

**BEAUTY AND SKINCARE E-COMMERCE MOBILE APPLICATION WITH ADVANCED  
SEARCHING MODULE USING IMAGE PROCESSING**

BY

TAN YEE SHIN

A REPORT

SUBMITTED TO

Universiti Tunku Abdul Rahman

in partial fulfillment of the requirements

for the degree of

**BACHELOR OF INFORMATION SYSTEMS (HONS) INFORMATION SYSTEMS  
ENGINEERING**

Faculty of Information and Communication Technology

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## ABSTRACT

Beauty and skincare E-Commerce Mobile Application with Advanced Searching Module using Image Processing is designed to bring great convenience to both sellers and buyers. As e-commerce is growing much faster than retail, many people opt for online shopping and some of the young generation started to set up an e-commerce business. This project is motivated to make contribution to the consumers by providing them a convenient way to shop online with simple steps, capable of easy browsing, online tracking, 24/7 online shopping and simple payment method. In addition, the purpose of this project is to motivate both sellers and buyers to use this mobile application for purchasing their beauty and skincare products.

This project is to be developed and managed with popular system development methodology – Agile methodology. This methodology supports incremental and iterative development in a consistent and disciplined way to execute the task. In agile methodology, it is mainly focused on incrementation and division of tasks into several time boxes. The proposed project aimed to be developed with current popular open source technologies. Android Studio is selected as the mobile app development tool which is easy to use and accurate programming. With Cloud Test Lab Integration, mobile app can be built for one and test on multiple android devices then further check about the compatibility and performance of an app using Android Studio.

The expected implementation of mobile app selling beauty and skincare products is allow users to purchase beauty and skincare products without travelling, quick searching items by keywords and quick recognizing products by images. Moreover, there are some features such as “remember me”, “forget password”, live chat and chatbots powered software for real-time communication that developed to enhance the user experience.

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## LIST OF ABBREVIATIONS

B2B	Business to Business Electronic Commerce
B2C	Business to Consumer Electronic Commerce
C2C	Consumer to Consumer Electronic Commerce
C2B	Consumer to Business Electronic Commerce
Inc.	Incorporated
Co.	Company
NCCC	National Consumer Complaints Centre
UK	United Kingdom
24-7	Twenty-four hours seven days a week
ADT	Ada Development Tools
SDK	Software development kit
JSON	JavaScript Object Notation
NOSQL	Non-relational
SQL	Structured query language
UI	User Interface
RAM	Random-access memory
ERD	Entity Relationship Diagram
OS	Operating system
GB	Gigabyte

PC	Personal Computer
APP	Application
DHL	Dalsey Hillblom Lynn
COD	Cash on Delivery
P.O.	Post Office
IG DM	Instagram Direct Messages.
IOS	iPhone OS, Mobile Operating System
DSDM	Dynamic Systems Development Method
AI	Artificial Intelligence
CRM	Customer Relationship Management
UML	Unified Modelling Language
n.d	No Date
SDK	Software development kit
API	Application program interface
REST	Representational State Transfer
JSON	JavaScript Object Notation
OCR	Optical character recognition

## **Chapter 1: Introduction**

### **1.1 Problem Statement**

#### **1.1.1 Uncategorized large databases and time consuming when manually enter large amount of texts**

There is a wide range of products selling online which mean that the product tagging process is quite time consuming as human have to sort the huge database with tags manually. As a result, labor costs increase. Another scenario is users did not even know what exactly the products are, so they did not know which keywords should be used when performing a search. Seller have to physically entering the large sums of content when adding new products to its store. What if there are thousands of images to be added, it will be a tedious task yet time-consuming.

#### **1.1.2 Inactive communication or slow response**

Another problem exists include low responsive rate or poor services which eventually result in buyers search for other sellers and the sales drop gradually. Customers whoever encounter a bad shopping experience tend to resist the shop and refuse to come back. (Ha, S., and Stoel, L. ,2012). Thus, the growth of an online business largely depends on the capability of a seller to keep their customers feel happy and satisfied in the same way. For example, if it takes up to 3 days only the seller response to buyers' enquiries in some cases which may leave a negative impression on that stores. Moreover, there is lack of interaction between sellers and buyers and buyers unable to examine the products themselves causes buyers lost confidence when purchasing via online.

#### **1.1.3 Loss or stolen parcel**

Very often, when buyers purchasing products through online, tracking number will be straightly given to the buyers. There are some cases like anyone can obtain the tracking number, reroute the parcel to other address and signed for the products during delivery of parcel. Unfortunately, it is quite hard to trace the case. However, some courier delivery company will not take the blame for any costs.

### 1.2 Background and motivation

Online shopping is becoming more popular nowadays among the youngest generation and elder generation, it is a form of internet commerce or electronic commerce. All people went for online shopping because they no need to spend time to queue up in the stores. According to the survey conducted in 2014, a total number of 47% of respondents react more actively towards online purchasing beauty and personal skin care products which also include fragrances. (Mottl, 2014). E- commerce is a useful platform that allow people around the world to buy global products without the need to travel far. With the innovation of the idea of e- commerce, it brings more convenience to both seller and buyer where sellers can start up their business through online and buyers just simply browse through all the products and services lists at the website, add the things they are interested to buy into the shopping cart and make payment via Internet then the parcel will be delivery to buyers' doorstep.

With the implementation of virtual chatbot, redundant duties can be minimizing in order to solve the tasks like manually addressing unresolved or inactive communications using automation. The virtual chatbot is designed to provide quick and instant replies about the beauty and skincare products. For this proposed project, bot is setup to readily answer some simple message or to provide some beauty tips to end-users. Recommendation will be given by the virtual chatbot according to the skin problem issues faced by the users. For example, users look for a product to get rid of the dark circles under the eyes, virtual chatbot will then fetches details from the database which it is most related and makes the relevant recommendation to the user. When the bot cannot recognize the end-user phrases or the intents are not matched, fallback intents will be prompted and automatically response with text such as "Sorry, what was that?" or "Can you say that again?". The conversation will further then handoff to human on live chat. Furthermore, chatbot can directing collecting the user's data by providing an online form asking users to state their problems. In addition, virtual chatbot will be enhanced to direct users to shipment tracking site in order to track their orders with just a simple click on a button. In this project, virtual chatbot and on line human agent can equally effectively handle the user's enquiries or needs.

## Chapter 1: Introduction

Basically, image recognition features will first recognize the products from the image captured and further classify them which will generate the classification labels of the image with probability. With just a simple step, user can choose the product images stored whether in mobile devices gallery or SD card and upload, then clicked on the “Label” button to detect the objects at a speed of light. It will return a list of labels telling what is exactly inside the images. Image labelling is about analyzing the products in an automate manner and subsequently return the relevant results based on the trained machine learning concepts. There are sometimes certain products lack of proper keyword attribution that lead to users unable to lookup for the products because the contents cannot be indexed. Hence, image recognition or image labelling are used to detect or identify the labels of the products to ensure that users able to get the automatic keywords recommendation. Clearly, image acknowledgment innovation combined with versatility and AI program offers an effective blend of potential highlights to save time yet enhance user experience.

The main reason of implementing OCR features in this project is to offer assistance businesses that further minimize the number of experts hiring and also to cut down the expenses of document processing. The inputs such as bank receipts or invoice will have to undergo data processing only then the data or text can be extracted and allow users to copy to any place they like. Therefore, users can quickly lookup the reference ID, beneficiary account number, payment details or amount in a receipt. Not only OCR will help to recognizes data or information contents automatically, it also able to read different style of handwritten text even though with different sizes. Furthermore, admin can save time with the use of OCR features to scan through the product’s description and copy paste when uploading a new product. In short, OCR will be converting the uploaded images to text and data can be retrieving in a shorter time with a high accuracy.

The reason why this work may be considered useful for the broader audience is that as a result of it appeared a mobile application, which can simplify the tracking process and also to help retrieving the contacts details effortlessly. For the shipment management, users can easily obtain the tracking number by scanning the barcode given by admin. Only the targeted user will able to see the contents of the shipment including the date

## Chapter 1: Introduction

ship out, email, phone number as well as tracking number. Nowadays, the paper-based business cards are easily vulnerable to failure or destruction. In order to protect the privacy data such as contact number, account number, email and any other information on the card, barcode scanning help to extract the data of the business card and stores in server electronic format. In this case, it will speed up the process of filling the shipment details such as receiver name, phone number, detailed address, postcode and state during checkout process.

The development of this project is motivated due to the Uncategorized large databases and time consuming when manually enter large amount of texts, inactive communication or slow response and cases like loss or stolen parcel as stated in Chapter 1.1. This project is motivated to make contribution to buyers by improving the search engine that enable buyers to browse the most accurate products using keywords in a faster and easier way. Moreover, this project is motivated to implement chatbot services that allow immediate or responsive communication with the buyers. Indeed, it is an easier way with the use of Optical Character Recognition features that only requires seller to capture the catalog, then extraction of the text will be automatically generated. As a result, it can save plenty of time when adding new products to the stores.

### 1.3 Objectives

- To identify various applications and features of the existing e-Commerce platform related to beauty and skincare products.
- To develop beauty and skincare ecommerce mobile application with advanced optical character recognition techniques and image processing services.
- To implement a chatbot to enhance customer experience by engaging with the conversational agent and human agent.

### 1.4 Proposed approach/study

The proposed approach in this project is to develop and design a beauty and skincare e-commerce mobile application with advanced searching module using image processing. The target users of this project could be anyone from teenagers to adults who own a mobile phone or tablets. Figure below describe the system modules of this mobile application together with titles and also description.

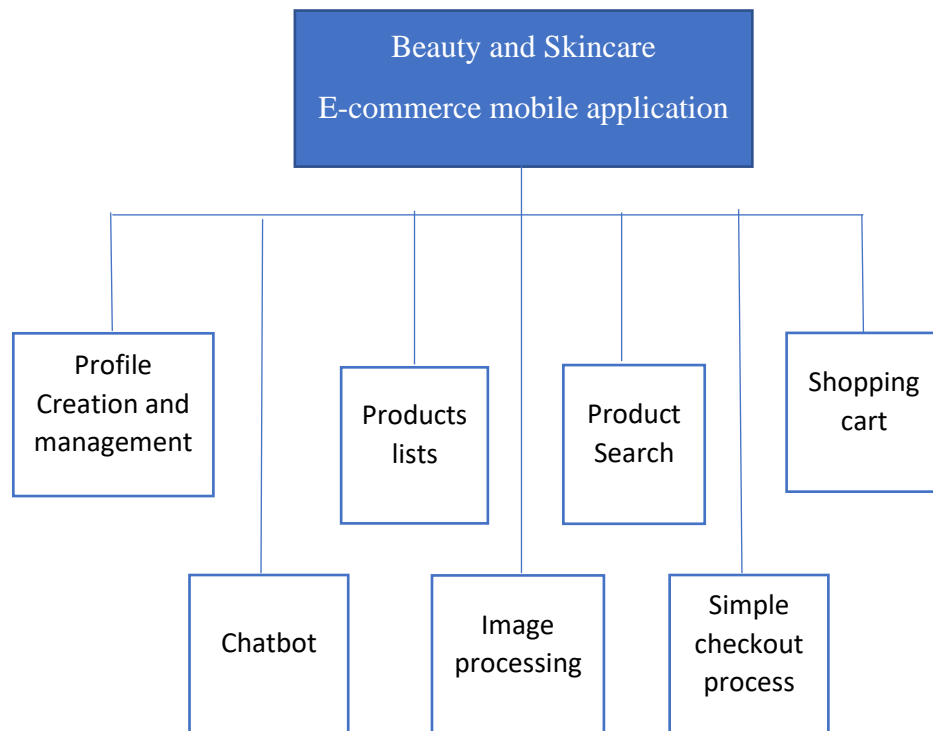


Figure 1.1 System Modules for the proposed system

#### 1.4.1 Profile Creation and Management Module

This module provided two ways for individual to access the page. For both admin and users' site, phone number and password are mandatory in order to login. Users may register new account using their name, phone number and password. A profile edit interface also provided to let users to modify their profile details such as uploading profile photo, changing name, password and address. To enhanced user experience, users can set security questions in case they forget their password.

### **1.4.2 Product Listing Module**

Both users and admin are allowed to vertically scroll through the lists to view more products, description and price as well. However, only admin is allowed to add new products and make changes or remove the products from the lists. Admin has to upload the product image, provide product name, product description and price when trying to add products based on the category of the beauty and skincare products.

### **1.4.3 Product Searching Modules**

Users are provided with an interface to start the search by typing keywords. This helps the users to find a specific product within a few seconds. By capturing the products images, the products can be classified and recognized. Customer experience will be enhanced if the mobile app is designed to guide the users to get their desired products as fast as possible.

### **1.4.4 Shopping Cart Modules**

Shopping cart is where users keeps their items before checking out. In the shopping cart where items are all display systematically, users can view all the items and make decision whether they want to proceed to checkout process or modify their cart. Before making payment, users still able to increase or decrease the quantity of the items that display at the shopping cart list. Users somehow can also remove the unwanted items from the shopping cart list by clicking at the “Remove” button.

### **1.4.5 Chatbot Module**

Chatbot is developed to provide some suggestions about the beauty and skincare products to users. Chatbot act as a communication bridge between user and seller. It is known as an auto-reply features. Generally, the chatbot in this project can handle a variety of low-level FAQs. However, human agent has to answer any questions that cannot answer by the chatbot. Regardless of the time zone or destination, users would be able to interact and communication with the sellers. A trained chatbot is ready to answer any general questions regarding the beauty and skincare products. Users also can get the skin consultation by chatting with the admin in real-time.



### **1.4.6 Simple checkout process**

In this project, the checkout process is designed as simple as possible. This is due to the intention of reducing cart abandonment. Users may require to fill in their shipping address and upload the bank receipt together with the transaction amount and references number written in the field provided. The main purpose of making the checkout process as simple as possible is to reduce the friction in user experience.

### **1.4.7 Image Processing Module**

In this project, image processing is related to label detection, optical character recognition and barcode scanning features. With advanced data labeling, users can quickly get to know the appropriate keywords or labels of the products. By merely taking the image of the product, it will process then classify the data automatically and further assign the product to the right category. OCR works like a scanner and converter in the same time. Users can upload the images of bank receipt, basic data such as reference number, beneficiary account number and transaction amount will be extracted automatically and allow users to copy it. Furthermore, barcode scanning will be used when admin wish to provide the shipment tracking information to users. Besides that, it can shorten the time to fill out the shipment details by allowing users to scan through the barcode and retrieve data such as name, phone number, email, address and other personal information.

## **1.5 Project Achievement**

The development of this project is motivated to make contribution to users that enable them to shop for beauty and skincare products online. Users can easily locate certain products and transaction no longer need to deal face to face. With zero starting costs, sellers able to start up and maintain an online store. Moreover, this project is motivated to implement chatbot services to enhance user experiences. With live chat, users can get a quick answer about the products or seek for an advice on skincare problems. This project also achieved by allowing users to track their orders after getting the tracking number given by admin. This project makes contribution by providing a mobile platform for them to purchase beauty and skincare products online, advance searching for a specific product and having chatbot readily to answer the users enquires.

## Chapter 1: Introduction

### 1.6 Report Organization

The headings of this report include table of contents, list of tables, figures, and abbreviations. The following is the arrangement of chapters and what is included as part of each chapter.

**Chapter 1** identifies the problem statement, describes the project background and motivation, defines project objectives, states proposed approach, and project achievements.

**Chapter 2** contains literature reviews on existing mobile ecommerce applications, best mobile application development platform, best cross platforms development framework,

backend technologies and project development methodologies.

**Chapter 3** clarifies system design with Entity Relationship Diagram, Use Case diagram and Flowchart.

**Chapter 4** discusses the methodologies, work procedures implemented in the project, and

technologies involved to develop the system.

**Chapter 5** states functional/non-functional requirements, and verification plan for system

testing.

**Chapter 6** concludes project achievement, objectives, challenges and future improvements.

**References** include a list of Harvard style citation that cite contents referred from other source.

**Poster and Turnitin Plagiarism check result** is included at the end of the report.

## **Chapter 2: Literature Review**

### **2.1 Review on existing e-commerce application**

This section highlights 4 existing e-commerce platform that are famous among the younger generation nowadays. E-commerce trends are becoming more obvious because Malaysian tends to buy their favorite items from online stores. The current situation is people shop for the products at the comfort of their house instead of shop at the high street. Thanks to e-commerce platform sites such as Shopee, Lazada, Zalora, Amazon and so on, people can shop online and place order with just a click and goods will be deliver to their doorsteps. In this section, for each existing e-commerce site, their advantages and drawback in terms of its feature are reviewed in details.

#### **2.1.1 Shopee**

Mobile app usage is growing 6% years over years and it significantly show that people nowadays prefer online shopping instead of visit brick-mortar store. According to a research done by Spaceotechnologies in 2019, Shopee mobile app was ranked top in 2019. Shopee is a Singaporean e-commerce platform which was first launched in 2015, then further expanded its reach to other country such as Malaysia, Indonesia, Taiwan, Vietnam and Philippines. At the early stage, Shopee was started its business with the concepts of C2C(Consumer-to-Consumer) and at the later state Sea group decided to move into B2C based business model. Shopee provide a convenient, simple and yet fast online platform for Shopee users where they can purchase certain products or even start up a business by selling their own products. That fact is that Shopee was recorded as a high rating apps on Google Play and App Store as it is free of charge for all to download and most importantly offer cheaper price all the time compared to the stores outside.

By browsing through Shopee platform, users first view a list of products with description and specification and add the interested items into the order cart and lastly make payment. Before placing order, users can compare the price and quality by scanning through the review and rating part.

## Chapter 2: Literature Review

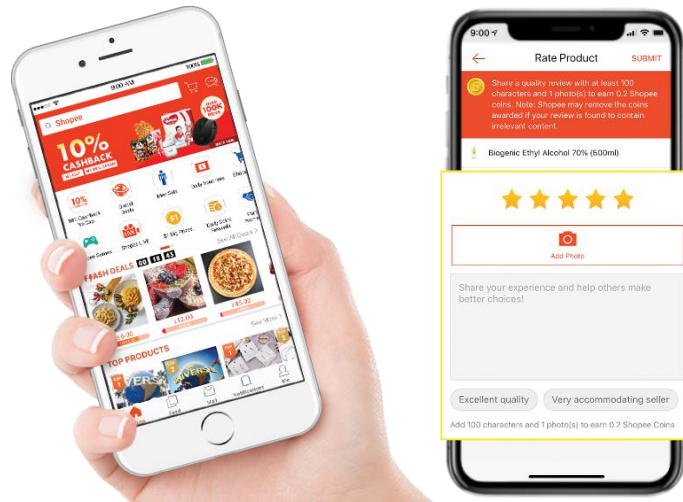


Figure 2.1 Shopee Product Rating

Figure 2.1 explained that once the purchased orders have been delivered, users can rate the seller and leaving any comments with at least 50 words regarding the products received or shipping services and also provide at least one picture in order to gain 3 Shopee coins. Although Shopee coins cannot be exchange for cash but it can be used to pay the products listed in the Shopee platform. The main purpose of Shopee coins is to reward Shopee users and help them save more in the next purchases.

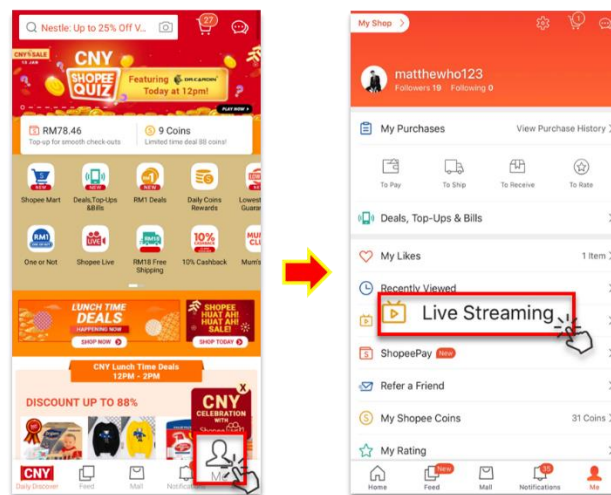


Figure 2.2 Shopee Live Streaming

The latest Shopee mobile app have been updated with a new feature, that is Shopee Live Streaming. It is possible for sellers to demo their product via live stream. As a

## Chapter 2: Literature Review

result, sellers can interact closely with their potential customers and able to answer all enquires or questions instantly. Shopee have some unique features such as Shoppe Guarantee, webchat, free shipping and so on. Firstly, Shoppe Guarantee -the payment will be collected from the buyer upon checkout and once the buyer got the order completely only then the payment will be release to the seller. In this way, we clearly see that Shoppe Guarantee is a policy that securely protect both sellers and buyers during transaction happen. In addition, Shopee have a free shipping program in collaboration with three couriers like Poslaju, J&T and DHL. If people wish to promote their own product and expand their business to Taiwan and South of East Asia, Shopee is the best choice. To buy and sell with ease with Shopee, webchat is introduced where users and sellers can communicate and interact actively. Thanks to this feature, trust and loyalty between both seller and buyer were able to enhance in the long run. Thirdly, both seller and buyer were able to gain benefit from Shopee free shipping program. For example, sellers can easily boost their sales by offering free shipping vouchers to their long-term customers.

However, Shopee e-commerce platform usually set a specific amount also known as minimum spend in order to qualify for free shipping. Either the free shipping vouchers or Shopee coins is strictly not transferrable to any users. Besides that, the drawbacks of Shopee include lack of touch and feel when ordering items from Shopee website. For instance, a shopper was not able to test or try the clothes on and consequently buy the wrong size or unfit clothes. Last but not least, it is time consuming if buyers wish to request return or refund of their purchased items.

## Chapter 2: Literature Review

### 2.1.2 Lazada

Just like any other e-commerce platform, Lazada is one of the powerful and useful online websites. It is founded in 2012 and implemented a B2B2C business model which is a mixture of B2B and C2C models. Lazada is a platform that acts as a bridge between users and sellers and a place that allow users to buy or trade items. In fact, anyone can easily shop with Lazada mobile app. According to a magazine article published in 2016, there are more than 30 million downloads in both Android and IOS platform since the launching of the Lazada mobile app in 2013. It is often suggested to set up an online store as Lazada University is a portal that guided and trained new sellers about the perfect and effective ways to manage the stores. Moreover, Lazada have been introduced Lazada wallet that make the checkouts more quicker and hassle free. For instance, when a buyer requested refund of a damaged items, it is more convenient if that buyer has a Lazada wallet account because the negotiation with the credit card issuers can be avoided and the refund money will be then directly transfer to the Lazada wallet. For those who do not own a credit card, Lazada had a COD services which allow the buyers to make an order from Lazada website and pay in cash only the order has been delivered to their hands.

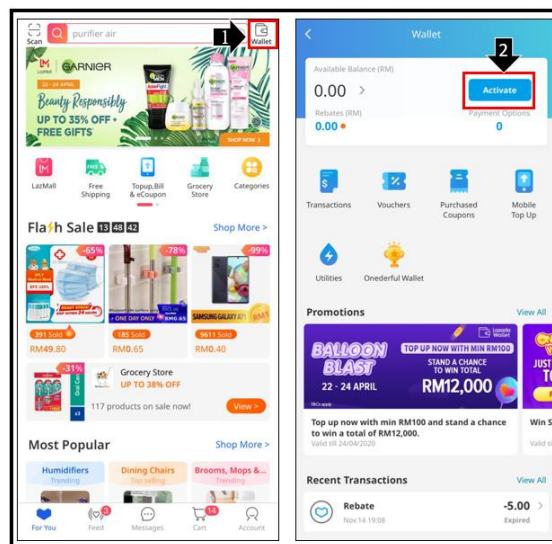


Figure 2.3 Lazada E-wallet

## Chapter 2: Literature Review

Lazada has a few benefits like buyer protection program, live chat services, bundled deals and many more. Buyer protection program guarantee anyone who buys from Lazada website receives the correct, complete and undamaged items. In others word, buyers can request refund or return of a specified product as Lazada offers 15days easy return. Lazada offers live chat services that lasts for 24 hours. This is to make sure the seller is responsive to buyers' inquiries. During birthday festival, users who own a Lazada wallet will be offered a 10% cashback for their purchase orders. Any users can make use of the digital payment method to pay for their orders offline. The transaction through Lazada wallet is truly fast and secure, besides that, all the transaction history will be recorded so that buyers can easily keep track of their expenses as shown in Figure 2.3.

The most important drawback is that e-commerce platform requires users to make payment online by either a credit card or debit card because for some people who does not own a credit card will suffer by not being able to buy anything online. Unlike Shopee, Lazada does not have online banking and Coins.ph. In addition, seller rating is a very important key to determine how well the sales was because seller that failed to fulfil the satisfaction of customers tend to have a low rate that result in lower visibility. Another drawback of selling products on Lazada platform was seller unable to control on their store's look.

### 2.1.3 Zalora

Zalora, an online fashion retail shop was founded in 2012 and it is an e-commerce site that offers local and international brands. With the launching of Zalora mobile app, both men and women can experience the online shopping experience by placing products via Internet. Beauty categories, fashion dresses and pants, shoes and accessories just to mention a few of Zalora's selling products. Indeed, Zalora shoppers can catch up the latest trends if they are buying from its store because Zalora had a part named "New this week" that keep the customer up to date regarding current fashion. Instead of browsing Zalora website with a laptop, one can easily install the Zalora app in their mobile devices as Zalora has been launching its mobile shopping app for Android and IOS supported mobile devices. Research showed that 25% of revenues of Zalora were come from mobile app (Tan, 2013).

#### CATEGORY NAVIGATION



Figure 2.4 Zalora navigation redesign

Zalora has a personal data protection policy that make sure every shopper was secure during making any transaction online. When the order has been shipped, an email was sent to the shopper's email together with the tracking number for the purpose of tracking. Truly, it helps to reduce the anxiety of shopper and the sellers can monitor the status of the parcels as well. As shown in figure 2.4, Zalora's users can easily shop by categories which make the searching more efficient and faster.

Besides that, Zalora was ready to respond to any enquiries 24hours. For example, Customer service hotline or other services like Zalora chat, IG DM @zaloramy and



## Chapter 2: Literature Review

Facebook chat were used for the interaction between buyer and seller at the same time handles the exchange or return items. Different from other e-commerce platform, Zalora accepted return of clothes or shoes that were not fit within 30 days of receipt with the condition of tags and invoice intact and original packing. However, Lee (2016) pointed out that not every products or items are exchangeable, earnings, beauty products, underpants, socks, earphone just to name a few of items which are not refundable because these items are not covered by Zalora' return policy.

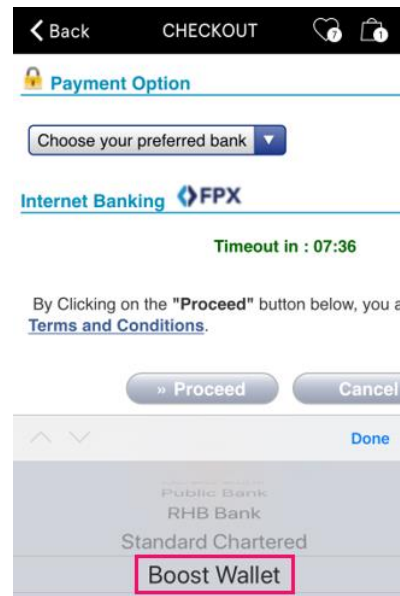


Figure 2.5 Boost wallet on board at Zalora

Zalora shoppers found it very easy to use the platform as Zalora launched a fabulous search engine where they can capture any photo of the items and some similar products will be display on the page. (Post, 2019). Moreover, Zalora shoppers can easily go to the nearby 7-Eleven outlets to collect the Zalora parcel. Instead of making payment via online banking, they can make the payment at any 7-eleven stores for the convenience of the buyers. Nowadays, Zalora shoppers actually can make use of Boost e-wallet to make payment with just a few simple steps as shown in figure 2.5 above.

The very first disadvantages were the price of the products selling on its site is quite expensive when compared to other e-commerce platforms like Shopee, Lazada and Taobao. Also, Zalora shoppers tend to develop a dependence habits as they nowadays rely on Zalora website to place order instead of visiting the stores at the street. Thus,

## Chapter 2: Literature Review

this causes many sellers go for online to market their goods and products, resulting in competitors increase sharply. Other than that, Zalora's delivery service was unsatisfied because it did not provide international delivery except areas within Malaysia and Brunei only. However, there is also a no-delivery zones which are Free Trade Zones and P.O. Box Addresses.

### 2.1.4 Amazon

There were millions of products that can be purchased on Amazon e-commerce platform. Amazon make people's life easier as it enables online shoppers to place an order in their own home and goods that they purchased will be delivered to the doorstep. Business model of Amazon include B2B and B2C. B2B also known as Business-to-Business which means that Amazon create its own page to open up a marketplace for all online sellers to buy from and sell to others. On the other side, B2C is a way of business model whereas goods and services were selling directing to the end users from either Amazon mobile app or website.

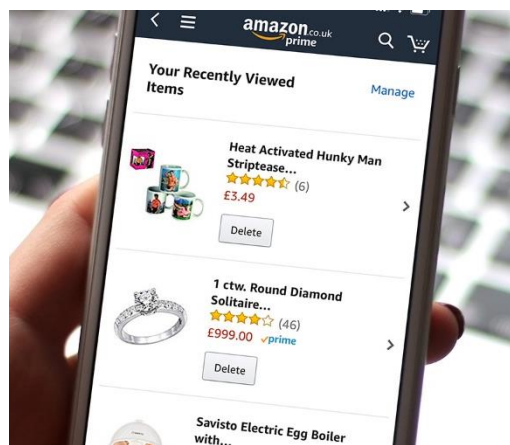


Figure 2.6 Amazon history browsing

Official Amazon mobile app are now available at Apple App Store or Google Play store. In Unites State, among all mobile shopping app, Amazon ranks the highest number of users in 2019 and become the most popular mobile app for online shopping (Statista, 2019). Amazon was a customer-friendly e-commerce mobile app platform that selling

## Chapter 2: Literature Review

products like furniture, home decor, kitchen, crafts and many more. One of the features 'Browsing History' is a simple yet faster way to view back all those recently viewed products and items as shown in Figure 2.6. Biersdorfer, J.D (2019) stated that once the browsing-history icon being turned on, online shoppers able to look back to what products they had been viewed and this features is useful enough as it works act as a record-keeping list. The development of Amazon shopping app truly saves a lot of time, with just a click of a button online shoppers can easily place the order and have the items delivery to the doorstep.

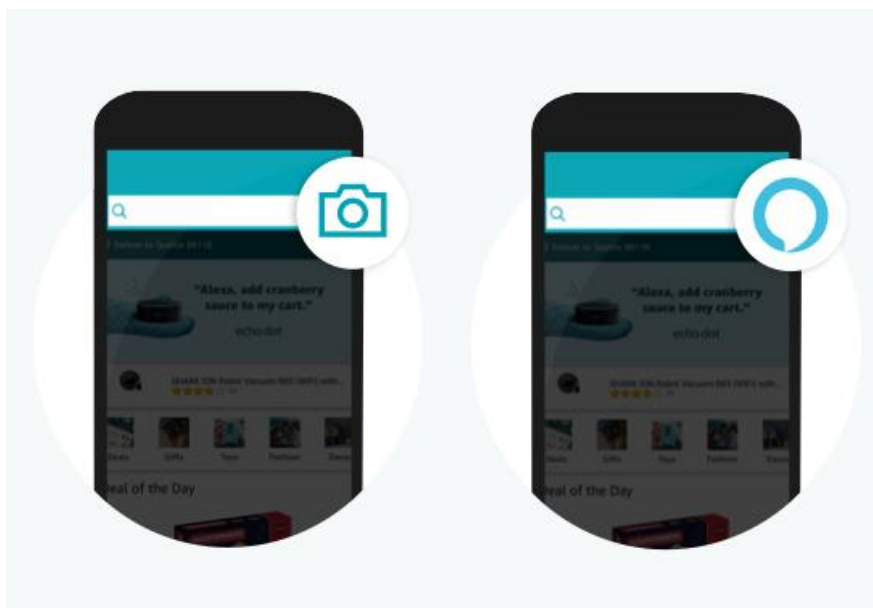


Figure 2.7 Amazon app features

As we all known that, Amazon is a global e-commerce marketplace and this company actually offer international shipping to others countries like Australia, Asia and Pacific, America and Europe. However, the buyers have to afford the customs, duties and taxes. In addition, Amazon Pay is one of the payment methods that enable transaction to be process more fast, efficient and more secure. All the data is securely protected. Payments Cards & Mobile, (2019) pointed out that Amazon Pay make online payment easier, more convenient and most importantly it did not require additional fees. Instead of searching for a certain product with keywords, Amazon allow anyone to locate or search for a specific product with a single tap on the camera icon. Undeniably, it really saves a lot of time and bring convenient for users to shop more. One can look for an

## Chapter 2: Literature Review

assistant provided by Alexa to track their purchase orders or even searching items as shown in Figure 2.7.

A downside of Amazon e-commerce platform was high competition in the marketplace. In fact, Amazon had a few thousands of sellers who registered their online stores and started to sell their goods and products. This clearly means that sales of the online business will be affected as the sellers who sells similar products tend to compete with each other. Furthermore, one of the drawbacks about selling by using Amazon platform was both individual and professional sellers were required to pay fees according to their selling plan. For example, \$0.99 per items fees will be charged from online shoppers whereas sellers have to pay the referral fees as well.

Another drawback includes sellers only able to get their profit or money earned for a duration of two weeks. It actually took about five days for Amazon to transfer the money to the sellers' account which was considered too long.

	Shopee	Lazada	Zalora	Amazon	Proposed Solution
Platform	Android, IOS, Web app	Android, IOS, Web app	Android, IOS, Web app	Android, IOS, Web app	Android, IOS
Fee	Free	Free	-	\$39.99 a month + additional selling fees	Free
Easy scalability	✓	✗	✗	✓	✓
Ability to expand	✗	✗	✓	✓	✓
Delivery speed	✓	✓	✓	✗	✓

## Chapter 2: Literature Review

Reasonable price	✓	✓	x	x	✓
Ease of shopping	✓	✓	✓	✓	✓
Return and Refund	✓	✓	✓	x	x
Mobile Experience	✓	✓	x	x	✓
Ease of navigation	✓	✓	✓	✓	✓
User- friendly interface	✓	✓	x	✓	✓
Live Streaming	✓	✓	x	✓	x
Linkable and Shareable	✓	✓	✓	✓	x
Unlimited Products	✓	✓	✓	✓	✓

Table 2.1 Comparison between similar applications

### 2.2 Critical Review on Similar Applications

People would feel annoying if they have to browse through messy and uncategorized products, hence visual search engine feature on the app actually help them to narrow down the type and brand of products. If they intended to look for a particular brand, they just have to click at the search bar and enter the brand name. After using the search bar to look for a specific product, consumers can continuously use the filter option to help them sort the products by price range, categories, brands, rating and so on. Customer loyalty can be enhanced by implementing a chat feature. Shopee, Lazada, Zalora and Amazon all have the chatbot services in their app that used to boost their sales by offering speedy response to consumers' enquiries. Undeniable, Shopee Lazada Zalora and Amazon have a user-friendly interface design in their app. In Shopee app, the shopping cart is designed that allow consumers to review back their products. They can easily add quantity or delete the products in the shopping cart. Moreover, Shopee users can negotiate the price with the sellers at the chatbot. Whether the negotiation succeed or not, it all depends on the sellers either accept the offer or reject it.

All four review e-commerce platforms accept Individual, Company and International Seller. In other words, whether at Shopee, Lazada, Zalora or Amazon, buyers from oversea are allow to make orders online through their platform. In some cases, online transactions will fail due to the reason such as enter the wrong card number, exceed fund limit and so on. Occasionally, the transaction with the international sellers or buyers might be declined due to the reason that the credit card might not support for oversea transaction that requires currency exchanges (Nair, 2016). Sometimes, end users might be confused and feeling headache because they have no idea which payment channels is best suit to them. For Shopee e-commerce platform, people can choose whether to use credit card, debit card, Shopee Pay, band transfer, over-the-counter or cash on delivery when they attempt to proceed to checkout.

Unlike the applications review, sellers and buyers do not necessary to go through those complex online transaction process. Instead of offer different payment channel, it only limit to one method which is simple payment by uploading the receipt to prove to the sellers that the payment is being made. This will eliminate the security issue from happening like bank frauds, identity theft and others e-Commerce frauds. Buyers have to fill in the information such as transaction amount and also reference number and

## Chapter 2: Literature Review

lastly upload the bank receipt. This benefit of this method is buyers do not need to worry about the online payment frauds and saving them a lot of work too. The proposed application allows users to identify and recognize the products by capturing the images of the products. By typing the keywords in the search bar, users can have a quick search on a particular product or item. In fact, the proposed application provides convenient access for product viewing. The machine chatbot is trained and designed to answer some general beauty and skincare questions and users are allowed to interact with human online at the same time.

Other issues related to the cost of selling include transaction fees, referral fees and also commission fees. All Shopee Mall sellers will be charged for at least 3% or at most 5% of commission fee for every product sold out. For every successful transaction being made through credit card, debit card, online banking or Shopee Pay, 2% of transaction fee will be applied to all sellers. Nowadays, Lazada is considered one of the leading e-commerce websites across Southeast Asia. Generally, the commission range for Lazada sellers is between 0.5% to 12% which is depending on what type or category of the products. For example, 4% of commission fee will be charged for all products related to Health and Beauty in the Lazada e-Commerce platform (Sohlberg, 2019). For the transaction fee in the Lazada platform is the same with Shopee which is 2%. Zalora is a successful online fashion business.

According to Dawood, Zalora's shopping app is available for Android and iOS, Zalora has managed to attract 38% of potential customers to download the app using mobile phone in 2018 which is known as the highest number of mobile engagements compared to other fashion apps. Normally, the commission is based on the Zalora policies. For different categories of products have different commission rates which range from 10% to 30%. Zalora may require the seller who attempts to upload multiple photos of their product to pay for extra fees, thus it is quite a high cost to maintain a business at the Zalora platform. Furthermore, it also has some hidden fees as a result of products returned by customers which is known as a return penalty. In addition, Amazon just like any other e-Commerce platform that collects referral fees from the sellers. Amazon has two different selling plans which are professional selling plan and individual selling plan. There will be no charge if sellers opt for the professional selling plan whereas there will be a total of \$0.99 fee charge on every product sold by the sellers who opt for the individual selling plan.

## Chapter 2: Literature Review

Considering the beauty products list on the Amazon, a total of 8% of commission fee will be apply if the total sales is at most \$10, if the total sales is greater than \$10, 15% of commission fee will be charge on the sellers.

However, the proposed application is developed to help those who are interest to start up a small business with low cost. It will be no commission fees apply to the sellers to ensure they can conduct the electronic business smoothly. Also, the storage fee is free of charge. The price for sign up or register as a seller is as low as RM50/month. From the sellers' perspective, e-Commerce not only can increase reduce operation costs but increase revenue for even small business (Chong Larry, 2019).



### Chapter 3 System Design

#### 3.1 Entity Relationship Diagram (ERD)

This project uses Entity Relationship Diagram to shows the relationships of entity sets stored in a firebase real-time database.

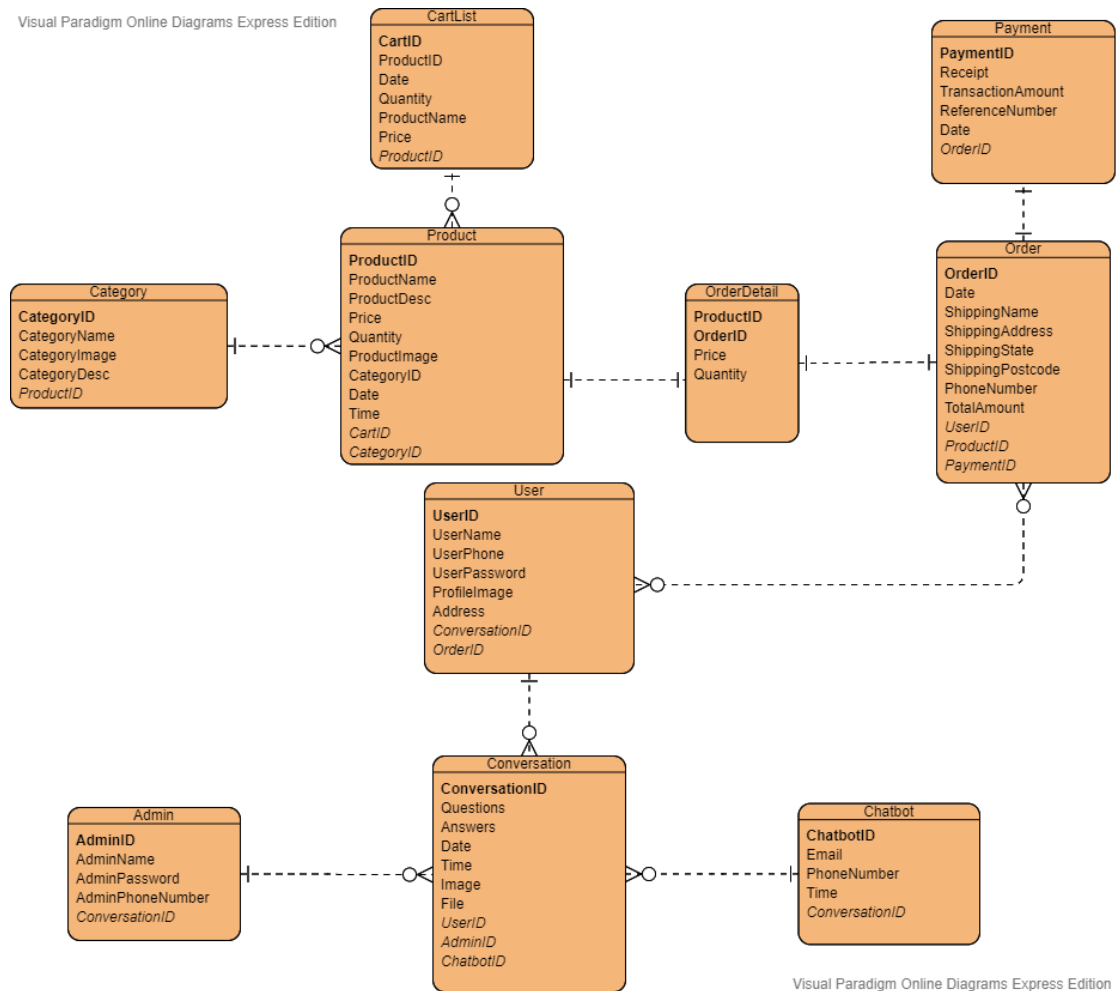


Figure 3.1 Entity Relationship Diagram

### 3.2 Use Case Diagram

This project uses Use Case Diagram to model user interaction with system components. This methodology helps to identify and clarify user requirements.

#### a. Authentication System

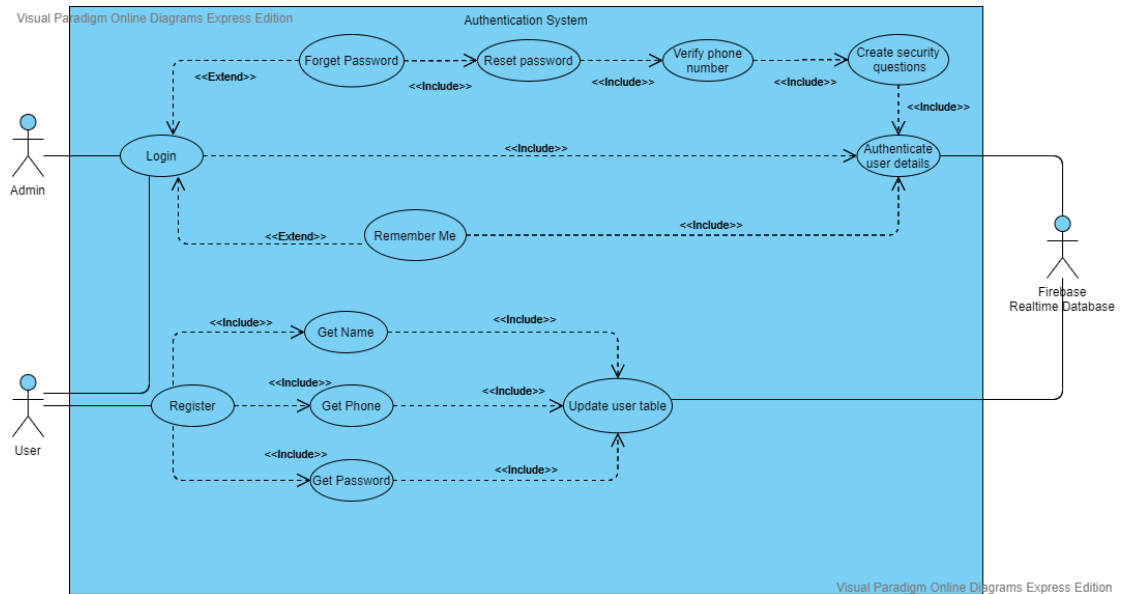


Figure 3.2 User Authentication Use Case

#### b. Product Management System (Admin)

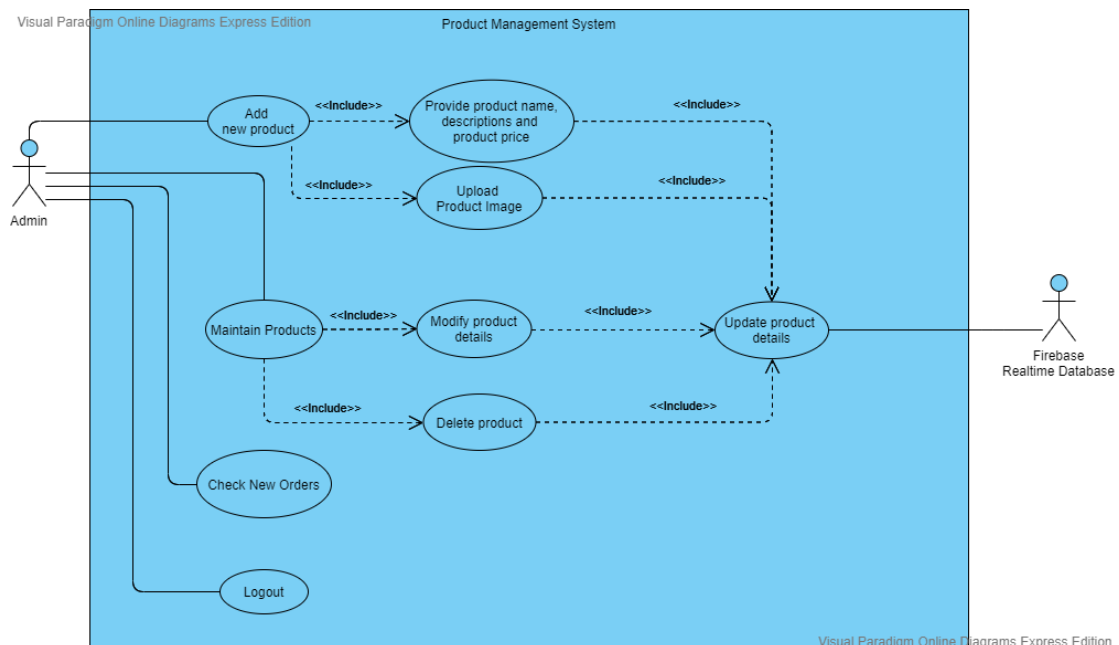


Figure 3.3 Product Management Use Case

**c. Homepage System**

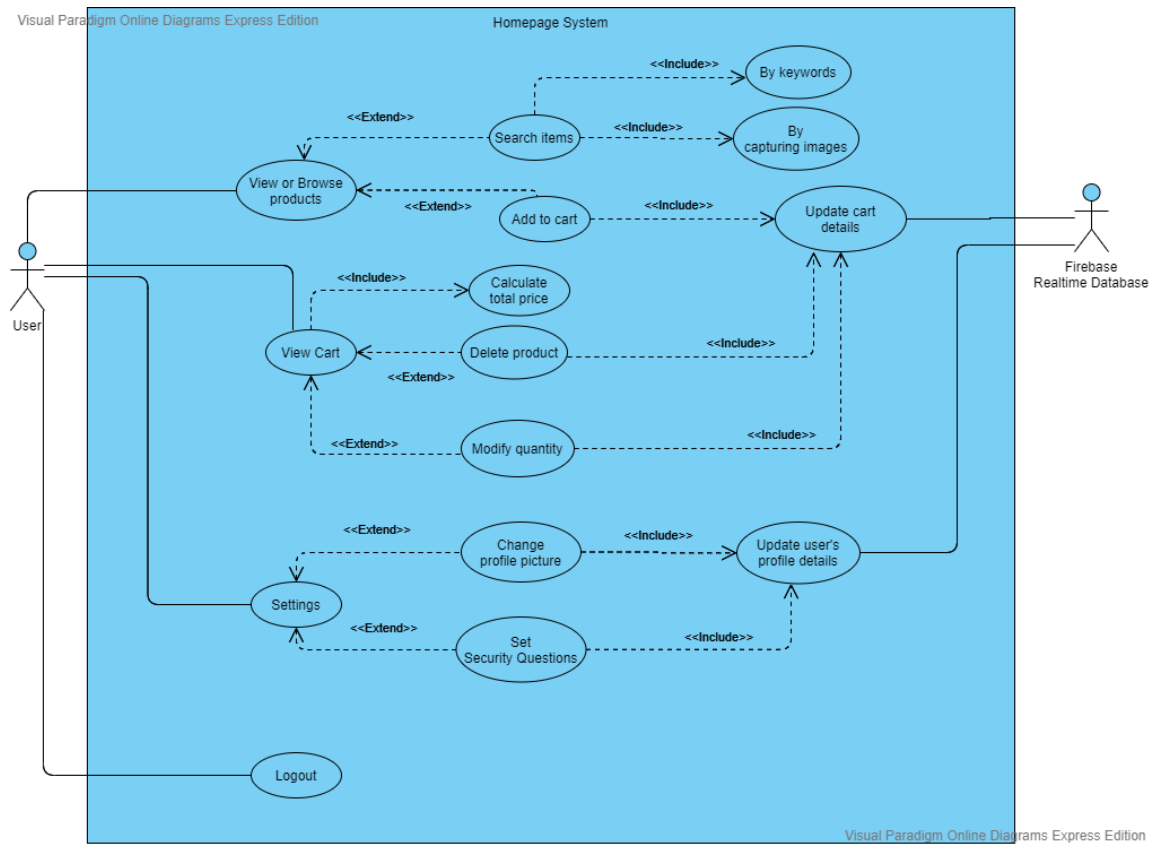


Figure 3.4 Homepage Use Case

**d. Payment System**

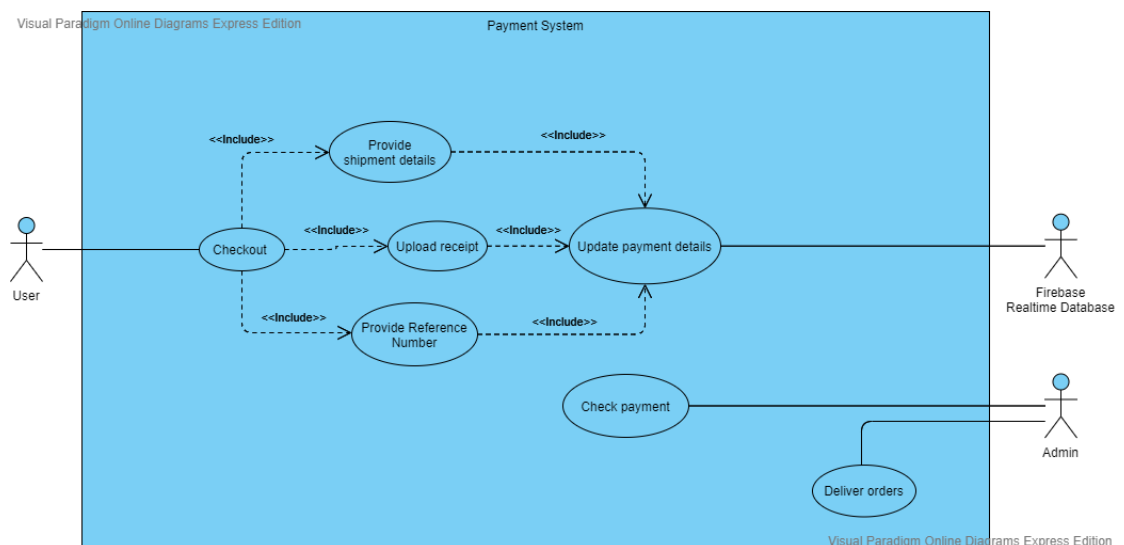


Figure 3.5 Payment Use Case

**e. Chatbot System**

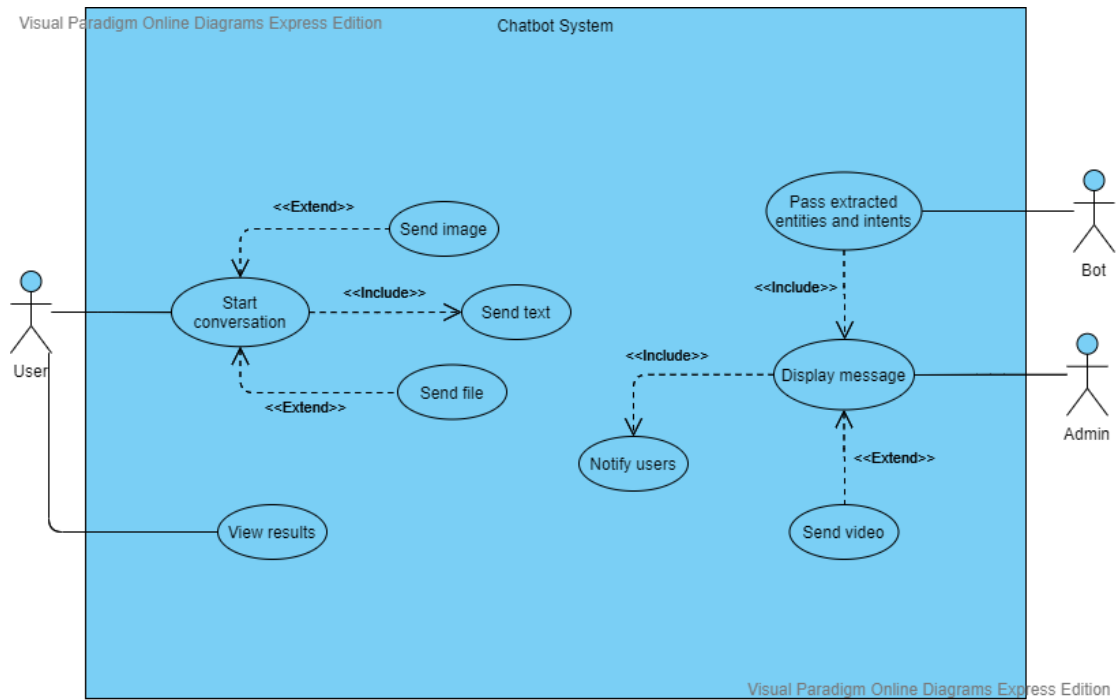


Figure 3.6 Chatbot Use Case

**f. Image Processing System**

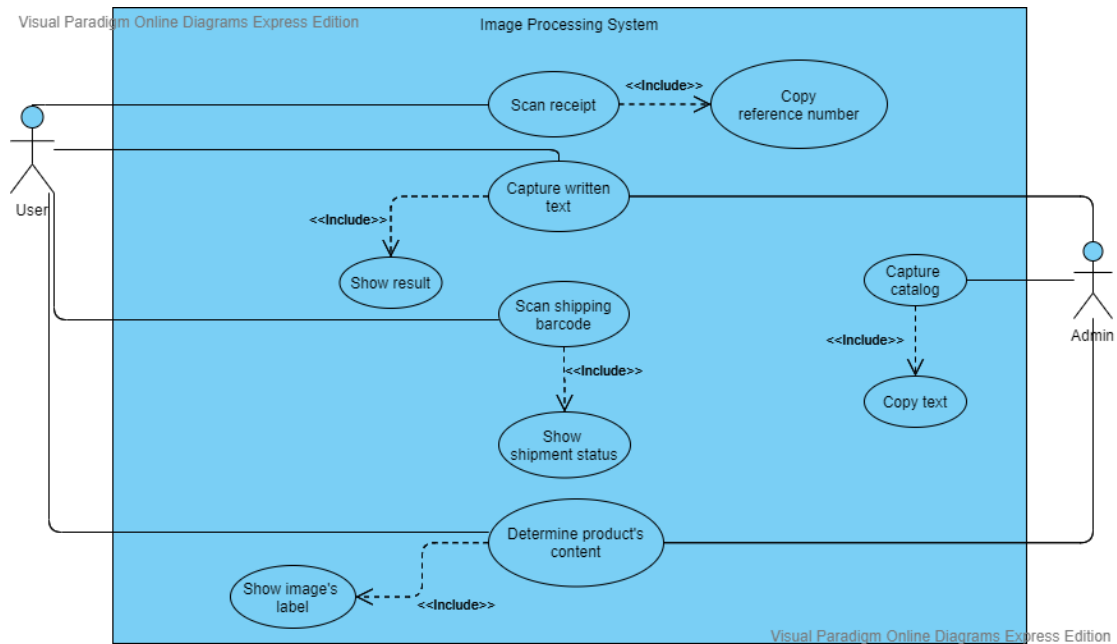


Figure 3.7 Image Processing Use Case

### 3.3 Flowchart

This project uses Flowchart to model activities process flow.

#### 3.3.1 User system flowchart

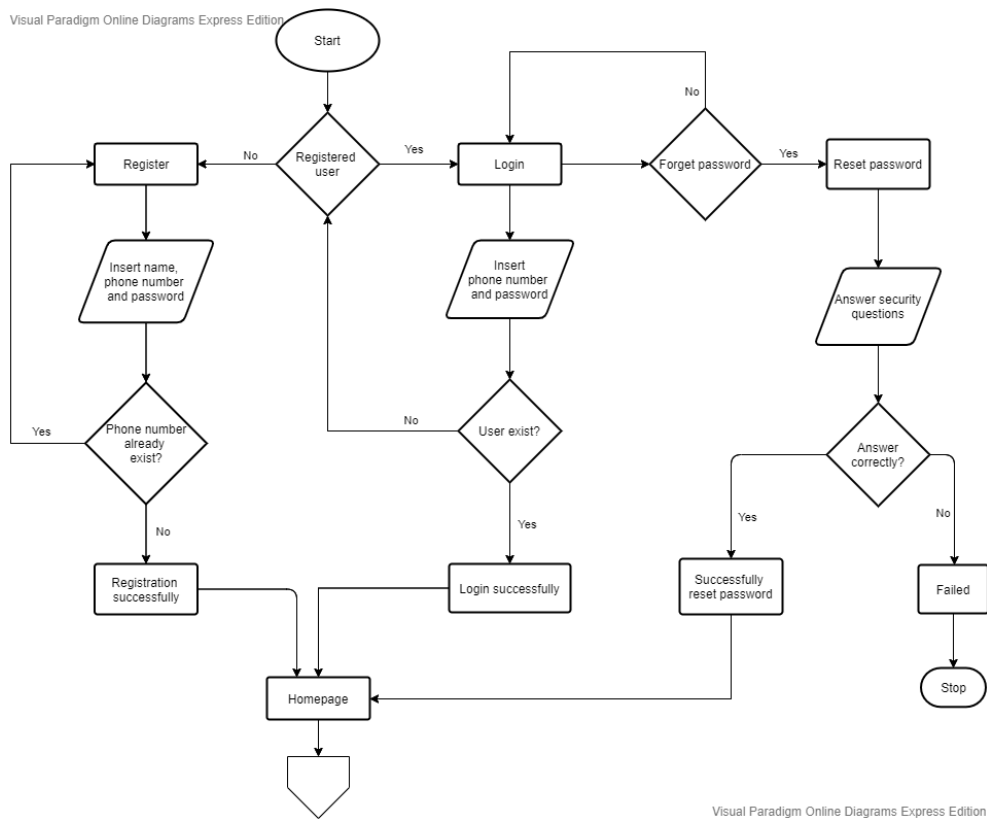


Figure 3.7 User flowchart

## Chapter 3: System Design

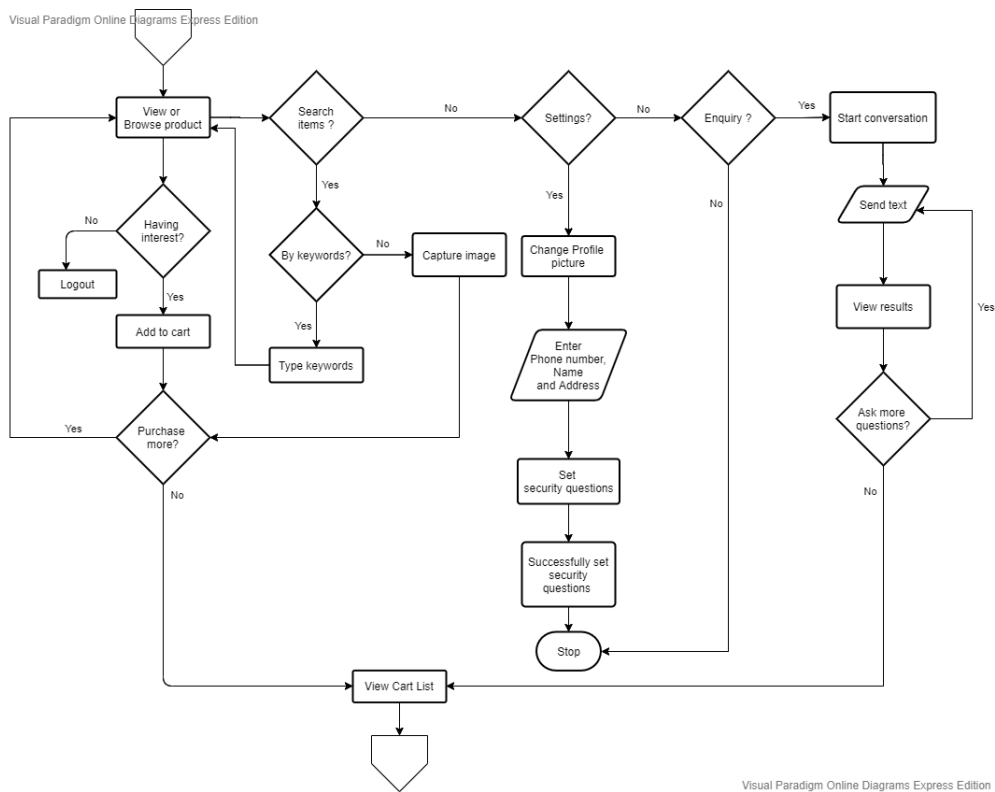


Figure 3.7 User flowchart

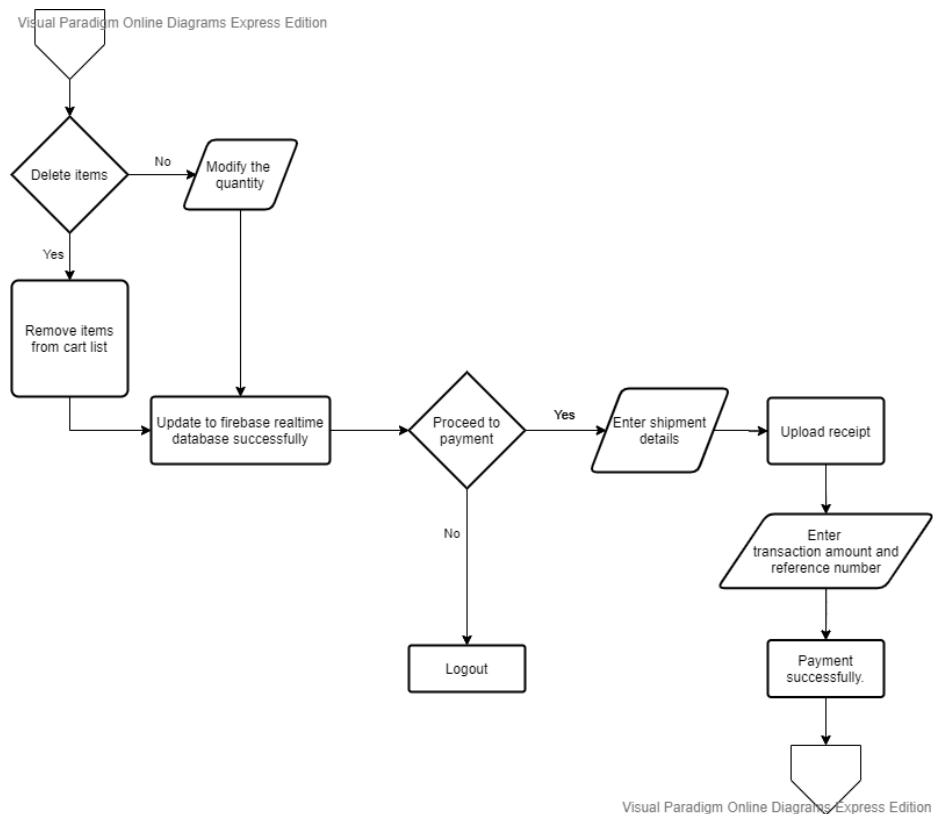


Figure 3.7 User flowchart

## Chapter 3: System Design

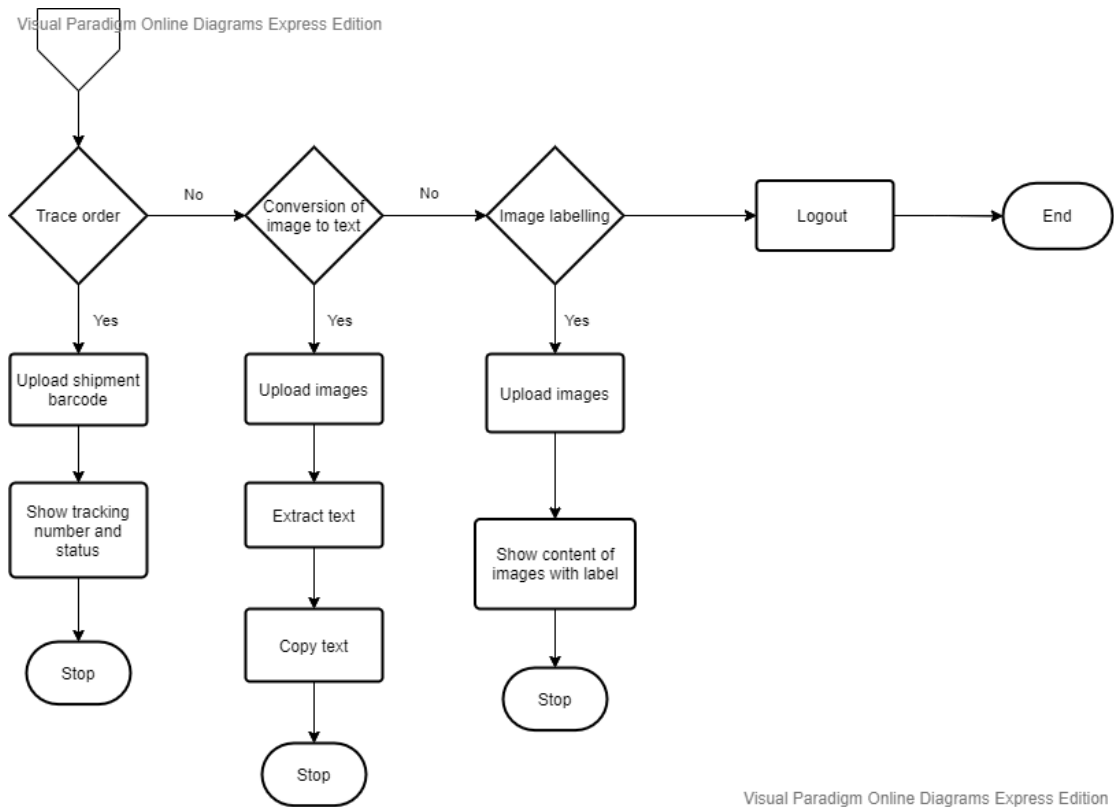


Figure 3.7 User flowchart

### 3.3.2 Admin system flowchart

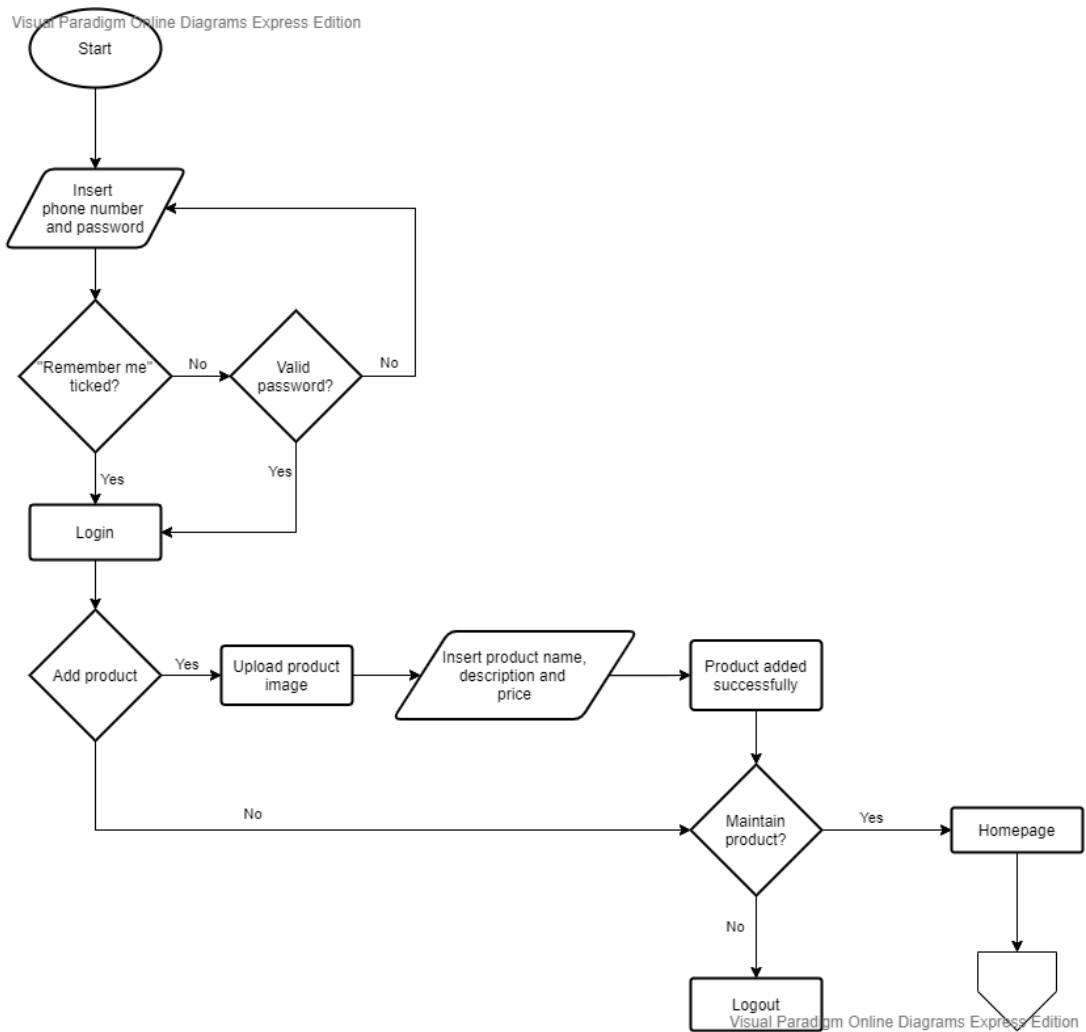


Figure 3.8 Admin flowchart



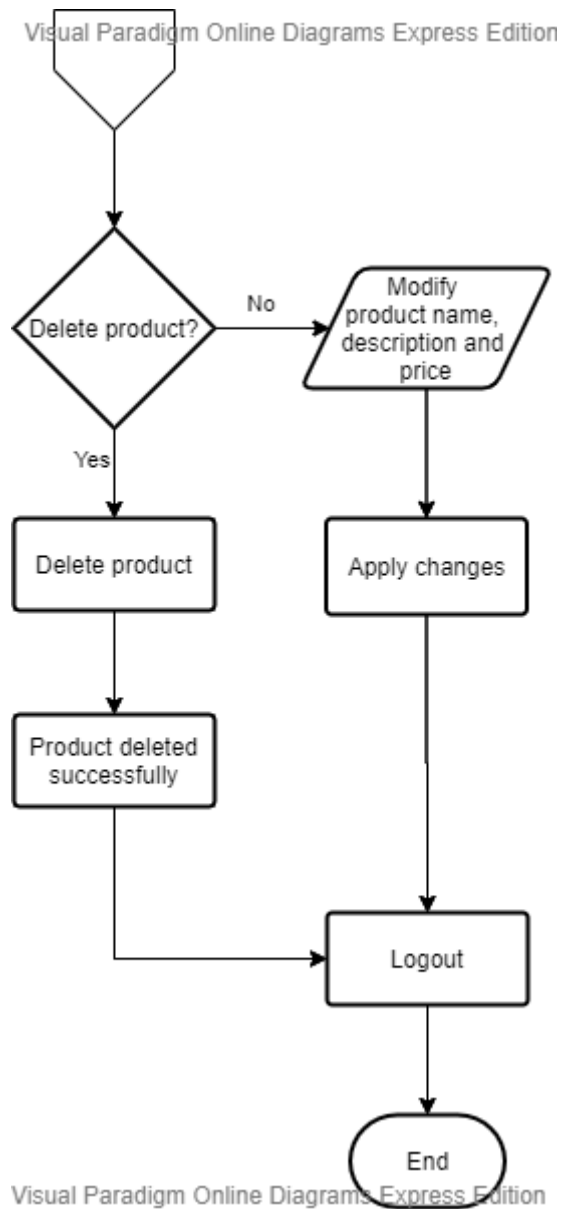


Figure 3.8 Admin flowchart

**Chapter 4: Methodology and Tool**

**4.1 Software Development Methodology and General Work Procedures**

Agile model focus on iteration approach- incrementation and division of tasks into several time boxes. Basically, it is about the ability to adapt to the changes quickly with an iteration way. In the Agile model, all the activities especially development and testing are executed concurrently. Scrum is an incremental process of agile framework which focuses on generating performance in the shortest possible time. Scrum methodology will be implemented with addition use of Kanban model on each Sprint cycle for the development of proposed project. There are total 14 processes address the specific activities and flow of a Scrum project. These processes are grouped into the following five phases:

Phase	Processes
Initiate	<ol style="list-style-type: none"> <li>1. Create prioritized product backlog (High to low)                             <ol style="list-style-type: none"> <li>a) Backend API module</li> <li>b) Profile management module</li> <li>c) Product details module</li> <li>d) Cart List module</li> <li>e) Search product module</li> <li>f) Shipment module</li> <li>g) Payment module</li> <li>h) Chatbot module</li> </ol> </li>   <li>2. Conduct release planning for FYP 2                             <ol style="list-style-type: none"> <li>a) Sprint 1: (week 1 – 5) – Staging                                     <ol style="list-style-type: none"> <li>i. Draft project report</li> <li>ii. Plan estimate user stories</li> <li>iii. Backend API module</li> <li>iv. Profile management module</li> <li>v. Product details module</li> </ol> </li> </ol> </li> </ol>

	<ul style="list-style-type: none"> <li>b) Sprint 2: (week 6-8) – Staging             <ul style="list-style-type: none"> <li>i. Cart List module</li> <li>ii. Search product module</li> <li>iii. Shipment module</li> </ul> </li>   <li>c) Sprint 3: (week 9 – 10) – Staging             <ul style="list-style-type: none"> <li>i. Payment module</li> <li>ii. Chatbot module</li> </ul> </li>   <li>d) Sprint 4: (week 11 – 12) – Testing             <ul style="list-style-type: none"> <li>i. User acceptance test plan</li> <li>ii. User acceptance test</li> </ul> </li>   <li>e) Sprint 5: (week 13) – Production             <ul style="list-style-type: none"> <li>i. Project report submission</li> <li>ii. Application pilot run</li> </ul> </li> </ul>
<p>Plan and Estimate</p>	<ul style="list-style-type: none"> <li>3. Create and refine user stories             <ul style="list-style-type: none"> <li>a) Break down each module into small tasks.</li> <li>b) Refine the project’s requirements.</li> </ul> </li>   <li>4. Approve, estimate, and commit user stories             <ul style="list-style-type: none"> <li>a) Present user stories, acceptance criteria and get feedback from supervisor.</li> <li>b) Estimate effort to develop functionalities in each story.</li> <li>c) Make sure the user stories add customer value to the product.</li> </ul> </li>   <li>5. Create tasks             <ul style="list-style-type: none"> <li>a) Visualize tasks on Kanban board to do list.</li> </ul> </li>   <li>6. Estimate tasks             <ul style="list-style-type: none"> <li>a) Estimate effort to accomplish task in task list.</li> </ul> </li> </ul>

	<p>7. Create Sprint backlog</p> <ul style="list-style-type: none"> <li>a) Add Sprint and Sprint tasks into Trello log.</li> <li>b) Make adjustments if issue arise.</li> </ul>
Implement	<p>8. Create deliverables</p> <ul style="list-style-type: none"> <li>a) Move tasks from to do list to on-going list.</li> </ul> <p>9. Conduct daily progress review</p> <ul style="list-style-type: none"> <li>a) Move completed task to completed column.</li> <li>b) Review progress and identify challenges.</li> </ul> <p>10. Adjust prioritized product backlog</p> <ul style="list-style-type: none"> <li>a) If challenges cannot be tackled.</li> </ul>
Review and Retrospect	<p>11. Demonstrate and validate Sprint</p> <ul style="list-style-type: none"> <li>a) Demonstrate Sprint deliverables to the supervisor.</li> <li>b) Conduct User Acceptance Test (UAT) to identify whether software is acceptable or not.</li> </ul> <p>12. Retrospect Sprint</p> <ul style="list-style-type: none"> <li>a) Update Trello log.</li> <li>b) Add recommendations.</li> </ul>
Release	<p>13. Present final deliverables</p> <ul style="list-style-type: none"> <li>a) Oral presentation including presentation slides to supervisor and moderator.</li> <li>b) Mobile app demo to show the user interface and functionality.</li> </ul> <p>14. Retrospect project</p> <p>Wrap FYP 2.</p>

Table 4.1 Scrum phases and processes

### 4.2 Technologies Involvement

#### a. Android Studio

Android Studio is an open source cross-development platform that helps developers to build dynamic mobile applications and offers development teams full customisation capabilities. It also offers other user interface to design dialogs, notifications, and menus for mobile app. APKs can be easily drag and drop in order to get a quick installation whereas emulators can be installed and run the app faster as it operates by imitating the design of the user device's architecture. Other than Java and Kotlin programming language, it is possible to implement other written programme with C or C++ language by using the Android Native Development Kit.

#### b. Java

Java is an object-oriented programming language used to write android apps. In case of any issues or problem, Java always provide the best documentation and also a strong online community support. Android operates on a number of different hardware platforms. It is easier to handler Java language compared to other programming language.

#### c. Picasso

The unique features of Picasso are resizing and scaling. Generally, Picasso decodes a picture of higher quality. It simplifies the process of loading images from various sources.

#### d. Firebase real time database

Firebase real time database is also known as cloud-hosted database that synchronized the data in real time to every connected client. It offers permission-based data access to data which is considered quite secure for an app development. Moreover, it is possible to access or retrieve the data during offline. All data will be stored in JSON. Cloud messaging is a powerful tool for android app development as it helps to send messages to anyone who is connected to the services effortlessly. Users can use either email, password, phone number or even social media application like Facebook for firebase authentication.

## Chapter 4: Methodology and Tool

### e. Github

This project uses version control system and repository to store version of applications and release new versions during project staging and production.

### f. TensorFlow Lite

TensorFlow Lite is a powerful software that widely used by developers on mobile and IoT devices to classify and identify hundreds of classes of objects in product searching features.

### g. Dialogflow

Dialogflow is a useful and powerful natural language processing (NLP) platform that can be trained to handle end-user's conversation. The implementation of chatbot features in this proposed project aims to automate customer service by providing instant replies to streamline human and machine virtual chatbot interaction. An email will be sent to the agent or human to handles the conversation if dialogflow agent fails to recognized the intent or phrase send by the end-users.

In the project, there are several tools being used for Android mobile application development. Firstly, Android studio is the main tools. This project is mainly focus for android applications so Android Studio is a great platform to develop a mobile app. The reason why Android Studio software is chosen because it is powerful and robust at the same time it provides new features and improvements which is much stronger than Eclipse ADT. In order to create or develop an interactive apps, developers can simply make use of the material designed from the SDKs. This is because of the easy availability of the Android SDK. One of the unique features of android is it allows customization as it is an open source platform. In others words, to integrated android apps into multimedia tools is not a difficult task for now.

Secondly, the project use Firebase for database storage and authentication. The offline and online data can be synchronized with Firebase through NoSQL database. Indeed, with the Firebase Realtime Database, the stored data can be access from multiple devices in a much easier way. All the data are stored in JSON format which means that

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there will be multiple nodes under a JSON tree. Firebase Realtime Database is simple yet convenient as compared to SQL database because there will be neither tables nor records in the JSON tree. With minimal effort, end users are allowed to download media files and visual contents that stored in the Firebase storage which powered by Google Cloud Storage.

### 4.3 User requirements

#### 4.3.1 Functional Requirements

##### a. Register and manage user account

In order to login and access all the features, this application should allow new user to create an account. Requirements of registration are name, phone number and password. Each registration may have a unique phone number and password. Besides that, admin and users are able to manage their account information from settings.

##### b. Login

This application only allows registered users to log into the system. Both users or admin must enter a verified phone number and a valid password. With a valid yet correct password, only then users and admin are able to login to access all of the features.

##### c. Add and maintain products

This application should allow admin to add new product according to the categories by providing the product images, description and product price. Moreover, admin should be allowed to manage the products such as modifying the product details or delete specific product.

##### d. View products

This application should allow users to browse through the listed products by scrolling down the page. All the products should be clearly display with the product image, description and product price as well. Users are allowed to specify a quantity of a specific products or items before adding them into cart list.

##### e. View Cart List

This application should allow users to look back on those products which they had added to their cart list previously. Furthermore, users can add more items or products to an existing cart list and even delete products from the cart list.



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### f. View profile

The application should allow users to manage their profile. For example, uploading profile image, providing their full name or address and also set security questions in case they forget their password after signing out from the application.

### g. Search for products or brand

This application should allow users to search for specific products and their brand by entering keywords.

### h. Image processing

This application can analyze and recognize the images with machine learning model that further helping user to identify the products using camera.

### i. Barcode scanning

This application should allow users to obtain their tracking number by scanning the barcode given by admin.

### j. Deliver message

This application should allow conversation between users and admin. Instead of chatting with admin, users should be able to communicate with the chatbot to answer any enquiry without any human interaction.

### k. Reset password

This application allows users to click on the “Forget Password” that will redirect them to the page to reset their password in case they forget the password.

### l. Logout application

This application should allow users and admin to perform logout action by clicking logout button in settings.

### 4.3.2 Non-functional Requirements

#### a. Usability

This application should provide useful function and features so that users can learn and perform their intended task easily. Users can easily get familiar with the application in a relevant short time.

#### b. User friendly

This application should have a minimalist user interface and provides interactive user experiences for user.

#### c. Thumb/ Finger friendly

This application should provide sufficient space for users to conveniently tap or click button with their fingertip.

#### d. Data integrity

This application makes use of Firebase Realtime Database in order to store data securely on Google cloud servers and synchronized to any linked device in real time.

#### e. Feedback

This application should provide instant feedback for every interaction through text or sound. Effective push notification can draw users back into the product or even alert users that they have incoming messages.

#### f. Extensibility

This application should be able to extend with extra functionality or features and make the modification of existing functionality available all the time.

#### g. Effectiveness

This application should provide functionality that allows user to shop for beauty and skincare products in more effective way.

#### h. Performance

The application should allow users to perform image processing by capturing photo and be able to classify and recognize the products in a rationally time.

#### 4.4 Review on Mobile Application Development Platforms

##### 4.4.1 Comparison between three platforms

	Native Android Development	Cross-Platforms	Mobile Web
Programming skills to code for iOS & Android	Objective-C, Swift, iOS SDK, Java, Android SDK	HTML, CSS, JavaScript, Hybrid Framework	HTML, CSS, JavaScript, Web app framework
Common Framework	Swift, Java, Objective-C	Ionic, PhoneGaps, Xamarin, React Native, etc.	Angular, React, Ember, Backbone, etc.
Platform Distribution	App Store/ Google Play	App Store/ Google Play	Web
Performance	Excellent	Good, close to native	Good
Maintenance and Updates	Easy	Easy	Hard
Support of TVs, wearables, and IoT	✓	✓	✗
API			
Camera	✓	✓	(via web API)
Microphone	✓	✓	(via web API)
Contacts access	✓	✓	Not Available
Gyroscope	✓	✓	(via web API)
Accelerometer	✓	✓	(via web API)
File upload	✓	✓	(via web API)

Offline access	✓	✓	(via web API)
Geolocation	✓	✓	(via web API)
Gesture Navigation	✓	✓	✓
Push notification	✓	✓	(via web API)

Table 4.2 Comparison between 3 mobile application development platforms

The proposed project requires access to some device features like camera, offline access, file upload, push notification and swipe navigation. To identify and classify the products, users have to capture using their mobile device's camera. Also, admin have to upload the product images and readily access by users. Besides that, the proposed project should provide good graphical performance and user experience to the user. Hence, native framework is suitable for the proposed project.

#### 4.5 Review on Backend Technologies

##### 4.5.1 Feature comparison between Google Firebase and MySQL

	Google Firebase	MySQL
Real-time data synchronization	✓	✗
Easy user authentication	✓	✓
push notifications	✓	✓
Platform support	iOS, Android, Web	iOS, Android, Web
Offline support	✓	✗
Google Cloud IoT tools Integration support	✓	✗

Table 4.3 Feature comparison between Google Firebase and MySQL

## **4.6 Design specification**

Driven by the convenience of selling or buying products online, just a click of a button, buyers can place an order and have the parcel delivered to their doorsteps whereas retailers or sellers can actually cross beyond the limitation of geographical area and start to export their product to other countries. In this highly competitive global market, e-commerce organizations have to keep track with the current technologies and be willing to make improvements for the growth of their business. It is very important to meet the expectations of the customers and the market demand.

### **4.6.1 Agile methodology**

There are many factors to be considered when selecting one of the software development methodologies that best suited the organization's objectives. In this project, agile methodology is the most suitable. The most suitable of e-commerce projects is Agile methodology. Agile model focus on iteration approach incrementation and division of tasks into several time boxes. It is approximately 2-4 weeks cycles for each small segment.

Among many types of agile methods, scrum, extreme programming, DSDM just to name a few are the most popular practical use of the agile model. Basically, it is about the ability to adapt to the changes quickly with an iteration way. In the Agile model, all the activities especially development and testing are executed concurrently.

The Agile Software Development Manifesto focus on four key values and outlines 12 Agile principles in the project management. Without impacting the project costs or postponed the project progress, all projects should follow the four core values of Agile which are: -

1. Individuals and interactions over processes and tools

In order to satisfy or meet the customer's needs, this project need to prioritize individuals regardless of the method or software being used. Individuals are the backbones for project development and communication acts as a basis coordination in the organization by allowing people to interact or transfer information with each other. Improvements of the features can be implements by listening to the feedback from people that currently using the applications.

## 2. Working Software Over Comprehensive Documentation

In agile software development, even though the working software is more valuable compared to comprehensive documentation, but the documentation is still necessary and it cannot eliminate from the projects. This is because reports are important for retailers and stakeholders, customers feel more secure as they can track the projects anytime. Comprehensive documentation should contain everything starting from the proposal of the project, intent of the mobile application to the testing of the outcome. Other than that, there are two important aspects such as timeframes and budget also need to be included in the documentation as well.

## 3. Customer Collaboration Over Contract Negotiation

Throughout the product development process, the involvement and collaboration of customers is important to ensure final products are delivery successfully. Layton, M.C(n.d.) describes that customer should be involved during the starting of the project, any time scope changes during the project and lastly the ending of the project as well. Customer normally are more familiar with the user interface because they are using the application. The mobile app project must be flexible enough for customers. In this case, developers have the capability to update and improve the app from time to time to meet the demand of customer.

## 4. Responding to Change Over Following a Plan

During the development of every projects, adaptivity is the key concepts. Agile team must be altering their behavior according to the situation to ensure the objective is achieved. Rather than being able to adapt or makes changes, the teams should be responding quickly to the feedback. Clearly, follow a plan is not enough and it is not encouraged as we might face various problems during the development stages. In addition, there are 12 key principles shown in the figure below to see how it will guide the agile project management.



Figure 4.1 12 key principles of agile software development

The twelve principles of agile development include:

1. Early and continuous delivery of software affect satisfaction of customer
  - The highest priority is to satisfy customers. Customer will have an idea how the products are being processed or developed through the continuous software delivery. The project is motivated to cultivate a new online shopping pattern that allow users to purchase their beauty and skincare products with just a click with their mobile phone.
2. Accommodate changing requirements throughout the development process
  - We cannot expect what is the changes of the environment coming next. Feedback from the customers is useful to improve the features of the projects. Depends on the adaptability, developers have to manage the changing requirements effectively such as attending the meetings to discuss the latest project schedules. Once the project focus to meet customer requirement and adapt to new technology, eventually it will be able to deliver a commercial successful mobile based application.

3. Frequent delivery of working software
  - It is important to keep the design of the project aligned with the intention of stakeholders. According to TechWell (2019), there are some reason why teams failed to deliver working software frequently, such as fear of repercussions, both developers and testers do not work together collaboratively and no agreement on the definition of “done”. Developers of the project monitor and evaluate the features and functionalities of the app by adopt the agile approach to make sure the working software is generated to measure the progress of projects accurately.
  
4. Collaboration between the business interested parties and developers throughout the entire project
  - Teamwork and collaboration between developers and other business or technical teams will enhance the system development in many ways. In others words, the collaboration throughout the projects is important as it will determine how the decision was made. Anyone are welcome to set up an online stores that selling beauty and skincare products through the mobile based selling platform.
  
5. Support, trust, and motivate the people involved
  - Only the motivated individual will be able to perform well in the project, they are trusting themselves and their teams to get the work done. Normally, good review or positive feedback from the customers will motivate developers of the project to keep developing and improving the app features.
  
6. Enable face-to-face interactions
  - Face to face communication also known as oral communication is used to convey or share information with each other. For instance, meeting is an efficient way for teams to discuss and prepare themselves to work towards the success.



7. The primary measure of progress is working software
  - To keep track of the project's progress, backlog is measured at any time during the sprints. In short, the ultimate factor that measures progress is to deliver functional software to the customer.
  
8. Consistent pace of development is supported by agile processes
  - By applying agile practices, whole team must be able to keep a constant pace to promote sustainable development. Culture of an organizations will affect the development pace.
  
9. Focus on technical detail and design help to improve agility
  - Improving the products include adding new features, debugging and other enhancements. Besides that, the teams should focus on technical excellence. A good user interface yet mobile friendly application able to enhance user experience.
  
10. Simplicity
  - Essential element like simplicity will help promote agile software development. For example, building a simple yet effective solution to meet the requirements and satisfy the customers. A simple chatbot is designed to provide customer services regarding the beauty and skincare products.
  
11. Self-organizing teams encourage high quality architectures, requirements, and designs
  - Skilled and motivated team members will turn out to be a high performing member. This will enable the best architectures and designs to be generated. To develop a successful mobile based application, developers must have a high coding and design skills that can shorten the time to accomplish the app.

12. Reflect on what kinds of methods that can be improve to become more effective frequently

- The purpose of reflection is to improve ourselves and make some adjustments in order to generate quality products. Agile software project mainly focusses on customers, so it is important to advance skills and knowledge as well. Regularly, the team make some adjustment and changes in order to meet the requirement of the system and further making the system to be more effective.

Agile Software development life cycle is the methodology of implementing the agile project management methodology to the process of software development. It is related to the Iterative or Incremental approach to execute the task. In agile methodology, all team members and developers focus on collaboration and usually work together to achieve the project's objective.



Figure 4.2 Agile Lifecycle Model

Agile Software Development Lifecycle Model is shown in figure b above. There consists of 6 phases:

1. Concept/Objective

The very first phase is concept. It is essential to scope out and prioritize projects as well as envisioned the projects. For example, identifying “what” to deliver and “who” should be in charge during the software development. Developer must have an idea of what kind of mobile app have to be developed. The estimated total amount of time to complete the whole project is calculated.

2. Inception/Identifying Requirement:

Normally, the customer's expectation is clarified in the first phase. All essential information is gathered and analyzed. Flow chart or high-level UML diagram are good method to show how the project's flow and its functionality. During the second phases of agile software development life cycle, initial support and fund are gathered.

3. Construction/Development/Iteration:

From the iteration of requirements, the teams work together to deliver working software. Furthermore, developers improve the product by modifying the mobile app features. According to the customer feedback, improvement along with the new functionality will be added. User experience is the top consideration when developing an ecommerce mobile application. It is vital to ensure work software is distributed regularly every week. In conclusion, the team's members work closely on the project's development.

4. Transition/Release

Working solutions are releasing regularly. For example, Quality Assurance testing, internal and external documentation are put into production. The features and functionality of the app is constantly tested to be improve. By using Android studio software, bugs can be easily identified and further debug it.

5. Production & Testing

Testing phases is very important before moving to the last phases as bugs and error will be able to determine in this phase. The developer will search for the bugs and error by examining the products. Android studio is useful to create a mobile app as all the works can be running via emulator without depend on battery life of mobile phone. In android studio, all the code can be debug using logcat.

6. Retirement

The very last phase is retirement which is related to system decommissioning. Newer version of software system usually replaced the old or legacy systems. Android studio has an automatic update features for the apps. It means that the latest app with its features will be developed.

Agile model focus on iteration approach. Agile methodology focusses on incrementation and division of tasks into several time boxes. Among many types of agile methods, scrum, extreme programming, DSDM just to name a few are the most popular practical use of the agile model. Below are the advantages and disadvantages of the Agile Model:

Advantages	Disadvantages
Suitable for fixed or changing requirements <ul style="list-style-type: none"> <li>• Customers has early and frequent opportunities to make decision and modifies the project</li> </ul>	Not suitable for large system <ul style="list-style-type: none"> <li>• Large project has complex requirement</li> </ul> Not suitable to handle complex dependency
Development processes is optimized <ul style="list-style-type: none"> <li>• Emphasize final products</li> </ul>	For each iteration, the length is quite short
Delivers early partial working solutions <ul style="list-style-type: none"> <li>• Customer satisfaction</li> </ul>	Lack of documentation Projects can easily fall off track
There is little or no planning required. Resource requirements are minimum.	More costly compared to waterfall model
Any defect, error, or bugs can be identify and fix in the middle of the project.	Only senior programmer can make decision during project development
Functionality can be developed rapidly and demonstrated. Continuous integration is encouraged	Poor communication within team members <ul style="list-style-type: none"> <li>• Divergent solutions</li> </ul>

Table 4.4 Review of Agile model

Agile methodology is feasible and it is based on iterative development which is suitable for the proposed project. Agile methodology is flexible, changes can be made in the project development requirements even after the initial planning has been completed. Team members can always test or run the app after finishing one module or a function and modify if necessary. In the later stage of development, the change in the features or requirement are accepted according to the feedback from customers. A significant benefit of Agile approach is fast delivery of new feature follow by the release or beta test the software in an early stage. On the other hand, Agile methodology may not work for certain project. One of the drawbacks of agile approach is not suitable for handling complex dependencies, it is quite difficult to fit into traditional organizations as well. Due to the factor of high dependencies on customers, the team will lose control if customers are not clear. Even though incremental delivery promotes the products faster, but it also brings negative effects like output become fragmented because teams work on different cycles in agile methodology. According to Green Garage (2019), it stated that workload increases due to the process of collecting and processing the feedback. Moreover, the scope or schedule can be uncertain sometimes.

**Chapter 5: Implementation and Testing****5.1 Verification Plan**

## a. Register

No	Test Steps	Attribute and Value	Expected Result
1	Register using <b>Correct</b> details and submit.	Name: jaceytan Phone number: 0168889635 Password: jacey123	User account is created successfully. Go to <b>Login Page</b> .
2	Register using <b>Used</b> phone number and submit.	Name: jaceytan Phone number: 0168889635 Password: jacey123	User is rejected to register followed by an error messages. Value: “Try again using another phone number”
3	Register using <b>Incorrect</b> details and submit.	Name: jaceytan Phone number: 1111111111 Password: jacey123	User is rejected to register followed by an error messages. Value: “Invalid phone number.”
4	Register with <b>Empty</b> details and submit.		User is rejected to update details followed by an error message.

			Value: “Please write your name/ Please write your phone number/ Please write your password.”
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Table 5.1 Register verification plan

**b. Login**

No	Test Steps	Attribute and Value	Expected Result
1	Login using <b>Correct</b> details and submit.	Phone number: 0168889635 Password: jacey123	User is logged in successfully. Go to <b>Home page</b> .
2	Login using <b>Incorrect</b> details and submit.	Phone number: 0161111111 Password: jacey123	User is rejected to login followed by an error message. Value: “Account with this 0161111111 number does not exists”
3	Login with <b>Empty</b> details and submit.		User is rejected to login followed by an error message. Value: “Please write your phone number/ Please write your password”
4	“ <b>Remember me</b> ” checkbox is ticked.		User is logged in successfully.



5	Verify the ' <b>Forgot Password</b> ' functionality.		User is redirect to <b>Reset Password</b> page.

Table 5.2 Login verification plan

### c. Reset Password

No	Test Steps	Attribute and Value	Expected Result
1	Leave the phone number and security questions fields <b>Blank</b> and submit.		User cannot proceed followed by an error message. Value: "Please complete the form"
2.	Enter <b>Incorrect</b> details and submit.	Phone number: 0161111111 Security Question1: tan Security Question2: kedah	User cannot proceed followed by an error message. Value: "The phone number does not exist!"
3	Enter <b>Valid</b> phone number and answer two security questions <b>Before</b> set security questions.	Phone number: 0168889635 Security Question1: tan Security Question2: kedah	User cannot proceed followed by an error message. Value: "You have not set the Security Questions yet!"

4	<p><b>After</b> set security questions, enter <b>Valid</b> phone number and answer two security questions <b>Wrongly</b></p>	<ul style="list-style-type: none"> <li>• Example1 Phone number: 0168889635 Security Question1: xxx Security Question2: kedah</li> <li>• Example 2 Phone number: 0168889635 Security Question1: tan Security Question2: xxx</li> </ul>	<p>Display message “Your first answer is wrong!”</p> <p>Display message “Your second answer is wrong!”</p>
5	<p><b>After</b> set security questions, enter <b>Valid</b> phone number and answer two security questions <b>Correctly.</b></p>	<p>Phone number: 0168889635 Security Question1: tan Security Question2: kedah</p>	<p>User able to write a <b>New Password.</b> New Password: jctan123 Display message “Password have been changed successfully.” Go to <b>Login Page.</b></p>

Table 5.3 Reset password verification plan

#### d. Settings

No	Test Steps	Attribute and Value	Expected Result
1	Change profile picture.	Upload image from device	User change the profile picture successfully.
2	Enter profile details and submit <b>Without</b> setting any security questions.	<p>Phone number: 0168889999 Full Name: Jacey Tan Yee Shin Address:</p>	<p>Profile details are updated successfully but a message “You have not set the Security Questions yet!” is shown.</p>

		1400, Jalan Westlake,31900 Kampar, Perak	
3	Enter profile details and set two security questions.	Phone number: 0168889999 Full Name: Jacey Tan Yee Shin Address: 1400, Jalan Westlake,31900 Kampar, Perak Security Question1: tan Security Question2: kedah	Display message “You have set the security questions successfully.” Go to <b>Home Page</b> .

Table 5.4 Settings verification plan

## e. Homepage

No	Test Steps	Attribute and Value	Expected Result
1	Browse through the products.		A list view of products simply appears as the user scrolls down the page.
2	Click on “ <b>Cart List</b> ” button at the right bottom corner.	Total Price: 0	Cart list is <b>Empty</b> .
3	Click on a specific product to purchase.	Product name: Aloe Vera Foam Cleaner 150ml Description: Remove makeup residue and	Products’ information such as product name, description and price are showed.

		impurities from your skin with its rich aloe vera extract. Product price: RM19	
4	<b>Increase or Decrease</b> the quantities while adding products to the cart.	Product name: Aloe Vera Foam Cleaner 150ml Description: Remove makeup residue and impurities from your skin with its rich aloe vera extract. Product price: RM19 Quantity :1	With quantity selector features, user added 1 bottle of Aloe Vera Foam Cleaner to the cart.
5	Click on “ <b>Add to Cart</b> ” button		User add the product to the cart list successfully. Display “Added to cart” message. Go to <b>Homepage Page.</b>
6	Select “ <b>Logout</b> ” from setting list.		User is logged out successfully. Go to <b>Login.</b>

Table 5.5 Homepage verification plan

#### f. View Cart List

No	Test Steps	Attribute and Value	Expected Result
1	Access the cart list by clicking on the “Cart” in the navigation drawer.	Product name: Aloe Vera Foam Cleaner 150ml Product price: RM19 Quantity :1	Products listed in a vertical view. Information such as product name, price and quantity are clearly shown.

2	Click on the “ <b>Edit</b> ” in the cart options.		User redirect back to where quantity of a certain products is chosen.
3	<b>Increase</b> the product to <b>4</b> .	<b>Quantity: 4</b>	User has been successfully added a total of 4 bottles of Aloe Vera Foam Cleaner to the cart. Display “Added to cart” message. Go to <b>Homepage Page</b> .
4	Click on the “ <b>Remove</b> ” in the cart options.	Cart List is <b>Empty</b> now.	User has been removing the 4 bottles of Aloe Vera Foam Cleaner from the cart. Message “Items removed successfully” is shown. Go to <b>Homepage Page</b> .

Table 5.6 Cart List Viewing verification plan

**g. Search for products**

No	Test Steps	Attribute and Value	Expected Result
1	Click “ <b>Search</b> ” in the navigation drawer.		Display Search screen

2	Search profile with <b>Keywords</b> and click “ <b>Search</b> ” button.	Search: Lipstick	Display a list of lipsticks with various brand.
3	Click on the <b>Camera</b> button at the top right corner.		Permission is requested where message pop out asking user whether to allow or deny the use of camera.
4	For the permission request, click on the “ <b>Deny</b> ” .		User cannot use the camera.
5	For the permission request, click on the “ <b>Allow</b> ” .		User accepts the permissions of the feature of the camera can be used.
6	Put the product in front of the camera.	Products: Kate Lipstick Probability: Lipstick–81% Fountain pen–6% Lighter–13%	It helps user to detect similar features of the data and identify the products.

Table 5.7 Products Searching verification plan

#### h. Shipment details

No	Test Steps	Attribute and Value	Expected Result
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1	Navigate to Cart List and click “Next” .		Calculate total price of the products. Display message “Total Price: RM76” .
2	Leave the shipment name field <b>Blank</b> and submit.	Name: Phone: Address: Postcode: State:	Display message “Please provide your full name.”
3	Leave the shipment phone number field <b>Blank</b> and submit.	Name: Tan Phone: Address: Postcode: State:	Display message “Please provide your phone number.”
4	Leave the shipment address field <b>Blank</b> and submit.	Name: Tan Phone: 0168889635 Address: Postcode: State:	Display message “Please provide your address.”
5	Leave the shipment postcode field <b>Blank</b> and submit.	Name: Tan Phone: 0168889635 Address: 1400, Jalan Seksyen 4 Postcode: State:	Display message “Postcode cannot be blank.”
6	Leave the shipment state field <b>Blank</b> and submit.	Name: Tan Phone: 0168889635	Display message “Please provide your city name.”

		Address: 1400, Jalan Seksyen 4 Postcode: 31900 State:	
7	Enter <b>Correct</b> details and submit.	Name: Tan Phone: 0168889635 Address: 1400, Jalan Seksyen 4 Postcode: 31900 State: Kampar, Perak	Display message “Your order has been confirmed.” Go to <b>Payment Page</b> .

Table 5.8 Shipment verification plan

**i. Payment**

No	Test Steps	Attribute and Value	Expected Result
1	Click “ <b>Update</b> ” <b>Without</b> filling out every required payment field.	Payment Receipt: No Transaction Amount: Reference Number:	User cannot proceed the payment process followed by an error message “Please key in the transaction amount you had made.
2	Fill in the <b>Transaction Amount</b> field <b>Only</b> and click Update.	Payment Receipt: No Transaction Amount: RM76 Reference Number:	“Reference Number is mandatory” .
3	Insert <b>Transaction Amount</b> and <b>Reference Number</b> and click Update.	Payment Receipt: No Transaction Amount: RM76 Reference Number: 980219	User is rejected to proceed. Display error message “Image is not selected” .



4	<b>Upload</b> payment receipt.	Payment Receipt: Yes Transaction Amount: RM76 Reference Number: 980219	User had completed the payment process. “Payment info updated successfully.” Go to <b>Track Shipment</b> .
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Table 5.9 Payment verification plan

#### j. Track Shipment

No	Test Steps	Attribute and Value	Expected Result
1	<b>After</b> successful payment.		Display message “We will send you a message with a shipment tracking number shortly.”
2	Click on the “ <b>Back</b> ” button		Go to <b>Home page</b> .
3	<b>Receive</b> tracking number from push notification.		A notification pop out showing a message “Hi, there! ☐ Your order has shipped out today... 🚚 Tracking Number: 620689709796”
4	Click on the “ <b>Cart</b> ” floating		Chat page is appeared.


	button at the right bottom corner.		
5	Click on the “ <b>Chat Now</b> ”		A new conversation is started.
6	Click on the option “  <b>Track Order</b> ”		It will navigate the user to the tracking site.
7	Track an order using the <b>Correct</b> tracking number and submit.	Tracking Number: 620689709796	The tracking result and details will automatically be shown.

Table 5.10 Shipment tracking verification plan

#### k. Chatbot

No	Test Steps	Attribute and Value	Expected Result
1	Click on the “ <b>Cart</b> ” floating button at the right bottom corner.		Chat page is appeared.
2	Click on the “ <b>Chat Now</b> ” .		A new conversation is started.
3	Select from a list of options.	“Beauty Tips”	Automatically replies “Use Vaseline for a

			smudge-free manicure”
4	Select from a list of options.	“Exchange Item”	<p>A form is generated that requires users to fill in their <b>Name</b>, <b>Gender</b> and state a <b>Reason</b>.</p> <p>After clicking on the submit button, the data will then send back to bot and will be handled by admin.</p>
5	Select from a list of options.	“Track Order”	Bot respond by providing a button that navigate the users to the Shipment Tracking Platform for tracking purposes.
6	Type <b>Irrelevant</b> sentences and send.	“I want a pepperoni pizza”	<p>Bot didn't recognize the phrases as a valid response.</p> <p>Display message “Say that one more time?” and pass</p>

			the conversation to admin.
7	Type <b>Relevant</b> sentences and send.	“How do I fix my dry skin”	A list template appeared that showing product image, title, description and a button.
8	Click on the “See us on Facebook” button.		User is redirect to Facebook page in a new tab.

Table 5.11 Chatbot verification plan

### I. Image processing

No	Test Steps	Attribute and Value	Expected Result
1	Click on the “ <b>AI Brain</b> ” floating action button at the right bottom corner.		A page listed with device’s photo is appeared.
2	“ <b>Swipe Down</b> ” to retrieve new photos.		New photos loaded from device.
3	“ <b>Select</b> ” any photo and click “ <b>Label</b> ” .	Photo: A picture of lipstick	Result: 1. Lipstick [0.69conf] 2. Tableware [0.48conf]
4	“ <b>Select</b> ” a bank receipt and click “ <b>OCR</b> ” .	Photo: Public Bank’ s printed receipt	Data such as reference number, beneficiary account number , date or

			time, email and amount are successfully extracted.
5	<p><b>“Upload”</b> barcode image and click <b>“Barcode”</b> .</p>	Photo: Barcode	<p>Barcode is successfully detected.</p> <p>Information such as email address, tracking number and link is provided.</p>

Table 5.12 Image processing verification plan

**5.2 Result**

**Users Sign Up Page**

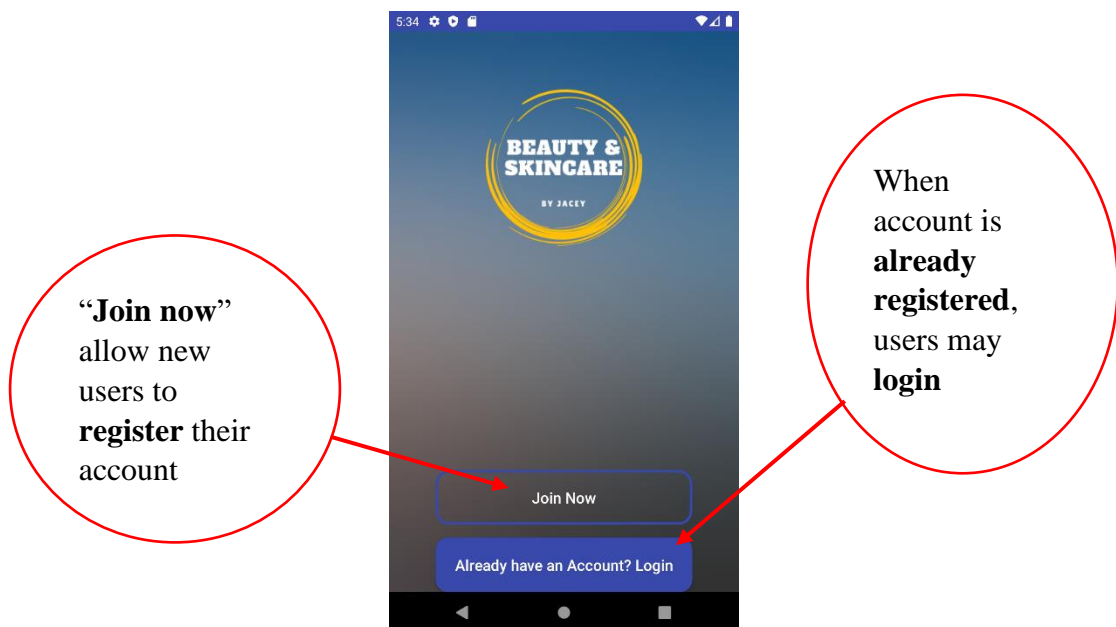
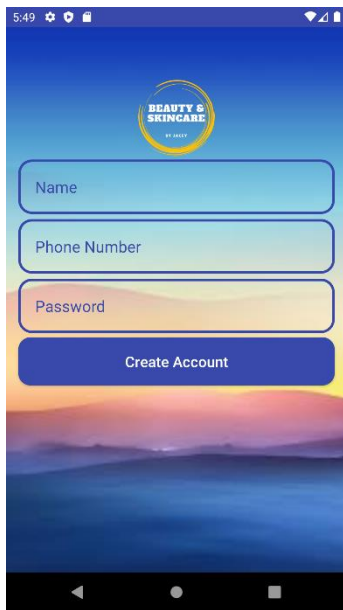


Figure 5.1 Join now and Login page

## Chapter 5: Implementation and Testing



Users have to fill in their **name, phone number** and **password** in order to create a **new account**

Figure 5.2 Registration form

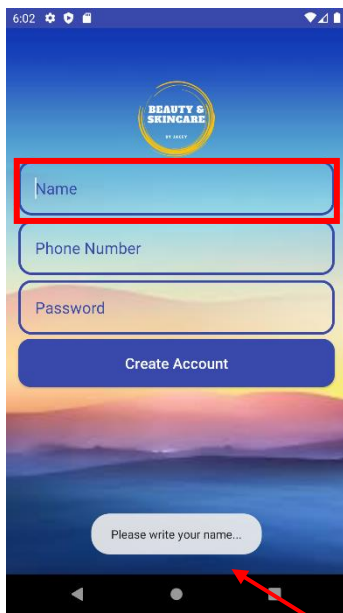


Figure 5.3a Incomplete form without name

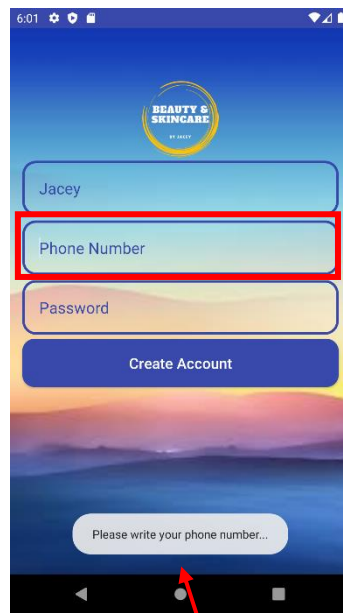


Figure 5.3b Incomplete form without phone number

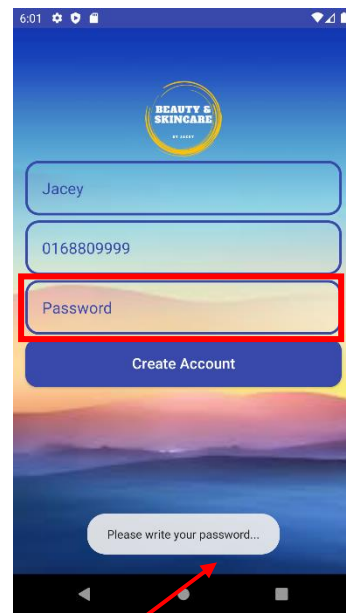
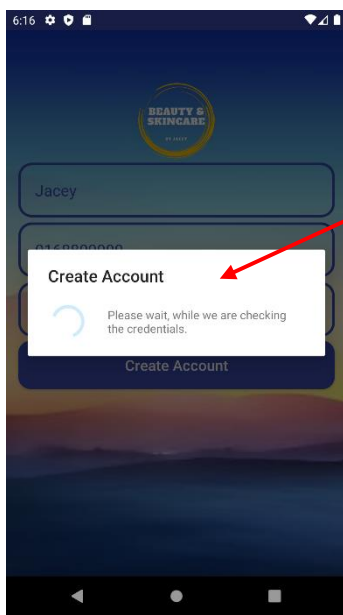


Figure 5.3c Incomplete form without password

When clicking Create Account **without** fill in name, phone number, or password will trigger messages like  
**"Please write your name/phone number/ password..."** toast, as shown in the above screen capture



After complete the registration form, an account is **created**.

**Successfully created an account**

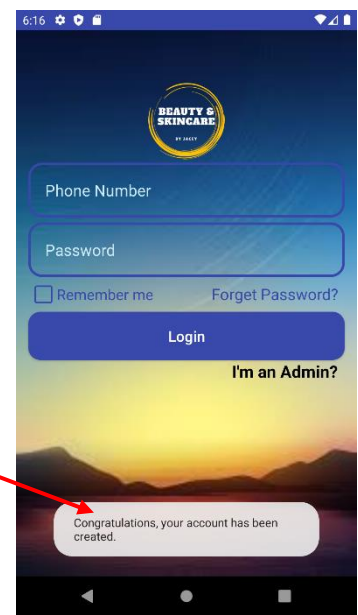


Figure 5.3e Successfully created account

When clicking at the **“I’m an Admin”**, it will link to admin **Login page**

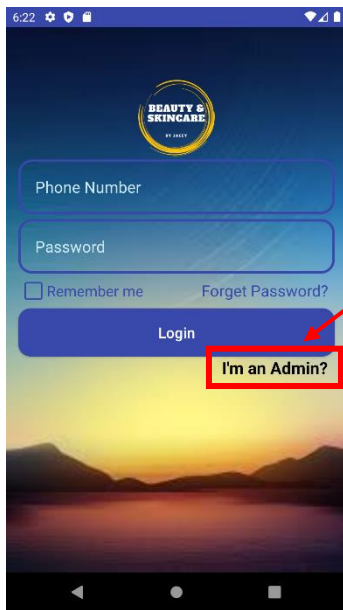


Figure 5.4 Login page for Users

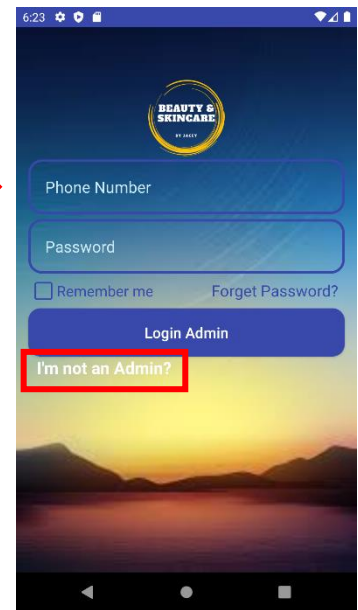
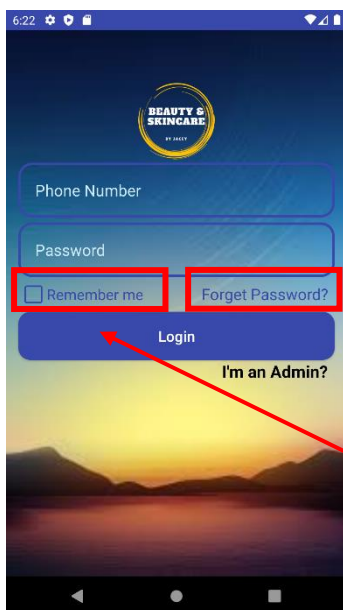


Figure 5.4a Login page for Admin

### Users Login Page



In case users **forgot their password**, clicking on it will direct users to another page to **reset their password**

**Authenticate automatically** when the user returns



Figure 5.4b Remember me and Forget Password options

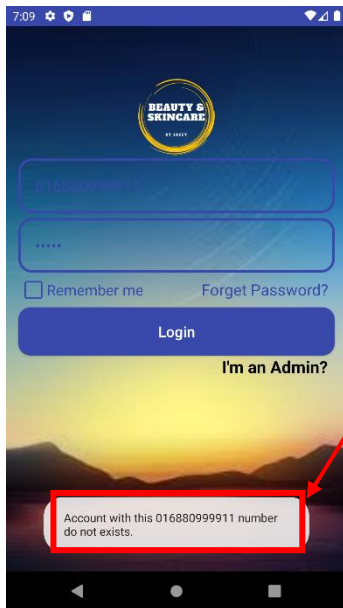


Figure 5.4c Invalid phone number

Invalid phone number and password

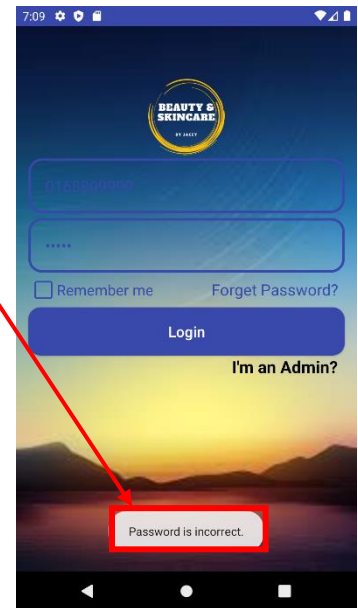


Figure 5.4d Invalid password

### Users Home Page

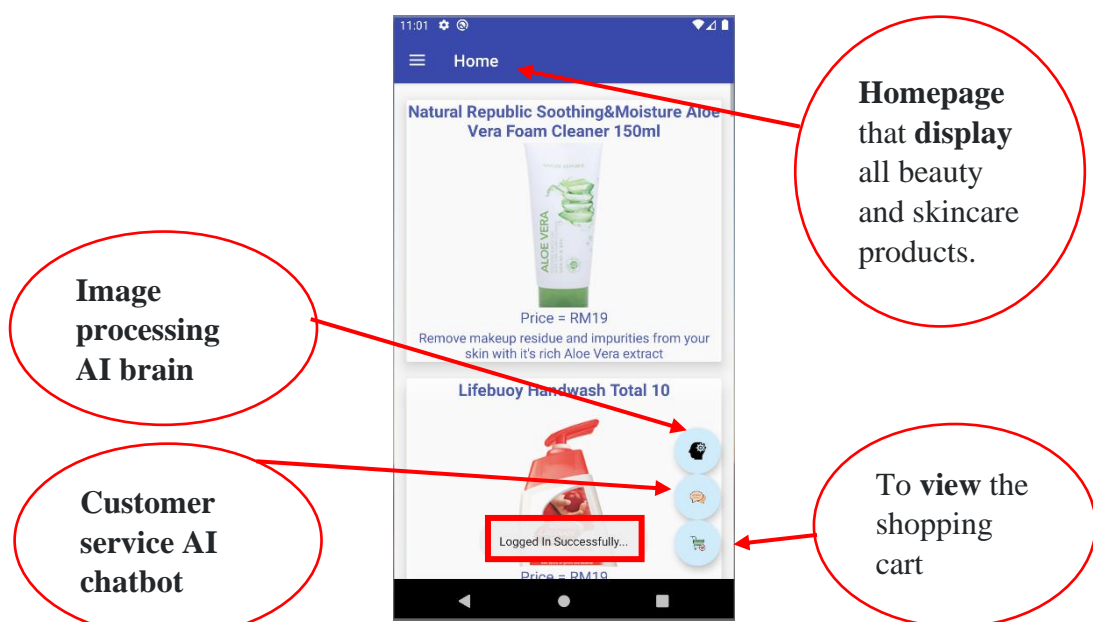


Figure 5.4e Homepage

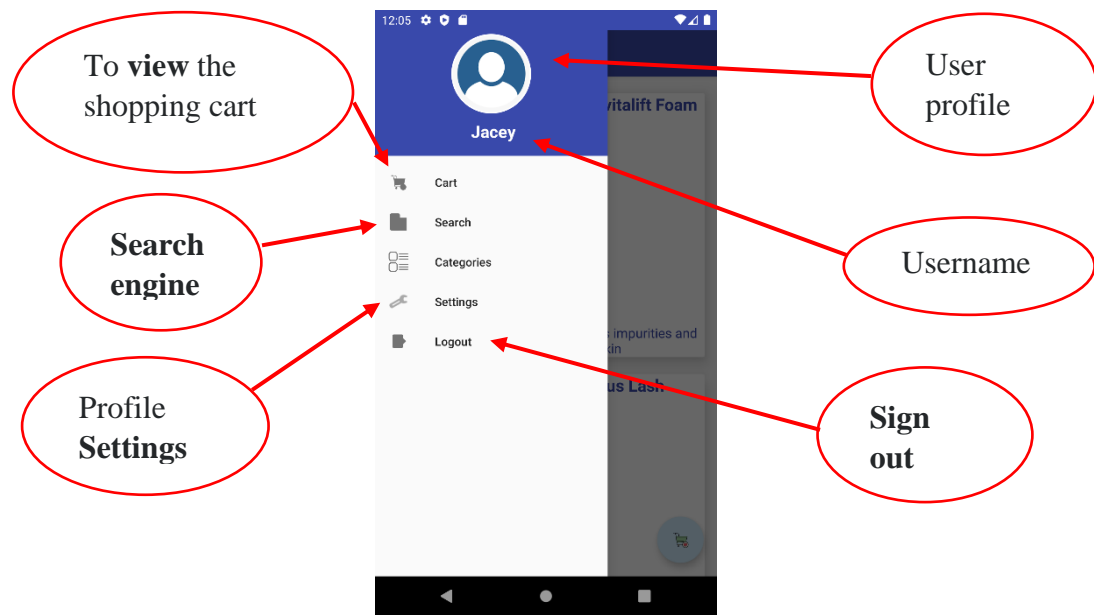
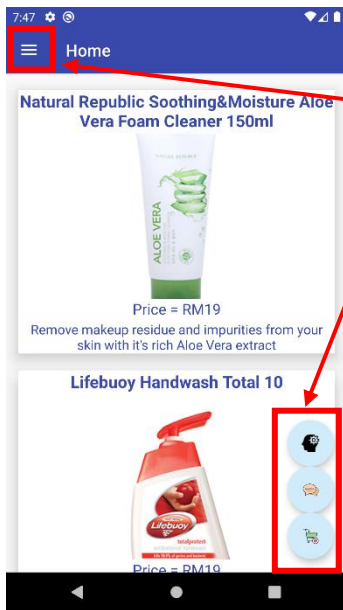


Figure 5.4f Navigation drawer

## Chapter 5: Implementation and Testing



Hamburger menu & three floating action button

Click **allow** to access photo in the devices

Figure 5.5 Homepage

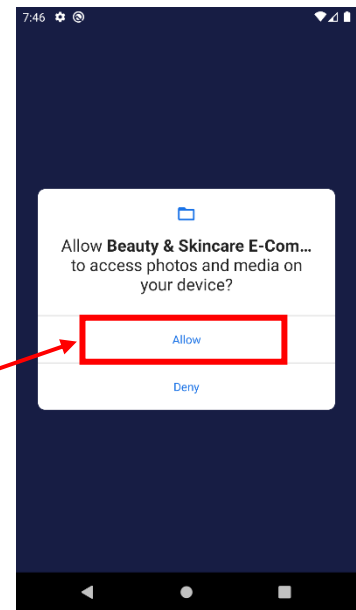
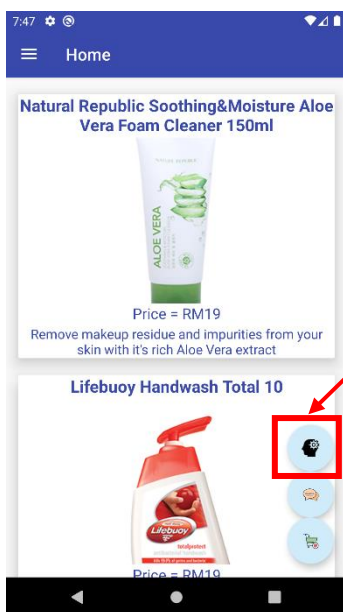


Figure 5.5a Permission request



Click on the "AI Brain" floating action button

Figure 5.6 Image Processing button



Figure 5.6a Loading page

### Image Processing Features



Swipe down to retrieve new photos

Select an image from mobile device and click on the icon



Figure 5.6c Pick an image and submit

Figure 5.6b Refresh

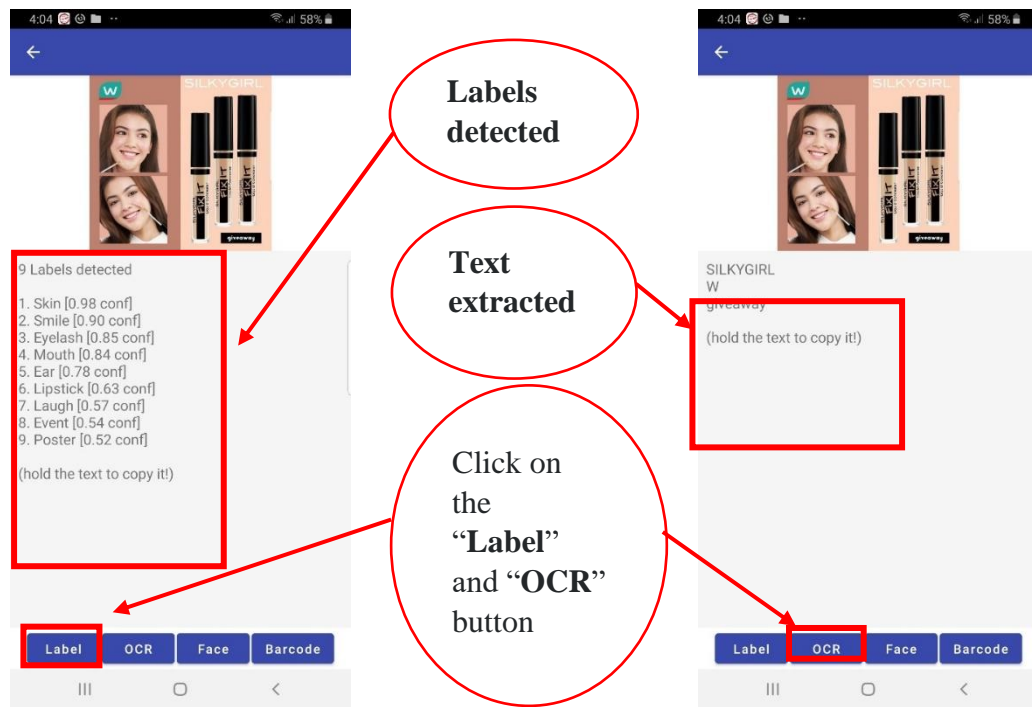


Figure 5.6d Image labelling

Figure 5.6e Optical Character Recognition

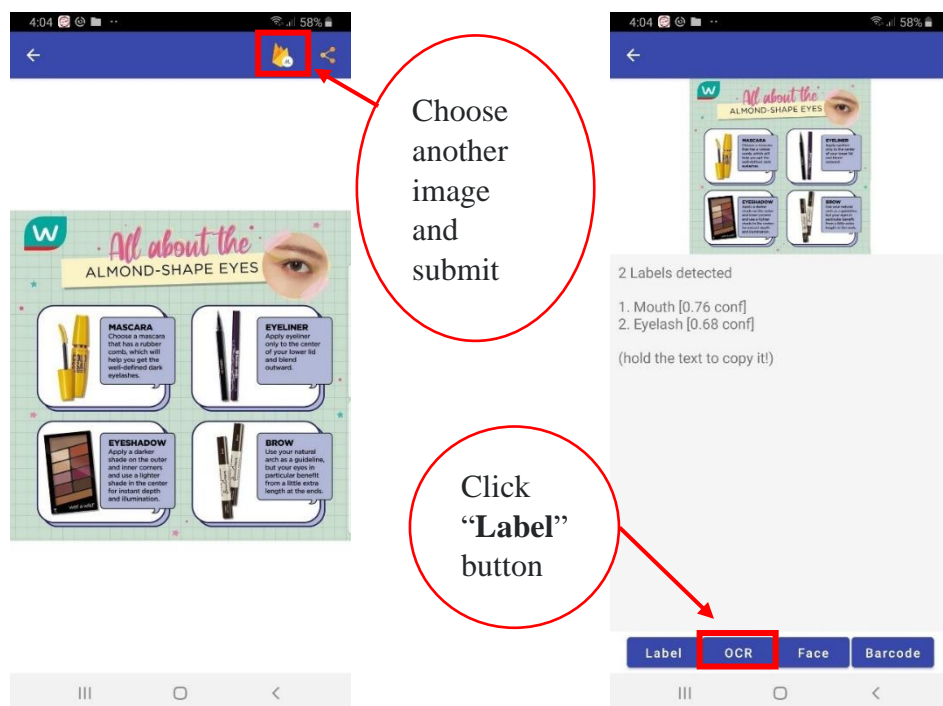


Figure 5.6f Pick another image and submit

Figure 5.6g Image labelling

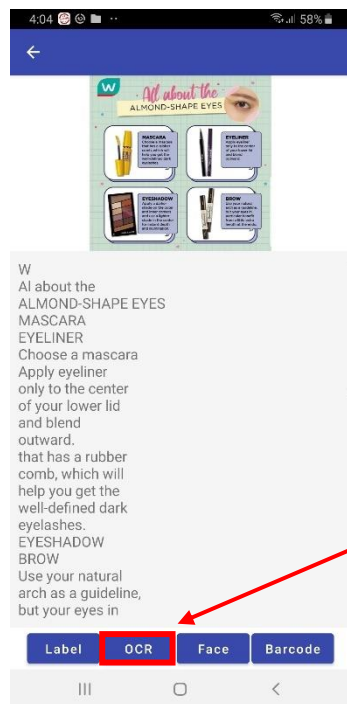


Figure 5.6h Optical Character Recognition

Long press to copy the extracted text

Click "OCR" button

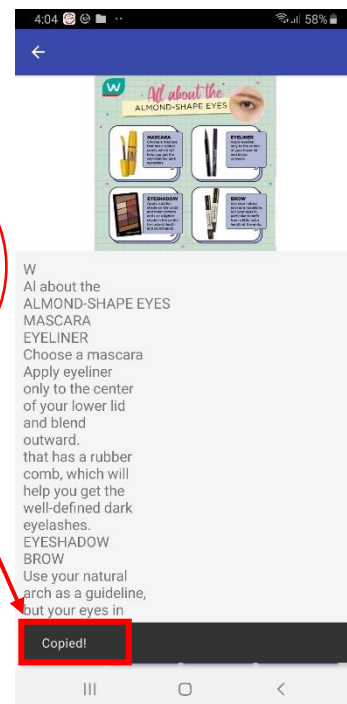


Figure 5.6i Copy extracted text

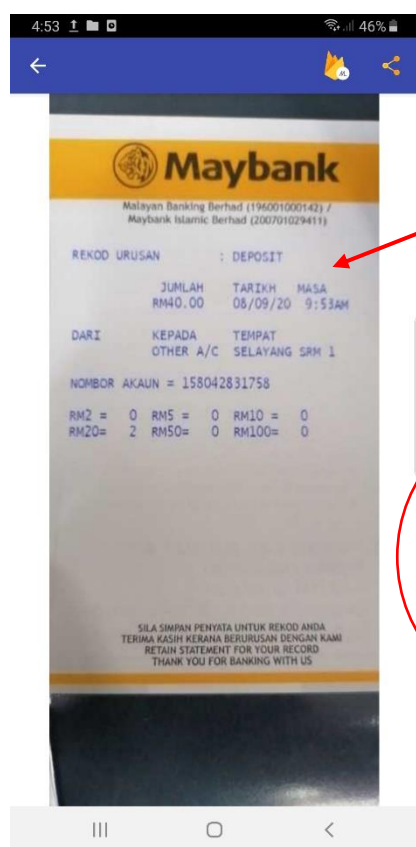


Figure 5.6j Maybank printed receipt

Select printed receipt

Text extracted successfully

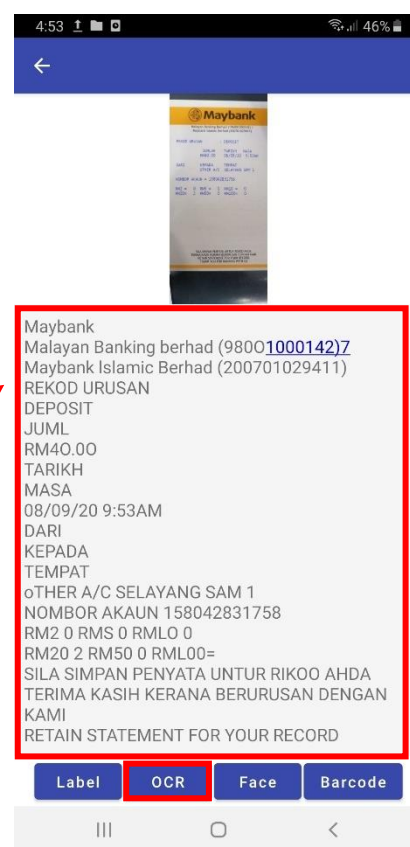
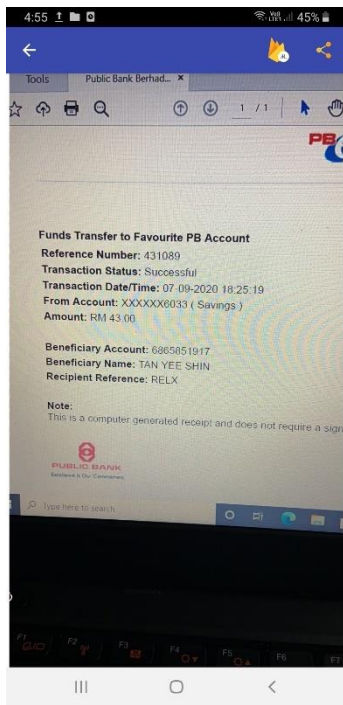


Figure 5.6k Data extraction from bank receipt



Reference number, Date or Time and beneficiary account extracted successfully

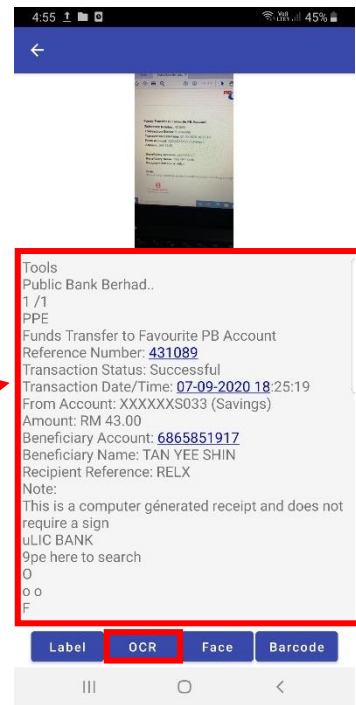
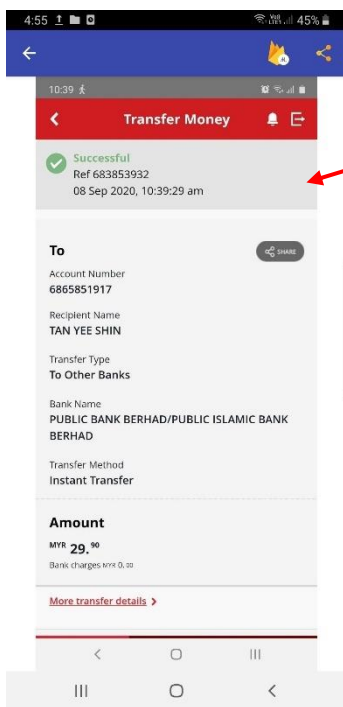


Figure 5.6l Receipt captured using mobile device

Figure 5.6m Data extraction from bank receipt



Select E-receipt

Reference number and account number extracted successfully

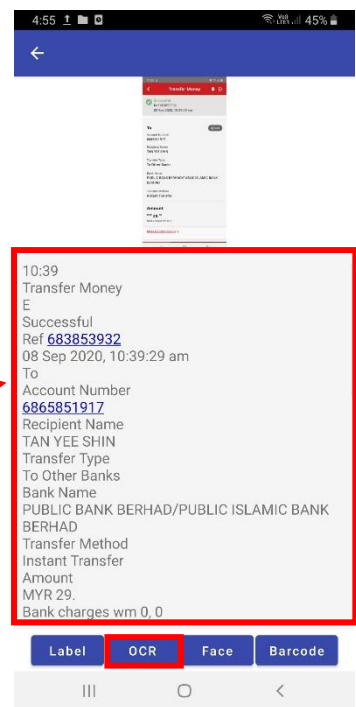


Figure 5.6n E-receipt

Figure 5.6o Data extraction from E-receipt



Figure 5.6p QR code

QR code given by sellers

Shipping information

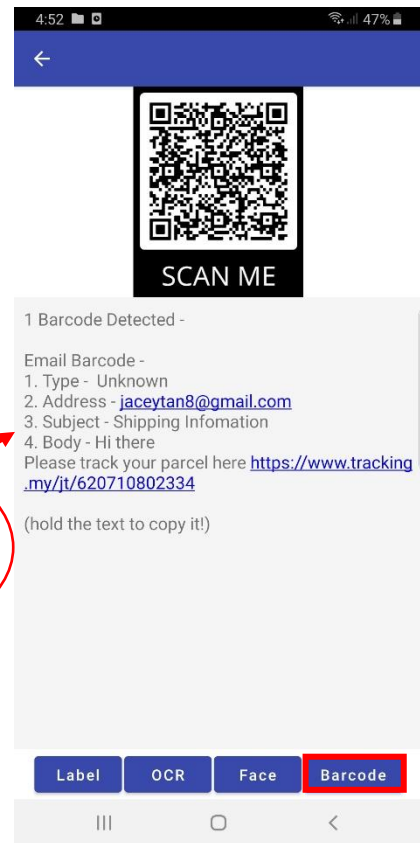


Figure 5.6q QR code scanning



## Chapter 5: Implementation and Testing



Figure 5.6r Barcode detected

Redirect to tracking website when clicking on the URL

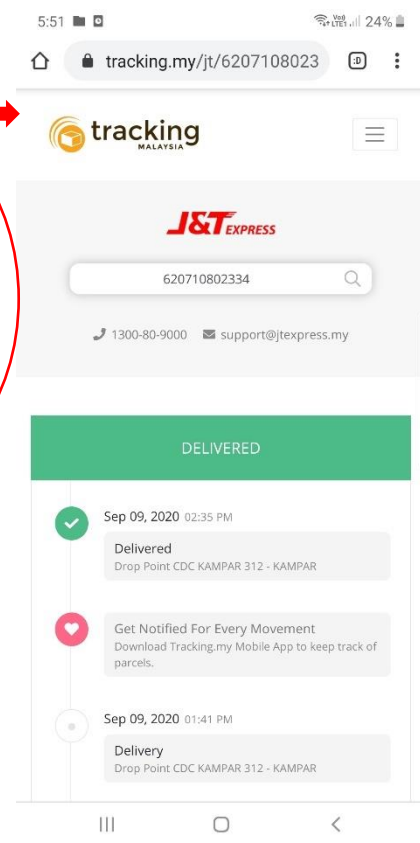
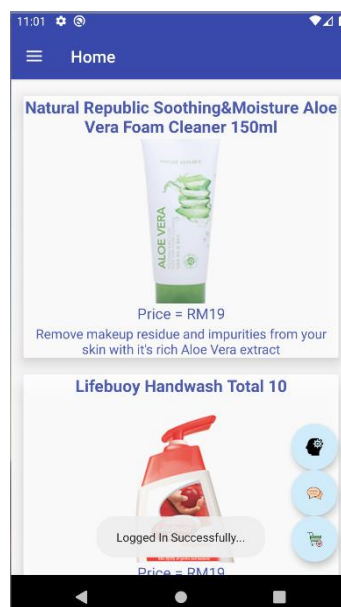


Figure 5.6s Tracking status

Back to Homepage



Browse through and select one product

Figure 5.6t Homepage

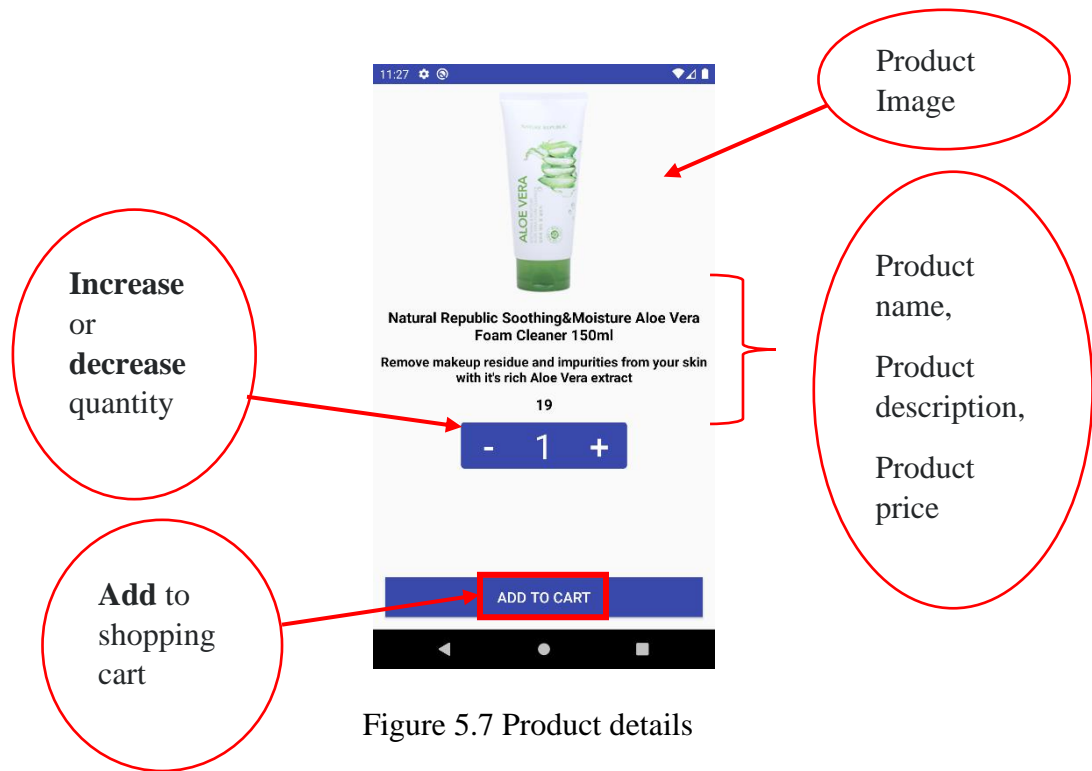


Figure 5.7 Product details

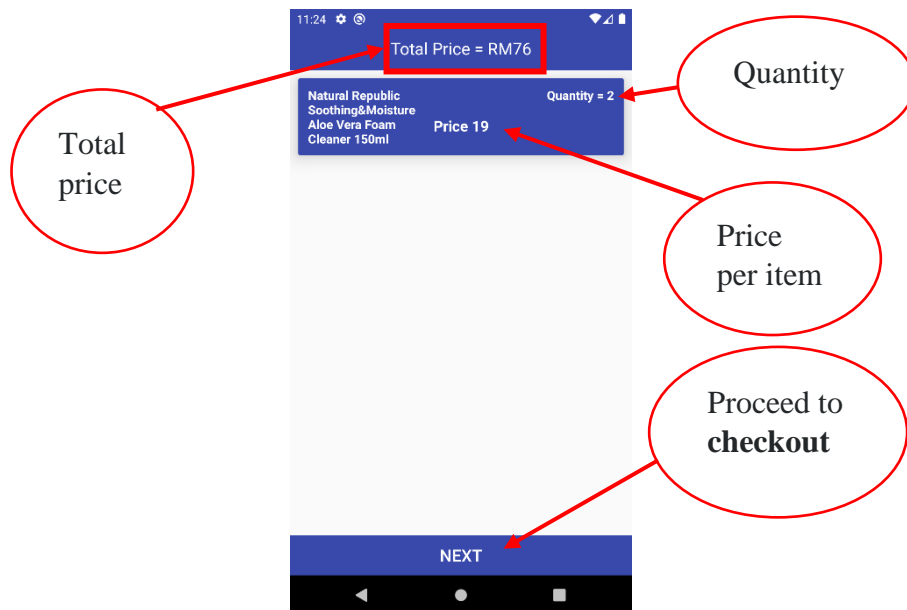


Figure 5.8 Shopping cart list

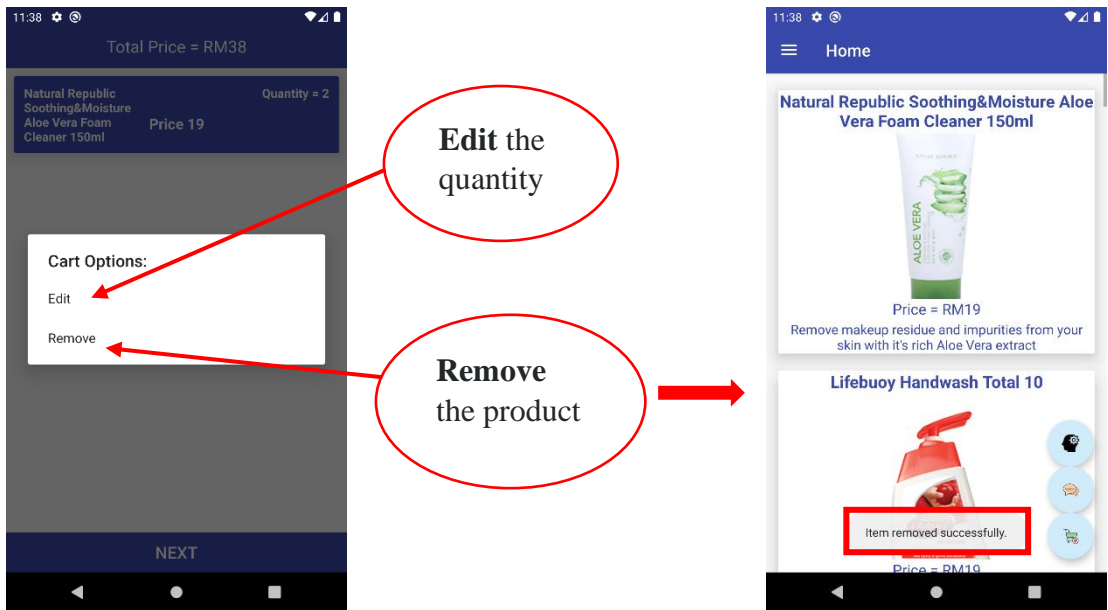


Figure 5.8a Cart option

Figure 5.8b Delete cart

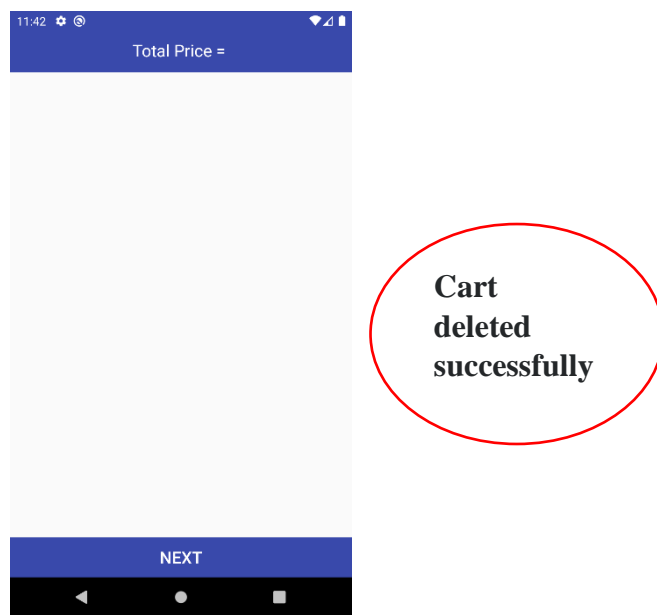


Figure 5.8c Blank shopping cart

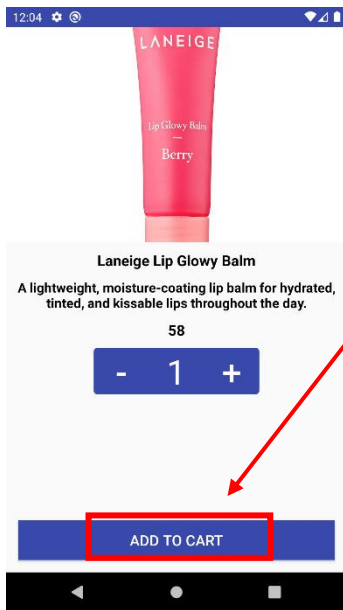


Figure 5.8d Add to cart

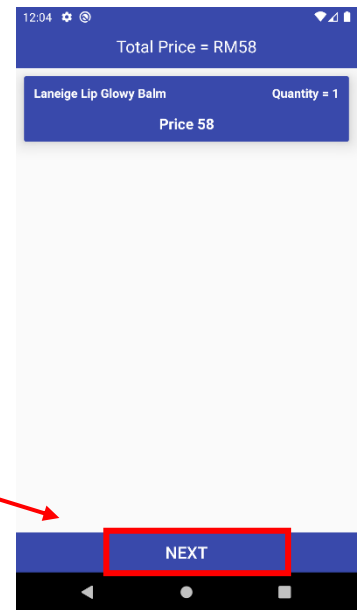


Figure 5.8e Checkout

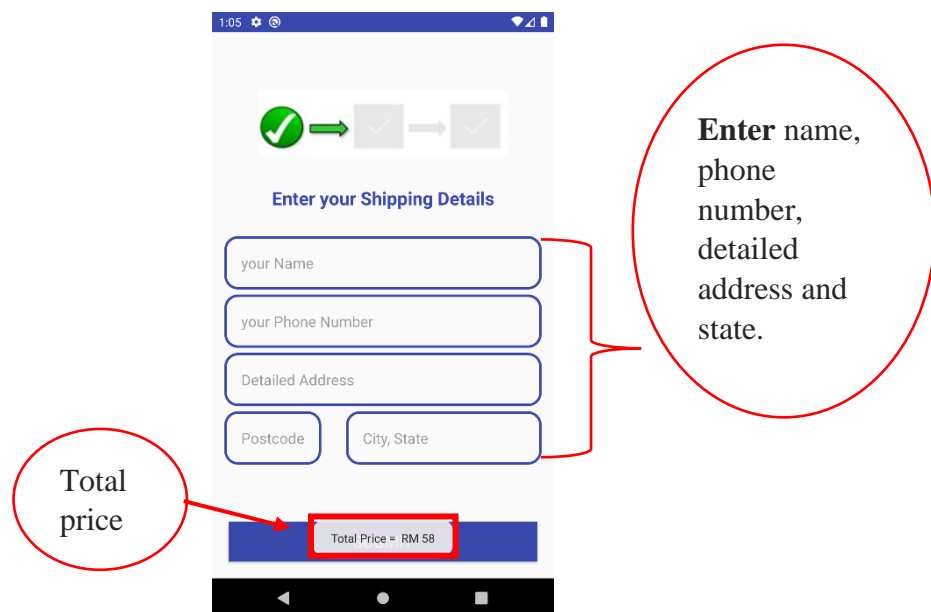


Figure 5.9 Shipment details

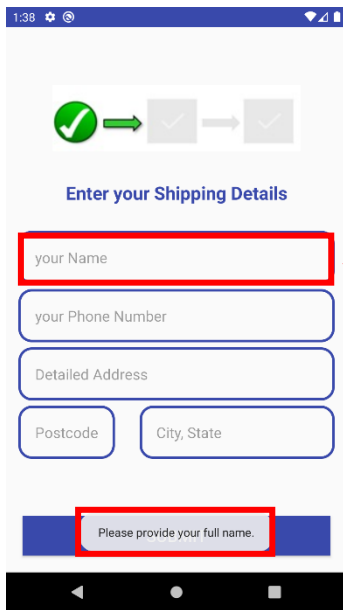


Figure 5.9a Empty name

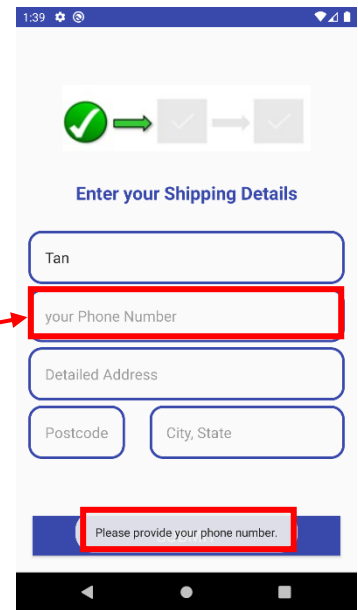


Figure 5.9b Empty phone

Name and phone number cannot be empty

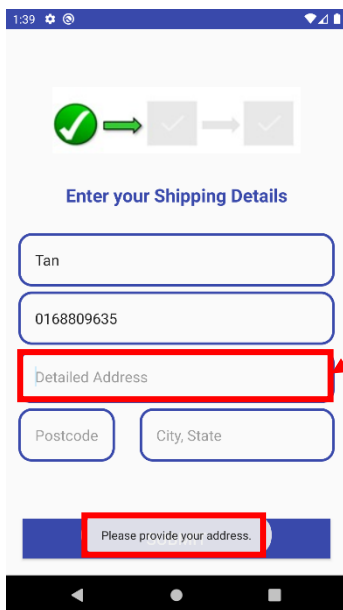


Figure 5.9c Empty address

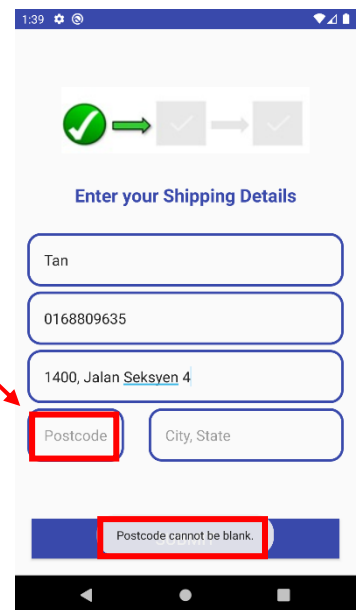
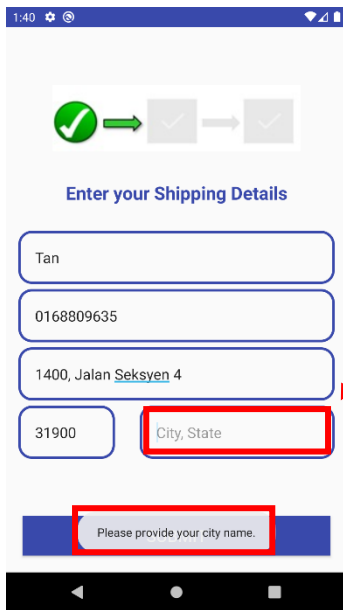


Figure 5.9d Empty postcode

Address and postcode cannot be empty



City, state cannot be empty

Figure 5.9e Empty city and state

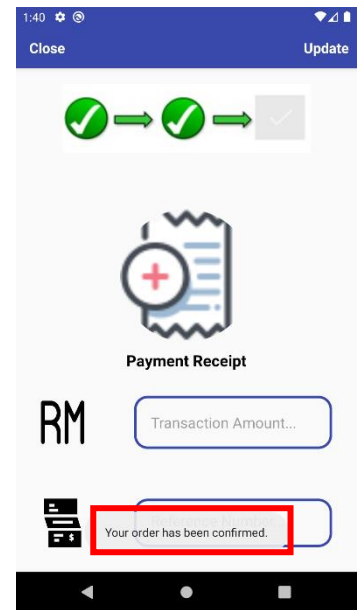
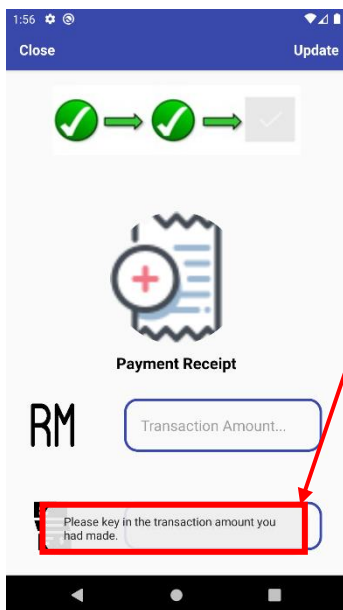


Figure 5.9f Confirm order



Transaction amount is required

Reference number is mandatory

Figure 5.9g Empty field

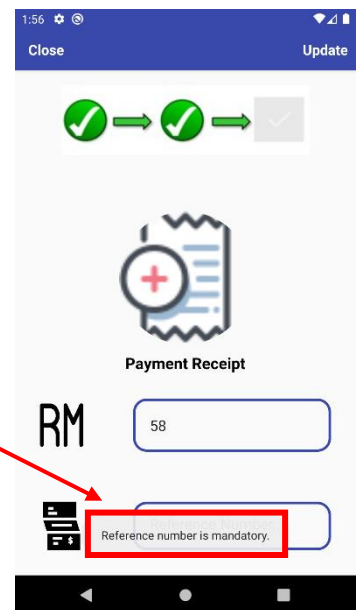


Figure 5.9h Empty field

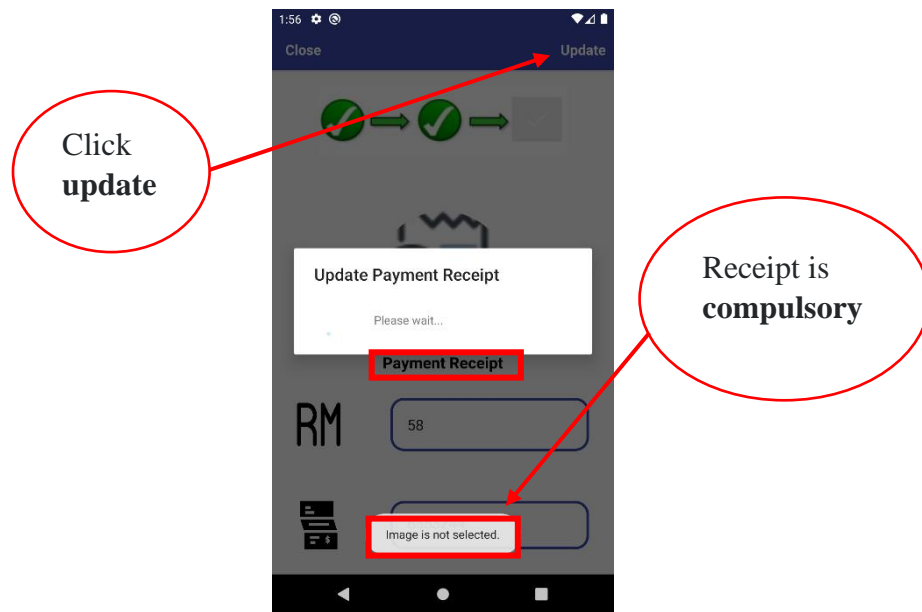


Figure 5.9i Receipt is missing

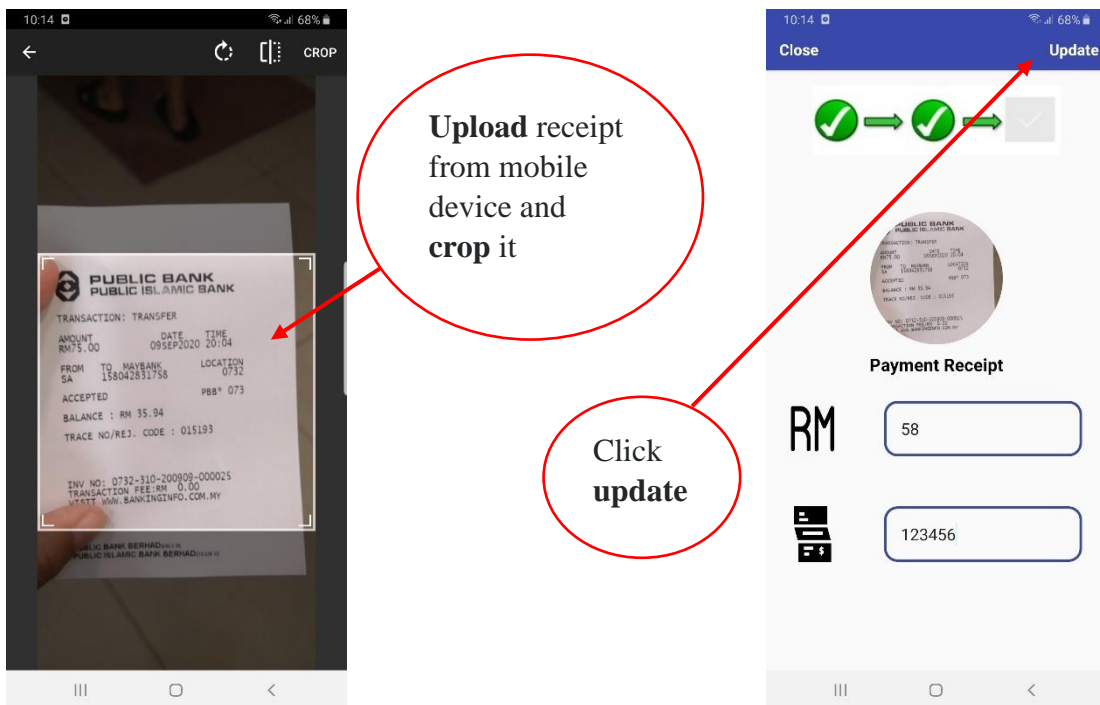
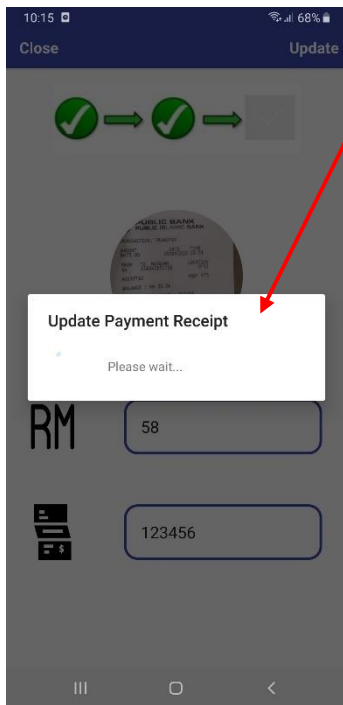


Figure 5.9j Crop receipt

Figure 5.9k Receipt is added



Updating the payment receipt

Payment info update successfully and wait to be verify

Back to Homepage

Figure 5.9l Update payment receipt



Figure 5.9m Payment info update successfully

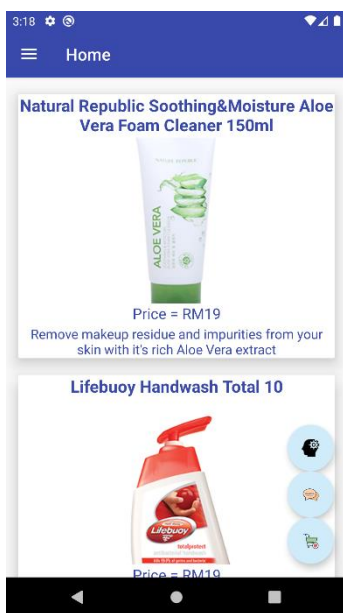
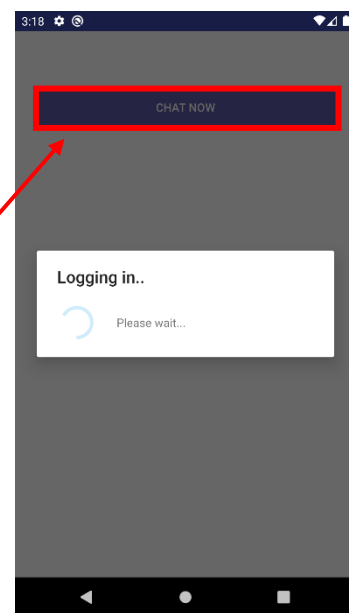


Figure 5.10 Homepage



Click on "Chat now" button

Figure 5.11 Chat now



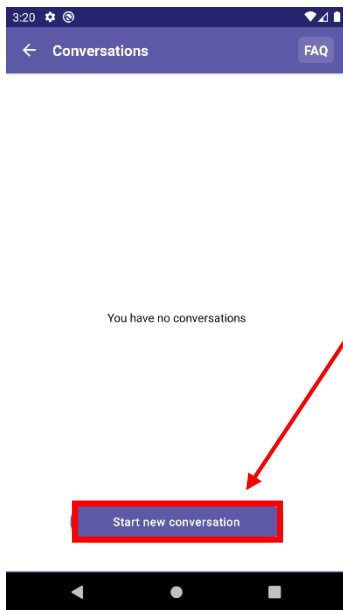


Figure 5.11a Empty conversation

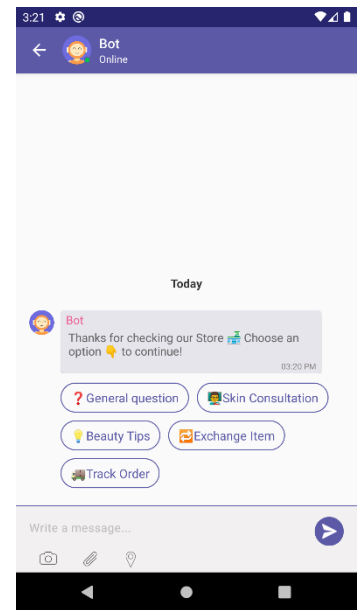


Figure 5.11b Start conversation

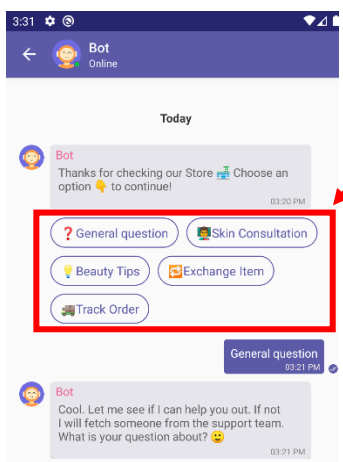


Figure 5.11c General question

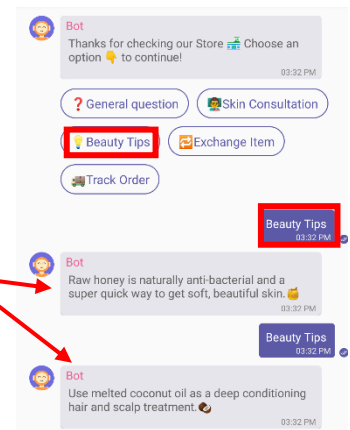


Figure 5.11d Beauty tips

Click on  
"Start new  
conversation"

Suggested  
replies  
provided

Beauty and  
skincare tips  
given by bot

## Chapter 5: Implementation and Testing

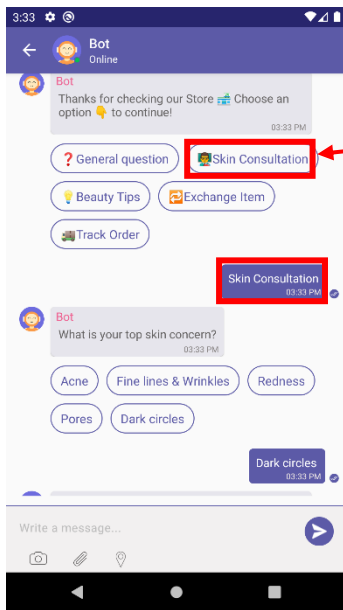


Figure 5.11e Skin consultation

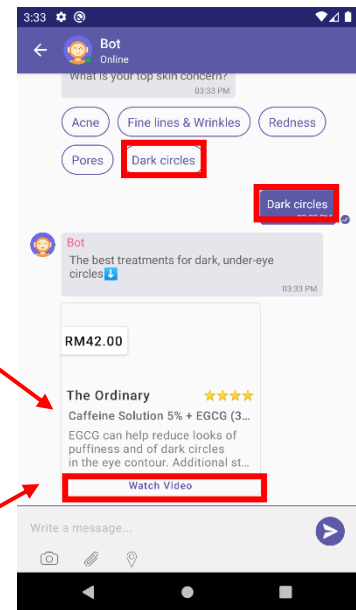


Figure 5.11f Dark circles

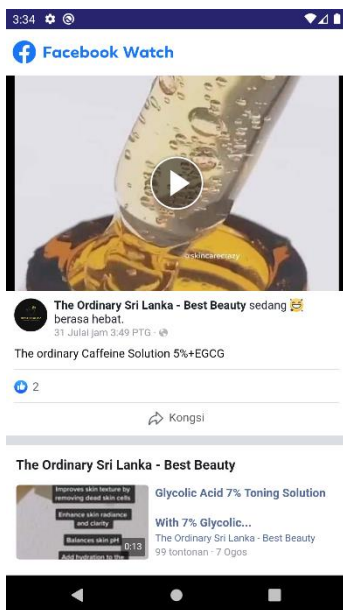


Figure 5.11g Watch video

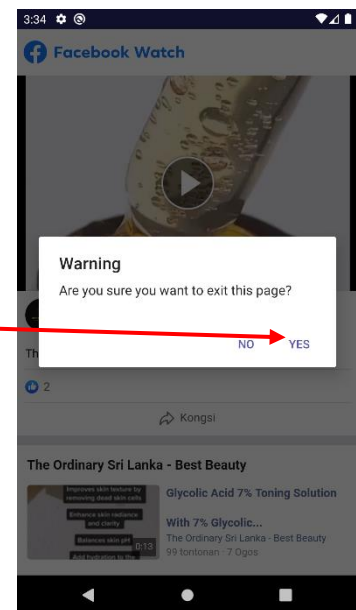


Figure 5.11h Dark circles

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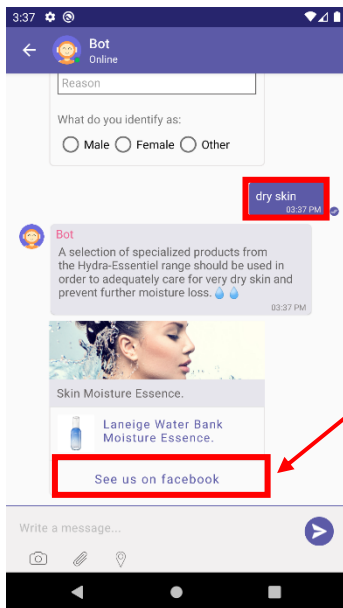


Figure 5.11i Dry skin

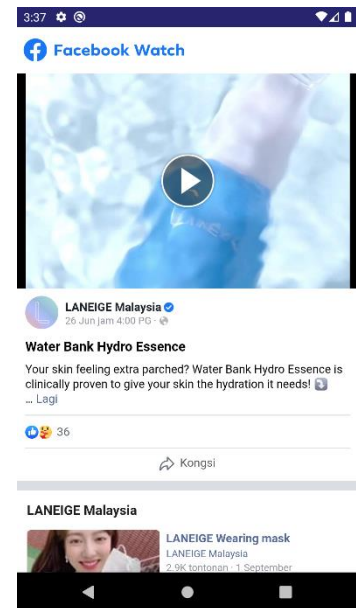


Figure 5.11j Watch video

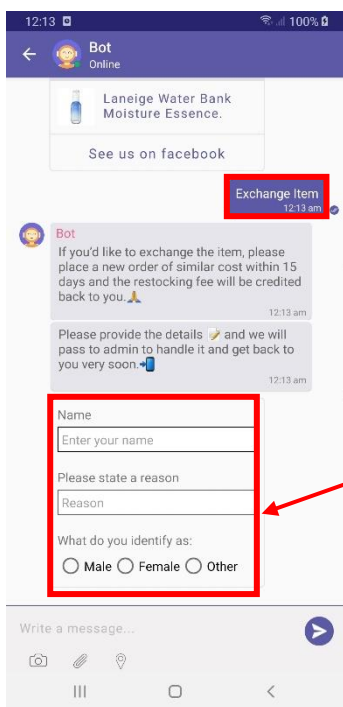


Figure 5.11k Exchange Item

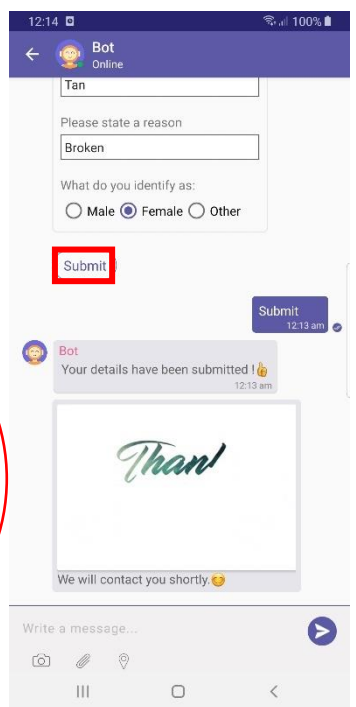


Figure 5.11l Fill form

Check it out on Facebook

A form is provided to allow users to state the reason for exchange items

## Chapter 5: Implementation and Testing

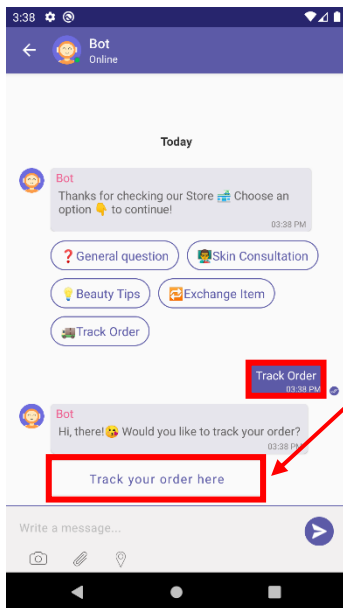


Figure 5.11m Track order

User  
redirect to  
tracking  
website

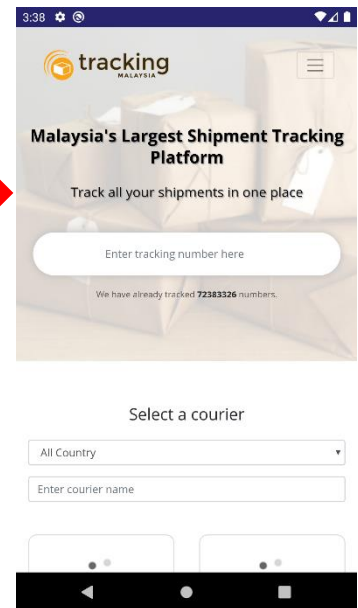


Figure 5.11n Tracking website

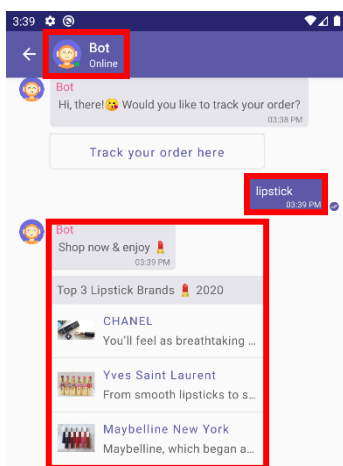


Figure 5.11o Lipstick

Bot to  
Human  
handoff

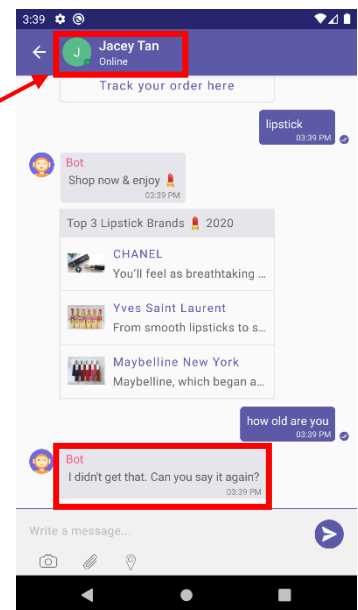


Figure 5.11p Unknown conversation

## Chapter 5: Implementation and Testing

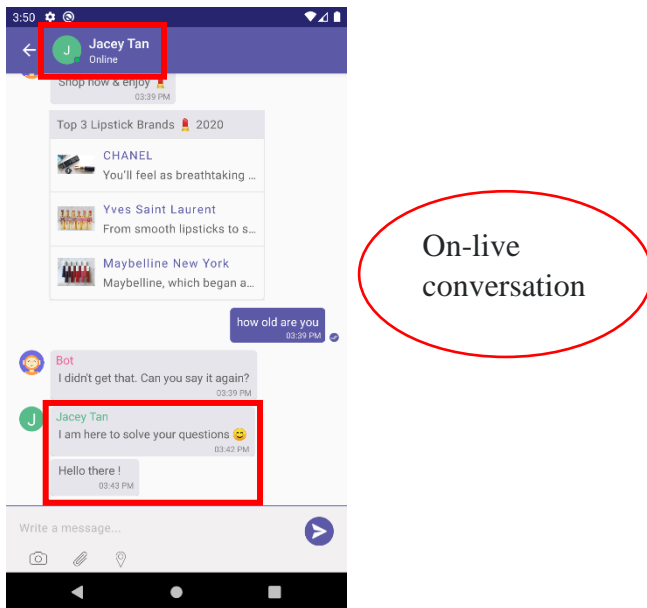


Figure 5.11q Human agent takeover

### Users Settings

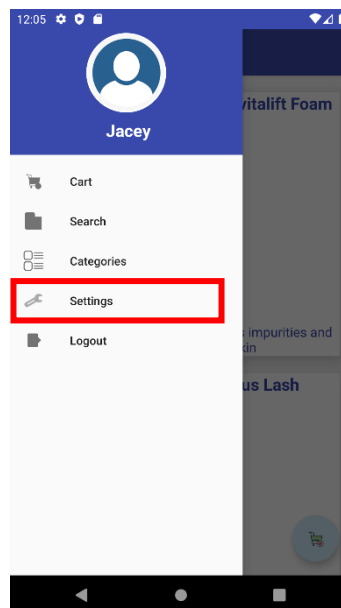


Figure 5.12 Navigation drawer

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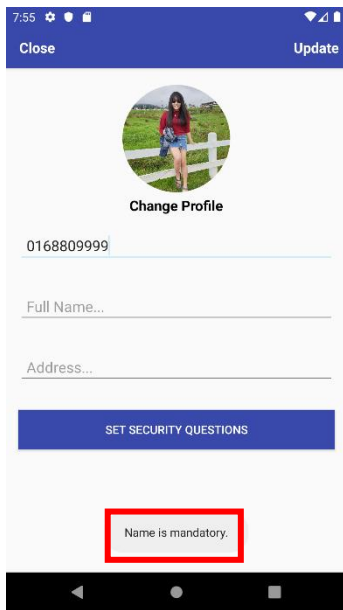


Figure 5.12a Empty profile name

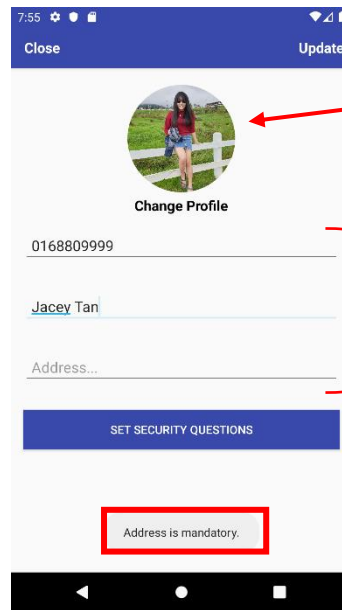


Figure 5.12b Empty profile address

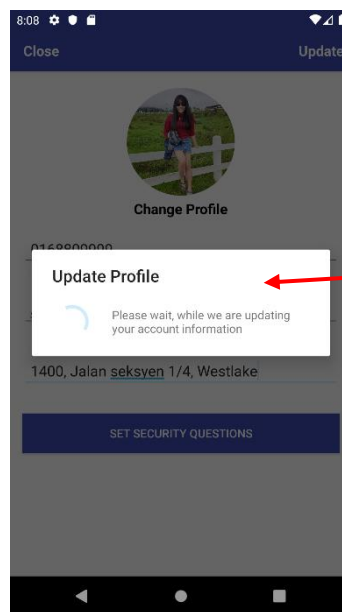


Figure 5.12c Update profile

Upload profile picture

Users required to enter phone number, name and address

Updating account information

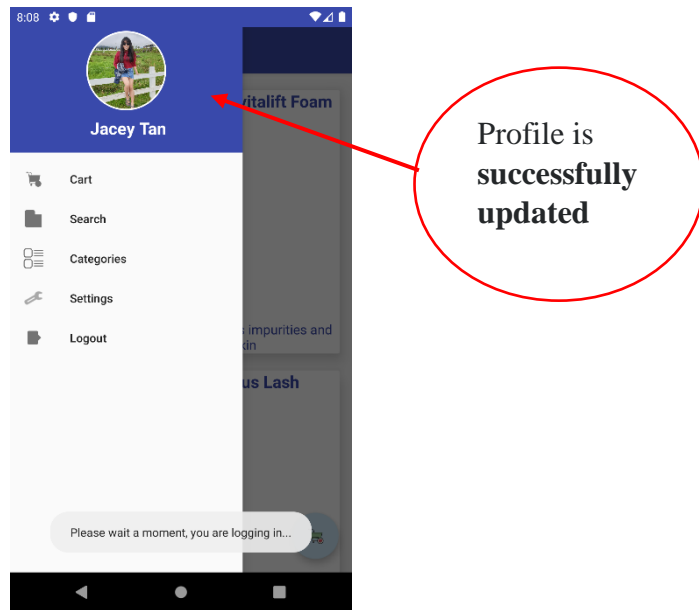


Figure 5.12d Profile updated

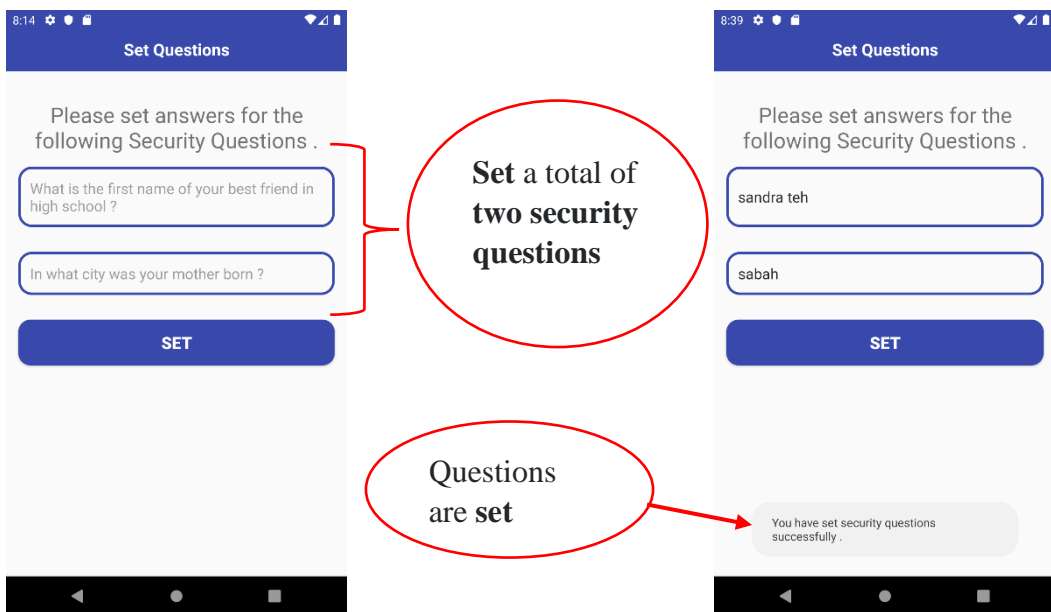


Figure 5.12e Security questions

Figure 5.12f Set questions

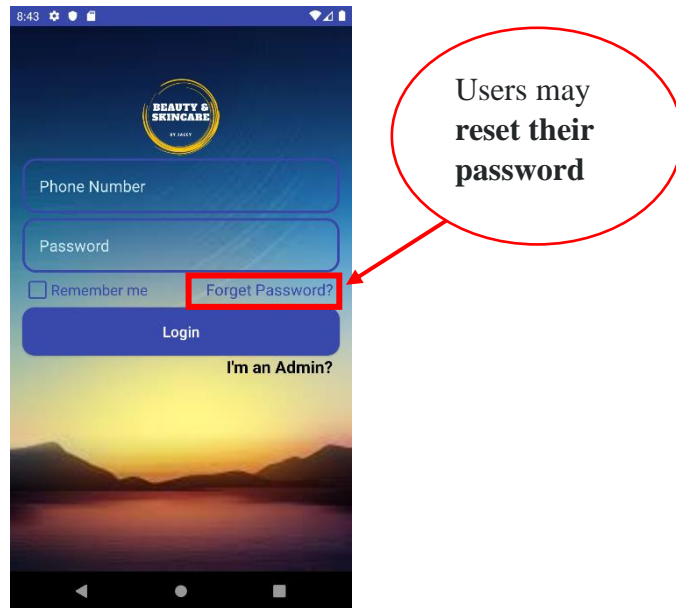


Figure 5.12g Forget password

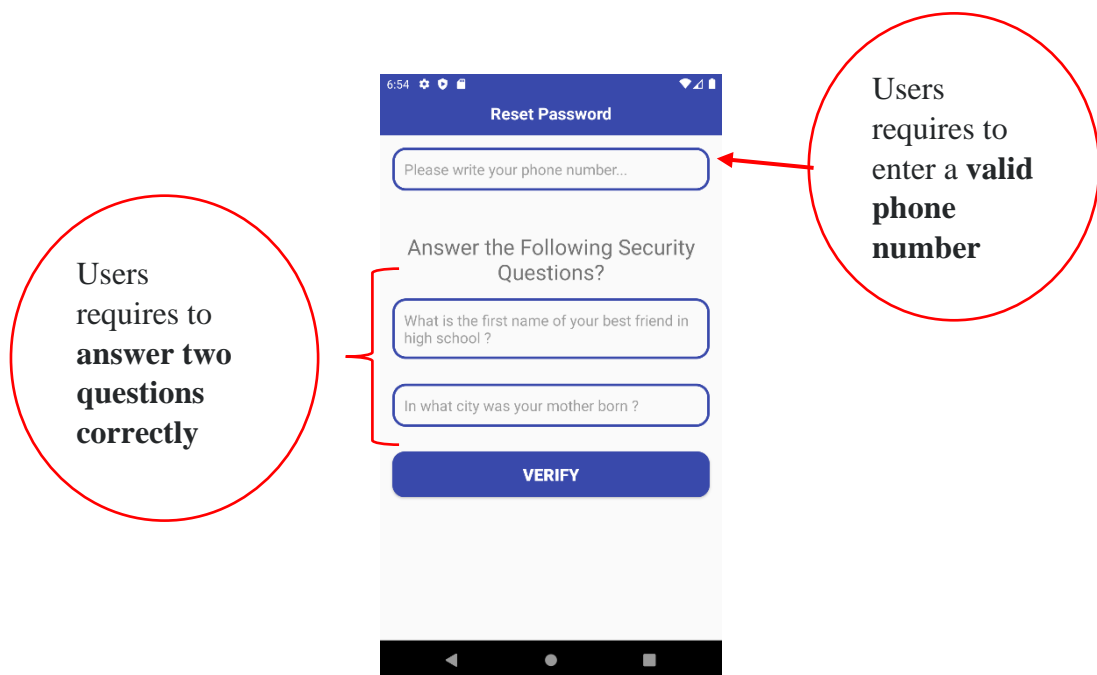


Figure 5.12h Reset password form



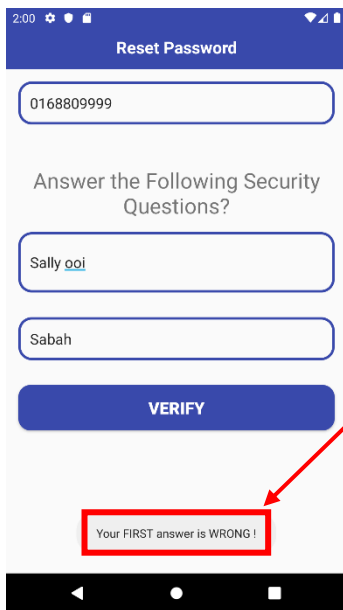


Figure 5.12i Wrong answer 1

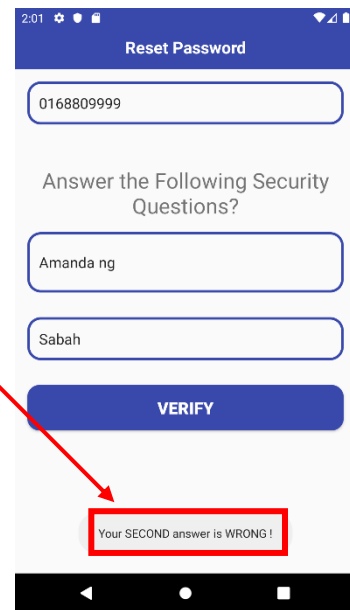
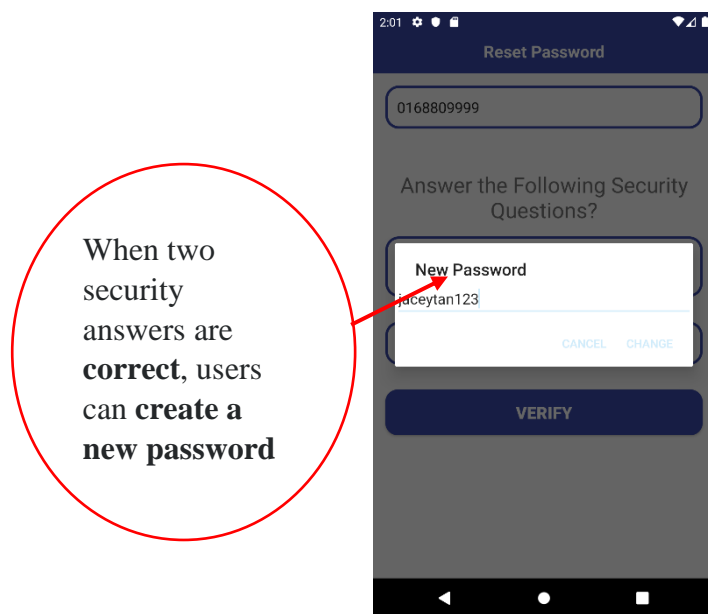
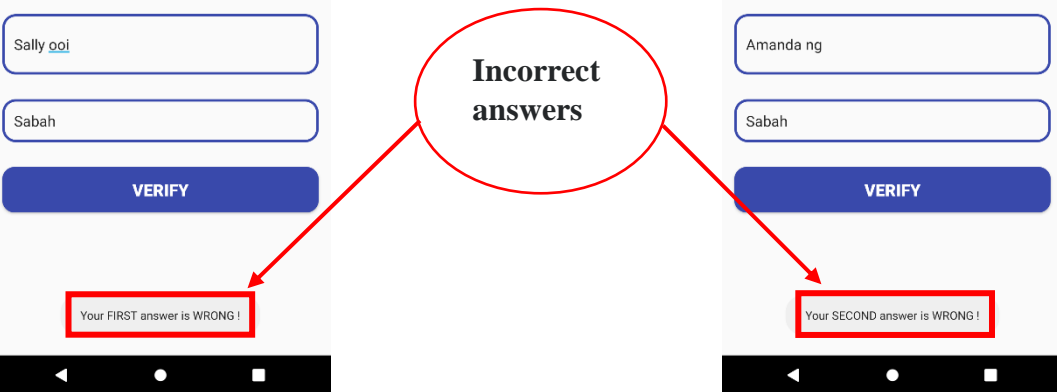


Figure 5.12j Wrong answer 2



When two security answers are **correct**, users can **create a new password**

Figure 5.12k New password

### Admin Login Page

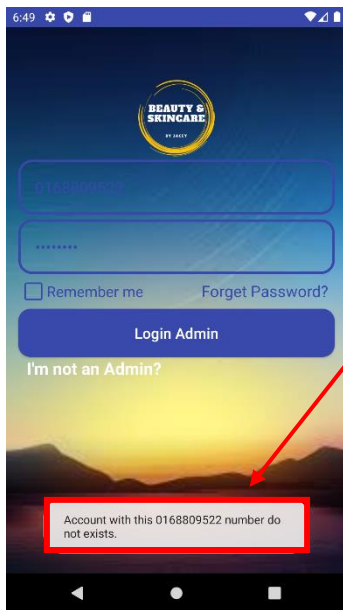


Figure 5.13 Invalid number

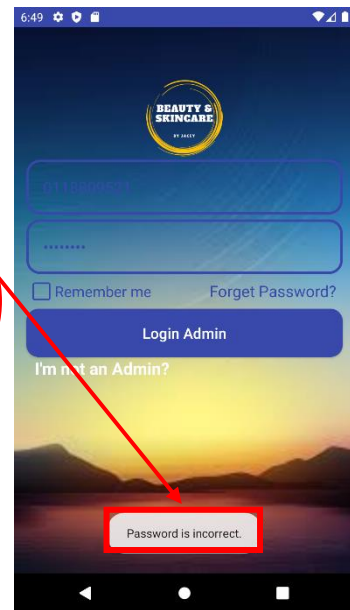


Figure 5.14 Invalid password

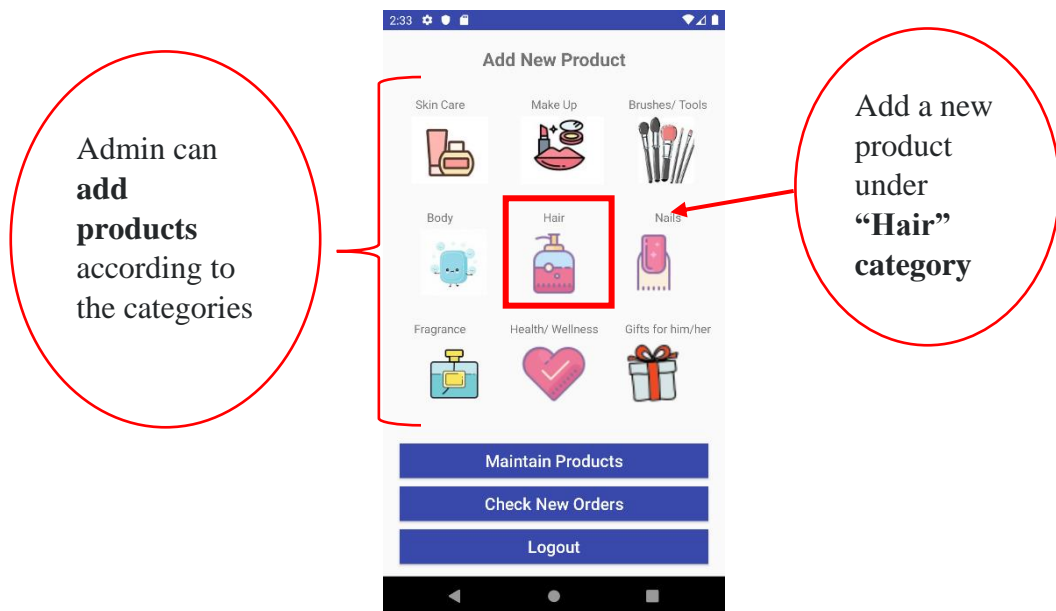


Figure 5.15 Add product

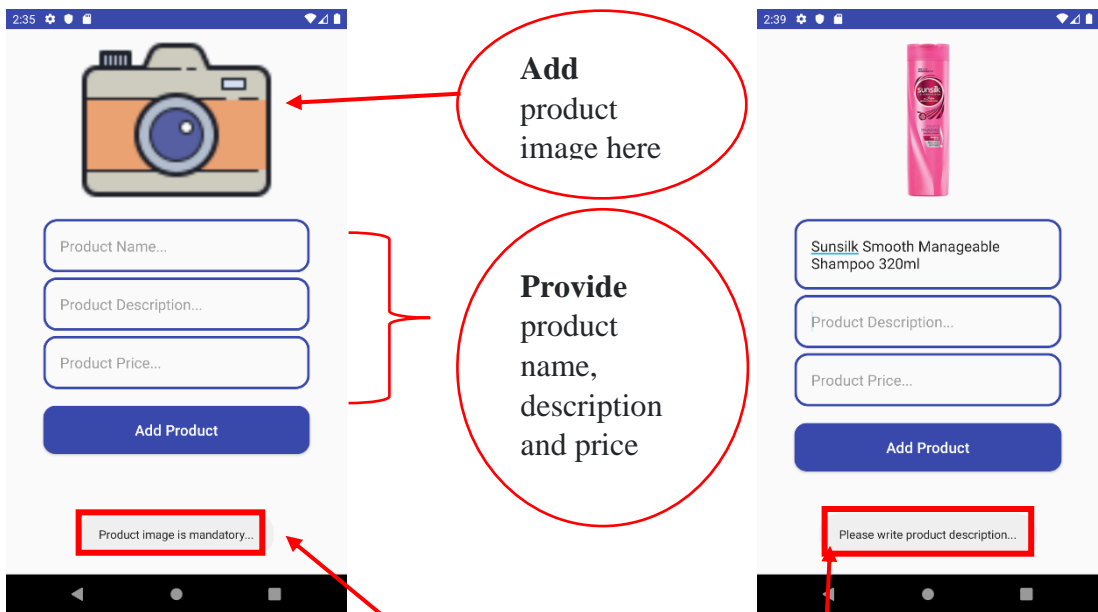


Figure 5.15a Add product image

Figure 5.15b Product description

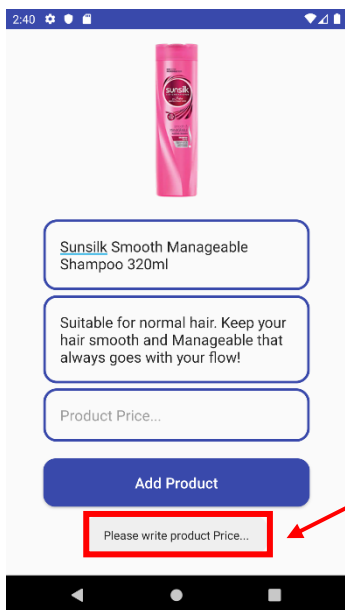
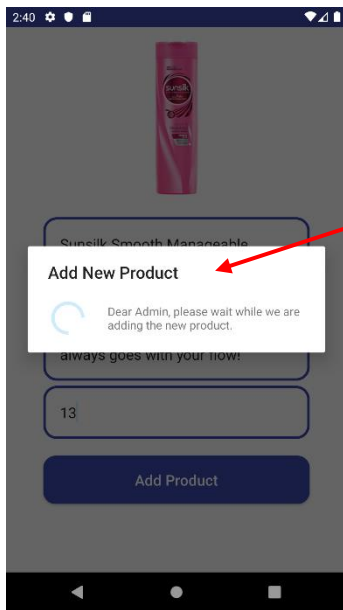


Figure 5.15c Product price

Product name,  
Product description,  
Product price  
**cannot be blank**



Adding new product

Successfully added product image to firebase storage

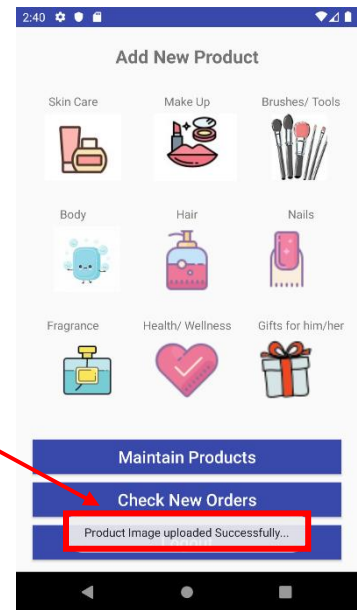


Figure 5.15e Add to storage

Figure 5.15d Product added

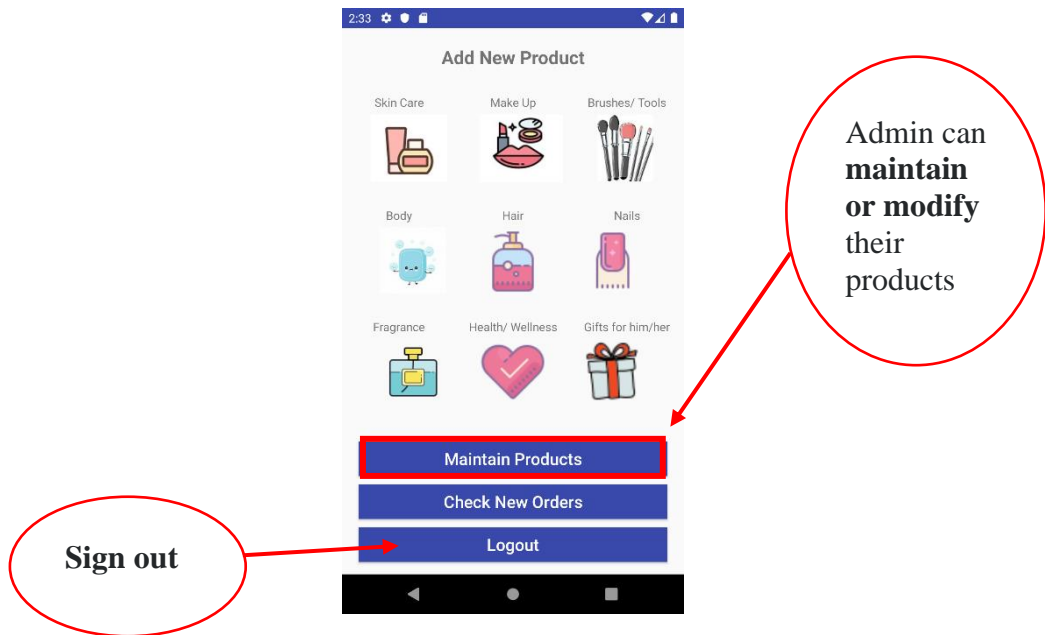


Figure 5.16 Maintain product

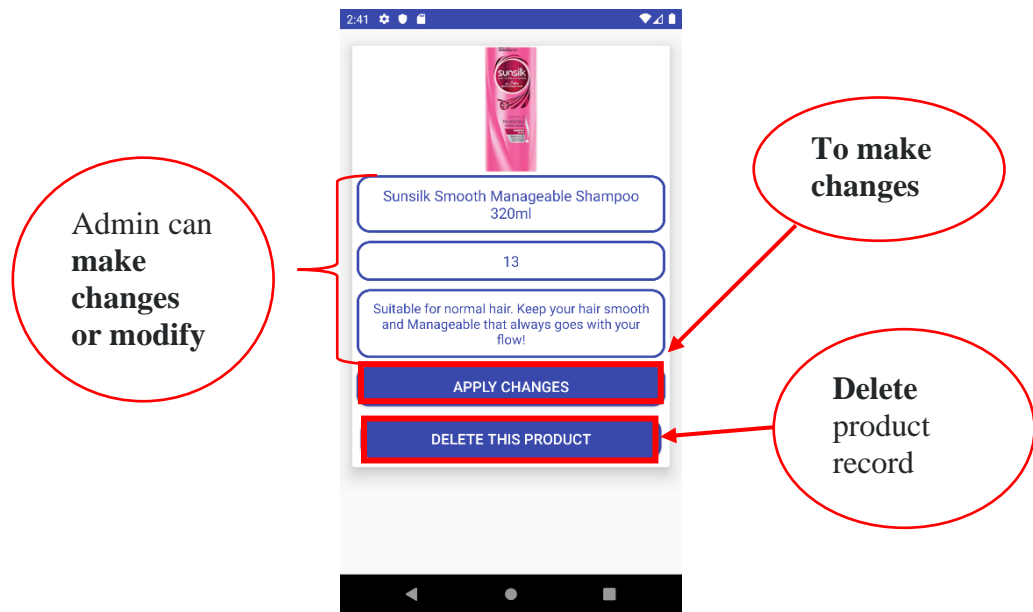


Figure 5.16a Preview product

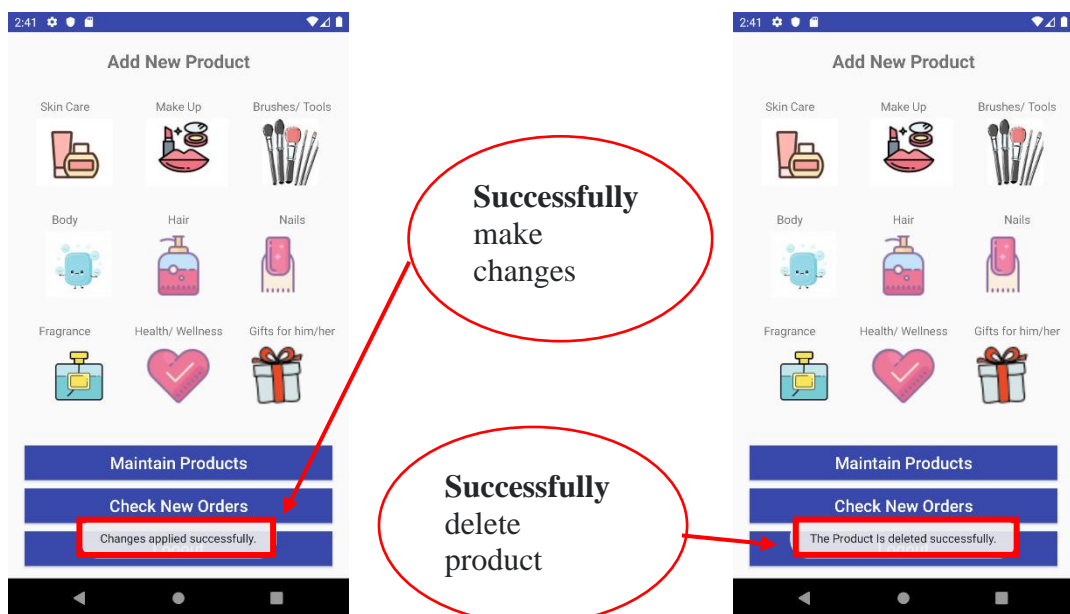


Figure 5.16b Makes changes

Figure 5.16c Delete product

## Chapter 5: Implementation and Testing

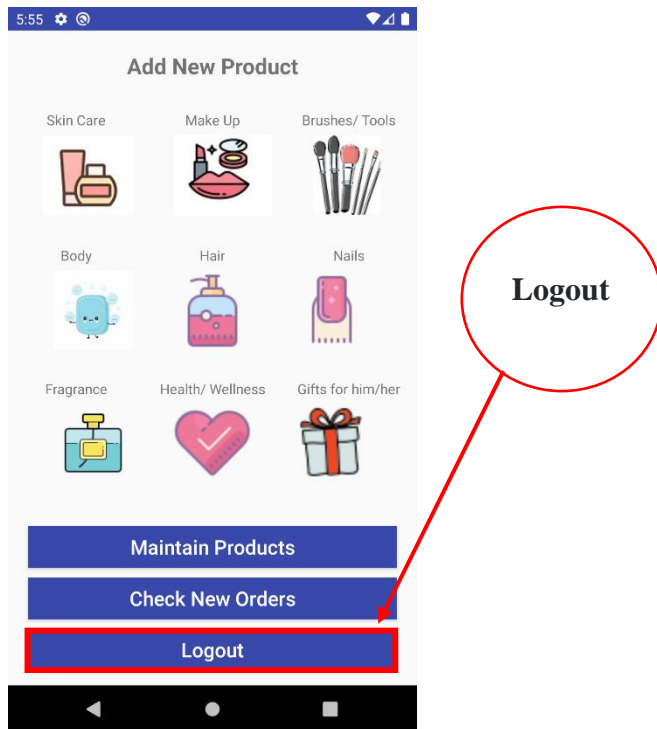


Figure 5.16d Admin logout

## **Chapter 6: Project Challenges and Future Improvements**

### **6.1 Implementation Issues and Challenges**

Following are the issues and challenges for the implementation phase of the project:

#### **6.1.1 Fragmentation issues**

Open source systems are vulnerable to fragmentation. Various types of mobile devices run on different versions of the Android operating system. Truly, it is quite hard to keep up with the changes. Usually, mobile devices fragmentation is associated with Android, with high fragmentation, it will impede timely access of new technologies. In addition, high software fragmentation will be able to screw up the entire mobile app infrastructure. In fact, it can be one of the challenges as Android is an open-source OS, different operating systems have different features which means it is difficult and hard to handle in a secure way. Fragmentation rates can reach as high as 99% during real-time application computing. Subsequently, it can result in program crashes or instabilities. It is important to cope with the supportability of Enterprise-critical software and make sure the version-specific issues can be solved to avoid fragmentation happen and destroy the online business.

#### **6.1.2 Consumes a huge RAM memory**

The project is develop using Android Studio software. 4GB Windows development machine will face a difficulty when implement their application using android studio software. Significantly, to run app with ease, it has to be at least 8 RAM on the system to prevent crashes and hangs due to lack of free space on the disk. Moreover, android emulator is performing much slower after updating. Hence, it is crucial to free physical RAM before launching android emulator.

### **6.1.3 Different types and brands of mobile devices and various screen sizes**

There are many android devices selling in the market, however different models have different screen size and pixels. In order to make sure the UI gracefully adapted to each screen sizes, there will be more hard works to do and to code. An app work perfectly on a smartphone does not mean it also work well on tablets. Resolution is also an important factor that contribute to the succeed of a mobile app because various screen resolution will affect how developers create their apps. If developers are not clear about the screen sizes and resolution of their devices, the developing mobile app will not be optimized for a variety of devices.

## **6.2 Conclusions and Future Improvements**

This e-Commerce project is developed to make contribution to users whom wish to buy beauty and skincare products from home without travelling. With the proposed system, users can save time because improved search engine allow users to search for a particular beauty and skincare products using keywords in a faster and easier way. Moreover, by moving the camera towards the products, it will recognize and classify those products in real-time. This project is motivated to make contribution to users by implement chatbot services that allow immediate or responsive communication with the users. Users can also get beauty advices and gift ideas by chatting with the trained machine bot or admin themselves. Besides that, this project designed a simple payment system that simply requires users to upload the bank receipt to proceed the checkout process. The main reason is to reduce friction in the checkout process. Lastly, they will receive tracking number from push notification and then start tracking their orders. With the proposed system, online purchasing beauty and skincare products just made so easy and faster.

In fact, this project has many ways to improve to motivate more users to start using this app to purchase their beauty and skincare products.

The best case is to integrate with current shop and rebate reward program to increase sales and in the same time maintain the current price point. Another idea is to add sharing features for the growing of site traffic by connecting to numerous of social



## Chapter 6: Project Challenges and Future Improvements

channel platform. Instead of searching product with keywords, it is more convenient if this project implements the filtered navigation that further help users to narrow down their product search.

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## Appendices

# FINAL YEAR PROJECT WEEKLY REPORT

(Project I / Project II)

<b>Trimester, Year:</b> Y3S2	<b>Study week no.:</b> WEEK 1-2
<b>Student Name &amp; ID:</b> TAN YEE SHIN 17ACB00873	
<b>Supervisor:</b> CIK NORAZIRA BINTI A JALIL	
<b>Project Title:</b> BEAUTY AND SKINCARE E-COMMERCE MOBILE APPLICATION WITH ADVANCED SEARCHING MODULE USING IMAGE PROCESSING	

### 1. WORK DONE

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

Meeting with supervisor to discuss about the works and tasks to be accomplish.

### 2. WORK TO BE DONE

Discuss in details with supervisor to make sure all problems pointed out during Final Year Project 1 can be solve.

### 3. PROBLEMS ENCOUNTERED

Problem statement and objectives are not clear or strong enough to support.

### 4. SELF EVALUATION OF THE PROGRESS

Keep working up and seek help from classmates and supervisor.



Supervisor's signature



Student's signature

## FINAL YEAR PROJECT WEEKLY REPORT

*(Project I / Project II)*

<b>Trimester, Year:</b> Y3S2	<b>Study week no.:</b> WEEK 3-4
<b>Student Name &amp; ID:</b> TAN YEE SHIN 17ACB00873	
<b>Supervisor:</b> CIK NORAZIRA BINTI A JALIL	
<b>Project Title:</b> BEAUTY AND SKINCARE E-COMMERCE MOBILE APPLICATION WITH ADVANCED SEARCHING MODULE USING IMAGE PROCESSING	

### 1. WORK DONE

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

Review all the problem statement and objective. Set up a timetable and manage time effectively.

### 2. WORK TO BE DONE

Test/QA every feature and function within the app. Understand how the app is going to work. Moreover, have an idea how the interface looks like.

### 3. PROBLEMS ENCOUNTERED

Emulator in android studio is not working. Sometime, the laptops might be lag due to the limited storage.

### 4. SELF EVALUATION OF THE PROGRESS

Get more hard drive storage for my PC and continue with the progress on development of project.





---

Supervisor's signature

---

Student's signature

# FINAL YEAR PROJECT WEEKLY REPORT

(Project I / Project II)

<b>Trimester, Year:</b> Y3S2	<b>Study week no.:</b> WEEK 5-6
<b>Student Name &amp; ID:</b> TAN YEE SHIN 17ACB00873	
<b>Supervisor:</b> CIK NORAZIRA BINTI A JALIL	
<b>Project Title:</b> BEAUTY AND SKINCARE E-COMMERCE MOBILE APPLICATION WITH ADVANCED SEARCHING MODULE USING IMAGE PROCESSING	

## 1. WORK DONE

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

Determine how the flow of the app when users interact with the app. Draw a block diagram on how the automation chatbot should be implement in order to enhance user experience.

## 2. WORK TO BE DONE

Searching and reading the article and journal from the google about the automation chatbot features. Understand how to use Dialogflow to build conversational features in the project.

## 3. PROBLEMS ENCOUNTERED

At the beginning, it might feel hard to code because lack of fundamental and knowledge about basics of intents when launching and managing conversations.

## 4. SELF EVALUATION OF THE PROGRESS

Self-learning from internet sources and finding related video tutorial on Youtube.



Supervisor's signature



Student's signature

## FINAL YEAR PROJECT WEEKLY REPORT

(Project I / Project II)

<b>Trimester, Year:</b> Y3S2	<b>Study week no.:</b> WEEK 7-8
<b>Student Name &amp; ID:</b> TAN YEE SHIN 17ACB00873	
<b>Supervisor:</b> CIK NORAZIRA BINTI A JALIL	
<b>Project Title:</b> BEAUTY AND SKINCARE E-COMMERCE MOBILE APPLICATION WITH ADVANCED SEARCHING MODULE USING IMAGE PROCESSING	

### 1. WORK DONE

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

Tring on a few bots and notice how the conversational patterns designed.

### 2. WORK TO BE DONE

Collect information in the internet sources and learn more about using rich message in custom bots.

### 3. PROBLEMS ENCOUNTERED

Kommunicate pricing starts at \$20.00 per month, per user.

### 4. SELF EVALUATION OF THE PROGRESS

Eligible developers can qualify for a free trial of 30days.



Supervisor's signature



Student's signature



## FINAL YEAR PROJECT WEEKLY REPORT

(Project I / Project II)

<b>Trimester, Year:</b> Y3S2	<b>Study week no.:</b> WEEK 9-10
<b>Student Name &amp; ID:</b> TAN YEE SHIN 17ACB00873	
<b>Supervisor:</b> CIK NORAZIRA BINTI A JALIL	
<b>Project Title:</b> BEAUTY AND SKINCARE E-COMMERCE MOBILE APPLICATION WITH ADVANCED SEARCHING MODULE USING IMAGE PROCESSING	

### 1. WORK DONE

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

Bots can handle all the incoming conversations and when unable to answer, they can assign conversion to humans. Test and run this automation conversation feature on mobile devices.

### 2. WORK TO BE DONE

Design and implement image processing technique such as image recognition, Optical character recognition and QR code scanning in the project.

### 3. PROBLEMS ENCOUNTERED

Having no knowledge of python make the developing of machine learning really hard to implement.

### 4. SELF EVALUATION OF THE PROGRESS

Seek solution on internet sources and getting some ideas on the article regarding machine learning and image processing technique.



Supervisor's signature



Student's signature

## FINAL YEAR PROJECT WEEKLY REPORT

(Project I / Project II)

<b>Trimester, Year:</b> Y3S2	<b>Study week no.:</b> WEEK 11-12
<b>Student Name &amp; ID:</b> TAN YEE SHIN 17ACB00873	
<b>Supervisor:</b> CIK NORAZIRA BINTI A JALIL	
<b>Project Title:</b> BEAUTY AND SKINCARE E-COMMERCE MOBILE APPLICATION WITH ADVANCED SEARCHING MODULE USING IMAGE PROCESSING	

### 1. WORK DONE

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

Start to create the app that can automatically detect objects in a provided image using Firebase MLKit. ML Kit makes it easy to apply ML techniques in the apps.

### 2. WORK TO BE DONE

Add more image processing features like Optical Character Recognition that used for the capture of invoice information such as invoice number.

### 3. PROBLEMS ENCOUNTERED

While trying to build or run the app, there is an error installing APK and application not responding error.

### 4. SELF EVALUATION OF THE PROGRESS

Searching for possible solution in stack overflow website.



Supervisor's signature



Student's signature

## FINAL YEAR PROJECT WEEKLY REPORT

(Project I / Project II)

<b>Trimester, Year:</b> Y3S2	<b>Study week no.:</b> WEEK 13-14
<b>Student Name &amp; ID:</b> TAN YEE SHIN 17ACB00873	
<b>Supervisor:</b> CIK NORAZIRA BINTI A JALIL	
<b>Project Title:</b> BEAUTY AND SKINCARE E-COMMERCE MOBILE APPLICATION WITH ADVANCED SEARCHING MODULE USING IMAGE PROCESSING	

### 1. WORK DONE

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

Conduct performance evaluation to improve the functionalities and the features of the app. Also, directly collect feedback from friends and supervisor after testing to run the app.

### 2. WORK TO BE DONE

Get the feedback from users by monitoring how they using the app to be able to identify and compare the expectation and the real-world results. Preparing for oral presentation.

### 3. PROBLEMS ENCOUNTERED

Using an old and unsupported version of Gradle. Furthermore, some test run configurations do not work.

### 4. SELF EVALUATION OF THE PROGRESS

Capable to solve problems on my own.



Supervisor's signature



Student's signature

# Poster



**Tools and Methodology**  
 The mobile application development use Android Studio as a tool and implement Agile Methodology for project management.

**Image Processing features:**

- Label detection
- Optical Character Recognition
- QR code Scanning

**Intelligent chat-based support:**

- Answer users' questions
- Human + bot hybrid 24/7 customer support

**DATA INTEGRITY**

**USABILITY**

**REACTION TIME**

**SECURITY**

**PERFORMANCE**

## [INTRODUCTION]

Beauty and Skincare E-commerce Mobile Application provide an online platform to sell or promote beauty and skincare products and allow users to shop at ease by using image processing technology.

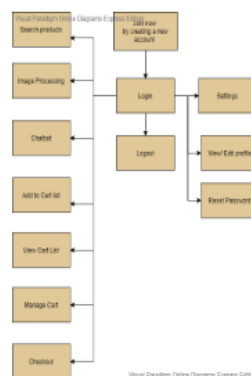
## [DISCUSSION]

The project has many ways to improve to motivate more users to start using this mobile application to purchase their beauty and skincare products.

## Objectives

- To identify various applications and features of the existing e-Commerce platform related to beauty and skincare products.
- To develop Beauty and Skincare E-commerce mobile application with advanced optical character recognition techniques and image processing services.
- To implement a chatbot to enhance customer experience by engaging with the conversational agent and human agent.

## [METHOD]



## [CONCLUSION]

This project design a mobile application that aims to provide a great convenience to any users whom wish to buy beauty and skincare products from home without travelling. This project highlights the features such as automation chatbot services, image processing technologies and so on to enhanced user experience.



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<b>ID Number(s)</b>	17ACB00873
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Signature of Supervisor

Name: CIK NORAZIRA BINTI A JALIL

Date: 11/09/2020

\_\_\_\_\_  
Signature of Co-Supervisor

Name:

Date:





**UNIVERSITI TUNKU ABDUL RAHMAN**



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

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