University of Colombo School of Computing

SCS2202 Group Project
Final Report

SHELFS - Online Bookstore

Group 12 CS

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1 INTRODUCTION

1.1 Problem Domain

Books play an important role in the life of all humans regardless of their age. They introduce us to the world of imagination, and provide us knowledge and many basic skills like reading, writing and speaking while boosting our memory and intelligence. There are many genres of books varying from history, comics, science, philosophy and many more which provide knowledge and pleasure to readers around the world.

Another major difficulty we face is purchasing brand-new books. As we all know, new books are usually on the expensive side. There are many people who struggle to purchase books due to their costs. Both these situations combined have hindered a major hobby of many readers in our country as they are unable to acquire their desired books. This situation has made us understand that this country lacks an online store where customers can order and buy books they desire. We have seen many online stores where people buy many items which saves a lot of time and cost for the customer. This sort of technique is not yet applied in Sri Lanka and hence, we have decided that it's time to provide our enthusiastic readers around the country with the opportunity to get their desired books right to their doorstep with minimum time and effort.

1.2 Current Systems and Limitations

There are many libraries and bookstores in Sri Lanka which provide readers with the books they desire. Public libraries and stores like M. D. Gunasena and Vijitha Yapa are premier names in this industry. The whole world is currently facing the COVID-19 pandemic which has affected the daily routine in Sri Lanka as well. Besides essential services, many other usual services including visits to libraries and bookstores are currently unavailable due to the travel restrictions imposed by the Government. Even without such restrictions, it is still a risk for people to visit many places as it will enhance the possibility of a spread of this virus. Another limitation we encounter is the price of new books. As we know, brand-new books are more costly and we see many people not capable of affording new books.

1.3 Proposed Objectives and Goals

- To develop a fully functional online bookstore for second-hand books based in Sri Lanka
- To supply books to readers right at their doorstep.
- To find innovative and sustainable solutions to practical problems that arise when buying books.
- To provide an opportunity for customers to buy second hand books which are quality assured at a lower price.
- To provide an opportunity for customers to sell books which they have already used and in good quality.
- To make the system user-friendly to our users by using simple implementation methods.
- To contribute towards grooming the next generation by promoting reading and learning

1.4 Proposed Solution

Shelfs – Online Bookstore, the latest online bookstore exclusively for all Sri Lankans, is aimed to provide our readers with the books they wish. The uniqueness of this store is that this store carries only second-hand books where we provide customers the opportunity to purchase their favourite books at lower cost than brand-new books, and this also opens the opportunity for customers who are willing to sell their books as well after their quality is assured. This store adopts a delivery system as well, hence our customers are given the luxury of receiving their desired books at their doorstep saving their time and cost. We aim to cover many genres of books, ranging from educational, to comics, to history and many more, providing the best experience to our users around the country

1.5 Scope Overview

- In Scope
  - Web application system for buying and selling books
  - Registered users can sign up as seller with the approval of admin
  - Delivery System management
    Delivery options (Courier or Delivery person) will be based on customer locations
    Delivery person can view pending deliveries and pickup locations
  - Managing transactions through online payment
  - Suggestion and complaints facility for customers

- Out of Scope
  - Salary system of employees
  - Vehicles used by delivery person
  - Handling cyber-attacks to website

1.6 Assumptions, Constraints and Limitations

Technology

Without definite business registrations obtaining payment gateway facility is tedious. Therefore, for demonstration purposes a sandbox will be used.
The online bookstore will be available only in the English language and assumes that users have required understanding of the language needed for navigating the website.

Finance

Potential clients who would implement this system as a business have necessary capital to invest for warehouse, delivery vehicles and relevant employees.

Resources

All users of the system have a device capable of browsing web pages. If implemented as a business all employees have said devices to perform their specific tasks.

2 FEASIBILITY STUDY

2.1 Technical Feasibility

We plan to use HTML, CSS, JavaScript for front end technologies. For the server side we will be using Java EE and MySQL as the database management system. All IDEs used for development are free. Laptops and desktops already owned by group members will be used as hardware.

All the technologies listed above are readily available for usage with the knowledge we already possess, and our team is also willing to enhance their skills in certain technologies which we haven't experienced until now. Hence, the technical feasibility of the project is assured.

2.2 Economic Feasibility

We compare the costs with income to determine the economic feasibility of the project.

2.2.1 Costs

Software and applications:
We will be using free and open-source software and applications to develop this, as mentioned above. Hence there won't be any costs incurred.

Hardware:
There won't be any additional hardware costs as there isn't a necessity for such equipment.

Utility costs:
The team will be using their personal routers and internet connections. There will be an increase in data usage but it will be manageable.

2.2.2 Income

- The final selling price of a book that will be displayed in the website will be the selling price stated by the Seller plus an additional 15 percent of the stated price.

- Buyers are required to pay the full amount of the item displayed. This amount is charged only after a customer confirms the purchase of a book.
- There will be an additional cost on delivery for customers who request the books to be delivered.
- Else if customer chooses courier method as the delivery option, courier fees will be calculated and displayed according to the number of books on the shopping cart.

Ultimately, the income from the system outweighs the expenses of the system, which guarantee the economic feasibility of the project.

2.3 Legal and Ethical Feasibility

The system does not break any rules or regulations under the law in Sri Lanka, hence there are no legal ramifications in the system.

- Data such as contact number and email of customers are released only when approached to buy books, only with the customer's permission.
- User data will neither be sold to any third party nor used for targeted advertising from external parties.
- All assets and resources used in the system are either open source or used with the proper attribution to the original author.

Considering the above stated facts, as there are no conflicts, the system is legally and ethically feasible.

2.4 Operational Feasibility

1. This web application provides solutions for two problems. As we know, brand-new books are relatively expensive to purchase and it's not affordable at all times. Since we focus on second-hand books, the prices of the books sold will be much lower so more people can afford them. The other major problem faced by book readers is their unavailability to travel in order to purchase books especially during pandemic times like this. Through our delivery system, we aim to address this problem by delivering our customers their desired books to their doorstep.

2. Users of the system should have a basic knowledge in IT and English. They require a personal computer or a mobile phone with internet connection to access the web application.
3. Users of the system should have a basic knowledge in online payment transaction mechanisms.
4. As the users are not required to have any special training or HR resources, the system is operationally feasible.

3 REQUIREMENTS

3.1 Stakeholder Identification

This product will bring an impact and benefit on the following user groups

1. **Buyer** – Actor who purchases books from the website
2. **Seller** – Actor who sells books on the website
3. **Administrator** – Actor who performs the administrative functions of the website
4. **Delivery Person** – Actor who pickups books from the sellers and delivers to the buyers

3.2 Functional Requirements

Stakeholder	Available Features
Buyer	**Browse items** Users can scroll the homepage and view all the categorised items or they can search for items, categories etc. If an unregistered user clicks on an item he/she will be asked to log in to the system or to create a new account. **Add to cart** When a user adds books to the cart he/she can view, remove books from the add to cart page. Users can view the total price and the quantity of the items added to the cart. **Request books** Registered users can request for books by giving the title, description, name of the author etc. **Sign up as a seller** Registered users in the Colombo area can sign up as sellers to sell books by providing their NIC. The signup requests will be sent to the admin and when the admin confirms the application they can start selling books. **Change account details**

	If a user wishes to change their account details they can change their details by updating the details in the change account details page.
Seller	**View sales history** Sellers can view the history of Sales made in the past. Sellers can view the details of those sales including payment status and other details associated with the particular item that was sold. **View buyer requests** Registered users are given the ability to request for a book that they want publicly. These public requests can be viewed by the Seller. **Post advertisement** In this use case the seller posts an ad for a book where the seller is required to enter the details of the book that he wishes to sell. **View posted books** The seller can view each item that he has put up on the website for sale. Sellers can click on a particular item that has been put on the website and view the details of the post that has been made which can be updated or deleted upon discretion.
Admin	**Check complaints from the users** Admin can receive complaints from the registered users **Manage users** In this function admin can create a user. The admin will input the necessary details for the user and create the new user of the system. Admin can also view existing details of any user. Furthermore, the admin has the ability to remove any users of the system. **Manage books** The admin can manage the books on the system and perform create, update, read and delete operations on books. **View seller application** When buyers want to gain access to be able to sell their own books, they need to register as a verified seller. For this, they will send an

	official request to the admin. The admin then will decide whether the details are valid and then either accept or reject the application.
Delivery Person	**View buyer and seller contact details** Delivery person can view the contact details and contact buyer and seller **View pending deliveries** Admin can assign a task to delivery person and the delivery person can view all the pending deliveries **View pending pickups** Delivery person can view the books from sellers that has to be picked up **Update pickup** When a delivery person completes a pickup he can update the pickup table **Update delivery** When a delivery is done successfully delivery person can update the delivery status

Table 1. Functional Requirements

3.3 Quality Attributes

3.3.1 Performance

Source	User
Stimulus	Requesting Webpage
Environment	Normal Execution
Artefact	Requested Web Page
Response	To increase the performance, we will be using a minimal amount of JavaScript and CSS code such that the performance is upheld and also the usability of the system is not compromised. Browser caching will also be made use of to increase load times and reduce no of requests made to servers. These will only make use when it is suitable and not made use of when it is not a suitable situation such as users logging out
Response measure	Average time taken to load requested web pages in the user's web browser.

Table 2. Quality Attributes - Performance

3.3.2 Security

Source	Malicious User
Stimulus	Gaining access to Database
Environment	Normal Execution
Artefact	Database
Response	Sensitive information of all users such as passwords will be hashed using SHA-256 Hashing algorithm. Each user’s password will be appended to a salt value which will be a unique value (usually) such that even if two users have the same password, the

	hashed value will be different. Therefore, a malicious user will not even know if two people have the same password.
Response measure	Amount of sensitive information a malicious user who has gained access to the database can retrieve.

Table 3. Quality Attributes - Security

Source	User (General)
Stimulus	Any request to the web server or any response from the web server with sensitive information.
Environment	Normal Execution
Artefact	Request body, Response body
Response	Using HTTPS protocols for transfer of data between server and client when exchanging sensitive information. HTTPS protocol will provide an encryption facility which will provide an extra layer of security to data moving through the internet and protect it from malicious actors on the internet trying to intercept them.
Response measure	Amount of sensitive information a malicious actor in the internet can retrieve from a request body or response body.

Table 4. Quality Attributes - Security

3.3.3 Usability

Source	User (General)
Stimulus	User's interface
Environment	Normal Execution
Artefact	Webpages

Response	Users in general will access web pages from a range of devices. Unlike the past a fixed webpage layout will not be suitable for viewing in these many devices. So, we use CSS flexbox and grid functionalities to make them responsive to many screen sizes such that the content of the page is clearly visible to the user and the presentation of the content will not hinder the user's ability to execute his functionality in the system.
Response measure	Ease of use of webpage across many devices

Table 5. Quality Attributes - Usability

3.3.4 Modifiability

Source	Developer, Software Engineer
Stimulus	Changing of source code of application
Environment	Development environment
Artefact	Source code of the application
Response	Organising the source code in modules such that it is easy to understand the structure of the application. Also Abstracting lengthy functions into separate modules such that code is more concise. Also abstracting helps in making changes to those parts. Then when we make a change, we can only make it at one part and the change will be effective across all components that use it. Else we would have to make changes at several parts and more possibility for irregularities across the changes made at different parts.
Response measure	Ease for developers to make changes to the system's source code

Table 6. Quality Attributes - Modifiability

4 USE CASE DIAGRAMS

4.1 Complete Use Case Diagram

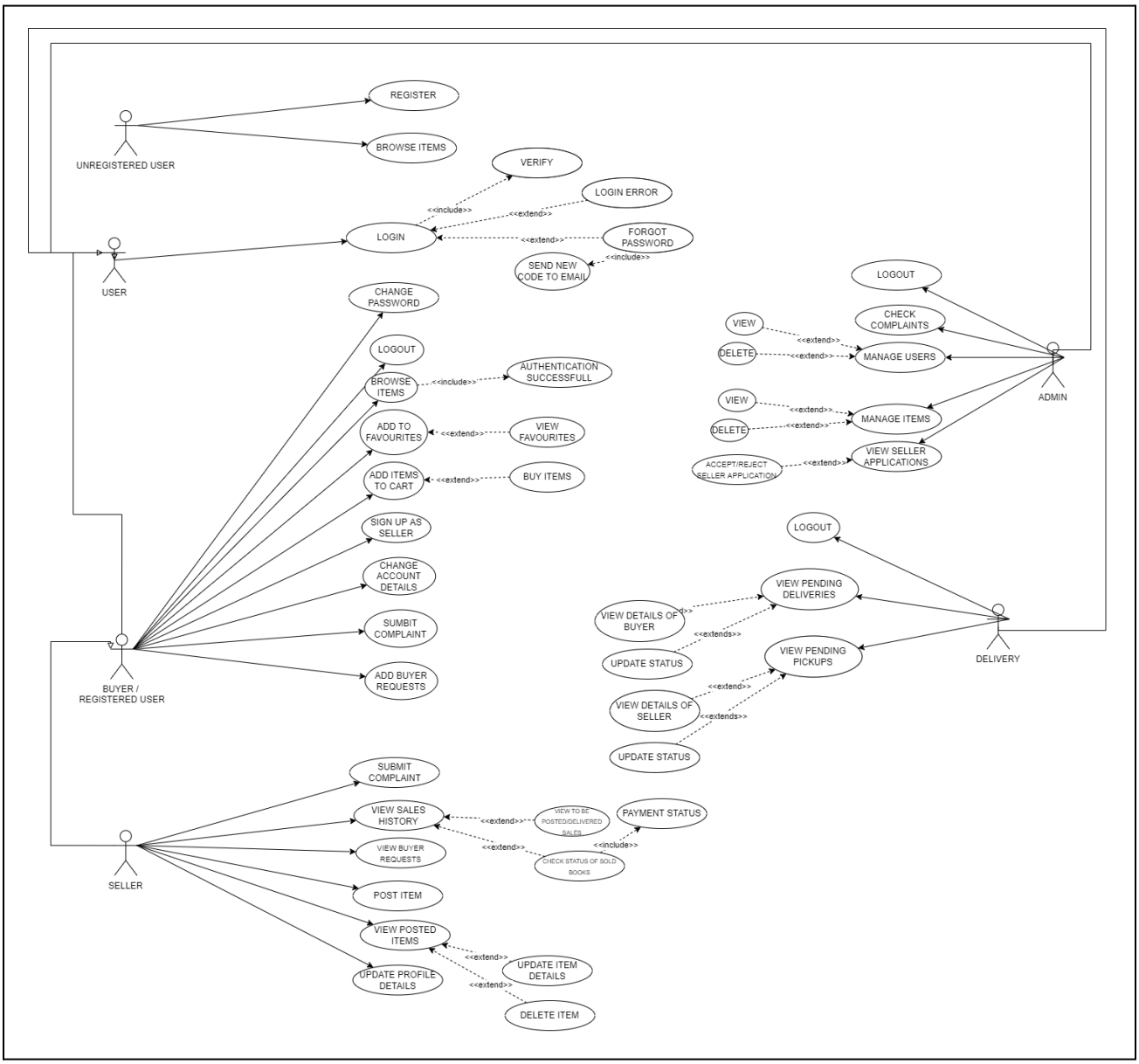


Figure 1. Complete Use case

4.2. Buyer

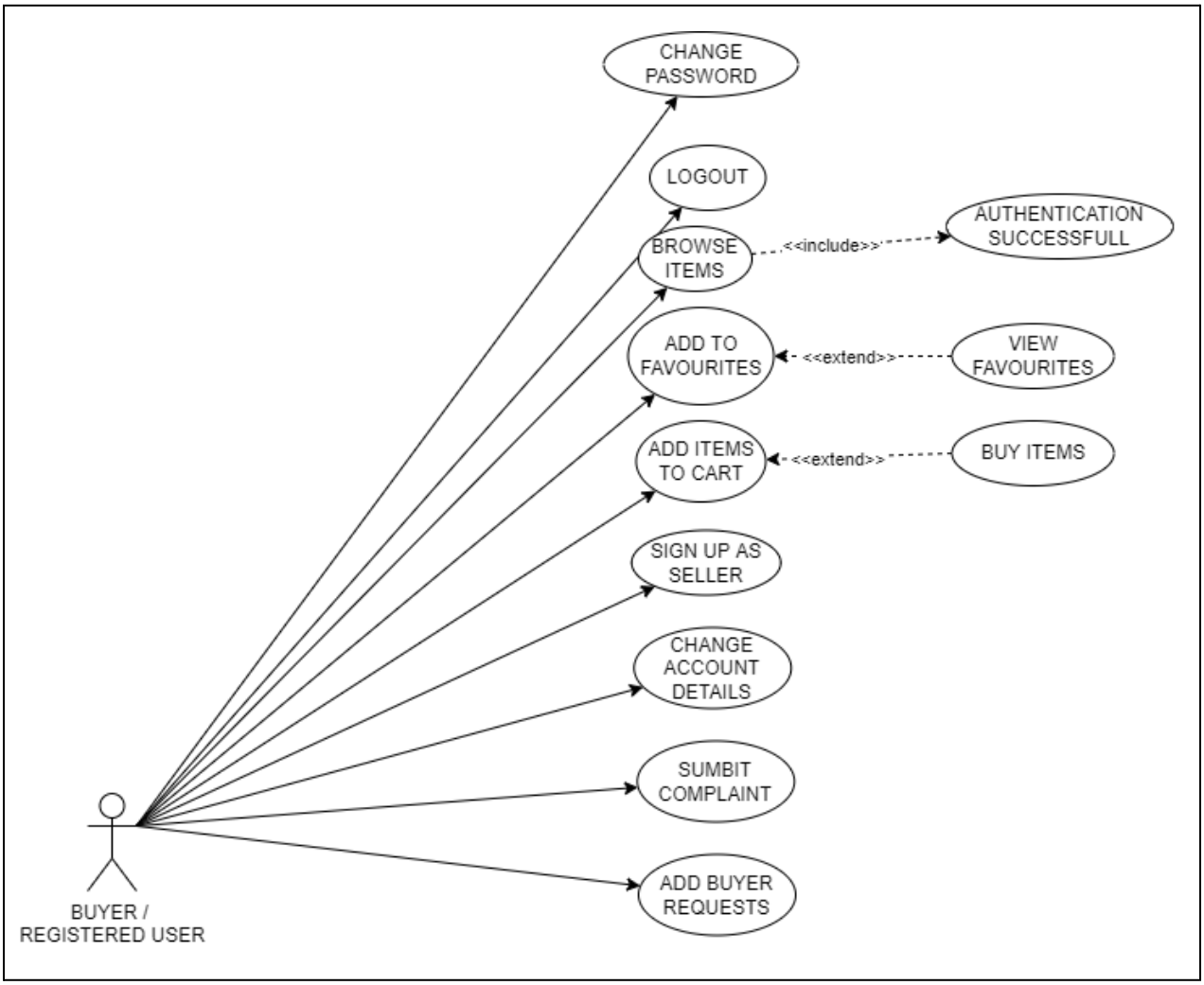


Figure 2. Buyer Use Case

4.3 Seller

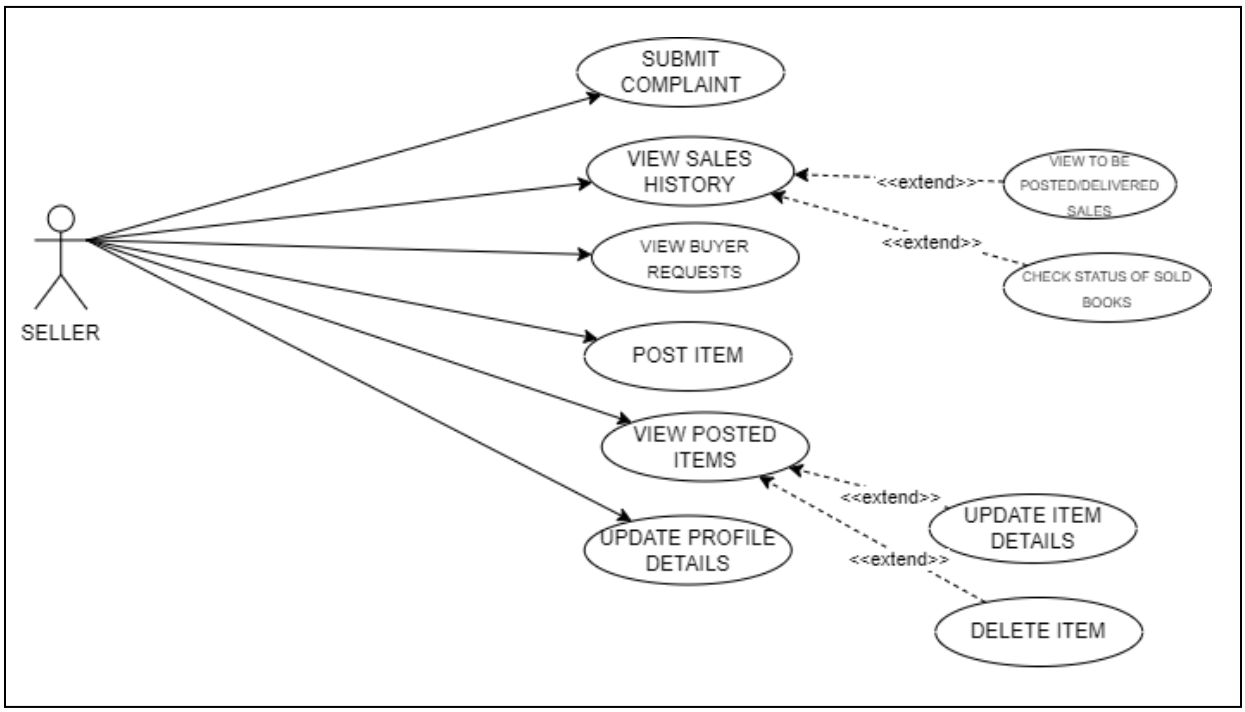


Figure 3. Seller Use case

4.4 Delivery Person

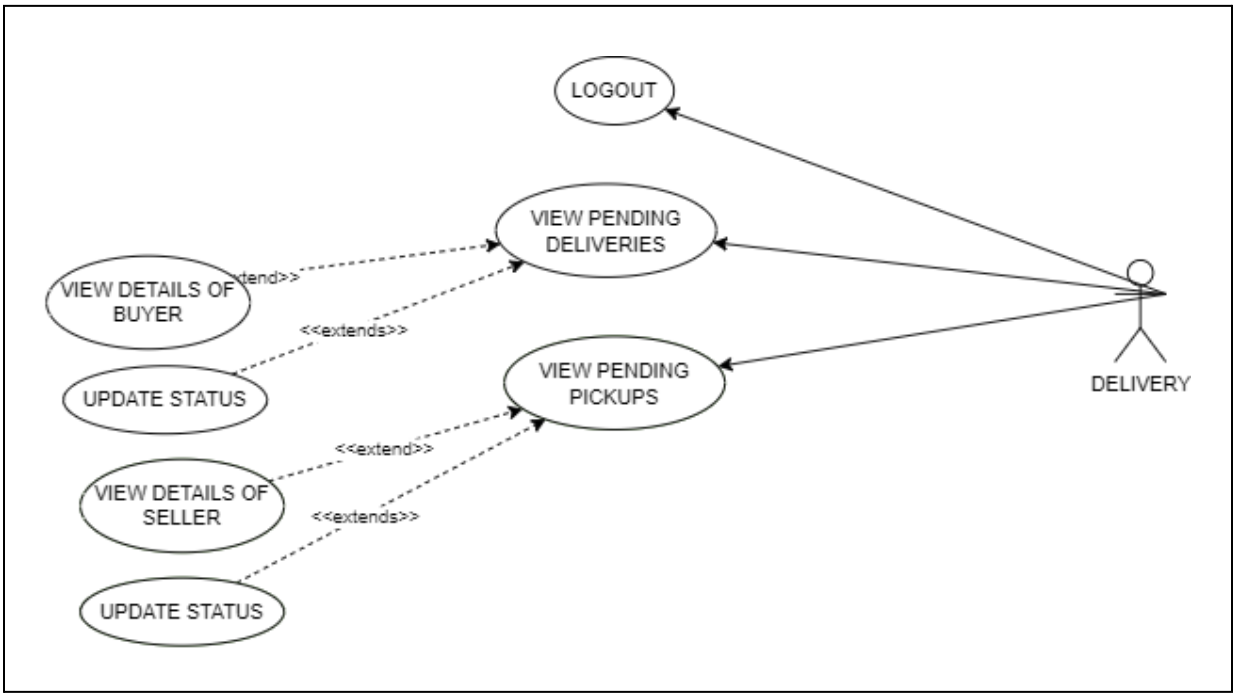


Figure 4. Deliver Person Use Case

4.5 Admin

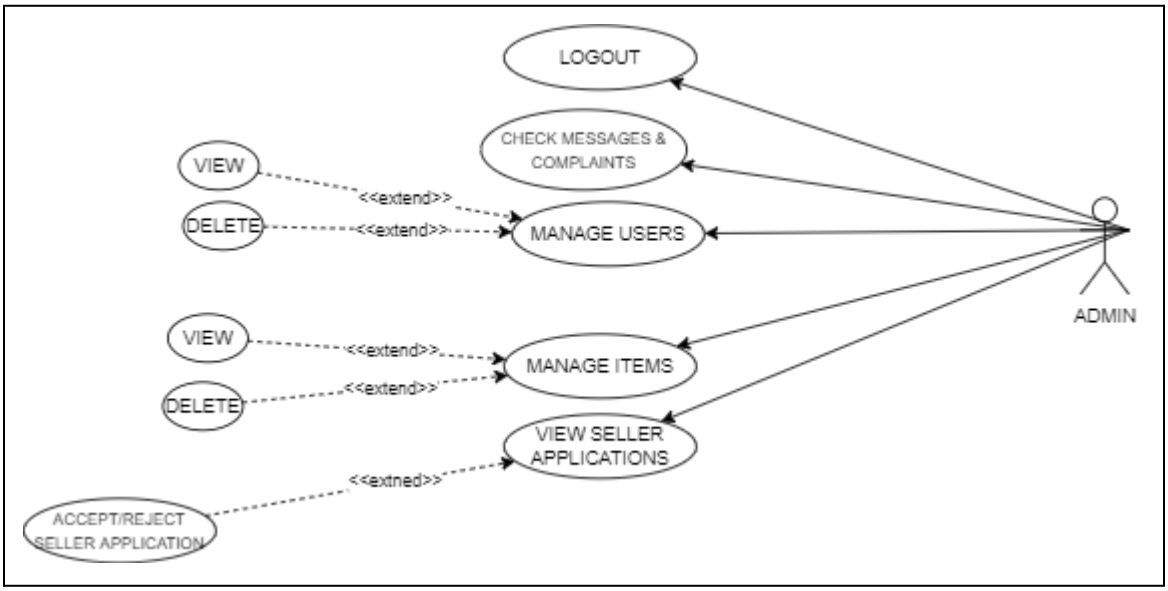


Figure 5. Admin Use Case

5 USE CASE NARRATIVES

5.1 Buyer

Use Case	Browse items
Summary	User browses the items
Actors	Unregistered user/ Registered user
Pre-Conditions	User has to go to the site link
Main Flow	Users can scroll the homepage and view all the categorised items or they can search for items, categories etc If and unregistered user clicks on an item he/she will be asked to logged in to the system or to create a new account
Exceptions	No exceptions
Post-Conditions	

Table 7. Buyer: Browse Items (Use Case)

Use Case	Add to cart
Summary	Registered users can click on item and add them to cart
Actors	Registered user
Pre-Conditions	User has to be logged in to the system
Main Flow	Users can add items to cart and later buy them. When buying items users can choose a payment method and proceed.
Exceptions	If two users tried to add the same item to the cart it would cause a problem. Therefore, to avoid such an issue the second user who

	adds the item will see a loading spinner saying 'Adding item to the cart'. If the first user purchased the item the system will display the message to the second user that the item has already been purchased. But if the first user removes that item from the cart the second user can proceed.
Post-Conditions	Once they purchase the items it will be added to their order list.

Table 8. Buyer: Add to Cart (Use Case)

Use Case	Buyer change account details
Summary	Buyer can change their account details name, address etc
Actors	Buyer (Registered user)
Pre-Conditions	User has to be logged in
Main Flow	Registered users have to go to profile and click on edit profile details. He/she can view current details and make changes to them and save it.
Exceptions	
Post-Conditions	Their details will be updated in the database

Table 9. Buyer: Change account details (Use Case)

Use Case	Request items
Summary	Registered users can request for items
Actors	Registered users
Pre-Conditions	User has to be logged in

Main Flow	Registered users can request items by giving the title, description, cover image etc. Then they can publish the request.
Exceptions	
Post-Conditions	New requests will be sent as a notification to sellers.

Table 10. Buyer: Request Items (Use Case)

Use Case	Sign up as a seller
Summary	Buyer can register as a seller
Actors	Registered users
Pre-Conditions	User has to be logged in
Main Flow	Buyer can go to the account settings and click on sign up as seller and fill the required details and submit it to the admin.
Exceptions	
Post-Conditions	Admin will check the details and decide whether to approve them as a seller or not. If they're approved as sellers, they will be notified.

Table 11. Buyer: Sign up as Seller (Use Case)

5.2 Seller

Use Case	Logout
Summary	User Logs out of the System
Actors	Registered User / Buyer, Seller
Pre-Conditions	User has to be Logged In

Main Flow	This is the way that the Registered User who is only a Buyer or a user who is both a Buyer and a Seller Logs out of the System
Exceptions	No exceptions
Post-Conditions	The user is now logged out of the system and cannot perform actions exclusive to registered users. Now treated as unregistered.

Table 12. Seller: Logout (Use Case)

Use Case	View Sales History
Summary	Seller can view details of past Sales
Actors	Seller
Pre-Conditions	Seller is logged in
Main Flow	Sellers can view the history of Sales made in the past. Sellers can view the details of those sales including payment status and other details associated with the particular item that was sold.
Exceptions	No exceptions.
Post-Conditions	

Table 13. Seller: View Sales History (Use Case)

Use Case	View Buyer requests
Summary	Seller can view Buyer Requests
Actors	Seller
Pre-Conditions	Seller has to be logged in
Main Flow	Registered User / Buyers are given the ability to post wanted ads for a book that they want

	publicly. These public requests can be viewed by the Seller and the Seller can then direct the Buyer towards an already existing Advertisement on the website or post the item matching the buyers request and then allow the buyer to buy the product from the said seller by visiting the Advertisement
Exceptions	No exceptions.
Post-Conditions	If a response was sent by a Seller, then the User which placed the request will be able to view it

Table 14. Seller: View Buyer Requests (Use Case)

Use Case	Post Item
Summary	Seller posts new Item for sale
Actors	Seller
Pre-Conditions	Seller has to be logged in
Main Flow	In this use case the seller posts an ad for a book. The seller is required to enter the details of the book that he wishes to sell. Once the details are entered the system will check for any faults in the input and then if everything is validated it will update the database accordingly and start to display the new item in the website.
Exceptions	No exceptions
Post-Conditions	The newly added item will be visible for Buyers to purchase

Table 15. Seller: Post Book (Use Case)

Use Case	View Posted items

Summary	Seller views and updates posted items on the system
Actors	Seller
Pre-Conditions	Seller should have posted at least one item
Main Flow	In this use case the seller can view each item that he has put up on the website for sale. Sellers can click on a particular item that has been put on the website and view the details of the post that has been made. Furthermore, he can update details with regard to the post and also he can delete a post. When updating a post, the details of the update will be saved on the database of the system. In the case of a delete the system will change the mode of the posted item such that it will hereafter not be visible to the public
Exceptions	No exceptions
Post-Conditions	If updates or deletes were executed necessary changes will be done in the database.

Table 16. Seller: View Posted Items (Use Case)

Use Case	Update profile details
Summary	Seller updates profile details
Actors	Seller
Pre-Conditions	Seller is logged in
Main Flow	In this use case the seller can update his profile details with regard to his seller account. Seller inputs updated account details and submits. The system will then check for any errors in the input and then update the profile.

Exceptions	No exceptions
Post-Conditions	Seller's profile details will be updated if there are no errors.

Table 17. Seller: Update Profile (Use Case)

5.3 Delivery Person

Use Case	Login
Summary	The delivery persons in the system can enter the system and can deliver books.
Actors	Delivery Person
Pre-Conditions	Must have an account created by admin.
Main Flow	Each delivery person is separated by username and password. If they're incorrect, display an error message on the screen that the password is incorrect. If the password and username are correct and the verification is successful, the delivery person can log to the system and can see their home page.
Exceptions	Only the delivery person who has been registered by admin, can log to the system by using a valid username and password.
Post-Conditions	After successful login delivery the person can access his account.

Table 18. Delivery: Login (Use Case)

Use Case	Logout

Summary	The delivery persons in the system can logout and can see the login page in the system.
Actors	Delivery Person
Pre-Conditions	Should have logged in to the system.
Main Flow	Each delivery person can logout and after can see the login page.
Exceptions	Only delivery people who have logged in to the system can logout by clicking the logout button.
Post-Conditions	After logout from the system, return the logging page.

Table 19. Delivery: Logout (Use Case)

Use Case	View pending deliveries
Summary	The delivery person starts the delivery process.
Actors	Delivery Person, Buyer
Pre-Conditions	The delivery person should be assigned to deliver at least one book.
Main Flow	One delivery item can be selected. Then get buyer details (Address, P NO and more). Notice that delivery has begun by contacting. If the delivery person is able to find the location, return the book to the buyer and get evidence, if not, it returns to the store.
Exceptions	Delivery person can only get customer details if he has assigned an order.
Post-Conditions	After delivering books, buyers can get buyers' evidence.

Table 20. Delivery: View Pending Deliveries (Use Case)

Use Case	View pending pickups
Summary	The delivery person completes their job.
Actors	Delivery Person
Pre-Conditions	Must have started the delivery process.
Main Flow	If active in the delivery process, upload buyer evidence for returning books and submit them.
Exceptions	Delivery person can only upload evidence if the delivery process is active.
Post-Conditions	After submitting evidence, it is a successful delivery.

Table 21. Delivery: View Pending Pickups (Use Case)

5.4 Admin

Use Case	Login
Summary	Admin logs in to the system
Actors	Admin
Pre-Conditions	No preconditions
Main Flow	Admin enters the username and password for the admin user account. System will check the input for any errors and then check if the username and password is correct. If there are no errors the system will log the admin in. In the case of any errors the correct login details will be needed to be inputted
Exceptions	No exceptions

Post-Conditions	Admin is logged in if no errors and can view the Admin page

Table 22. Admin: Login (Use Case)

Use Case	Logout
Summary	Admin logs out of the system
Actors	Admin
Pre-Conditions	Admin is logged into the system
Main Flow	Admin clicks the logout button and then the user session will be ended by the system. The admin will be directed to the admin login page
Exceptions	No exceptions
Post-Conditions	Admin is logged out of the system

Table 23. Admin: Logout (Use Case)

Use Case	Check messages and complaints
Summary	Admin check messages and complaints from users
Actors	Admin
Pre-Conditions	No preconditions
Main Flow	Admin can receive messages and complaints from Users such as Buyers and Sellers. These messages will be visible in a section in the Admin's view. From here the admin can read the messages and complaints and can also reply to the messages and complaints.
Exceptions	No exceptions

Post-Conditions	If the admin replied to any messages to the user the reply will be visible to the relevant user

Table 24. Admin: Check Complaints (Use Case)

Use Case	Manage users
Summary	Admin managers users of the system
Actors	Admin
Pre-Conditions	No preconditions
Main Flow	In this use case Admin can create a user. The admin will input the necessary details for the user and create the new user of the system. Admin can also view existing details of any user. Furthermore, the admin has the ability to delete any users of the system.
Exceptions	No exceptions
Post-Conditions	The actions taken by the admin will be reflected on the system. If the admin created a user the new user can log in. If the admin deletes a specific user the user is no longer part of the system.

Table 25. Admin: Manage Users (Use Case)

Use Case	Manage items
Summary	Admin can manage books on the system
Actors	Admin
Pre-Conditions	No preconditions
Main Flow	In this use case the admin can manage the books on the system. He can perform create, update, read and delete operations on books.

Exceptions	No exceptions
Post-Conditions	If the admin created a book the book will be added for sale. If the admin updates a book those changes will be visible for users, and if deleted a book they will no longer be visible to users for buying.

Table 26. Admin: Manage Items (Use Case)

Use Case	View Seller applications
Summary	Seller accepts or rejects requests to become sellers
Actors	Admin
Pre-Conditions	There are requests from users to become sellers
Main Flow	When a buyer wants to gain access to be able to sell his own books on the system, he needs to register himself as a verified seller. For this purpose, he will send an official request to the admin for this. The admin then will decide whether the details are valid and then either accept or reject the application.
Exceptions	No exceptions
Post-Conditions	If the admin accepted the Users request to become a seller, then that user will now gain the access to sell books on the system as a verified seller.

Table 27. Admin: View Seller Applications (Use Case)

6 CLASS DIAGRAM

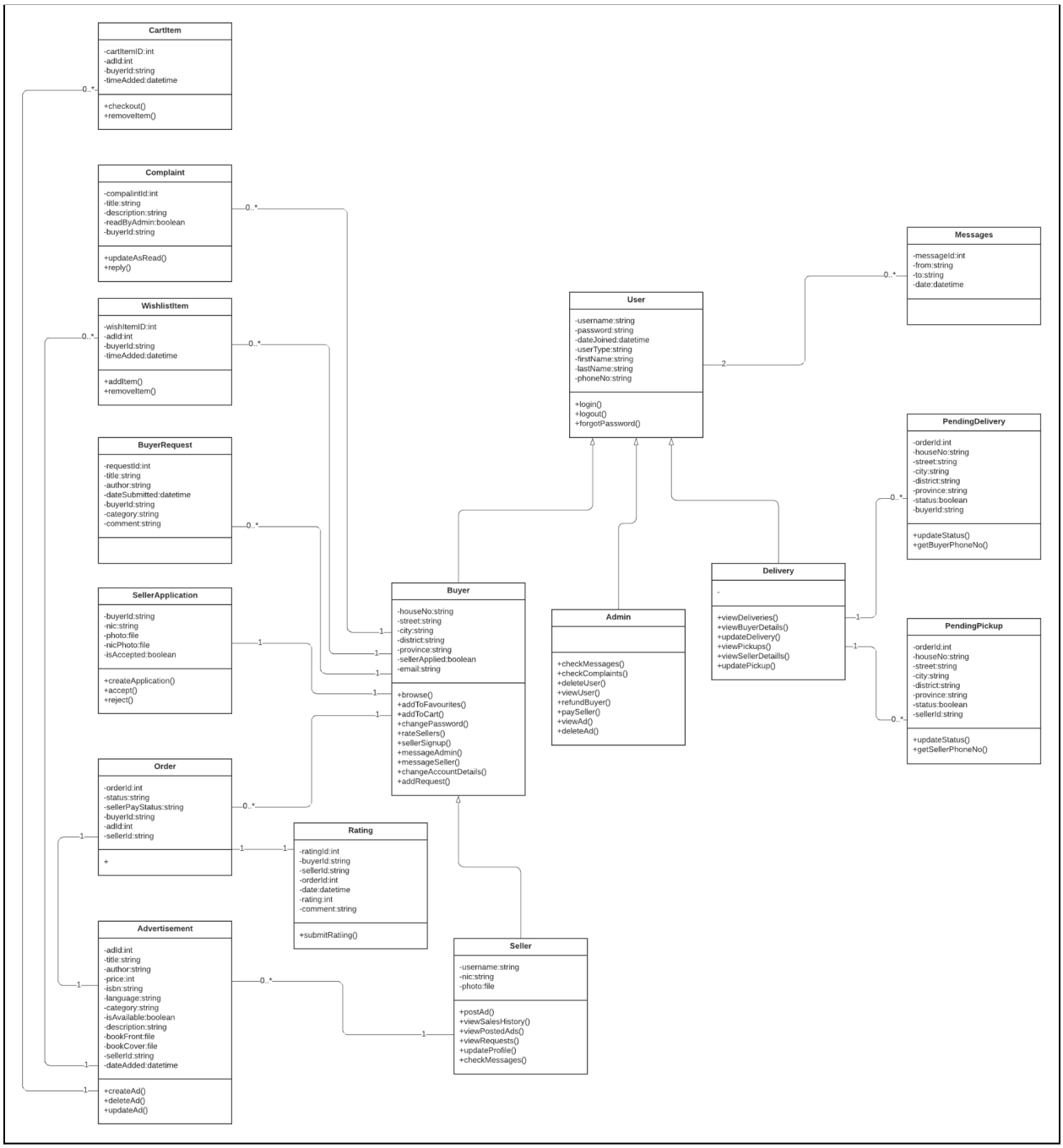


Figure 6. Class diagram

Click here for full sized image

(https://drive.google.com/file/d/1ztakbp1ZxpO98W-LgW9kqdQY7GAAynsR/view?usp=sharing)

7 ENTITY RELATIONSHIP DIAGRAM

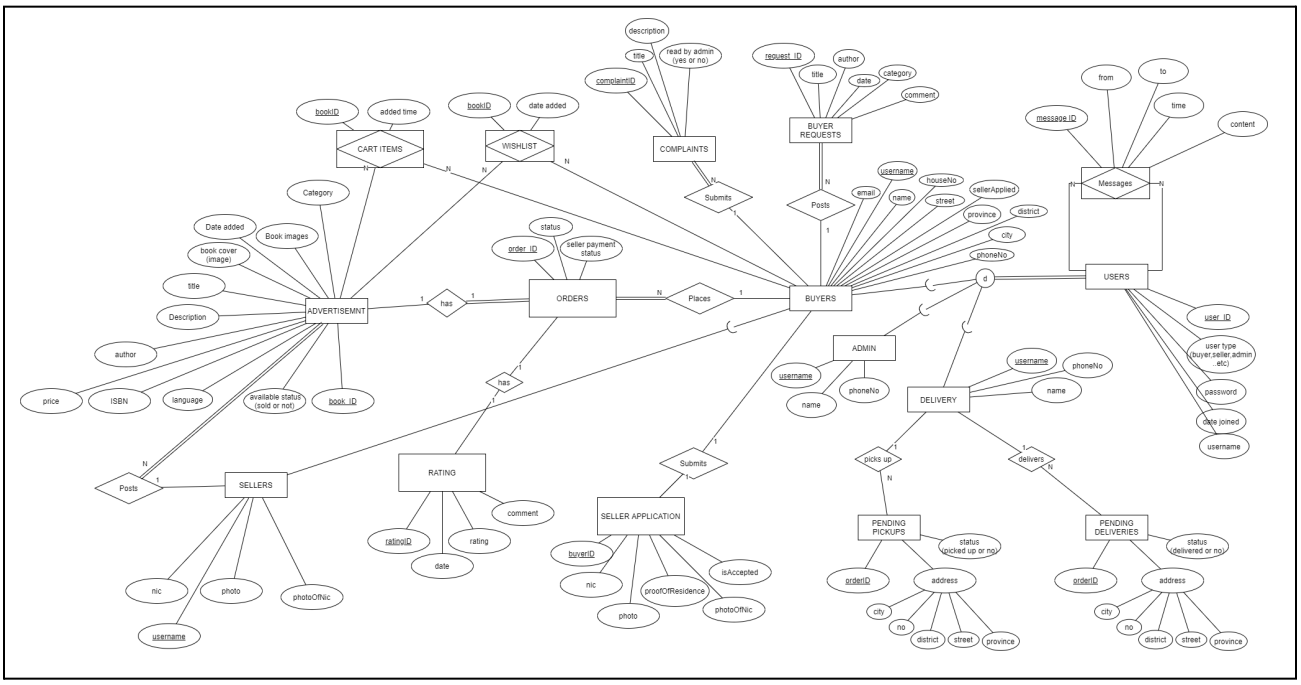


Figure 7. Entity Relationship diagram

Click here for full sized image

(https://drive.google.com/file/d/15gTlUowZ9wCRldEE1sFvLdBqzvAKb7k8/view?usp=sharing)

8 COMPONENT DIAGRAM

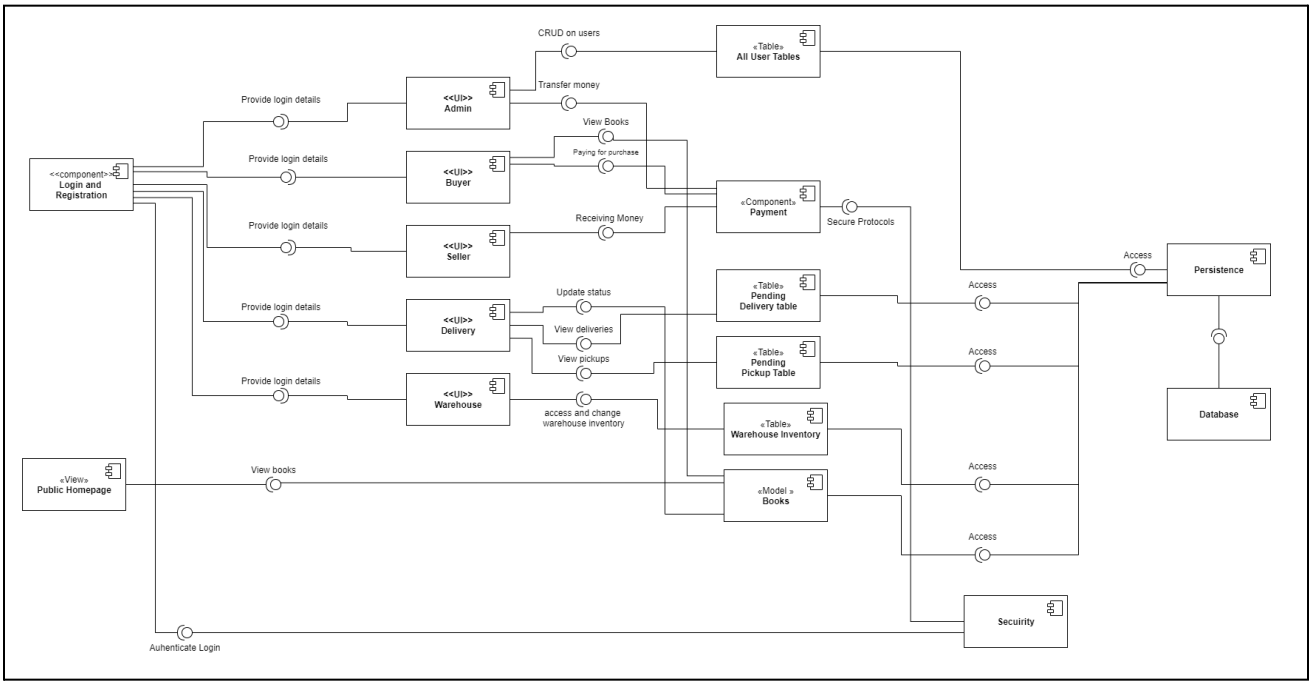


Figure 8. Component diagram

9 ACTIVITY DIAGRAMS

9.1 Buyer

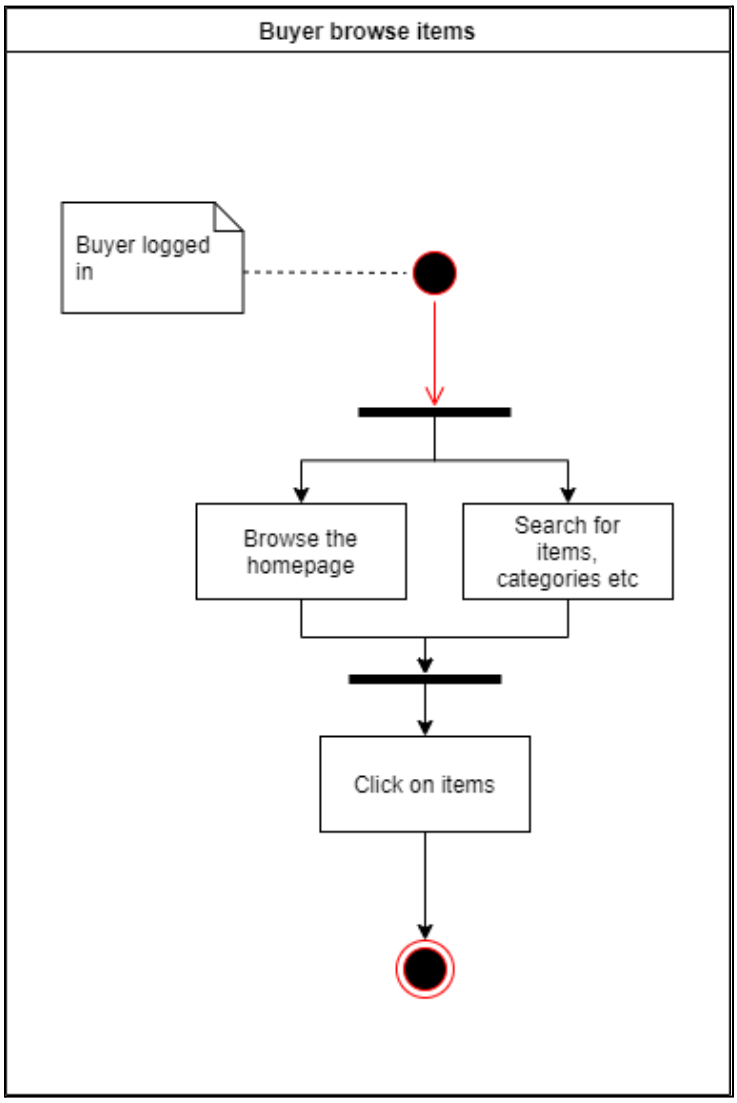


Figure 9. Buyer: Browse Items (Activity)

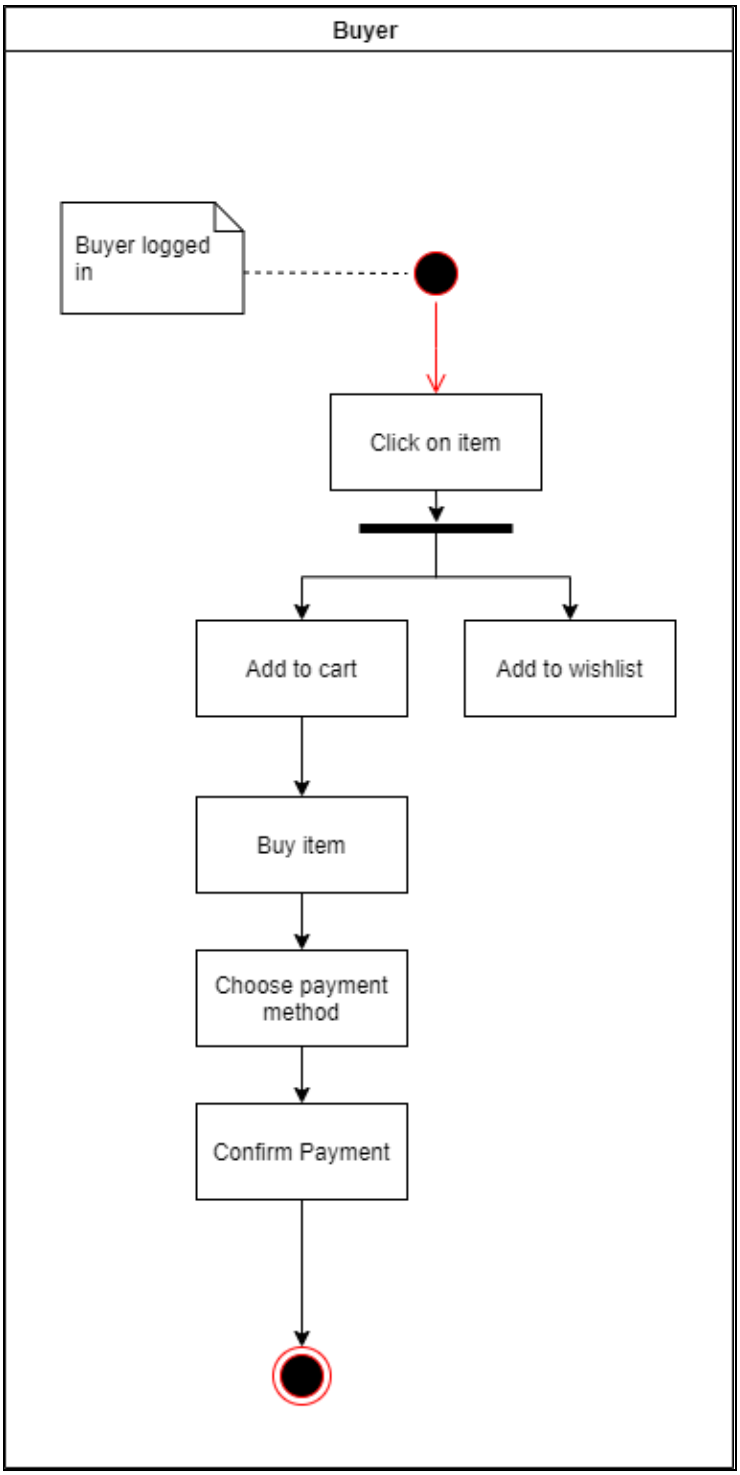


Figure 10. Buyer: Add to Cart (Activity)

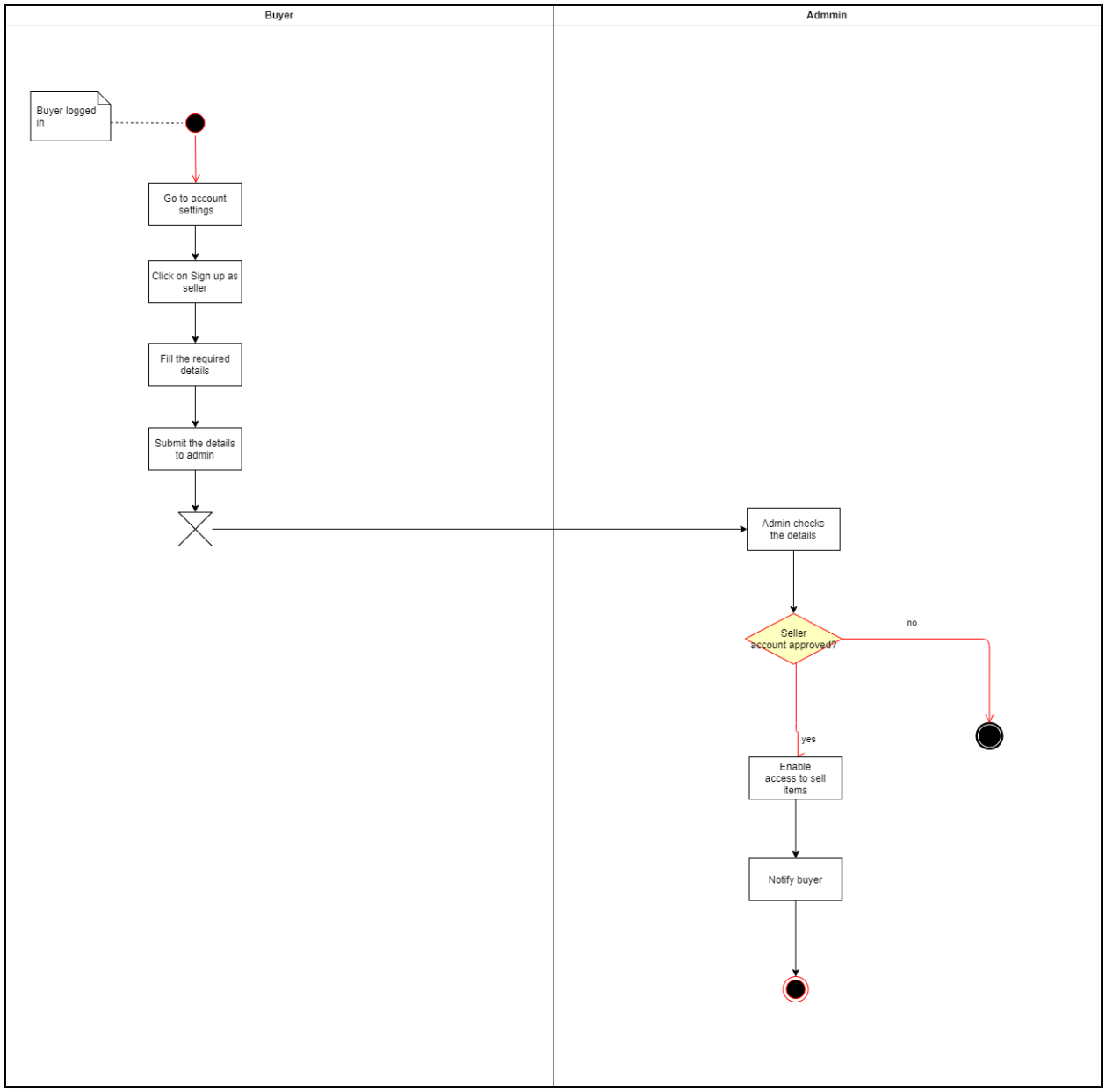


Figure 11. Buyer: Sign up as Seller (Activity)

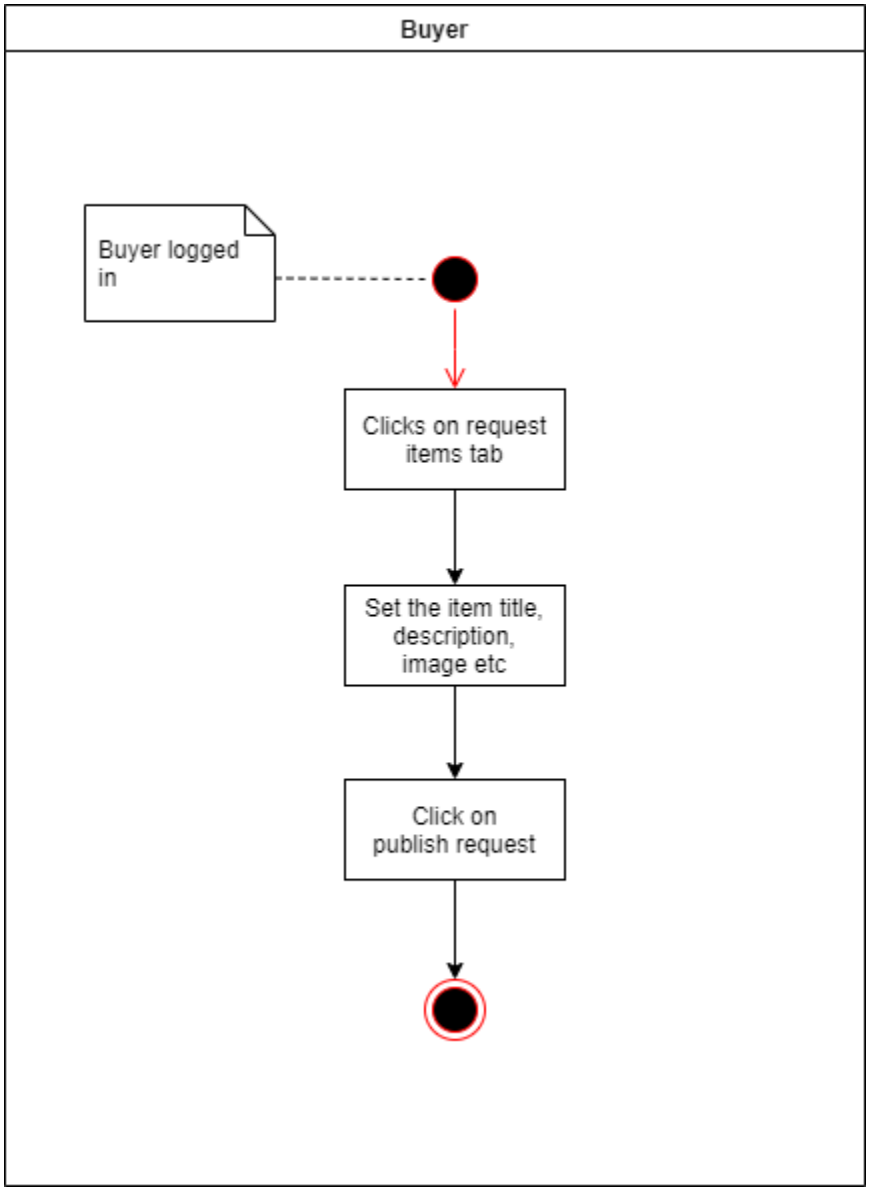


Figure 12. Buyer: Request Books (Activity)

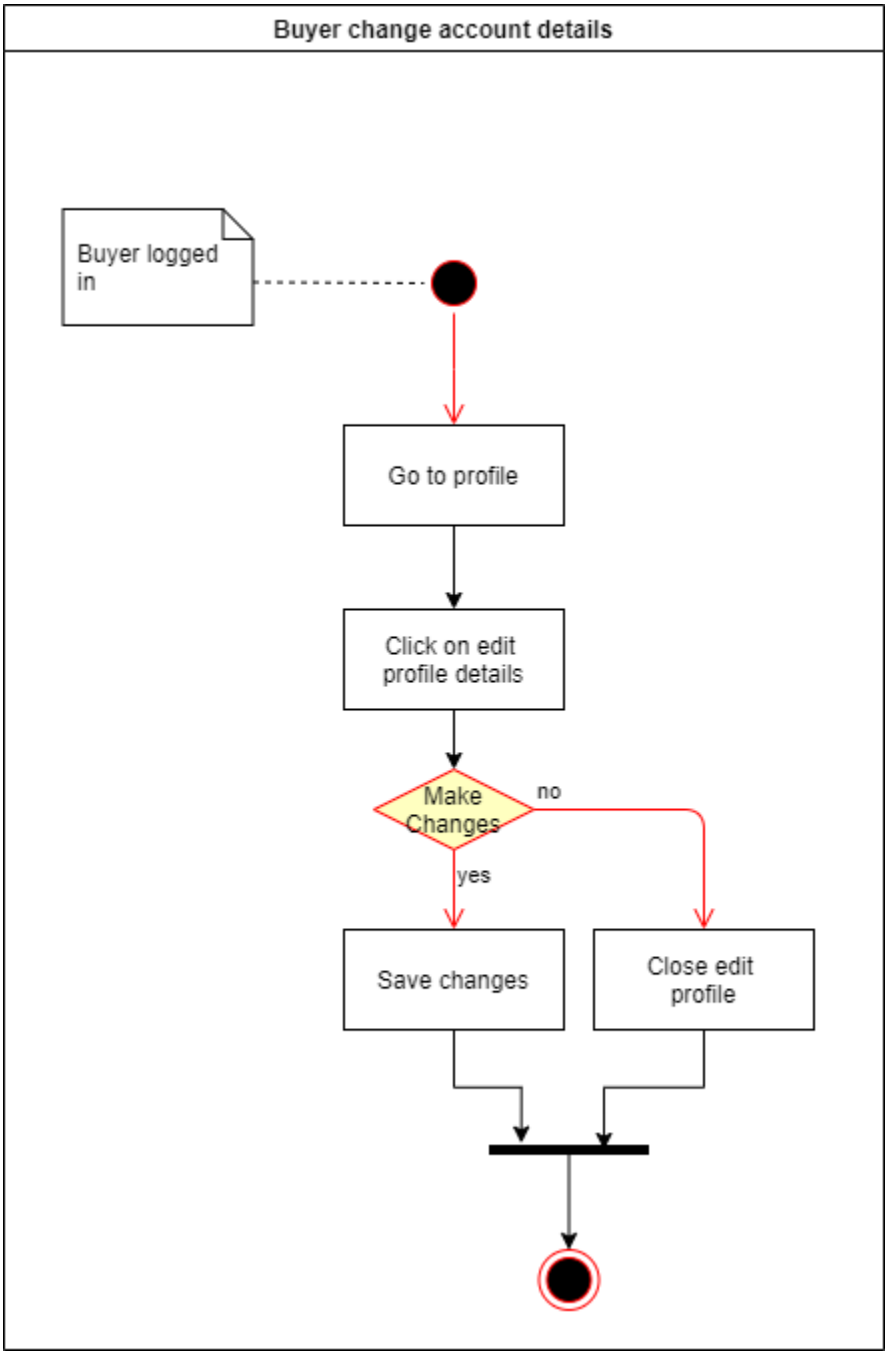


Figure 13. Buyer: Change account details (Activity)

9.2 Seller

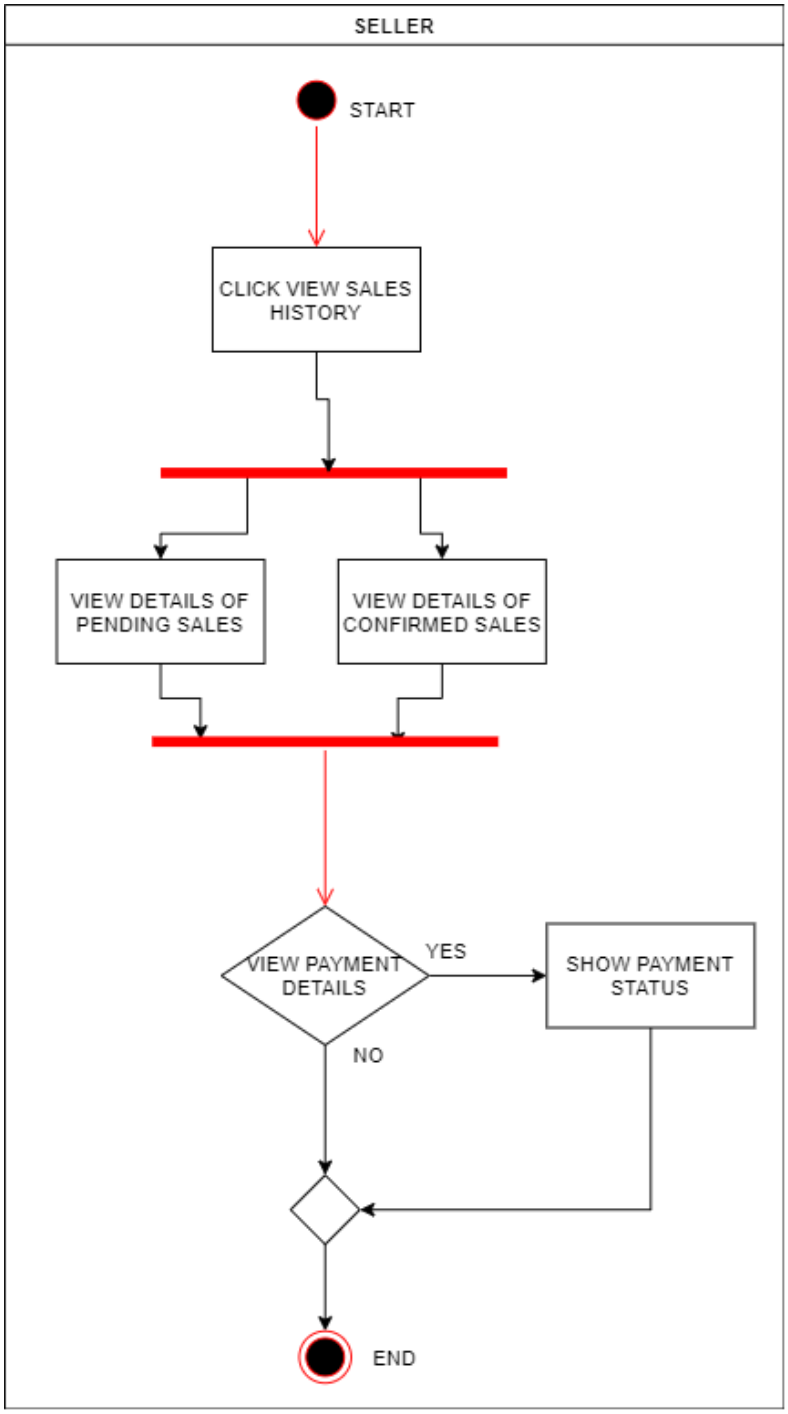


Figure 14. Seller: View Sales history (Activity)

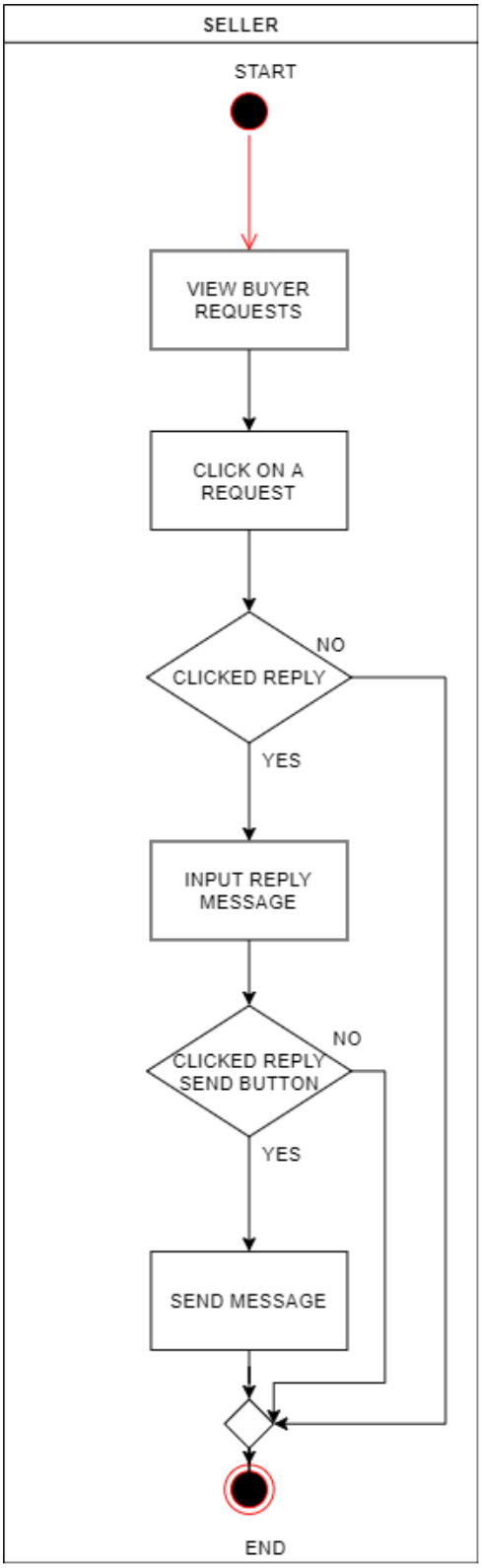


Figure 15. Seller: View Buyer requests (Activity)

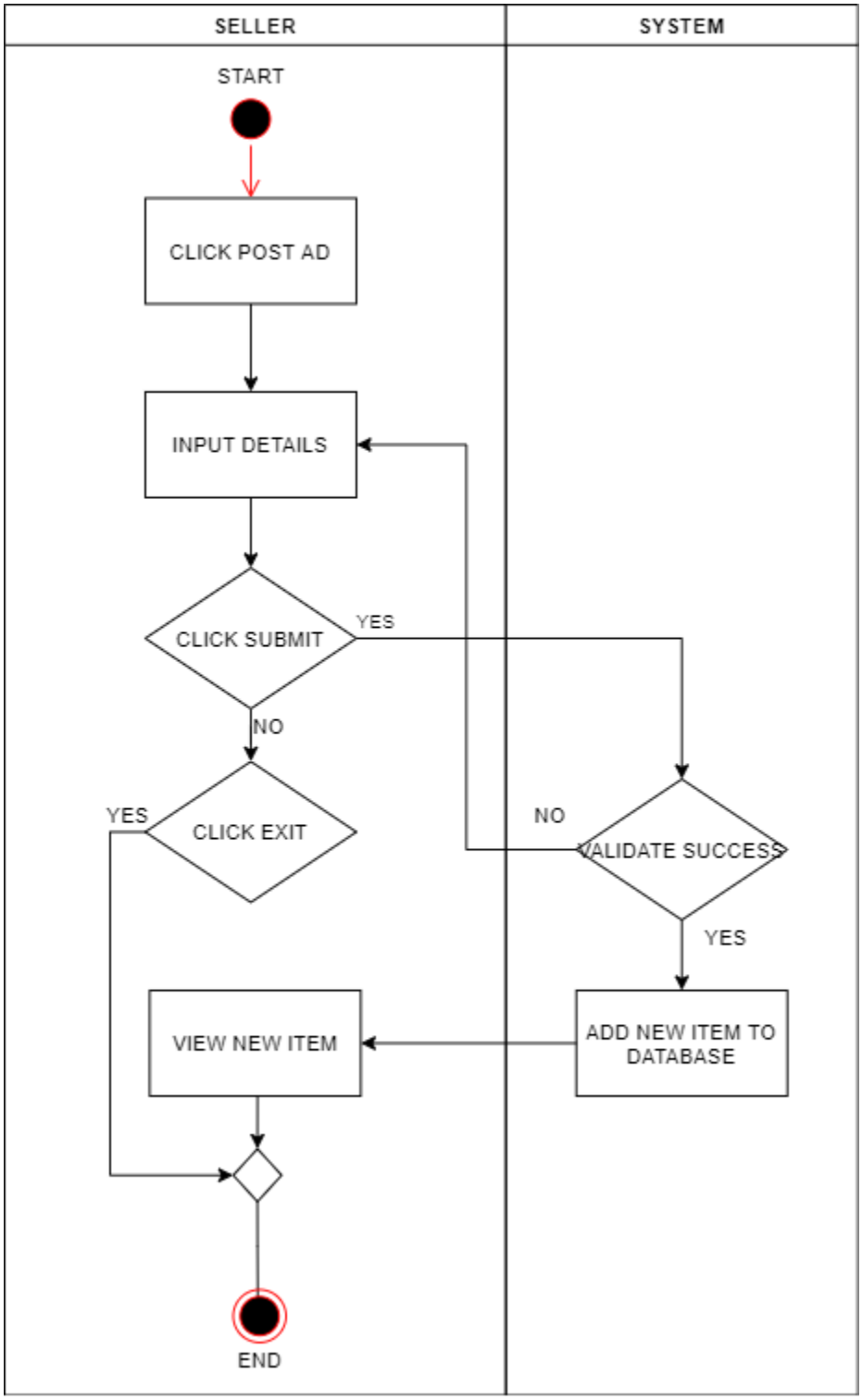


Figure 16. Seller: Post Advertisement (Activity)

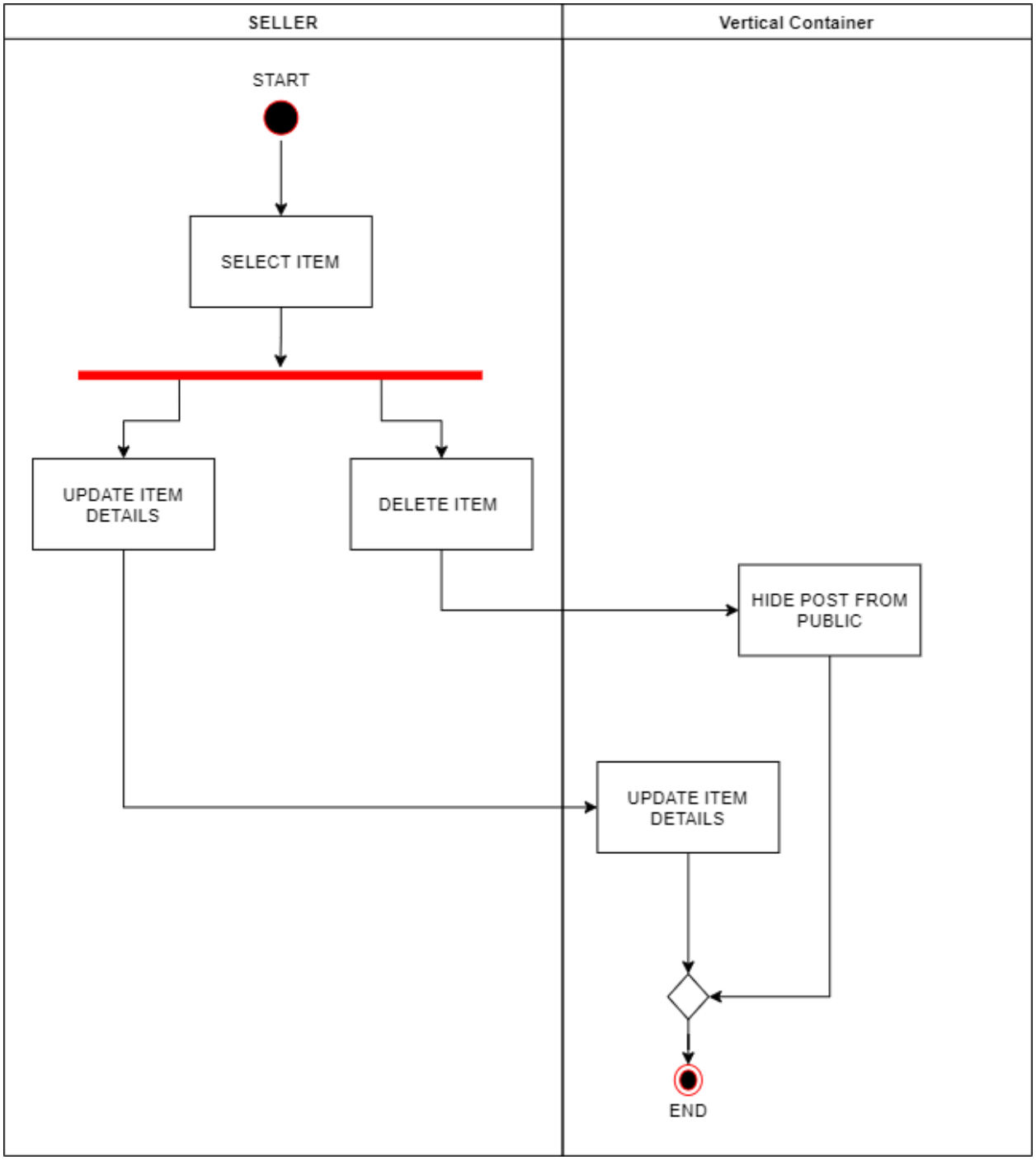


Figure 17. Seller: View Posted books (Activity)

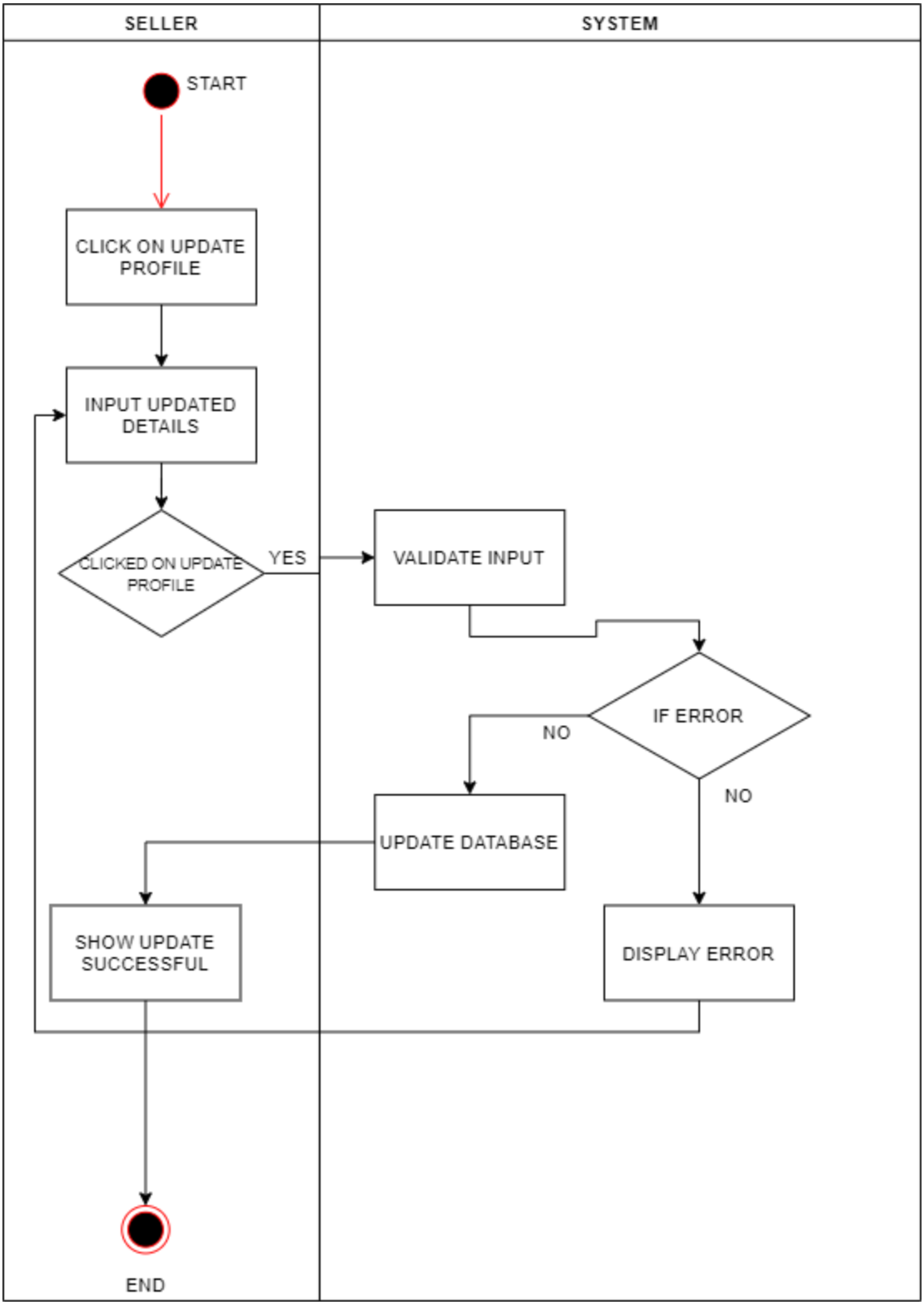


Figure 18. Seller: Update profile

9.3 Delivery Person

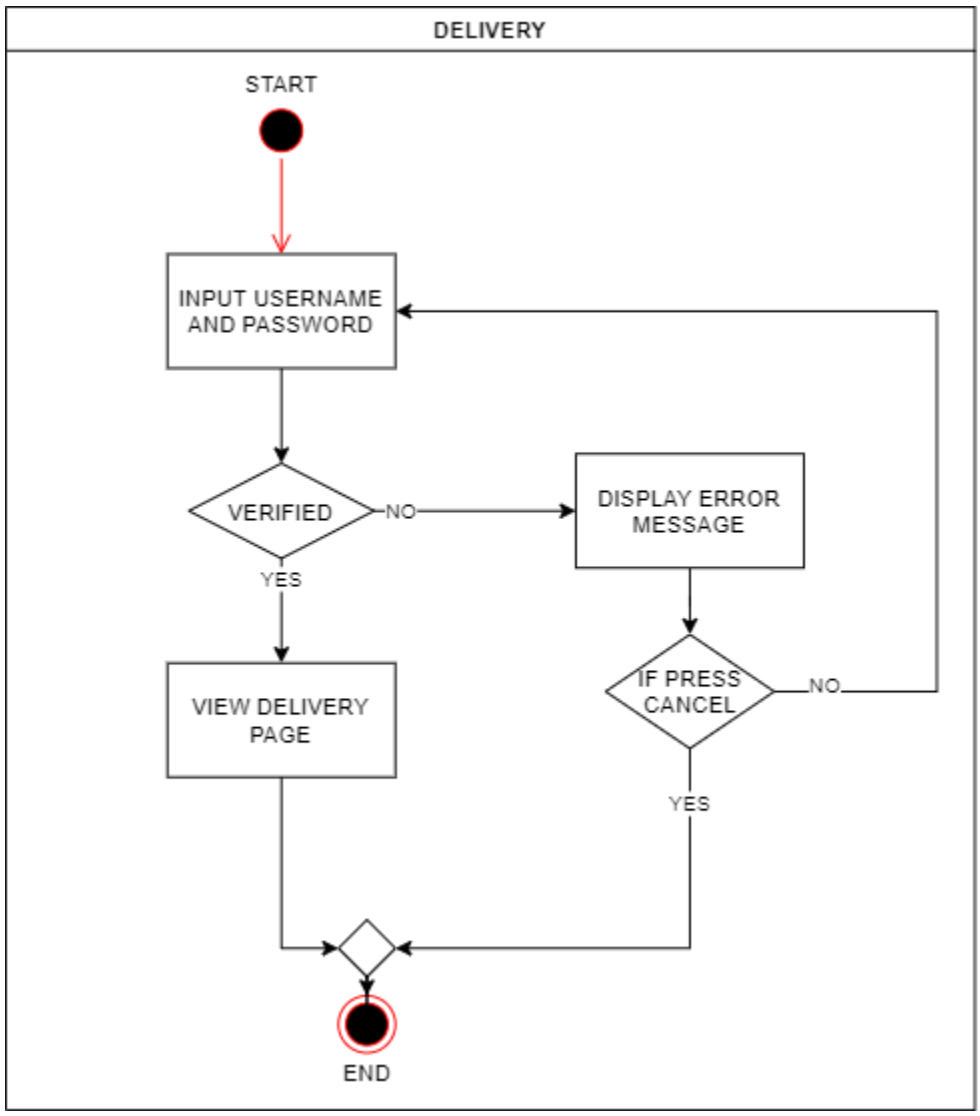


Figure 19. Delivery: Login (Activity)

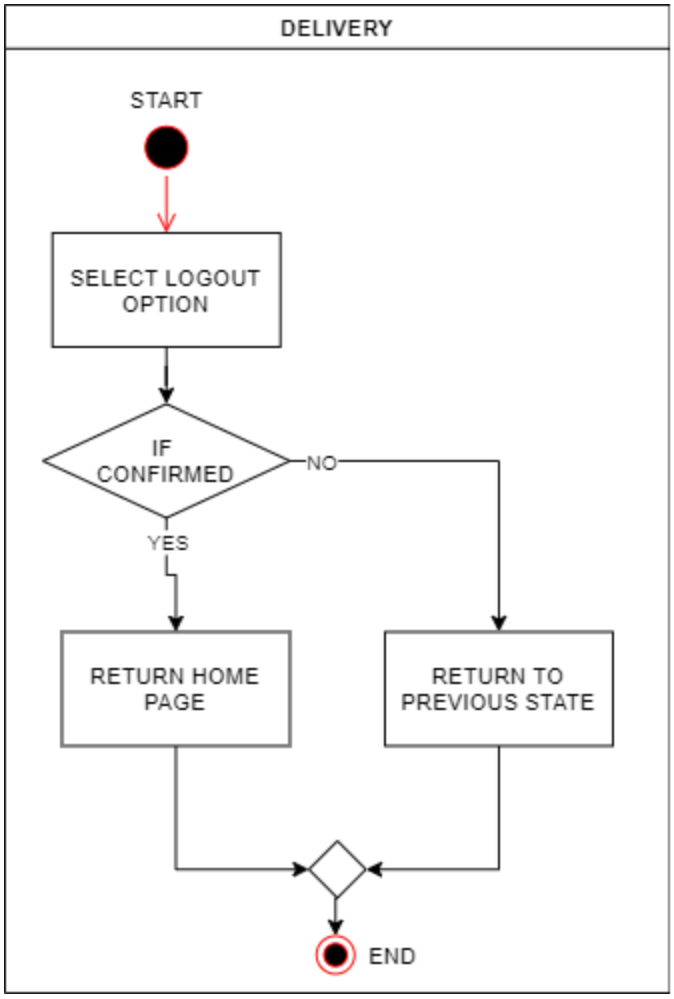


Figure 20. Delivery: Logout (Activity)

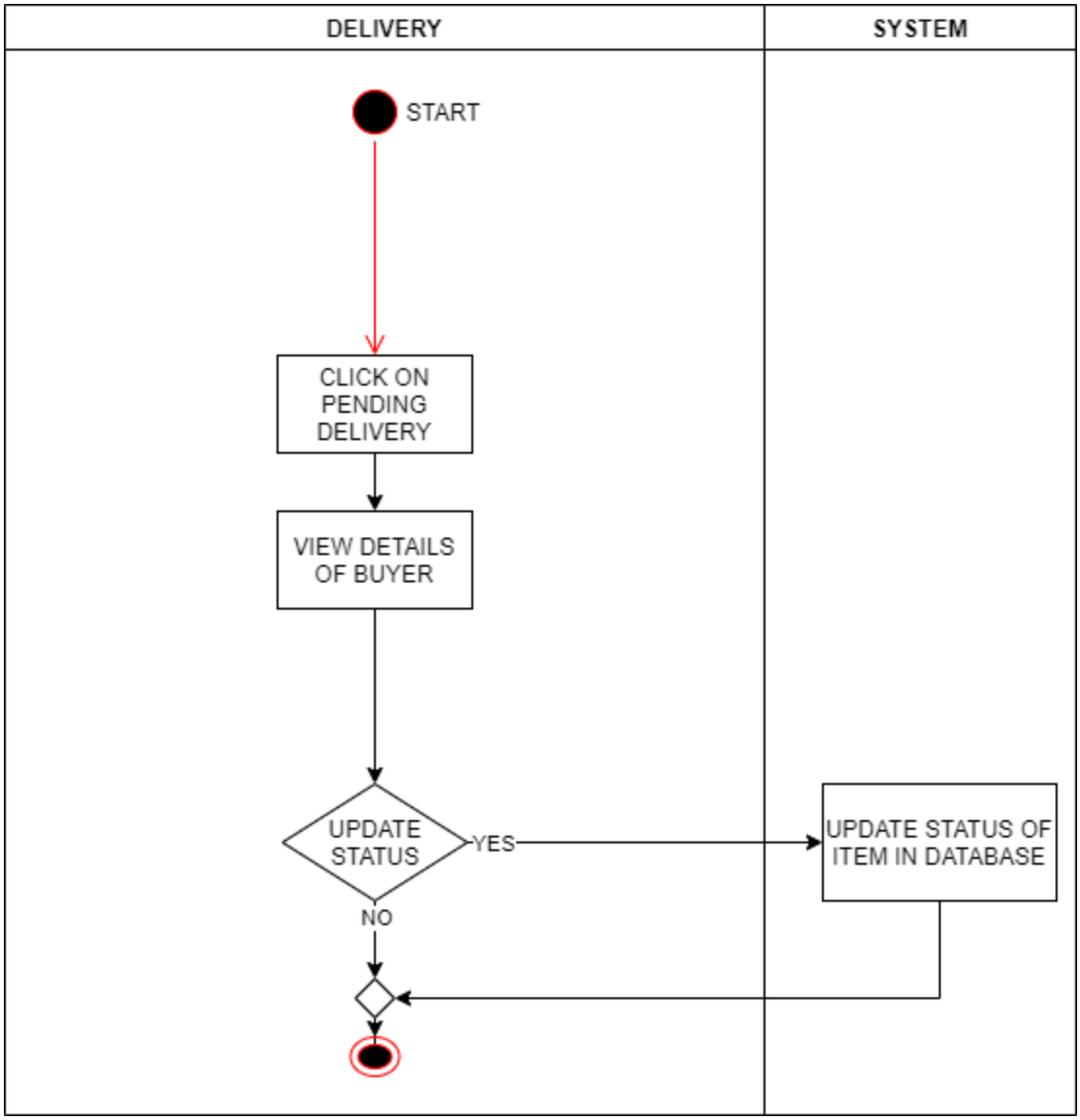


Figure 21. Delivery: View Pending delivery (Activity)

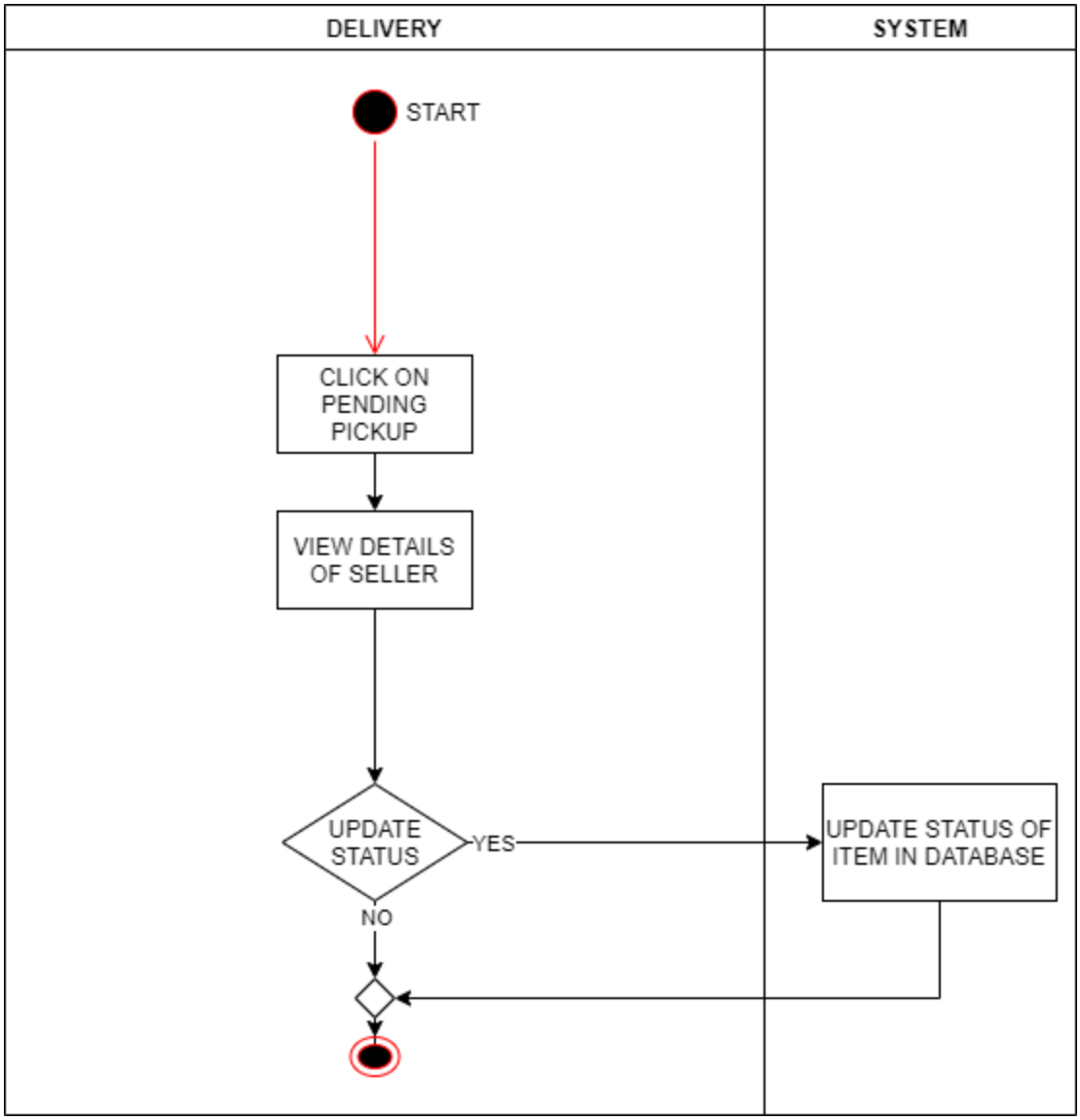


Figure 22. Delivery: View pending pickup (Activity)

9.4 Admin

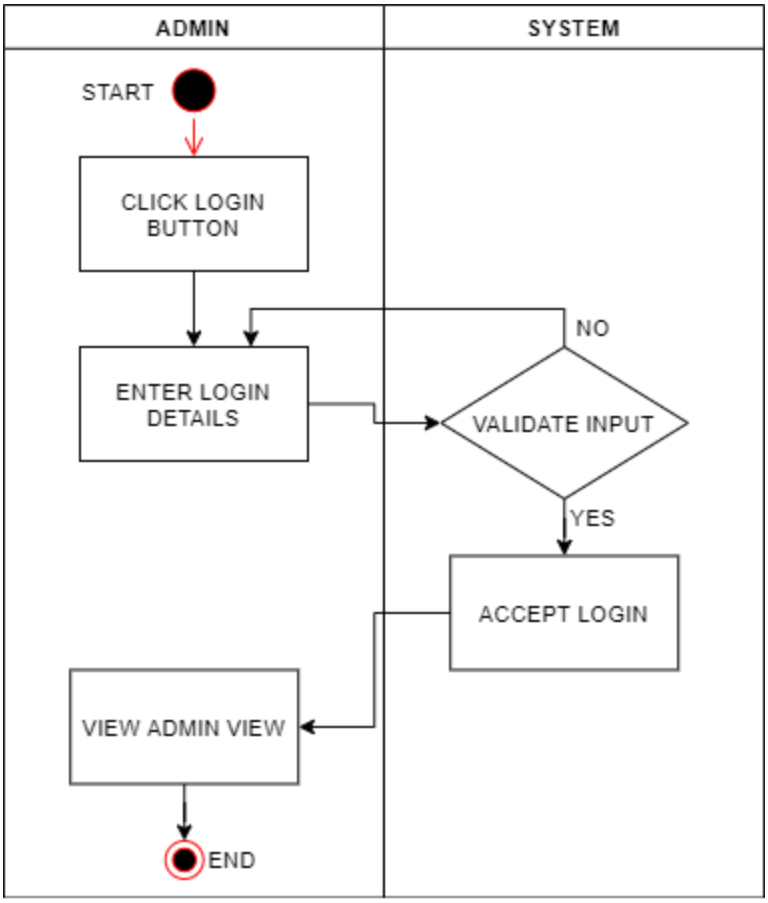


Figure 23. Admin: Login (Activity)

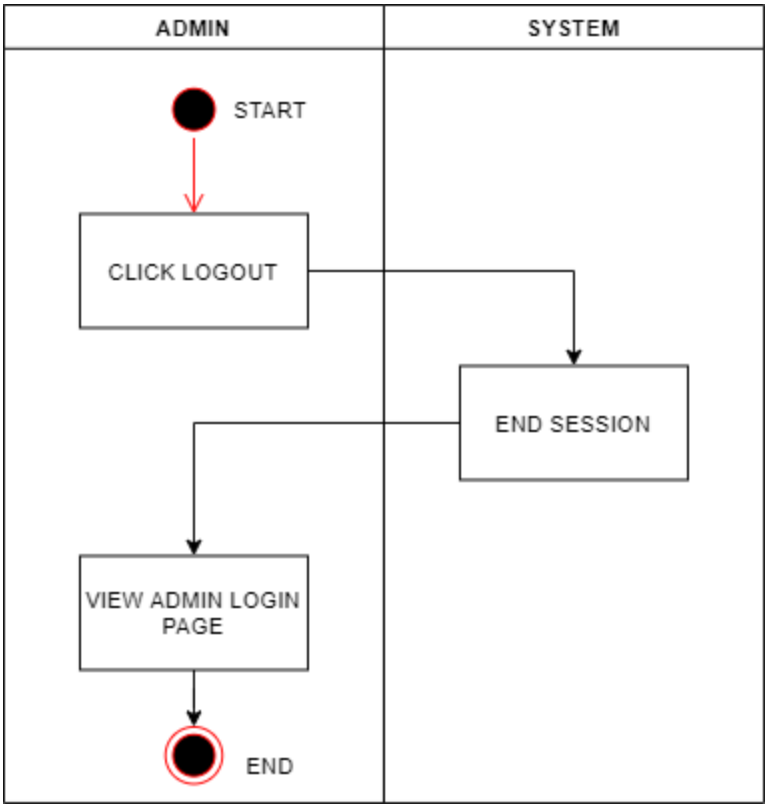


Figure 24. Admin: Logout (Activity)

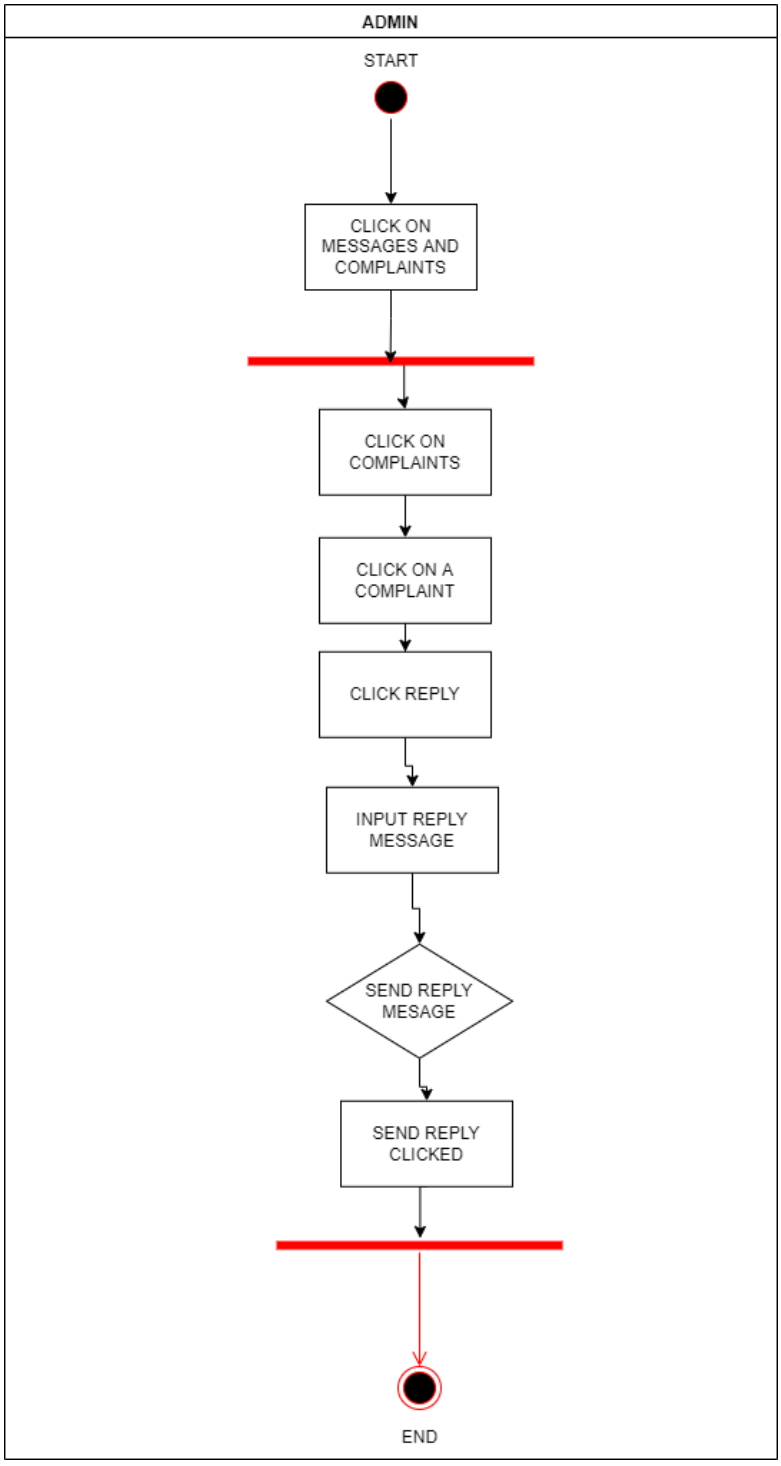


Figure 25. Admin: Check complaints (Activity)

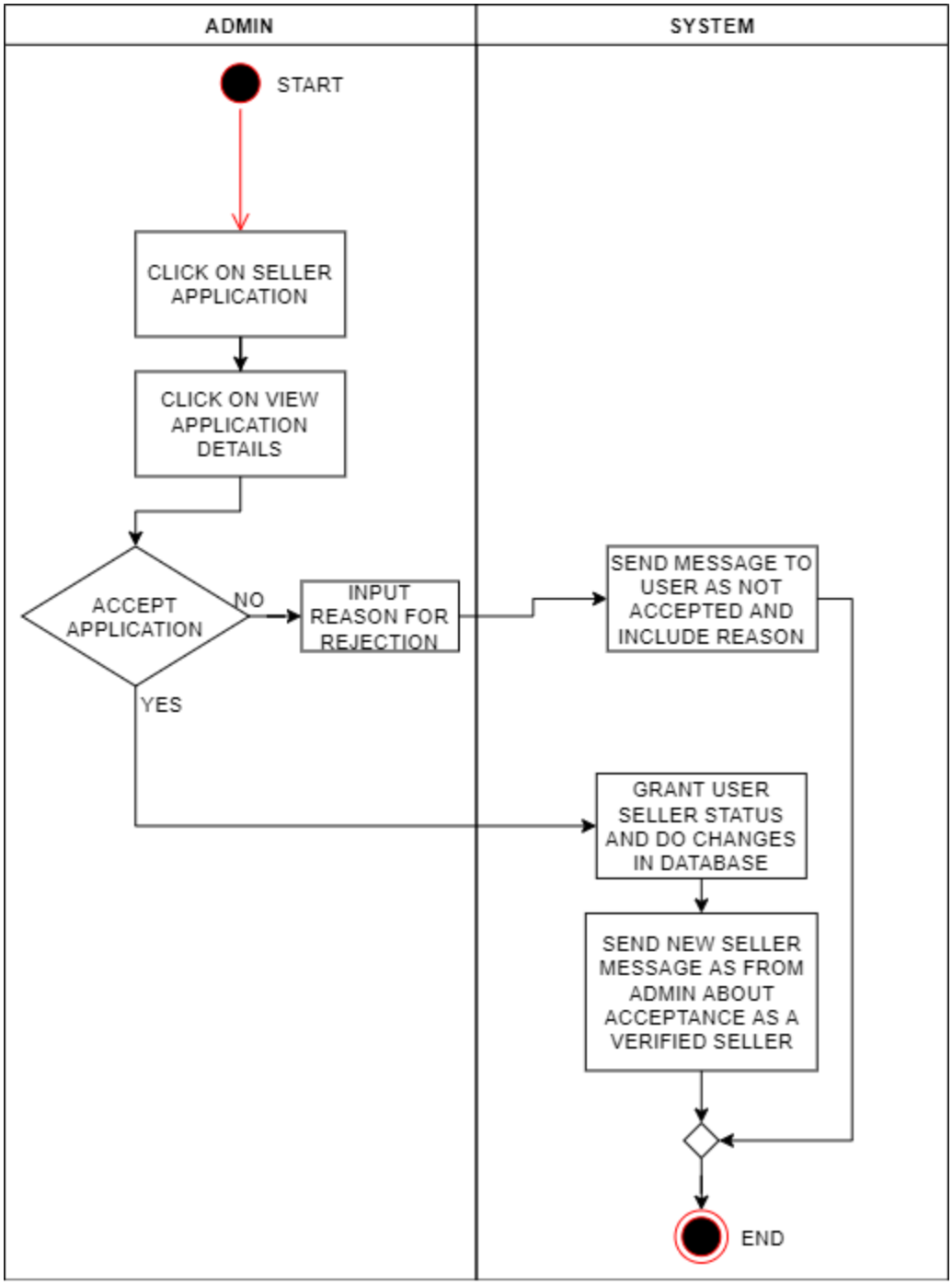


Figure 26. Admin: View Seller Applications

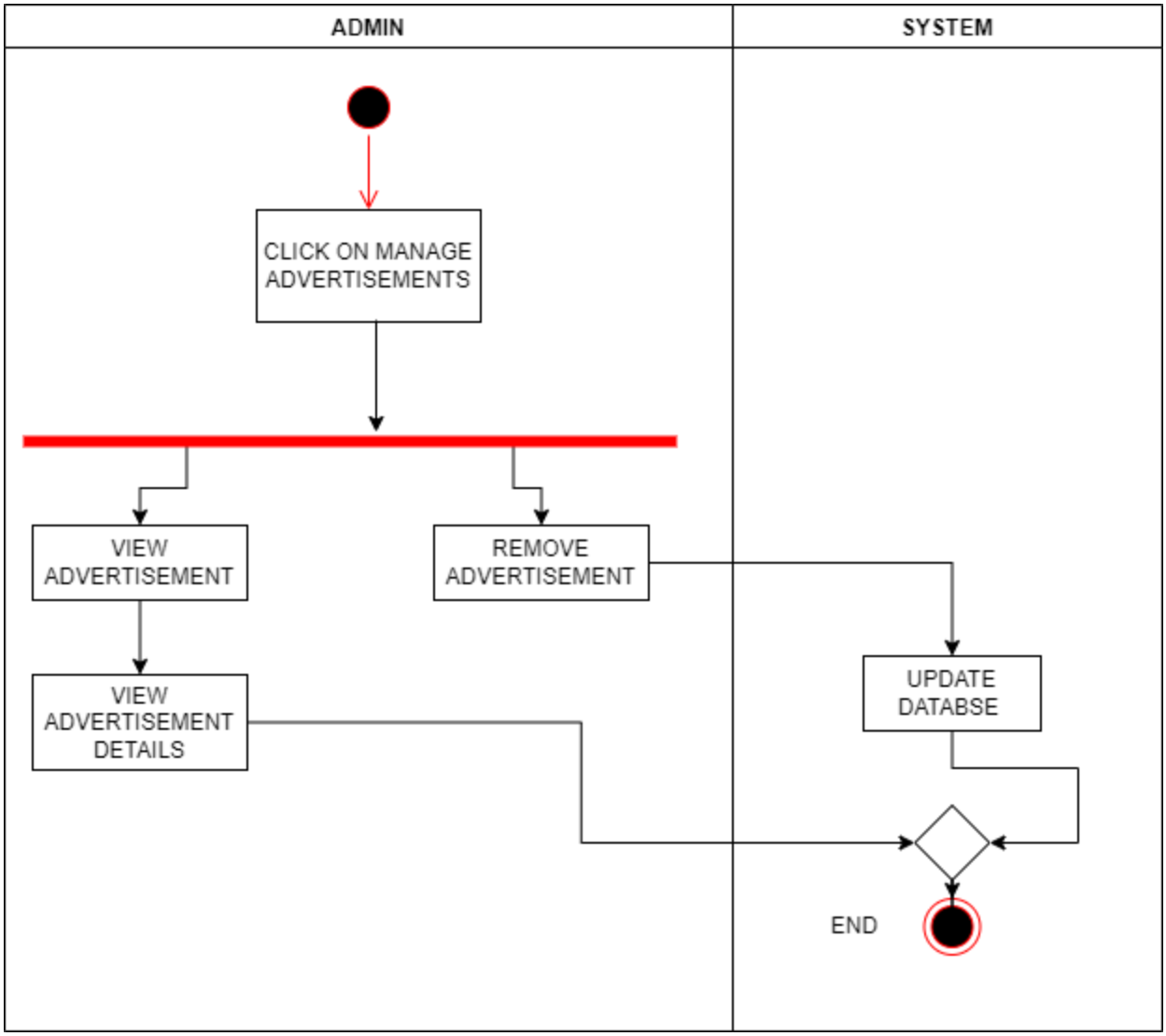


Figure 27. Admin: Manage advertisements (Activity)

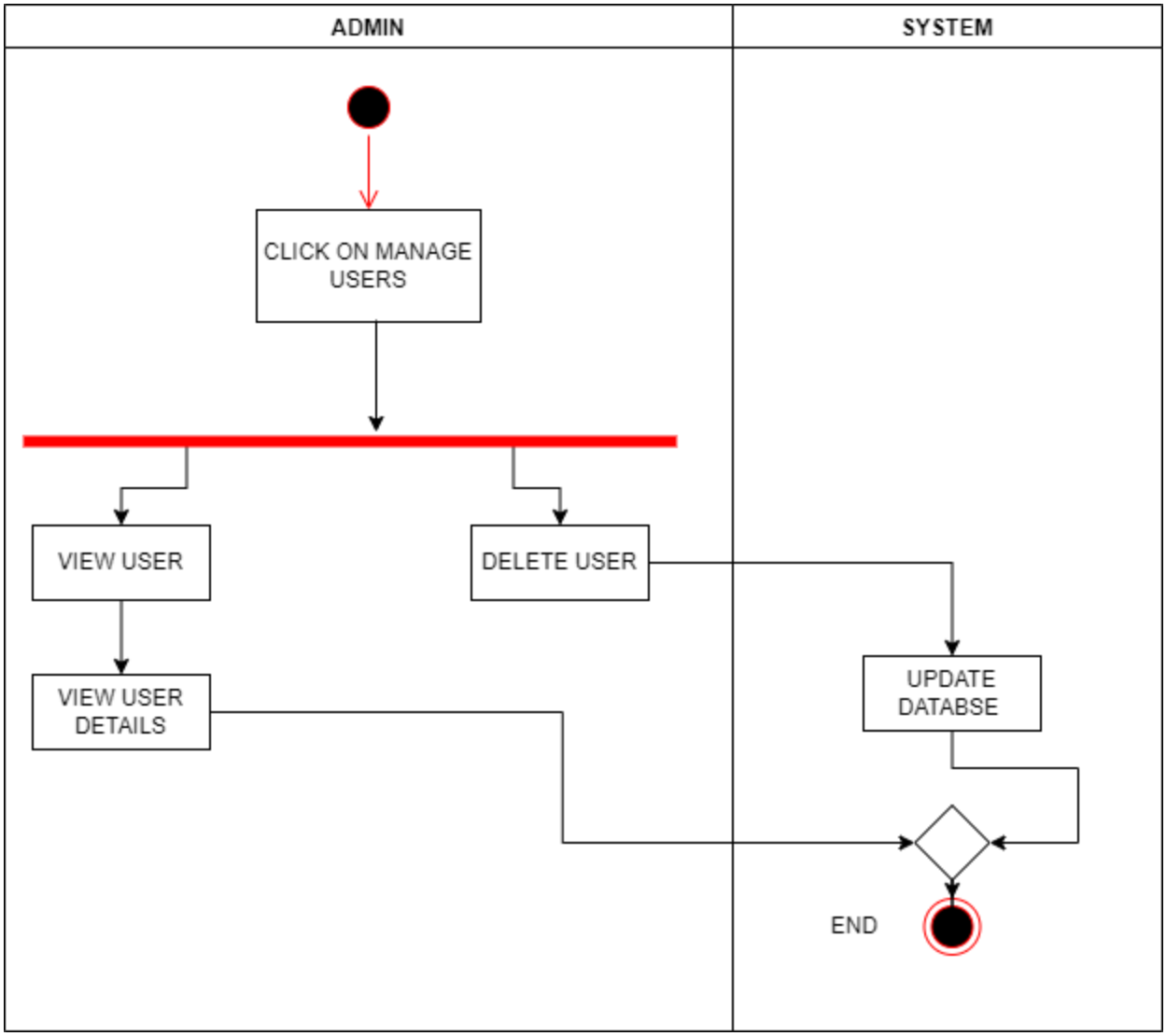


Figure 28. Admin: Manage Users (Activity)

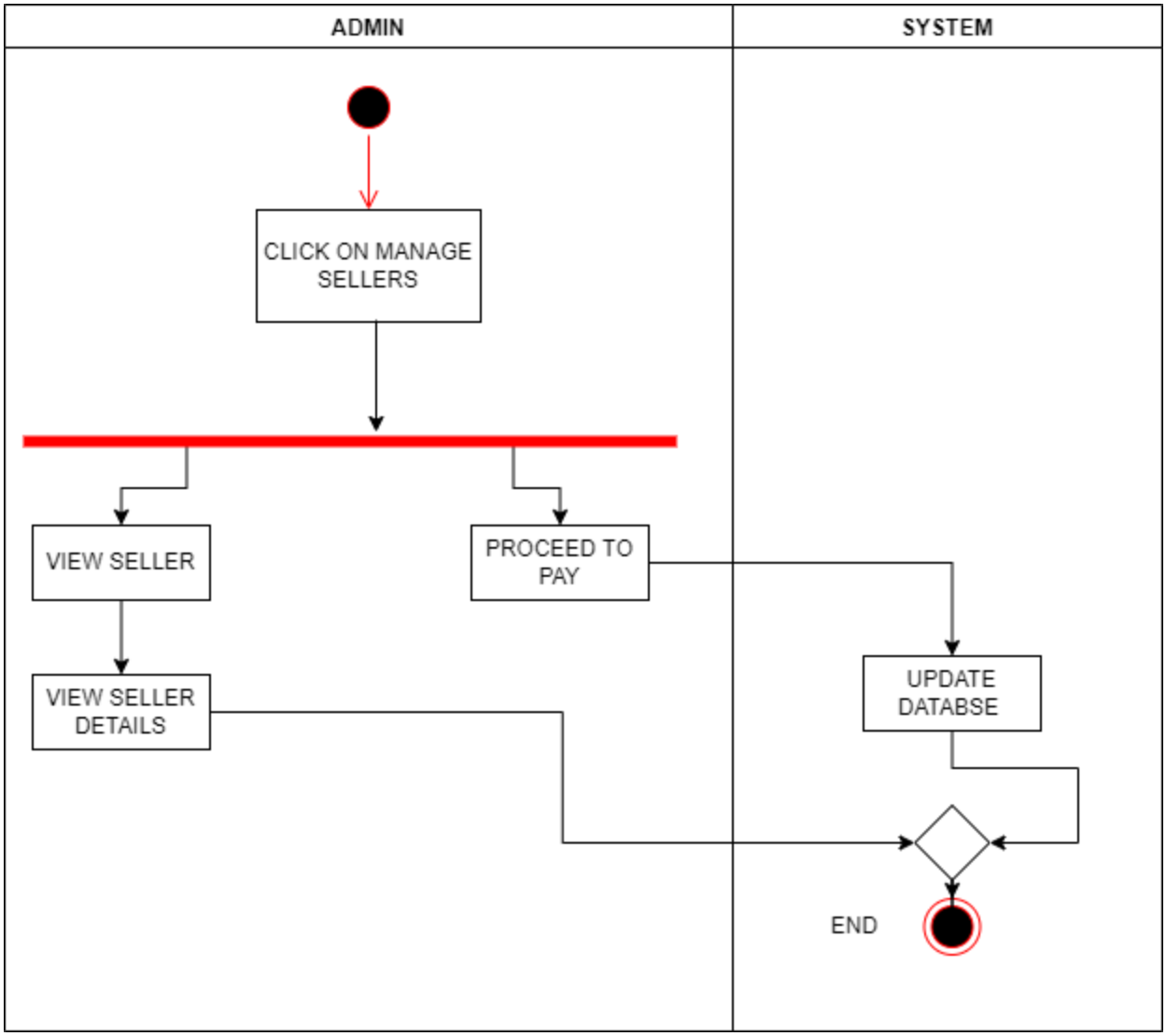


Figure 29. Admin: Manage Sellers (Activity)

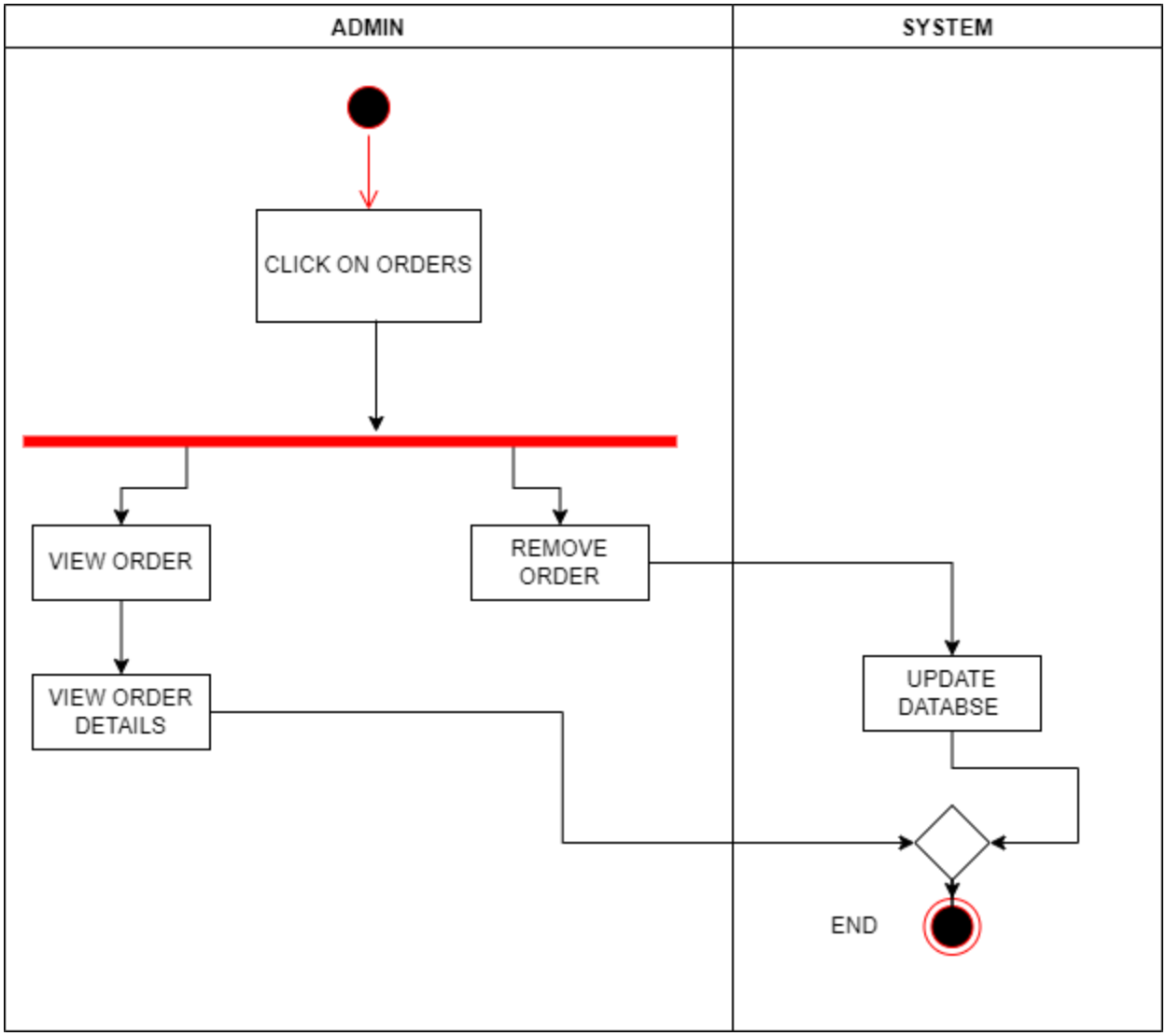


Figure 30. Admin: View Orders (Activity)

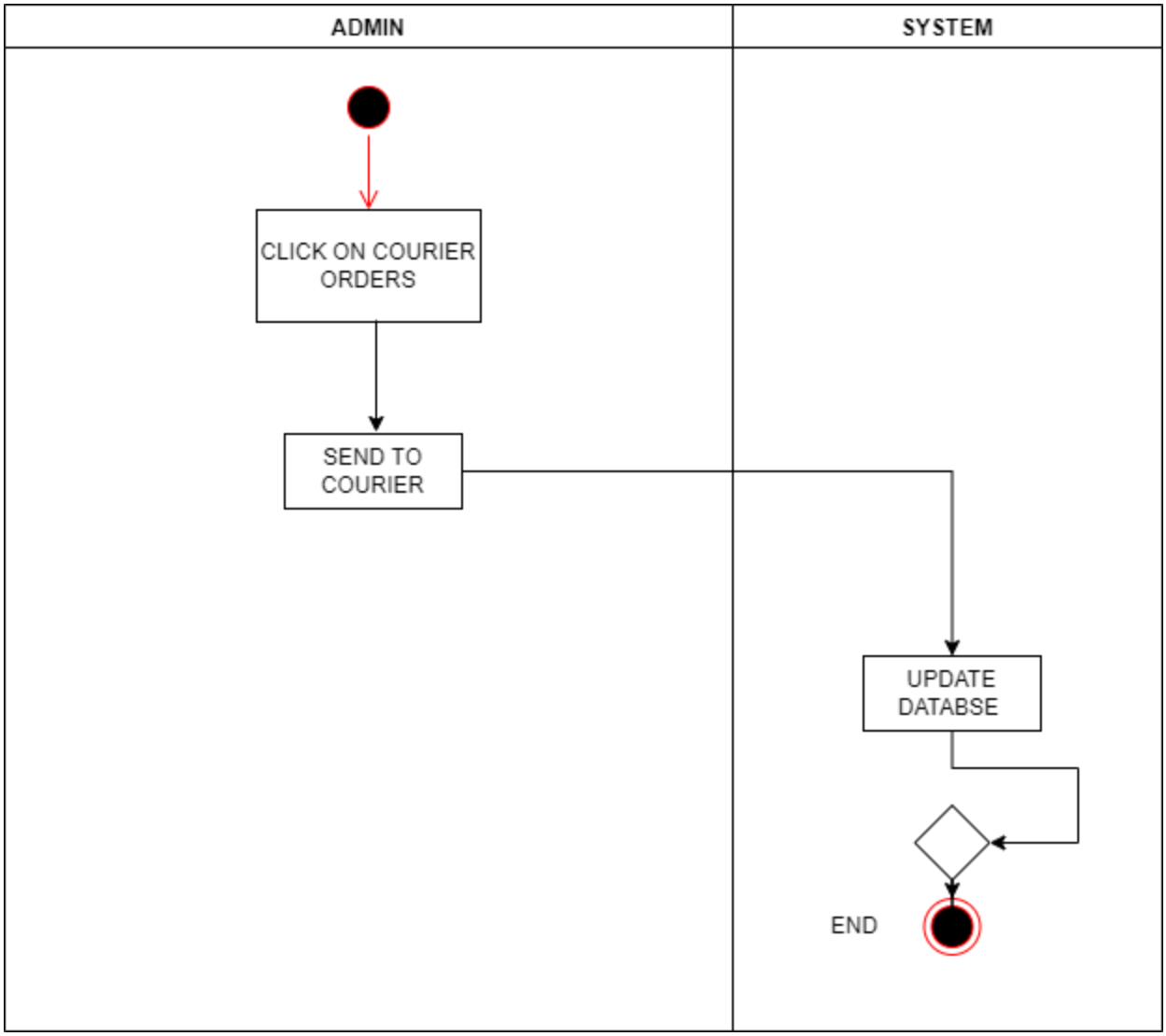


Figure 31. Admin: View Courier orders (Activity)

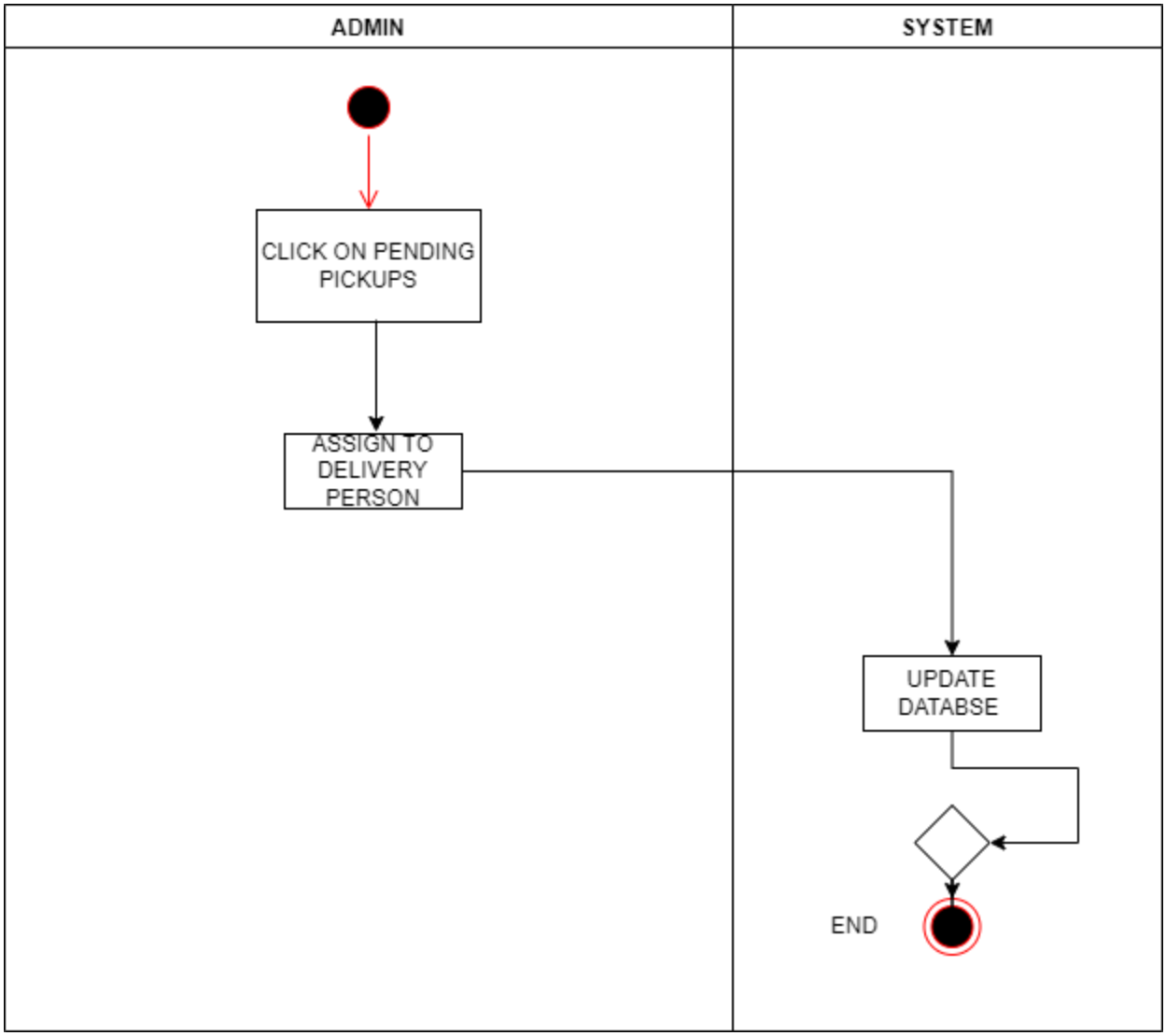


Figure 32. Admin: Assigning Pickup (Activity)

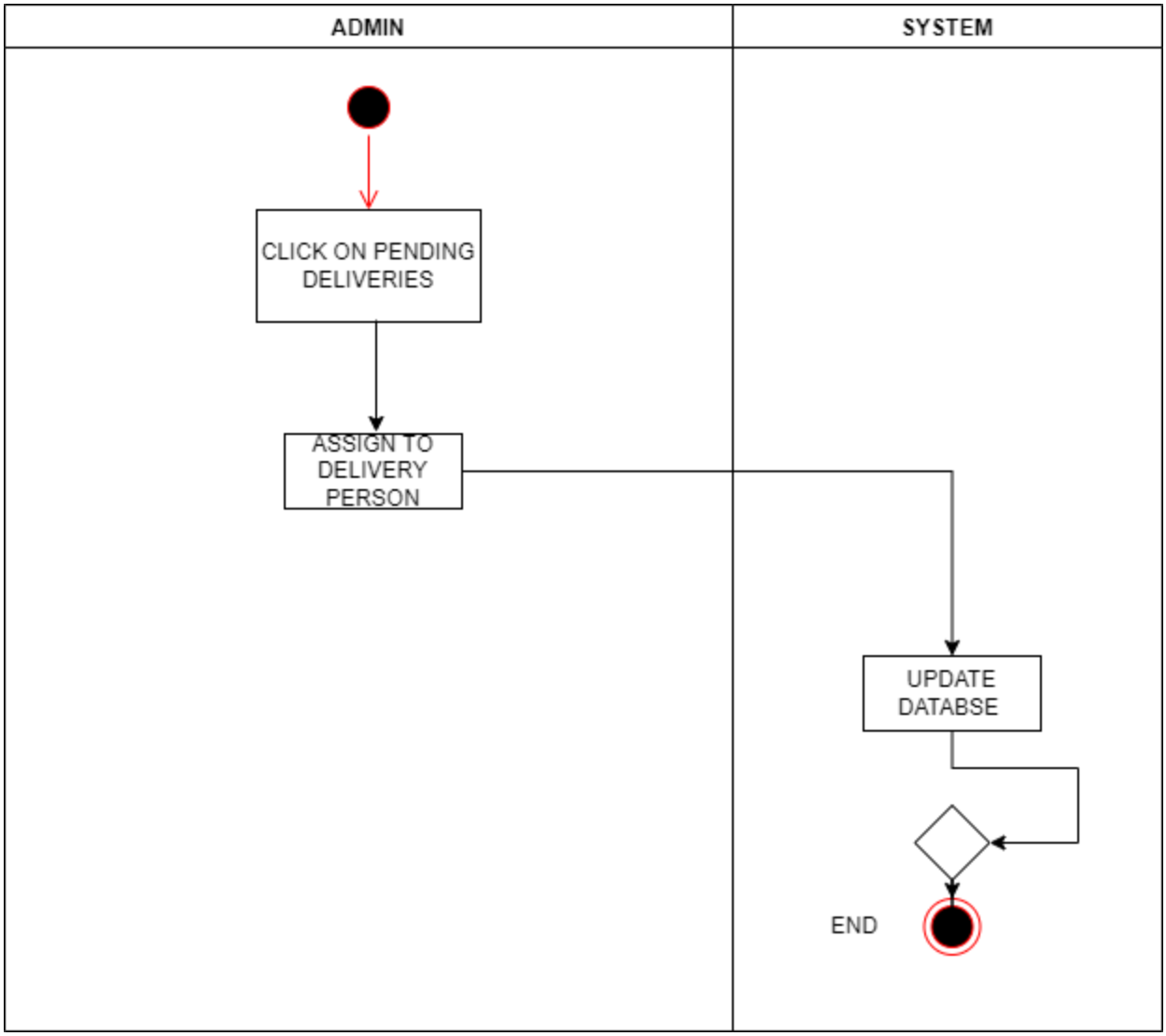


Figure 33. Admin: Assigning Delivery (Activity)

10 SEQUENCE DIAGRAMS

10.1 Buyer

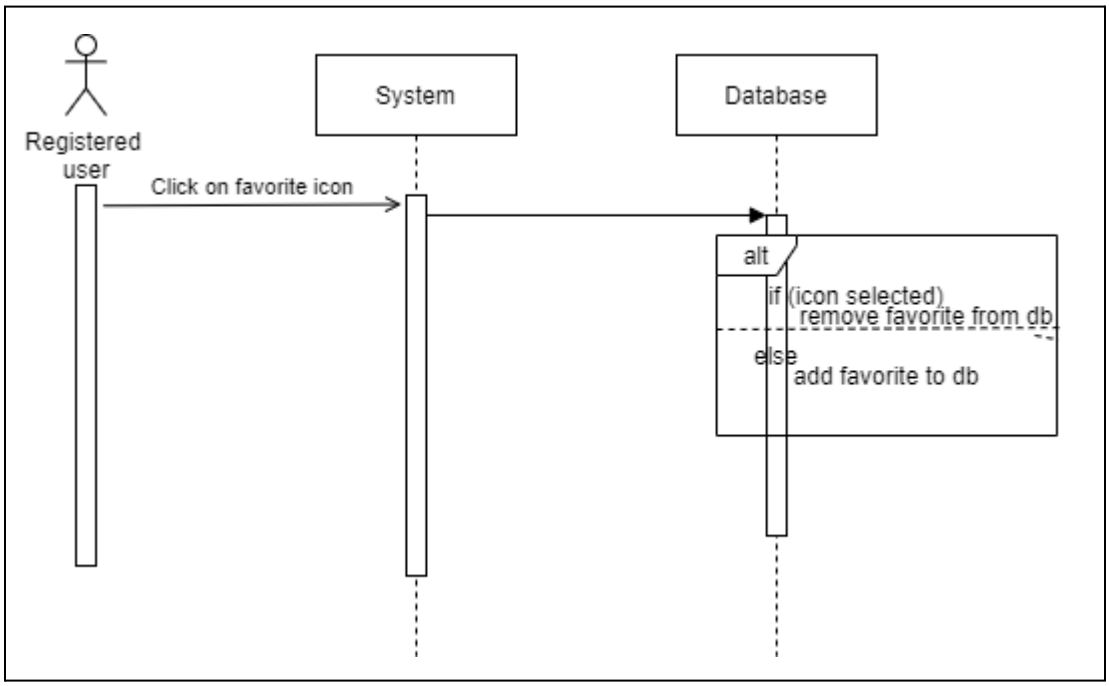


Figure 34. Buyer: Add items to favourites (Sequence)

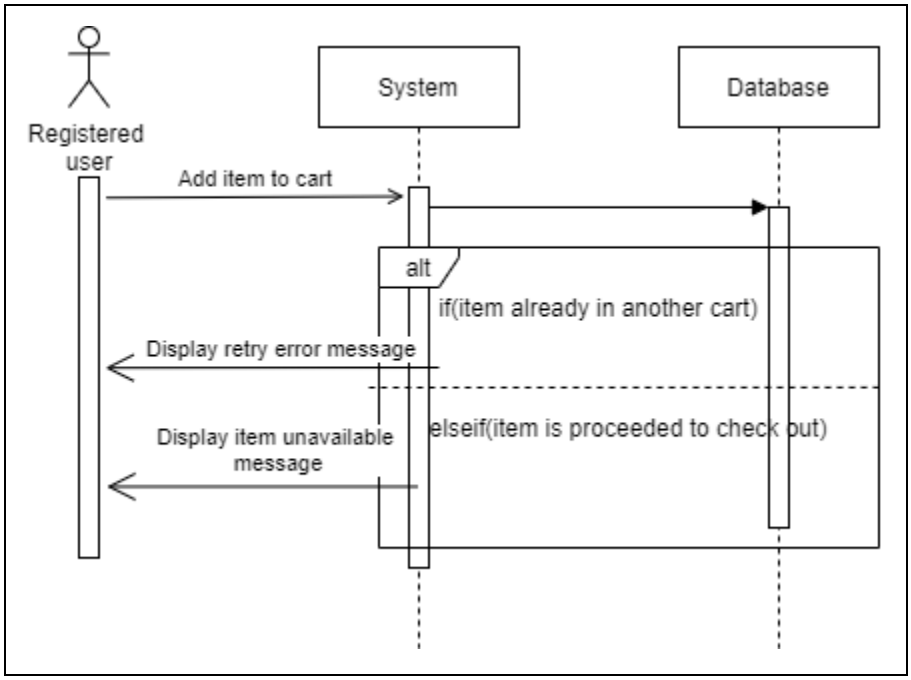


Figure 35. Buyer: Add items to Cart (Sequence)

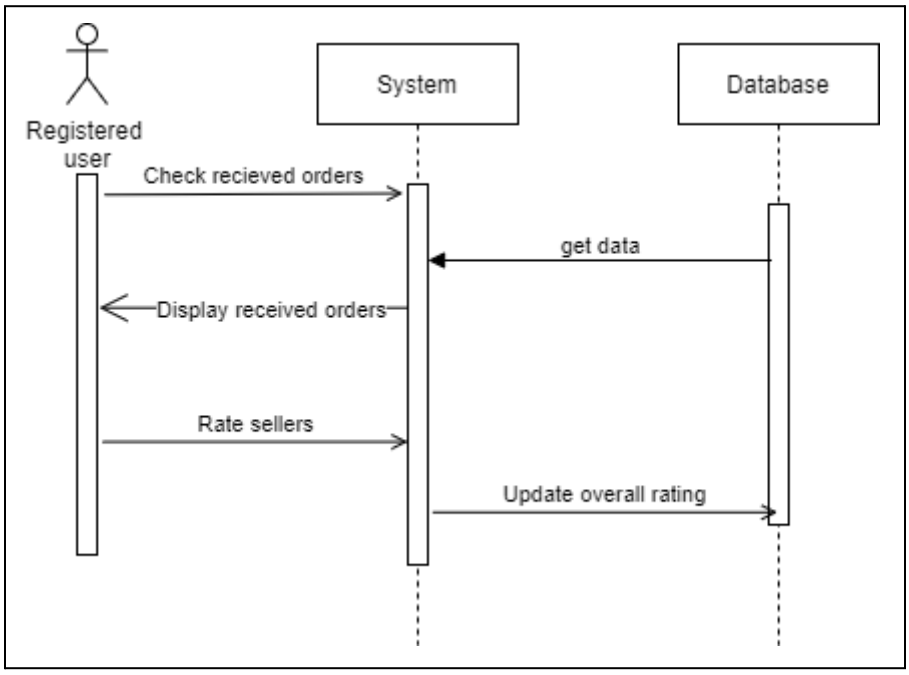


Figure 36. Buyer: Check received orders (Sequence)

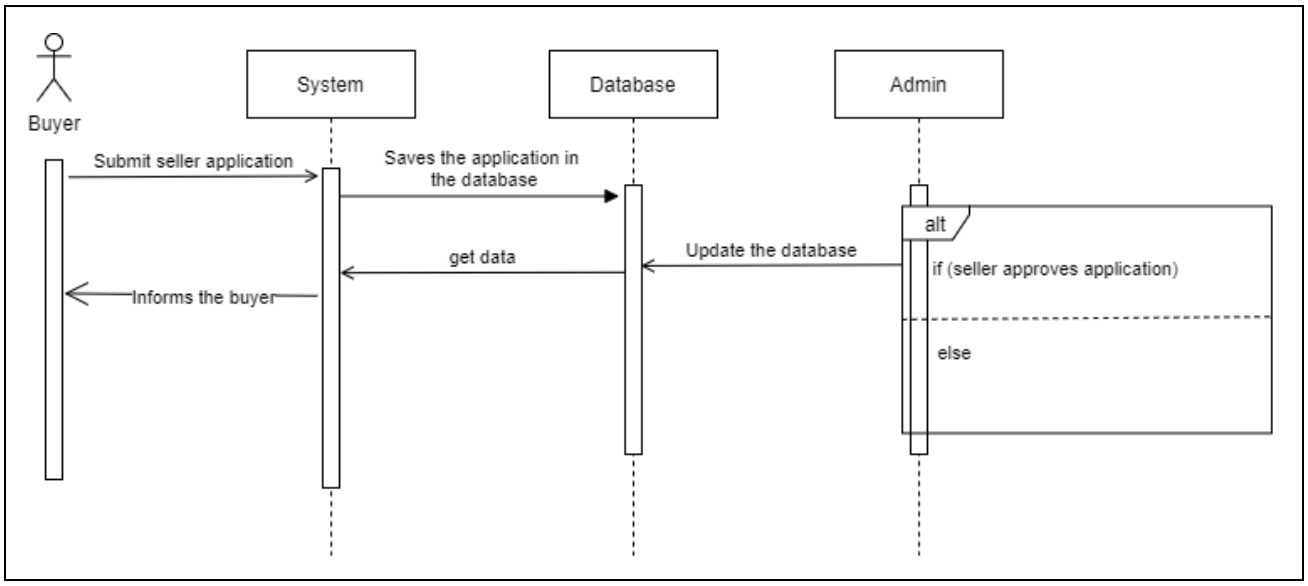


Figure 37. Buyer: Submit Seller Application (Sequence)

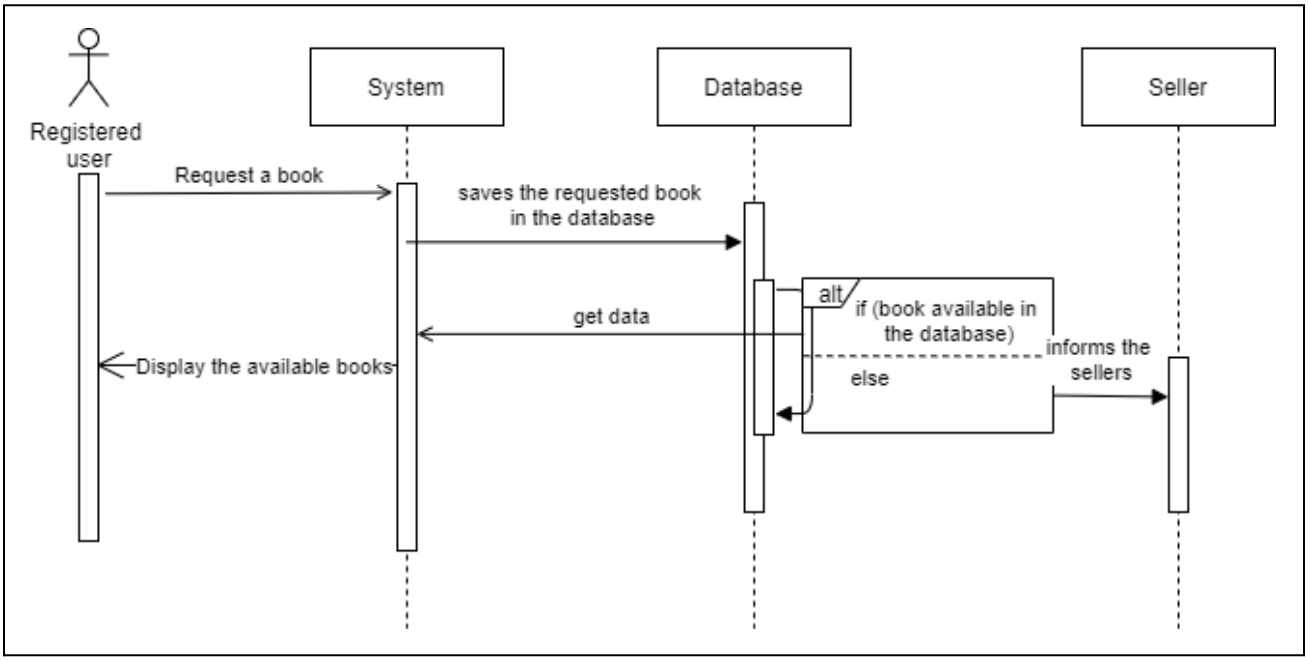


Figure 38. Buyer: Request Books (Sequence)

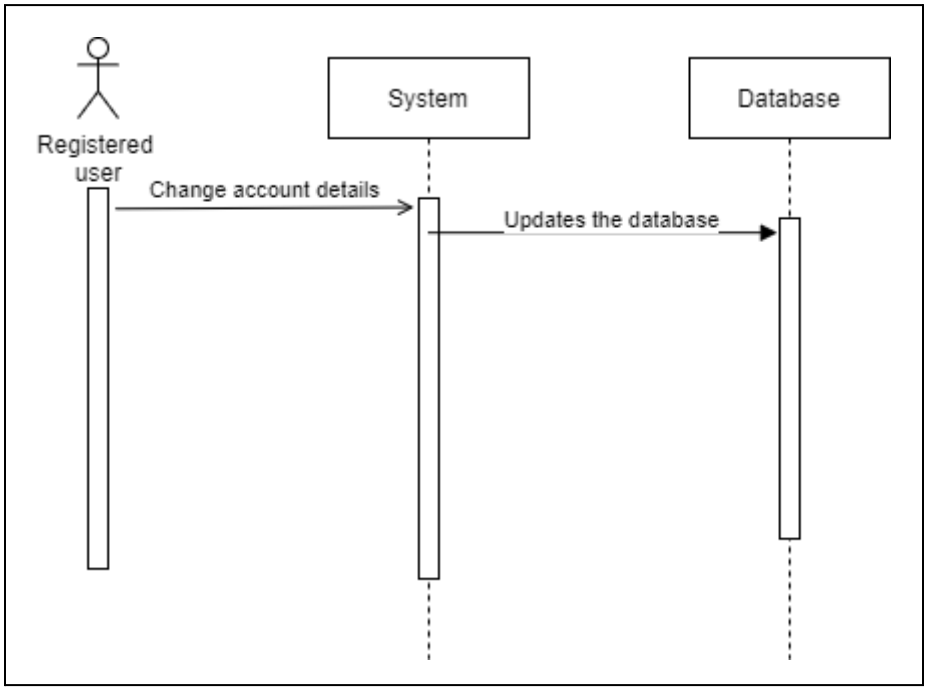


Figure 39. Buyer: Change account details (Sequence)

10.2 Seller

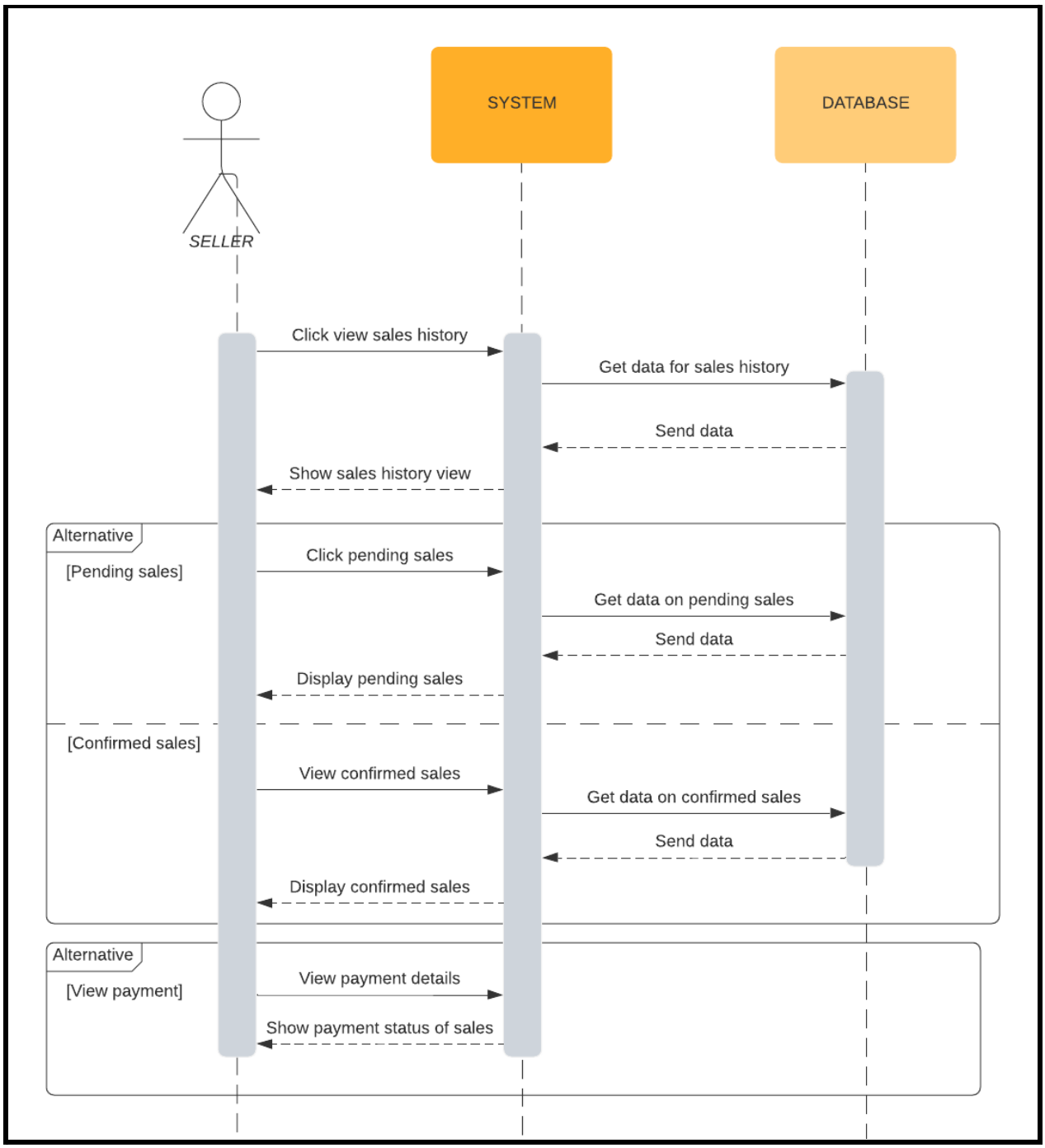


Figure 40. Seller: View sales history (Activity)

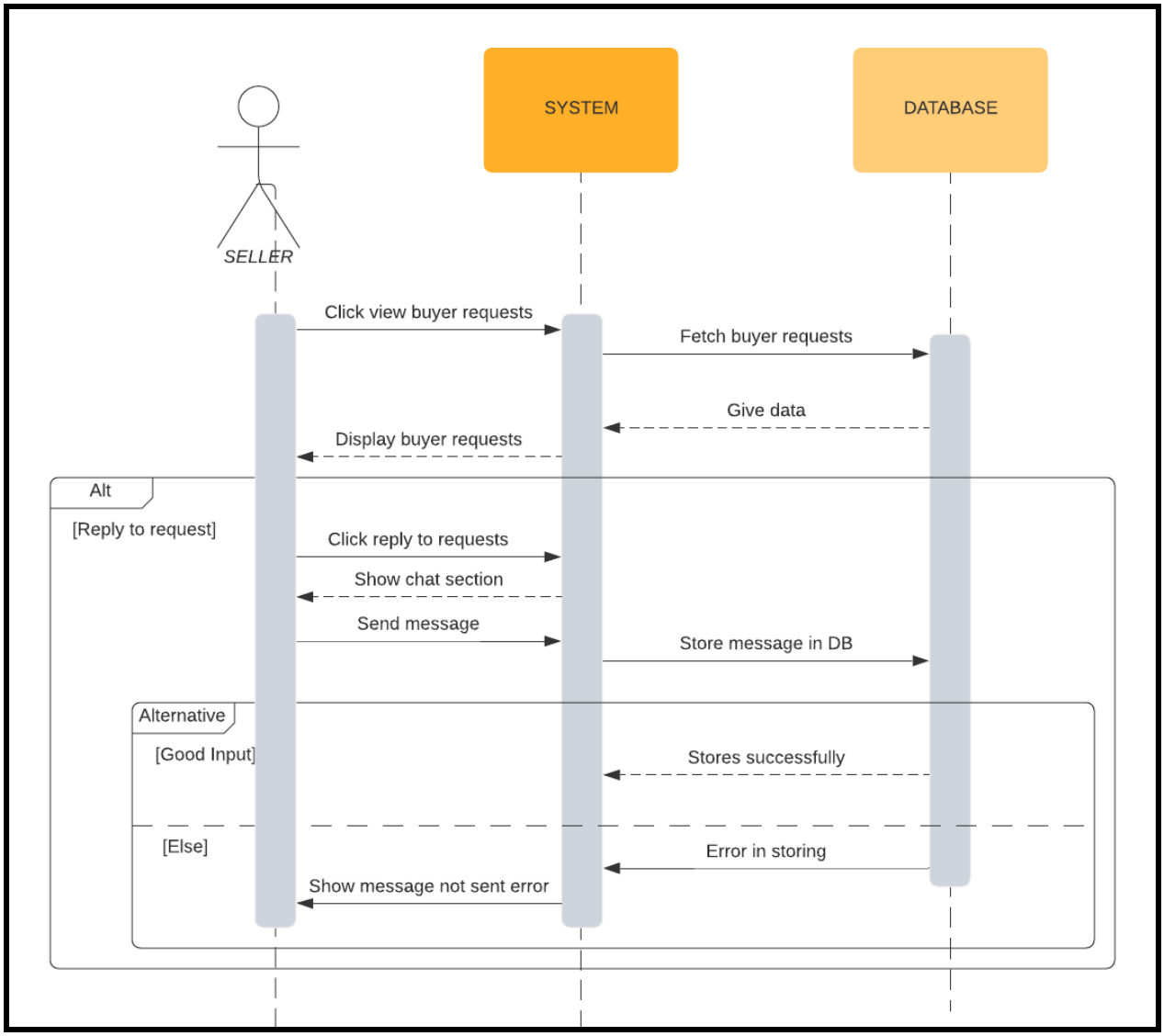


Figure 41. Seller: View buyer requests (Activity)

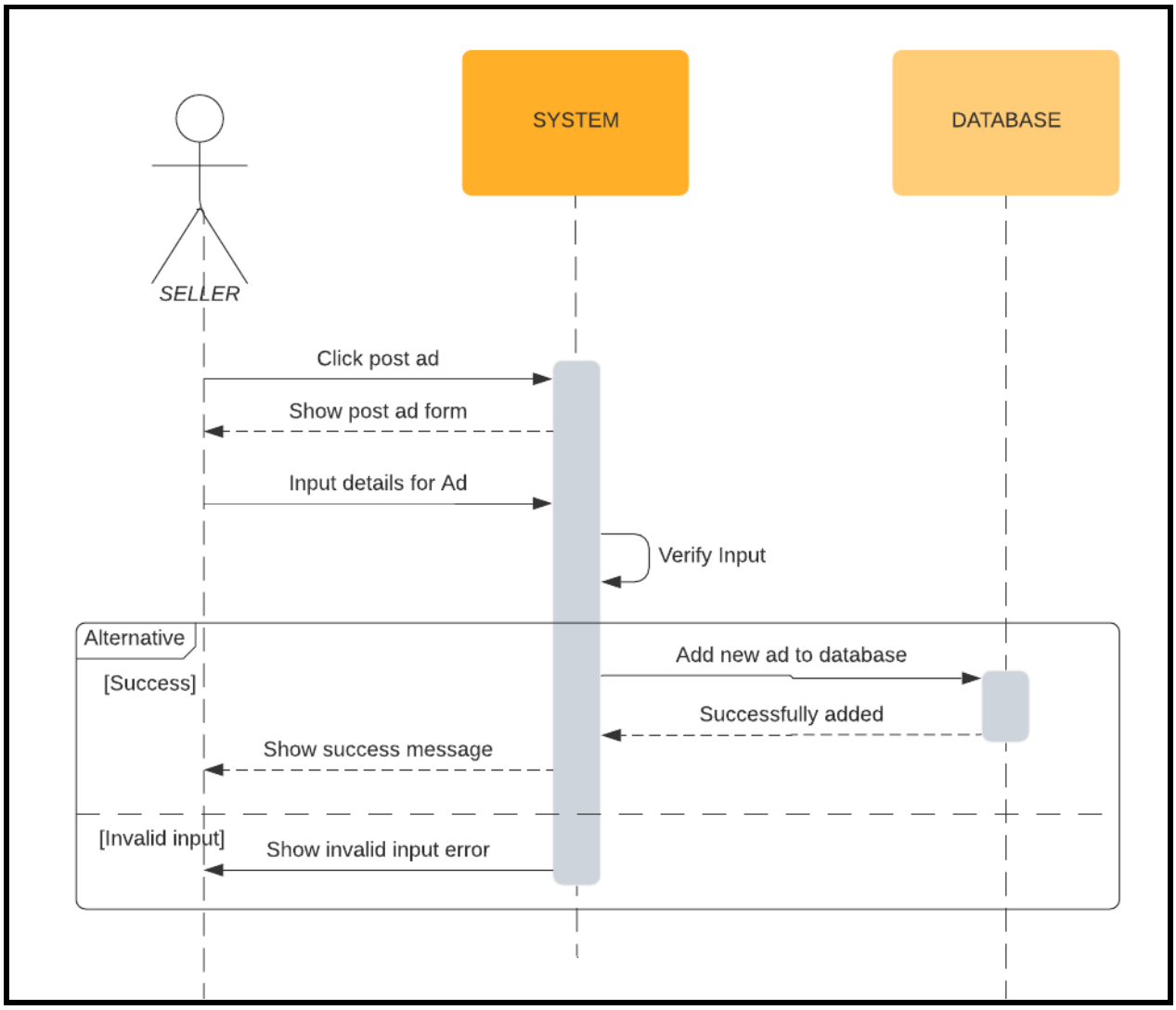


Figure 42. Seller: Post advertisement (Activity)

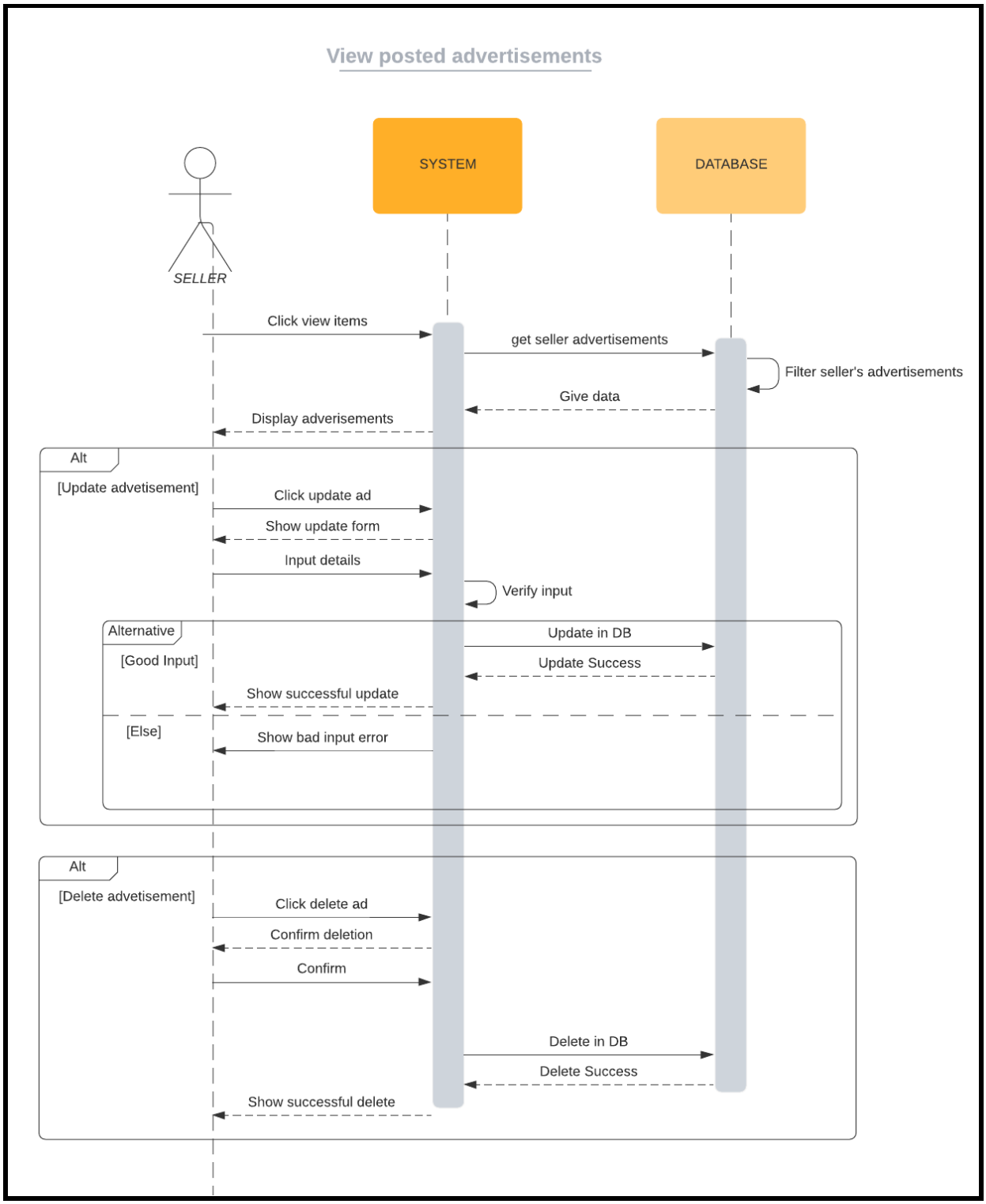


Figure 43. Seller: View posted advertisements (Activity)

10.3 Delivery Person

10.4 Admin

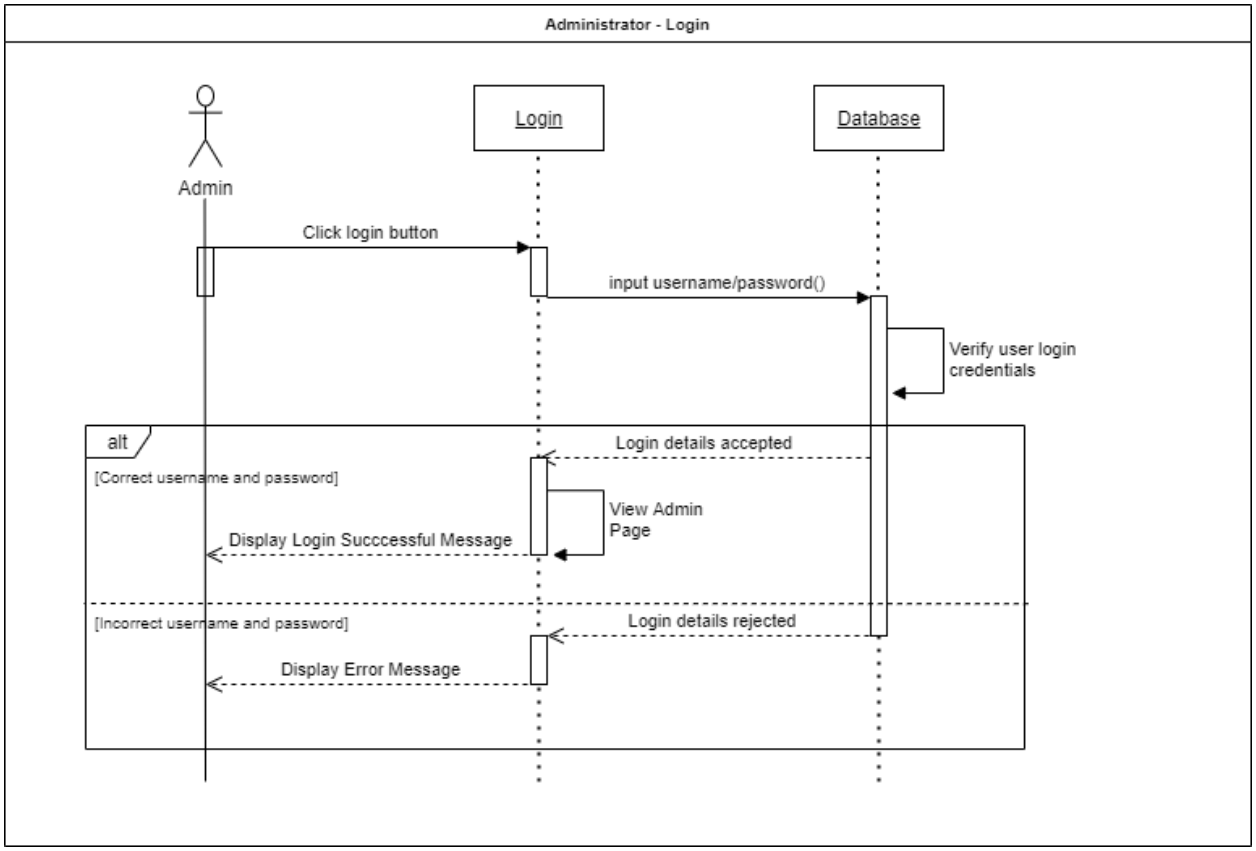


Figure 44. Admin: Login (Sequence)

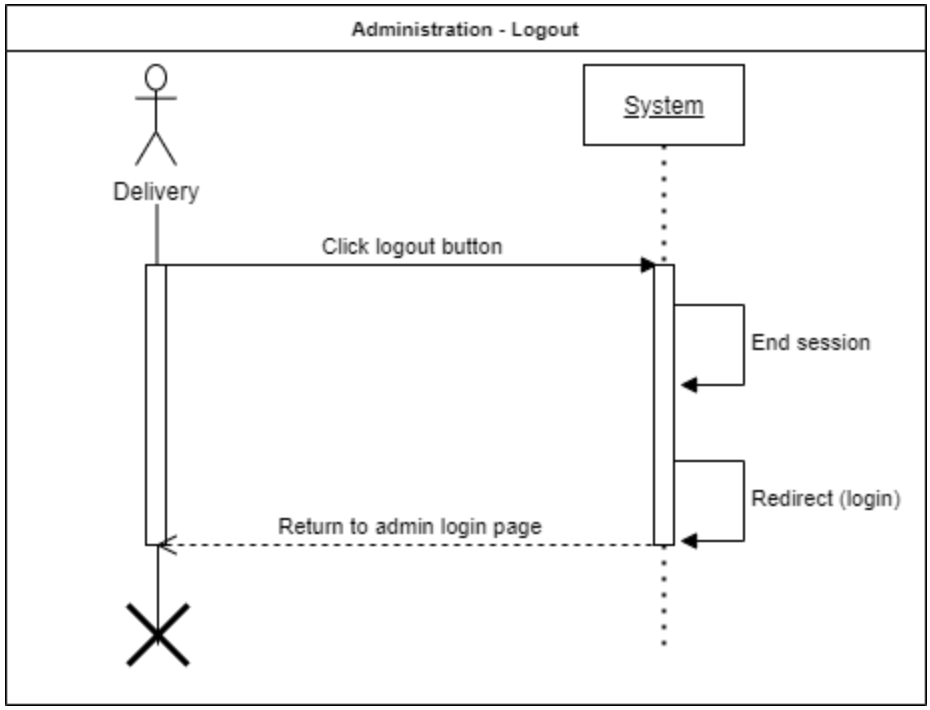


Figure 45. Admin: Logout(Sequence)

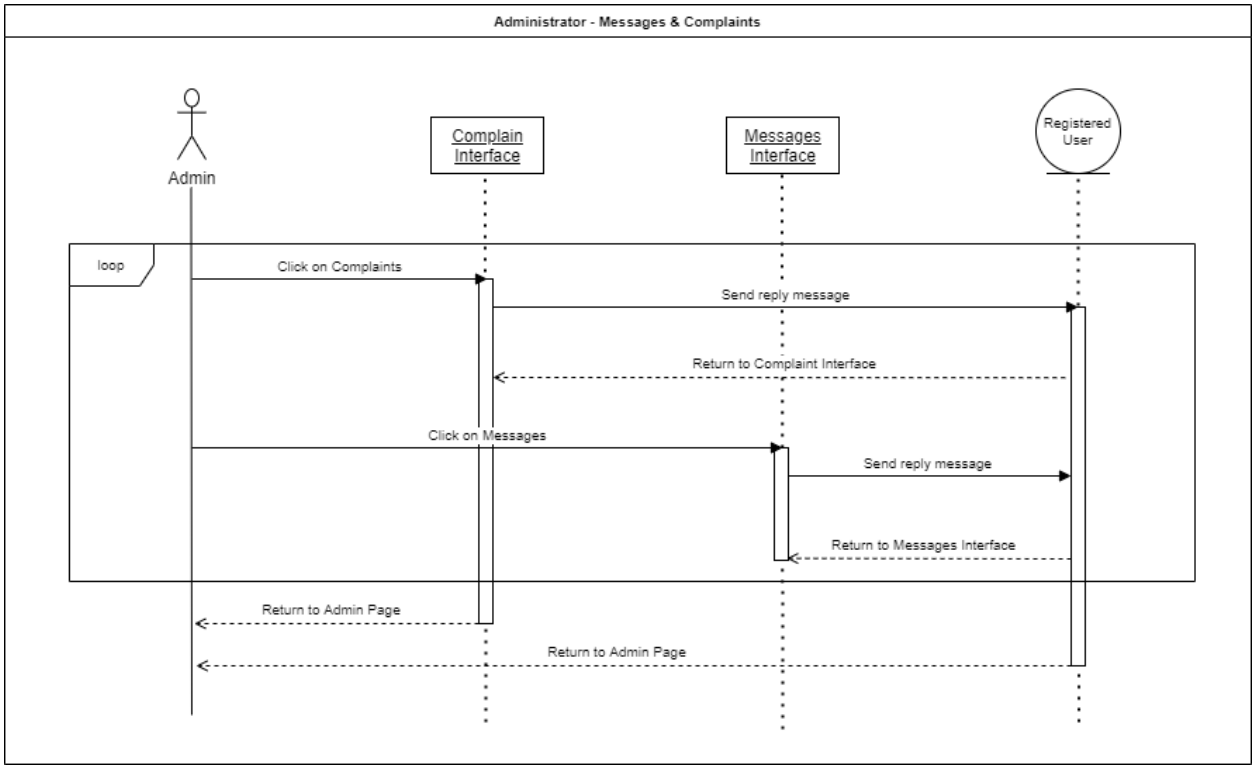


Figure 46. Admin: Viewing Complaints (Sequence)

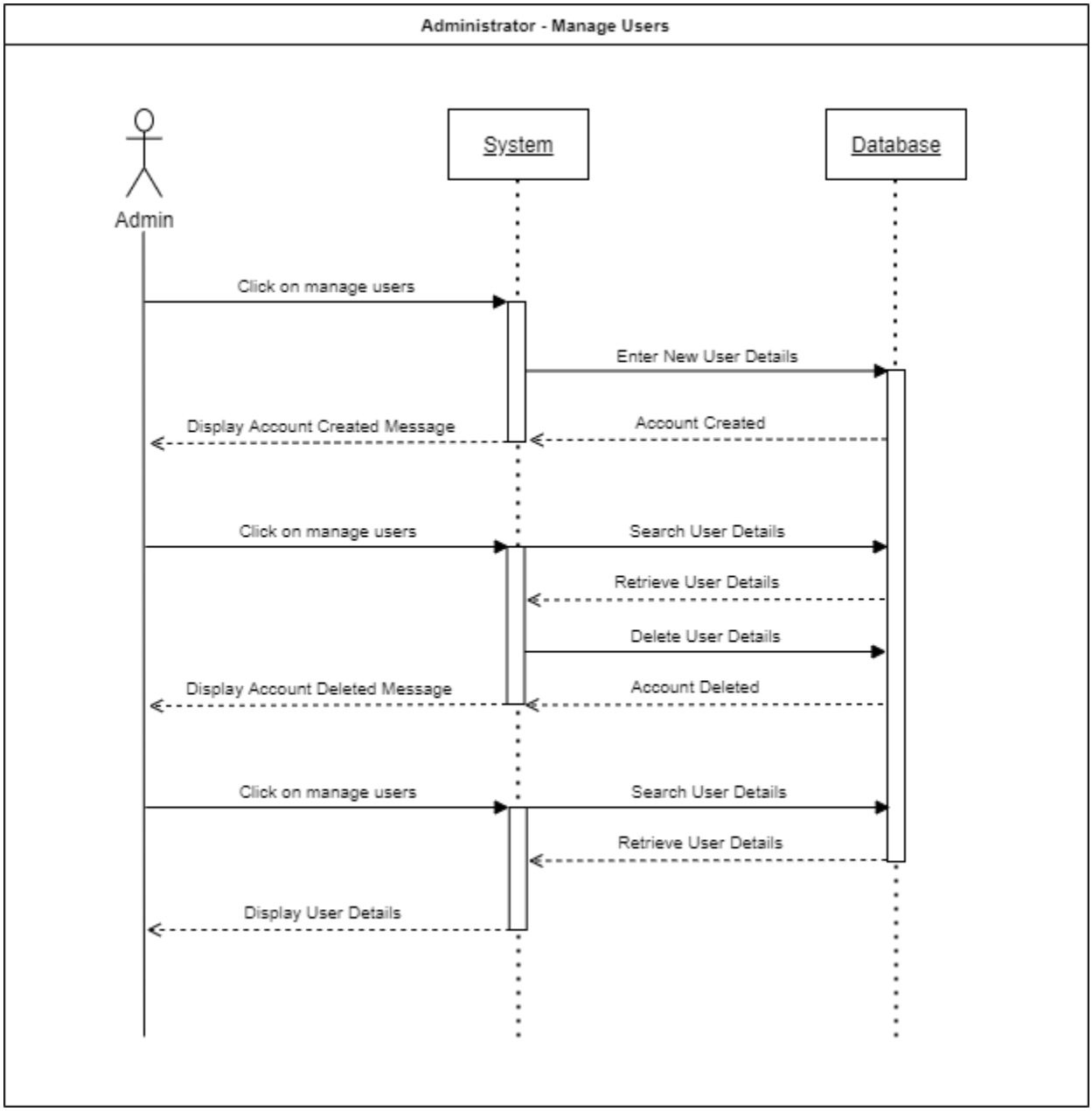


Figure 47. Admin: Viewing Users (Sequence)

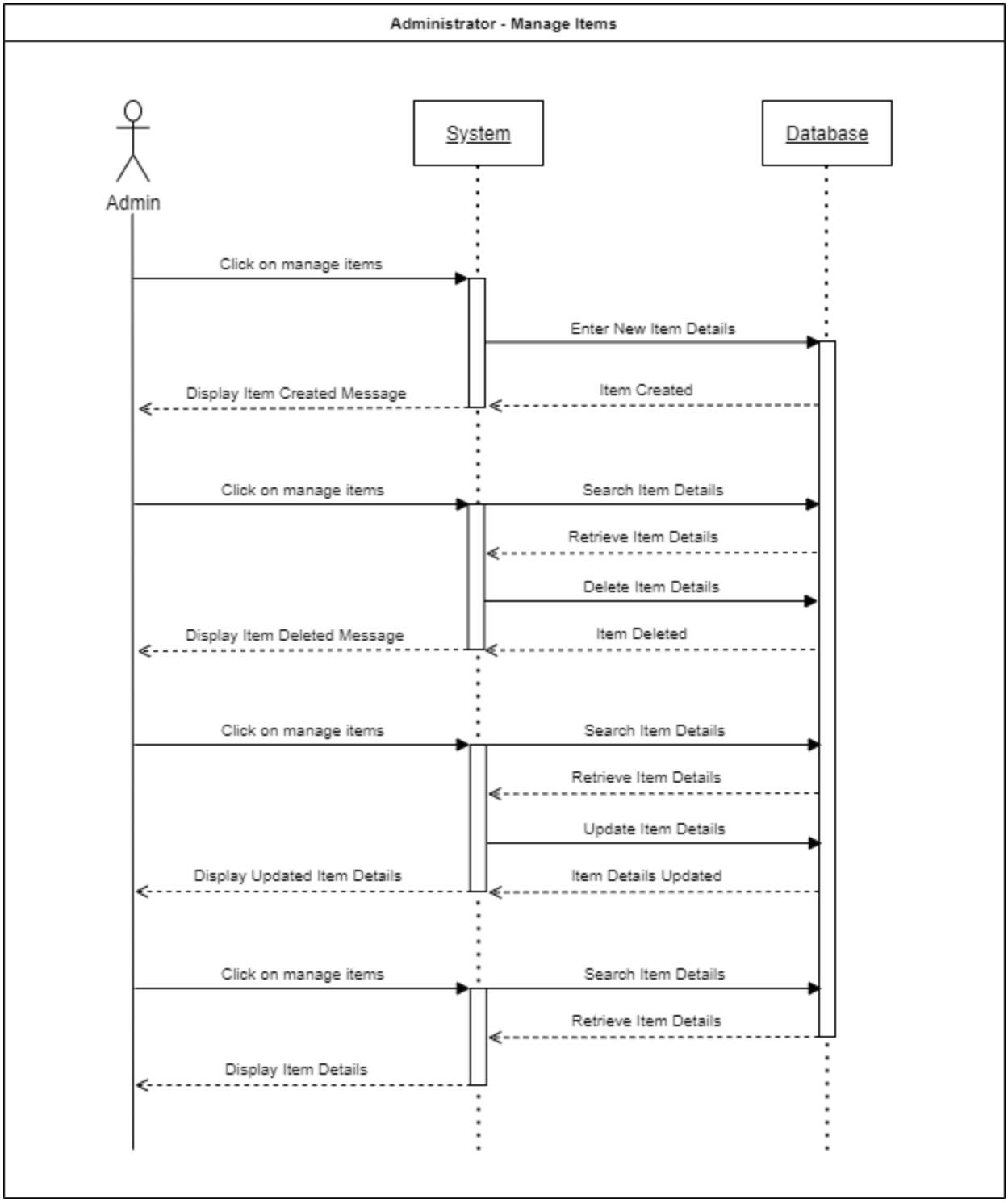


Figure 48. Admin: Manage items (Sequence)

11 STATE TRANSITION DIAGRAMS

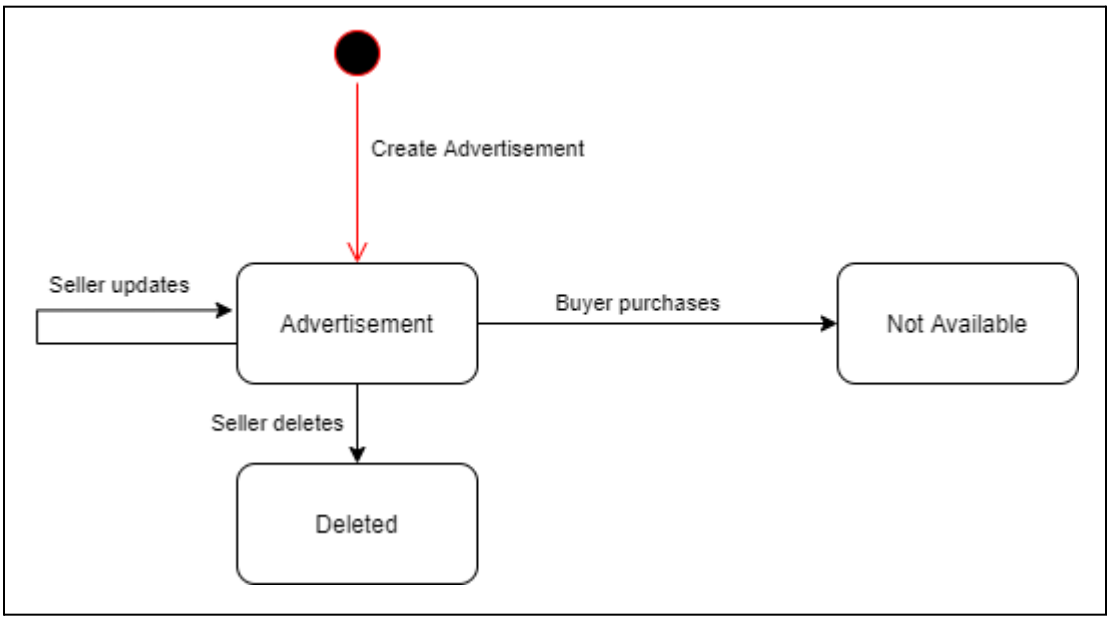


Figure 49. Advertisement (State)

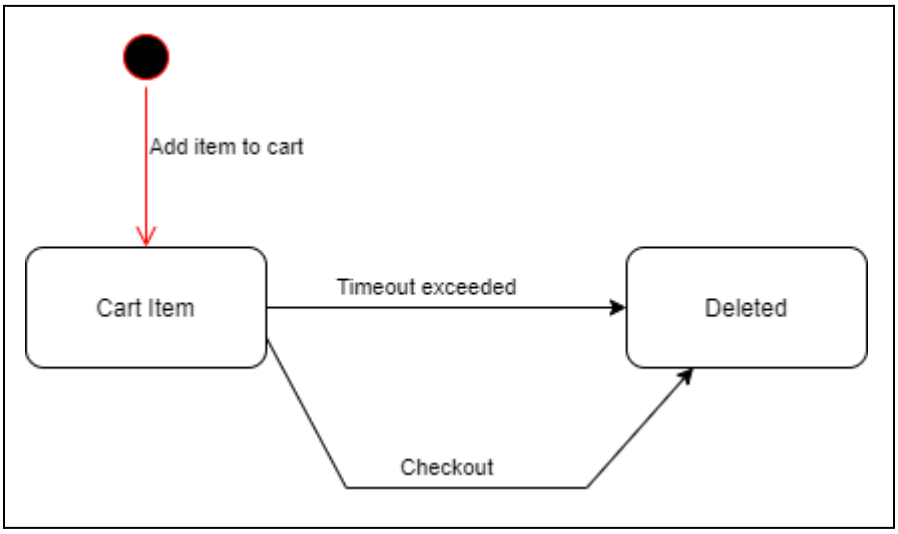


Figure 50. Cart-Item (State)

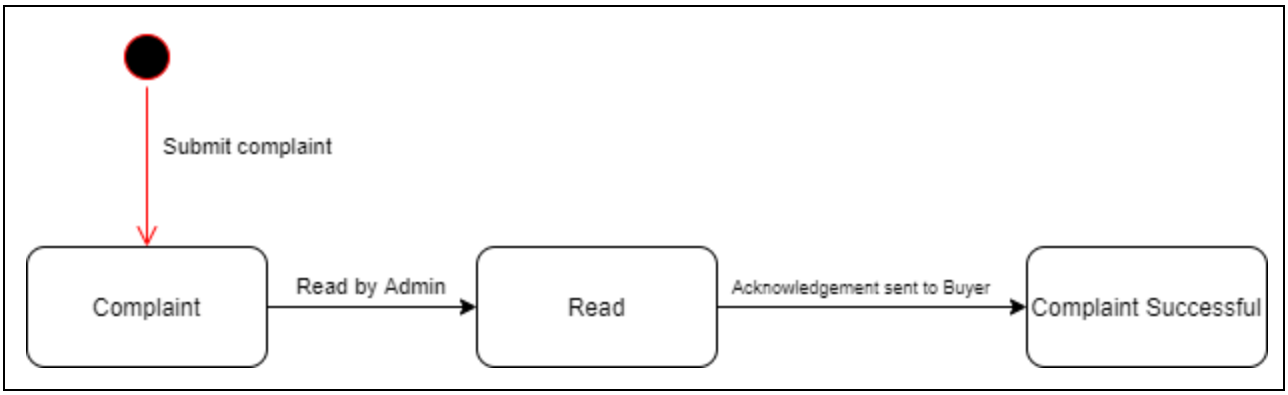


Figure 51. Complaint (State)

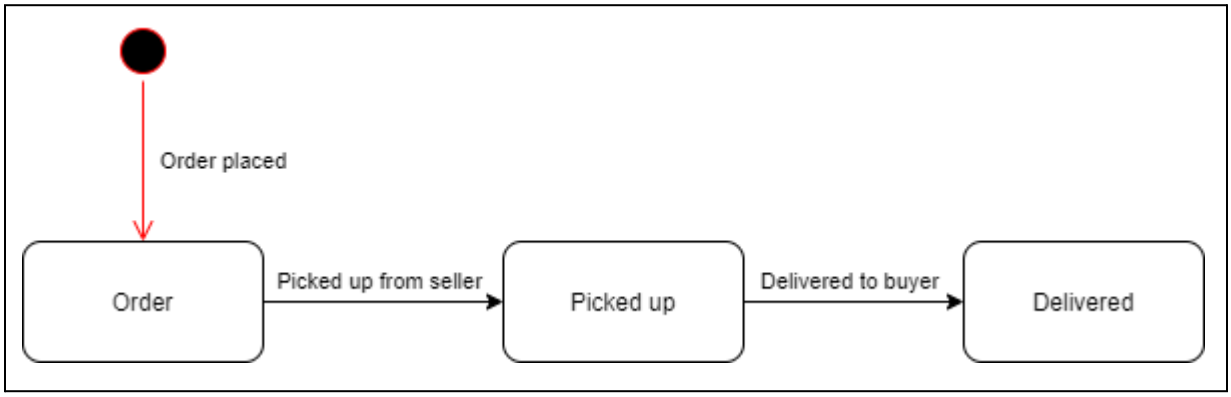


Figure 52. Order (State)

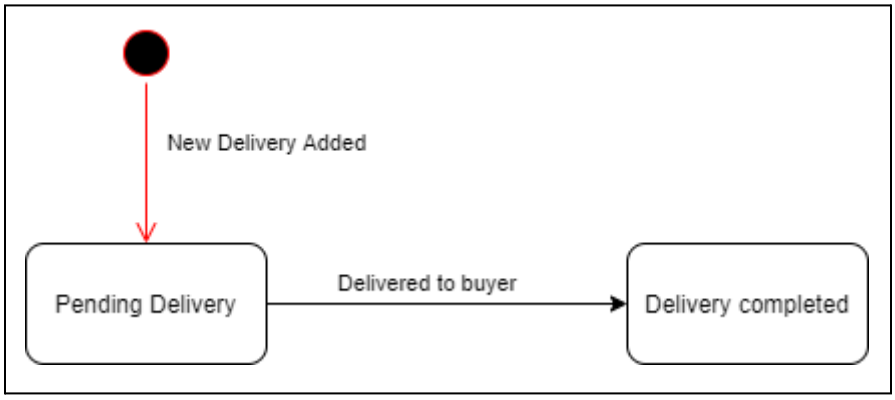


Figure 53. Pending Delivery (State)

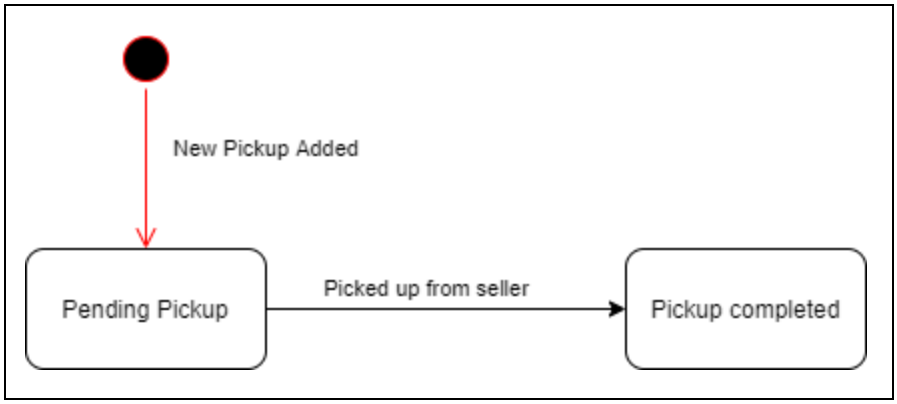


Figure 54. Pending pickup (State)

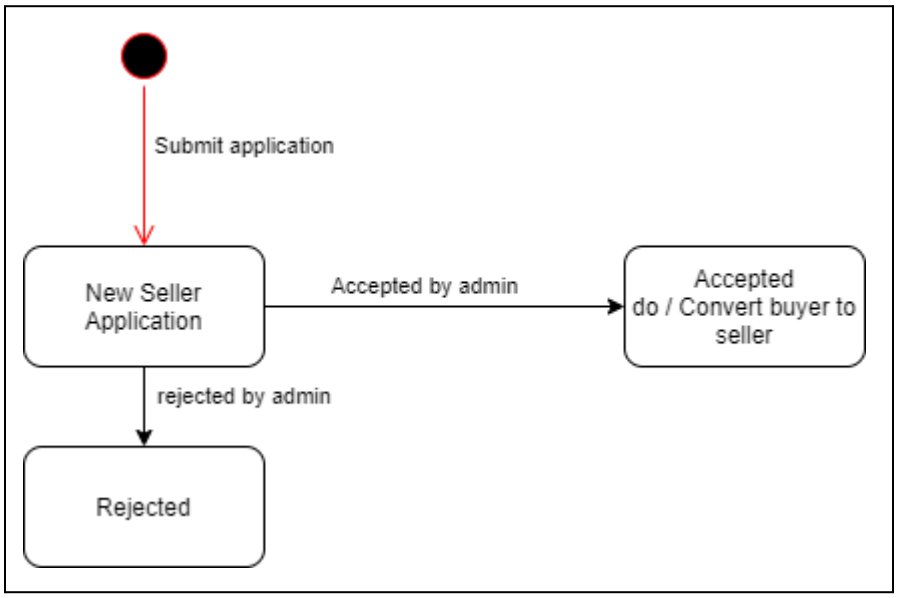


Figure 55. Seller Application (State)

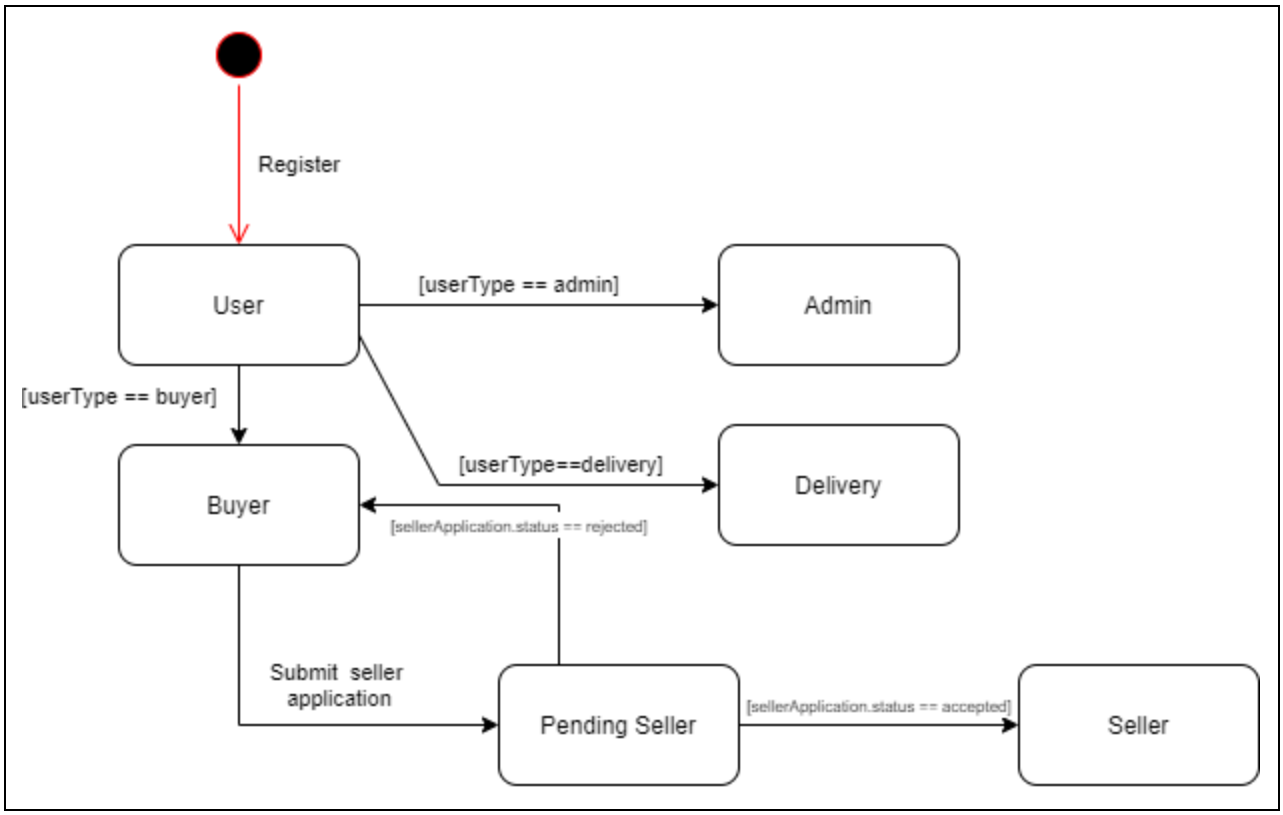


Figure 56. User Registration (State)

12 TEST CASES

Test case ID	Test case	Testing steps	Test data	Expected Outcome
1	Login	1. Click on signin button on the home page.	Username: buyer1 Password: buyerone123	Direct to buyer's view
		2. Enter the details	Username: seller1 Password: sellerone123	Direct to seller's view
		3. Click on Login button	Username: admin1 Password: adminone123	Direct to admin's view
			Username: delivery1 Password: deliveryone123	Direct to delivery's view
			Username: invalid1 Password: invalidone123	Show incorrect login message
2	Buyer: Browse books	1. Click on search bar and type keyword	Keyword: Mind	Show 'The Mind Games' advertisment
			Keyword: Rowling	Show 'Harry Potter' advertisement
3	Buyer: Add to Cart	1. Search for advertisement	Advertisement: The Lord of the Rings	The Lord of the Rings' is added in Cart page

		2. Click view on advertisement		
		3. Click 'Add to Cart' on advertisement		
4	Buyer: Remove from Cart	1. Click 'Remove' on advertisement in Cart page	Advertisement: The Lord of the Rings	The Lord of the Rings' is removed from Cart page
5	Buyer: Proceed to Checkout	1. Click 'Proceed to Checkout' on Cart page	Advertisement: The Lord of the Rings	Checkout page with 'The Lord of the Rings' added
6	Buyer: Make payment	1. Click 'Proceed to Payment on Checkout page		Redirected to 'PayHere' payment gateway
7	Buyer: Make book request	1. Click 'Requests Books' on sidebar	Title: Game of Thrones, Author: George Martin, Category: Fiction, Preferred price: 1250, Comment: Book about politics	Book request added to database
		2. Enter the details of book		
		3. Click 'Request'		
8	Buyer: Edit buyer request	1. Click 'Requests Books' on sidebar	Title: Game of Thrones, Author: George Martin, Category:	Book request is updated

			Fiction, Preferred price: 1100 Comment: Book about politics	
		2. Click edit on a request		
		3. Fill edit form		
		4. Click 'Edit' button		
9	Buyer: View My Shelf	1. Click on 'My Shelf' on sidebar	Title: The Mind Games, Author: Densel Washington, Category: Fiction,Price: 1100, Description: Book about human mind	Book can be seen on 'My Shelfs' page
10	Buyer: Add to Favourites	1. Search for advertisement	Advertisement: The Lord of the Rings	Book is added to 'My favourites' page
		2. Click view on advertisement		
		3. Click 'Add to Cart' on advertisement		
11	Buyer: Remove from Favourites	1. Click on 'My Favourites' page	Advertisement: The Lord of the Rings	Book is removed from 'My Favourites'
		2. Click 'Remove' on advertisement		

12	Buyer: View 'My Orders'	1. Click on 'My Orders' in sidebar	Order ID: 24	Order details visible on page
13	Buyer: Seller Application	1. Click on 'Become a Seller' in sidebar	NIC No: 199933210059, Bank Account No: 204200100091326, Bank Name: Sampath Bank, Bank Branch: Dehiwala	Seller Application submitted and visible to Administrator
		2. Fill the details		
		3. Click 'Register'		
14	Buyer: Submit complaint	1. Click 'Submit Complaint' on sidebar	Title: Browse not Working, Description: The browse function to browse books is not working.	Complaint is submitted and can be view by Administrator
		2. Fill the details		
		3. Click 'Submit'		
15	Buyer: Change Password	1. Click 'Settings' on sidebar	Current Password: buyerone123, New Password: buyerone456	Buyer password is changed
		2. Enter current password and new password		
16	Buyer: Change Account details	1. Click Settings on sidebar	Phone:0773271188, House: 34A, Street:	Buyer's details are updated in database

			Galle Road, City:Wellawatte, District: Colombo	
		2. Fill in new details		
17	Seller: Post Book	1. Click 'Post Book' on sidebar	Title: The Hobbit, Author: J.R.R. Tolkien, ISBN: 9780044403371, Category: Fiction, Language: English, Price: 750, Description: This is the first book in the 'The Lord of the Rings' series	New book is posted with the given details.
		2. Fill in the details for the advertisement		
		3. Click 'Post' button		
18	Seller: Sales History	1. Click on 'Sales History' in sidebar	Buyer: buyer1, Title: The Mind Games, Author: Densel Washington, Price: 1250	Details of the completed sale is shown in the page
19	Seller: View buyer requests	1. Click on 'Buyer Requests' in sidebar	Title: Village by the Sea, Author: Anita Desai, Category: Fiction,	Details of the buyer request can be viewed

			Preferred price: 1250, Buyer: buyer1	
		2. Click on a specific request		
20	Seller: Posted Books	1. Click on 'Posted Books' in sidebar	Title: The Alchemist, Author: Paulo Coelho Price: 1300, ISBN: 9788408052944	The unsold books posted by the seller can be view
21	Seller: Pending Sales	1. Click on 'Pending Sales' in sidebar	Title: Life on the Mississippi, Author: Mark Twain, Buyer: buyer1	The newly sold books by seller will be shown here.
22	Admin: Seller Applications	1. Click on 'Seller Applications' in sidebar	Buyer: buyer3	If accept buyer is raised to seller status, else user remains as buyer
		2. Click on a application		
		3. Accept or Reject		
23	Admin: View Advertisements	1. Click on 'Manage Advertisements' on sidebar	Title: The Lord of the Rings, Author: J.R.R. Tolkien	Details of available advertisment is shown
		2. Click on an advertisement		
24	Admin: Delete Advertisement	1. Click on 'Manage	Title: The Lord of the Rings,	Advertisement is removed as

		Advertisements' on sidebar	Author: J.R.R. Tolkien	available and is no longer visible to users
		2. Click on an advertisement		
		3. Click on 'Remove' `		
25	Admin: Add Delivery Person	1. Click on 'Manage Delivery Persons	Username: deliveryNew, Password: deliveryNew123, Name: Ravindu Weerasinghe, Phone: 0777622971	New delivery person is added
		2. Fill 'Add delivery person' form		
		3. Click 'Add Deliverer'		
26	Admin: Remove Delivery Person	1. Click on 'Manage Delivery Persons	Deliverer: deliveryRemove	The delivery persons account is deleted
		2. Click 'Remove' on delivery person		
27	Admin: Assign Pickups	1. Click on 'Assign Pickups' on sidebar	PickupId: 67, Deliverer: delivery1	Pickup will be assigned to deliverer and visible in his interface
		2. Select Delivery person for Pickup		

		3. Click 'Assign'		
28	Admin: Assign Deliveries	1. Click on 'Assign Deliveries on sidebar	Order ID: 89, Deliverer: delivery1	Delivery will be assigned to deliverer and visible in his interface
		2. Select Delivery person for Delivery		
		3. Click 'Assign'		
29	Admin: Assign Courier	1. Click on 'Assign Courier' on sidebar	Order ID: 99	Delivery status of order will be updated
		2. Click 'Given to Courier'		
30	Admin: View Orders	1. Click on 'Orders' on sidebar	Order ID: 78	Details and status of order can be viewed
31	Admin: View Complaints	1. Click on 'Complaints' on sidebar	Complaint ID: 50, Title: Browse not Working, Description: The browse function to browse books is not working.	Details of submitted complaint can be viewed
32	Admin: Reply to complaint	1. Click on 'Complaints' on sidebar	Complaint ID: 50, Title: Browse not Working, Description: The browse function to browse books is not working, Reply: We are in the process of	Reply is sent to the buyer and can be viewed by the buyer

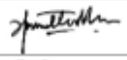
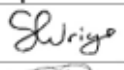
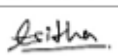
			fixing the issue.	
		2. Click on a complaint		
		3. Fill the reply form		
		4. Click 'Reply'		
33	Admin: Refund Buyers	1. Click 'Refund Buyers' on sidebar	Advertisement ID: 99, Buyer: buyer1, Price: 1400	Refund is updated as 'Refund complete'
		2. Click 'Refund given' on a buyer's refund		
34	Admin: Change Password	1. Click 'My Account' on sidebar	Current Password: adminone123, New Password: adminone456	
		2. Enter current password and new password		
35	Delivery: Pending Pickup	1. Click on 'Pending Pickups' on sidebar	PickupId: 77, Update: Get from Seller; PickupId:88, Update: Give to Store	If update is 'Got from Seller' button changes to 'Give to Store', if update is 'Give to Store' pickup removed from interface.
		2. Select a pickup and give the relevant update		
36	Delivery: Pickup History	1. Click 'Pickup History' on sidebar	PickupId: 88	Details of pickup will be shown

		2. Click on a pickup		
		3. View the details		
37	Delivery: Pending Delivery	1. Click on 'Pending Delivery' on sidebar	Order ID: 96, Update: Get from Store; Order ID: 88, Update: Give to Buyer	If update is ' button changes to 'Get from Store', if update is 'Give to Buyer' delivery removed from interface.
		2. Select a delivery and give the relevant update		
38	Delivery: Delivery History	1. Click 'Delivery History' on sidebar	Order ID: 88	
		2. Click on a delivery		
		3. View the details		
39	Delivery: Change password	1. Click 'My Account' on sidebar	Current Password: deliveryone123, New Password: deliveryone456	
		2. Enter current password and new password		
40	Unregistered: Registration	1. Click 'Join Shelfs' on sidebar	Username: newUser99, Name: Robin Hobb, email: 2019cs100@stu.ucsc.cmb.ac.lk	Receive code in email, submit code and create account

		2. Fill details		
		3. Receive verification code to email		
		4. Verify Account using Verification form		
41	Forgot Password	1. Click 'Forgot Password'	Username: newUser99	Receive code in email, submit code and create new password
		2. Enter username		
		3. Get OTP code from email		
		4. Submit OTP and create new password		
42	Logout	1. Click 'Logout' on sidebar		User is logged out of account

13 Declaration

We as members of the project titled Shelfs – Online Bookstore, certify that we have carried out this project according to the guidelines provided by the coordinators and supervisors of the course. To the best of our knowledge and brief, the project work will not contain any material previously published or written by another person or ourselves..

Student Name	Index No.	Signature
1). A. H. Munas	19001002	
2). B. K. S. R. Rodrigo	19001452	
3). T. R. Ramanayake	19001292	
4). A. K. Muthumala	19001045