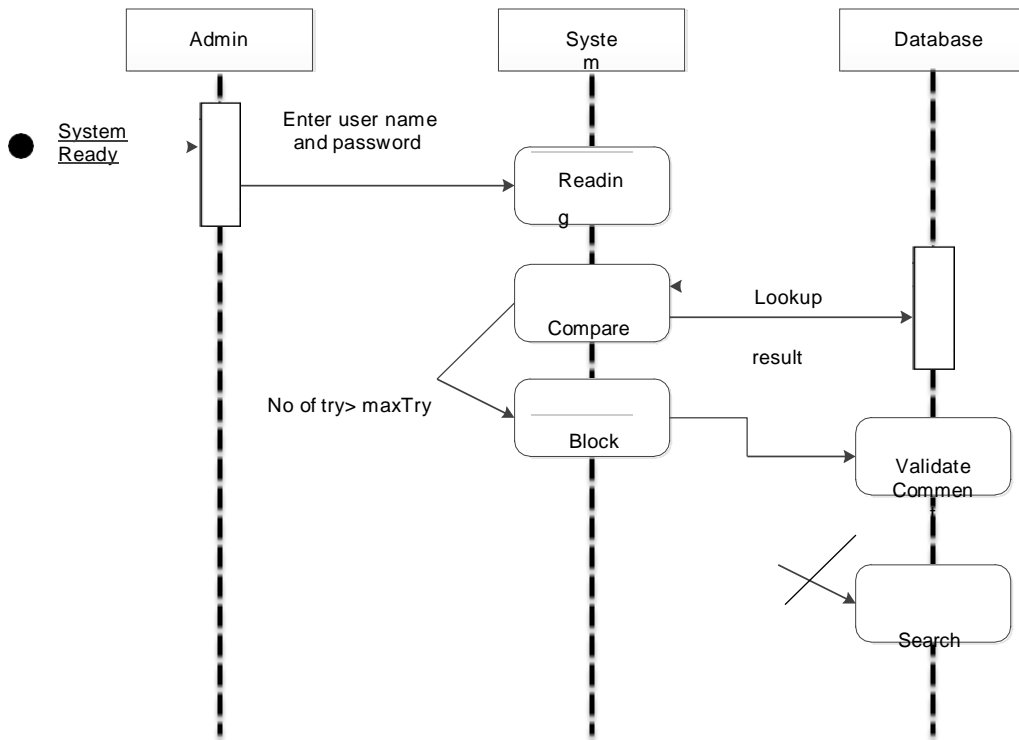


Figure 35: Sequence Diagram for Admin

Chapter 8: Conclusion

We are pleased to submit the final SRS report on Where is My Blood (WIMB) System. The SRS helps the developers to automate the system. This report contains usecases which are the most important part of the scenario based modeling as well as the system for development. The main aim of the project is to provide an easy to use application for searching the Blood as well as Doner. In addition, the SRS has been done sequentially so that the readers can easily understand the SRS report and can visualize the system as well. We have tried our best to make the SRS of the WIMB System so that it will help us to develop the WIMB system in a smooth way and hopeful that the readers will get benefit from the document.

Appendix

Table of Figure

Figure 1: Usecase Diagram for WIMB.....	22
Figure 2: Usecase Diagram for Authentication.....	23
Figure 3: Usecase Diagram for Sign Up.....	24
Figure 4: Usecase diagram for sign in	25
Figure 5: Usecase Diagram for Forgot Password	26
Figure 6: Usecase diagram for.....	28
Figure 7: Usecase diagram for rating and comment.....	30
Figure 8: Usecase diagram for update	32
Figure 9: Usecase diagram for account management.....	34
Figure 10: Activity diagram for WIMB.....	35
Figure 11: Activity diagram for search.....	36
Figure 12: Activity diagram for rating and comment.....	37
Figure 13: Activity diagram form rating and comment.....	38

Figure 14: Activity diagram form rating and comment.....	39
Figure 15: Activity diagram for sign up	40
Figure 16: Activity diagram for sign in	41
Figure 17: Activity diagram for forgot password	42
Figure 18: Swim lane diagram on WIMB.....	43
Figure 19: Swim lane diagram on search.....	44
Figure 20: Swim lane diagram on sign up	45
Figure 21: Swim lane diagram on rating and comment	46
Figure 22: Swim lane diagram on rating and comment.....	47
Figure 23: Swim lane diagram on account management.....	48
Figure 24: Swim lane diagram on sign up	49
Figure 25: Swim lane diagram on sign in	50
Figure 26: Swim lane diagram on forgot password.....	51
Figure 27: Data relationship diagram	55
Figure 28: ER diagram for WIMB System.....	56

Figure 29: Class diagram for WIMB System.....	62
Figure 30: State diagram for Blood Doner.....	67
Figure 31: State Diagram for Registered User.....	68
Figure 32: State Diagram for Admin	68
Figure 33: Sequence Diagram for Blood Doner	69
Figure 34: Sequence Diagram for Registered User.....	70
Figure 35: Sequence Diagram for Admin	70
Figure 36: Concept diagram for WIMB	72

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