

# BOOK STORE MANAGEMENT SYSTEM

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Faculty of Computing and Informatics

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## ABSTRACT

This report details the comprehensive development process of a web-based Book Store Management System, created as our final year project to enhance operational efficiency in traditional bookstores. The system automates key functions such as inventory management, sales processing, and data analytics. Core features include CRUD operations for book records, real-time stock tracking, barcode scanning, and analytical reporting on sales trends and customer behavior. Both software and hardware components are incorporated and will be discussed in detail throughout the report. The document outlines the project objectives, target users, scope, system features, and testing results. Through effective teamwork, research, and continuous refinement, the project has achieved its intended goals. Additionally, the report covers the system's architecture, data flow diagrams, interface previews, and testing procedures, providing a complete view of the development process and areas for future improvement. Overall, this project showcases the practical application of IT knowledge and skills acquired during our diploma studies.

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*Part I:*

*Introduction*

## 1.1 Overview

In the contemporary digital age, the swift expansion of online businesses and e-commerce platforms has greatly altered the way individuals buy products, including books. We see the inconvenience of the traditional common bookstore system. Hence, we wish to implement a web-based Book Store Management System corresponds with the modern tendencies currently by offering users an effective platform to provide an inventory management, customer self-services, sales tracking, and data reporting to enhance efficiency and profitability.

This project is designed to meet the needs of both customers and administrators. It enables the user to view book collections available in the bookstore, grasp the best-selling books recently, and making payments, while administrators can efficiently manage all books available through ISBN, track books inventory, and views the sales reports and detailed information for making informed decisions in the future. A membership feature implemented for customers to join to get discounts and free gifts if they spend up to a certain amount, and for the bookstore owner to grasp the opportunity for stock clearance.

The system is developed using modern web technologies such as JavaScript XML (React.js) and CSS for the frontend, while Node.js for handling the backend logic. APIs are utilized to facilitate smooth interaction between components, and Google Cloud is employed to manage and store data efficiently. The GitHub platform is chosen for version management and team cooperation during the development workflow.

Overall, this project offered a valuable and real-world application of the skills learned during university by combining the core concepts of web programming and database administration.

## 1.2 Project Objectives

Our project objectives including,

1. To develop a common system that allows both administrator and user to easily perform various operations implemented in the bookstore management system website respectively.

*A system that can be used by both users and administrators is more cost-saving due to less output devices is required in the bookstore. Administrator operations such as tracking, updating, and managing book stock, and the filter features which implemented in the system streamlined the bookstore management by providing accurate inventory records. A user-friendly purchasing system is implemented to convenient customers' purchases. A search engine is employed in the system for customers to search the available book items. Besides, a self-service payment service is provided for customers to make purchases self-service.*

2. To enhance the efficiency and ability of store owners to make the right decisions through the sales report in the admin panel, which results in higher profits.

*Detailed sales and inventory reports are presented on the administrators' side (store owners). Financial performance, customer preferences, and market trends are included in the reports. This helps those who are entitled to make informed decisions and increase business profitability by viewing the sales report and visualized graph.*

3. To reduce time spent on traditional physical payment methods by providing

a user-friendly checkout platform.

*Customers can save time by avoiding long queues through self-checkout through the payment process provided by the system. Clear instructions, multiple secure payment options, and a minimal number of steps that ensure a streamlined checkout process for customers. From the merchant's perspective, the goal of reducing labor costs can be achieved by only hiring customer services to aid customers who encounter problems in the self-checkout process through the system.*

## 1.3 Target Users

### 1. Bookstore Owners and Managers

*Bookstore owners and managers are the primary decision-makers and administrators of the bookstore. The system is designed to help them efficiently manage inventory, sales, and supplier information, while also providing insights into business performance and sales trends. This enables data-driven decision-making and operational optimization.*

### 2. Bookstore Employees

*Employees will interact with the system to streamline daily operations such as book checkouts and stock updates. The system simplifies routine processes by automating book searches, price lookups, and transaction recording, which reduces manual errors and increases productivity. Employees also receive system-generated alerts for low-stock items and pending supplier orders, helping them maintain stock levels proactively.*

### 3. Customers

*The system is designed to enhance the shopping experience by providing accurate inventory information and fast checkout through barcode scanning and secure payment options. Additional features such as loyalty points and personalized recommendations aim to improve customer satisfaction. The system also ensures the security of customer data and protects earned discount points from unauthorized use.*

### 4. Suppliers and Vendors

*Suppliers and vendors are key stakeholders in the bookstore's supply*

*chain. The system facilitates better communication and tracking of purchase orders with suppliers, improving transparency and reducing the chances of miscommunication or delays in restocking. It also supports efficient inventory replenishment and order status monitoring.*

## 1.4 Project Scope

The Book Store Management System is a web-based application designed specifically for in-store use by bookstore administrators, employees, and customers. The system supports key bookstore operations such as inventory tracking, self-service checkout, membership management, and sales reporting. It aims to improve operational efficiency while delivering a smoother, faster customer experience.

Scope of Coverage:

- Area: The system is designed for use within the physical bookstore only. It runs on in-store desktops or kiosks, with no support for mobile or remote access.
- Time: The system is intended to operate during store business hours, providing continuous functionality for bookstore employees and customers throughout the day. All data is stored and updated in real-time, and historical data is retained for reporting and e-receipt.
- Payment: Customers are guided through a simplified self-checkout experience using barcode scanning followed by an online payment process. During checkout, users who are not members are given the option to register for membership before proceeding to payment. If a valid member is identified, applicable discounts are automatically applied.
- Delivery: No delivery or shipping options are supported for customers. All purchases are to be completed physically at the bookstore. While the system helps administrators (bookstore owner and managers) track supplier information and manually manage purchase records.

- Cancellation: Users can cancel payment before final confirmation during the checkout process. However, there is no automated cancellation or refund system after payment is completed. Post-payment issues must be resolved manually by bookstore staff.

System Limitation:

From a hardware standpoint, barcode scanning relies on webcam integration rather than dedicated scanning devices, and the system does not support direct connection to physical receipt printers; all transactions generate an on-screen e-receipt as the sole output. Moreover, the system is limited strictly to on-site usage through bookstore desktops or kiosk computers; there is no mobile or remote accessibility. The system does not support any cash payments, which may pose risks in scenarios where customers prefer or require cash transactions, potentially leading to dissatisfaction or operational limitations during payment.

From a technical perspective, the current Stripe integration is limited to test-mode transactions and does not support live payments, e-wallets, or FPX. Additionally, all supplier-related data, including purchase records and stock updates, must be manually entered by administrators. The system does not support automated supplier communication, which limits operational efficiency.

## 1.5 Gantt Chart 1

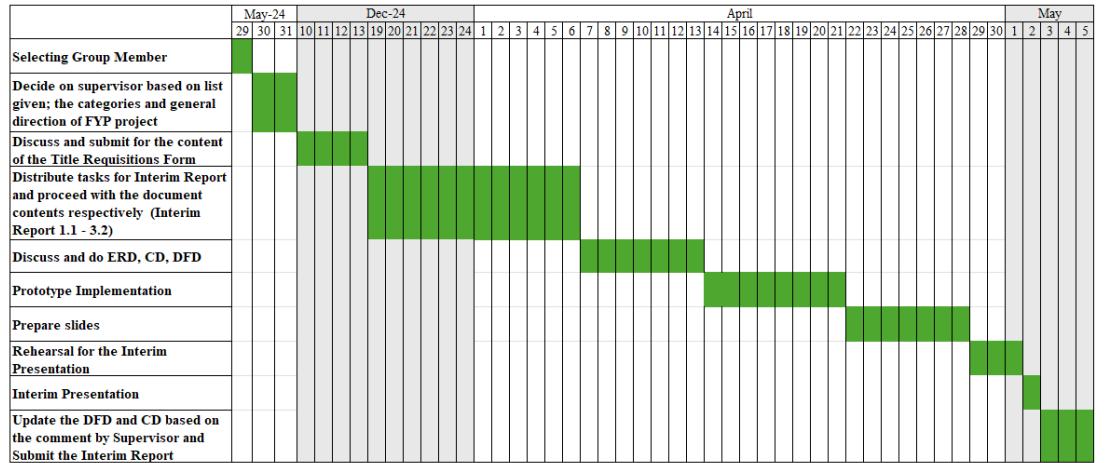


Figure 1.1 FYP Part 1

## 1.6 Gantt Chart 2

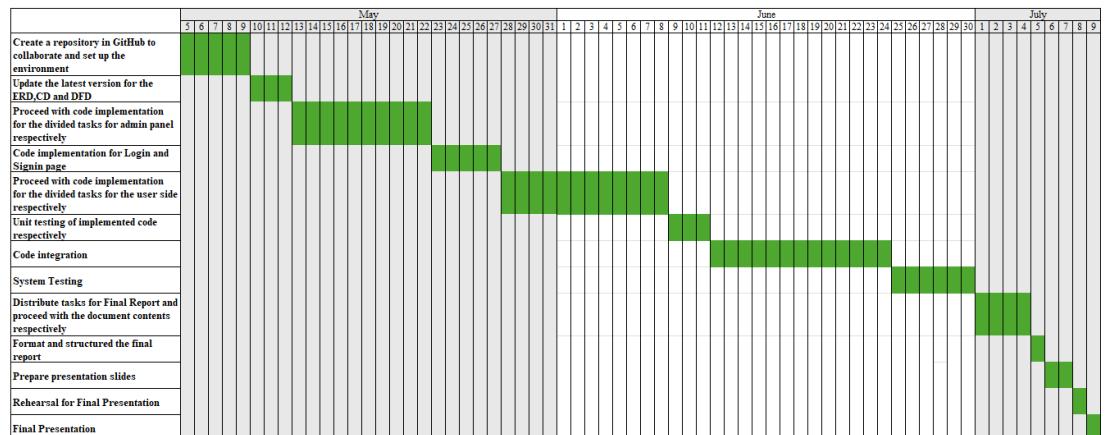


Figure 1.2 FYP Part 2

## 1.7 Division of Work

TASKS	STUDENTS		
	Tan Yin Wun	Ashley Law Jia Ye	Wong Mei Jing
Documentation preparation	X	X	X
Background study	X	X	X
Preparing project proposal	X	X	X
Overview		X	
Objectives		X	
Target Users			X
Project Scope			X
Gantt chart	X	X	
Primary Study		X	
Problem Statements		X	
System Features	X		
Hardware/Software Requirements	X		
Data flow diagram & Context Diagram	X		
Entity relationship diagram	X		
Data dictionary			X
System Interface Design	X	X	X
System Coding & System Testing	X	X	X
Further enhancement	X	X	X
Compilation of Final Report	X	X	X
Presentation and Demo	X	X	X
Setup guidance	X		X
Meeting Minutes		X	

**Table 1.1:** *Division of tasks*

*Part II:*

*Primary Study And*

*Literature Review*

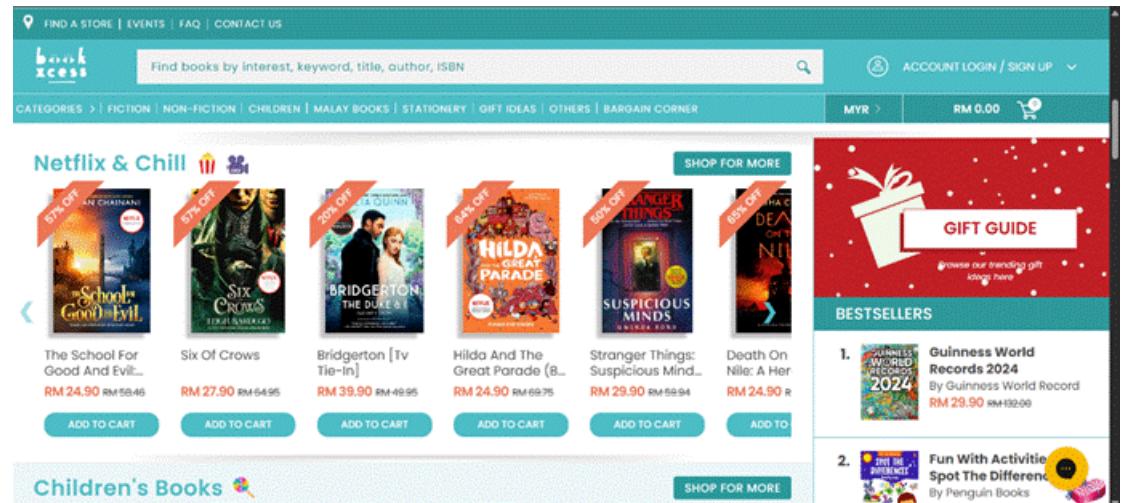
## 2.1 Primary Study

To achieve our goals, we conducted research for two existing/similar systems on the market.

The first existing and similar system is BookXcess Webpage. (<https://www.bookxcess.com/>)

The aspects of design, features and functions of the BookXcess Webpage system include rational visual hierarchy; functional search and filter options; book details page; and perfect checkout process. However, the webpage provides a non-user-friendly navigation; an unsatisfying sign-up page; and an unsuitable color scheme.

### 1. Rational Visual Hierarchy

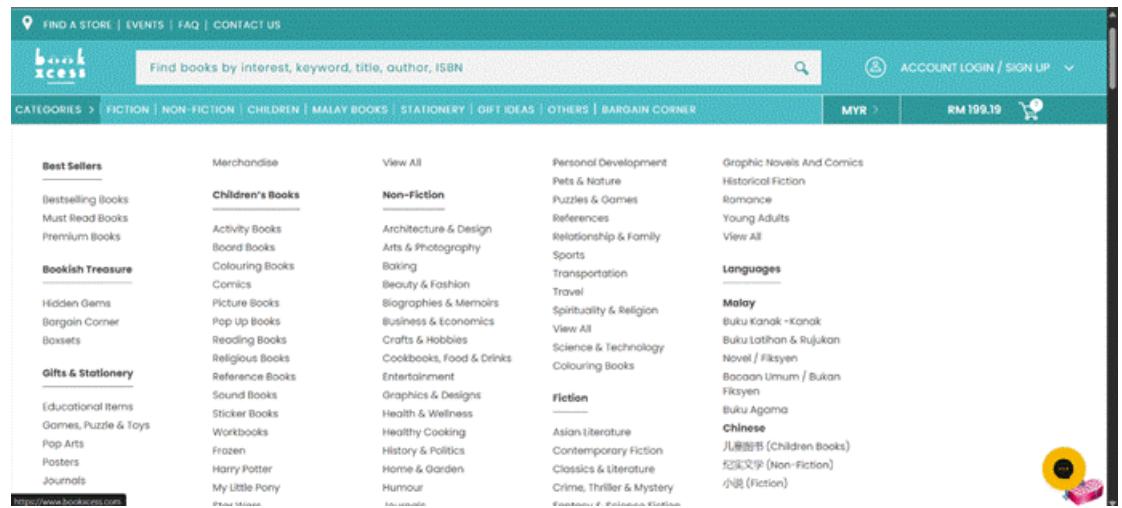


**Figure 2.1.1 BookXcess Main Page**

The BookXcess Webpage provides a well-structured and rational visual hierarchy. Can't deny that this makes the webpage able to be used efficiently by

the customers (user). Important elements like book titles, prices, and "Add to Cart" buttons had be prominently displayed and easy to find on the webpage. Not only that, the book titles of every book available in the webpage is in a larger font to attract attention, while the discounted price is placed below in a smaller font but in a sharp color (orange), and the original price is placed beside and strikethrough.

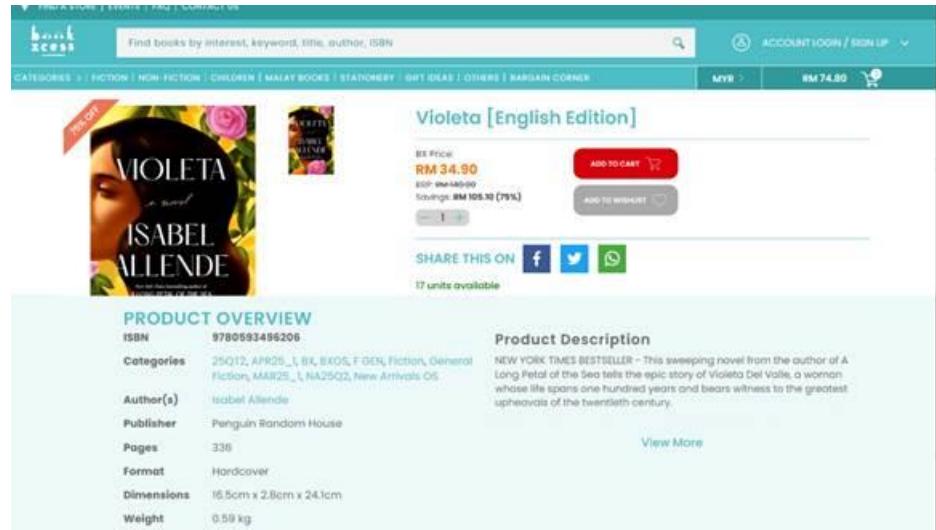
## 2. Functional Search and Filter Options



**Figure 2.1.2 BookXcess Filter Details**

A search bar which is placed at the top of the webpage enhances user experience. The search bar enables users to search the books they want by ISBN, author, or even any keyword and users' interest. A simple filter column is employed under the search bar of the webpage. When the user hovers the keywords in the filter, the details will pop out for the user to select. This makes it easier for customers (user) easier to find what exactly they are looking for and actually encourages them to spend more time on the webpage.

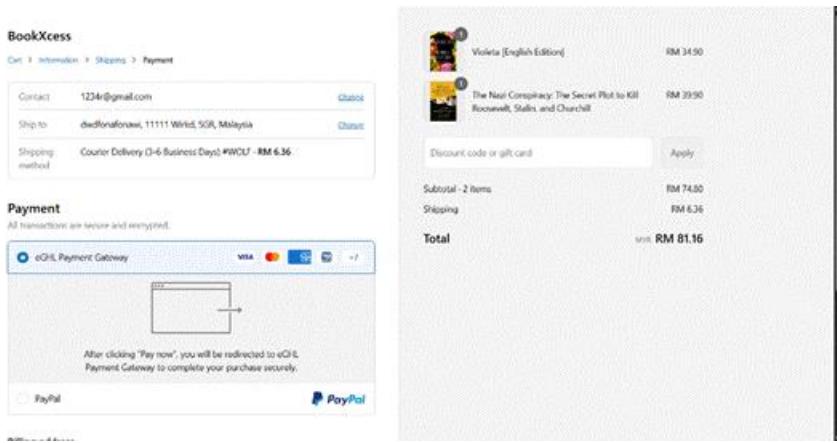
### 3. Book Details Page



**Figure 2.1.3 Book Details Page for BookXcess Webpage**

The book detail page of the webpage provided the book cover picture, and the product overview such as ISBN, categories, authors, publisher etc. is listed at the left-hand side of the webpage, while the product description is placed beside the product overview, making a neat and tidy visualization for user. A zoom-in feature for book covers is implemented for users to examine the details before clicking in and checking the product details.

### 4. Perfect Checkout Process



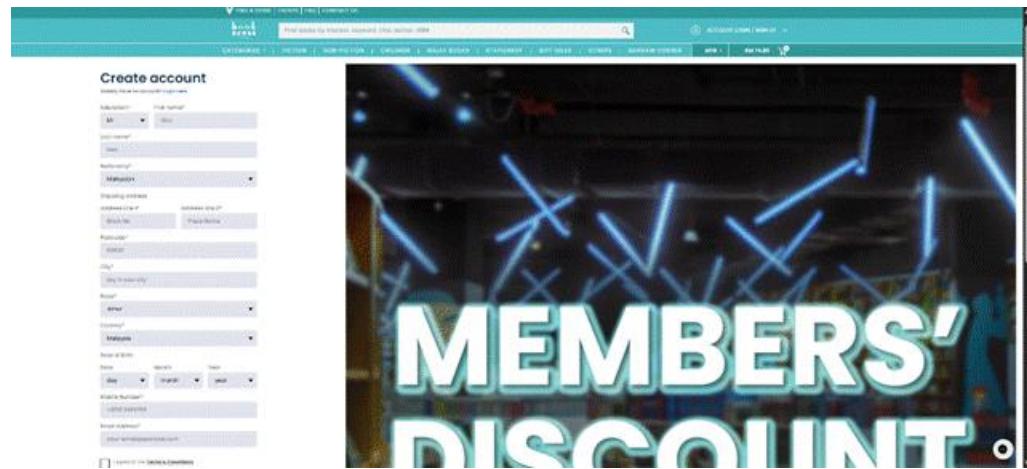
**Figure 2.1.4 BookXcess Payment Page**

The checkout process implemented on the webpage is simple and efficient. The design of the checkout webpage is clear and tidy - left hand side for users to fill-in required information and make payments, while on the right-hand side for users to check their details of the payment. Not only that, the webpage provides multiple payment options, such as credit/debit cards, PayPal, and even TouchnGo E-wallet for users to make their payments.

## 5. Non-User-Friendly Navigation

Although the filter column helps keep the webpage neat and organized, using mouse hovering as the method to activate the filter might lead to usability issues. Users may accidentally trigger the filter or unintentionally interact with other nearby buttons, especially when navigating quickly or using a touchpad. This could disrupt their browsing experience and potentially cause frustration, making the interface feel less intuitive and user-friendly.

## 6. Unsatisfying Sign-Up Page



**Figure 2.1.5 BookXcess Sign-Up Page**

There is not a column for users to create their own password on the sign-up page. However, users are required to log in to the webpage after they sign up, and it requires a password to log in to the webpage. This makes users troublesome to click on the "forgot password" to set their own password. Not only that, the webpage design requires users to scroll up to get the message pop up that account created successfully.

## 7. Unsuitable Color Scheme

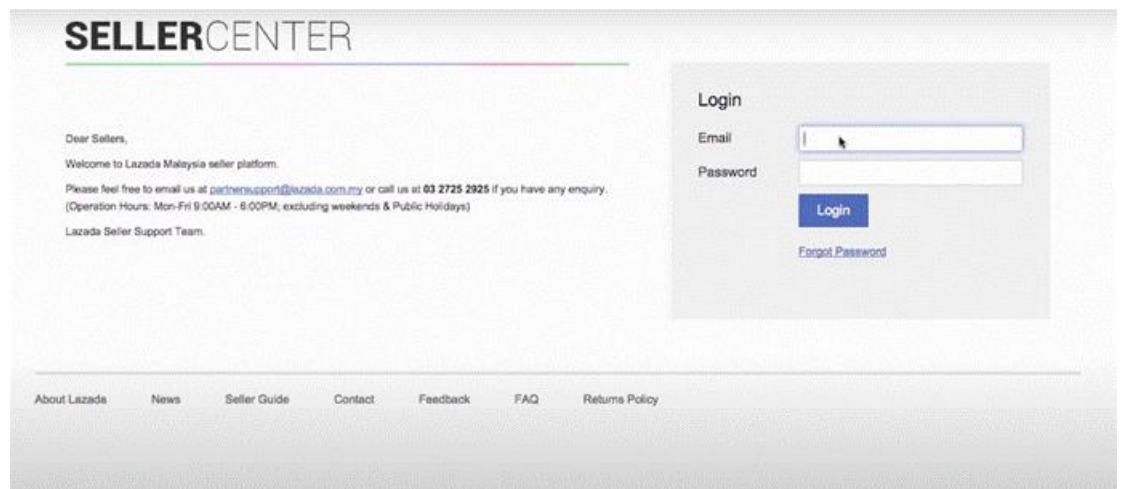
Overall, the BookXcess Webpage could be counted as simple and efficient. However, the webpage uses a color scheme that is not visually appealing, which may affect the overall user experience. The webpages exhibit a neglect for detail in their design, leading to an uncomfortable user experience. Minor discrepancies in layout, spacing, font style, or element alignment might appear trivial on their own, but collectively they will generate a feeling of imbalance or discomfort to the user. This slight absence of refinement can lead users to

unconsciously doubt the professionalism or trustworthiness of the website, even when the main functions are operating as they should.

The second existing and similar system is Lazada Seller Center Webpage. (<https://sellercenter.lazada.com.my/>)

The aspects of design, features and functions of the Lazada Seller Center Webpage system included help center login page; simple dashboard overview; functional inventory management system (manage product, add product, edit product, etc. ); and visualized sales reports. However, the webpage has an overwhelming interface, which causes complex navigation.

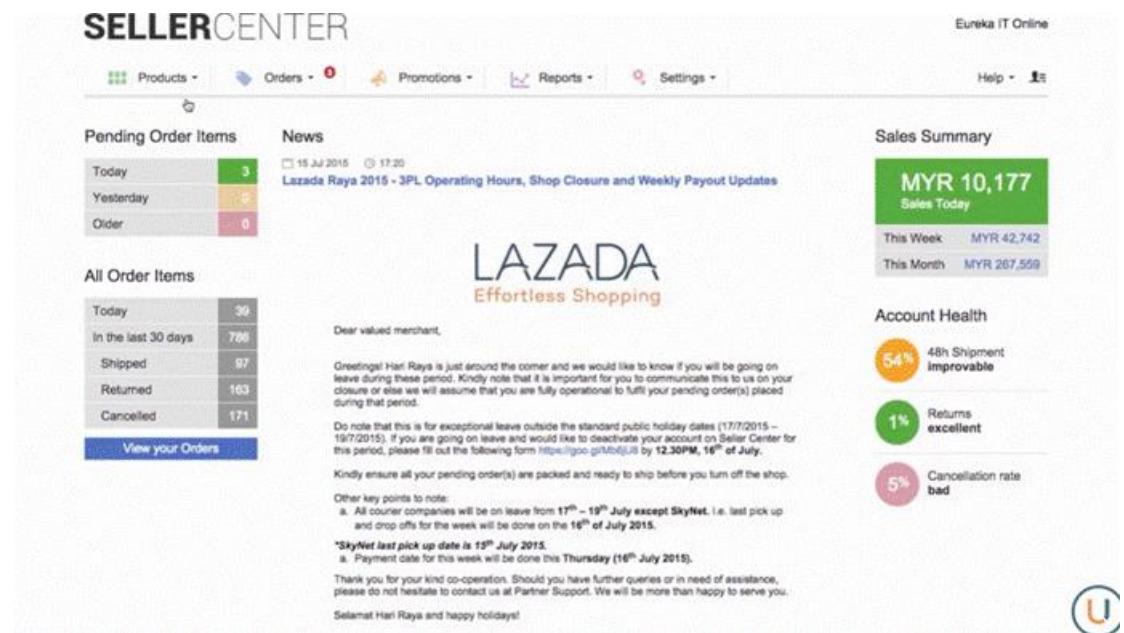
### 1. Help Center Login Page



**Figure 2.1.6 Lazada Seller Center Webpage Login Page**

The login Page of the webpage has a simple and user-friendly UI, which allows users to login through email and password. Additional options such as "Forgot Password" and "Sign Up" convenience the users to access the webpage.

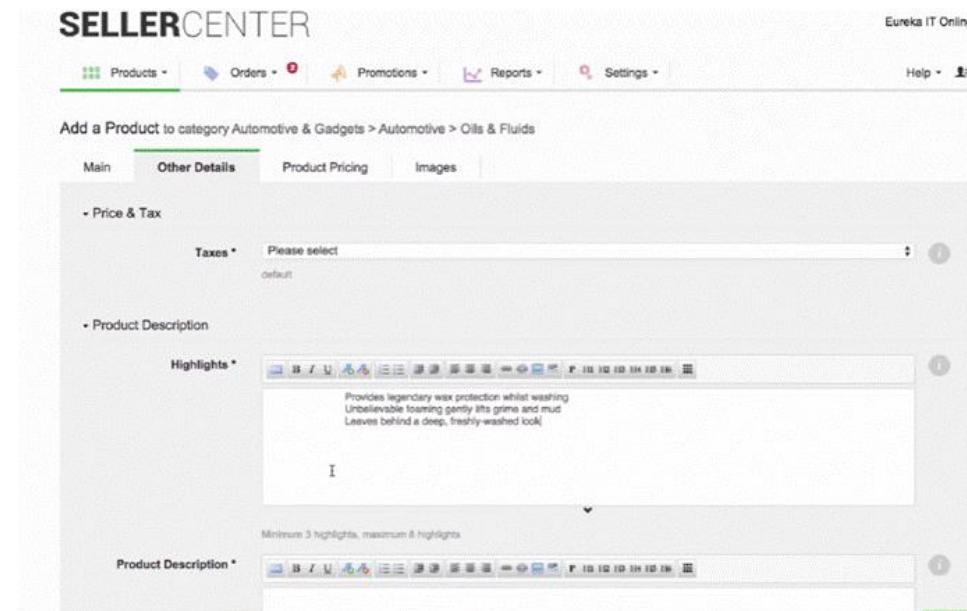
## 2. Simple Dashboard Overview



*Figure 2.1.7 Lazada Seller Center Main Page*

The admin panel on the webpage featured a clean and organized dashboard that provides a quick summary of important metrics. All operations, such as product management, order management, promotions, and sales reports are provided at the top column of the webpage. The left-hand side of the webpage shows the pending order items within three days, and all order items for user (seller). While a sales summary for this week and this month is provided on the right-hand side of the webpage.

## 3. Functional Inventory Management System



**Figure 2.1.8** Lazada Seller Center Add Product Page

Product Overview								Export	+ Add	Home	Logout	Search
Edit	Name	SKU	Created	Price	Sale Price	Available	Visible	Active				
	Apple EarPods Earphones Lightning Cable (Support all iOS) Dual Port Car Charger	Apple 3 in 1 Earpod	17 Jan 2015	99.00	39.00	40	<input checked="" type="checkbox"/>					
	Dell PowerEdge T20 Mini Tower Server for Small & Medium Office (Xeon E3-1225 v3 3.20GHz, 1TB, 4GB, ECC, 7 Pro)	Dell PowerEdge T20 Mini Server	25 Apr 2015	2,999.00	2,499.00	3	<input checked="" type="checkbox"/>					
	Eyatronic K6 Intelligent Mini Robot Vacuum Cleaner with 3 Working Mode	Eyatronic K6	31 Oct 2014	899.00	279.00	2	<input checked="" type="checkbox"/>					
	Kingmax 4GB DDR3L 1600MHz Low Voltage Notebook Memory Ram SO-DIMM	Kingmax 4GB 1600MHz DDR3L SO-DIMM	08 Jul 2015	189.00	125.00	10	<input checked="" type="checkbox"/>					
	Dell 1510X Standard Series DLP Projector (Dual VGA, HDMI, RJ45, XGA, 3500 ANSI Lumens)	Dell Projector 1510X	08 Jul 2015	2,599.00	2,299.00	1	<input checked="" type="checkbox"/>					
	Western Digital WD 500GB 3.5" Caviar Blue Internal SATA Hard Disk Drive (WD5000AAK3)	WD 3.5" 500GB Caviar Blue Internal SATA HDD	18 Jul 2015	199.00	169.00	50	<input checked="" type="checkbox"/>					
	Microsoft Surface Pro 3 Type Cover (Blue)	Microsoft Surface Pro 3 Type Cover - Blue	18 Jul 2015	499.00	409.00	10	<input checked="" type="checkbox"/>					
	Dell S2715H 27" Full HD IPS LED Monitor (Black)	Dell S2715H FHD 27inch IPS LED	18 Jul 2015	1,299.00	1,199.00	10	<input checked="" type="checkbox"/>					
	Dell S2415H 24" IPS Full HD LED Monitor with virtually borderless design and an ultra-wide view	Dell S2415H 24inch IPS FHD LED Monitor	18 Jul 2015	899.00	799.00	10	<input checked="" type="checkbox"/>					
	Western Digital WD 3TB 7200RPM 3.5" SATA III 6Gb/s Cache	WD 3TB 3.5"	30 Jul 2015	499.00	409.00	8						

**Figure 2.1.9** Lazada Seller Center Manage Product Page

A fully functional inventory section allows admin (seller) to easily add, edit, remove product listings, etc. A user-friendly interface is implemented in the webpage for the admin to categorize the products they wish to sell, provide the details of the products, and upload photos of the products through the admin panel.

#### 4. Visualized Sales Reports

The screenshot shows the Lazada Seller Center interface. At the top, there's a navigation bar with links for Products, Orders, Promotions, Reports (which is currently selected), and Settings. Below the navigation bar, a green banner displays a success message: "Your request to generate an export was added successfully and will be processed in a moment. You can check the availability of your requested export." The main content area is titled "Transaction Overview". Underneath, there are two tabs: "Current Statement" (which is active) and "Transaction Overview". The "Transaction Overview" tab displays a table of transactions. The table has columns for Date, Transaction Type, Transaction Number, Order Number, Details, Amount, GST, WHT, and Statement. There are three rows of data in the table:

Date	Transaction Type	Transaction Number	Order Number	Details	Amount	GST	WHT	Statement
24 Aug 2014	Cancellation Fee	MY100XU-13PJ324	309956492	Hp Officejet 8100 Printer Reference: 99840	-39.68			18 Aug 2014 - 24 Aug 2014
24 Aug 2014	Cancellation Fee	MY100XU-1GLMV8E	304664162	Samsung Mlt- D105S Toner Cartn ...	-11.00			18 Aug 2014 - 24 Aug 2014
24 Aug 2014	Cancellation Fee	MY100XU-1XDMBAZ	309662462	Hp Deskjet 1510 All-In-One Reference:	-14.40			18 Aug 2014 - 24 Aug 2014

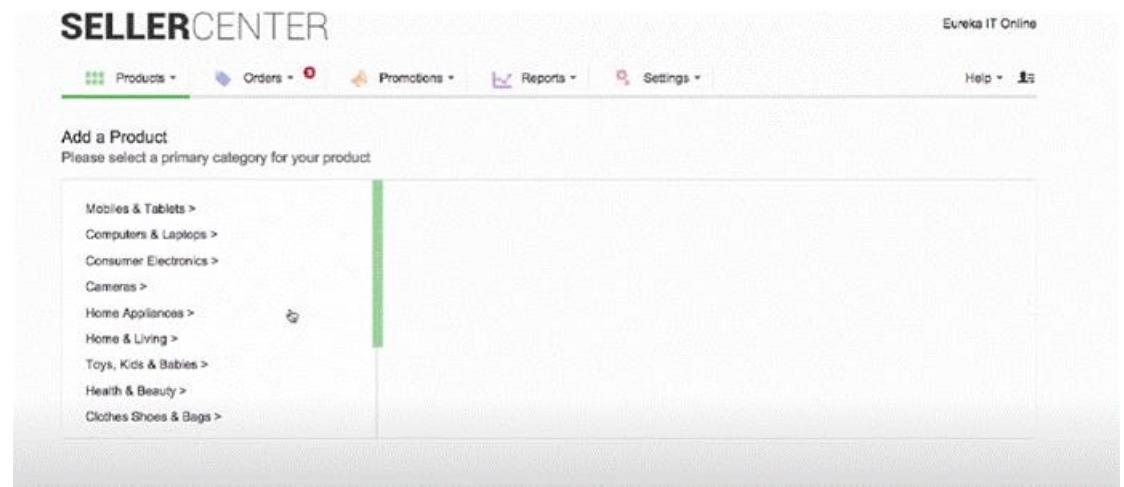
**Figure 2.1.10 Lazada Seller Center Table Form Report Page**



**Figure 2.1.11 Lazada Seller Center Line Graph Report Page**

Visualized Sales Reports are provided for the admin (seller) to make informed decisions, track progress toward goals, and identify opportunities to enhance sales. The sales reports offer users a detailed overview of their store's financial performance over specific time periods. It includes key data such as total sales revenue, number of orders, and sales by category. There are two forms of sales reports implemented on the webpage, firstly is table form, while lastly is line graphs. The table form provides every detail of each sales record. Line graphs make it easy for admin (seller) to analyze trends and compare performance across different days, weeks, or months.

## 5. Overwhelming Interface which Causes Complex Navigation



**Figure 2.1.12** Lazada Seller Center Select Category for Product Page

Although the webpage provides a wide array of tools, the interface can be overwhelming, especially for new sellers. The abundance of features and data can make navigation cumbersome, leading to a steep learning curve. For instance, the webpage requires admin (seller) to select categories of each product they wish to sell starting from the most general to the most specific, which may be confusing especially for new users. This process is also inconvenient, as it requires multiple clicks to reach the appropriate tag and category of the product.

## 2.2 Problem Statement

### **Objective:**

To develop a common system that allows both administrator and user to easily perform various operations implemented in the bookstore management system website respectively.

### **Problem Statement:**

- We have found that most merchants in the bookselling industry have chosen to keep their user pages and admin panels separately and use different devices to support them. Due to this phenomenon, we came up with the idea of developing a Bookstore Management System Webpages that supports both administrator and user functions for reducing outputs required, leading to costs-saving indirectly. We aim to provide an easy-to-use interface with implementing a rational visual hierarchy, a functional search and filter options, and a simple checkout process for better customers experience. To achieve this, we decided to implement user-friendly navigation, and carefully choose the color scheme used in the system webpage.
- Managing a bookstore involves handling multiple processes such as inventory tracking, customer service, supplier coordination, and sales management. Traditional methods like manual recording-keeping or outdated software are time-consuming, prone to errors, and lacks scalability. Therefore, we plan to implement an underwhelming interface admin panel which includes a functional management system for books management to avoid complex navigation.

**Objective:**

To enhance the efficiency and ability of store owners to make the right decisions through the sales report in the admin panel, which results in higher profits.

**Problem Statement:**

- The absence of an integrated system leads to difficulty in tracking book stock and sales trends, inefficient customer service and checkout processes, and a lack of data insights for informed decision-making. To overcome stated issues, a real-time sales report and visualized graph will be provided in the admin panel. Those who are entitled are able to view the yearly book sales to grasp the market trends and make informed decisions, resulting in higher profits.
- A membership mechanism would encourage consumers to consume while also allowing store owners to set up a series of free gifts. This is a win-win mechanism, where store owners can achieve the goal of clearing inventory based on the market trends through gifts, while gaining customer favor and increasing customer return visits and purchase rates.

**Objective:**

To reduce time spent on traditional physical payment methods by providing a user-friendly checkout platform.

**Problem Statement:**

- We found that self-service machines are still not very common in the bookselling industry in Malaysia. Therefore, we hope to develop the relevant market and lead the bookselling industry to keep pace with the times. A user-friendly checkout platform will be employed with the aim of avoiding long queues for customers' pay processes.
- From the merchant's perspective, the goal of reducing labor costs is able to be achieved through the system. This is due to, compared with traditional cashiers, merchants can only hire customer services to aid customers who encounter problems in the self-checkout process.

*Part III:*

*System Design*

### 3.1 System Features

#### Admin

- Can sign in and log in using ID and password.
- Can manage books by add, edit or delete books.
- Can display all the book's info on the table.
- Can add or delete genre and book type.
- Can search the books by name and filter the books with genre (e.g., Science, Fiction, Mystery, Biography) or type of book (e.g., Novel, Magazine, Comic).
- Can filter books with low stock or without genre or book type.
- Can display the admin profile that includes all the information of the staff.
- Can check the sales report of the books every year and include a graph.
- Can update the purchase records from the publisher to add the stock of books.
- Can manage membership by editing or deleting members.
- Can search for members by name.
- Login with a specific ID and password will switch to user site for user to use.

#### User

- Act as a POS system and self-service autopay machine in the physical bookstore for user to search for books and pay the bill after buying books from the bookstore.
- Need a safe key to logout because only staff that know the safe key can logout from the user page.
- Can add, edit or delete membership from member portal.
- Main page for user to choose either search or pay.
- Choosing search will display all the books with book cover image, name and price and sort by sales.

- Can search the books that wanted to buy and can filter the books by genre or type like admin.
- After searching can click on the book to check for the details of the book.
- Can add, edit or delete rating and comment.
- Choosing pay enables to scan the barcode of the book and add to cart.
- After clicking the pay button, it will ask if the user is a member and search the member by ID and direct to the payment gateway.
- After paying, the sales record updated and will generate e-receipt for user and back to main page.
- Can redeem a free gift if spend a specific amount of money in the bookstore.

## 3.2 Hardware/Software Requirements

### 3.2.1 For Developer

Hardware:

Item	Description	Source	Price
Laptop / PC	Development machine with sufficient specs	Already owned	Varies (~RM2000+)
Webcam	Act as barcode scanner for testing	Already owned	RM50 – RM200

**Table 3.2.1.1: Hardware requirements for developer**

Software:

Item	Description	Source	Price
Node.js	Backend JavaScript runtime	<a href="https://nodejs.org">nodejs.org</a>	Free
Express.js	Web application framework	via npm install express	Free
React.js	Frontend framework	via npx create-react-app	Free
MySQL	Local database testing	<a href="https://mysql.com">mysql.com</a>	Free
Google Cloud Platform (GCP)	Cloud service provider for database hosting	<a href="https://cloud.google.com">cloud.google.com</a>	Free Tier / Pay-as-you-go
Google Cloud SQL	Managed cloud-based MySQL database service	Part of GCP	Free Trial 90 days
Visual Studio Code	Integrated development environment (IDE)	<a href="https://code.visualstudio.com">code.visualstudio.com</a>	Free
GitHub	Team collaboration tool	<a href="https://github.com">github.com</a>	Free
Postman	API testing tool	<a href="https://postman.com">postman.com</a>	Free
Bootstrap / CSS	UI styling frameworks	via CDN / npm	Free

**Table 3.2.1.2: Software requirements for developer**

### 3.2.2 For User

Hardware:

Item	Description	Source	Price
Desktop / Laptop / In-store Touchscreen Computer	To access the bookstore user system in-store	Shopee, Lazada, HP Store, Dell	RM1500 – RM3500
Barcode Scanner	For scanning books into cart	Shopee, Lazada	RM80 – RM300
Receipt Printer	To print e-receipts	Shopee, Canon, HP, Epson	RM150 – RM600

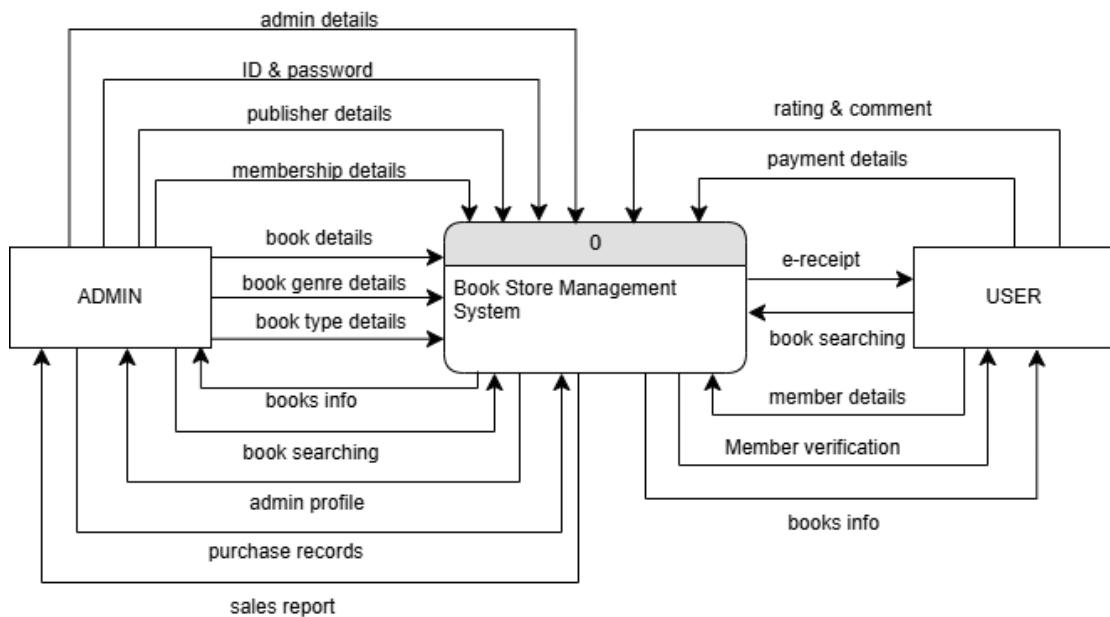
**Table 3.2.2.1: Hardware requirements for user**

Software:

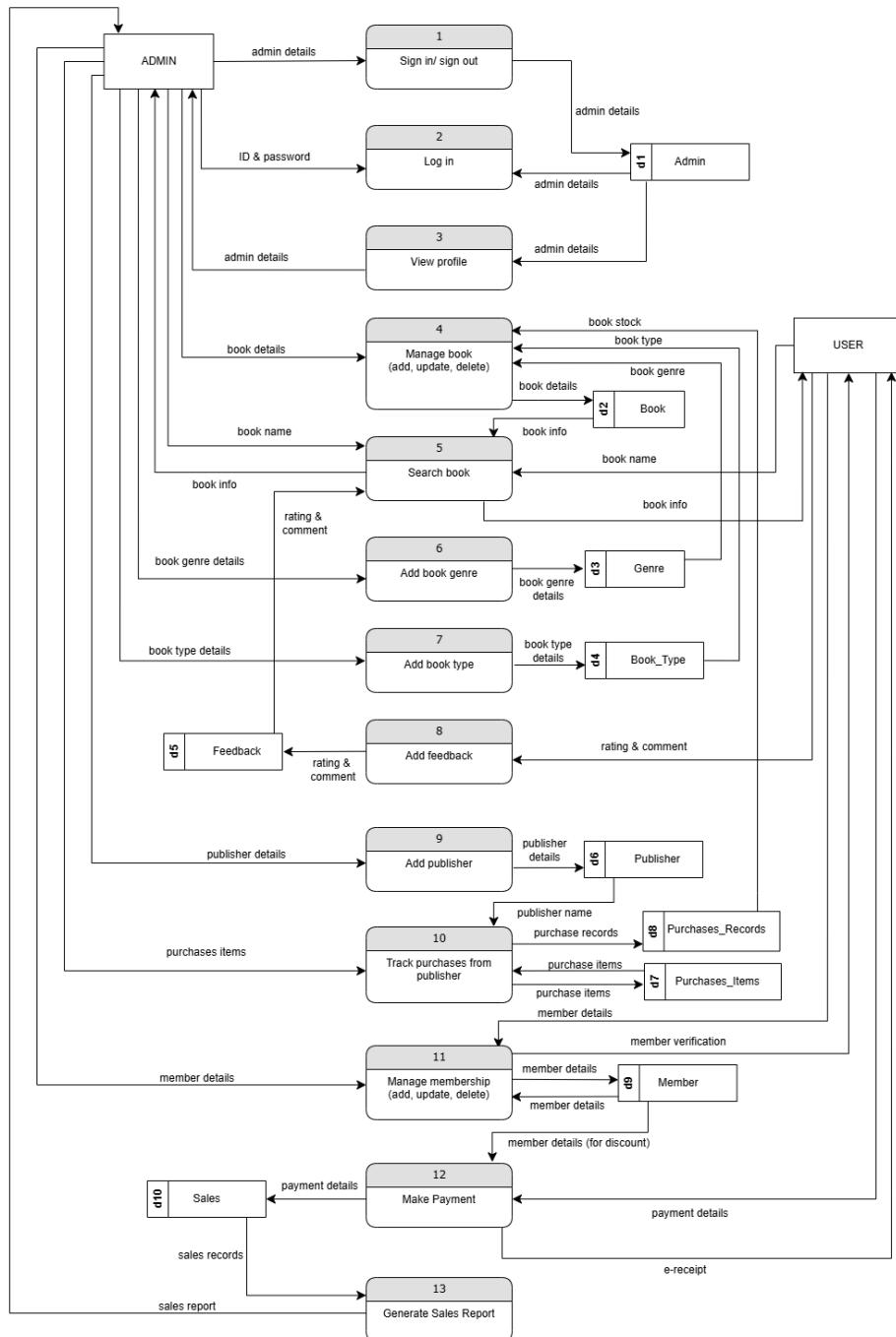
Item	Description	Source	Price
Web Browser (Chrome, Firefox, etc.)	To run the system frontend	Pre-installed	Free
Online Banking Access / Credit or Debit Card	For payment via Stripe integration (FPX / Mastercard)	Provided by user's bank / card issuer	Varies

**Table 3.2.2.2: Software requirements for user**

### 3.3 Context Diagram & Data Flow Diagram



**Figure 3.3.1** Context Diagram

**Figure 3.3.2 Data Flow Diagram**

### 3.4 Entity Relationship Diagram

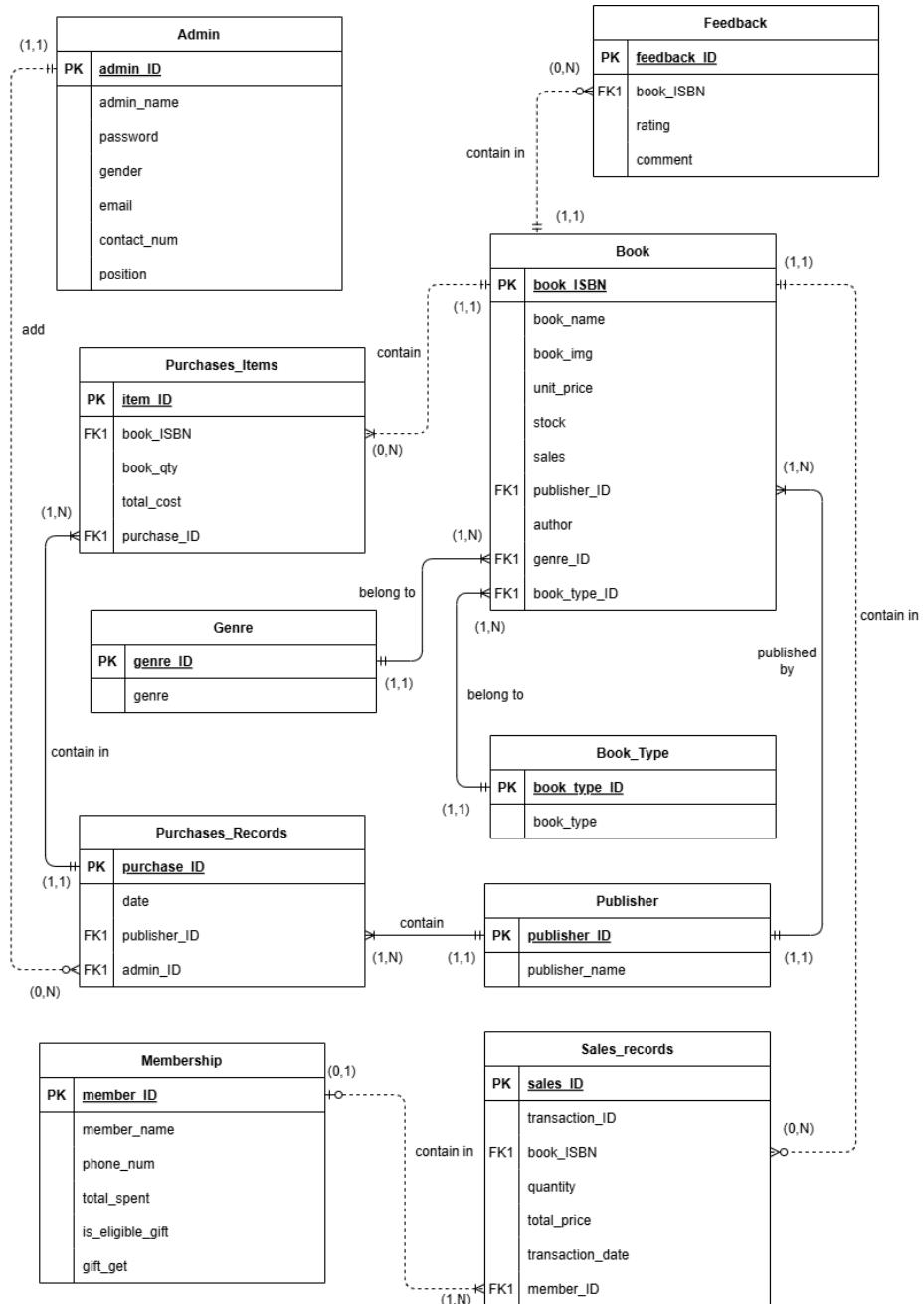


Figure 3.4.1 Entity Relationship Diagram

## 3.5 Data Dictionary

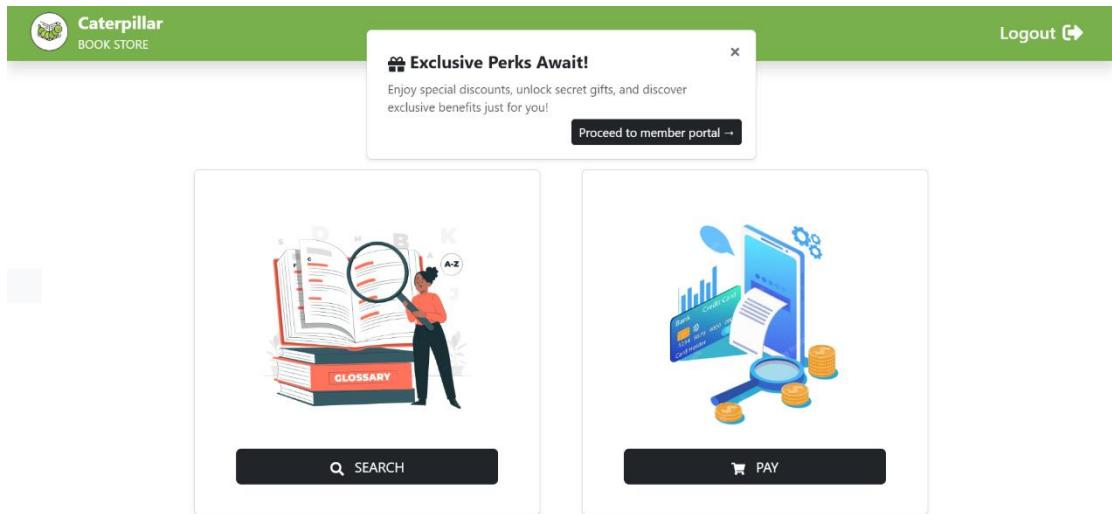
Table Name	Attribute Name	Contents	Type	Format	Required	PK or FK	FK reference Table
ADMIN	admin_ID admin_name password gender email contact_num position	Admin Identification Admin name Admin password Admin gender Admin email Contact Number Position	AutoNumber VChar(30) Vchar(30) Vchar(6) Vchar(50) Vchar(50) Vchar(30)	9 XXXXXXXX Y XXXXXXXX Y Male/Female Y XXXXX@x.xx Y XXXXXXXXXX Y XXXXXXXXXX Y	Y Y Y Y Y Y Y	PK	
BOOK	book_ISBN book_name book_img unit_price stock sales publisher_ID author genre_ID book_type_ID	Book ISBN Book Name Book Image Unit Price Stock Sales Publisher Identification Author Genre Identification Book Type Identification	Vchar(20) Vchar(100) Vchar(255) Decimal(10,2) Int(5) Int(5) AutoNumber Vchar(50) AutoNumber AutoNumber	XXXXXXXXXX XXXXXXXXXX URL Path 9999.99 99999 99999 9 XXXXXXXXXX 9 9	Y Y Y Y Y Y Y Y Y	PK FK FK FK	PUBLISHER GENRE BOOK_TYPE
PURCHASES_RECORDS	purchase_ID date publisher_ID admin_ID	Purchase Identification Date Publisher Identification Admin Identification	AutoNumber Date AutoNumber AutoNumber	9 YYYY-MM-DD 9 9	Y Y Y Y	PK FK FK	PUBLISHER ADMIN
PURCHASES_ITEMS	item_ID book_ISBN book_qty total_cost purchase_ID	Item Identification Book ISBN Book Quality Total Cost Purchase Identification	AutoNumber Vchar(20) Int(4) Decimal(10,2) AutoNumber	9 XXXXXXXXXX 9999 9999.99 9	Y Y Y Y	PK FK FK	BOOK PURCHASES_RECORDS
MEMBERSHIP	member_ID member_name phone_num total_spent is_eligible_gift gift_get	Member Identification Member Name Phone Number Total Spend Is Eligibility for Gift Gift Get	AutoNumber Vchar(50) Int(10) Decimal(10,2) Boolean Vchar(50)	9 XXXXXXXXXX 9999999999 99999.99 Y/N XXXXXXXXXX	Y Y Y Y Y Y	PK	
SALES_RECORDS	transaction_ID book_ISBN quantity total_price transaction_date member_ID	Transaction Identification Book ISBN Quantity Total Price Transaction Date Member Identification	AutoNumber Vchar(20) Int(4) Decimal(10,2) Date AutoNumber	9 XXXXXXXXXX 9999 9999.99 YYYY-MM-DD 9	Y Y Y Y N	PK FK FK	BOOK MEMBERSHIP
PUBLISHER	publisher_ID publisher_name	Publisher Identification Publisher Name	AutoNumber VChar(100)	9 XXXXXXXXXX	Y Y	PK	
FEEDBACK	Feedback_ID Book_ISBN rating comment	Feedback Identification Book ISBN Rating Comment	AutoNumber Vchar(20) Int(5) Vchar(100)	9 XXXXXXXXXX 9999 XXXXXXXXXX	Y Y Y Y	PK FK	BOOK
GENRE	genre_ID genre	Genre Identification Genre	AutoNumber Vchar(20)	9 XXXXXXXXXX	Y Y	PK	
BOOK_TYPE	book_type_ID book_type	Book Type Identification Book Type	AutoNumber Vchar(20)	9 XXXXXXXXXX	Y Y	PK	

**Figure 3.5.1 Data Dictionary**

*Part IV:*

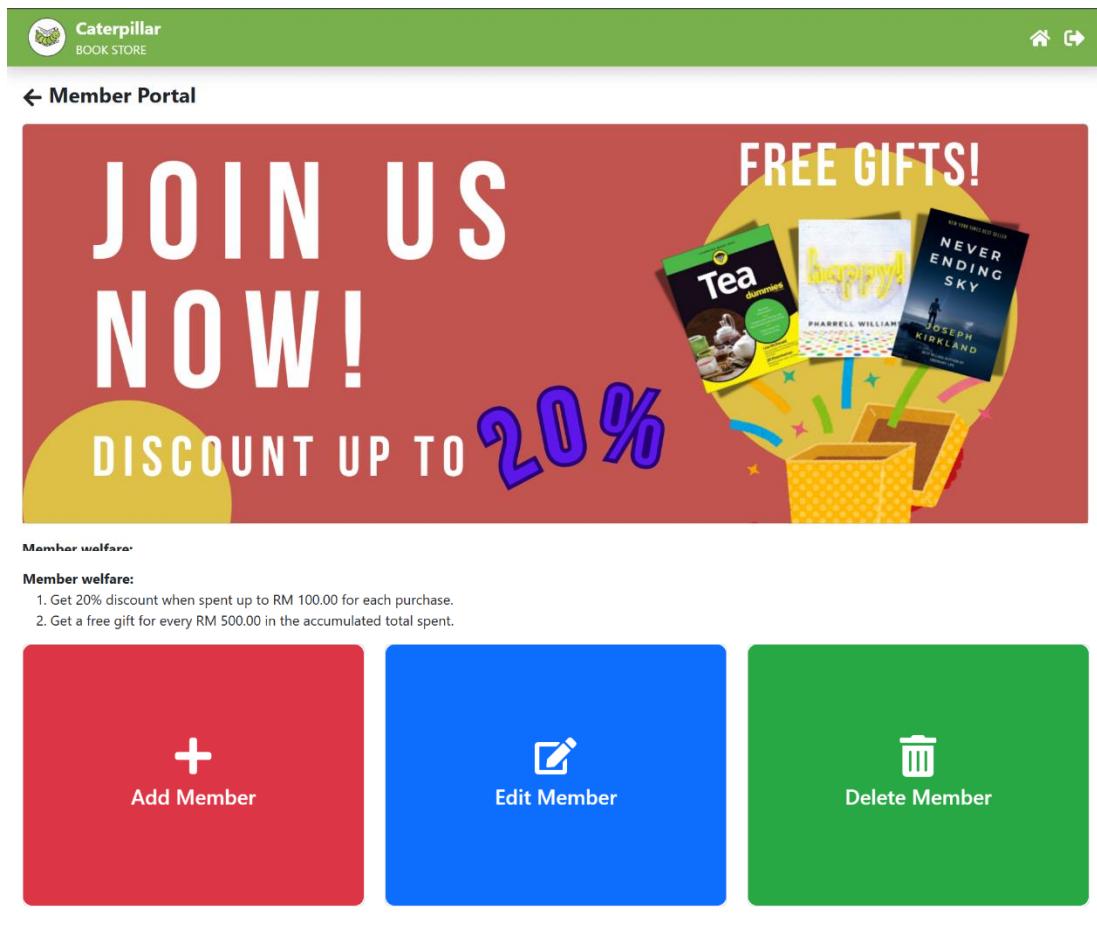
*System Previews*

## 4.1 Customer/Member Module



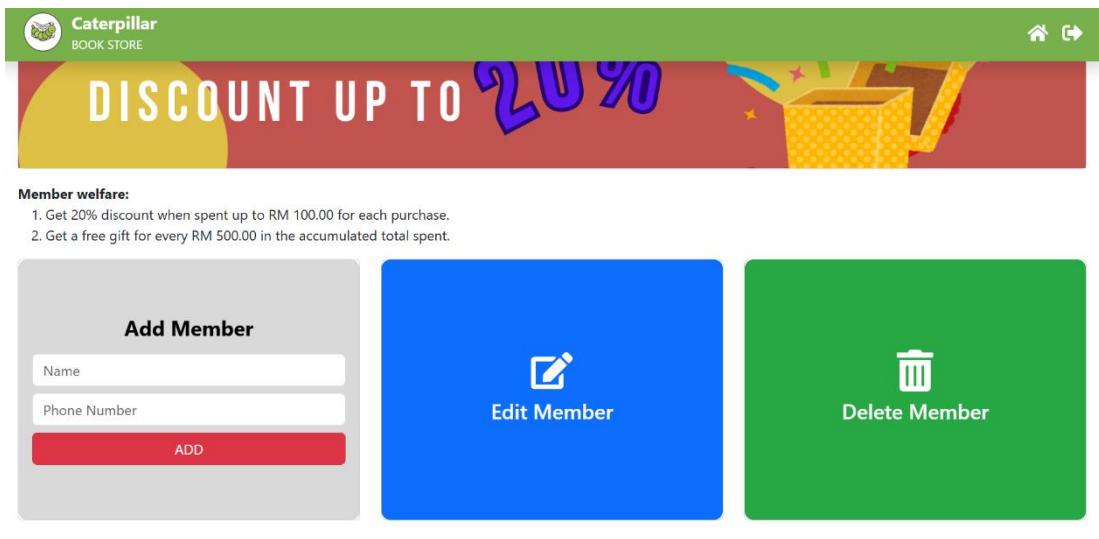
**Figure 4.1.1 User Home Page**

This webpage will first display to the user (customers who use the system webpage). A “search” and “pay” button are implemented into the webpage. The user can choose the features according to their desire by clicking on it. A notification will appear to encourage users to join the membership by prompting the user to the member portal. If the user is not satisfied with the notification, they are able to close the notification by clicking the “x” of the notification.



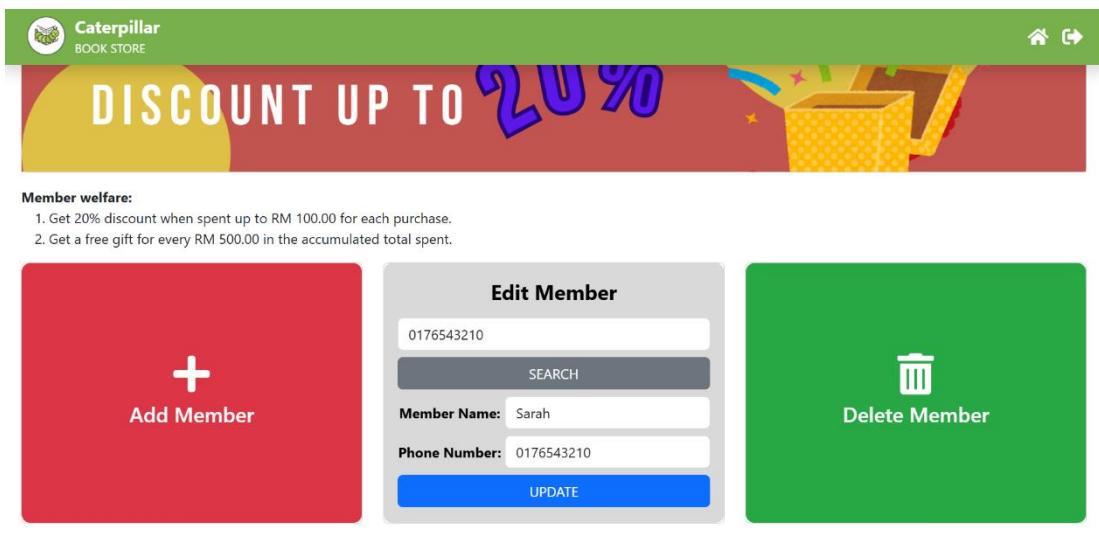
*Figure 4.1.2 Member Portal*

In the member portal, it'll show a poster to promote the member welfare, along with the detailed explanation of the member's welfare. Then it'll have three cards for different operations including add member, edit member and delete member.



**Figure 4.1.3 User Self-Service Add Membership**

For add member, user needs to enter the name and phone number. Then they can click on the “Add” button to join the membership. It shows an alert of “Member successfully added” after successfully adding the member.

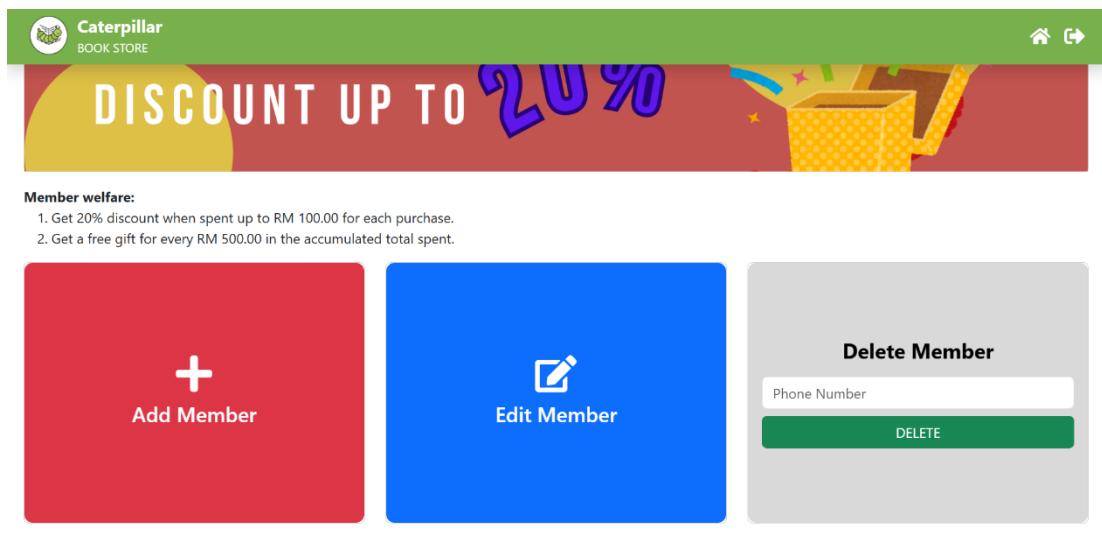


**Figure 4.1.4 User Self-Service Update Info for Membership**

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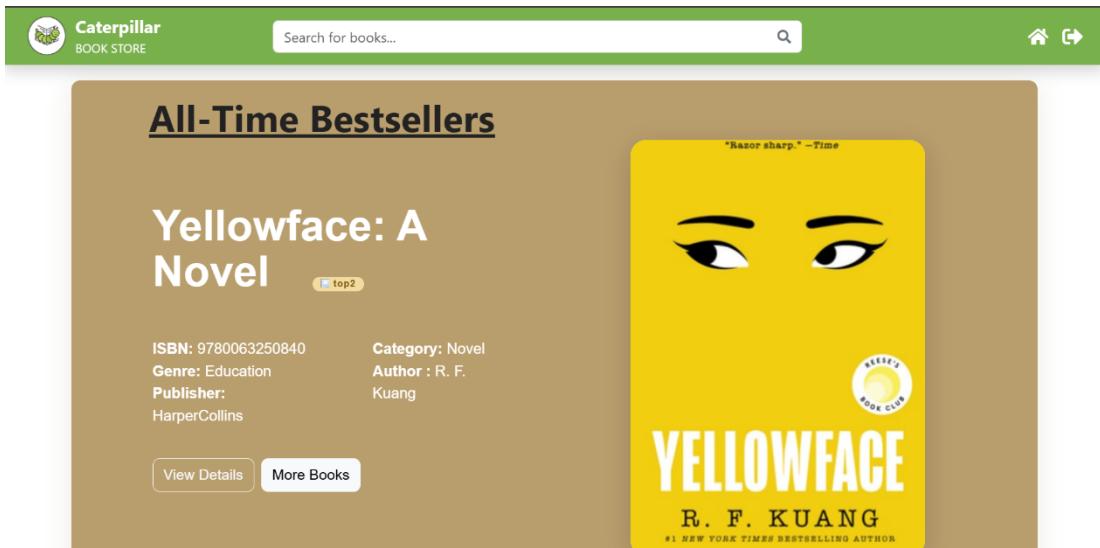
Faculty of Computing and Informatics

For edit member, user needs to first enter the phone number to search for the member ID. If the phone number is not found, it will show the alert of “Member not found” else it’ll show the name and phone number of the member for the member to update.

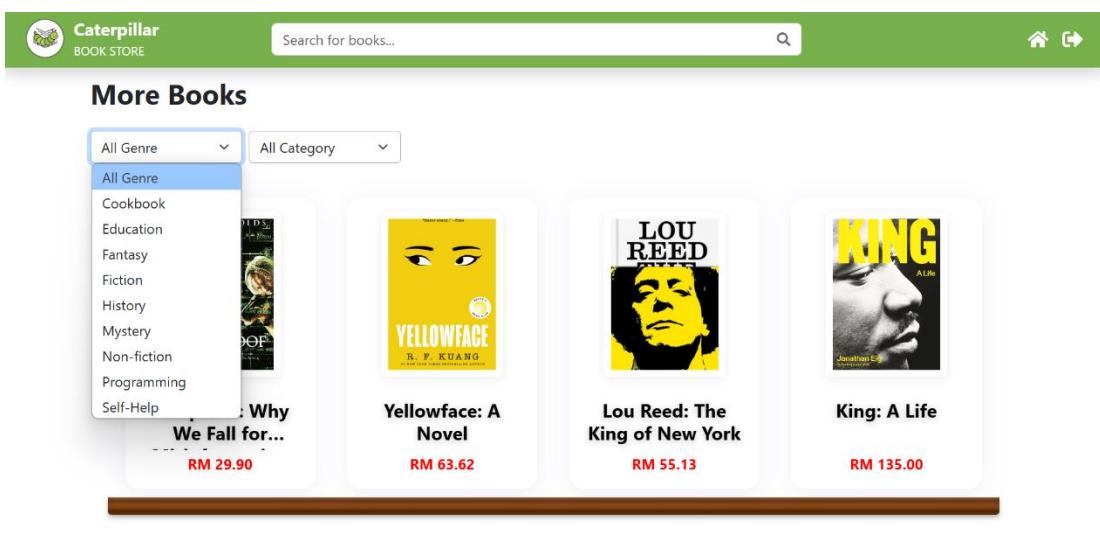


*Figure 4.1.5 User Self-Service Quit Membership*

For delete member, user is required to enter the phone number to search for the member ID. Then they can click on the “Delete” button to delete the membership. It shows an alert of “Member deleted successfully” after deleting the member.



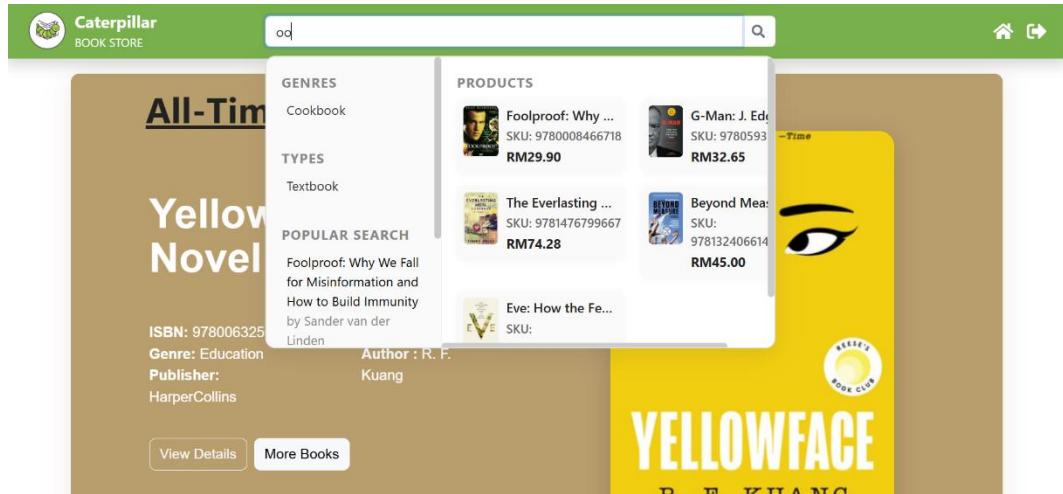
*Figure 4.1.6 User Display All Time Bestsellers*



*Figure 4.1.7 User Display More Book*

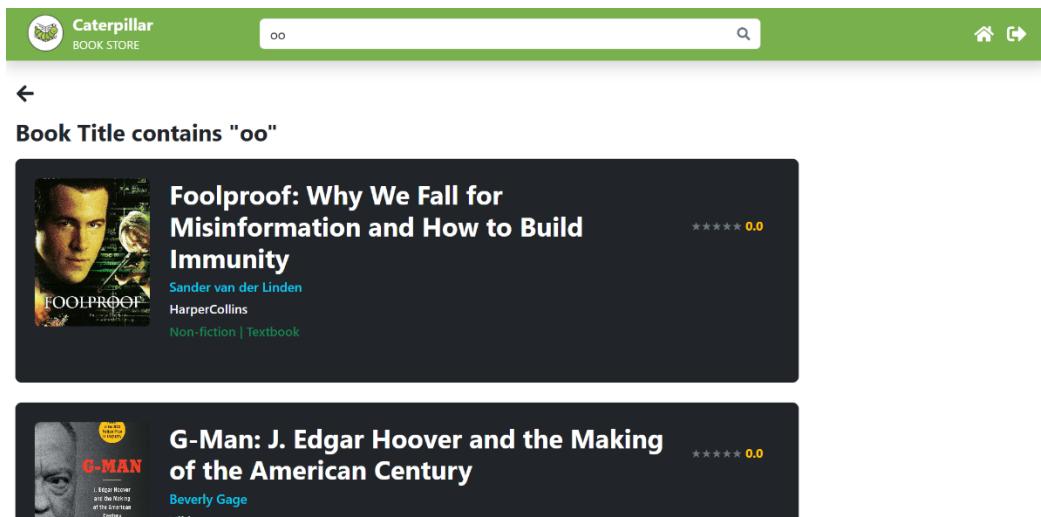
For the user display book section, the top 3 all-time bestselling books are displayed at the top section, each of them includes a button named “View Details” that users can click to view more details about that book. Users can also click on the “More Books” button. It will bring users to the More Books section that allows customers to easily browse books by selecting a genre or category from the filter dropdown list. Every

book shown is also clickable, just like the top seller section, allowing users to open up a detailed view of the book.



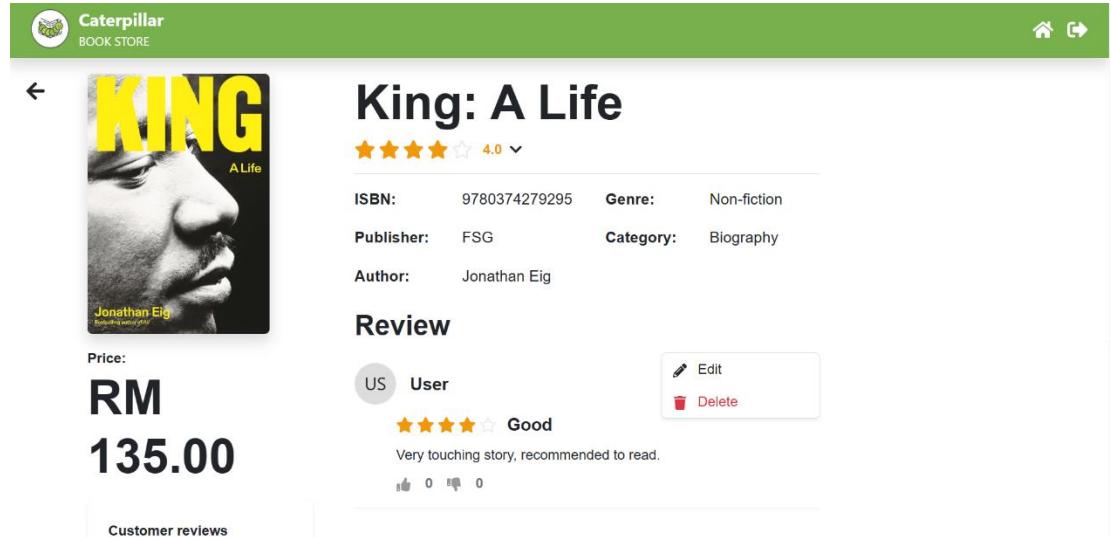
**Figure 4.1.8 User Search Bar**

Besides finding the book by filtering the book's genre and category, users can also search for a specific book by genre, type and name using the search bar located in the top navigation.



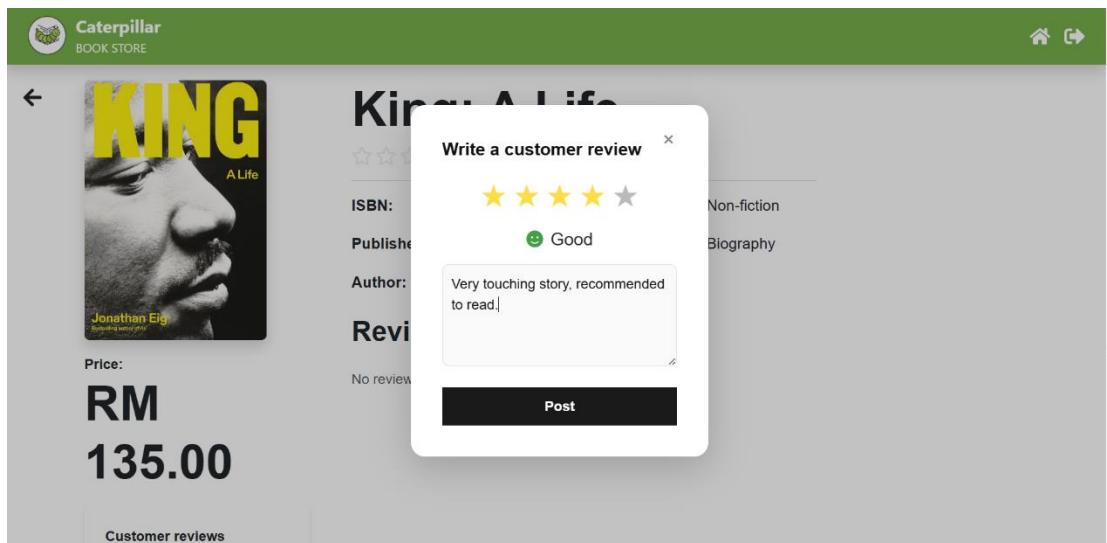
**Figure 4.1.9 User Search Bar Result**

If users search for a specific book by genre or type using the search bar, they will be directed to a search results page that lists all the books matching their search criteria. Users can view book details either by clicking on a book in the 'Products' section of the search bar dropdown or by selecting a book from the search results page.



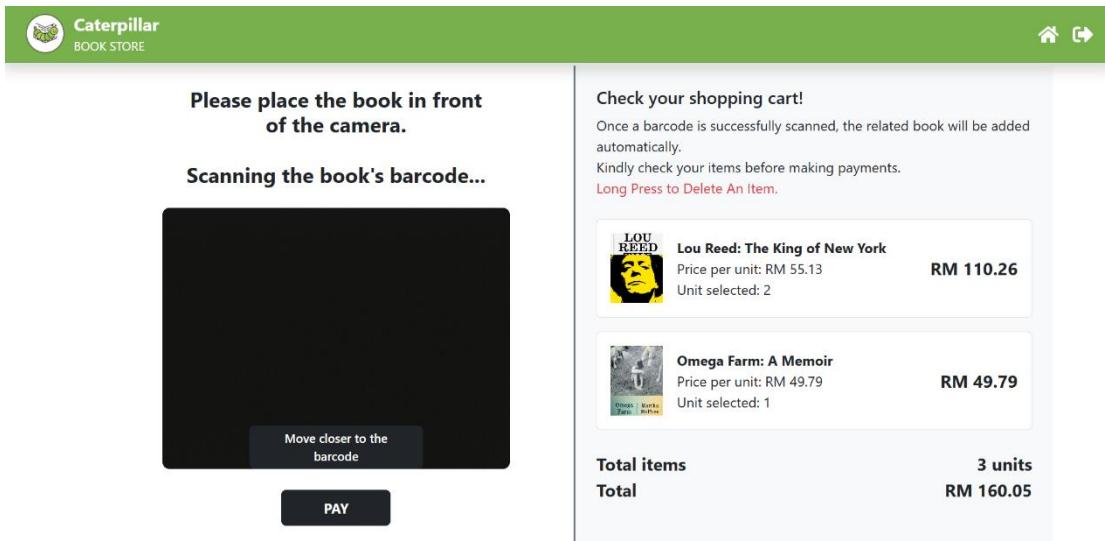
**Figure 4.1.10 User Book Detail Page**

Once the customer clicks on a book, the book's detailed information including the average rating and reviews from other users will be displayed on this page. To return to the user main page, the customer is required to click the back icon at the top left corner.



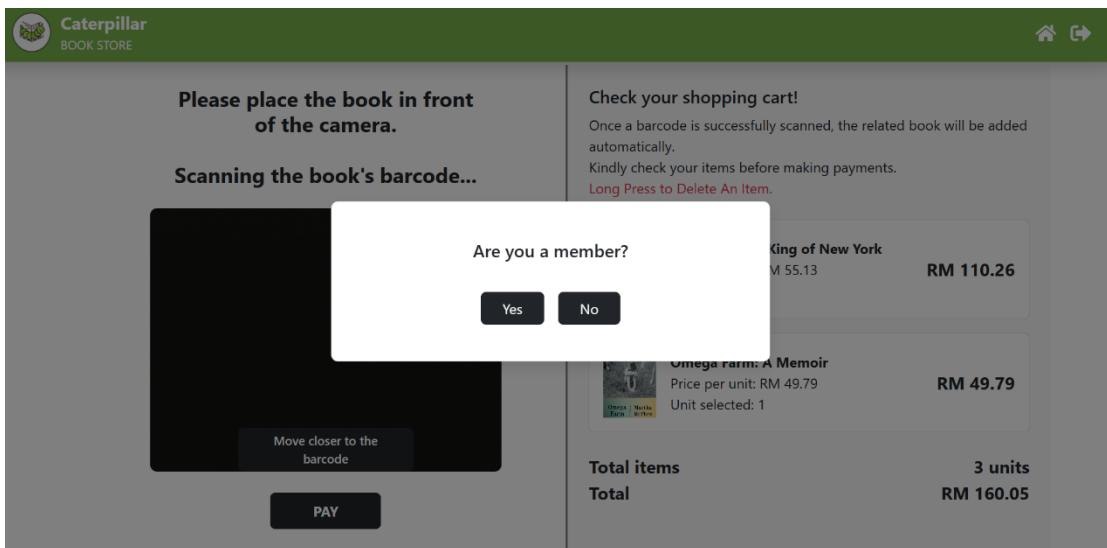
**Figure 4.1.11 User Review & Feedback Form**

Users are allowed to write their own reviews by selecting a star rating and entering their comments, then clicking the 'Post' button to save it. If a user wants to edit their review, they can click on the three dots beside their review to open a small dropdown menu showing 'Edit' and 'Delete' options. If someone posts an unethical comment, it can be reported by clicking the 'Delete' option. Users can also like or dislike the command by clicking the icon below each command.

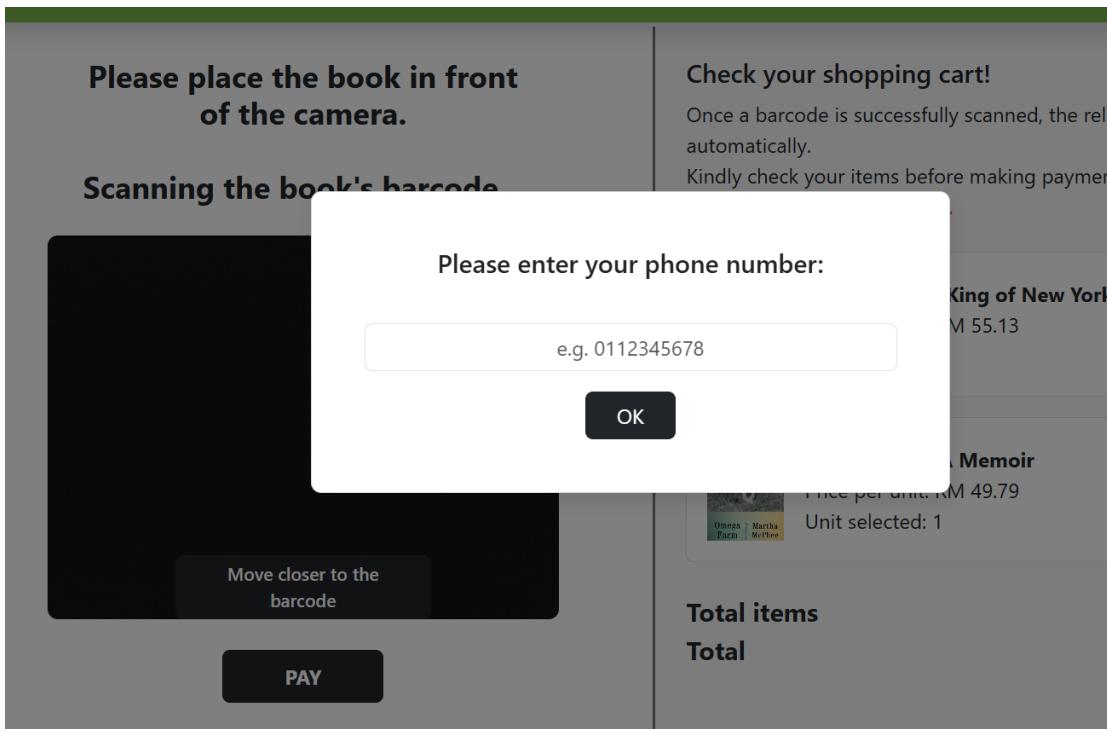


**Figure 4.1.12 User Barcode Scanning Page**

Clicking on the “pay” button from the user home page will bring the user (customers) to this webpage. The user is required to scan the book’s barcode by following the guidelines of the webpage. The shopping cart list placed at the right panel will display and be added to the cart whenever a book’s barcode is scanned successfully. Long press on a book item enables the user to delete the book items from the cart. The user can make a payment by clicking the pay button under the scan feature.

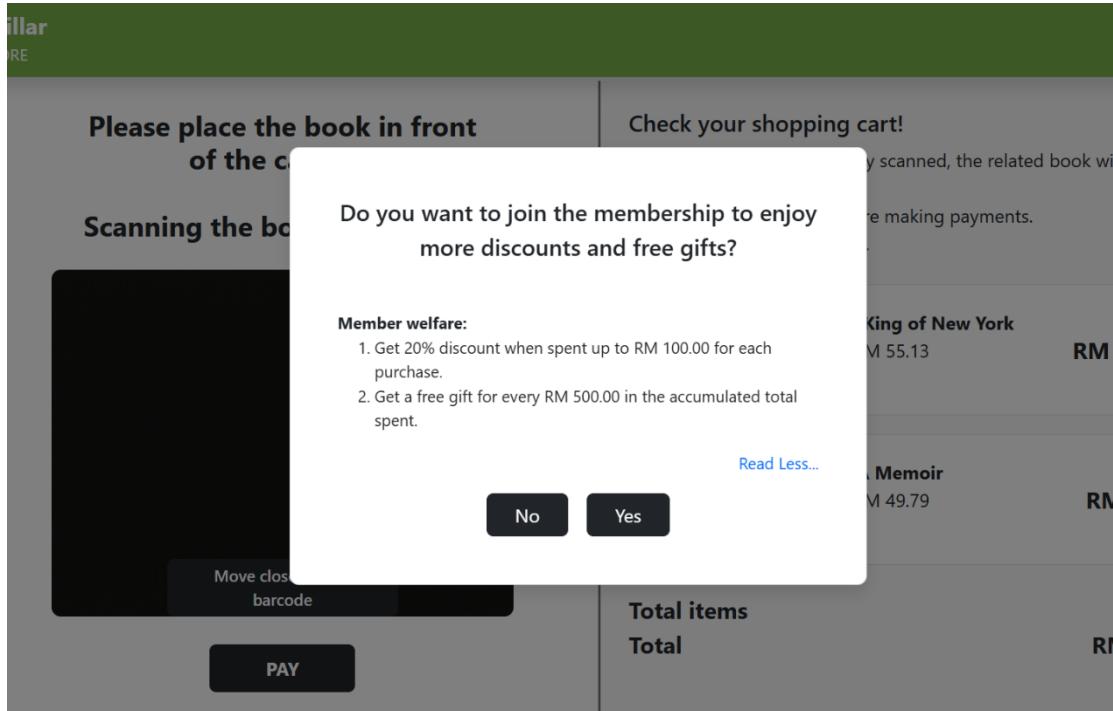


**Figure 4.1.13 Member confirmation**



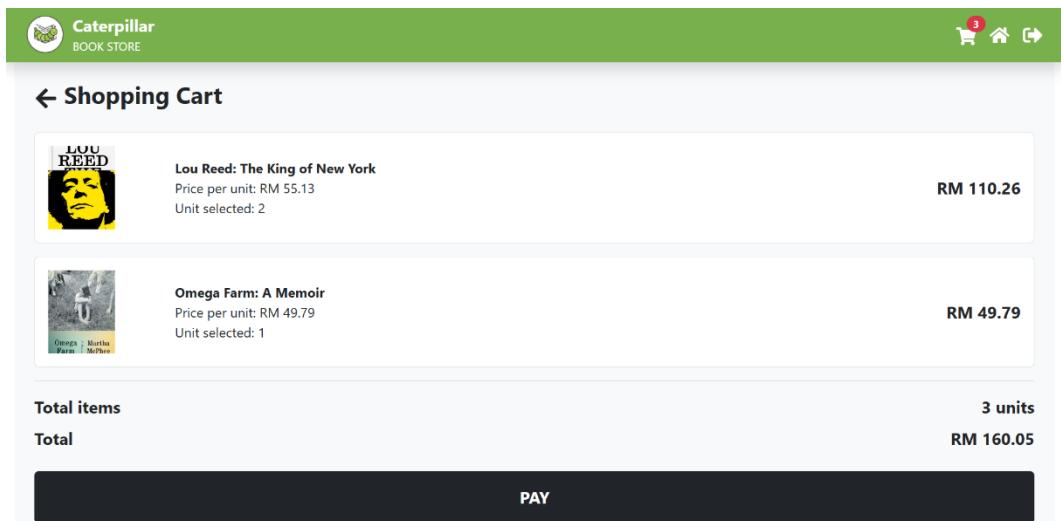
**Figure 4.1.14 Member verification**

After clicking the “PAY” button, it will ask if the user is a member. Clicking “Yes” will ask for the phone number of the member to get the member ID.



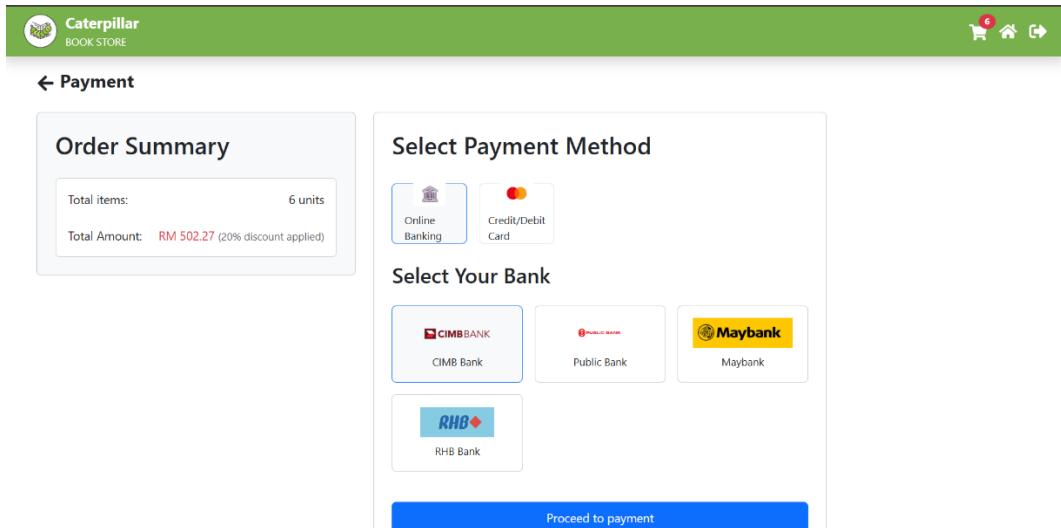
**Figure 4.1.15 Membership invitation**

Clicking “No” from member confirmation will trigger the member invitation to ask if the user wants to join the membership or not. User can click on read less or read more to know more about the member welfare. Clicking “Yes” will lead the user to member portal to add member, while clicking “No” will direct to payment page.



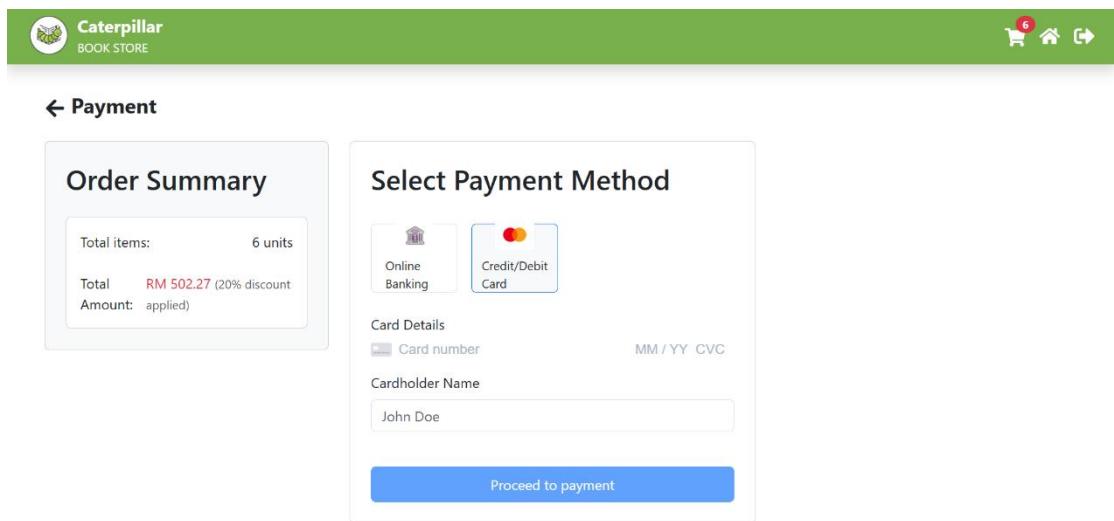
**Figure 4.1.16 User Shopping Cart Page**

The user (customers) can access this page by clicking the cart icon on the top right. Every book item scanned record will display on this page. The user can make a payment by clicking the “pay” button implemented at the bottom of the web page.



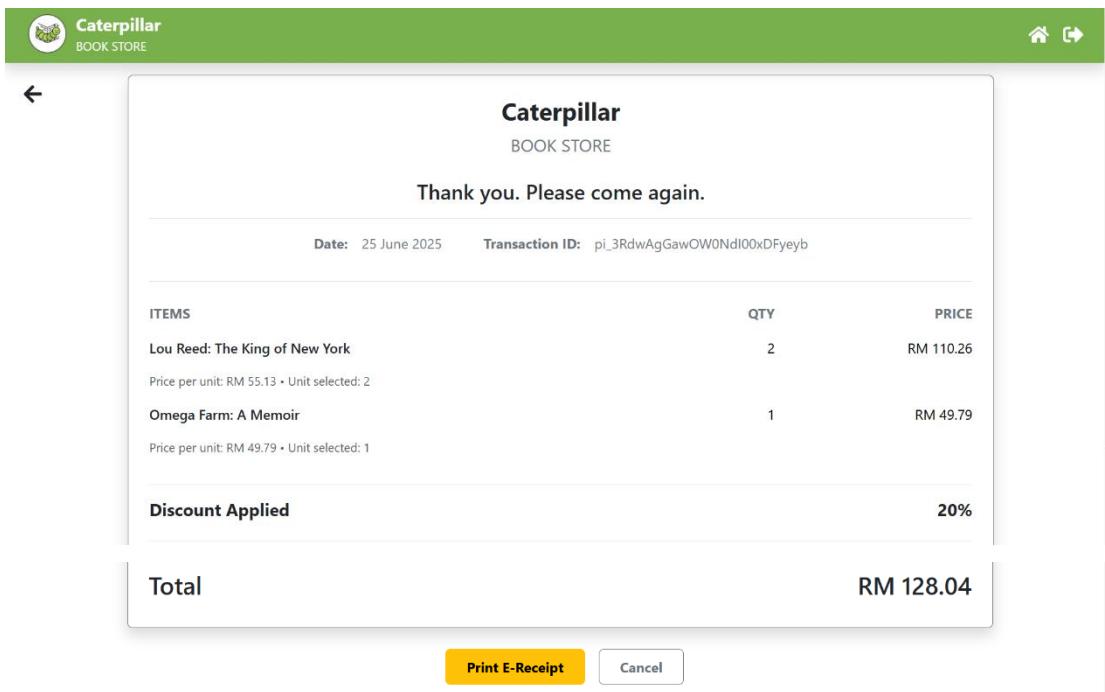
**Figure 4.1.17 User Payment Page with online banking method**

Clicking the “pay” button will bring to this page, the user is able to select the payment method they prefer to make the payment. There is provided a quick summary with the total amount on the left side of the web page. If the user selects online banking, they can choose the bank they preferred to make the payment.



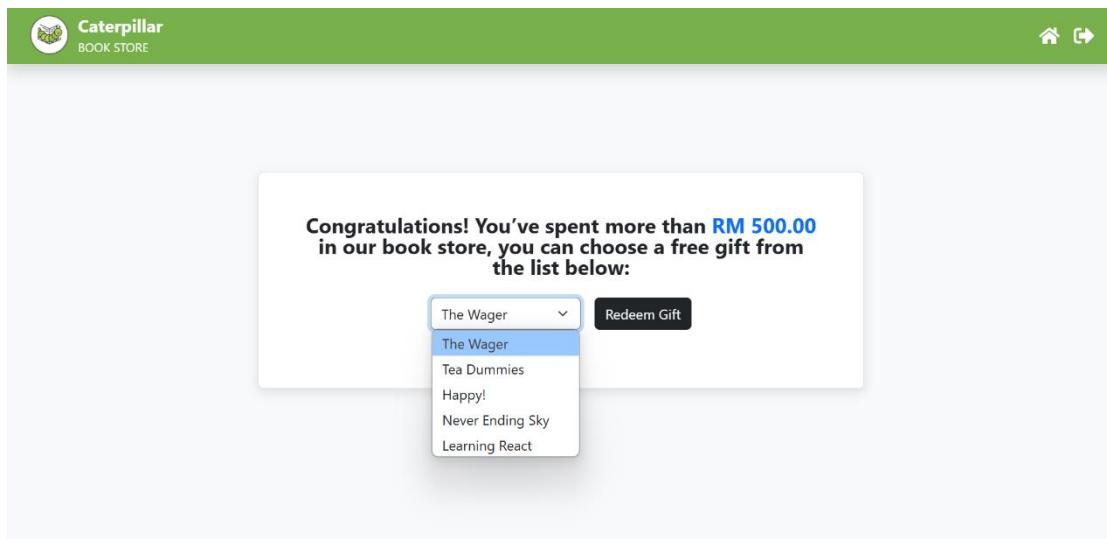
**Figure 4.1.18 User Payment Page with credit/debit card payment method**

If the user clicked on the credit/debit card, they need to key in the details to proceed with the payment transaction.



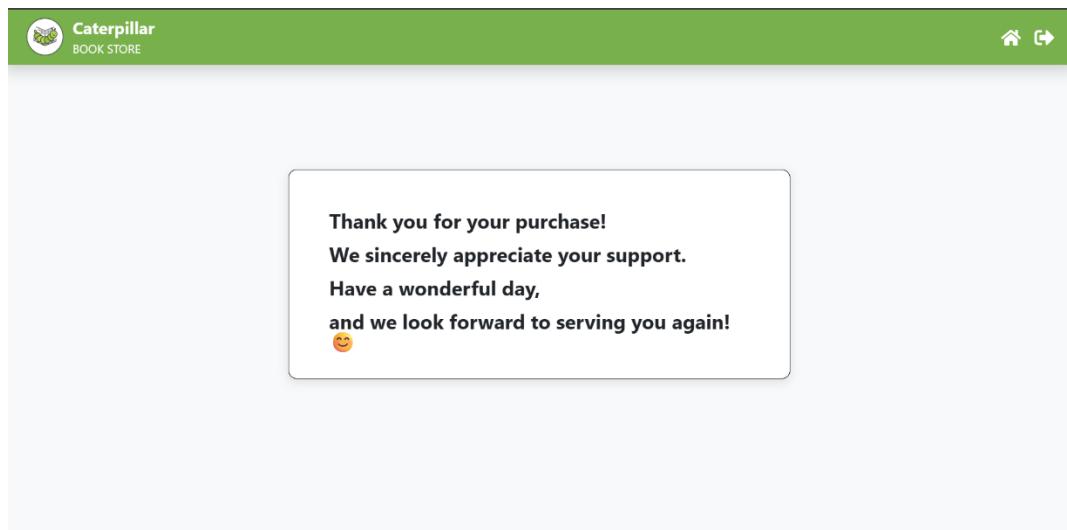
**Figure 4.1.19 User E-Receipt Page**

The webpage will bring the user to this page once the payment is successful. A pdf format file will be saved in the device when the user clicks on the “print e-receipt” button.



*Figure 4.1.20 User Redeem Gift Page*

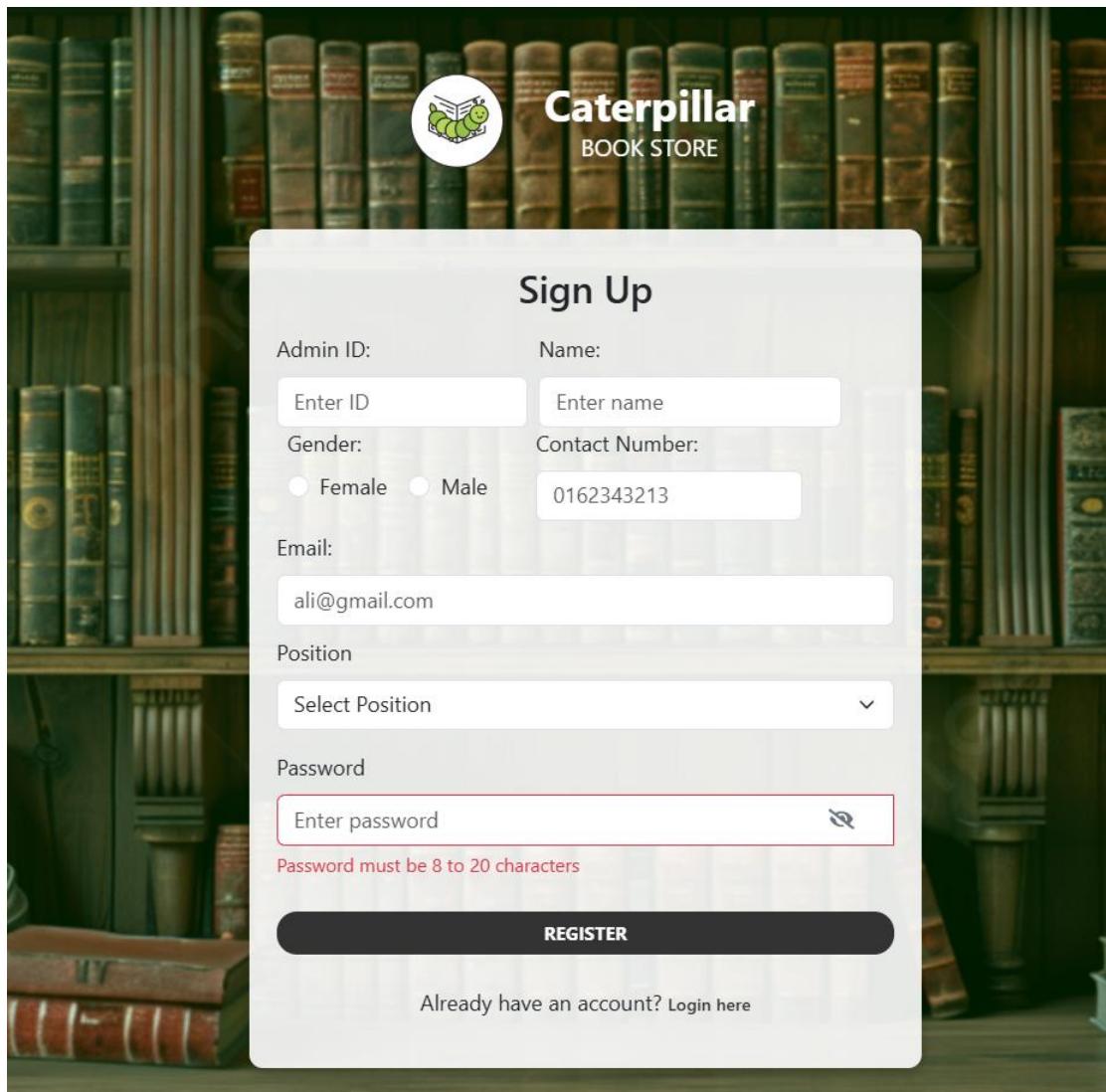
If the user is a member and accumulates a total spent of RM 500, it will lead the user to the redeem gift section. User can choose a free gift from the dropdown menu and click on “Redeem Gift” button to get the free gift. After that, it will update the total spent and gift get of the member and direct to the thank you page.



*Figure 4.1.21 User Thank you Page*

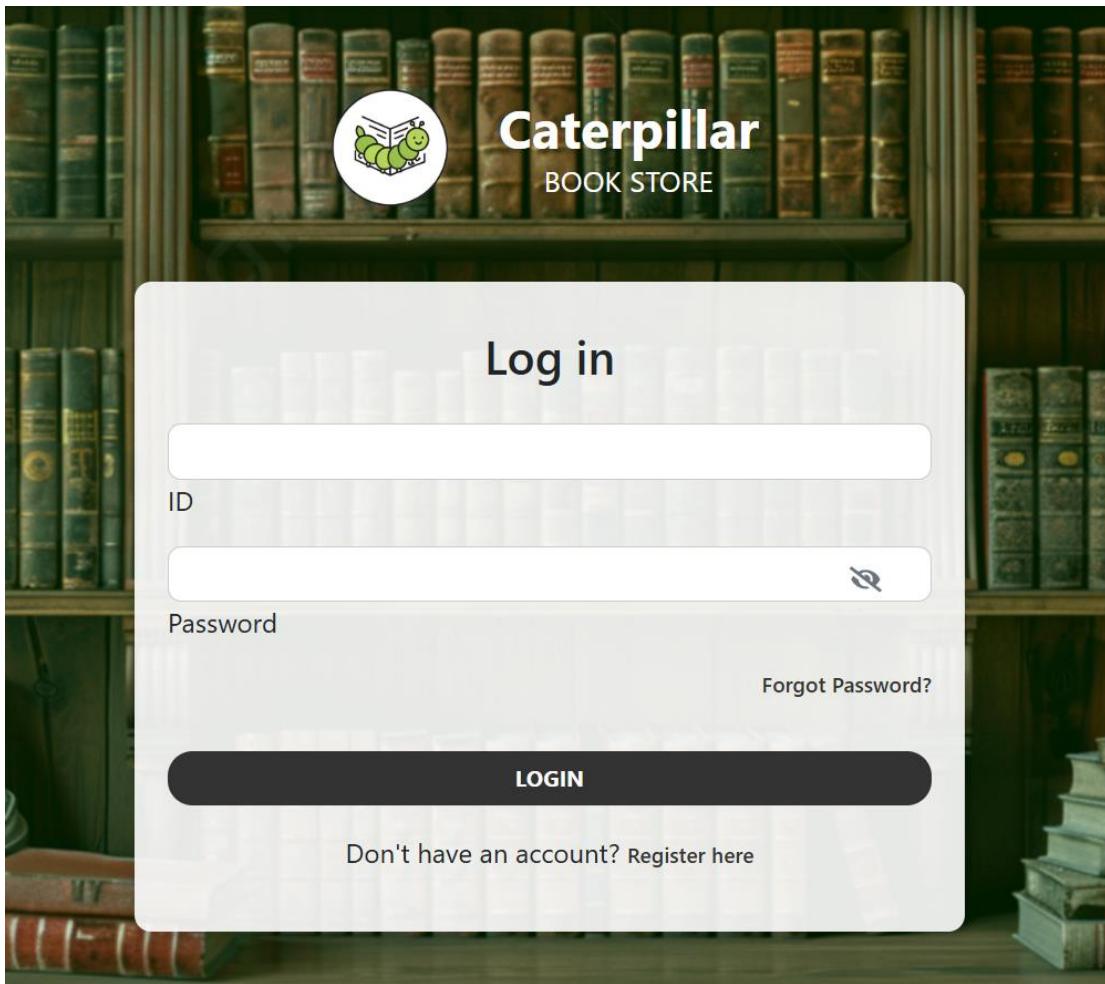
A thank you message is implemented after the e-receipt page to thank the customer after everything is settled successfully. The webpage system will reset to the first page (“search and pay” page) after 30 seconds without detecting any response or clicking the home icon implemented at the top right side.

## 4.2 Admin/Staff/Front Desk Module



**Figure 4.2.1 Admin Sign Up Page**

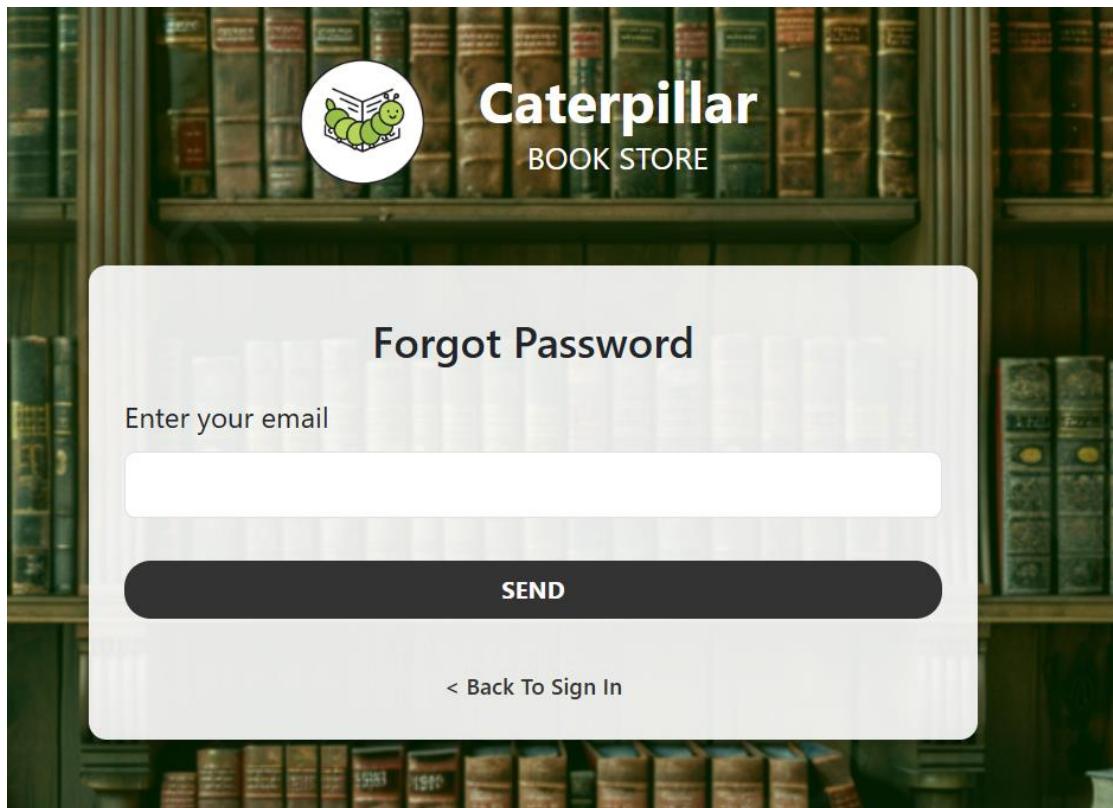
Every new employee is required to register their admin account upon first login by filling in their personal information, including admin ID, name, gender, contact number, email address, position and set their own password (must 8 to 20 characters).



#### ***4.2.2 Admin & User Log in Page***

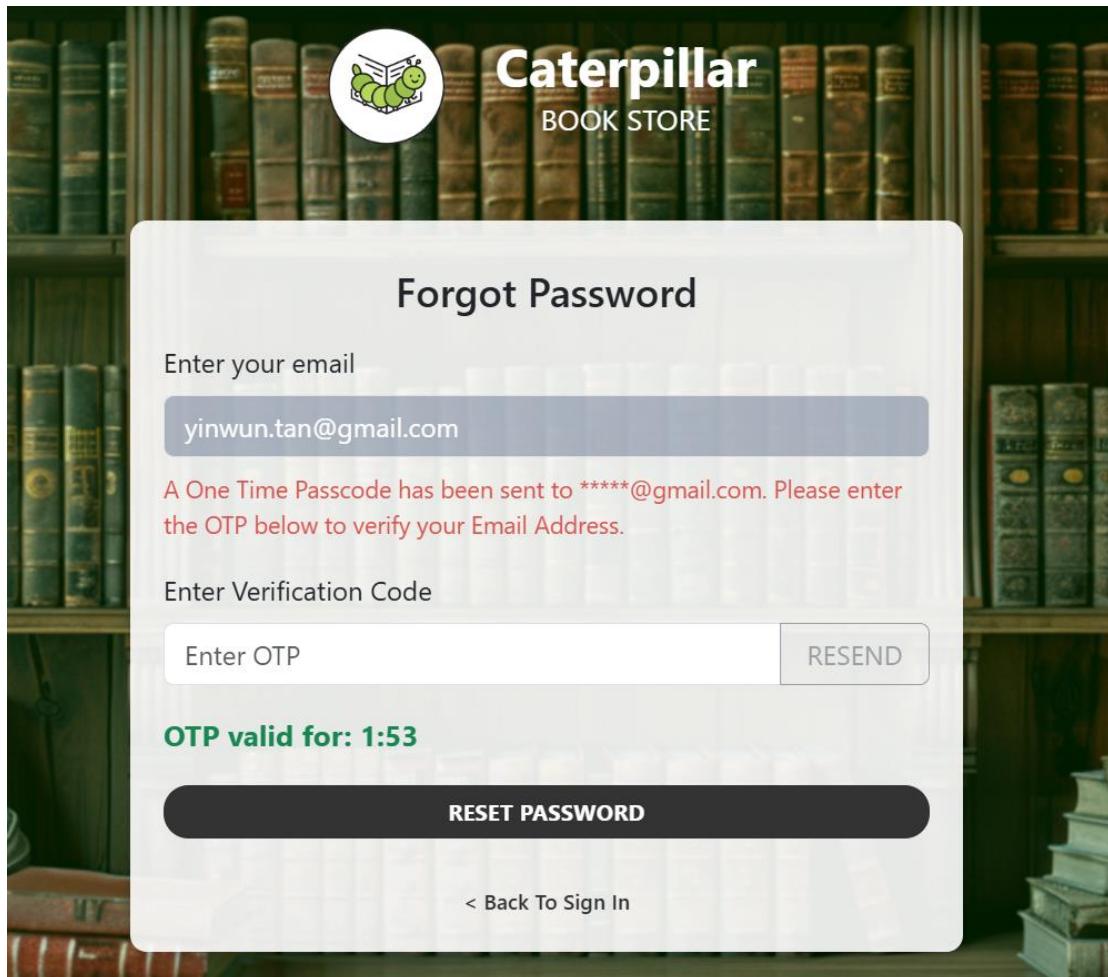
For the login page, we designed two roles: admin and user. Admins must enter their Admin ID and password to log in to the bookstore's admin management system. If they have not registered an account, they should click the underlined text 'Register here' located below the login button. If an admin forgets their password, they can click on 'Forgot Password' for assistance in resetting it.

For user login, admins help customers by logging in with a default ID (user123) and password (userpass). The user login ID and password are kept confidential from the users themselves.



#### ***4.2.3 Key in Email for Forget Password***

After clicking on the “Forget Password” option in login form, admin should enter their own email (the same email registered) for account authentication and then click on the "Send" button.



#### 4.2.4 Admin Authentication with OTP code

A one-time passcode (OTP) will be sent to your email address. Once received, manually enter the OTP below to proceed with resetting your password. There is also a "Back to Sign In" button in case you navigate to this page unintentionally.



**4.2.5 Admin Reset Password Page**

For the reset password form, admin is required to enter their password twice to confirm it is typed correctly. If the passwords do not match, an alert will be shown. The new password must be between 8 and 20 characters; if it does not meet this requirement, a warning will appear below the input box, prompting you to enter it again. Once completed, you may click the "Save" button to return to the sign-in page.

**Profile**

Some info may be visible to other people

Admin ID:	345
Name:	Tan Yin Wun
Gender:	Female
Contact Number:	0123456789
Email:	yinwun.tan@gmail.com

#### 4.2.6 Admin Profile Page

After logging into the admin page, you will see a profile icon in the upper right-hand corner. When you click on it, your admin ID and email will be displayed. You can view your personal information by clicking on "Manage Profile." This will display your profile, including your admin ID, name, gender, contact number, position, email, and password. There is also a "Logout" button located at the bottom of the left sidebar.

**Manage Book**

ISBN	Name	Price (RM)	Stock	Author	Sales	Publisher	Genre	Type
9780008466718	Foolproof: Why We Fall for Misinformation and How to Build Immunity	29.90	10	Sander van der Linden	0	HarperCollins	Non-fiction	Textbook
9780063250840	Yellowface: A Novel	63.62	258	R. F. Kuang	0	HarperCollins	Education	Novel
9780374193393	Lou Reed: The King of New York	55.13	876	Will Hermes	0	Knopf	Non-fiction	Biography
9780374279295	King: A Life	135.00	470	Jonathan Eig	0	FSG	Non-fiction	Biography

ISBN !	Name !	Price (RM) !	Publisher !	Genre !	Type !
9780008466718	Foolproof: Why We Fall for Misinformation and How to Build Immunity	29.90	HarperCollins	Non-fiction	Textbook
9780063250840	Yellowface: A Novel	63.62	HarperCollins	Education	Novel
9780374193393	Lou Reed: The King of New York	55.13	Knopf	Non-fiction	Biography
9780374279295	King: A Life	135.00	FSG	Non-fiction	Biography

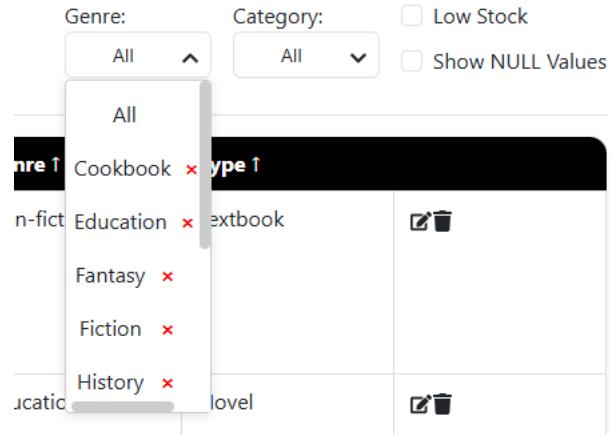
#### 4.2.7 Manage Book Page

In the Manage Book section, the admin can manage each book's information displayed in the table using Edit and Delete actions. There are Genre and Category filters available, allowing the admin to easily filter books by specific genres, categories as well as NULL values. For stock management, if the stock amount is less than a specified threshold, admins can quickly view all books with low stock by selecting the checkbox labeled "Show Low Stock". Additionally, there is an "Add Book" button located below the table, allowing the admin to add new books to the system.

The screenshot shows a modal window titled "Add New Book". The form includes fields for ISBN (text input), Name (text input), Price (number input with RM placeholder and up/down arrows), Stock (number input with up/down arrows), and Genre (a dropdown menu with options: History, Mystery, Non-fiction, Programming, Self-Help, and a "Type new genre..." input field). There is also a "Choose File" button with "No file chosen" text and a "Save" button at the bottom.

#### 4.2.8 Add New Book Form

The "Add New Book" form allows admins to input essential book details such as ISBN, title, price, stock, genre, type, publisher, author name and book cover image. We have implemented custom dropdowns with dynamic options, enabling users to add new genres, types and publishers which will automatically store into the backend database.



#### 4.2.9 Filter Deletion

For the filter feature, admins are allowed to delete any genre or category from the dropdown list. If a genre or type is deleted, any book associated with that deleted genre/type will display "NULL" under the respective field. These NULL entries can still be filtered using the “Show NULL” checkbox. To resolve NULL entries, the admin can manually add a new genre or type through the edit form.

The screenshot shows the Caterpillar Book Store application. On the left is a sidebar with a logo, the store name 'Caterpillar BOOK STORE', and navigation links: 'Manage Book' (highlighted), 'Purchase Records', 'Sales Report', and 'Manage Member'. On the right, the main area has a header 'Manage Book' and a search bar. Below is a table of books:

ISBN #	Name #	Price (RM)
9780038466718	Foolproof: Why We Fall for Misinformation and How to Build Immunity	29.90
9780063250640	Yellowface: A Novel	63.62
9780374193393	Lou Reed: The King of New York	55.13
9780374279295	King: A Life	135.00

To the right of the table is an 'Edit Book' modal for the first book. The modal fields include:

- Name:** Foolproof: Why We Fall for Misinformation and How to Build Immunity
- Price:** RM 29.90
- Stock:** 10
- Genre:** Non-fiction
- Type:** Textbook
- Publisher:** HarperCollins
- Author:** Sander van der Linden
- Book Image:** An image of the book cover featuring Ryan Reynolds.
- File Input:** 'Choose File' button with placeholder 'No file chosen'.
- Buttons:** 'Save Changes' and a close button.

At the bottom right of the main area is a '+ ADD BOOK' button.

#### 4.2.10 Edit Book Form

Faculty of Computing and Informatics

The admin can click on the Edit icon in the last column of the table to open the edit form. From there, they can update the book's name, price, stock, genre, type, publisher, author, and book image, which will be displayed on the user page. Once the changes are made, clicking the Save button will update the book's information.

ISBN ↑	Name	Price	Stock	Author	Publisher	Genre	Type	Actions
978000632 50840	Yellowfac e: A Novel	63.62	258	R. F. Kuang	HarperCo llins	Education	Novel	
978000632 50840	Foolp : Why Fall fo Misin matic and How to Build Immunity							
97803741 93393	Lou Reed: The King	55.13	876	Will Harmes	Knopf	Non- fiction	Biograph y	

#### 4.2.11 Book Deleted Alert

When an admin attempts to delete a book, a confirmation alert is displayed to prevent accidental deletion.

The screenshot shows the Caterpillar Book Store Admin interface. On the left, there's a sidebar with a logo of a caterpillar reading a book, titled "Caterpillar BOOK STORE". Below it are links for "Manage Book", "Purchase Records", "Sales Report", and "Manage Member". At the bottom is a "Logout" button. The main area has a search bar with "wa" typed in, showing results for "The Wager". It says "See all results for 'wa'" and "Search Results for 'The Wager'". There are filters for "Genre" (All), "Category" (All), "Low Stock" (unchecked), and "Show NULL Values" (unchecked). A table below lists the book details:

ISBN ↑	Name ↑	Price (RM)	Stock ↑	Author ↑	Sales ↑	Publisher ↑	Genre ↑	Type ↑	
97803855 34260	The Wager	28.50	42	David Grann	0	Doubleday	History	Novel	

Page 1 of 1

#### 4.2.12 Admin Search Book Page

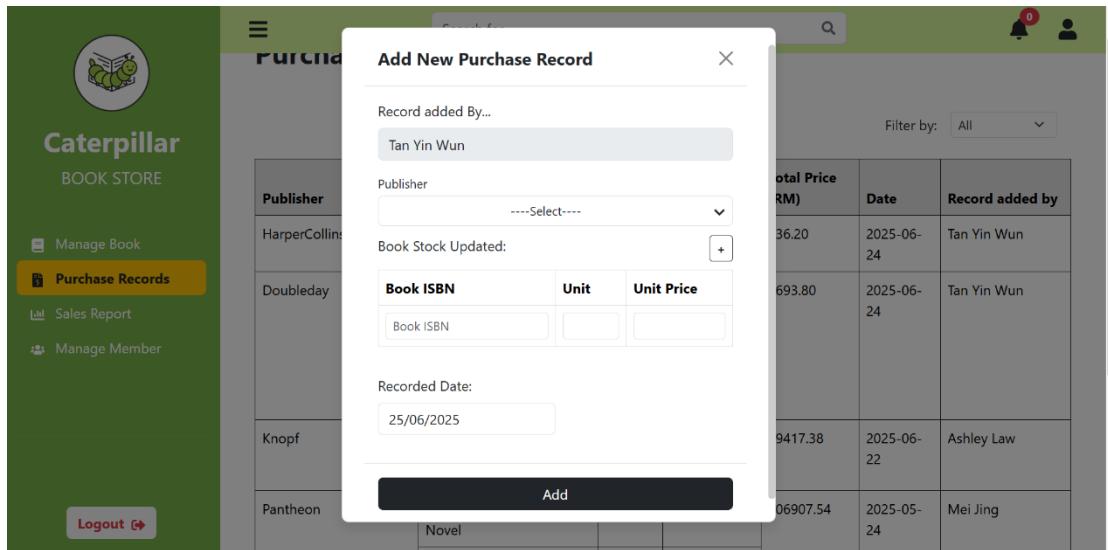
A search bar is located above the admin navigation, allowing the admin to search for books by name. The results are displayed in a table showing details such as ISBN, name, price, stock, author, sales, publisher, genre, and book type. The admin can also click on either the Edit icon or Delete icon to update the book information or delete the book, the functioning exactly the same way as in the Manage Book section.

Publisher	Book Name	Unit	Unit Price (RM)	Total Price (RM)	Date	Record added by
HarperCollins	Yellowface: A Novel	10	63.62	636.20	2025-06-24	Tan Yin Wun
Doubleday	Normal Rules Don't Apply: Stories	20	53.94	3693.80	2025-06-24	Tan Yin Wun
	Harry Potter & Goblet of Fire	40	44			
	The Wager	30	28.5			
Knopf	Wellness: A novel	400	58.23	49417.38	2025-06-22	Ashley Law
	The Last Ranger: A novel	342	76.39			
Pantheon	Chain Gang All Stars: A Novel	781	81.54	106907.54	2025-05-24	Mei Jing
	An Autobiography of Skin: A Novel	568	76.1			
FSG	Ordinary Notes	150	33	41400.00	2025-04-30	Mei Jing
	King: A Life	270	135			
Scribner	The Everlasting Meal Cookbook: Leftovers A-Z	100	74.28	10017.08	2025-03-24	Ashley Law
	Omega Farm: A Memoir	52	49.79			

Add New Record

**Figure 4.2.13 Admin Purchase Record Page**

Admins are able to check the purchase records in the purchase record section in the admin panel. Filters such as filter by “date” and “record added by” are available for the convenience of admin to check the purchase records.

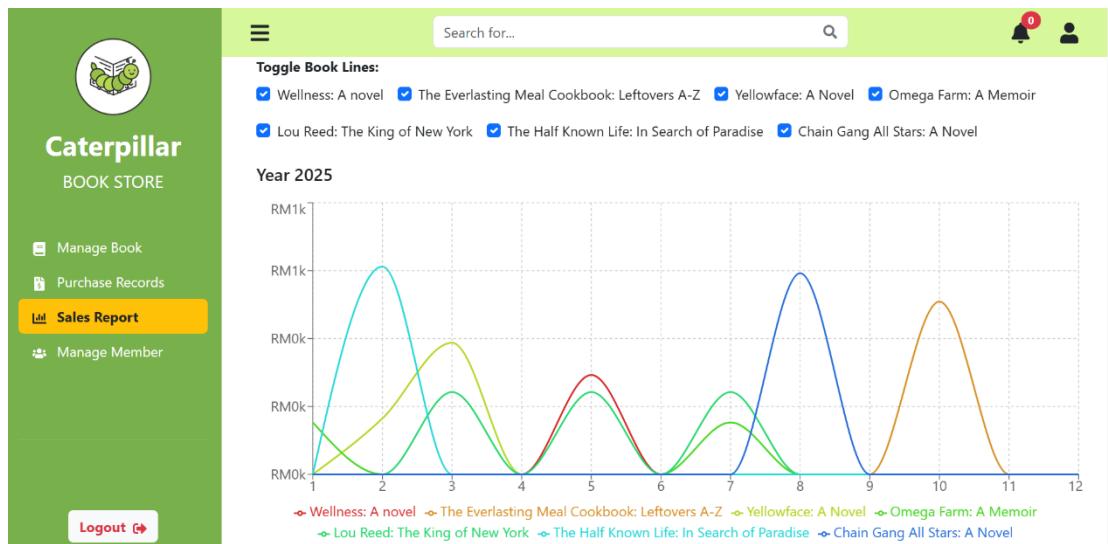


**Figure 4.2.14 Admin Add New Purchase Record**

An add new records feature button is implemented at the bottom right corner of the webpages for admin to add new purchase records based on Publisher whenever new stocks arrive. The form will pop out whenever the button is clicked. Admin can add more books purchase record at once based on the Publisher by clicking the add button inside the form.

The screenshot shows a sales report interface for the Caterpillar Book Store. On the left, there's a sidebar with a logo, navigation links for 'Manage Book', 'Purchase Records', 'Sales Report' (which is highlighted in yellow), and 'Manage Member'. Below these is a 'Logout' button. The main area has a green header with a search bar and a notification icon. The title 'Sales Report' is displayed, along with a dropdown for 'Select Year: 2025'. Below this is a table with columns for Product Name, Jan, Feb, Mar, Apr, and May, further divided into Price, Units Sold, and Total.

Product Name	Jan			Feb			Mar			Apr			May		
	Price	Units Sold	Total	Price	Units Sold	Total	Price	Units Sold	Total	Price	Units Sold	Total	Price	Units Sold	Total
Wellness: A novel	RM58.23	0	RM0	RM58.23	0	RM0	RM58.23	0	RM0	RM58.23	0	RM0	RM58.23	6	RM292.86
The Everlasting Meal Cookbook: Leftovers A-Z	RM74.28	0	RM0	RM74.28	0	RM0	RM74.28	0	RM0	RM74.28	0	RM0	RM74.28	0	RM0
Yellowface: A Novel	RM63.62	0	RM0	RM63.62	3	RM164.7	RM63.62	5	RM387.55	RM63.62	0	RM0	RM63.62	0	RM0
Omega Farm: A Memoir	RM49.79	2	RM153	RM49.79	0	RM0	RM49.79	0	RM0	RM49.79	0	RM0	RM49.79	0	RM0

**Figure 4.2.15 Sales table****Figure 4.2.16 Sales graph**

At the sales report section, admin can select the year from the dropdown filter, and it'll display the sales report of the year from January to December, include all the book sales in table form and line graphs. For the line graph, admin can toggle the visibility of the book lines from the check box to see certain sales of specific books.

<b>Id ↑</b>	<b>Name ↑↓</b>	<b>Phone Number</b>	<b>Total Spent ↑↓</b>	<b>Gift Get ↑↓</b>	<b>Actions</b>
1	Liam Mitchell	01647301529	RM 0.00	0	<input checked="" type="checkbox"/> <span style="color: red;">Delete</span>
2	Jane	0112345678	RM 0.00	0	<input checked="" type="checkbox"/> <span style="color: red;">Delete</span>
3	Aiden Carter	01573826740	RM 0.00	0	<input checked="" type="checkbox"/> <span style="color: red;">Delete</span>
4	John Doe	0123456789	RM 0.00	0	<input checked="" type="checkbox"/> <span style="color: red;">Delete</span>
5	Peter	0198765432	RM 0.00	0	<input checked="" type="checkbox"/> <span style="color: red;">Delete</span>

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**Figure 4.2.17 Manage Member**

**Edit**

Name  
Liam Mitchell

Phone Number  
01647301529

Total Spent (RM)      Gifts Get  
0.00      0

**Save**

**Figure 4.2.18 Edit Member**

For the manage member section, it'll show a table of member ID, name, phone number, total spent and gift get, admin can choose to sort by ascending or descending order. Admin can also search member by name, edit member and delete member.

*Part V:*

*System Testing*

## 5.1 System Testing

### Admin

Test ID	Test Case	Expected Result	Actual Result	Status
1	<u>Login:</u> Enter valid admin ID and valid password. Click “Login” button.	- Admin should be able to login to the system. -The system should display profile page with the info of the admin.	-Admin is able to login. -Profile page with info of admin is displayed.	Pass
2	<u>Login:</u> Enter invalid admin ID and invalid password. Click “Login” button.	-Admin should not be able to login to the system.	-Admin is unable to login.	Pass
3	<u>Register:</u> Enter admin ID, name, gender, phone number, email, position and password. Click the “Register” button.	-Admin should be able to register and get alert of “Registration successful”	-Admin able to register and get the alert of “Registration successful”	Pass

4	<u>Forgot password:</u> Enter valid email and click on the “Send” button.	-It should send an OTP to the email.	-OTP able to receive in the email.	Pass
5	<u>Forgot password:</u> Enter invalid email and click on the “Send” button.	-It should not send OTP to the email.	-OTP is not able to receive in the email.	Pass
6	<u>OTP verification:</u> Enter valid OTP within 2 minutes. Click the “Reset Password” button.	-It will show alert of “OTP verified successfully” -It will go to reset password form.	-The alert of “OTP verified successfully” has shown. -It navigates to reset password form.	Pass
7	<u>OTP verification:</u> Enter invalid OTP or OTP expired. Click the “Reset Password” button.	-It should show alert of “Invalid OTP” or “OTP expired”	-The alert of “Invalid OTP” or “OTP expired” has shown.	Pass

8	<u>Reset password:</u> Enter the new password and confirm the password. Click on the “Save” button.	-Password should be reset in the database table. -It should go back to login form.	-New password is able to use to login. -It goes back to login form after reset password.	Pass
9	<u>Manage book:</u> Choose the filter of genre or book type.	-It should be able to apply the filter of the genre or the book type and show only those books being filtered.	-It is able to show the genre or book type being filtered.	Pass
10	<u>Manage book:</u> Check the checkbox on “Low Stock” or “show Null value”	-It should only show books that stock less than 10 if “low stock” is checked. -It should only show books that genre or book type are null if “show Null value” is checked.	-It is able to show books with stock less than 10 only when “low stock” is checked. -It is able to show books with genre or book type null when “show Null value” is checked.	Pass

11	<p><u>Add book:</u></p> <p>Enter the book ISBN number, book name, unit price, book stock, genre, book type, publisher, author and image.</p> <p>Click the “Save” button.</p>	<p>-It should be able to add the book in the table and display it in the table.</p>	<p>-The book is able to add into the table and display in the table.</p>	Pass
12	<p><u>Edit book:</u></p> <p>Enter the data that want to update and click on the “Save changes” button.</p>	<p>-The form should have the original data if the field doesn't change it'll keep the original data.</p> <p>-The data should be updated in the table after click on “Save changes” button.</p>	<p>-The form is able to get the original data and show.</p> <p>-The data is updated after clicking “Save changes” button and displaying the updated data in the table.</p>	Pass
13	<p><u>Delete book:</u></p> <p>Click on the trash can icon. Click “yes” for confirm delete.</p>	<p>-It should be able to delete the book from the table.</p>	<p>-The book is able to delete from the table.</p>	Pass

14	<u>Add genre, book type, publisher:</u> Enter the new genre, book type or publisher and click on the “+” icon from the dropdown list.	-New genre, book type or publisher will be updated in the dropdown list respectively.	-New genre, book type or publisher is able to add into the dropdown list respectively.	Pass
15	<u>Delete genre or book type:</u> Click on the “x” icon beside the genre or book type from the filter dropdown list.	-The genre or book type will be deleted and books with the genre or book type, their genre or book type will turn to null.	-Genre or book type is able to delete and set to null value for the books with the deleted genre or book type.	Pass
16	<u>Search book:</u> Enter the book name that want to search in the search bar and click enter.	-It should be able to display the search results of the book searched in the table.	-It is able to display the search results in the table.	Pass
17	<u>Purchase records:</u> Choose filter of date, publisher or recorded by.	-It should be able to apply the filter of the date, publisher or recorded by and show only those books being	-It is able to show the purchase records based on date, publisher or recorded by being filtered.	Pass

		filtered.		
18	<p><u>Add purchase records:</u>            Enter the publisher, books with ISBN, unit price and stock and recorded date.            Click the “add” button.</p>	<ul style="list-style-type: none"> <li>-It should be able to get the admin name from login and fill in record added by.</li> <li>-It should be able to add the purchase record inside the table.</li> </ul>	<ul style="list-style-type: none"> <li>-The admin name is able to get and filled in the record added by field.</li> <li>-The purchase record is able to add inside the table.</li> </ul>	Pass
19	<p><u>Sales report:</u>            Choose filter of the year.</p>	<ul style="list-style-type: none"> <li>-It should display the sales report of that year and generate graph for it.</li> </ul>	<ul style="list-style-type: none"> <li>-The sales table and graph are able to generate based on year chosen.</li> </ul>	Pass
20	<p><u>Sales report:</u>            Click on “Export to pdf” or “Export to excel”.</p>	<ul style="list-style-type: none"> <li>-It should be able to export the sales table to pdf file or excel file respectively.</li> </ul>	<ul style="list-style-type: none"> <li>-It is able to download pdf or excel file of the sales table.</li> </ul>	Pass
21	<p><u>Sales report:</u>            Check the checkbox of the book names above the graph.</p>	<ul style="list-style-type: none"> <li>-It should be able to filter the book lines being checked in the line graph.</li> </ul>	<ul style="list-style-type: none"> <li>-It is able to display the lines for the books that are being checked in the line graph.</li> </ul>	Pass

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22	<u>Edit member:</u> Update the name, phone number, total spent and gifts get. Click the “Save” button.	-It should be able to update the member data and display in the table.	-The member data is able to update and display in the table.	Pass
23	<u>Delete member:</u> Click on the trash can icon and click “yes” to confirm delete.	-It should be able to delete the member in the table.	-The member is able to delete in the table.	Pass
24	<u>Search member:</u> Search the member by name in the search bar.	-It should be able to display the search results with the member name input.	-It is able to display the search results with the name searched.	Pass

**User**

<b>Test ID</b>	<b>Test Case</b>	<b>Expected Result</b>	<b>Actual Result</b>	<b>Status</b>
1	<u>Login:</u> Enter “user123” for the ID and “userpass” for the password. Click “Login” button.	- Admin should be able to login to the user home page.	-Admin is able to login to the user home page.	Pass
2	<u>Display book:</u> Click “Search” button. Choose the genre or book type filter.	<ul style="list-style-type: none"> <li>-It should display the top three highest sales books at the top and other books at the bottom.</li> <li>-It should apply the filter and only show books with that genre or book type.</li> </ul>	<ul style="list-style-type: none"> <li>-It is able to display the top three sales books and the other books.</li> <li>-It only shows the books of that genre or book type after filtering.</li> </ul>	Pass
3	<u>Search books:</u> Search book name, genre or book type in the search bar.	-It should show the search results of the book name, genre and book type.	-It is able to show the search results of the book name, genre and book type.	Pass

4	<u>Book Details:</u> Click on one of the books to check its details.	-It should show all the details of the book including book name, ISBN, genre, book type, publisher, author, price, rating and comments.	-It is able to show all the details of the book.	Pass
5	<u>Feedback:</u> Click on the “Write Comment” button. Rate stars and write comment. Click on the “Post” button.	-It should be able to add the rating and comment under the reviews section of the book.	-It is able to add the rating and comment under the reviews section.	Pass
6	<u>Feedback:</u> Click on the three dots to show more. Click “Edit” or “Delete” button.	-User should be able to edit or delete the comment.	-User is able to edit or delete the comment of that book.	Pass

7	<p><u>Scan Barcode:</u></p> <p>Click “Pay” button on the home page.</p> <p>Put the barcode in front of the camera to scan.</p>	<p>-User should be able to scan the barcode and the book will be add to cart.</p>	<p>-User is able to scan the barcode and the book scanned is add to cart.</p>	Pass
8	<p><u>Member:</u></p> <p>Click “Yes” when it asked “Are you a member?” Enter the phone number.</p>	<p>-It should search the member ID by phone number.</p> <p>-It should go to the payment page if member found.</p>	<p>-It is able to get the member ID from the phone number.</p> <p>-It displays payment page if member found.</p>	Pass
9	<p><u>Member:</u></p> <p>Click “No” when it asked “Are you a member?” Click “Yes” when it asked “Do you want to join the membership?”</p>	<p>-It should navigate to member portal for user to add member.</p>	<p>-It is able to navigate to member portal.</p>	Pass

10	<u>Member:</u> Click “No” when it asked “Are you a member?” Click “No” when it asked “Do you want to join the membership?”	-It should direct to payment page for user to pay.	-It is able to direct to payment page.	Pass
11	<u>Add member:</u> Enter name and phone number. Click the “Add” button.	-User should be able to register as a member.	-User is able to register as a member.	Pass
12	<u>Edit member:</u> Enter valid phone number. Click on “Search” button. Update the name or phone number. Click on “Update” button.	-It should be able to search the member ID with the phone number. -It should be able to update the member name and phone number.	-It is able to search the member ID with the phone number. -It is able to update the member name and phone number.	Pass

13	<u>Edit member:</u> Enter invalid phone number. Click on “Search” button.	-It should give an alert of “Member not found.”	-It is giving the alert of “Member not found.”	Pass
14	<u>Delete member:</u> Enter valid phone number. Click on “Delete” button.	-It should be able to delete the member.	-It is able to delete the member with the phone number.	Pass
15	<u>Payment:</u> Choose a payment method from online banking, and credit/debit card.	-It should go to the responding payment gateway based on the option chosen.	-It is able to go to responding payment gateway after choosing.	Pass
16	<u>E-Receipt:</u> Click on “Print e-receipt” button.	-It should download the pdf file of the e-receipt. -It should navigate to thank you page.	-It is able to download the pdf file of the e-receipt. -It is able to direct to thank you page.	Pass

17	<p><u>Redeem gift:</u></p> <p>Choose the gift from the dropdown list. Click on “Redeem Gift” button.</p>	<p>-It should show alert of “Gift successfully redeemed”</p> <p>-It should update the total spent and gift get in the member table.</p>	<p>-It is able to show alert of “Gift successfully redeemed”</p> <p>-It is able to update the data in the member table.</p>	Pass
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*Part VI:*

*Conclusion*

## 6.1 Conclusion

All details and contents of the final year project are listed in this report, including the comprehensive development process of a web-based Book Store Management System. A bookstore system website was created as our final year project to enhance operational efficiency in traditional bookstores. It includes both user side and admin panel, leading the integration of online payment as well as supporting the transition from a physical bookstore to a hybrid model.

In order to narrow the scope and clarify the direction to ensure the project is well-planned, an overview, project objectives, target user, project scope, primary study, and problem statement are fully documented in the report. Not only that, system features, and hardware/software requirements for both admin and user are presented in detail in the report. The core features include the CRUD operations to provide inventory management, customer self-services such as barcode scanning for books and payment process, sales tracking, and data reporting to enhance efficiency and profitability. A context diagram (CD), data flow diagram (DFD), entity relationship diagram (ERD), and data dictionary leading the system website development process to be more practicable.

The report also included with system previews and system testing in detail, providing a detailed visual representation of the website's features, layout, and user interactions, along with comprehensive system previews, confirming the design decisions and navigational flow, and confirming the system's functionality and readiness for real-world implementation.

In conclusion, the developed website bridges the gap between conventional book retail and digital commerce. It gives bookshop owners the ability to effectively run their businesses while providing customers with a cutting-edge, safe, and user-friendly shopping experience. Our final year project endeavors a positive start toward adopting digital revolution without sacrificing conventional bookstores' essential characteristics.

## 6.2 Future Enhancements

Although the current implementation of the bookstore system website has met its main objectives of book browsing, administrator management, and secured online payments, there are still several aspects of the system that could be further improved in future iterations:

### **1. Implement for More Payment Method**

Adding more available payment methods such as Grab Pay, Pay Pal, Touch N Go EWallet, etc. would improve user experience as the user is able to make their payment with their preference payment method.

### **2. Improvement of Hardware Integration**

Future versions of the system can incorporate real hardware devices such as barcode scanners to improve operational efficiency. This would streamline tasks such as inventory management and sales processing by enabling staff to scan book ISBNs easily and directly into the system.

### **3. Delete Publisher Feature in the Purchase Record Page**

Adding a delete publisher function in the Purchase Record Page of the admin panel allows bookstore staff to delete outdated or inaccurate publisher records from the system, promoting better data management.

### **4. Implement a add to cart button for the available books**

By searching for books and adding them directly to the shopping cart, customers can save time by searching for available books first, paying, and then picking

up the books.

### **5. Editable Quantity in Shopping Cart**

Adding an edit function for quantity of each book items in the cart would convene customers' payment process as this enhancement enables the user is able to edit or update the quantity of items for each book without scanning them again before making payment.

### **6. System Security Improvement**

By implementing session timeouts and multi-factor authentication (MFA), the admin account security could be enhanced, making the whole system more secure as the risk of data breaches is reduced.

### **7. Book Management Convenience**

Adding an AI image processing feature to extract data from book cover image when uploading a book cover image to the system website could simplify the work of bookstore staff, leading to an increase in work efficiency.

### **8. Inventory Management Automation**

Implementation of barcode scanning features for adding purchase records would reduce manual input errors and streamline the backend operations for bookstore staff.

### **9. Chat Assistance or Chatbot Feature**

Implementing an AI-driven chatbot service definitely would enhance customer service by providing users instant support without additional employee cost. This feature will be friendly for those who are introverts or prefer to solve

problems on their own.

## **10. Multilingual Support**

Adding the option for multiple languages would enhance the system's accessibility to the user community. This feature would improve the user experience for the bookstore especially it serves a multilingual population in Malaysia.

With these improvements, the bookstore system will become more robust, more intelligent, and increasingly user-friendly, enabling traditional bookstores to not only survive but potentially flourish in the digital age.

*Part VII:*

*References*

List of URL addresses, reference books or bibliography entries

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*Part VIII:*

*Appendix*

## Appendix A: Meeting minutes

### A.1 Internal Group Meetings

*These are meetings held solely among group members to discuss progress, assign and distribute tasks, and to get prepared for the supervisor meetings.*

#### Meeting 1

- **Date:** 30th May 2024 (Thursday)
- **Time:** 10:00 AM – 11:30 AM
- **Venue:** MMU Library Cyberjaya
- **Attendees:**
  - Tan Yin Wun
  - Ashley Law Jia Ye
  - Wong Mei Jing
- **Agenda:**
  - Discuss and decide on the categories and general direction of FYP project
  - Set general expectations and deliverables on the FYP project
  - Discuss on deciding supervisor for FYP project based on the given list
- **Key Discussion Points:**
  - Web-based project is chosen during the discussion
  - A bookstore management system is proposed for the FYP project
  - Discussed on general functionality of the bookstore management system
  - Discussed and decided Miss Ruzanna to be our supervisor for the FYP project
- **Action Items:**
  - Sent an email to request Miss Ruzanna to be a supervisor for our group
  - Start to do some research and self-studying based on the discussed general direction of the project

## Meeting 2

- **Date:** 10th December 2024 (Tuesday)
- **Time:** 2:00 PM – 4:00 PM
- **Venue:** MMU Library Cyberjaya
- **Attendees:**
  - Tan Yin Wun
  - Ashley Law Jia Ye
  - Wong Mei Jing
- **Agenda:**
  - Discuss the project direction details and reach consensus with other team members
  - Complete the Title Requisitions Form as requested
- **Key Discussion Points:**
  - Discuss and confirm the objectives of the project, target user and the scopes of the project
  - Discuss the project requirements, including software and hardware of the project
  - Decided the problem statement of the project
  - Voted and decided a group leader for the FYP project
- **Action Items:**
  - Submit the Title Requisitions Form in pdf format to supervisor
  - Submit the Microsoft Form regarding the FYP 1 after the Title Requisitions Form is approved by Supervisor (13 December 2024)
  - Start revising and self-studying regarding the required skills and programming language based on the discussed details for the FYP project.

### Meeting 3

- **Date:** 19th December 2024 (Monday)
- **Time:** 12:30 AM – 1:00 PM
- **Venue:** MMU Library Cyberjaya
- **Attendees:**
  - Tan Yin Wun
  - Ashley Law Jia Ye
  - Wong Mei Jing
- **Agenda:**
  - General discussion on the contents of the Interim Report
  - Distribute and assign tasks for the Interim Report
  - Set a due date for the assigned tasks of the Interim Report
- **Key Discussion Points:**
  - Review the Interim Report template provided in Teams to divide tasks evenly for the Interim Report
- **Action Items:**
  - Start proceeding to do the divided tasks on the Interim Report
  - Keeps going with revising and self-studying regarding the required skills and programming language based on the discussed details for the FYP project.

## Meeting 4

- **Date:** 7th April 2025 (Monday)
- **Time:** 1:30 PM – 3:00 PM
- **Venue:** MMU Library Cyberjaya
- **Attendees:**
  - Tan Yin Wun
  - Ashley Law Jia Ye
  - Wong Mei Jing
- **Agenda:**
  - Each team member presents the current progression of assigned tasks for the Interim Report respectively
  - General discussion on the contents of the Interim Report based on the works of every team member
- **Key Discussion Points:**
  - Discussion on the Entity Relationship Diagram (ERD), Data Flow Diagram (DFD), Context Diagram (CD), and Data Dictionary based on the Rubric and requirements for FYP project
  - Confirm and reach consensus with other team members on the functionality of the project, including webpages for both user and administrator
- **Action Items:**
  - Modify, enhance and update the content of the Interim Report based on the discussion respectively
  - Requested consultation time with Supervisor
  - Keeps going with revising and self-studying regarding the required skills and programming language based on the discussed details for the FYP project.

## Meeting 5

- **Date:** 14th April 2025 (Monday)
- **Time:** 1:30 PM – 4:00 PM
- **Venue:** MMU Library Cyberjaya
- **Attendees:**
  - Tan Yin Wun
  - Ashley Law Jia Ye
  - Wong Mei Jing
- **Agenda:**
  - Discussion on the design of the system website we plan to implement
  - Distribute and assign tasks for the webpages that planning to implement as discussed
  - Planning a general timeline on the implementation of the web-based project
- **Key Discussion Points:**
  - Voted and decided the design of the system website we plan to implement
  - Divide the webpages evenly for the prototype implementation in FYP 1 and system website implementation in FYP 2
  - Set a due date for the prototype implementation for the Interim Report
- **Action Items:**
  - Implement the general prototype design, including side bar for admin panel and nav bar for user side, ensuring a consistent style for the prototype implementation
  - Continue with revising and self-studying regarding the required skills and programming language based on the discussed details for the FYP project.

## Meeting 6

- **Date:** 21st April 2025 (Monday)
- **Time:** 1:30 PM – 2:30 PM
- **Venue:** MMU Library Cyberjaya
- **Attendees:**
  - Tan Yin Wun
  - Ashley Law Jia Ye
  - Wong Mei Jing
- **Agenda:**
  - Each team member presents the current progression of assigned tasks for the Interim Report and implemented prototype respectively
  - General discussion on the work contents showed for every team member
  - Discussion on the details of Interim presentation
  - Set a due date for the assigned tasks of the Interim presentation slides
- **Key Discussion Points:**
  - All group members view on each other's latest work and provide suggestions.
  - Voted and decided the slides template for Interim presentation, and proceed with the presentation slides
- **Action Items:**
  - Modify, enhance and update the content of the Interim Report based on the discussion respectively
  - Start proceeding to do the divided tasks regarding the Interim presentation
  - Carry on with revising and self-studying regarding the required skills and programming language based on the discussed details for the FYP project

## Meeting 7

- **Date:** 28th April 2025 (Monday)
- **Time:** 1:30 PM – 2:30 PM
- **Venue:** MMU Library Cyberjaya
- **Attendees:**
  - Tan Yin Wun
  - Ashley Law Jia Ye
  - Wong Mei Jing
- **Agenda:**
  - Each team member presents the current progression of assigned tasks for the Interim presentation respectively
  - General discussion on the work contents showed for every team member
  - Interim presentation Rehearsal
- **Key Discussion Points:**
  - All group members view on each other's latest work and provide suggestions
  - Reach consensus on the presentation flow during Interim presentation Rehearsal
- **Action Items:**
  - Modify, enhance and update the content of the Interim Report based on the discussion respectively
  - Continue with revising and self-studying regarding the required skills and programming language based on the discussed details for the FYP project.

## Meeting 8

- **Date:** 5th May 2025 (Monday)
- **Time:** 1:30 PM – 3:00 PM
- **Venue:** MMU Library Cyberjaya
- **Attendees:**
  - Tan Yin Wun
  - Ashley Law Jia Ye
  - Wong Mei Jing
- **Agenda:**
  - Last confirmation on the Interim Report
  - Discussion on the real web-based system website implementation
  - Set detailed expectations and deliverables on the implementation of system website for FYP project
- **Key Discussion Points:**
  - Instead of MySQL decided initially, Google Cloud is chosen for the backend of the project
  - More CRUD agreed to add in the user side based on suggestions from Supervisor, including comment feature, self-service on member information update feature, and etc
- **Action Items:**
  - Submit the Interim Report, prototype and presentation slides in pdf format to supervisor
  - Create a repository in GitHub and set up the environment to collaborate
  - Start proceeding to do the divided tasks regarding the real system website implementation

## Meeting 9

- **Date:** 12th May 2025 (Monday)
- **Time:** 1:30 PM – 2:30 PM
- **Venue:** Online (Microsoft Teams)
- **Attendees:**
  - Tan Yin Wun
  - Ashley Law Jia Ye
  - Wong Mei Jing
- **Agenda:**
  - Each team member presents the current progression of assigned tasks for the implementation of web-based system website of the project.
  - General discussion on the work contents showed for every team member
- **Key Discussion Points:**
  - All group members view on each other's latest work and provide suggestions
  - Discussion on the updated latest version of Entity Relationship Diagram (ERD) and Data Flow Diagram (DFD)
- **Action Items:**
  - Modify, enhance and update the coding based on the discussion respectively
  - Continue for the system website implementation

## Meeting 10

- **Date:** 19th May 2025 (Monday)
- **Time:** 1:30 PM – 2:30 PM
- **Venue:** MMU Library Cyberjaya
- **Attendees:**
  - Tan Yin Wun
  - Ashley Law Jia Ye
  - Wong Mei Jing
- **Agenda:**
  - Each team member presents the current progression of assigned tasks for the implementation of web-based system website of the project.
  - General discussion on the work contents showed for every team member
- **Key Discussion Points:**
  - All group members view on each other's latest work and provide suggestions
- **Action Items:**
  - Modify, enhance and update the coding based on the discussion respectively
  - Continue for the system website implementation

## Meeting 11

- **Date:** 26th May 2025 (Monday)
- **Time:** 3:30 PM – 4:30 PM
- **Venue:** Online (Microsoft Teams)
- **Attendees:**
  - Tan Yin Wun
  - Ashley Law Jia Ye
  - Wong Mei Jing
- **Agenda:**
  - Each team member presents the current progression of assigned tasks for the implementation of web-based system website of the project.
  - General discussion on the work contents showed for every team member
- **Key Discussion Points:**
  - All group members view on each other's latest work and provide suggestions
  - Vote and decide to make a consultation with Supervisor regarding the updated version of Entity Relationship Diagram (ERD) and Data Flow Diagram (DFD)
- **Action Items:**
  - Modify, enhance and update the coding based on the discussion respectively
  - Continue for the system website implementation

## Meeting 12

- **Date:** 2nd June 2025 (Monday)
- **Time:** 3:30 PM – 4:30 PM
- **Venue:** Online (Microsoft Teams)
- **Attendees:**
  - Tan Yin Wun
  - Ashley Law Jia Ye
  - Wong Mei Jing
- **Agenda:**
  - Each team member presents the current progression of assigned tasks for the implementation of web-based system website of the project.
  - General discussion on the work contents showed for every team member
- **Key Discussion Points:**
  - All group members view on each other's latest work and provide suggestions
- **Action Items:**
  - Modify, enhance and update the coding based on the discussion respectively
  - Continue for the system website implementation

## Meeting 13

- **Date:** 9th June 2025 (Monday)
- **Time:** 1:30 PM – 2:30 PM
- **Venue:** MMU Library Cyberjaya
- **Attendees:**
  - Tan Yin Wun
  - Ashley Law Jia Ye
  - Wong Mei Jing
- **Agenda:**
  - Each team member presents the current progression of assigned tasks for the implementation of web-based system website of the project.
  - General discussion on the work contents showed for every team member
  - Discussion and task distribution on Final Report
- **Key Discussion Points:**
  - All group members view on each other's latest work and provide suggestions
  - Review the Final Report template provided in Teams to divide the tasks evenly
  - Set due dates on Code Combination and Final Report
- **Action Items:**
  - Modify, enhance and update the coding based on the discussion respectively
  - Continue and complete for the system website implementation
  - Start proceeding to code combination for the system website

## Meeting 14

- **Date:** 16th June 2025 (Monday)
- **Time:** 1:30 PM – 2:30 PM
- **Venue:** MMU Library Cyberjaya
- **Attendees:**
  - Tan Yin Wun
  - Ashley Law Jia Ye
  - Wong Mei Jing
- **Agenda:**
  - Each team member presents the current progression of assigned tasks of the project.
  - General discussion on the work contents showed for every team member
- **Key Discussion Points:**
  - All group members view on each other's latest work and provide suggestions
  - Checking and ensuring the process of code combination conduct smoothly
- **Action Items:**
  - Modify, enhance and update the contents based on the discussion respectively
  - Continue for the combination of coding for the system website implementation

## Meeting 15

- **Date:** 24th June 2025 (Tuesday)
- **Time:** 10:00 AM – 11:10 AM
- **Venue:** MMU Library Cyberjaya
- **Attendees:**
  - Tan Yin Wun
  - Ashley Law Jia Ye
  - Wong Mei Jing
- **Agenda:**
  - Each team member presents the current progression of assigned tasks of the project.
  - General discussion on the work contents showed for every team member
  - Discussion on the Final presentation details
- **Key Discussion Points:**
  - All group members view on each other's latest work and provide suggestions
  - Checking and ensuring the process of code combination conduct smoothly
  - Voted and decided the slides template for Final presentation, and proceed with the presentation slides
- **Action Items:**
  - Modify, enhance and update the contents based on the discussion respectively
  - Continue and complete for the combination of coding for the system website implementation
  - Proceed with the presentation slides regarding the Final presentation

## Meeting 16

- **Date:** 28th June 2025 (Monday)
- **Time:** 2:30 PM – 3:30 PM
- **Venue:** Online (Microsoft Teams)
- **Attendees:**
  - Tan Yin Wun
  - Ashley Law Jia Ye
  - Wong Mei Jing
- **Agenda:**
  - Each team member presents the current progression of assigned tasks respectively
  - General discussion on the work contents showed for every team member
  - Discussion on enhancements based on suggestions from the supervisor
- **Key Discussion Points:**
  - All group members view on each other's latest work and provide suggestions
  - Discussion on enhancements based on suggestions from the supervisor in Supervisor Meeting 6
- **Action Items:**
  - Modify, enhance and update the contents for the final report and the system implemented based on the discussion respectively
  - Continue with the presentation slides regarding the Final presentation
  - Proceed to prepare the scripts for the Final presentation respectively

## Meeting 17

- **Date:** 8th July 2025 (Tuesday)
- **Time:** 3:00 PM – 4:30 PM
- **Venue:** MMU Library Cyberjaya
- **Attendees:**
  - Tan Yin Wun
  - Ashley Law Jia Ye
  - Wong Mei Jing
- **Agenda:**
  - Each team member presents the current progression of assigned tasks respectively
  - General discussion on the work contents showed for every team member
  - Final presentation Rehearsal
- **Key Discussion Points:**
  - All group members view on each other's latest work and provide suggestions
  - Reach consensus on the presentation flow during Final presentation Rehearsal
- **Action Items:**
  - Modify, enhance and update the content based on the discussion respectively
  - Enhance the scripts for the Final presentation respectively

## A.2 Supervisor Meetings

*These are formal meetings between the group members and the project supervisor to review progress, get feedback, and proceed to the next steps.*

### Meeting 1

- **Date:** 13th June 2024 (Thursday)
- **Time:** 12:30 AM – 1:00 PM
- **Venue:** Supervisor's Office
- **Attendees:**
  - Miss Ruzanna (Supervisor)
  - Tan Yin Wun
  - Ashley Law Jia Ye
  - Wong Mei Jing
- **Agenda:**
  - Briefly explain to the supervisor regarding the general content and direction of the project
  - Supervisor provides suggestions and improvements regarding the project
- **Key Discussion Points:**
  - Miss Ruzanna accepted our request and agreed to be a supervisor for our FYP project
  - Supervisor provided feedback on proposed topics
- **Action Items:**
  - Modify and improve the direction of FYP project based on the feedback
  - Keeps going on with the research and self-studying based on the latest general expectations and deliverables on the FYP project

## Meeting 2

- **Date:** 9th April 2025 (Wednesday)
- **Time:** 2:00 PM – 3:00 PM
- **Venue:** Supervisor's Office
- **Attendees:**
  - Miss Ruzanna (Supervisor)
  - Tan Yin Wun
  - Ashley Law Jia Ye
  - Wong Mei Jing
- **Agenda:**
  - Briefly explain to the supervisor regarding the whole system project we plan to implement
  - Review the Entity Relationship Diagram (ERD), Data Flow Diagram (DFD), and Data Dictionary
  - Supervisor ensures the content details meet the requirements, and provides suggestions and enhancements regarding the project
- **Key Discussion Points:**
  - Our idea on implementing a bookstore system webpage with detailed explanations on the functionality of each webpage and database tables respectively, approved by Supervisor
  - Entity Relationship Diagram (ERD), Data Flow Diagram (DFD) approved by Supervisor with minor changes
- **Action Items:**
  - Enhancement for the content of Interim Report based on the suggestions given for the project

### Meeting 3

- **Date:** 18th April 2025 (Friday)
- **Time:** 1:20 PM – 2:00 PM
- **Venue:** Online (Microsoft Teams)
- **Attendees:**
  - Miss Ruzanna (Supervisor)
  - Tan Yin Wun
  - Ashley Law Jia Ye
  - Wong Mei Jing
- **Agenda:**
  - Showing and seeking for advice of the Supervisor regarding the implemented prototype
  - Review the latest version of our Interim Report
- **Key Discussion Points:**
  - The supervisor provides feedback on the data flow diagram in the Interim Report
  - Prototype implemented is accepted and approved
- **Action Items:**
  - Update the data flow diagram with the correct format as pointed out by Supervisor
  - Make appointment for Interim Presentation

## Meeting 4

- **Date:** 2nd May 2025 (Friday)
- **Time:** 1:30 PM – 2:30 PM
- **Venue:** Online (Microsoft Teams)
- **Attendees:**
  - Miss Ruzanna (Supervisor)
  - Tan Yin Wun
  - Ashley Law Jia Ye
  - Wong Mei Jing
- **Agenda:**
  - Conducting the Interim Presentation based on the appointment made on last Supervisor Meeting (18th April 2025, Friday)
  - Supervisor provides feedback on the Interim Presentation
- **Key Discussion Points:**
  - The supervisor provides suggestions on adding more features for user side to increase the code weights for user side
- **Action Items:**
  - Update the Entity Relationship Diagram (ERD), Data Flow Diagram (DFD), and the Context Diagram (CD) based on the suggestions by Supervisor

## Meeting 5

- **Date:** 29th May 2025 (Thursday)
- **Time:** 3:00 PM – 3:30 PM
- **Venue:** Online (Microsoft Teams)
- **Attendees:**
  - Miss Ruzanna (Supervisor)
  - Tan Yin Wun
  - Ashley Law Jia Ye
  - Wong Mei Jing
- **Agenda:**
  - Supervisor review and provide advice based on the latest version of Entity Relationship Diagram (ERD) and Data Flow Diagram (DFD)
  - Confirm with the sufficiency of the code weights for the user side
- **Key Discussion Points:**
  - Entity Relationship Diagram (ERD) and Data Flow Diagram (DFD) approved by Supervisor with minor changes
  - New features in the user side are agreed by Supervisor
- **Action Items:**
  - Update the Entity Relationship Diagram (ERD) and Data Flow Diagram (DFD) based on the advice of Supervisor
  - Proceed to system website implementation

## Meeting 6

- **Date:** 30th June 2025 (Monday)
- **Time:** 11:00 AM – 12:37 PM
- **Venue:** Online (Microsoft Teams)
- **Attendees:**
  - Miss Ruzanna (Supervisor)
  - Tan Yin Wun
  - Ashley Law Jia Ye
  - Wong Mei Jing
- **Agenda:**
  - Showing and seeking for advice of the Supervisor regarding the fully implemented web-based system website
  - Review the latest version of our Final Report
- **Key Discussion Points:**
  - Inquiry about the details, rubric and precautions of Final presentation
  - The supervisor provides feedback on both our systems and final report content
  - Confirmation of the date submitted final report and source code
- **Action Items:**
  - Update the content of Final Report based on Supervisor's suggestions
  - Enhance the implemented systems based on comments from the Supervisor

## Appendix B: Website Samples/Questionnaire/Forms

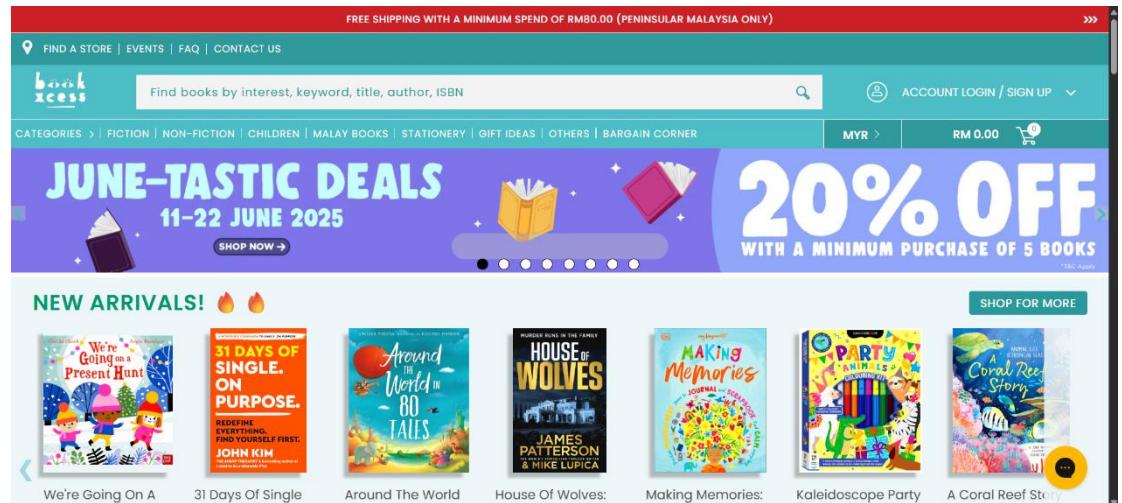


Figure 5.1: BookXcess main page website screenshot

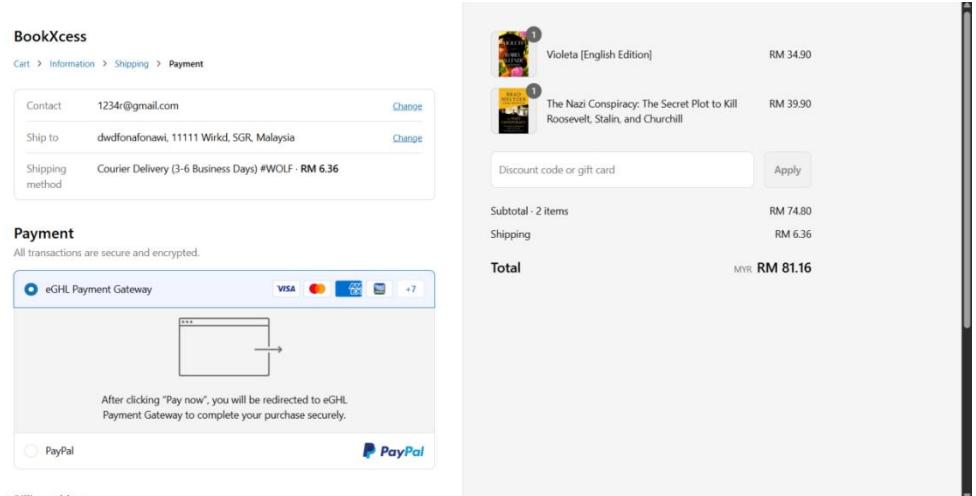


Figure 5.2: BookXcess payment page website screenshot

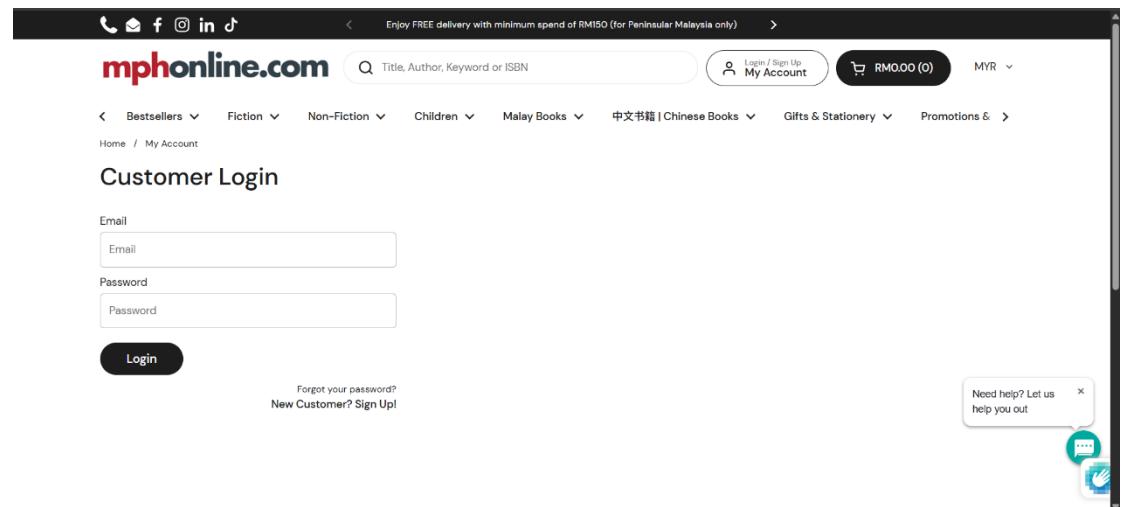


Figure 5.3: MPH login page website screenshot

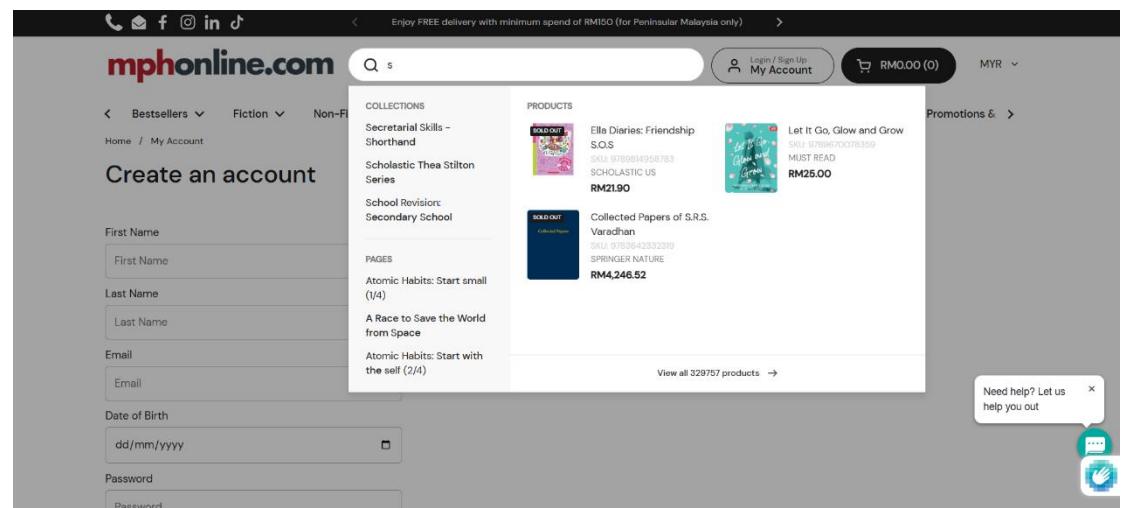


Figure 5.4: MPH search bar website screenshot

**SELLER CENTER**

Eureka IT Online

Product Overview All Live Image Missing Poor Quality Sold Out Inactive Export + Add Name, SKU Search

Edit	Name	SKU	Created	Price	Sale Price	Available	Visible	Active
<a href="#">Edit</a>	Apple EarPods Earphones Lightning Cable (Support all iOS) Dual Port Car Charger	Apple 3 in 1 Earpod	17 Jan 2015	99.00	39.00	40	<input checked="" type="checkbox"/>	<input type="button" value="OFF"/>
<a href="#">Edit</a>	Dell PowerEdge T20 Mini Tower Server for Small & Medium Office (Xeon E3-1225 v3 3.20Ghz, 1TB, 4GB ECC, 7 Pro)	Dell PowerEdge T20 Mini Server	25 Apr 2015	2,999.00	2,499.00	3	<input checked="" type="checkbox"/>	<input type="button" value="ON"/>
<a href="#">Edit</a>	Evatronic K6 Intelligent Mini Robot Vacuum Cleaner with 3 Working Mode	Evatronic K6	31 Oct 2014	899.00	279.00	2	<input checked="" type="checkbox"/>	<input type="button" value="ON"/>
<a href="#">Edit</a>	Kingmax 4GB DDR3L 1600Mhz Low Voltage Notebook Memory Ram SO-DIMM	Kingmax 4GB 1600Mhz DDR3L SO-DIMM	08 Jul 2015	189.00	125.00	10	<input checked="" type="checkbox"/>	<input type="button" value="ON"/>
<a href="#">Edit</a>	Dell 1510X Standard Series DLP Projector (Dual VGA, HDMI, RJ45 XGA 3500 ANSI Lumens)	Dell Projector 1510X	08 Jul 2015	2,599.00	2,299.00	1	<input checked="" type="checkbox"/>	<input type="button" value="ON"/>
<a href="#">Edit</a>	Western Digital WD 500GB 3.5" Caviar Blue Internal Sata Hard Disk Drive (WD5000AAKS)	WD 3.5" 500GB Caviar Blue Internal Sata HDD	18 Jul 2015	199.00	169.00	50	<input checked="" type="checkbox"/>	<input type="button" value="ON"/>
<a href="#">Edit</a>	Microsoft Surface Pro 3 Type Cover (Blue)	Microsoft Surface Pro 3 Type Cover - Blue	18 Jul 2015	499.00	409.00	10	<input checked="" type="checkbox"/>	<input type="button" value="ON"/>
<a href="#">Edit</a>	Dell S2715H 27" Full HD IPS LED Monitor (Black)	Dell S2715H FHD 27inch IPS LED	18 Jul 2015	1,299.00	1,199.00	10	<input checked="" type="checkbox"/>	<input type="button" value="ON"/>
<a href="#">Edit</a>	Dell S2415H 24" IPS Full HD LED Monitor with virtually borderless design and an ultra-wide view	Dell S2415H 24inch IPS FHD LED Monitor	18 Jul 2015	899.00	799.00	10	<input checked="" type="checkbox"/>	<input type="button" value="ON"/>
<a href="#">Edit</a>	Western Digital WD 3TB 2500 RPM 3.5" SATA III 2.0 MR Cache	WD 3TB 3.5"	20 Jul 2015	450.00	350.00	0	<input checked="" type="checkbox"/>	<input type="button" value="ON"/>

Figure 5.5: Lazada seller center manage product page website screenshot

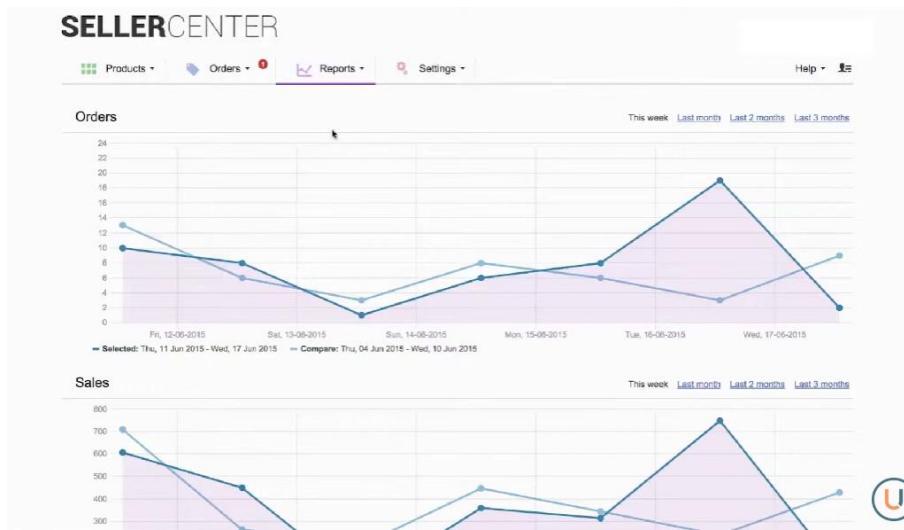


Figure 5.6: Lazada seller center graph report page website screenshot

## Appendix C: Client/Server Setup Guide

This section should provide the user manual for user and administrator in terms of:

### 1. Hardware configuration or setup

This section details the minimum hardware requirements and network configuration necessary to deploy and run the Book Store Management System.

Server Requirements:

- Processor: Intel Xeon or equivalent (Quad-core, 2.4GHz or higher)
- RAM: Minimum 16 GB
- Storage: SSD with at least 500 GB of available space
- Network: Gigabit Ethernet Port
- Operating System: Windows Server 2019 / Ubuntu Server 22.04 LTS
- Backup: External storage for daily/weekly backups

Client Requirements:

- Processor: Intel Core i5 or equivalent
- RAM: Minimum 8 GB
- Storage: Minimum 100 GB of free space
- Network: Stable internet connection or LAN
- Operating System: Windows 10 / macOS 12 / Ubuntu Desktop 22.04

Network Setup:

- Ensure all client devices are connected to the same local area network (LAN) as the server.
- Assign static IP to the server.
- Open necessary ports (e.g., 3000, 5000, 8080 depending on system requirements) in the firewall.
- Test connectivity using ping or remote access tools.

## 2. System Integration Manual

This section explains how the different components of the system work together, including third-party services used for payment, authentication, and data storage. The system integrates with:

- Stripe for secure online payment processing
- Nodemailer with a Google Account (Gmail SMTP) to send OTPs during password recovery
- Google Cloud SQL to manage and host the relational database backend

### A. Stripe Payment Integration

#### 1) Setup:

- Sign up at Stripe Dashboard.
- Get your API keys: STRIPE\_SECRET\_KEY, STRIPE\_PUBLISHABLE\_KEY, and STRIPE\_WEBHOOK\_SECRET.

#### 2) Backend Integration:

- Install Stripe SDK: `npm install stripe`
- Create an endpoint for handling Stripe webhooks (e.g., `/api/payment/webhook`).

- 3) Local Development with Stripe CLI:
  - Stripe cannot reach localhost directly from its servers.
  - Use the Stripe CLI to forward events: stripe listen --forward-to localhost:5000/api/payment/webhook

B. Gmail SMTP (Nodemailer) for OTP Email

- 1) Google Account Setup:
  - Use a dedicated Gmail account for the system (e.g., yourapp.noreply@gmail.com).
  - Enable 2-Step Verification in the Gmail account.
  - Generate an App Password from Google Account settings (not your regular password).
- 2) Backend Integration:
  - npm install nodemailer
  - Configure transport:

```
const transporter = nodemailer.createTransport({  
  service: 'gmail',  
  auth: {  
    user: process.env.EMAIL_USER,  
    // e.g., yourapp.noreply@gmail.com  
    pass: process.env.EMAIL_PASS  
    // app password, not Gmail password  
  }  
});
```

C. Google Cloud SQL Integration

- 1) Instance Setup:
  - Create a MySQL instance in Google Cloud SQL.
  - Configure authorized networks to allow access from your backend

server or IP.

- Enable SSL if required for secure connections.
- 2) Backend Connection
  - Use appropriate database driver (mysql2/promise)
  - Store credentials as: DB\_HOST, DB\_USER, DB\_PASS, DB\_NAME, DB\_PORT

### 3. Installation Procedure

This guide outlines the complete installation procedure to set up the full-stack web application, including frontend (React) and backend (Node.js with Express and MySQL). It assumes basic familiarity with Node.js, MySQL, and terminal commands.

#### Step 1: Project Folder Structure

- Create a root folder for your project.
- Inside it, create two separate subfolders:
  - frontend/
  - backend/
- Open two terminal instances, one for each folder and navigate into them:
  - Terminal 1: cd frontend
  - Terminal 2: cd backend

#### Step 2: Backend Setup (Node.js + Express)

- Initialize npm, install express and all other required packages in one go:

- cd backend
- npm init-y
- npm i express
- npm install
- Install dependencies:
  - npm install express mysql2 cors dotenv
- Install development tools (optional):
  - npm install -D nodemon
- Add a .gitignore file in the backend folder:
  - node\_modules/
  - .env
- Create server files:
  - db.js (MySQL DB connection)
  - server.js (Express server entry point)
  - router/Bookrouter.js (example API routes)
- Setup .env file (optional):
  - PORT=5000
  - DB\_HOST=localhost
  - DB\_USER=root
  - DB\_PASSWORD=yourpassword
  - DB\_NAME=your\_database\_name
- Start the server using nodemon:
  - npm run dev

### Step 3: Frontend Setup (React + Vite)

- Scaffold the frontend project:

- cd frontend
- npm create vite@latest frontend  
(Choose React and JavaScript when prompted)
- Install frontend dependencies:
  - cd frontend
  - npm install
  - npm install react-router-dom bootstrap
- Import Bootstrap CSS in App.jsx:
  - In App.jsx, at the top of the file, add:

```
import 'bootstrap/dist/css/bootstrap.min.css';
```
- Set up React Router:
  - In src/main.jsx define our router with:

```
import React from 'react';
import ReactDOM from 'react-dom/client';
import { BrowserRouter } from 'react-router-dom';
import App from './App';

ReactDOM.createRoot(document.getElementById('root')).render(
  <React.StrictMode>
    <BrowserRouter>
      <App />
    </BrowserRouter>
  </React.StrictMode>
);
```
- Run the frontend development server:

- If not already present, add this script to your package.json:

```
"scripts": {  
    "start": "vite"  
}
```

- Use the default Vite command to start the server and run the localhost frontend:
  - npm run dev