UTAR Second Hand E-Commerce Application

By

Calvin Chua Kai Pin

A REPORT

SUBMITTED TO

Universiti Tunku Abdul Rahman

in partial fulfillment of the requirements

for the degree of

BACHELOR OF INFORMATION SYSTEMS (HONOURS) BUSINESS INFORMATION SYSTEMS

Faculty of Information and Communication Technology

(Kampar Campus)

JAN 2024

UNIVERSITI TUNKU ABDUL RAHMAN

REPORT STATUS DECLARATION FORM

Title: **UTAR Second Hand E-commerce Application**

Academic Session: JAN 2024

I CALVIN CHUA KAI PIN
(CAPITAL LETTER)

declare that I allow this Final Year Project Report to be kept in Universiti Tunku Abdul Rahman Library subject to the regulations as follows:

1. The dissertation is a property of the Library.
2. The Library is allowed to make copies of this dissertation for academic purposes.

Verified by,

(Author's signature)

(Supervisor's signature)

Address:
_30, Jalan Bayu Impian 12A/ks9,
__Klang, 41200,_____
__Selangor_____

__Ts Dr Wong Pei Voon_____
Supervisor's name

Date: 26 April 2024

Date: 26 April 2024

Universiti Tunku Abdul Rahman			
Form Title : **UTAR Second Hand E-Commerce Application**			
Form Number: **FM-IAD-004**	Rev No.: **0**	Effective Date: **21 JUNE 2011**	Page No.: **1 of 1**

FACULTY OF INFORMATION TECHNOLOGY

UNIVERSITI TUNKU ABDUL RAHMAN

Date: 26 April 2024

SUBMISSION OF FINAL YEAR PROJECT ~~/DISSERTATION/THESIS~~

It is hereby certified that _____***Calvin Chua Kai Pin***_ (ID No: __***2002000***__) has completed this final year project entitled "*UTAR Second Hand E-Commerce Application*" under the supervision of _Ts Dr Wong Pei Voon_ from the Department of Digital Economy Technology, Faculty/Institute* of Faculty of Information and Communication Technology, and _____ (Co-Supervisor)* from the Department of _____, Faculty/Institute* of _____.

I understand that University will upload softcopy of my final year project ~~/ dissertation/ thesis~~* in pdf format into UTAR Institutional Repository, which may be made accessible to UTAR community and public.

Yours truly,

Calvin Chua Kai Pin

*Delete whichever not applicable

DECLARATION OF ORIGINALITY

I declare that this report entitled "**UTAR Second Hand E-Commerce**" is my own work except as cited in the references. The report has not been accepted for any degree and is not being submitted concurrently in candidature for any degree or other award.

Signature : 

Name : Calvin Chua Kai Pin

Date : 25 April 2024

ACKNOWLEDGEMENTS

I would like to express my sincere thanks and appreciation to my supervisor, Ts Dr Wong Pei Voon for giving me the opportunity to work on this e-commerce application development project. Furthermore, I would like to express my appreciation to my brother, Colin Chua Kai Ling for giving me the ideal to work on this project. Their guidance, expertise, and support have been invaluable throughout this journey.

ABSTRACT

As internet technologies grow rapidly, some offline retail stores and vendors started to move their business to E-commerce. This trend has been keeping growing until now as people having their own mobile phone is ubiquitous. More and more E-commerce platforms have been introduced and are being used by offline retail stores and vendors as their first step toward E-commerce. There is a variety of useful features are introduced in the E-commerce platform to improve business processes. There are three similar E-commerce platforms have been reviewed. However, there are some limitations in the E-commerce platforms which need to be improved. Hence, the objective of the project is to develop a second-hand E-commerce application. Also, to identify the basic and main components and processes in e-commerce. After that, complete the 6 modules which include the buyer module, seller module, location distance module, community module, item module, and authentication module. Lastly, integrating these 6 modules becomes an application.

Table of Contents

LIST OF FIGURES

LIST OF TABLES

LIST OF ABBREVIATIONS

CRM	Customer Relationship Management
UTAR	University Tunku Abdul Rahman
AI	Artificial Intelligence

CHAPTER 1 INTRODUCTION

Project Background

In this chapter, we present the background and motivation of our project, our contributions to the field, and the description of the project. The area of study in this project will on a mobile application that focuses on the business application field.

1.1 Introduction

Since UTAR students must rent their own accommodation to live and study, students prefer things like furniture and tools that can make their life easier at the university. Then, when UTAR students graduate, they can sell their items that are still in good condition to other students or newcomers to avoid waste. Nowadays, there are many E-platforms where UTAR students used to sell their used items, such as HIhive Marketplace [1], UTAR E-Market [2], and Facebook Marketplace [3]. Although the mentioned platforms are commonly used by UTAR students to sell used items, there are some limitations there which need to be improved.

1.2 Problem Statement

Nowadays, as internet technologies grow rapidly, some offline retail stores and vendors started to move their business to E-commerce. This trend has been keeping growing until now as people having their own mobile phone is ubiquitous. More and more E-commerce platforms have been introduced and are being used by offline retail stores and vendors as their first step toward E-commerce. Besides, people also started using E-commerce platforms such as Lazada [4] and Shopee[5] to purchase their desired items without physically going to the store. Apart from that, as the E-commerce platforms mentioned becoming more popular among the people we called as buyers, and the offline retail stores we called as sellers, a variety of features have been used to help the business processes in the mentioned platforms such as review section, recommendation, filter, etc. However, there are possibilities that some of the features are badly used by the sellers like spamming the review section to attract buyers with good reviews. For here the trust issue from buyers to the sellers may rise if this action keeps on. According to this research in [6], 30.9% of reviews in the Fakespot-supported marketplaces which include Amazon, and two million active eCommerce websites built on Shopify were defined as

fraudulent. Also, according to [7], fake reviews will affect buyers' purchase decisions and some of the fake reviews are produced with intention. Thus, the reviews in the E-commerce platform will make buyers hard to build trust in the seller, and there is a need to provide community features such as a friend recommendation. The previous E-commerce platform mentioned, there seems to lack of this feature. Since buyers will trust more on their friends more than the reviews provided by strangers.

Next, the E-commerce platforms mentioned seem to lack the feature that will show the current distance between the buyers and the sellers. Although this feature seems to not be important for them, however, in second-hand business processes this will be important information for the buyers. According to the research by M. D. Alam [8], the location of the seller in the second-hand market is important for the buyers when the buyers decide to purchase the second-hand product, and it is recommended to add this information.

Moreover, some of the Second-Hand E-commerce platforms mentioned seem to have not integrate their platforms with Artificial Intelligence (AI) technology such as the generative AI model. As the AI technology has become the global trends recently, there have been thousands of AI created and being started using by people and enterprises to help them in making the productivity as well as increase efficiency on the business processes. Currently the most mentioned AI model which is the generative AI. Generative AI is an AI that able to produce various types of content, such as text, video, drawing and audio. With the user-friendly interface and easy to use of Generative AI have become popular among by able to produce quality content and text in short amount of time.

1.3 Motivation

The project aims to develop a new second-hand E-commerce application for especially UTAR students. The purpose of developing this system is to improve trust issues in business processes. As the current second-hand E-commerce platforms that are mostly used by UTAR students today are lacking some of the features that important in the business processes. Hence, a new second-hand E-commerce application is needed not only for sellers, especially UTAR students, and buyers to buy and sell the used items, but also to implement some features to improve and make the business processes more reliable and smoother.

1.4 Contributions

In this proposed application, we expect to solve three problems of current similar systems which are lacking a friend recommend feature, lacking distance showing from the seller to buyer, and lacking an AI integration feature. The below paragraphs explain what and how the proposed solutions are able to solve the problems mentioned.

Friend recommends feature

This proposed solution is able to reduce some of the trust issues in process of selecting the seller. As the buyers will always check the reviews from past buyers that comment on their perspective of the sellers' services and products. However, as mentioned previously there some of the reviews may be fake and this will affect the buyers' decision on selecting a seller. Thus, this proposed solution will be useful to support the buyer's decision on selecting a seller as people tend to believe or trust their familiar people like friends and family.

Distance showing feature.

As the information on the seller's location is important in the second-hand market. This proposed solution will be able to support the buyers when comes to the decision to buy or not by referring to the distance between the sellers.

Generative AI feature

This feature is useful for both the buyers and sellers, this feature can act as one of assistance which able to help you to perform some of the task such as generating the description of the product for the seller, and increasing the accuracy of the product searching by using AI to find the similar product. Furthermore. This generative AI can be used as the chatbot to respond to the buyers enquires and based on the enquires to better retrieve desired result.

1.5 Scopes

In this second-hand E-commerce application, we will only cover modules which include the buyer module, seller module, location distance module, community module, item module, and authentication module. Below will describe what each module will do and what functions will involve.

Buyer module

The buyer module, this module will focus on the buyer's perspective. This module will cover buyer registration, buyer's view on the application, buyer's communication with the seller and friends, buyer's shopping cart and checkout, and lastly storing buyer's related information.

Seller module

The seller module is similar to the buyer module, but this module will focus on the seller's perspective. This module will cover seller registration, seller's view on the application, seller's communication with buyer, order and checkout management, item posting, analytic feature, and lastly storing seller's related information.

Location distance module

The location distance module, this module will perform to find and store the buyer's and seller's location. After that, it will calculate the distance between the seller and buyer based on the location stored, then display it for the buyer and seller to view.

Community module

The community module, this module will focus on handling the buyer's friend adding and the subscription to the seller from the buyer. This module will cover the buyer friend adding, the recommendation from the buyer's friend, the subscription of the buyer to the seller, push notification, and storing friend adding and subscription-related information.

Item module

The item here means the second-hand products that will be sold by the seller. This item module, this module will mainly focus on inventory management where the seller can post the items that need to sell and handle the item availability. This module will cover item posting, item display on the application view, item availability management, categorizing the item, and storing the item information.

Authentication module

This authentication module is to handle the authentication of the user when login in or sign up for the application. This module will cover username and password checking, authentication of the user data, and storing the user information.

1.6 Objectives

The main objective of the project is to develop a second-hand E-commerce application. There are a few sub-objectives that need to be achieved to achieve the main objective. Below is the list of the sub-objectives.

1. To be able to reduce the trust issue among buyers toward sellers when implementing the friend-recommended feature in the community module.

2. To be able to display the distance between the buyer and seller in the location module.

3. To be able to let the seller to use generative AI to generate the product description.

1.7 Report Organization

The research details will be expounded upon in the upcoming chapters. In Chapter 2, we will delve into an extensive review of E-commerce applications primarily designed for the sale of second-hand items. Additionally, our research will encompass an exploration of the challenges that commonly arise within the business processes associated with second-hand item sales, along with proposed solutions.

Chapter 3 will be dedicated to elaborating on the system design for E-commerce applications. This comprehensive exploration will encompass various components, including use cases, activity diagrams, block diagrams, and entity-relationship diagrams (ERD), all contributing to a holistic understanding of the system's architecture.

In the Chapter 4, we will showcase the preliminary work carried out for the project. This work involves the development of a prototype that offers a tangible demonstration of the application's structure and navigation, providing a visual representation of its functionality and layout.

Lastly, in Chapter 5, we will draw our research to a conclusion. This chapter will encapsulate the findings, insights, and overall outcomes of the project, providing a comprehensive summary of our research journey and its implications.

CHAPTER 2 LITERATURE REVIEW

Literature Review

2.1 Review of similar systems or platforms

2.1.1 Review of UTAR E-Marketplace

UTAR E-Marketplace is a web-based E-commerce platform that sells a variety of products to the community that stays near the University Tunku Abdul Rahman (UTAR) both Kampar and Sungai Long campuses. This platform mainly uses to serve the UTAR community which is UTAR students and UTAR staff. Next, let us review on what are the functionalities provided in this platform, and what are limitations of this platform.

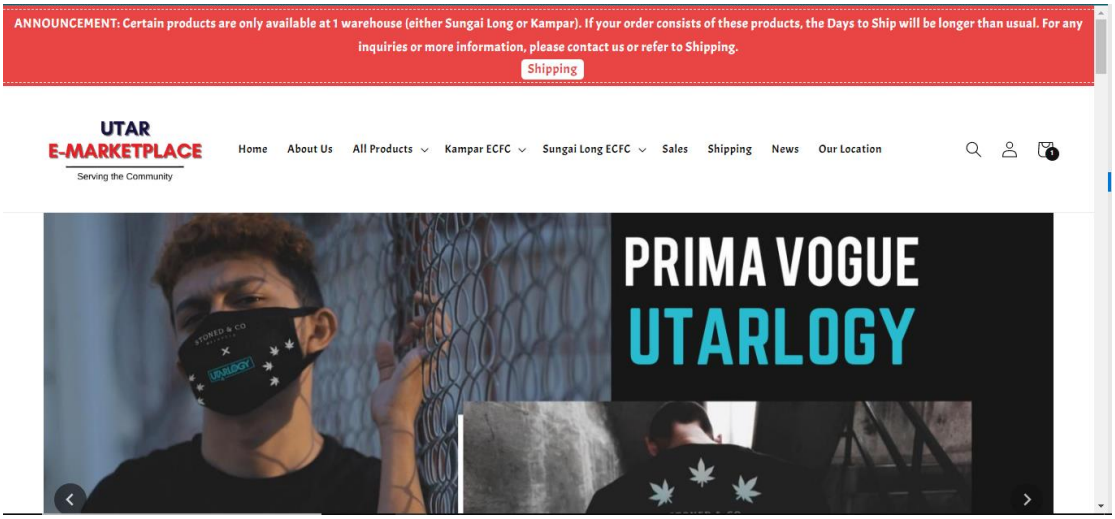


Figure 2.1 UTAR E-Marketplace.

Firstly, let us review the platform's functionalities and features. This platform has categorizing functions in which the platform categorizes and separates the products based on their categories such as books and stationery and kitchen category. Other than selling the products, this platform also provides a news section that allows the buyers, especially the UTAR community to see the news regarding the UTAR. The contents provided in the news section included the current UTAR hospital building progress and also some of the fundraising for the UTAR hospital. As this platform serves mostly the UTAR community, the platform has a section that will categorize and display the products based on location. The buyers can choose which

products to display based on the location provided. Currently, there are only two locations provided which are in Kampar and Sungai Long. Furthermore, this platform provides a sales section in which all the promotional products will be displayed in that section. Same as other E-commerce platforms, the platform also has a shopping cart feature that will list all the shopping items the buyers added. Additionally, UTAR E-Marketplace also provides a shipping section that will tell some of the information regarding the shipping details.

After reviewing the functionalities of the platform, now let us review its limitations. The inner-search function of the platform is not very useful as the buyers need to provide the correct name of the product in order to let the search successful. Next, is the platform's lack of a review section where review is important to the buyers to know information such as feedback from other buyers. If there are no reviews or feedback on the product and seller, the buyers will be less confident to buy the product on this platform.

2.1.2 Review on Marketplace in Hi-Hive

The Hi-Hive is a community mobile application specialized for UTAR. In this application, there is a variety of features such as news feeds, events, and more. In this section, we only review the ‘marketplace’ in the Hi-Hive app.

Figure 2.2 Hi-Hive Marketplace.

Firstly, let us review the functionalities and features in the Hi-Hive marketplace. Same as the previous UTAR E-Marketplace, it has a categorizing function in which the buyers can display the products based on the category. Furthermore, the buyers themselves also sell the product in this marketplace by clicking the ‘sell’ button on the upper left app, after typing in the product name, the buyers need to provide the details of the product like the photo, price, description,

and contact, and more. After completing the setup, the buyer can publish the product and then wait until someone is interested in the buyer's product. The buyer also can check the products that they have published on the profile. Additionally, the marketplace also has the inner-search function which functionally not only can search by product name and also can search with the 'tag' that the seller sets on their product. On the other hand, the marketplace provides many ways for buyers to contact the seller. For example, when the buyer decides to buy this product from the seller, the buyer can choose whether to message or direct call the seller. Also, when the buyer chooses to message the seller, the buyer will navigate to the chat room and the buyer will have many ways to communicate. The buyer can choose whether to text, audio record, or send a photo to communicate with the seller.

Now let us review its limitations. Same as the previous UTAR E-Marketplace, it does not have a review section. Furthermore, the buyer cannot find their purchase history in the marketplace. This function is important to the buyer as the buyer can use it to refer back to the seller when the buyer wants to buy the product from that particular seller they bought before. Also, this marketplace does not have a shopping cart which this feature allows the buyer to keep the products wants to buy and then check out at once. So, the buyer only can buy once at a time in this marketplace.

2.1.3 Review on Marketplace on the Facebook

Facebook is a social network platform that makes people connect and share their interests. Nowadays, Facebook has become the most used social media platform in the world, and it has introduced many types of new functionalities and features that are innovative and useful for Facebook users. In this section, we will only review the 'marketplace' on Facebook.

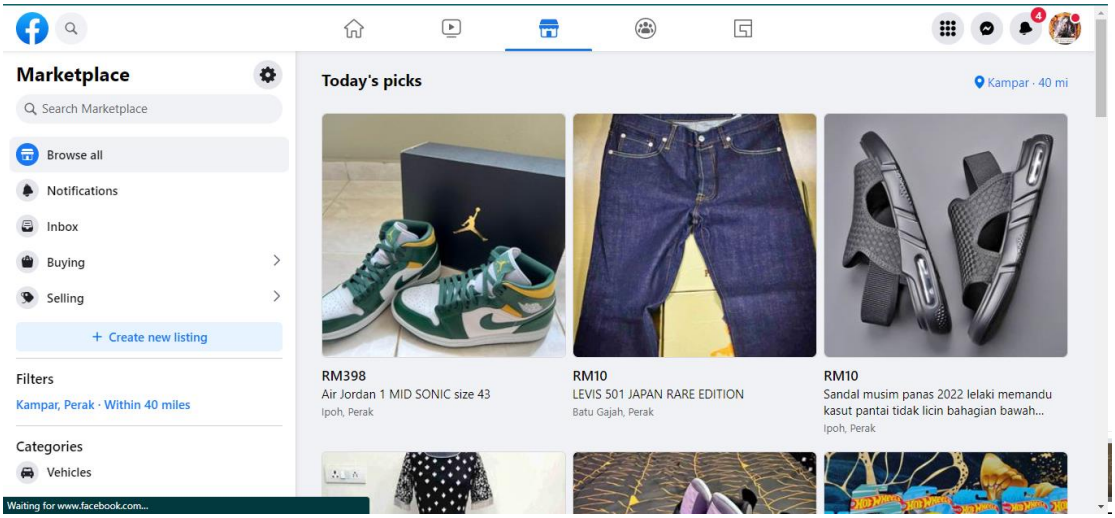


Figure 2.3 Facebook Marketplace.

Firstly, let us review the functionalities and features of the Facebook marketplace. The Facebook marketplace has a categorizing function that will categorize the products that sell by the seller in the marketplace and also has a filter function in which the user can filter the products based on many aspects such as the price range, distance, date, etc. The user is also able to save the products in the marketplace for future action and able to follow the seller. Furthermore, the user also can search the products based on the location their want and set the radius of the location selected by the user. After that, the marketplace will show the products based on location and the radius set by the user. Furthermore, the user also can become a seller in this marketplace by just using their own Facebook account and clicking on the 'Create new list' button on the left menu to sell the item. The marketplace also provides many useful features such the notification features which the user can receive new information from the sellers that the user has followed as well as other sellers. Other than that, the marketplace has an inbox feature in which the user can check their buying and selling status like payment status, shipping status, completed transactions, and more. Additionally, the marketplace also provides a chat function for the user to communicate with the seller. Next, the marketplace provides dashboard features that are useful for the seller. The dashboard will display the summary of the seller activities in the marketplace such as rating and the chat to answer.

After reviewing its functionalities and features, now let us review its limitations. The limitation is it does not display the other sellers' rating and review to the user. In the marketplace, the user only can see their own rating and the review from the buyer that buys their products. This limitation might cause the user difficulty to make the purchase decision as there are no other users' reviews that can be references to them.

2.2 Proposed Solutions

In this section, we will propose and suggest some solutions to the limitations discussed previously for each system or platform reviewed.

2.2.1 Proposed Solutions for UTAR E-Marketplace

In UTAR E-Marketplace, we have stated the limitation of the inner-search function which only can use to search by the product name. We suggest adding a tag to the product. The tag can work as the second option to represent the product. For instance, when the buyer searches for specific clothing like a jacket, we can add the tag called 'jacket - clothe' to the jacket-typed product. So that the system is able to find the product with the tag instead of the name. Next,

provide a rating and review function for the product or seller after the buyer receive them. Also, display the rating and review on the product page, so that the buyer can view the product and seller rating and review on the product.

2.2.2 Proposed Solutions for Marketplace in Hi-Hive

In the Hi-Hive marketplace, we suggest that the marketplace can add a purchase history section for the buyer to check what they have bought. Also, this can let the buyer refer back to the seller they bought with before, as some buyers like to buy the item from the same seller. Next, is to add a shopping cart for the buyer to temporarily store the shopping item until they checkout or cancel the item. This can help the buyer to reduce the buying frequency and provide a shopping item list to the buyer to indicate what the buyer has in the cart.

2.2.3 Proposed Solutions for Marketplace on Facebook

In the Facebook marketplace, we suggest that the marketplace can add a seller rating and review section in the seller profile. So that the user is able to observe the rating of the seller and the review from other users that have bought things from that seller. This lets the user take it as a reference in making the purchasing decision.

Table 2.3 Summary of Literature Review

Systems or Platforms name	Description	Functionalities and Features	Limitations	Proposed Solutions
UTAR E-Marketplace [2]	Web-based E-commerce platform which sells a variety of products to the community that stays near the UTAR both Kampar and Sungai Long campuses	• categorizing functions • news section • categorize and display the products based on the location • shopping cart feature	• inner-search function • does not have the review section	• adding a tag to the product • provide a rating and review function
Marketplace in Hi-Hive [1]	Marketplace in Hi-Hive App that allows the user to buy and sell a variety of products	• categorizing function • able to sell the product • the inner-search function • variety of ways of communicating	• does not have the review section • cannot find the purchase history • does not have the shopping cart feature	• add the purchase history section • add a shopping cart feature
Marketplace on the Facebook [3]	Marketplace in Facebook Social Network that allows the user to buy and sell a variety of products	• categorizing function • filter function • save products function • Search product with location • able to become the seller • notification features • inbox feature • chat function • dashboard features	• do not display the other sellers' ratings and review	• add a seller rating and review section in the seller profile

Chapter 3 System Design

3.1 System Design

In this system design section, we will provide an overview of the comprehensive system design using essential diagrams commonly employed in mobile application development. These diagrams encompass the use-case diagram, block diagram, activity diagrams, and entity relationship diagram, collectively contributing to a holistic understanding of the system's architecture and functionality.

3.2 Use Case Diagram

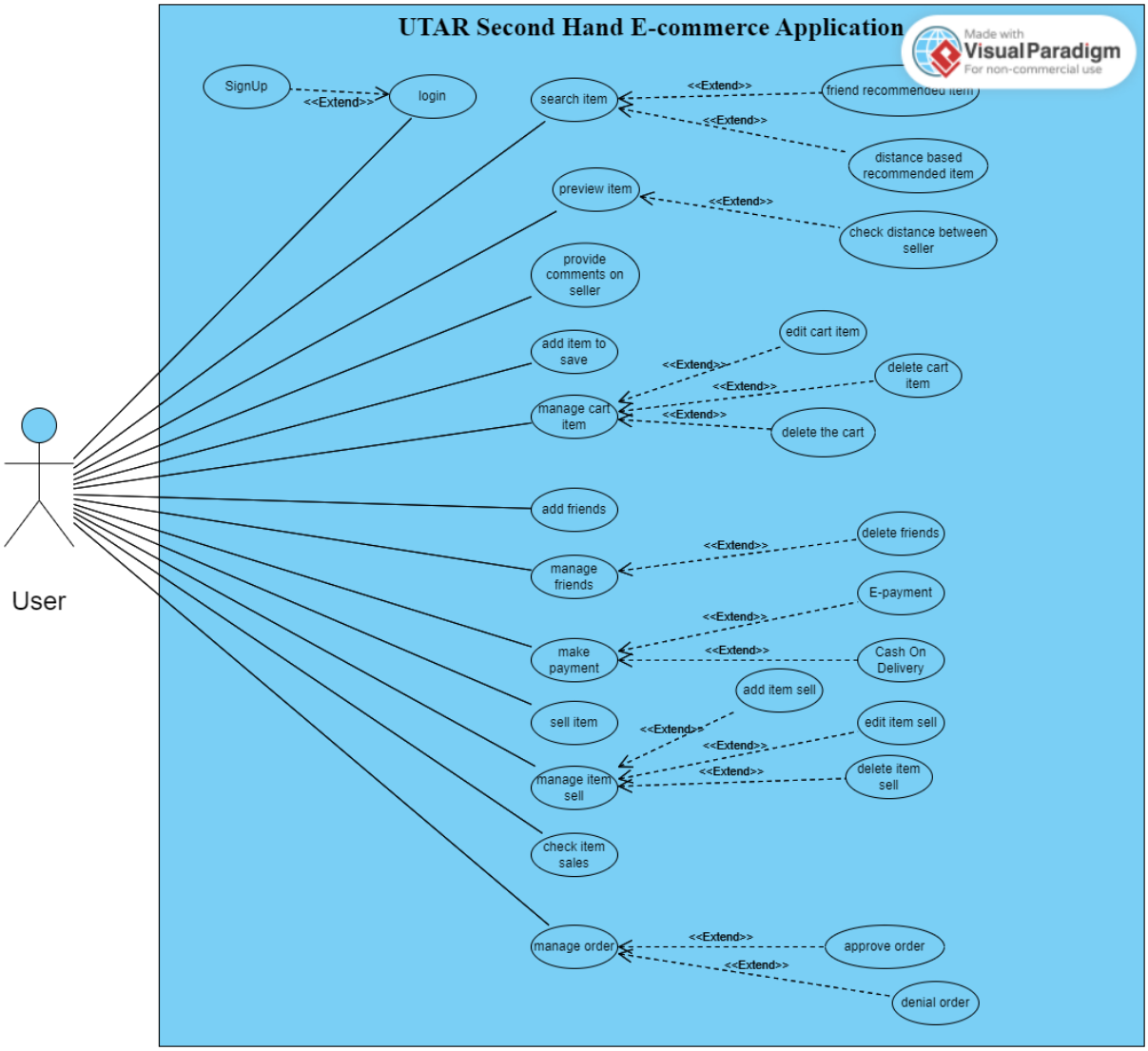


Figure 3.1 Use Case Diagram for UTAR Second-Hand E-commerce

Figure 3.1 portrays the use-case diagram for the UTAR Second-Hand E-commerce Application, a visual representation of how users interact with the system. Within this diagram, distinct use cases have been meticulously defined, each shedding light on a specific aspect of the application's functionality. As we progress, we will provide a comprehensive exploration of these use cases, explaining how they encapsulate the system's behavior from a user-centric perspective.

Let's begin with the "login" use case, which is linked to the "SignUp" use case through an extend relationship. This use case pertains to user authentication within the application, requiring users to log in before accessing its features. In the event that a user is new to the application, they must complete the signup process to register a new account.

Next, we move on to the "search item" use case, which has two extend relationships with "friend recommended item" and "distance-based recommended item" use cases. This functionality allows users to search for items displayed within the application. By default, the application displays friend-recommended items. However, users can opt to view items based on seller distance and sort them from nearest to farthest.

Moving on to the "preview item" use case, which is extended by the "check distance between seller" use case. This functionality enables users to view selected item details, such as descriptions and prices. Additionally, users can check the location of the seller's store and determine the distance between them.

The "provide comment on seller" use case facilitates users in providing their opinions on seller through the comment section after the user bought the product from the seller.

Next in line is the "add item to save" use case, which enables users to store items they intend to purchase. Subsequently, the "manage save item" use case, extending to "delete the saved item" use cases, empowers users to manage the contents of their shopping carts, whether by editing or removing items in the save section.

The "add friends" use case lets users add friends within the application, while the "manage friends" use case, extended by the "delete friend" use case, allows users to manage their friends list by unfriending or deleting friends as needed.

The "make payment" use case, with extensions to "E-payment" and "Cash On Delivery" use cases, allows users to make payments for approved orders. Users can select their preferred payment method, either E-payment or cash on delivery.

Moreover, the "sell item" use case empowers users to become sellers within the application, adding items to sell to other users. The "manage item sell" use case, extended by "add item sell," "edit item sell," and "delete item sell" use cases, provides sellers with the tools to manage their items, including adding new items, editing existing item details, and removing items no longer for sale.

The "check item sales" use case allows sellers to review their item sales within the application. Finally, the "manage order" use case, with extend relationships to "approve order" and "denial order" use cases, grants sellers the ability to manage orders from buyers, deciding whether to approve or deny them.

In essence, the use-case diagram presented here serves as a fundamental blueprint for understanding the UTAR Second-Hand E-commerce Application's functionality through the lens of its users. This diagram not only captures the various ways users interact with the system but also highlights the core functionalities that underpin its operation. In essence, it offers a vital framework for comprehending the application's scope and behavior in a user-centric context.

3.3 Block Diagram

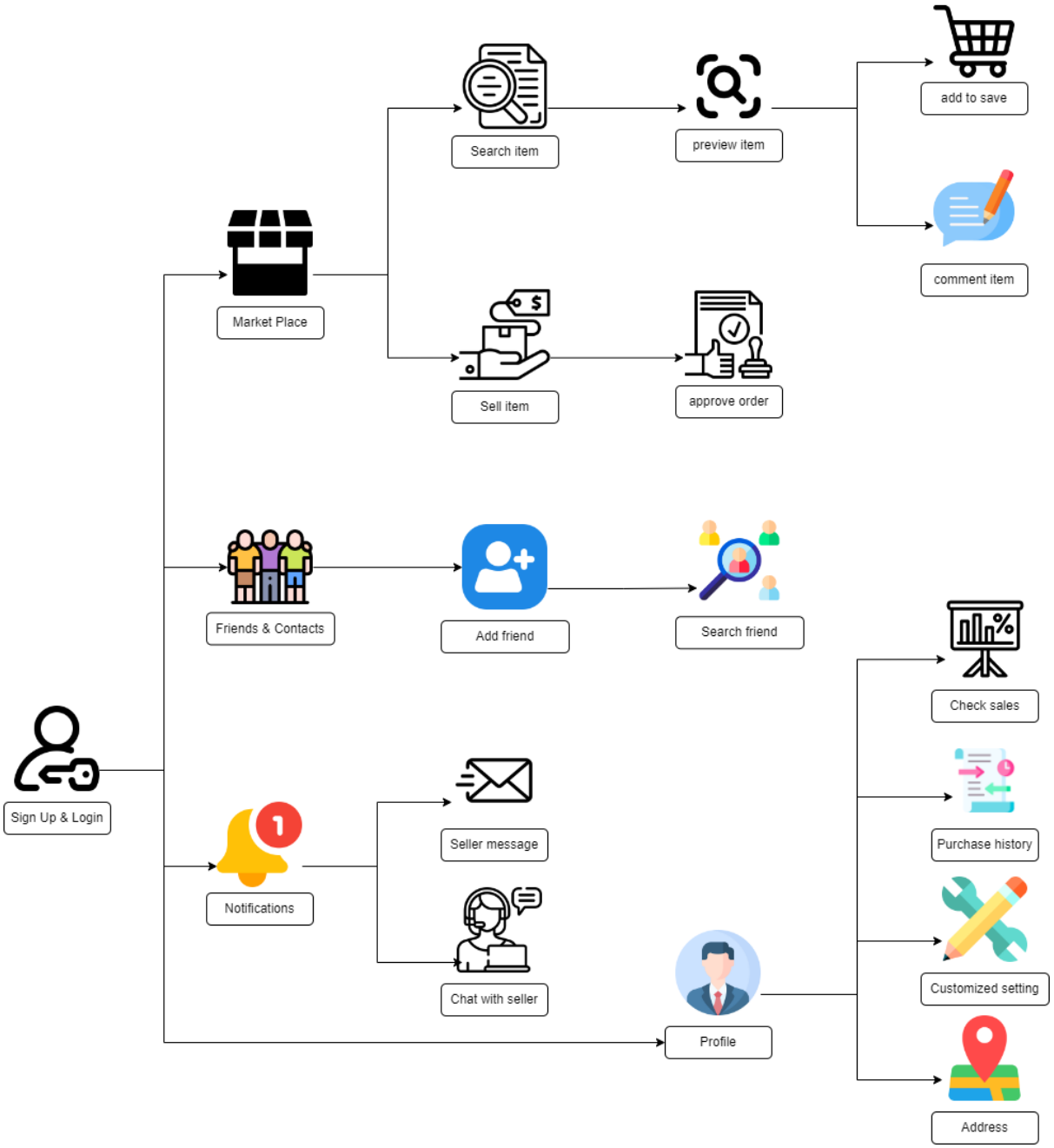


Figure 3.2 Block diagram for UTAR Second-Hand E-commerce Application.

Figure 3.2, displayed above, depicts the block diagram for the UTAR Second-Hand E-commerce Application. This block diagram provides an overview of the application's structural elements. It comprises five main blocks: "Sign Up & Login," "Market Place," "Friends & Contacts," "Notifications," and "Profile." Let's delve into the functions and actions associated with each of these blocks.

First, for the very first block of the application is the “Sign Up & Login” block. This is a very important block for the user to perform first, so that the application can store and retrieve

the information according to the user account. Also, this bock is important for ensuring the information is retrieve correctly and help the application identify which information is belong to the user accout. After the user have loged into the application, the user now can access the other blocks to perform the desired operations.

In the “Market Place” block, the user can search for the items that available in the marketplace. The user also can preview the item that selected to see the details of the item like the name and descriptions. After that, if the user willing to buy the item, the user add that item into the save section for making the order later. Other than that, the user can also write comments to the item to express their opinion to the seller. Furthermore, in this block the user also can choose to become a seller to sell the item. After becoming a seller, the seller can perform order management on the item them sell whether to approve or unapprove the order for that item. These are all the things that the user can perform in the “Market Place” block.

Next, in the “Friends & Contacts” block, the user can manage their friends and also can add a new friend to the friend list whether search by the name or search by the phone contact number. These are all the things that the user can perform in the “Friends & Contacts” block.

Furthermore, in the “Notifications” block, the users able to received the seller information like receiving messages from the seller. Also, the users can chat with the seller regarding on the item details. These are all the things that the user can perform in the “Notifications” block.

Lastly, in the “Profile” block, the user can do the customizations on the application setting for example like the theme colour according to their preferences. Other than the setting customizations, the user able to check the purchases history records, and for the seller can also view the sales records of the item they sell. Furthermore, the user also can set or change the addresses of the delivery place, and for the seller can change or set the address for the store. These are all the things that the user can perform in the “Profile” block.

In summary, the block diagram serves as a valuable tool to illustrate the application's components or blocks and elucidate the actions that users can perform within each of these components. It offers a clear overview of the application's functionality and structure.

3.4 Activity Diagrams

3.4.1 Authentication Activity Diagram

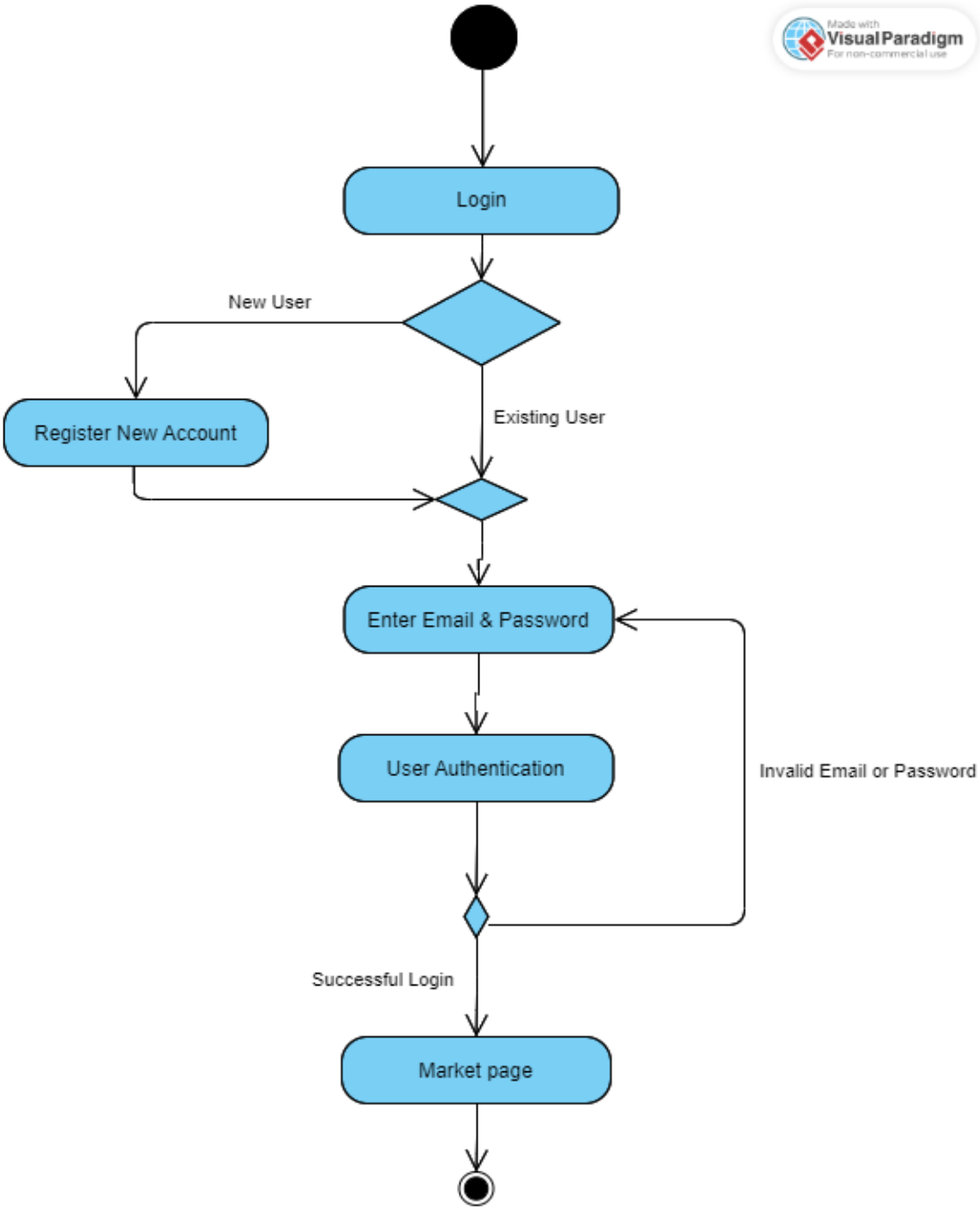


Figure 3.3 Authentication Activity Diagram for UTAR Second-Hand E-commerce Application.

The diagram presented in Figure 3.3 depicts the activity sequence for user authentication within the UTAR Second-Hand E-commerce Application. It effectively outlines the steps involved in authenticating users when user access the application. Let's delve into the process described in the activity diagram.

Upon launching the application, users are initially required to complete a login procedure in order to gain access. Existing users can simply input their email address and password to log in. Conversely, if a user is new to the application, they must first register a new account. Once the registration is successfully completed, the user is prompted to enter their email address and password.

Once the user has provided their email address and password, the application proceeds to verify their authentication credentials. If the authentication process is successful, the user is directed to the application's landing page, granting them access to the application's functionalities. However, if the authentication fails, the application will promptly notify the user of the authentication issue and request them to re-enter their email address and password. In summary, this paragraph elucidates the sequence of actions depicted in the activity diagram, showing how users authenticate themselves when accessing the UTAR Second-Hand E-commerce Application.

3.4.2 Search Item Activity Diagram

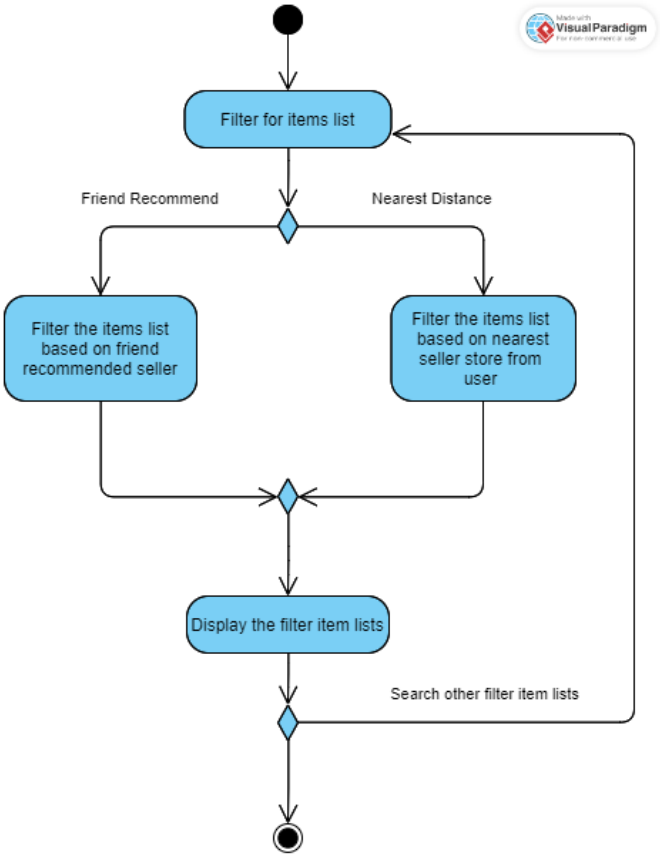


Figure 3.4 Search Item Activity Diagram for UTAR Second-Hand E-commerce Application.

Figure 3.4 depicts the activity flow for item searching within the UTAR Second-Hand E-commerce Application. It illustrates how the application showcases items available in the marketplace based on user-selected filter criteria. Let's delve into the process outlined in the activity diagram.

When a user navigates to the marketplace page within the application, the default filtering option applied by the application is to display items recommended by friends. Additionally, the user has the flexibility to choose for alternative filtering options, specifically to filter items either by friend recommendations or by proximity to the nearest seller's store relative to their location. Once the user has made their choice regarding the filtering criteria, the application proceeds to display the items in accordance with the selected filter.

In summary, this paragraph provides insight into the step-by-step process elucidated in the activity diagram, elucidating how users can search for items within the UTAR Second-Hand E-commerce Application based on their chosen filter preferences.

3.4.3 Become Seller Activity Diagram

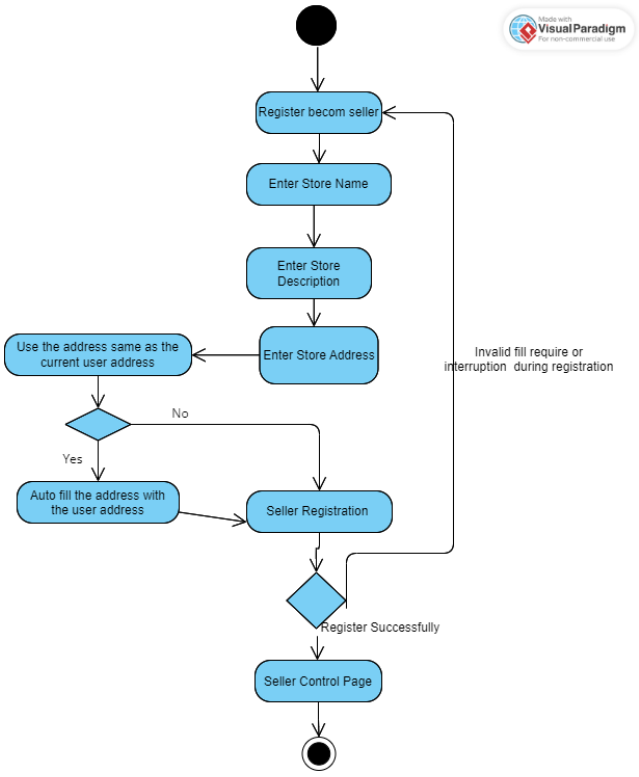


Figure 3.5 Becom Seller Activity Diagram for UTAR Second-Hand E-commerce Application.

The Figure 3.5 diagram above describes the activity diagram of registration of becoming seller in the UTAR Second-Hand E-Commerce Application. This diagram has outlined the flow of process for becoming seller in the application.

When the user is in the profile page, user will see a icon with label of "Become Seller" and this icon is where the user can registrater to becoming a seller in this application to sell their used items. After the user clicked the icon, the user will see several columns fill, this fill required the user to key in the name for their store, and also need to key in the store description for indicate what their store will sell. After fill in the store name and description, the user will required to fill in the address for the store in order to be able to capture the distance of the store with the buyer. There is a small switch button at top right of the address column fill section, that switch button is used for auto fill in the address column with the user own address information, meaning that the store will use the same address as the user address. The user might choose to switch on the switch button for fill in the address info or fill in themselves.

After the user have done fill in the store and address information, the user can click submit for the registration process, the application process this registration. After for a while, the application will alert a message saying the registration is successfully means the user registration of becoming seller is successfully. If the alert saying there are something wrong during the registration means there will be the internet interruption during the registration process, the user can try the submit again.

In short, this activity diagram explains the flow of how user to becoming seller in the UTAR Second-Hand E-Commerce Appilication.

3.4.4 Place Order Activity Diagram

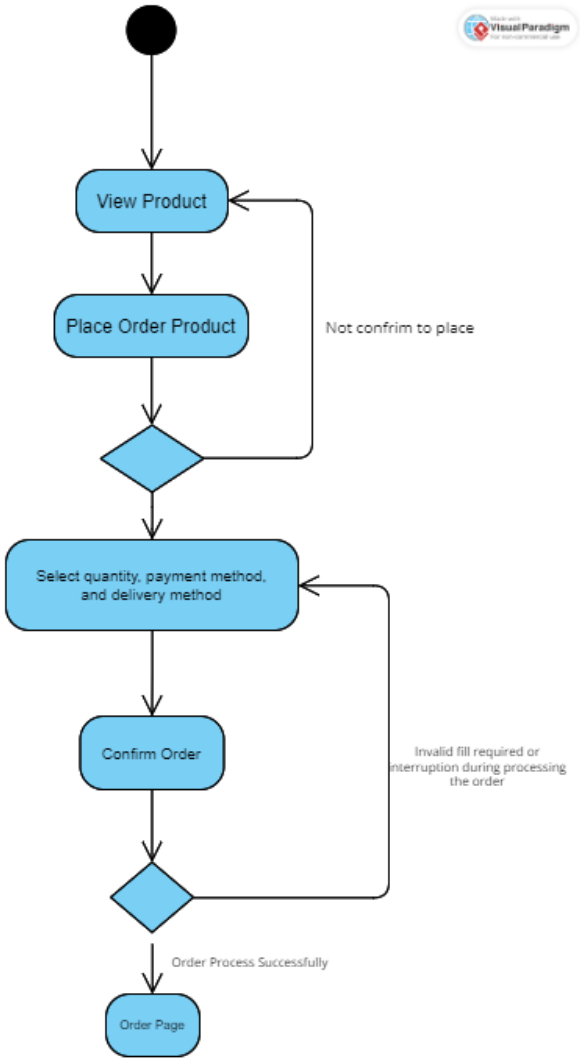


Figure 3.6 Place Order Activity Diagram for UTAR Second-Hand E-commerce Application.

The Figure 3.6 diagram present the activity diagram of placing order for the product or item in the UTAR Second Hand E-Commerce Application. The diagram has shown the steps involved in placing order for a product in the application.

When user is in the product page, if the user wishes to purchase the product, the user can press the “order” button to place order the product. After pressing the button, the user will navigate to the checkout order page, in this page user will be required to select the quantity of the product to be purchased, then choose which payment and delivery method for purchasing this product. After done selecting the quantity of the product and the methods, the user can then click the “place order” button to confirm and place the order. After for a while, the application alert message indicates the place order status, if the message said successfully meaning the order is successfully placed and the seller will be able to see the order. If the message said

something wrong occur, it indicates that might some interruption like poor internet causing this problem, but the user can try place the order again and it might be successful now.

In conclusion, this diagram provides insight into the step-by-step process elucidation of the order placement in the application.

3.5 User Interface Design

As user interface (UI) is important thing for user to be able to interact with any computer and mobile device. In this user interface design section, we will see how the UTAR Second Hand E-Commerce Application user interface is designed and how it can interact with the user in order to achieve the project objectives. Below we observe some of important pages UI of the application and discuss how the UI represents.

3.5.1 Login & SignUp Page Design

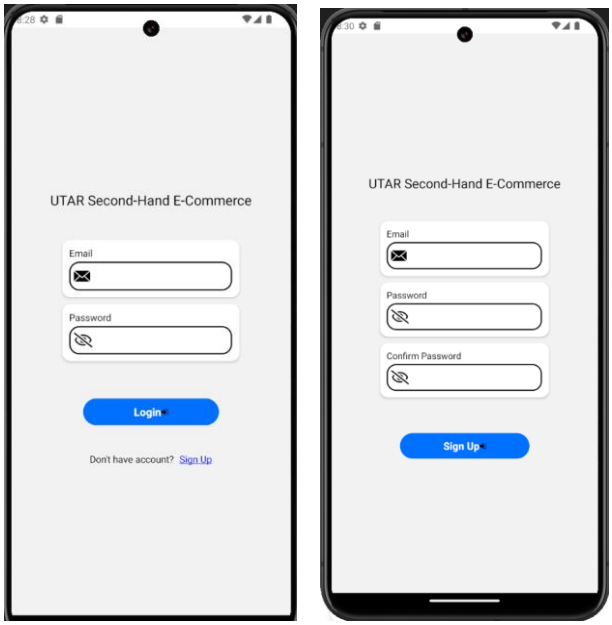


Figure 3.7 Login & SignUp Page Design for UTAR Second-Hand E-commerce

The above figures show the UI design for the login and signup page. These two pages is use for authenticate the user information. As to authenticate the user, it required the user to provide their user email address and password. So, in the login page there are two input column prepared for the user to able to key in their user email address and password to perform the authentication. Same goes for the signup page, if the user do not have the account for this UTAR Second Hand E-Commerce Application, the user required create a new account with their email address and set a password for it. Therefore, in the signup there are three columns

for user to key in they email address, and a password for the new account. Also, in order to enhance the user memory of their password, they are required to key in again the same password in the “confirm password” input column for the password checking. After that, the user can tap on the “signup” button to create and authenticate the account.

3.5.2 Home Screen Page Design

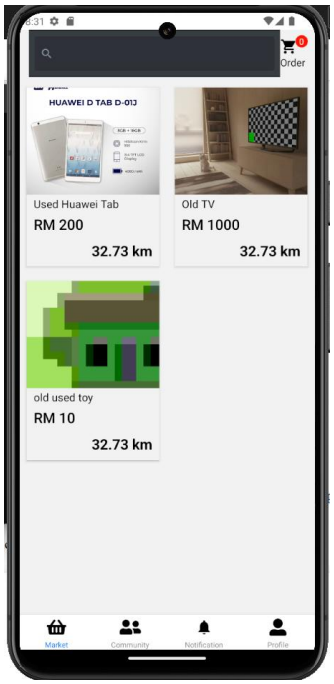


Figure 3.8 Home Screen Page Design for UTAR Second-Hand E-commerce Application

The above figure 3.8 shows the UI design of the first landing page which is “market” page after the user done the authentication. In this page, the user can view the list of products offer in the “market” page. In order to make the application navigation more easily accessible, we use bottom tab UI design, and included four pages in it. Therefore, the user can easily navigate through the application by tapping the icons in the bottom tab. Furthermore, in the “market” page we can see that the product card has included the distance number it in, this distance number is show to the user that this is the distance between the user and the seller that selling this product based on the radius calculation.

3.5.3 Product Page Design

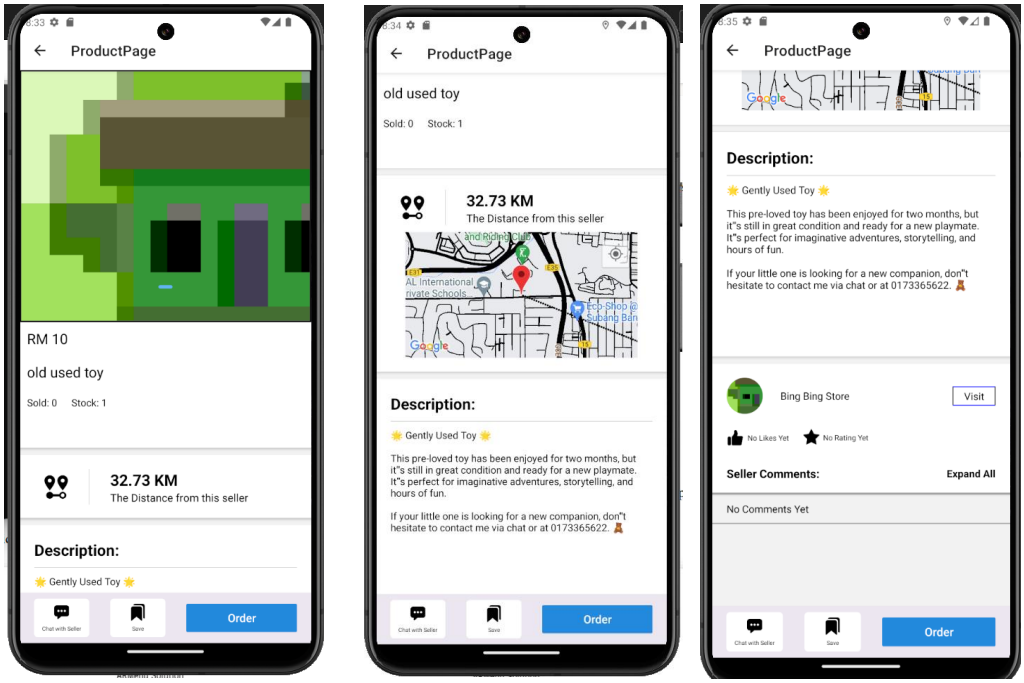


Figure 3.9 Product Page Design for UTAR Second-Hand E-commerce

The above figure 3.9 show the UI design for the product page that show the details of the product information. By tapping the product card in the “market” page, the user will navigate to that “product” product page. In this page, the user can view the detail of the product offer such as the image of the product which can be enlarge by tapping the image. Furthermore, the user can also see the distance of the place where the product offer. If the user wants to know where the place of the product offer, the user can tapping the column where the distance be shown, after that the map of the product offer place or the seller place will be shown and there a dot line that illustrate the distance between the user and seller. Also, the user can tap icon in the top right of the map to show the current user location to feel the distance. On the other hand, the page also shows the product description that describes the product information such as the model and condition of the model. Below the description part, the page also shows the seller information like the rating and likes as well as the seller comment list, which is from other users or buyers. This seller information able to let the user have better impression of the seller that able to let the user have confidence to place order the product from the seller. Lastly, at the very bottom of the page, there is a bottom panel that used to contain the action button for the user such as the “chat with seller” button for chatting with seller, “save” button for the user to save it to the save list, and the “order” button for the user to able to place order the product.

3.5.4 Order Confirm Page Design

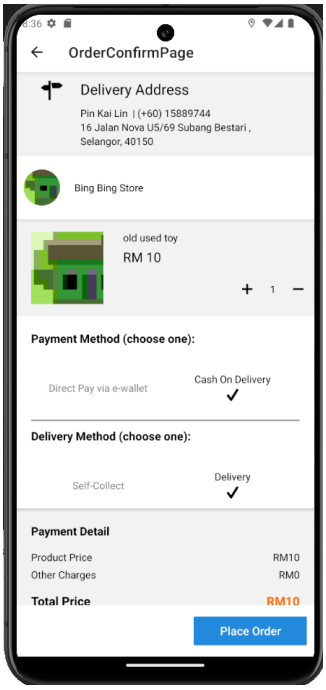


Figure 3.10 Order Confirm Page Design for UTAR Second-Hand E-commerce Application

The above figure shows the UI design of "ordercomfirmpage" or also mean as the checkout page for the product that the user placed order. In this page we can see that the page has shown the user delivery address and also show the product information that the user wanted to order. In the product information section, the user able to select the quantity of the product to purchase by tapping the increment or decrement button. Furthermore, this page shows the payment and delivery method options section for the user to choose for the payment and delivery of the product. The user will be required choose one of the methods in order to proceed the checkout of the product. After done the quantity and methods selection, in the payment detail section will show the total amount of the product which include all the charges required. After the user have confirmed, the user can tap the "place order" button to checkout the product. After for a while, the application will alert the message indicate the checkout status.

3.5.5 Profile Page Design

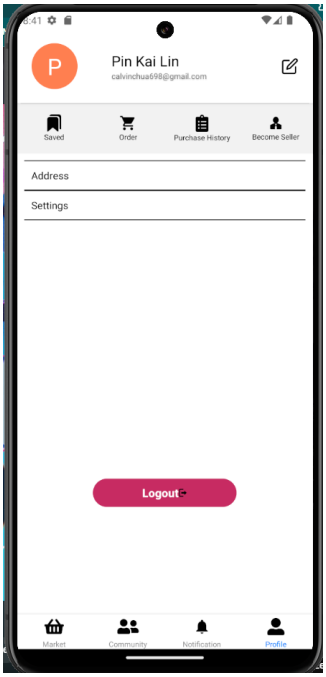


Figure 3.11 Profile Page Design for UTAR Second-Hand E-commerce Application

The above figure shows the UI design for the "profile page" which is the page for user to check their information and perform some settings for the application. We can see that at the top of the page, there is a user panel that displays the information of the user, and also the user can edit their information by tapping the edit icon at right side of the panel. Furthermore, below the user panel, we can see that there are icons that represent as action button for different actions. In this section, the user can view their saved product by tapping the "saved" icon, and also to view their ordered product status by tapping the "order" icon. For the remaining, the "purchased history" icon will show the previous product transaction that made by user, and the "become seller" icon is where the user can register to become seller for this application to start sell their used items. On the other hand, in the page we can see that there several settings button like "address" and "settings" that able the user to do some changes, and the "logout" button at the bottom of the page enable the user to logout to the application.

3.5.6 Profile Creation Design

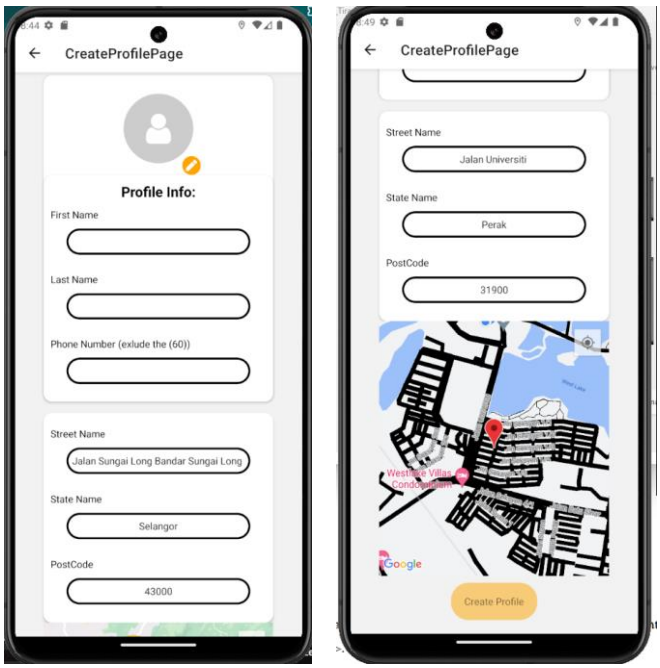


Figure 3.12 Profile Creation Design for UTAR Second-Hand E-commerce Application

The above Figure 3.12 show the UI design for the "createprofilepage" which is the page for the user profile creation for this application. In this page, the user will be required to fill in all the required details such as user's name and phone number. Also, the user will need to fill in the address as this address information is important for this application to achieve its objectives. The user also can use the address details that generated by the application by detecting using the user phone GPS. After the user have fill in all the required fill, the user now can tap the "create profile" button to create the profile for the application.

3.5.7 Become Seller Page Design

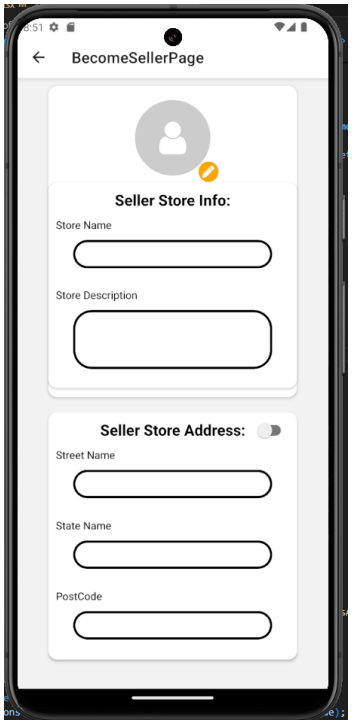


Figure 3.13 Become Seller Page Design for UTAR Second-Hand E-commerce Application

The above figure shows the UI design of the "becomesellerpage" which is the seller registration page for the user wanted to be the seller to sell their used items. In this page, there are sections which seller store information section and seller store address detail section. For the seller store info section, the user needed to fill in the name of the store and also fill in the store description that describes their store. Next, in the seller store address section, the user is required to fill in the store address which is like the place where the items from. If the user wants to use the address as same as their address set in their profile, the user switch or tap the switch button at the top right of the seller store address section. After on the switch button, the application will automatically fill the address. After the user have filled all the details, the user can tap the "submit" button at the bottom of the page to submit the registration.

3.5.8 Seller Control Page Design

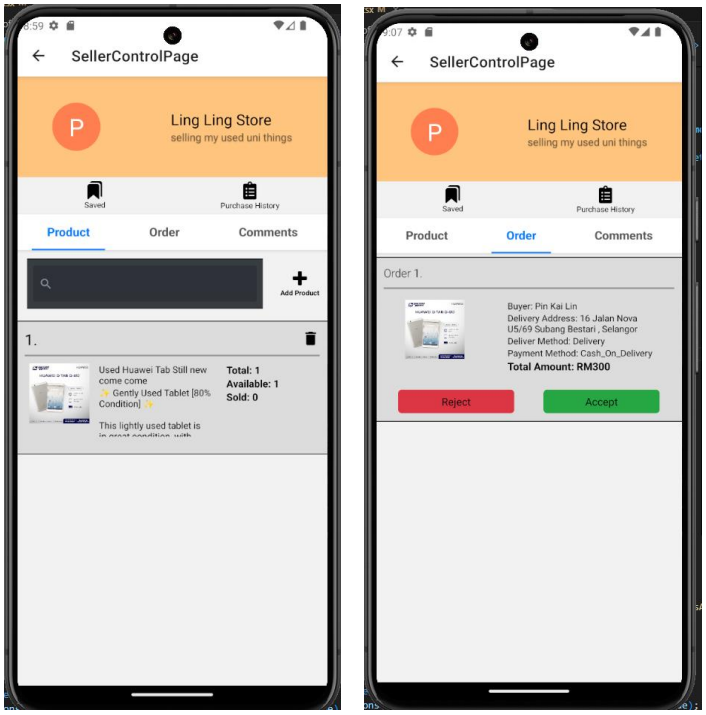


Figure 3.14 Seller Control Page Design for UTAR Second-Hand E-commerce Application

The above Figure 3.14 show the UI design of the “sellercontrolpage” which is act as the seller panel page for the seller to manage their store. In this page we can there is a seller information panel that displays the seller store details such as store name. Also, the page have the product tab view that show the items or products list that the seller sell. In the product tab view, the seller can add new item or product by tapping the “addproduct” icon button. Furthermore, in the order tab view it displays the list of the order that make by the other buyers and waiting for the seller to accept or approve the order.

3.5.9 Order Page Design

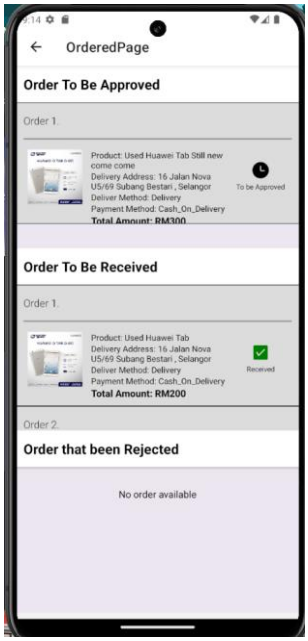


Figure 3.15 Order Page Design for UTAR Second-Hand E-commerce Application

The above figure shows the UI design of the "orderedpage" which is the page to show the user or buyer placed order item's status list. The page is divided into three sections which is use for displaying the different status of the placed order by the buyer. The buyer gain insight on what is the current status of the placed order item.

3.6 Entity Relationships Diagram

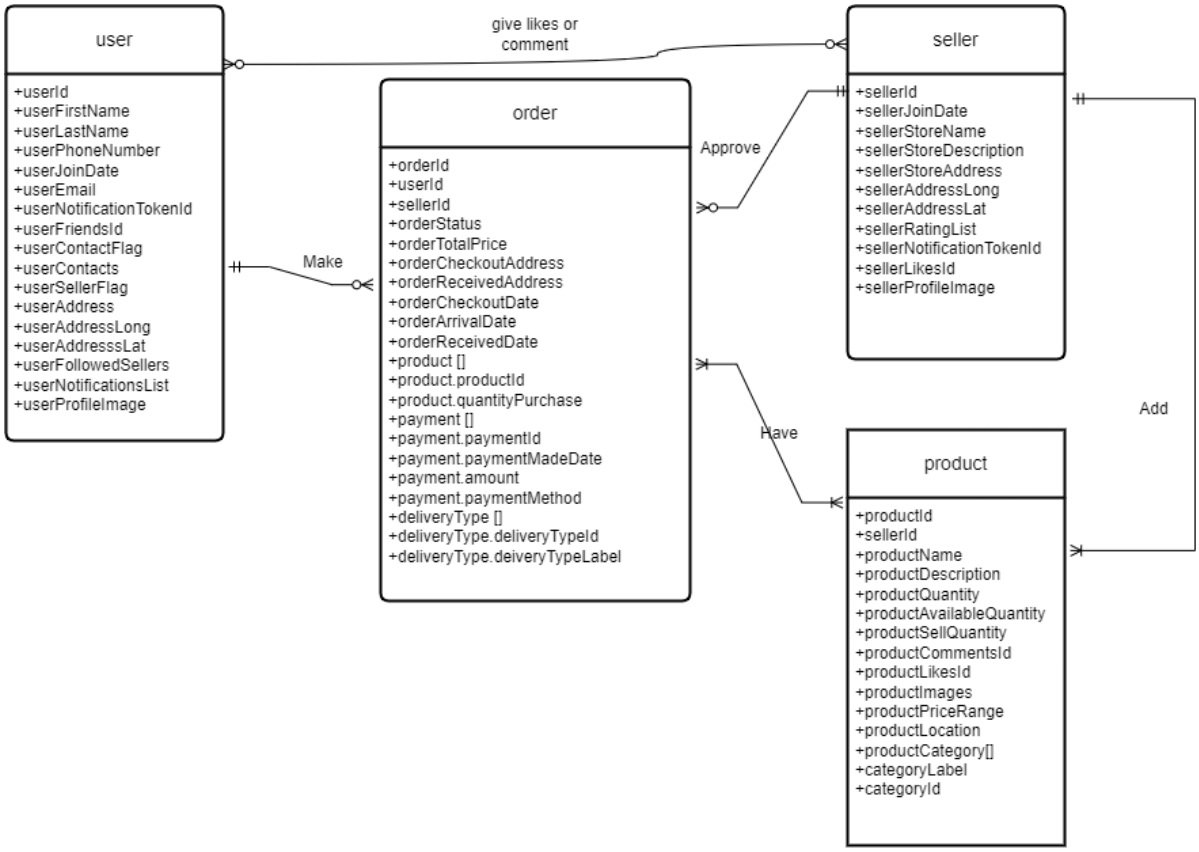


Figure 3.16 Entity Relationships Diagram for UTAR Second-Hand E-commerce Application.

The ERD displayed in Figure 3.7 illustrates the Entity Relationship Diagram for the UTAR Second-Hand E-commerce Application. It offers a visual representation of the application's entities and provides insight into the logical structure of its database. Notably, this project uses a NoSQL database, which is a document database storing data in a key-value pair format similar to JSON. Consequently, the design and representation of relationships between entities will differ from the traditional SQL databases. In the subsequent section, we will provide descriptions of the attributes within each entity and identify the types of relationships they establish with other entities.

Entity: user

The “user” entity is used to store the user information such the name, address, email address and more that related to the user information. Following we will show what are the attributes in the “user” entity and its relationships with others entity.

Attributes:

Within the "user" entity, several attributes are defined, including userId, userFirstName, userLastName, userPhoneNumber, userJoinDate, userEmail, userNotificationTokenId, userFriendsId, userContactFlag, userContacts, userSellerFlag, userAddress, userAddressLong, userAddressLat, userFollowedSellers, userNotificationsList and userProfileImage.

Relationships:

The "user" entity establishes relationships with three other entities: "seller", and "order".

1. Relationship with "seller":

   The relationship between the "user" entity and the "seller" entity is characterized as a zero-to-many relationship. This signifies that each user has the capacity to give like or give comment to zero or more sellers.

2. Relationship with "order":

   The relationship type between the "user" entity and the "order" entity is likewise one-to-many, indicating that each user can place zero or more orders with sellers.

Entity: order

The “order” entity is used to store the order information such the product’s id, user’s id, total price of the order and more that related to the order information. Following we will show what are the attributes in the “order” entity and its relationships with others entity.

Attributes:

Within the "order" entity, various attributes are defined, including orderId, userId, sellerId, orderStatus, orderTotalPrice, orderCheckoutAddress, orderReceivedAddress, orderCheckoutDate, orderPlacedDate, and orderReceivedDate.

Embedded Documents Attributes:

In the “order” entity, there are three embedded entities which are “payment”, and “deliveryType” as well as references entity, “product”.

Attributes of “payment” entity:

Within the "payment" entity, various attributes are defined, including paymentId, paymentMadeDate, amount, and paymentMethod.

Attributes of “deliveryType” entity:

Within the “deliveryType” entity, various attributes are defined, including deliveryTypeId, deliveryTypeLabel, and deliveryTypeDescriptions.

Attributes of “product” references entity:

Within the “product” references entity, various attributes are defined, including productId, and quantityPurchase.

Relationships:

The "order" entity establishes relationships with five other entities: "user", "seller", “deliveryType”, "payment", and “product” .

1. Relationship with “user”:
   The relationship between the “order” entity and the “user” entity is defined as a one-to-one relationship. This implies that each order can only make by one user.
2. Relationship with “seller”:
   The relationship between the “order” entity and the “seller” entity is defined as a one-to-one relationship. This indicates that each order can only approve by one seller.
3. Relationship with “deliveryType”:
   The relationship between the “order” entity and the “deliveryType” entity is classified as a one-to-one relationship. This indicates that each order can only have one delivery type.
4. Relationship with “payment”:
   The relationship between the “order” entity and the “payment” entity is classified as a one-to-one relationship. This indicates that each order can only have one payment made.
5. Relationship with “product”:
   The relationship between the “order” entity and the “product” entity is classified as a many-to-many relationship. This indicates that each order can have one or more product.

Entity: product

The “product” entity is used to store the order information such the product’s id, product name, product price, product quantity and more that related to the product information. Following we will show what are the attributes in the “product” entity and its relationships with others entity.

Attributes:

Within the "product" entity, various attributes are defined, including productId, productName, productDescription, productQuantity, productAvailableQuantity, productSellQuantity, productCommentsId, productLikesId, productImages, productPriceRange, productCategoryId, productLocation, and sellerId.

Embedded Documents Attributes:

In the “product” entity, there are one embedded entity which are “productCategory”.

Attributes of “productCategory” entity:

Within the "productCategory" entity, various attributes are defined, including categoryLabel and categoryId.

Relationships:

The "product" entity establishes relationships with five other entities: "order", "seller", and “productCategory” .

1. Relationship with “order”:
   The relationship between the “product” entity and the “order” entity is defined as a many-to-many relationship. This implies that each product can be in one or more order.
2. Relationship with “seller”:
   The relationship between the “product” entity and the “seller” entity is defined as a one-to-one relationship. This indicates that each product can only be added by one seller.
3. Relationship with “productCategory”:
   The relationship between the “product” entity and the "productCategory” entity is defined as a one-to-many relationship. This implies that each product can only have many category to represent them.

Entity: seller

The “seller” entity is used to store the order information such the seller id, seller name, seller store name, seller address, and more that related to the seller information. Following we will show what are the attributes in the “seller” entity and its relationships with others entity.

Attributes:

Within the "seller" entity, various attributes are defined, including sellerId, sellerJoinDate, sellerStoreName, sellerStoreDescription, sellerFollowersId, sellerStoreAddress, sellerAddressLong, sellerAddressLat, sellerRatingList, sellerNotificationsTokenid, sellerProfileImage, and sellerLikesId.

Relationships:

The "seller" entity establishes relationships with five other entities: "order", "user", and “product” .

1. Relationship with “order”:
   The relationship between the “seller” entity and the “order” entity is defined as a zero-to-many relationship. This implies that each sellers can approve zero or more orders.
2. Relationship with “user”:
   The relationship between the “seller” entity and the “user”entity is defined as a zero-to-many relationship. This indicates that each sellers can be liked or give comment by zero or more users.
3. Relationship with “product”:
   The relationship between the “seller” entity and the "product” entity is defined as a one-to-many relationship. This indicates that each seller can add one or more products.

Entity: productCategory

The “productCategory” entity is a embedded entity in the product entity used to store the product category information such the category name and its descriptions. Following we will show what are the attributes in the “productCategory” entity and its relationships with others entity.

Attributes:

Within the "productCategory" entity, various attributes are defined, including categoryId and categoryLabel.

Relationships:

The "productCategory" entity establishes relationships with the entity: “product” .

1. Relationship with “product”:
   The relationship between the “productCategory” entity and the “product” entity is defined as a zero-to-many relationship. This implies that each product category can be apply to zero or more products.

Entity: deliveryType

The “deliveryType” entity is the embedded entity in the “order” entity that used to store the delivery type or method information such the delivery type name and its descriptions. Following we will show what are the attributes in the “deliveryType” entity and its relationships with others entity.

Attributes:

Within the "deliveryType" entity, various attributes are defined, including deliveryTypeId and deliveryTypeLabel.

Relationships:

The " deliveryType " entity establishes relationships with the entity: “order” .

1. Relationship with “order”:
   The relationship between the “deliveryType” entity and the “order” entity is defined as a one-to-many relationship. This implies that each delivery type can be apply to one or more orders.

Entity: payment

The “payment” entity is the embedded entity in the “order” entity that used to store the payment information such the method used, amount and its payment date. Following we will show what are the attributes in the “payment” entity and its relationships with others entity.

Attributes:

Within the "payment" entity, various attributes are defined, including paymentId, paymentMadeDate, paymentMethod, and amount.

Relationships:

The "payment" entity establishes relationships with two other entities: “order”.

1. Relationship with “order”:
   The relationship between the “payment” entity and the “order” entity is defined as a one-to-one relationship. This implies that each payment can be made in only one order.

In summary, the ERD plays a pivotal role in application development, serving as the blueprint for the project. The entities depicted in the diagram hold significant importance for achieving the objectives of this project and are crucial components of the application's design and functionality.

CHAPTER 4 Design Specification

4.1 Methodologies

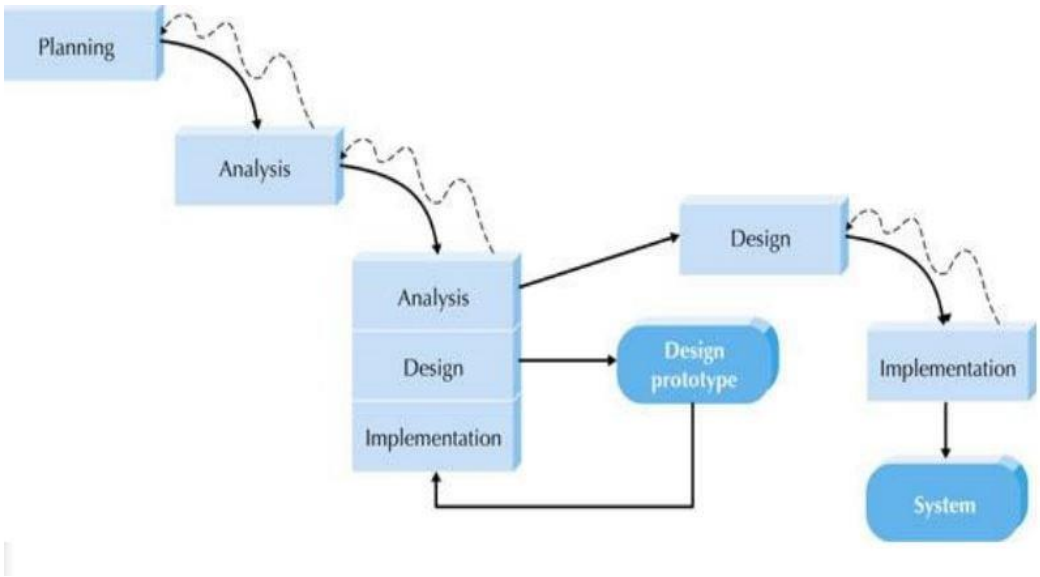


Figure 4.1 Throw-away Prototyping Approach [9]

The methodology we will use for our project development is throwaway prototyping. Throwaway prototyping is the methodology that is used in the software development life cycle (SDLC) and this methodology can iterate between the phases in SDLC. In SDLC, there are four phases involved which are planning, analysis, design, and implementation. In the throwaway prototyping methodology, we will iterate between the analysis, design, and implementation phases with the prototype. The prototype in the throwaway methodology is used to define whether it meets the requirements and the objective. After defining it, the prototype will be abandoned, and we will need to continue to analyze the requirements and the objective obtained from the previous prototype to design and implement the new prototype. This process will end until all the requirements and objectives are achieved, and we will start to develop the actual system based on information gathered from the previous prototypes.

4.2 Tools

4.2.1 Hardware

The hardware involved in this project is a laptop, monitor, and android mobile device. A computer is issued for the development of the application. Next, a monitor is used for extending the screen of the existing laptop screen to increase productivity. A mobile device is used for testing and deploying this application.

Table 4.1 Specifications of laptop

Description	**Specifications**
Model	LENOVO LEGION 5
Processor	Intel(R) Core(TM) i5-11400H @ 2.70GHz
Operating System	Windows 11
Graphic	Intel(R) UHD Graphics and NVIDIA GeForce RTX3060
Memory	16GB DDR4 SAMSUNG RAM
Storage	512GB MICRON SSD

4.2.2 Sotfware

The software involved in this project is Visual Studio Code, TypeScript, Node.js, React-Native, Firebase, Expo-Go, and Andriod Studio. The Visual Studio Code obviously is the code editor for this project, this code editor provides several useful extensions tools that can be download and use to make the project development smoother. Next, the language used for this project is TypeScript, a superset of JavaScript, which provides a type safety environment that the JavaScript did not have, and it make overall project code more safer. The Node.js is the server environment run-time that able to let JavaScript run on the machine. Furthermore, React-Native and Expo-Go are the framework that specially for mobile application development which able to cross-platform. Lastly, Andriod Studio is used as the alternative for the physical mobile device as it provides virtual devices manager which can launch a virtual Andriod mobile device in the computer environment. By using the virtual mobile device able to speed up the project rendering process.

4.3 Requirements

4.3.1 Connectivity Requirements for Users

Table 4.2 Connectivity Requirements for Users

Description	Compulsory
Wifi / Data Connection	Yes
GPS	Yes
Bluetooth	No

4.3.2 Software Requirements for Users

Table 4.3 Software Requirements for Users

Description	Requirements
Android Version	Android 6 or above
IOS Version	IOS 13.4 or above

Chapter 5 System Testing

5.1 System Testing

In this system testing section, we will test our application, which is "UTAR Second-Hand E-commerce Application", by according to modules that covered under the application scope. The modules including buyer module, seller module, location distance module, community module, and item module. By performing the application testing according to the module able to let identify better on is the application is performing well and correctly within the modules scope.

5.2 Buyer Module Testing

In the buyer module, the application needs to able to handle the information related to the buyer or user in order to ensure the user experience and the accuracy of the information display to user.

5.2.1 Buyer Registration

Testing Cases – Login and Sign Up

Table 5.1 Buyer Registration – Testing Cases - Login and Sign

Role (User/Seller)	Steps to take	Expected Results	Actual Result (Pass/Fail)
Both	1. Fill in valid "email" and valid "password". 2. Tap "login" button	– Alert message show "Sign in successful!" – Then navigate to "HomeScreen" page	Pass
	1. 1.Fill in invalid "email" and invalid "password" 2. Tap "login" button	– Alert message show "error signing in: Firebase: Error (auth/wrong-password"	Pass

	1. Do not fill in “email” and/or “password”. 2. Tap “login” button	– Alert message show “Please enter both email and password”	Pass
	1. Fill in valid “email” and valid “password” and valid “confirm password”. 2. Tap “Sign Up” button	– Alert message show “Sign in successfully “ – Then navigate to “HomeScreen” page	Pass
	1. Fill in valid “email” and invalid “password” and/or invalid “confirm password”. 2. Tap “Sign Up” button	– Alert message show “Password does not match”	Pass
	1. Fill in invalid “email” and valid “password” and valid “confirm password”. 2. Tap “Sign Up” button	– Alert message show “Sign up failed! error signing in: Firebase: Error (auth/invalid-email)”	Pass
	1. Do not fill in “email” and/or “password” and/or “confirm password”. 2. Tap “Sign Up” button	– Alert message show “Please fill in the all the filed”	Pass

5.2.2 Buyer Related Information Storing

Testing Cases – Profile Creation

Table 5.2 Buyer Related Information Storing - Testing Cases – Profile Creation

Role (User/Seller)	Steps to take	Expected Results	Actual Result (Pass/Fail)
User	1. After successful sign up 2. Navigate to "HomeScreed"	– Alert message show about incomplete profile information – Tap the "LET'S DO IT" button, then navigate to "createprofilepage"	Pass
	1. Fill "first name" and fill "last name" and fill "phonenumber" and fill all address fill column. 2. Tap "Create Profile"	– The" Create Profile" button can be tapped. – Alert message show "Profile created successfully!"	Pass
	1. Do not fill "first name" and/or "last name" and/or "phonenumber" and do not fill all address fill column 2. Tap "Create Profile"	– The" Create Profile" button cannot be taped	Pass

Testing Cases – Edit Profile Information

Table 5.3 Buyer Related Information Storing – Testing Cases - Edit Profile Information

Role (User/Seller)	Steps to take	Expected Results	Actual Result (Pass/Fail)
User	1. Tap on "edit" icon in "profile" page	– Navigate to "EditProfilePage"	Pass
	1. Fill "first name" and fill "last name" and fill "phonenumber" and fill all address fill column. 2. Tap "Update Profile"	– The" Update Profile" button can be tapped. – Alert message show "Profile updated successfully!"	Pass
	1. Do not fill "first name" and/or "last name" and/or "phonenumber" and do not fill all address fill column. 2. Tap "Update Profile"	– The" Update Profile" button cannot be tapped	Pass

5.2.3 Buyer's Communication with the Seller and Friends

Testing Cases – Chat with Seller and Friends

Table 5.4 Buyer's Communication the Seller and Friends – Testing Cases – Chat with Seller and Friends

Role (User/Seller)	Steps to take	Expected Results	Actual Result (Pass/Fail)
User	1. Tap on "chat" icon	– Navigate to "chat" page	Fail

5.3 Seller Module Testing

In the seller module, the application needs to able to handle the information related to the sellers in order to ensure that the overall flow of business can be performed more efficiently. Especially in inventory or the item management that important the seller module successfully implemented.

5.3.1 Seller Registration

Testing Cases – Become Seller Registration

Table 5.5 Seller Registration – Testing Cases - Become Seller Registration

Role (User/Seller)	Steps to take	Expected Results	Actual Result (Pass/Fail)
User	1. Fill "store name" and fill "store description"" and fill all address fill column. 2. Tap "Submit"	– Alert message show "Seller profile created successfully!"	Pass
	1. Fill "store name" and fill "store description"" and fill all address fill column. 2. Tap "Submit"	– "Submit" cannot be tapped	Pass
	1. Tap the button in the "seller store address" section	– Auto fill all the seller store address fill column	Pass

5.3.2 Seller Related Information Storing

Testing Cases – Edit Seller Information

Table 5.6 Seller Related Information Storing – Testing Cases - Edit Seller Information

Role (User/Seller)	Steps to take	Expected Results	Actual Result (Pass/Fail)
Seller	1. Fill "store name" and fill "store description"" and fill all address fill column. 2. Tap "Update New Info"	– Alert message show "Seller profile updated successfully!"	Pass
	1. Fill "store name" and fill "store description"" and fill all address fill column. 2. Tap "Update New Info"	– "Update New Info" cannot be tapped	Pass
	1. Tap the button in the "seller store address" section	– Auto fill all the seller store address fill column	Pass

5.3.3 Seller's View on The Application

Testing Cases – Seller Control Page or Panel Navigation

Table 5.7 Seller's View on The Application – Testing Cases – Seller Control Page or Panel Navigation

Role (User/Seller)	Steps to take	Expected Results	Actual Result (Pass/Fail)
Seller	1. Tap the "Seller Panel" icon in the profile page	– Navigate to "Seller Control Page"	Pass

	1. Tap the "product" icon in the tab view in "seller control page"	– Show the product list view	Pass
	1. Tap the "order" icon in the tab view in "seller control page"	– Show the order list view	Pass
	1. Tap the "comments" icon in the tab view in "seller control page"	– Show the comment list view	Pass

5.3.4 Seller's Communication with Buyer

Testing Cases – Chatting with Buyers

Table 5.8 Seller's Communication with Buyer – Testing Cases - Chatting with Buyers

Role (User/Seller)	Steps to take	Expected Results	Actual Result (Pass/Fail)
Seller	1. Tap on "chat" icon	– Navigate to "chat" page	Fail

5.3.5 Seller Order and Checkout Management

Testing Cases – Order Status Management

Table 5.9 Seller Order and Checkout Management – Testing Cases - Order Status Management

Role (User/Seller)	Steps to take	Expected Results	Actual Result (Pass/Fail)
Seller	1. When buyers placed order the seller product	– The order list view in "seller control page" show the order	Pass
	1. When seller tap on "Accept" button	– The order list view display "checksquare"icon	Pass

	2. Tap the "confirm" button	and the label "to be sent" – The "order sent" button show	
	1. When seller tap on "Reject" button 2. Tap the "confirm" button	– The order list view display "closesquare" icon and the label "Rejected"	Pass
	1. When seller tap on "Order Sent" button 2. Tap the "confirm" button	– The order list view display "clockcircle" icon and the label "waiting for accept"	Pass
	1. When the buyer tap on "Received Order?" button	– The order list view display "checksquare" icon and the label "Done"	Pass

5.3.6 Seller Item Posting

Testing Cases – Add Item and Edit Item

Table 5.10 Seller Item Posting – Testing Cases -Add Item and Edit Item

Role (User/Seller)	Steps to take	Expected Results	Actual Result (Pass/Fail)
Seller	1. When seller tap on "add product" icon button	– Navigate to "addproductpage"	Pass
	1. Add at least one "image" and fill "productname" and	– Alert message show "Product	Pass

	"productdescription" and fill "number of stock" and fill "number of stock availability " and fill "product price" and fill "categorytype" 2. Tap "add product"	Added Successfully "	
	1. No add "image" and no fill "productname" and/or no fill "productdescription" and/or no fill "number of stock" and/or no fill "number of stock availability " and/or no fill "product price" and fill "categorytype" 2. Tap "add product"	– Alert message show "Please fill in all fields and add at least one image."	Pass
	1. Add at least one "image" and fill "productname" and "productdescription" and fill "number of stock" and fill "number of stock availability " and fill "product price" and fill "categorytype" 2. Tap "update product"	– Alert message show "Product Updated Successfully "	Pass
	1. No add "image" and no fill "productname" and/or no fill	– Alert message show "Please fill in all fields and	Pass

	"productdescription" and/or no fill "number of stock" and/or no fill "number of stock availability " and/or no fill "product price" and fill "categorytype" 2. Tap "update product"	add at least one image"	

5.4 Location Distance Module Testing

In the location distance module, the application needs to be able to identify the distance of the buyer or user with seller in order to present the more accurate distance between them. As the location distance module is one of the objectives of this project, so the make the application manage to capture the location of the buyer and seller is vital.

5.4.1 Find and Store the Buyer's and Seller's Location

Testing Cases – Locate and Store the Buyer's and Seller's Location Details

Table 5.11 Find and Store the Buyer's and Seller's Location – Testing Cases – Locate and Store the Buyer's and Seller's Location Details

Role (User/Seller)	Steps to take	Expected Results	Actual Result (Pass/Fail)
	1. When user or buyer and seller log in to the application	− Locate the longitude and latitude details	Pass

5.4.2 Calculate Distance between Buyer's Location and Seller's Location

Testing Cases – Calculate and Display the Distance

Table 5.12 Calculate Distance between Buyer's Location and Seller's Location – Testing Cases – Calculate and Display the Distance

Role (User/Seller)	Steps to take	Expected Results	Actual Result (Pass/Fail)
	1. When user or buyers in the "market" page	– The distance is shown in each product card	Pass

5.5 Community Module Testing

In the community module, the application needs to be to manage the interaction and communication of the user with another user as well as with the seller. As reducing the trust issue between user and seller, this module plays important role in this project in order to reach the objective.

5.5.1 User Friend Adding

Testing Cases – Adding Contact List

Table 5.13 User Friend Adding – Testing Cases - Adding Contact List

Role (User/Seller)	Steps to take	Expected Results	Actual Result (Pass/Fail)
User	1. Tap on the "add contact" icon button	– Show a list of contact found in the modal view	Pass
	1. Tap on the "add contact" button in the modal view	– Alert a message show "contact list successfully"	Pass

5.6 Item Module Testing

In the item module, the application needs to be to manage the item or product added or posted by seller in order for them able to sell the buyers.

5.6.1 Item Posting

Testing Cases – Adding Item and Editing Item

Table 5.14 Item Posting – Testing Cases - Adding Item and Editing Item

Role (User/Seller)	Steps to take	Expected Results	Actual Result (Pass/Fail)
Seller	1. When seller tap on "add product" icon button	– Navigate to "addproductpage"	Pass
	1. Add at least one "image" and fill "productname" and "productdescription" and fill "number of stock" and fill "number of stock availability" and fill "product price" and fill "categorytype" 2. Tap "add product"	– Alert message show "Product Added Successfully"	Pass
	1. No add "image" and no fill "productname" and/or no fill "productdescription" and/or no fill "number of stock" and/or no fill "number of stock availability" and/or no fill "product price" and fill "categorytype"	– Alert message show "Please fill in all fields and add at least one image."	Pass

	2. Tap “add product”		
	1. Add at least one “image” and fill “productname” and “productdescription” and fill “number of stock” and fill “number of stock availability ” and fill “product price” and fill “categorytype” 2. Tap “update product”	– Alert message show “Product Updated Successfully ”	Pass
	1. No add “image” and no fill “productname” and/or no fill “productdescription” and/or no fill “number of stock” and/or no fill “number of stock availability ” and/or no fill “product price” and fill “categorytype” 2. Tap “update product”	– Alert message show “Please fill in all fields and add at least one image”	Pass

5.6.2 Item Display on Application View

Testing Cases – Fetch Item from Database and Display in “Market” Page

Table 5.15 Item Display on Application View – Testing Cases – Fetch Item from Database and Display in “Market” Page

Role (User/Seller)	Steps to take	Expected Results	Actual Result (Pass/Fail)

	1. Fetch item data from database	– Get a list of item data from database	Pass
	1. Filter the item data based on distance and current user friend recommend seller item	– Get a sorted item data list – Display the items to the "Market" Page	Pass

5.6.3 Item Availability Management

Testing Cases – Item Stock Out Management

Table 5.16 Item Availability Management - Testing Cases – Item Stock Out Management

Role (User/Seller)	Steps to take	Expected Results	Actual Result (Pass/Fail)
	1. When the item available stock number become 0	– Disable the order function for that item.	Pass

CHPATER 6 CONCLUSION AND RECOMMENDATION

In this concluding section, we'll sum up the main aspects of our project, encompassing the problems we tackled, the driving motivation, and our proposed solutions.

We started out by identifying particular problems areas. First, we noted the lack of a friend recommendation feature—which is crucial for affecting customer decisions—in the current e-commerce platform. In addition, we observed the absence of a distance display function, which would indicate the proximity of buyers and sellers—an important consideration, particularly in transactions involving second-hand products. Finally, we noted the absence of an AI assistance feature in several e-commerce platforms, which is particularly a new innovation for the second-hand products market.

Initiating this project was mainly motivated by the need to create a specialized second-hand E-commerce application for UTAR students. The limitations provided by existing platforms, which restricted students from easily transacting in used goods, served as the motivating factor behind the initiative. Our objective was to give these transactions a more reliable and efficient platform.

In search of solutions, we investigated numerous techniques to addressing these highlighted issues. Our ideas included adding a friend recommendation function to increase buyer confidence, adding a distance display option to show seller closeness, and adding a generative AI feature that would let the seller manage the second-hand product with more effective.

In summary, all the aspects outlined in this conclusion have been detailed in their respective project sections. With the help of innovative thinking and strong drive, our work has made a great deal toward resolving the difficulties that have been identified. We hope that the results and contributions of our project will have a long-lasting influence on the field of business applications, especially in the area of second-hand market. In the future, we hope to enhance the existing by completing the necessary feature that still lack in the application. Furthermore, we wish to implement more AI powered features and models to enhance and innovate our application. We hope that our effort will help set the groundwork for more studies and activities in this field.

REFERENCES

[1] *hi-hive. (2020), Google Play Store, Accessed: November. 29,2022. [Online] Available: https://play.google.com/store/apps/details?id=com.slc.hihive.community*

[2] *"UTAR E-marketplace," UTAR E-Marketplace. [Online]. Available: https://unipreneur.utar.edu.my/. [Accessed: 05-Dec-2022].*

[3] *"Facebook," Facebook.com. [Online]. Available: https://www.facebook.com/marketplace. [Accessed: 05-Dec-2022].*

[4] *Lazada*. (2013), Google Play Store, Accessed: November. 29,2022. [Online] Available: https://play.google.com/store/apps/details?id=com.lazada.android

[5] *Shopee*. (2015), Google Play Store, Accessed: November. 29,2022. [Online] Available: https://play.google.com/store/apps/details?id=com.shopee.my

[6] Fakespot, "More than 30 percent of online customer reviews deemed fake with the problem expected to hit an all-time high this holiday shopping season," *PR Newswire*, 17-Nov-2021. [Online]. Available: https://www.prnewswire.com/news-releases/more-than-30-percent-of-online-customer-reviews-deemed-fake-with-the-problem-expected-to-hit-an-all-time-high-this-holiday-shopping-season-301426512.html. [Accessed: 29-Nov-2022].

[7] *Researchgate.net*. [Online]. Available: https://www.researchgate.net/publication/342637896_Fake_Reviews_in_E-Commerce_Marketing. [Accessed: 29-Nov-2022].

[8] *M. Alam, "Factors that Influence the decision when buying second-hand products!," Jul. 2015. Available: https://www.diva-portal.org/smash/get/diva2:839612/FULLTEXT01.pdf*

[9] “Throw-away Prototyping Approach - LiamWho,” *LiamWho*. Nov. 05, 2017. Accessed: Sep. 07, 2023. [Online]. Available: https://www.liamwho.com/software-process-models-w02/throw-away-prototyping-approach/

APPENDIX

WEEKLY LOG

FINAL YEAR PROJECT WEEKLY REPORT

Trimester, Year: Jan24	**Study week no.: 4**
Student Name & ID: Calvin Chua Kai Pin	
Supervisor: Ts Dr Wong Pei Voon	
Project Title: UTAR Second Hand E-Commerce Application	

1. WORK DONE Done on the UI design for several page for the project.
2. WORK TO BE DONE Identify the problem occur the function used in the application.
3. PROBLEMS ENCOUNTERED Encountered crash during the development of the application.
4. SELF EVALUATION OF THE PROGRESS Being progressing and need to enhance mind set.

wong _____ _____ _____

Supervisor's signature Student's signature

FINAL YEAR PROJECT WEEKLY REPORT

Trimester, Year: Jan24	**Study week no.:6**
Student Name & ID: Calvin Chua Kai Pin	
Supervisor: Ts Dr Wong Pei Voon	
Project Title: UTAR Second Hand E-Commerce Application	

1. WORK DONE

Managed to solve the crashing issue.

2. WORK TO BE DONE

Complete the seller panel features function.

3. PROBLEMS ENCOUNTERED

Having on issue implementing third-party library.

4. SELF EVALUATION OF THE PROGRESS

Being progressing.

wong

Supervisor's signature

Student's signature

FINAL YEAR PROJECT WEEKLY REPORT

Trimester, Year: Jan24	**Study week no.: 9**
Student Name & ID: Calvin Chua Kai Pin	
Supervisor: Ts Dr Wong Pei Voon	
Project Title: UTAR Second Hand E-Commerce Application	

1. WORK DONE

Managed to implement the third-party library to the application.

2. WORK TO BE DONE

Find alternative for integrate current trendy generative AI to the applciation

3. PROBLEMS ENCOUNTERED

Having problem on type error for some variable in the Typescript.

4. SELF EVALUATION OF THE PROGRESS

Hardworking boosting the progress

wong

Supervisor's signature

Student's signature

FINAL YEAR PROJECT WEEKLY REPORT

Trimester, Year: Jan24	**Study week no.: 11**
Student Name & ID: Calvin Chua Kai Pin	
Supervisor: Ts Dr Wong Pei Voon	
Project Title: UTAR Second Hand E-Commerce Application	

1. WORK DONE

Managed to find the generative AI model and implemented it to the application.

2. WORK TO BE DONE

Complete the remaining part of the project and try implementing Google Map API for the location module.

3. PROBLEMS ENCOUNTERED

Experience the project crashing again.

4. SELF EVALUATION OF THE PROGRESS

Being Progressive and aim for desired result.

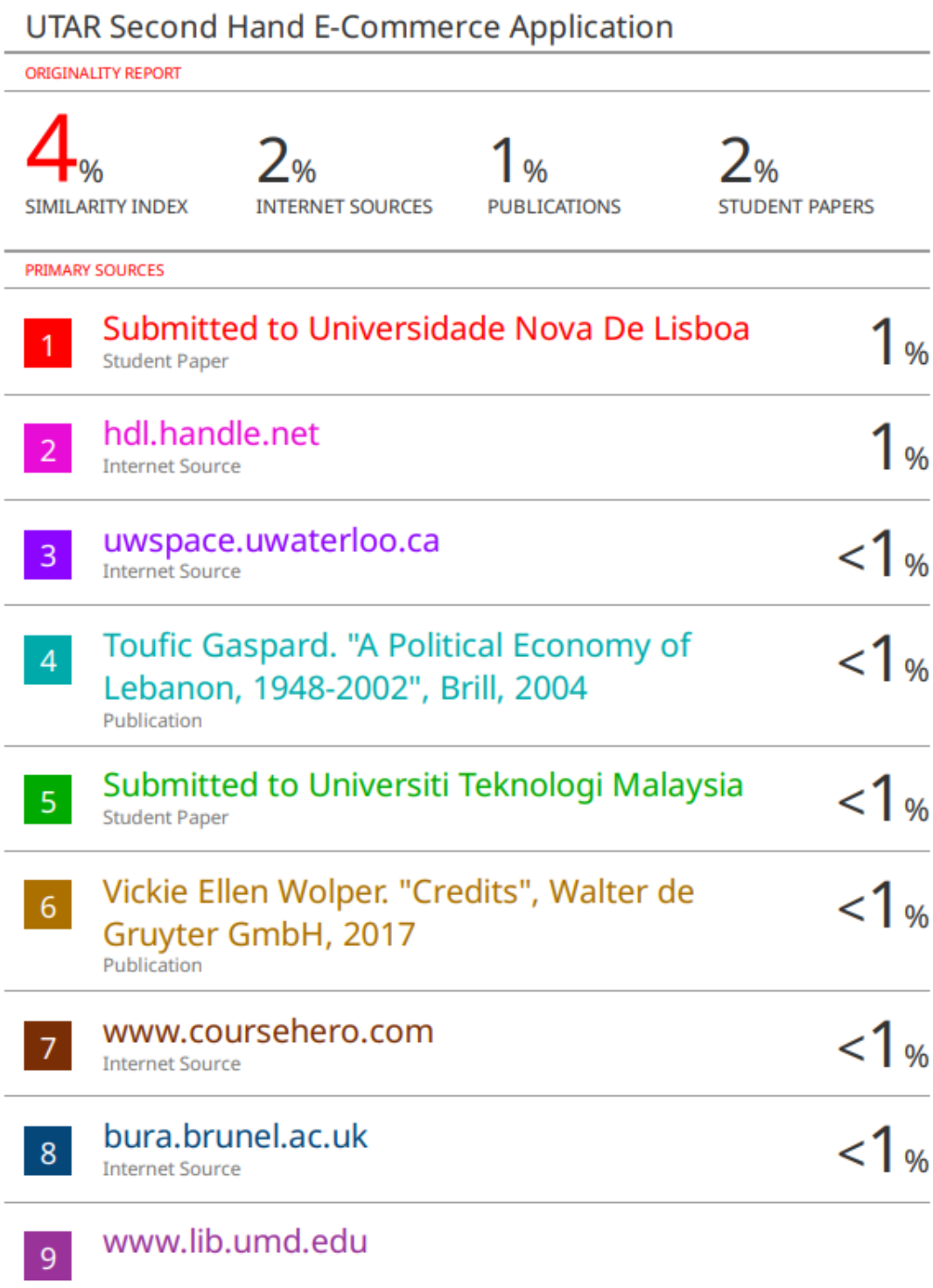
wong
Supervisor's signature

Student's signature

POSTER


FACULTY OF INFORMATION AND COMMUNICATION TECHNOLOGY (FICT)
UTAR SECOND HAND E-COMMERCE APPLICATION
Introduction
The issue centers on UTAR students, who, during their studies, often acquire items like furniture and tools for convenience in their accommodations. Upon graduation, they opt for sustainability by selling these items to others to reduce waste. While platforms like HIhive Marketplace, UTAR E-Market, and Facebook Marketplace are commonly used for these transactions, they exhibit limitations that require improvement.
1
BUY
2
Objective
Develop a high reliable second-hand E-commerce application.
Proposed Solutions
Implement friend recommend feature
Implement distance showing feature
Implement generative AI feature
3
4
PAY
Why this application?
Provide a high reliable and trustworthy E-commerce environment for buying and selling.
5
Conclusion
We hope that the results and contributions of our project will have a long-lasting influence on the field of business applications, especially in the area of second-hand sales. In the future, we hope to enhance the existing by completing the necessary feature that still lack in the application. Furthermore, we wish to implement more AI powered features and models to enhance and innovate our application. We hope that our effort will help set the groundwork for more studies and activities in this field.
Developer: Calvin Chua Kai Pin
Supervisor: Ts Dr Woon Pei Voon

PLAGIARISM CHECK RESULT



UTAR Second Hand E-Commerce Application

ORIGINALITY REPORT

4%	2%	1%	2%
SIMILARITY INDEX	INTERNET SOURCES	PUBLICATIONS	STUDENT PAPERS

PRIMARY SOURCES

1	Submitted to Universidade Nova De Lisboa Student Paper	1%
2	hdl.handle.net Internet Source	1%
3	uwspace.uwaterloo.ca Internet Source	<1%
4	Toufic Gaspard. "A Political Economy of Lebanon, 1948-2002", Brill, 2004 Publication	<1%
5	Submitted to Universiti Teknologi Malaysia Student Paper	<1%
6	Vickie Ellen Wolper. "Credits", Walter de Gruyter GmbH, 2017 Publication	<1%
7	www.coursehero.com Internet Source	<1%
8	bura.brunel.ac.uk Internet Source	<1%
9	www.lib.umd.edu	

FYP2 CHECKLIST

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

FACULTY OF INFORMATION AND COMMUNICATION TECHNOLOGY

Full Name(s) of Candidate(s)	Calvin Chua Kai Pin
ID Number(s)	2002000
Programme / Course	IB
Title of Final Year Project	UTAR Second Hand E-commerce Application

Similarity	**Supervisor's Comments (Compulsory if parameters of originality exceeds the limits approved by UTAR)**
Overall similarity index: 4 **%** **Similarity by source** Internet Sources: 2 % Publications: 1 % Student Papers: 2 %	
Number of individual sources listed of more than 3% similarity: 0	
Parameters of originality required and limits approved by UTAR are as Follows: **(i) Overall similarity index is 20% and below, and** **(ii) Matching of individual sources listed must be less than 3% each, and** **(iii) Matching texts in continuous block must not exceed 8 words** ***Note: Parameters (i) – (ii) shall exclude quotes, bibliography and text matches which are less than 8 words.***	

Note Supervisor/Candidate(s) is/are required to provide softcopy of full set of the originality report to Faculty/Institute

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

wong
_____
Signature of Supervisor

_____
Signature of Co-Supervisor

Name: Ts Dr Wong Pei Voon _____ Name: _____

Date: 26/4/2024 _____ Date: _____

UNIVERSITI TUNKU ABDUL RAHMAN

FACULTY OF INFORMATION & COMMUNICATION TECHNOLOGY (KAMPAR CAMPUS)

CHECKLIST FOR FYP2 THESIS SUBMISSION

Student Id	2002000
Student Name	Calvin Chua Kai Pin
Supervisor Name	Ts Dr Wong Pei Voon

TICK (√)	DOCUMENT ITEMS Your report must include all the items below. Put a tick on the left column after you have checked your report with respect to the corresponding item.
✓	Title Page
✓	Signed Report Status Declaration Form
✓	Signed FYP Thesis Submission Form
✓	Signed form of the Declaration of Originality
✓	Acknowledgement
✓	Abstract
✓	Table of Contents
✓	List of Figures (if applicable)
✓	List of Tables (if applicable)
	List of Symbols (if applicable)
✓	List of Abbreviations (if applicable)
✓	Chapters / Content
✓	Bibliography (or References)
✓	All references in bibliography are cited in the thesis, especially in the chapter of literature review
✓	Appendices (if applicable)
✓	Weekly Log
✓	Poster
✓	Signed Turnitin Report (Plagiarism Check Result - Form Number: FM-IAD-005)
✓	I agree 5 marks will be deducted due to incorrect format, declare wrongly the ticked of these items, and/or any dispute happening for these items in this report.

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

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

Ca/

_____

(Signature of Student)

Date: 26 April 2024