

**BYTEBAZAAR: UNVEILING THE FUTURE OF COMPUTER RETAIL WITH A
WEB-BASED E-COMMERCE PLATFORM**

BY

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FINAL YEAR DESIGN PROJECT REPORT

This Report Presented in Partial Fulfillment of the Requirements for the
Degree of Bachelor of Science in Computer Science and Engineering

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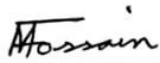
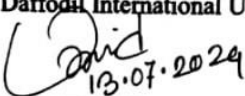
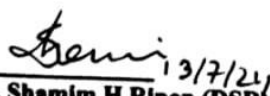
DHAKA, BANGLADESH

JULY 2024

APPROVAL

This Project titled "ByteBazaar: Unveiling the Future of Computer Retail with a Web-Based E-Commerce Platform", submitted by Md. Riyad Talukder, ID: 201-15-3446 to the Department of Computer Science and Engineering, Daffodil International University, has been accepted as satisfactory for the partial fulfillment of the requirements for the degree of B.Sc. in Computer Science and Engineering and approved as to its style and contents. The presentation has been held on 13-07-2024.

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DECLARATION

We hereby declare that, this project has been done by us under the supervision of **Shahadat Hossain, Lecturer (Senior Scale), Department of CSE** Daffodil International University. We also declare that neither this project nor any part of this project has been submitted elsewhere for award of any degree or diploma.

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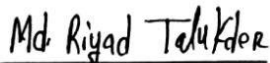
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ABSTRACT

“Bytebazaar” presents an business-to-consumer e-commerce application designed specifically for computer purchases. The program has several features and makes use of technologies like ReactJS, Tailwind CSS, Node.js, Express.js, MongoDB, etc. Consumers can use a search option to browse and find the things they want, add items to their shopping basket, and check out. Users must log in or register if they haven't already in order to facilitate orders. Cash on delivery or online transactions are two ways to make payments. While admins and sellers can control orders and products, users can manage their accounts. Admins have the power to remove people from their accounts and designate new admin. The goal of this e-commerce system is to offer a complete solution by giving customers access to a safe, adaptable, and user-friendly environment.

TABLE OF CONTENTS

CONTENTS	PAGE NO
Approval	ii
Declaration	iii
Acknowledgement	iv
Abstract	v
Table of contents	vi-viii
List of figures	ix-x
List of tables	xi
CHAPTER 1: INTRODUCTION	1-4
1.1 Overview	1
1.2 Background and Present State	1
1.3 Problem Statement	1-2
1.4 Objectives	2
1.5 Scope and Limitations	2-3
1.6 Report Organization	3
1.7 Summary	4
CHAPTER 2: LITERATURE REVIEW	5-8
2.1 Overview	5
2.2 Related Works	5
2.3 Comparison between existing works	6-7
2.4 Open Issues	7
2.5 Summary	8
CHAPTER 3: REQUIREMENT ANALYSIS & DESIGN SPECIFICATION	9-52
3.1 Overview	9

3.2 System Design	9-48
3.3 Hardware/ Software Requirement	48-49
3.4 Project Management and Financial Analysis	49-52
3.5 Summary	52
CHAPTER 4:IMPLEMENTATION	53-57
4.1 Overview	53
4.2 Prototype Design	53-56
4.3 System Testing	56
4.4 Summary	56-57
CHAPTER 5: RESULT AND ANALYSIS	58-60
5.1 Overview	58
5.2 Experimental	58-60
5.3 Performance	60
5.4 Summary	60
CHAPTER 6:IMPACT ON SOCIETY, ENVIRONMENT AND SUSTAINABILITY	61-68
6.1 Impact on Life	61
6.2 Impact on Society & Environment	61-64
6.3 Ethical Aspects	64-65
6.4 Sustainability Plan	65-67
6.5 Summary	68
CHAPTER 7: CONCLUSION AND FUTURE WORK	69-70
7.1 Conclusions	69
7.2 Further Suggested Works	69
7.3 Limitations/ Conflict of Interests	70

REFERENCES	71
APPENDIX	72-77
PLAGIARISM REPORT	78-80

LIST OF FIGURES

FIGURES	PAGE NO
Figure 3.1: Use case diagram for my system	9
Figure 3.2: Activity diagram of registration	18
Figure 3.3: Activity diagram of login	19
Figure 3.4: Activity diagram of search product	19
Figure 3.5: Activity diagram of add to cart	20
Figure 3.6: Activity diagram of check out	21
Figure 3.7: Activity diagram of payment	22
Figure 3.8: Activity diagram of like or dislike	23
Figure 3.9: Activity diagram of add to favorite	24
Figure 3.10: Activity diagram of review and rating	25
Figure 3.11: Activity diagram of manage account	26
Figure 3.12: Activity diagram of manage product	28
Figure 3.13: Activity diagram of manage order	29
Figure 3.14: Activity diagram of make admin	30
Figure 3.15: Activity diagram of log out	30
Figure 3.16: Sequence diagram of registration	31
Figure 3.17: Sequence diagram of login	32
Figure 3.18: Sequence diagram of search product	33

Figure 3.19: Sequence diagram of add to cart	34
Figure 3.20: Sequence diagram of check out	35
Figure 3.21: Sequence diagram of payment	36
Figure 3.22: Sequence diagram of like or dislike	37
Figure 3.23: Sequence diagram of add to favorite	38
Figure 3.24: Sequence diagram of review and rating	39
Figure 3.25: Sequence diagram of manage account	40
Figure 3.26: Sequence diagram of manage product	42
Figure 3.27: Sequence diagram of manage order	43
Figure 3.28: Sequence diagram of make admin	44
Figure 3.29: Sequence diagram of log out	45
Figure 3.30: Entity Relationship (ER) diagram for my system	46
Figure 3.31: SWOT Analysis	51
Figure 4.1: Database	53
Figure 4.2: Home Page Design	54
Figure 4.3: Admin Dashboard Design	54
Figure 4.4: Seller Dashboard Design	55
Figure 4.5: Consumer Dashboard Design	55

LIST OF TABLES

TABLES	PAGE NO
Table 2.1: Comparative analysis with my work	6
Table 3.1: Registration use case description	10
Table 3.2: Login use case description	10
Table 3.3: Search product use case description	11
Table 3.4: Add to cart use case description	11
Table 3.5: Check out use case description	12
Table 3.6: Payment use case description	12
Table 3.7: Like or dislike use case description	13
Table 3.8: Add to favorite use case description	13
Table 3.9: Review and rating use case description	14
Table 3.10: Manage account use case description	15
Table 3.11: Manage product use case description	16
Table 3.12: Manage order use case description	17
Table 3.13: Make admin use case description	17
Table 3.14: Log out use case description	18
Table 3.15: Entity Relationship (ER) diagram description	47-48
Table 3.16: Financial analysis	52

CHAPTER 1

Introduction

1.1 Overview

I discussed project's background and present state, problem statement, objectives, and scope and limitations.

1.2 Background and Present State

The advent of e-commerce has ushered in a new era of business, completely transforming conventional retail operations. Online shopping has become ubiquitous due to the proliferation of smartphones and the growth of internet connectivity. Consumers now demand easy-to-use online shopping experiences that make it simple for them to browse, assess, and buy goods. Even with e-commerce's benefits, issues with internet connectivity, security, and dependability still exist. To tackle this, cutting-edge technology, strong security measures, and a thorough comprehension of customer behaviour are needed. By leveraging digital technologies, Bytebazaar, an online retailer specialising in computer sales, has created a frictionless purchasing experience. Bytebazaar is a B2C marketplace with distinctive features including product likes and dislikes and the option to filter based on these preferences. It was inspired by sites like Amazon and Rayans. These unique characteristics raise user pleasure and engagement, differentiating Bytebazaar in the crowded e-commerce market.

1.3 Problem Statement

The e-commerce website has a wide range of issues. An internet connection is among them. Users need electronic devices like computers and smartphones when they visit a website to see and purchase products. An internet connection is necessary. One of the most important aspects of an e-commerce website is the faith that customers have in it. We have to constantly ensure that our website upholds our customers' confidence. It is quite difficult to stay up with this. We frequently run into numerous issues when trying to

locate our customers and deliver the products on schedule. We frequently run into numerous issues with the e-commerce website's security.

1.4 Objectives

Our objectives consist of

- Create a website that makes it easier for people to buy the computers they want.
- Establish a vibrant online store where a wide variety of laptop products are sold and promoted.
- Give customers easy access to their preferred laptop categories and comprehensive product details.
- Assure a user-friendly interface to improve client happiness and expedite the buying experience.
- Enhance customer shopping experience by saving time and ensuring safety.
- To accommodate user preferences, provide a variety of flexible payment alternatives, such as online purchases and cash on delivery.
- Create a website that is responsive to guarantee the best possible user experience on a range of devices.

1.5 Scope and Limitations

The project is to create a comprehensive online store with a focus on computer sales. To access the platform's capabilities, which include searching products, reading comprehensive product information, and adding items to their shopping basket for eventual purchase, to purchase a product, users must log in or register. Order placement will be made easier with the implementation of a secure checkout process. Customers, sellers, and admin will be able to manage their user profiles on the system and make necessary updates to their personal information. Additional rights, such as controlling orders and adding, modifying, and removing products, will be granted to sellers and admins. Moreover, admins will have control over user management, which includes the power to remove individuals and give admin responsibilities. Bytebazaar has a number of

drawbacks, including as its reliance on dependable internet connections, possible security risks, and the difficulty of keeping current goods inventories. To stay up with changing customer expectations, the user interface and experience must also be continuously improved. Last but not least, handling logistical problems and guaranteeing timely customer assistance can also be difficult.

1.6 Report Layout

I've outlined the entire project review in the report layout in the following few points:

In chapter 1, the project's background and present state, problem statement, objectives, project scope, and limitations were discussed.

In chapter 2, the literature review covered related works, compared existing works, and identified open issues..

In chapter 3, the project's system design, hardware/software requirements, and project management along with financial analysis were discussed.

In chapter 4, My project's prototype design and system testing were discussed.

In chapter 5, My project's experimental results and performance analysis were discussed.

In chapter 6, My project's impact on society, environment, ethical considerations, and sustainability plan were discussed..

In chapter 7, My project's conclusions, suggestions for further work, and limitations/conflicts of interests were discussed.

1.7 Summary

The background of the research examines how e-commerce has revolutionised the retail industry, emphasising how smartphone use and internet accessibility have made online purchasing omnipresent. Bytebazaar uses digital technology to provide a smooth buying experience in the B2C computer sales sector, addressing issues including internet dependency, security concerns, and logistical difficulties. Developing an intuitive platform with strong security features and a variety of payment choices is one of the goals. But there are drawbacks as well, such as unstable internet, security flaws, and the constant need for interface improvements to keep up with changing user demands and logistical requirements.

CHAPTER 2

Literature Review

2.1 Overview

I discussed project's related works, comparison between existing works, and open issues.

2.2 Related Works

I delved into platforms like Amazon, Rayans , and various other websites to gather inspiration and insights into user interfaces, search functionality, product listings, checkout processes, payment gateways, mobile responsiveness, customer reviews, and social media integration. For this project I have gathered many information such as stakeholder analysis, demand gathering, functionalities definition, non-functional aspect outlines, and iterative development planning from below mentioned sites.

Related Site Links

- <https://www.ryanscomputers.com/>
- <https://www.startech.com.bd/>
- <https://www.paragoncomputerbd.com/>
- <https://www.computervillage.com.bd/>
- <https://www.amazon.com/>

2.3 Comparison between existing works

Table 2.1: Comparative analysis with my work

Features	TechLand bd	Ryans	Computer Village	StarTech	Paragon- Computer bd	Proposed system
Like or dislike to products	No	No	No	No	No	Yes
Filtering liked and disliked products	No	No	No	No	No	Yes
Add to favorite or wishlist	Yes	Yes	Yes	Yes	Yes	Yes
Search option of products	Yes	Yes	Yes	Yes	Yes	Yes
Detailed descriptions of products	Yes	Yes	Yes	Yes	Yes	Yes
Offers collection	Yes	Yes	Yes	Yes	Yes	Yes
Customer reviews and ratings	Yes	Yes	Yes	Yes	Yes	Yes
Multiple payment options	Yes	Yes	Yes	Yes	Yes	Yes
Chatting option	Yes	Yes	Yes	No	Yes	No
Purchase coin's products	No	No	No	No	No	Yes
Product add to cart	Yes	Yes	Yes	Yes	Yes	Yes
Quick view	Yes	Yes	No	No	Yes	Yes

It is evident from the above table that my proposed system has two special qualities not seen in the other systems or e-commerce websites mentioned. These include likes or dislikes to products, Purchase coin's products, and filtering liked and disliked products. Customers can like the product they like and dislike the product they don't like based on like and dislike features. Customers will find it easy to understand how many people like and detest a product when this is done. The feature that allows customers to filter their favorite and disliked products implies that the products they like will travel on the like route and the products they detest will go on the dislike route. Thus, except from my system, none of the other systems described have these two special properties. The above table also reveals several properties that are shared by all of the systems listed and are quite common. A few of these include gathering offers, reading and evaluating customer reviews, and adding items to carts, wishlists, and favorites. Again, the above table shows

us which features are present in some of the systems described and which are not. Among these are chat, and Quick view choices. Thus, we may conclude that my system has two distinct elements that are not present in the other systems mentioned: likes and dislikes to products and filtering liked and disliked products.

Gap Analysis

It is evident from the above table that the systems listed have certain holes in them. And those are that, while they are available in my system, none of the previously stated systems offer likes or dislikes to products, Purchase coin's products ,filtering liked and disliked products. Once more, some of the systems described lack the quick view option that is present in my project.

2.4 Open Issues

Bytebazaar is working hard to become the premier online store for branded laptops, but there are a number of urgent problems that need to be addressed strategically. The most important of these difficulties is the requirement for a dependable internet connection, which is necessary for easy user engagement and platform accessible on a range of devices. Furthermore, the ongoing problem of optimising the platform for device compatibility necessitates constant improvement in order to suit a variety of user preferences and device specs. It is crucial to preserve and grow customer trust, which calls for constant efforts to support openness, dependability, and user happiness via thorough product information and dependable service provision. Another challenge is logistical effectiveness, since Bytebazaar is dedicated to optimising processes to guarantee timely and effective product delivery. In order to protect user information and maintain platform integrity, it is imperative to take precautions against cybersecurity threats and data vulnerabilities. This calls for strict security measures and constant monitoring. By taking decisive action to address these issues, Bytebazaar will be able to improve its market position and provide its clients with a seamless, safe, and reliable buying experience.

2.5 Summary

I looked into popular e-commerce sites like Rayans, Amazon, and others to learn about their functionality, user interfaces, and product listings. A comparison analysis revealed distinctive aspects of my suggested system that are absent from other platforms, like filtered product views and product liking/disliking. Enhancing user engagement and product personalisation is the goal of these advances. Cybersecurity, gadget compatibility, and internet dependability are still major issues. Bytebazaar tries to overcome these difficulties to establish itself as a leading online retailer for branded laptops, delivering a seamless and secure buying experience for customers while retaining trust and operating efficiency.

CHAPTER 3

Requirement Analysis and Design Specification

3.1 Overview

I discussed project's system design, hardware/ software requirements, and project management and financial analysis.

3.2 System Design

Use Case Diagram

Use Case Diagram for “My system”.

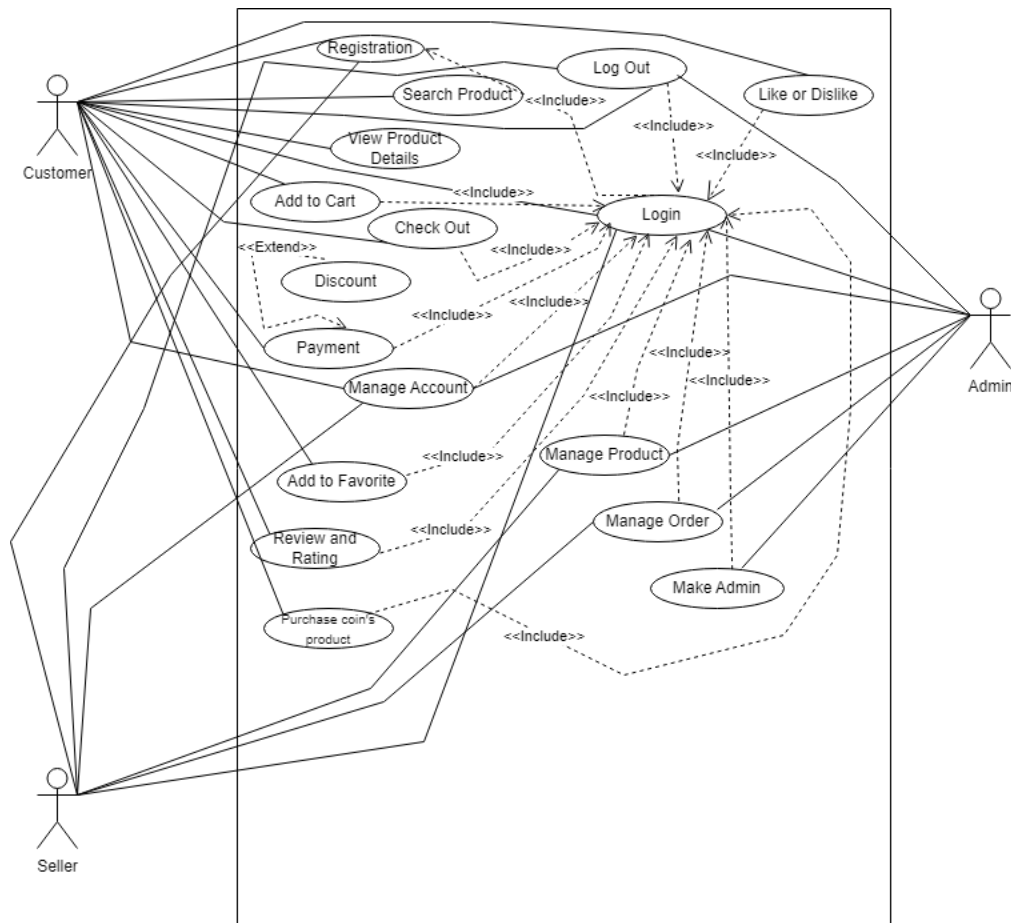


Figure 3.1: Use case diagram for my system

Every use-case is a small piece of this project. By implementing small pieces together a project is created.

Use Case Description

Registration

Table 3.1: Registration use case description

Use case name	Registration
Introduction	The user can register with the system.
Actors	Customer and seller.
Pre-conditions	None.
Post-conditions	The user will get an account for entering the website by logging in.
Basic flow	Select registration button. Fill up the input field of name, email and password. Submit the registration form.
Alternate flow	The user will not get an account for entering the application by logging in, and they will get an error message.

Login

Table 3.2: Login use case description

Use case name	Login
Introduction	It is used to enter the system.
Actors	Customer, seller and admin.
Pre-conditions	Registration.
Post-conditions	The user will be getting access to enter the website.
Basic flow	Fill up the input field of email and password. Submit login button.
Alternate flow	The user will not be getting access to enter the website and they will get an error message.

Search Product

Table 3.3: Search Product use case description

Use case name	Search Product.
Introduction	The user is able to locate the product they require.
Actors	Customer or Guest customer.
Pre-conditions	None
Post-conditions	The user will get the product for which they searched and they will be able to view the product details.
Basic flow	• Enter the name of the product in the search filed. • Click the search button.
Alternate flow	The user will get the product for which they searched and they will get an error message.

Add to cart

Table 3.4: Add to cart use case description

Use case name	Add to cart
Introduction	It is used to add products to cusmoter's shopping cart.
Actors	Customer, guest customer.
Pre-conditions	None
Post-conditions	The user will be successful in adding a product to their shopping cart.
Basic flow	• Search product. • Click ' add to cart' button of product.
Alternate flow	The user will not be successful in adding a product to their shopping cart and they will get an error message.

Check out

Table 3.5: Check out use case description

Use case name	Checkout
Introduction	It is used to check out products from the customer's shopping cart.
Actors	Customer.
Pre-conditions	Login, add to cart.
Post-conditions	The customer will be successful in completing the checkout process.
Basic flow	• Login to the system. • Click shopping cart button. Customers must have a product in their shopping cart. • Click checkout button.
Alternate flow	The customer will not be successful in completing the checkout process and they will get an error message.

Payment

Table 3.6: Payment use case description

Use case name	Payment
Introduction	It is used to make a payment for an order.
Actors	Customer.
Pre-conditions	Login, add to cart, checkout.
Post-conditions	The customer will be able to make a payment for an order and get an order confirmation.
Basic flow	• Login to the system. • Select a payment method. • Calculate total amount. • Click payment button.
Alternate flow	The customer will not be able to make a payment for an order and they will get an error message.

Like or dislike

Table 3.7: Like or dislike use case description

Use case name	Like and dislike
Introduction	It is used to express customers' opinions on products, such as how nice the products are or not.
Actors	Customer.
Pre-conditions	Login.
Post-conditions	The customer will be able to give likes and dislikes to the product based on their opinion by using the like and dislike button.
Basic flow	• Login. • Search Product. • Click like or dislike button.
Alternate flow	The customer will not be able to give likes and dislikes to the product based on their opinion by using the like and dislike button, and they will get an error message.

Add to favorite

Table 3.8: Add to favorite use case description

Use case name	Add to favorite
Introduction	It is used for adding favorite products to customers' favorite or wishlist.
Actors	Customer and guest customer.
Pre-conditions	None
Post-conditions	The customer will be successfull in adding their favorite product to their wishlist.
Basic flow	• Search product. • Click add to favorite or wishlist button.
Alternate flow	The customer will not be successfull in adding their favorite product to their wishlist and they will get an error message.

Review and rating

Table 3.9: Review and rating use case description

Use case name	Review and rating
Introduction	The purpose of it is to provide an expedited shopping experience.
Actors	Customer and guest customer.
Pre-conditions	None.
Post-conditions	The customer will be able to share their shopping experience.
Basic flow	• Search product. • Click a product. • Select rating star and write a review. • Click submit button.
Alternate flow	The customer will not be able to share their shopping experience and they will get an error message.

Manage account

Table 3.10: Manage account use case description

Use case name	Manage account
Introduction	It is used for changing user information.
Actors	Customer, seller, admin.
Pre-conditions	Login.
Post-conditions	The user will be able to change their information such as name, password, image .
Basic flow	• Login to the system • Change Information i) Change name ▪ Enter new name in input field. ▪ Click Submit button. ii) Change Password ▪ Enter current password. ▪ New Password. ▪ Confirm Password. ▪ Clicks on the “Change Password” button. iii) Change Image ▪ Select new photo or enter new URL. ▪ Click submit button.
Alternate flow	The user will not be able to change their information such as name, password, image and they will get an error message.

Manage product

Table 3.11: Manage product use case description

Use case name	Manage product
Introduction	It is used to manage the product. It includes adding products, updating products, and deleting products.
Actors	Seller and admin.
Pre-conditions	Login.
Post-conditions	The user will be able to manage product (adding products, updating products, and deleting products).
Basic flow	• Login to the system • Manage product i) Adding product ▪ Enter the name of product details such as title, price and description etc in the input field. ▪ Clicks on the “Add” button. ii) Updating product ▪ Select a product and modify it’s details. ▪ Clicks on the “Update” button. iii) Deleting product ▪ Select a product. ▪ Clicks on the “Delete” button.
Alternate flow	The user will not be able to manage product (adding products, updating products, and deleting products), and they will get an error message.

Manage order

Table 3.12: Manage order use case description

Use case name	Manage order
Introduction	It is used to manage order. It includes accept order and cancel order.
Actors	Seller and admin.
Pre-conditions	Login.
Post-conditions	The user will be able to manage order (accept order and cancel order).
Basic flow	• Login to the system • Manage order i) Accept Order ▪ Clicks on the “Accept” button. ii) Cancel Order ▪ Clicks on the “Cancel” button.
Alternate flow	The user will not be able to manage order (accept order and cancel order), and they will get an error message.

Make admin

Table 3.13: Make admin use case description

Use case name	Make admin
Introduction	It is used for making admins.
Actors	Admin.
Pre-conditions	Login.
Post-conditions	The user will be able to create admins.
Basic flow	• Login to the system. • Go to dashboard. • Click on “make admin” button.
Alternate flow	The user will not be able to create admins and they will get an error message.

Log Out

Table 3.14: Log Out use case description

Use case name	Log Out.
Introduction	It is used to log out of the user account on the system.
Actors	Customer, seller and admin.
Pre-conditions	Login.
Post-conditions	The user will be able to log out of their account on the system.
Basic flow	• Login to the system • Clicks on 'log out' button.
Alternate flow	The user will not be able to log out of their account on the system and they will get an error message.

Activity Diagram with Description

Registration

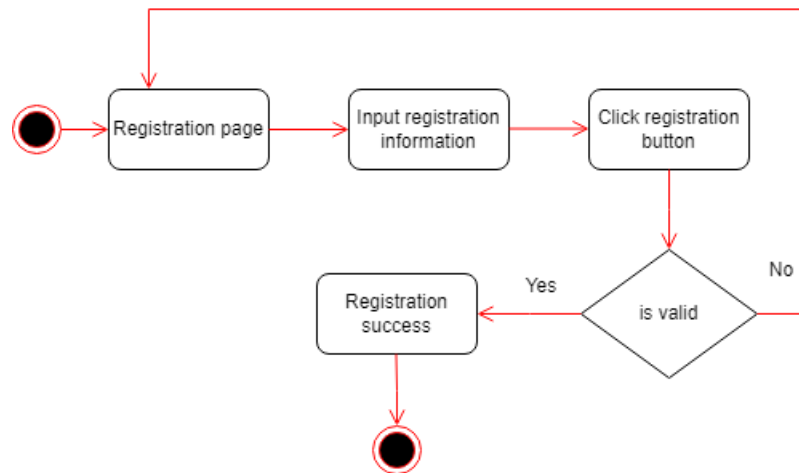


Figure 3.2: Activity diagram of registration

We must first visit the registration page in order to register. After that, We must enter the required data and press the registration button to finish the process. The registration will be approved if all the information is accurate. If not, the signup page will appear.

Login

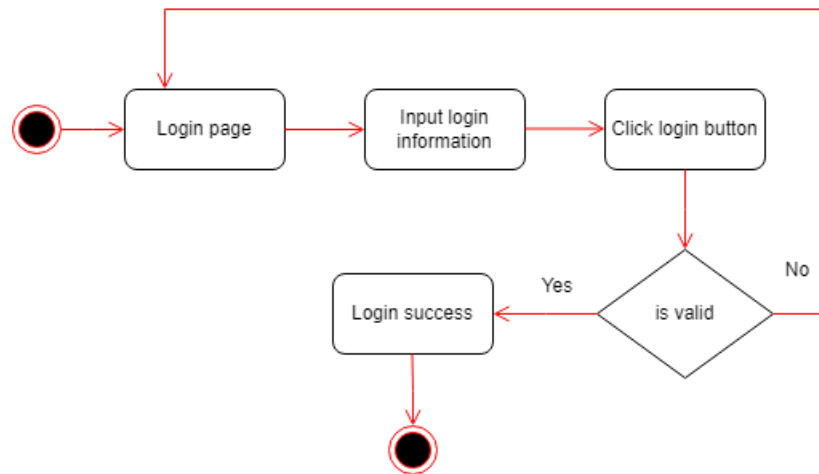


Figure 3.3: Activity diagram of login

We must first visit the login page in order to register. After that, We must enter the required data and press the login button to finish the process. The login will be approved if all the information is accurate. If not, the login page will appear.

Search product

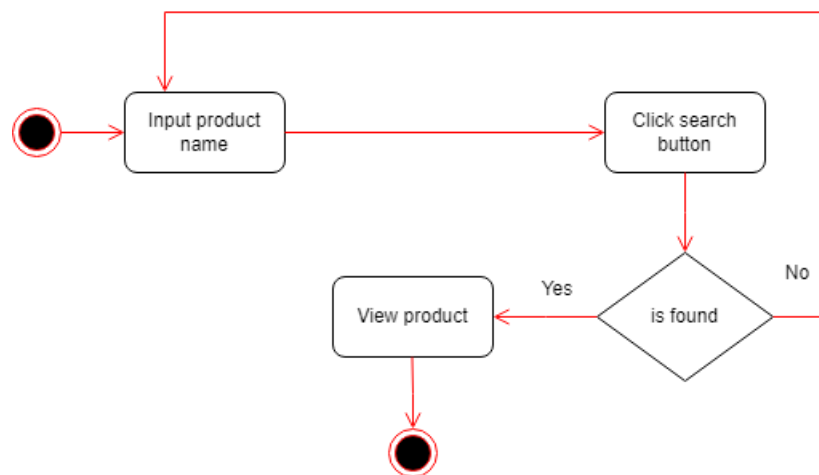


Figure 3.4: Activity diagram of search product

We must first type the product's name into the search field in order to find it. Next, to begin searching, click the search button. We can view the product if it is on display. If not, the page with the search bar will be displayed.

Add to cart

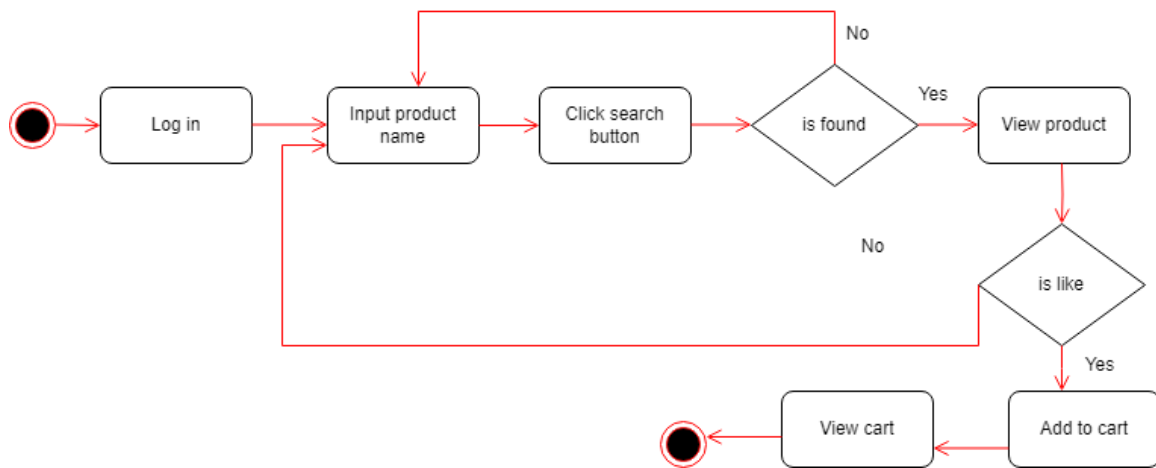


Figure 3.5: Activity diagram of add to cart

If we want to add a product to cart, we have to first login to the website .We must first type the product's name into the search field in order to find it. Next, to begin searching, click the search button. We can view the product if it is on display. If not, the page with the search bar will be displayed. If we are able to view the product and decide we want it, we can add it to our cart and then view it from there. We can visit the page with the search bar if we decide we don't like the product.

Check out

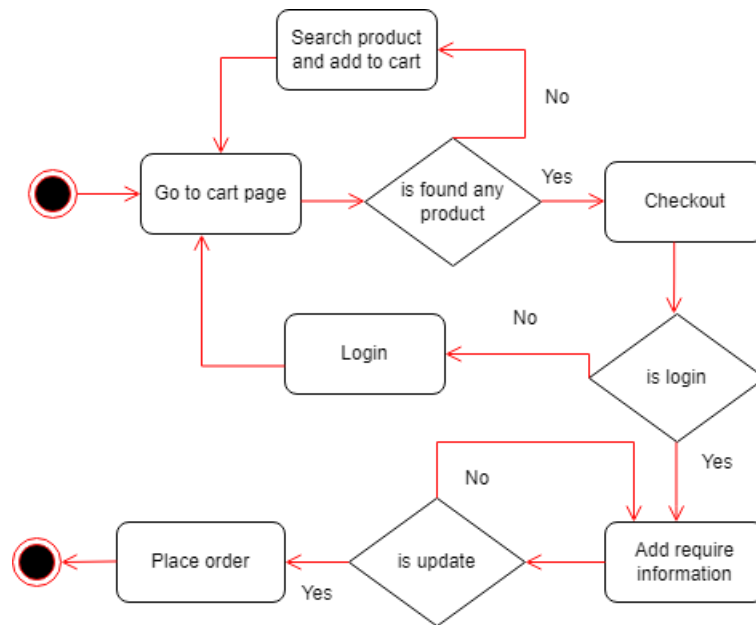


Figure 3.6: Activity diagram of check out

We must first get to the shopping cart in order to check out. We can check out any products that we see in our cart. If not, we must use the search bar to find the product. Next, we must search for products we like and add them to our carts. After that, we will be able to check out. If we are logging in, we will be able to checkout. If not, we must log in before check out. We need to provide the necessary information for checkout. If we are able to update those details after that, we will update. If not, we can submit an order.

Payment

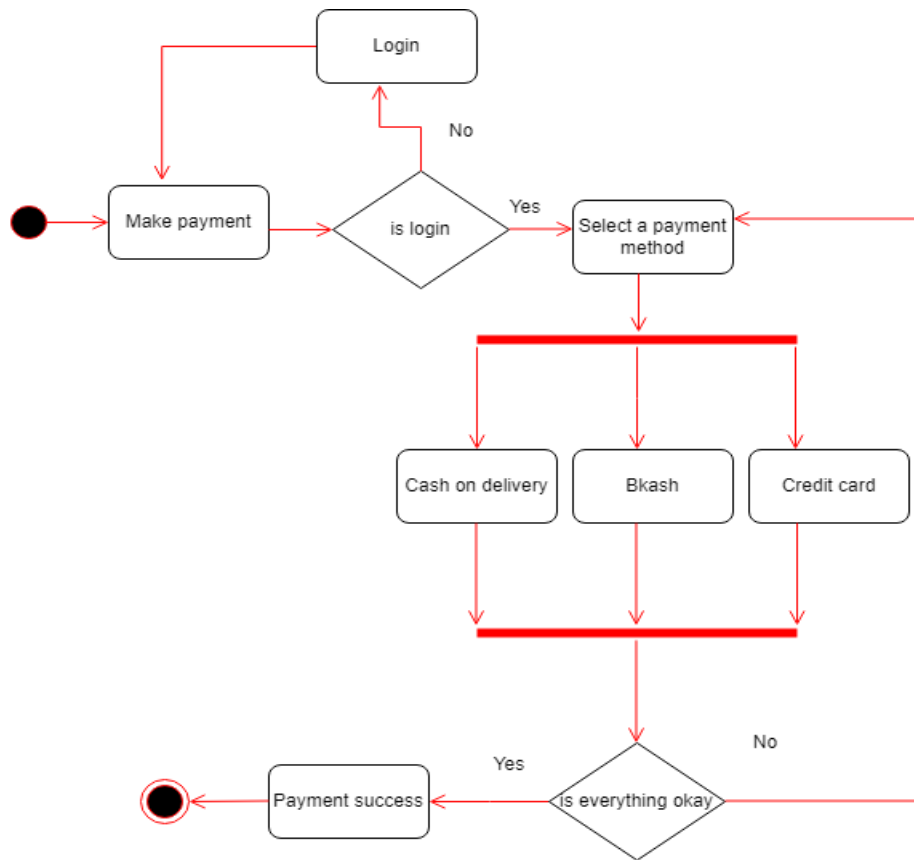


Figure 3.7: Activity diagram of payment

We must first log in to the website in order to make a payment. In the event that we are logged in, click Choose a Payment option to finalize the transaction. Should everything be in order, the payment will be accepted. If not, a page to choose our payment method will appear.

Like or dislike

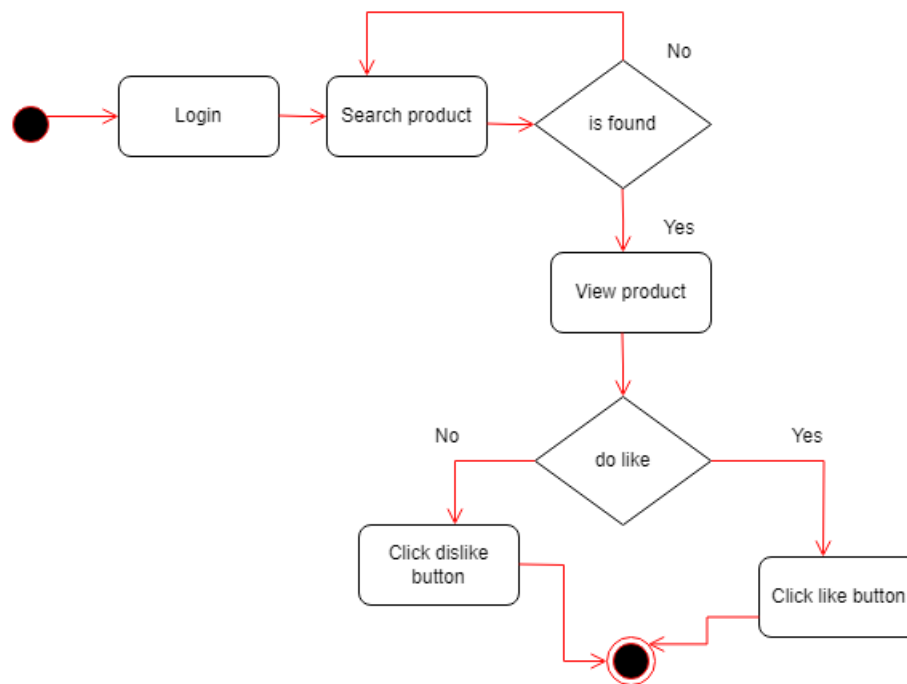


Figure 3.8: Activity diagram of like or dislike

If we want to like or dislike a product, we have to first login to the website. Then we have to search for the product. If we find a product, then we will view it. If we like the product, then we will give it a like. If not, we will give it a dislike. I can go to the search bar page if we don't find any products.

Add to favorite

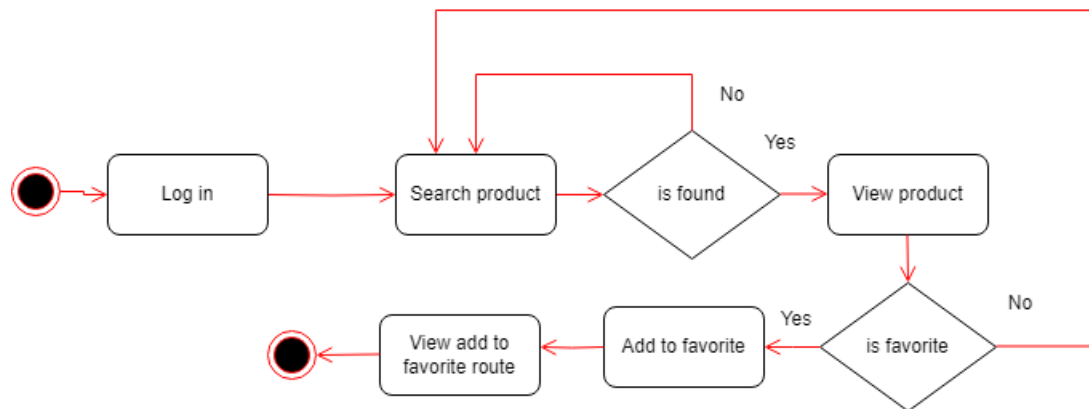


Figure 3.9: Activity diagram of add to favorite

We must first log into the website in order to add a product to our favorites. Next, we need to locate the product. We will view the product if we discover it. We will add the product to our favorites if we think it's good. If not, we can access the page with the search bar. If there are no products, I can get to the page with the search bar.

Review and rating

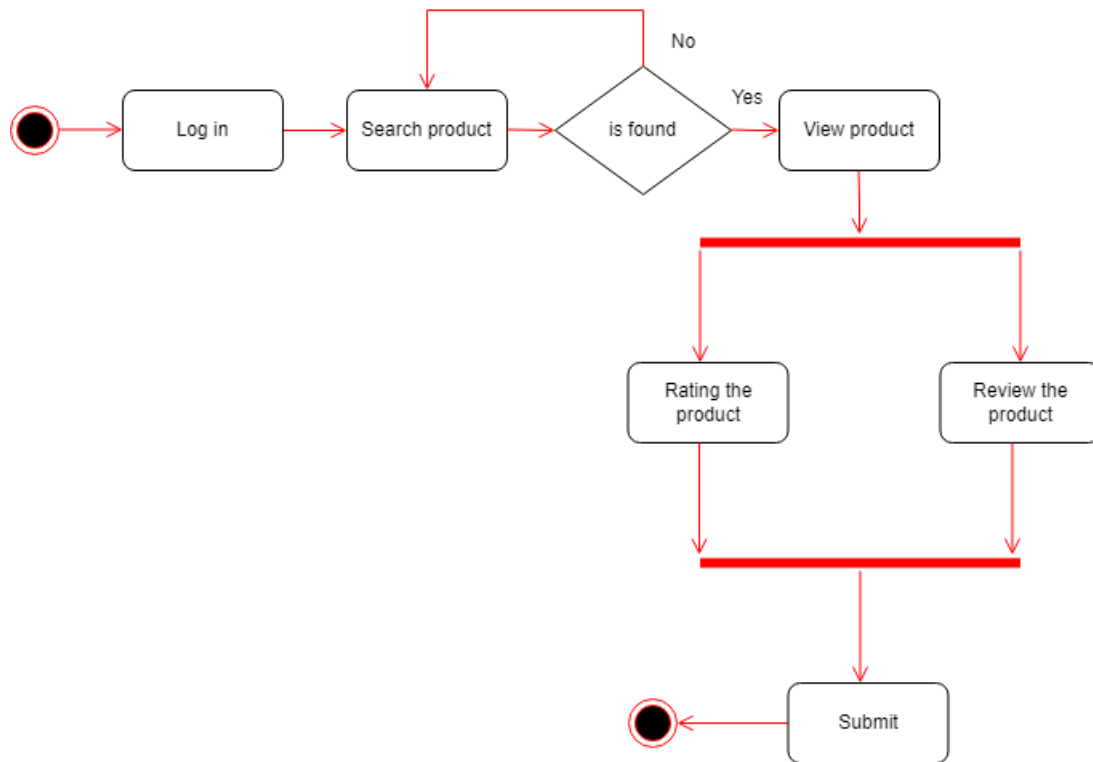


Figure 3.10: Activity diagram of review and rating

If we want to add a review and rating, we have to first login to the website .Prior to assigning a rating and review, we must conduct a product search. After locating the product, we will view it, rating it, and write a review. Next, we'll submit it. I can go to the search bar page if we don't find any products.

Manage account

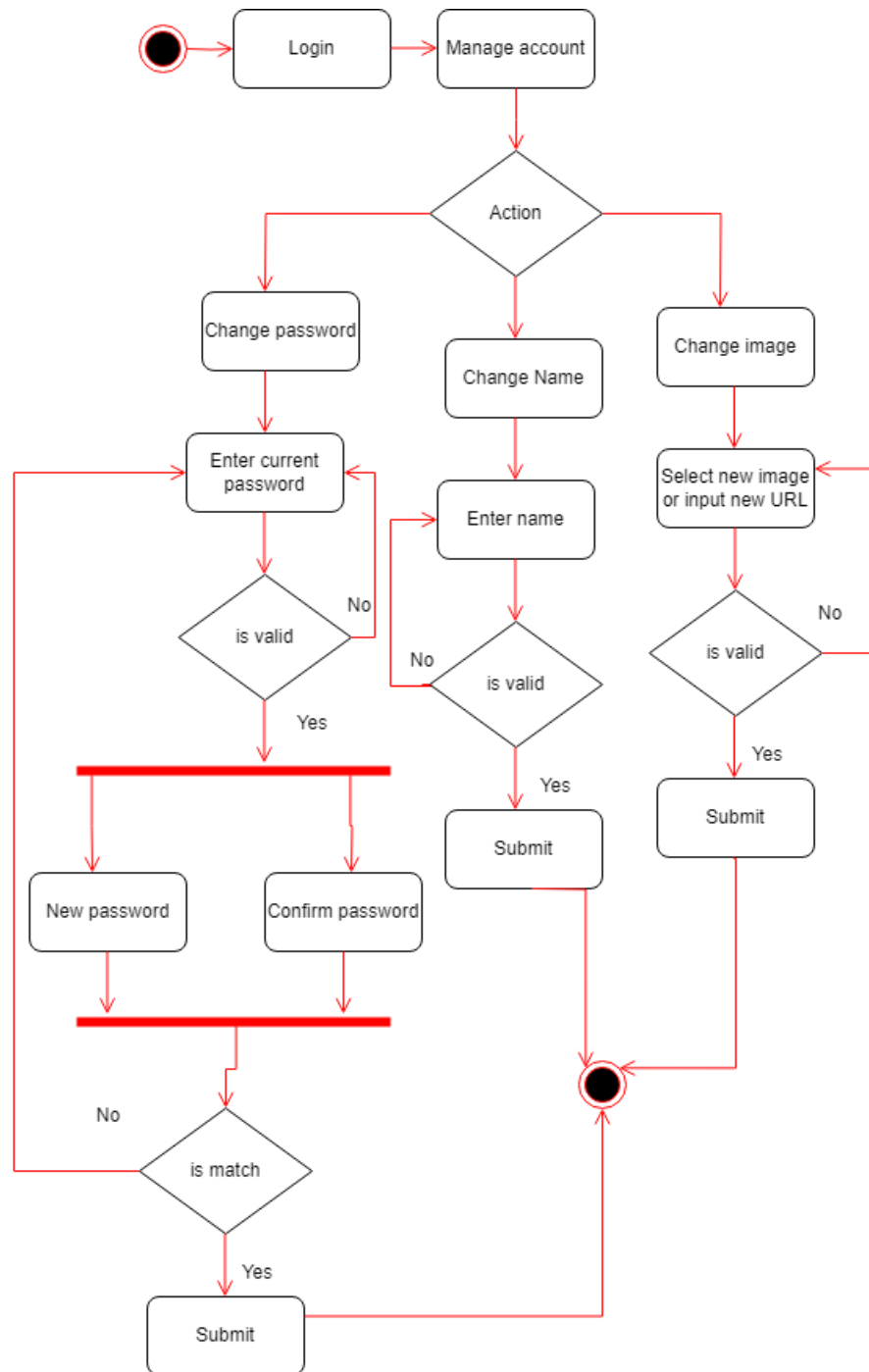


Figure 3.11: Activity diagram of manage account

We must log in to the website in order to manage the account. By selecting the account manage option after logging in, we can modify the password, name, and photo. We have to go to the password change option in order to change the password. Then we must enter the current password. we must enter the current password again if the input is invalid. If it is legitimate, we must enter a new password and confirm password. If the new and confirm passwords not correspond, we will need to start this process over using the existing password. And then submit if the results match. Thus, a new password will be used.

We must select the "Change Name" option and enter the new name if we wish to alter the name. We will need to provide the input again if it is invalid. And we must submit if it is legitimate. Thus, a name change is planned. To alter the image, navigate to the "Change Image" option, provide a new URL, or choose a different photo. We will need to provide the input again if it is invalid. And we must submit if it is legitimate. Thus, the picture will be altered.

Manage product

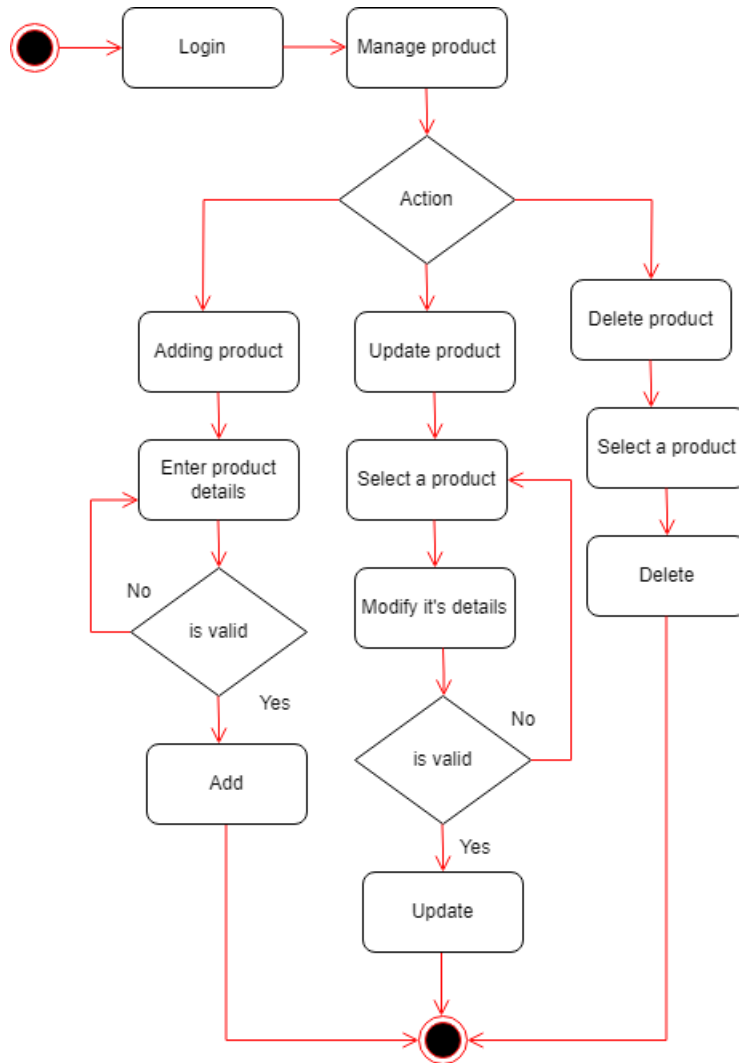


Figure 3.12: Activity diagram of manage product

We must log in to the website in order to manage the product. By selecting the account manage option after logging in, we can add , modify and delete product. To add a product, we must select the adding product option and enter the product information. In the event that the input is invalid, we must provide it again. Clicking the "Add" button is required if it is legitimate. The product will therefore be added. Choose a product and enter new info about it if we wish to modify it. We will need to provide the input again if it is invalid. We must click the Update button if it is legitimate. Then the item will

therefore be updated. Select the product we wish to remove, then click the delete button. Thus, the item will be removed.

Manage order

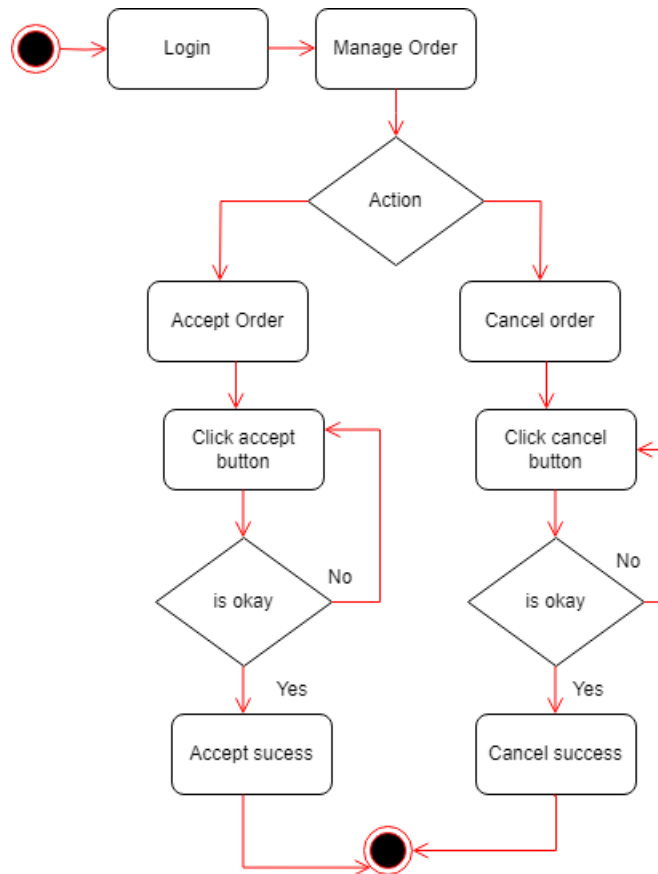


Figure 3.13: Activity diagram of manage order

To manage order, We need to log in to the website. After logging in, we can accept or cancel orders by choosing the order manage option. We must click the accept button in order to accept an order. In the event that something is not right, we must click the accept button once more. And the order will be accepted if everything is in order. We must click the cancel button in order to cancel an order. In the event that something is not right, we must click the cancel button once more. And the order will be cancelled if everything is in order.

Make admin

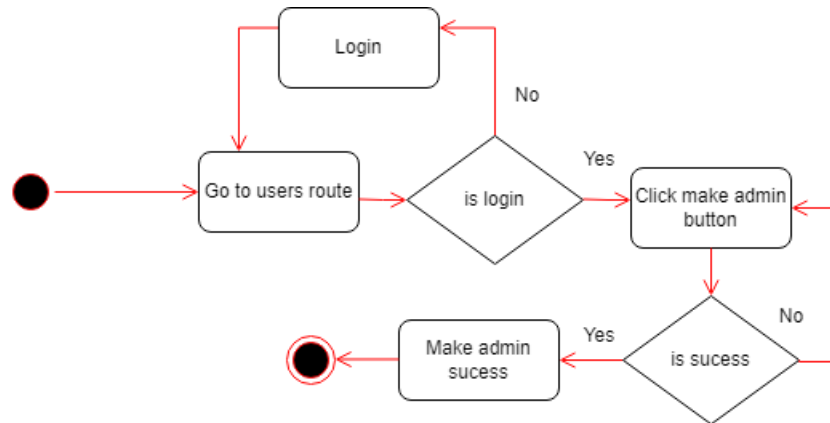


Figure 3.14: Activity diagram of make admin

First, log in to the website as the admin. Proceed to the dashboard's user list if We are already logged in. Next, press the "make admin" button. If all goes according to plan, create admin will succeed. If not, press the "make admin" button once more.

Log out

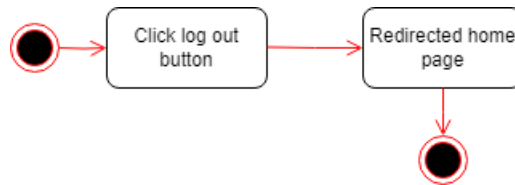


Figure 3.15: Activity diagram of log out

We must first click the "Log Out" button. Then taken to the main page.

Sequence Diagram with describe

Registration

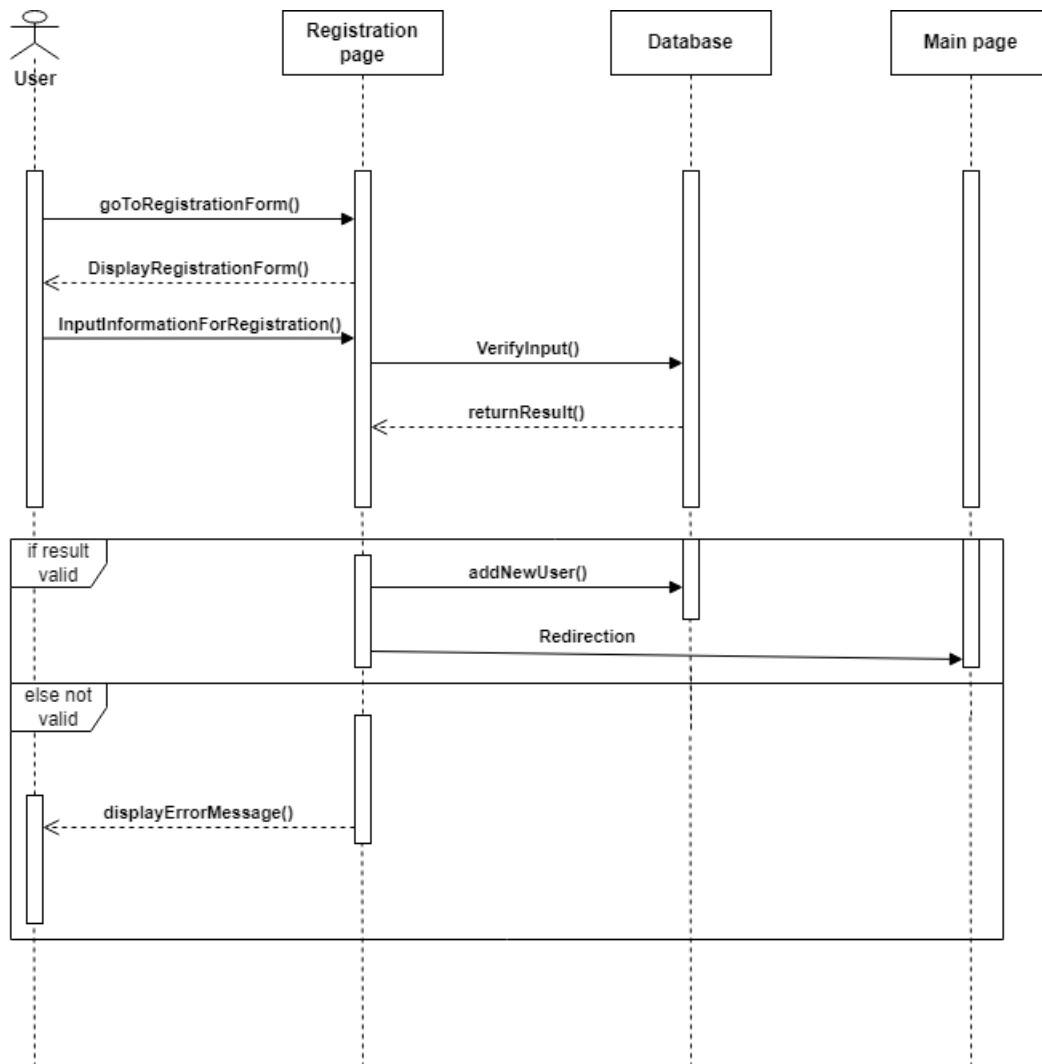


Figure 3.16: Sequence diagram of registration

The registration form will be presented as a response to the request the user sent to the registration page to access the registration form. Next, provide required registration information. The inputs will be verified in a database. The database will then provide the response. The new user add will be stored in the database and will reroute to the main page if the input is legitimate. An error message will appear if it is not valid.

Login

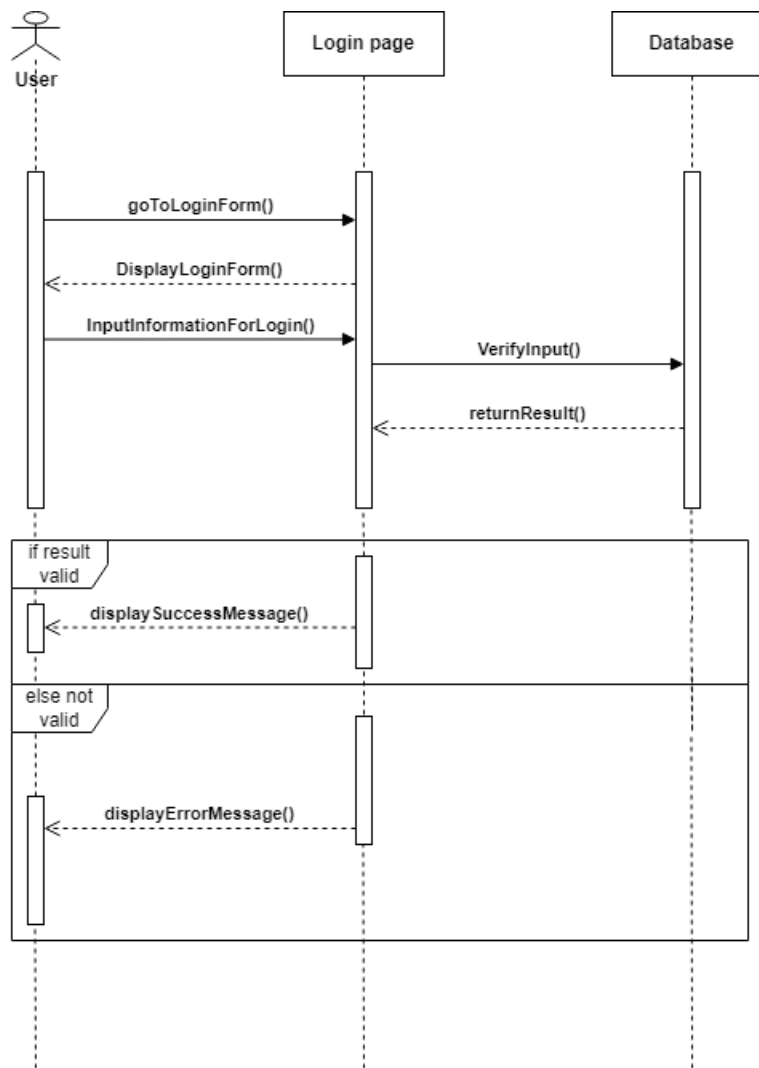


Figure 3.17: Sequence diagram of login

The login form will be presented as a response to the request the user sends to the login page to access the login form. Submit the necessary data for logging in. The inputs will be verified in a database. The database will then provide the response. A success message will appear if the input is genuine. An error message will appear if it is not valid.

Search product

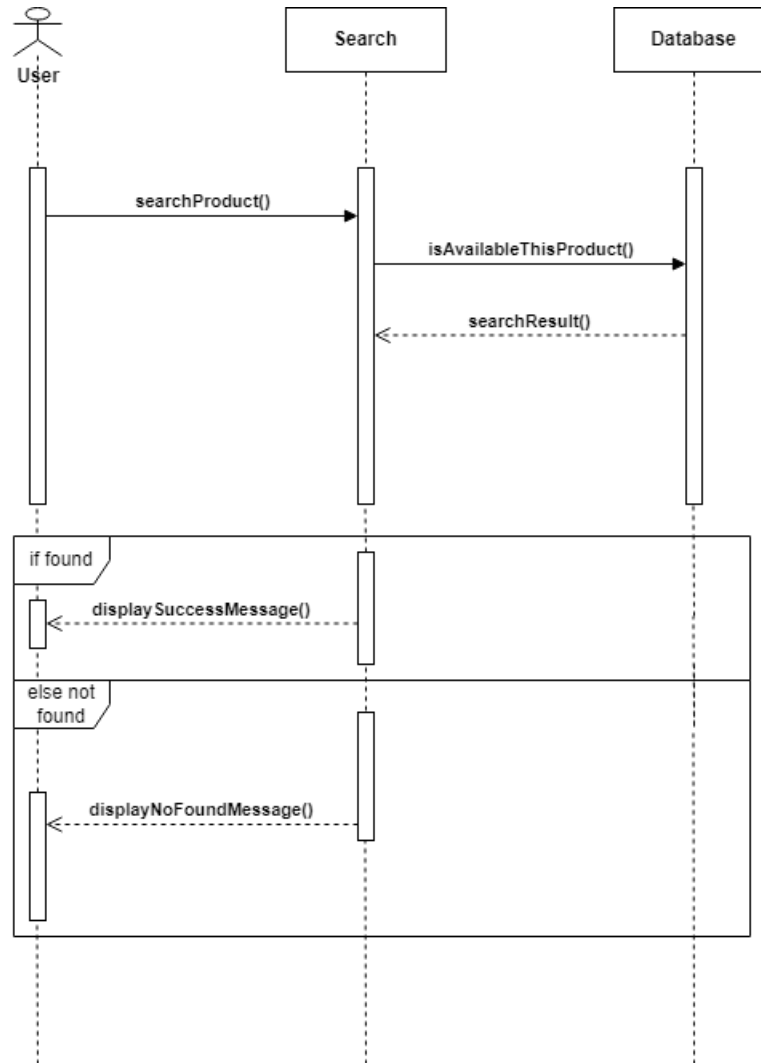


Figure 3.18: Sequence diagram of search product

To search, we must type the product's name. Next, it will determine if the product is present in the database. The search result will then be sent. A success message will appear if the product is located in the database. If not, an error notice will be displayed.

Add to cart

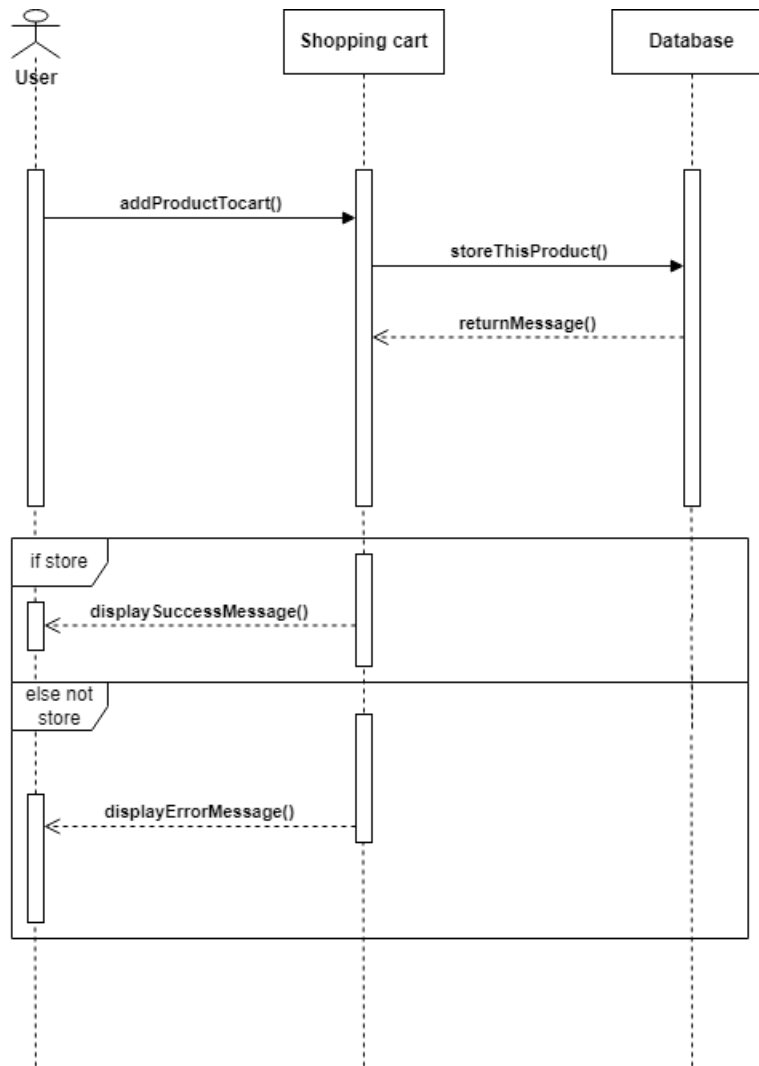


Figure 3.19: Sequence diagram of add to cart

A product is added to the cart and then is stored in the database. The return result will then be sent from the database. A success message will be display if it is stored in the database. Otherwise, an error message will be display.

Check out

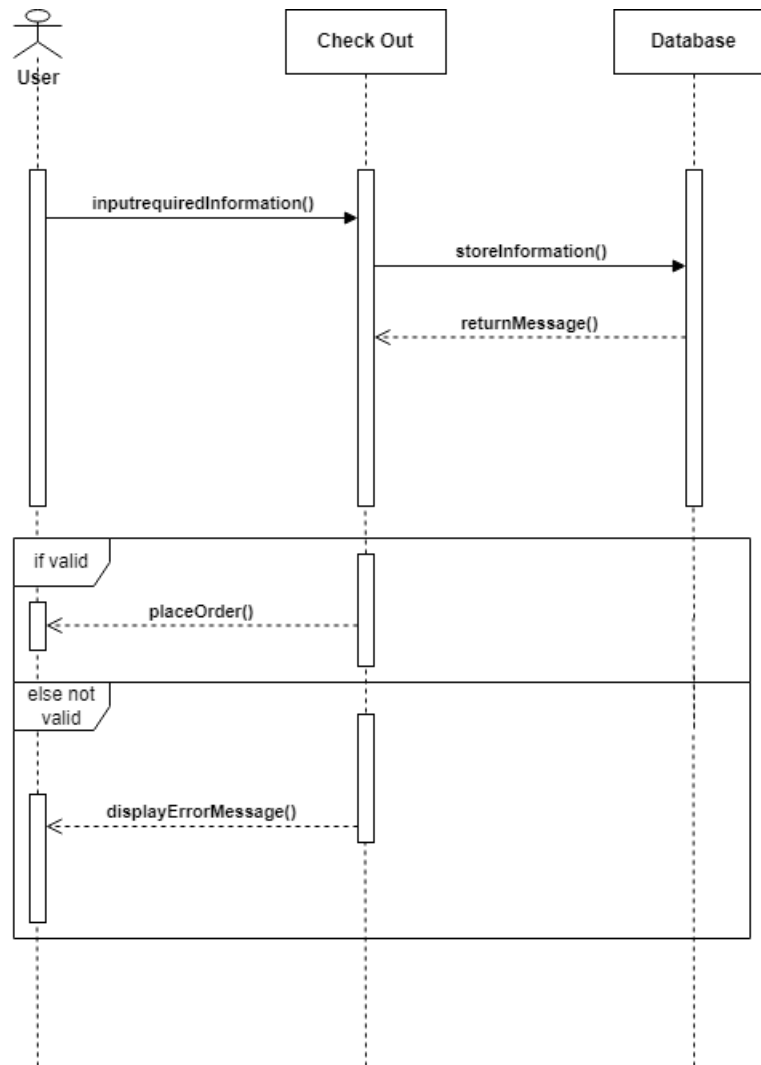


Figure 3.20: Sequence diagram of check out

Enter the necessary information to check out. after which the input will be kept in the database. The return result will then be sent from the database. If the input is stored in the database then an order will be placed. It will display an error message otherwise.

Payment

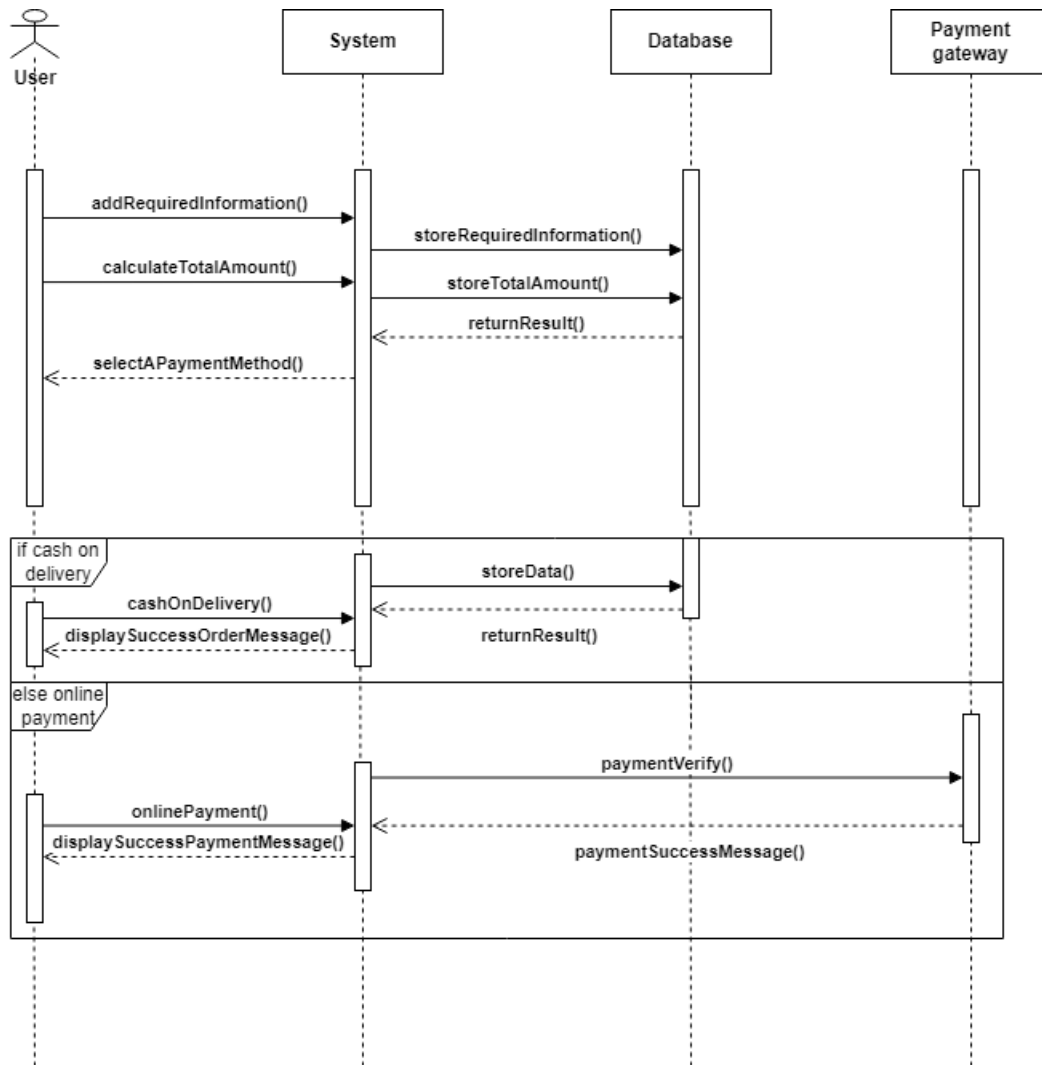


Figure 3.21: Sequence diagram of payment

We must first enter the necessary data in order to make the payment. After which the input will be stored in a database. Then the total amount needs to be calculated. After which the amount will be kept in a database. After which a return message will be sent back. Next we need to decide on a mode of payment. If we choose the cash on delivery option, the information will be stored in the database and we will receive a reply message. Following which a success order message will appear. If we choose to pay online, the payment will

be validated by the payment gateway and we will receive a response in the form of a return message. after which a payment success message will appear.

Like or dislike



Figure 3.22: Sequence diagram of like or dislike

To express our disapproval or love for a product, we must click the like or dislike button. user data who has given like or dislike will be store in database.

Add to favorite

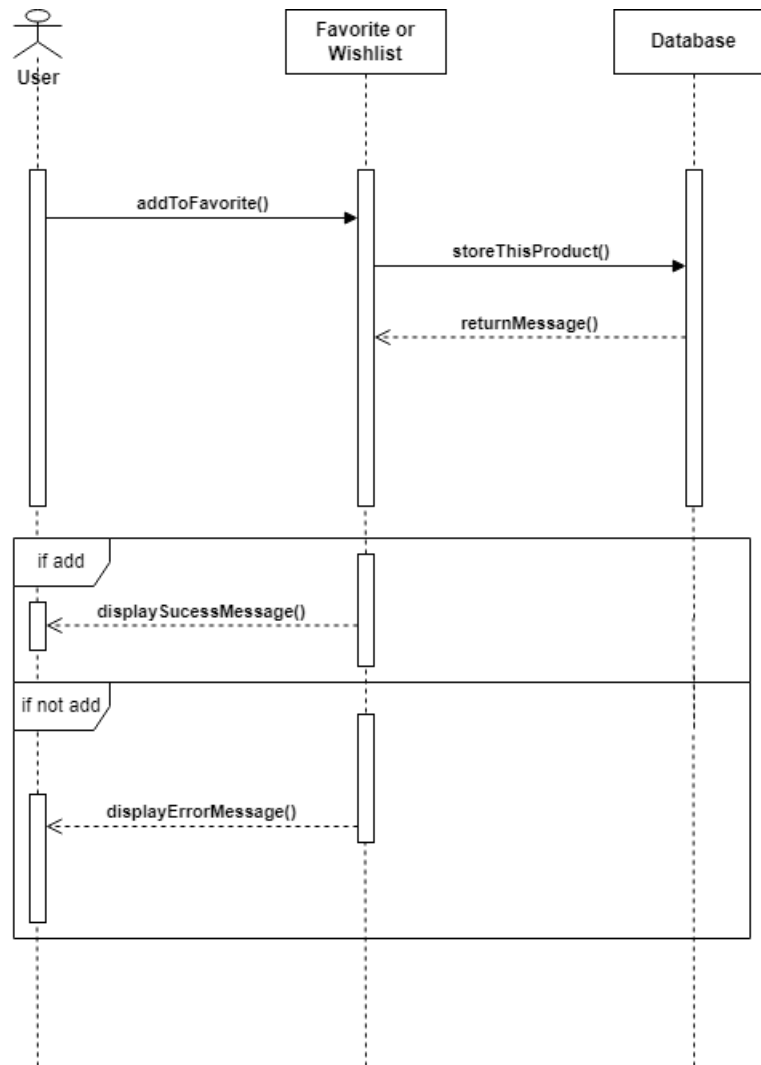


Figure 3.23: Sequence diagram of add to favorite

A product is added to the favorite and then is stored in the database. The return result will then be sent from the database. A success message will be display if it is stored in the database. Otherwise, an error message will be display.

Review and rating

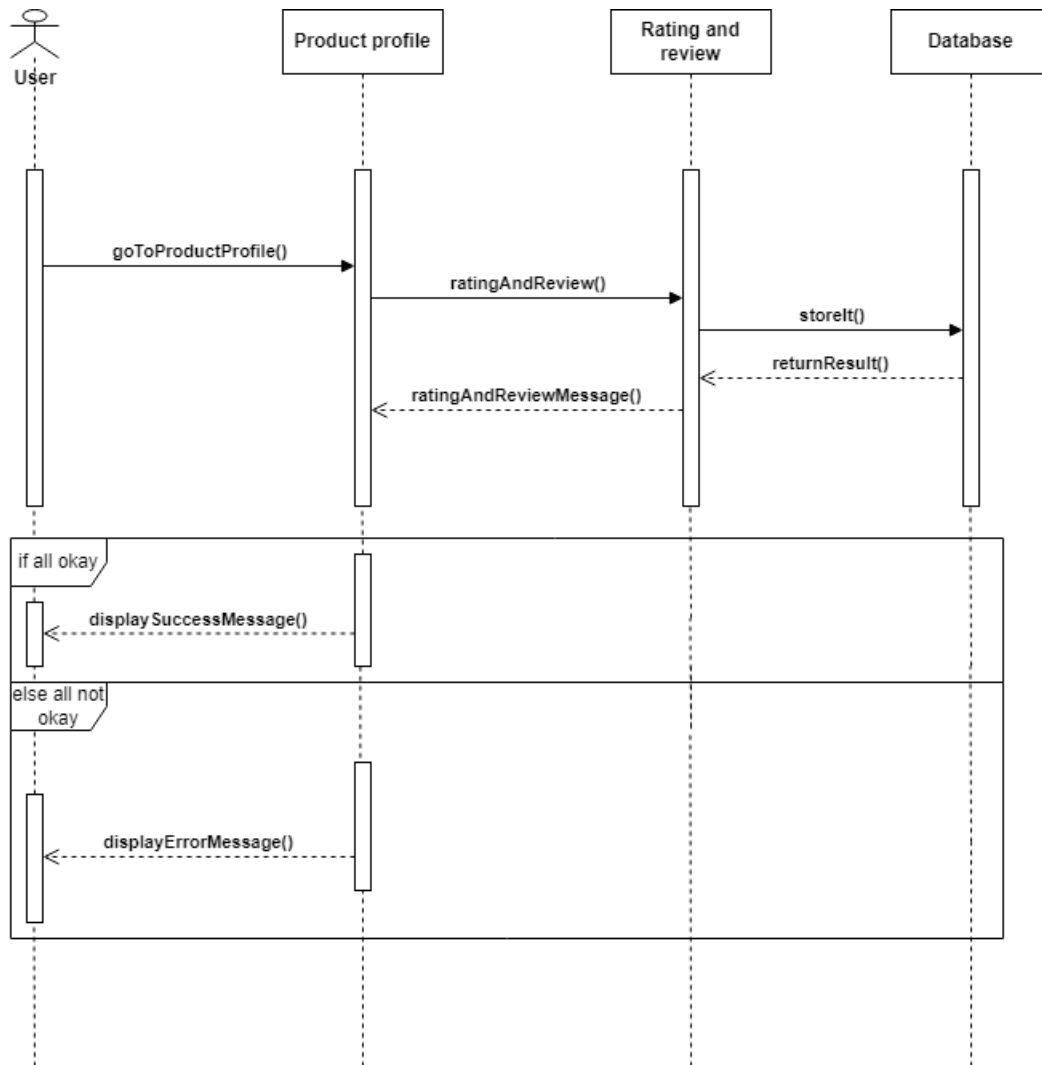


Figure 3.24: Sequence diagram of review and rating

We must first examine the product profile before rating and reviewing a product. After that, we must rate and submit a review. Then a database will be used to store those. Then a response in the form of a reply message will be sent. After which the review and rating notification will appear. An alert indicating success will appear if everything is in order. If not, a message indicating an error will appear.

Manage account

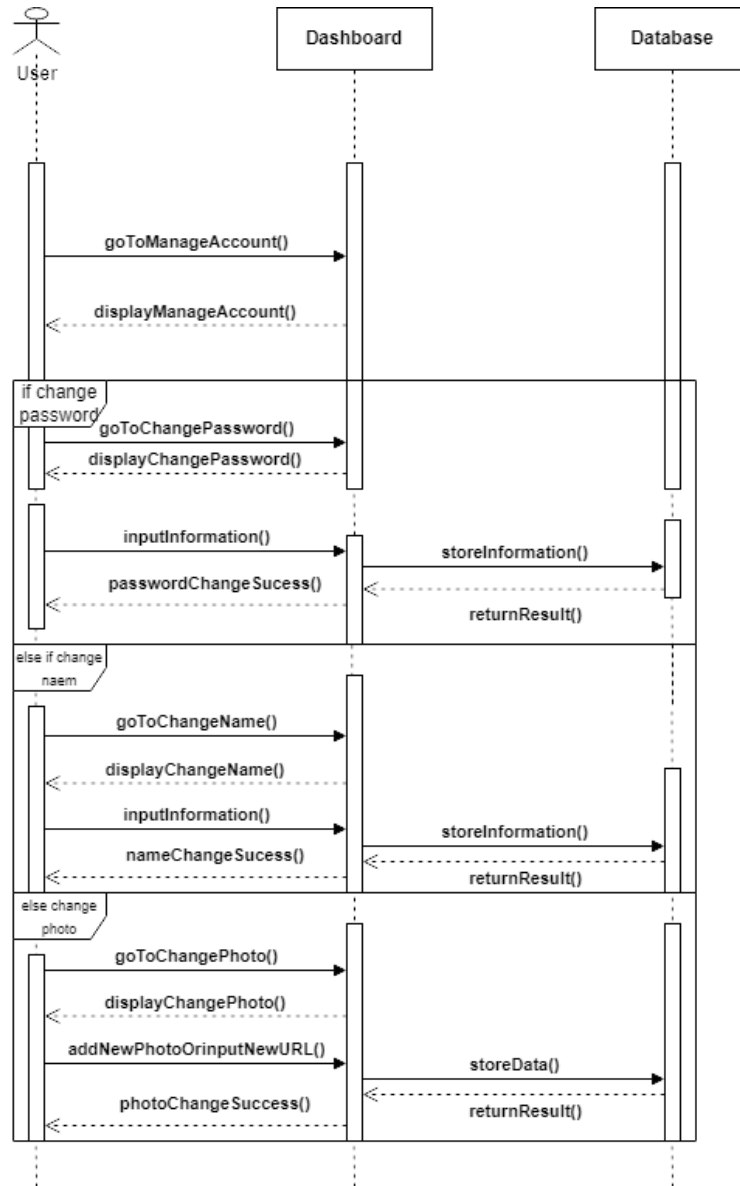


Figure 3.25: Sequence diagram of manage account

A request needs to be issued to the dashboard in order to manage the account. The manage account will then appear as the response. Subsequently, in order to modify the password, we will need to submit a request for the password to be changed. The response will then be presented on the change password form. Next, the pertinent data have to be entered. These inputs are going to be recorded in the database. After that, a return result

will be sent. The password change will then be effective. Subsequently, in order to modify the name, we have to submit a request for the name change. The response will then be

presented on the change name form. Next, the pertinent data have to be entered. These inputs are going to be recorded in the database. After that, a return result will be sent. The name change will then be effective. Subsequently, in order to change the image or url, we have to submit a request for the change image. The response will then be shown as the altered image form. Next, enter the new URL or choose a new image. The newly created image or these inputs will be stored in the database. After that, a return result will be sent. The image change will then be effective.

Manage product

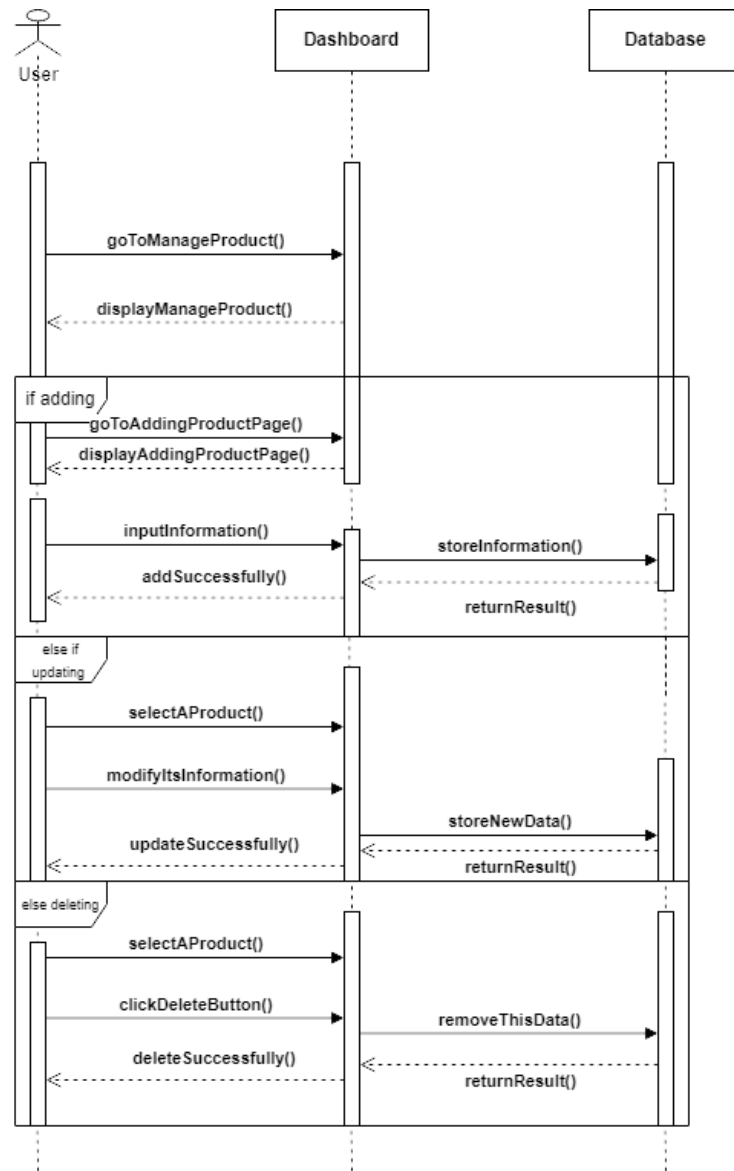


Figure 3.26: Sequence diagram of manage product

A request needs to be issued to the dashboard in order to manage the product. The manage product will then appear as the response. Subsequently, in order to add the product, we will need to submit a request for the product to be added. The response will then be presented on the add product form. Next, the pertinent data have to be entered. These inputs are going to be recorded in the database. After that, a return result will be

sent. The product will be added. Subsequently, in order to modify the product, we have to submit a request for the update product. The response will then be presented on the modify product form. Next, the pertinent new data have to be entered. These inputs are going to be recorded in the database. After that, a return result will be sent. Then the product will be updated. To remove a product, pick the product and click the delete button. The product will be removed from the database. Afterwards, a return message will be displayed, followed by a success remove message.

Manage order

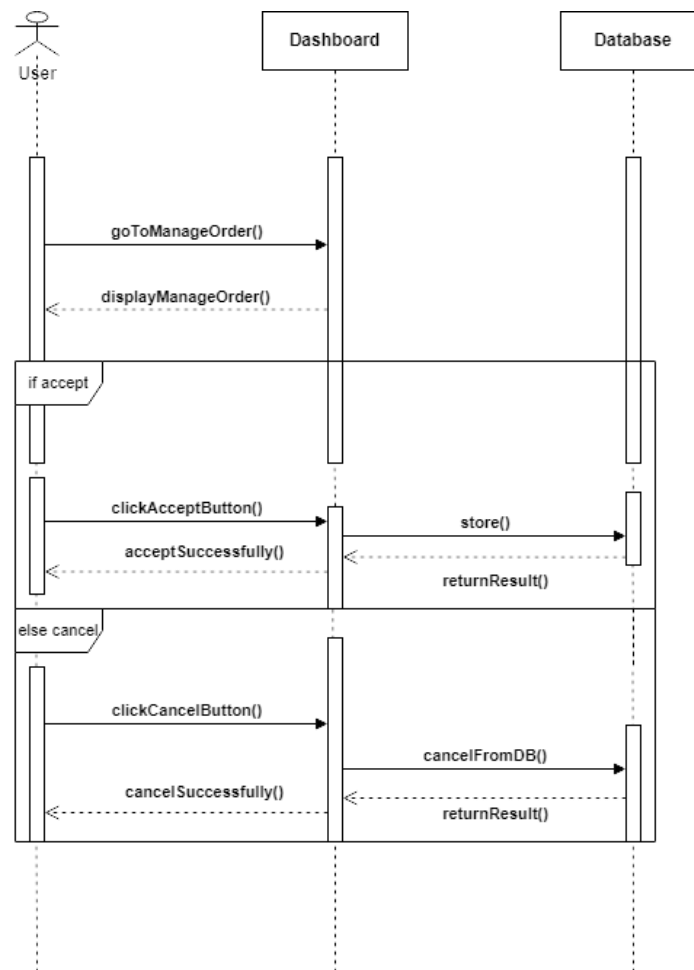


Figure 3.27: Sequence diagram of manage order

A request needs to be issued to the dashboard in order to manage order. The manage order will then appear as the response. To accept an order , click the accept button. The order will be stored to the database. Afterwards, a return message will be displayed, followed by a success accept message. To cancel order, click the cancel button. The order will be removed from the database. Afterwards, a return message will be displayed, followed by a success cancel message.

Make admin

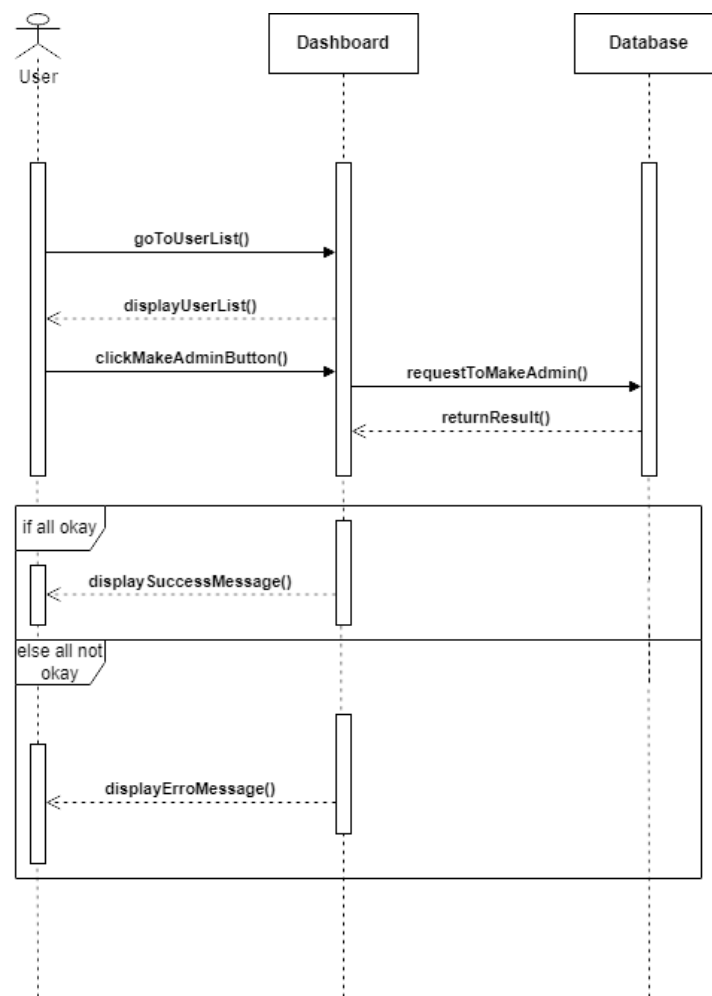


Figure 3.28: Sequence diagram of make admin

Prior to accessing the userlist, a request must be sent. Userlist route will be shown after that. then we must select the "Make Admin" button. The database will receive this request in order to add a new admin. subsequently a reply message will be sent back to us. A success message will appear if everything is in order. If not, a notice indicating an error will appear.

Log out

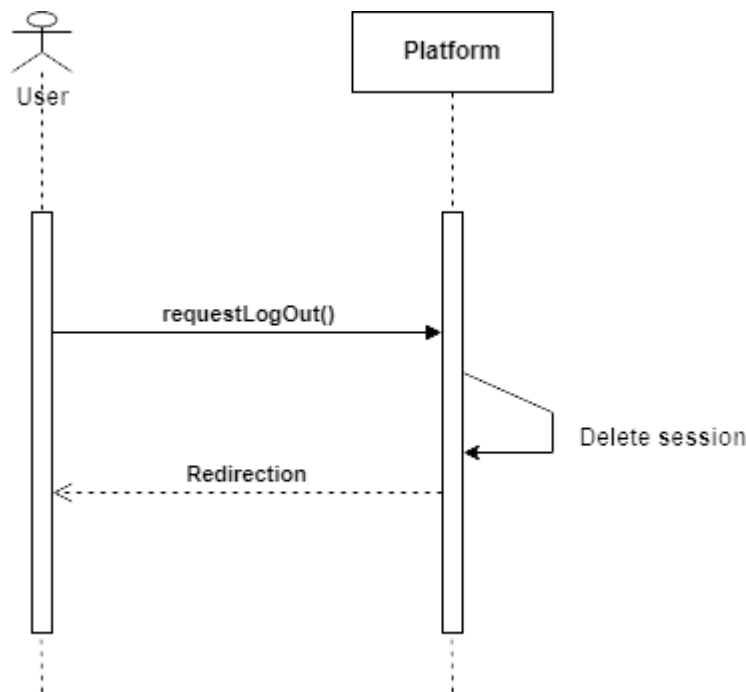


Figure 3.29: Sequence diagram of log out

We must send a request to the platform in order to logout. Then the platform will automatically remove the sessions. After which the user is redirected.

Entity Relationship (ER) Diagram with description

Entity Relationship (ER) Diagram

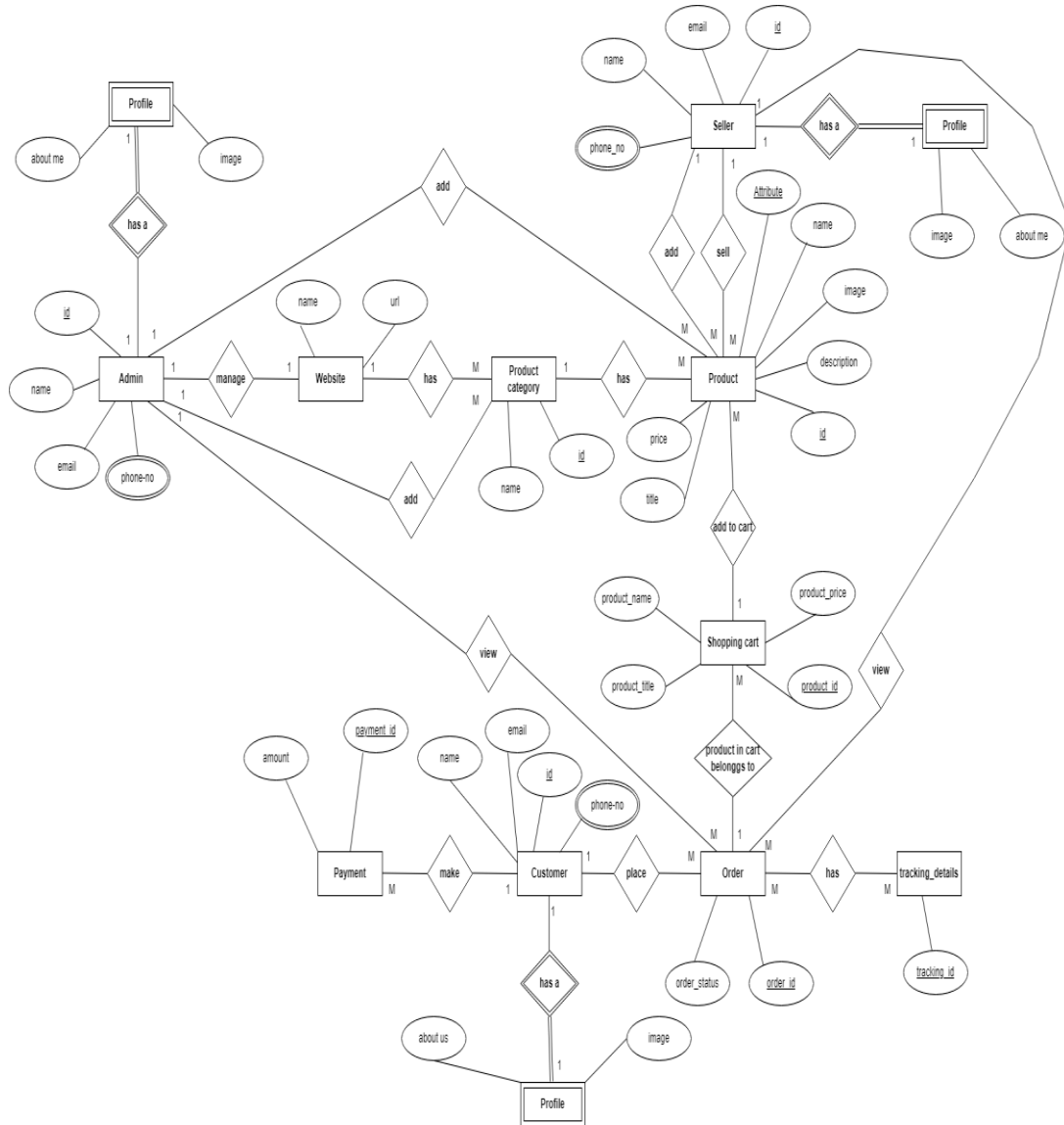


Figure 3.30: Entity Relationship (ER) diagram for my system

Entity Relationship (ER) diagram description

Table 3.15: Entity Relationship (ER) description

Entity	Description
Admin	Admin entity has 4 attributes and those are name, id,email and phone no.Admin has a one-to-one manage relationship with the website entity. Admin has a one-to-one relationship with the profile entity. Admin has one-to-many add relationships with product entities. Admin has one-to-many add relationships with product category entities. Admin has a one-to-many view relationship with the order entity.
Profile	The profile entity has two attributes, and those are about me and image. The profile entity has a one-to-one relationship with the admin, seller, and customer entities.
Website	website entity has two attributes, and those are name and url. The website entity has a one-to-one manage relationship with the admin entity. The website entity has a one-to-many relationship with the product category entity.
Product category	Product category entity has two attributes, and those are name and ID. The product category entity has a one-to-many relationship with the product entity. The product category entity has a one-to-one relationship with the website entity. Product category entity has a many-to-one add relationship with admin entity.
Product	Product entity has seven attributes, and those are name,attribute,image,title,description,price and ID. The product entity has a many to one relationship with the product category entity. The product entity has a many to one sell relationship with seller entity.The product entity has a many to one add relationship with seller entity.The product entity has a many to one add to cart relationship with shopping cart entity. The product entity has a many to one add relationship with admin entity
Seller	Seller entity has 4 attributes and those are name, id,email and phone no. Seller has a one-to-one relationship with the profile entity. Seller has one-to-many add relationships with product entities. Seller has one-to-many sell relationships with product entities. Seller has a one-to-many view relationship with the order entity.
Shopping cart	Shopping cart entity has 4 attributes and those are product name, product id,product tile and product price. Shopping cart has one-to-many add to cart relationship with product entity. Shopping cart has many to one product in cart belongs to relationships with order entity.
Order	Order entity has two attributes and those are order status and order ID. Order

	has many to many relationship with tracking details entity. Order has many to one place order relationships with customer entity. Order entity has a many to one view relationship with admin entity. Order entity has a many to one view relationship with seller entity.
Tracking details	Tracking details entity has one attribute and that is tracking ID. Tracking details has many to many relationship with order entity.
Customer	Customer entity has 4 attributes and those are name, id,email and phone no. Customer has a one-to-one relationship with the profile entity. Customer has a one-to-many place order relationship with order entity.Customer has a one-to-many make payment relationship with payment entity.
Payment	Payment entity has two attributes and those amount and payment ID. payment entity has many to one make payment relationship with customer entity.

3.3 Hardware/ Software Requirement

Analyzing requirements is crucial to the development of a system. In order to design a system, we need to gather a lot of needs. I must first determine what needs there are for my system before I can begin to examine it. Hardware and software are the two categories into which it can be separated. I have taken idea about e-commerce site such as B2B, C2C, B2C and C2B.After that I decided that B2C is best for me.

Software

To construct my system, I have to use a variety of frameworks and computer languages. My system will be well-designed and easy to use as a result. To build my system, I'll need a medium-sized computer and the following components:

- Operating System: Windows 7 / 8 / 10 / 11, Linux distribution, Mac OS X.
- Programming Languages: JavaScript.
- For Front-End: ReactJS.
- Style Sheet Language: CSS.
- CSS Framework: Tailwind CSS.
- For Back-End: NodeJS.
- Back-End Framwork: ExpressJS.

- Database: MongoDB.
- Tools: Visual Studio Code, Extensions for VS Code.

Hardware

To develop the application, I'll need the following hardware requirements:

- Processor: Core i3 or higher.
- RAM: 2 GB to higher.
- Space on plate (disk): 500 MB to higher.

3.4 Project Management and Financial Analysis

Project Management

- **Project Objectives:**

- A. To develop a ecommerce website for buy and sell laptop products
- B. Establish a vibrant online store where a wide variety of laptop products are sold and promoted.
- C. Give customers easy access to their preferred laptop categories and comprehensive product details .

- **Project Timeline:**

- A. Phase 1: Project Planning and Research (2-4 weeks)
- B. Phase 2: Design and Prototyping (6-8 weeks)
- C. Phase 3: Front-End Development (8-12 weeks)
- D. Phase 4: Back-End Development (10-14 weeks)
- E. Phase 5: Testing (4-6 weeks)
- F. Phase 6: Deployment (2-4 weeks)
- G. Phase 7: Post-Launch and Marketing (Ongoing)

- **Resource Planning:**

- A. **Equipment and Tools:**

- Development and Testing Servers

- High-performance Computers for Development Team Design Software(Adobe Creative Suite)
- Collaboration Tools (Slack, Trello, or project management software)
- Version Control System (Git)
- Testing Tools (Selenium for automated testing)

B. Software and Technologies:

- Front-End Technologies (ReactJS and Tailwind CSS)
- Back-End Technologies (NodeJS and ExpressJS)
- Database Management System (MongoDB)
- Server Hosting (AWS, or Google Cloud)
- Payment Gateway Integration (Bkash and Credit card)
- Security Software and SSL Certificates

C. Data and Content:

- Product Data: Provided by sellers or sourced through agriculturaldatabases/APIs
- Product Images: Provided by sellers or obtained through agreements withsuppliers
- User Documentation: Prepared by the technical writing team

D. Training and Skill Development:

- Ensure that the development team has the necessary training and skills in e-commerce development, security, and database management.
- Provide additional training on specific technologies and tools as needed.

- **Risk Management:**

SWOT analysis involves assessing the Strengths, Weaknesses, Opportunities, and Threats of a project. Here's a SWOT analysis for the e-commerce platform

for agricultural products:



Figure 3.31: SWOT Analysis

- **Communication Plan:**

I had met a software engineer brother whose name is Sohel. I collected many information and requirements about e-commerce site from him. And I had also arranged includes

- A. Stakeholder Meetings:**

- Purpose:** Update stakeholders on project requirements gathering progress and gather feedback.

- Participants:** stakeholders.

- Frequency:** Bi-weekly or as specified in the project plan.

- B. Change Control Meetings:**

- Purpose:** Discuss and approve any changes to the project scope or requirements.

- Participants:** Supervisor.

- Frequency:** As needed when change requests arise.

Financial Analysis

Below is a general table with estimated costs for different components of a my project.

Table 3.16: Financial analysis

SN	Components	Estimated Cost (BDT)
01.	Domain and Hosting	1500-2000
02.	Visiting Stakeholders	500-1000
03.	Documentation and Report Writing	500-1000
04.	Miscellaneous (licenses, or tools)	3000-4000
05.	Contingency (10% of total)	900-1300
Total Estimated Cost		6,400-9,300

3.5 Summary

In-depth discussion of requirement analysis, system design, input-output analysis, project management, and financial analysis are included in this chapter, which covers important project components. Requirements for hardware and software, such as operating systems, programming languages, and hardware specs, are found during requirement analysis. An entity-relationship diagram and other diagrams, including use case, activity, and sequence diagrams, are all included in system design. The procedures users must take in order to interact with the system and the associated outputs are described in detail by input-output analysis. Project management uses the Agile SDLC paradigm, placing a strong emphasis on user feedback and iterative development. The initiative is self-funded financially, demonstrating a personal commitment to its advancement. This thorough synopsis provides a clear grasp of the project's scope and execution plan, laying the groundwork for later chapters.

CHAPTER 4

Implementation

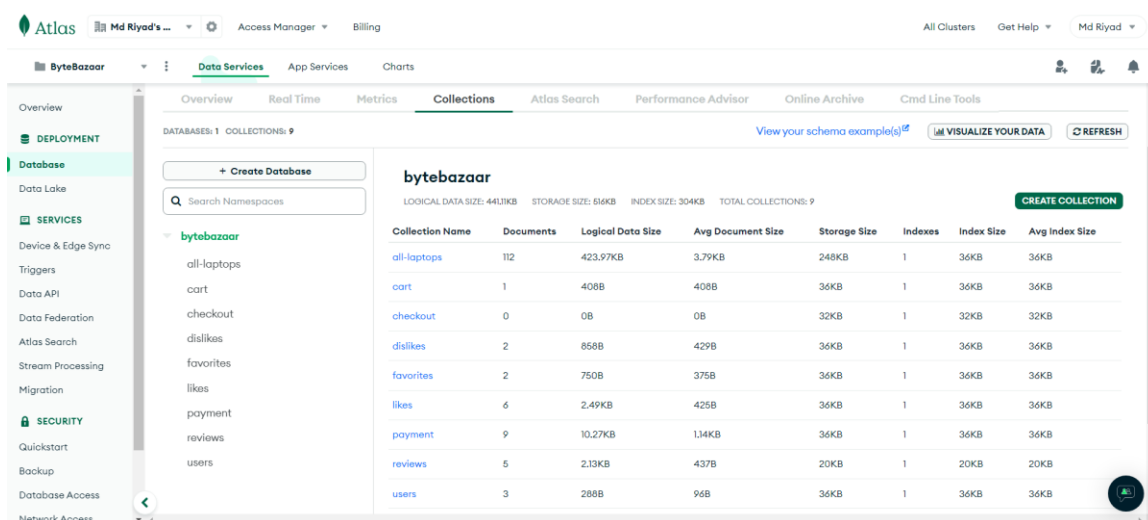
4.1 Overview

I discussed project's prototype design, and system testing.

4.2 Prototype Design

Implementation of Database

The Bytebazaar application can efficiently store, manage, and retrieve data by using the Bytebazaar database in MongoDB, which includes collections such as all-laptops, cart, checkout, dislikes, favourites, likes, payment, reviews, and users. The data integrity, security, and performance of the programme are guaranteed by these collections, which serve as a solid foundation for its operation. From handling transactions and user feedback to maintaining product information and user interactions, each collection has a distinct function. This strong database design facilitates smooth CRUD operations, allowing for effective data management and giving the e-commerce platform a safe and expandable environment.



Collection Name	Documents	Logical Data Size	Avg Document Size	Storage Size	Indexes	Index Size	Avg Index Size
all-laptops	112	423.97KB	3.79KB	248KB	1	36KB	36KB
cart	1	408B	408B	36KB	1	36KB	36KB
checkout	0	0B	0B	32KB	1	32KB	32KB
dislikes	2	858B	429B	36KB	1	36KB	36KB
favorites	2	750B	375B	36KB	1	36KB	36KB
likes	6	2.49KB	425B	36KB	1	36KB	36KB
payment	9	10.27KB	1.14KB	36KB	1	36KB	36KB
reviews	5	2.13KB	437B	20KB	1	20KB	20KB
users	3	288B	96B	36KB	1	36KB	36KB

Figure 4.1: Database

Implementation of Front-end Design

The goal of Bytebazaar - Web-based E-commerce Platform's front-end design is to provide a user-friendly, responsive interface that makes it simple for consumers to browse products, navigate the site, and complete their purchases quickly.

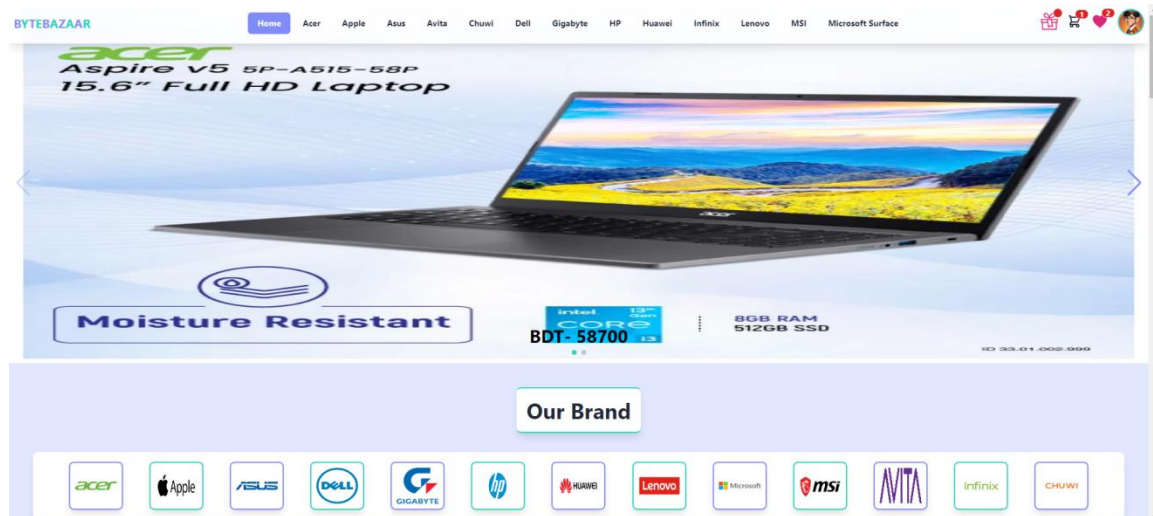


Figure 4.2: Home Page Design

This is the official website of the web-based e-commerce platform Bytebazaar. Various laptop brand names, including Apple, HP, Asus, Acer, and more, are displayed in this navbar and dashboard.



Figure 4.3: Admin Dashboard Design

This is the Bytebazaar admin dashboard, a web-based e-commerce platform. This page contains a number of controls for controlling the website, such as making admin and seller, managing orders, products, and user accounts. It also shows earnings, revenue and sales orders data in addition to performing various administrative tasks.

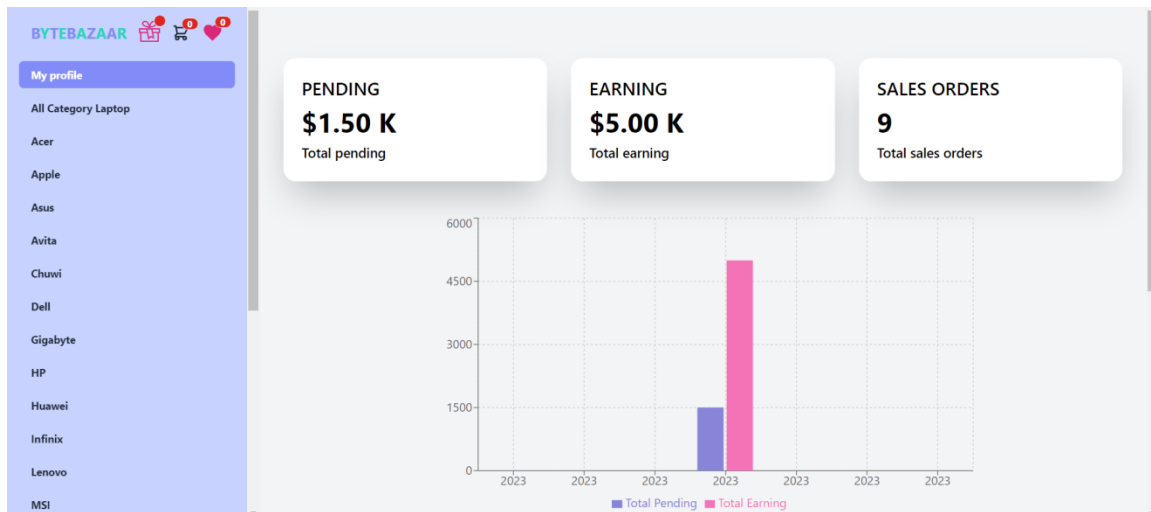


Figure 4.4: Seller Dashboard Design

This is the Bytebazaar seller dashboard, a web-based e-commerce platform. This page contains a number of controls for controlling the website, such as managing orders, products, and user accounts. It also shows earnings, pending order and sales orders data in addition to performing various administrative tasks.

Field	Value
Name	Md Riyad Talukder
Email	mdriyadtalukder69@gmail.com

Figure 4.5: Consumer Dashboard Design.

This is the Bytebazaar web-based e-commerce platform's consumer dashboard or profile page. The customer's details are shown on this page, where they can also make changes to their profile data.

4.3 System Testing

System testing entails a thorough assessment to guarantee operation, dependability, and customer happiness for Bytebazaar, an online store that specialises in branded laptops. The testing procedure includes a number of crucial elements: First, functional testing confirms that every feature—including product search, in-depth product descriptions, cart addition, and safe checkout procedures—operates as planned on various browsers and devices. Performance testing, which is the second step, evaluates how Bytebazaar responds to different traffic loads and makes sure it stays stable and responsive even during periods of high usage. Testing database query performance, server response times, and overall system scalability are all included in this. Thirdly, in order to find and fix vulnerabilities in financial transactions, user authentication procedures, and data processing, security testing is essential. This entails following data protection laws, validating SSL certificates, and conducting penetration tests. Fourthly, usability testing makes sure that the Bytebazaar interface is accessible and easy to use, meeting a range of user requirements. This entails assessing user feedback systems, accessibility features, and navigation processes. Finally, to guarantee a flawless user experience for every user, compatibility testing verifies Bytebazaar's compatibility with various operating systems, browsers, and devices. Bytebazaar strives to create a stable, secure, and user-friendly e-commerce platform that satisfies customer expectations while upholding high performance and reliability standards through thorough testing across these domains.

4.4 Summary

Through rigorous system testing, Bytebazaar, an online store that specialises in branded laptops, guarantees reliable functionality and user happiness. Functional testing checks that functions like secure checkout and product search work on various browsers and

devices. Performance testing evaluates the system's scalability with different traffic volumes. Vulnerabilities in data management and transactions are addressed by security testing. Compatibility testing examines performance in various contexts, whereas usability testing guarantees an easy-to-use interface. All of these tests work together to provide a dependable and secure platform. In the highly competitive e-commerce market, Bytebazaar's devotion to thorough testing demonstrates its determination to deliver a flawless user experience while upholding high standards of performance and data integrity.

CHAPTER 5

Result and Analysis

5.1 Overview

I discussed project's experimental, and performance.

5.2 Experimental

The "Bytebazaar" testing implementation follows a methodical approach to ensure the platform's functionality, security, usability, and usefulness. The testing protocols are summarised as follows:

Testing Types:

- Unit testing: Verify that each module, feature, and component functions as intended.
- Integrity testing: Verify that functionality and integration go smoothly by looking at how various modules interact with one another.
- System testing: Confirm that the system's general functionality and behaviour adhere to the set standards.
- User Acceptance Testing (UAT): To make sure the platform satisfies user needs, involve stakeholders in scenario-based testing based on real-world scenarios.
- Security testing: Perform security evaluations to identify vulnerabilities and guarantee a robust defence against intrusions.
- Performance testing: Evaluate the system's stability and responsiveness by monitoring its operation under various loads.

Testing Procedures:

- Develop thorough test cases that address all functionalities, edge cases, and user scenarios.
- Execution and Reporting: Generate reports outlining passed/failed scenarios, record outcomes, and execute test cases in a methodical manner.
- Bug tracking: Assign priority, keep track of resolutions, and log and monitor issues as they are found using bug tracking software.
- Regression Testing: To make sure that newly implemented features or bug patches don't damage already-existing functionalities, perform regression testing afterwards.
- User input Incorporation: To improve usability and address user experience issues, incorporate user input from UAT into testing cycles.

Testing Environments:

- Development Environment: In their local development environments, developers test particular parts and functionality.
- Test system functionality and integration in a staging environment that is identical to the production setting.
- User Testing Environment: Conduct user acceptance testing (UAT) in a supervised testing environment with real users or stakeholders.

Automation:

- Automated Testing: To do repeated and regression tests, use automated testing frameworks (e.g., Jest for JavaScript and Selenium for UI testing).
- For seamless testing and deployment, incorporate automated testing into continuous integration/continuous deployment (CI/CD) pipelines.

"Bytebazaar" lowers risks and ensures a high-quality user experience by adhering to these testing environments and procedures, which ensure functionality, security, dependability, and user satisfaction prior to deployment.

5.3 Performance

The system, integration, and unit testing for "Bytebazaar" were successfully finished, according to the test results and reports. They demonstrate robust functionality, compliance with security guidelines, and positive user feedback, ensuring a solid and excellent platform.

Test results and reports provide essential documentation of the testing process, encompassing the issues discovered, their impact on the software, and recommended improvements.

5.4 Summary

Bytebazaar ensures functionality, security, usability, and user happiness through a comprehensive testing strategy that includes unit, integrity, system, user acceptability, security, and performance testing. All functionalities and scenarios are covered by thorough test cases, which are meticulously executed, bug tracked, and regression tested to maintain high standards. Testing environments integrate automated testing for efficiency and cover the phases of development, staging, and user testing. System, integration, and unit test completion success highlights Bytebazaar's dedication to provide a stable platform that satisfies user and security requirements. Test findings, impact analyses, and suggestions for continuous improvement are documented in test results and reports, guaranteeing a dependable and excellent e-commerce experience.

CHAPTER 6

Impact on Society, Environment, and Sustainability

6.1 Impact on Life

Bytebazaar has improved the lives of stakeholders and customers alike, leaving a lasting impression on the internet commerce scene. Bytebazaar provides customers with unmatched ease of use by letting them quickly peruse, evaluate, and buy branded laptops from a wide range of online options. The ability to obtain things that might not be available locally is made possible by this accessibility, which crosses geographic boundaries. By enabling merchants, particularly smaller companies, to reach a larger audience and increase their market presence through an online platform, Bytebazaar also promotes economic opportunities. The addition of sophisticated features that improve customer experience and confidence in online purchases includes product likes, filtering options, and secure payment methods. Beyond sales, Bytebazaar promotes career opportunities in technical, customer service, and e-commerce logistics, supporting the expansion of skills and the economy in the digital sector. All things considered, Bytebazaar is evidence of the revolutionary potential of e-commerce in terms of improving accessibility, growing markets, and stimulating technological and economic progress.

6.2 Impact on Society & Environment

Society

The "Bytebazaar" adoption has a great deal of potential to improve society in a number of ways.

- **Enhanced Shopping Efficiency:** The platform saves time and increases efficiency in locating and buying preferred products by streamlining the shopping experience for users. Simplified processes simplify online shopping for consumers, facilitating item browsing, selection, and purchase.
- **Enhanced Accessibility:** Bytebazaar guarantees inclusion in online shopping for a

wide range of user demands, including those of people with disabilities, with its user-friendly interface and accessibility features. This accessibility encourages equitable access to goods and services, creating a more welcoming online marketplace.

- **Personalised buying Experiences:** Bytebazaar boosts consumer satisfaction and improves the online buying experience by offering customised product presentations and personalised recommendations. Customers' entire purchasing experience is improved by being able to find products that correspond with their interests.
- **Support for Businesses:** Bytebazaar helps sellers and businesses access a larger audience and boost sales by streamlining online transactions and order administration. The platform helps both individual sellers and corporate organisations by streamlining the online sales process.
- **Environmental effect:** By encouraging online buying, which can help reduce carbon footprints associated with traditional retail practices, Bytebazaar indirectly contributes to lowering environmental effect. By promoting online shopping and reducing the need for physical storefronts, Bytebazaar helps create a more sustainable ecosystem for the retail industry.
- **Economic Impact:** By promoting a robust online marketplace that benefits both local and global economies, the platform may encourage economic growth. The e-commerce industry is expanding due in part to an increase in digital transactions and online sales, which presents chances for companies and individuals.
- **Technology Adoption:** By encouraging the retail industry to embrace technology, Bytebazaar drives innovation and digitisation in online shopping experiences. By utilising technological innovations like smooth transactions and tailored recommendations, Bytebazaar opens the door for further advancements in e-commerce platform development.
- **Education and Accessibility:** By giving consumers access to a wide variety of

goods and brands, Bytebazaar promotes intercultural communication and makes it easier for people to comprehend international marketplaces. Users can broaden their knowledge and cultural awareness by exploring and discovering new companies, experiences, and goods.

In the end, "Bytebazaar" helps society by improving the online buying experience, encouraging inclusivity and accessibility, assisting companies, and utilising digital transactions to support environmental sustainability.

Environment

There are various ways in which Bytebazaar - Web-based E-commerce Platform might help the environment:

- **Decreased Paper Consumption:** By digitising the purchasing process, the platform reduces the amount of paper used and waste produced by traditional retail methods by doing away with the need for printed invoices, receipts, and other paper documentation.
- **Encouraging Sustainable Shopping Practices:** Bytebazaar promotes customers to make environmentally conscious purchases, supporting sustainable production and lessening environmental effect. It does this by showcasing eco-friendly items and sustainable brands.
- **Decreased Transportation Emissions:** Bytebazaar lowers fuel consumption and greenhouse gas emissions related to transportation by facilitating online shopping and home delivery services, which eliminate the need for separate excursions to physical stores.
- **Data-Driven Sustainability Measures:** By utilising data analytics, Bytebazaar can offer businesses insights into the buying habits and preferences of its customers, allowing them to minimise their environmental effect, optimise inventory management, and cut down on waste.
- **Encouraging Recycling and Reuse:** By providing alternatives for reconditioned or

pre-owned products, Bytebazaar may encourage recycling and reuse activities by prolonging the lifespan of goods and lowering the need for new production.

- In order to lessen the environmental impact of packaging waste, Bytebazaar should encourage sellers to utilise sustainable packaging materials and techniques, such as recyclable or biodegradable packaging.
- Educational Opportunities: Bytebazaar may help spread knowledge about sustainability and environmental issues by offering resources and information on eco-friendly practices and products. This will enable customers to make decisions that will benefit the environment.

All things considered, Bytebazaar - Web-based E-commerce Platform supports environmentally friendly purchasing habits, lowers transportation-related emissions, and encourages conscientious production and consumption.

6.3 Ethical Aspects

Undoubtedly, a number of ethical issues are taken into account during the development and deployment of Bytebazaar - Web-based E-commerce Platform:

- Strong security and privacy procedures must be in place to protect user data, including credit card numbers, browsing histories, and personal information. following the GDPR and other data privacy laws and regulations, as well as getting users' express consent before collecting and using their data.
- Giving consumers accurate information about data usage, privacy rules, and terms of service is a crucial step towards transparency and gaining their consent. acquiring written approval before to gathering and using user data.
- Fair & Unbiased Suggestions: Ensuring that the customised suggestions and product recommendations given to users are free from hidden commercial interests and are fair and impartial.

- **Accessibility:** Making ensuring the platform is inclusive of all users by designing it to be usable by everyone, including those with impairments, and by adhering to accessibility requirements.
- **Responsible AI and Personalization:** Using machine learning and AI algorithms to create personalized experiences in an ethical manner that respects user privacy and autonomy.
- **Accountability and Transparency in Business Practices:** Steer clear of unscrupulous business tactics and uphold integrity and transparency in the costs, services provided, and customer assistance.
- **Environmental Impact Consideration:** Endorsing sustainable behaviours and ethical consumerism, such buying eco-friendly products and reducing your environmental footprint.
- **Ensuring that recommendation algorithms utilised in decision-making processes are free from biases based on gender, ethnicity, or other discriminating criteria is known as "unbiased recommendation systems."**
- **Ethical Advertising and Marketing:** Making sure that the platform's advertising and marketing methods follow moral principles and don't employ dishonest or misleading techniques.

Through the integration of moral values into the development and administration of "Bytebazaar," the platform places a premium on user privacy, equity, openness, accessibility, and moral business conduct, thus cultivating a sense of confidence and honesty among its stakeholders and users.

6.4 Sustainability Plan

Creating a sustainability plan for "Bytebazaar" means putting strategies in place to guarantee sustainability over the long run, reduce environmental effect, and encourage moral and responsible behaviour. This is a synopsis:

Environmental Sustainability:

- Reducing Carbon Footprint: Provide incentives or promotions to users who use ecologically friendly modes of transportation.
- Optimal Routeing: Make use of algorithms to recommend travel paths that reduce the amount of fuel and carbon emissions.
- Eco-Certified Partnerships: Work with environmentally conscious vendors and suppliers to encourage sustainable product and shipping options.
- Give users the choice to offset their carbon impact through carbon offset programmes or by making donations to environmental groups.

Responsible Data Handling:

- Privacy Compliance: Make sure that data protection laws and regulations are followed, and update privacy policies on a regular basis to safeguard user information.
- Data Encryption and Security Measures: To protect user data, constantly improve data encryption and security procedures.
- Data Minimalism: Comply with data minimisation guidelines, gathering and storing just the minimal amount of user data required for platform operation.

Social Responsibility:

- Improve Accessibility: To better serve individuals with impairments, accessibility features should be updated on a regular basis.
- Community Engagement: Foster cross-cultural exchanges, support sustainable tourist practices, and assist local communities through charitable endeavours.

Continuous Improvement:

- Integration of User Feedback: To improve features and satisfy user requirements and preferences, collect and take into account user feedback.
- Innovation and Adaptation: Keep abreast of technology developments and incorporate new features to enhance platform functionality and user experience.
- Observation and Documentation: Provide stakeholders with regular updates on privacy compliance, user happiness, and environmental impact data.

Ethical Business Practices:

- Transparent Practices: To foster consumer loyalty and trust, uphold transparency in pricing, services, and company interactions.
- Fair Partnerships: To preserve moral business standards, form fair and moral alliances with stakeholders and suppliers.
-

Employee Engagement:

- Employee Involvement: Education and Knowledge To promote a culture of accountability, teach staff members about sustainable methods and moral behaviour.
- Well-being Programs: Implement initiatives that promote work-life balance and employee well-being.

This sustainability strategy aims to steer "Bytebazaar" towards maintaining moral standards, environmental awareness, and continuous improvement while coordinating the platform's expansion with responsible and sustainable practices.

6.5 Summary

The effects of Bytebazaar include notable advancements in environmental sustainability, economic opportunity, and accessibility. It improves customer convenience by providing a wide range of laptop options and enabling international access. By enabling small businesses and boosting consumer confidence through secure transactions, the platform promotes economic growth. By reducing carbon footprints and encouraging sustainable shopping habits, Bytebazaar also supports environmental sustainability. Fair recommendations, user privacy, and open business processes are all guaranteed by ethical considerations. A strong sustainability strategy strives to maintain moral standards and environmental awareness in its operations by emphasising social participation, appropriate data handling, and continual development. In general, Bytebazaar aspires to sustainable development and inclusive growth in the e-commerce industry.

CHAPTER 7

Conclusion and Future Work

7.1 Conclusions

For a number of laptop companies, the development of "Bytebazaar" is a major step forward in the online retail space. Through the careful integration of contemporary technology and a user-centric design methodology, Bytebazaar seeks to optimise the shopping experience for both buyers and sellers. The platform prioritises data privacy and ethical behaviour while catering to a wide range of customer needs. It features an easy-to-use interface, personalised product recommendations, and strong security measures. Bytebazaar's emphasis on environmental sustainability, continual improvement, and appropriate data handling is indicative of its dedication to ethical business practices. The project's success is based on its capacity to improve online shopping, encourage sustainable habits, and guarantee effective order administration and fulfillment—despite encountering difficulties during development and testing. If Bytebazaar is to be relevant and have an impact in the ever-changing e-commerce sector, it will be imperative that it receives constant feedback and remains innovative and adaptable. By putting ethical standards and customer satisfaction first, Bytebazaar is positioned to become the industry leader in online laptop sale.

7.2 Further Suggested Works

The idea outlines the primary paths for "Bytebazaar"'s medium-term e-commerce development. It provides strategies and tactics for boosting the level of competition, encouraging the development of contemporary infrastructure, adding to employment opportunities, and enhancing e-commerce-related laws. By concentrating on these crucial areas, "Bytebazaar" hopes to strengthen its position in the market, encourage economic expansion, and guarantee a strong legal system that encourages safe and just online transactions.

7.3 Limitations/ Conflict of Interests

The idea As a well-known e-commerce platform, Bytebazaar has a number of restrictions and possible conflicts of interest that could have an impact on its business practices and competitive standing. The ongoing issue of competing with both established giants such as Amazon and regional rivals affects Bytebazaar's market share and client acquisition techniques. Strong data protection measures are necessary because managing large amounts of client data for customised services raises serious concerns about data privacy and compliance with laws like the GDPR. Additionally, Bytebazaar runs the risk of periodic downtime or technical issues that could negatively affect user experience and sales due to its reliance on third-party services and technology infrastructure for website operations and payment processing. In the face of intense competition, ethical factors—such as reasonable prices, environmentally friendly operations, and objective product recommendations—are crucial to preserving consumer confidence. Bytebazaar must embrace technological innovation, strategic governance, and moral business practices in order to meet these difficulties and maintain its development and reputation in the fast-paced e-commerce sector.

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Appendix A

Course Outcomes, Complex Engineering Problems (EP) and Complex Engineering Activities (EA) Addressing

Title: ByteBazaar: Unveiling the Future of Computer Retail with a Web-Based E-Commerce Platform

Students ID: 201-15-3446

CO Description for FYDP

CO	CO Descriptions	PO
Phase -I		
CO1	Integrate recently gained and previously acquired knowledge to identify a web based travel management problem for the Final Year Design Project (FYDP)	PO1
CO2	Analyze different aspects of the goals in designing a solution for this FYDP	PO2
CO3	Explore diverse problem domains through a literature review, delineate the issues, and establish this goals for the FYDP	PO4
CO4	Perform economic evaluation and cost estimation and employ suitable project management procedures throughout the development life cycle of the FYDP	PO11
Phase -II		
CO5	Design and develop technical solutions and system components or processes that meet specified requirements, ensuring compliance with public health and safety standards, as well as considering cultural, socioeconomic, and environmental factors in this FYDP	PO3
CO6	Choose and apply appropriate methodologies, resources, and contemporary engineering and IT technologies to address complex engineering processes, encompassing prediction and modeling, while adhering to relevant constraints in this FYDP	PO5
CO7	Analyze societal, health, safety, legal, and cultural considerations, along with associated responsibilities, in the context of professional engineering practice and the resolution of this problem, employing logical reasoning guided by contextual understanding.	PO6
CO8	Comprehend and evaluate the enduring sustainability and impact of professional engineering endeavors in addressing intricate engineering challenges within social and environmental frameworks.	PO7
CO9	Implement ethical principles and adhere to professional standards and norms in this FYDP	PO8
CO10	Capable of operating proficiently both individually and as a team member or leader across diverse teams and interdisciplinary settings in this FYDP.	PO9

CO11	Proficiently communicate with the engineering community and broader society regarding complex engineering endeavors, including the ability to comprehend and generate comprehensive reports and design documentation, as well as provide and receive clear instructions throughout this FYDP.	PO10
CO12	Acknowledge the importance of self-directed and life-long learning within the evolving landscape of technology, and possess the readiness and capability to engage in lifelong learning endeavors.	PO12

Addressing CO (1 to 8), Knowledge Profile (K), Attainment of Complex Engineering Problems (EP), and Attainment of Complex Engineering Activities (EA)

Addressing CO (1 to 8), Knowledge Profile (K), Attainment of Complex Engineering Problems (EP):

SN	EP Definition	Attainment	CO	Justification (with Knowledge Profile)	References
1.	EP1: Depth of Knowledge required	Yes	CO1, CO2, CO3, CO5, CO6, CO7 and CO8	The project covers Engineering Fundamentals (K3) through process modeling, data design, and front-end development, showcasing strong engineering principles application. The project tackles Specialist Knowledge (K4) by integrating front-end and back-end design, interaction design, and user experience (UX), utilizing HTML, CSS, ReactJS, Redux, Tailwind CSS for the front end, and NodeJS frameworks like Laravel for the back end, demonstrating expertise in web-based travel management system development.	Page no: [9-49], Section: [3.2, 3.3] Page no: [53-56], Section: [4.2, 4.3]
				The project applies engineering practice & design (K5) by integrating design requirements like user interface, security, scalability, customization, compatibility, accessibility, and reliability, ensuring a robust and user-centric bytebazaar with design principles. The project addresses engineering practice & technology (K6) by employing HTML, CSS,	Page no: [9-49], Section: [3.2, 3.3]

				NodeJS, React JS, MongoDB, JS, and scalable development with MERN MVC framework and Composer.	Page no: [53-56], Section: [4.2]
				The project covers research literature K8 by reviewing analogous platforms, UI/UX studies, security protocols, personalization algorithms, and industry trends, enabling informed decision-making for integrating innovative features into this system.	Page no: [5-7], Section: [2.2, 2.3]
2.	EP2: Range of Conflicting Requirements	Yes	CO2, and CO7	The project confronts EP-2 by addressing challenges like integrating diverse features while maintaining user experience, balancing security with functionality, scalability, real-time data synchronization, evolving industry standards, privacy regulations compliance, and implementing effective recommendation systems through careful planning, flexible development, and continuous adaptation.	Page no: [1-3] Section: [1.3.1.5]
3.	EP3: Depth of analysis required	Yes	CO2, and CO6	The project tackles EP-3 by prioritizing solutions like contemporary front-end design for enhanced user experience and selecting Nodejs for streamlined back-end development, addressing challenges such as user interaction optimization, platform accessibility, and scalability to provide a superior web-based bytebazaar	Page no: [53-56], Section: [4.2]

4.	EP4: Familiarity of Issues	Yes	CO8	The project fulfills EP-4 by integrating insights from bytebazaar into development, optimizing processes, enhancing user experience, ensuring data security, and contributing to industry efficiency and effectiveness, bridging Computer Science and Engineering with the travel domain for impact beyond CSE boundaries.	Page no: [1-2,5], Section: [1.3, 2.2]
5.	EP5: Extends of application codes	No	CO5	N/A	N/A
6.	EP6: Extends of stakeholders involved and conflicting requirements	No	CO8	N/A	N/A
7.	EP7: Interdependence	Yes	CO5	The project meets CEP, EP-7 by addressing high-level problems across stages, ensuring data integrity, security, and performance in database implementation, optimizing user experience through intuitive front-end design, and conducting comprehensive testing.	Page no: [53-56], Section: [4.2]

Addressing CO11 with Complex Engineering Activities (EA) [Some or all of the following]:

SN	EA Definition	Attainment	CO	Justification	References
1.	EA1: Range of resources	Yes	CO11	The development of this system leverages a skilled team across domains, meticulous financial resource allocation for infrastructure, marketing, and development, and utilizes tools like Visual Studio Code, and various programming languages, frameworks, and databases for effective execution.	Page no: [48-49], Section: [3.3]
2.	EA2: Level of interaction	No		N/A	N/A
3.	EA3: Innovation	No		N/A	N/A
4.	EA4: Consequences for society and the environment	Yes		This projects emphasizes social impact and environmental sustainability by enhancing trip efficiency, promoting buying laptop, and ensuring ethical considerations such as strong security, privacy, and transparent business practices, fostering societal well-being and environmental stewardship.	Page no: [61-67], Section: [6.1, 6.2, 6.4]

5.	EA-5: Familiarity	Yes		The Comparative Analysis for "bytebazaar" evaluates market competitors like Expedia and Booking.com to highlight bytebazaar's unique features, security, personalization, and customer engagement, enriching market understanding and informing strategic decisions for enhanced competitiveness and value proposition.	Page no: [6-7], Section: [2.3]
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Addressing CO (4, 9, 10, and 12):

SN	COs	Attainment	Justification	References
1	CO4	Yes	The project captures CO4 by integrating financial management practices, including budgeting, resource allocation, cost management, and risk mitigation, ensuring efficient fund distribution, monitoring expenditures, and identifying optimization areas while maintaining quality.	Page no: [49-52], Section: [3.4]
2	CO9	Yes	The project upholds ethical practices by prioritizing user privacy, maintaining transparency in data usage, providing fair suggestions, respecting cultural sensitivities, and promoting accessibility, fostering trust, transparency, and integrity among stakeholders.	Page no: [64-65], Section: [6.3]
3	CO10	No	N/A	N/A
4	CO12	Yes	The project's implementation phase emphasizes lifelong learning through diverse testing protocols, automated frameworks, and CI/CD pipelines, ensuring ongoing improvement and adaptation to emerging tech trends, with results analysis refining the platform for enhanced effectiveness.	Page no: [53,60], Section: [4.2,5.3]

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