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WORKSHOP 1

REPORT

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EXECUTIVE SUMMARY

In university life, many students have unused items like textbooks, furniture, and electronics, particularly at the end of the semester when these items are no longer needed. However, these items may hold significant value for other students who actively seek second-hand options to save money. Especially as students face rising study and living costs, the demand for affordable alternatives is at an all-time high. Currently, students rely on social media platforms for trading, which leads to scattered information and challenges in locating suitable items or potential buyers. This lack of a centralized platform results in significant inefficiencies, increasing the time and effort needed for buyers and sellers to connect and finalize transactions. Additionally, students often struggle with managing and categorizing their listings on social media, further complicating the trading process and diminishing user experience. To address these issues, this project aims to develop a dedicated second-hand trading platform specifically designed for university students, centralizing transaction information for easier access and trading. Key objectives include improving transaction efficiency through search and categorization features that allow users to quickly find the items they need, as well as facilitating product management by providing an intuitive interface for users to easily upload, edit, and manage their listings. The platform will target university students and include essential features such as user registration and login, search functionality, and transaction recording capabilities. The significance of this project lies in its ability to meet the growing market demand for second-hand trading among university students, promote sustainable consumption practices by encouraging the reuse of items, and enhance economic benefits by allowing students to earn income from selling unused items while providing affordable options for their peers.

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CHAPTER 1: INTRODUCTION

1.1 Introduction

The Second-hand Trading Platform is a tailored solution for university students, designed to streamline the process of buying and selling used items within a university environment. University students often find themselves accumulating a variety of items that they no longer need, ranging from textbooks, electronics, and furniture to transportation-related products. These items are often in good condition but are no longer essential to the students' daily lives, creating an opportunity for both sellers and buyers to benefit. This platform serves as a dedicated, user-friendly space where students can easily exchange these items, helping them save money, reduce waste, and make the most out of their possessions.

The platform allows users to create personal accounts, giving them the ability to upload detailed listings of items they wish to sell. These listings include comprehensive descriptions, clear photographs, and accurate pricing information, empowering students to set fair and competitive prices based on their evaluation of the item's condition and market demand. This feature ensures transparency and fosters trust between buyers and sellers, while also helping users avoid the complexities and risks often associated with informal sales channels such as social media or physical bulletin boards.

In addition to the selling functionality, the platform also offers a powerful search feature, allowing users to browse through a wide range of available items and easily filter them based on specific criteria such as item category, price, and keywords. This reduces the time and effort needed to find particular items, enabling users to quickly locate exactly what they need without the uncertainty and clutter of browsing on less

specialized platforms. The search and filter system is optimized to meet the needs of university students who value efficiency and convenience.

For administrators, the platform includes robust administrative controls that allow them to monitor and regulate the marketplace. Administrators can delete listings that violate the platform's policies, ensuring that all items for sale adhere to the rules and maintaining a safe environment for users. In addition to item management, administrators have access to various analytical tools and reports, such as profit and fee reports, which provide insight into the platform's financial performance on a monthly and annual basis. They can also generate transaction reports, which summarize the volume and trends of purchases and sales across different categories, allowing for data-driven decisions to improve the platform's functionality.

By centralizing the buying and selling process in a structured and reliable environment, this platform enhances the overall trading experience for university students. It not only simplifies the way students buy and sell used items but also fosters a sense of community by facilitating transactions among peers. As students are empowered to manage their items more effectively, they are better able to make informed decisions while contributing to a more sustainable and cost-effective lifestyle on campus.

1.2 Problem Statement

Managing second-hand item trading effectively within the university student community poses significant challenges, primarily due to the lack of a centralized platform. Students often rely on social media for these transactions, which presents several difficulties in connecting buyers and sellers, ensuring the accuracy of listings, and organizing inventory. These problems are compounded by the inefficiency of manual processes, such as posting items and tracking interactions, which ultimately leads to delays, miscommunication, and dissatisfaction for both parties involved.

1. **Fragmented Information Across Platforms.** One of the most pressing issues in second-hand item trading is the fragmented nature of information when using social media. Listings are scattered across different pages, groups, and posts, making it difficult for students to find what they are looking for or for sellers to locate potential buyers. This disorganization not only increases the time and effort required to complete a transaction but also reduces the chances of a successful sale. Social media's reliance on individual user management rather than a structured platform means buyers and sellers often face difficulties in verifying the legitimacy and details of listings, leading to confusion and lost opportunities.
2. **Inefficiency in Connecting Buyers and Sellers.** Without a centralized platform, there is a notable inefficiency in the trading process. Both buyers and sellers face difficulties in locating each other and finalizing deals. In a decentralized system like social media, users have to rely on manual searches and informal communication methods, leading to increased time spent on finding suitable items or buyers. This inefficiency results in delayed transactions, reduced sales opportunities, and a lower likelihood of completing successful trades, as buyers may be unable to find their desired items in a timely manner, while sellers struggle to attract the right audience for their goods.

3. **Lack of Organization and Categorization.** The absence of a well-structured system for managing listings makes the process of posting and searching for items on social media even more complicated. Without predefined categories and filters, sellers often create inconsistent or unclear listings, and buyers have to manually sift through numerous posts to find relevant items. This disorganization leads to frustration and inefficiencies for both parties. Sellers may struggle to showcase their items effectively, and buyers may waste time navigating through irrelevant listings, making the experience far from ideal for students looking for an easy and efficient way to buy and sell items.

1.3 Objective (s) of the project

This project embarks on the following objectives:

- a. To create a centralized platform for college students for second-hand transactions, providing a simplified, user-friendly experience for buyers and sellers. The platform integrates all information into one place, reduces scattered information in social media listings, and makes it easier to find the right items or buyers.
- b. To streamline the trading process. Making it easier and faster for buyers and sellers to complete transactions. This will reduce the time and effort compared to using scattered social media platforms.
- c. To implement efficient item management and categorizing functions, allowing users to upload, update and delete second-hand items for sale. The platform will also enable easy classification and search, solving the difficulties students encounter when managing and finding items on social media.

1.4 Scope

1.4.1 Module to be developed

1. Login and Register

This module will provide secure access to the platform for both administrators and existing users. Administrators and registered users can log into the system by entering their registered username and corresponding password accurately. For new users, the system will allow registration by signing up with the required details, such as full name, email address, username, password, and phone number. This process ensures secure and efficient user management while keeping unauthorized users from accessing the platform.

2. Item Management

This module enables users to add, update, or remove items they wish to sell on the platform. Users must provide detailed descriptions of their items, including specifications, condition, and pricing information. Administrators have the authority to review and remove any items that fail to meet the platform's guidelines or do not comply with the specified categories. This ensures that the items listed are appropriate and meet the platform's standards, maintaining a safe and organized marketplace for all users.

3. Search and Filter

The search and filter functionality allows both administrators and users to locate items efficiently. Users can search by entering keywords, setting a price range, or selecting categories such as books, electronics, or furniture. Administrators can use the same filters to review or manage items, ensuring compliance with platform guidelines. This feature enhances user experience by enabling quick and accurate searches while maintaining an organized platform.

4. Calculation

This module is responsible for calculating the total price of the selected items, including platform fees. During checkout, the system will clearly display the calculated total to the user, ensuring they understand the breakdown of prices and any additional charges. This feature aims to provide transparency during the purchasing process, preventing surprises and enhancing the user's trust in the platform.

5. Data Analysis Report

The data analysis module will generate comprehensive reports based on transaction data, including total sales, item categories, and monthly or yearly income. These reports will assist administrators in tracking the platform's performance and user activity, helping to identify trends, make informed decisions, and optimize operations. The reports will provide valuable insights into the platform's effectiveness and the financial health of the system.

6. Transaction Management

This module will manage the entire transaction process, including payment processing, recording transaction history, and confirming completed sales. Users will be able to see the history of their transaction, while administrators have permission to track all the transaction history of the users.

7. Profile Management

This module allows users to update their personal information, such as their email address, phone number, and password. By providing the ability to edit profiles, the platform ensures that user information remains accurate and up to date. This feature also enhances user satisfaction by allowing them to maintain control over their personal data.

1.4.2 Target User

1. Administrator

The administrator is a user with special privileges who oversees the platform's management and ensures compliance with its policies. Administrators have access to key modules such as Login and Register, where they can securely log in to the system, and Item Management, where they can review and remove items that violate the platform's guidelines. Additionally, they have access to the Search and Filter module to locate specific items for review. The Data Analysis module with Calculation module provides administrators with detailed reports based on transaction data, enabling them to monitor sales, assess platform performance, and make informed decisions. Finally, they manage the platform's operations through the Transaction Management module by overseeing payments, tracking transaction history, and confirming completed sales.

2. Users / Students

The primary users of the platform are students who buy and sell second-hand items. Users can access the Login and Register module to create an account or log in securely, and the Item Management module to manage their listings by adding, updating, or removing items. Through the Search and Filter module, they can locate items by using keywords, price ranges, or category filters. The Profile Management module enables users to update their personal information, such as their email, phone number, and password, ensuring their details remain accurate and up to date. The Calculation module helps users view the total price of selected items, including any applicable fees, during the checkout process. Finally, the Transaction Management module allows users to monitor their purchases, review order histories, and confirm completed transactions.

1.5 Project Significance

This project aims to create a dedicated second-hand trading platform tailored specifically for university students, addressing their unique needs and challenges. By centralizing transaction information, the platform simplifies the trading process, making it more accessible and efficient. Students can easily register, upload items they wish to sell, and search for affordable second-hand goods such as textbooks, furniture, and electronics.

The platform offers essential features, including item management, transaction management, and a robust search system, enabling users to efficiently browse, manage, and complete transactions. This ensures that students save time and effort compared to traditional methods like social media or physical bulletin boards. Additionally, the platform fosters a sense of community by connecting students with their peers, encouraging sustainable practices by promoting the reuse of items, and reducing waste.

Ultimately, the project seeks to empower university students with a convenient, efficient, and environmentally friendly solution to meet their trading needs while enhancing their overall campus experience.

1.6 Gantt Chart of Project Activities

Table 1.1 Gantt Chart

[illegible]

CHAPTER 2: ANALYSIS OF PROBLEM

2.1 Problem Decomposition Description

1. User Login and Registration

During login, the system will verify that the entered username and password match the credentials stored in the database, providing feedback for both successful and failed login attempts. For new users, the registration process will collect necessary information such as full name, email, username, password, and phone number, ensuring that the data is validated and securely stored in the database to protect user privacy.

2. Item Management

Users can input detailed descriptions, including the name, details of the items, and price of an item. The input will be validated to ensure accuracy before saving to the database. Users will also have the option to edit their listings, with updates reflected immediately. Additionally, administrators will have the authority to remove non-compliant items to ensure the platform adheres to its guidelines, with all changes reflected in the database.

3. Search and Filter

Users can search for specific products using keywords, and filter results by criteria such as price and category. This will help students quickly locate what they need, saving them time and improving their user experience.

4. Calculation

Manage the calculation of the price of the item, including platform fees. During checkout, the system will ensure that the calculated price is displayed clearly, providing transparency to users about the cost of their purchases.

5. Data Analysis Report

Generate reports based on transaction data, summarizing the total sales, profit fee income and admin can select the month and year for the report.

6. Transaction Management

Oversee the entire transaction process includes the selection of items, purchase confirmation, and payment processing. The system will securely handle payment transactions and maintain accurate records of transaction history for both users and administrators.

7. Profile Management

Allows users to view and edit their personal information on the platform. Users can update their profile details, such as their email and phone number ensuring that their information is always up to date. The system will validate the input to ensure accuracy and save any changes to the database. In addition, the module allows users to change their password. To ensure security, users must first input their old password correctly before being permitted to create a new one.

2.2 Structured Chart

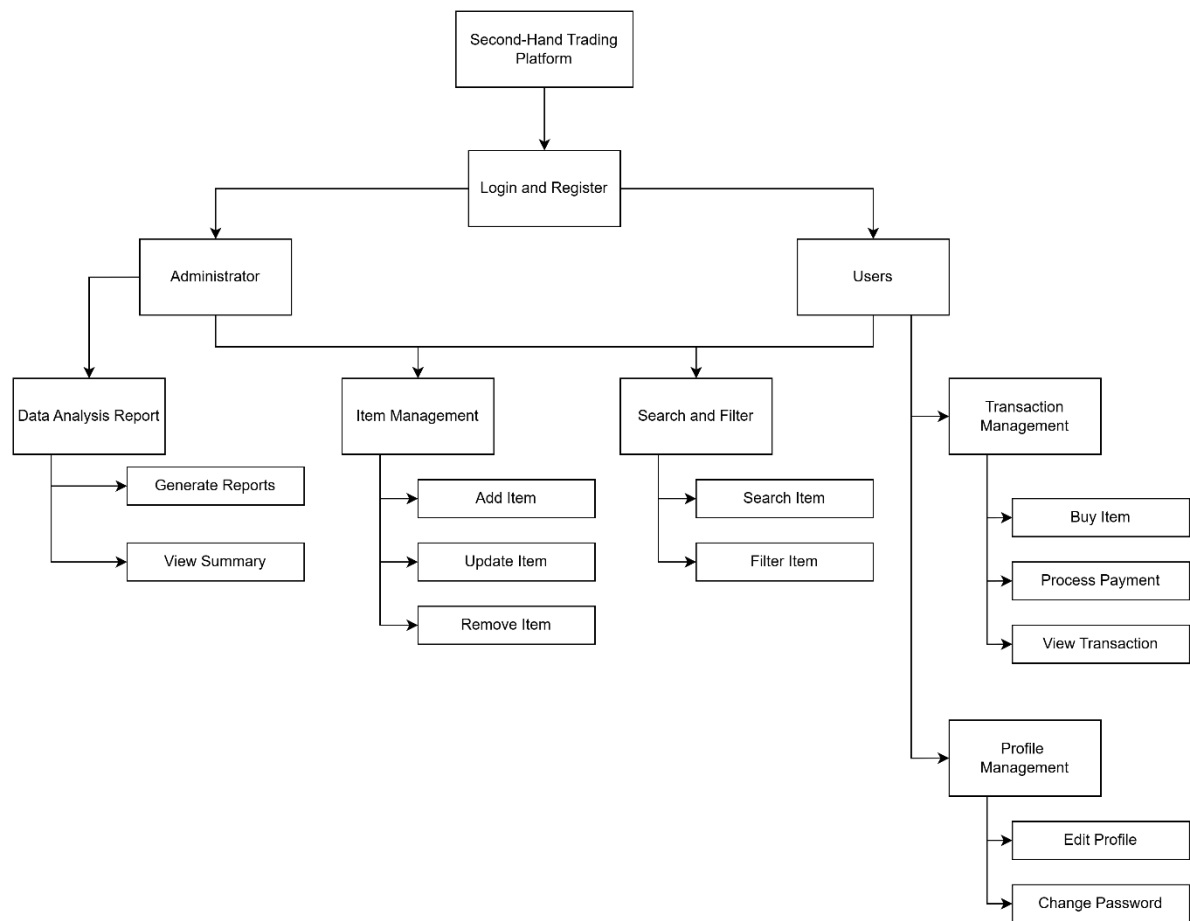


Figure 2.1 Structured Chart

CHAPTER 3: DESIGN

3.1 Flowchart

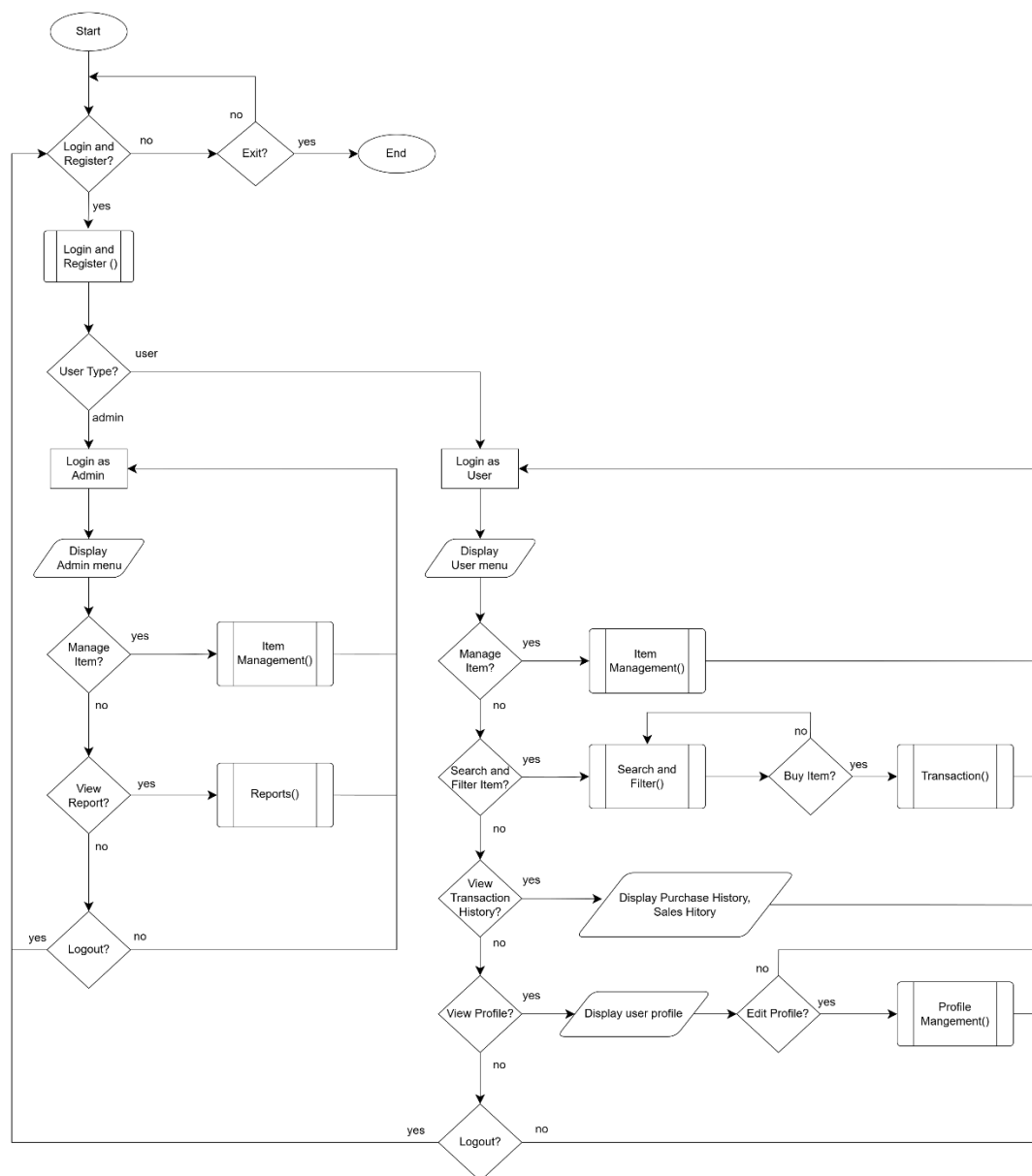
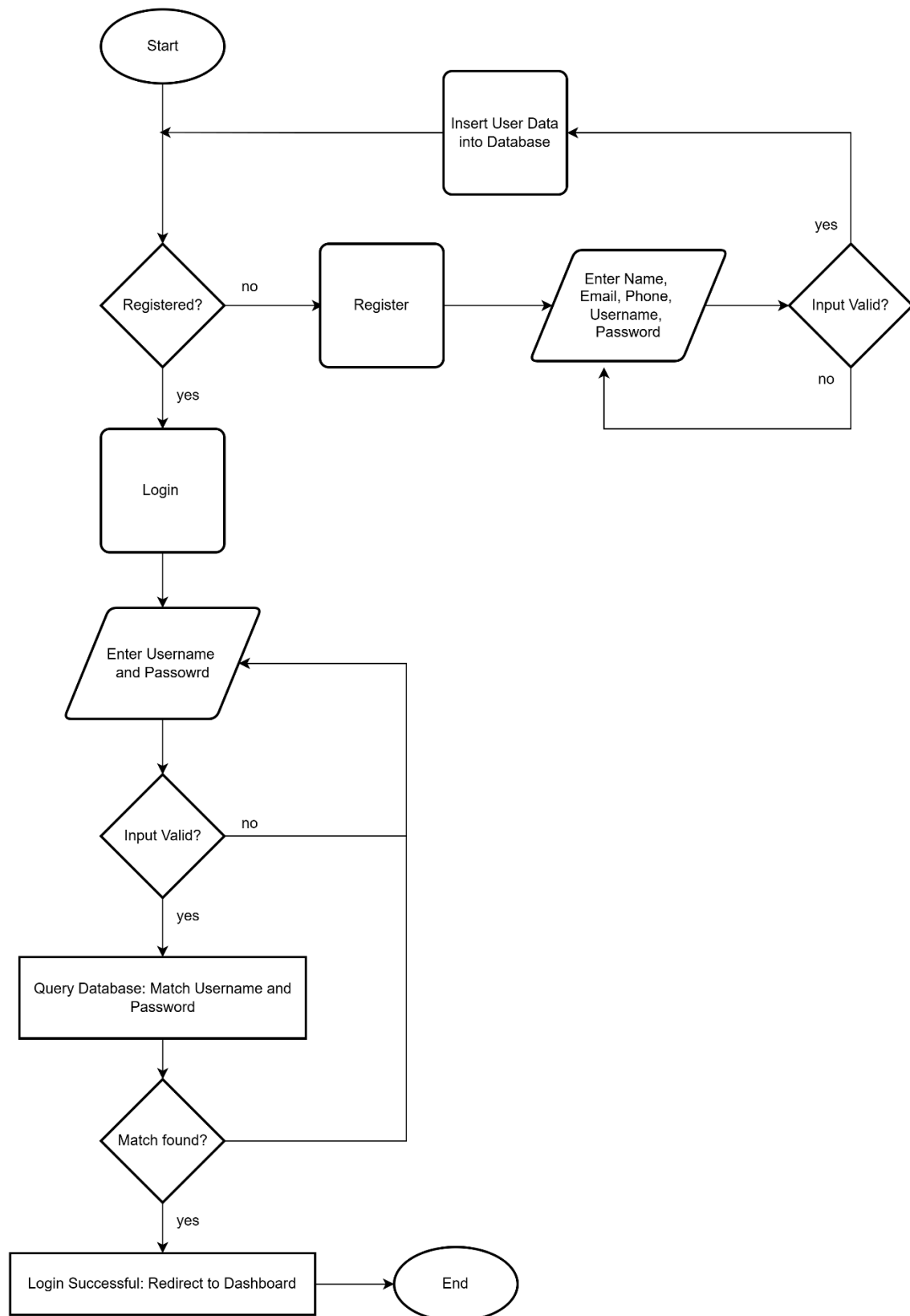


Figure 3.1 Main Menu

**Figure 3.2 Login and Register**

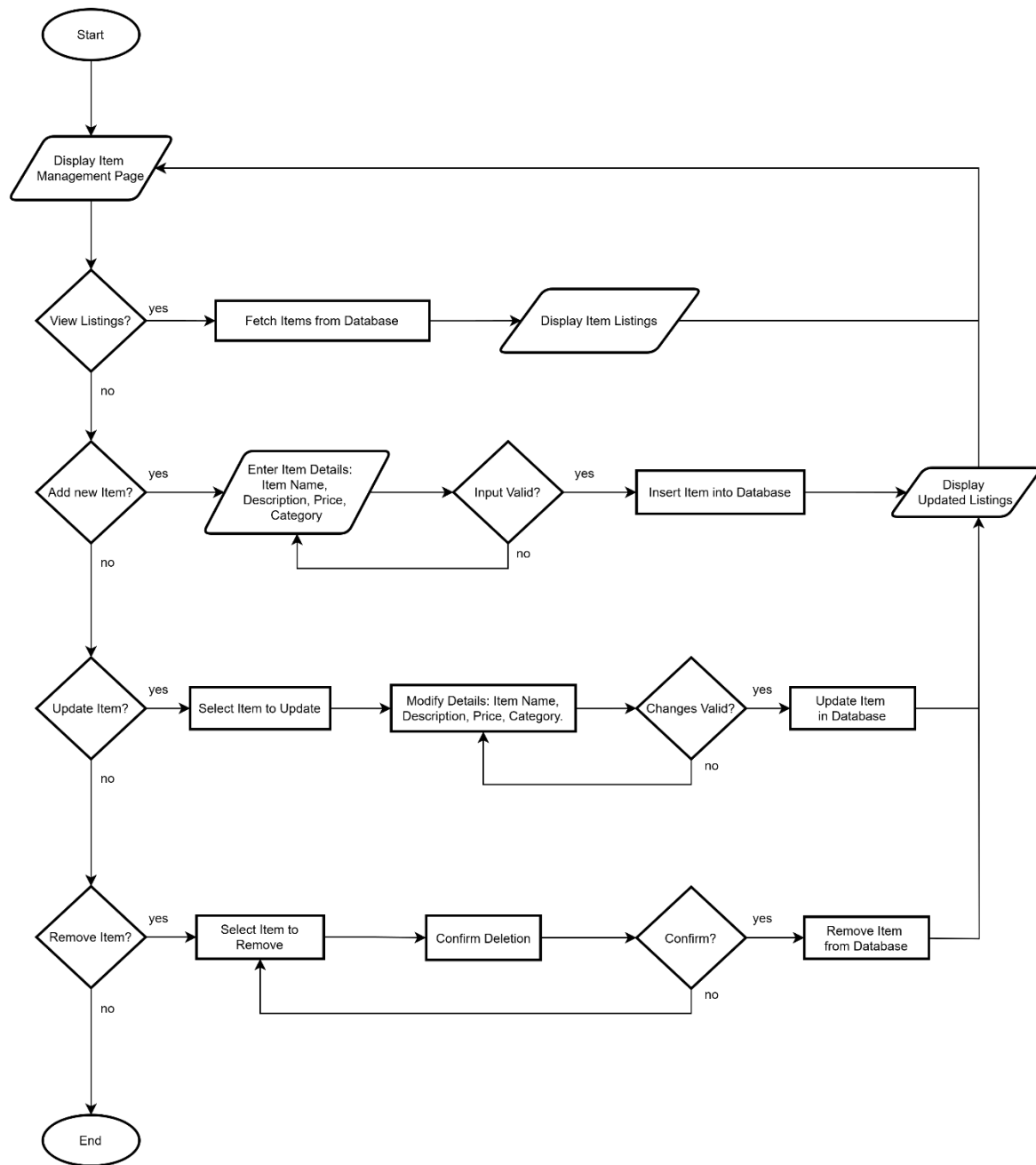


Figure 3.3 Item Management

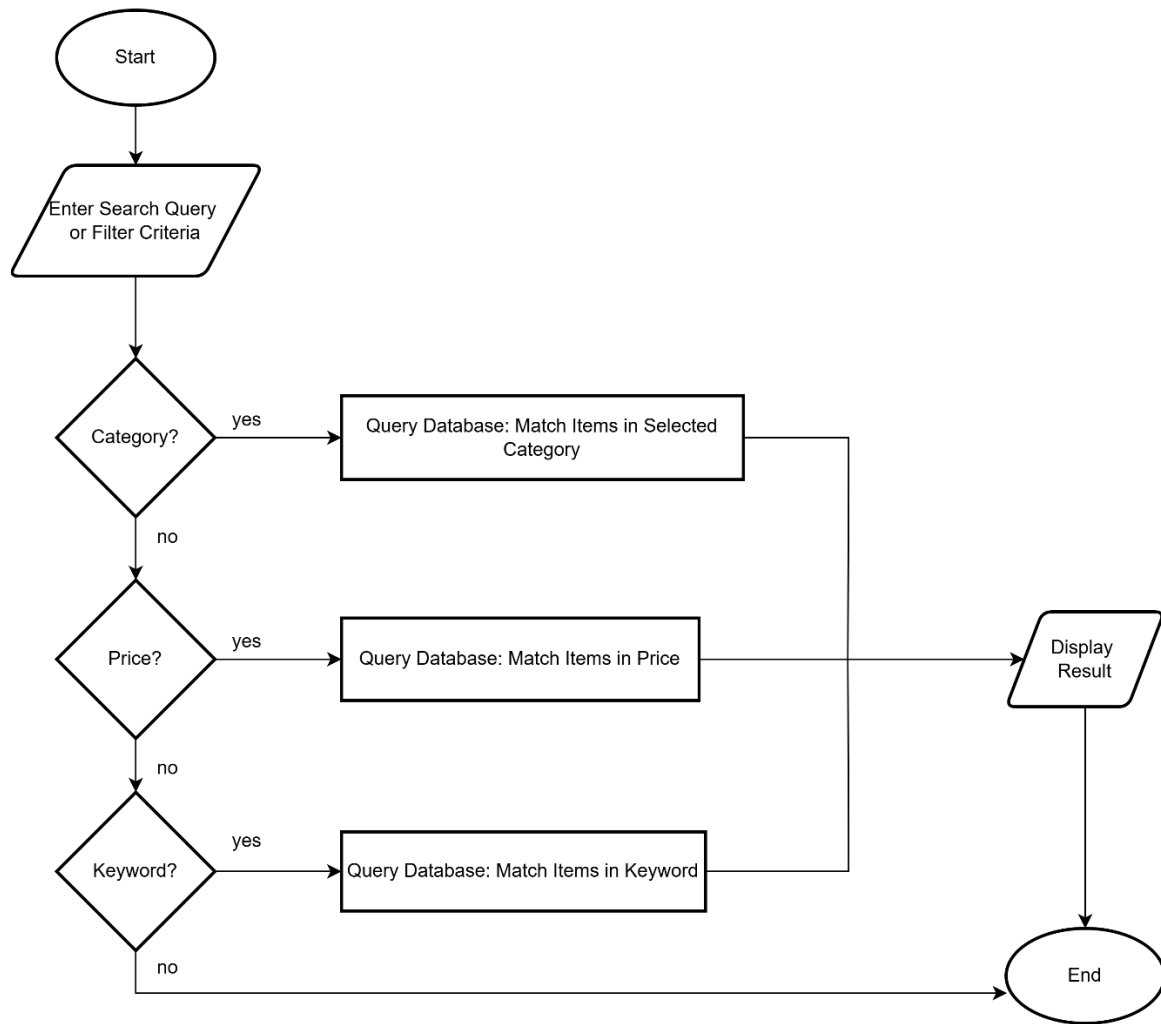


Figure 3.4 Search and Filter

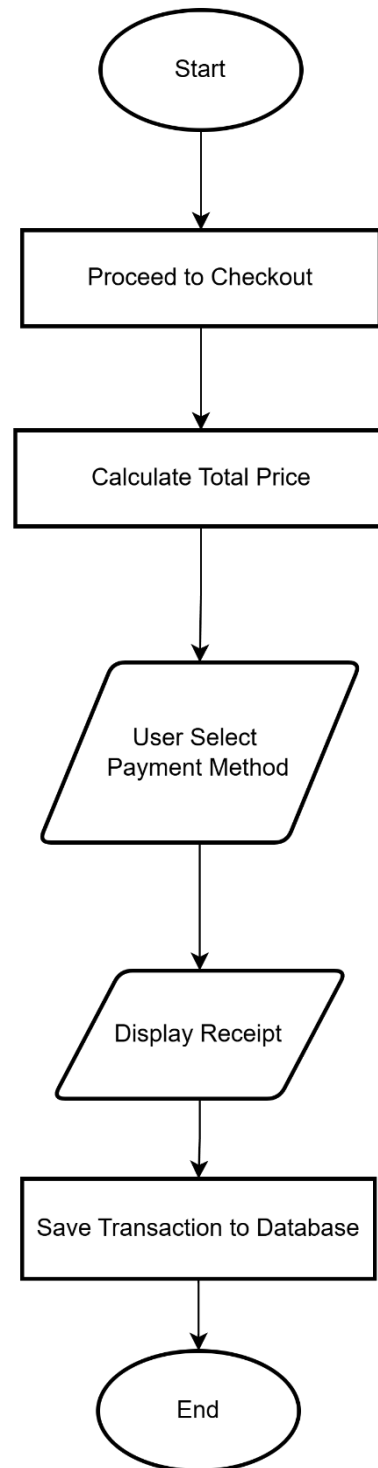


Figure 3.5 Transaction

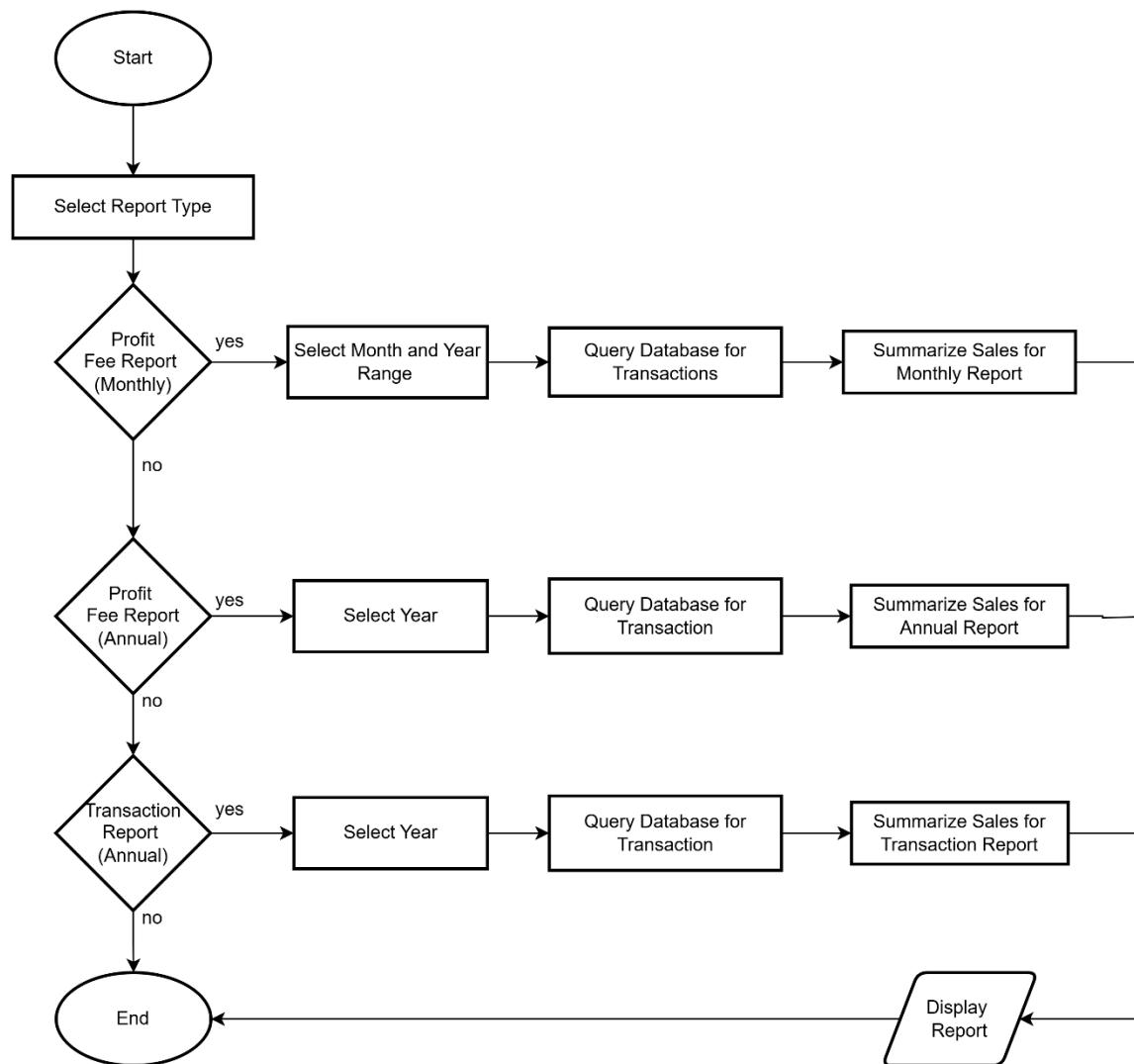


Figure 3.6 Data Analysis Report

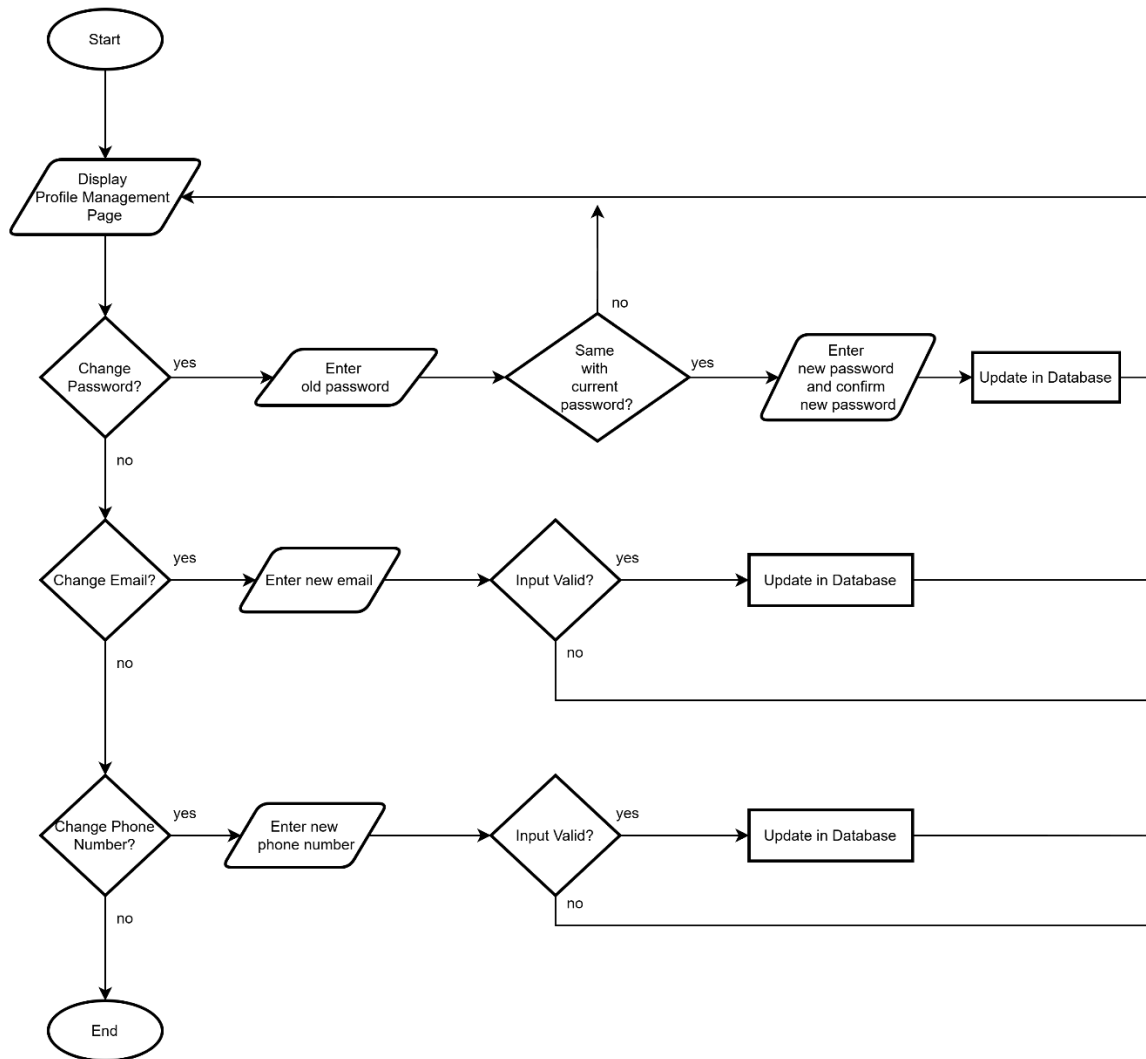


Figure 3.7 Profile Management

3.2 ERD

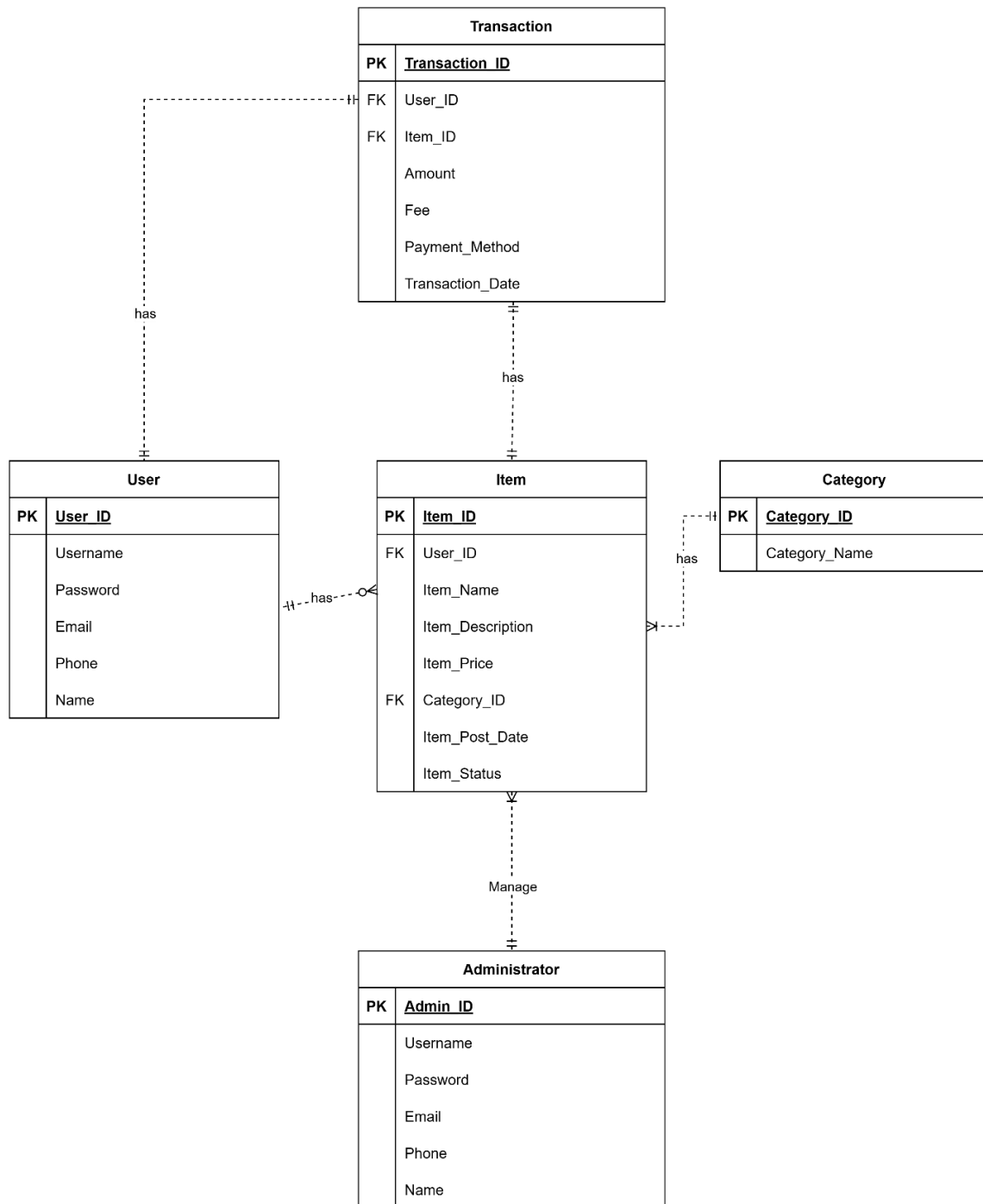


Figure 3.8 Entity Relationship Diagram

3.3 Data Dictionary

Table 3.1 Data Dictionary for User

Attribute	Data Type	Constraints	Description
User_ID	INT	PK	Unique identifier for each user.
Username	VARCHAR(50)	NOT NULL, UNIQUE	User's login name.
Password	VARCHAR(255)	NOT NULL	Encrypted password for user authentication.
Email	VARCHAR(100)	NOT NULL, UNIQUE	User's email address.
Phone	VARCHAR(15)	NOT NULL, UNIQUE	User's phone number for contact purposes.
Name	VARCHAR(100)	NOT NULL	Full name of the user.

Table 3.2 Data Dictionary for Administrator

Attribute	Data Type	Constraints	Description
Admin_ID	INT	PK	Unique identifier for each administrator.
Username	VARCHAR(50)	NOT NULL, UNIQUE	Admin's login name.
Password	VARCHAR(255)	NOT NULL	Encrypted password for admin authentication.
Email	VARCHAR(100)	NOT NULL, UNIQUE	Admin's email address.
Phone	VARCHAR(15)	NOT NULL, UNIQUE	Admin's phone number for contact purposes.
Name	VARCHAR(100)	NOT NULL	Full name of the administrator.

Table 3.3 Data Dictionary for Item

Attribute	Data Type	Constraints	Description
Item_ID	INT	PK	Unique identifier for each item.
User_ID	INT	FK, NOT NULL	References User_ID in the User table.
Item_Name	VARCHAR(100)	NOT NULL	Name of the item.
Item_Description	TEXT	NULLABLE	Description of the item.
Item_Price	DECIMAL(10, 2)	NOT NULL	Price of the item.
Category_ID	INT	FK, NOT NULL	References Category_ID in the Category table.
Item_Post_Date	DATE	NOT NULL	Date the item was posted.
Item_Status	ENUM('Sold','Available')	NOT NULL	Default 'Available'

Table 3.4 Data Dictionary for Category

Attribute	Data Type	Constraints	Description
Category_ID	INT	PK	Unique identifier for each category.
Category_Name	VARCHAR(50)	NOT NULL, UNIQUE	Name of the category (e.g., Books, Furniture).

Table 3.5 Data Dictionary for Transaction

Attribute	Data Type	Constraints	Description
Transaction_ID	INT	PK	Unique identifier for each transaction.
User_ID	INT	FK, NOT NULL	References User_ID in the User table.
Item_ID	INT	FK, NOT NULL	References Item_ID in the Item table.
Amount	DECIMAL(10, 2)	NOT NULL	Total transaction amount.
Fee	DECIMAL(10, 2)	NOT NULL	Platform fee 3%
Payment_Method	VARCHAR(45)	NOT NULL	Method of payment (e.g., TNG, Credit Card).
Transaction_Date	DATE	NOT NULL	Date of the transaction.

3.4 Interface Design

```
=====
                        Second-Hand Platform
=====

1. Login
2. Register
3. Exit

Enter your choice:
```

Figure 3.9 Starting Page

```
===Register===
Enter Username: soon
Enter Password: 12345
Enter Email: soon@gmail.com
Enter Phone Number: 0123455555
Enter Real Name: SoonUTeM

Registration successful. Welcome, SoonUTeM!
Press any key to return to continue...|
```

Figure 3.10 Register Page

```
=== Login ===
Enter Username: soon
Enter Password: *****|
```

Figure 3.11 Login Page

User

```

Login successful. Welcome, SoonUTeM! You are logged in as a normal user.

=====
                        USER MENU
=====

1. Add Your Item
2. Delete Your Item
3. Edit Your Item
4. Display Your Items List
5. Buy Items
6. My Purchase
7. My Sales
8. My Profile
0. Logout

Enter your choice: |

```

Figure 3.12 User Menu Page

```

=====
                        ADD ITEM
=====
Enter Item name:Logitech G102 Mouse
Select Category:
  1. Book
  2. Furniture
  3. Electronic
  4. Sport
  5. Others
Enter your choice (1-5): 3
Enter Price (e.g., 5.00, 10.99 - Minimum RM 1.00): RM 40
Enter Description: Wired gaming mouse. Best budget gaming mouse. Condition: Like new, minimal use.

```

Figure 3.13 Add Item Page

```

=====
                        ADD ITEM
=====
Item Name: Logitech G102 Mouse
Category: Electronic
Price: RM40
Description: Wired gaming mouse. Best budget gaming mouse. Condition: Like new, minimal use.
Are you sure you want to add this item? (Y/N): |

```

Figure 3.14 Confirmation Add Item Page

ID	Item Name	Description	Price (RM)	Category	Post Date	Status
30095	Logitech G102 GAMING Mouse	Logitech G102 Gaming Mouse. Condition: New	50.00	Electronic	2025-01-08	Available

Enter Item ID to delete (or enter 0 to return user menu): 30095

Are you sure you want to delete this item? (Y/N): n

Figure 3.15 Delete Item Page

ID	Item Name	Description	Price (RM)	Category	Post Date	Status
30095	Logitech G102 Mous...	Wired gaming mouse. Best budget gam...	40.00	Electronic	2025-01-08	Available

Choose a Item to Edit

Enter Item ID to edit (or enter 0 to return user menu): 30095

Figure 3.16 Edit Item Page

```

=====
                        EDIT ITEM
=====

1. Item Name
2. Item Description
3. Item Price
0. Return to menu

Enter your choice:|

```

Figure 3.17 Edit Item Menu Page

```

=====
                        EDIT ITEM NAME
=====

Current Item Name: "Logitech G102 Mouse"

Enter New Item Name (enter '0' for return menu): Logitech G102 GAMING Mouse

Are you sure you want to edit this item name? (Y/N): y|

```

Figure 3.18 Edit Item Name Page

```

=====
EDIT ITEM DESCRIPTION
=====

Current Item Description: "Wired gaming mouse. Best budget gaming mouse. Condition: Like new, minimal use."
Enter New Item Description (enter '0' for return menu): Logitech G102 Gaming Mouse. Condition: Minimal Use.
Are you sure you want to edit this item description? (Y/N): y|

```

Figure 3.19 Edit Item Description Page

```

=====
EDIT ITEM PRICE
=====

Current Item Price: "RM 40.00"
Enter new item price (e.g., 5.00, 10.99 - Minimum RM 1.00) (enter '0' for return menu): 50
Are you sure you want to edit this item price? (Y/N): y|

```

Figure 3.20 Edit Item Price Page

ID	Item Name	Description	Price (RM)	Category	Post Date	Status
30095	Logitech G102 GAMING Mouse	Logitech G102 Gaming Mouse. Condition: Minimal Use.	50.00	Electronic	2025-01-08	Available

```

===Menu===
1. See Item's Details
0. Return to user menu

Enter your choice: 1
Enter Item ID to see Item's Details: 30095|

```

Figure 3.21 Display User's Item List Page

```

=====
ITEM DETAILS
=====

*****
Item ID: 30095
Item Name: Logitech G102 GAMING Mouse
Item Description: Logitech G102 Gaming Mouse. Condition: Minimal Use.
Category: Electronic
Item Price: RM50.00
Item Post Date: 2025-01-08
Item Status: Available
*****

Press any key to return to item list...|

```

Figure 3.22 Display User's Item Details Page

ID	Item Name	Description	Price (RM)	Category	Post Date
30002	Used Laptop (Dell ...	Dell Inspiron 15, 8GB RAM, 256GB SS...	1200.00	Electronic	2024-11-15
30004	Badminton Racket (...)	High-quality Yonex badminton racket...	100.00	Sport	2024-09-05
30005	Calculus Textbook	Advanced calculus textbook for univ...	40.00	Book	2024-08-30
30009	Physics for Scient...	Comprehensive physics textbook. Con...	55.00	Book	2024-11-20
30011	Coffee Table	Round wooden coffee table. Conditio...	120.00	Furniture	2024-09-09
30014	Wireless Earbuds (...)	Noise-canceling earbuds with chargi...	400.00	Electronic	2024-06-22
30017	History Textbook	In-depth history textbook for unive...	45.00	Book	2024-10-27
30021	Chemistry Textbook	Textbook covering organic and inorg...	60.00	Book	2024-12-23
30025	Coffee Maker (Sing...	Single-serve coffee maker, compact ...	25.00	Electronic	2024-12-10
30026	Electric Kettle	1.7L electric kettle, perfect for q...	20.00	Electronic	2024-12-05
30027	Dorm Room Fan	Portable fan for dorm room, 3-speed...	20.00	Electronic	2024-11-30
30028	Bookshelf (Small)	Compact wooden bookshelf for small ...	40.00	Furniture	2024-11-25
30030	Portable Speaker	Bluetooth portable speaker, waterpr...	30.00	Electronic	2024-11-10
30031	Dorm Bed Frame	Sturdy metal bed frame for twin siz...	80.00	Furniture	2024-10-30
30033	Microwave (Compact...	Compact microwave for dorms, 20L ca...	50.00	Electronic	2024-10-20
30034	Headphones (Wired)	Over-ear wired headphones, noise-ca...	40.00	Electronic	2024-10-15
30035	Desk Lamp (Adjusta...	LED desk lamp with adjustable brigh...	25.00	Furniture	2024-10-12
30036	Mini Fridge	Compact fridge, ideal for small dor...	100.00	Electronic	2024-10-08
30037	Printer (All-in-On...	All-in-one printer (print, scan, co...	60.00	Electronic	2024-10-02
30077	Dryer (Portable)	Compact portable dryer. Condition: ...	80.00	Electronic	2024-12-10
30080	Food Processor	Multi-functional food processor. Co...	60.00	Electronic	2024-05-22
30084	Cordless Vacuum	Cordless vacuum cleaner, great for ...	70.00	Electronic	2024-11-30
30089	Hiking Backpack	Durable hiking backpack, 30L capaci...	40.00	Sport	2024-09-22
30091	Dishwasher	Compact dishwasher, great for small...	150.00	Electronic	2024-06-28
30092	Air Conditioner (P...	Portable air conditioner, 12000 BTU...	250.00	Electronic	2024-10-23
30095	Logitech G102 GAMI...	Logitech G102 Gaming Mouse. Conditi...	50.00	Electronic	2025-01-08

===Menu===
1. Buy Item
2. Search and Filter Item
0. Return to Menu

Enter your choice: 1
Enter Item ID to buy: 30004

Figure 3.23 Buy Item Page

=====
BUY ITEM
=====

Item ID: 30004
Item Name: Badminton Racket (Yonex)
Item Description: High-quality Yonex badminton racket. Condition: Used a few times, excellent condition.
Category: Sport

Seller's Information:
Name: Soon Wei Hong
Seller's Email: soonweihong0857@gmail.com
Seller's Contact Number: 0169695272

Item Price: RM100.00
3% Platform Fee: RM3.00
Total Price: RM103.00

Are you sure you want to buy this item? (Y/N): y

Figure 3.24 Buy Item Details and Confirmation Page

```

=====
                                CHECKOUT
=====

Choose Payment Method:
    1. Credit Card
    2. TNG
Enter your choice (1 or 2): 2|

```

Figure 3.25 Checkout and Payment Method Page

```

===== Search and Filter Menu =====
Enter keyword to search (or leave blank to skip): laptop
Enter minimum price (or -1 to skip): 1000
Enter maximum price (or -1 to skip): 3000
Select Category:
    1. Book
    2. Furniture
    3. Electronic
    4. Sport
    5. Others
Enter category to filter by (or -1 to skip): 3|

```

Figure 3.26 Search and Filter Menu Page

ID	Item Name	Description	Price (RM)	Category	Post Date
30002	Used Laptop (Dell ...	Dell Inspiron 15, 8GB RAM, 256GB SS...	1200.00	Electronic	2024-11-15

Enter Item ID to buy (or enter 0 to cancel): 0|

Figure 3.27 After Search and Filter Page

ID	Item Name	Description	Price (RM)	Category	Post Date	Purchase Date
30004	Badminton Racket (...	High-quality Yonex badminton racket...	100.00	Sport	2024-09-05	2025-01-08

```

===Menu===
1. See Item's Details
0. Return to user menu

Enter your choice: 1
Enter Item ID to see Item's Details: 30004|

```

Figure 3.28 My Purchase Page

```

=====
MY PURCHASE DETAILS
=====
*****
Item ID: 30004
Item Name: Badminton Racket (Yonex)
Item Description: High-quality Yonex badminton racket. Condition: Used a few times, excellent condition.
Category: Sport
Item Post Date: 2024-09-05
Purchase Date: 2025-01-08
-----
Seller's Information:
Name: Soon Wei Hong
Seller's Email: soonweihong0857@gmail.com
Seller's Contact Number: 0169695272
-----
Item Price: RM100.00
3% Platform Fee: RM3.00
Total Cost: RM103.00
-----
*****

Press any key to return to item list...|

```

Figure 3.29 My Purchase Item Details Page

ID	Item Name	Description	Price (RM)	Category	Post Date	Sold Date	Status
30095	Logitech G102 GAMING Mouse	Logitech G102 Gaming Mouse. Condition: Minimal Use.	50.00	Electronic	2025-01-08	2025-01-08	Sold

===Menu===
1. See Item's Details
0. Return to user menu
Enter your choice: 1
Enter Item ID to see Item's Details: 30095

Figure 3.30 My Sales Page

ITEM SOLD DETAILS
<p>Item ID: 30095 Item Name: Logitech G102 GAMING Mouse Item Description: Logitech G102 Gaming Mouse. Condition: Minimal Use. Category: Electronic Item Price: RM50.00 Item Post Date: 2025-01-08 Item Sold Date: 2025-01-08 Item Status: Sold Earning: RM50.00</p> <p>The item was purchased by Jun Teoh Buyer's Information: -Name: Jun Teoh -Buyer's Email: Jun@gmail.com -Buyer's Contact Number: 01232345667</p> <p>Press any key to return to item list.. </p>

Figure 3.31 My Sales Item Details Page

```
=====
                        USER PROFILE
=====

-----
Personal Information:
User ID: 10032
Username: soon
Email: soon@gmail.com
Phone: 0123455555
Name: SoonUTeM
-----

Number of Items Uploaded: 1
Number of Items Sold: 1
Total Earnings: RM 50.00
-----

===Menu===
1. Edit Profile
0. Return to menu

Enter your choice: |
```

Figure 3.32 User Profile Page

```
=====
                        EDIT USER PROFILE
=====

1. Change Password
2. Change Email
3. Change Phone Number
0. Return to menu

Enter your choice: |
```

Figure 3.33 Edit User Profile Page

Administrator

Login successful! You are logged in as an administrator.

=====

ADMIN MENU

=====

1. Display Available Item
2. Display Sold Item
3. Delete Item
4. View Report
0. Logout

Enter your choice: |

Figure 3.34 Admin Menu Page

ID	Item Name	Description	Price (RM)	Category	Post Date
30002	Used Laptop (Dell ...	Dell Inspiron 15, 8GB RAM, 256GB SS...	1200.00	Electronic	2024-11-15
30005	Calculus Textbook	Advanced calculus textbook for univ...	40.00	Book	2024-08-30
30009	Physics for Scient...	Comprehensive physics textbook. Con...	55.00	Book	2024-11-20
30011	Coffee Table	Round wooden coffee table. Conditio...	120.00	Furniture	2024-09-09
30014	Wireless Earbuds (...)	Noise-canceling earbuds with chargi...	400.00	Electronic	2024-06-22
30017	History Textbook	In-depth history textbook for unive...	45.00	Book	2024-10-27
30021	Chemistry Textbook	Textbook covering organic and inorg...	60.00	Book	2024-12-23
30025	Coffee Maker (Sing...	Single-serve coffee maker, compact ...	25.00	Electronic	2024-12-10
30026	Electric Kettle	1.7L electric kettle, perfect for q...	20.00	Electronic	2024-12-05
30027	Dorm Room Fan	Portable fan for dorm room, 3-speed...	20.00	Electronic	2024-11-30
30028	Bookshelf (Small)	Compact wooden bookshelf for small ...	40.00	Furniture	2024-11-25
30030	Portable Speaker	Bluetooth portable speaker, waterpr...	30.00	Electronic	2024-11-10
30031	Dorm Bed Frame	Sturdy metal bed frame for twin siz...	80.00	Furniture	2024-10-30
30033	Microwave (Compact...	Compact microwave for dorms, 20L ca...	50.00	Electronic	2024-10-20
30034	Headphones (Wired)	Over-ear wired headphones, noise-ca...	40.00	Electronic	2024-10-15
30035	Desk Lamp (Adjusta...	LED desk lamp with adjustable brigh...	25.00	Furniture	2024-10-12
30036	Mini Fridge	Compact fridge, ideal for small dor...	100.00	Electronic	2024-10-08
30037	Printer (All-in-On...	All-in-one printer (print, scan, co...	60.00	Electronic	2024-10-02
30077	Dryer (Portable)	Compact portable dryer. Condition: ...	80.00	Electronic	2024-12-10
30080	Food Processor	Multi-functional food processor. Co...	60.00	Electronic	2024-05-22
30084	Cordless Vacuum	Cordless vacuum cleaner, great for ...	70.00	Electronic	2024-11-30
30089	Hiking Backpack	Durable hiking backpack, 30L capaci...	40.00	Sport	2024-09-22
30091	Dishwasher	Compact dishwasher, great for small...	150.00	Electronic	2024-06-28
30092	Air Conditioner (P...	Portable air conditioner, 12000 BTU...	250.00	Electronic	2024-10-23

====Menu====

1. See Item's Details
2. Search and Filter Item
0. Return to menu

Enter your choice: |

Figure 3.35 Display Available Item Page

30086	Oven (Toaster)	Toaster oven, 4-slice capacity. Con...	40.00	Electronic	2024-08-21
30087	Couch	Small couch for dorm rooms, blue fa...	100.00	Furniture	2024-06-14
30088	Shoes (Running)	Pair of running shoes, size 10. Con...	40.00	Sport	2024-12-04
30090	Wall Clock	Wall clock with simple design. Cond...	20.00	Furniture	2024-03-19
30093	Electric Grill	Electric indoor grill, perfect for ...	50.00	Electronic	2024-12-06
30094	Honor X9A Second H...	Second Hand HonorX9A, Used 2 years...	650.00	Electronic	2025-01-07
30095	Logitech G102 GAMI...	Logitech G102 Gaming Mouse. Condit...	50.00	Electronic	2025-01-08

===Menu===

1. See Item's Details
2. Search and Filter
0. Return to menu

Enter your choice: |

Figure 3.36 Display Sold Item Page

ID	Item Name	Description	Price (RM)	Category	Post Date
30002	Used Laptop (Dell ...	Dell Inspiron 15, 8GB RAM, 256GB SS...	1200.00	Electronic	2024-11-15
30005	Calculus Textbook	Advanced calculus textbook for univ...	40.00	Book	2024-08-30
30009	Physics for Scient...	Comprehensive physics textbook. Con...	55.00	Book	2024-11-20
30011	Coffee Table	Round wooden coffee table. Conditio...	120.00	Furniture	2024-09-09
30014	Wireless Earbuds (...)	Noise-canceling earbuds with chargi...	400.00	Electronic	2024-06-22
30017	History Textbook	In-depth history textbook for unive...	45.00	Book	2024-10-27
30021	Chemistry Textbook	Textbook covering organic and inorg...	60.00	Book	2024-12-23
30025	Coffee Maker (Sing...	Single-serve coffee maker, compact ...	25.00	Electronic	2024-12-10
30026	Electric Kettle	1.7L electric kettle, perfect for q...	20.00	Electronic	2024-12-05
30027	Dorm Room Fan	Portable fan for dorm room, 3-speed...	20.00	Electronic	2024-11-30
30028	Bookshelf (Small)	Compact wooden bookshelf for small ...	40.00	Furniture	2024-11-25
30030	Portable Speaker	Bluetooth portable speaker, waterpr...	30.00	Electronic	2024-11-10
30031	Dorm Bed Frame	Sturdy metal bed frame for twin siz...	80.00	Furniture	2024-10-30
30033	Microwave (Compact...	Compact microwave for dorms, 20L ca...	50.00	Electronic	2024-10-20
30034	Headphones (Wired)	Over-ear wired headphones, noise-ca...	40.00	Electronic	2024-10-15
30035	Desk Lamp (Adjusta...	LED desk lamp with adjustable brigh...	25.00	Furniture	2024-10-12
30036	Mini Fridge	Compact fridge, ideal for small dor...	100.00	Electronic	2024-10-08
30037	Printer (All-in-On...	All-in-one printer (print, scan, co...	60.00	Electronic	2024-10-02
30077	Dryer (Portable)	Compact portable dryer. Condition: ...	80.00	Electronic	2024-12-10
30080	Food Processor	Multi-functional food processor. Co...	60.00	Electronic	2024-05-22
30084	Cordless Vacuum	Cordless vacuum cleaner, great for ...	70.00	Electronic	2024-11-30
30089	Hiking Backpack	Durable hiking backpack, 30L capaci...	40.00	Sport	2024-09-22
30091	Dishwasher	Compact dishwasher, great for small...	150.00	Electronic	2024-06-28
30092	Air Conditioner (P...	Portable air conditioner, 12000 BTU...	250.00	Electronic	2024-10-23

Enter Item ID to delete (or enter 0 to return user menu): |

Figure 3.37 Delete Available Item Page

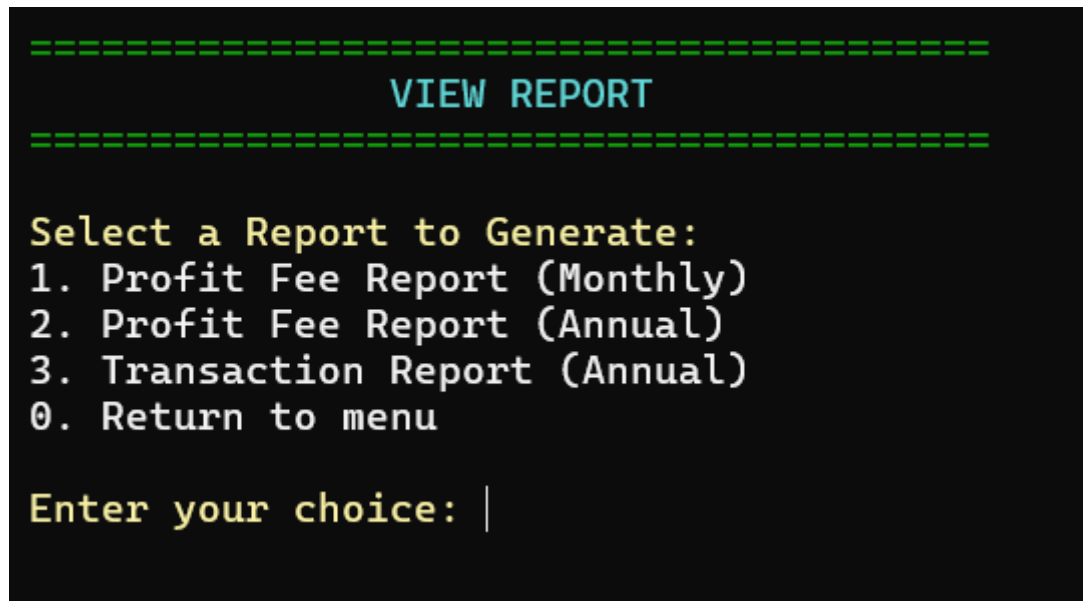


Figure 3.38 View Report Page

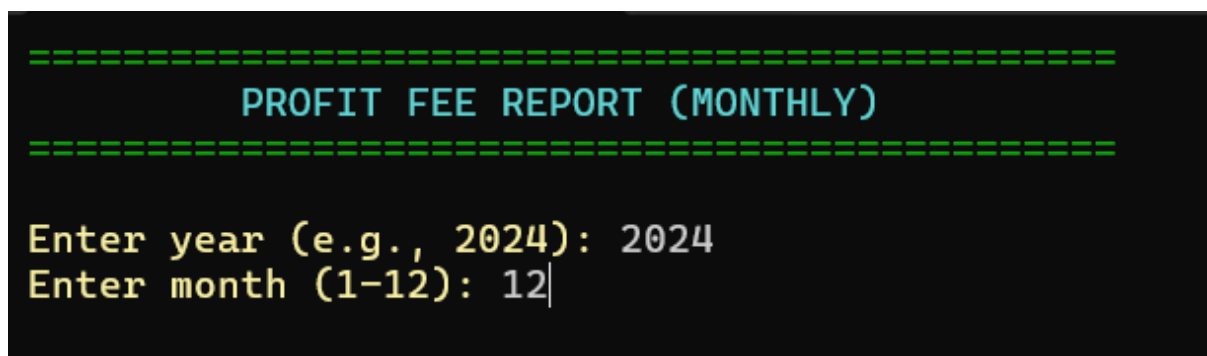


Figure 3.39 Select Year and Month for Profit Fee Report (Monthly)

```

=====
PROFIT FEE REPORT (MONTHLY)
=====

Profit Fee Summary for 12/2024:
-----
Category      | Total Fee (RM) | Percentage of Total Profit (%)
-----
Book          | 1.80           | # 4.10
Furniture     | 3.90           | ## 8.87
Electronic    | 32.70          | ##### 74.40
Sport         | 5.55           | ### 12.63
-----

Total Profit Fee in 12/2024: RM43.95

Press any key to return to menu...|

```

Figure 3.40 Profit Fee Report (Monthly) Page

```

=====
PROFIT FEE REPORT (ANNUAL)
=====

Enter year (e.g., 2024): 2024|

```

Figure 3.41 Select Year for Profit Fee Report (Annual)

```

=====
PROFIT FEE REPORT (ANNUAL)
=====

Profit Fee Summary for 2024:
-----
Month | Total Fee (RM) | Percentage of Annual Profit (%)
-----
1      | 4.80           | ## 2.54
2      | 15.90          | ##### 8.41
3      | 15.90          | ##### 8.41
4      | 19.50          | ##### 10.32
5      | 27.45          | ##### 14.52
6      | 18.47          | ##### 9.77
7      | 8.70           | #### 4.60
8      | 7.65           | #### 4.05
9      | 5.55           | ### 2.94
10     | 13.65          | ##### 7.22
11     | 7.50           | #### 3.97
12     | 43.95          | ##### 23.25
-----

Total Annual Profit Fee: RM189.02

Press any key to return to menu...|

```

Figure 3.42 Profit Fee Report (Annual) Page

```

=====
TRANSACTION REPORT (ANNUAL)
=====

Enter year (e.g., 2024): 2024|

```

Figure 3.43 Select Year for Transaction Report (Annual)

```
=====
TRANSACTION REPORT (ANNUAL)
=====

Transaction Summary for 2024:
-----
Category          | Transactions | Percentage (%)
-----
Book              | 4           | ##### 7.27
Furniture         | 13          | ##### 23.64
Electronic        | 25          | ##### 45.45
Sport             | 11          | ##### 20.00
Others            | 2           | ## 3.64
-----

Total Transactions: 55

Press any key to return to menu...|
```

Figure 3.44 Transaction Report (Annual) Page

CHAPTER 4: IMPLEMENTATION

4.1 Naming Convention

```
class Menu {
public:
    bool login(string username, string password);
    void registerUser();
    void userMenu(int userid);
    void adminMenu();
    void displayMainMenu();
};
```

Figure 4.1 Naming Convention Example

Based on Figure 4.1, the class and method names starting with uppercase letters for each word, while parameters starting with a lowercase letter and capitalizin subsequent words.

```
public:
    DBConnection();
    ~DBConnection();
    void prepareStatement(std::string query);
    sql::PreparedStatement* stmt;
    sql::ResultSet* res;
    void QueryStatement();
    void QueryResult();

private:
    sql::Connection* connection;
};
```

Figure 4.2 SQL Variable

Based on Figure 4.2, SQL variables which are used to connect to databases and to call out the local data. All of them are in the global declaration to use through system and not repeating declaration.

4.2 Function

```
class Item {
public:
    void addItem(int userid, string itemName, string itemDescription, double itemPrice, int category);
    void removeItem(int itemID, int userID);
    void adminRemoveItem(int itemID);
    void displayUserAvailableItemList(int userID);
    void displayUserSoldItemList(int userID);
    void displayUserPurchaseItemList(int userID);
    void displayAllItemList();
    void displaySoldItemList();
    void displayItemDetails(int itemID, int userID);
    void AdminDisplayItemDetails(int itemID);
    void AdminDisplaySoldItemDetails(int itemID);
    void displaySoldItemDetails(int itemID, int userID);
    void displayPurchaseItemDetails(int itemID, int userID);
    void buyItem(int buyerID, int itemID);
    void Transaction(int buyerid, int sellerid, int itemid, double itemPrice, string PaymentMethod);
    void SearchAndFilter(const string& keyword, double minPrice, double maxPrice, int categoryID);
    void SearchAndFilterSoldItem(const string& keyword, double minPrice, double maxPrice, int categoryID);
    void generateMonthlyProfitFeeReport();
    void generateAnnualProfitFeeReport();
    void generateAnnualTransactionReport();
    void MyProfile(int userid);
    void UserEditPassword(int userid, string oldPassword);
    void UserEditEmail(int userid, string newEmail);
    void UserEditPhone(int userid, string newPhone);
};
```

Figure 4.3 Function Example

Most functions are declared as void because they perform tasks without returning a value, such as adding or displaying items. Parameters are passed either by value or by reference, improving efficiency and reducing memory usage where needed. This mix of return types and parameter handling optimizes functionality and performance.

4.3 Array

```
double monthlyFees[12] = { 0 }; // Array to store total fees for each month
double totalProfit = 0.0;
double maxMonthlyFee = 0.0; // To store the maximum monthly fee for scaling the bar chart

while (db.res->next()) {
    int month = db.res->getInt("Month");
    double fee = db.res->getDouble("TotalFee");
    monthlyFees[month - 1] = fee;
    totalProfit += fee;
    maxMonthlyFee = max(maxMonthlyFee, fee); // Update the max monthly fee
}

if (totalProfit == 0.0) { // Check if no transactions exist
    cout << RED << "No transactions found for the year " << year << "." << RESET << endl;
    return;
}
```

Figure 4.4 Array Example

The figures show that the constant array is used to store the data, ensuring consistent and organized storage of values for easy access and manipulation.

4.4 Selection

```
switch (choice) {
    case 1:
        item.generateMonthlyProfitFeeReport();
        cout << endl << endl << endl << BYELLOW << "Press any key to return to menu..." << RESET;
        _getch(); // Wait for a key press
        system("cls");
        cout << BYELLOW << "Returning to menu..." << RESET << endl;
        break;

    case 2:
        item.generateAnnualProfitFeeReport();
        cout << endl << endl << endl << BYELLOW << "Press any key to return to menu..." << RESET;
        _getch(); // Wait for a key press
        system("cls");
        cout << BYELLOW << "Returning to menu..." << RESET << endl;

        break;

    case 3:
        item.generateAnnualTransactionReport();
        cout << endl << endl << endl << BYELLOW << "Press any key to return to menu..." << RESET;
        _getch(); // Wait for a key press
        system("cls");
        cout << BYELLOW << "Returning to menu..." << RESET << endl;

        break;

    case 0:
        system("cls");
        cout << BYELLOW << "Returning to menu..." << RESET << endl;
        break;

    default:
        cout << RED << "Invalid choice!" << RESET << endl;
}
}
```

Figure 4.5 Switch Case Selection


```

if (db.res->next()) {
    char choice;
    while (true) { // Start an infinite loop to keep asking for input
        cout << CYAN << endl << "Are you sure you want to delete this item? (Y/N): " << RESET;
        cin >> choice; // Read only the first character
        if (cin.peek() != '\n') {
            // If there are extra characters, ignore the rest and consider it invalid
            cin.ignore(numeric_limits<streamsize>::max(), '\n');
            cout << RED << "Invalid choice! Please enter only 'Y' or 'N'." << RESET << endl;
            continue; // Prompt again
        }

        // Check if the input is valid (Y/y or N/n)
        if (choice == 'Y' || choice == 'y') {
            item.removeItem(itemid, userid);
            system("cls");
            cout << CYAN << "( Item deleted successfully! )" << RESET << endl;
            break; // Exit the loop if the user confirms the addition
        }
        else if (choice == 'N' || choice == 'n') {
            system("cls");
            cout << YELLOW << "Cancelled. Returning to user menu..." << RESET << endl;
            break; // Exit the loop if the user cancels the action
        }
        else {
            // Invalid choice, print error and prompt again
            cout << RED << "Invalid choice! Please enter 'Y' to confirm or 'N' to cancel." << RESET << endl;
        }
    }
}

```

Figure 4.6 Nested If-Else Selection

```

if (cin.fail() || (categoryID != -1 && (categoryID < 1 || categoryID > 5))) { // Ensure valid input
    cin.clear(); // Clear the error flag
    cin.ignore(numeric_limits<streamsize>::max(), '\n'); // Discard invalid input
    cout << RED << "Invalid input! Please enter a number between 1 and 5, or -1 to skip." << RESET << endl;
}
else {
    break; // Valid input
}

```

Figure 4.7 If-Else Selection

The figures show the different selection functions used in the project, including the switch-case selection, nested if-else selection, and if-else selection, each providing a structured way to control the flow of the program based on different conditions.

4.5 Control

```
while (true) {
    cout << BWHITE << "Enter minimum price (or -1 to skip): " << RESET;
    cin >> minPrice;

    if (cin.fail() || minPrice < -1) { ... }
    else {
        break; // Valid input
    }
}
```

Figure 4.8 While Loop

```
for (int i = 0; i < 12; i++) {
    double percentage = (totalProfit != 0) ? (monthlyFees[i] / totalProfit) * 100 : 0.0;

    // Scale the bar length based on the maximum monthly fee instead of total annual profit
    double scaledPercentage = (maxMonthlyFee != 0) ? (monthlyFees[i] / maxMonthlyFee) * 100 : 0.0;
    string bar = string(static_cast<int>(scaledPercentage * 0.25), '#'); // Adjust multiplier as needed
    cout << left << setw(6) << (i + 1)
        << " | " << setw(15) << fixed << setprecision(2) << monthlyFees[i]
        << " | " << bar << " " << fixed << setprecision(2) << percentage << endl;
}
```

Figure 4.9 For Loop

```
do {
    // Truncate Item Name and Item Description if they are too long
    string itemName = db.res->getString("Item_Name");
    string itemDescription = db.res->getString("Item_Description");

    if (itemName.length() > 18) { ... }

    if (itemDescription.length() > 35) { ... }

    // Display each item with its corresponding details
    cout << left << setw(5) << db.res->getInt("Item_ID") << " | "
        << BCYAN << setw(22) << itemName << RESET << " | "
        << setw(40) << itemDescription << " | "
        << setw(15) << fixed << setprecision(2) << db.res->getDouble("Item_Price") << " | "
        << setw(15) << db.res->getString("Category_Name") << " | "
        << setw(11) << db.res->getString("Item_Post_Date") << " | "
        << setw(10) << db.res->getString("Item_Status") << " | " << endl;
} while (db.res->next());
```

Figure 4.10 Do-While Loop

The figures show the different control structures used in the project, including the for loop, while loop, and do-while loop, each offering a distinct way to repeat tasks based on specific conditions, ensuring efficient iteration and control flow within the program.

4.6 Pointer

```
public:
    DBConnection();
    ~DBConnection();
    void prepareStatement(std::string query);
    sql::PreparedStatement* stmt;
    sql::ResultSet* res;
    void QueryStatement();
    void QueryResult();

private:
    sql::Connection* connection;
};
```

Figure 4.11 Pointer Example

The figure shows the pointers that are used in the SQL in the project, providing a way to reference and manipulate memory addresses efficiently when interacting with the database.

4.7 Error Handling

```
if (username.empty()) {
    cout << RED << "Error: Username cannot be empty!" << RESET << endl;
    return;
}
else if (username.find(' ') != string::npos) {
    cout << RED << "Error: Username cannot contain spaces!" << RESET << endl;
    return;
}

cout << YELLOW << "Enter Password: " << RESET;
getline(cin, password);
if (password.empty()) {
    cout << RED << "Error: Password cannot be empty!" << RESET << endl;
    return;
}
else if (password.find(' ') != string::npos) {
    cout << RED << "Error: Password cannot contain spaces!" << RESET << endl;
    return;
}

cout << YELLOW << "Enter Email: " << RESET;
getline(cin, email);
if (email.empty()) {
    cout << RED << "Error: Email cannot be empty!" << RESET << endl;
    return;
}
else if (email.find('@') == string::npos) {
    cout << RED << "Error: Email must contain '@'!" << RESET << endl;
    return;
}
```

Figure 4.12 Error Handling Example

The figure shows the error handling techniques used in the project, ensuring that invalid inputs, such as empty fields or spaces in the username and password, are detected and appropriate error messages are displayed to guide the user.

CHAPTER 5: CONCLUSION

5.1 Constraints

The platform faces several constraints that may affect its functionality and user experience. A key limitation is its dependency on user engagement, as low participation rates could hinder its effectiveness. Ensuring data integrity and moderating listings pose challenges, as fraudulent or inaccurate entries could reduce trust. Scalability is a concern, as the current design might struggle to support a larger user base or expanded features. Technical limitations, such as limited server capacity and delays in processing, may impact performance. Financial constraints, including restricted budgets for development and marketing, could limit growth. Lastly, managing disputes, ensuring compliance with university policies, and addressing ethical concerns like unfair pricing present additional challenges.

5.2 Future Improvements

To address these constraints and improve the platform, several enhancements can be implemented. The target audience could be expanded to include alumni, staff, or users from multiple universities, increasing the user base and market potential. Advanced features such as AI-based recommendations, live chat, and real-time notifications could boost user engagement and convenience. Strengthening security with robust verification systems would reduce fraud, while a feedback and rating system could enhance transparency and credibility. Integrating secure payment gateways and offering multiple payment options would streamline transactions. Providing sellers with data analytics tools could optimize their sales strategies. Finally, upgrading the platform's infrastructure would ensure scalability, supporting future growth and adaptability.

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