SHOPPING APPLICATION: PRICE COMPARISON AND SHOPPING PLANNER

BY

YUEN JIANG KEE

A REPORT

SUBMITTED TO

UNIVERSITI TUNKU ABDUL RAHMAN

In partial fulfilment of the requirements

For the degree of

BACHELOR OF INFORMATION SYSTEM (HONS) INFORMATION SYSTEMS ENGINEERING

Faculty of Information and Communication Technology

(Perak Campus)

Jan 2018

UNIVERSITI TUNKU ABDUL RAHMAN

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DECLARATION OF ORIGINALITY

I declare that this report entitled "_Shopping application: Price comparison and shopping planner__" 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.

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Date : _____

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I would like to thanks to my supervisor, Mr Ku Chin Soon, because Mr Ku provide a lot of information when I doing my project, he guide me patiently step by step when I facing a problem and also he provide so idea to improvement my project It is my first time to handle an android mobile application myself.

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ABSTRACT

This system is a shopping application for decision support. It will provide the consumer with the comparison of the product in several shopping center in Kampar. This system can help the consumer make a short decision before they are go to the actual retail store purchase the item. It can help the consumer save a lot of time go through all the shopping center to compare each shopping center product price see which product price is more reasonable to them. To design this mobile application purpose is to help customer select a best price by comparing each shopping center product and give a decision making to the consumer which is greatest. Consumer can well-know which product in which shopping center is more reasonable and affordable to them. Consumer can use their mobile phone install the shopping application to check the latest shopping center details without going the actual shopping center to check the product price update.

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LIST OF ABBREVIATIONS

SQL	Structured Query Language
PHP	Hypertext Preprocessor

Chapter 1: Introduction

1.1 Project Inspiration

Shopping application for decision support is a system to help the consumer make a decision when they want to purchase something for themselves (Heijden, 2005). It can help the consumer choose the lower price product after do a comparison with the product. It help the consumer compare the price, size and brand of the product in two or three shopping center in Kampar area, see which product is more worthy to the consumer, then the application system will make a decision making to the consumer after do a calculation of the total price in the consumer product list. Consumer can select the product they want to purchase and select two or three shopping center in the application system, then the system will calculate the total of the price in each shopping center and give a best result to the consumer see which are more worthy for the consumer. After that, consumer can follow the decision making by the application go to the shopping center purchase their product. Besides that, the shopping application also can help the consumer check the product size, brand and quantity to do a comparison. The software application can do compare with the distance of the shopping center and calculate the fuel of the vehicle and make another decision to the user. Consumer can using this shopping application to do the comparison and get the decision from the application to see which shopping center are selling lower price product. The decision making for the consumer is depend on the product price, see which product at the lowest price. The software will display the lowest price product in each shopping center without the consumer find themselves.

1.2 Problem Statement

Nowadays, Economic instability a lot of people started saving money for their future and they would not spend their money in unnecessary thing. They only purchase an affordable item for themselves but they need to spend a lot of time go through all the shopping center collect all the product details and do a comparison to make decision making see which item in which shopping center is more worthy to them. But it is waste a lot of time and customer resource especially car fuel to collect all the product details in different shopping center. Sometime a lot people because of one item is cheaper in one of the shopping they will expressly to this shopping center and only purchase that item they want. It is loss they resource because of one thing. Even they collect all the item details they also need to spend a lot of time to analyst it in the stock market. This is a big problem to spend they time find out all the product details in several shopping center, but when the shopping center update the product price details consumer need go to do the research again, sometimes waste their time to find parking in shopping center (Hamilton, 2016). Most of the shopping center will update their price in each month. So the consumer need to spend their time on each month to do a research about the product details, it is waste a lot of time to do the research. Because of the cheaper product they want to purchase.

This is the problem why the consumer need a solution to help them solve their problem because it is inconvenient to them. Besides that some of the customer will reading all the shopping center booklet to collect the product information and make an analyses see which product is worthy in these shopping center. They need investigate themselves by reading those booklet which is shopping center provider. However, each shopping center will update the product in each month so consumer want to keep collect those booklet in each month.

Sometime consumer at shopping center see any product they want to purchase but they do not know other shopping center sales these product in how much. They do not know which shopping center are selling reasonable price so they afraid purchase unworthy but sometime they will regret did not buy the product because other shopping center are selling higher product price. They need an immediately decision to help them check other

shopping center market sales. This problem always happen to the consumer, consumer do know want to purchase of not.

The problem at above need a solution to solve it, if not it is incontinent for the consumer waste their time, money and resource.

1.3 Project Scope

In this project is to build a shopping application for decision support to help the consumer analyze the shopping plan in the shopping center in Kampar area. Besides that, this application also can help the user calculate the cost form starting point to the destination when they want to purchase their product these location. This application only take the shopping center in Kampar area and calculate the distance point between the user see whether which decision is suitable to the user. User can use this mobile application to read the shopping center product details and compare each other in different shopping center in Kampar area. And also user allow to detect current location and calculate the distance of the shopping center and see which shopping center is nearby and product price is affordable. This application can help the user calculate the worthy shopping plan to the user.

To develop this mobile application is using these language such as

- JAVA (Android)
- SQL
- PHP
- Android XML.

This mobile application are going to implement these following module

Retrieve product details module

This module is allow user check the product details on each shopping center, it will glad the data in database and display it to the user. So that, user can see all the product on the shopping center which user selected in the mobile application.

Update product price module

This module is allow the admin position to update the product price in each shopping center, so that the user can identify the latest product

Create product module

Admin allow to create a product in each shopping center.

Delete product module

Admin also allow to delete product in each shopping center.

Price average module

To calculate the average product price in the history product price table, and generate the product price graph let the user know the current product price and previous product price status.

Compare product price module

User can select the product they want to purchase into the list and do a price comparison in those shopping center in Kampar area. This module compare the total price of the product see whether which one is cheaper than other shopping center and generate a analyze details to the user.

Sign in module

User can create a new user account for the mobile application, after they created the account they can sign in to this application and use it easily. The purpose of create account because user can store their information details in the application without type it again and again when their use this application. User can use several way to sign in the account including their email address.

Calculate distance module

This module can help the user detect their location and calculate the distance fuel cost between the shopping center and add the cost in the total product price to make another comparison. User can know well the distance cost fees and product fees when they go either one shopping center in Kampar area.

Product Promotion module

Retrieve the product promotion in these shopping mall and do a comparison between each other, make sure the user can get the better benefit on those shopping center.

Decision making support module

To give an advice decision making depend on total price, promotion and distance cost to the user. Show out the percentage of decision on each shopping center. So that user can refer the decision making provided and make their own decision.

1.4 Objective

1. To design a price comparison tool

Today shopping center become more and more competitive, a lot of shopping center selling product also become more flexible, sometime cheaper sometime unworthy. Customer will not investigate one by one see which market sales in a reasonable price, so that to design an efficient price comparison tool for shopping to help the consumer collect the product details from those shopping center, make the consumer become more convenient and less time consuming. After collect all the data from those shopping center, user can select one of the product they want to purchase to do a comparison between the shopping center. See which market are selling reasonable price. Highlight the reasonable price and the market name and tell the user this product in this market are selling reasonable price. So the user can know this product are lowest price in these market sales.

Consumer can select a few of product in each round to do a comparison between the shopping center, then calculate the total of product price in each market and do a comparison between the total in different market see which total price is more reasonable. Display the message to the user let them know purchase this few thing total price in this market is cheaper than other market. It can help the user check the total price before they go to purchase those product item.

Record down the user buying behavior for the future use, if the user had select the product to do a comparison in few time. The software can help the user automatically record down the product in the user favorites list, if the favorites product have any discount in any shopping center the shopping application will alert the user tell them your favorites product having a discount in one of the shopping center. So the user can easy get the latest information without searching themselves.

2. To design a customer shopping planner

Reduce the consumer searching time increase the response time, user can faster get their searching result. If the response time is faster user can make the decision immediately on shopping time. User can use their phone to search the product details and do the comparison between two or three shopping center in Kampar area. List out three traveling path and show the user see which traveling path is shorter distance, compare traveling path between those shopping center see which traveling path is cheaper, after calculated the petrol cost average add in to the total product price of each shopping center see which shopping center is worthy to the user.

3. To design a promotion comparison tool

Retrieve and list out all the product user has selected in the application, find out those product promotion details in those shopping center. See which shopping center provide highest benefit to the user so that the user can clearly identify those promotion list in the shopping center.

1.5 Impact, significance and contribution

By using this mobile application it will help the user reduce their searching work on shopping center, they can easily find out the latest information through this application without go to research themselves. Besides that, the user can get more than one shopping center information in Kampar area without go through one by one at those shopping center website, this application can display those shopping center product details in Kampar it help the user reduce their work.

Besides that, the user can use this mobile application to do a comparison of the product in those shopping center in Kampar area. Therefore, user can easily know which shopping center are sell cheaper than other in Kampar. More fast and convenience for the user to compare the product price in shopping center.

Lastly, using this mobile application can been more efficiently, user can reduce a lot of work to do a research in those shopping center to make a comparison. Using this mobile application can help their compare those product faster and accurate so that it can help user to reduce their work.

1.6 Chapter summary

This chapter is talking about how the shopping application decision support application help the user solve their buying behavior in their daily life. Most of the user want to buy a cheaper product because they want to save money for the future but they want to do a lot of research work to compare several shopping center in Kampar see whether which shopping center are selling more cheaper than other. So in this chapter is introduce this mobile application to help the user solve their problem in daily life. In the objective and project scope to introduce the project concept, module and function. In the impact, significance and contribution part, it explain how the influence of the user and how this mobile application bring benefit to the user in Kampar.

Chapter 2: Literature Review

2.1 Existing Shopping decision approaches

2.1.1 Refer inside a retail store product

This approaches is using the price comparison of the actual retails store product (Heijden, 2006). Directly compare the price of the product and find out the cheaper one, using the cheaper product as a decision support and suggest the decision to the user. So that referring the actual retail store to take the actual price of the shopping center. Nowadays, this shopping decision support system usually use in computer platform because computer are easily to management and it make comfortable to user. User can directly click and view in front on the screen.

2.1.2 Decision support system for group buying

This decision support system is based on group buying in electronic commerce (MATSUO, 2002), when each buyer is cooperate with another buyer to purchase product together, they can get a discount on the electronic commerce site. They are using the AHP (analytic hierarchy process) structured to determine the number of buyer purchase product together. The number of buyer purchase together increase the discount amount also will increasing depend on the number of buyer.

2.2 Existing application

2.2.1 SmartShopper

After doing some research on internet, I found that some of the application have provide the price of the shopping center. A mobile application called SmartShopper, it can helped the consumer collect all the product details form some bigger shopping center in Malaysia. Such as, ECONSAVE, TESCO, AEON, GIANT, THE STORE and other (Anon., 2015). It will show how many active deals product in the shopping center, is a review application for the shopping center.

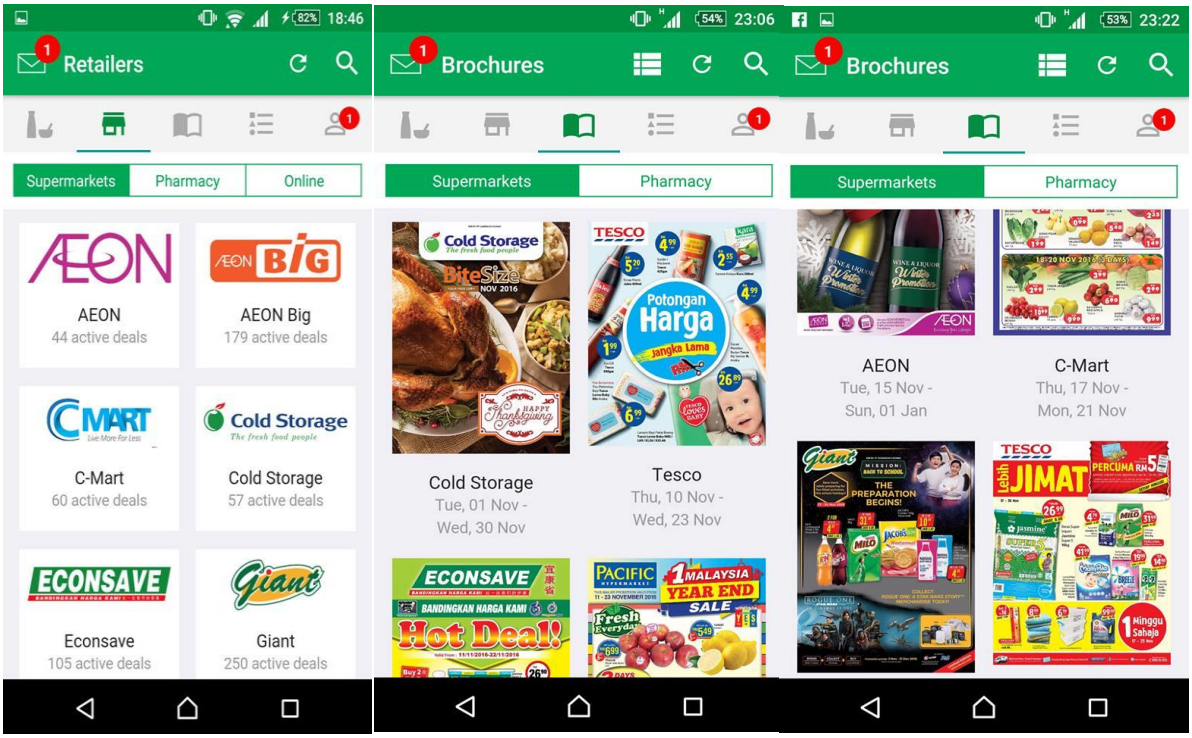


Figure 2.2.1.1

Customer can check the updated price information by using this application, and also user can read the brochures (Figure 2.2.1.1) on this application see which shopping center having a promotion.

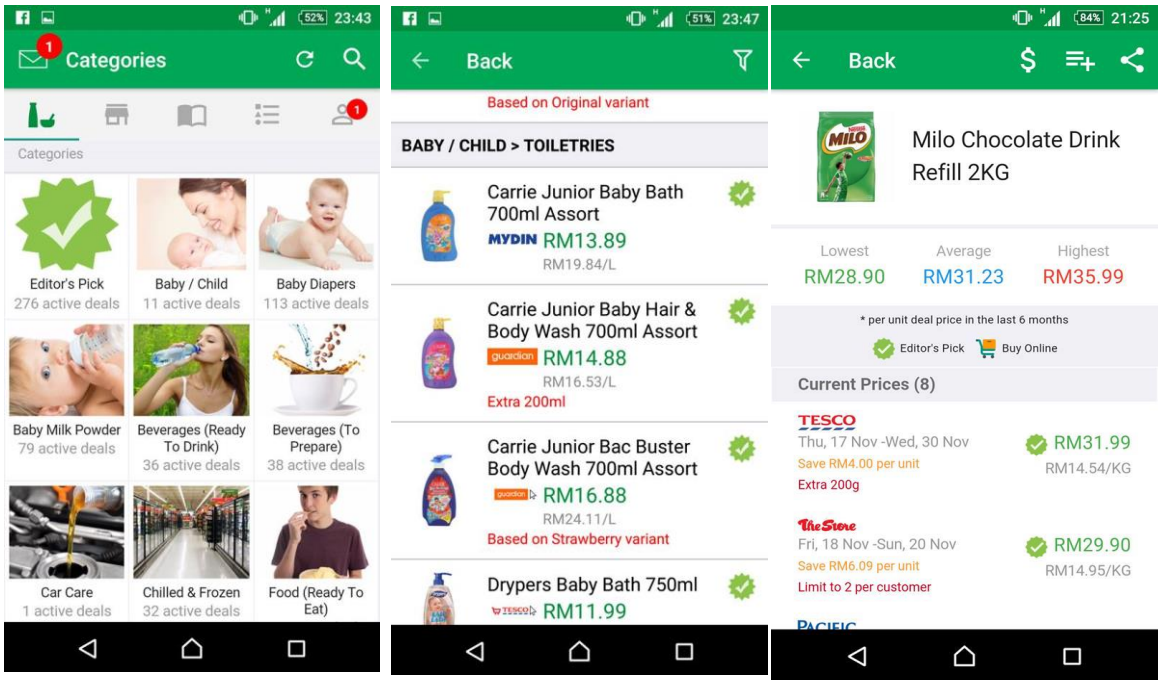


Figure 2.2.1.2

In figure 2.2.1.2 show that SmartShopper have differentiate the categories type of the product, after click inside the categories will show out the product details and price in the market sales place. When select a product on the application, it will display the product details and the price in lowest, Average and Highest, and display all the price in different market.

The strength of SmartShopper is a clear display to list out the product price and details in different market sales user can clearly to identify the product in which shopping center. it is ease of use and this software also provide a tutorial to teach the user how to use this software.The weakness of SmartShopper is cannot do a total price comparison, only can compare each product price in each round and User need to calculate total themselves and need to make their own decision for purchase the product.

To resolve the weakness in SmartShopper are can let the user pick a list of product and calculate the total price of it, after calculate the total price do a comparison in those market sales see which market final result is more worthy to the user. So the system can help the user make a decision. Without user calculate and analyses themselves.

2.2.2 Smartprix

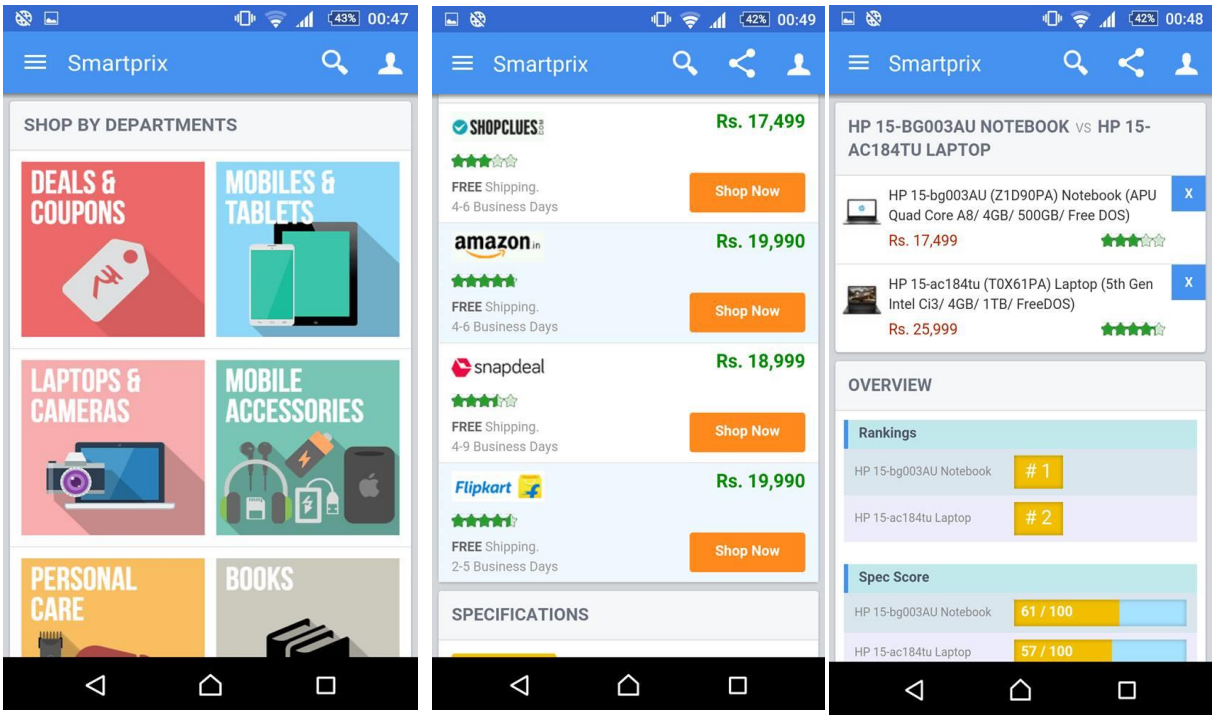


Figure 2.2.2.1

Another application called Smartprix also is an online shopping comparison application, it also retrieve all the product details from those online shopping website, such as, amazon, ebay, flipkart and other website (Anon., 2011). Like other application, it can show all the price in different market sales. However in this application can compare with different product to check the product quality or material. It can help the user to make their own decision.

The strength of Smartprix is can compare with different product, check the quality and material, so user can have a strong decision making for themselves and the weakness is cannot pick a product in list only can check the product price in each round and also searching function is not accurate and slow response time

To resolve the weakness of Smartprix is can let the user pick the product in the list and allow user compare their product in one round, if let the user compare the price one by one will waste a lot of time. To increase the searching speed and the percentage of accurate of the searching product.

2.2.3 Trivago

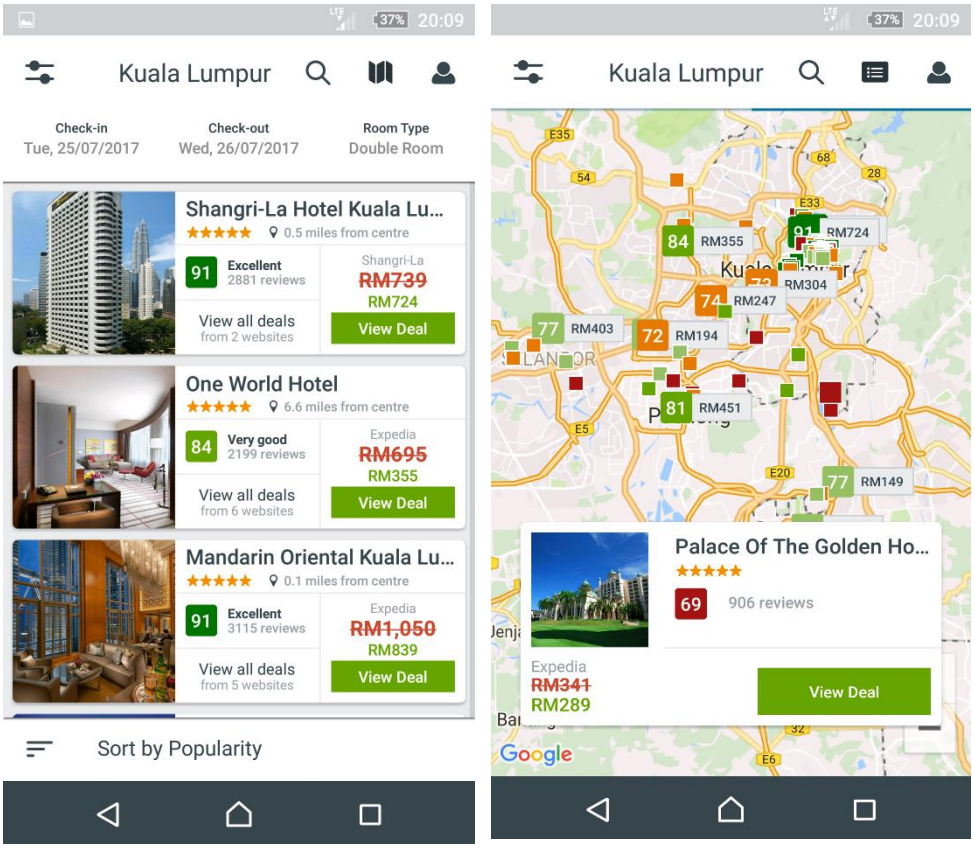


Figure 2.2.3.1

Trivago is travel and hotel planner mobile application, Trivago can help the user find the estate in Malaysia. User can search the rent or sale house by go through this mobile application. After the user search the location, Trivago will show out all the estate at the location (Anon., 2015). All the product will show out the price so that user can do a comparison themselves see whether which product is suitable for them.

The strength of Trivago is Trivago can list out the location of the product in the google map so that user can compare the distance of the product. It use a numeric to differentiate the product and also the product will show out the price to the user.

The weakness of Trivago is the lowest rate owner hard to find the customer. Because Trivago only recommended user use the high rate product.

2.3 Comparison of the existing application

	SmartShopper	**Trivago**	**Smartprix**
User Interface	High	Low	Medium
User friendly	High	Low	Medium
Respond time	Medium	Low	High
Product price comparison function	High	Low	Medium
Compare product details	Low	Low	High
Searching function	Medium	Medium	Low
Decision making for user	High	Medium	Medium
Detect Location	No	Yes	No

Table 2.3.1

This is the comparison between the software in Table 2.3.1, compare SmartShpper, Trivago and Smartprix see which application do well in these part user interface, user friendly, respond time, product price comparison, compare product details, searching function and decision making for user.

2.4 Existing techniques approach to compare product price

SmartShopper and Smartprix are using the existing techniques price comparison approach to show the price details to the user. Which is show out the product details sell in several shopper so that the user can clarify see which shopper are selling the product in cheaper price. This is one of the existing techniques to help the user do a price comparison. The problem of doing price comparison is sometime user cannot compare the latest product price in the shopper, it will take the oldest price information to do a comparison. Therefore it is not accurate.

2.5 Existing techniques approach to do a shopping planner

In the existing application Trivago to show the existing techniques to help the user to do a shopping planner is show out the nearby product in current location so that the user can clarify what product a nearby to them therefore they can make their decision faster. This is one of the existing techiques to help the user do the shopping planner. Besides that, it will show out the price of the nearby location product, user can find out the nearby and cheaper product in this situation. The problem of this techniques is without a traveling path to tell the user how to go these location which is user selected so that user can compare the travelling path between each other.

2.6 Chapter summary

In this chapter had discuss about the existing shopping decision support approach and existing shopping decision support application that other people are using. There have some comparison between each existing application, to find out the limitation and strength of the existing application. However, in this proposed application will improve the weakness of the application and will doing better than the existing application.

Chapter 3: Proposed Method/Approach

3.1 Methodology used

This shopping decision support mobile application will develop by using java language. Java is one of the language to build the mobile application. Also, java provide a lot of libraries will have different function to assist us to develop mobile application in java platform.

In this mobile application had include different function to help the user make the decision making to select the way of shopping. Inside the mobile application had include text, image, location detection, get latest information and other to assist the user how to proceed on this application. Besides that, the user should sign in or sign up before use the application, because it need to detect the user privilege. After the user login to the application, they can modify their account by using the application function to perform theirs tasks. For example, select the product in those shopping center, compare the product with price, distance and benefit.

Lastly, the shopping decision support mobile application is work on all the android device include the latest version of android.

3.2 Methodology

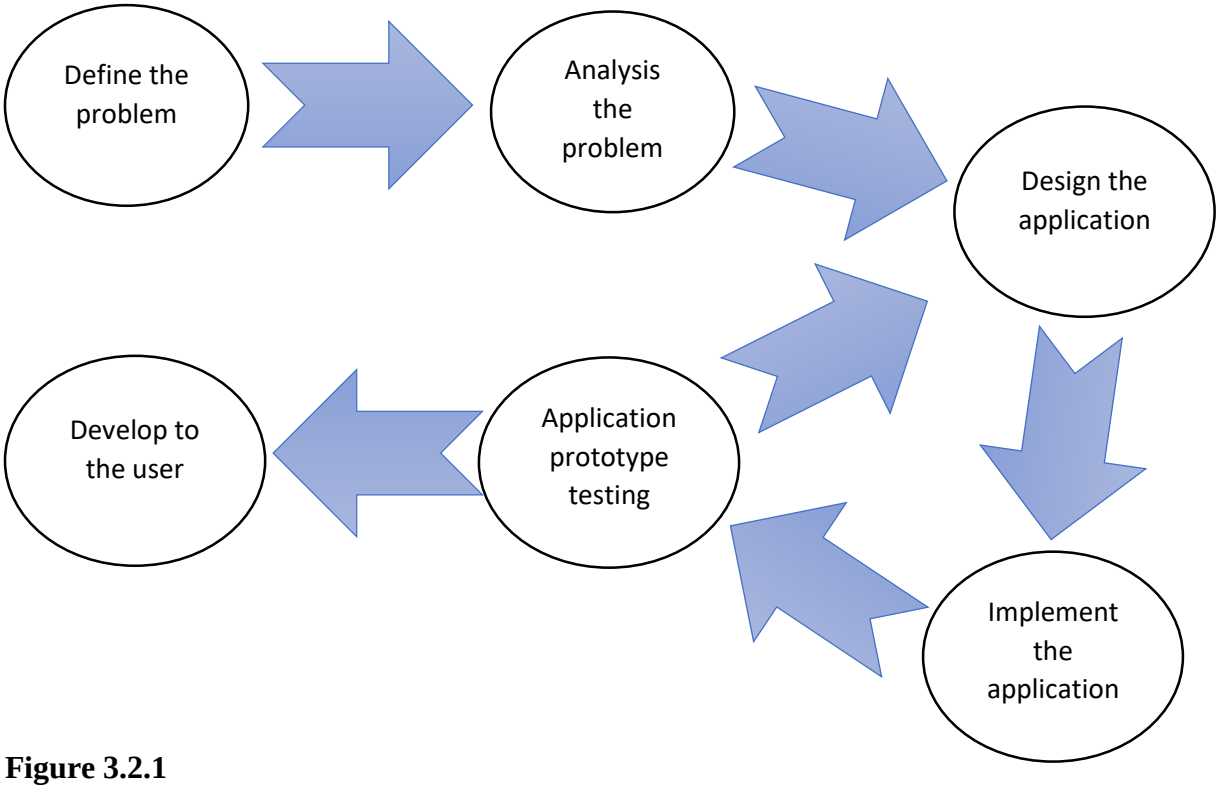


Figure 3.2.1

Figure 3.1.1.1 show the methodology of developing the shopping decision support mobile application, in this methodology have several phases which is planning, analysis, design, testing and implementation. In planning phases is to determine the goals and objective after define the problem.

In the analysis phases, is gather all the information by the user and identify the requirement of the user, what they want and what they need. After that, put the requirement on the application.

After analysis phases, it will go to design phases, implement phases and testing phases. These phases are related by developing the application. After the design of the application to identify how the system run and work, it will go to the implement phases to coding out the application. If the mobile application is finish, it will give the user or developer to do the prototype testing to improve the mobile application again and again.

After the satisfaction of testing, the system will develop and deliver to the real user in the outside world.

3.3 Gantt chart

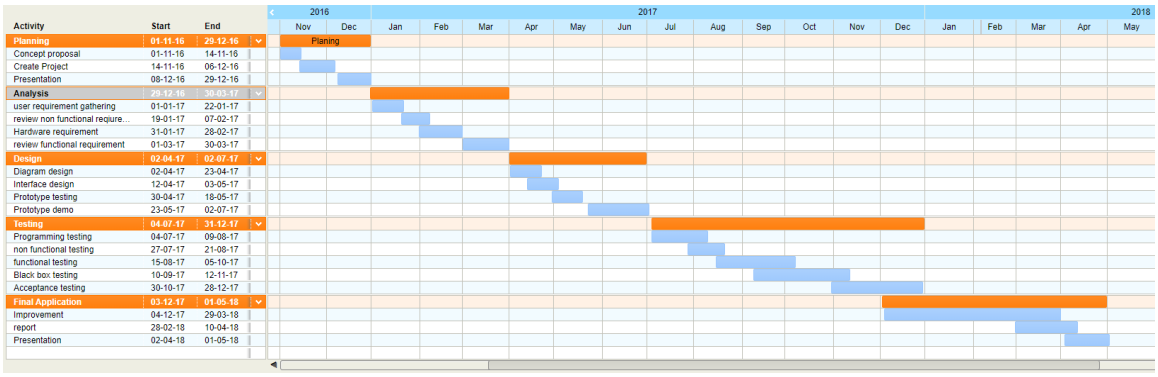


Figure 3.3.1 Gantt chart show that the duration of mobile application development (01 - 11- 2016 – 01-5-2018)

The mobile application development starting with the planning of the concept and create a project plan to present to the client. After that in the analysis phase gather all the user requirement come out the non-functional requirement, hardware requirement and functional requirement of the shopping decision support application. In the design phases come out the diagram such as use case, activity and class diagram to show how the application run and proceed. After that come out the application prototype to give the user test and collect the feedback from the user.

After testing, develop the presentation and report give the user more understand on it.

3.4 Tools, connectivity, hardware and software

Android studio

Android studio is one of the platform to develop mobile application through the java language and XML language. Android studio also allow user to use API and libraries to develop the application therefore, it is more convenient and ease of use.

Visual paradigm

Visual paradigm is a software to draw the diagram such as UML diagram, class diagram and Activity diagram.

PhpMyAdmin

PhpMyAdmin is a free software tool to write the php language, use phpmyadmin to create an online database and retrieve the data in the application.

3.4.1 Connectivity requirement for user

Description	Compulsory
Internet connection	YES
GPS	YES

Table 3.4.1.1 connectivity requirement for user

3.4.2 Hardware Requirement

Description	Minimum requirement
Processor	1.0GHz or higher
RAM	256MB or higher
Internal storage	512MB or higher

Table 3.4.2.1 Hardware Requirement

3.4.3 Software Requirement

Description	Minimum requirement
Android version	Android 4.0 or higher

Table 3.4.3.1 Software Requirement

3.5 System functionalities

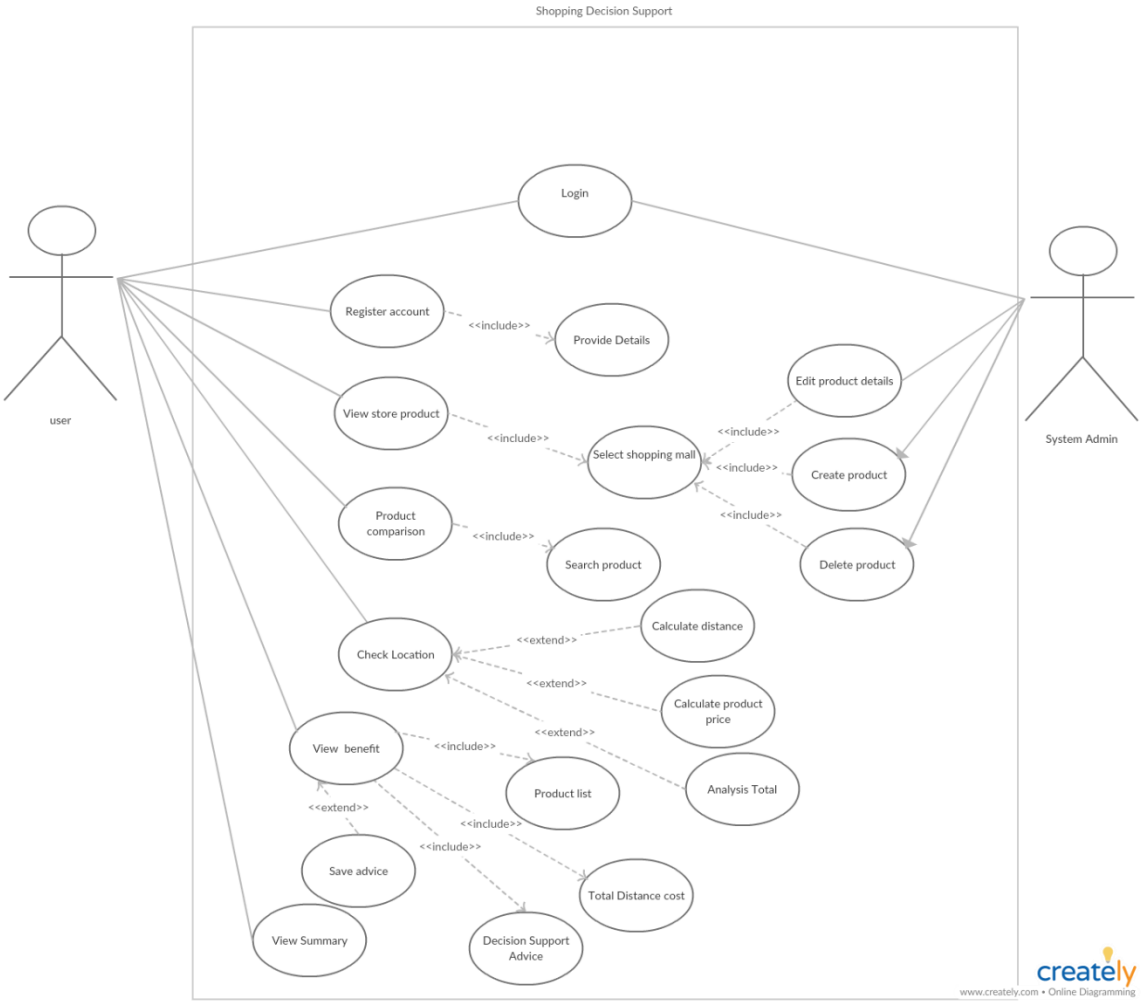


Figure 3.5.1

Figure 3.5.1 show that the use case diagram of the mobile application, there are several function provide by the application.

Login

- Login function is needed for every application because it want to determine the privilege of user see whether is normal user or admin.

Register account

- This function allow the user register a new account in the shopping decision support application. But they need to provide their basic information to register the account

Check product details

- This function allow the user check the product information in selected shopping mall. User can see all the product in the shopping mall go through this function.

Graph history product price

- The function allow the user check the previous price of the product see whether the product price is highest or lowest.

Product comparison

- This function allow the user select several product and do a comparison between several shopping mall see whether which shopping mall are selling more worthy
- Sum up total cost in the product list.

View product benefit

- This function allow the user view the promotion of the product in each shopping center and do a simply comparison between each other.
- Decision support advice, that provide a percentage decision support in each shopping center which is to help the user make their decision in future.

Check location

- This function allow the user detect their current location and find a best way purchase plan
- Calculate the distance and convert it into a traveling cost and add into the total cost of user
- Using the distance multiple with petrol cost and km per liter (Anon., 2011)

Admin functionality

- Admin allow to edit the product details in the online database
- Admin allow to view and edit the petrol cost.
- Admin allow to create and delete product.

3.6 System Design

3.6.1 Product price comparison in same shopping mall

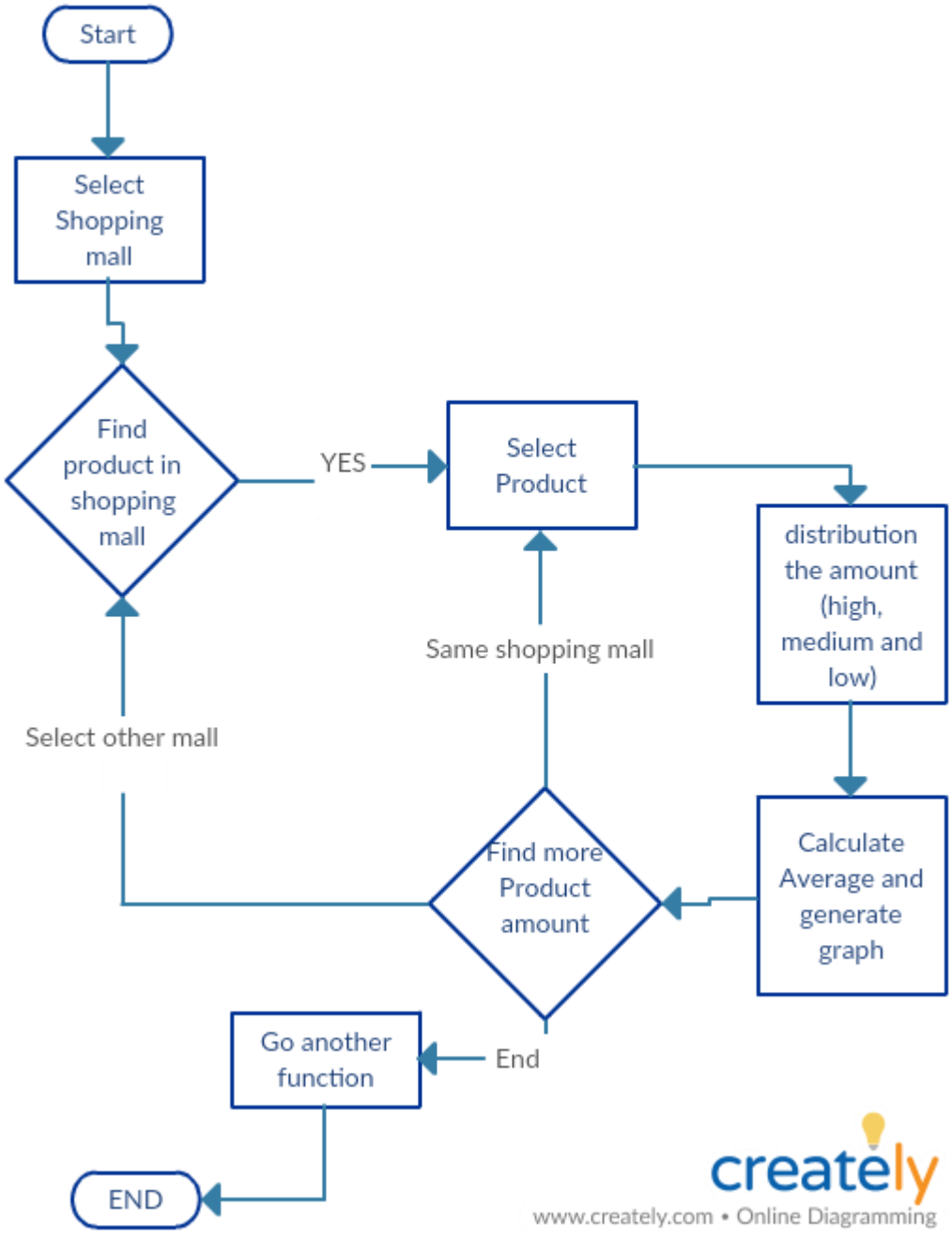
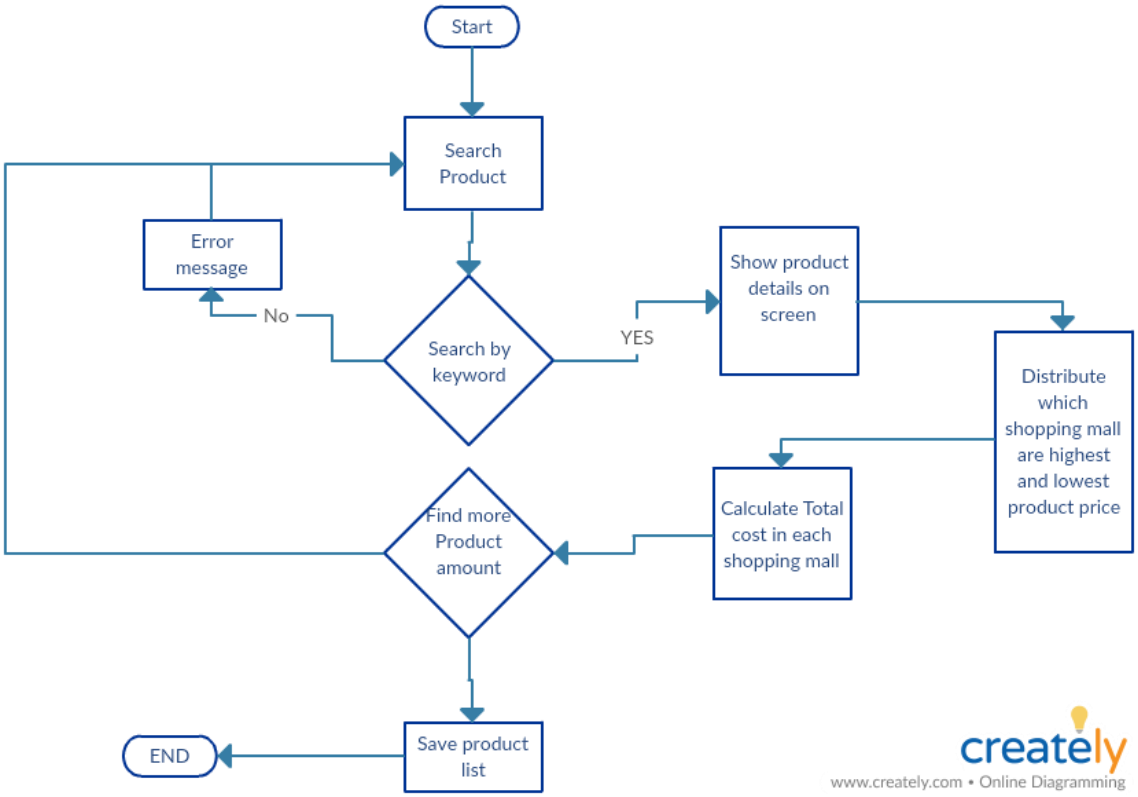


Figure 3.6.1.1

In the figure 3.6.1.1 show that the process of the comparison product price in same shopping mall, first the user need to select the shopping mall they want to go. The system will retrieve all the product in the shopping mall that user has selected. After that the user can select the product to review these product details in the shopping mall. When the user has click in the product to view the details, the system will display the product details, current amount, and higher amount of the product in certain period, lowest amount of product price, calculate average of cost of the product and generate a line graph on the screen. User can find more product on the shopping mall or select another shopping mall.

3.6.2 Product price comparison in different shopping mall



3.6.2.1 Compare product price in different shopping mall

In figure 3.5.2 show that the process of compare product price in different shopping mall, first user can search the product in keyword, if the keyword is correct then the product will appear on the screen, else will pop an error message to the user. When the product appear on the screen also will have three different shopping mall price. The price will compare each other and found out the highest and lowest value on the product. At the bottom will have the shopping mall sum total price that user had selected the product on screen, User can add another product into the product list by search another keyword, else user can save the product list and proceed to another function.

3.6.3 Shopping planner Calculate Traveling path and distance

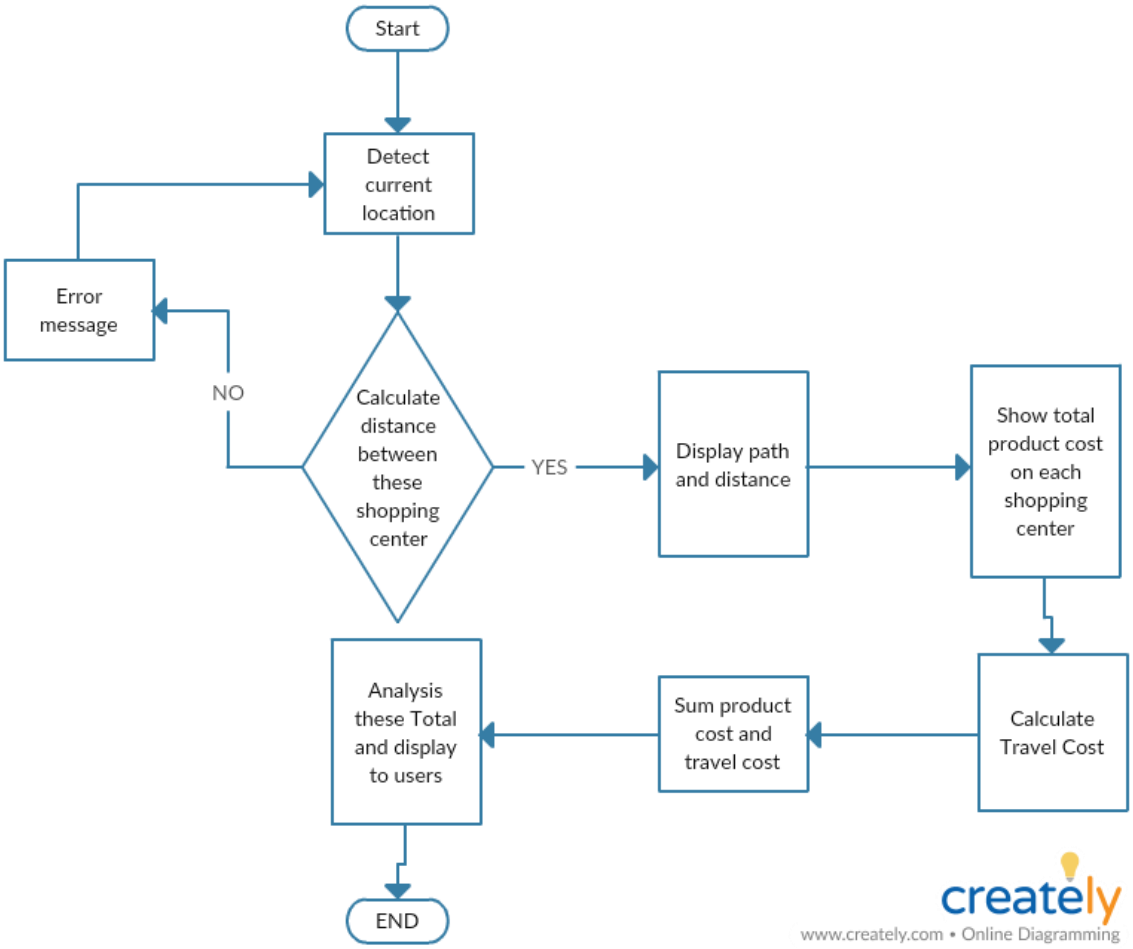


Figure 3.6.3.1

In figure 3.6.3.1 show that the process of shopping planner to calculate traveling path and distance, first the user must detect their current location to give the application know where we are. After that the product list will automatic add into Shopping planner so that the user can directly get the sum total of product in each shopping mall. In this process the application need to calculate the distance between current location and these shopping center location, if successful calculate it will display the path and distance to the user, besides that the application will also calculate the traveling cost to the user so that the user can directly see the total cost of product and traveling cost on the screen, lastly total up these value together and show to the user as reference.

3.6.4 Shopping planner Compare better benefit

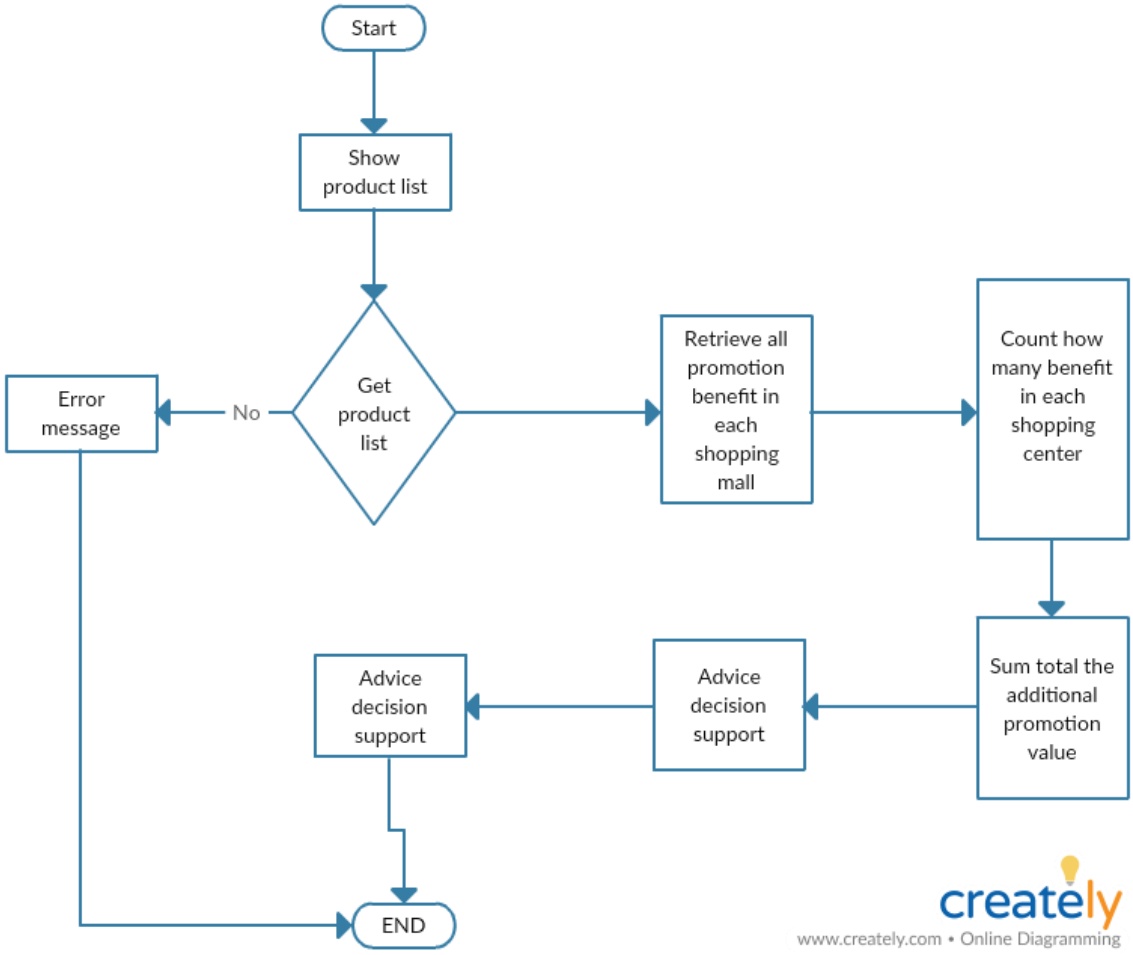


Figure 3.6.4.1

In figure 3.6.4.1 show that the shopping planner compare with a better benefit in each shopping center. User can retrieve the product list from the comparison page and use the product to do a benefit comparison in each shopping center. In this process the application will count how many total benefit in each shopping center and total up the product price in additional promotion as a reference for future use. In the advice process the application will find out the shortest total price and biggest promotion benefit in the shopping center. The advice decision support will convert into percentage in each shopping center, the biggest percentage show that mean the biggest advice to the user. Lastly the user can choose one of the shopping center advice and the user can read it on summary page.

Chapter 4: System Design

4.1 System Architecture

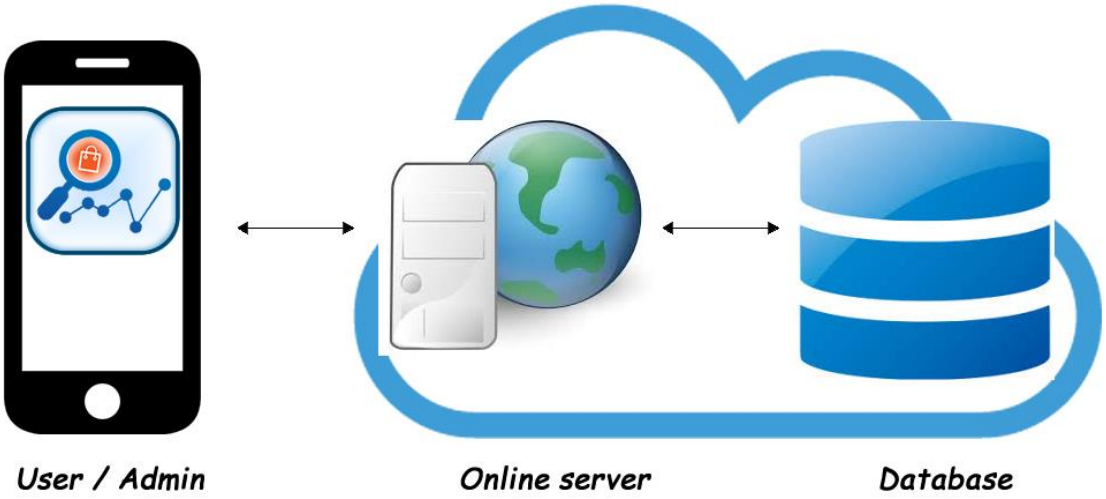


Figure 4.1.1

In Shopping Decision Support application, it will used the mobile phone to access the internet connection to communication with the online server, user or admin can get the data from the server in the database and use these data to do a shopping decision support function on the mobile phone. All the shopping center information and details in Kampar are store in the online server so that the user can retrieve it from the server and do a comparison tool with these data.

Besides that, the user must use an internet connection login in to the application before proceed to these shopping decision support function. If the user must the username and password on the database the application will allow the user login in to the application after that the application will detect on the user type see whether this user is normal position or admin position.

4.2 Block Diagram

Figure 4.2.1

The Block diagram in Figure 4.2.1 show that the user are allow to use mobile phone to gather and retrieve all the information details in these shopping center which is TESCO, ECONSAVE and GIANT. User can select some of the product they want to purchase in further to do a comparison function see which shopping center are provide better benefit to the user. After that the application will provide a recommended decide support to the user, so that the user can follow the summary decision in their future.

4.3 User Interface

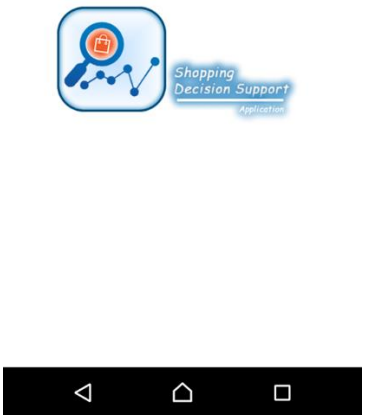


Figure 4.3.1 Splash screen

When the user opened the application will have a animation splash screen pop out first.

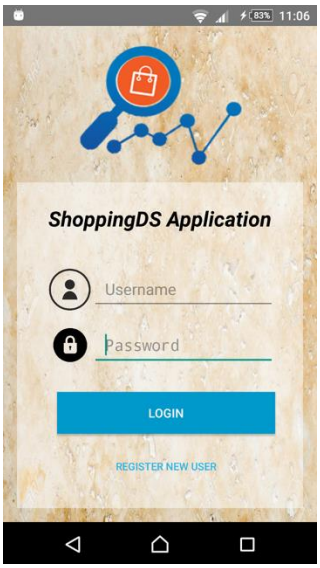


Figure 4.3.2 Login Interface Design

User can login to the application by using their username and password, the purpose of login in to the application is to identify whether the user is Admin or a normal users.

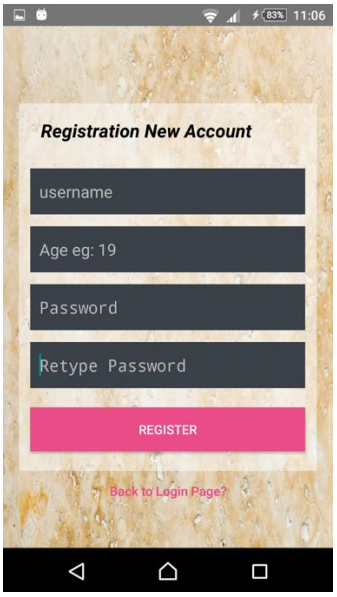


Figure 4.3.3 Registration New Account Design

If the user does not have any username and password in this application, they can registration a new account in this page.

Figure 4.3.4 Admin View Design

If the user login in admin position, they will directly go to the admin page and they can edit the product details in these shopping center.

Figure 4.3.5 Tesco admin view

When the user click on Tesco, they will go to TESCO shopping mall and view all the product in TESCO

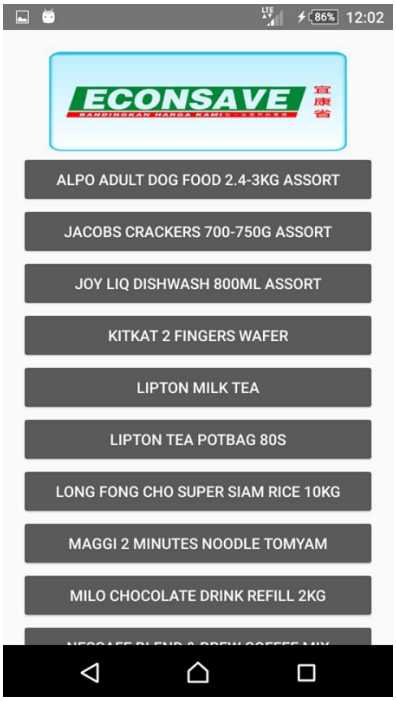


Figure 4.3.6 ECONSAVE admin view

Same as Figure 4.3.4, user can view all the product in the ECONSAVE store.

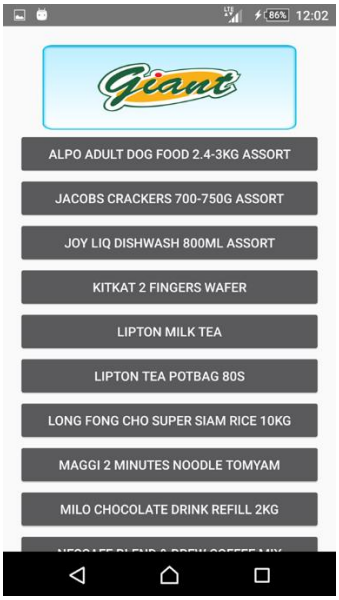


Figure 4.3.7 GIANT admin view

All the product in GIANT store show to the admin, admin can select one of the product to update.

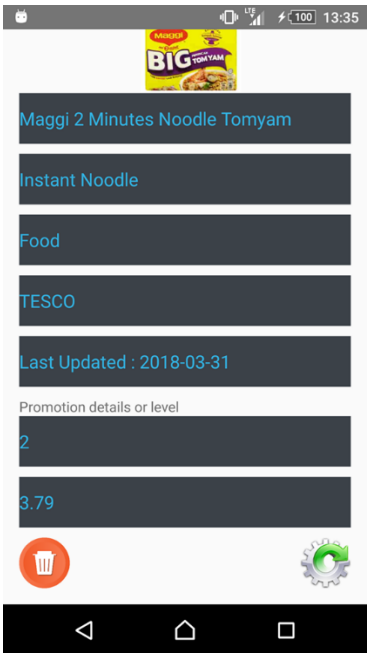


Figure 4.3.8 EDIT VIEW

Admin can update the product price on selective product, the product also has shown to the user when is the product last updated. The admin also have delete product function.

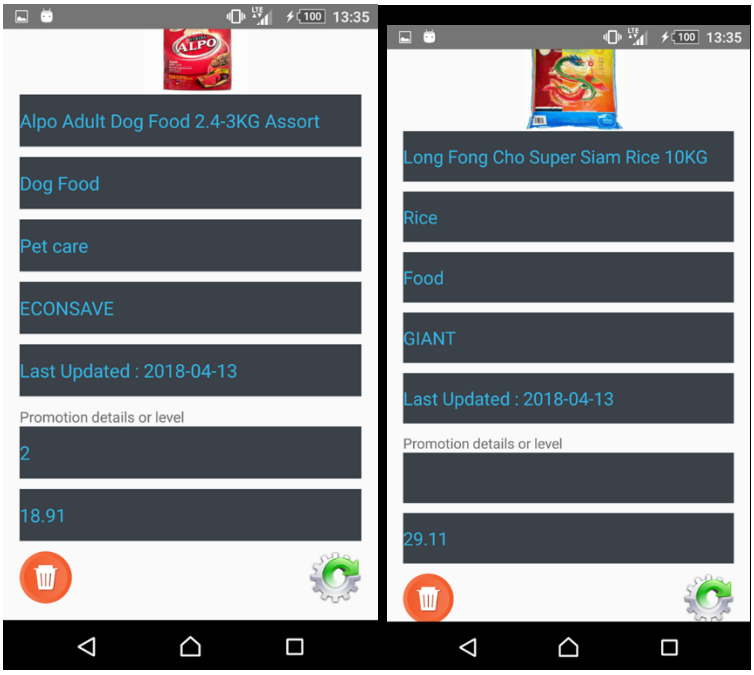


Figure 4.3.9 Promotion edit

Admin can change the product price and also can change the promotion details or level, admin can change the promotion details in word and also can change the promotion details in level. In this application have 2 promotion level which is level 1 and 2. Level 1 is the promotion buy 2 free 1 and level 2 is promotion buy 2 discount 32% of cost.

Figure 4.3.10 Add new product

Admin also can add new product in each shopping center.

Figure 4.3.11 Normal User Menu

After successful login the normal user will directly come to this user menu interface with several option to select.

Figure 4.3.12 View Product Design

When the user click on the View Product, They can see the three shopping center button on the screen the user can select one of the shopping center and view the product on the shopping center.

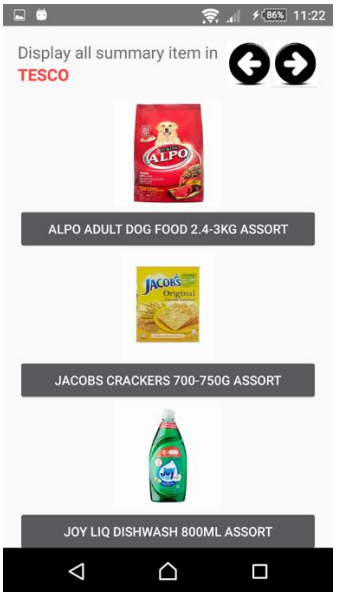


Figure 4.3.13 TESCO VIEW

User can view all the product in TESCO with image and product name, user can click on next button to view next page and also click on back button to view previous page.

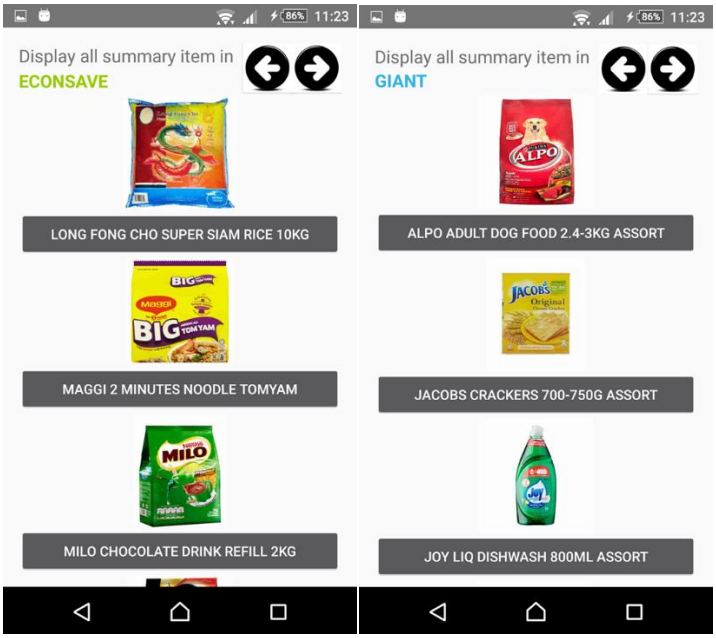


Figure 4.3.14 ECONSAVE/GIANT

Same as Figure 4.3.11 user can view all the product in the shopping center that user selected.

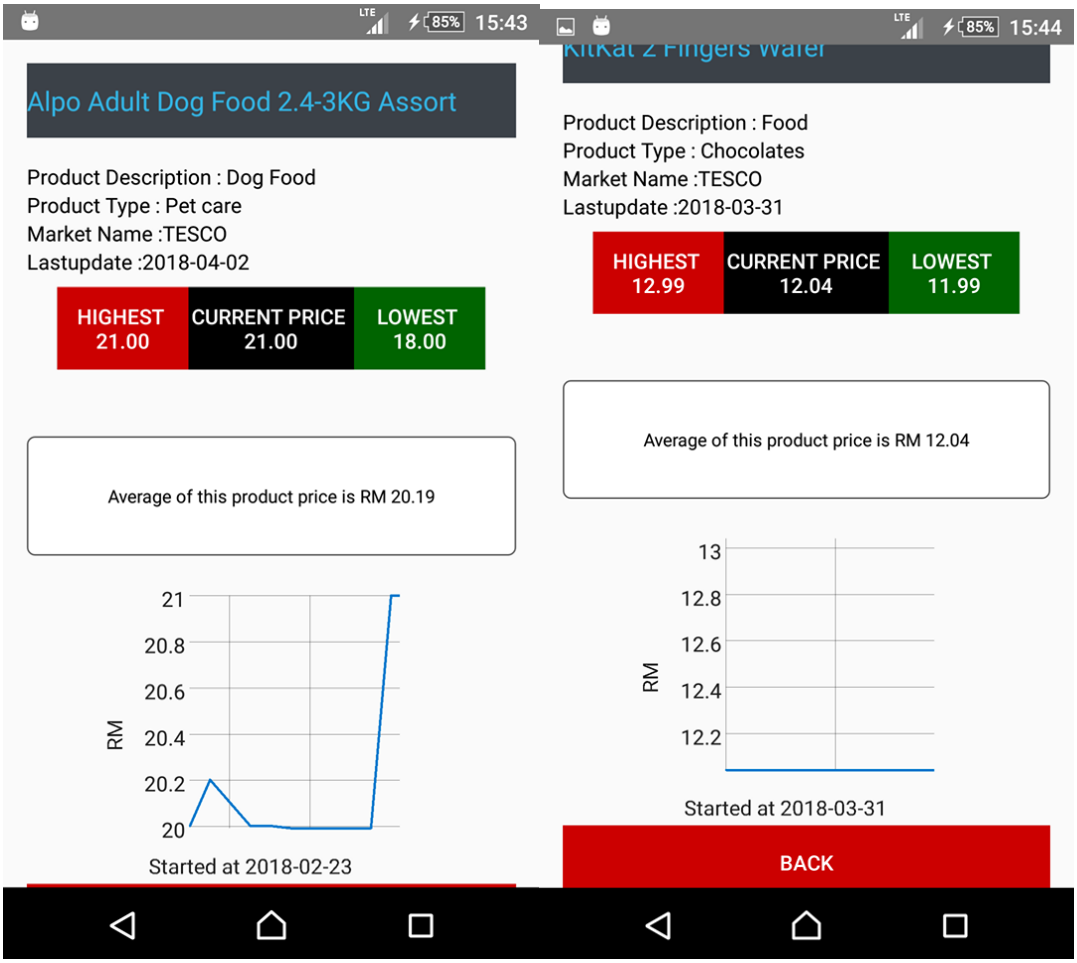


Figure 4.3.15 View Product Page

When the user select one of the product in these shopping center, they will see the product details such as product description, product type, Market Name and Last update product price. Beside that the user can view the average of the product price see whether the product price is worthy for the user in current date or not. Also, the application will provide a line graph to give the user easily identify the current product price in the shopping center. It will display the highest product price, current price and lowest product price as a reference to the user, and they can faster make their decision as well.

Figure 4.3.16 Search bar

When the user click on the comparison product button on user menu, they will come to this interface screen which is use to search the product in keyword, so that the user can search the product they want to purchase in future.

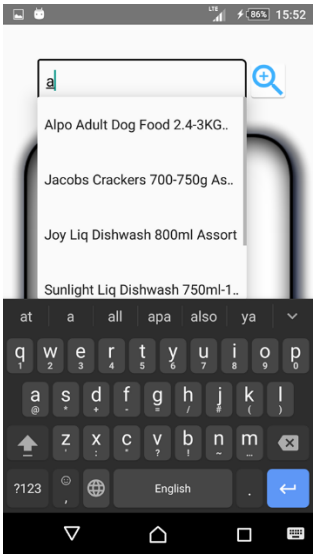


Figure 4.3.17 Auto complete

Also, in this search function the application will provide an auto complete function to help the user search the product easily without type entire keyword on the search bar.

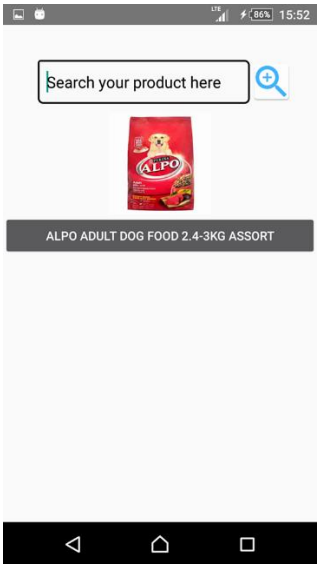


Figure 4.3.18 Found product

After the user search on product by product name the product name and image will appear on the screen then the user can select on it.

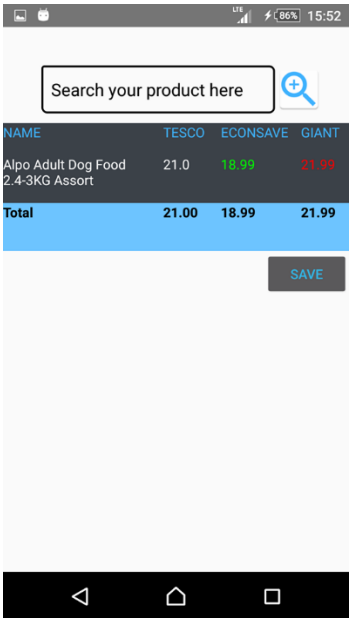


Figure 4.3.19 add to view list

The product detail will list out on the screen and show out the shopping center selling price so that the user can clearly identify which market are selling lower price.

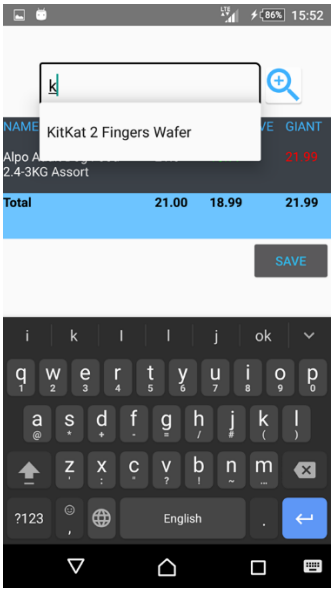


Figure 4.3.20 Search another

The function can compare several product together such as product list that user want to purchase in the future. User can continue search the product on search bar.

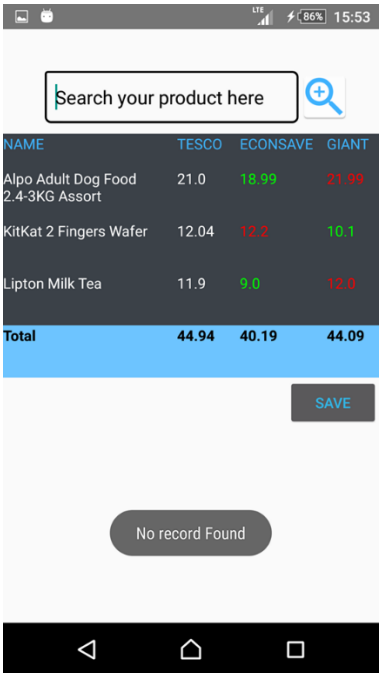


Figure 4.3.21 Several product list

It can add several product together and do a comparison together in these shopping center, besides that if the keyword does not match the product in database it will pop out a notification to tell the user “no record found”

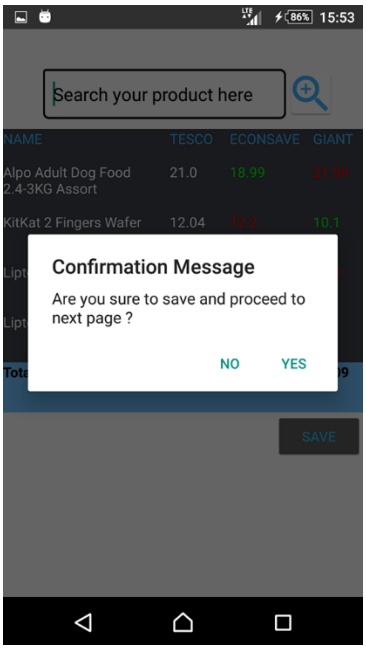


Figure 4.3.22 Save product list

If the user already add the product into the list, the user can click on save button to save the product list and proceed to next function they want to do.

Figure 4.3.23 GPS function

After back to the user menu, user required to continue the function which is click on the view location button to calculate the distance. User must open the GPS setting in the mobile phone before proceed to next steps.

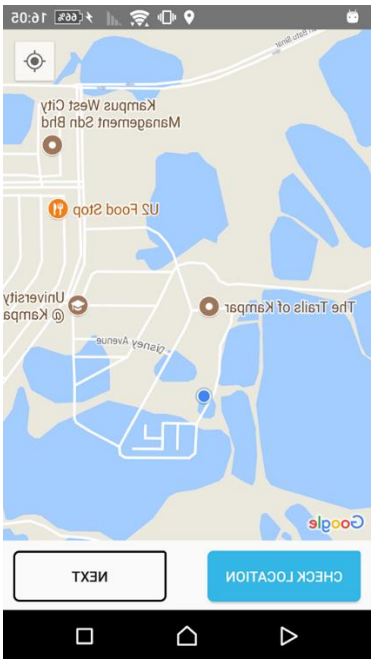


Figure 4.3.24 Current location

User can click on the small button in the top right side which is to detect user current location.

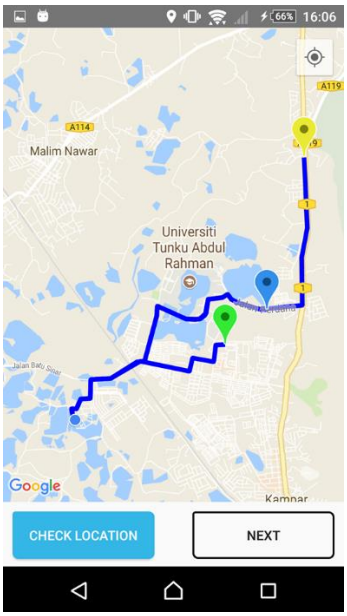


Figure 4.3.25 Search shopping center

After that user can click on the Check location to search the three market in Kampar which is TESCO, ECONSAVE and GIANT.

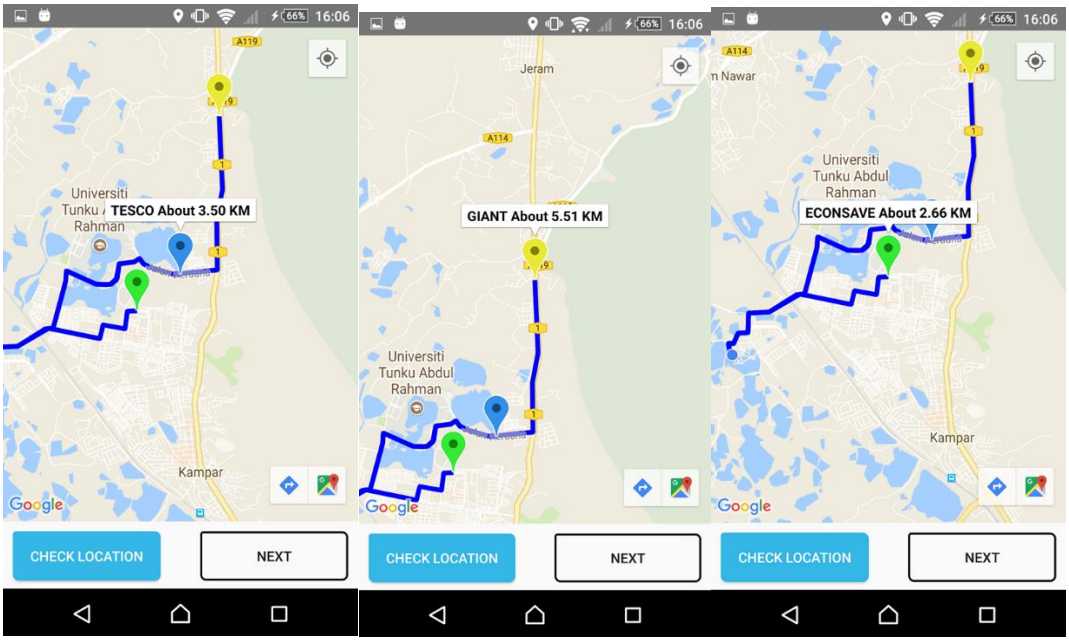


Figure 4.3.26 Onclick pointer

When the user click on the pointer is will show which shopping mall and distance between starting point.

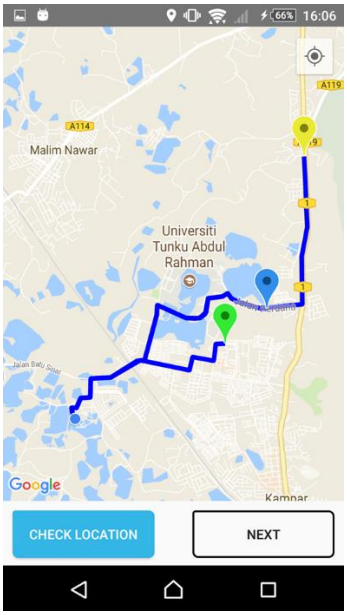


Figure 4.3.27 Traveling path

It will show the path from starting point to these shopping mall, this function is to find out the traveling path distance to shopping mall.

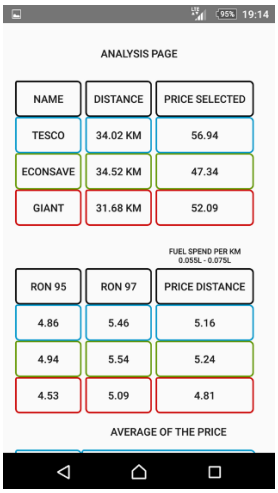


Figure 4.3.28 Analysis Page

It will show the analysis page after the user check location, In this analysis page user can see the total price on the product list and the distance of the shopping center. It will according to the distance and calculate the petrol price in RON 95 and RON 97. And take the average price as decision.

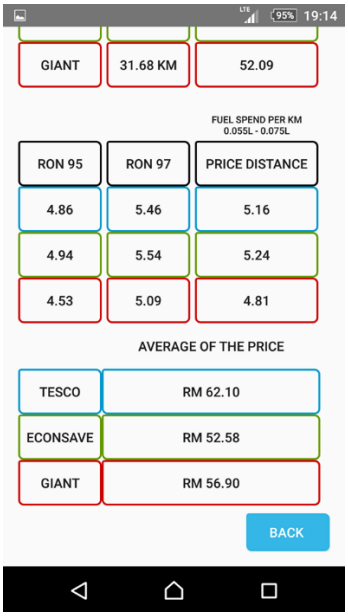


Figure 4.3.29 Analysis Page

After get the average petrol price and total up with the product list price in these shopping center.

Figure 4.3.30 View benefit

After the analysis page the user can go to promotion view to compare the product benefit in each shopping center, this application can help the user get the better benefit from the shopping center. In figure 4.3.29, user can check all the benefit provide by these shopping center. So that user can easily find out the better one.

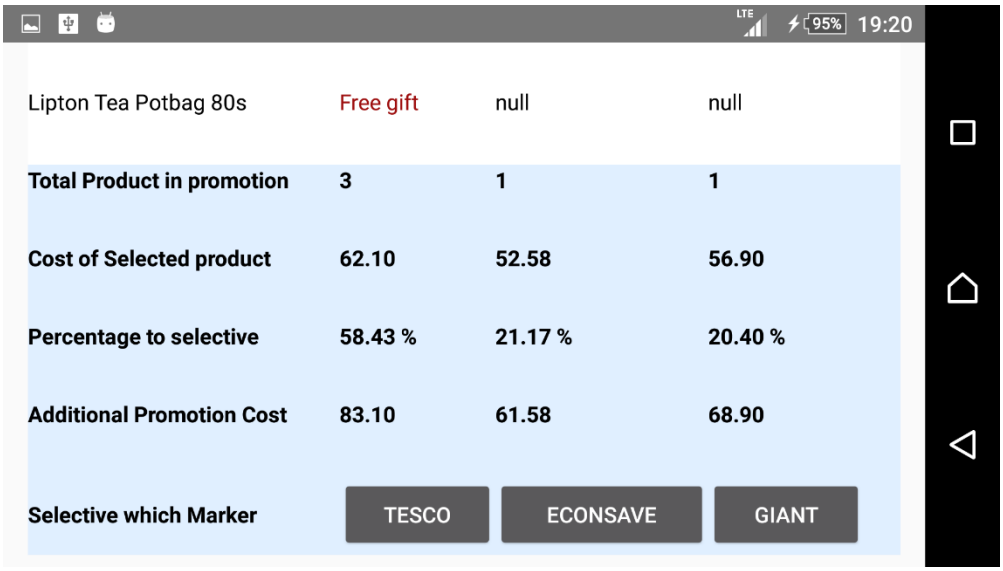


Figure 4.3.31 Decision support

The application will give advice to the user in percentage, so that user can select they want to choose purchase product from which shopping center. And also it will have the user count after promotion product cost such as buy 2 free 1 then it will automatic add one me product price to the total cost.

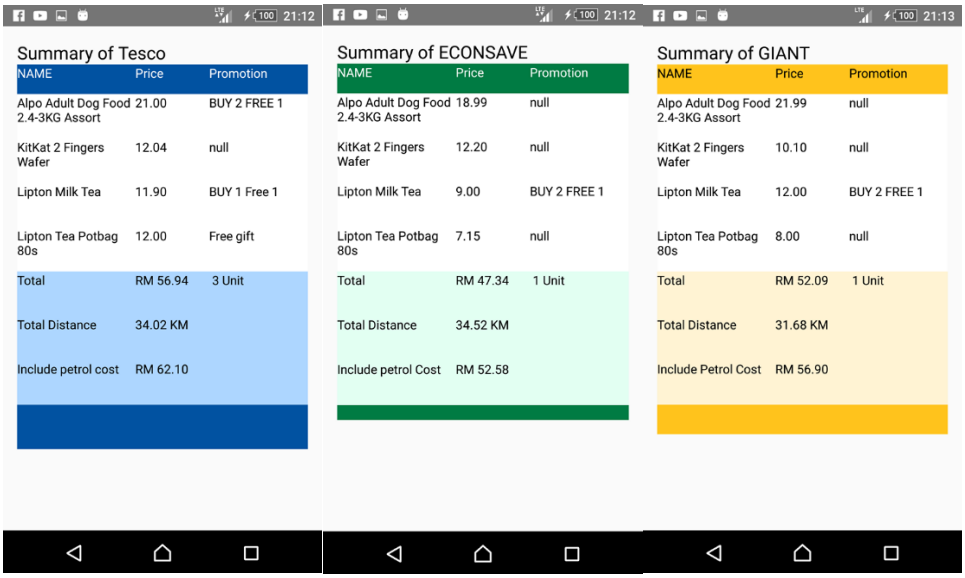


Figure 4.3.32 Summary page

When the user select one of the shopping center it will save it on the summary, user can select the summary details in user menu, after user select the summary details in user menu, it will according the user selected shopping center and display the purchasing item in these shopping center.

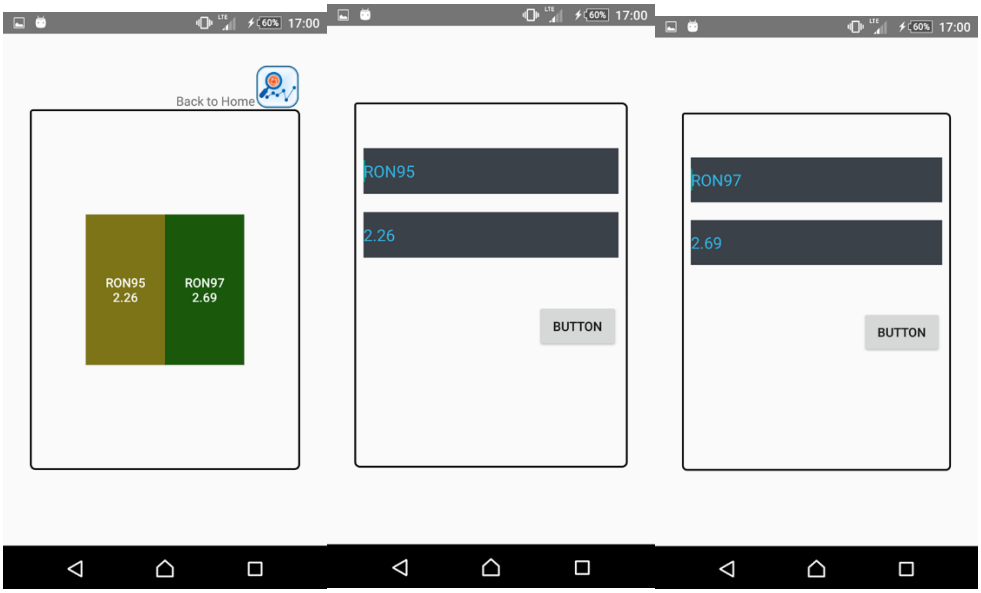


Figure 4.3.33 Admin edit petrol page

Furthermore, Admin can check the current petrol price and also can update the petrol price in this function

4.4 Database Design

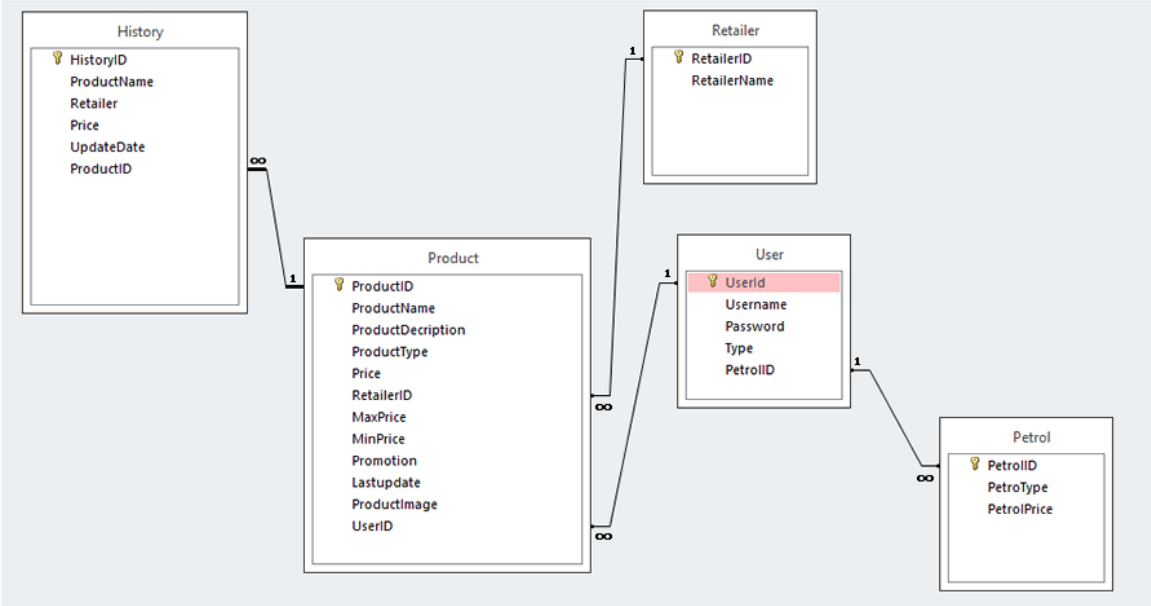


Figure 4.4.1 Database design

There are several main class in the application which is History, Product, Retailer, User and Petrol.

The user can check the product details in retailer, the admin can update the product details in retailer. After updated product details will store to the history, history will generate the graph to normal user as a review of the product price history.

Chapter 5 System Testing

Test Objective: Price Comparison tools

Test Plan 1: User able to read the product in one of the shopping center and compare product price history

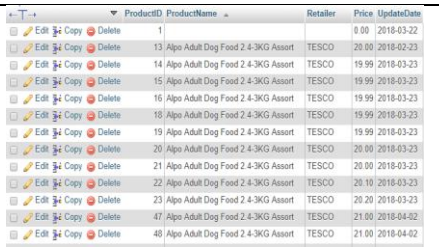
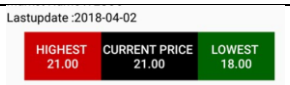
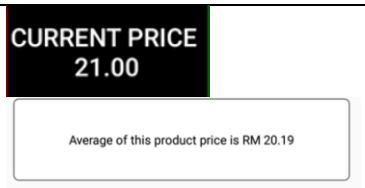
Input	Expected output	Actual output
The user can view the graph of the product price history	User can select the date of the product price to view the product price on that date	User able to view the price product on the started date until the last updated date
		 History table
User can see the highest and lowest price in the same time	User able to select the period of time to check the highest and lowest price in the period of time	User only able to see the starting updated and last updated highest and lowest price in the shopping center
		
User can view the average of product cost as reference	User able to see the average cost and compare with the current product cost	User able to see the average of cost together with the current product price
		

Table 5.1.1 Compare product price history

Test Plan 2: Price comparison with other shopping center

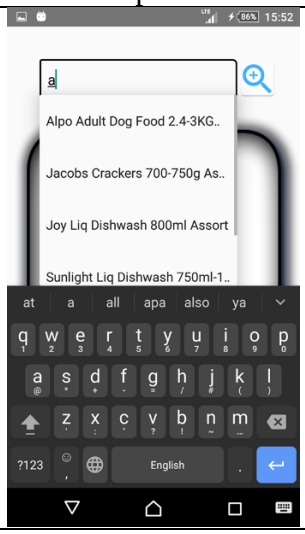
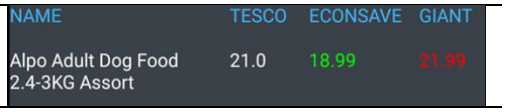
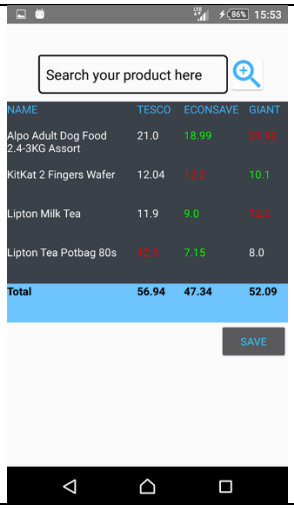
Input	Expected output	Actual output
User able to select product they want to compare	User able to search the product in keyword	User can type the keyword with autocomplete function to generate the entire product name
		
User able to check the product price in these shopping center	User able to identify which shopping center are selling lower price	With different color to represent higher and lower product price
		
User can add several product into the list and compare those product together	User able to find out which shopping center total price is lower than other	User able to see those product total up in each shopping center
		

Table 5.2.1 comparison tool with different shopping mall

Test Objective: Find the distance of shopping center
Test Plan 3: Search location and find the traveling path

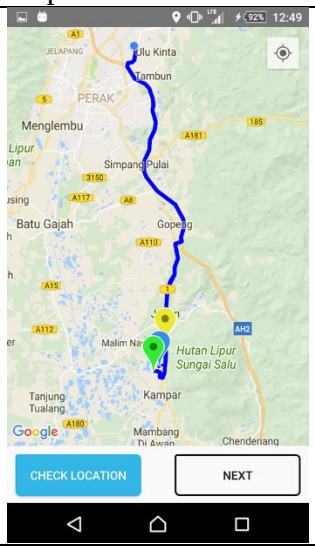
Input	Expected output	Actual output
User able to detect current location	User can view the current location on maps	User can view current location
User able to know the shopping center location	User can find out three shopping center area in Kampar	User can view the shopping center on the maps
		

Table 5.3.1 location and traveling path

Test Plan 4: Covert the distance to petrol cost

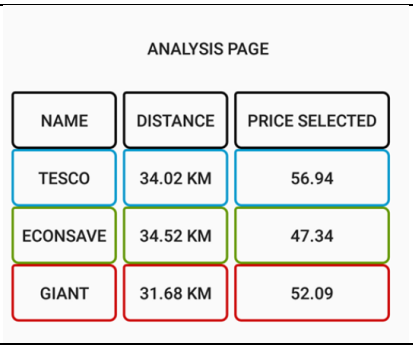
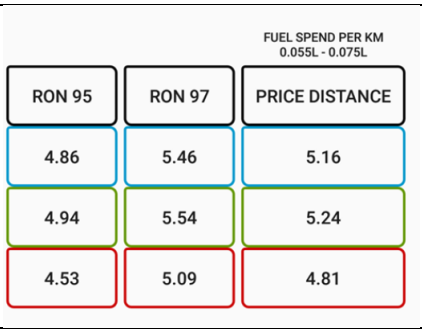
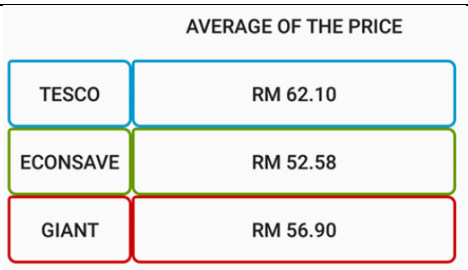
Input	Expected output	Actual output
User can view the distance in KM	User able to view the distance	User able to view the product cost and distance in each shopping center
		
User able to view the petrol cost	User able to view the different type of petrol cost	User can view the fuel spend per km and the different type of petrol cost
		
User able to view the total price	User able to view the sum total in each shopping center	User able to view the total cost plus petrol cost
		

Table 5.4.1 distance cost

Test Objective: Support decision advice
Test Plan 5: How user get advice

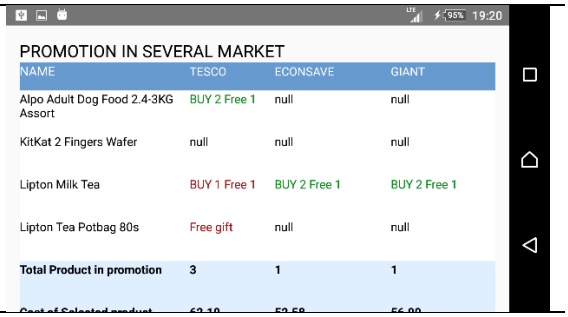
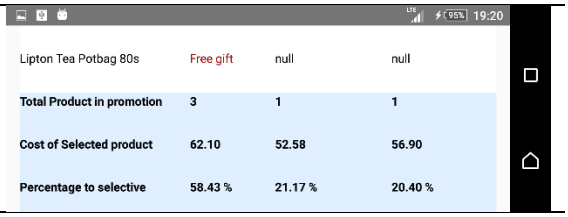
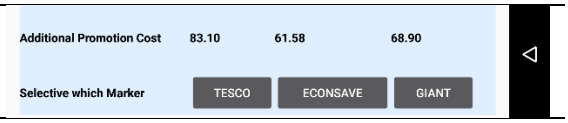
Input	Expected output	Actual output
User able to see the benefit that shopping center provided	Show all the promotion details to the user	User able to view the product promotion in each shopping center
		
User able to see the support decision	Show the percentage of support decision	User able to see the pecentage of support decision in each shopping center
		
User able to see the after promotion product price	Display all the additional promotion Cost	User able to see the addition promotion cost as a reference for future use
		
User can select one of the shopping center to record down the details for future use	User able to record down the details for future use	User able to review the details in summary function

Table 5.5.1 decision support

Chapter 6 Discussion

6.1 Project Achievement

In this application project has been created was achieve the objective goals in the end. The result was shown can give the user clearly identify the product details in each shopping center so that user can do a simply comparison on this application. Besides that, when this application get the distance between each shopping center will calculate the petrol cost for the user and add into the final total product cost so that it can help user clearly identify the total up of cost. Also, user can find out the better benefit in each shopping center on the application and having an application decision advice to the user. Therefore user can compare it easily on this application.

6.2 System Strength and limitations

The strength of the project is user can have a visualization of the product image without having a lot of word on the project, therefore user can easily identify the product without looking the product name.

The system limitations of this project is when the users are looking on the product price and the admin update in the same time the product details would not refresh immediately it need the user refresh manually on the page only can get the latest information. Because the project is using php the data cannot get in immediately and response to the page.

Another limitations in this project is the distance may have some little different with the actual one, because I use the latitude and longitude to count the distance directly without go through all the route and count the distance.

6.3 Future enhancement/ Improvement

Referring to the limitation the user and admin using the application in the same time, while the admin update the product details in time user cannot immediately to get the data, they need to refresh the page only can get the latest data. Therefore in the future enhancement I will use the firebase to set as my database, because firebase having a real time connection. When other side of application doing something another side of application will immediately show the latest information to the user, so I think use firebase to replace phpmyadmin is the future enhancement.

Another enhancement is the distance function to count the traveling cost need to improve, In this application the user only allow to count the traveling cost but in future enhancement I think the GPS can count time period also because some time may have traffic jam therefore if the GPS in this application can count the time period from current location to destination can help the user clearly identify the traveling cost and time used.

Chapter 7 Conclusion

Technology become more and more advance, users no need collect a lot of catalog in shopping center and compare each other product price with pen and paper. They can use the technology to reduce their work such as using the technology to collect the product details online without going out to collect and read the catalog in hardcopy every week or every month.

In this project user can use this application to reduce their extra work on collecting the product details, this application can provide the latest product information in TESCO, ECONSAVE and GIANT. So that the user can easily check it on their mobile phone. Another purposed of this application is can help the user compare the product price in one shopping center and in different shopping center. They can see the product price selling average in one shopping center to decide whether is worthy to purchase or not, besides that they also can compare several product in three shopping center and find out the cheaper total price there are selling. However, something user not only see the price to decide whether want purchase or not, they also need to compare the benefit of the shopping center provided. Therefore, in this application also have another function to compare the product benefit that shopping center provide so that the user can easily found out the better decision by go through this application.

Lastly, I hope this application can help user solve their issue to finding the best solution in decision making.

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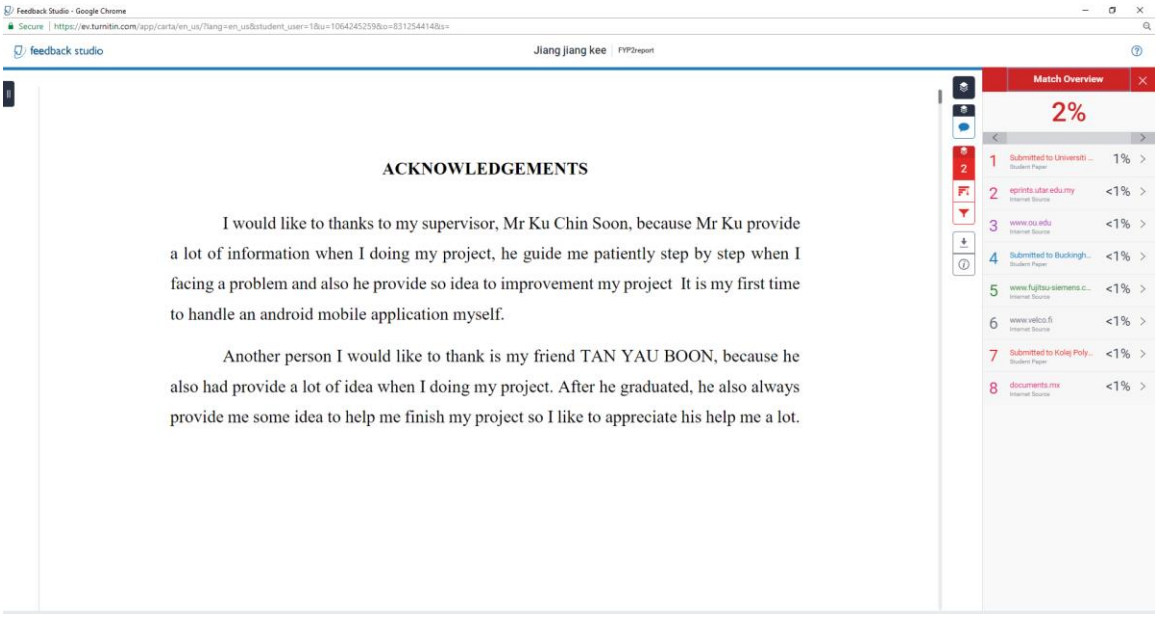

ACKNOWLEDGEMENTS

I would like to thanks to my supervisor, Mr Ku Chin Soon, because Mr Ku provide a lot of information when I doing my project, he guide me patiently step by step when I facing a problem and also he provide so idea to improvement my project It is my first time to handle an android mobile application myself.

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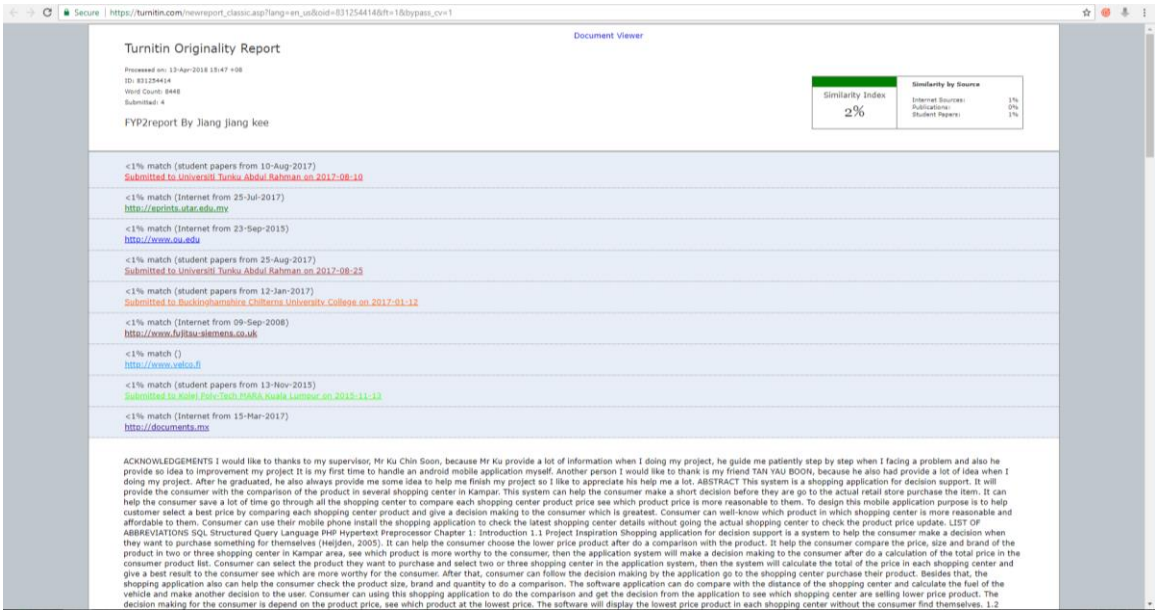
Appendix G: Plagiarism check summary



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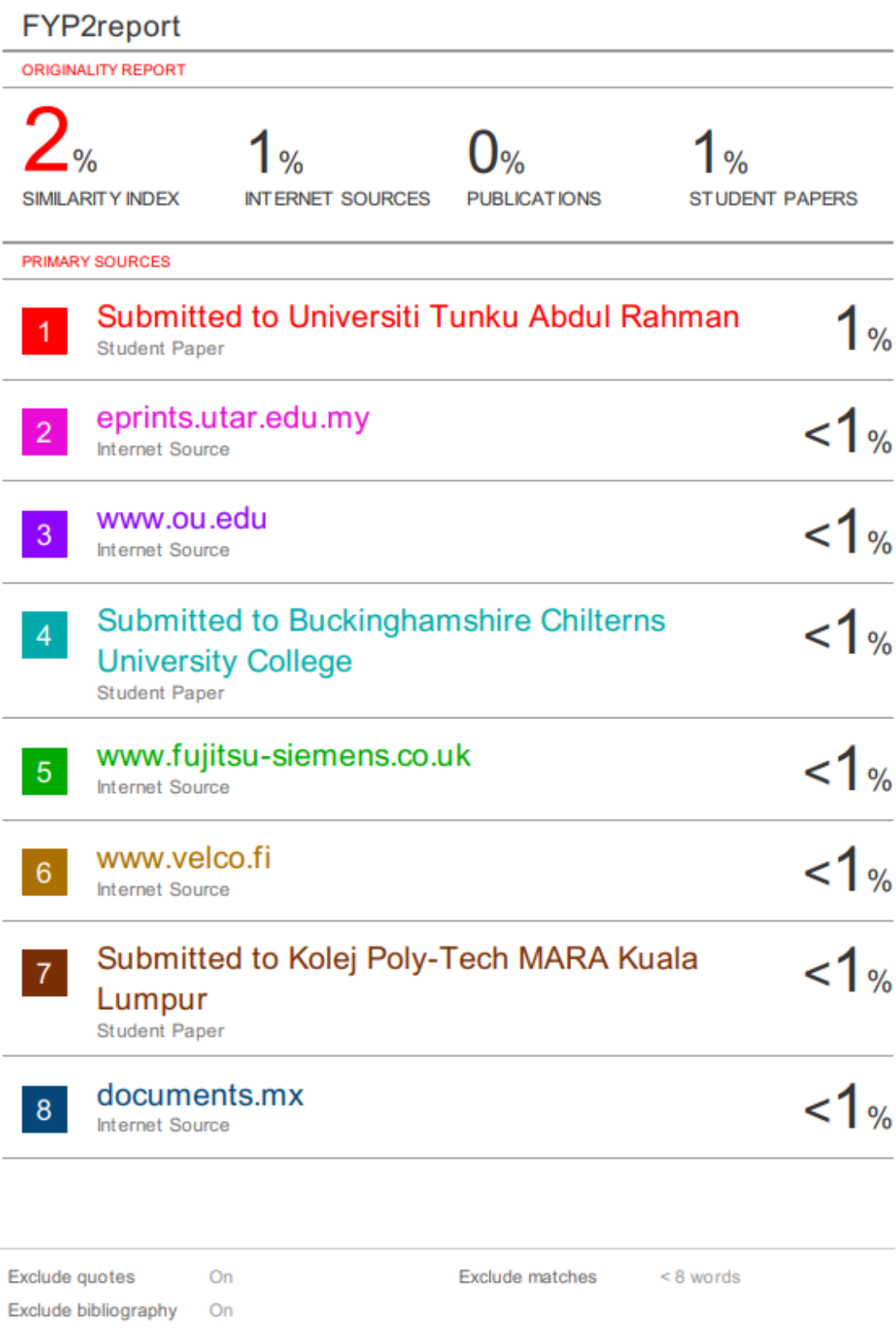
Appendix G: Plagiarism check summary



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