COMMUNITY PRICE SHARING AND PRICE COMPARING ON MOBILE APPLICATION

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DECLARATION OF ORIGINALITY

I declare that this report entitled" **COMMUNITY PRICE SHARING AND PRICE COMPARING ON MOBILE APPLICATION**" is my own work except as cited in the references. The report has not been accepted for any degree and is not being submitted concurrently in candidature for any degree or other award.

Signature :   _____

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ABSTRACTS

This project is a mobile application for the purpose of community price sharing and price comparing on mobile application. This project aims to solve problem like no existing e-marketplace apps consists of community, sharing to community function, manual registration and etc. This project going to solve all these problems with several functions.

This application allow user to promote their business online and a platform for user interacts with other user in the platform. This project focuses on community price sharing which user shares price with other user. Besides, it also allows user to compare the product price among the users in the platform. This projects will focus developing community and also product function. Examples of community function are adding friend, deleting friend, comment and etc. Product function allow user to add, update, delete products. These function will solve the problem faced by existing application.

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CHAPTER 1 INTRODUCTION

1.1 Project Inspiration

This project is going to develop a mobile application which named as 'Store Hunter'. Store Hunter is an online advertising platform to help consumers to spend money wisely and at the same time this is also a platform for people to advertise their products. This application will show different prices so that consumer can compare them and then make a decision. It also has a community feature to connect users in this application and allow them to add friend, share products, follow store, mark products and so on. The targeted users of this application are Malaysians who prefer to buy product at the physical store instead of online buying. The main reason for developing this project is to benefit people in spending lesser money with product comparison. This project is inspired by the consumer behavior in Malaysia. Malaysian need an application to compare price before purchasing goods. According to the findings from part of Nielsen's Global Survey of Consumer Shopping Behavior, Malaysian is quite sensitive to price in purchasing product, with four fifths saying price is the most important factor in their purchasing decision. (Warc,2013) This project is needed by the society because currently there are less application similar to it.

This chapter is an introduction of this project. First of all, project background will be discussed in detail with example given. Next, problem domain will be discussed in detailed as well. After problem domain, it will discuss on people who face the problem as stated in the problem domain. Lastly, importance of problem will be discussed and this chapter will be ended with a chapter summary.

1.2 Project Background

In year 2007, an evolutionary mobile device was introduced to the world by Apple, and it was iPhone. This mobile device is a smartphone because it has a system with running apps which can be downloaded from App Store. Functional phone in mobile industry has been replaced by smartphone. Today, three main system in mobile devices are iOS by Apple, Android by Google and Windows by Microsoft. These three operating system has it owns advantages and disadvantages. According to Statista website, the number of available application of iOS, Android, and Windows are respectively 1.4 million, 1.5 million and 0.3millon. (Statista,2015). People life was totally changed by smartphone. People now less often communicate with sending SMS, they tend to use instant messaging which required Internet connection like Whatapps or Wechat. Other than that, GPS is integrated in smartphone so that smartphone users can use navigation application to go wherever they want to go.

Today, online business should not rely on website, it should focus on mobile platform as well. According to Mobile Marketing Statistic 2015, number of mobile users has first time exceed number of computer user. Besides, according to mobile analytics vendor Flurry, 80% of mobile media time is spent on application instead of browser. (Danyl Bosomworth,2015). In Malaysia, mobile usage is higher than computer usage with the percentage of 51% and 39%. This is why online business should develop mobile application to stay prosper in the market. Having a mobile application in customer smartphone because customer can always get the latest information from the push notification.

Malaysian are sensitive to price in purchasing goods. Therefore, there are few mobile application in market are doing promoting and comparing price. One of the existing mobile application is Smart Shopper. This application displays products from different retailers like AEON, Econsave, Giant, Tesco and so on with price. Another application is BigSale Malaysia which display all promotion of products and services. These application will be discussed in detailed in literature review.

In conclusion, this project is going to develop Store Hunter on Android mobile platform. The duration of this project will be 1 years and it will finish by May 2016.

1.3 Problem domain

There are several problem faced by consumers in purchasing goods. Existing application like SmartShopper and BigSale Malaysia could not help much in solving their problem. Those problem are below:

1.3.1 No community in existing application

There is no community features in existing application. For instance, one of the existing application SmartShopper can only share to Wechat community, it has no community in its own application. There is a problem here. Users share to Wechat community will mix with those Wechat information. It creates inconvenience if user want to search back the shared product in Wechat next time because of too many unrelated information.

1.3.2 Users could not track certain product for price tracking

Users of existing application cannot track particular product price. Tracking product price is important because users are sensitive to the price. For example, when users are interested in some product, users might save it into wishlist it and then wait for it to have promotion. Besides, if user could not monitor the price, users are hard to compare the price because users cannot keep track or record the price in application.

1.3.3. Registration and updates are done by application developer

Store Hunter is a platform for consumers to look for promotion and at the same time it needs people to upload product on this platform. However, with the existing application, for advertiser who want to promote, they need to personally contact the application developer to request registration. Moreover, if advertisers want to update, they need to send update to application developer and wait for application developer to update.

1.3.4 Existing application does not have price comparing function
Existing application like BigSale Malaysia application does not provide price comparing function. If user wants find out the cheapest product in the platform, user could not do that. Price comparing is a feature that helps user to find out the competitive price and benefit user so that user will only stick to the application.

1.4 Project Objective

The main objective of this project is to solve the problem mention in the previous chapter. At the end of this project, these objectives will be refer to review this project.

1.4.1 Community is created for user to share information

Store Hunter will allow people to share information in this application. Information is shared to the community in this application instead of sharing to other application like Wechat. For every product, there is a share button for user to share. Users are able to share to their profile. Sharing here means to share product price to friend.

1.4.2 There is a button for user to track product price if product price drops

This feature will give users a better shop experience because the product prices are monitored in user application. Users are able to add this product into a wishlist for monitoring purpose. Once the price of product has changes, users are able to see it in the wishlist panel.

1.4.3 Users are able to manually register an account and manage account by themselves

Users are allowed to register an account so that they can creates an online store to promote their product or business. The registration is a simple form with a register button. After clicking the register button, users will get an account and start creating stores. Besides, product in the online store can be managed by users themselves. Maintaining stores like adding, updating, and deleting products are controlled by users.

1.4.4 There is a button for user to compare product price

This feature will help user to save money because price comparing can help user to find out the best deal in the platform. User just needs to press on the compare button, then Store Hunter will return user with the similar product and with the price.

1.5 Project Scope

Store Hunter is an online promoting platform to help consumers to spend money wisely and at the same time this is also a platform for advertiser to promote their products. This project requires a computer with running Microsoft Windows operating system. This project will be developed on Android mobile platform with tools such as Android Studio, PHP and Apache. This project will be finished at the end of May2016.

This project mainly focus on two big modules which are community module and market module. For community module, it has manage profile, manage news feed module, commenting and liking module, notification module and sharing module. For market module, it has maintaining products and store module, search module, add to wishlist, price comparing and add to cart module.

Community-profile

Profile is a very important part in this mobile application. It always helps you to know what other sharing, thinking, and looking for. For example, one of your friends share some product which is doing promotion, it might be something that the user has been looking for long time. Before start using this, this application requires user to register before using it. Therefore, user can perform adding friend, deleting friend, track product price and add product to cart. Adding friend and deleting friend are about managing relationship with friend in this community. Friend is defined as a user in this community. Friend can be user's real friends and family or even a stranger in this network. For advertisers who want to promote product in this platform, they must register account before doing this. After that, other users in this network can search advertisers in this community and also add them as friend.

Community-news feed module

News feed module means how to display user shared post to friends. There are two category of information: friend post and family post. In this project, there will be an algorithm to display and filter out information. Family post will be displayed first and followed by friend post.

Community-commenting and liking module

Commenting and liking means users can comment and rate on the post. This commenting and liking module helps to build the community better because users can interact with other users. For instance, if user A shares something, user B will be able to see it and comment or like it.

Community-notification module

Users will receive notification where there is other user in the community add them. Notification will let user see the friend request and user can perform next action such as accepting friend.

Community-sharing module

User can share product to his or her home page so that friend or family can see that product in their news feed. However, if a stranger visit that user profile will not able to see what user shares due to privacy. Besides, users can comment or like on the post shared by friend.

Product-managing products and store module

This module is about managing advertiser's product and store information. Advertiser can create new products in his or her store with a photo, description and detailed information. Advertiser also need to provide products price and store information such as address and contact number. Besides, advertiser can delete or update products. For instance, if the price of vegetable changes, advertiser can just update it by modifying the price of products.

Product-search module

This module requires user input to search for a product in database. The return results will be product information or user information.

Product-add to cart module

This module will store the product which user is planning to buy so that when user visit the store, this cart will display to user what he or she needs to buy. Add to cart feature will

allow user to delete if user accidentally adds wrong product into the list. Beside, product in the list has a button that allow user to open navigation apps to go to the place of the shop.

Product-compare price module

This module allows user to compare price. Users can compare price on products. For example, user can compare a product with other similar product in the platform.

1.6 Impact, Significance and Contribution

This project will give impact to advertiser and Malaysian. This project allows advertiser to advertise their product in a centralized advertising platform where everyone comes here to look for products. This project will ease the use of mobile application in advertising because user has control to add, update, delete product anytime. Advertisers do not need to request developer when they want to do changes in application

As mentioned above, Malaysian are sensitive to price. This application give much impact to them because they need a price comparison tool in their live. This application gives portability to user because user can check the price anytime at anywhere. In addition of comparing the price, user can also share the low price to other people in the network by adding them as friends. It would benefit users because other people would share him the promotion price next time.

This project is attractive to the people because it is likely to be the first one who merges the technology of community and online advertising platform together in an application. It makes online advertising tool more powerful with the community module.

1.7 Chapter summary

This chapter has discussed on the project inspiration, the idea of this project. Project background has also been discussed with the overall information of the project. Next, project problem has been discussed with three problem. Project objective is discussed after project problem where it has 3 objective for the future to review the success of this project. Project scope has been discussed as well with the functionality of this application. Impact, significance and contribution briefly discussed about people who benefit from this project and what impact will be given to people.

CHAPTER 2 LITERATURE REVIEW ON COMMUNITY SHARING PRICE AND PRICE COMPARING ON MOBILE APPLICATION

2.1 Chapter Overview

This chapter will discuss on the purpose of this project. 4 existing or similar applications will be discussed with strengths and weaknesses. This project would position Store Hunter as mobile advertising application. There are several articles have been reviewed on this title. After reviewing those articles, they totally give inspiration to this project to come out with features that consumers want to see.

2.2 Method to solve the problem

There are other developers in the market come out with some solution to solve the problem.

- Users could not track certain product price

    Carousell is an application for people to shop. It has a simple shopping application with delivery service. This application could solve this problem because it has a feature of liking a product. After users like particular product, users can check back on its user profile to see what product has been liked before. Besides, the price of the product is also shown clearly there.

2.3 Community Network

Community sharing price is a big module in this project. So, what is community? Community here is defined as a platform for a group of users having a same interest which share the reasonable price of product with the other users. Example of community are Facebook, Twitter, LinkedIn, Youtube and etc. According to the research conducted by researchers from Rice University, they have analyzed the major characteristics of those very large online social networks. However, there are only 2 characteristic are useful in this project.

1) User-based: The difference between websites and online social network is, websites depend on the content that was updated by one user and read by Internet visitors. The updates in the websites are determined by the webmaster. On the other hand,

contents in online social network are determined by users in the social network. The network would be an empty space without the existence of the users. The network is made up by users instead of one person, due to this it makes the social networks so much more exciting and dynamic for internet users.

2) Interactive: Another characteristic of a successful social network is interactive. Social network is not only chatting and forums anymore. Social network like Facebook now has become a game platform for people to play game.

2.4 Mobile Advertising

Before the introduction of mobile advertising, online advertising has to be introduced first because they are related. Online advertising is a means of delivering promotional messages to consumer through Internet. Mobile advertising is actually a subset of online advertising. However, mobile advertising is a form of online advertising which takes place in mobile phone environment. Mobile advertising is defined as a form of advertising with mobile (wireless) phones or other mobile devices. Mobile advertising has many ways to do it, such as mobile web advertising, SMS advertising, MMS advertising, mobile video and TV advertising and mobile application advertising. The most common mobile advertising is displaying banner in the application or a full screen of advertisement in the middle of using application.

Mobile advertising has been in existence for long time ago. In year 1993, the first clickable web advertisement or online banner advertisement was sold to a Silicon Valley law firm by a website call Global Network Navigator. In year 1994, the first SMS text message was sent from one person to another person in Finland. In Year 1997, Finnish news provider provided free news headlines through SMS. In Year 2000, the first mobile advertising conference took place in London, hosted by Wireless Marketing Association. In Year 2010, Apple releases its mobile advertising platform called iAd. At the same year, the size of the U.S mobile advertising market increases to USD 1.45 billion. In year 2011, mobile services revenue exceeded USD 1 trillion for the first time. In Year 2012, smartphone has become one of the quickest spreading information method in history, with 50% of US people own smartphone.(KnowOnlineAdvertising.com,ND)

Mobile advertising today means much more than sending message to consumers. (Fredrik Helander, 2010). Due to the tremendous increase in number of smartphone users, mobile advertising has much more potential in smartphone application. The increased smartphone adoption causes an increase in mobile browsing. For instance, Europe is expected to have smartphone penetration rate of 92% in the year 2014. (Fredrik Helander, 2010). At the same year, mobile browsing is expected to exceed PC browsing. (Fredrik Helander,2010). In addition, according to the TAPSENSE, a complete guide to mobile marketing for 2014 report, it shows that smartphone owner spend an average of 127 minutes in application per day. In comparison, the average amount of time spent with newspaper is merely 22 minutes.

2.5 Online Store

Hence, what are the characteristics of a good online store for people to advertise product? How do characteristics influence consumer to make impulsive buying decision? There are three factors which affect consumer buying decision: product selection, reasonable priced selection, good user interface design. Online store managers can stimulate impulse purchases by investing in product selection and enjoyable online store experiences. (Tibert Verhagen and Willemijn van Dolen, ND). Another factors to influence consumer to buy products is a large, reasonable priced selection, which is sorted by the interests of most visitors, stimulates positive effect and diminished negative effect, and it might lead to impulse buying. Next, the factor that makes consumers to spend more time with the online store is through an attractive, funny site, which makes consumers feel pleasure to browse through, gives visitors' positive emotions to stay longer in the application. As one realizes that online store merchandise and online store enjoyment have been demonstrated to influence rational purchases as well.(H. Van der Heijden and T.Verhagen, 2004)

In this project, Store Hunter is categorized as mobile application advertisement because it provides an online store for consumers to advertise their products. They do not need to look for a vendor to help them to display advertisement in other application. Store Hunter will be still doing advertisement but there is difference with the advertisement mentioned above. The mobile advertisement above is advertisement sent by vendor to

consumer mobile phone through SMS or MMS. However, Store Hunter is an interactive advertisement platform where people can opt to advertise on this platform and view advertisement from the application.

2.6 Existing application in the market

In this section, four existing application will be reviewed in order to compare their features to innovate this project. Four existing application are MSSP Discover, Deals Malaysia, Smartprix and MySmartPrice. MSSP Discover is an application allows members to search, view, and locate nearby participant merchants in this application to look for any discounts promoted by the advertisers. Deals Malaysia is promoting doing on daily deals and group buying aggregator in the region. This application helps you to find the deals that you want and allows you to see the promotion. Smartprix and MySmartPrice are application from India. Both of them are categorized as price comparing software. However, they do have online buying to allow consumers buy online.

2.6.1 MSSP Discover

The content in MSSP is more to services instead of products. Therefore, automotive, beauty, entertainment, fashion, F&B, and so on. This application requires internet connection to fetch data from its server to display to user. MSSP is an application about discount and offers. In this application, every stores also offers discount like 10 percent or 2 percent.
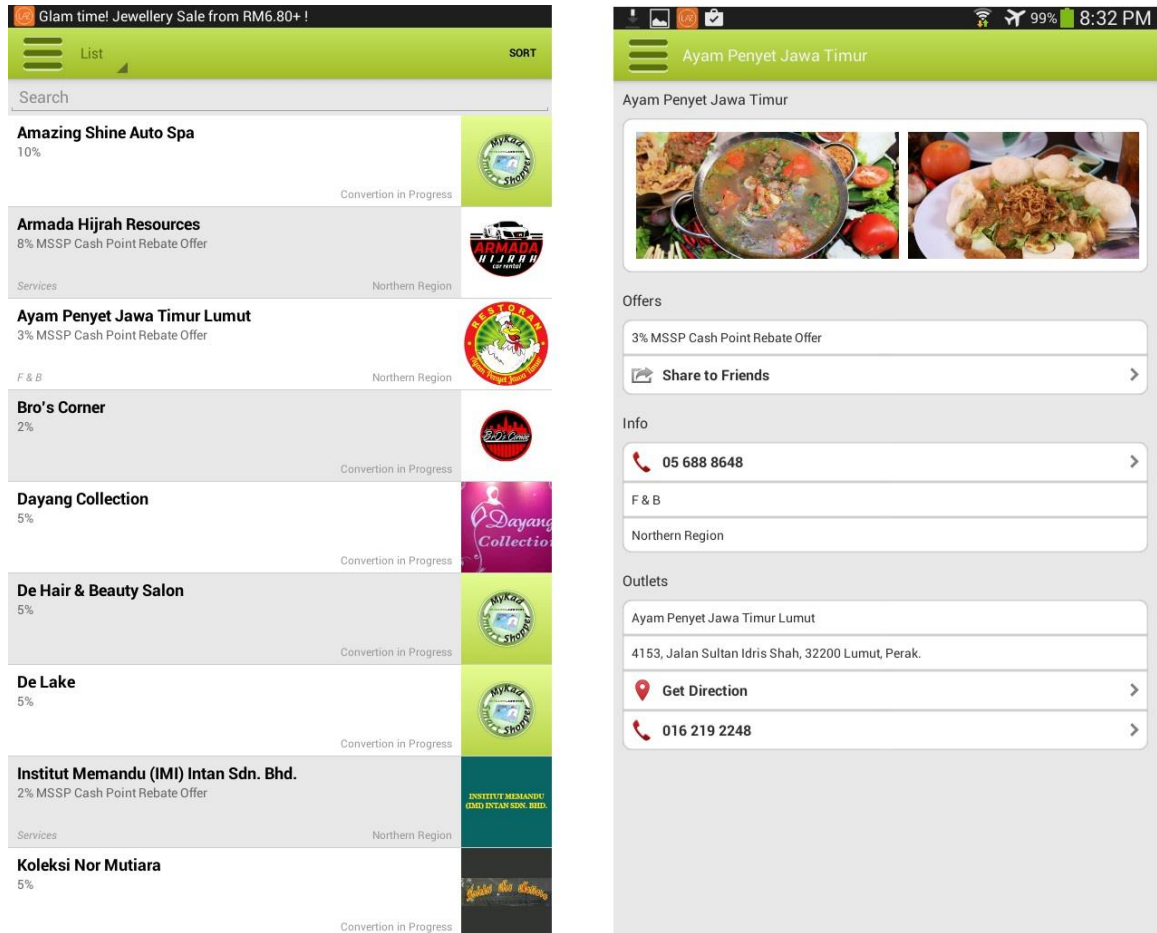
Figure 2-6- 1 Screenshot of MSSP Discover

Strengths

    i.   <u>Services are divided into region</u>

        This application gather services from different region in Malaysia. Therefore, users can view these services based on the location like central region, east coast, east Malaysia, northern region, and southern region.

    ii.   <u>Services are also divided into category</u>

        This application divides all services into category. In addition, these category also contain many product inside which gives user more alternative choices to see.

Weaknesses

    i.   <u>Only services, no product available in this application</u>

        Users can only find services with offer or promotion, they could not find those product like daily supplies, clothes, furniture in this application.

2.6.2 Deals Malaysia

Deals Malaysia is a platform to promote products on streetdeal.my, Groupon, Lazada and others online shopping website. Deals Malaysia covers products and services. This application does not provide online buying and it is just a promoting application.
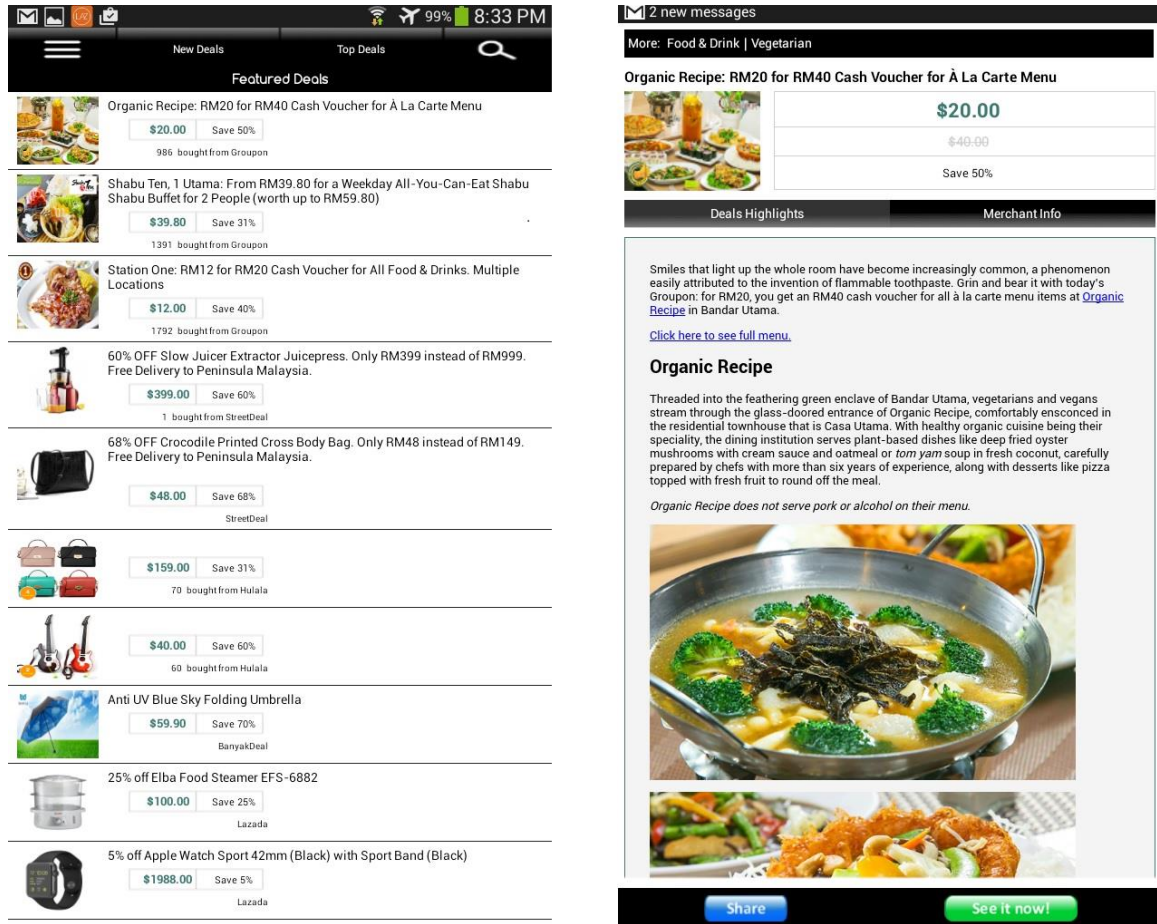
Figure 2-6- 2 Screenshot of Deals Malaysia

Strength

i. <u>Easily find deals in this application</u>

This application has many products and the promotion is great also. Furthermore, there are New Deals tab and Top Deals tab. New Deals shows the latest deals to users. Top Deals shows 100 most popular deals in this application so that users so that people can know what other people are buying.

ii. <u>The information given is adequate</u>

When users press on the product, it will display the deals hightlights to user with a very detail description. Besides, it will also show users the merchant info so that users can easily contact with the merchant. Merchant info are restaurant name, address which are enough for users to drive to that place to buy this services or products.

Weaknesses

i. <u>The currency is confusing</u>

The currency in this application is confusing because this application is using $(dollar sign) but this is selling products to Malaysian. Therefore, first time users might think that this application is oversea which is unable to buy in Malaysia. MYR should be used as a currency unit here.

ii. <u>Some information is linked to other website</u>

Although the information is adequate, there are still some product needs to link to other website which requires users to run browser to get extra information. Extra information should be displayed together in the application.

2.6.3 Smartprix

Smartprix is a price comparison application in India. This application compares prices online across all online stores like Flipkart, Amazon, Snapdeal, Jabong, Myntra, Infibeam, eBay, PayTM, Shopclues and many core. This application has different categories of item, and most of the item are digital products such as mobile phones, laptop, camera and etc.
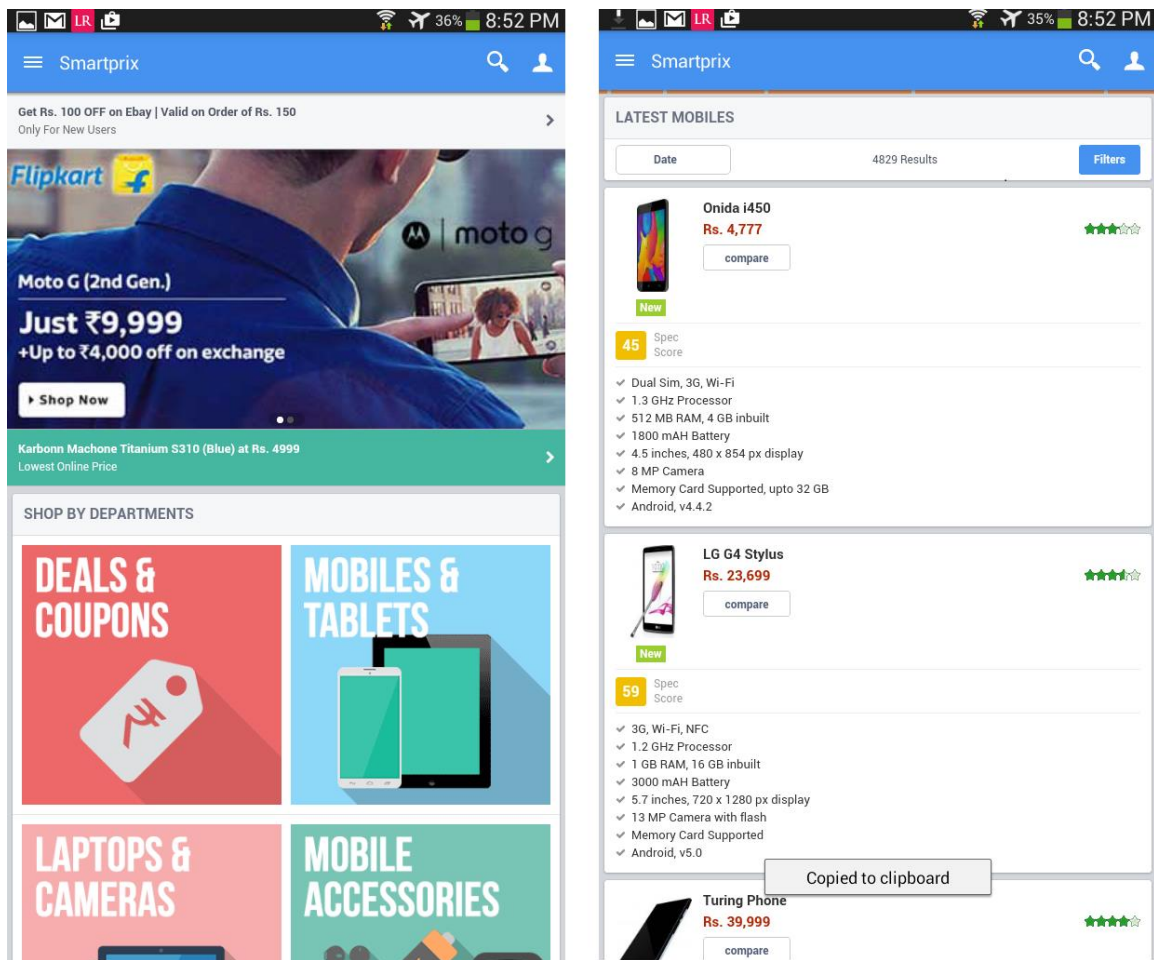
Figure 2-6- 3 Screenshot of Smartprix application

Strength

i. Price alert feature

This application allows user to select product and put in price alert list. After users set a price alert for a particular product, whenever the price drops, he or she will get an alert on his or her email.

ii. Powerful product comparison

This application allows user to compare price, it also allows user to compare specification. For instance, comparing two smartphone, this application shows the prices of two smartphone and the specification of each smartphone. Besides, it also highlights the best specifications of each smartphone. In addition, it also shows you the ranking, specification score, and operating of this system.

Weaknesses

i. Less products category in this application

This application only have 5 categories of product which are mobiles and accessories, laptops and accessories, cameras and accessories, beauty and personal care and book an media. It does not have other popular product such as man and woman clothing, furniture, car accessories and etc

2.6.4 MySmartPrice

MySmartPrice is a price comparison application in India. This application compares prices across 100s shopping sites including Flipkart, Amazon, Snapdeal, Myntra, Jabong, EBay, Paytm, Shopclues, Rediff shopping, and etc.
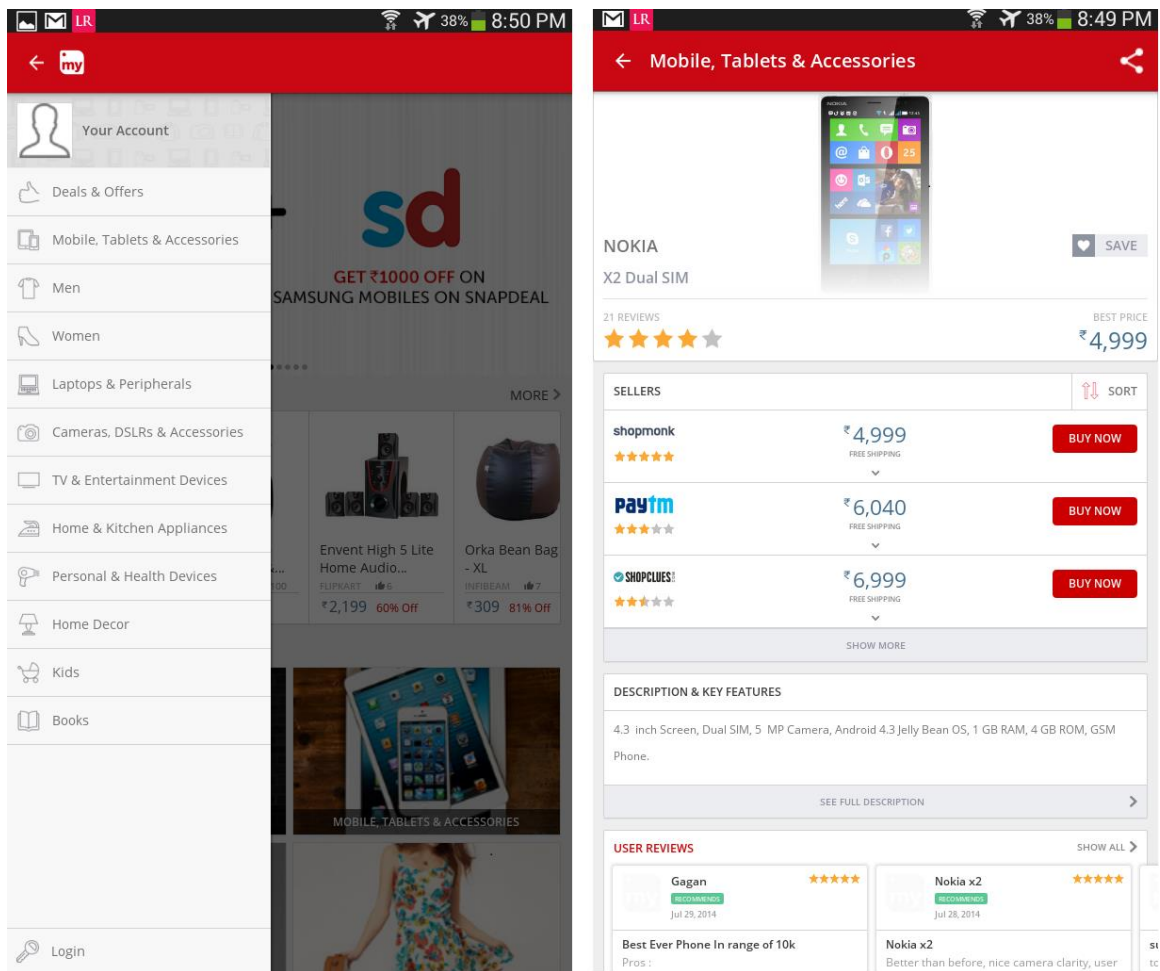
Figure 2-6- 4 Screenshot of MySmartPrice application

Strength

    i.   <u>Automated price comparison</u>

        This application automatically shows prices of other advertiser to user whenever user view product in the application. Other store prices will be displayed under the product. Besides, it also provides a "Buy Now" button for user to ease the buying process.

    ii.   <u>Price Graph</u>

        Price graph is a feature to display the history of price. The increase/decrease of price is shown in the graph with the price at y-axis and month at x-axis. Users can clearly see the flow of the price and it helps user in making buying decision.

    iii.   <u>Large category of product</u>

        MySmartPrice offers large category of product. The product in category ranged from digital products, clothing, home & kitchen appliances, personal & health devices and so on.

Weaknesses

    i.   <u>Price alert feature is not that good</u>

        After user set alert for certain item, user cannot trace back what product is set. A good implementation of price alert feature should have a list for user to see what product has been set alert.

    ii.   <u>Price graph</u>

        Price graph is a strength of this application because it is a very unique feature which other applications do not have. However, it can be a weakness because not all the product in this application has price graph. Only certain product has price graph where other product do not have.

2.7 Comparison

Criteria	MSSP Discover	Deal Malaysia	SmartPrix	MySmartPrice
Registration	✔	✘	✘	✔
Sharing product	✘	✔	✔	✔
GUI design	✔	✔	✔	✔
Photos available	✔	✔	✔	✔
Program performance	✔	✔	✔	✔
Adequate information	✘	✔	✔	✔
Adequate product	✘	✔	✘	✔
Adequate Category	✘	✔	✘	✔
Add stores to favourite	✘	✘	✘	✘
Add product to favourite	✘	✘	✘	✘
Online purchasing	✘	✘	✔	✔
Chat feature	✘	✘	✘	✘
Comment feature	✘	✘	✔	✘
Rating feature	✘	✘	✔	✔
Search feature	✔	✔	✔	✔
Malaysia currency	✔	✘	✘	✘

User friendliness	✖	✖	✔	✔
Delivery products	✖	✖	✔	✔
Price alert	✖	✖	✔	✔
Compare price	✖	✖	✔	✔
Price graph	✖	✖	✖	✔

Table 2-7-T1: Comparison table of two existing application

2.8 Conclusion

Each application has different features. There are common features like displaying photos, searching and good GUI design. Therefore, in this project, these common features are confirmed to appear in the mobile application.

2.9 Chapter Summary

This chapter has discussed on how other people solve the problem in the method to solve the problem. Next, community network is discussed also with reviewing on other journal. The following section also discussed on mobile advertising which talked about the history and benefit of this. Online store has also been discussed with the characteristics for a good online store. Next, there are four existing systems have been discussed, they are MSSP Discover, Deals Malaysia, Smartprix and MySmartPrice. After reviewing four existing system, there were a table to compare the features of each application.

CHAPTER 3 METHODOLOGY ON COMMUNITY PRICE SHARING AND PRICE COMPARING ON MOBILE APPLICATION

3.1 Chapter Overview

In this chapter, the methodology used in the project will be discussed with the real situation. It does not only explain the function of each phases, it also explains how it applies them.

3.2 Software methodology

The software methodology used in developing this project is Phased Development. Phased Development breaks the application requirement into several chunk, and it will develop them sequentially. The most important feature will be developed first in the project. Phased Development model is suitable to this project because it can prioritize the feature to ensure that the first version of application consists of the most useful feature. The following phases will develop features that less priority. Phased Development have multiple version of a system in short development cycles. At the end of each version, system will be reviewed so that developers know what component is needed in the next version.
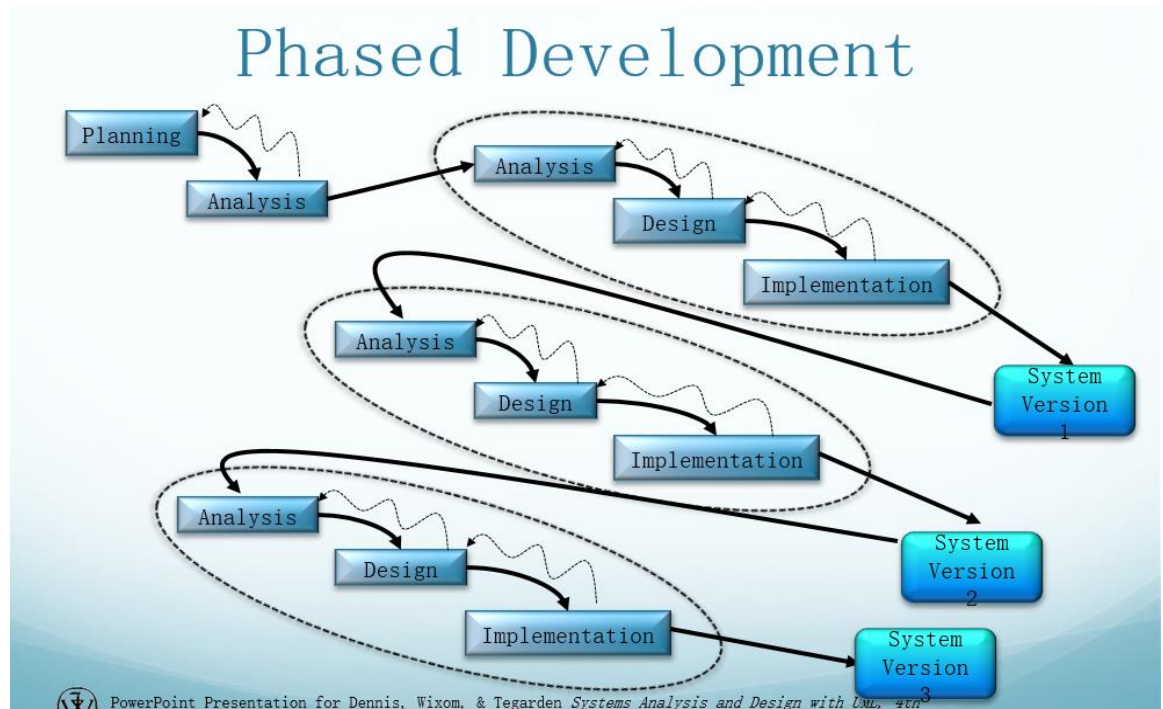
Figure 3-2- 1 Phased Development

How Phased Development methodology is used in this project?

There are three system version in this project. The flow of phased development in this project is Planning, Analysis, System Version 1, System Version 2, System Version 3. Detail of each phase will be discussed below.

Planning

The duration of this project is one year. It is from 1 June 2015 – 30th May. In the planning phase, the first activity is conducting research. At the beginning of project, project developer must do some research on the topic that going to be developed. For example, why does this project develop in mobile platform? What is online store? and etc. Next, observing consumer needs means what people want in the market. For example, people might need price comparison in the application. After that, analyze other existing application to see what other people are doing in the market. Next one will be discussing with supervisor. Supervisor will point out the strength and weaknesses of the idea generated by project developer. After deciding title, project developer needs to prepare

system proposal. Submit system proposal after that. The last activity is to modify system proposal if changes are needed.

Analysis

This phase will analyze the problem faced by consumers. For example, some existing application in the market is not good enough. Next, from analysis of existing system, project developer come out with functional requirement to overcome the problem. After that, write a FYP1 report. Discussion with supervisor will be done in the middle of doing FYP1 report. Before submitting FYP1 report, project developer will let supervisor to check through the report before submitting up. The last activity is to submit FYP1 report.

Development of System Version 1

Analysis (Version 1)

The first analysis here is to analyze how to do online database. What technology is required to host an online database. Next, do some research online to find out how does user interface look attractive to users.

Design (Version 1)

Design system database is a very important part in design phase in system version 1. The beginning of the project is to work on database. This is because without database, it cannot let other part of the project function. Besides, after analysis of network technology, project developer needs to design his own network architecture of the system. For instance, should this project use self-hosting method or shared-hosting? . Next, create working data model. Then, design user interface of application. The last activity in design phase is discussion with supervisor

Implementation (Version 1)

Project developer will start coding on developing network. For instance, use server-side programming to develop online hosting. Next, start coding on user interface in Android Studio. After that, review system and discuss with supervisor. Next, convert prototype into current complete version of application. It means that, make those user interface works

with the back end code. For example, this application allows user to register an account online. Test the application on mobile devices. If any bugs or error found, conduct the troubleshooting and fix the bugs. Last activity will be update all documentation.

Development of System Version 2

Analysis (Version 2)

Study the review of version 1. Share this application with friends and family. Listen to their review. Next, analyze on second important feature.

Design (Version 2)

Design the database needed by second important feature. After that, design the user interface of second important feature. Last activity of this phase is discussion with supervisor.

Implementation (Version 2)

Same as implementation in System Version 1. Developing user interface comes first. After this, develop the functionality which is the back end code. After that, review the system. Check those features again and reduce the chance of getting bugs or error. Next, discuss with supervisor. Convert the prototype in to current complete version of application. After that install the application in mobile device. Conduct troubleshooting if any bugs or errors found. Last activity of this phase is update all documentation.

Development of System Version 3

Analysis (Version 3)

Study the review of version 2. Share this application with friends and family and ask for the feedback. Then changes can be applied if project developer think they are needed. Since this is the last phase, analyze the rest of the features stated in the report. Analyze on overall project requirement. This is to make sure all the features mentioned are developed.

Design (Version 3)

Design the database again. This is because the database design before might not perfectly suit the feature that will be developed soon. Design the user interface of features. Last activity in this phase is discussion with supervisor.

Implementation (Version 3)

Same as previous implementation, developing user interface first. Next, do the functionality of this feature. Next, review the system to reduce the chances of getting bugs and error. Next, discuss with supervisor. Then, convert prototype into current complete version of application. Now test the application on mobile device. Next, conduct troubleshooting if bugs or error found. Then, update all documentation and finalized them. After that, hand over the final system and FYP2 report to supervisor.

3.3 Project Timeline and grantt chart

ID	Task Mode	Task Name	Duration	Start	Finish	Predecessors
1		Store Hunter system	230 days	Mon 6/1/15	Fri 4/15/16	
2		**Planning**	**20 days**	**Mon 6/1/15**	**Fri 6/26/15**	
3		Conduct research	2 days	Mon 6/1/15	Tue 6/2/15	
4		Observe consumer needs	2 days	Wed 6/3/15	Thu 6/4/15	3
5		Analyse other application	2 days	Fri 6/5/15	Mon 6/8/15	4
6		Discuss with supervisor	1 day	Tue 6/9/15	Tue 6/9/15	5
7		Conduct feasibility analysis	1 day	Wed 6/10/15	Wed 6/10/15	6
8		Prioritize project request	1 day	Thu 6/11/15	Thu 6/11/15	7
9		Allocate resource	1 day	Fri 6/12/15	Fri 6/12/15	8
10		Prepare system proposal	7 days	Mon 6/15/15	Tue 6/23/15	9
11		Submit system proposal for checking	1 day	Wed 6/24/15	Wed 6/24/15	10
12		Modify system proposal if changes are needed	2 days	Thu 6/25/15	Fri 6/26/15	11
13		**Analysis (overall system)**	**16 days**	**Mon 6/29/15**	**Mon 7/20/15**	**12**
14		Study the problem faced by consumer	2 days	Mon 6/29/15	Tue 6/30/15	
15		Model current system	1 day	Wed 7/1/15	Wed 7/1/15	14
16		Analyze functional requirements	1 day	Thu 7/2/15	Thu 7/2/15	15
17		Write FYP1 report	10 days	Fri 7/3/15	Thu 7/16/15	16
18		Discuss with supervisor	1 day	Fri 7/17/15	Fri 7/17/15	17
19		Modify FYP1 report if changes are needed	1 day	Fri 7/17/15	Fri 7/17/15	17
20		Submit FYP1 report	1 day	Mon 7/20/15	Mon 7/20/15	18

Figure 3-3- 1 Project timeline 1

21		Development of System version 1	60 days	Tue 7/21/15	Mon 10/12/15	20
22		Analysis(Version 1)	10 days	Tue 7/21/15	Mon 8/3/15	
23		Analyze database	5 days	Tue 7/21/15	Mon 7/27/15	
24		Analyze user preference of GUI	5 days	Tue 7/28/15	Mon 8/3/15	23
25		Design(Version 1)	15 days	Tue 8/4/15	Mon 8/24/15	22
26		Conduct research	2 days	Tue 8/4/15	Wed 8/5/15	
27		Design system database	2 days	Thu 8/6/15	Fri 8/7/15	26
28		Design network architecture of system	4 days	Mon 8/10/15	Thu 8/13/15	27
29		Create working data model	2 days	Fri 8/14/15	Mon 8/17/15	28
30		Convert data model into functional database	2 days	Tue 8/18/15	Wed 8/19/15	29
31		Design user interface of application	2 days	Thu 8/20/15	Fri 8/21/15	30
32		Discuss with supervisor	1 day	Mon 8/24/15	Mon 8/24/15	31
33		Implementation	34 days	Tue 8/25/1	Fri 10/9/15	25
34		Develop network architecture	3 days	Tue 8/25/15	Thu 8/27/15	
35		Develop user interface	8 days	Fri 8/28/15	Tue 9/8/15	34
36		Review the system	3 days	Wed 9/9/15	Fri 9/11/15	35
37		Discuss with supervisor	3 days	Mon 9/14/15	Wed 9/16/15	36
38		Convert prototype into current complete version of application	10 days	Thu 9/17/15	Wed 9/30/15	37
39		Test application on mobile device	3 days	Thu 10/1/15	Mon 10/5/15	38
40		Conduct the troubleshooting	2 days	Tue 10/6/15	Wed 10/7/15	39
41		Update all documentation	2 days	Thu 10/8/15	Fri 10/9/15	40

Figure 3-3- 2 Project timeline 2

42		Development of System version 2	46 days	Tue 10/13/	Tue 12/15/15	21
43		Analysis(Version 2)	5 days	Tue 10/13/	Mon 10/19/15	
44		Study the review of version 1	2 days	Tue 10/13/1	Wed 10/14/15	
45		Analyze on second feature	3 days	Thu 10/15/1	Mon 10/19/15	44
46		Design(Version 2)	7 days	Tue 10/20/	Wed 10/28/15	43
47		Conduct research	2 days	Tue 10/20/1	Wed 10/21/15	
48		Design system database	2 days	Thu 10/22/1	Fri 10/23/15	47
49		Design user interface of application	2 days	Mon 10/26/1	Tue 10/27/15	48
50		Discuss with supervisor	1 day	Wed 10/28/1	Wed 10/28/15	49
51		Implementation(Version 2)	34 days	Thu 10/29/	Tue 12/15/15	46
52		Develop user interface	8 days	Thu 10/29/1	Mon 11/9/15	
53		Develop functionality	3 days	Tue 11/10/1	Thu 11/12/15	52
54		Review the system	3 days	Fri 11/13/1	Tue 11/17/15	53
55		Discuss with supervisor	3 days	Wed 11/18/1	Fri 11/20/15	54
56		Convert prototype into current complete version of application	10 days	Mon 11/23/15	Fri 12/4/15	55
57		Test application on mobile device	3 days	Mon 12/7/15	Wed 12/9/15	56
58		Conduct the troubleshooting	2 days	Thu 12/10/1	Fri 12/11/15	57
59		Update all documentation	2 days	Mon 12/14/1	Tue 12/15/15	58

Figure 3-3- 3 Project timeline 3

60		Development of System version 3	120 days	Wed 12/16/	Tue 5/31/16	42
61		Analysis (overall system)	10 days	Wed 12/16/	Tue 12/29/15	
62		Study the review of version 2	2 days	Wed 12/16/1	Thu 12/17/15	
63		Analyze on all other features	3 days	Fri 12/18/1	Tue 12/22/15	62
64		Analyze on overall project requirement	5 days	Wed 12/23/1	Tue 12/29/15	63
65		Design(Version 3)	7 days	Wed 12/30/	Thu 1/7/16	61
66		Conduct research	2 days	Wed 12/30/1	Thu 12/31/15	
67		Design system database	2 days	Fri 1/1/16	Mon 1/4/16	66
68		Design user interface of application	2 days	Tue 1/5/16	Wed 1/6/16	67
69		Discuss with supervisor	1 day	Thu 1/7/16	Thu 1/7/16	68
70		Implementation(Version 3)	69 days	Fri 1/8/16	Wed 4/13/16	65
71		Develop user interface	20 days	Fri 1/8/16	Thu 2/4/16	
72		Develop functionality	3 days	Fri 2/5/16	Tue 2/9/16	71
73		Review the system	3 days	Wed 2/10/16	Fri 2/12/16	72
74		Discuss with supervisor	3 days	Mon 2/15/16	Wed 2/17/16	73
75		Convert prototype into current complete version of application	30 days	Thu 2/18/16	Wed 3/30/16	74
76		Test application on mobile device	3 days	Thu 3/31/16	Mon 4/4/16	75
77		Conduct the troubleshooting	2 days	Tue 4/5/16	Wed 4/6/16	76
78		Update all documentation	2 days	Thu 4/7/16	Fri 4/8/16	77
79		Finalize all documentation involved	2 days	Mon 4/11/16	Tue 4/12/16	78
80		Hand over final system deliverable	1 day	Wed 4/13/16	Wed 4/13/16	79
81		Hand in FYP2	1 day	Wed 4/13/16	Wed 4/13/16	79

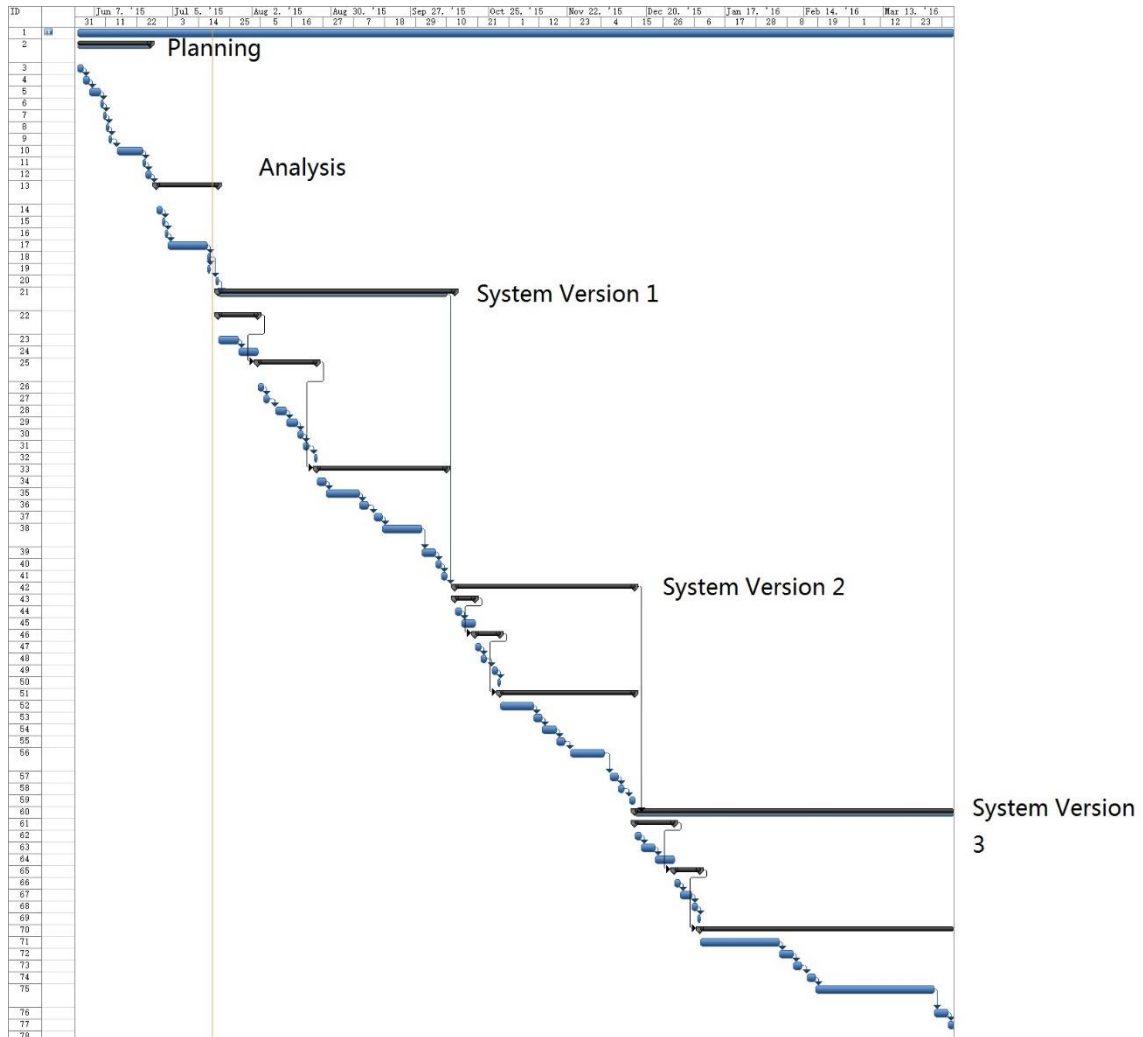Figure 3-3- 4 Project timeline 4

Figure 3-3- 5 Grantt chart

3.4 System Analysis

3.4.1 Functional Requirement

<u>User registration</u>

- The system shall let everyone to register themselves under registration page.

- The system shall validate the username to avoid same username in system

- The system shall ask user to enter all required information in registration form.

- The system shall alert users if error found in form.

- The system shall save and update if the users successfully create an account.

<u>User Login</u>

- The system shall let member to login
- The system shall check the login information

<u>Manage profile</u>

- The system shall let user to add other account as friend.
- The system shall let user to delete friend in friend list.
- The system shall let user to choose other user as friend or family.

<u>Manage news feed</u>

- The system shall let user to refresh the news feed
- The system shall display family post first then only friend post.

<u>Search products or stores</u>

- The system shall let user to search products or user.

<u>Make comment</u>

- The system shall let user to make comment on friend post.
- The system shall save the comment and update the database.

<u>Make liking</u>

- The system shall let user to make liking on friend postl
- The system shall automatically save the rating.

<u>Manage notifications</u>

- The system shall display user notification.
- The system shall allow user to view notification.

<u>Share information</u>

- The system shall allow user to share product information.
- The system shall allow user to share on his profile.

- The system shall save the shared information in database.

Manage store

- The system shall allow store owner to update the store.
- The system shall save the changes and update the database.

Manage product

- The system shall allow user to add product in the store.
- The system shall allow user to delete product in the store.
- The system shall allow user to update product in the store.
- The system shall provide form for user to perform add and update product
- The system shall save the form in the database.

Compare price

- The system shall automatically display the prices from other online store once user clicks on particular product.
- The system shall display similar product only.

Add to cart

- The system shall allow user to add product to the cart.
- The system shall automatically save product in the database.

Add to wishlist

- The system shall allow user to add product in wish list.
- The system shall automatically save product in the database.

3.4.2 Non Functional Requirements

Operational Requirements

- The system should operate in Android platform.
- The system should work with internet connection.

- The system should use session technology and cache in order to save memory consumption.

Performance Requirements.

- The system should retrieve the information from database within 5 seconds.
- The system should not have fatal error during run time.

Usability Requirements

- The system should be user friendly and ease of use.
- The system should have less keyboard input.

3.4.1 Software Requirement

In order to complete this project, several software have been selected to be used along the development process

i.   Android Studio
    a. This is a software to develop this Android application.
ii. MySQL database
    a. This is a DMBS(Database Management System) that host the database of Store Hunter.
iii. Visual Paradigm Community
    a. This is a software for developer to draw diagrams while doing documentation. This software is used to draw class diagram, activity diagram, use case and object diagram.

3.4.2 Hardware requirement for computer

Hardware	Minimum Requirement	Recommended Requirement
CPU	1 Cores	4 Cores or more
Random Access Memory	2GB RAM	4GB RAM
Disk space	10GB	-

Table 3-4-2-T1: Hardware requirement table

3.4.3 Hardware requirement for testing on mobile phone

Hardware	Minimum Requirement
CPU	Dual cores and above
Random Access Memory	1GB RAM
Disk space	10MB
Internet Connection	Yes
Android minimum version	Android 4.0

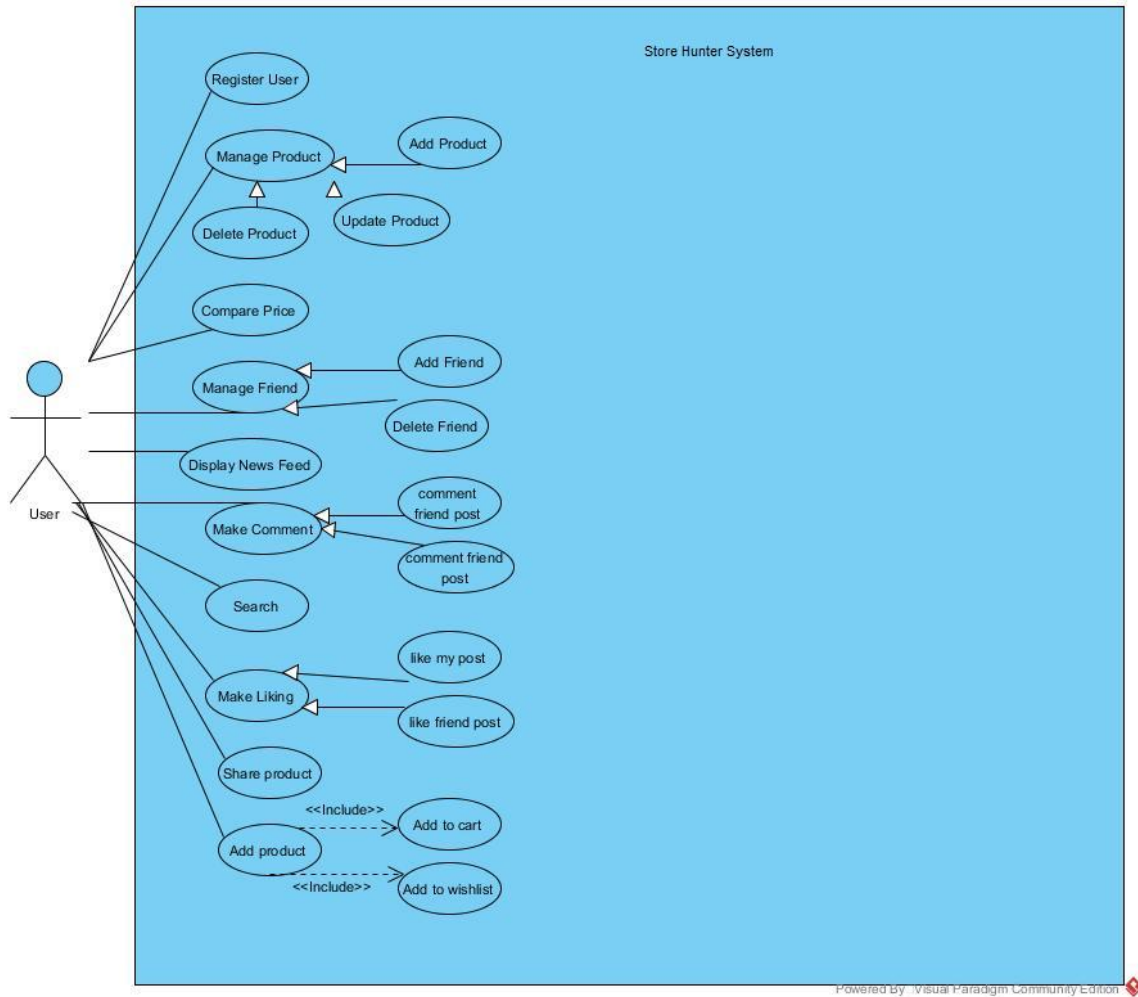Table 3-4-3-T1: Hardware requirement for testing on mobile phone

3.4.4 Use case diagram

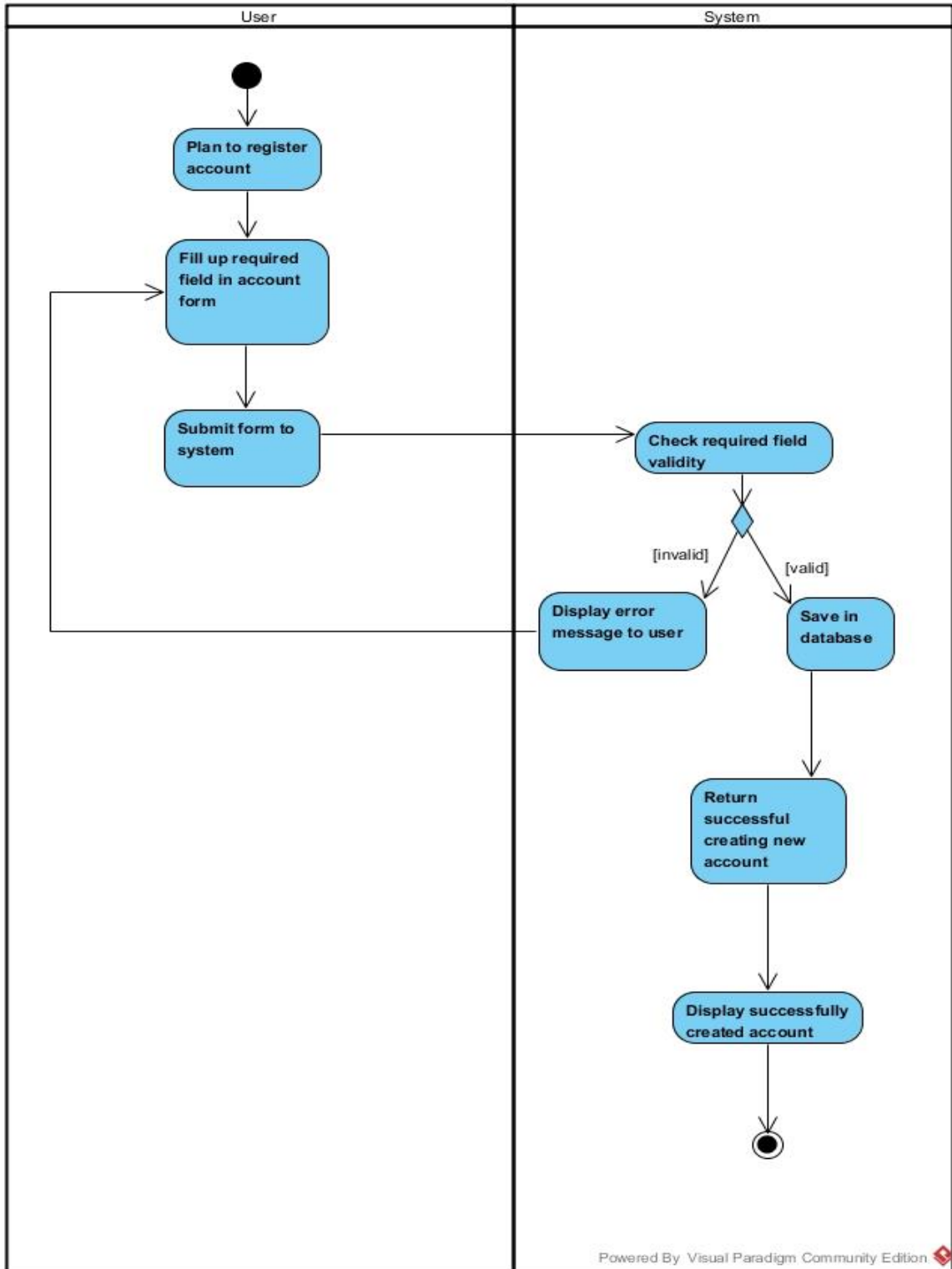Figure 3-4-4-1 Use case diagram of Store Hunter

3. 4.5Activity diagram

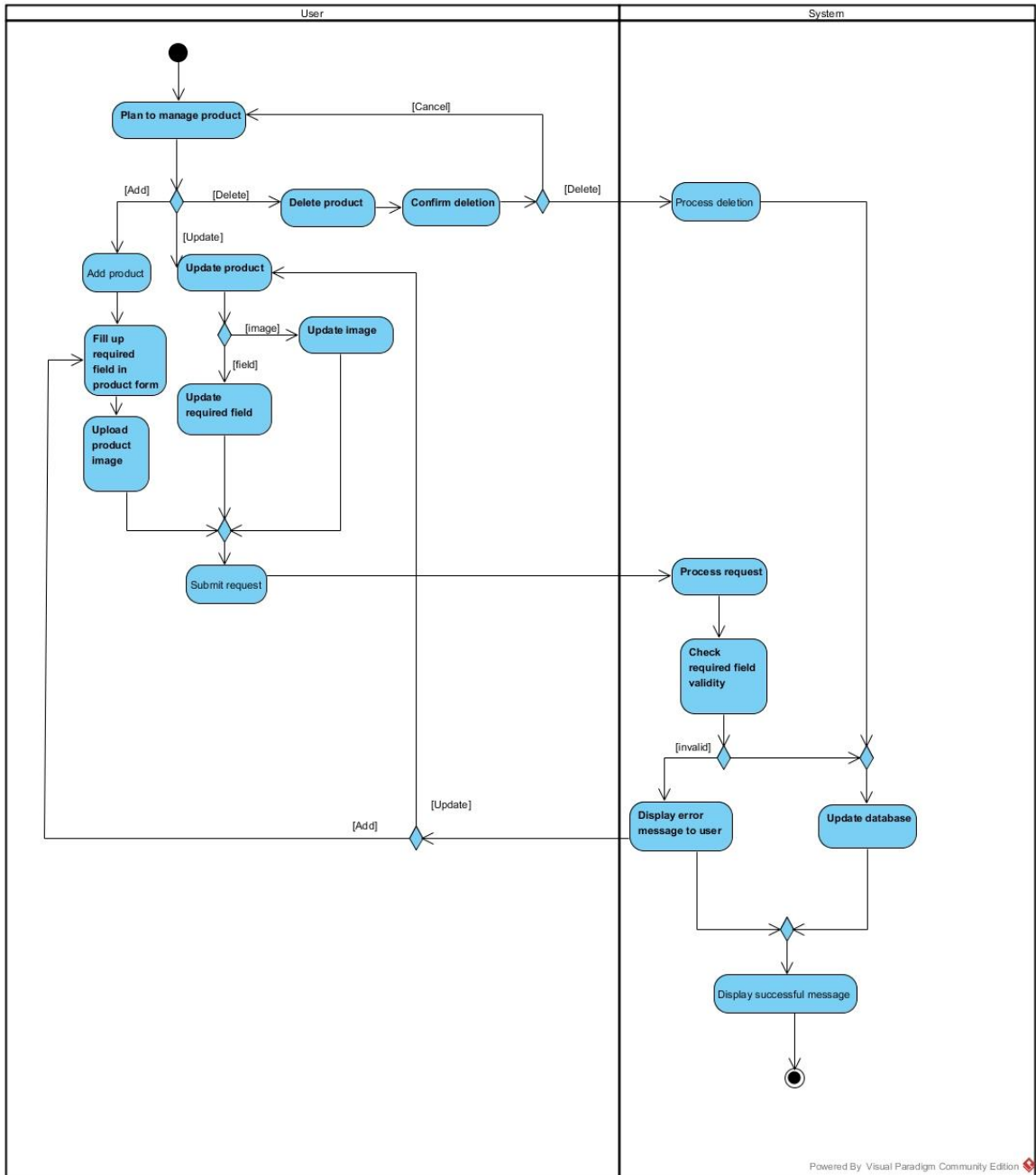Figure 3-4-5- 1 Activity diagram of register user

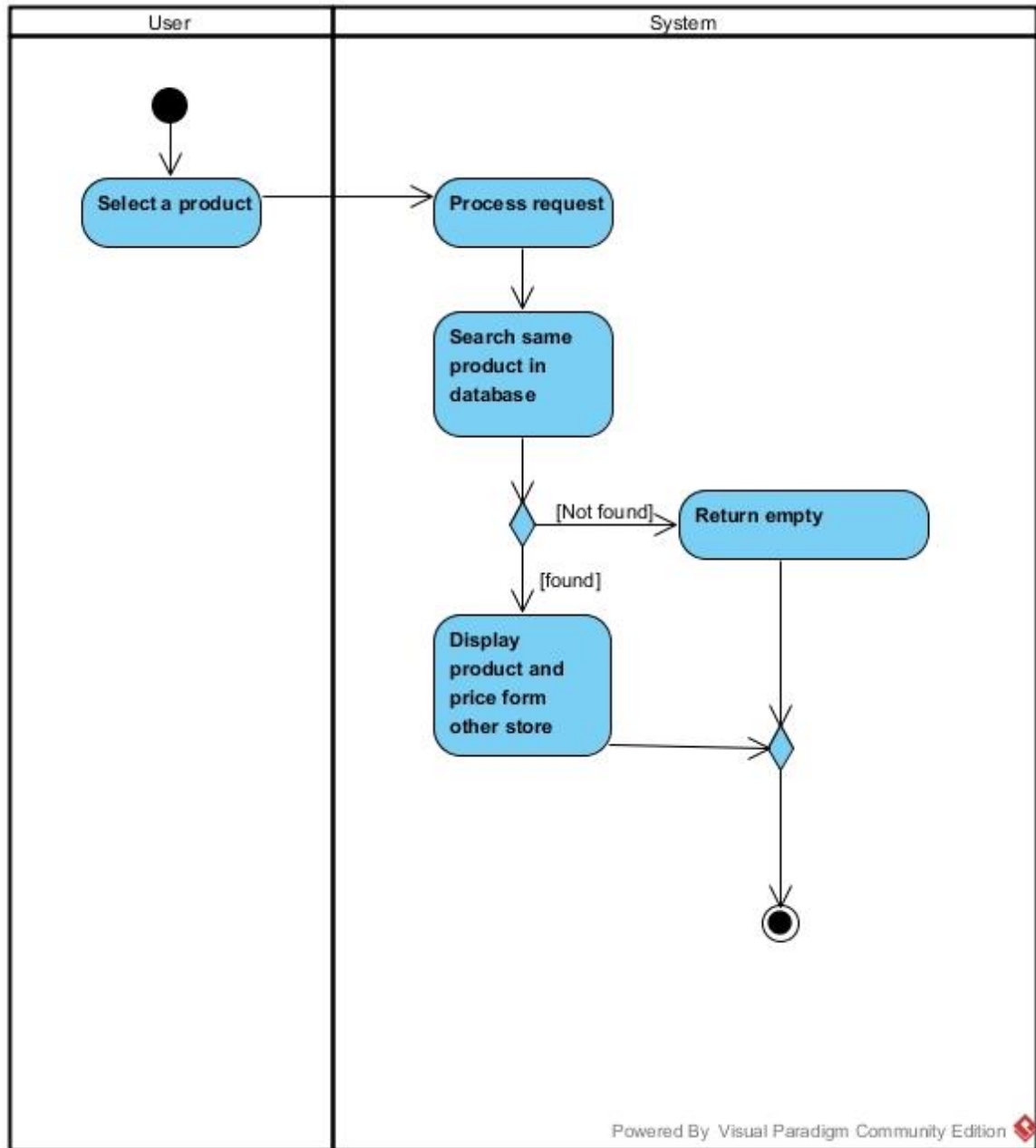Figure 3-4-5-2 Activity diagram of manage product

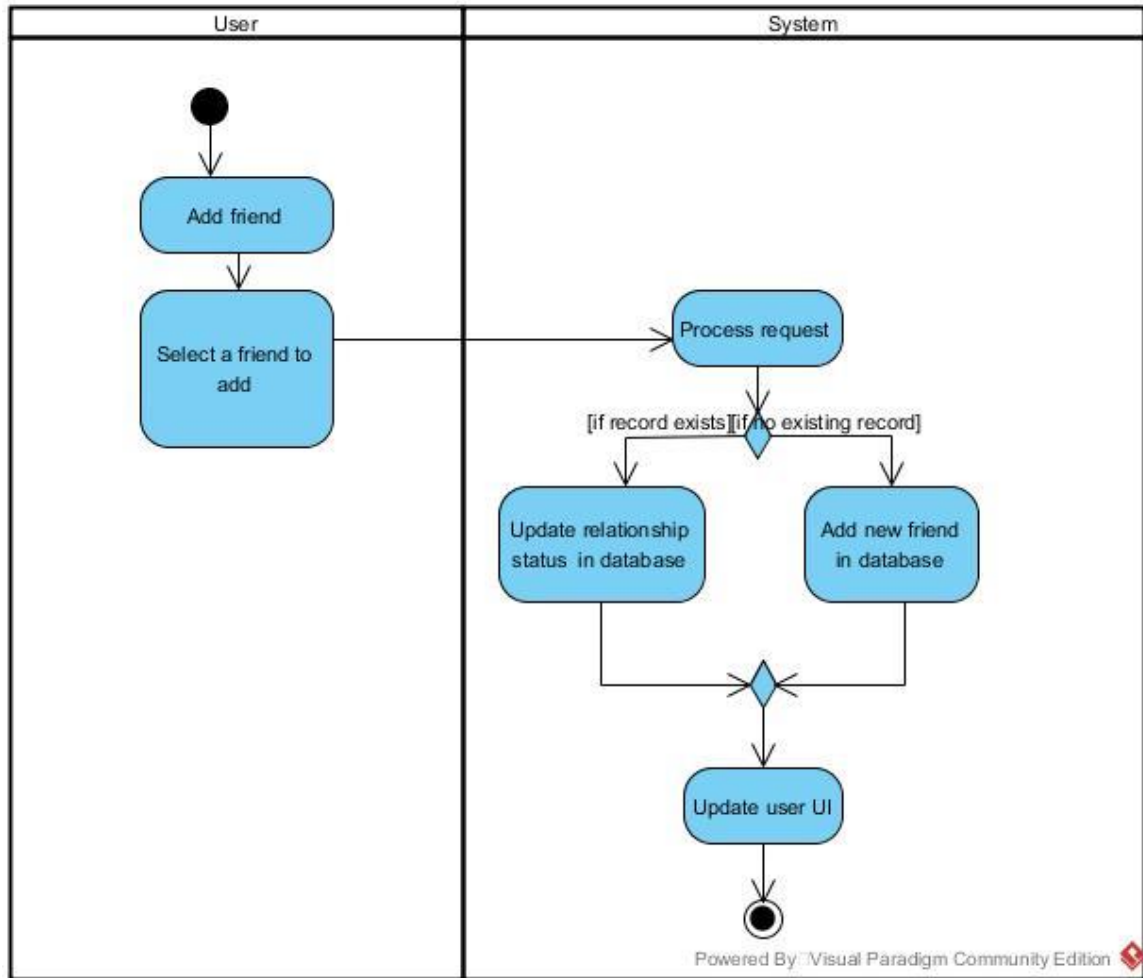Figure 3-4-5-3 Activity diagram of comparing price

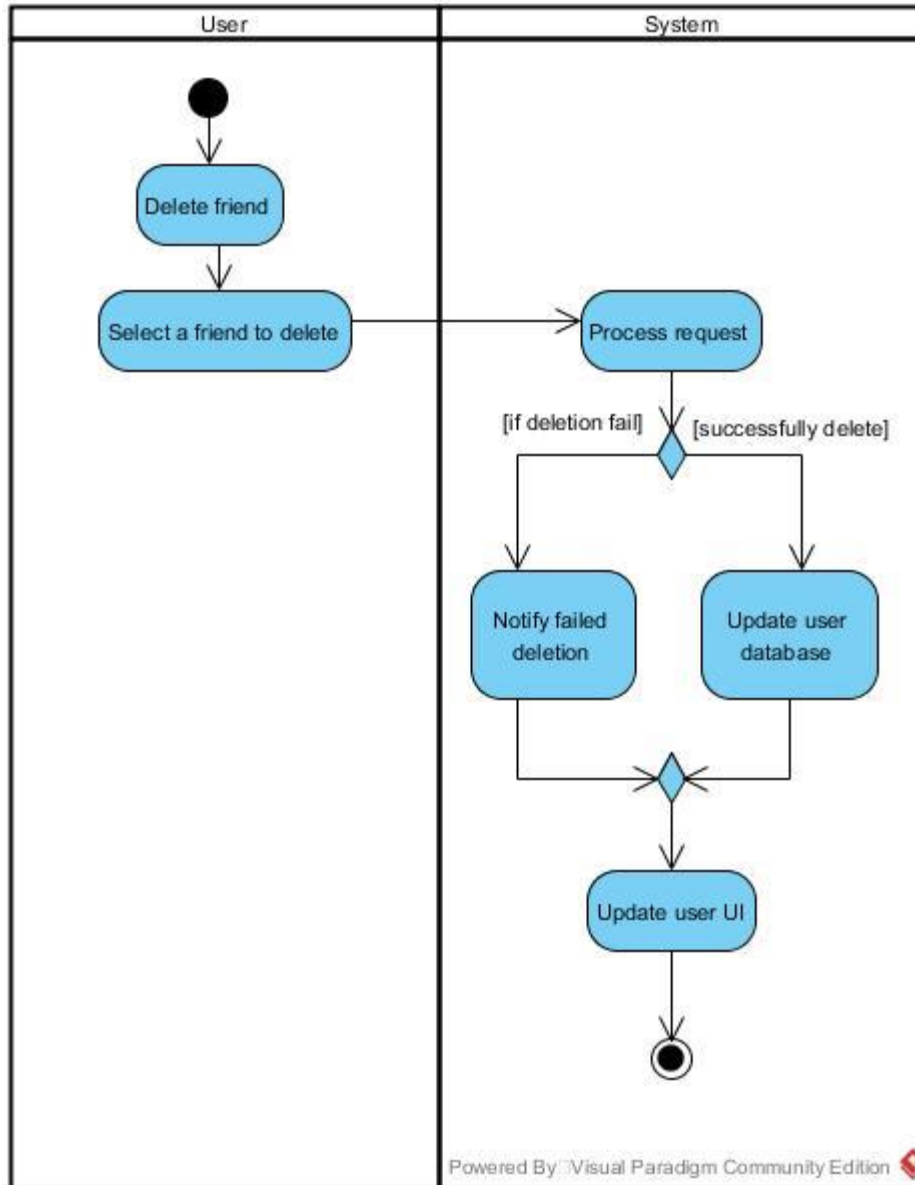Figure 3-4-5-4 Activity diagram of adding friend

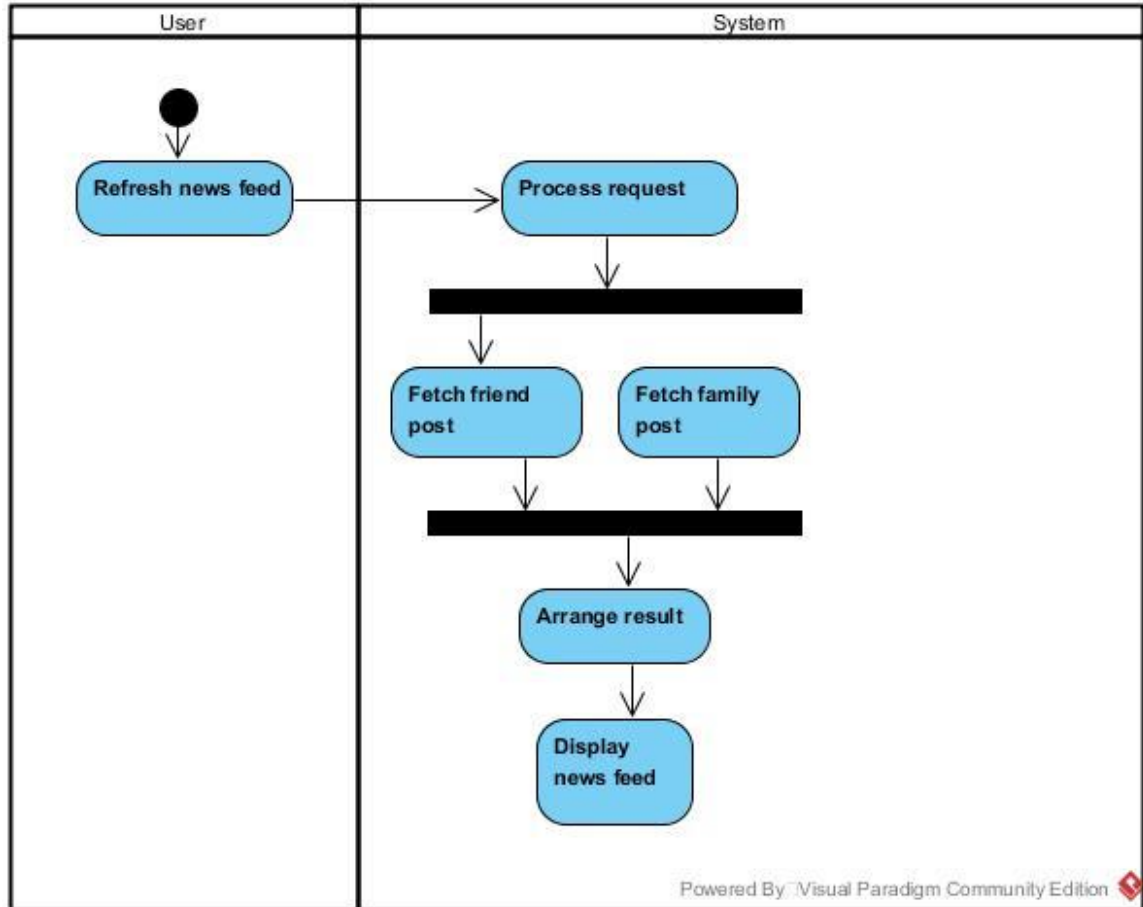Figure 3-4-5-5 Activity diagram of delete friend

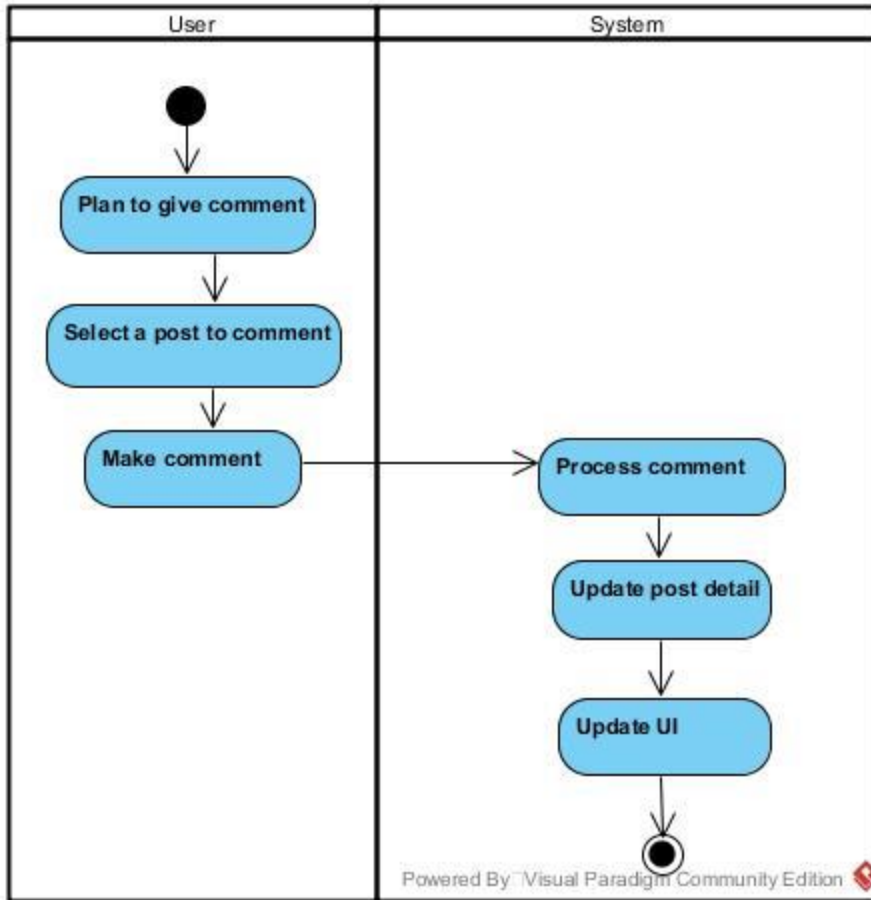Figure 3-4-5-6 Activity diagram of display news feed
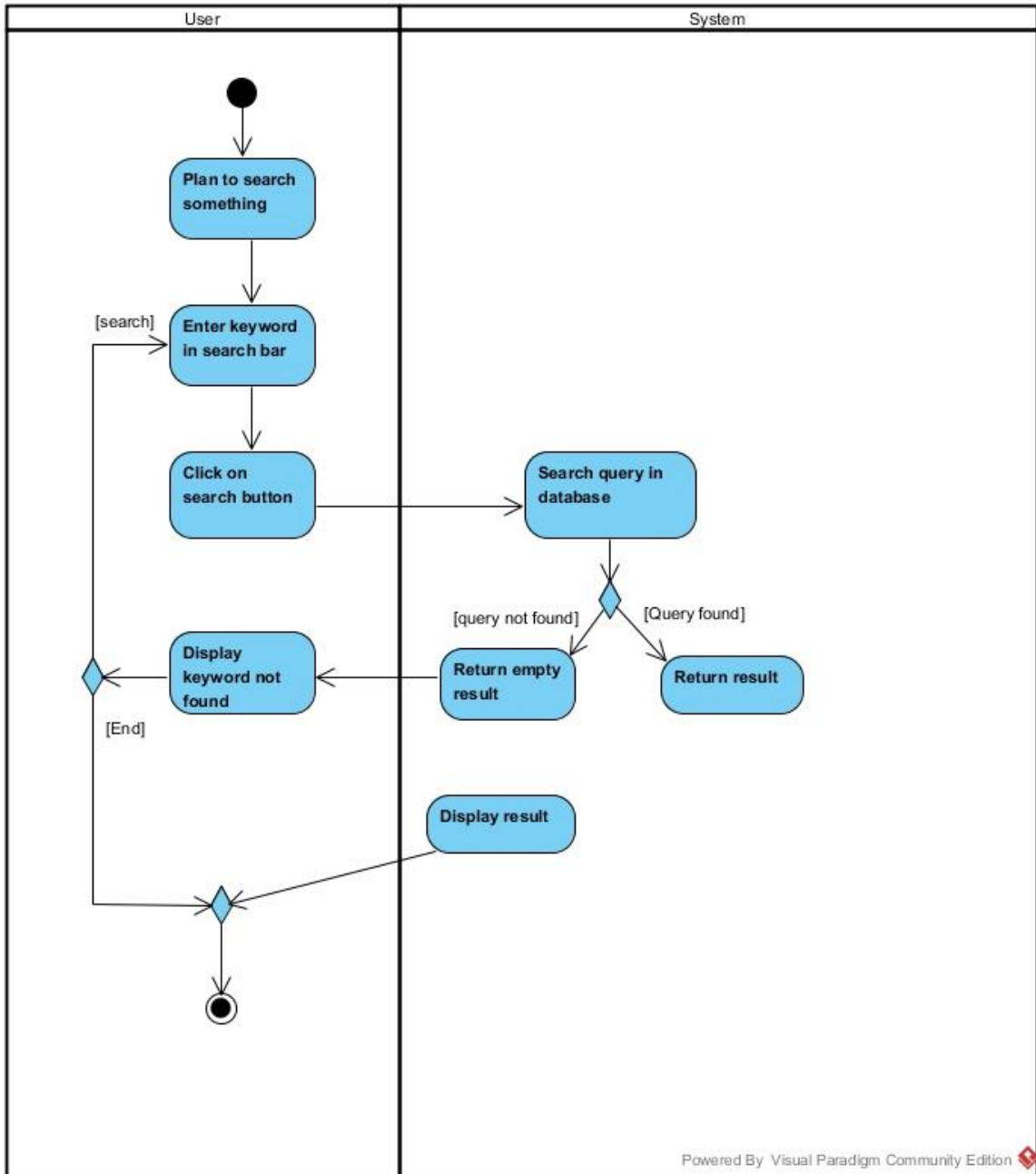
Figure 3-4-5-7 Activity diagram of make comment

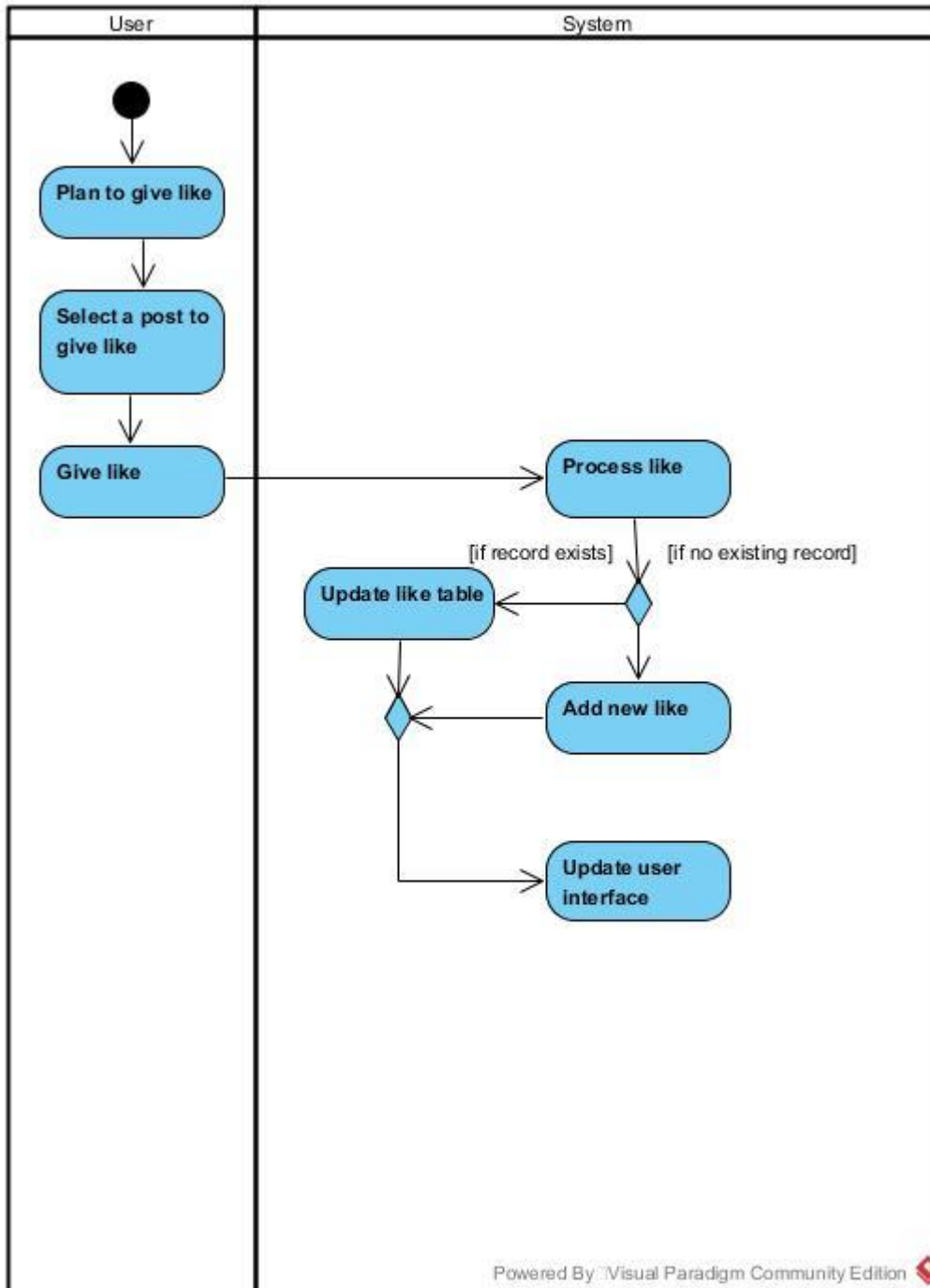Figure 3-4-5-8 Activity diagram of search
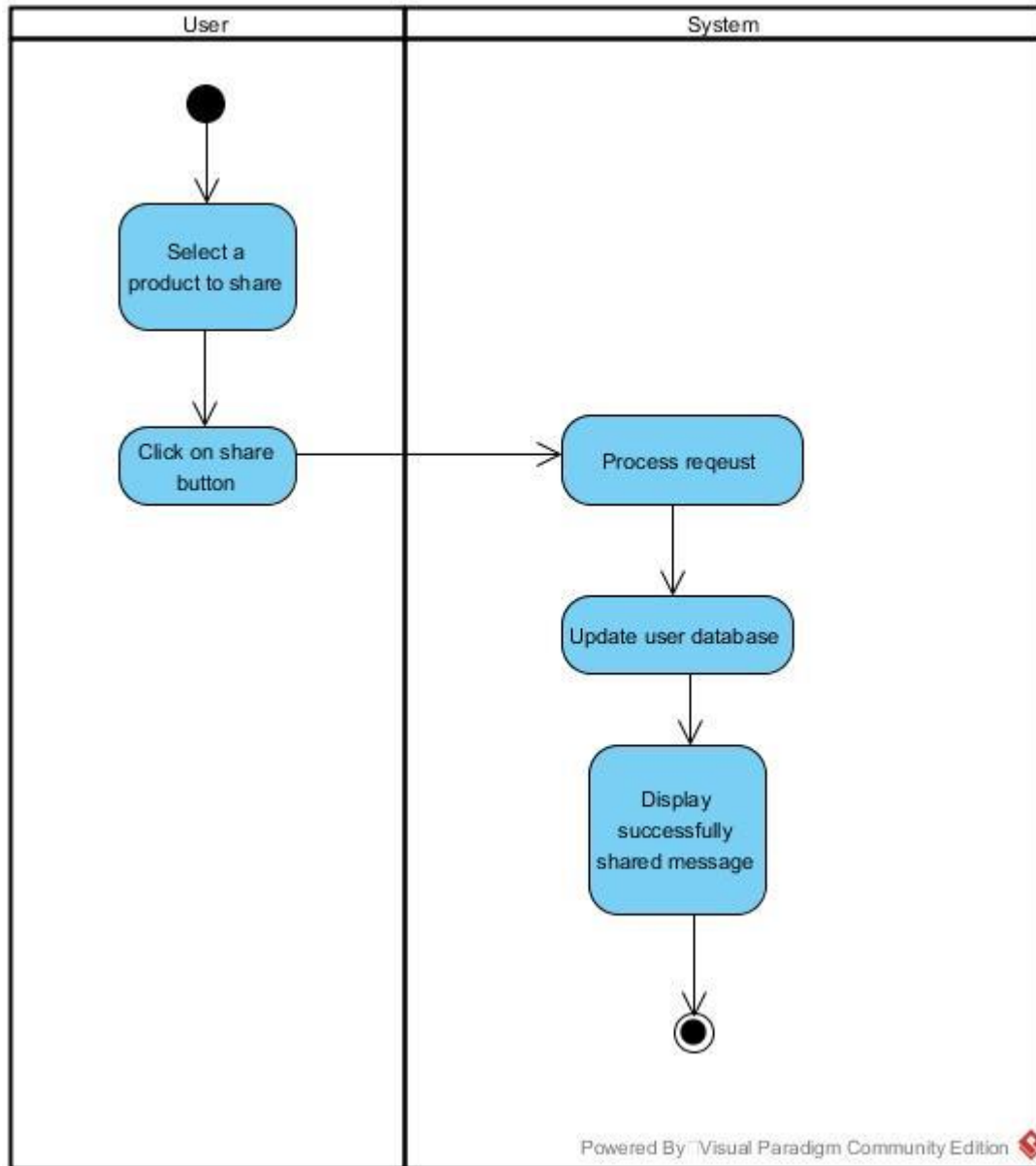
Figure 3-4-5-9 Activity diagram of liking

Figure 3-4-5-10 Activity diagram of sharing
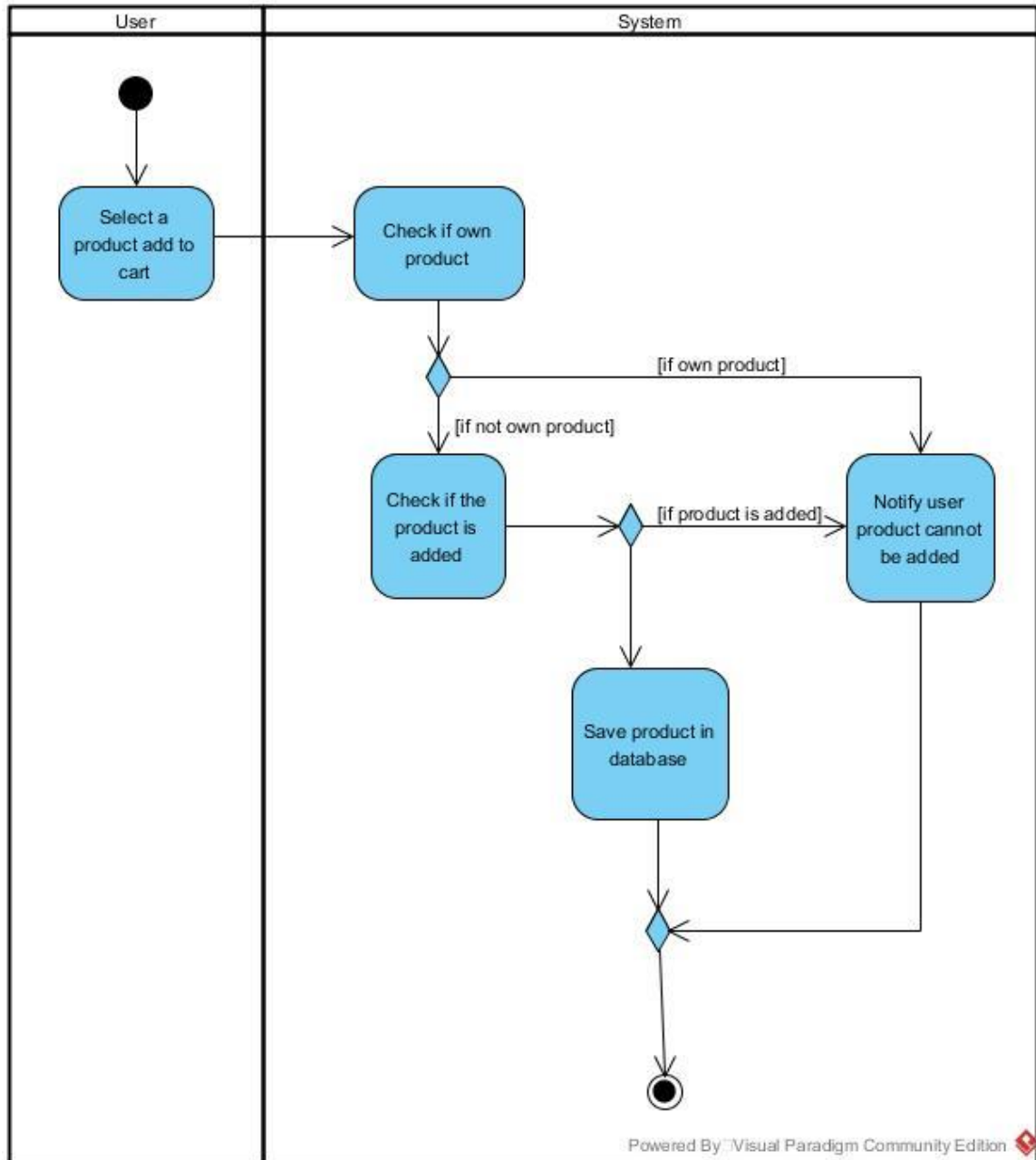
Figure 3-4-5-11 Activity diagram of adding cart
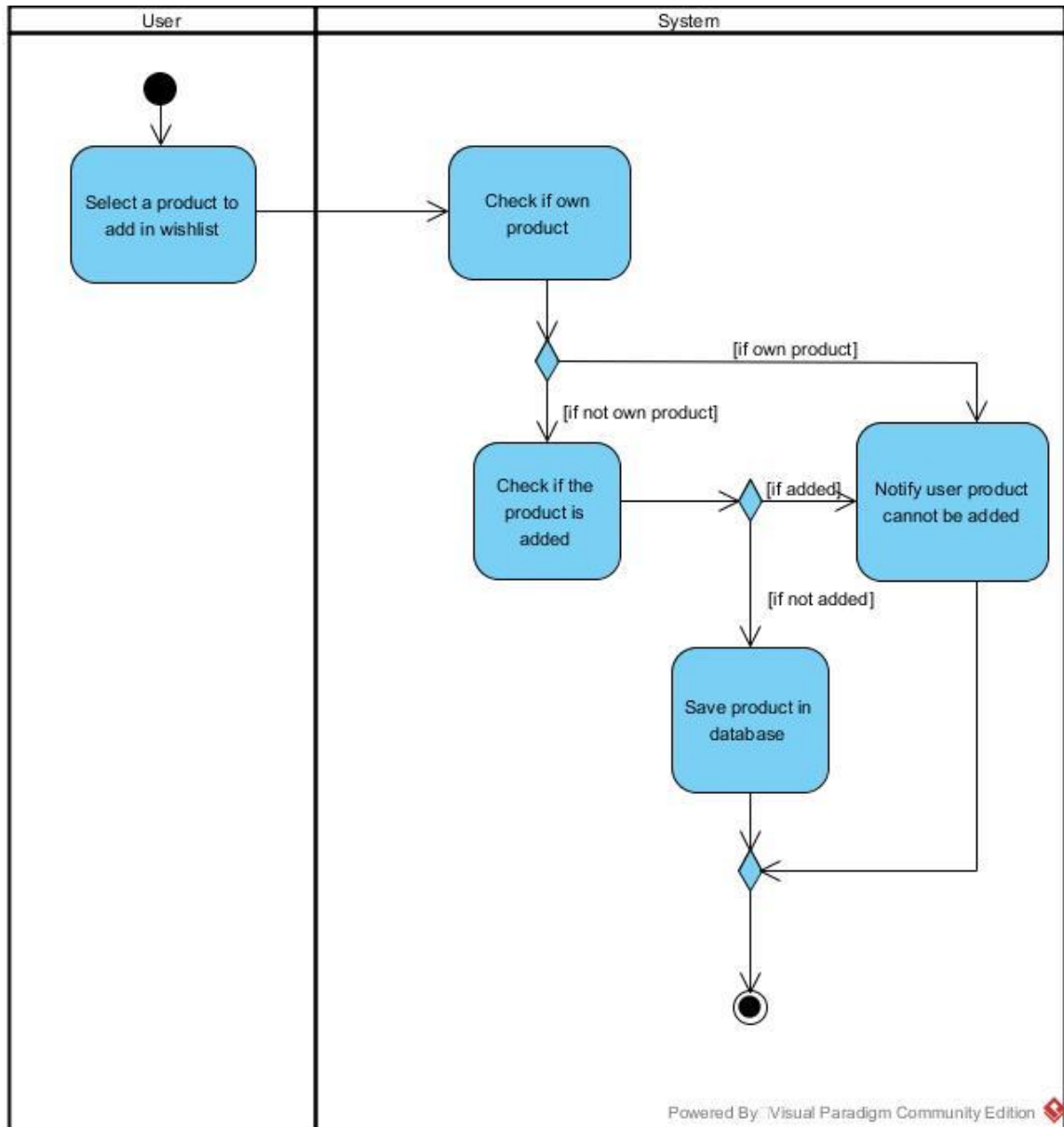
Figure 3-4-5-12 Activity diagram of adding wishlist

3.4.6 Class diagram
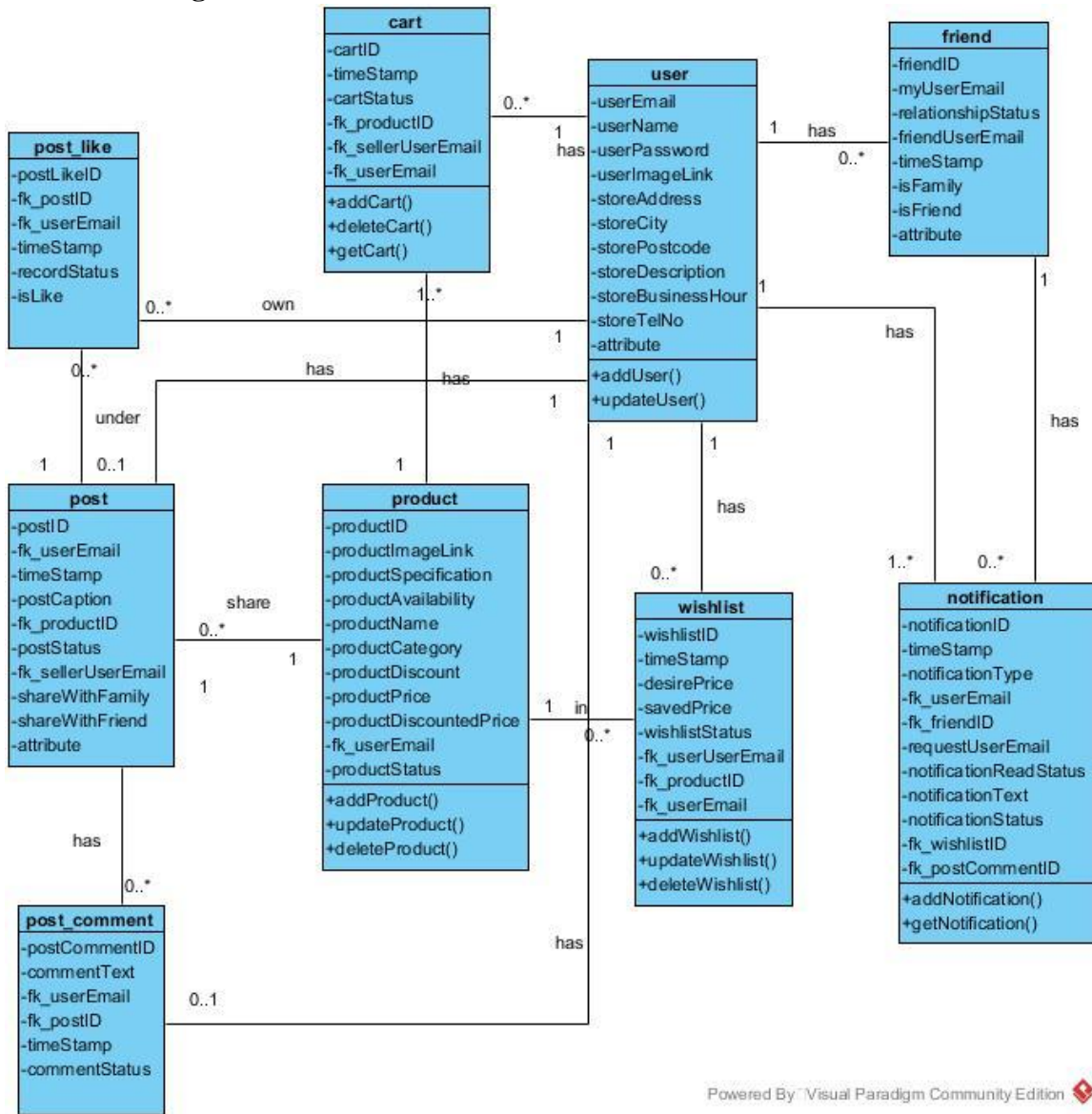
Figure 3-4-6- 1 Class diagram

3.4.7 Object diagram
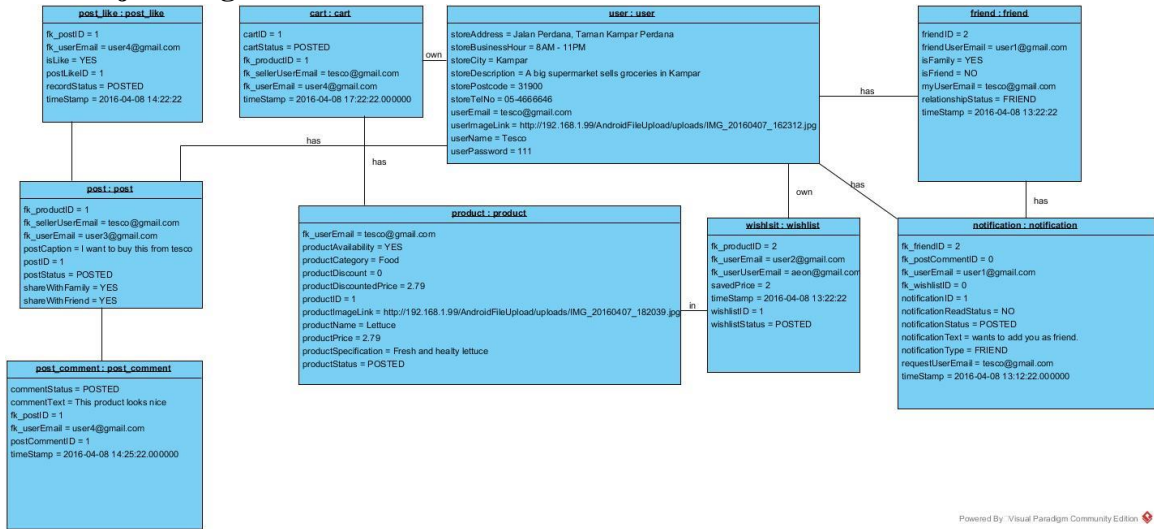
Figure 3-4-7-1 Object diagram

CHAPTER 4: SYSTEM DESIGN ON COMMUNITY PRICE SHARING AND PRICE COMPARING ON MOBILE APPLICATION

4.1 Project design

After information are gathered previously, some design of the application have come out. Afther this, some Graphical User Interface of the application will be shown later.

4.2 Graphical User Interface Design

Login UI
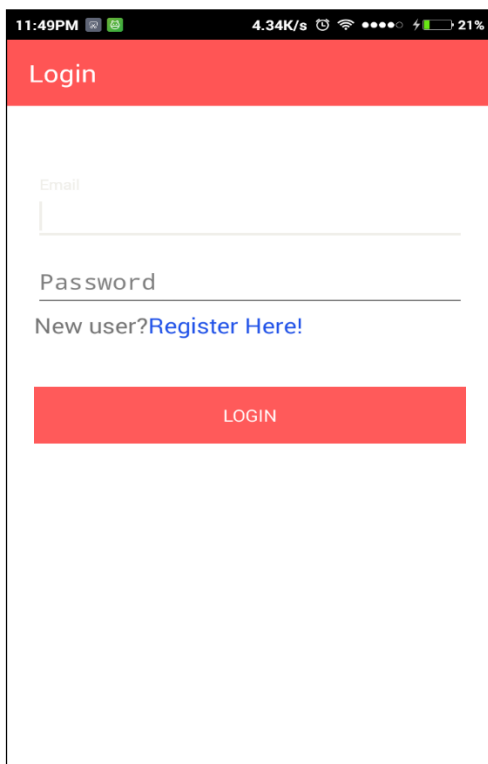
Figure 4-2- 1 Screenshot of login page

Figure 4-2- 2 Screenshot of login page

GUI(Graphical User Interface) Name: Login UI

This is the first login activity when user first install this application and use it.

Component: email input field, password input field, login button

Email input field: User need to enter email to login.

Password input field: User need to enter password in order to login.

Login button: User can press on it to finish login. If email input or password input is invalid, system will notify user with error message.

Register UI
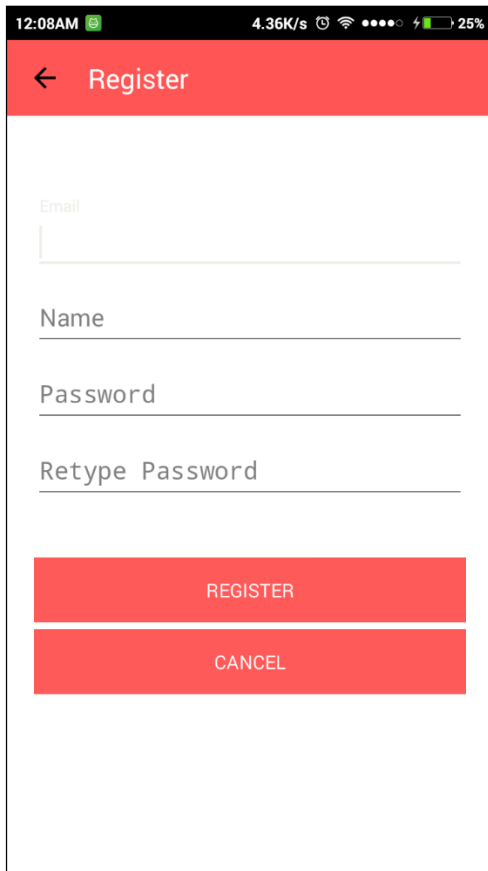
Figure 4-2- 3 Screenshot of register page

GUI Name: Register UI

This interface is to let user who does not have an account in Store Hunter to register.

Component: Email input field, name input field, password input field, retype password input field, register button, cancel button.

Email input field: User needs to enter email to register.

Name input field: User needs to enter name to register.

Password input field: User needs to enter password for the account.

Retype password input field: User needs to enter password twice for password confirmation.

Store Details UI
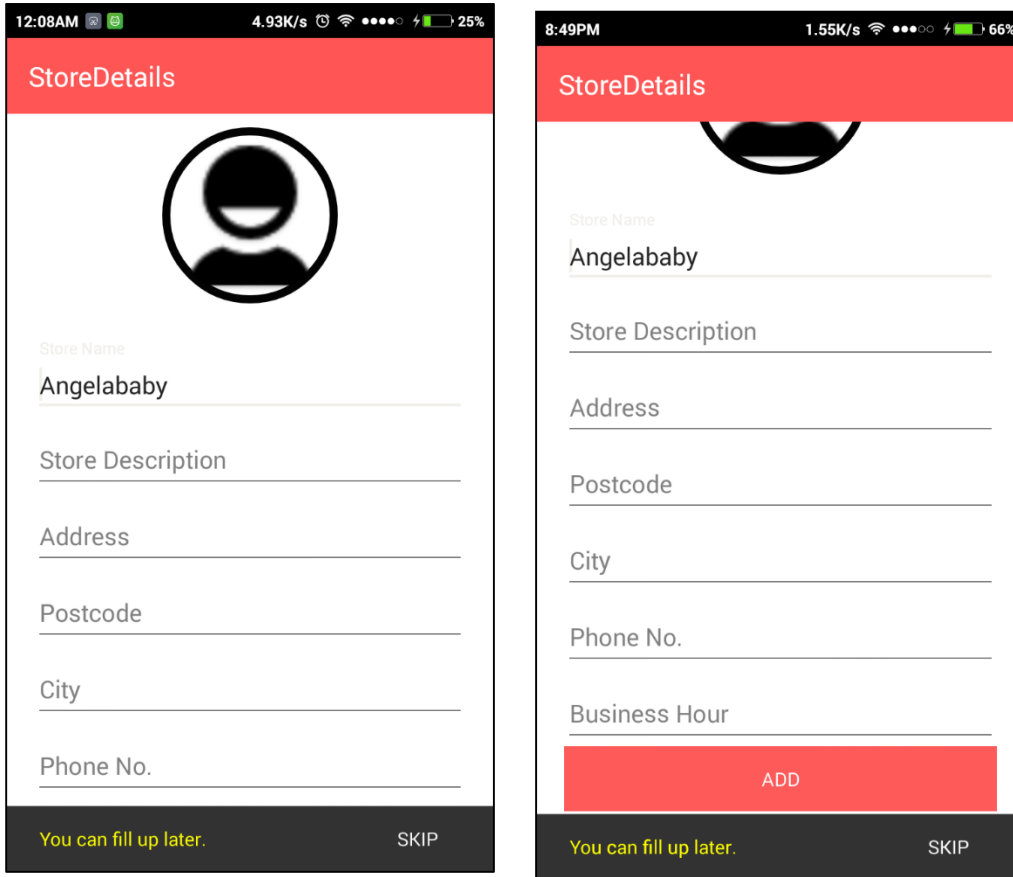
Figure 4-2-4 Screenshot of Store details

GUI Name: Store Details UI

This interface is to let user input additional user information. For a normal user who does not have a store, this page is not important to them. However, for a user who plans to promote product in Store Hunter, this application is crucial because customer would want to see more information from the seller.

Component: User profile picture, store name input field, store description input field, address input field, postcode input field, city input field, phone no. input field, business input field, add button, snackbar(SKIP).

User profile picture: User can press on it and select either take a photo or upload an image for user profile picture.

Store name input field: Store name is actually the same with the user name created previously.

Store description input field: A brief description to the store so that people in Store Hunter can know more about the store.

Address input field: Address for the store. It is useful because user can use this address to search the location in Google map or other navigation application.

Postcode input field: Postcode for the address.

City input field: City for the address.

Business Hour: Business hour for the store. For instance, "Monday to Friday 9am – 6pm."

Add button: When user complete the form, by pressing add button user will be able to upload information to the server.
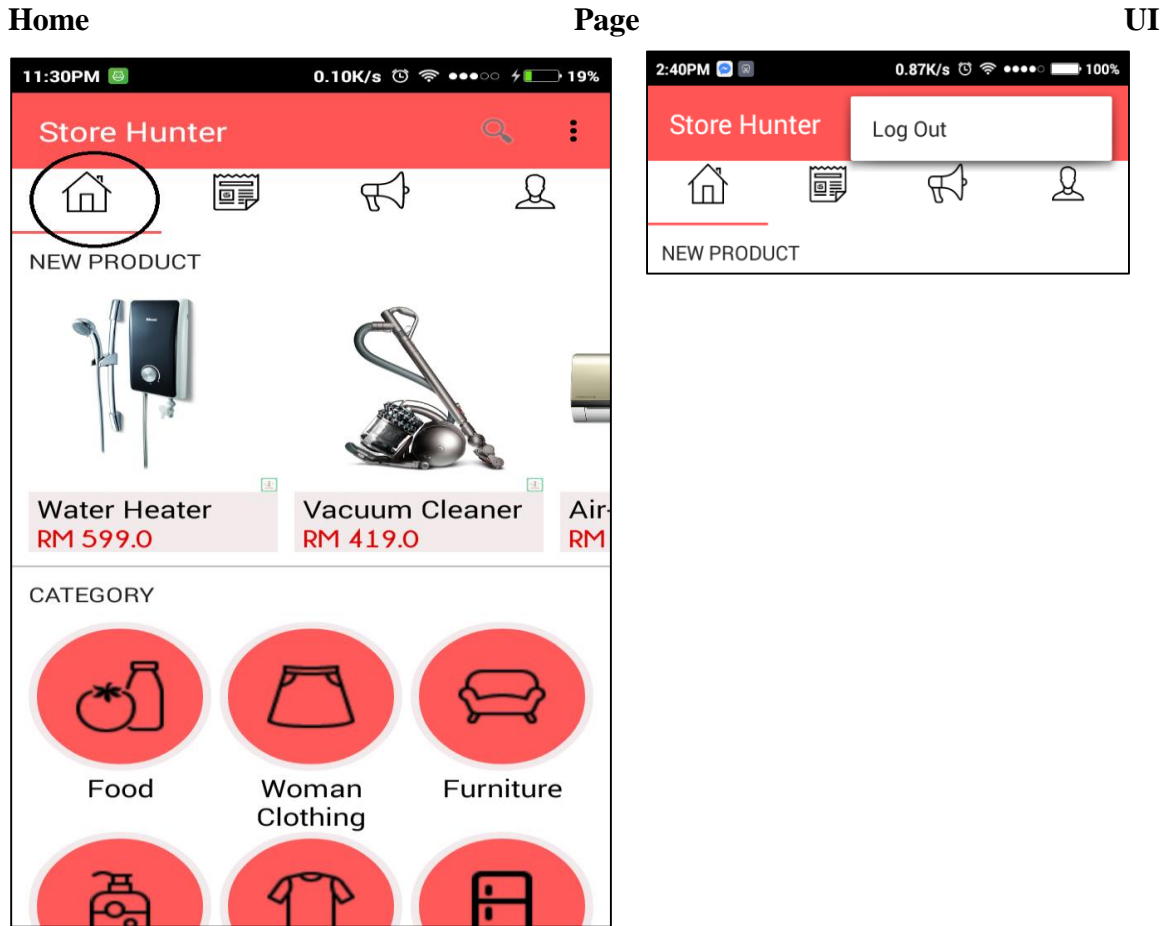
Home   **Page**   **UI**

Figure 4-2-5 Screenshot of the home page

GUI Name: Home UI

This is the first user interface after user login to the application. This is the first interface called "Home Page".

Components: Search Bar, New Product list, Category, logout

Search Bar: To allow user to type in any query to search any product or users. Then, system will display result in another user interface.

New Product List: To give user the latest product in Store Hunter, there are always five latest products in the "NEW PRODUCT" list. New products are updated each time users refresh it. Users are able to see more information of the product by pressing on any products in the list.

Category: Products are categorized in six category: food, daily supplies, woman clothing, man clothing, furniture. Users are able to explore more products by pressing on any category.

Logout: User can logout and then it will direct to login page.

Search Bar
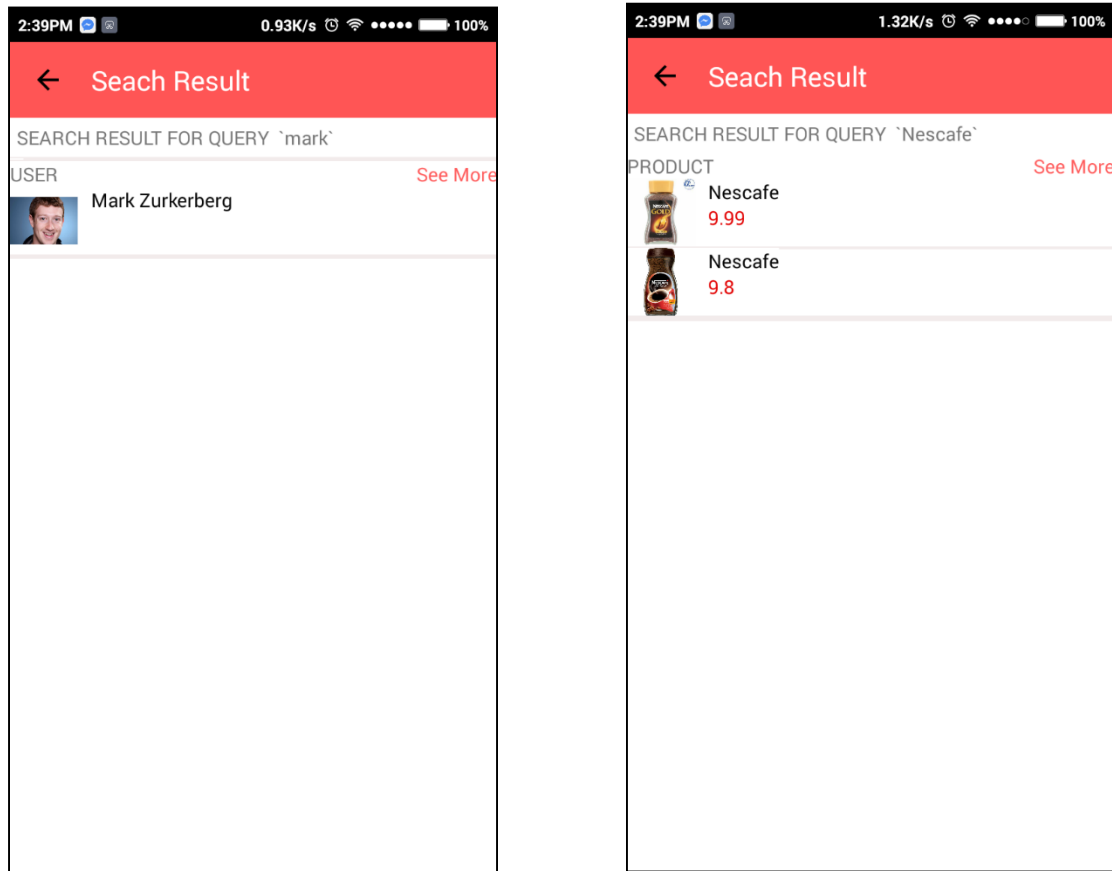
Figure 4-2- 6 Screenshot of search result

GUI Name: Search result UI

This interface is to allow user to search something in Store Hunter. User can search any user or any product by typing the keyword in the search bar. Then, the display result will be displayed in this page.

Product Category UI
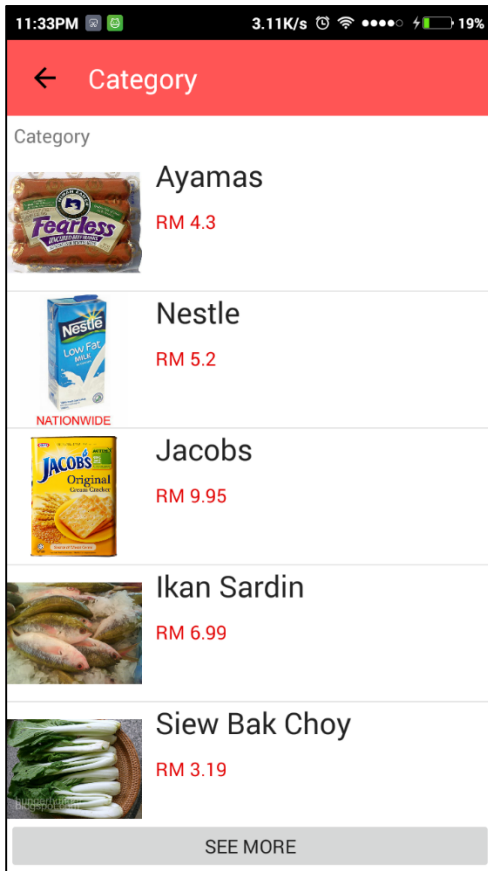
Figure 4-2-7 Screenshot of Category Product Information

This interface is to group all the products from the same category and display to user.

Component: Category product list, see more button

Category product list: The products in this list are from the same category. For example, **food category.** Users can press on the products in the list, it will direct to another page to display all information about the product.

See more button: This button allow user to see more products from the same category. System does not fetch all products from server at one server request, therefore, by pressing on see more button, system will do a fetching from server to fetch more product.

Product Information UI
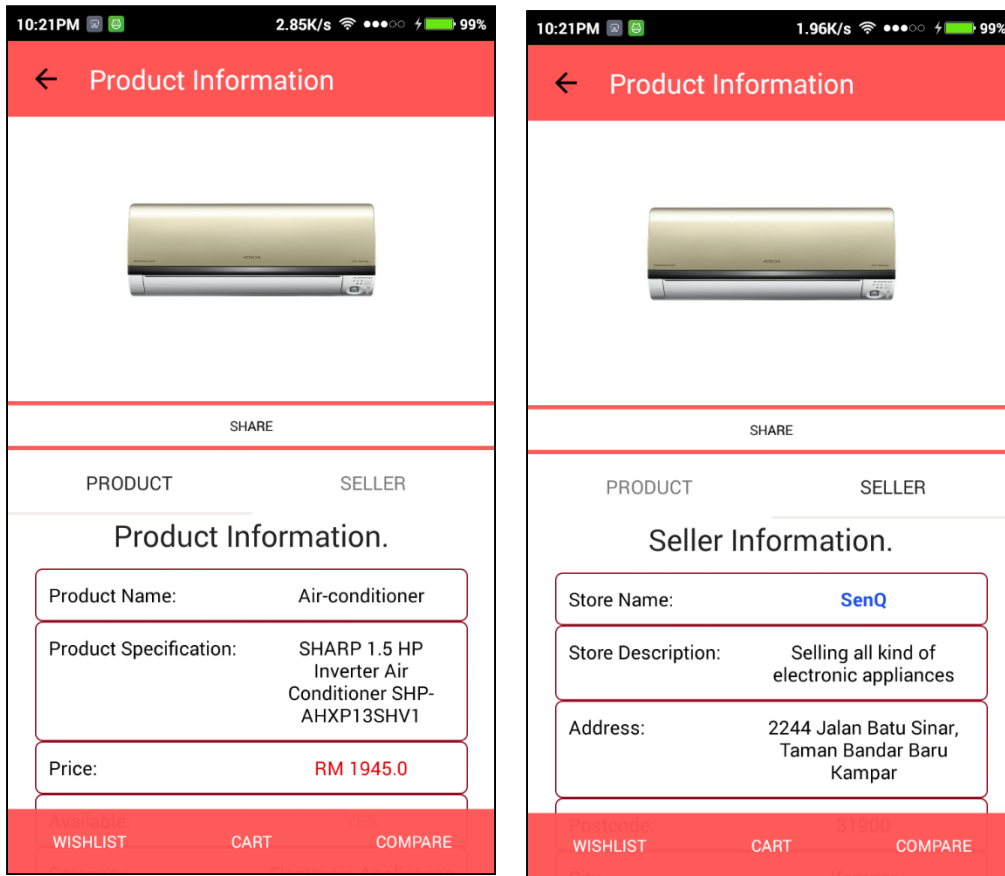
Figure 4-2-8 Screenshot of Product information page
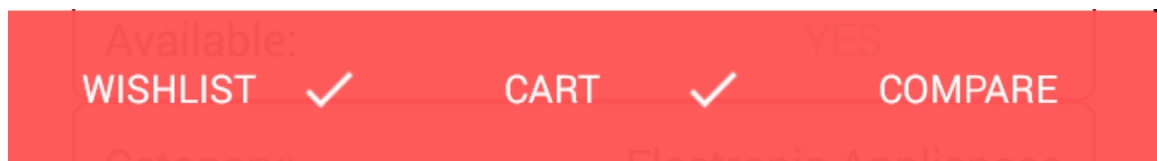
Figure 4-2-9 Screenshot of product is in wishlist and cart
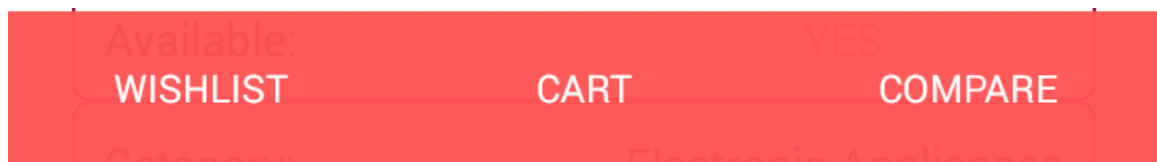
Figure 4-2- 10 Screenshot of product is not in wishlist and cart

GUI Name: Product UI

Component: Product photo, share button, wishlist button, cart button compare button, product information, seller information

Product photo: This is product photo. User can press on it to have a larger product view.

Share button: This is a share button for user to share this product to user's shared post. User's friend and family is able to see the share post. The default sharing privacy is to share with friend and family.

Product Information: This is a panel to display all information of the product.

Seller Information: This is a panel to display all information of the product. User can press on the blue color seller name in order to view the details of the seller.

Wishlist button: This is a button for user to add this product into the wishlist. If the product is added in the wishlist, user will see a tick in the wishlist button. Otherwise, tick will not show in the wishlist button. If the product is posted by the user himself, user cannot perform adding product into wishlist.

Cart button: This is a button for user to add this product into the cart. If the product is added in the cart, user will see a tick in the cart button. Otherwise tick will not show in the cart button. If the product is posted by the user himself, user cannot perform adding product into cart.

Compare button: This is a button for user to compare product. User can press on it and it will direct to another activity to display compare result.

Adding in wishlist UI
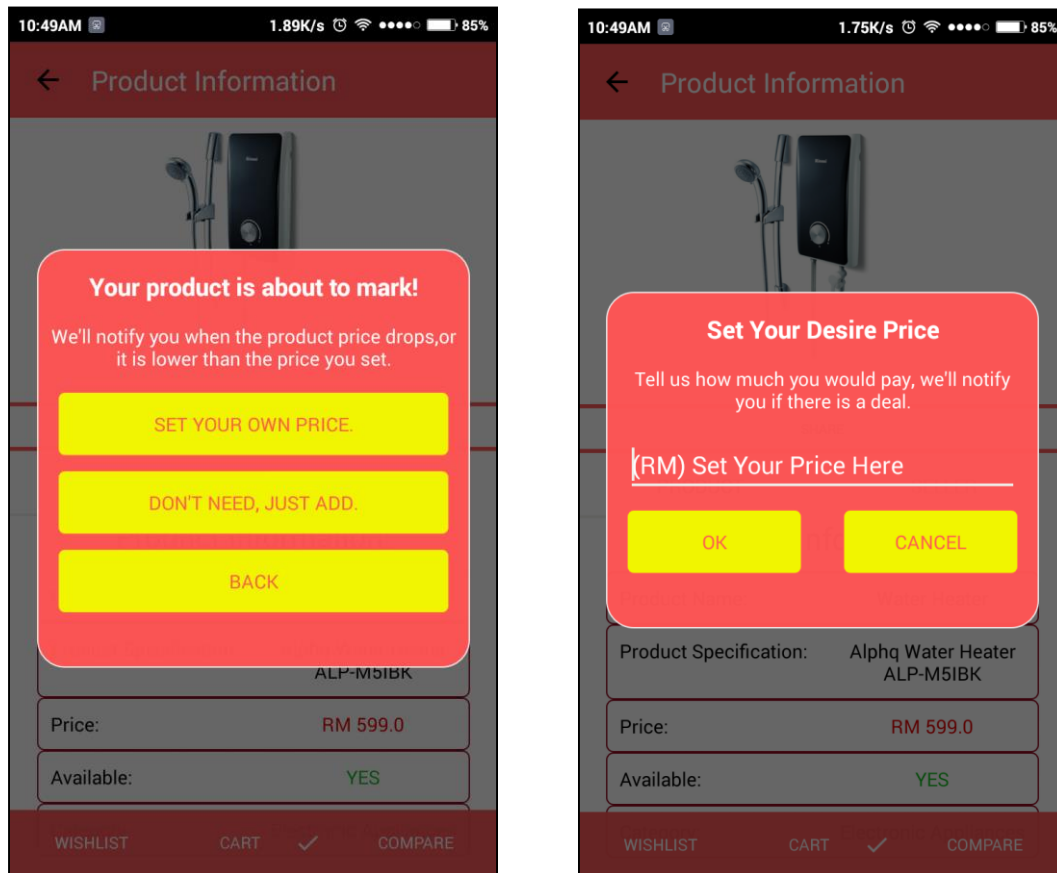
Figure 4-2- 11 Screenshot of adding wishlist

GUI Name: Adding wishlist UI

This interface is to confirm the user desire price with user. If user wants to add any product into wishlist for monitoring price purpose, system will first ask user the desire price, if user choose "SET YOUR OWN PRICE", then it will direct to another activity for user to type in the price. If user choose 'DON'T, NEED, JUST ADD", then it will straight away add into wishlist and update database.

Compare
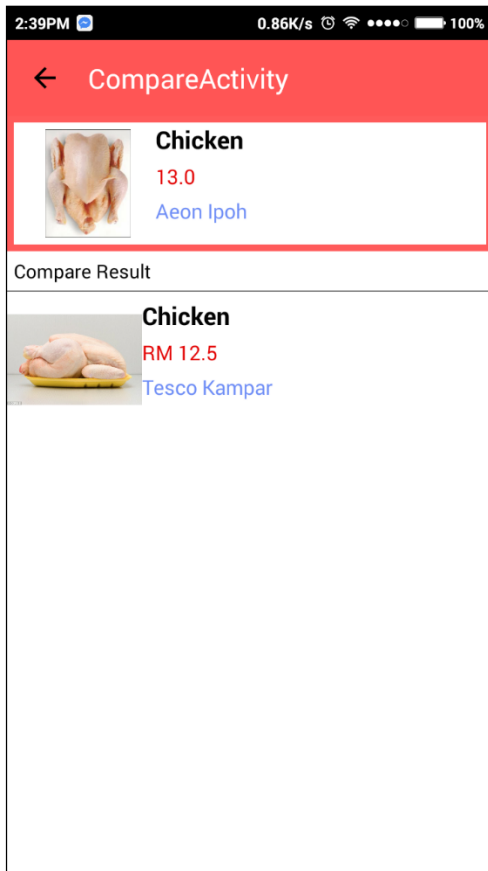
Figure 4-2-12 Screenshot of compare price

GUI Name: Compare UI

This interface is to display compare result when user press on the compare button, system will look for the similar product and display to user.

Share product
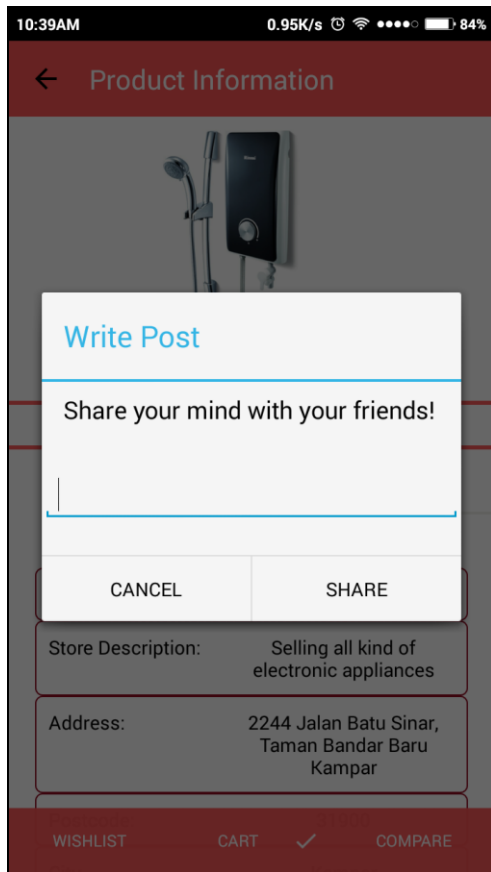
Figure 4-2- 13 Screenshot of share product

GUI Name: Share product UI

This interface is to share product to the community. By sharing the product, user can share the product price also.

Component: Cancel button, share button, caption input text

Cancel button: User can press on it, the dialog box will dismiss.

Share button: User can press on it, the dialog box will dismiss and share to user friend.

Caption input text: User can type the caption in the box.

User profile (Econsave)
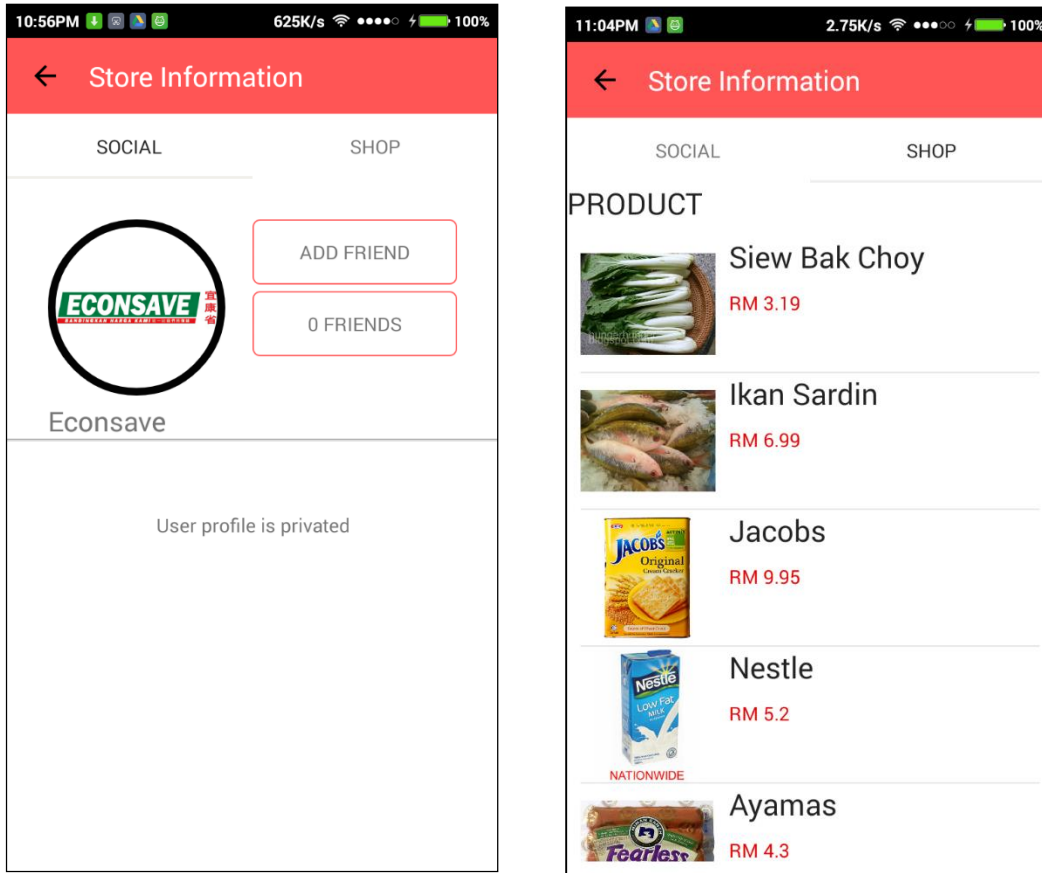
Figure 4-2-14 Screenshot of user profile(Econsave)

GUI Name: User Profile UI

This interface is to show a user profile. This is an Econsave user profile. There are two information to show to the user, social information and shop information. Social information means the post that shared by the user. In this case, Econsave user social information is private because it cannot be seen by stranger, these information only show to friend or family. Shop means what product listed by this user. Some user might have an empty shop because not all user are here to promote product, some of them just want to explore products here.

Component: Social – user profile photo, add friend, friend, Shop – product

User profile photo: This shows the user profile picture to let other recognize easily.

Add friend button – This allow user to perform add friend, delete friend.

Product – User can press on the product in the list, and it will direct to another activity to display product information.

User Profile(Normal user, not intend to promote product)
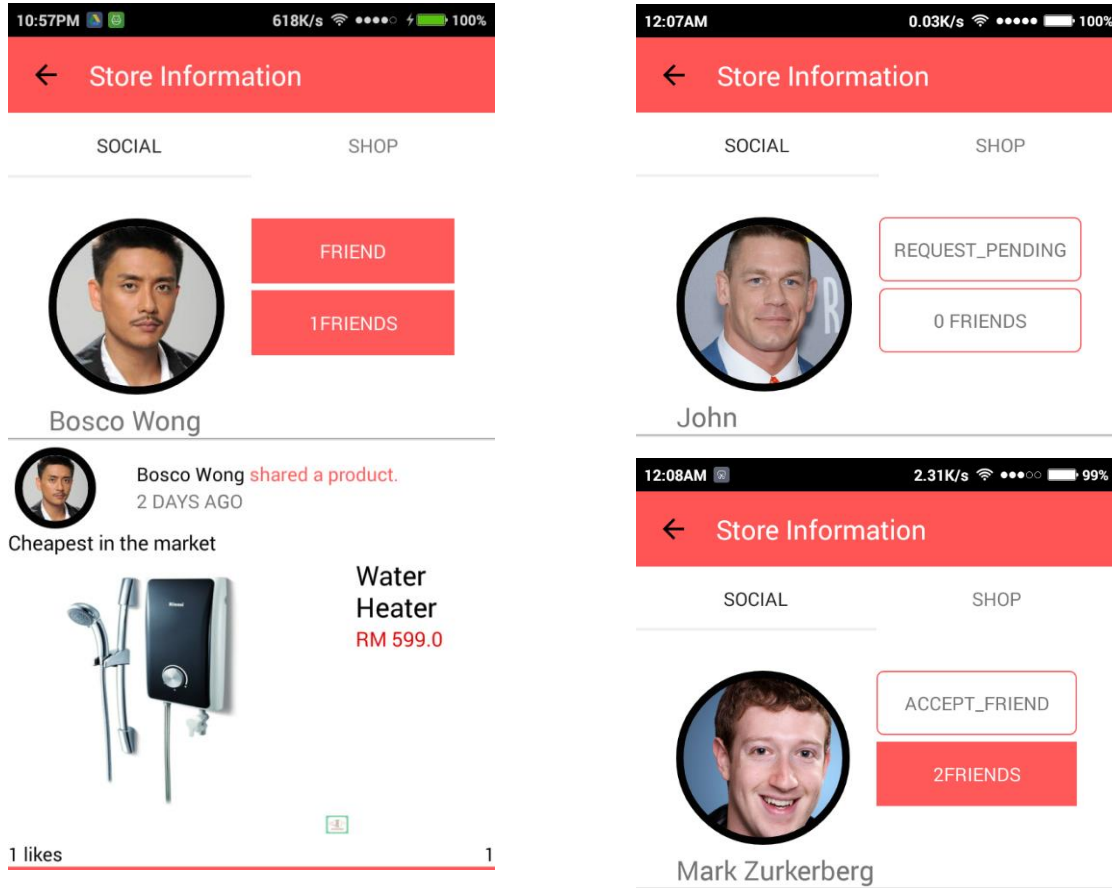
Figure 4-2-15 Screenshot of user profile(normal user)

This is the screenshot of normal user. If the relationship between two users are friend or family, he or she can see the other user shared post here.

There are four function in a button, "ADD FRIEND", "FRIEND", "REQUEST_PENDING", "ACCEPT_FRIEND",

"ADD FRIEND" – A stranger

"FRIEND" – A friend or family

"REQUEST_PENDING" – This user is previously added, now waiting this user to accept friend request

"ACCEPT _FRIEND" – This user is waiting you to accept friend request.

User Profile(Select friend category)
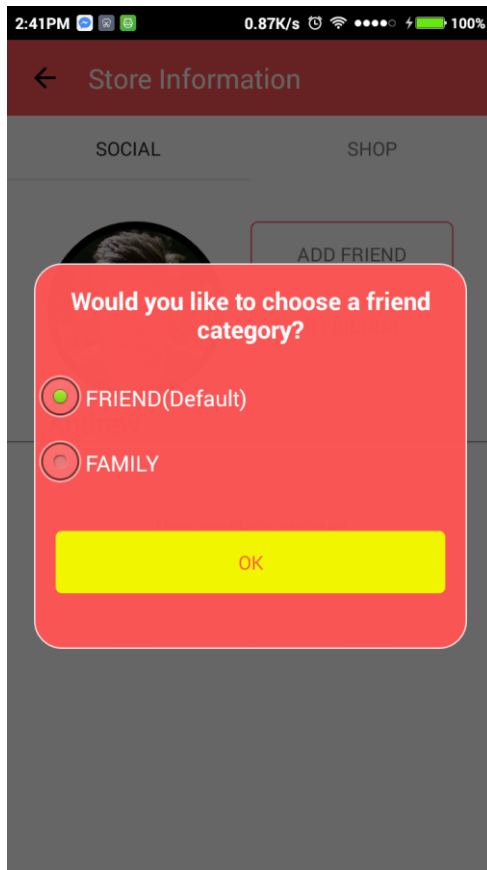
Figure 4-2- 16 Screenshot of select friend category

GUI Name: Select friend category

This interface is to let user to choose the relationship between another user. For instance, if user A adds user B as friends, this dialog box will pop up and ask user A about the relationship between user A and user B. The default option is "FRIEND". However, there is only one relationship between two users, that is either friend or family. This dialog will pop up also whenever user accept friend.

News Feed UI
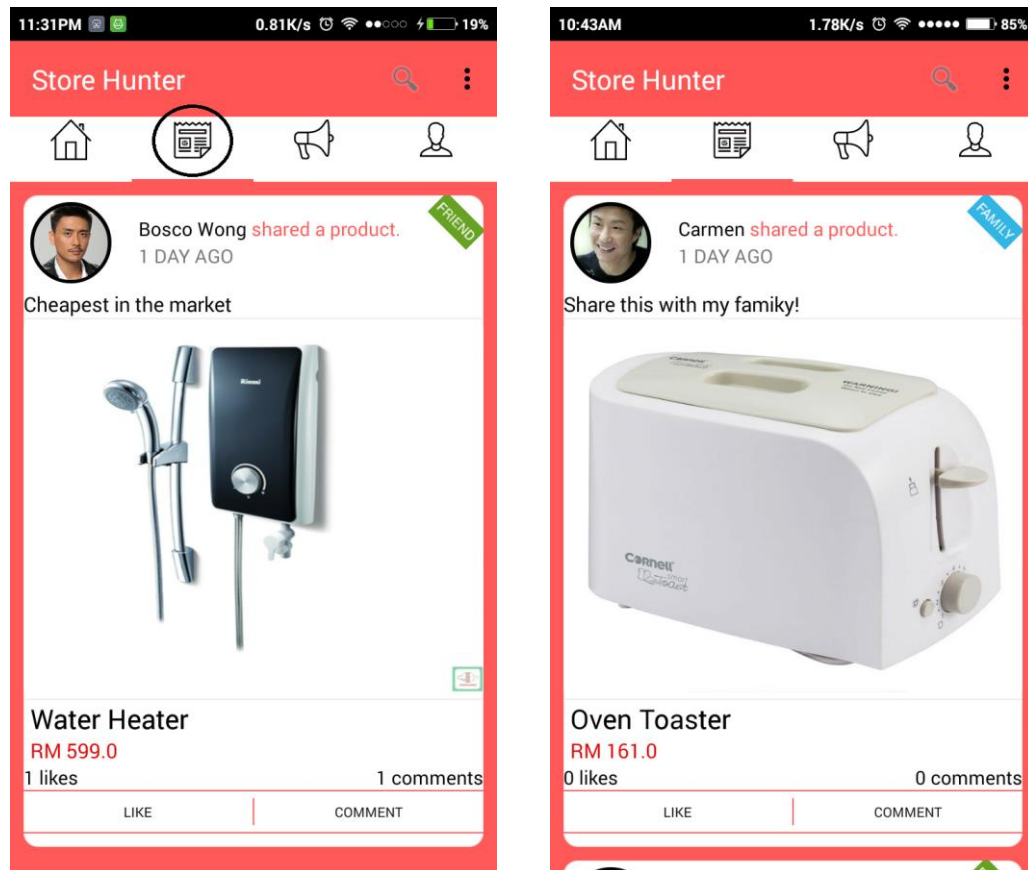
Figure 4-2-17 Screenshot of News Feed

GUI Name: News Feed UI

This interface is to show user's friend activity. Friend shared posts will be displayed here. Besides, family's post will be displayed first and followed by friend's post.

Component: User profile picture, user name, timestamp, post caption, product photo, product name, product price, post total likes, post total comments, like button and comment button.

User profile picture: This display friend's or family's profile picture. User can press on the user profile picture and view that user profile information.

User name: This display friend's or family's name so that user can recognize his friend or family.

Timestamp: This indicates time that user's friend or family share this post. For instance, three days ago, 1 hour ago.

Post caption: This show the mind and thought when user share particular post. For example.,"Cheapest in the market!".

Product photo: This indicates the product in the post. Product photo can show user the product instantly so that user can have more information at the first sight. User can press on the product picture and it will direct to the product information page to have more details on the product.

Product name: This indicates the product name in the post. Product name can help user to recognize the product with the product name.

Product price: This indicates the product price in the post. Users are price sensitive hence product price is displayed here in order to catch user attention.

Post total likes: This indicates the total likes of a post.

Post total comments: This indicates the total comment of a post.

Like button: User can press on it to do a "liking" action. Like button allows interaction between user and user. When user "like" a product, like button text will turn to red color and the "LIKE" text in the button will be bold.

Comment button: User can press on it to do a "commenting" action. Comment button will direct user to another activity to do comment.

Comment
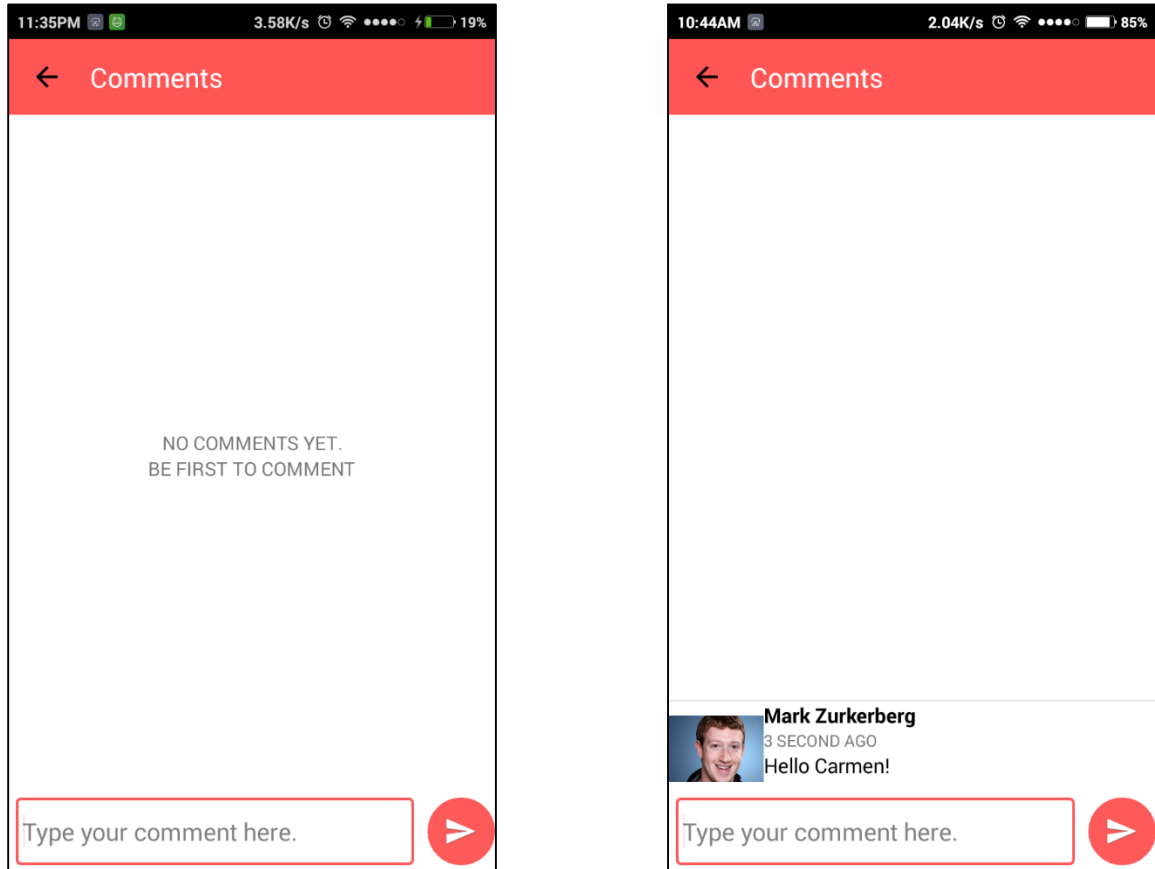
Figure 4-2-18 Screenshot of comment

GUI Name: Comment UI

This user interface is to let user comment on friend's or family's post.

Component: Comment list, comment input field, send button.

Comment list: This comment list is to display comment to user. This list is updated every three seconds.

Comment input field: This is for user to type in comment.

Send button: This is for user to send out the comment. If the comment is empty, system will warn user that comment is empty.

Notification UI
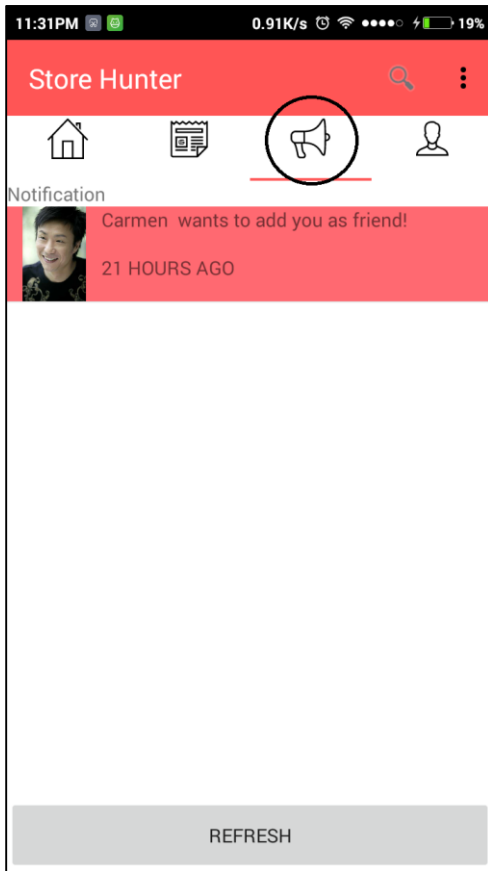
Figure 4-2-19 Screenshot of notification page

GUI Name: Notification UI

This interface shows notification of the user. Whenever a stranger add a user as friend, user will receive a friend request notification.

Component: notification list, refresh button:

Notification list: New notification will be displayed here. Notifications are arranged with the latest notification at top. User can press on the notification and it will direct to the another user profile

Refresh button: User can press on refresh button to see the latest notification.

Me UI
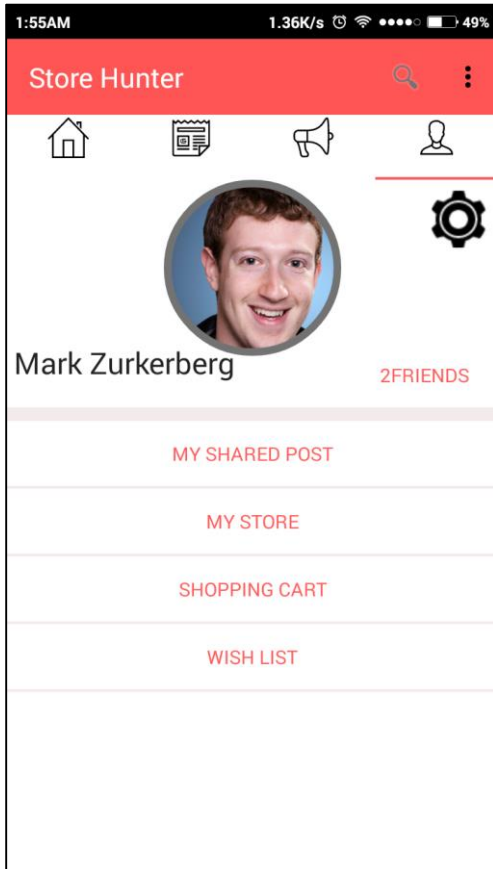
Figure 4-2-20 Screenshot of Me page

GUI Name: Me UI

This indicates the user own information like user profile photo, user name.

Component: user profile photo, user name, user setting, friend list, my shared post button, my store button, shopping cart button, wish list button

User profile photo: This shows the user profile picture so that other user can recognize this user.

User name: This shows the user name so that other user can recognize this user.

User setting: This show the user setting, user is able to change it anytime.

Friend list: User can press on it then it will direct to a friend list. It show all the friends of the user.

My shared post button: User can press on it then it will direct to another activity show all the post that has been shared by user.

My store button: User can press on it then it will direct to another activity to show all the product posted by user. For instance, user is a Tesco Grocery Shop, then Tesco can view the products uploaded by pressing this My store button.

Shopping cart button: User can press on this button then it will direct to another activity to show what user plan to buy.

Wish list button: User can press on this button then it will direct to wish list activity to show product that user want to monitor.

Update User Setting
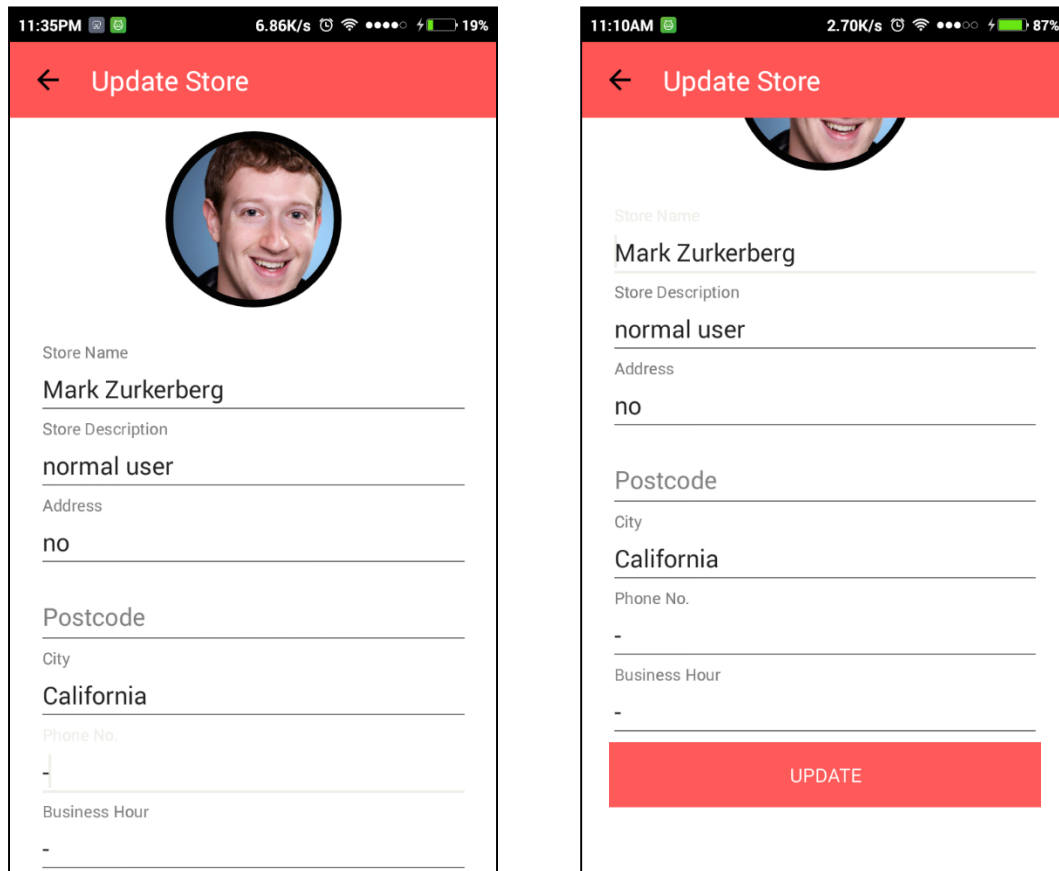
Figure 4-2-21 Screenshot of store setting

GUI Name: User Setting UI

This interface is to let user to update user setting. For instance, if user wants to change user name, or store address, user can do it here.

Component: User profile picture, store name input field, store description input field, address input field, postcode input field, city input field, business hour, update button

User profile picture: User can press on it and select either take a photo or upload an image for user profile picture.

Store name input field: Store name is actually the same with the user name created previously.

Store description input field: A brief description to the store so that people in Store Hunter can know more about the store.

Address input field: Address for the store. It is useful because user can use this address to search the location in Google map or other navigation application.

Postcode input field: Postcode for the address.

City input field: City for the address.

Business Hour: Business hour for the store. For instance, "Monday to Friday 9am – 6pm."

Update button: When user complete the form, by pressing add button user will be able to upload information to the server and update the database.

Friend list
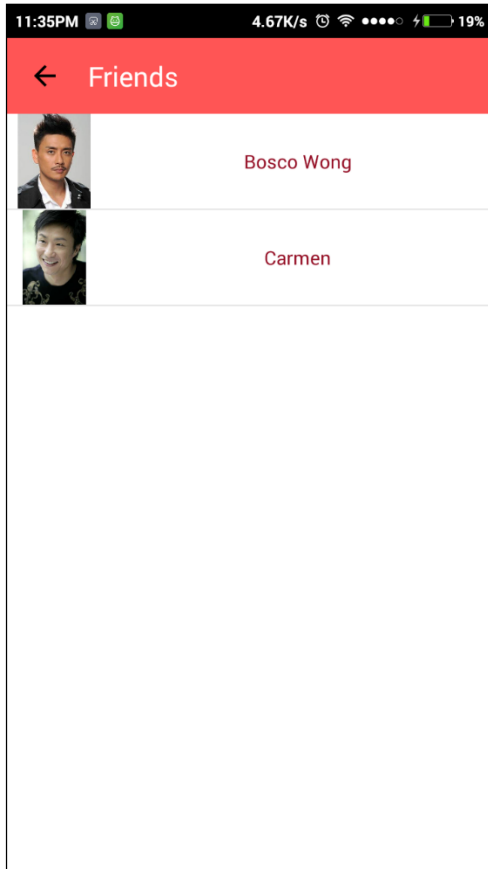
Figure 4-2-22 Screenshot of friend list

GUI Name: Friend list UI

This interface is to allow user to check the currently friend or family.

Component: Friend list

Friend list: User can press on any friend to view friend profile.

My Shared Post
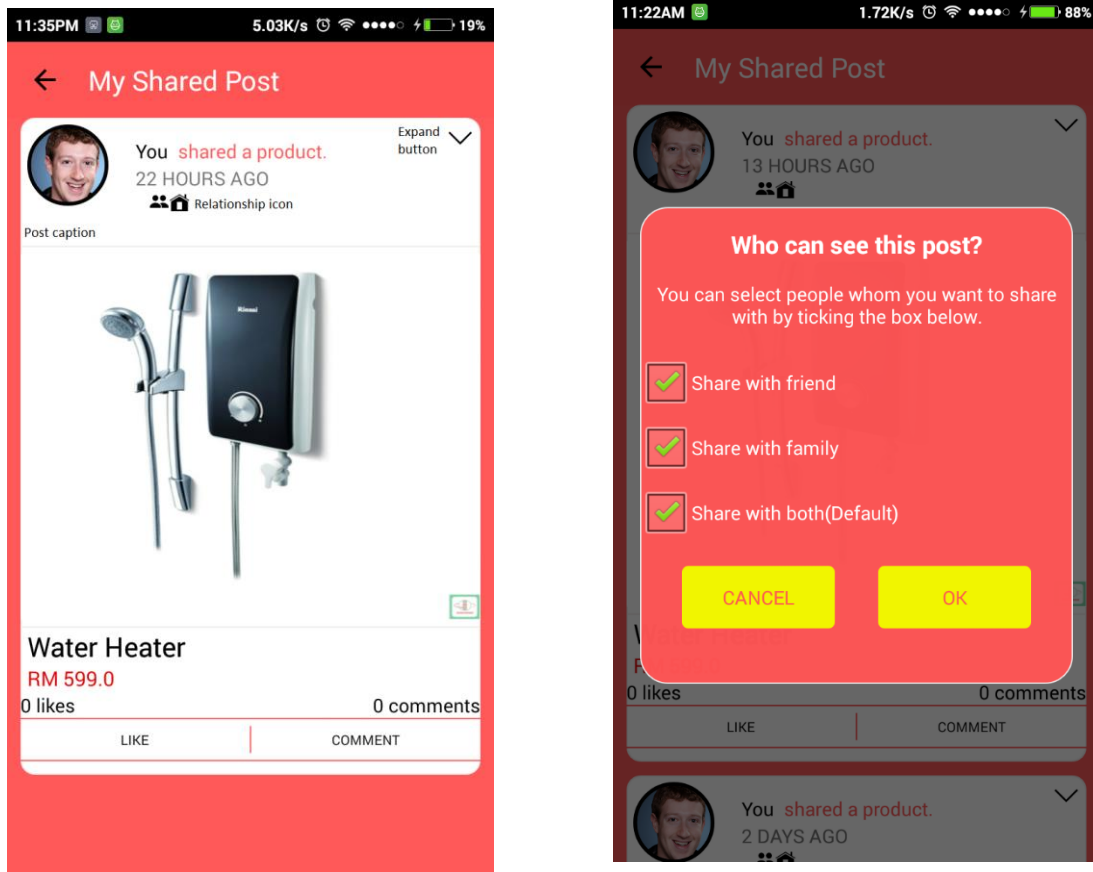
Figure 4-2-23 Screenshot of my shared post

GUI Name: My shared post UI

Component: User profile picture, user name, timestamp, post caption, product photo, product name, product price, post total likes, post total comments, like button and comment button, icon expand, relationship icon.

User profile picture: This display friend's or family's profile picture. User can press on the user profile picture and view that user profile information.

User name: This only display "You" because all post here only belong to user himself.

Timestamp: This indicates time that user's friend or family share this post. For instance, three days ago, 1 hour ago.

Post caption: This show the mind and thought when user share particular post. For example.,"Cheapest in the market!".

Product photo: This indicates the product in the post. Product photo can show user the product instantly so that user can have more information at the first sight. User can press on the product picture and it will direct to the product information page to have more details on the product.

Product name: This indicates the product name in the post. Product name can help user to recognize the product with the product name.

Product price: This indicates the product price in the post. Users are price sensitive hence product price is displayed here in order to catch user attention.

Post total likes: This indicates the total likes of a post.

Post total comments: This indicates the total comment of a post.

Like button: User can press on it to do a "liking" action. Like button allows interaction between user and user. When user "like" a product, like button text will turn to red color and the "LIKE" text in the button will be bold.

Comment button: User can press on it to do a "commenting" action. Comment button will direct user to another activity to do comment.

Icon expand : This allows user to decide who can see the post. For instance, share to friend, share to family, or share to both.

Relationship icon: When user post is only shared to friend, then the friend icon appears, if user post is only shared to family, then the family icon appears, if user post is shared to both, both icons appear.

My Store
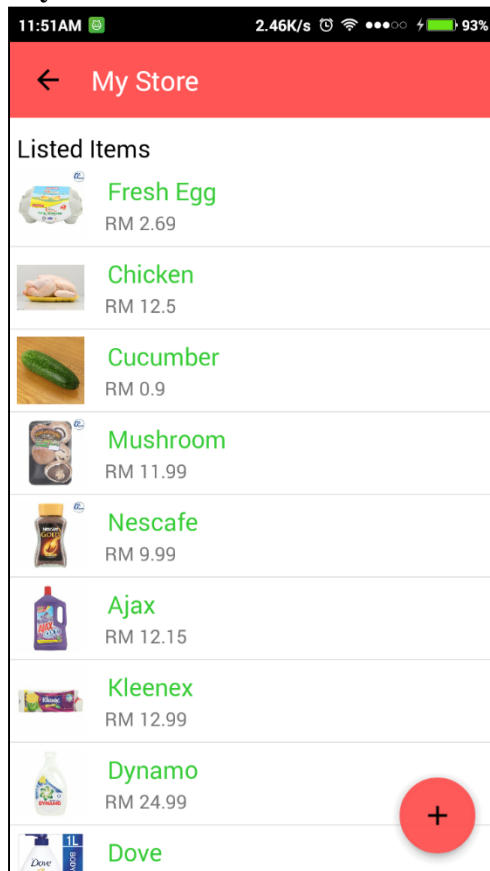
Figure 4-2-24 Screeenshot of my store

GUI Name: My store UI

This interface allow user to manage user own product. User can perform adding product, updating product and deleting product here.

Component: add button, product list

Add button: User can press on the add button, then it will direct to another page for user to add product.

Product list: User can press on any product in the list, it will direct to another page for user to update product.

Add Product
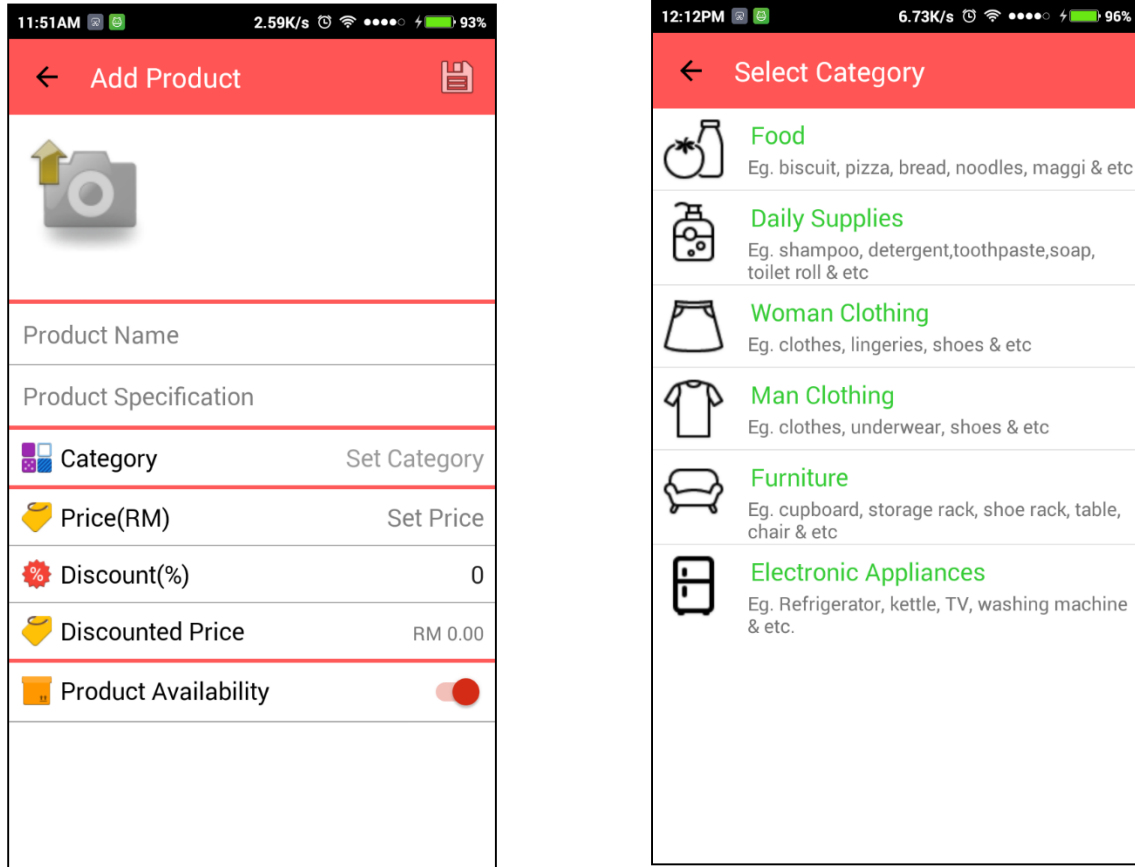
Figure 4-2-25 Screenshot of add product

GUI Name: Add product UI

This interface is to allow user to add product.

Component: Upload product image, product name input field, product specification input field, set category, price input field, discount input field, discounted price, product availability.

Upload product image: User needs to upload an image for the product posted so that people can easily recognize the product.

Product name input field: User needs to input product name.

Product specification input field: User needs to input specification of the product.

Set category: User can press on it and then it will direct to another page for selecting the category for the product.

Price input field: User needs to input price for the product.

Discount: User can choose to offer discount like 10% or 20% on the product or user can also choose not to offer any discount and leave it as 0%.

Discounted Price: This figure is automatically calculated each time there is a change in price or discount.

Product availability: If the product is not available yet, user can choose set to not available. The default option for product availability is YES(available).

Update Product
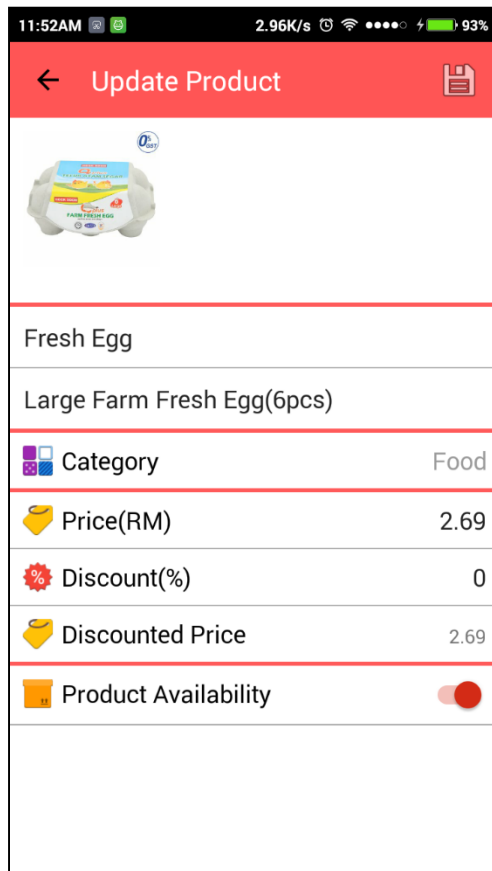
Figure 4-2-26 Screenshot of update product page

GUI Name: Update product UI

When user press on the product in the product list in My Store UI, it will direct to this update product page. User can do changes in product name, product price and etc.

Delete Product
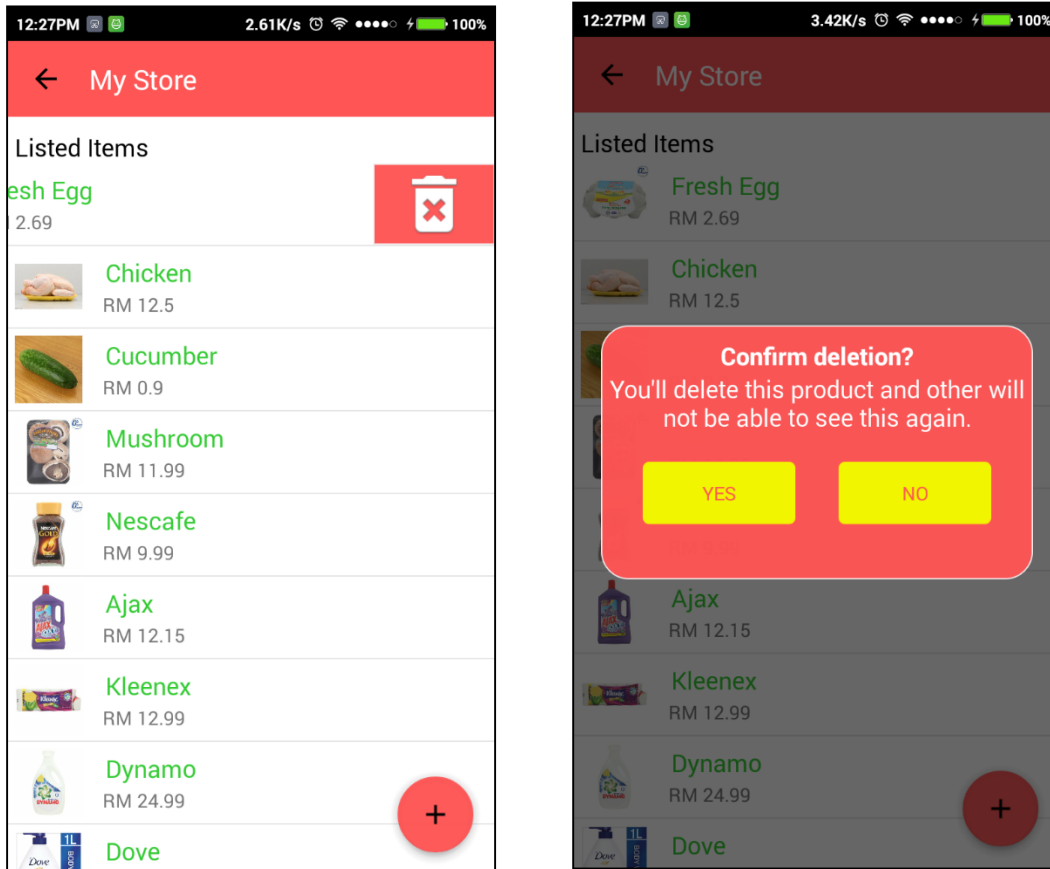
Figure 4-2-27 Screenshot of delete product

GUI Name: Delete product UI

This interface allow user to delete product. When user tap on the product and swipe left, a delete icon will display at the right. User can press on the delete icon, then system will confirm with user again whether to delete it or not.

My Shopping cart
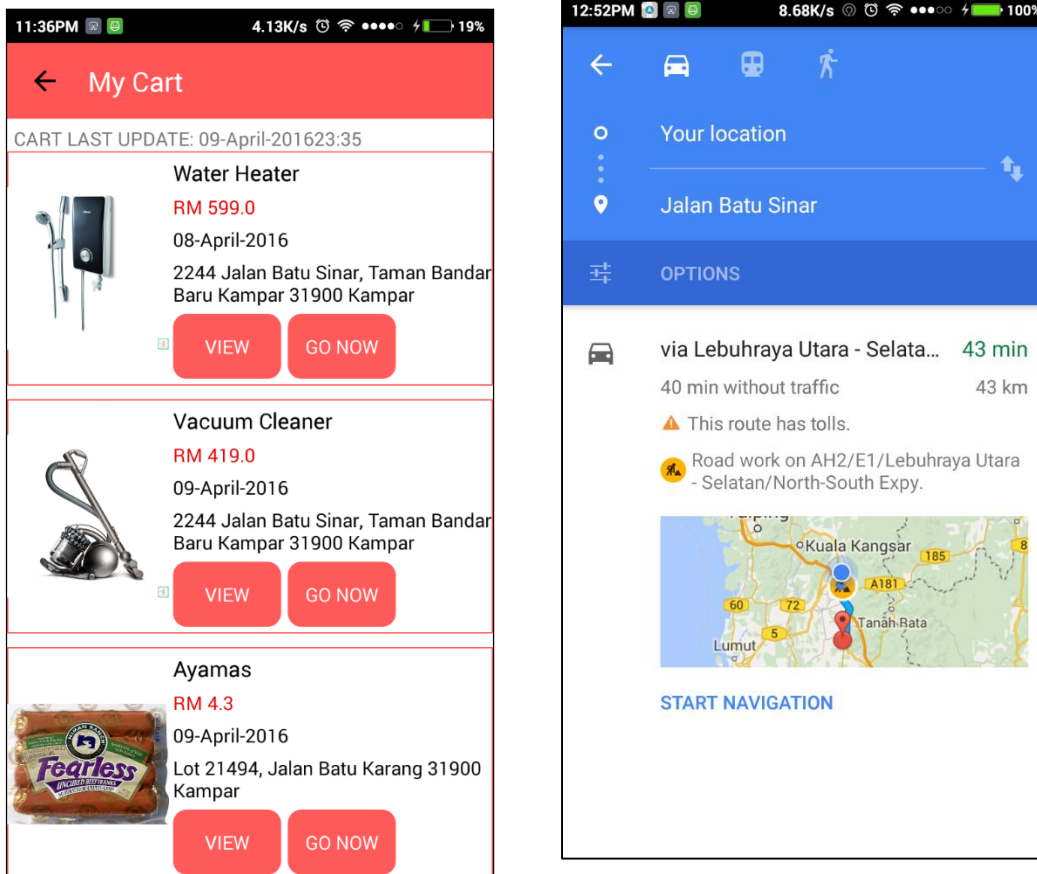
Figure 4-2-28 Screenshot of my shopping cart

GUI Name: My Shopping Cart

This interface is to manage the products added in the carts.

Component: Cart last update, view button, go now button

Cart last update: Each time user fetch data from server, cart last update will display the fetching time to indicate that this is the latest cart list.

View button: User can press on it to view the product information.

Go now button: These products are product that user plan to buy, so if user want to go to the shop now, user can press on go now button to open the navigate application.

Wishlist
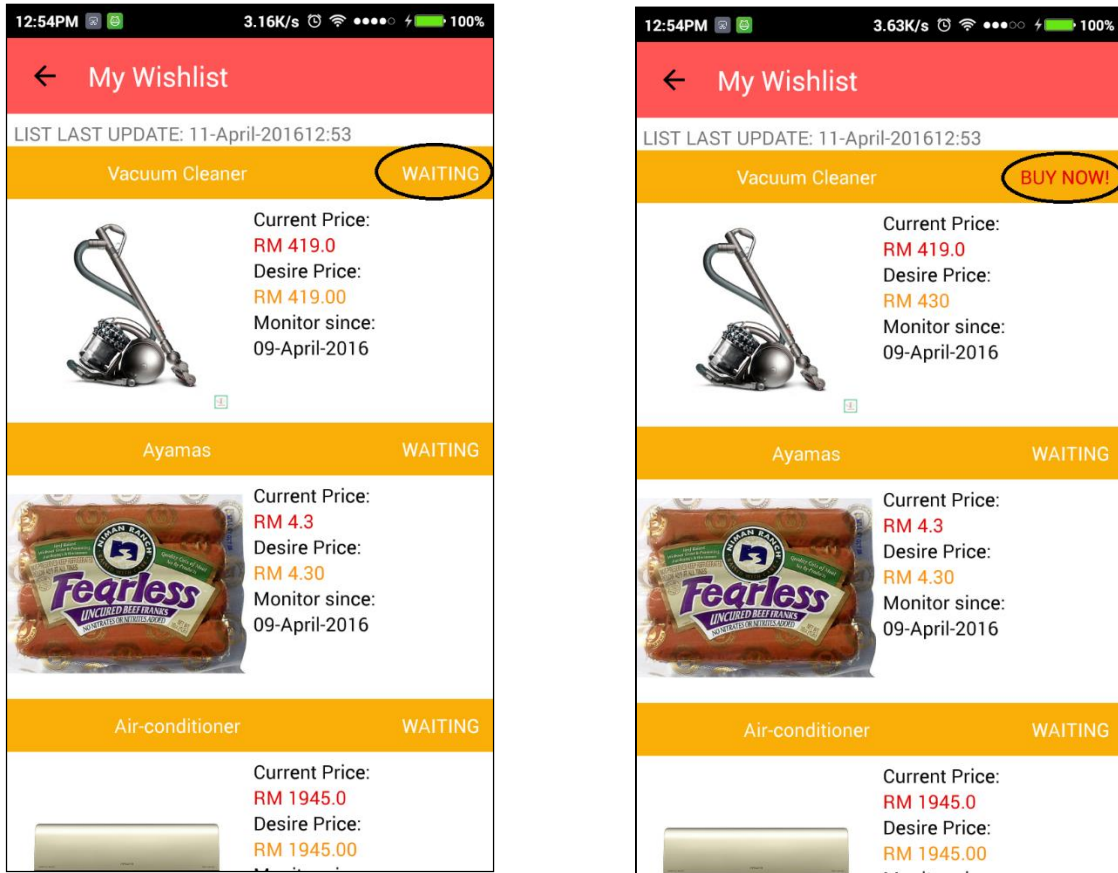
Figure 4-2-29 Screenshot of wishlist

GUI Name: Wishlsit UI

This interface is to monitor the product price in wishlist. Products here are added by user previously and now user can see the current product price, desire price and time added date clearly. As the figures above, if the current product price is still higher than the user desire price, it will show "WAITING" indicates that system waiting the product price to drop. If current price is lower than user desire price, it will show "BUY NOW!" indicates that system detects that is a great deal for user.

Update wishlist
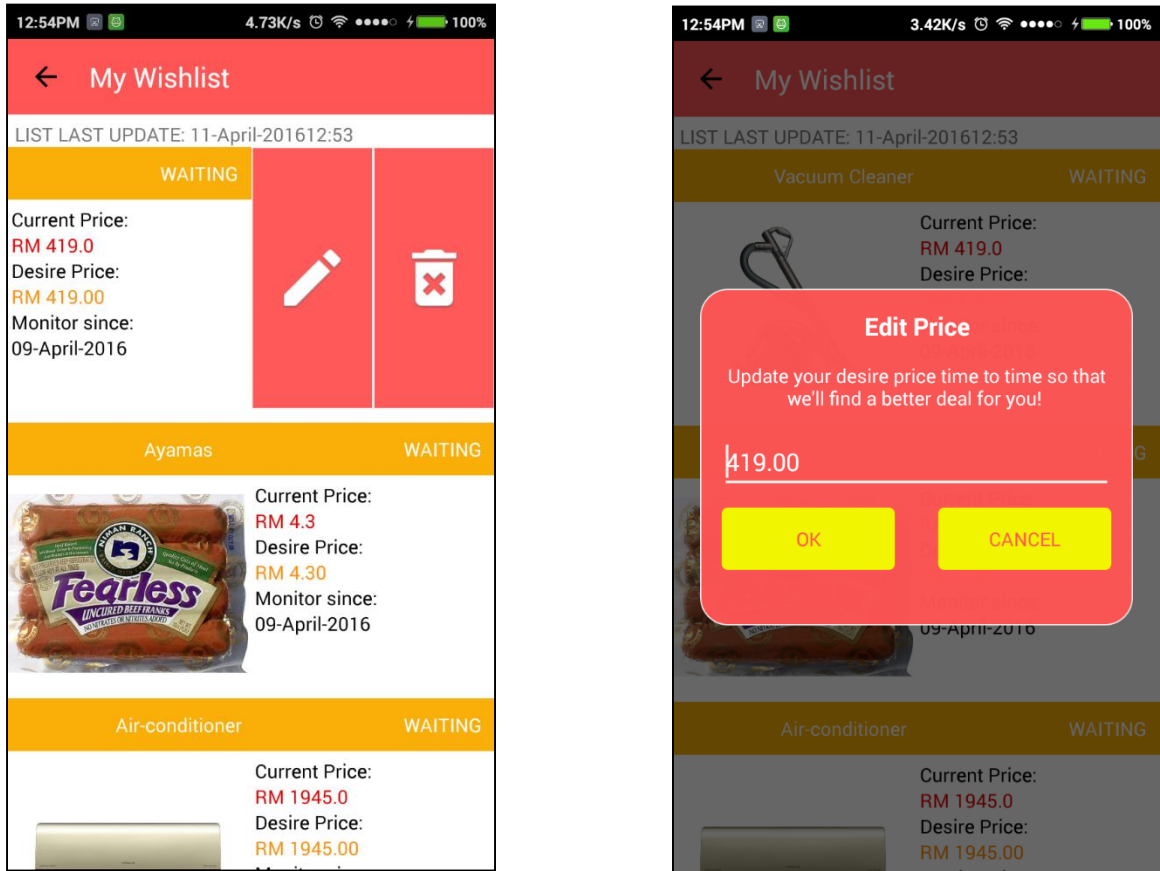
Figure 4-2- 30 Screenshot of update wishlist

GUI Name: Update wishlist UI

This interface allow user to update the desire price set previously. User need to tap on the product in wishlist, swipe left to make these two icons appear. The first icon is edit price button, and second is delete button. If user press on edit price button, it will pop up a dialog box for user to enter a new price for the product. By pressing OK button, it will update database.

Delete wishlist
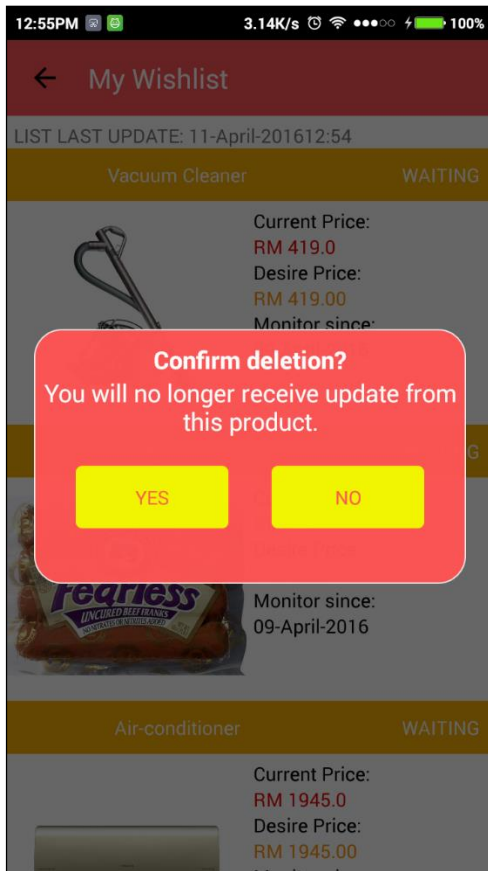
Figure 4-2-31 Screenshot of delete wishlist

GUI Name: Delete wishlist UI

This interface is to confirm again with the deletion of wishlist.

4.3 Entity Relationship Diagram
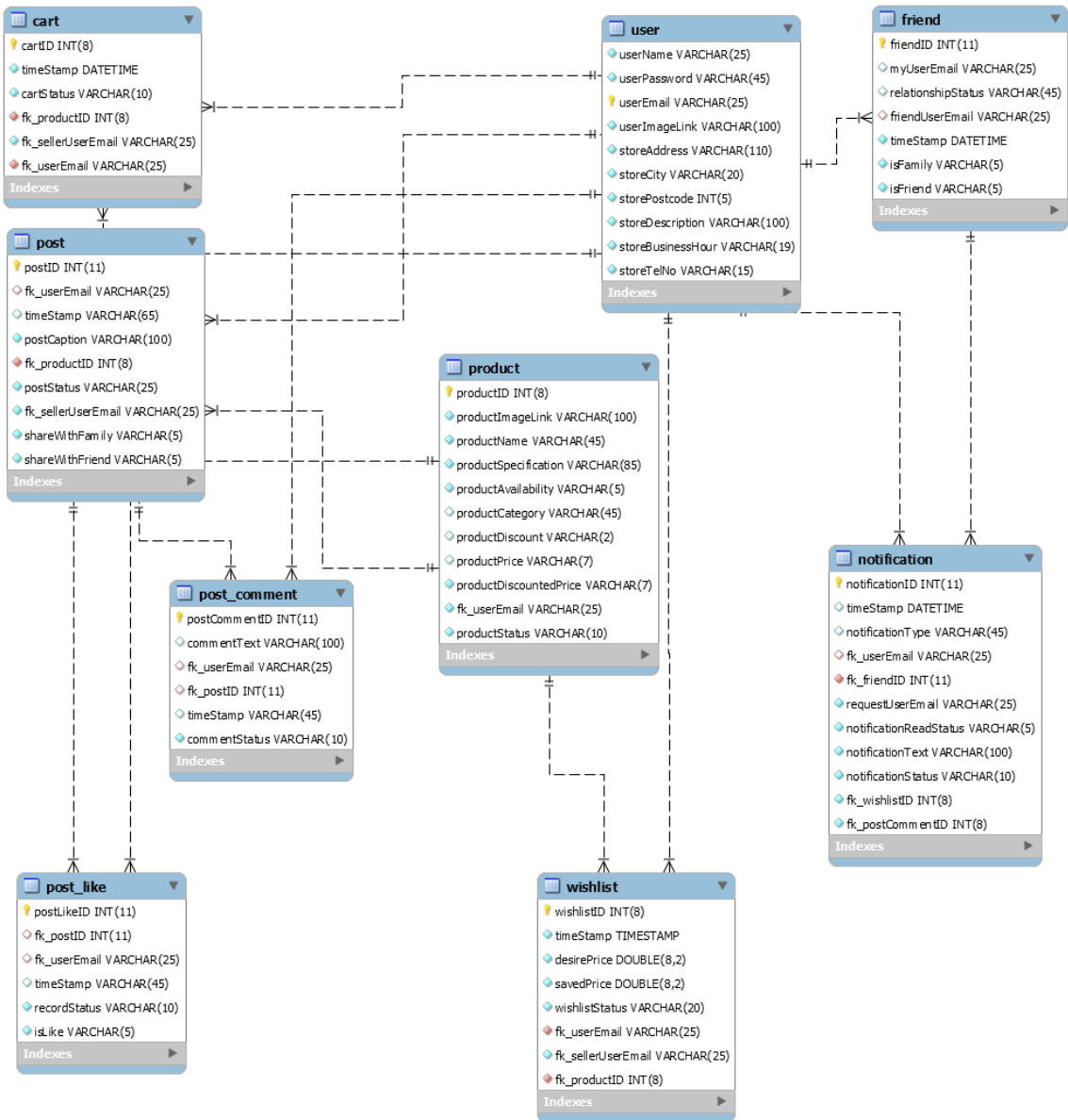
Figure 4-3- 1 Entity relationship diagram

4.4 System architecture

        This application requires user to have an android smartphone with version at least 4.0 or above. For example, this project will use Redmi 2 with android version of 4.4 to test the application. Users are required to have knowledge on using android smartphone, and able to turn on wireless connection or 3g network in order to access Internet. Users are also required to access Play Store and download this application.

        As this project involves web services, therefore it will use client-server architecture to host the database in laptop. In this project, before the project go public, database is setup in a computer Besides, wamp server has to be installed in the same computer. This is to ensure that the connection is really stable between database and phone while testing the application. The benefit of using client-server architecture is user do not need to store very size of data in mobile phone, all data are fetched from database.

Figure 4-4-1 Server-side architecture

Detail of the whole architecture
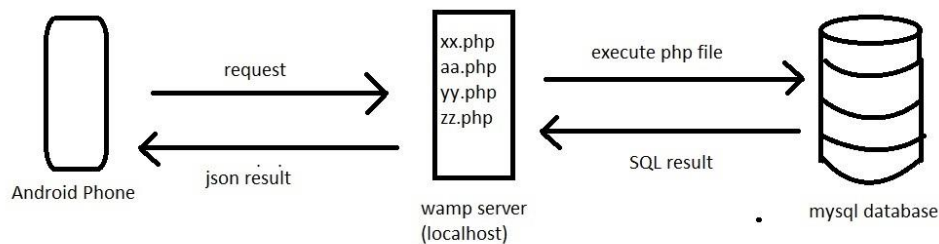
Figure 4-4-2 Architecture of Store Hunter system

The figure above show the big picture of Store Hunter architecture. Let explain it with a scenario. For instance, user want to view a product and the product details are in database.

The requirement of fetching data from database is the phone has a WiFi connection. First step, user has to select the product, then system will automatically send the request to the wamp server. Then, wamp server will execute the php script that order by the request form user, access the database with the user id and password(which is set before), and run the sql command in php script to fetch data from database. After database done its job, if database has result return to php script, php script will wrap the result into a json format. After that, wamp server will get the json format result and return to user Android phone. After getting json result from server, Store Hunter will extract the information from the json result and then put into an object for further process. Lastly, information will be display to the user.

CHAPTER 5: SYSTEM TESTING

5.1 Project Implementation & Testing

After design phase, implementation phase is about to start. User interface design will be developed with Android Studio. Besides, database and wamp server will be set up for the connection and data transfer. In this chapter, the system will be tested by unit testing with several test cases. The importance of unit testing is to make sure all module are implemented correctly.

5.2 Implementation Issues and challenges

Implementation phase is very important in the project development process. The implementation phase develop the product and involve user to use it in real situation. However, there are several challenges in this phase.

Connection speed

This is the biggest concern in developing this application because without connection, there will be no data shown in the apps.

Server capacity

This is another concern because this application will store many images like product image or user image in server. Therefore, server must have enough storage to store all of them.

5.3 Development tools

5.3.1 Android development tool

This project is to be used in Android platform devices, therefore, this is developed with Android Studio 1.5. The language used to develop this Android application is Java.

5.3.2 Web Technology

This project requires web technology for sending data to server and receiving data from server. Therefore, an apache server is installed and PHP script is used for managing server request. Apache server will access the local database to get data and then wrap the data into JSON format and return back to user.

5.3.3 Database environment

This project requires a database to store all user data like user information, product, community information and etc. This project has chosen Mysql database because it is easy to use, user friendly with Mysql workbench, reliability, user friendly user interface and etc. Mysql comes together with wamp installed in the computer and php script can access this database through server.

5.3.4 Notepad

Notepad is a write that comes with Windows Operating System. This is used for creating and editing the PHP script. This is a simple yet powerful tool.

5.3.5 Google Chrome

Google Chrome is a popular browser used by people all over the world. In this project, it is used to debug PHP script is correct or not. If there is any syntax problem in the PHP script, Google Chrome will display the error to user.

5.3.6 Visual Paradigm Community Edition

Visual Paradigm is a software that helps development team to draw those diagram such as use case diagram, class diagram, object diagram and activity diagram.

5.4 Test Plan

Unit test plan is used here to test the system performance.

Test case 1

Test case module: Login Page

Test case code: LG

Test Priority: MED

Description: Test login function

Test Case ID	Steps(Description)	Expected Results	Actual Results	Status
LG 001	Display login page	Display login page	Display login page	PASS
LG 002	Enter wrong user email or password and login.	Display error	Display error	PASS
LG003	Enter wrong format of user email	Display error	Display error	PASS
LG004	Enter correct user email and password and login	Navigate to Store Hunter main page	Navigate to Store Hunter main page	PASS

Table 5-4-T1 Login page test case table

Test case 2

Test case module: Register

Test case code: RG

Test Priority: MED

Description: Test register function

Test Case ID	Step(Description)	Expected Result	Actual Result	Status
RG 001	Open registration page	Display registration page	Display registration page	PASS
RG 002	Enter wrong format of user email, correct name and password. Click Register.	Display wrong email format message.	Display wrong email format message.	PASS
RG003	Enter correct format of user email and name, not identical password. Click Register.	Display wrong password message	Display wrong password message	PASS
RG004	Enter correct format of user email, name, and password. Click register	Navigate to store detail page.	Navigate store detail page	PASS
RG005	Click Cancel button	Navigate to login page	Navigate to login page	PASS

Table 5-4-T2 Register page test case table

Test case 3

Test case module: Store setting module

Test case code: SS

Test Priority: MED

Description: Test store setting

Test case ID	Step(Description)	Expected Result	Actual Result	Status
SS 001	Open store setting page	Display store setting page	Display store setting page	PASS
SS 002	Select take photo and display in page	Pop up dialog box and let user to choose to take new photo or select existing image in gallery. Then photo will be display on the page.	Pop up dialog box and choose to take new photo. After taking photo, image is displayed on the page	PASS
SS 003	Select image from gallery and display in page	Pop up dialog box and let user to choose to take new photo or select existing image in gallery. Then photo	Pop up dialog box and choose select from gallery. After selecting image, image is displayed on the page	PASS

		will be display on the page.		
SS 004	Click SKIP on snackbar.	Navigate to Store Hunter Main Page	Navigate to Store Hunter Main Page	PASS
SS 005	Click Add button	Navigate to Store hunter Main Page	Navigate to Store Hunter Main Page	PASS

Table 5-4-T3 store test case table

Test case 4

Test case module: Search Module

Test case code: S

Test Priority: MED

Description: Test search module

Test case ID	Store(Description)	Expected Result	Actual Result	Status
S 001	Type keyword in search bar	Return user result	Return user result	PASS

Table 5-4-T4 search test case table

Test case 5

Test case module: Share module

Test case code: SHR

Test Priority: HIGH

Description: Test share module

Test case ID	Store(Description)	Expected Result	Actual Result	Status
SHR 001	Press on share product	Pop up a dialog box and allow user to type post caption. Shared post will be displayed in My Share Post page.	Pop up a dialog box and type post caption. My Shared Post page has this new post.	PASS
SHR 002	Press on Cancel button	Dismiss dialog box	Dismiss dialog box	PASS

Table 5-4-T5 share test case table

Test case 6

Test case module: Manage product module

Test case code: MP

Test Priority: HIGH

Description: Test manage product module. (Add product, update product, delete product)

Test case ID	Store(Description)	Expected Result	Actual Result	Status
MP 001 (Add product)	Press on add button to add product.	Navigate to add product page.	Navigate to add product page	PASS
MP 002 (Add product)	Select take photo to upload to server	Pop up dialog box and let user to choose to take new photo or select existing image in gallery. Then photo will be display on the page.	Pop up dialog box and choose to take new photo. After taking photo, image is displayed on the page	PASS
	Select image from gallery and display in page	Pop up dialog box and let user to choose to take new photo or select existing image in gallery.	Pop up dialog box and choose select from gallery. After selecting image, image	PASS

		Then photo will be display on the page.	is displayed on the page	
	Post product with any required field wrong information. Click save.	Display error message.	Display error message.	PASS
	Post product with all required field filled with correct information. Click save.	Navigate to My Store page.	Navigate to My store page	PASS
MP 003 (Update product)	Click on any product in My Store product list.	Navigate to edit product page with field filled with information.	Navigate to edit product page with field filled with information	PASS
	Update product with any required field wrong information. Click save.	Display error message.	Display error message.	PASS
	Update product with all required field filled with correct information. Click save.	Navigate to My Store page.	Navigate to My store page	PASS

MP 004	Tap on a product swipe left to display delete button.	Delete button shows.	Delete button showed	PASS
	Press on delete button to delete.	Pop up a confirmation on product deletion.	Pop up a confirmation on product deletion.	PASS

Table 5-4-T6 manage product test case table

Test case 7

Test case module: Compare module

Test case code: CP

Test Priority: MED

Description: Test compare module

Test case ID	Store(Description)	Expected Result	Actual Result	Status
C 001	Open a product information page. Then press on compare button	Navigate to compare result page to display the compare result to user.	Navigate to compare result page and display result from database.	PASS

Table 5-4-T7 compare test case table

Test case 8

Test case module: Manage friend module

Test case code: MF

Test Priority: MED

Description: Test friend module

Test case ID	Store(Description)	Expected Result	Actual Result	Status
MF 001	Open a stranger profile.	Display a stranger profile.	Display a stranger profile	PASS
	Press on ADD FRIEND button	Save request in database and display"REQUEST_ PENDING" on the button.	Request is saved in database and button display "REQUEST_PENDING".	PASS
MF 002	Press on ACCEPT FRIEND button	Save request in database and display "FRIEND" on button.	Request is saved in database and button display "FRIEND"	PASS
MF 003	Press on REQUEST _PENDIN G button	Display dialog box to confirm cancelation of friend request.	Display dialog box to confirm cancelation of friend request.	PASS
	Press on OK button.	Save request in database and display "ADD FRIEND" on the button.	Request is saved in database and button display "ADD FRIEND"	PASS

MF 004	Press on FRIEND button	Display dialog box to confirm friend deletion.	Display dialog box to confirm friend deletion	PASS
	Press on OK button	Save request in database and display "ADD FRIEND" on the button	Request is saved in database and button display "ADD FRIEND"	PASS

Table 5-4-T8 manage friend test case table

Test case 9

Test case module: News feed module

Test case code: NF

Test Priority: MED

Description: Test news feed module

Test case ID	Store(Description)	Expected Result	Actual Result	Status
NF 001	Open news feed page	Display family's post first only followed by friend's post.	Family's post is displayed first then only display friend's post.	PASS

Table 5-4-T9 news feed test case table

Test case 10

Test case module: Commenting module

Test case code: CM

Test Priority: MED

Description: Test commenting module

Test case ID	Store(Description)	Expected Result	Actual Result	Status
CM 001	Select any post in news feed page or my shared post page. Click comment button	Navigate to comment page.	Navigate to comment page	PASS
	Type some comment and press send.	Comment is saved in database and it will be displayed within 3 seconds.	Comment is saved in database and it is displayed within 3 seconds	PASS
	Send comment with empty comment	Display error message.	Display error message.	PASS

Table 5-4-T10 commenting test case table

Test case 11

Test case module: Liking module

Test case code: L

Test Priority: MED

Description: Test liking module

Test case ID	Store(Description)	Expected Result	Actual Result	Status
L 0001	Select any post in news feed module or my shared post module	Display like button.	Like button is displayed.	PASS
	Press like button on the selected post if the post is not liked.	Like button text color changed to red, total like for the post plus one.	Like button text color is changed to red and total like for the post plus one.	PASS
	Press like button on the selected post if the post is liked.	Like button text color changed to grey, total like for the post deduct one.	Like button text color is changed to grey and total like for the post deduct one.	PASS

Table 5-4-T11 liking test case table

Test case 12

Test case module: Add cart module

Test case code: CA

Test Priority: MED

Description: Test add cart module

Test case ID	Store(Description)	Expected Result	Actual Result	Status
CA 001	Open a product information page	Display product information with cart button.	Display product information with cart button	PASS
	Press on cart button if cart button has no tick icon.	Save product in cart list, update database and display a tick beside cart.	Product is saved in cart list, database is updated and tick is beside cart.	PASS
	Press on cart button if product owner is myself	Notify user that this product cannot be added.	Notify user that this product cannot be added	PASS
	Press on cart button if cart button has a tick there.	Notify user that this product has been added in cart.	Notify user that this product has been added in cart.	PASS

Table 5-4-T12 add cart test case table

Test case 13

Test case module: Add wishlist module

Test case code: WI

Test Priority: MED

Description: Test add wishlist module

Test case ID	Store(Description)	Expected Result	Actual Result	Status
WI 001	Open a product information page	Display product information with wishlist button.	Display product information with wishlist button	PASS
WI 002	Press on wishlist button if wishlist button has no tick icon.	Display a dialog to ask user to enter desire price or just add the product anyway.	Display a dialog to ask user to enter desire price or just add the product anyway.	PASS
	Press on "SET MY OWN PRICE" button	Display another dialog box to enter price.	Display another dialog box to enter price.	PASS
	Set the price and click OK button.	Save product in wishlist and save this wishlist in database.	Save product in wishlist and save this wishlist in database.	PASS

	Press on "DON'T NEED, JUST ADD" button	Dismiss dialog. Save product in wishlist. Update database.	Dismiss dialog. Product is saved in wishlist. Database is updated.	PASS
WI 003	Press on wishlist button if wishlist button has a tick icon.	Notify user that product cannot be added.	Notify user that product cannot be added.	PASS

Table 5-4-T13 add wishlist test case table

5.5 Test result

This unit testing is based on testing all the module. So here is a result after testing all the unit.

Test Case	Module	Status
1	Login	PASS
2	Register	PASS
3	Store Setting	PASS
4	Search	PASS
5	Share	PASS
6	Manage product	PASS
7	Compare	PASS
8	Manage friend	PASS
9	News feed	PASS
10	Commenting	PASS
11	Liking	PASS
12	Add cart	PASS
13	ADD wishlist	PASS

Table 5-5-T1 Test result table

After the unit testing is conducted, it is clear that all module have passed the testing.

CHAPTER 6 SYSTEM EVALUATION AND DISCUSSION

This chapter is about how did this project solve the problems in problem domain and how does the final product fulfill the project aim and objective. Here is how the problem has been solved.

6.1 Proposed system completion

Problem	Solution
No community in existing application	Community is created in Store Hunter. Community has features like making friends with other in the platform, sharing other friend post, giving like on friend's post and commenting on friend's post.
Users could not track certain product for price tracking	Add to wishlist feature is created in Store Hunter. User can track any product price now by saving the product into wishlist. When user add product into wishlist, user can set his desire price or just leave it as the same with current product price. Besides, user manage the wishlist item such as edit the desire price or delete wishlist.
Registration and updates are done by application developer	Store Hunter has register and login function to user. User can create an account with their user email and login to use the application. User can also post product in the platform to promote them. Besides, user are able to perform adding, updating and deleting product in Store Hunter.

Existing application does not have price comparing function	Store Hunter has implemented comparing price function. User just needs to press on the compare price button in the product information page, then system will direct user to the comparing result. Similar product and product price will be displayed to user at another page.

Table 6-1-T1 proposed system completion

In a nutshell, problems mentioned previously are solved with the implementation of Store Hunter.

6.2 System strength and limitation

Store Hunter is a new mobile application and it is not perfect. It has its own strengths and limitation. Let discuss about the strength first.

Strength

1. Combination of e-marketplace with community

   This idea is new in the market because there are very less application are doing the same thing with Store Hunter. The uniqueness of Store Hunter is user can explore product as usual but with an additional community price sharing. User can share to friends in this platform and have more interaction with other user.

2. Integrated navigation

   Products in the cart list are product that user going to buy. There is a button for every product called "Go Now". When user want to visit the shop, user just has to press on the button and it will open the navigation apps and automatically navigate user to the shop. This provides convenience and user friendliness to user.

Limitation

1. Only friend request appear in notification list. Like and comment, price drop notification will not notify another user.
2. No notification sound
3. Users cannot retrieve password if they forgot their password because there is no email server in this project.
4. No admin control because admin site control panel is not developed in this project.
5. No bug and feedback feature. User cannot report inappropriate post, comment and product.
6. Users are not allowed to type other languages word except English word.

6.3 Future enhancement

1. A feature that identify the shop is open or not

   Currently there is a feature in Store Hunter that navigates user to the shop, but it is not good enough. The system should let user know whether the business is currently open or not. If user reaches the shop but the shop is closed at the moment, then it will be a frustrated experience for user.

2. Display total number of available stock unit

   Currently there is no feature to tell user how many stock is still available in the shop. The future enhancement is there is a function that let the shop to update the available stock unit. Without this function, buyer might feel frustrated if buyer want to order a bulk amount but the stock is limited.

3. Extend to worldwide location

   Store Hunter is currently only available in Malaysia. It is good to extend to worldwide to benefit more people and it is a big leap in the growth of Store Hunter.

4. Better social interaction

   Now the community module is simple. In the future, it is suggested to add more feature to make the entire community more lively and active. For instance, add a feature that enable a user to invites another user in the platform to go to a shop buy product together.

CHAPTER 7: CONCLUSION

In a nutshell, smartphone is leading the technology today with the Internet technology. Mobile application is playing an important role in business world because it is the fastest and direct way to advertise product by pushing notification to users. This project would create a new platform to advertise product and at the same time it would assist people in making buying decision. Let summarize this project, this project would develop Store Hunter in mobile platform. The main reason for developing this application is to benefit people in spending lesser money by price comparison. This application would have a community for people to community which allow them to share price among the friends.

In chapter 2, there are four existing application in the market have been reviewed. There is one introduction for every existing application as well as the strengths and weaknesses. Apart from existing application, this project also reviewed on how people do community, how people do online store and mobile advertising. After so much of review, this project has seen some strengths which are potential to be implemented in this project.

In chapter 3, system analysis discussed with project timeline, grant chart, system requirements, use case diagram, activity diagrams, class diagram and object diagram. For use case diagram, it clearly shows the functionality of the system. Next, each functionality is defined more deeply in activity diagram. The database for the entire system has been designed in class diagram with the attribute and constructor. After that, object diagram showed real data in class diagram to make it easy to understand.

In chapter 4, system UI design has been discussed with multiple screenshots of application, and also some description to illustrate the UI. All these screenshots were taken in a real Android devices with running Store Hunter. With the screenshots, design of the application is clearer now because a picture speaks thousand words.

In chapter 5, system implementation and testing has been discussed with some implementation issues and test cases. Implementation issues such as technical concern like server capacity, connection speed have been discussed and test cases have been carried out to make sure the application is working as expected.

In chapter 6, it discusses about proposed system completion and some strengths and limitations of the system. It is obvious that there are many improvement to be made in the future to make Store Hunter better. Besides, limitations of Store Hunter have to be fixed in order to gain more users in the market. Future enhancement has also been discussed with few points to enhance the future project.

In conclusion, Store Hunter is not a perfect a project and it has a lot of improvement to be done in the future. Therefore, next version of Store Hunter will do it better with more attractive features to gain users in market.

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