

**Online Pre-loved / Second-hand Book System**

BY

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## REPORT STATUS DECLARATION FORM

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## **ABSTRACT**

This project is to build an online preloved book system for helping the people to sell the preloved books to the one who needs. The Online Preloved Book System is an e-commerce platform that helps users to sell and buy second-hand books. There are six problems has been found in most of the existing system which are lack of Online Pre-loved system that only sells book category in mobile application, lack of interactivity between buyer and seller, lack of Wishlist, lack of book recommender, lack of favourite list and lack of seller feature. Therefore, this online preloved book system will be doing as a mobile application where nowadays most people have their own mobile phone so it will be convenient if user can use the system as a mobile application. The system has involved one user as a person which is a person can be a book seller and book buyer or only seller or only buyer. Method that has been applied to develop an online pre-loved book system is SDLC, and the software are Android Studio, Java programming language and Firebase. In conclusion, the Online Preloved Book System is a convenient and user-friendly platform for buying and selling used books online. Besides, it also help the user to find their favourite book by providing a chatbot that is doing book recommender. It provides a great opportunity for book lovers to share their passion for books and help to reduce waste by giving preloved books a new home.

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## LIST OF ABBREVIATIONS

<i>OTP</i>	One-time password
<i>JSON</i>	JavaScript Object Notation
<i>IDE</i>	Integrated development environment
<i>SDLC</i>	Software Development Life Cycle
<i>NLP</i>	Natural Language Processing
<i>CNN</i>	Convolutional Neural Networks
<i>SVD</i>	Singular Value Decomposition

# Chapter 1 Introduction

## 1.1 Project Background

Nowadays, people rarely sell their used books. They simply leave their used books in a corner or throw them away. Meanwhile, we can sell the used book to people who are interested so we can get the budget to buy another interesting book. Therefore, the books will be reused and will not be wasted. Therefore, creating an online preloved book system will be good since it is a platform that allows users to buy and sell second-hand books. There are some of the similar applications that are available in Google Play Store [1]. Used books is rarely can be sold in Malaysia. It is because Malaysia has less platform that is selling used books in mobile application. Most of them is using website such as Books n Bobs. Moreover, thousands of used books found in dumper outside of Reno bookstore [2]. It is because most of the books is used before and recycling it will be costing a lot. Therefore, the bookstores rather throw the books away instead of giving services cost for recycling. Therefore, creating an online preloved book system will help in selling the used books without wasting any cost or books. The used books can be reused and sell to the people who are interested in the books. As you can see on the news, a total of 95 bookstores have closed since 2018 and 32 outlets were closed in 2020 [3]. This have proved that bookstores must embrace changes to survive and avoid closure. Therefore, creating an online preloved books system is playing an important role on helping the bookstores to sell their book in mobile application due to the people in this generation always use phone and cannot leave without phone. Besides, used books or second-hand books should have second chances [4]. Although most of them are second-hand books or used books, it does not mean that they are not valuable. Some of the used books have autograph of the writer which is so memorable. Therefore, selling the used books online is better in helping the used books to find new owner. Furthermore, spending way too much money to read is one of the problems on the Malaysian these days [5]. Since the new books are expensive, it makes people lost their interest on reading. Therefore, selling used books with a cheaper price will increase the interest of people in reading and it can increase their knowledge by reading the used books.

## **1.2 Problem Statement**

Although the existing application of Online Pre-loved Book System is serving their purposes in fulfilling the objective of the application, there are still problems that can be found in them both in terms of technical and non-technical. The applications in this field are found not mature enough for the current market and there are times that it cannot fulfill everyone's needs. Below shows the problem that can be found after researching the relevant applications and studies.

### **1.2.1 Lack of seller features**

Seller features is important in building an online preloved book system since the main purpose of this project is to let the user to sell their used book to someone who is interested to the used books. Therefore, the used book will not be wasted and will be bought by the new owner. There are several preloved bookstores such as ThriftBook and Book Depository that only allows users to sells the book to them instead of the user selling themselves [12]. The user will earn less credit from selling the preloved book.

### **1.2.2 Lack of Live Chat**

There is no Live chat function in most of the Online Pre-loved / Second-hand Book System. Therefore, there is no interaction between user and seller. Without communication between sellers, it will be not convenient for the user if user wanted to ask any question related to the books from the seller. Most of the preloved book existing system does not have Live Chat except Carousell [13].

### **1.2.3 Lack of Online Pre-loved system that only sells book category in mobile application.**

Most of the Online Pre-loved / Second-hand Book System only can be used in website platform which is not convenient for most of the users. These days people like using their mobile phone to go on online shopping or exploring in social media. Therefore, people nowadays cannot leave without their phone. That is why having a mobile application for users to sell and buy books online is important and more convenient. It can make the user to add the picture of the book inside and sell it online. It can help user to gain money from selling their second-hand book and use the credit to buy another second-hand book. Therefore, this had made users to save money and the books can be recycle for the people who interested to buy it. There is less application which only sell the second-hand books. Most of the mobile application allows user



to sell things in different kind of category including books but there is no category special for user to search for the books. Abebooks only has website as their platform to sell the preloved used book [14].

#### **1.2.4 Lack of Book Recommender Chatbot**

Book recommender chatbot is an advanced features in online preloved book system. It helps in recommending books for user. Therefore, users are able to know more books that they are interested in. All of the existing system that had been done research has found that none of them has book recommendations chatbot.

#### **1.2.5 Lack of Wishlist**

Having Wishlist in an online preloved book system is important. It is because it allows user to add to Wishlist when they have not enough budget to purchase the preloved book. Therefore, the users can check the preloved book in the Wishlist when they have enough budget instead of searching for it again. BookScouter does not have Wishlist that will bring benefit to the preloved book system [15].

#### **1.2.6 Lack of Favourite List**

Favourite list is an additional feature to help users to make wishes on the books and hoping someone to sell. It is because the books that recommended might not be selling in the online preloved book system. Therefore, by adding favourite list users are able to find the books that they desired to buy. All of the existing system does not have favourite list which allow user to choose for the category they prefer and the system will suggest them by recommend them a book list that they might like.

### **1.3 Motivation**

The aim of this project is to develop an online preloved book system that is better than the similar system existing in this market. It is to resolve all the problem that user might face when using the online preloved book system. For example, there are less online preloved book system which has seller features. They just selling their books instead of helping the user to sell the used book. Therefore, developing an online preloved book system with seller features is important and it will really solve the problem of the used book being wasted. Besides, the current system of online preloved book system does not have live chat. It is important to have

Live chat because there are many benefits of having Live chat in an online preloved book system [6]. One of the benefits of having live chat is the user can interact with the seller when they faced any problem. Besides, they can get an immediate respond from the seller. While doing research on online preloved book system, most of the existing system does not have online book recommender chatbot. It is an additional feature for having book recommender chatbot which is integrating with NLP method in the online preloved book system. Book recommender chatbot can suggest the books that the user might interested in. Moreover, most of the online preloved book system in current market does not have mobile application. Most of them are using website as their platform but people in this generation cannot leave without their phone. Therefore, developing an online preloved book system with mobile application will be useful for the people in this generation. In addition, having Wishlist in an online preloved books system is quite important. It is because it will bring benefit for the user who interested in buying the used books but lack of budget. Therefore, they can add the used book to shopping cart in Wishlist when they have enough budget to buy it. Besides, by having favourite list which allow user to choose for the category they preferred and customized preference book list will be showed to the user. All these features will make the online preloved book system to be more efficient and useful to the user and seller to buy or sell the used book so the used books will not be wasted.

#### 1.4 Objectives

The aim of this project are as follows:

1. **To develop an online preloved book system that allows user to sell their used books and buy used books in the system.** This will be saving the environment without chopping trees to print new books. User can sell their used books to someone else who is interested to the used books. This is to resolve the problem statement of 1.2.1.
2. **To develop an online preloved book system with Live chat system that allows user to interact with the seller** when they are facing any problem. This is to resolve to the problem statement of 1.2.2.
3. **To develop an online preloved book system that build as a mobile application.** User can download the mobile application of online preloved book system in Google Play Store. This is to resolve the problem statement of 1.2.3.

4. **To develop an online preloved book system with book recommender chatbot** to allow user to find the books in the category that they are interested. This is to resolve the problem statement of 1.2.4.
5. **To develop an online preloved book system with Wishlist that allow user to store the preloved book in Wishlist so it will be easier for users to find the book back in the future.** User can click the love button of the preloved book to store the preloved book that they are interested in the Wishlist. Therefore, the users can check out the preloved book in the future. This is to resolve the problem statement of 1.2.5.
6. **To develop an online preloved book system with favourite list to allow user to make wishes and show the wishes on the favourite list.** As an online preloved book, there are some situations of the books that the users are interested is not being sold by any users. Therefore, it will benefit the users by allowing users to enter the books that they are interested and there is a list showing the users wishes. This is to resolve the problem statement of 1.2.6.

Therefore, with a well develop online preloved book system will bring benefit to books lover, book seller and environment since this can prevent on printing new books and reused the used books.

## 1.5 Project Scope and Direction

The scope of the project is to develop an online preloved book system which is let user to sell or buy their used books and included many additional functions that make user feel convenient. The examples of the functions are recommended book chatbot, live chat, order tracking system, and Wishlist. First, the project will be created to **allow user to be a seller and sell the used book**. The user allowed to customize their seller profile by putting the information related to the used books. For instance, condition of the used book, price and the quantity of the used books. Therefore, the used books will not be wasted and will be sold to people who are interested on the used books. Besides, user can **text the seller in live chat** when they faced any problems in the online preloved book system. The chat history will be saved to the Firebase so it will be easier for the user or seller to check back the chat history. Moreover, the online preloved book system will be created with book recommender system **to allow user to find**

**their desired book.** User can find the books that are interested in the book recommender system. The book recommender system is a chatbot that implement with deep learning NLP method to suggest the books from the category that the user is interested. In addition, the online preloved book system will be created with favourite list to **allow user to make wishes when the books that wanted is not on sale.** It will be useful for the user to make wishes by entering the books title, author name of the book they wanted and the price of the preloved books desired. Therefore, it will be show at the favourite list and the user that has the book can sell the preloved book to him. Besides, the online preloved book system will be created with Wishlist feature to **allow user to add their favourite used books into the Wishlist** when they are out of budget. Therefore, when they have enough budget to buy the used books, user can add the used books into the shopping cart from the Wishlist. This project is targeting the books lover and the books seller that need an online preloved books system to sell the used books or buy the used books without worrying on the trustworthy in the mobile application.

## 1.6 Contributions

Nowadays, most of the people just throw away the used book or leave them in a corner. They are not willing to sell them or find a new owner to the used book because it will be troublesome. Therefore, this project will bring benefit to the book lover and second-hand book seller. Firstly, by developing the online pre-loved boook system it will reduce waste and conserves resources, contributing to the environment by reusing the used books. It will reduce the need for new books to be printed and saving trees from chopping tree to print new books. Besides, the used books with cheaper price provides affordable books for people who may not be able to afford new books. Therefore, those people who cannot afford the expensive new books can buy the second-hand book. It helps in supporting the circular economy by selling used books among people. It is like sharing the interested books to each other with a cheaper price.

Recently, research have been done on similar system to online preloved second-hand book system in Google Play Store and online preloved second-hand website. Most of the book shop did not have the seller features which does not allow user to become a seller and sell their used books. In recent years, the utilization of pre-trained models in natural language processing which is (NLP) tasks has gained significant traction. Pre-trained models such as those based on deep learning architectures like recurrent neural networks (RNNs) and transformers, have demonstrated remarkable effectiveness in various NLP applications, including chatbot

development. These pre-trained models are typically trained on large-scale text corpora and learn rich representations of language, enabling them to capture complex linguistic patterns and semantics. By fine-tuning these pre-trained models on specific tasks or domains, developers can expedite the development process and achieve competitive performance with reduced computational resources. For instance, in the implementation of the chatbot presented in this study, a pre-trained model using the TensorFlow/Keras framework is employed, leveraging the model's pre-existing knowledge to generate responses to user queries. Such approaches not only streamline the development process but also enhance the chatbot's ability to understand and generate human-like responses, contributing to improved user experience and engagement. Therefore, creating an online preloved second-hand book system with advanced features will bring several positive impacts on the environment and supporting the circular economy.

## **1.7 Report Organization**

The details of this research are shown in the following chapters. In Chapter 2, some related backgrounds of existing online preloved book system and discover the disadvantage and advantage to implement in online preloved book system. Besides, chatbot related research also had been done in Chapter 2. In addition, methodology, logical design diagram of online preloved book system, like use case, sequence diagram, activity diagram and ERD diagram, system architecture design of online preloved book system, system requirement like hardware and software is presented in Chapter 3. Moreover, Chapter 4 is the system design of online preloved book system. In Chapter 5 is the system implementation. In Chapter 6 is the system evaluation and discussion. In Chapter 7 is the conclusion and recommendation.

# Chapter 2 Literature Review

## 2.1 Introduction on Literature Review

Research and review had been done on some of the existing system of the online preloved book system. The advantages and the limitation of the existing system of online preloved book system had been studied. There are several existing online preloved book system such as “ThriftBook”, “AbeBooks”, “Book Depository”, “Blackwell’s”, “Carousell”, “BookScouter”, “BookLal”. Besides, research on the Natural Language Processing for chatbot had been done. After reviewing the existing online preloved book system, some solutions had been proposed to overcome the limitation of the existing online preloved book system.

## 2.2 ThriftBooks

User accounts has been created to review the system but seller account cannot be created since it did not allow seller to sell books in the system [12].

### 2.2.1 Advantages of the system

#### 2.2.1.1 Has Filters

Filters plays an important role in an online preloved book system. It helps the user to filter the large collection of books into different kinds of categories, price and authors. It helps the user to filter it instead of scrolling all the way down to find the books the user is interested in.

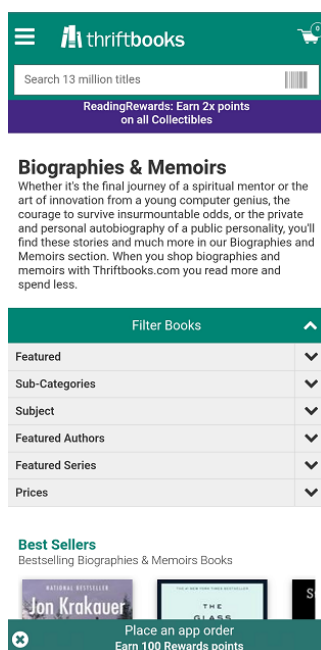


Figure 2.2.1.1.1 Screenshot of filter features in Online Preloved Book System

### 2.2.1.2 Has WishList

Having wishlist is quite important to an online preloved book system. It allows users to add the books that they interested to wishlist and save in it. Therefore, user can check the wishlist and add the books to cart whenever they wanted to buy the books.

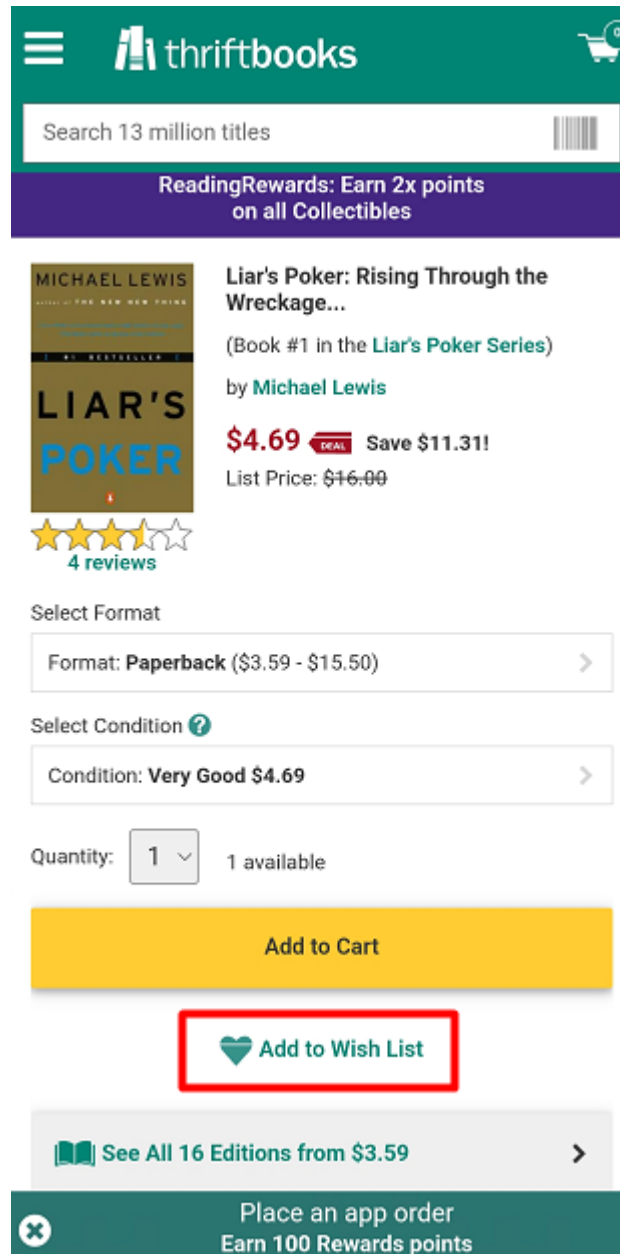
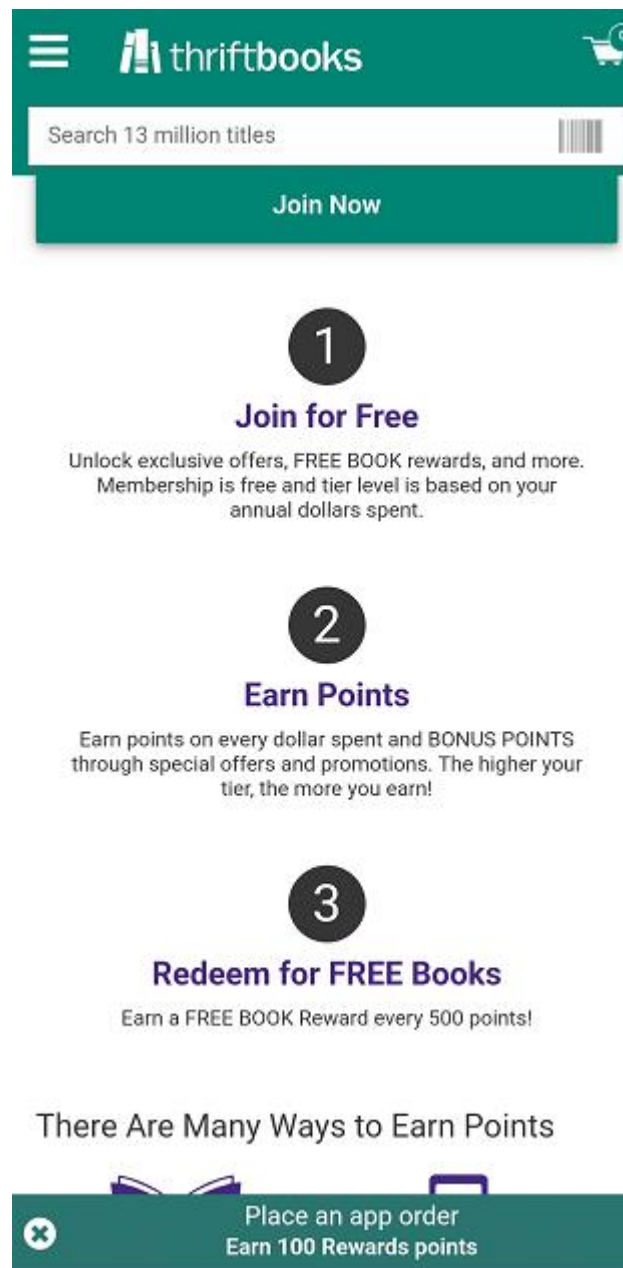


Figure 2.2.1.2.1 Screenshot of Wishlist features in Online Preloved Book System

### 2.2.1.3 Has Customer reward

The Thrift books has customer reward features which can act as a customer loyalty. It allows user to accumulate points whenever they wanted to buy their prelove books. By having customer reward, user can earn their points while buying the books and user are allowed to

redeem rewards with their points. The rewards can be discount voucher code so that user can apply it when they wanted to buy books in the future.

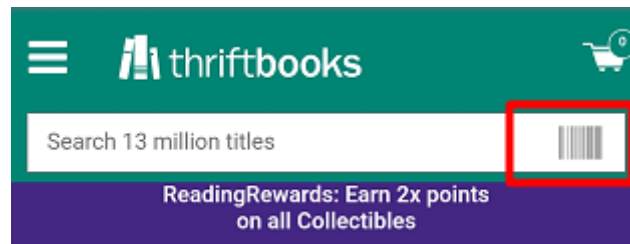


*Figure 2.2.1.3.1 Screenshot of customer reward in Online Preloved Book System*

#### **2.2.1.4 Has Scan barcode of the books**

Thrift books has provided a feature which is scanning the barcode of the books by searching for the books. It will be convenient for the user to scan the bar codes of the book and it will automatically help the user to search for the book.





*Figure 2.2.1.4.1 Screenshot of Scan barcode features in Online Preloved Book System*

## **2.2.2 Limitation of the system**

### **2.2.2.1 Unable to choose more shipping method**

The Thrift book system does not provide many shipping methods for the user to choose. It will be not useful for the user to use it to ship their books. It only provided 5 options and in the 5 options only one shipping method is for international and the others shipping method only allows to ship in US. It will be not convenient for the user who wanted to choose international shipping but does not know what is the international shipping company that Thrift book system going to provide.

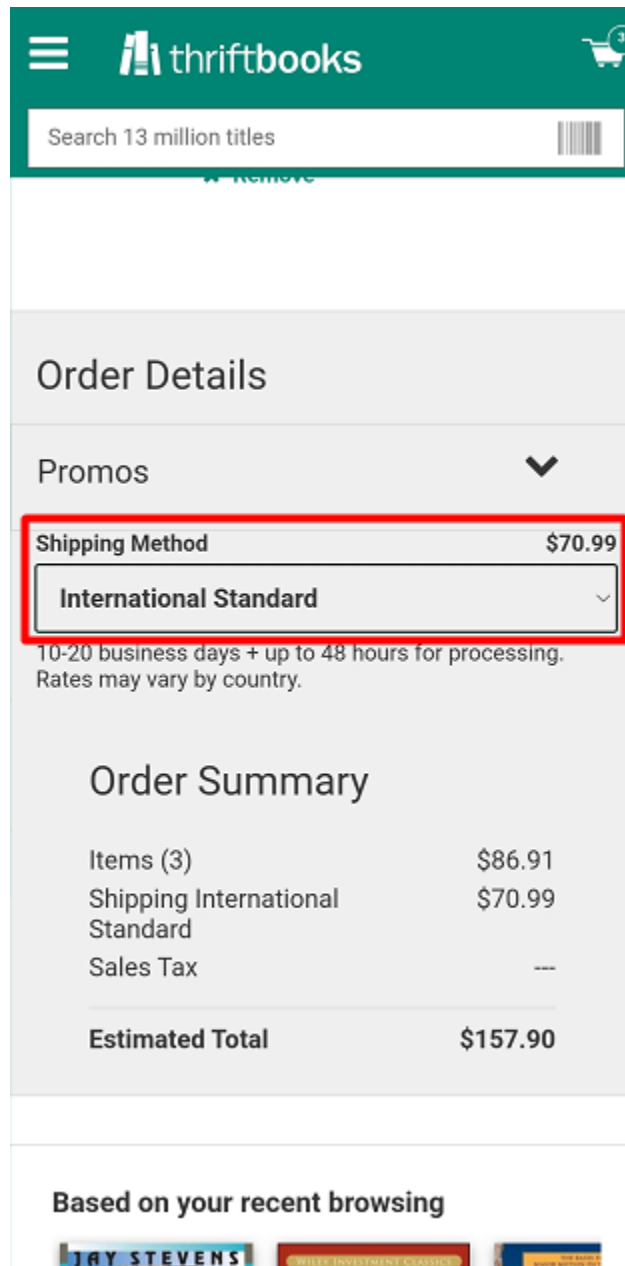


Figure 2.2.2.1.1 Screenshot of shipping method in Online Preloved Book System

### 2.2.2.2 Unable to report the reviews

The Thrift books system does not allow user to report the reviews. The statement of the review will be not true if the review given is simply written by others and we cannot do anything to report it. It will influence others thought of this book by watching this review.

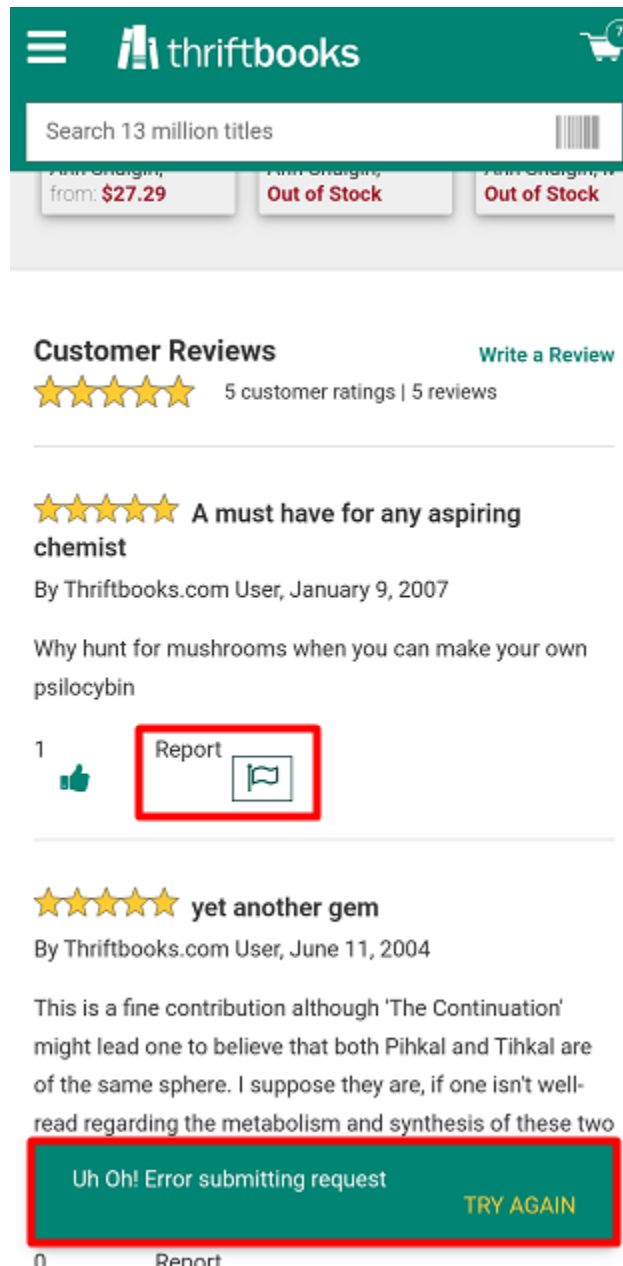


Figure 2.2.2.2.1 Screenshot of fail to report the review in Online Preloved Book System

### 2.2.2.3 Lack of a e-wallet payment system

The Thrift books system has limited amount of payment system which is not convenient for the international customer who wanted to purchase with another payment. People in this generation like using e-wallet. Therefore, adding e-wallet payment system will bring convenient to user to make payment.



*Figure 2.2.2.3.1 Screenshot of payment method.*

#### **2.2.2.4 Lack of an Order Tracking System**

The Thrift books system does not have order tracking system. Having order tracking system in an e-commerce mobile app is important. It is because user can track the purchased book locations and where have the book reached. It will be useful for the user to estimate the delivery time and they can guess the date of the books will reach their house. Therefore, customer can estimate the time of the books will arrive and plan to be free to receive the books.

#### **2.2.2.5 Lack of Live Chat**

The Thrift books system does not have live chat which is chatbot in their mobile application. Live chat is a convenient function for the customer to interact with seller when they are facing any problem. The customer can get a faster respond from the seller in live chat instead of sending email and asking the problem with emailing the customer. By emailing, the customer needs to wait for several days to get their solution which is not convenient. Therefore, by having live chat customers can have immediate respond from seller to solve their problem.

#### **2.2.2.6 Lack of seller features**

The Thrift books system does not have seller function. It only allows customers to sell books to them by searching the ISBN of the books and packing the book to them. The thrift books system will sell the books instead of seller. Therefore, sellers will get less credit from selling the used book.

### **2.3 AbeBooks**

User accounts and seller accounts has been created to review the system. Seller account can add the used books and prices to the AbeBooks website to sell the books [14].

## 2.3.1 Advantages of the system

### 2.3.1.1 Has recently view features

AbeBooks has a function which is recently view features. It has provided efficiency for the customer to view back the items they view before. The customer can see the books that they had browsed before to add them back to cart. It will immediately add the product as a new entry into the recent view items section after the user clicks on a product page in the system. Both the user and the retailers will find this feature helpful. Retailers can keep track of the items that are most popular among customers and increase the supply of the product. The user will appreciate the convenience of checking on this section and ensuring they have not forgotten to add anything to their shopping cart before they proceed to check out the items.

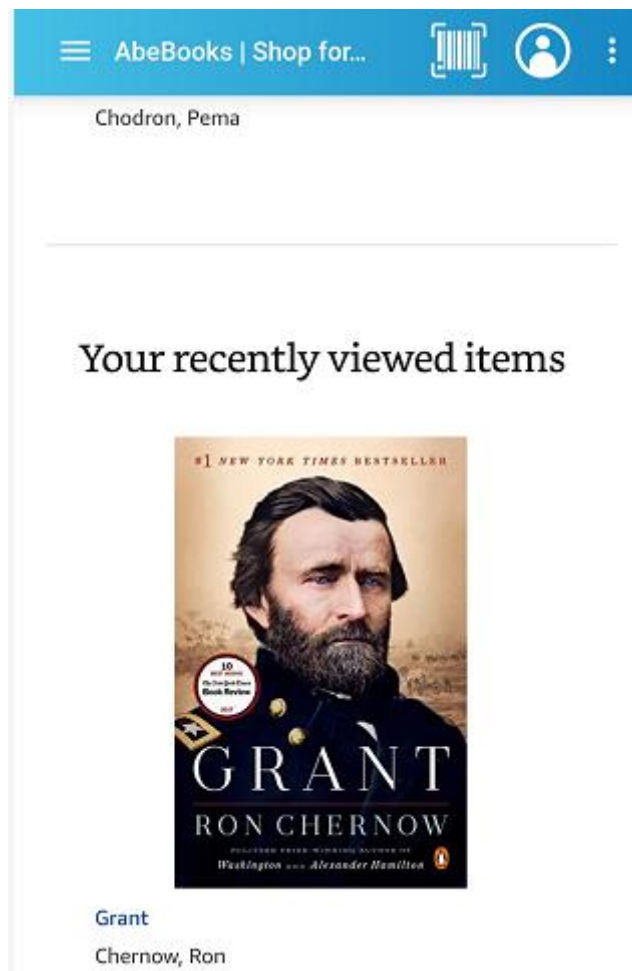


Figure 2.3.1.1.1 Screenshot of recently view features

### 2.3.1.2 Has Wishlist

AbeBooks has a function which is Wishlist. Wishlist allows user to save what items they like by adding the item into Wishlist. Then, the user can check their favourite items in the Wishlist. By having Wishlist, users can refer to the items that they wanted to buy in their account and check it back in the future. It helps users to know what their interest is in the product without buying it immediately. Besides, Wishlist can be a benefit to the seller. It is because Wishlist helps the seller to know what the users like. Wishlist is a good alert for user to buy it on sale. It will be convenient for users to check the items which are out of stock.



Figure 2.3.1.2.1 Screenshot of Wishlist features

### **2.3.1.3 Has Scan barcode of the books**

AbeBooks has provided a feature which is scanning the barcode of the books by searching for the books. It will be convenient for the user to scan the barcodes of the book and it will automatically help the user to search for the book.



*Figure 2.3.1.3.1 Screenshot of scan barcode features*

### **2.3.1.4 Has Seller features**

AbeBooks has seller features which allow customers to sign up and become a seller in AbeBooks. The customer can sell their used books or preloved to another user who is interested on the book. It will be good because the customer can get the budget to buy new books and the used books will not be wasted.

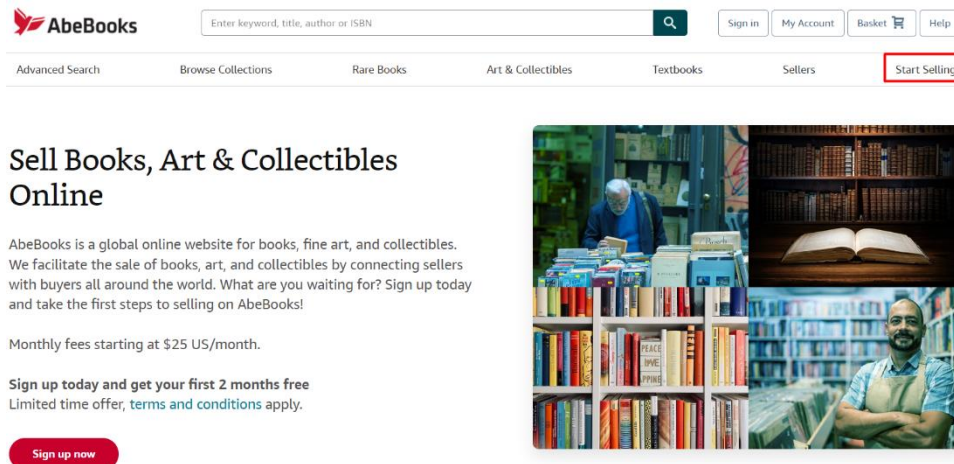


Figure 2.3.1.4.1 Screenshot of seller features

## 2.3.2 Limitations of the system

### 2.3.2.1 Unable to choose more shipping method

AbeBooks system does not provide many shipping methods for the user to choose. It will be not useful for the user to use it to ship their books. It only provided 2 options and in the 2 options only one shipping method is for international and the others shipping method only allows to ship in US. It will be not convenient for the user who wanted to choose international shipping but does not know what is the international shipping company that Abebooks system going to provide.

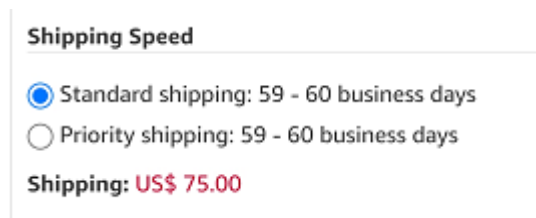


Figure 2.3.2.1.1 Screenshot of shipping method

### 2.3.2.2 Lack to filter features

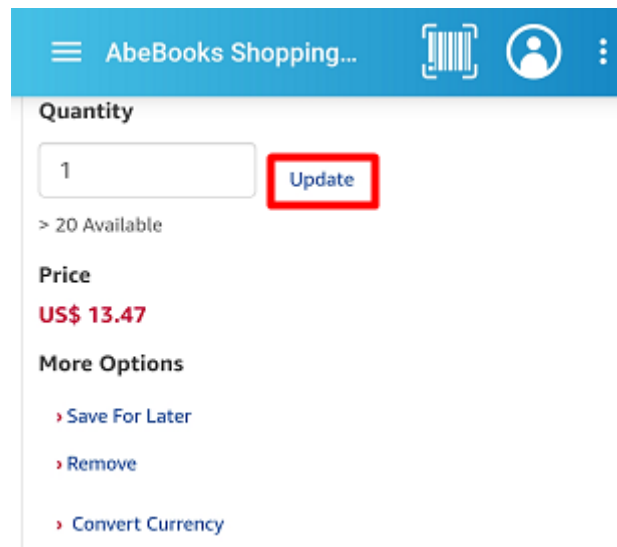
AbeBooks does not have filter features which helps the customer to filter the books into books categories. Therefore, when customer wanted to search for the books, they can filter the books to the books categories and search their books from the book categories.

### 2.3.2.3 Update the quantity of books manually

AbeBooks does not have the function which is automatically add the new quantity of books to cart. Customers have to click the update button to update the quantity of books to the cart. It is



not convenient for the customer to update the quantity of books to the cart manually. Some of the customer might did not aware of the button and did not update the new quantity of books in the cart.



*Figure 2.3.2.3.1 Screenshot of update the quantity of books manually*

#### **2.3.2.4 Lack of E-wallet Payment System**

The AbeBooks system has limited amount of payment system which is not convenient for the international customer who wanted to purchase with another payment. It will be user friendly if added e-wallet payment system into the online preloved book system.

#### **2.3.2.5 Lack of an Order Tracking System**

The AbeBooks system does not have order tracking system. Having order tracking system in an e-commerce mobile app is important. It is because user can track the purchased book locations and where have the book reached. It will be useful for the user to estimate the delivery time and they can guess the date of the books will reach their house. Therefore, customer can estimate the time of the books will arrive and plan to be free to receive the books.

#### **2.3.2.6 Lack of Live Chat**

The AbeBooks system does not have live chat in their mobile application. Live chat is a convenient function for the customer to interact with seller when they are facing any problem. The customer can get a faster respond from the seller in live chat instead of sending email and asking the problem with emailing the customer. By emailing, the customer needs to wait for

several days to get their solution which is not convenient. Therefore, by having live chat customers can have immediate respond from seller to solve their problem.

### **2.3.2.7 Lack of Customer reward**

The AbeBooks system does not have customer reward features. Customer reward feature is important because it allows users to accumulate points whenever they want to buy their preloved books. Customer reward also can be acts as a customer loyalty. By having customer reward, users can earn their points while buying the books and users are allowed to redeem rewards with their points. The rewards can be discount voucher code so that users can apply it when they want to buy books in the future.

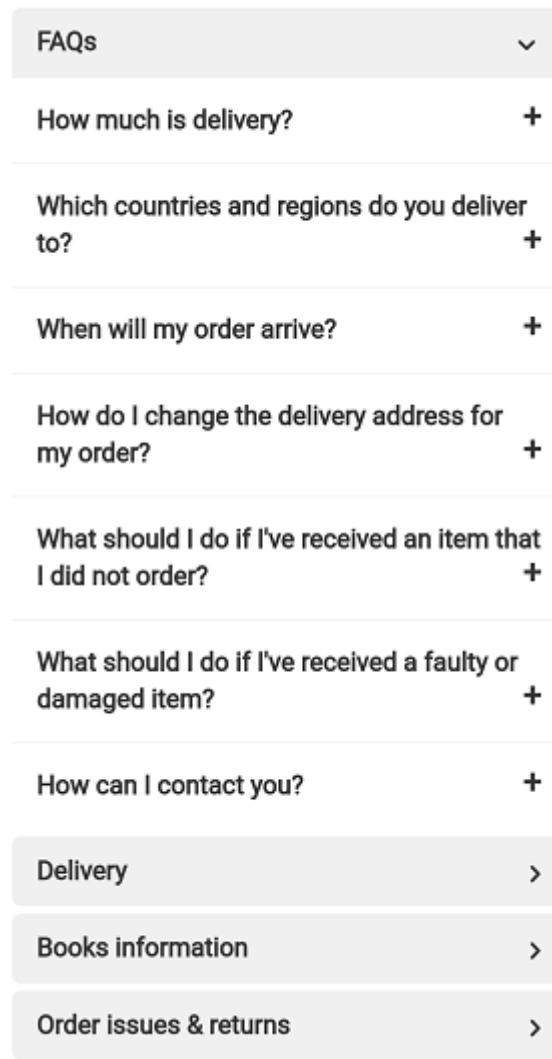
## **2.4 Book Depository**

User accounts has been created to review the system but seller account cannot be created since it did not allow seller to sell books in the system.

### **2.4.1 Advantages of the system**

#### **2.4.1.1 Has FAQ**

Book Depository has FAQ function which allows users to see the most frequently ask by other users to know the information related to Book Depository. For instance, how much is delivery is asked by one of the users.



*Figure 2.4.1.1.1 Screenshot of FAQ feature*

### **2.4.1.2 Has WishList**

Book Depository has a function which is Wishlist. Wishlist allows user to save what items they like by adding the item into Wishlist. Then, the user can check their favourite items in the Wishlist. By having Wishlist, users can refer to the items that they wanted to buy in their account and check it back in the future. It helps users to know what their interest is in the product without buying it immediately. Besides, Wishlist can be a benefit to the seller. It is because Wishlist helps the seller to know what the users like. Wishlist is a good alert for user to buy it on sale. It will be convenient for users to check the items which are out of stock.

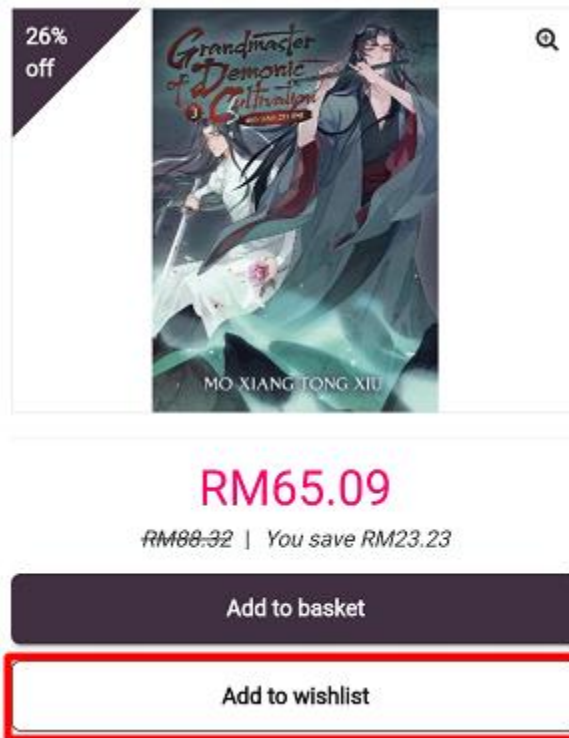


Figure 2.4.1.2.1 Screenshot of Wishlist feature

### 2.4.1.3 Has Scan barcode of the books

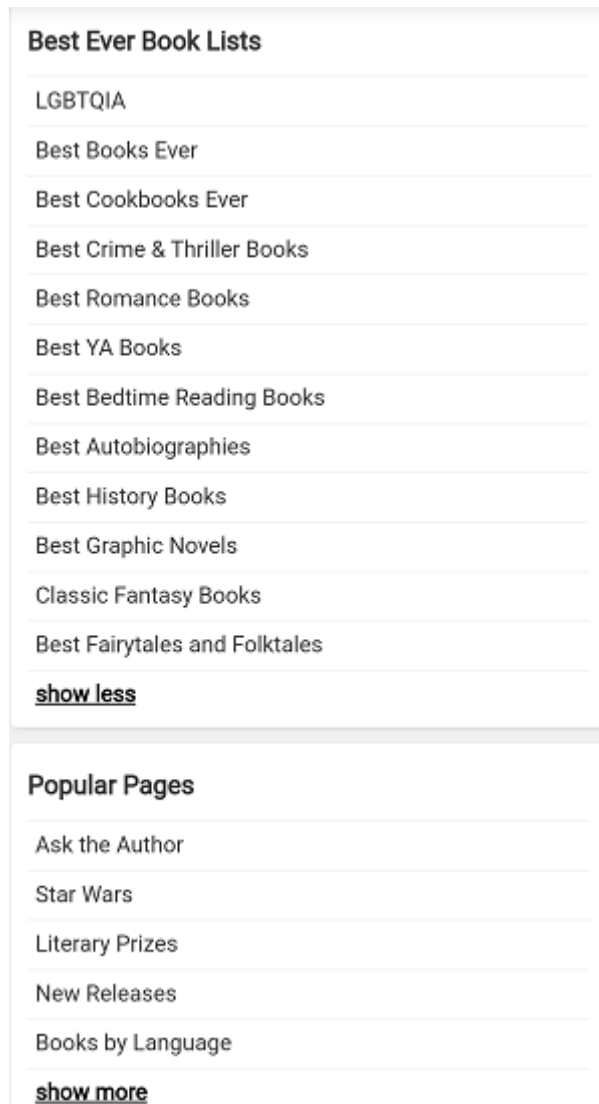
Book Depository has provided a feature which is scanning the barcode of the books by searching for the books. It will be convenient for the user to scan the barcodes of the book and it will automatically help the user to search for the book.



Figure 2.4.1.3.1 Screenshot of scan barcode feature

### 2.4.1.4 Has filter the books categories

Book Depository has provided a feature which is filter the books into books categories. Therefore, users can search for the books by filtering the books to the books categories and search their books from the book categories.



*Figure 2.4.1.4.1 Screenshot of filter feature*

## **2.4.2 Limitations of the system**

### **2.4.2.1 Unable to choose more shipping method**

Book Depository does not provide many shipping methods for the user to choose. It will be not useful for the user to use it to ship their books. It only needed to user to fill in their own country. It will be not convenient for the user who wanted to choose international shipping but does not know what the international shipping company is that Book Depository system going to provide.

### 1. Delivery Address

Full name \*

First and last name. For example: John Smith

Delivery country \*



Find your delivery address:

Enter address manually

Figure 2.4.2.1.1 Screenshot of shipping method

### 2.4.2.2 Update the quantity of books manually

Book Depository does not have the function which is automatically add the new quantity of books to cart. Customers have to click the update button to update the quantity of books to the cart. It is not convenient for the customer to update the quantity of books to the cart manually. Some of the customer might did not aware of the button and did not update the new quantity of books in the cart.

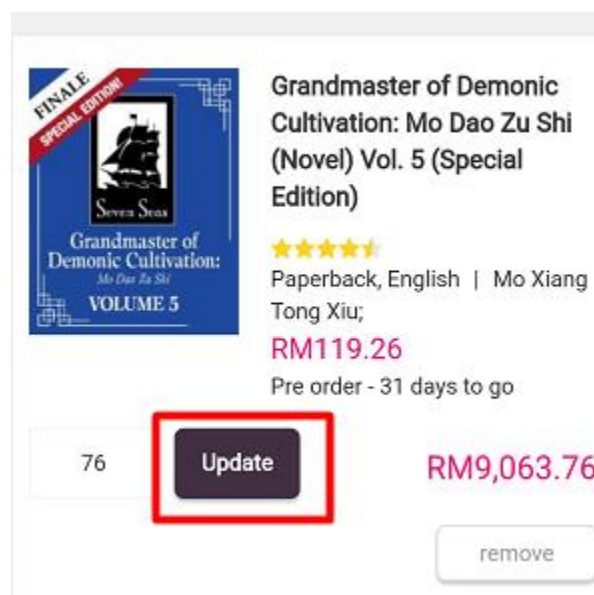


Figure 2.4.2.2.1 Update quantity of item in shopping cart

### 2.4.2.3 Unable to view the review rating description

Book depository does not provide a function which is view the rating description. Rating description is quite important for the customers because the customer will view the rating description before buying the items.

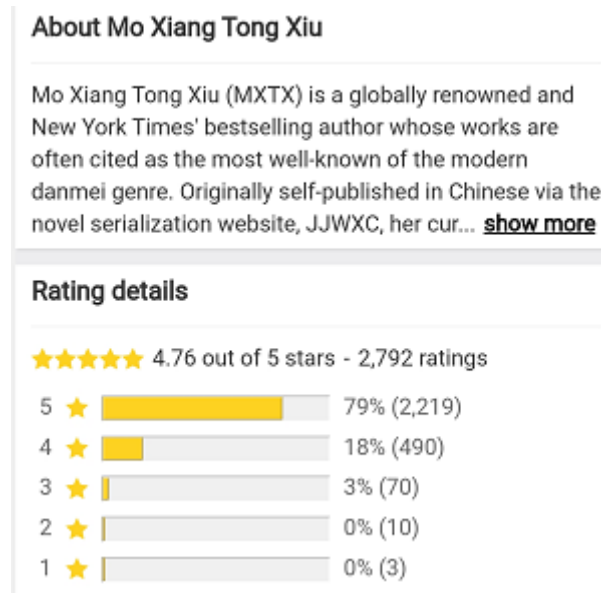


Figure 2.4.2.3.1 Screenshot of rating details

### 2.4.2.4 Lack of E-wallet Payment System

Book Depository system has limited amount of payment system which is not convenient for the international customer who wanted to purchase with another payment. It will be convenient for the customer to use e-wallet when making payments since e-wallet is quite popular these days.

### 2.4.2.5 Lack of an Order Tracking System

Book Depository system does not have order tracking system. Having order tracking system in an e-commerce mobile app is important. It is because user can track the purchased book locations and where have the book reached. It will be useful for the user to estimate the delivery time and they can guess the date of the books will reach their house. Therefore, customer can estimate the time of the books will arrive and plan to be free to receive the books.

### 2.4.2.6 Lack of Live Chat

Book Depository does not have live chat which is chatbot in their mobile application. Live chat is a convenient function for the customer to interact with seller when they are facing any

problem. The customer can get a faster respond from the seller in live chat instead of sending email and asking the problem with emailing the customer. By emailing, the customer needs to wait for several days to get their solution which is not convenient. Therefore, by having live chat customers can have immediate respond from seller to solve their problem.

#### **2.4.2.7 Lack of Customer reward**

Book Depository does not have customer reward features. Having customer reward is important. It is because it allows users to accumulate points whenever they want to buy their preloved books. By having customer reward, users can earn their points while buying the books and users are allowed to redeem rewards with their points. The rewards can be discount voucher code so that users can apply it when they want to buy books in the future.

#### **2.4.2.8 Lack of seller features**

Book Depository system does not have seller function. The Book Depository system will sell the books instead of seller. Therefore, the used or preloved books of the user cannot be sold in the system.

### **2.5 Blackwell's**

User accounts has been created to review the system but seller account cannot be created since it did not allow seller to sell books in the system [17].

#### **2.5.1 Advantages of the system**

##### **2.5.1.1 Has cookies**

Blackwell's has cookies to store information on the user's device. Cookies can also be used to track the user's behaviour on the website including their clicks, navigation patterns, and other interactions. This information can be used to improve the website's functionality and user experience, as well as to personalize content and advertising based on the user's interests. However, cookies also raise concerns about privacy and data security since they can be used to collect and share user data without their knowledge or consent.



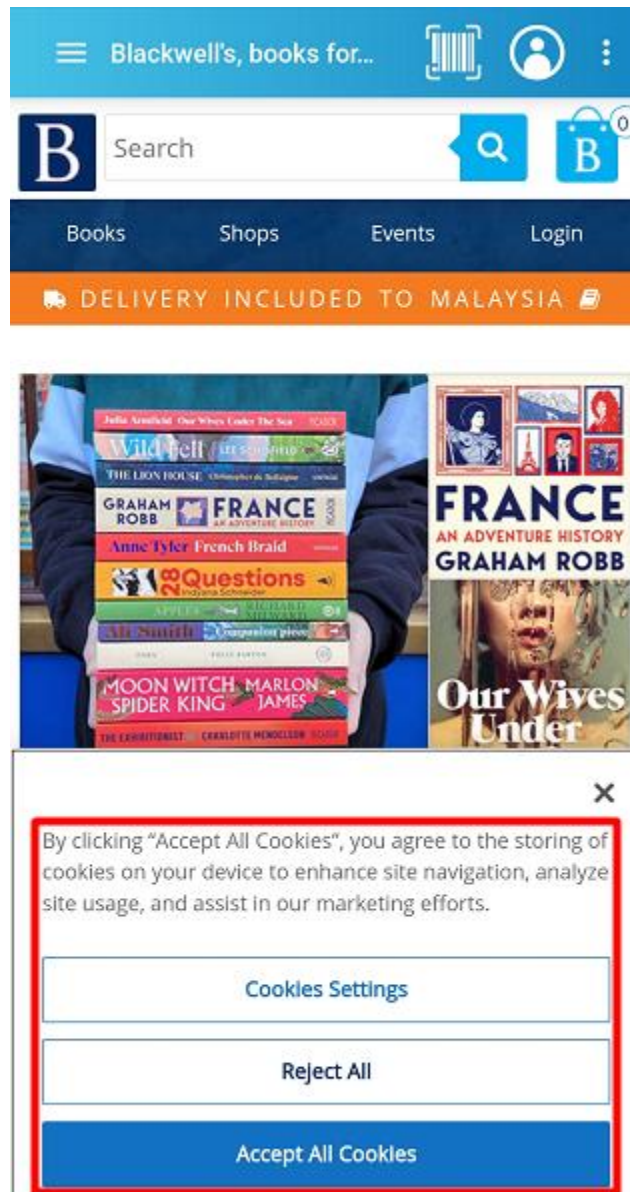
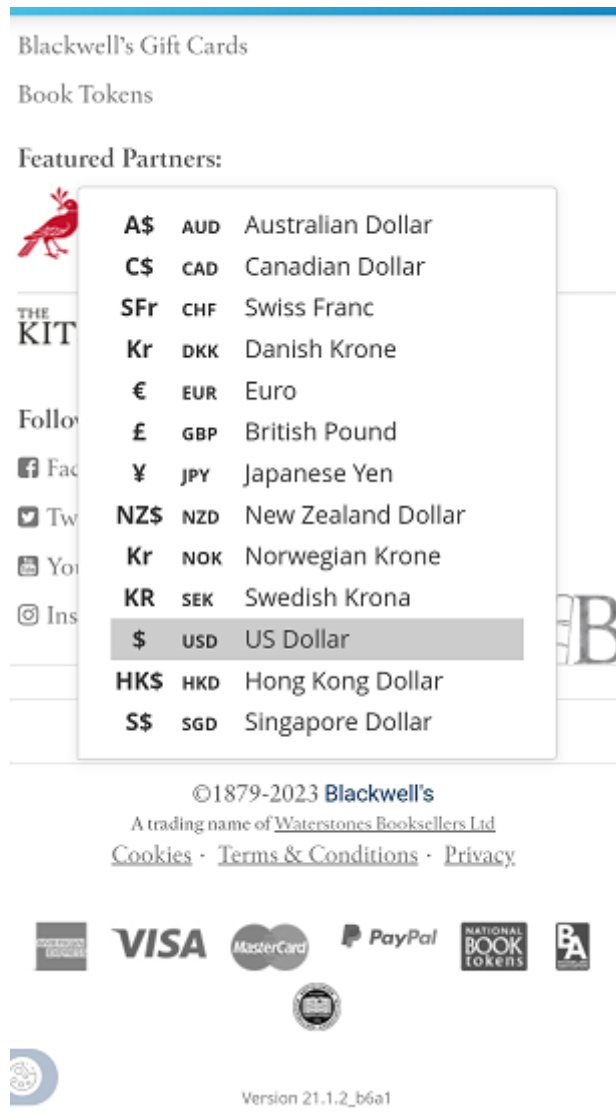


Figure 2.5.1.1.1 Screenshot of cookies feature

### 2.5.1.2 Has automatically change price currency

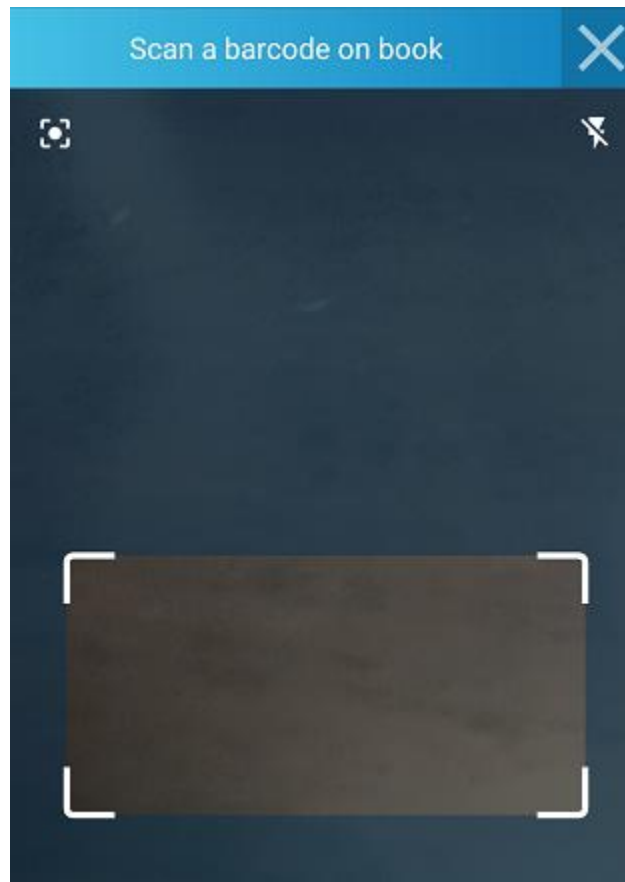
Blackwell's system has a function which is allowed users to choose the price of currency of their own country. Once they pressed it, it will automatically change price currency to the chosen currency. All the prices of the books will be changed to the country currency.



*Figure 2.5.1.2.1 Screenshot of convert currency features*

### 2.5.1.3 Has Scan barcode of the books

Blackwell's system has provided a feature which is scanning the barcode of the books by searching for the books. It will be convenient for the user to scan the barcodes of the book and it will automatically help the user to search for the book.



*Figure 2.5.1.3.1 Screenshot of scan barcode features*

#### **2.5.1.4 Has filter feature**

Blackwell's system has provided a feature which is filtering the books into several categories. Filters play an important role in an online preloved book system. It helps the user to filter the large collection of books into different kinds of categories, price and authors. It helps the user to filter it instead of scrolling all the way down to find the books the user is interested in.



*Figure 2.5.1.4.1 Screenshot of filter feature*

## 2.5.2 Limitation of the system

### 2.5.2.1 Unable to view the product details

Blackwell's system does not allow the users to view the details of the product. Once the user clicks the book, it will remain in the same page.

### 2.5.2.2 Unable to add to shopping cart

Blackwell's system does not allow the users to add the preloved book to shopping cart. It will be remained unchanged even clicked reserve in store.



Figure 2.5.2.2.1 Screenshot of unable to add to shopping cart

### 2.5.2.3 Lack of rating

Blackwell's system does not allow the users to add rating. Rating is quite important for the user to know the comments of previous user who bought the books. User can refer to the rating and decides whether wanted to buy the book or not.

#### **2.5.2.4 Lack of E-wallet Payment System**

Blackwell's system has limited amount of payment system which is not convenient for the international customer who wanted to purchase with another payment. It will be useful if E-wallet is added to the payment system.

#### **2.5.2.5 Lack of an Order Tracking System**

Blackwell's system does not have order tracking system. Having order tracking system in an e-commerce mobile app is important. It is because user can track the purchased book locations and where have the book reached. It will be useful for the user to estimate the delivery time and they can guess the date of the books will reach their house. Therefore, customer can estimate the time of the books will arrive and plan to be free to receive the books.

#### **2.5.2.6 Lack of Live Chat**

Blackwell's system does not have live chat which is chatbot in their mobile application. Live chat is a convenient function for the customer to interact with seller when they are facing any problem. The customer can get a faster respond from the seller in live chat instead of sending email and asking the problem with emailing the customer. By emailing, the customer needs to wait for several days to get their solution which is not convenient. Therefore, by having live chat customers can have immediate respond from seller to solve their problem.

#### **2.5.2.7 Lack of Customer reward**

Blackwell's system does not have customer reward features. Customer reward features is important because it allows users to accumulate points whenever they want to buy their preloved books. By having customer reward, users can earn their points while buying the books and users are allowed to redeem rewards with their points. The rewards can be discount voucher code so that users can apply it when they want to buy books in the future.

#### **2.5.2.8 Lack of seller features**

Blackwell's system does not have seller function. The Blackwell's system will sell the books instead of seller. Therefore, the used or preloved books of the user cannot be sold in the system.

### **2.6 Carousell**

User accounts and seller accounts has been created to review the system. Seller account can add the used books and its prices to the Carousell to sell the books [13].

## 2.6.1 Advantages of the system

### 2.6.1.1 Has Wishlist

Carousell has Wishlist which allows user to add their interested book into the Wishlist. User can add it to Wishlist when they do not have enough budget to buy the books. Therefore, it will be easier for user to find the interested books when they have enough budget. They can directly add to cart in the Wishlist.



Stuff you like appears here  
Find your favorites and start creating your own  
wish-list

*Figure 2.6.1.1.1 Screenshot of Wishlist feature*

### 2.6.1.2 Has Filter feature

Carousell system has provided a feature which is filtering the items into several categories. Filters plays an important role in an online preloved book system. It helps the user to filter the large collection of books into different kinds of categories, price and authors. It helps the user to filter it instead of scrolling all the way down to find the books the user is interested in.

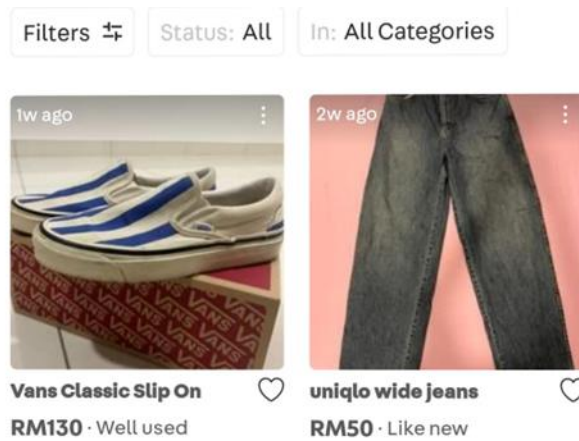


Figure 2.6.1.2.1 Screenshot of filter feature

### 2.6.1.3 Has Live chat

Carousell system has a feature which is live chat. Live chat is a convenient function for the customer to interact with seller when they are facing any problem. The customer can get a faster respond from the seller in live chat instead of sending email and asking the problem with emailing the customer. By emailing, the customer needs to wait for several days to get their solution which is not convenient. Therefore, by having live chat customers can have immediate respond from seller to solve their problem.

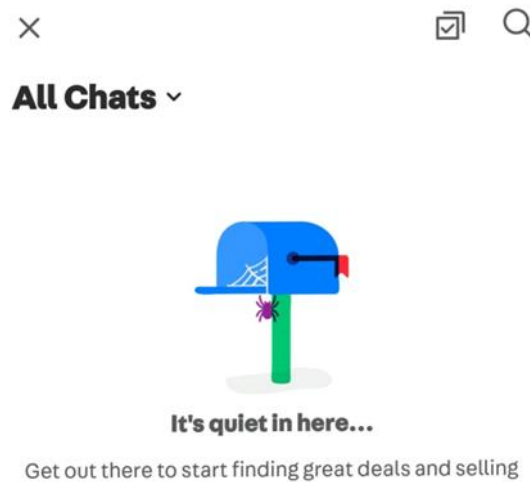


Figure 2.6.1.3.1 Screenshot of live chat feature

### 2.6.1.4 Has order tracking feature

Carousell system does not have order tracking system. Having order tracking system in an e-commerce mobile app is important. It is because user can track the purchased book locations and where have the book reached. It will be useful for the user to estimate the delivery time

and they can guess the date of the books will reach their house. Therefore, customer can estimate the time of the books will arrive and plan to be free to receive the books.

## Delivery status

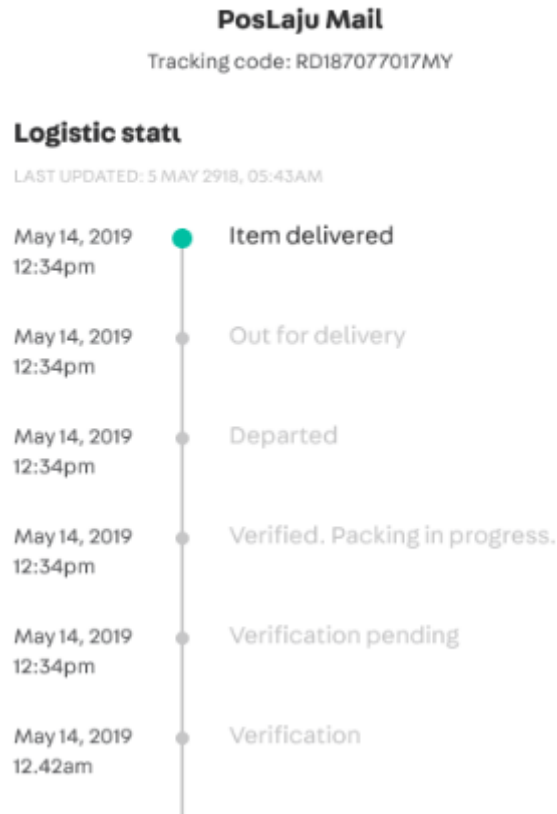


Figure 2.6.1.4.1 Screenshot of order tracking system

### 2.6.1.5 Has seller feature

Carousell system has seller features in their system. Seller features is important in building an online preloved books system. It is because it allows the user to become a seller and sell the used books. Once the books is sold so the user has more budget to buy the books that they are interested. In addition, the used books will not be wasted and will be sold to a new owner.

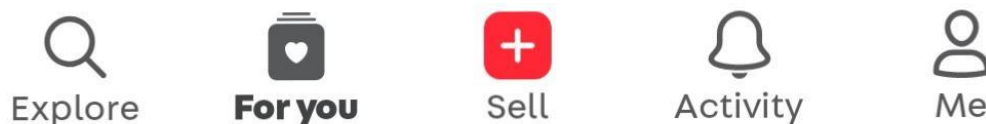
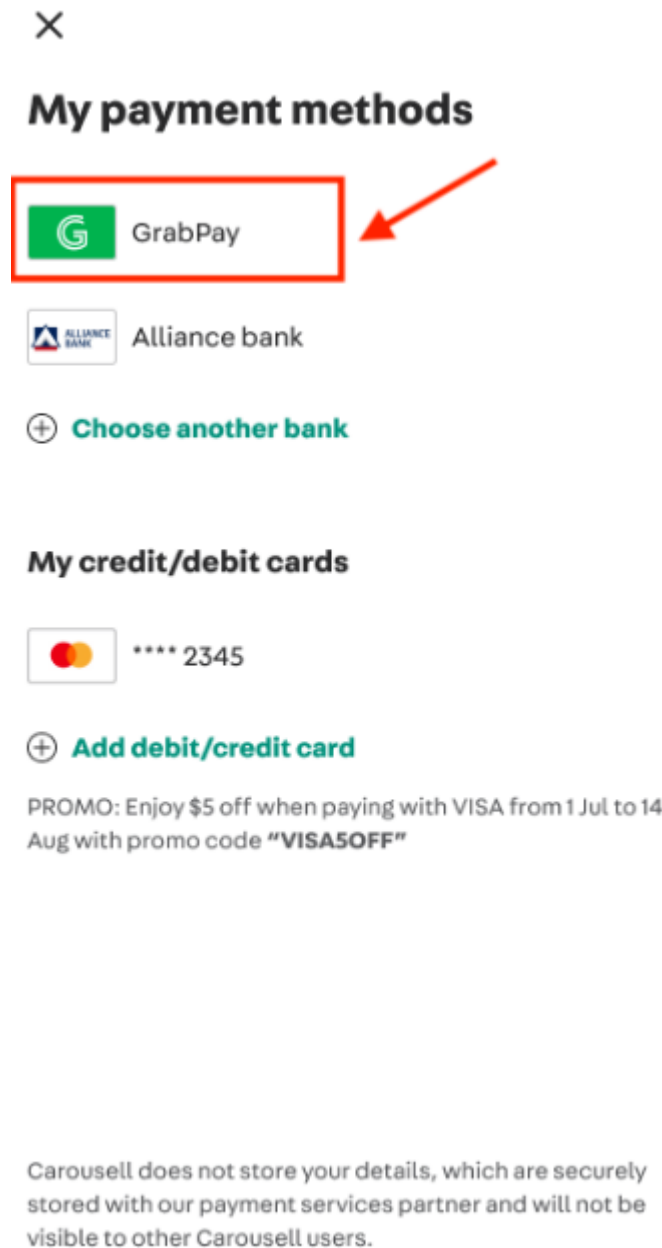


Figure 2.6.1.5.1 Screenshot of seller features



### 2.6.1.6 Has multiple payment methods include E-wallet

Carousell system has multiple payment methods in their system. Carousell had included e-wallet like grab pay to be one of the payment methods for the user to make payments.



*Figure 2.6.1.6.1 Screenshot of payment method*

## 2.6.2 Limitation of the system

### 2.6.2.1 Lack of Customer reward

Carousell system does not have customer reward features. Customer reward features is important because it allows users to accumulate points whenever they want to buy their preloved books. By having customer reward, users can earn their points while buying the books

and users are allowed to redeem rewards with their points. The rewards can be discount voucher code so that users can apply it when they want to buy books in the future.

#### **2.6.2.2 Lack of advance search**

Carousell does not have advance search in their system. Advance search is for the user to search the book by its ISBN. Therefore, it will be convenient for the user to search for the books that they are interested.

#### **2.6.2.3 Lack of scan barcode**

Carousell does not have scan barcode in their system. It is because their system is not only focus on books categories. It has included other categories like shirt, food and others.

### **2.7 BookScouter**

User accounts and seller accounts has been created to review the system. Seller account can add the used books and prices to the BookScouter to sell the books [15].

#### **2.7.1 Advantages of the system**

##### **2.7.1.1 Has Live Chat**

BookScouter has a feature which is live chat. Live chat is a convenient function for the customer to interact with seller when they are facing any problem. The customer can get a faster respond from the seller in live chat instead of sending email and asking the problem with emailing the customer. By emailing, the customer needs to wait for several days to get their solution which is not convenient. Therefore, by having live chat customers can have immediate respond from seller to solve their problem.

The screenshot shows a live chat interface. At the top, there is an orange header with a search icon and the text 'Answers' on the left, and a speech bubble icon with the text 'Ask' on the right. Below the header, the text 'How can we help?' is displayed in white, followed by 'We usually respond in a few hours' in a lighter shade. The main form area is white and contains four input fields: 'Name' (with a vertical cursor), 'Subject', 'Email address', and 'How can we help?' (with a large text area and icons for attachments and emojis). At the bottom of the form is an orange button labeled 'Send a message'.

*Figure 2.7.1.1.1 Screenshot of Live chat feature*

### **2.7.1.2 Has seller feature**

BookScouter has seller features in their system. Seller features is important in building an online preloved books system. It is because it allows the user to become a seller and sell the

used books. Once the books is sold so the user has more budget to buy the books that they are interested. In addition, the used books will not be wasted and will be sold to a new owner.

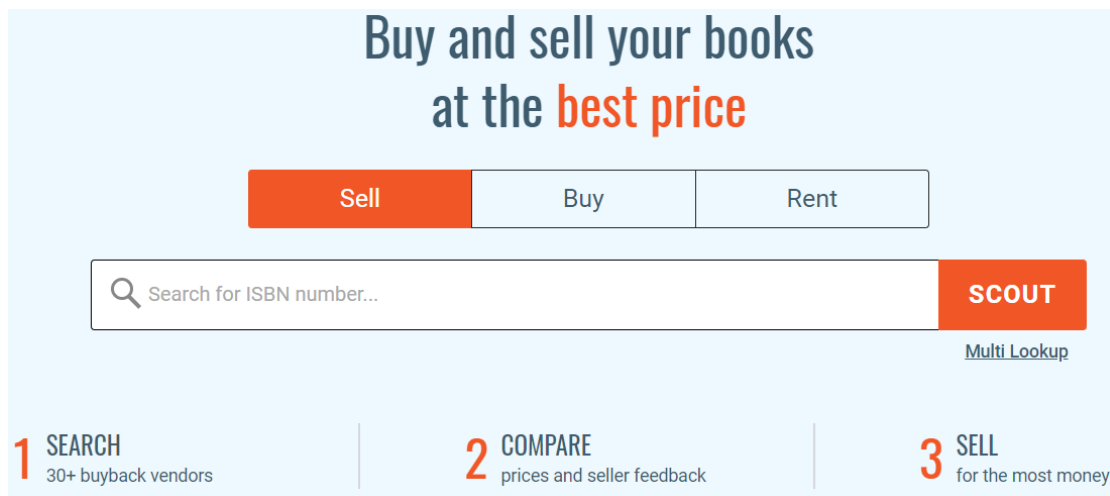


Figure 2.7.1.2.1 Screenshot of seller feature

### 2.7.1.3 Has advance search

BookScouter has advance search which allows user to search the books by typing the ISBN of the books that the user interested. The result of searching the interested book will be more accurate and even faster.

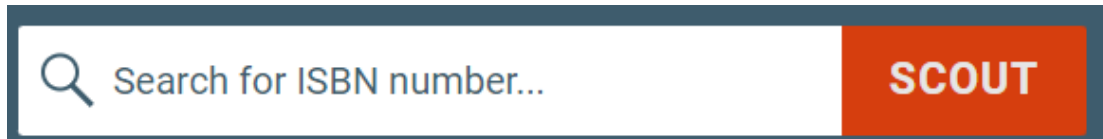


Figure 2.7.1.3.1 Screenshot of advance search feature

## 2.7.2 Limitation of the system

### 2.7.2.1 Lack of Wishlist

BookScouter does not have WishList. Wishlist is one of the important functions for the user. Wishlist allows user to save what items they like by adding the item into Wishlist. Then, the user can check their favourite items in the Wishlist. By having Wishlist, users can refer to the items that they wanted to buy in their account and check it back in the future. It helps users to know what their interest is in the product without buying it immediately. Besides, Wishlist can be a benefit to the seller. It is because Wishlist helps the seller to know what the users like. Wishlist is a good alert for user to buy it on sale. It will be convenient for users to check the items which are out of stock.

### 2.7.2.2 Lack of Customer reward

BookScouter does not have customer rewards which act as a customer loyalty in their system. Customer reward features is important because it allows users to accumulate points whenever they want to buy their preloved books. By having customer reward, users can earn their points while buying the books and users are allowed to redeem rewards with their points. The rewards can be discount voucher code so that users can apply it when they want to buy books in the future.

### 2.7.2.3 Lack of Payment method

BookScouter does not have multiple payment methods. Payment method like e-wallet such as grab pay should be one of the payment methods for the user to make payments. It is because in this generation most people use e-wallet like touch n go or grab pay to make payment.

## 2.8 BookLal

User accounts and seller accounts has been created to review the system. Seller account can add the used books and its prices to the BookLal to sell the books [18].

### 2.8.1 Advantages of the system

#### 2.8.1.1 Has Wishlist

BookLal has a feature which is Wishlist. Wishlist is one of the important functions for the user. Wishlist allows user to save what items they like by adding the item into Wishlist. Then, the user can check their favourite items in the Wishlist. By having Wishlist, users can refer to the items that they wanted to buy in their account and check it back in the future. It helps users to know what their interest is in the product without buying it immediately. Besides, Wishlist can be a benefit to the seller. It is because Wishlist helps the seller to know what the users like. Wishlist is a good alert for user to buy it on sale. It will be convenient for users to check the items which are out of stock.

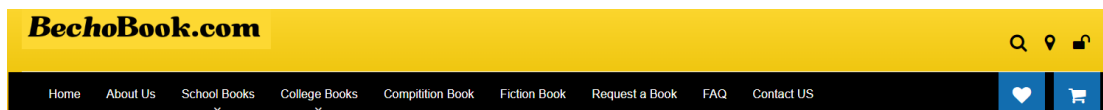


Figure 2.8.1.1.1 Screenshot of Wishlist feature

### 2.8.1.2 Has request book feature

BookLal has a feature which is allowed user to request book. It allows user to request book by entering the books name and phone number. Therefore, the user will get notify when the book requested is in stock.

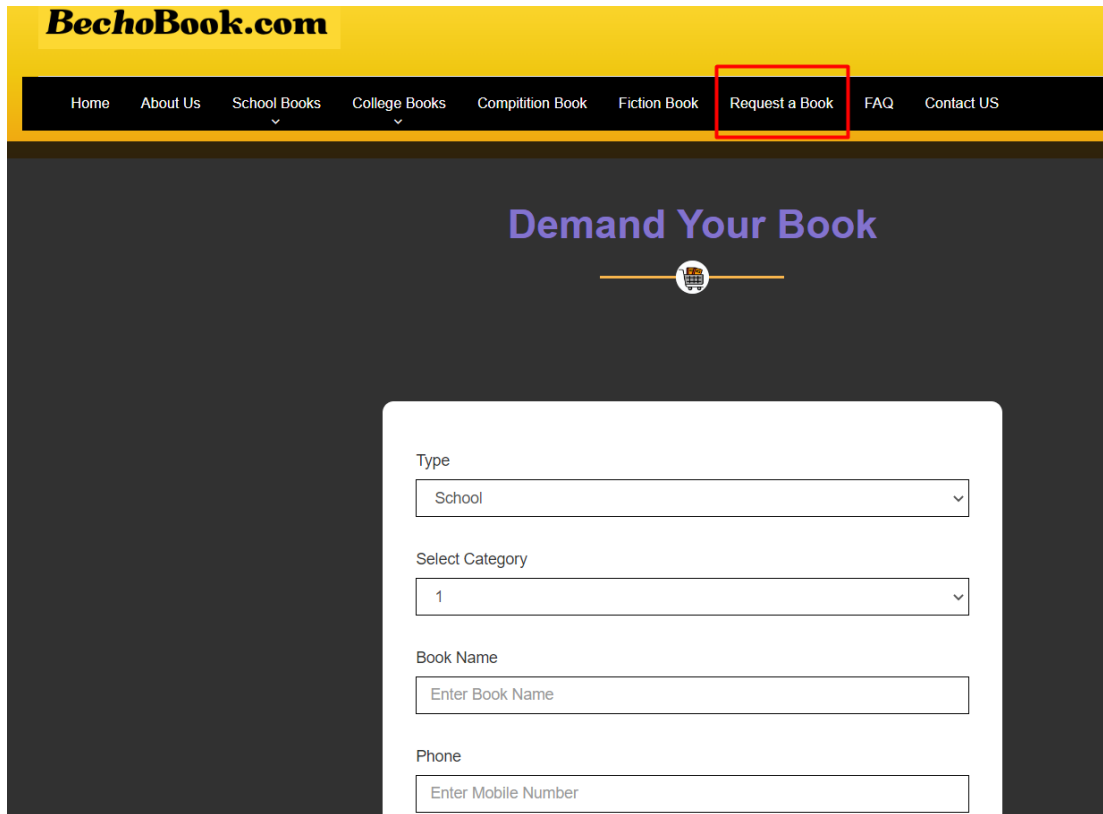


Figure 2.8.1.2.1 Screenshot of request book feature

### 2.8.1.3 Has Filter feature

BookLal has a feature which is filtering the books into different kind of categories. Filters plays an important role in an online preloved book system. It helps the user to filter the large collection of books into different kinds of categories, price and authors. It helps the user to filter it instead of scrolling all the way down to find the books the user is interested in.



Figure 2.8.1.3.1 Screenshot of Filter feature

## 2.8.2 Limitation of the system

### 2.8.2.1 Lack of Live Chat

BookLal does not have Live Chat in their system. Live chat is a convenient function for the customer to interact with seller when they are facing any problem. The customer can get a faster respond from the seller in live chat instead of sending email and asking the problem with

emailing the customer. By emailing, the customer needs to wait for several days to get their solution which is not convenient. Therefore, by having live chat customers can have immediate respond from seller to solve their problem.

### **2.8.2.2 Lack of Customer reward**

BookLal does not have customer reward which acts as a customer loyalty in their system. Customer reward features is important because it allows users to accumulate points whenever they want to buy their preloved books. By having customer reward, users can earn their points while buying the books and users are allowed to redeem rewards with their points. The rewards can be discount voucher code so that users can apply it when they want to buy books in the future.

### **2.8.2.3 Lack of E-wallet Payment method**

BookLal does not have multiple payment methods. Payment method like e-wallet such as grab pay should be one of the payment methods for the user to make payments. It is because in this generation most people use e wallet like Touch n go or Grab pay to make payment.

## **2.9 Natural Language Processing**

Natural Language Processing which is NLP, is the intersection of grammar, calculation, and statistics [8]. The aim of NLP is to automate the recognizing of human language. NLP draws heavily in the field like statistics and theory of computation in its emerging stages. Its primary goal is to analyze, understand, and generate natural language. NLP encompasses various applications such as speech recognition, language translation, and text summarization. Recommender system is designed to offer suggestions for products and services based on users' preferences and needs [9]. By analyzing user behavior and choices, these systems identify relevant items from a vast pool of information. Techniques like hybrid filtering, collaborative filtering, and content-based filtering are commonly employed in building such systems.

### **2.9.1 Singular Value Decomposition (SVD) algorithm + Collaborative filtering algorithm**

Singular Value Decomposition algorithm can be used to develop a recommendation system with Collaborative filtering [10]. Matrix factorization has been used to derive the latent factor

and makes recommendations based on the matrix of the user element. SVD has been proof that is good in handling large datasets, extracting features, reducing noise and dimensionality so as to speed up computation [6].  $A = U \cdot S \cdot V^T$  [11].  $A$  is the user-item interactions which is  $m$  rows for users and  $n$  column for items.  $U$  is the orthogonal matrix ( $m \times m$ ) which is representing the users with latent factors.  $S$  is the diagonal matrix ( $r \times r$ ) which is the rank of matrix that has singular values.  $V^T$  are the items with latent factors with transpose ( $r \times n$ ).  $V^T$  utilized to calculate item similarity and capturing underlying features of items based on user-item interactions. By computing similarities between items using these vectors, recommendations are generated for users to suggest items similar to those they have interacted. This method effectively captures latent factors and enhance recommendation accuracy in addressing information overload by providing suggestions based on user preferences and behaviors. The disadvantage of the method is cold start. Cold start is unable to recommend things to the new user. It is because new users have less historical data so its hard to understand their preference and behavior. Therefore, it is the limitation to provide them personalized recommendations.

## 2.9.2 Convolutional Neural Networks

Convolutional Neural Networks (CNNs) play a crucial role in text classification tasks which including chatbot development due to their ability to effectively capture spatial dependencies within data [16]. CNNs were employed as the classifier for chatbot creation leveraging specific tokenization tools to preprocess text data. Word Embedding technique has adopted to transform text into numerical vectors to facilitate text processing. The research has utilized the "Word2Vec" Word Embedding technique to convert text into numerical representations. The research has evaluated the performance of different CNN architectures including AlexNet, LeNet-5, ResNet, and VGGNet by comparing their accuracy, F1 score, training time, and execution time. LeNet-5 exhibited superior accuracy, the fastest training time, and minimized losses compared to the other architectures evaluated in the study.



## 2.10 Comparison with existing system and proposed system

Table 2.10.1 Compare and contrast among reviewed systems that similar with Online Preloved Book System

Existing System Features	Thrift Books	AbeBooks	Book Depository	Blackwell's	Carousell	Book Scouter	BookLal	Proposed System
Filters	√		√	√	√			√
WishList	√	√	√		√		√	√
Customer Reward	√							√
Scan barcode	√	√	√	√				
Multiple Payment Method Include E-wallet					√			√
Order Tracking System					√			√
Live Chat					√	√		√
Seller features		√			√	√	√	√
Recently view features		√						√
FAQ			√					√
Cookies				√				
Advance search	√	√	√	√		√		
Change price currency automatically				√				
Request book							√	

Table 2.10.1 shows the comparison between similar existing system of online Preloved book System.

First, the ThriftBook system has several features such as filters, Wishlist, customer reward, advance search and it able to scan barcode of the books. Furthermore, Abebooks has recently view features, Wishlist, able to scan barcode of the books, advance search and seller features which allows users to sell their Preloved book. Besides, Book Depository has several features such as FAQ, Wishlist, advance search, filter feature and able to scan the barcode of the books. Moreover, Blackwell's has some features which are having cookies, price currency convention automatically, advance search, able to scan barcode of the books and it has filter features which allows user to filter the books category or the price of the books. In addition, Carousell has several functions in their system which are Wishlist, filter feature, Live chat, order tracking feature, seller feature and E-wallet payment methods. Additionally, Book Scouter has multiple feature which are having Live chat, seller feature and advance search, BookLal has multiple features in their system which are Wishlist, request book features and filter feature.

After reviewing all the existing online preloved book system, every online preloved book system has their strength and weakness. Therefore, the system that going to proposed several features which are filter feature, Wishlist, Qr code payment system, Order Tracking system, Live chat, seller feature, recommendation book chatbot.

# Chapter 3 System Methodology/Approach

## 3.1 System Requirement

### 3.1.1 Hardware

The hardware involved in this project is computer and android mobile device. A computer issued for the coding part of the online pre-loved book system in the development stage. A mobile device is used for testing the function and flow of the application to ensure that the application can run smoothly without being stuck or having any bugs.

Table 3.1.1.1 Specifications of laptop

Description	Specifications
Model	Acer Nitro 5
Processor	Intel Core i5-12500H
Operating System	Windows 11
Graphic	NVIDIA GeForce RTX3050 4GB GDDR6
Memory	8GB DDR4 RAM
Storage	512GB Gen4 SSD

Table 3.1.1.1 shows the specifications of the laptop that will be used in the development stages of this project.

Table 3.1.1.2 Specifications of mobile device

Descriptions	Specifications
Model	Redmi Note 10S
Processor	Qualcomm SM6225 Snapdragon 680
Operating System	Android 11
Memory	8GB
Storage	128GB

Table 3.1.1.2 shows the specifications of the mobile device that will be used in the testing stage of this project.

### **3.1.2 Software**

#### **3.1.2.1 Programming Language Used In this project**

Java is the programming language that will be used to develop the online preloved books system. Java is the primary programming language used for developing Android app. Besides, Java is well-supported by the Android development platform. Java has provided a number of advantages in developing Android applications which including a set of libraries and frameworks, and excellent performance.

Besides, Python also had been used to train the chatbot. Python is utilized for training the chatbot and showcasing flexibility in language selection for specific tasks.

#### **3.1.2.2 Development Tools**

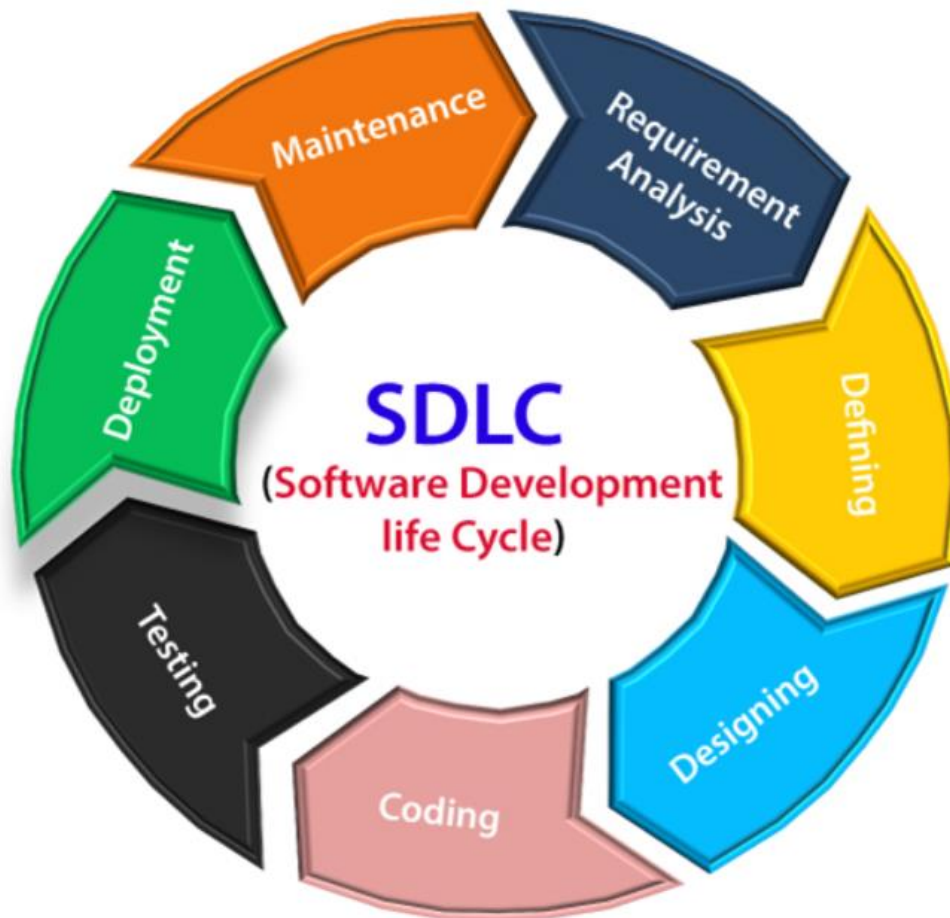
Android Studio will be used as development tools to develop the online preloved book system. Android Studio is the official Integrated Development Environment (IDE) that helps in building Android applications. Besides, Android Studio has a range of features which good in developing a high-quality application. Android Studio support some of the programming language which is Java and Kotlin. Java had been learnt in Object Oriented Programming. Therefore, Java will be used to develop the online preloved book system.

Visual Studio Code had been used to train the chatbot. Visual Studio is a widely used IDE. It facilitates chatbot development. Leveraging pretrained models expedites training, saving time and resources. Developers can fine-tune models within Visual Studio for enhancing performance and functionality efficiently. Besides, port forwarding had been used in Visual Studio Code to create a public URL for the android studio to get the respond for the book recommend chatbot.

#### **3.1.2.3 Database Selection**

Firebase is chosen for the database of this project which is online preloved book system. It is because Firebase provides many features and services for building mobile applications which including real-time databases. Besides, Firebase also supports NoSQL database by creating a database for storing data information. NoSQL database is one of the key features of Firebase. It is because NoSQL stores data in JSON format and provides real-time synchronization to users with the Cloud Service.

## 3.2 Methodology



*Figure 3.2.1 Software Development Life Cycle (SDLC)*

The SDLC is the methodology of this online preloved book system. SDLC stands for Software Development life Cycle [7]. The processes of SDLC have broken down into several stages which are Requirement analysis, Defining, Designing, Coding, Testing and Deployment. For the first stage, requirement analysis which is in the planning phase. It is an important stage that collect the online preloved book system requirements to ensure that the online pre-loved book system is built in quality assurance and identify the risk of building the online pre-loved book system. For the second stage which is Defining. It is a stage that will be documented the requirements of the online pre-loved book system after the requirement analysis and let the project skateholders to agree on the requirements of the software system. The next stage is Designing. Designing is the third stage which will be done after the Requirement Analysis and Defining. In this stage, the online pre-loved book system architecture is designed, including the database schema, user interface, and software modules. In addition, the next stage is Coding which is started to develop the online preloved book system. In this stage, the online pre-loved

book system will be doing the development by using compilers which include implementing the codes. The next stage is Testing. In Testing phase, the codes will be tested after it is generated in the compiler. It will be tested to ensure there is no bug which is to keep the quality of the online pre-loved book system good and to ensure all the requirements of the customer for the online pre-loved book system is completely fulfilled. The next stage is Deployment. The online pre-loved book system will be released once all the requirements has been met and there is no more bugs or errors. Last but not least, Maintenance is the last stage for the Software Development Life Cycle (SDLC). In this stage, the customer will be started using the software system as it has already deployed. Once the application is launched, a weekly maintenance service should be provided to the customer to ensure that the online preloved book system is always in a good condition as the customers are our users of this system. When there is any error occurs, maintenance will be provided then we will be solving the problem immediately.

### 3.3 User Requirement

Table 3.3.1 Functional requirements

<b>Functional Requirement</b>	<b>Description</b>
Can upload book images	Allow seller to upload preloved book image.
Can add used book to sell book	Allow seller to add preloved book to sell the used book.
Can view the sell used book list	Allow seller to view the list to know what they are selling.
Can delete the used book	Allow seller to delete the preloved book when it is not available anymore.
Can filter and search	Allow buyer to filter and search for the preloved book they are interested.
Can add preloved book to Wishlist	Allow buyer to add the preloved book into Wishlist
Can chat in live chat	Allow buyer and seller to chat in live chat.
Can view the order status	Allow buyer to view the order status

Can do transaction	Allow buyer and seller to pay and receive the money by scanning qr and sending receipt.
Can delete preloved book from Wishlist	Allow buyer to delete preloved book from Wishlist.
Can update user information	Allow buyer and seller to update their user information.
Can update profile picture	Allow buyer and seller to update their profile picture.
Can add the preloved book into shopping cart	Allow buyer to add the preloved book into shopping cart.
Can remove the preloved book from the shopping cart	Allow buyer to remove the preloved book from the shopping cart

Table 3.3.2 Non-Functional requirements

<b>Non-Functional Requirement</b>	<b>Description</b>
Performance	The respond of activity in each fragment will be appear less than 3 seconds when the users click on it.
Usability	The system is easy to use.
Availability	The system is always available.
Operation	It can be operated on Android platform.

### 3.4 Use case Diagram of Online Preloved Book system

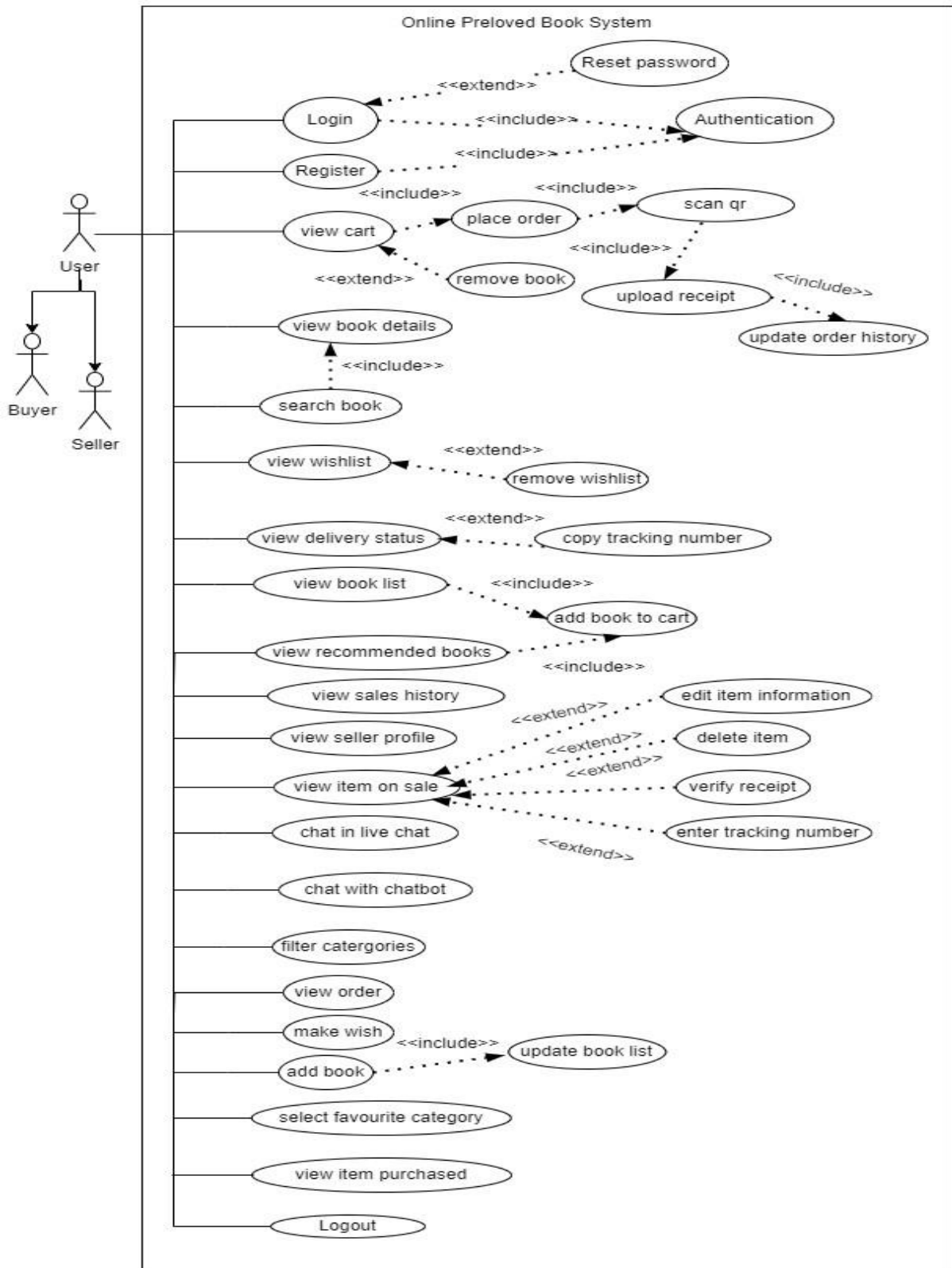


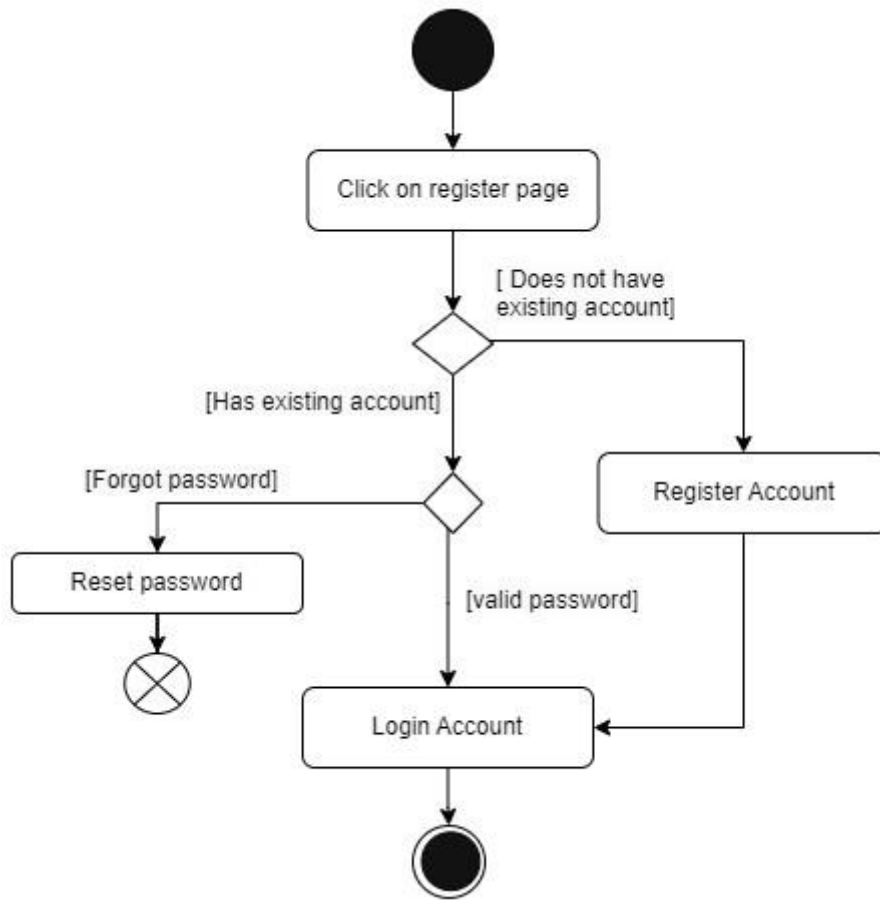
Figure 3.4.1 Use Case Diagram of Online Preloved Book System



Figure 3.4.1 has shown the use case diagram of online preloved book system. A user in online preloved book system can be a buyer and seller at the same time. Since it is selling a preloved book platform, it will be convenient for user to be seller and buyer at the same time. First, user can login and register to the online preloved book system with authentication. User need to insert OTP from phone message to login to the online preloved book system. Besides, the user can view the shopping cart and check out to place order. During place order, user can scan QR code of the seller to make payment then the user has to upload receipt to confirm payment. After making payment, the online preloved book system will help the user to send the receipt to the seller to verify the payment to make sure the amount paid is correct. After the transaction is verified, the seller will enter tracking number for the item to allow user to keep track of the delivery status. Moreover, the user can view the book details by clicking the preloved books. The user even can search for the preloved books to see whether the book is available or not. Besides, user can view the Wishlist and remove the book from Wishlist if the user does not have interest on buying it. User can view the delivery status. By viewing the delivery status, user allowed to track the delivery status of the preloved book purchased by using the tracking number. The user can view the book list and add the preloved book into shopping cart if interested to buy it. The user can view recommended books in the homepage and also can be added to shopping cart. The user can view seller profile and clicking the profile of the seller. Besides, the user can chat with the seller if they have any questions on the preloved book. User is allowed to filter the books category based on the price. In addition, user who wanted to be a seller can add the preloved book by entering the product name, description, price and category. If the user provided discount, it can be provided by entering the discount price and discount note. User can remove the preloved book if he does not want to sell it anymore or the preloved book already sold. Besides, user as seller can edit the information of the item on sale. User can chat with the chatbot for books recommender. Users can view the item they have purchased. User can make wish if the item is not in the book list. Last but not least, user is allowed to logout.

### 3.5 Activity Diagram of Online Preloved Book system

#### 3.5.1 Activity Diagram of User Authentication system



*Figure 3.5.1.1 Activity Diagram of User Authentication system*

When user press on the ‘New user’ button, user can register an account. If the user already has an account, user can enter the email and password to log in to the system. User can reset his password if he presses forgot password.

### 3.5.2 Activity Diagram of Seller Module

#### 3.5.2.1 Activity Diagram of seller add item

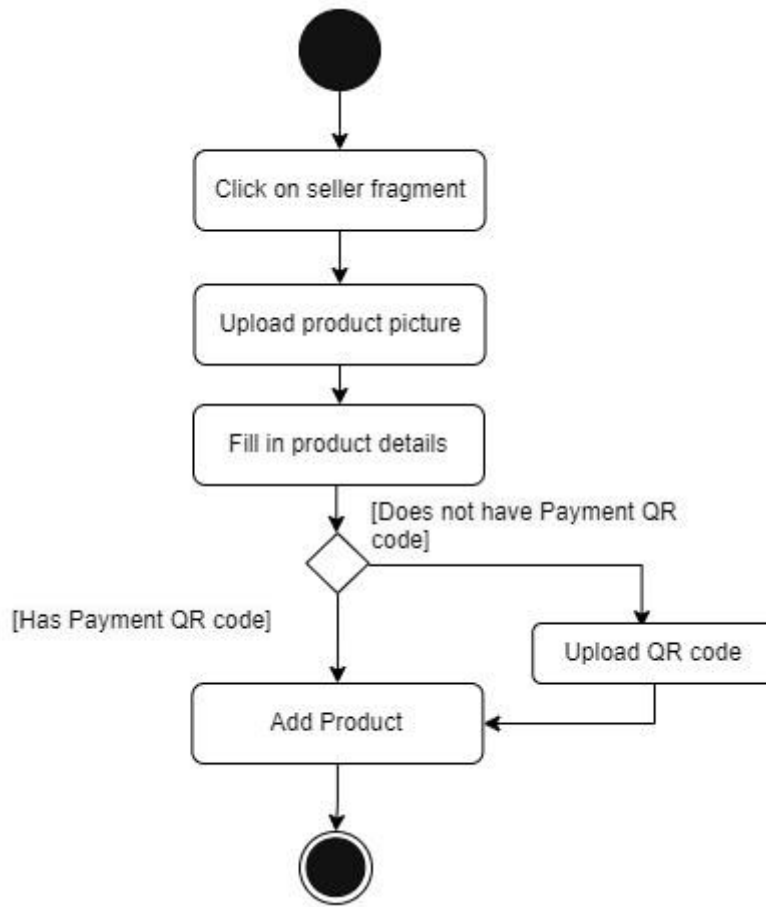


Figure 3.5.2.1.1 Activity Diagram of seller add item

When user press on the seller fragment, user is able to upload the picture of the product and fill in the product details. Once they pressed the ‘Add Product’ button, the system will check whether they had uploaded payment Qr code or not. If the user hasn’t upload, the system will intent the user to upload the payment Qr code. After the user uploaded the Qr code , it will transfer user back to add product.

### 3.5.2.2 Activity Diagram of seller managing item

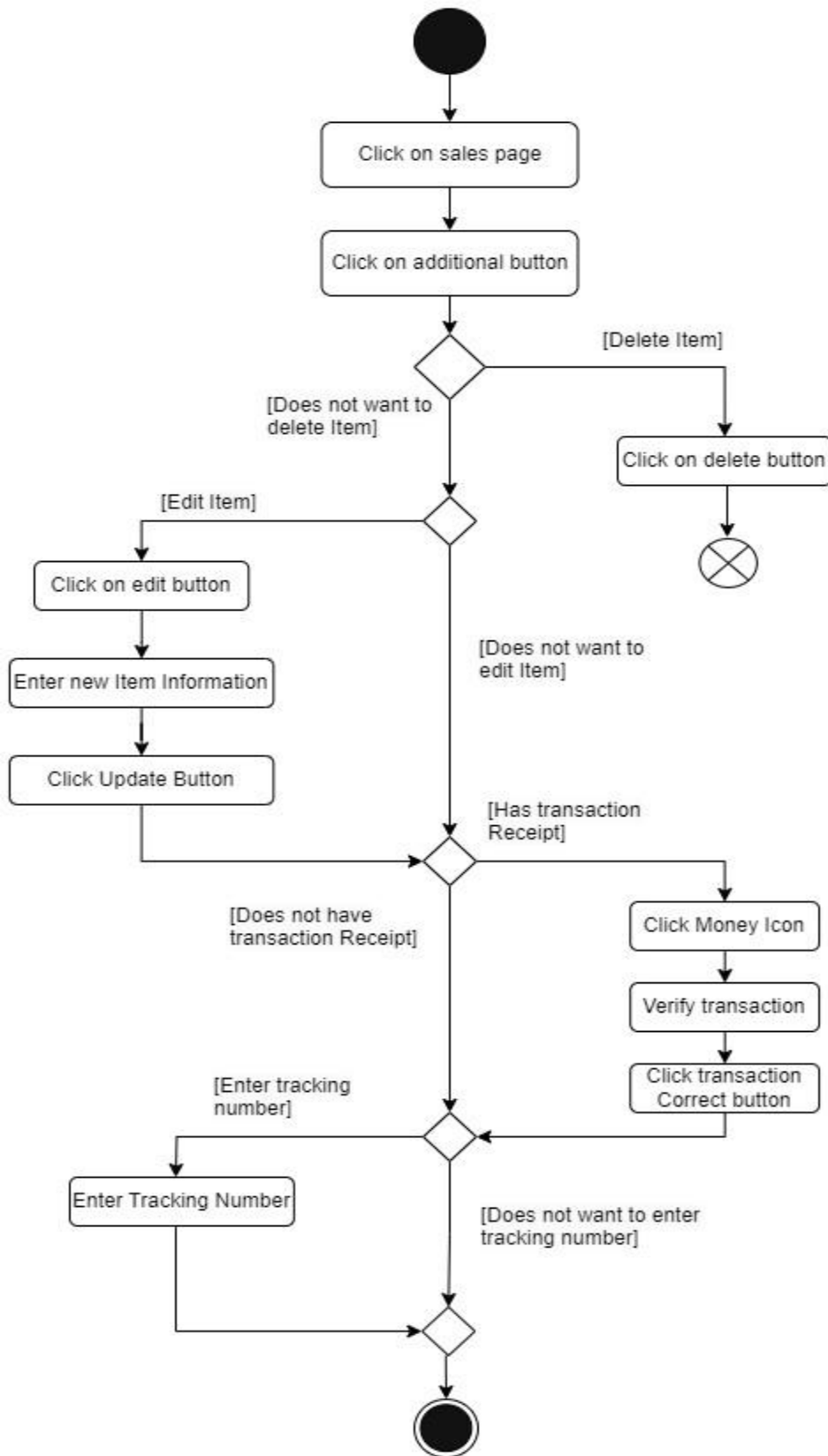
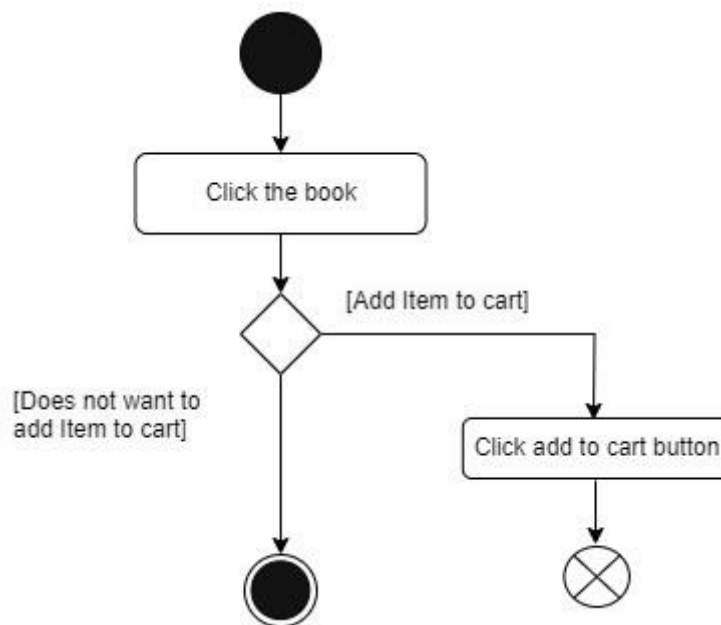


Figure 3.5.2.2.1 Activity Diagram of seller managing item

When the user as seller click on the item on sale page, user can click on additional features button. Once they pressed it, they can delete and edit the button. Besides, the user can press the delete button to delete the item. Moreover, the user is able to edit the product information by the edit features. If there's buyer paid the item, seller can check on the transaction receipt to verify the transaction which to make sure the transaction is correct. Once the transaction is correct, the seller can press on the transaction correct to verify it. Besides, user is able to enter the tracking number for buyer to check on the delivery status.

### 3.5.3 Activity Diagram of Buyer Module

#### 3.5.3.1 Activity Diagram of buyer add item to cart



*Figure 3.5.3.1.1 Activity Diagram of buyer add item to cart*

When the user clicks on the book that they are interested, the user can add the book to the shopping cart.

### 3.5.3.2 Activity Diagram of buyer check out item from cart

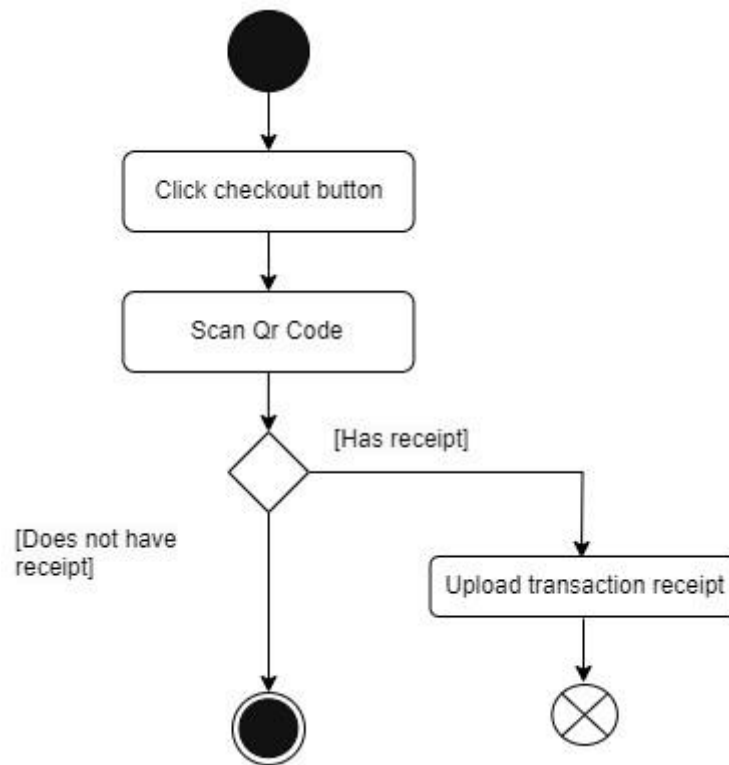


Figure 3.5.3.2.1 Activity Diagram of buyer check out item from cart

After user had added the book to the shopping cart, the user is able to check out the item or remove the item from shopping cart. Once the user clicked checkout button, the user is able to scan Qr code to do transaction. After the user has paid the item, the user needs to screenshot the receipt and upload it.

### 3.5.3.3 Activity Diagram of buyer add item to Wishlist

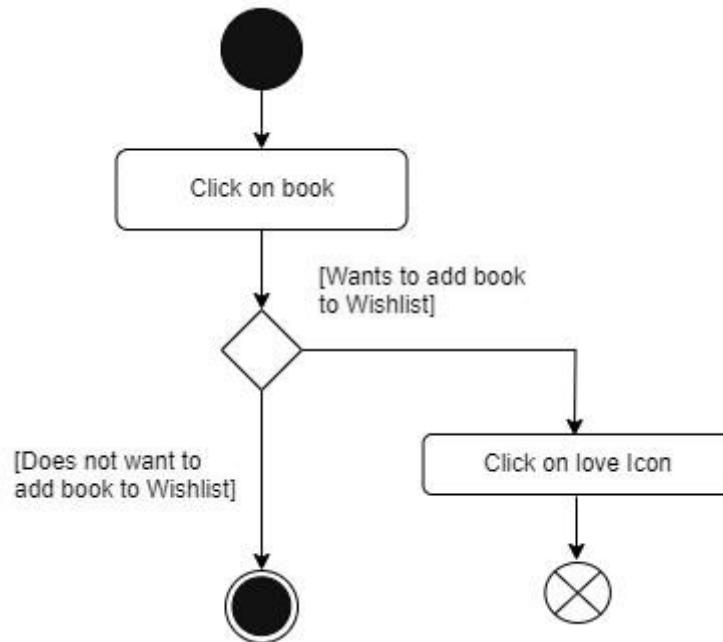


Figure 3.5.3.3.1 Activity Diagram of buyer add item to Wishlist

The user is able to add the book to wishlist if they are interested on the book but without budget so the user can press on the love icon of the book.

### 3.5.3.4 Activity Diagram of buyer create wish of the books they interested in

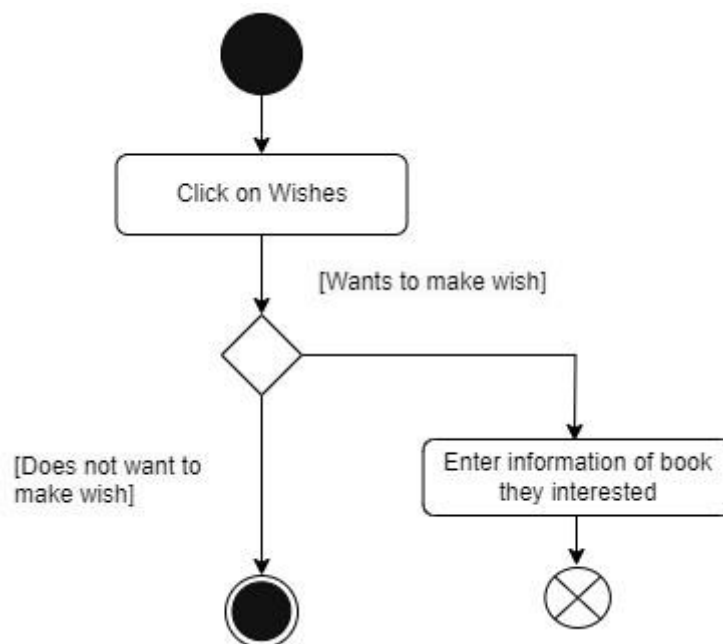


Figure 3.5.3.4.1 Activity Diagram of buyer create wish of the books they interested in

User is able to make wishes by pressing on the wishes icon. User is able to enter the information of the book they are interested but did not sell by anyone.

### 3.5.3.5 Activity Diagram of buyer click on seller profile

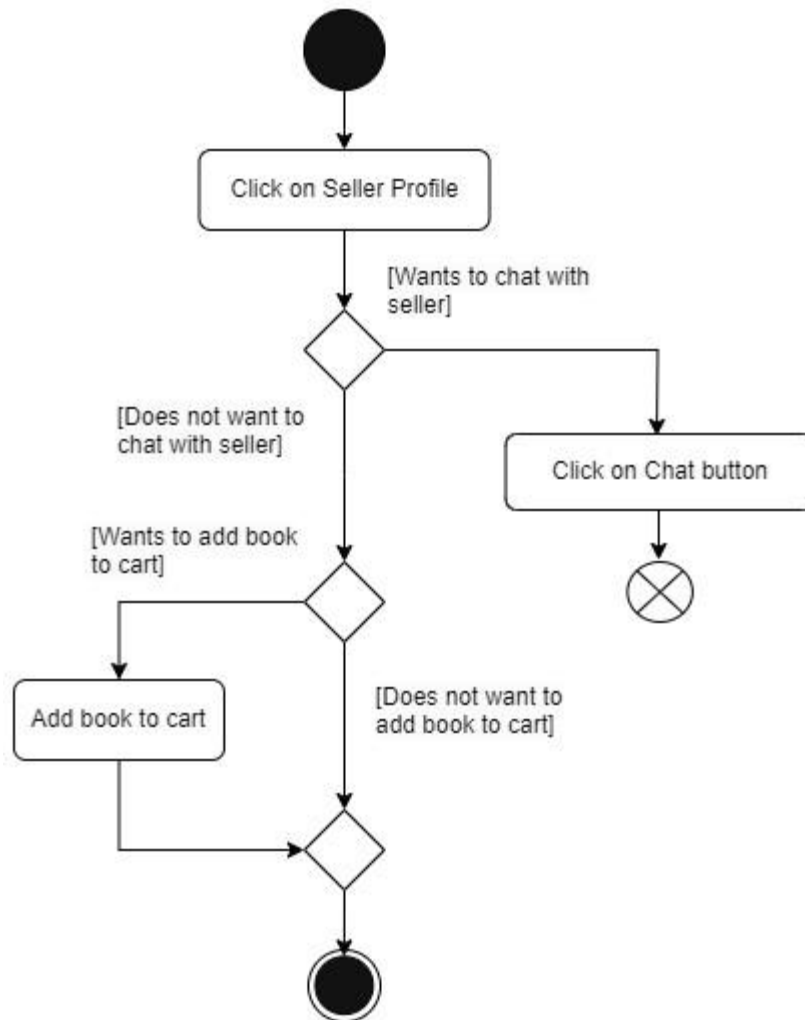
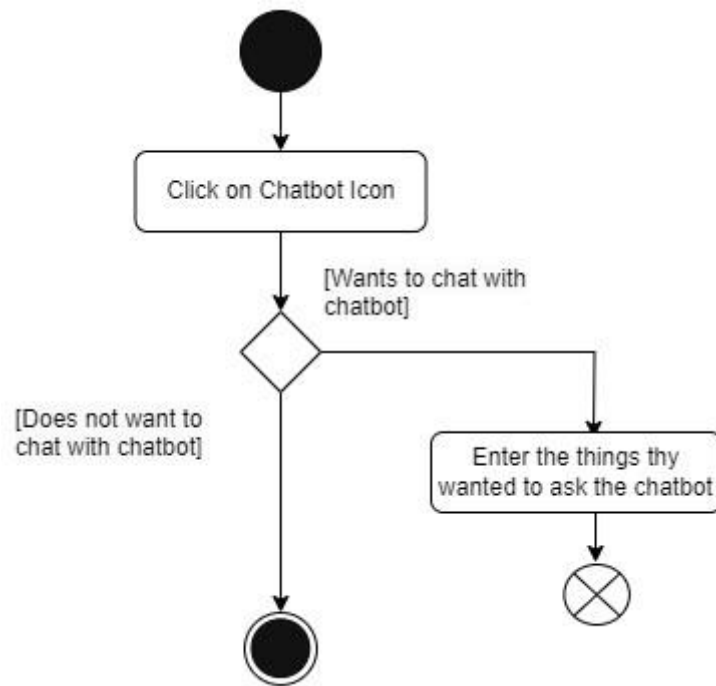


Figure 3.5.3.5.1 Activity Diagram of buyer click on seller profile

When user press on seller profile picture, user is able to chat with seller by clicking the chat button. Besides, user is able to see the preloved book list that sold by the seller. If the user is interested on the preloved book, user is able to add the preloved book into shopping cart.



### 3.5.3.6 Activity Diagram of user chat with chatbot



*Figure 3.5.3.6.1 Activity Diagram of user chat with chatbot*

Once the user press the chatbot icon, the user is able to chat with the chatbot. The chatbot is online book recommender. Therefore, user can ask the chatbot to suggest the book of the category that they are interested.

### 3.6 Sequence Diagram of Online Preloved Book system

#### 3.6.1 Sequence Diagram of Register system

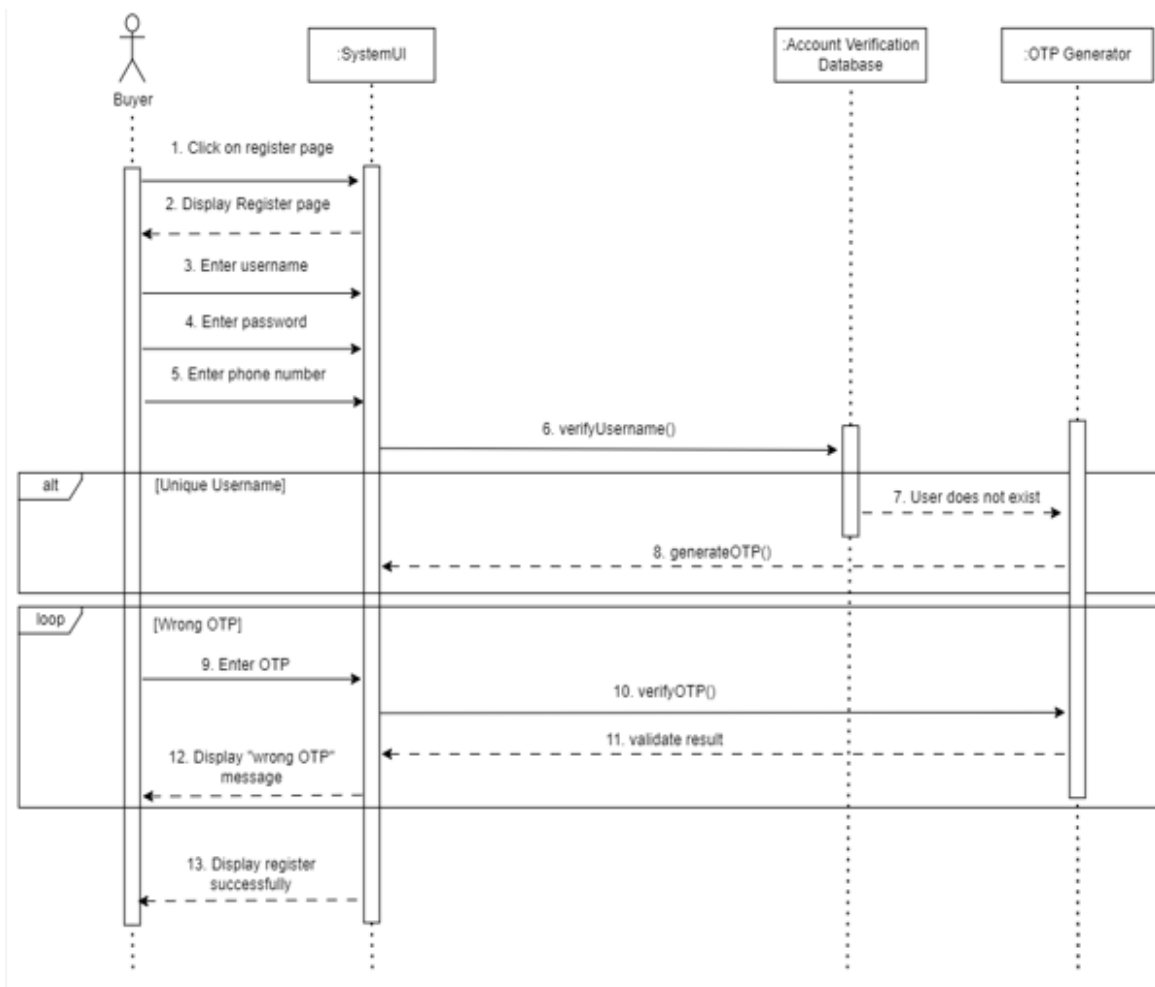


Figure 3.6.1.1 Sequence Diagram of Register System

Based on the *Figure 3.6.1.1*, user can click on the register page. The system interface will be displayed the register page. User is required to enter their information like username, password and phone number. When the user clicks the register button, the Account Verification database will be verify the username whether it is unique if the username is unique then the OTP generator from Firebase will be generating OTP to user by sending the OTP number through messages of phone number given. Users need to enter the OTP number and the system will verify it. If the OTP is wrong then it will display wrong OTP message. If successful, the system will help the user to register.

### 3.6.2 Sequence Diagram of Login system

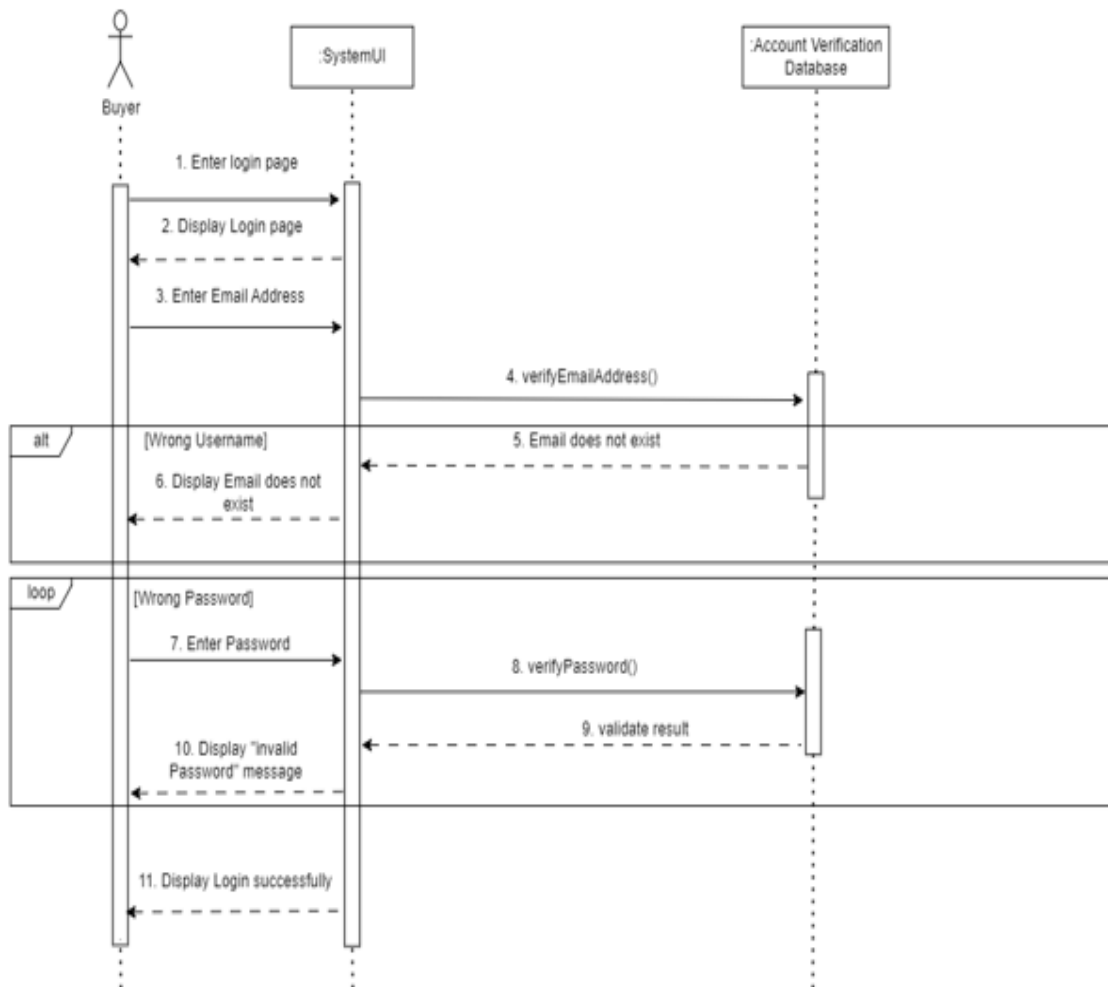


Figure 3.6.2.1 Sequence Diagram of Login System

Based on the *Figure 3.6.2.1*, user can click on the login page. The system interface will be displayed the login page. User is required to enter their email address and password. When the user clicks the login button, the Account Verification database will be verifying the email address whether it is existed if the email address is not exist then it will display email address does not exist. If the email address is existed, it will proceed to verify the password. If the password is invalid, it will be displaying invalid password message. If the password is valid then it will successfully login into the online preloved book system.

### 3.6.3 Sequence Diagram of View Cart

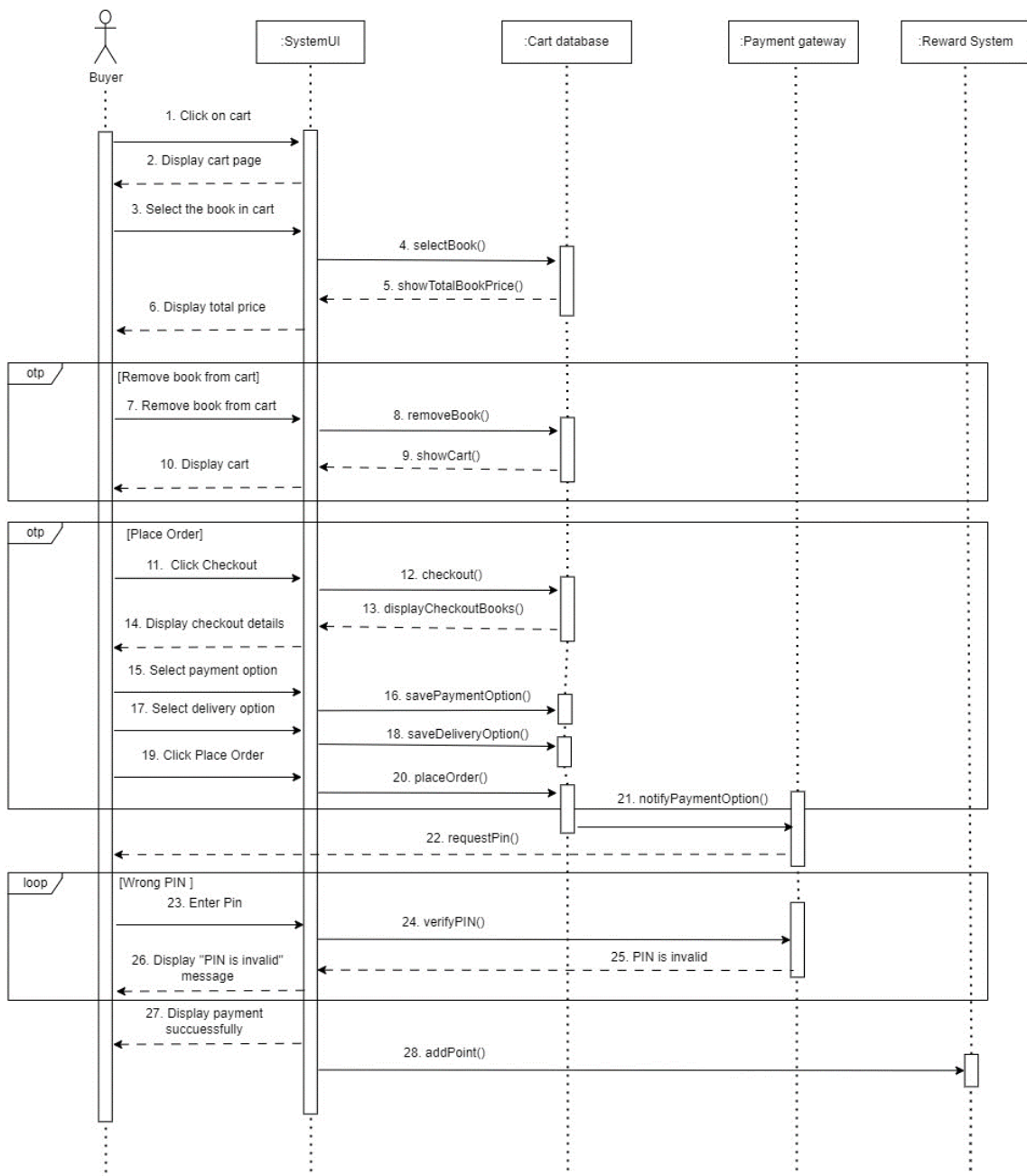


Figure 3.6.3.1 Sequence Diagram of View Cart

Based on the *Figure 3.6.3.1*, user can click on the shopping cart. The system interface will be displayed the shopping cart page. The user has to select the preloved book in the shopping cart and the system will display the selected books with total price of the book. If user wanted to remove the book from cart, user can remove the preloved book in the cart and the shopping cart will be updated. If user wanted to place order, user can click checkout and the system will display checkout details then the user can select payment options and select the delivery option.

After selecting the options, the system will request payment PIN from user. User need to enter the payment PIN to verify the payment. If the PIN is invalid, the payment will be cancelled and display invalid PIN. If the PIN is valid, it will display payment successfully. The system will help the user to add point automatically.

### 3.6.4 Sequence Diagram of View Book details

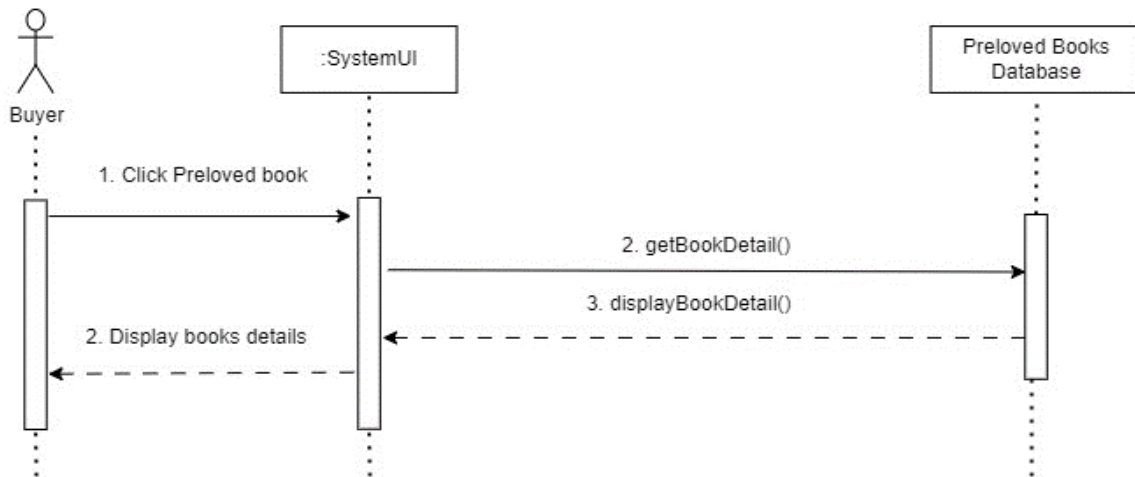


Figure 3.6.4.1 Sequence Diagram of View Book details

Based on the *Figure 3.6.4.1*, user can click the preloved book to check the details of the preloved book. The preloved book details will be displayed once the user done clicking.

### 3.6.5 Sequence Diagram of search book

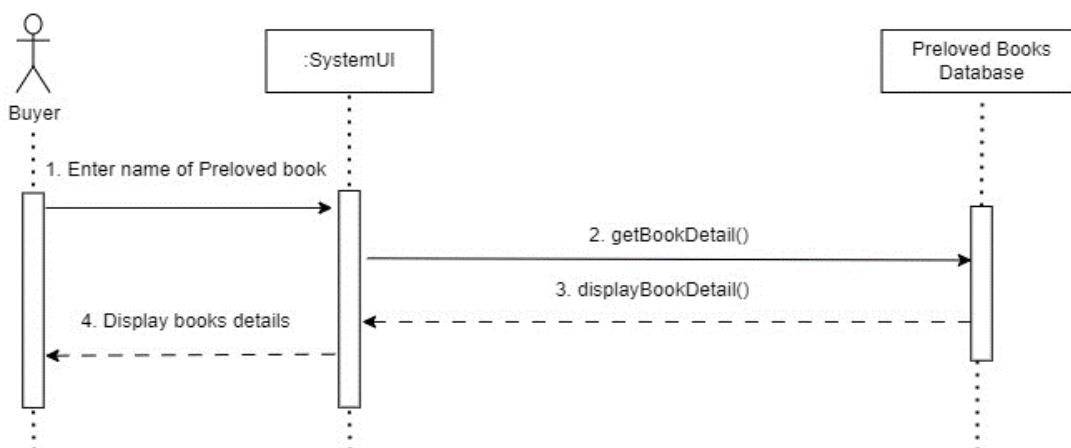
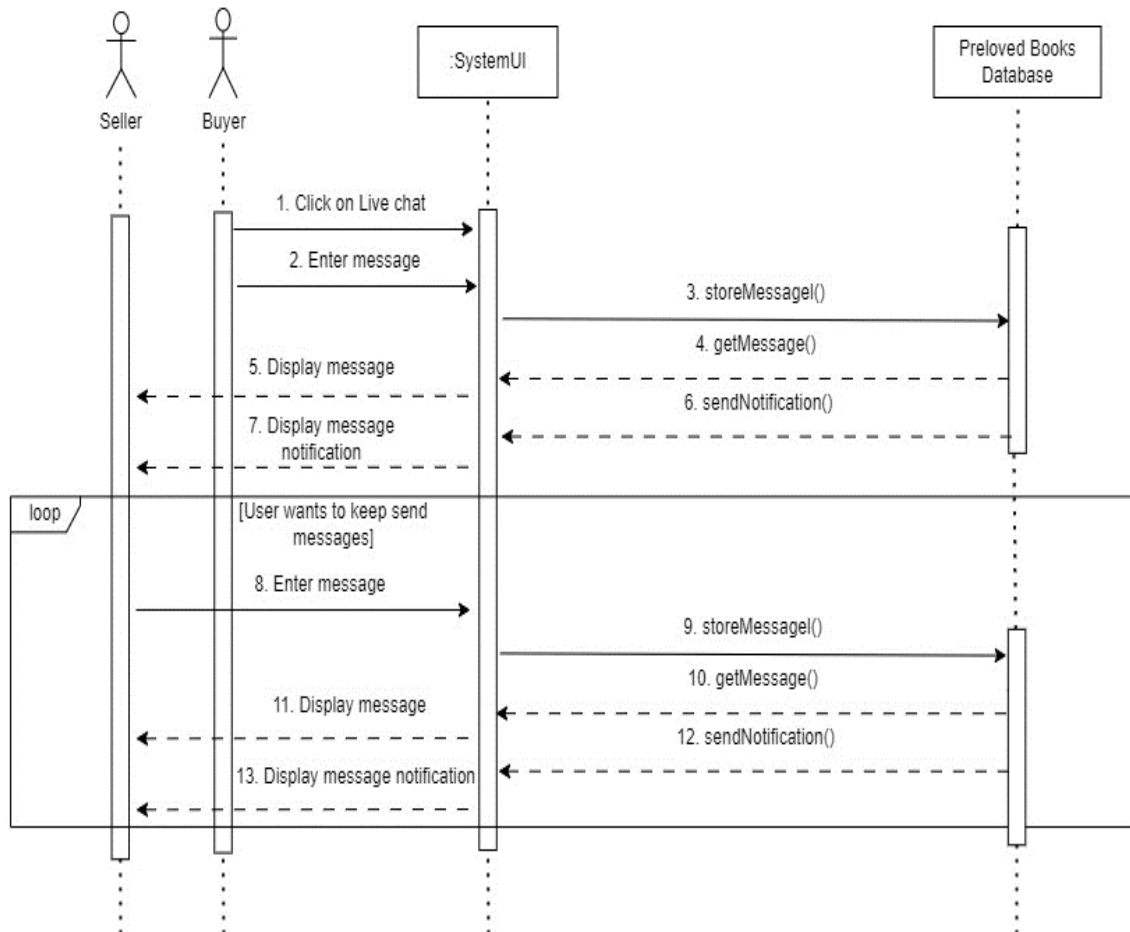


Figure 3.6.5.1 Sequence Diagram of search book

Based on the *Figure 3.6.5.1*, user can enter the name of the preloved book in the search place. The system will get the book details from the database. The system will display the book details for the user.

### 3.6.6 Sequence Diagram of live chat



*Figure 3.6.6.1 Sequence Diagram of live chat*

Based on the *Figure 3.6.6.1*, user can click on the live chat to chat with another user which is seller to ask some questions about the preloved book then the user can enter the message. The system will get and store the message and display the message to another user. Besides, the user can send message notification to the user. The user which is seller also can reply to the message by entering the message and the steps will be repeated like above.

### 3.6.7 Sequence Diagram of ordering tracking system

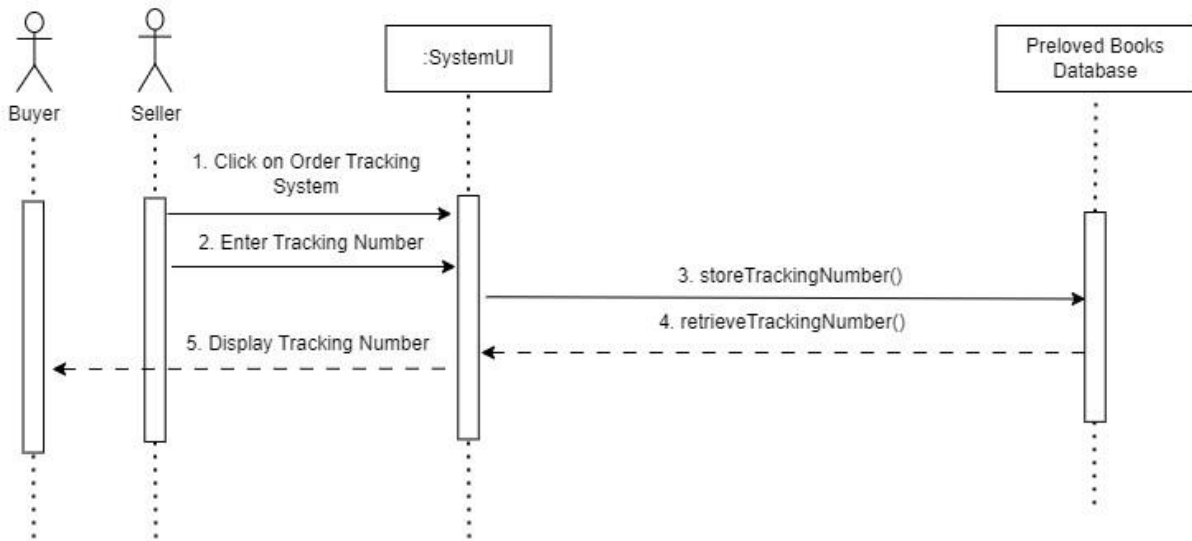


Figure 3.6.7.1 Sequence Diagram of order tracking system

Based on the *Figure 3.6.7.1*, user which wanted to be a seller can click on the order tracking system then click send the parcel. The system will store the delivery status and update the delivery status to the user which is buyer which allowed them to track their parcel. It will be displaying the delivery status to the user. In addition, the buyer needs to click parcel received when the parcel has been shipped to the user's house. The system will store the delivery status and update the delivery status to the seller. It will display in the seller's delivery status.

### 3.6.8 Sequence Diagram of add book

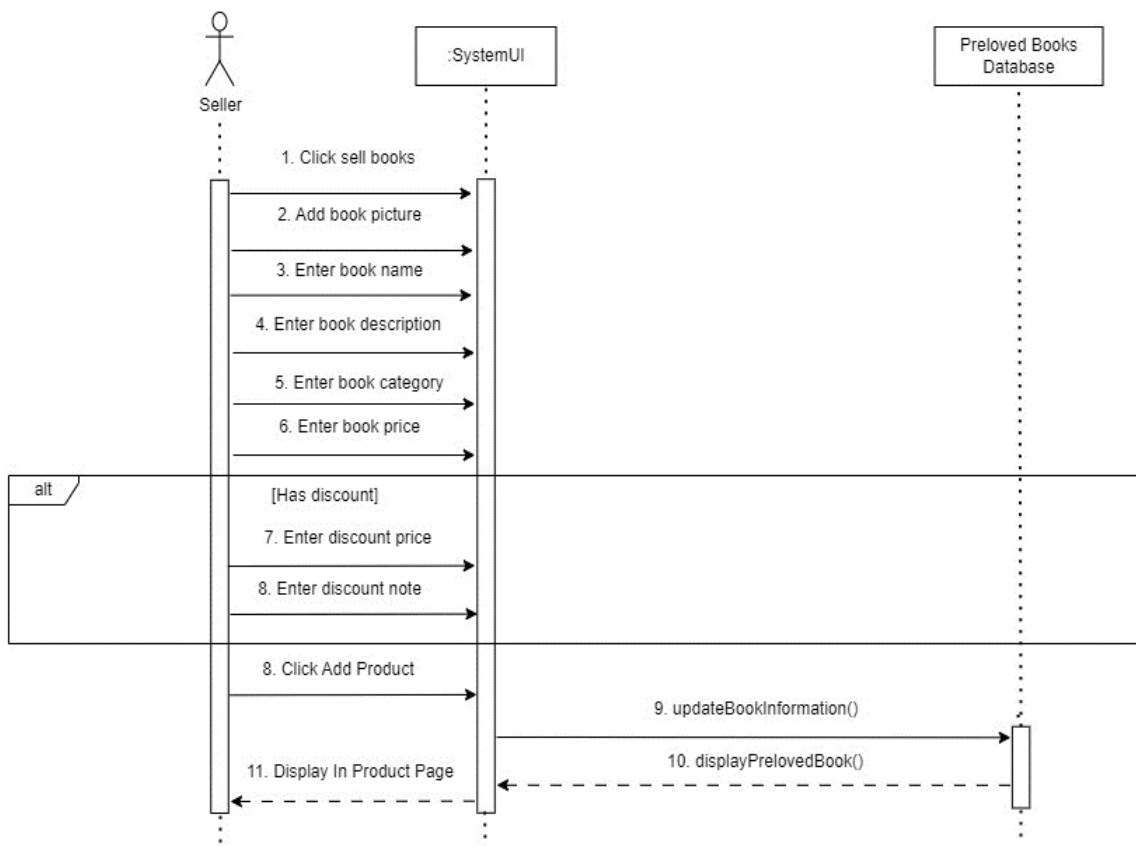


Figure 3.6.8.1 Sequence Diagram of add book

Based on the *Figure 3.6.8.1*, user can click sell book button to add preloved book that the user wanted to sell. Users require to insert image of the preloved book from gallery or camera. User need to enter the book name, book description, book category and book price. If the user wanted to give discount to the buyer, user can enter the discount price and discount note like 10% discount. After inserting the information of the preloved book, user need to click the add product. Therefore, the system will update to the database and display the preloved book on product page which is category page.



### 3.6.9 Sequence Diagram of remove book

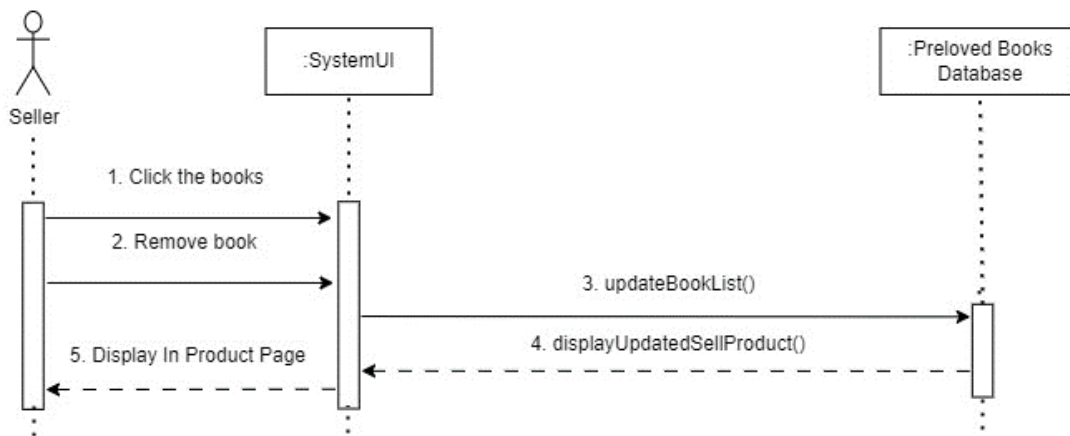


Figure 3.6.9.1 Sequence Diagram of remove book

Based on the *Figure 3.6.9.1*, user can click on the preloved book that wanted to sell and remove it. Then, the system will update it to the book list and display the updated product page to the user.

### 3.6.10 Sequence Diagram of view Wishlist

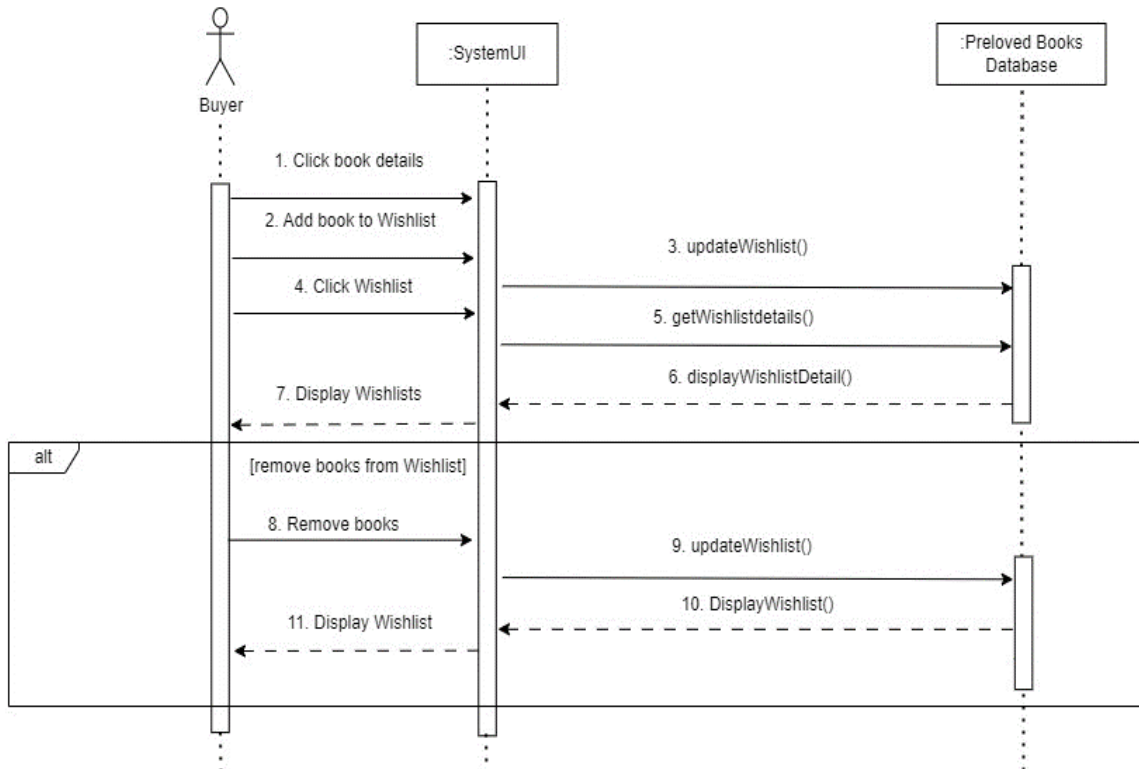
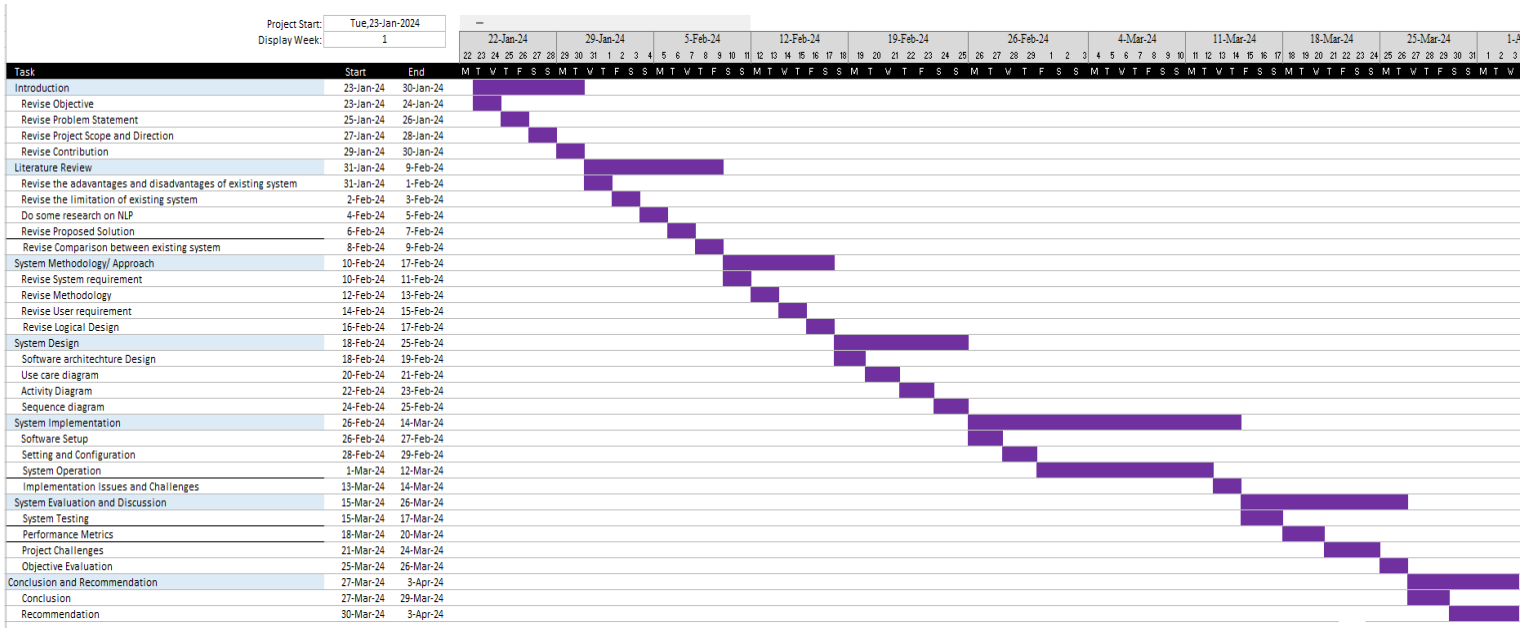


Figure 3.6.10.1 Sequence Diagram of view Wishlist

Based on the *Figure 3.6.10.1*, user can click on the preloved book details. If they are interested with the book but have no budget to buy, user can add the preloved book into the Wishlist. The system will update the Wishlist so that when the user click on the Wishlist the preloved book will be shown. The user can remove the preloved book from Wishlist if they are no longer interested with the preloved book. The system will display the updated Wishlist to the user.

### 3.7 Timeline



*Figure 3.7.1 Timeline of FYP2*

# Chapter 4 System Design

## 4.1 Wireframe Design

A wireframe is a skeletal visual representation of a digital interface, illustrating its structure and functionality without the inclusion of detailed design elements like colors or images.

### 4.1.1 User Authentication Page

#### 4.1.1.1 Register Page

←

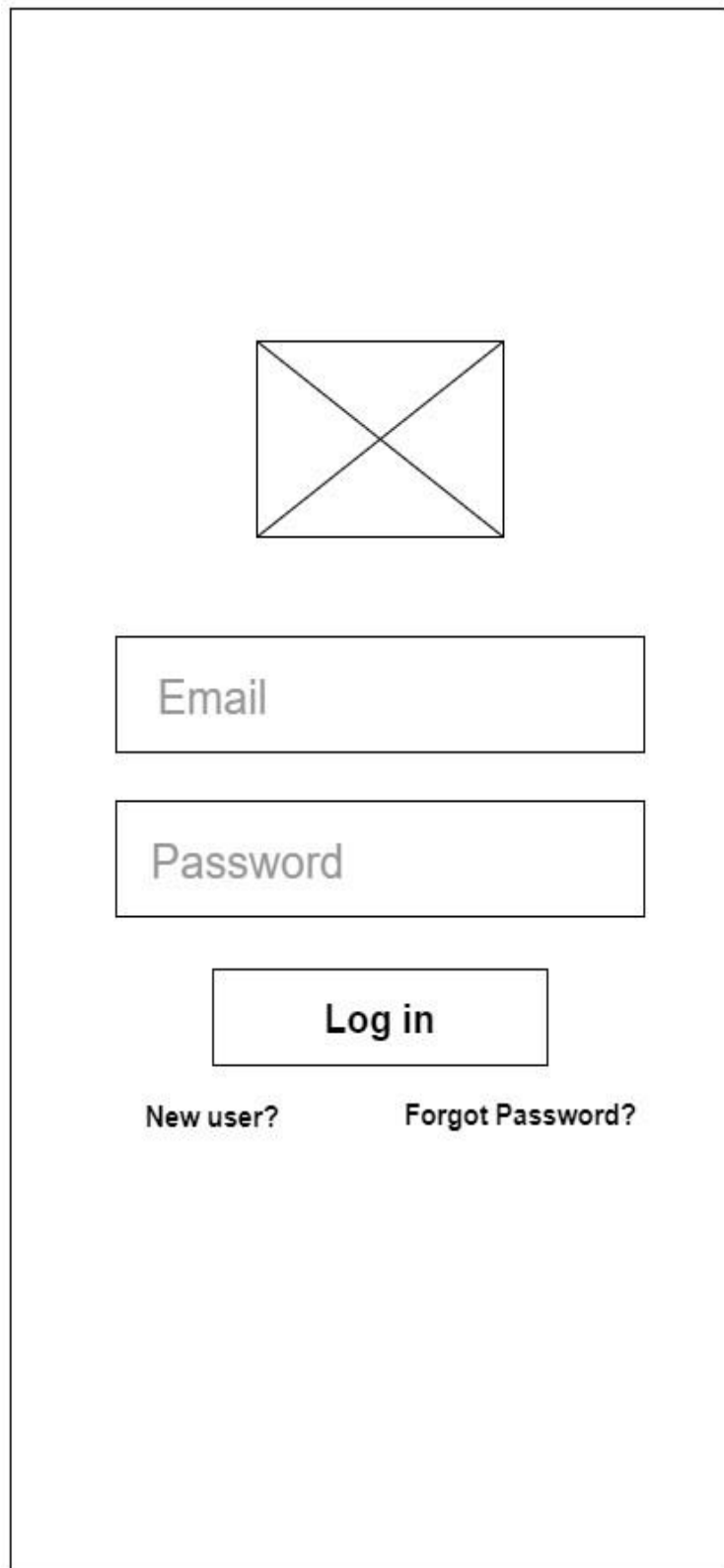
**Welcome New User**

OTP:

Already have an account? [Login](#)

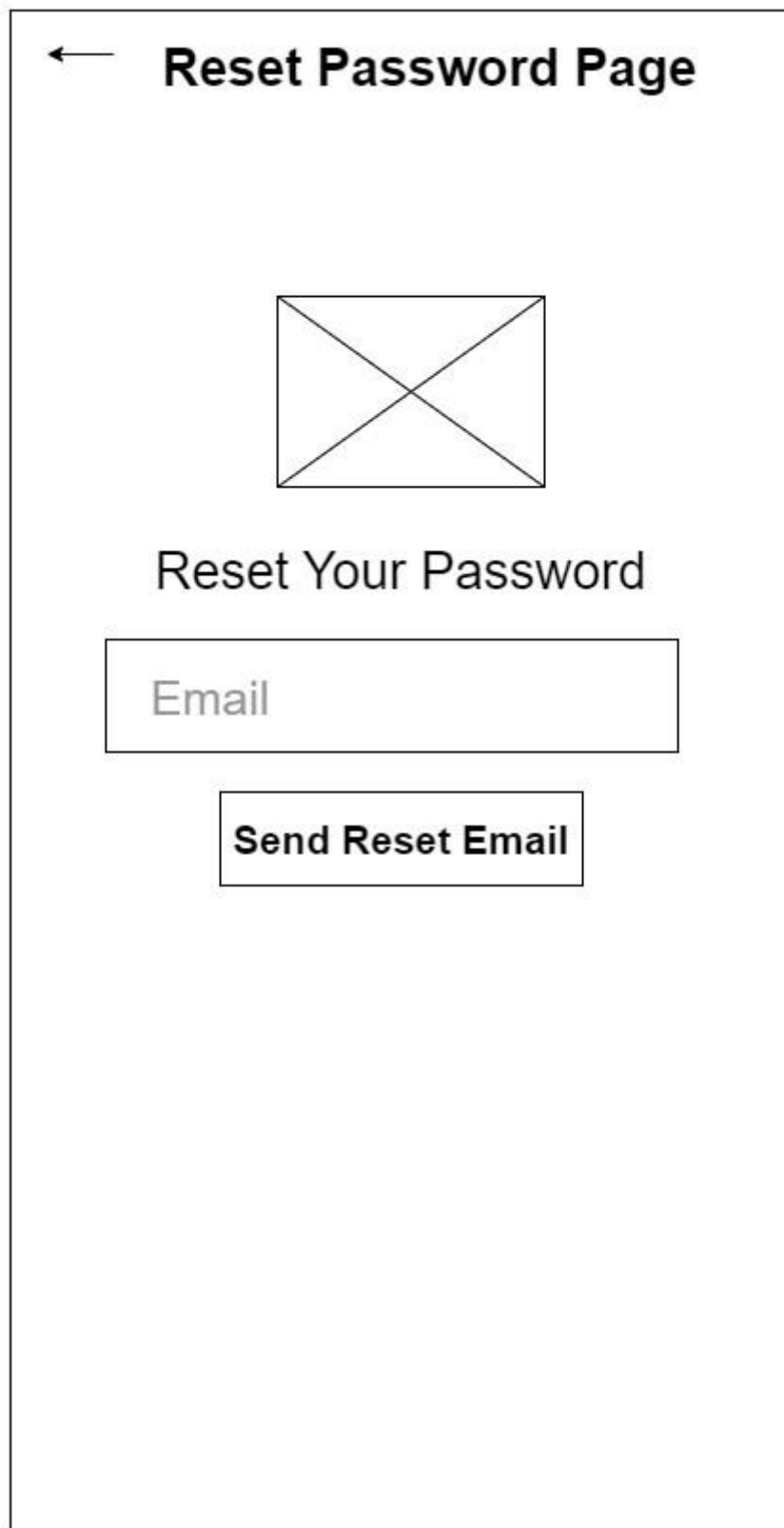
Figure 4.1.1.1 Wireframe sketch of register page

### 4.1.1.2 Login Page



*Figure 4.1.1.2 Wireframe sketch of login page*

### 4.1.1.3 Reset Password Page



*Figure 4.1.1.3 Wireframe sketch of reset password page*

## 4.1.2 Home Page

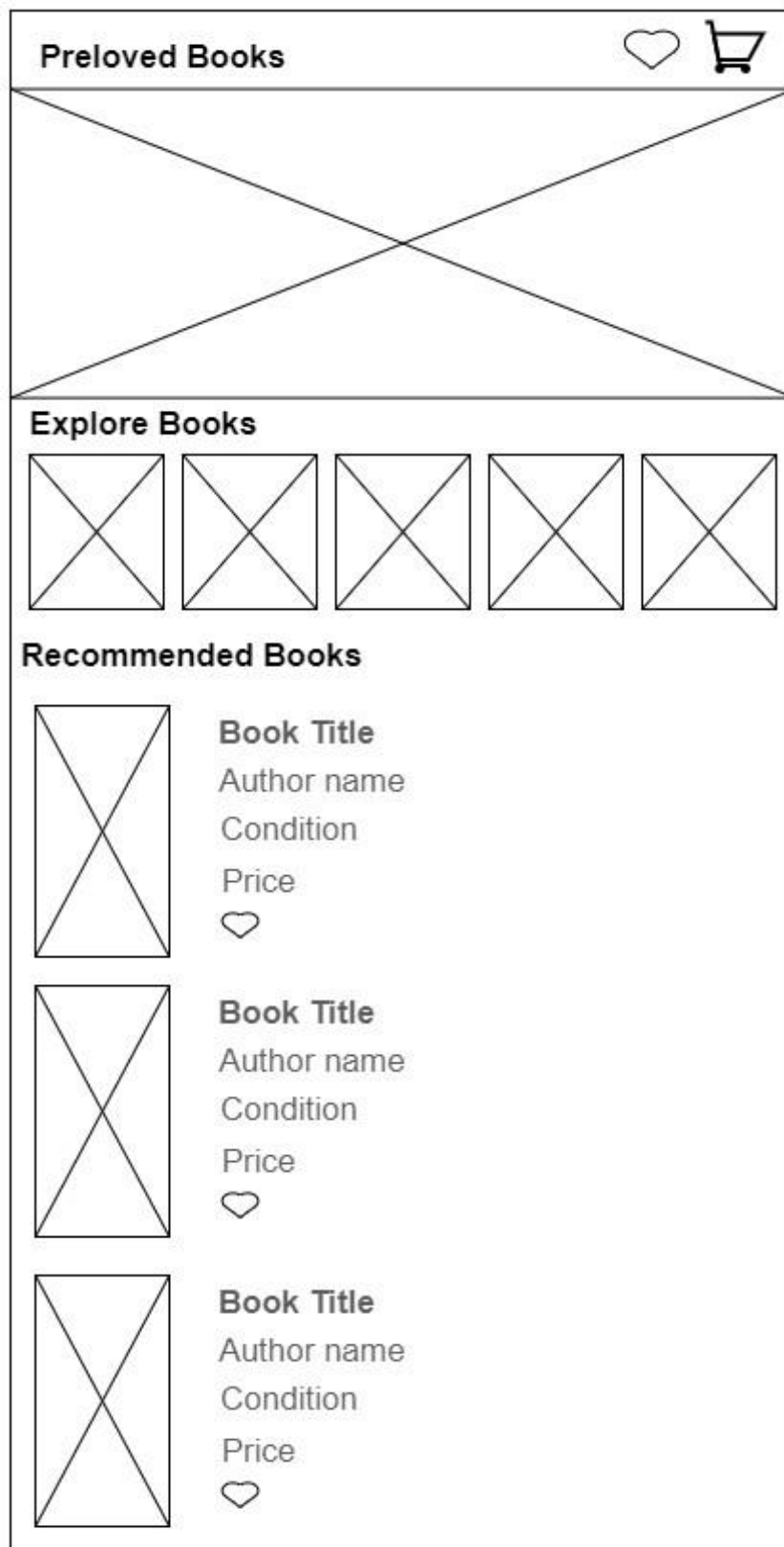
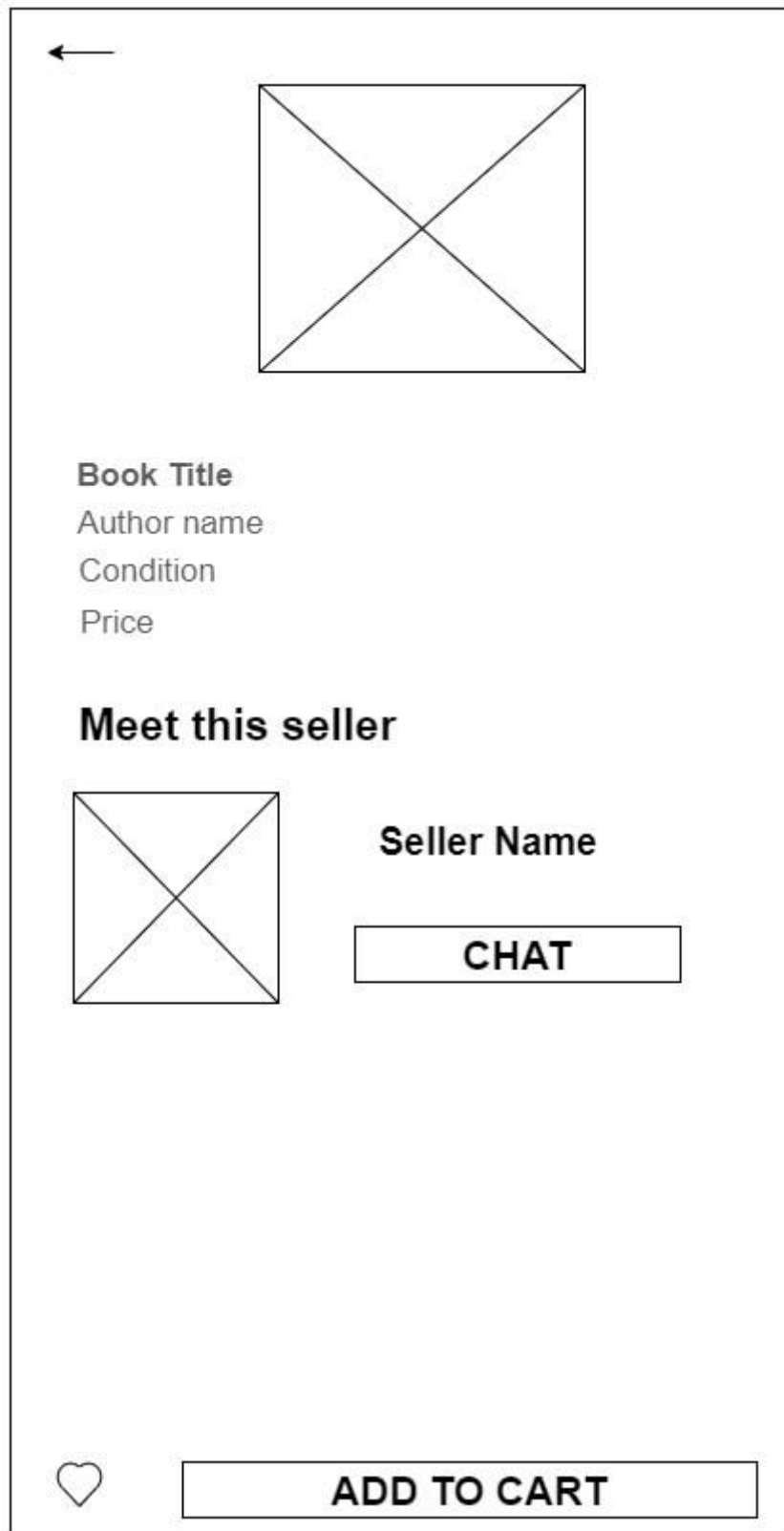


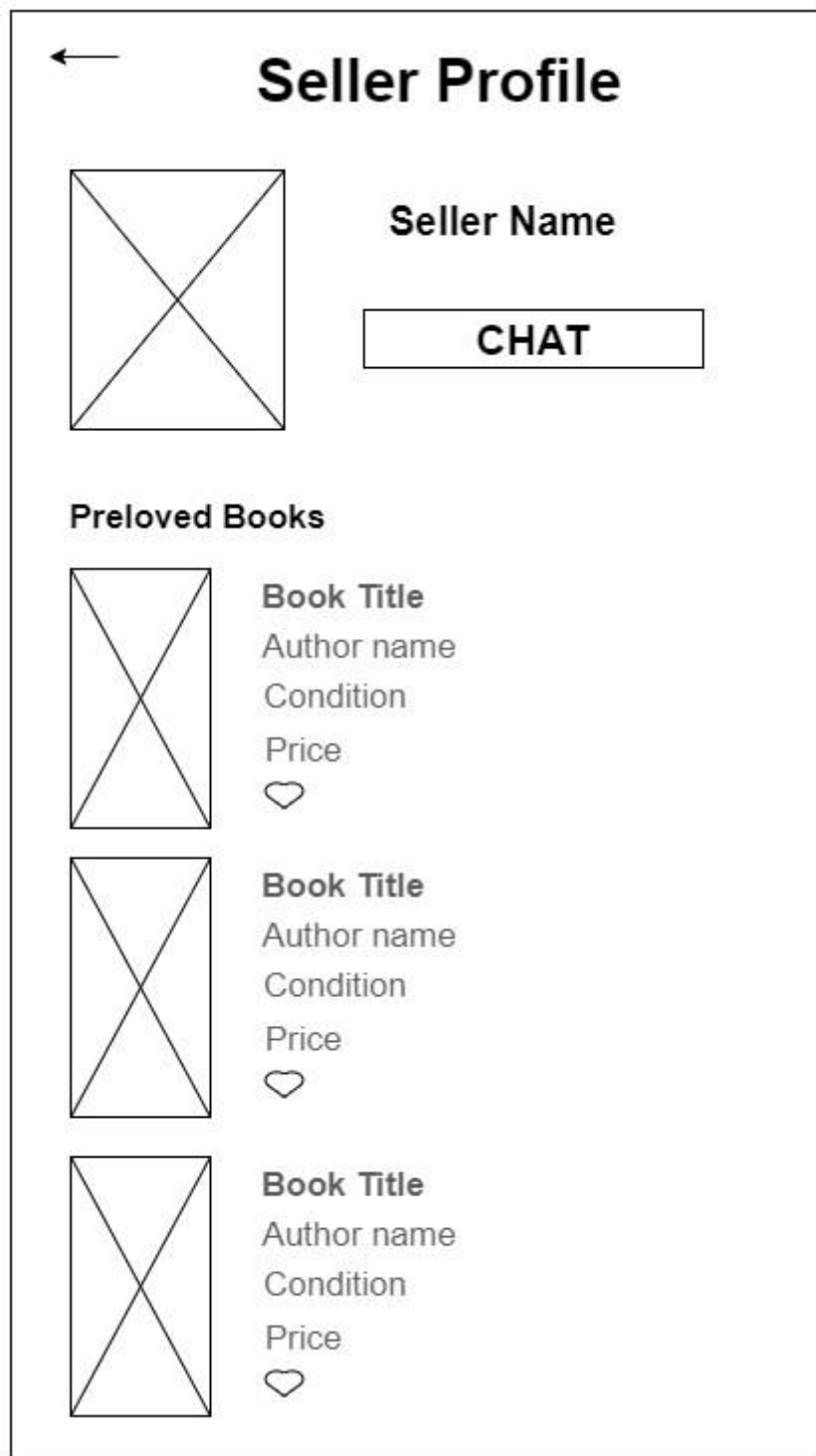
Figure 4.1.2 Wireframe sketch of Home page

### 4.1.3 Product detail Page



*Figure 4.1.3 Wireframe sketch of Product detail Page*

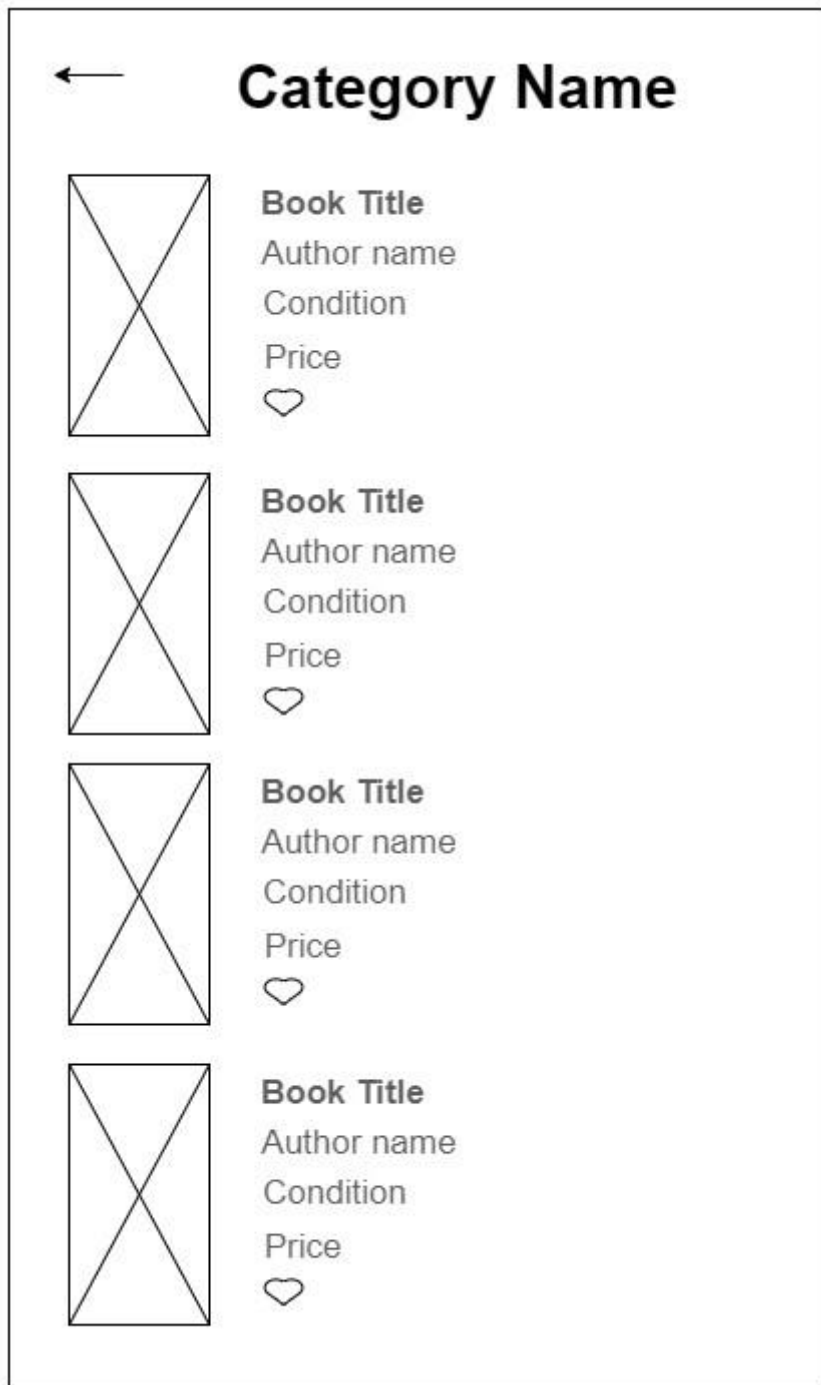
#### 4.1.4 Seller Profile Page



*Figure 4.1.4 Wireframe sketch of Seller Profile page*

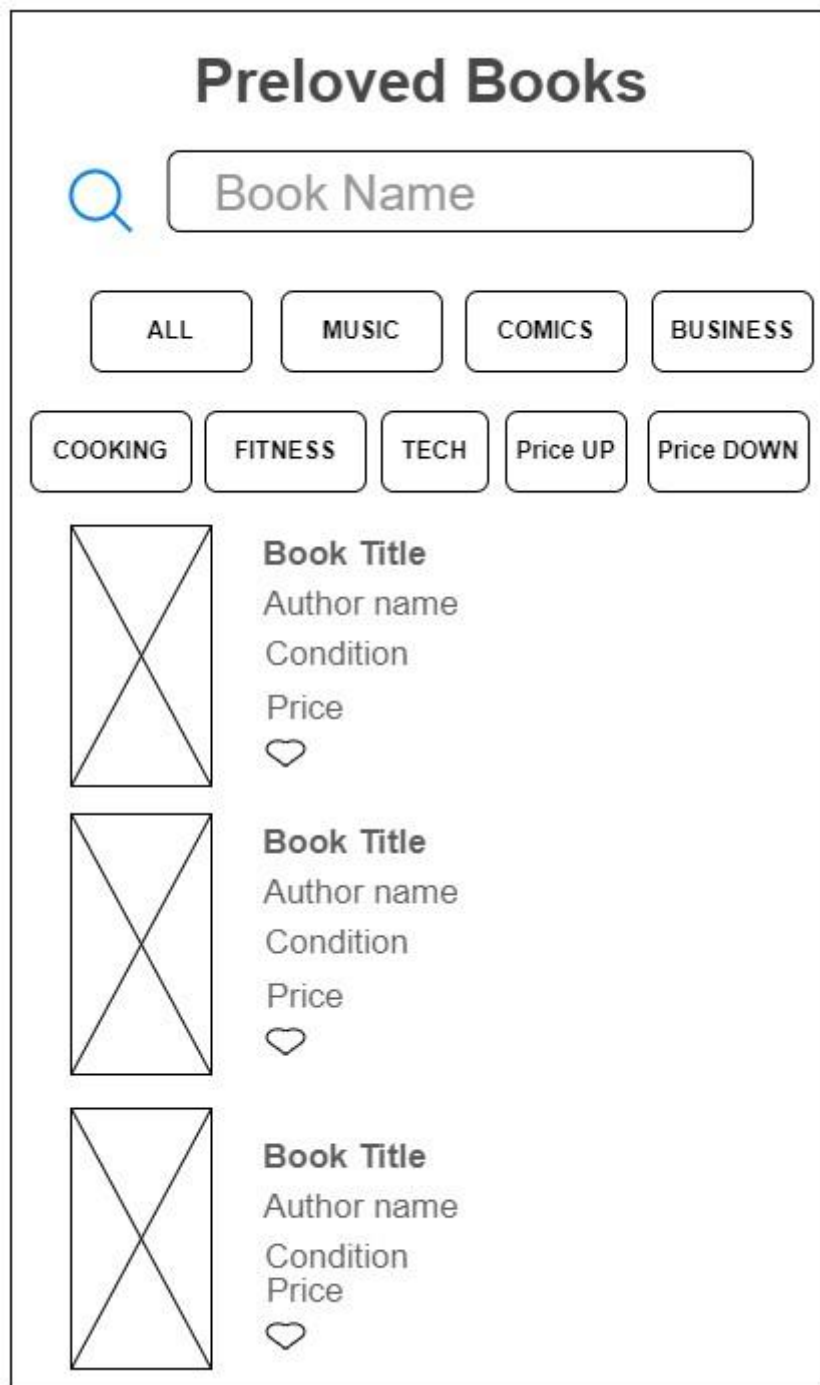


### 4.1.5 Category Page



*Figure 4.1.5 Wireframe sketch of Category page*

#### 4.1.6 Search and Filter Page



*Figure 4.1.6 Wireframe sketch of Search and Filter Page*

### 4.1.7 Add Product Page

**Add Product**

Product Name

Product Description

Category

Product Author

Product Condition

Price

Discount

**Add Product**

*Figure 4.1.7 Wireframe sketch of Add Product Page*

## 4.1.8 Live Chat Page

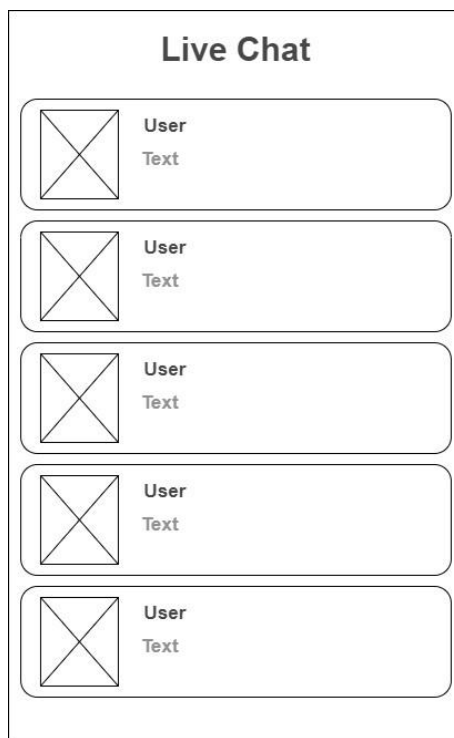


Figure 4.1.8.1 Wireframe sketch of Live Chat Home Page

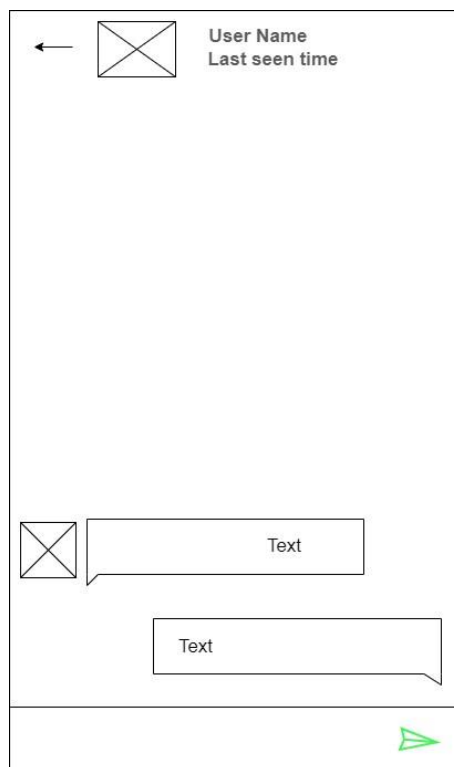


Figure 4.1.8.2 Wireframe sketch of Live Chat Page

### 4.1.9 Wishlist Page

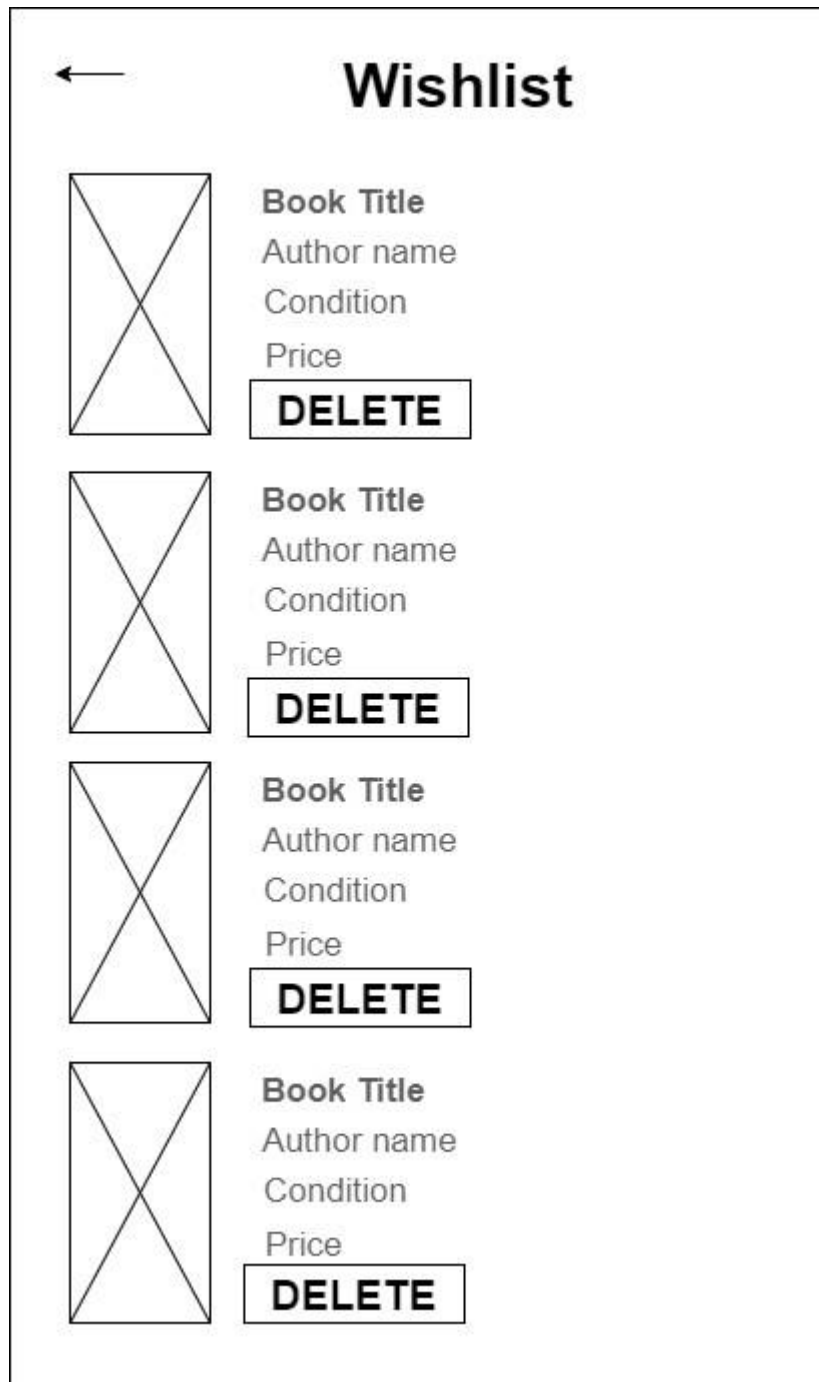


Figure 4.1.9 Wireframe sketch of Wishlist Page

#### 4.1.10 Shopping Cart Page

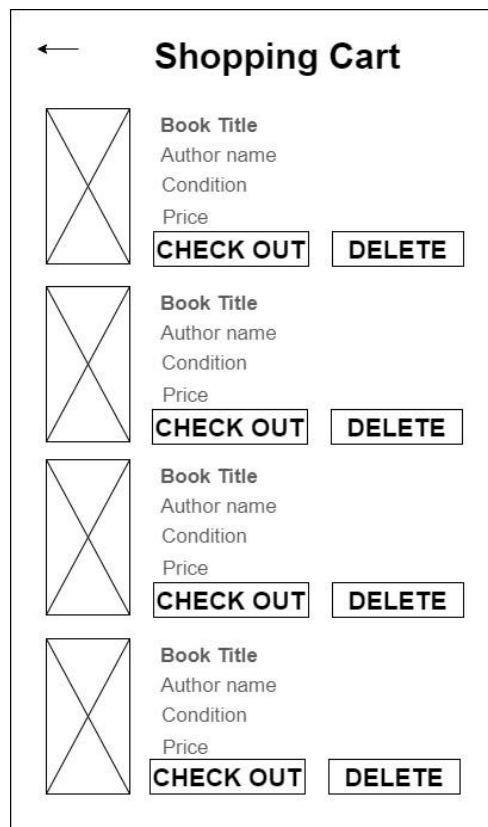


Figure 4.1.10.1 Wireframe sketch of Shopping Cart Page

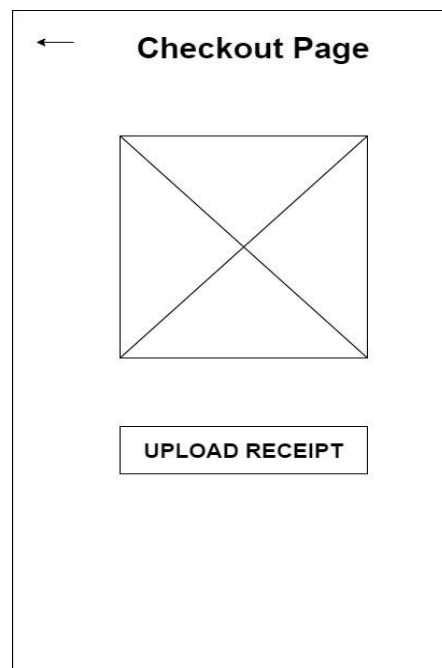


Figure 4.1.10.2 Wireframe sketch of Shopping Cart Checkout Page

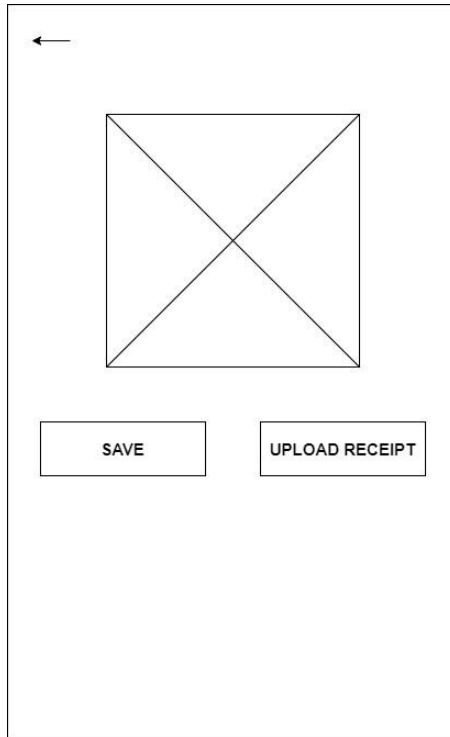


Figure 4.1.10.3 Wireframe sketch of Upload Receipt Page

#### 4.1.11 User Profile Page

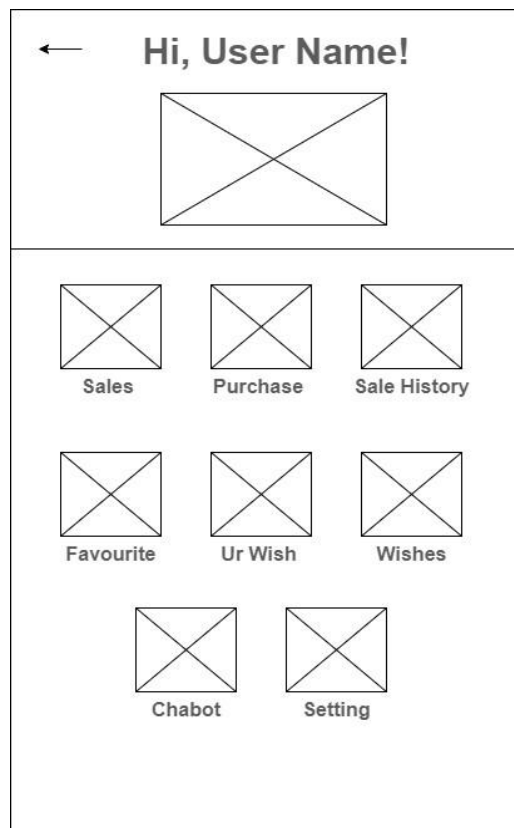


Figure 4.1.11 Wireframe sketch of User Profile Page

#### 4.1.12 Item On Sale Page

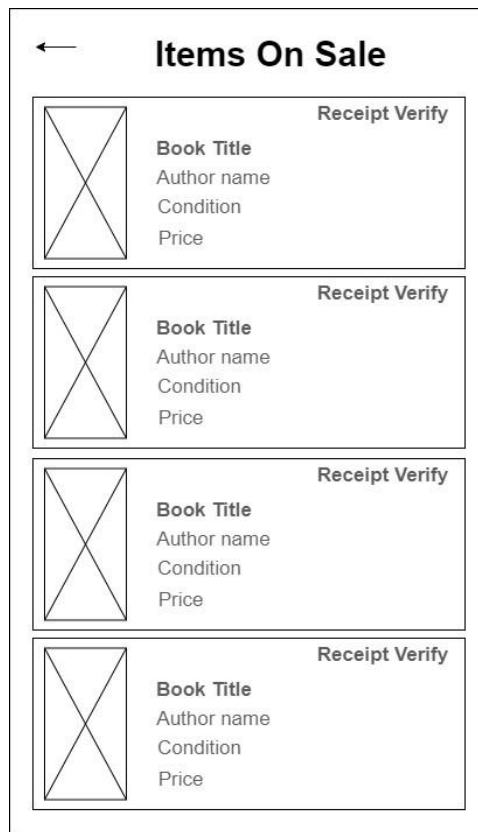


Figure 4.1.12.1 Wireframe sketch of Item On Sale Page

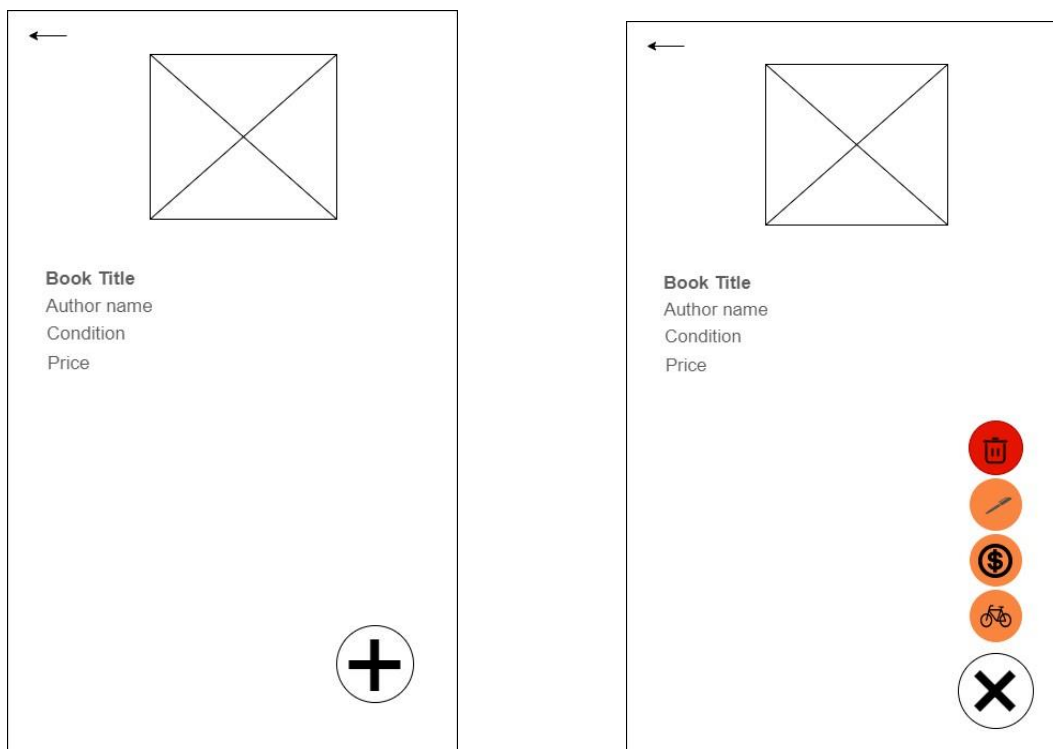


Figure 4.1.12.2 Wireframe sketch of Item On Sale Product Feature Page



← **Update Product**

Product Name

Product Description

Category

Product Author

Product Condition

Price

Discount

**Update Product**

*Figure 4.1.12.3 Wireframe sketch of Item On Sale Product Edit Page*

← **Transaction Verify**

Price

**TRANSACTION CORRECT**

*Figure 4.1.12.4 Wireframe sketch of Item On Sale Transaction Verify Page*

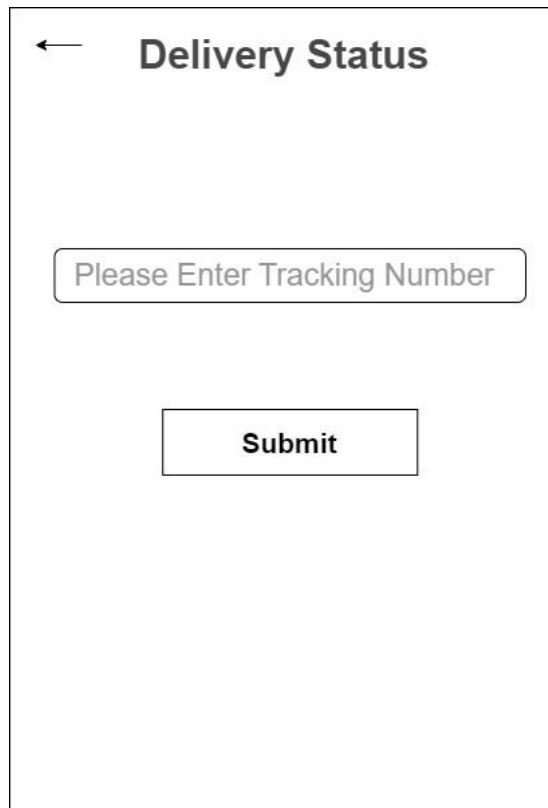


Figure 4.1.12.5 Wireframe sketch of Item On Sale Delivery Status Page

#### 4.1.13 My Orders Page

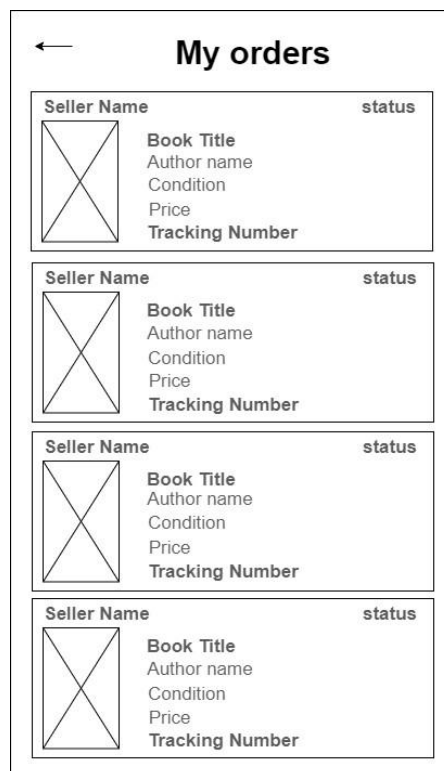


Figure 4.1.13 Wireframe sketch of My Orders Page

#### 4.1.14 Edit Profile Page

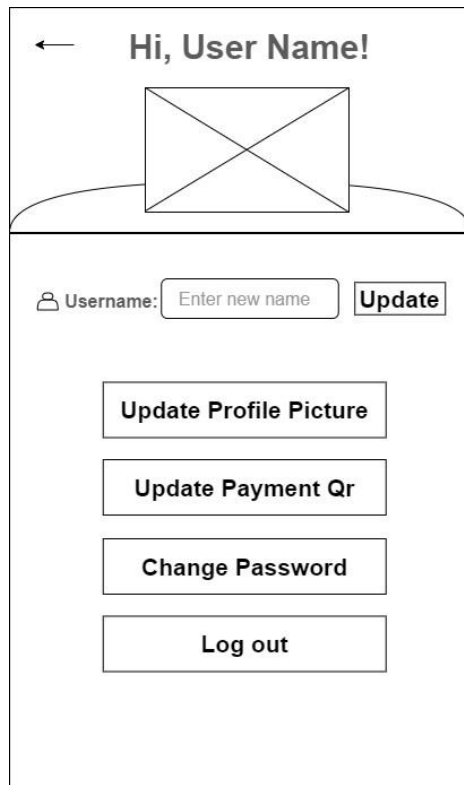


Figure 4.1.14.1 Wireframe sketch of Edit Profile Page

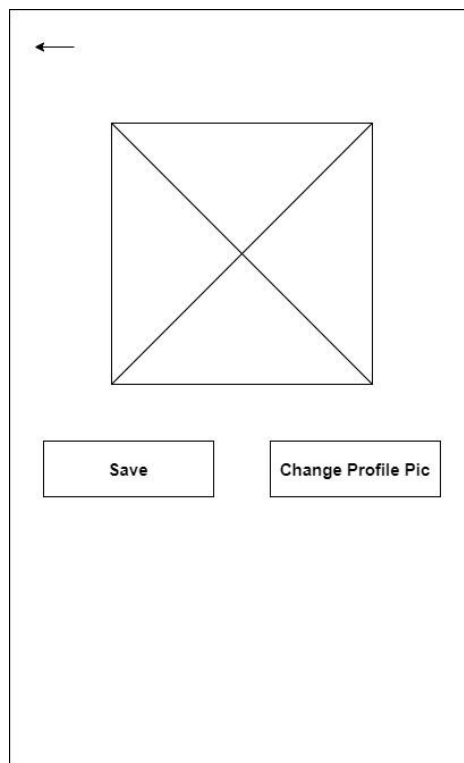
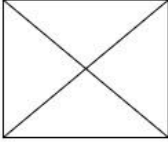


Figure 4.1.14.2 Wireframe sketch of Update Profile Picture Page

#### 4.1.15 Select Favourite Category Page

←



Which category of book do you like?

- Music
- Cooking
- Comics
- Fitness
- Technology
- Business

Figure 4.1.15 Wireframe sketch of Select Favourite Category Page

#### 4.1.16 Make Wishes Page

← **Make a wish**

Figure 4.1.16 Wireframe sketch of Make Wishes Page

#### 4.1.17 View Wishes Page

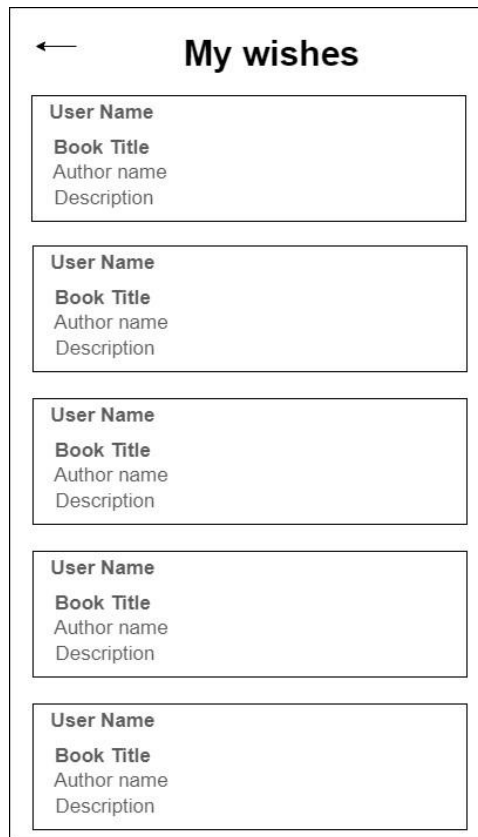


Figure 4.1.17 Wireframe sketch of View Wishes Page

#### 4.1.18 Chatbot Page

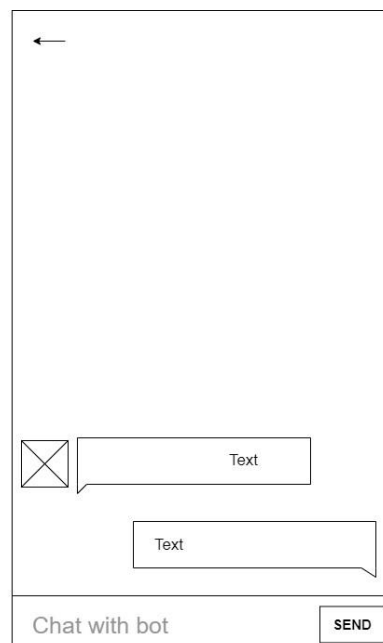


Figure 4.1.18 Wireframe sketch of Chatbot Page

#### 4.1.19 Sales History Page

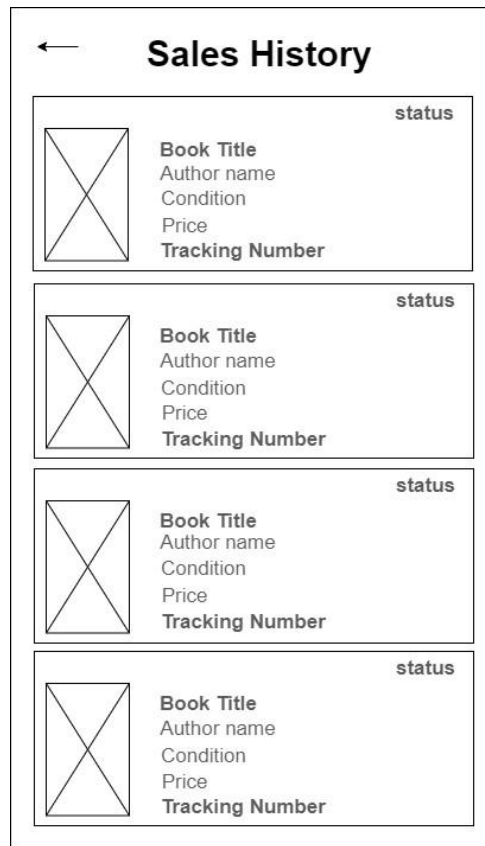


Figure 4.1.19.1 Wireframe sketch of Sales History Page

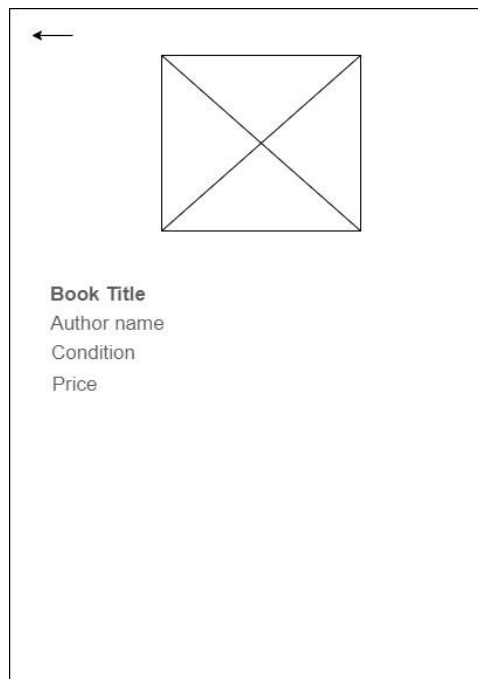


Figure 4.1.19.2 Wireframe sketch of Sales History Product Detail Page

## 4.2 System Architecture Diagram

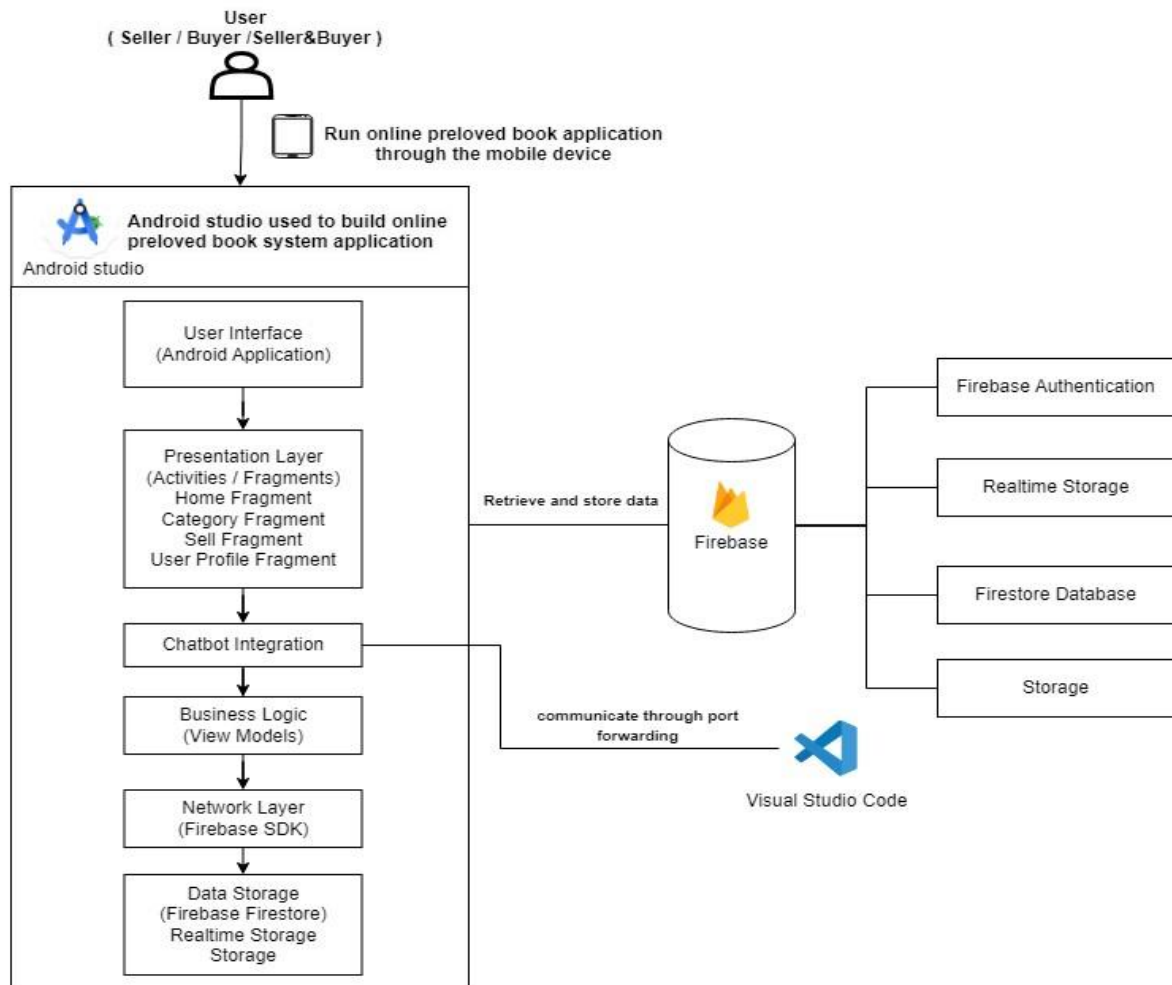
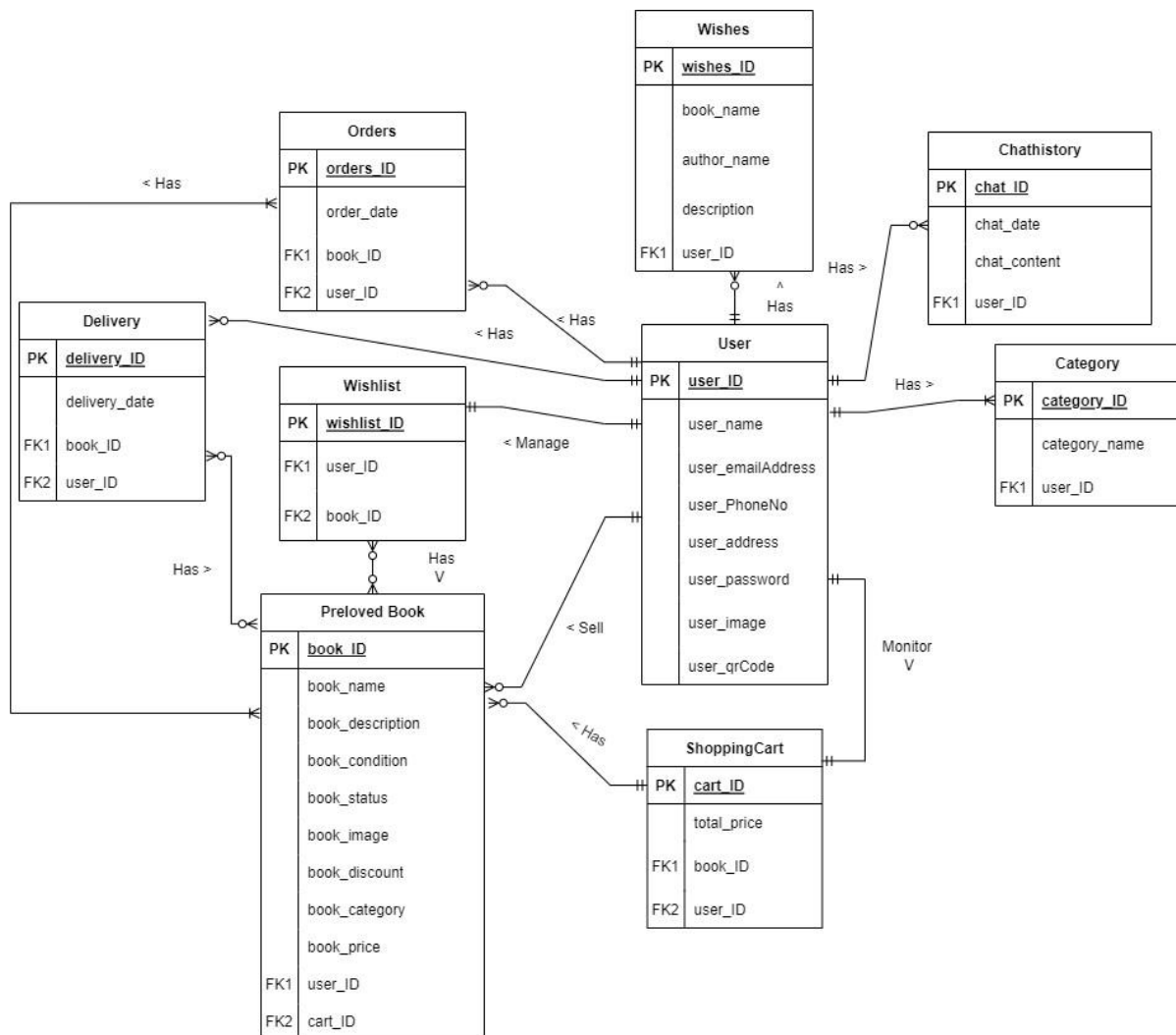


Figure 4.2.1 System Architecture Design of Online Preloved Book system

Based on Figure 4.2.1, it is a system architecture design of Online Preloved Book system. First, it has user which can be a seller or buyer or seller and buyer at the same time. Users will be accessing the online preloved book system using mobile application and the android studio is used to build the Android studio. Therefore, the user will be access to the user interface of online preloved book system. Besides, user has to login and register into the online preloved book system with using Firebase Authentication with OTP to be more secure. After successfully login into the online preloved book system, there are some presentation layers in the online preloved book system such as Home Fragment, Sell Fragment, Category Fragment and User Profile Fragment. Home Fragment is the main home UI fragment of the online preloved book system. Category Fragment is the UI fragment that allows users to browse preloved books by categories. Sell Fragment is the UI fragment that allows users to fill in the information of the preloved book that wanted to be sold. User Profile fragment is the UI

fragment that display the user information and allows user to change their information and check the order history and item that is selling. Moreover, chatbot integration is for the book recommender chatbot which will retrieve the chatbot response from visual studio code with port forwarding. Furthermore, Business Logic is the view models that handle the data presentation and user interaction in the user interface. Network Layer is the Firebase SDK which is allows the network services like receiving data from Firebase. Besides, Data Storage is the real time cloud based to store the information of the user, orders, delivery status and the preloved books. Besides, the online preloved book system will be using Firebase as cloud-based storage. Firebase is very useful since it has Firebase Authentication, Realtime Storage, Firestore Database and storage.

### 4.3 ERD Diagram of Online Preloved Book system





*Figure 4.3.1 ERD Diagram of Online Preloved Book System*

Figure 4.3.1 shows the ERD Diagram of Online Preloved Book System. The information will be stored in the Firebase is personal information of user, shopping cart, chat history, payment, Wishlist, category, preloved book and reward.

In the database, Table “User” will be stored the user\_name and user\_emailAddress, user\_PhoneNo, user\_Address and user\_password. The user\_emailAddress and the user\_password will be authenticated to access to the online preloved book system. The primary key of “User” table is user\_ID. It is unique and will be generated by Firebase automatically.

The “ChatHistory” table has a primary key which is chat\_ID and it contain one foreign key which is user\_ID. It has stored the chat\_content and chat\_date in the table. It has many to one relationship to the “User” table.

In the “Wishlist” table, it has a primary key which is the wishlist\_ID. It has one foreign key which is book\_ID. It is many to many relationships with “Preloved Book” table.

In the “Delivery” table, it has a primary key which is delivery\_ID. It has two foreign keys which are book\_ID and user\_ID. The delivery\_date has stored in the table.

In the “PrelovedBook” table, it has a primary key which is book\_ID. It has two foreign keys which are user\_ID and cart\_ID. It stored the book\_name of the preloved book, book\_description , book cetgory and book price of the preloved book. It has many to one relationship with “User” table and many to one relationship with “ShoppingCart” table , “Wishlist” table and “Category” table ,many to many relationship with “Delivery” table and “Payment” table.

In the “ShoppingCart” table, it has a primary key which is cart\_ID and it has a foreign key which is book\_ID. It will helps the customer to store the items in shopping cart and calculate the total price of the preloved book selected. Besides, it has one to one relationship with “User” table and one to many relationship with “PrelovedBook” table.

Last but not least , “Category” table has a primary key which is the category\_ID. It has stored the name of the category and it has a foreign key which is book\_ID. It has one to many relationship with “PrelovedBook” table.

# Chapter 5 System Implementation

## 5.1 Hardware Setup

The hardware involved in this project android mobile device. A mobile device is used for testing the function and flow of the application to ensure that the application can run smoothly without being stuck or having any bugs.

Table 5.1.1 Specifications of mobile device that had been used in testing

<b>Descriptions</b>	<b>Specifications</b>
Model	Redmi Note 10S
Processor	Qualcomm SM6225 Snapdragon 680
Operating System	Android 11
Memory	8GB
Storage	128GB

Table 5.1.1 shows the specifications of the mobile device that will be used in the testing stage of this project.

## 5.2 Software Setup

Visual Studio was employed for port forwarding to connect the chatbot model to the Android phone. Configuring port forwarding settings within Visual Studio established a direct link between the computer and Android device. This involved specifying the port number for communication and the IP addresses of both devices. With the setup complete, the chatbot could be accessed from the phone's web browser using a URL generated through the port forwarding. This seamless integration allowed for convenient testing and interaction with the chatbot directly from the mobile device.

## 5.3 Setting and Configuration

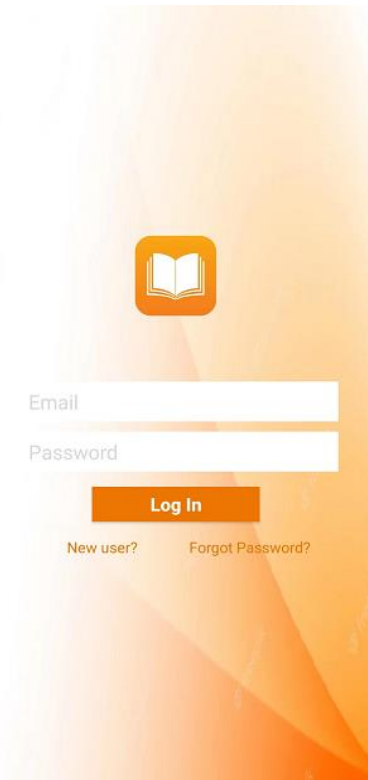
In a typical setup, servers are kept running continuously with fixed IP addresses which allowing clients to consistently connect. Backup servers with pre-programmed addresses or network redirection ensure minimal downtime which can take over when the main server is down. However, the online preloved book system which using Ngrok requires a dynamic IP address due to its tunneling functionality. The server's IP address need to change whenever the Ngrok server restarts. To address this, Ngrok's IP is captured and stored in an environment variable

for the application which to ensure it connects through the Ngrok tunnel every time the server restarts.

## 5.4 System Operation

The theme of the online Preloved book system is orange and yellow. The system is start with three kinds of users which is buyer , seller and a user which is buyer and seller at the same time.

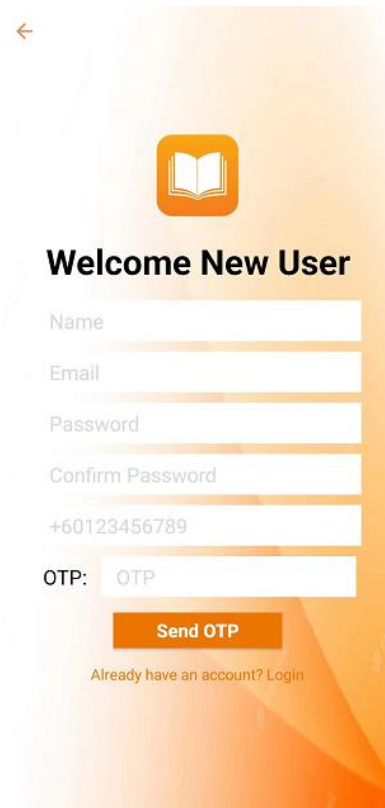
### 5.4.1 Authentication – Login Page



*Figure 5.4.1.1 Screenshot of Login page*      *Figure 5.4.1.2 Screenshot of Login page (Filled)*

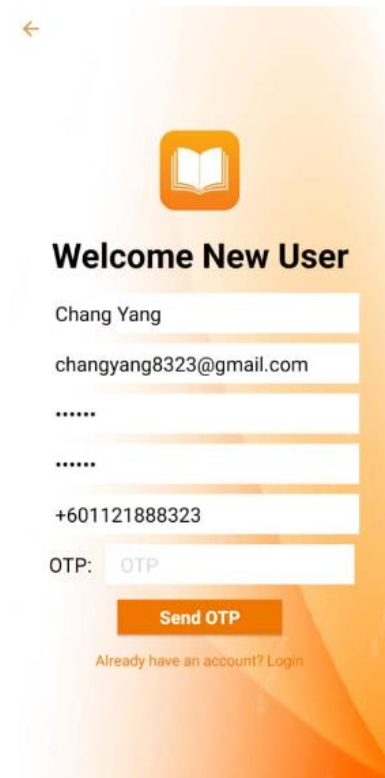
Based on Figure 5.4.1.1, it is a login page of online preloved book system. User is allowed to input their email and password to login to the online preloved book system. There is a login button which user can press it after input their email and password. If the user is new to the online preloved book system, user can press the New user button to register into the online preloved book system. If the user had registered and forgot their password, user can click the forgot password to go into the password reset page.

## 5.4.2 Authentication – Register Page



A screenshot of a mobile application's registration page. At the top left is a back arrow. Below it is an orange icon of an open book. The heading "Welcome New User" is centered. The form contains the following fields: "Name", "Email", "Password", "Confirm Password", a phone number field with "+60123456789" pre-filled, and an "OTP:" field with "OTP" pre-filled. A "Send OTP" button is below the OTP field. At the bottom, there is a link: "Already have an account? Login".

Figure 5.4.2.1 Screenshot of Register page

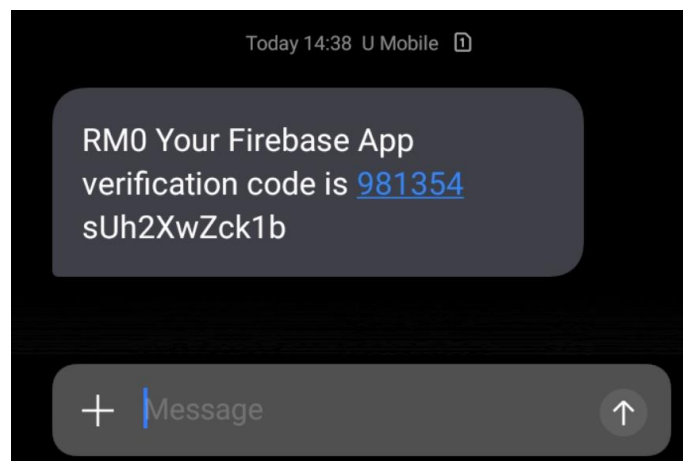


A screenshot of the same mobile application's registration page, but with the form fields filled. The fields contain: "Chang Yang" for Name, "changyang8323@gmail.com" for Email, two masked password fields (each with six dots), and "+601121888323" for the phone number. The "OTP:" field still contains "OTP". The "Send OTP" button and the "Already have an account? Login" link are also present.

Figure 5.4.2.2 Screenshot of Register page (Filled)



*Figure 5.4.2.3 Screenshot of Verify OTP*



*Figure 5.4.2.4 Screenshot of OTP in SMS*



*Figure 5.4.2.5 Screenshot of OTP is correct*

Based on Figure 5.4.2.1, it is a registration page of online preloved book system. User is allowed to enter their name, email address, password, confirm password and phone number. User can click the send OTP after inserting their phone number. Therefore, user will be receiving OTP from phone SMS. User has to input the OTP to be registered successfully. If user already has an account, user can click the login button to directly login instead of registering.

### 5.4.3 Authentication – Password Reset Page

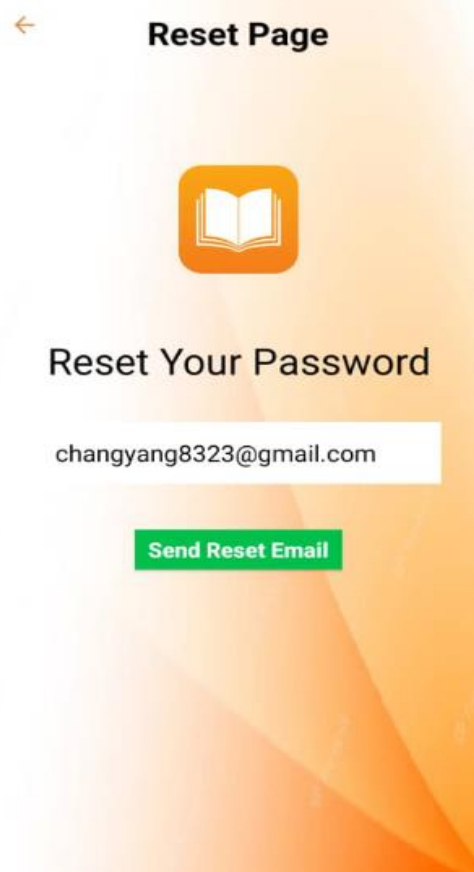
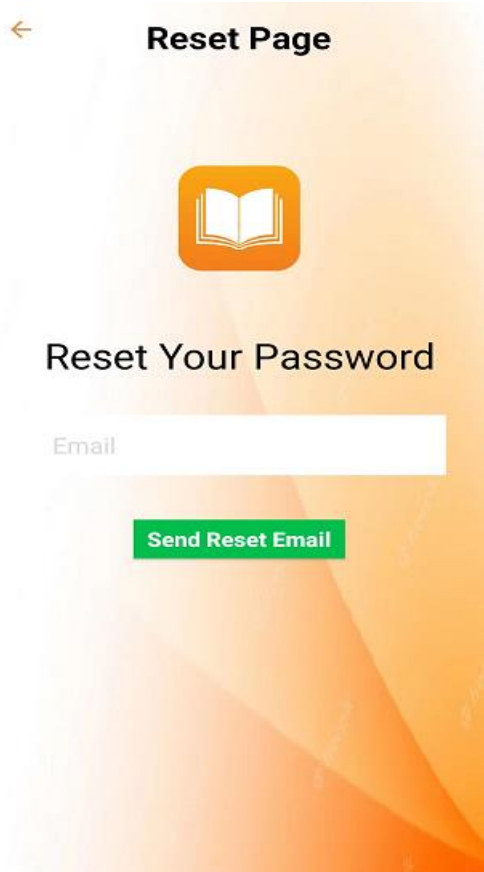


Figure 5.4.3.1 Screenshot of Password Reset

Figure 5.4.3.2 Screenshot of Password Reset (Filled)

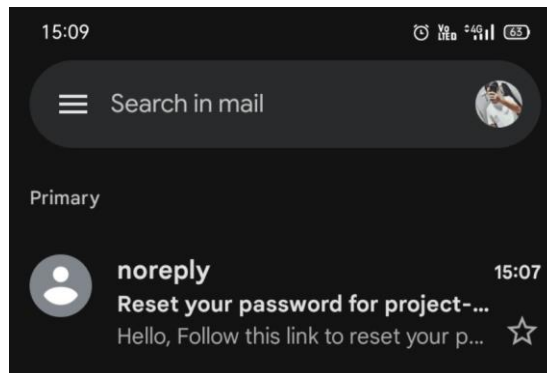


Figure 5.4.3.3 Screenshot of Email notice of reset password



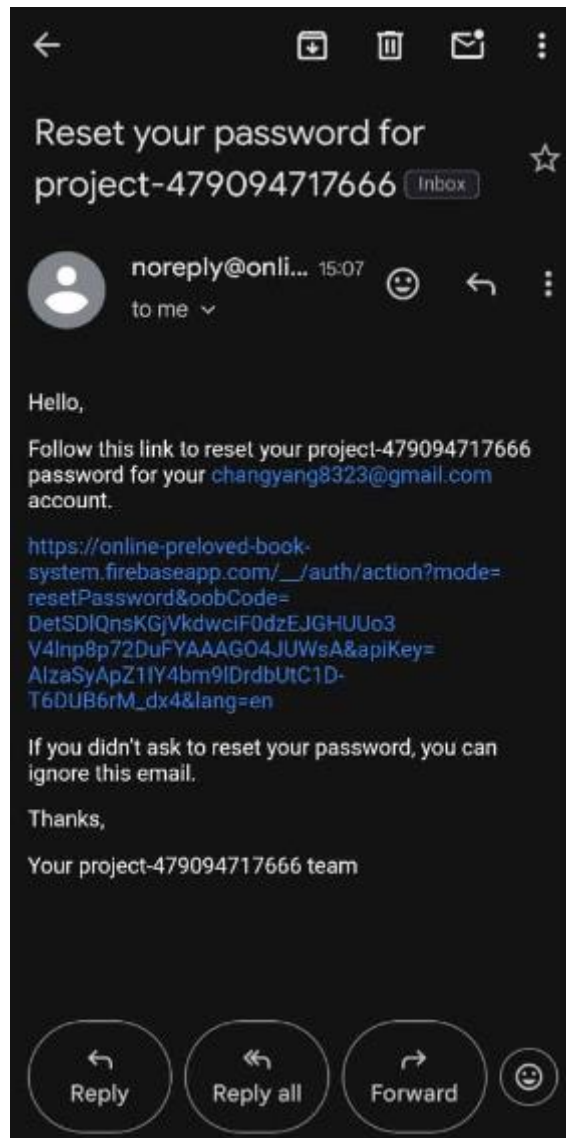


Figure 5.4.3.4 Screenshot of Password Reset Link

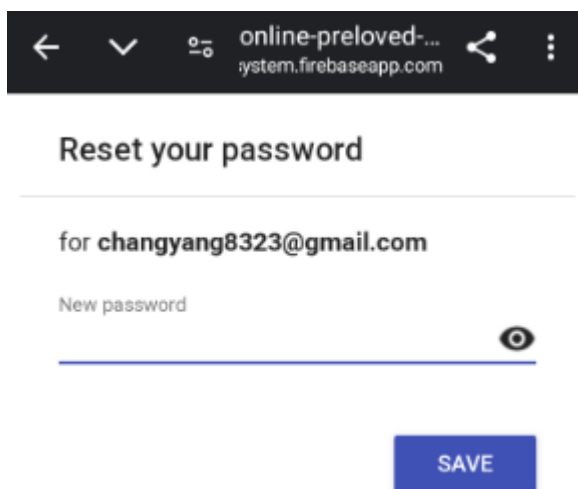


Figure 5.4.3.5 Screenshot of reset password

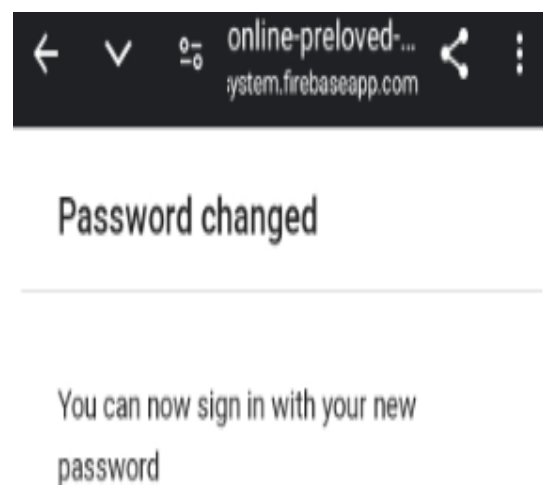


Figure 5.4.3.6 Screenshot of renew password

Based on Figure 5.4.3., it is a password reset page of online preloved book system. User has to input their email address and press send reset email button. Therefore, Firebase will be generated link and send to user's email. User has to click the link from the email and input the new password. After input the new password, user is required to go to Login Page by pressing the back button at the top left of the screen and input their email addresses and new password to get login successfully into the online preloved book system.

#### 5.4.4 Home Page

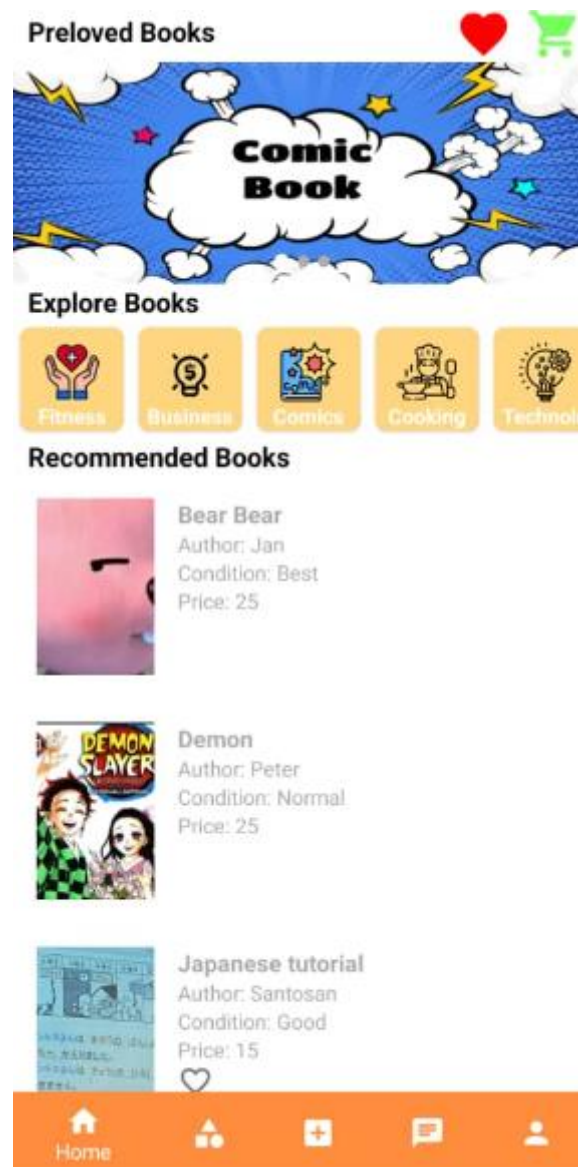


Figure 5.4.4.1 Screenshot of Home Page

Based on Figure 5.4.4.1, it is a home page of online preloved book system. There is a image slider. It is used to attract the user. Besides, the explore books has some categories which are music, fitness, business, comics, cooking and technology. User is allowed to click the specific

categories to get to explore the preloved books under the certain selected categories. Besides, the recommended books are the book list that suggested for the user based on the category that user is interested in.

#### 5.4.5 Product Detail Page

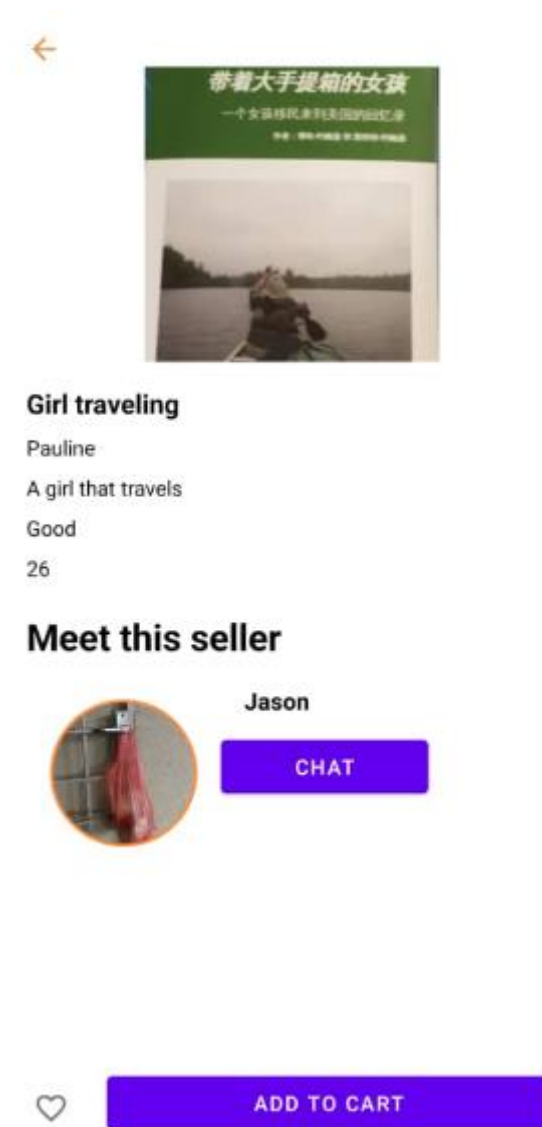


Figure 5.4.5.1 Screenshot of Product Detail Page

Based on Figure 5.4.5.1, it is a home page of online preloved book system. There is a image slider. It is used to attract the user. Besides, the explore books has some categories which are music, fitness, business, comics, cooking and technology. User is allowed to click the specific categories to get to explore the preloved books under the certain selected categories.

## 5.4.6 Seller Profile Page

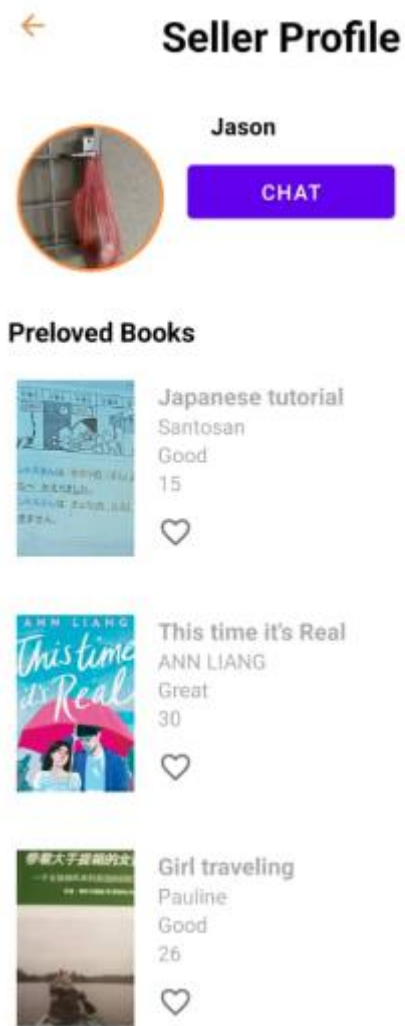


Figure 5.4.6.1 Screenshot of Seller Profile Page

Based on Figure 5.4.6.1, it is a home page of online preloved book system. There is a image slider. It is used to attract the user. Besides, the explore books has some categories which are music, fitness, business, comics, cooking and technology. User is allowed to click the specific categories to get to explore the preloved books under the certain selected categories.

### 5.4.7 Live Chat Page



Figure 5.4.7.1 Screenshot of Live Chat Page

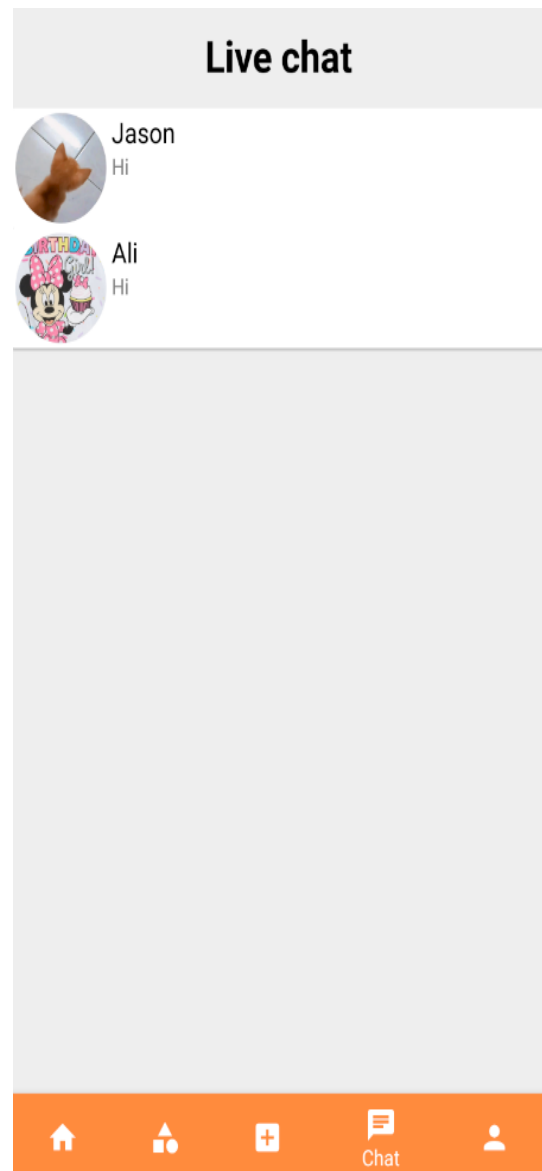


Figure 5.4.7.2 Screenshot of Chat List Page

Based on Figure 5.4.7.1, it is a live chat page of online preloved book system. User is able to text the seller and able to see the message is delivered. Besides, user is able to see the last seen which stated the date and time on top of the screen. Figure 5.4.7.2 is the chat list of the live chat.

### 5.4.8 Wishlist Page

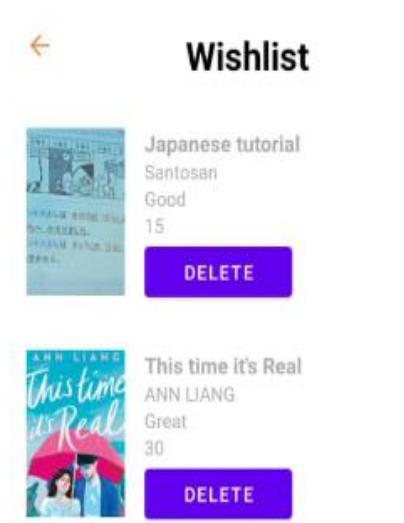


Figure 5.4.8.1 Wishlist Page



Figure 5.4.8.2 Screenshot of Item Delete from Wishlist

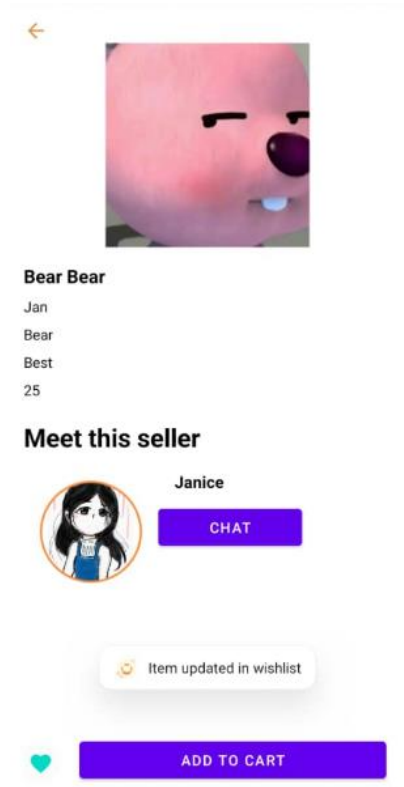


Figure 5.4.8.3 Item add to Wishlist

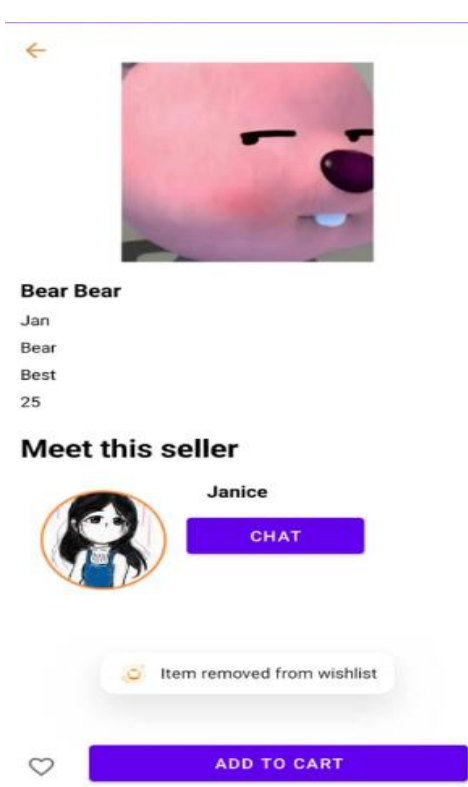


Figure 5.4.8.4 Item Delete from Wishlist in Product

Page

Based on Figure 5.4.8.1, it is a Wishlist page of online preloved book system. User is able to see their preloved book in the Wishlist when they do not have enough budget. Besides, Figure 5.4.8.2 had shown, the preloved book removed from Wishlist and a toast message will be popped out to show the user that the item has been removed from Wishlist. Besides, Figure 5.4.8.3 and Figure 5.4.8.4 has shown that the item is added and removed from the Wishlist in the Product Detail page when the user click on the love icon.

### 5.4.9 Shopping Cart Page

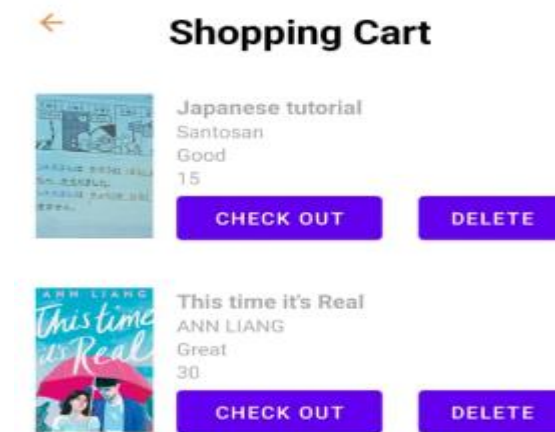


Figure 5.4.9.1 Screenshot of Shopping Cart Page



Figure 5.4.9.2 Item added to cart

## ← Checkout Page

LEE HUI NEE



UPLOAD RECEIPT

*Figure 5.4.9.3 Screenshot of Checkout Page*



*Figure 5.4.9.4 Screenshot of Upload Receipt Page*

Based on Figure 5.4.9.1, it is a shopping cart page of online preloved book system. User is able to checkout their item and delete the item from the shopping cart. Figure 5.4.9.2 had shown that the user is able to add the preloved book to shopping cart in the product detail page and a toast message will be showing up to show the user that the item is successfully added into shopping cart. Figure 5.4.9.3 is shown that user to able to scan the Qr code to make payment. Figure 5.4.9.4 is the page for user to upload receipt after they had made payment.



### 5.4.10 Search and Filter Page

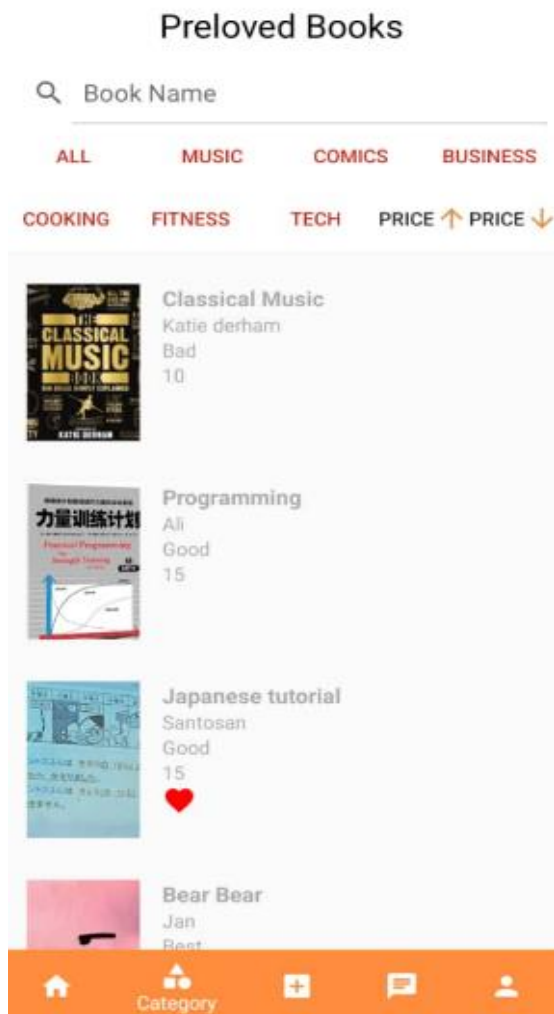


Figure 5.4.10.1 Filter in ascending order

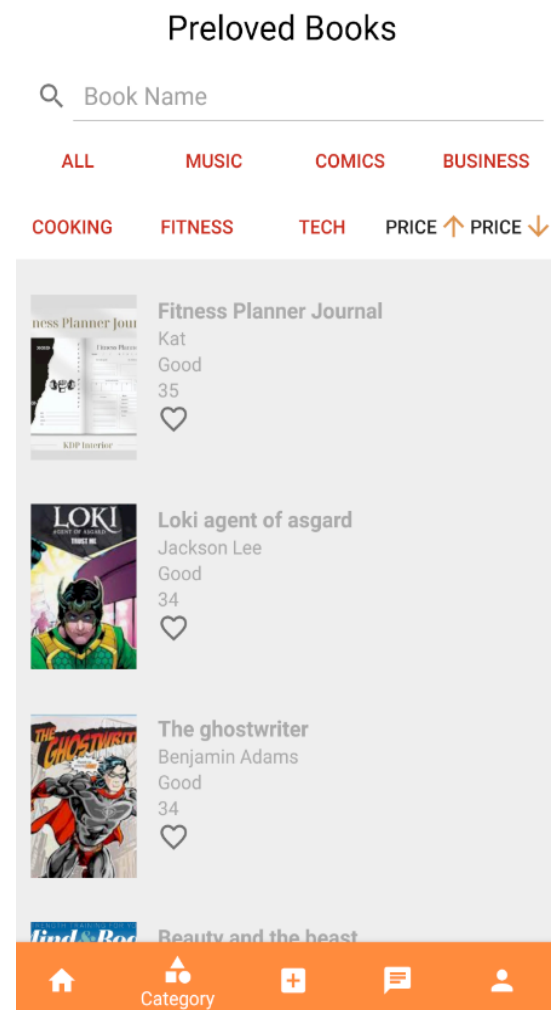


Figure 5.4.10.2 Filter in descending order

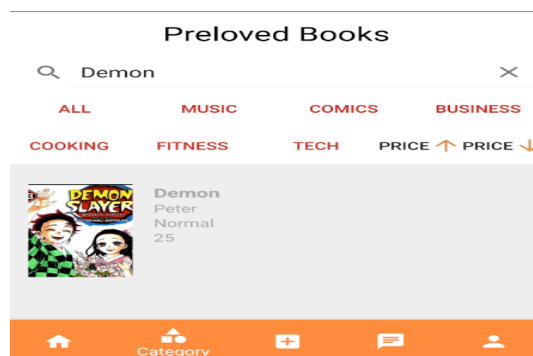
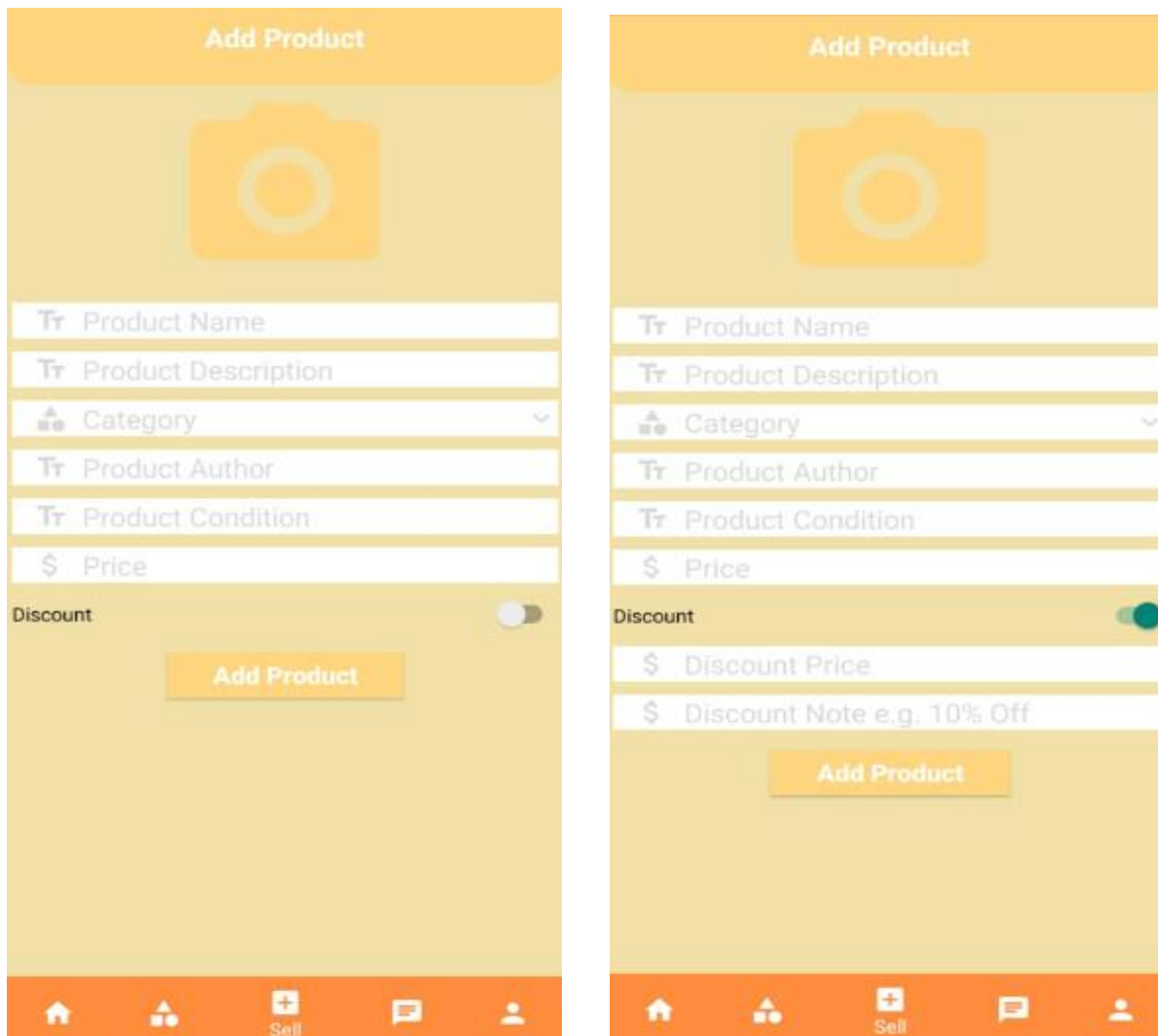


Figure 5.4.10.3 Search feature

Based on Figure 5.4.10.1 to Figure 5.4.10.3, it is a search and filter page which allow user to search for the book that they are interested in. Besides, user can filter the books by category and price either in ascending or descending order.

### 5.4.11 Add Product Page



*Figure 5.4.11.1 Screenshot of Add Product Page*

Based on Figure 5.4.11.1, it is an add product page. User is able to be a seller once they had added the product in add product page.

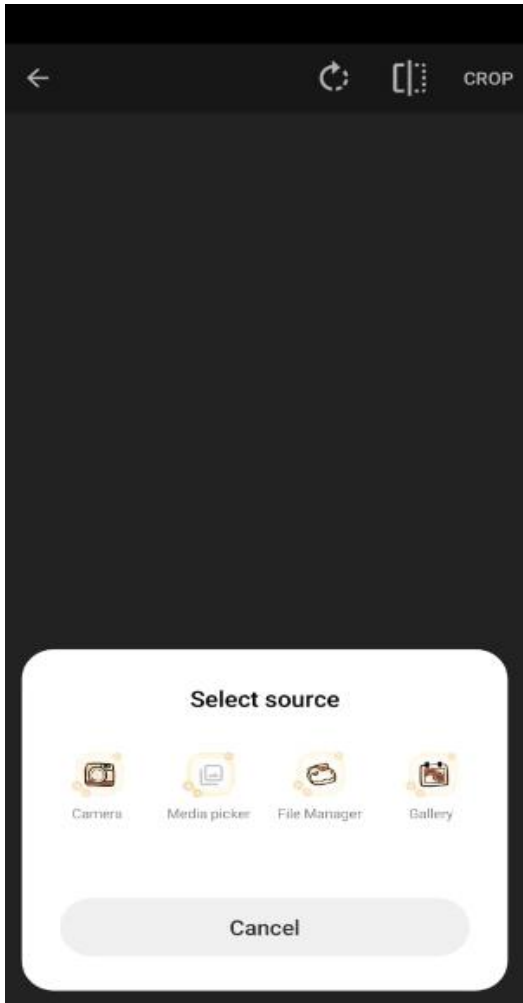


Figure 5.4.11.2 Select source

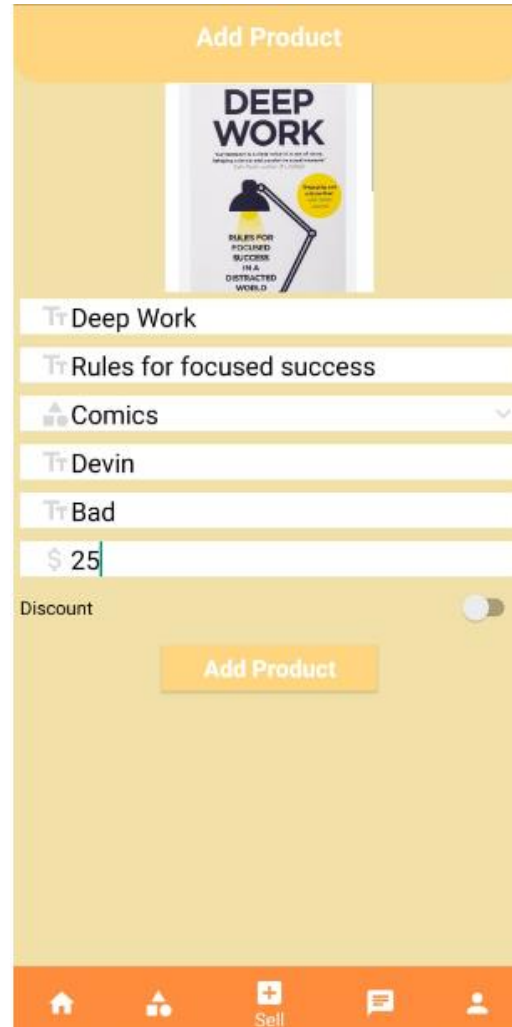


Figure 5.4.11.2 Add Product Page (Filled)

Based on Figure 5.4.11.2, user is able to upload the image of the preloved book by selecting the source like gallery. Besides, in Figure 5.4.11.3 user is able to fill in the details of the book and fill in the price they wanted to sell.

### 5.4.12 Item On Sale Page

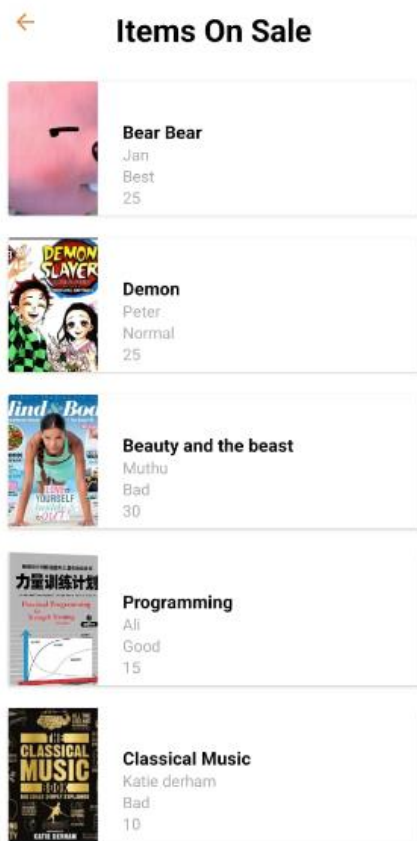


Figure 5.4.12.1 Item On Sale Page

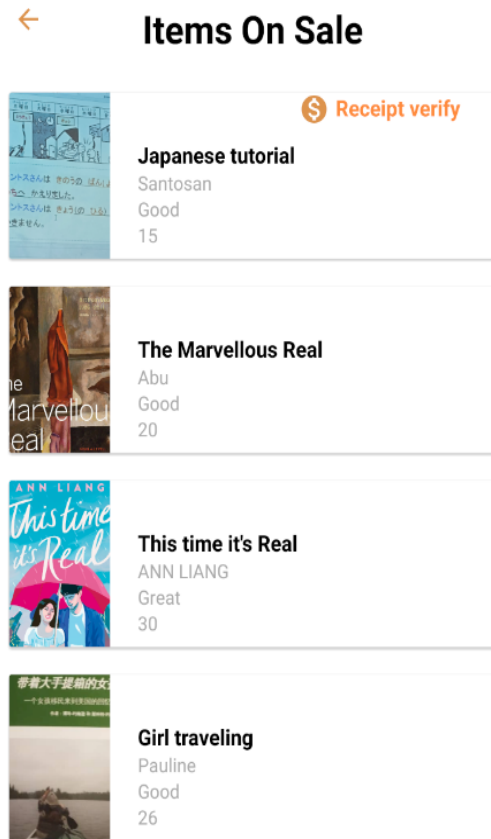
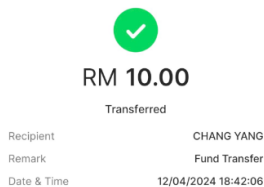


Figure 5.4.12.2 Receipt to verify

#### Transaction Verify



Price: 15

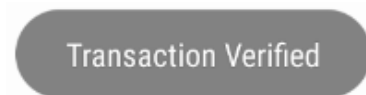


Figure 5.4.12.3 Verify the transaction Figure 5.4.12.4 Toast message of transaction verified

Based on Figure 5.4.12.1, It is an item on sale page. It is a page that shows the item that seller has been added the product. Once someone as a buyer has made payment to buy the book, a receipt verify will show up to seller in Figure 5.4.12.2. It is to let the seller to check on the transaction and to see if the transaction is correct or not. Figure 5.4.12.3 is to verify the transaction. If the transaction is correct, a toast message saying transaction verified will be pops out. If the transaction is wrong, user as a seller can chat with the buyer in live chat.



Figure 5.4.12.5 Screenshot of Product Detail of Item On Sale Page

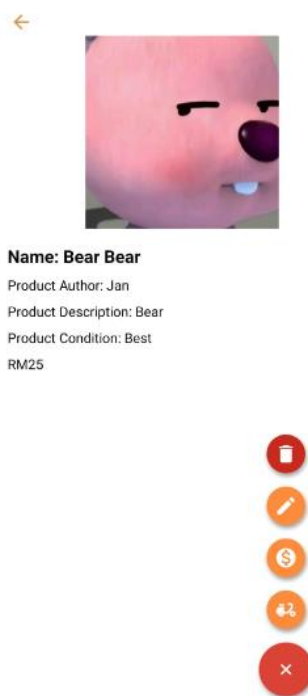
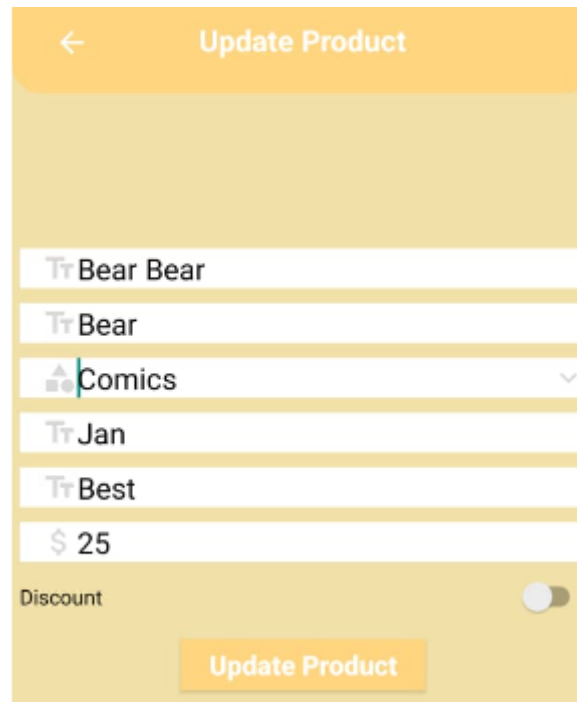
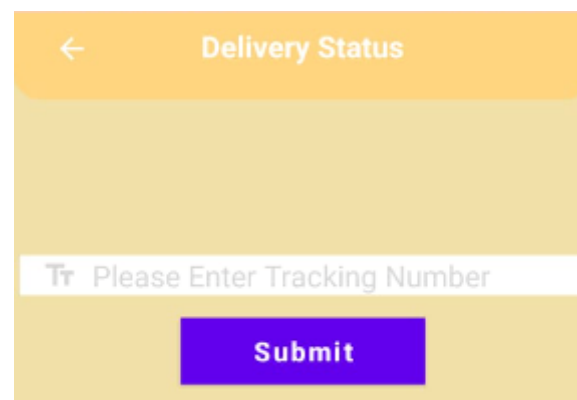


Figure 5.4.12.6 Additional Features of Product Detail of Item On Sale Page

Based on Figure 5.4.12.5, it is product detail of item on sale page. Based on Figure 5.4.12.6, there are several features for the seller to use which is delete feature, update product and track the transaction of buyer and update delivery status feature.



*Figure 5.4.12.7 Edit Product Detail of Item On Sale Page*



*Figure 5.4.12.8 Enter tracking number of Item On Sale Page*

Based on Figure 5.4.12.7, it is edit product detail page. User is able to update the product detail even though the product had been added. Besides, User as a seller can add order tracking number for the user to check on the delivery status of the item in Figure 5.4.12.8.

### 5.4.13 User Profile Page

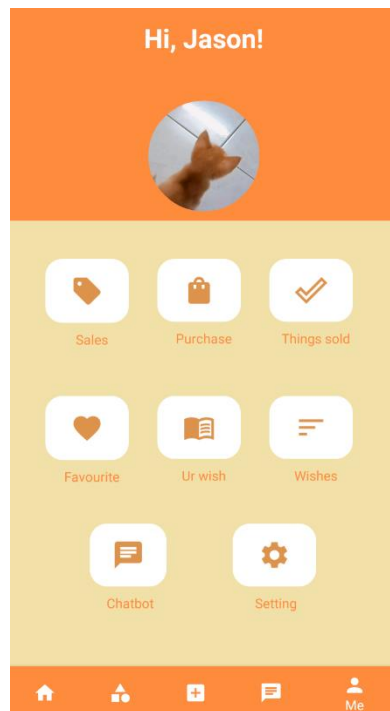


Figure 5.4.13.1 Screenshot of User Profile Page

Based on Figure 5.4.13.1, it is a user profile page. It had showed the profile picture and the name of the user. Besides, it has provided all the feature for the user such as Sales, Purchase, Things sold, Favourite, Your Wish, Wishes, Chatbot and Setting.

### 5.4.14 Setting Page

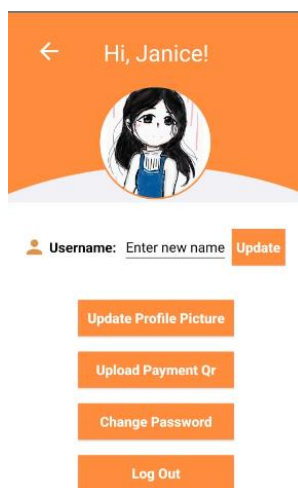


Figure 5.4.14.1 Setting Page



Figure 5.4.14.2 Update Profile Picture Page



*Figure 5.4.14.3 Screenshot of Upload Payment Qr code Page*

Based on Figure 5.4.14.1, it is a setting page. There are several buttons inside which are update profile picture, upload payment QR code, change password and log out buttons. When the user presses on the update profile picture button, the user is able to change their profile picture from the gallery. Figure 5.4.14.3 is the upload payment QR code page. It allows users to upload the QR code for the user to make payment by scanning the QR code.

#### **5.4.15 Favourite Category Page**



*Figure 5.4.15.1 Screenshot of Favourite Category Page*



Based on Figure 5.4.15.1, it is a favourite category page. It allows user to choose on the category of book that the user like. Then, the category will be used in suggesting user the book the user might be satisfied with in homepage.

#### 5.4.16 Make a Wish Page

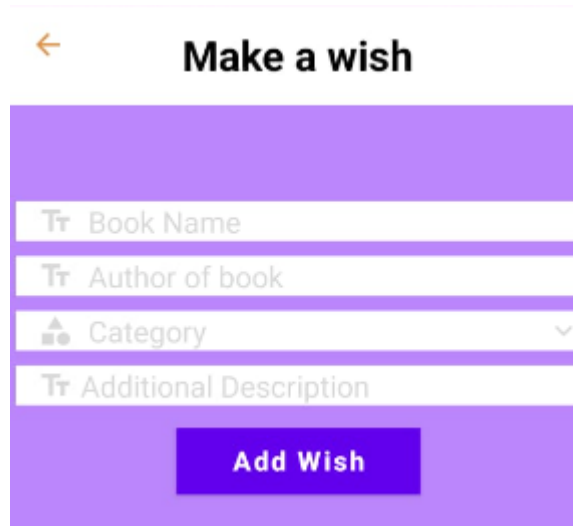


Figure 5.4.16.1 Screenshot of Make a Wish Page

Based on Figure 5.4.16.1, it is a page for user to make wish on the books that did not sell buy anyone.

#### 5.4.17 View Wishes Page

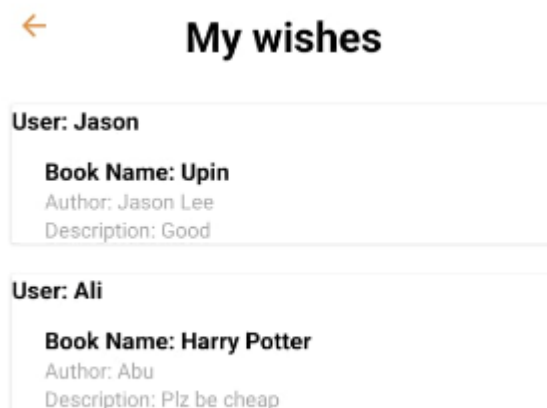


Figure 5.4.17.1 Screenshot of View Wishes Page

Based on Figure 5.4.16.1, it is a view wishes page. It will show the wishes that made by anyone. The wish will be seen by everyone. Therefore, user is able to see if the preloved book is sold by anyone.

### 5.4.18 Chatbot Page

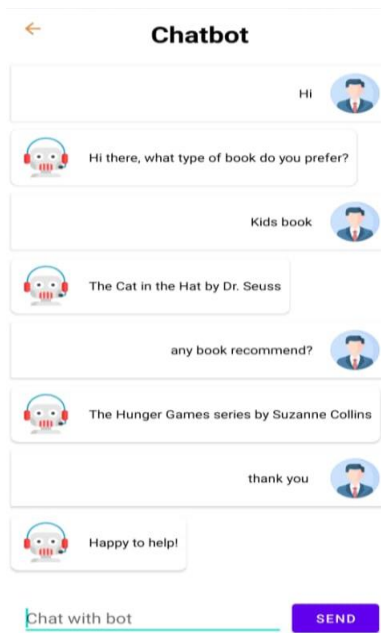


Figure 5.4.18.1 Screenshot of Chatbot Page

Port	Forwarded Address
5000	https://10ngh7zj-5000.ass...

Figure 5.4.18.2 Screenshot of Port Forwarding in Visual Studio for the chatbot

Based on Figure 5.4.18.1, it is a book recommender chatbot that allows user to ask the chatbot to recommend them some book based on the category they mentioned. Besides, the chatbot module is being trained in visual studio code. The chatbot is implemented using standard neural network. The standard neural network is trained to understand the input of the user and trying to search responding respond from the preset intents. The chatbot is hosted in a machine as a service. Figure 5.4.18.2 have shown that port forwarding has been used to enable the application chatbot to connect to the server.

### 5.4.19 Item Purchased Page

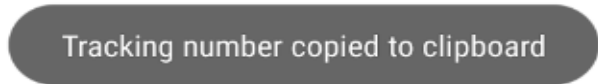
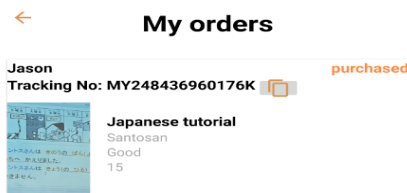


Figure 5.4.19.1 Item Purchased Page      Figure 5.4.19.2 Toast message of copied to clipboard

Based on Figure 5.4.19.1, it is an item purchased page. It is a list to record the item that the user has purchased. It allows user to check for their orders and keep track on their item's delivery status. User is allowed to copy the tracking number instead of typing the letters and numbers by clicking the copy icon. Figure 5.4.19.2 is the toast message of tracking number copied to clipboard.

## 5.4.20 Item Sold Page

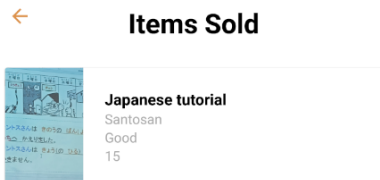


Figure 5.4.20.1 Item Sold Page

Based on Figure 5.4.20.1, it is an item sold page. It is a list to record the item that sold by the user. It allows user to check for their sales history. Figure 5.4.20.2 is the item details of the item sold. User can check back the information of the item if they want.

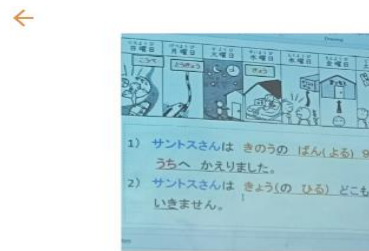


Figure 5.4.20.2 Item Details of item sold

## 5.5 Implementation Issues and Challenges

During the initial development phase of book recommender chatbot, Visual Studio Code has been used to train the chatbot. NLP method has been implemented in the Visual Studio Code to build the module of the chatbot. Visual Studio Code assigns a local IP address to the running application which restricts access solely to devices on the same local network.

To overcome this challenge and facilitate broader testing, a temporary solution had been implemented which is using Ngrok. Ngrok is a valuable tool that creates a publicly accessible URL for locally developed applications. By establishing a tunnel through Ngrok, we were able to transform the chatbot module local IP address into a public URL accessible from any device with an internet connection. This approach significantly improved testing capabilities, allowing testers and users to access the application remotely. While Ngrok provided a temporary solution for broader testing, it introduced a new challenge which is dynamic URLs. Ngrok assigns a unique public URL each time the application is launched. This presented an obstacle when integrating the URL with the mobile application, as the code would need constant updates to reflect the new URL generated by Ngrok. This repetitive process is inefficient and hinders a smooth development workflow. Unfortunately, the free plan of Ngrok has been running out. Therefore, port forwarding of Visual Studio Code has been used to generate a public URL to put in the android studio so that the chatbot in android studio can get respond from the module.

# Chapter 6 System Evaluation and Discussion

## 6.1 System Testing

This chapter dives into the system testing methodologies and performance metrics that will ensure the online preloved book mobile app functions flawlessly. Software testing offers a several techniques, we will focus on a strategic combination to achieve optimal results. We will employ a broader approach encompassing both black-box testing which is simulating user interactions and white-box testing which is examining internal functionality. This comprehensive strategy ensures the app behaves as expected from a user's perspective and functions seamlessly under the hood.

### 6.1.1 Verification Plan

The first test is to test the **seller features module**. The purpose of testing is to make sure the information of the preloved book is stored in the database and allows other to see and buy it.

The second test is to test the **live chat module**. The purposed of testing is make sure that the users are able to chat in the live chat and the messages history has been stored in database.

The third test is to test the **order tracking module**. The purpose of testing is to make sure that the user like buyer is allowed to track their parcel after purchased their preloved book. Therefore, the seller can update the shipping delivery status after sending the parcel.

The fourth test is to test the **chatbot module**. The purpose of testing is to make sure that the user is able to get respond whenever they texted the chatbot for book recommenders.

### 6.1.2 Performance Matrix

The performance matrix serves as a roadmap to ensure a smooth and efficient user experience within the online preloved book system. Key metrics like launch time, screen load times, and API call response speeds are critical. Targeting metrics like 5 second launch times and 3 second API response times helps deliver a snappy and responsive experience. Furthermore, monitoring memory usage and battery consumption safeguards overall device performance. By addressing these performance metrics, alongside scalability testing and device compatibility checks, online preloved book system mobile application that functions flawlessly for all users raising a increasing preloved book community.

## 6.2 Testing Setup and Result

To comprehensively evaluate the online preloved book mobile app, testing setup was established. Functionality testing verified core features like user registration, book listing creation and search capabilities. Performance testing measured metrics like launch time, screen load times, and memory usage, comparing them to predefined benchmarks. The testing results will be documented in detail, outlining successes, encountered issues, and areas for improvement. This comprehensive testing approach ensures the app delivers a smooth, secure, and user-friendly experience for the online preloved book community.

### 6.2.1 Authentication Module

The user can be a seller or buyer or seller or buyer at the same time.

Table 6.2.1.1 Registration Testing

Input	Description	Expected Output	System Output
Blank Input	To test if the system will allow user to register if the user did not input anything	Cannot register or login.	The system does not allow user to register or login. The system will display “Requires email and password”.
Input email as Jan without proper email format	To test if the system notices the email format is wrong.	The system will display “Email format wrong”	The system will display “Email format wrong” and not allow to register or login.
Password: 123456 Confirm Password:123	To test if the system notices the confirm password is different with the password.	The system will display “password different”	The system will display “confirm password is different”
Phone number: 177061802	To test if the system notices the phone number format is wrong.	The system will display “phone number format is wrong”	The system will display “phone number format is wrong” and ask the user to enter again

OTP: 123455	To test if the system notices the OTP is wrongly type	The system will display “Wrong OTP”	The system will display “OTP is wrong”
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Table 6.2.1.2 Login Testing

<b>Input</b>	<b>Description</b>	<b>Expected Output</b>	<b>System Output</b>
Input email as Jan without proper email format	To test if the system notices the email format is wrong.	The system will display “Email format wrong”	The system will display “Email format wrong” and not allow to register or login.
Input wrong password	To test if the system notices the password is wrong.	The system will display “Password wrong”	The system will display “The password is wrong”

Table 6.2.1.3 Reset Password Testing

<b>Input</b>	<b>Description</b>	<b>Expected Output</b>	<b>System Output</b>
Input email as Ali without proper email format	To test if the system notices the email format is wrong.	The system will display “Email format wrong”	The system will display “Email format wrong” and not allow to register or login.
Input email that does not exists	To test if the system notices the email does not exist	The system will display “Email does not exist”	The system will display “The email does not exist”

## 6.2.2 Seller Module

### 6.2.2.1 Add Product

Table 6.2.2.1.1 Add Product Testing

<b>Input</b>	<b>Description</b>	<b>Expected Output</b>	<b>System Output</b>
None	To test if the system will not allow user to add product if the input is empty	The system will display the field requires to enter.	The system will display the field requires to enter and does not allow user to add product
New book with all required fields filled correctly	Valid Product Addition	Success message confirming product addition	The system will display “Product Added successfully”
Attempt to add a product with missing required fields	Missing Required Fields	Error message indicating missing or invalid fields	The system will display “missing required fields”
Product with an invalid price format	Invalid Price Format	Error message indicating invalid price format	The system will display “invalid price format”

### 6.2.2.2 Update Product

Table 6.2.2.2.1 Update Product Testing

<b>Input</b>	<b>Description</b>	<b>Expected Output</b>	<b>System Output</b>
None	To test if the system will not allow user to add product if the input is empty	The system will display the field requires to enter.	The system will display the field requires to enter and does not allow user to add product
New book with all required fields filled correctly	To test if the system knows valid product addition	The system will display success message product addition	The system will display “Product Added successfully”

Attempt to add a product with missing required fields	To test if the system knows missing required fields	The system will display error message indicating missing or invalid fields	The system will display “required fields need to be added”
Product with an invalid price format	To test if the system knows invalid price format	The system will display error message indicating invalid price format	The system will display “Invalid Price Format”

### 6.2.2.3 Verify Transaction

Table 6.2.2.3.1 Verify Transaction Testing

Input	Description	Expected Output	System Output
Click the button “Transaction correct”	To test if the system verifies a transaction and check for status update	The system will change transaction status updated to "Verified"	The system will display transaction status updated to "Verified"

### 6.2.2.4 Delete Product

Table 6.2.2.4.1 Delete Product Testing

Input	Description	Expected Output	System Output
Delete the product	To test if the system will be able to delete the product	The system will display product deleted.	The system will display “Product deleted”.

### 6.2.2.5 Add Tracking Number

Table 6.2.2.5.1 Add Tracking Number Testing

Input	Description	Expected Output	System Output
None	To test if the system will not allow user to add tracking number if the input is empty	The system will display the field requires to enter.	The system will display the field requires to enter and does not allow user



			to add tracking number.
Add Tracking number	To test if the system be able to store the tracking number to Firebase	The system will display tracking number added successfully.	The system will display “Tracking number added successfully”.

### 6.2.2.6 View Sales History

Table 6.2.2.6.1 View Sales History Testing

Input	Description	Expected Output	System Output
View Sales History at profile fragment	To test if the system will allow seller to view the sales history.	The system will display the item that sold by the seller.	The system displayed the preloved book that sold by the seller.

### 6.2.3 Buyer Module

#### 6.2.3.1 Add Product to Shopping Cart

Table 6.2.3.1.1 Add Product to Shopping Cart Testing

Input	Description	Expected Output	System Output
Click the shopping cart of the preloved book	To test if the system be able to add the preloved book into the shopping cart	The system will display product added successfully.	The system will display “Item added to cart”

#### 6.2.3.2 Delete Product from Shopping Cart

Table 6.2.3.2.1 Delete Product from Shopping Cart Testing

Input	Description	Expected Output	System Output
Click the delete button of the preloved book in the shopping cart	To test if the system be able to delete the preloved book from the shopping cart	The system will remove the item from shopping cart.	The system will directly delete the item from shopping cart.

### 6.2.3.3 Checkout Product in Shopping Cart

Table 6.2.3.3.1 Checkout Product in Shopping Cart Testing

Input	Description	Expected Output	System Output
Click the checkout button of the preloved book in the shopping cart	To test if the system be able to transfer user to checkout page.	The system will transfer user to checkout page.	The system will directly intent to the checkout page.

### 6.2.3.4 Upload Receipt

Table 6.2.3.4.1 Upload Receipt Testing

Input	Description	Expected Output	System Output
Click the upload receipt button in the checkout page	To test if the system be able to intent to upload receipt page.	The system will intent to upload receipt page	The system display “Please Upload Receipt”.
Click “UPLOAD RECEIPT” button	To test if the system be able to allow user to upload receipt in the upload receipt page	The system will ask user to choose source to upload the receipt.	The system asked user to choose source like gallery to upload the receipt.
Click “SAVE” button	To test if the system be able to save the receipt image to the database	The system will save the image to database	The system saved the image of receipt in the database and display “Upload receipt successfully.

### 6.2.3.5 View Orders

Table 6.2.3.5.1 View Orders Testing

Input	Description	Expected Output	System Output
View the item purchased	To test if the system be able to display the orders purchased by the user.	The system will be able to display the orders purchased by different users.	The system displayed the items purchased by the user.

### 6.2.3.6 Search and Filter the Items

Table 6.2.3.6.1 Search and Filter the Items Testing

<b>Input</b>	<b>Description</b>	<b>Expected Output</b>	<b>System Output</b>
Search the preloved book	To test if the system be able to display the preloved book searched by user	The system will be able to display the preloved book that searched by the user.	The system displayed the preloved book that search by the user according to the words type in the search area.
Click the category button	To test if the system be able to display the preloved book based on the category that clicked by the user.	The system will be able to display the preloved book according to the category.	The system displayed the preloved book according to the category.
Click Price ascending and descending order	To test if the system be able to filter the preloved book based on the price ascending or descending order.	The system will be able to display the preloved book according to price in ascending or descending order.	The system displayed the preloved book according to price in ascending or descending order.

### 6.2.3.7 Add the Items into Wishlist

Table 6.2.3.7.1 Add the Items into Wishlist Testing

<b>Input</b>	<b>Description</b>	<b>Expected Output</b>	<b>System Output</b>
Search the preloved book	To test if the system be able to display the preloved book searched by user	The system will be able to display the preloved book that searched by the user.	The system displayed the preloved book that search by the user according to the words type in the search area.

### 6.2.3.8 Delete the Items into Wishlist

Table 6.2.3.8.1 Delete the Items into Wishlist Testing

Input	Description	Expected Output	System Output
Delete the preloved book in the Wishlist	To test if the system be able to delete the preloved book in the Wishlist	The system will be able to remove the preloved book in the Wishlist	The system displayed the preloved book that has been removed from the Wishlist.

### 6.2.3.9 View Seller Profile

Table 6.2.3.9.1 View Seller Profile Testing

Input	Description	Expected Output	System Output
Click seller profile	To test if the system be able to allow user to view seller profile	The system will be able to show the profile of the seller.	The system displayed the seller profile and shows the items that sold by the seller

### 6.2.3.10 View Product Detail

Table 6.2.3.10.1 View Product Detail Testing

Input	Description	Expected Output	System Output
Click the preloved book	To test if the system be able to allow user to view the product detail	The system will be able to show the profile of the seller.	The system displayed the seller profile and shows the items that sold by the seller

### 6.2.3.11 Chat with seller

Table 6.2.3.11.1 Chat with seller Testing

Input	Description	Expected Output	System Output
Click the "CHAT" button	To test if the system be able to intent to	The system will be able to show the	The system displayed the live

	the seller conversation.	conversation chat of the seller.	chat page of the seller.
Enter text in live chat	To test if the system be able to allow user to text in the live chat	The system will display the text in the live chat.	The system displayed the text in the live chat.
Click send button	To test if the system be able to save the text to database and display to the seller	The system will save the text which is message in the database and display it on the seller live chat.	The system saved the message in the database and display it on the seller live chat.
View last seen	To test if the system be able to allow user to see the last seen of the seller	The system will display the time of seller last seen of the live chat.	The system displayed the time including date of seller last seen of the live chat.
View message delivered	To test if the system be able to show the message has been delivered.	The system will display the message delivered once it delivered to the seller live chat.	The system displayed the “Delivered” under the message if the message has been sent.

#### 6.2.4 Make wishes

Table 6.2.4.1 Make wishes Testing

Input	Description	Expected Output	System Output
None	To test if the system will not allow user to make wishes if the input is empty.	The system will display the field requires to enter.	The system will display the field requires to enter and does not allow user to make wishes.

New book with all required fields filled	To test if the system knows product is not exist yet so can allow user to make wish	The system will display success message made wishes successfully	The system will display “Wishes successfully made”
Attempt to make wishes with missing required fields	To test if the system knows missing required fields	The system will display error message indicating missing or invalid fields	The system will display “required fields need to be added”

### 6.2.5 View Wishes

Table 6.2.5.1 View Wishes Testing

Input	Description	Expected Output	System Output
Click “Your Wishes” Icon	To test if the system be able to allow user to view the wishes made by the user.	The system will be able to show the wishes made by the user.	The system displayed the wishes made by user.

### 6.2.6 Choose Favourite Category

Table 6.2.6.1 Choose Favourite Category Testing

Input	Description	Expected Output	System Output
Click “Favourite” Icon	To test if the system be able to show the category to the user.	The system will be able to show the category to the user.	The system displayed the category to the user to choose.
Click multiple category that interested	To test if the system be able to allow user to choose multiple categories and save it to database.	The system will allow user to choose multiple categories and save it to the database	The system displayed the multiple category checkbox and save the checkbox that is checked in database

## 6.2.7 View Recommended Book

Table 6.2.7.1 View Recommended Book Testing

<b>Input</b>	<b>Description</b>	<b>Expected Output</b>	<b>System Output</b>
View Recommended Book	To test if the system be able to allow user to view the recommended book.	The system will be able to show the recommended book based on the category that user had chosen in favourite.	The system displayed the recommended book based on the category that user had chosen in favourite.

## 6.2.8 Update Username

Table 6.2.8.1 Update Username Testing

<b>Input</b>	<b>Description</b>	<b>Expected Output</b>	<b>System Output</b>
None	To test if the system will not allow user to update username if the input is empty.	The system will display the field requires to enter.	The system displayed the field requires to enter and does not allow user to update username.
Enter username existed	To test if the system knows username is existed so cannot allow user to update username	The system will display username already existed	The system displayed "Username existed"
New Username	To test if the system knows the username is new so can be updated by the user	The system will display username update successfully.	The system will display "Username updated successfully"

## 6.2.9 Upload Profile Picture

Table 6.2.9.1 Upload Profile Picture Testing

Input	Description	Expected Output	System Output
Click the upload profile picture button.	To test if the system be able to intent to upload profile picture page.	The system will intent to upload profile picture page	The system display “Please Upload Profile Picture”.
Click “UPLOAD PROFILE PICTURE” button	To test if the system be able to allow user to upload profile picture.	The system will ask user to choose source to upload the profile picture.	The system asked user to choose source like gallery to upload the profile picture.
Click “SAVE” button	To test if the system be able to save the profile picture image to the database	The system will save the image to database	The system saved the image of profile picture in the database and display “Upload Profile Picture successfully.

## 6.2.10 Upload Payment Qr Code

Table 6.2.10.1 Upload Payment Qr Code Testing

Input	Description	Expected Output	System Output
Click the upload payment Qr code button in the checkout page	To test if the system be able to intent to upload payment Qr code page.	The system will intent to upload Payment Qr Code page	The system display “Please Upload Payment Qr Code”.
Click “UPLOAD Qr payment” button	To test if the system be able to allow user to upload payment Qr code.	The system will ask user to choose source to upload the payment Qr code.	The system asked user to choose source like gallery to upload the payment Qr code.
Click “SAVE” button	To test if the system be able to save the payment Qr code image to the database	The system will save the image to database	The system saved the image of payment Qr code in the database and display “Upload



			payment Qr code successfully.
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### 6.2.11 Logout

Table 6.2.11.1 Logout Testing

Input	Description	Expected Output	System Output
Click "Logout"	To test if the system be able to allow user to logout	The system will proceed to logout	The system helped the user to logout

### 6.3 Project Challenges

The project challenges of the online preloved book system is the payment gateway. Some research has been done on applying the payment gateway in the online preloved book application but it needs to be charging fees. Payment gateways typically charge fees impacting both sellers' profits and the platform's revenue. Therefore, the online preloved book system has implemented payment Qr code instead of third-party payment gateway but the disadvantage is there is a possibility that some of the buyer might pay lesser money according to the preloved book price so the seller need to verify the transaction by using the receipt uploaded by the buyer. It created troublesome to the seller and buyer. Besides, another challenge lies in training a book recommender chatbot to provide exceptional customer support and recommend the books that they might be interested in. While chatbots can answer basic inquiries, ensuring they understand complex questions and deliver helpful responses requires ongoing development.

### 6.4 Objectives Evaluation

The objective of the online preloved book is to encourage people to buy preloved book and provide book lover a platform to explore for the books they are interested in. Besides, it can save the earth by selling the preloved book with lower price instead of throwing it away. The user as a seller can add product, delete the product, edit the product information, verify the product transaction, add tracking number of the delivery to allow user to track the delivery status of the product they have purchased and check for the sales history. Moreover, user as buyer can add the product to the shopping cart and proceed to checkout. During checkout, user can scan the payment Qr code to do transactions. After they have paid, they can upload the

receipt to the seller to allow seller to do transactions verification. The user can check out their orders and copy the tracking number to check for the delivery status of the item. The user can make wishes and view wishes for the books that have not sold by anyone. In addition, user can choose multiple categories that they are interested in and the recommended book section will recommend the preloved books according to the categories of the user had chosen. The online preloved book platform had offered a personalized touch with category-based recommendations for the users. Besides, user is able to add the preloved books to the Wishlist if they have not enough budget. The user can chat with the seller if they have encountered any problem. They can view the product details and the profile of the seller. Moreover, the user is able to chat with the chatbot which is book recommender to give some suggestions on the books they might be interested in. The user able to perform search and filter the product by categories and price. Besides, user can manage their own profile by uploading profile pictures, change username, upload payment Qr code, reset password and perform logout.

# Chapter 7 Conclusion and Recommendation

## 7.1 Conclusion

The online preloved book system which is the proposed system of this project is a mobile application that sells preloved book. The aim of this project is to provide a platform for the books lover to buy preloved book with affordable price while promoting sustainability by giving preloved books a second life and reducing waste. The online preloved book act as a preloved bookshelf which offers a seamless user experience allowing bookworms to browse their desired book, manage wishlist, and connect with sellers by using the live chat. Besides, it also has book recommendations chatbot to suggest new books that the users might be interested to users. It will bring benefits to the book's lovers.

Some research have been done on existing market. There are only few similar applications of online preloved book system can be found in Google Play Store. Besides, the online preloved book has been by adding book recommendations chatbot which other preloved book system did not have. Most of the system is bookstore instead of selling preloved books. The reviewed applications are more than likely to be a barebone application that has very less function.

The SDLC is the methodology of this online preloved book system during development of the mobile application. The processes of SDLC have broken down into several stages which are Requirement analysis, Defining, Designing, Coding, Testing, Deployment and Maintenance. First, the online preloved book system starts by figuring out what users want and need in the Requirement Analysis stage. Then, define what the online preloved application will do and set its goals. In the Designing phase, plan out how the application will look and work. After that, build the online preloved book system in mobile application in the Coding phas. Once the app is built, test it to fix any problems in the Testing phase. When everything works well, launch the application for people to use in the Deployment phase. Lastly, the application running smoothly and update it as needed in the Maintenance phase.

There are a lot of challenges have faced during the development of the online preloved book application. The project challenges of the online preloved book system is the payment gateway. Some research has been done on applying the payment gateway in the online preloved

book application but it needs to be charging fees. Payment gateways typically charge fees impacting both sellers' profits and the platform's revenue. Therefore, the online preloved book system has implemented payment Qr code instead of third-party payment gateway but the disadvantage is there is a possibility that some of the buyer might pay lesser money according to the preloved book price so the seller need to verify the transaction by using the receipt uploaded by the buyer. It created troublesome to the seller and buyer. Besides, another challenge lies in training a book recommender chatbot to provide exceptional customer support and recommend the books that they might be interested in. While chatbots can answer basic inquiries, ensuring they understand complex questions and deliver helpful responses requires ongoing development.

Throughout the development phase of the online preloved book system, several challenges have appeared each presenting an opportunity for learning and growth. One significant learning experience involved mastering the use of Natural Language Processing (NLP) techniques to deploy a chatbot along with leveraging tools like Ngrok to establish a public URL for its operation. I am grateful to have successfully navigated them and delivered the online preloved book system on time. Looking ahead, I remain committed to continually enhancing and refining the system ensuring its robustness and effectiveness in meeting the needs of users.

## **7.2 Recommendation**

Looking ahead, there are a few ways we can make the online preloved book system even better. When we have enough money and resources, integrating a proper and secure payment system would make buying and selling books easier and safer. Additionally, continuing to refine the NLP chatbot module through ongoing training and development efforts promises to yield more accurate and helpful responses further augmenting customer support capabilities. Furthermore, implementing image detection technology for uploaded book images could ensure the images uploaded is truly book to enhance trust and reliability within the platform. These improvements will make the online preloved book system more reliable and user-friendly, making everyone's experience better.

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# FINAL YEAR PROJECT WEEKLY REPORT

(Project II)

<b>Trimester, Year: T3,Y3</b>	<b>Study week no.: 1</b>
<b>Student Name &amp; ID: Lee Hui Nee 20ACB01408</b>	
<b>Supervisor: Cik Ana Nabilah Binti Sa'uadi</b>	
<b>Project Title: Online Pre-loved / Second-hand Book System</b>	

## 1. WORK DONE

[Please write the details of the work done in the last fortnight.]

Do the timeline of the project and do planning for the project.

## 2. WORK TO BE DONE

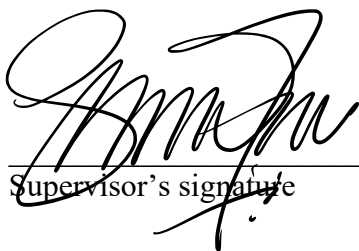
Revise FYP1 report.

## 3. PROBLEMS ENCOUNTERED

No problem encountered.

## 4. SELF EVALUATION OF THE PROGRESS

Project is on scheduled.



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Supervisor's signature



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Student's signature

# FINAL YEAR PROJECT WEEKLY REPORT

(Project II)

<b>Trimester, Year: T3,Y3</b>	<b>Study week no.: 2</b>
<b>Student Name &amp; ID: Lee Hui Nee 20ACB01408</b>	
<b>Supervisor: Cik Ana Nabilah Binti Sa'uadi</b>	
<b>Project Title: Online Pre-loved / Second-hand Book System</b>	

## 1. WORK DONE

[Please write the details of the work done in the last fortnight.]

Had Revised FYP1 report and done the chapter 1 part.

## 2. WORK TO BE DONE

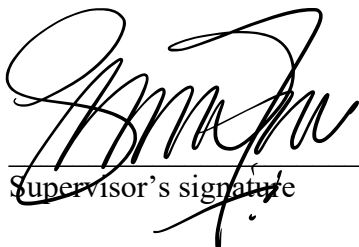
Revise the chapter 2 part and add the NLP.

## 3. PROBLEMS ENCOUNTERED

No problem encountered.


## 4. SELF EVALUATION OF THE PROGRESS

Project is on scheduled.



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Supervisor's signature



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Student's signature



# FINAL YEAR PROJECT WEEKLY REPORT

(Project II)

<b>Trimester, Year: T3,Y3</b>	<b>Study week no.: 4</b>
<b>Student Name &amp; ID: Lee Hui Nee 20ACB01408</b>	
<b>Supervisor: Cik Ana Nabilah Binti Sa'uadi</b>	
<b>Project Title: Online Pre-loved / Second-hand Book System</b>	

## 1. WORK DONE

[Please write the details of the work done in the last fortnight.]

Done with Chapter 2 literature review.

## 2. WORK TO BE DONE

Do the system design.

## 3. PROBLEMS ENCOUNTERED


No problem encountered.

## 4. SELF EVALUATION OF THE PROGRESS

Project is on scheduled.



Supervisor's signature



Student's signature

# FINAL YEAR PROJECT WEEKLY REPORT

(Project II)

<b>Trimester, Year: T3,Y3</b>	<b>Study week no.: 5</b>
<b>Student Name &amp; ID: Lee Hui Nee 20ACB01408</b>	
<b>Supervisor: Cik Ana Nabilah Binti Sa'uadi</b>	
<b>Project Title: Online Pre-loved / Second-hand Book System</b>	

## 1. WORK DONE

[Please write the details of the work done in the last fortnight.]

Completed the system design.

## 2. WORK TO BE DONE


Improve on the system.

## 3. PROBLEMS ENCOUNTERED

No problem encountered.

## 4. SELF EVALUATION OF THE PROGRESS

Project is on scheduled.



Supervisor's signature



Student's signature

# FINAL YEAR PROJECT WEEKLY REPORT

(Project II)

<b>Trimester, Year: T3,Y3</b>	<b>Study week no.: 6</b>
<b>Student Name &amp; ID: Lee Hui Nee 20ACB01408</b>	
<b>Supervisor: Cik Ana Nabilah Binti Sa'uadi</b>	
<b>Project Title: Online Pre-loved / Second-hand Book System</b>	

## 1. WORK DONE

[Please write the details of the work done in the last fortnight.]

Has done the Live Chat system

## 2. WORK TO BE DONE

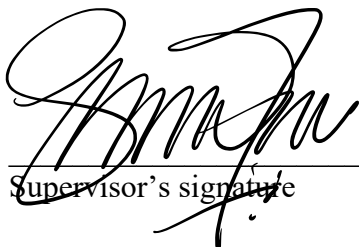
Develop the recommender book list.

## 3. PROBLEMS ENCOUNTERED


No problem encountered.

## 4. SELF EVALUATION OF THE PROGRESS

Project is on scheduled.



Supervisor's signature



Student's signature

# FINAL YEAR PROJECT WEEKLY REPORT

(Project II)

<b>Trimester, Year: T3,Y3</b>	<b>Study week no.: 8</b>
<b>Student Name &amp; ID: Lee Hui Nee 20ACB01408</b>	
<b>Supervisor: Cik Ana Nabilah Binti Sa'uadi</b>	
<b>Project Title: Online Pre-loved / Second-hand Book System</b>	

## 1. WORK DONE

[Please write the details of the work done in the last fortnight.]

Completed the recommender book list.

## 2. WORK TO BE DONE

Continue to develop the buyer module

## 3. PROBLEMS ENCOUNTERED

No problem encountered.

## 4. SELF EVALUATION OF THE PROGRESS

Project is on scheduled.



Supervisor's signature



Student's signature

# FINAL YEAR PROJECT WEEKLY REPORT

(Project II)

<b>Trimester, Year: T3,Y3</b>	<b>Study week no.: 9</b>
<b>Student Name &amp; ID: Lee Hui Nee 20ACB01408</b>	
<b>Supervisor: Cik Ana Nabilah Binti Sa'uadi</b>	
<b>Project Title: Online Pre-loved / Second-hand Book System</b>	

## 1. WORK DONE

[Please write the details of the work done in the last fortnight.]

50% of buyer module done.

## 2. WORK TO BE DONE

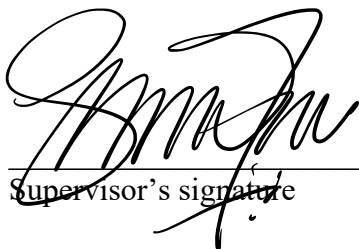
Complete the buyer module,

## 3. PROBLEMS ENCOUNTERED

No problem encountered.

## 4. SELF EVALUATION OF THE PROGRESS

Project is on scheduled.



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Supervisor's signature



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Student's signature

# FINAL YEAR PROJECT WEEKLY REPORT

(Project II)

<b>Trimester, Year: T3,Y3</b>	<b>Study week no.: 9</b>
<b>Student Name &amp; ID: Lee Hui Nee 20ACB01408</b>	
<b>Supervisor: Cik Ana Nabilah Binti Sa'uadi</b>	
<b>Project Title: Online Pre-loved / Second-hand Book System</b>	

## 1. WORK DONE

[Please write the details of the work done in the last fortnight.]

Completed the buyer module.

## 2. WORK TO BE DONE

Do the Chatbot with NLP.

## 3. PROBLEMS ENCOUNTERED

No problem encountered.

## 4. SELF EVALUATION OF THE PROGRESS

Project is on scheduled.



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Supervisor's signature



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Student's signature

# FINAL YEAR PROJECT WEEKLY REPORT

(Project II)

<b>Trimester, Year: T3,Y3</b>	<b>Study week no.: 10</b>
<b>Student Name &amp; ID: Lee Hui Nee 20ACB01408</b>	
<b>Supervisor: Cik Ana Nabilah Binti Sa'uadi</b>	
<b>Project Title: Online Pre-loved / Second-hand Book System</b>	

## 1. WORK DONE

[Please write the details of the work done in the last fortnight.]

Chatbot for book recommendation has been done.

## 2. WORK TO BE DONE

Need to retrieve the response of chatbot to the online preloved book application.

## 3. PROBLEMS ENCOUNTERED

No problem encountered.


## 4. SELF EVALUATION OF THE PROGRESS

Project is on scheduled.



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Supervisor's signature



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Student's signature

# FINAL YEAR PROJECT WEEKLY REPORT

(Project II)

<b>Trimester, Year: T3,Y3</b>	<b>Study week no.: 11</b>
<b>Student Name &amp; ID: Lee Hui Nee 20ACB01408</b>	
<b>Supervisor: Cik Ana Nabilah Binti Sa'uadi</b>	
<b>Project Title: Online Pre-loved / Second-hand Book System</b>	

## 1. WORK DONE

[Please write the details of the work done in the last fortnight.]

Has implemented chatbot in the application.

## 2. WORK TO BE DONE

Do the wireframe.

## 3. PROBLEMS ENCOUNTERED

No problem encountered.

## 4. SELF EVALUATION OF THE PROGRESS

Project is on scheduled.



Supervisor's signature



Student's signature



# FINAL YEAR PROJECT WEEKLY REPORT

(Project II)

<b>Trimester, Year: T3,Y3</b>	<b>Study week no.: 12</b>
<b>Student Name &amp; ID: Lee Hui Nee 20ACB01408</b>	
<b>Supervisor: Cik Ana Nabilah Binti Sa'uadi</b>	
<b>Project Title: Online Pre-loved / Second-hand Book System</b>	

## 1. WORK DONE

[Please write the details of the work done in the last fortnight.]

Has done the wireframe.

## 2. WORK TO BE DONE

Develop the payment system.  
Develop order tracking system.

## 3. PROBLEMS ENCOUNTERED

No problem encountered.

## 4. SELF EVALUATION OF THE PROGRESS

Project is on scheduled.



Supervisor's signature



Student's signature

# FINAL YEAR PROJECT WEEKLY REPORT

(Project II)

<b>Trimester, Year: T3,Y3</b>	<b>Study week no.: 13</b>
<b>Student Name &amp; ID: Lee Hui Nee 20ACB01408</b>	
<b>Supervisor: Cik Ana Nabilah Binti Sa'uadi</b>	
<b>Project Title: Online Pre-loved / Second-hand Book System</b>	

## 1. WORK DONE

[Please write the details of the work done in the last fortnight.]

Done payment system.  
Done order tracking system.  
Done with report.

## 2. WORK TO BE DONE

Prepare for presentation.

## 3. PROBLEMS ENCOUNTERED

No problem encountered.

## 4. SELF EVALUATION OF THE PROGRESS

Need to improve skill in developing application.



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Supervisor's signature



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Student's signature

# POSTER



UNIVERSITI TUNKU ABDUL RAHMAN  
FACULTY OF INFORMATION COMMUNICATION AND TECHNOLOGY  
Prepared by : Lee Hui Nee x Supervisor: Ana Nabilah Binti Sa'udo  
BACHELOR OF COMPUTER SCIENCE (HONOURS)

## TITLE: ONLINE PRE-LOVED / SECOND-HAND BOOK SYSTEM

### ABSTRACT

Introducing an online pre-loved / second-hand book application to **benefit book lovers**. This application allows book lovers to sell their preloved book and buy books at a cheaper price. Besides, it also asve the Earth by recycling the preloved book to someone who is interested instead of wasted.

### PROJECT OBJECTIVES

- To develop an online preloved book system that is built as a mobile application
- To provide Live chat feature to enable direct communication between seller and user
- To develop book recommender chatbot to recommend books based on user preference
- To provide order tracking system

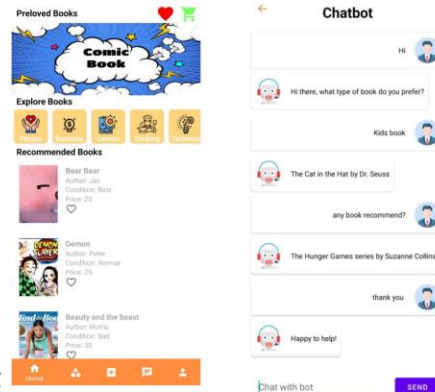
### PROPOSED METHOD



The processes of SDLC have broken down into several stages which are Requirement analysis, Defining, Designing, Coding, Testing and Deployment.

### RESULT & DISCUSSION

The application provides several features to book lovers. These features improved user engagement, satisfaction, and efficiency.



### SOFTWARE / TOOLS



### CONCLUSION

The online preloved book system serves its purpose of benefiting book lovers by providing several features to enhance the online preloved book system.

### FUTURE RECOMMENDATION

The application will be improved by adding payment gateway and ,book image detection .

## PLAGIARISM CHECK RESULT

### Online Pre-loved / Second-hand Book System

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5%

SIMILARITY INDEX

2%

INTERNET SOURCES

0%

PUBLICATIONS

4%

STUDENT PAPERS

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<b>Form Title : Supervisor's Comments on Originality Report Generated by Turnitin for Submission of Final Year Project Report (for Undergraduate Programmes)</b>			
Form Number: FM-IAD-005	Rev No.: 0	Effective Date: 01/10/2013	Page No.: 1 of 1



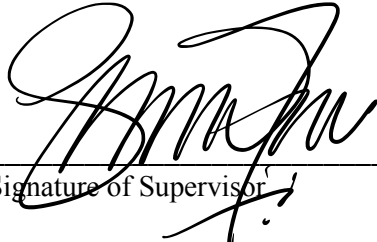
**FACULTY OF INFORMATION AND COMMUNICATION TECHNOLOGY**

<b>Full Name(s) of Candidate(s)</b>	Lee Hui Nee
<b>ID Number(s)</b>	2001408
<b>Programme / Course</b>	CS
<b>Title of Final Year Project</b>	Online Pre-loved / Second-hand Book System

<b>Similarity</b>	<b>Supervisor's Comments (Compulsory if parameters of originality exceeds the limits approved by UTAR)</b>
<b>Overall similarity index: <u>5</u> %</b>  <b>Similarity by source</b> Internet Sources: <u>2</u> % Publications: <u>0</u> % Student Papers: <u>4</u> %	
<b>Number of individual sources listed of more than 3% similarity: <u>1</u></b>	Related to formatting issue under UTAR
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Note Supervisor/Candidate(s) is/are required to provide softcopy of full set of the originality report to Faculty/Institute

***Based on the above results, I hereby declare that I am satisfied with the originality of the Final Year Project Report submitted by my student(s) as named above.***

  
 \_\_\_\_\_  
 Signature of Supervisor  
 Name: Ana Nabilah Binti Sa'udi  
 Date: 26/04/2024

\_\_\_\_\_  
 Signature of Co-Supervisor  
 Name: \_\_\_\_\_  
 Date: \_\_\_\_\_





**UNIVERSITI TUNKU ABDUL RAHMAN**

**FACULTY OF INFORMATION & COMMUNICATION TECHNOLOGY  
(KAMPAR CAMPUS)**

**CHECKLIST FOR FYP2 THESIS SUBMISSION**

Student Id	20ACB01408
Student Name	Lee Hui Nee
Supervisor Name	Cik Ana Nabilah Binti Sa'uadi

<b>TICK (✓)</b>	<b>DOCUMENT ITEMS</b>
	Your report must include all the items below. Put a tick on the left column after you have checked your report with respect to the corresponding item.
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✓	I agree 5 marks will be deducted due to incorrect format, declare wrongly the ticked of these items, and/or any dispute happening for these items in this report.

\*Include this form (checklist) in the thesis (Bind together as the last page)

I, the author, have checked and confirmed all the items listed in the table are included in my report.

(Signature of Student)

Date: 25/04/2024