

**GROCERIES ONLINE ORDERING AND DELIVERY (GOOD)  
MOBILE APPLICATION**

**BY**

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**BACHELOR OF TECHNOLOGY (HONS) BUSINESS INFORMATION SYSTEM  
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Dissertation submitted in partial fulfillment of  
The requirements for the  
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CERTIFICATION OF APPROVAL

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Business Information System Programme  
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in partial fulfillment of the requirement for the  
BACHELOR OF TECHNOLOGY (Hons)  
(BUSINESS INFORMATION SYSTEMS)

Approved by,

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## **CERTIFICATION OF ORIGINALITY**

This is to certify that I am responsible for the work submitted in this project, that the original work is my own except as specified in the references and acknowledgements and that the original work contained have not been undertaken of done by unspecified sources or persons.

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Date:

**TENGGU HAZLEEN BINTI TENGGU HAZNI**

## ABSTRACT

The evolution of the Internet and the dynamic of the economy nowadays have created businesses to enter online market. This has given birth to E-commerce activity where buying and selling of products and services are done via the net. Research proved that e-commerce enables simpler, faster and efficient business transactions.

In Malaysia, many giant and famous grocery chains like Tesco have joined this effort in implementing e-commerce in their business. However, the implementation of it in SMEs especially the local grocery shop is still downcast. Thus, the objective of this project is aimed to develop a mobile application call Groceries Online Ordering and Services (*GOODS*) for local grocery shops in Malaysia. A prototype was developed using the Rapid Application Development. *GOODS* was designed in such a way that can help customers to do their groceries shopping online at anytime and anywhere using smartphone with internet connection.

Based on the survey results with the public people that have been done, majority of them believes that *GOODS* can help to assist their shopping behavior and they would be glad to have a mobile application that can help them to perform their groceries shopping. Therefore, it has been proved that there is a need for a mobile application to be developed for online ordering groceries shopping in the local context.

Besides that, the idea of this paper is also to study the customer perceptions on online shopping and propose a solution that would benefits the customers that is developing *GOODS* mobile application. Besides that, with the help of the mobile application, it also intends to help bring the business one step ahead and remain competitive in the market.

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## CHAPTER 1

### INTRODUCTION

#### 1.1 BACKGROUND OF STUDY

Online grocery sales in United States between 2012 to 2013 is estimated \$6.5 billion (Statista,2014). Data retrieved from *malaysiacrunch.com* in 1<sup>st</sup> August 2015 shows that e-commerce market size in Malaysia is increasing from RM1.8 billion in 2010 to RM5 billion in 2014 and the number is expected to grow by 2020 ( Belsie, 2015).

This growing market had attracted numbers of "pure-play" - companies that focused exclusively on selling through the Internet, and attempted to replace traditional bricks-and-mortar company. Many traditional bricks-and-mortars company today have decided to enter E-commerce market to maintain their competitive advantage. The rapid use of Internet today provides a developing prospect of E-commerce (Wu, 2003). E-commerce is a business transaction that takes place via internet (Mach & Cao, 2002). These transactions include buying and selling of goods, services and even information

According to Dictionary.com, groceries are foods and other commodities sold by a grocer and shopping by definition is an activity in which a customer browses the available goods or services presented by one or more retailers with the intent to

purchase a suitable selection for their needs. Meanwhile, grocery shopping is an activity where customer browses their food items and other commodities for their own benefit (Peterson et.al, 1998). Electronic grocery shopping services provide this convenience by enabling consumers to order groceries from anywhere and at any time and having the groceries subsequently delivered at home Burke (1997) and Gillet (1970).

According to Aylott & Michael (1999), time pressure is one of the factors that cause shopping stress. People nowadays are becoming very busy with their daily work schedule and this application is very limited in the existing market. Hence, this project aims to develop a mobile application for customers to do their groceries shopping anywhere at any time using smartphone with internet connectivity. This application allows customers to select local groceries shop and sends their orders online. They can browse through which products are available in the shops, compare prices and do their shopping online. After proceeding to checkout, they have to provide delivery method either self-pick-up at the store or delivered to their address. The shops will receive their orders and then prepare the product for them. If the customers choose to have the order being delivered to them, they have to key in delivery information such as home address. Once the confirmation is received by the shopkeeper, they will send out an SMS to confirm orders and their estimated delivery time. Else, they need to self-pick the orders by their own. This project intends to help save time, increase convenience and provides more choice to the customers.

## 1.2 PROBLEM STATEMENT

In today's fast paced society, it is very hard to be competitive without using cutting edge technology that available in the market. In order for retail business to be more productive in processing order, it needs a solution that can help to facilitate their current ordering process with the use of technology and software (Zulfiqar, 2011).

Research confirms grocery shopping is stressful, and time pressure was mentioned as only one factor causing shopping stress (Aylott & Michael,1999). People nowadays are very busy with their daily work schedule. Driving to shops just to buy one or two products is very inconvenience as it takes more time, energy and effort to leave home or work. By shopping online, customers can quickly search for the products they need and order them without having to physically go to the shop. It will increase convenience by saves travel expenses, and time going to the grocery store.

In addition, in this advance world of technology, customers are more likely to spend their time over the internet. Online shopping has become the most popular choice nowadays. Customers prefer to shop online rather than visit the physical store which takes more time; energy and can even incurred more cost. This is same when it comes to shop for groceries. However, such application is very limited especially in our local context. Most application is implemented in giant company like Tesco which provide online ordering service for their customers. Hence, by having a mobile application for groceries online ordering for small business helps the business to be competitive and provide ease for the customers to order their groceries online. Therefore, this project is not only intends to help customers side but also to the seller itself.

### **1.3 OBJECTIVE(S)**

This projects aims to:

- 1) To understand customer and shopkeeper perceptions on online shopping.
- 2) To analyze the user requirement for online shopping.
- 3) To design a database, GUI, and system architecture of online groceries shopping.
- 4) To develop a mobile application call GOOD for customers to shop their groceries online from Bismmi Hammad.

### **1.4 SCOPE OF STUDY**

This section describes the scope of study of this project.

Firstly, *GOOD* application can only be accessible with Internet connection. Customers can do their groceries shopping with their mobile phone that is when only it is connected to the internet.

Secondly, *GOOD* is developed using Android platform where it will only be available on android play store. This platform is chosen due to its competency and popularity in today's environment.

Thirdly, this project is done for small and medium size grocery store. Giant company like Tesco has implemented online ordering service for their customers many years ago. However, the implementation of such application is still downcast in local groceries shop. Hence this project is developed to help the local business to be competitive with the implementation of this application.

## **CHAPTER 2**

### **LITERATURE REVIEW**

#### **2.1 OVERVIEW OF E-COMMERCE**

For years, e-commerce has become the popular terms in everyday and business life. As technology evolves, electronic transaction has become more complex and people are able to see many new applications. According to Mirolubov (2013), E-commerce is defined as the integrated application of information and communication technologies (ICT) in support of all the activities of business and execution of automatized business process of a company while Kalatota and Whinston (1997) define e-commerce as the process of buying and selling of information, products and services via computer networks. As online use grows, the number of people shopping at virtual malls is also increasing rapidly. Studies have shown that e-commerce might replace the traditional shopping pattern in the future (Nam et al., 2002). Almost every business activity can be done over the internet nowadays. Many brick and mortar company has decided to change their business strategy by building their very own corporate website or mobile application to offer online transaction (Doan N, 2013). Peapod for example has started their online ordering services since 1989 and since then it has shown significant impacts to their business. Their revenue has increased and their sales have grown up.



Wenyi & Xin (2000) mentioned in their studies:

*“It is no doubt that E-commerce are gradually replacing traditional business in a better way, such as removing the limitation of time and improving company’s efficiency and competitive advantages”.*

In seller point of view, e-commerce have the ability to provide information, facilitate two-way communication with customers, collect market research data, promote goods and services and provide rich and flexible new retail channel Basu and Muylle (2003) while Srinivasan et.al (2002) suggest that e-commerce giver seller a mechanism for broadening target markets, improving customer communications, extending product lines, improving cost efficiency, enhancing customer relationships and delivering customized offers.

E-commerce helps to transform customer’s shopping experience and also possess many benefits (Dennis et al, 2004). For customers, E-commerce helps to facilitates shopping experience where they can save time doing shopping online anytime, anywhere and for almost anything that they desired. Busy consumers prefer this to the restrictions of when a mall or shop is open and the need to physically travel to a shop. Online business takes shopping a step further by taking itself to the customer creating conveniences of shopping anywhere and at any time (Rainu T, 2012).

According to Mach & Cao (2002), there are three different categories of E-commerce. There are from Customer, Business and Government perspectives. In the customer side, they are; Customer-to-Customer (C2C), Customer-to-Business (C2B), and Customer-2-Government (C2G). From Business perspective of e-commerce, they are; Business-2-Consumer (B2C), Business-to-Business (B2B), and Business-to-Government (B2G), and from the Government aspect; it also revolves between government (G2G), government to business (G2B), and government to customers (G2C)

## 2.2 FACTORS INFLUENCING ADOPTION OF E-COMMERCE

There are few factors that influence adoption of e-commerce that is found relevant in this study. There are grouped into the number of Internet users, organizational readiness and pressure from external parties (Hansen, 2005).

### 2.2.1 Number of Internet User

The increasing number of Internet users worldwide drives the transformation of economy from traditional business into e-commerce. Statistic from *www.internetworldstats.com* shows that the growth of Internet users in the world is increased 630% from 2000-2014. This indicates the increasing of Internet population and online markets. No companies can deny and ignore this change. Hence, going online is the solution that every business need to implement to remain competitive or without e-commerce, companies may lose its competitiveness to their competitors (Damanpour, 2011).

**Table 1. Internet Usage Statistics**

(Retrieved from: (<http://www.internetworldstats.com/stats.html>, accessed on 9/3/2015)

Area	2000	2014	Growth
Global	360,000,000	2.267.000.000	630%
Asia	114.300.000	1.017.000.000	890%
Vietnam	200.000	30.800.000	15400%

Table 1 shows the internet usage statistics taken from (<http://www.internetworldstats.com/>, 2015). This table shows the significant increase of the internet users from year 2000 to 2014.

### **2.2.2 Organizational Readiness**

Meanwhile, Beatty (2001) said that organizational readiness was assessed and measured by the company's financial and also its technological resources. The compatibility and consistency of e-commerce with firm's culture, values, and preferred work practices also need to be considered before adopting them in the business.

### **2.2.3 Pressure from External Parties**

External pressure on the other hand, was assessed by incorporating to five elements. There are competitions, social factors, and dependency on other firms that already using e-commerce, the industry, and finally the government (C.C. Lin,2003). Evidence has also been found that some customers may request electronic services from their suppliers. Daniel and Storey (1997), in their studies on electronic banking services found that, certain customers were requesting their bank to develop e-banking services or they were likely to move to a competing bank that did offer such services. This is all the external pressure that what make e-commerce successfully being implemented in the business (Mehrtens, 2001).

## **2.3 BENEFITS OF E-COMMERCE**

Without any doubt, E-commerce has changed the whole society and affects every participants of the economy. E-Commerce has both negatively and positively impact to customers, businesses and governments (Xu and Quaddus, 2009). E-commerce also provides many benefits to both sellers and buyers. Raymond (1985) said that not only large firms will be benefits by e-commerce, small and medium sized enterprises (SMEs) can also be benefited from e-commerce. Some of the benefits of E-commerce for SMEs are discussed below:

### **2.3.1 Convenience**

The primary benefit of online groceries shopping is convenience (Elizabeth D & Hugh W, 2002) To individuals, the most useful impact of e-commerce is providing the ability to access online services from everywhere at any time. Porter (2001) said that, e-commerce helps business to grow by having 24/7/365 business operation hours. Customers can shop anytime and the product will be delivered to their address within the specific time frame. In the context of groceries shop, the implementation of e-commerce can offer the opportunity for shop to offer their products outside normal operating hours (Daniel and Storey, 1997). Other uses of E-commerce within the firms are discussed by McBride (1997) that said e-commerce allows seller to carry out business without the barriers of time or distance. One can log on to the internet at any time, be it day or night and purchase or sell anything one desire at a single click of the mouse. Meanwhile, e-commerce in groceries shop context, customers would not need to travel from one place to another just to buy one or two products for their needs. Thus, customers will feel much more convenient to use online services than offline services.

### **2.3.2 Personalized, Customized Products and Services**

Watson et al. (2001) found that e-commerce will help business to provide enhanced services to the customers. This application also would help seller to understand customer behavior better (Daniel and Storey, 1997). For example, the application will help to collect and analyses data pieces to provide appropriate result to the customer. By knowing the customer preferences, the shop keeper can offer them a similar product with cheaper price in the future. In other words, data is customized and personalized to each and every customer. Such customization enhances customer experience and increases customer satisfaction rate.

### **2.3.3 Better Communication and Interaction Between Customer And Seller**

With the help of advance technology, customers can be supported via different channels such as emails, real time chatting. Communication between organizations is also improved with the use of information systems (Chong, 2000). E-commerce also offers opportunity for companies to enter dialogue with their customers. Butler and Peppard (1998) and Wilson et al. (2001) encourage firms to move away from the traditional approach to making business by having Internet as a medium of communication between them.

### **2.3.4 New Potential Market**

Napier et al. (2001) pointed out that by the implementing and using e-commerce in business, sellers can access narrow markets segments that are widely distributed. E-commerce helps business to approach more customers from different areas and market segments.

### **2.3.5 Enhanced Efficiency & Effectiveness, Time and Cost Savings**

E-commerce also improves business efficiency and effectiveness as transactions are conducted faster with reduced costs. Another source of significant cost savings is the elimination of paper within the business and the associated delay and re-keying information that is done conventionally and normally been done using paper based systems (Porter, 2001).By ordering online, customer can quickly search for products they need and order them without having to physically go to the store. It will also save time spend and travel expenses going to the store. Hoffman and Novak (2000) found that e-commerce helps customer to access global markets with larger product availability from a variety of sellers at reduced costs.

## **2.4 RISK AND CHALLENGE OF E-COMMERCE**

Nevertheless, despite all the advantages by implementing e-commerce in the business, the risk possess by doing e-commerce also cannot be neglected. According to Kahneman and Tversky (1979), risk can be defined as the individual's perception of likelihood of loss associate with purchasing the product offered.

### **2.4.1 Security Issues**

Privacy and security issues are the most concern problem raised by both individuals and organizations in e-commerce (Kotler, 2009). They affect not only the development of the application but also the strategy to build trust between customers and organizations (Velmurugan, 2009). Users are afraid of losing privacy because their personal information is published to the network. Purchasing online is also a concern to customers because they are afraid of losing bank account's information. E-commerce also raises a question on trust between sellers and buyers. E-commerce successes largely depend on gaining and maintain the trust and confidence of customers. Hence, it is important to understand how risk and trust affect the purchasing decisions made on the online.

### **2.4.2 Maintenance**

Challenge that e-commerce businesses face is to operate and manage their online activities. It requires much effort to maintain the information systems as customers need to access and support at any time and from anywhere. Business has to have good IT infrastructure in order to implement this online ordering systems. The implementation of information system requires high expenses to ensure a secure and reliable service (Hardcastle, 2009).

### **2.4.3 Customer**

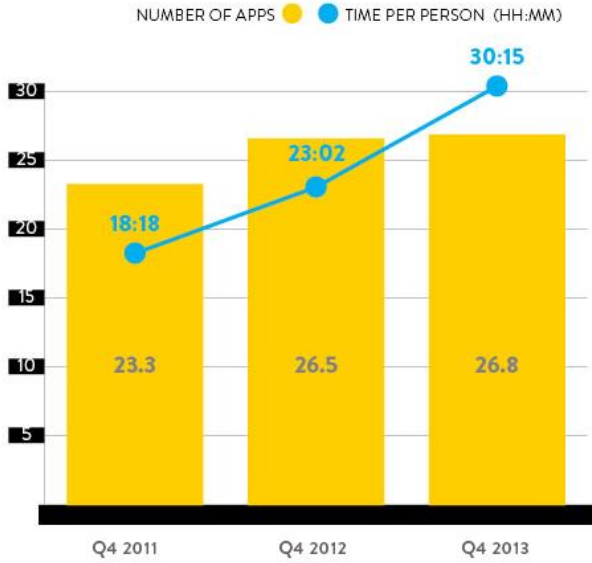
Challenges to customers are to attract them using the new technology. Most people from older generation are used with the conventional ways of shopping because they don't have good knowledge to use the application. Besides that, the challenge of e-commerce is when there are interruption of the system occur. If there is no network connection, customers will not able to use the application. Hence, it is essential to develop an application that can help and assist customers doing online shopping where it is a safe site where all kinds of products and services can be found with little effort.

## **2.5 MOBILE APPLICATION IN BUSINESS**

The growth rate of people with smartphone and using mobile application nowadays is very high (Islam, 2010). Studies by e-Marketer in 2012 shows that consumers spends more minutes per day on mobile with growth of 52% from 2010-2012. Thus, a new application with support from smart phone features has growing more rapidly nowadays. Using mobile application in developed country are becoming facilitate and people, society of developing country are upgrading themselves and making a new type of IT infrastructure. Mobile application are running on a small hand hold mobile device which is moveable, easy to use and are accessible at any time and from any place as long as there are good internet connection.

**MOBILE APP USAGE IS ON THE RISE**

**AVERAGE APPS USED AND TIME PER PERSON PER MONTH**



Read as: During Q4 2013, mobile owners used 26.8 apps on average per month and spent 30 hours, 15 minutes in them  
Source: Nielsen

**Figure 1. Average Apps Used and Time per Person per Month**

Figure 1 shows the survey data from Nielsen which proves that Android and Iphone users age 18 years old and over in US spend more time each month using apps than they did two years ago. In Q4 2013, they spent 30 hours, 15 minutes using apps, a full half-day more than 18 hours, 18 minutes in Q4 2011. The average number of apps used per month, however, only increased slightly from 23.2 in Q4 2011 to 26.5 during the same period in 2012 and 26.8 apps per month in Q4 2013.



CATEGORY	Q4 2012	Q4 2013	GROWTH	% GROWTH
<b>TOTAL</b>	<b>23:02</b>	<b>30:15</b>	<b>7:13</b>	<b>31%</b>
SEARCH, PORTALS, & SOCIAL	8:33	10:56	2:22	28%
ENTERTAINMENT	6:11	10:34	4:22	71%
COMMUNICATION	3:29	3:48	0:19	9%
PRODUCTIVITY & TOOLS	2:00	2:16	0:16	14%
COMMERCE & SHOPPING	1:23	1:33	0:09	12%
NEWS & INFORMATION	1:00	1:33	0:33	55%
TRAVEL	1:14	1:18	0:04	6%
FAMILY & LIFESTYLE	0:59	1:16	0:16	29%
PHOTOGRAPHY	0:26	1:01	0:34	131%
FINANCE	0:33	0:35	0:03	10%

Read as: During Q4 2013, smartphone owners spent nearly 11 hours per person, on average, accessing social and search apps.

Source: Nielsen

**Figure 2: Top 10 Smartphone App Categories by Time per person**

People are using mobile application to contact friends, browse internet, entertainment and even for shopping. Mobile application has help people to do their daily task in much faster and more efficient ways.

Based on Figure 2, it shows that commerce and shopping is one of the top 10 categories people spend most of their time in smartphone application. Hence, not only the mobile application has an impact for users, but it is also plays an important role for the business (Yang et.al, 2009) Mobile apps are used basically in order to increase the efficiency of business process.

## 2.6 RELATED WORK

This section discusses the related work for this study. There are Peapod, Tesco Online and Grocer Express.com.

### 2.6.1 Peapod



**Figure 3: Peapod Mobile Application**

Peapod is one of the popular android applications that provide online groceries ordering services to customers. Peapod are offer in both website and mobile application. The features of this application is customers can search for products customers looking for, provide weekly specials offers and ‘Guess My Orders’ – a way to speed up shopping process by automatically add items that are frequently purchase. The advantages of this application are that they have barcode scanning where customers can scan products easily and add to cart. Besides that, Peapod also offer free delivery services to their customers. However, the disadvantage of this application is that, it is only available in the United States where it does not implement in Malaysia. Based on the review, many people agree that this application is very helpful and consistently improving. This application also get high rated from the customers that show they are happy with this application. Based on the reviews from customers, many ranked Peapod as 5 stars application.

With the help of advance technology, customers can be supported via different channels such as emails, real time chatting. Communication between

organizations is also improved with the use of information systems (Chong, 2000). E-commerce also offers opportunity for companies to enter dialogue with their customers. Butler and Peppard (1998) and Wilson et al. (2001) encourage firms to move away from the traditional approach to making business by having Internet as a medium of communication between them.

### 2.6.2 Tesco Online

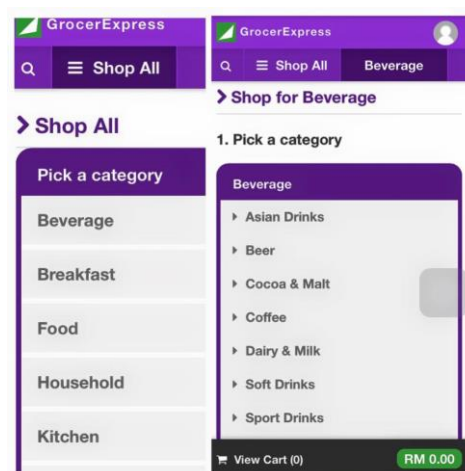


**Figure 4: Tesco Online Mobile Application**

Tesco Online application provides convenience to customer where they can make and purchase their groceries shopping online. By shopping with Tesco online, customers can earn their Tesco Club Card Points. Tesco guaranteed the product to reach the customer on time and with good conditions. Customer also has the ability to reject the item before receiving them. Besides that, there is no maximum or minimum order of purchase. Tesco Online is available worldwide, anywhere Tesco store is operated. Tesco Online offer both website and mobile application for its

customers. Compared to Peapod, Tesco Online received lower review which 3.8 stars. Most comments are on the new interfaces of the application and suggestion on the mode of payment that Tesco offered. They should have the Cash on Delivery mode as not all people have credit card to do online payment.

### 2.6.3 Grocer Express.Com



**Figure 5: Grocer Express Mobile Application**

Grocer Express is one of the Malaysia first online supermarket which offers home and offices delivery. It provides fast, easy and convenient online shopping experience to customers. Users can create their own personal dashboards where they can organize items that they purchased. Grocer Express are available both in Website and Mobile platform to ease customer purchase online. However, Grocer Express only provides delivery service only to Klang Valley area.

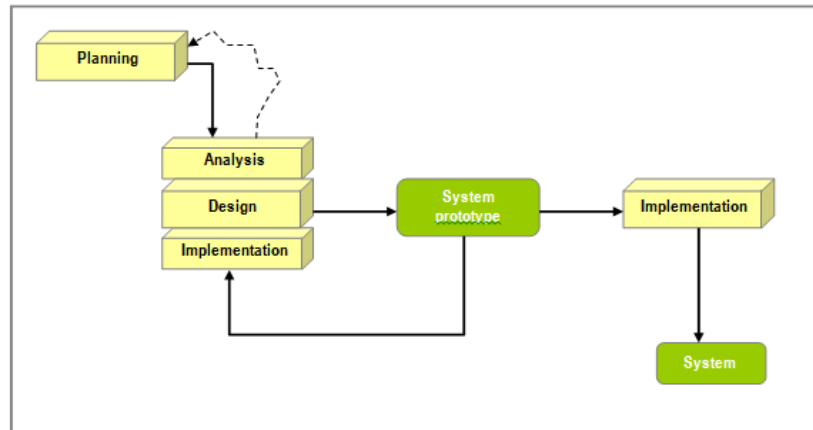
## CHAPTER 3

### METHODOLOGY

#### 3.1 PROJECT DEVELOPMENT METHODOLOGY

*GOODS* mobile application is developed using Rapid Application Development (RAD) because it avoids long planning phase and allows prototype to be rebuild and redefined repeatedly to identify the most significant and useful features for implementation to deliver good results and output. RAD is use to ensure that the project activities are well designed to cater all the needs of this project by promoting timely delivery and within budget.

Figure 6 shows the phases for the project. *GOODS* mobile application will be developed accordingly using the 5 main phases in RAD that consists of phases such as Planning, Analysis, Design, Implementation and System prototype. Each of the Analysis, Design and Implementation phase will be perform concurrently and on each cycle resulting in a system prototype that will be reviewed by the local people in order to measure the effectiveness of the prototype model. Based on the diagram below, FYP I will consists of planning phase until designing phase while the other Implementation/ Development phase will be done in FYP II.



**Figure 6: Rapid Application Development**

## 3.2 PROJECT ACTIVITIES

### 3.2.1 Planning Phase

For this stage of the project development, a high level view of the project was initiated. Some readings and research was carried out to get an idea of the project's feasibility. During this phase, the goals and the objectives of the project has been determined. These goals will be used as a point of reference for the rest of the development process to ensure that the project stays on track. The objective, scope and research elements also being done in this phase to make sure the development process will be clear and easy to achieve during the design phase and meet the requirement.

### Requirements Gathering

Requirement gathering is usually the first part of any software product. The main target group will be the customers and shop keeper in local grocery store. This is to find out the real need in the market for the mobile application that will be developed. For this project, it has been decided to gather user requirements by using pre-survey method to:

## **Customers**

- Customers are expected users of GOODS mobile application. An online pre-survey questionnaire has been conducted to the public people with 25 respondents to understand the customer perception on online groceries shopping. This sample is taken from Seri Iskandar online community Facebook group. This is to understand the factors, perceived benefits, risk and challenge customers face when shopping groceries online.

## **Shopkeeper**

- An interview is conducted in a local grocery stores in Sri Iskandar to get a depth understanding on how the business is conducted, to identify problem in the business and study how an application can effectively help to assist business process.

## **Literature Survey**

Literatures are collected and analyzed using related literatures that were found on the same topic as this project. This is important as to ensure the existence of research topic in the proposed project as well as its feasibility within the time frame given.

## **Collecting Data from Customers (Questionnaire)**

Questionnaires are done before building the mobile application to predict the aspect of the mobile application product. This is important to understand the user requirement. It is best to use this questionnaire technique because it tests out ideas quickly and informally. The questionnaire is send to the Seri Iskandar online community in Facebook group. Out of 54 members in the group, 30 responded to online survey. The results of the survey will be analyzed and act as the basis and guidelines for the development of *GOODS* mobile application.

## Collecting Data from Shopkeepers (Interview)

An interview has been conducted with the owner of local grocery store to understand how the business is being done. Besides, the purpose of the interview is also to identify problem, challenges and opinion on the implementation of mobile-based application to assist ordering process in their store. Interview also is conducted in several groceries store in Sri Iskandar to get the clear understanding of how the business process in the stores.

**Table 2: Interview Outline**

<b>INTERVIEW OUTLINE</b>	
<i>Groceries Online Ordering &amp; Services (GOODS) Mobile Application</i>	
<b>Interviewer:</b> Tengku Hazleen Binti Tengku Hazni	
<b>Post:</b> Project Developer	
<b>Interviewee:</b> Siti Saleha Bt Bismi Ahmad	
<b>Post:</b> Owner's daughter	
<b>Location:</b> Bismmi Hammad Ent	
<b>Date:</b> 12 March 2015	
<b>Time:</b> 5.30pm	
<b>Objective:</b>	
Agenda:	
Brief Introduction on proposed project	10 min
<u>Interview's Question</u>	
<b>Question 1:</b> How the business process in your grocery store?	10 min
<b>Question 2:</b> How you keep track of your inventory?	10 min
<b>Question 3:</b> What problem normally occurs in your business?	10 min
Summary of Major Point	5 min
Closings	5 min
<b>Total of Hour:</b>	<b>50 mins</b>



## **GOODS Requirement Gathering**

Before developing GOODS mobile apps, few requirement gathering technique had been done to get all the necessary information regarding this apps. This is including study the related work that are currently in Google Play and AppStore to get the idea on what GOODS should be like.

By studying the related work, it is understand what components that should be in online ordering mobile application. This includes formal and additional components. Formal component is important component that must be include in the mobile apps like view product details and add item to cart while additional component is something extra like barcode scanning. Hence, it will act as a guideline and procedure on what to be in *GOODS*.

### **3.2.2 Analysis Phase**

In this phase, some of the analysis on the objective, scope and research elements is being done to make sure the development process will be clear and easy to achieve during the design phase and meet the requirements. I come out with UML diagrams such as use case, context diagram and entity relationship diagram (ERD) which will be discussed further in the result and discussion part.

### 3.2.3 Development Phase

Next, the process will move on to the development phase where the application will be developed with the selected tools and method. The element focus during this phase is to make sure it will be user friendly to the target group. Several suitable functions will be created and used in developing the mobile application. The purpose of this phase is to transform the requirements into complete and detailed system design specifications before moving to the final stage that is the development phase. Graphical user interface (GUI), database and system architecture will be design at this phase:

- **GUI:** Things that is visible to the user, such as screen layout and navigation.
- **Database architecture:** Focus on the design, development, implementation and maintenance of programs that store and organize information for the business. Structured Query Language (SQL) is database architect program that will be using in this *GOODS* project.
- **System architecture:** A conceptual model that defines the structure, behavior and views of a system. It describes a formal representation of a system in organized way that supports reasoning about the structure of the system.

#### Tools required

The tools required for the development of the proposed mobile application would be divided into hardware and software as listed below:

- Hardware  
Laptop and Android Smartphone will be used for the development of the mobile application. The laptop will be used as a platform to install all the necessary software and tools required. Laptop also will be used to open the

admin webpage to manage the inventories to the database while Android Smartphone will be used for the configuration and testing of the mobile application designed.

- Software

MySQL Server, PHP MyAdmin, Open Cart and Phone Gap will be used for the development of *GOODS* mobile application. MySQL Server is used to create database for storing the inventories data while PHP MyAdmin will be used to create coding to build webpage for the project. Whereas Phone Gap is used to build *GOODS* apps for Android phone.

### System Requirements

As the mobile application being developed the author has identified some of the system requirements, for the mobile application to run smoothly and effectively. Basically, the system requires all these features in order to run successfully on the users browser. However some components may require additional system resources not outlined below because mobile applications have numerous components, both software and hardware and the author cannot test on all configurations.

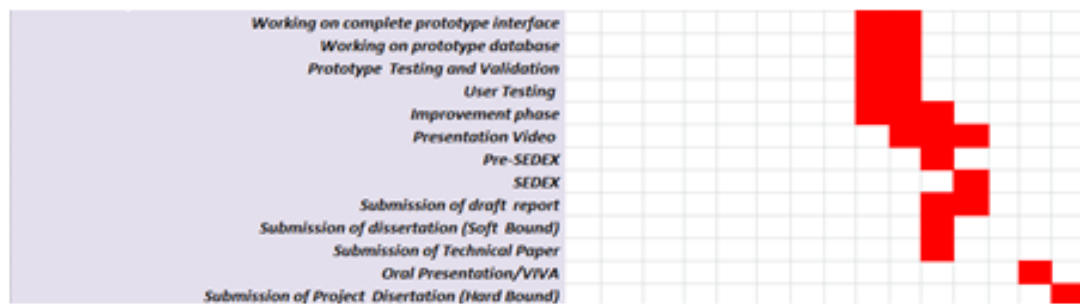
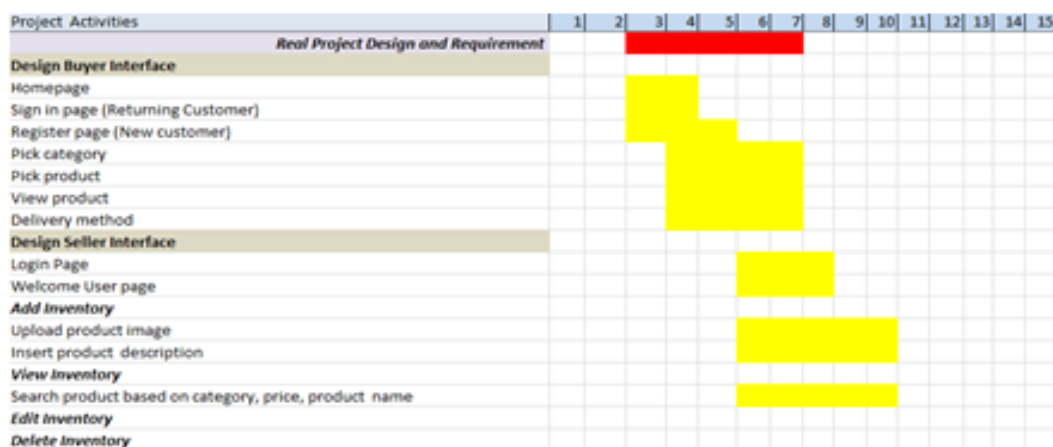
**Table 3: System Requirements**

Features	Descriptions
Operating system/ Platform	Device: ·Phone Gap -Open Cart software
Memory	Device:- ·RAM 1GB ·Internal Memory: 16GB
Display	Target Device:  ·480 x 800 pixels, 3.7 inches

### 3.2.4 Implementation Phase

The application prototype will be built based on the user requirement given in early stage. In this phase, the process will continue until it meet the requirement of the user.

### 3.3 GANTT CHART



## CHAPTER 4

### RESULT AND DISCUSSIONS

This chapter presents the results of the study. This chapter consists of the UML diagrams and the GUI for this project. It also focuses mainly on the analysis and discussion of the results collected throughout the development of *GOODS* mobile application.

#### 4.1 INTERVIEW

Based on the interview, it is understand how Bissmi Hammad does their business. Currently, Bissmi Hammad has their own in house POS system that is monitored by the shop's owner. With the system, it is easier to keep track of the sales progression every day and it can generate a weekly sales report. To update their inventory, Bissmi Hammad used a system call inventory management system. For every item that is stock in, it will be updated in this system using barcode scanner. This system will link with 2 PCs, account and survey PC. Account PC is to keep track of the account activities such as account receivables and account payable while the survey PC will directly linked to the POS system.

Every time customer buys a product, the staff will scan the product and it will reduce the inventory in the survey PC. After the inventory reach certain amount, the system will alert staff that they need to stock up the particular product. In Bismmi Hammad, they have the good infrastructure such as computer and internet

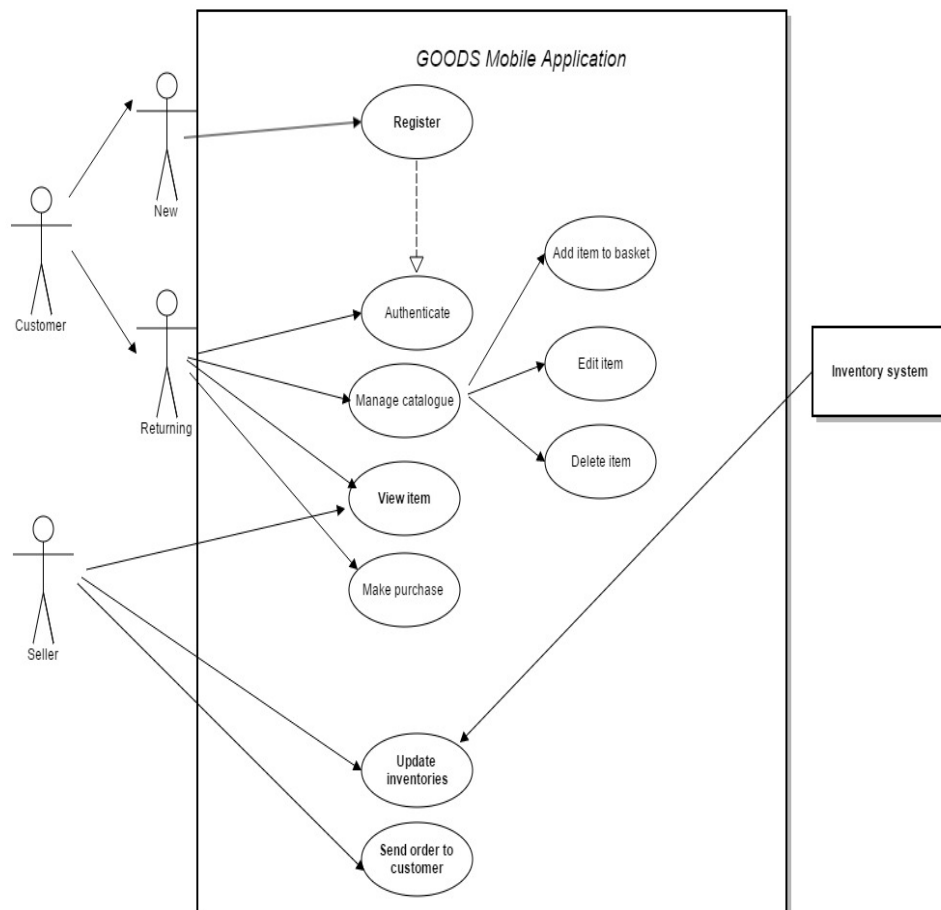
connectivity. However, there are also drawbacks in the system where it will hang after too many transactions occur. It will take around 10 minutes for the system to recover as normal. The problem will occur when there are many customers in the shop especially during the peak hour (during weekend, or between 6 to 9pm every day). After explaining to the shop owner's about how *GOODS* will works, which customer can order their groceries item online, she is strongly agree with the idea of this project. This is to reduce the congestions in their shop. According to her, sometimes, customer has to queue long only to pay for one or two product. They found it inconvenience for the customer's side. Bissmi Hammad also offers delivery services to nearby restaurants. The restaurant owner will call the shop and order items that they need before 6pm. Then, the staff will quickly pack the order and send to their shop at 8pm every day. Hence, it is hope with the implementations of *GOODS*, the shop will be more productive than ever.

## **4.2 ANALYSIS**

The analysis was performed at the initial stage before proceeding to the development of *GOODS* mobile application with the aim to obtain comprehensive information related to e-commerce as well as the desired functionalities and needs from the targeted users of *GOODS* mobile application. The method and result of the analysis will be used in this project and it is further discussed below:

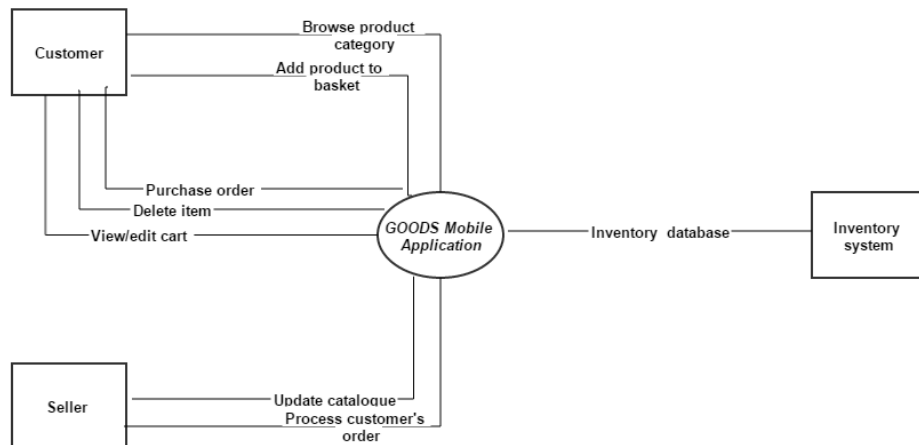
### 4.2.1 UML Diagrams

From the analysis phase, UML diagrams were produced. These UML diagrams are use case, context diagram and entity-relationship diagram (ERD).



**Figure 7: Use Case diagram**

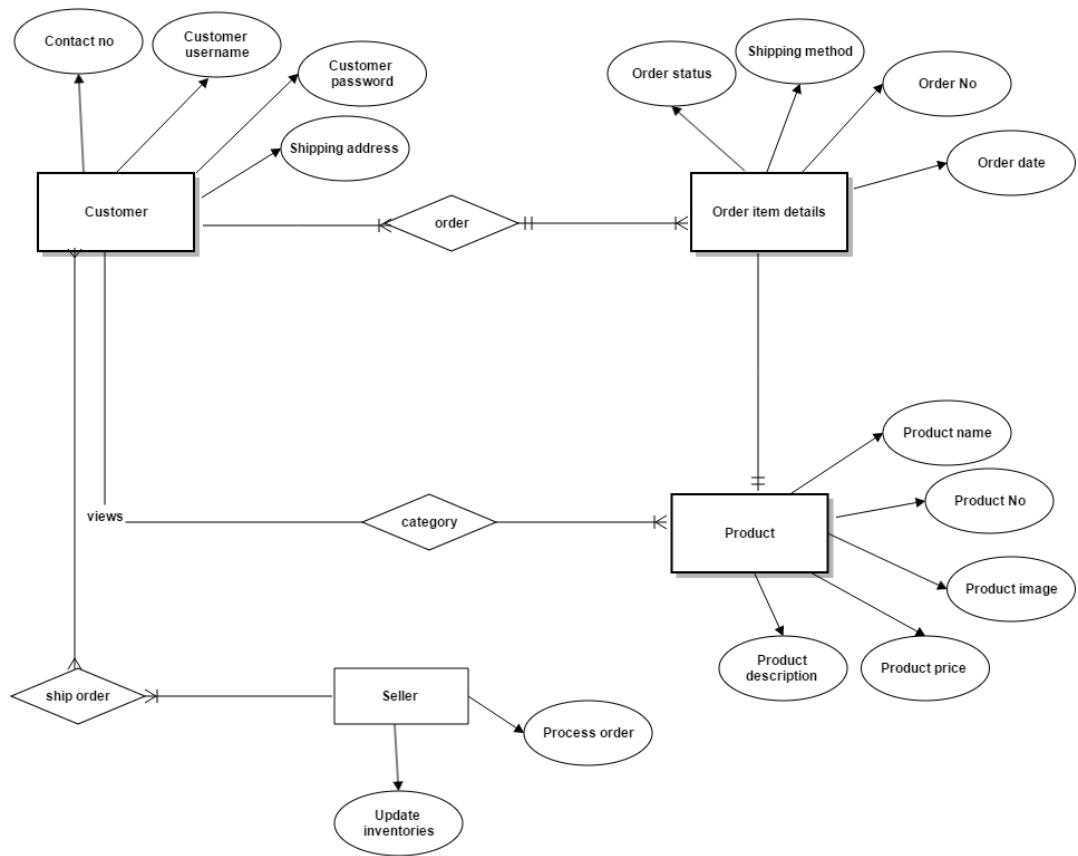
Figure 7 shows the use case diagram for GOOD mobile application. There are 2 users for this application : Customers and seller. Customer can be divided into two groups which is the new or returning customer. New customer need to register to the application while returning customer can login to the application and manage catalogue consists of add item, edit item, delete item, view item and make purchase. Meanwhile, the seller can view item, update inventories in the inventories systems and send order to the customers.



**Figure 8: Context Diagram**

This diagram presented in figure 8 shows the overall views of the system. For customers, they can browse product category, add product to basket, view/edit cart and purchase their order while seller can update catalogue and process customer's order.





**Figure 9: ERD Diagram**

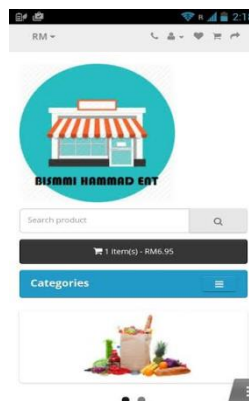
Figure 9 shows the entity (table) relations in this project. There are 4 main items in the relationship module namely customer, seller, order item details and product. These four modules are interconnected with each other.

## 4.3 DESIGN

In this section, the progress and results of GOOD application designation and navigation process will be discussed and described briefly.

### 4.3.1 GOOD User Interface

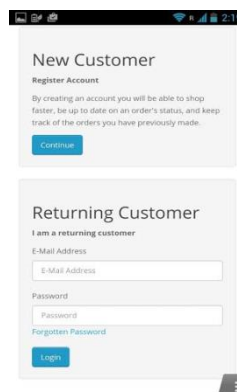
#### *GOOD* Home Page



**Figure 10: *GOOD* Home Page**

This is the home page for GOOD mobile application.

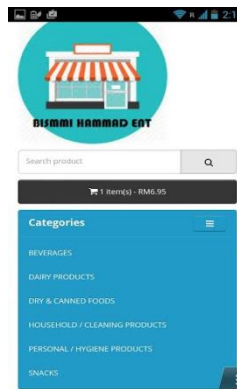
#### New/Returning Customer Login



**Figure 11: New/Returning Customer Login**

Here, if the user is already a *GOOD* member, they need to sign in else they need to register and provide his/her information.

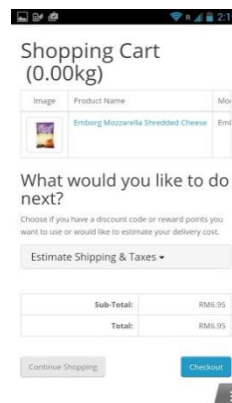
## Browse Product Category



**Figure 12: Browse Product Category**

From this page, there are 6 product categories user can choose from namely: Beverages, dairy product, dry & canned foods, household & cleaning products, personal & hygiene products and snacks.

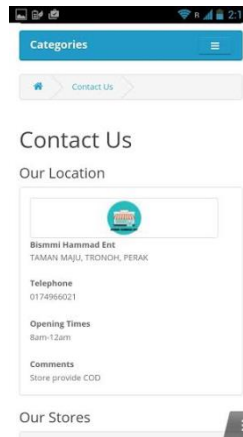
## View Cart



**Figure 13 : View Cart**

This page shows the order summary customer has made. Customer can choose to continue shopping or checkout from this page.

## Contact Us



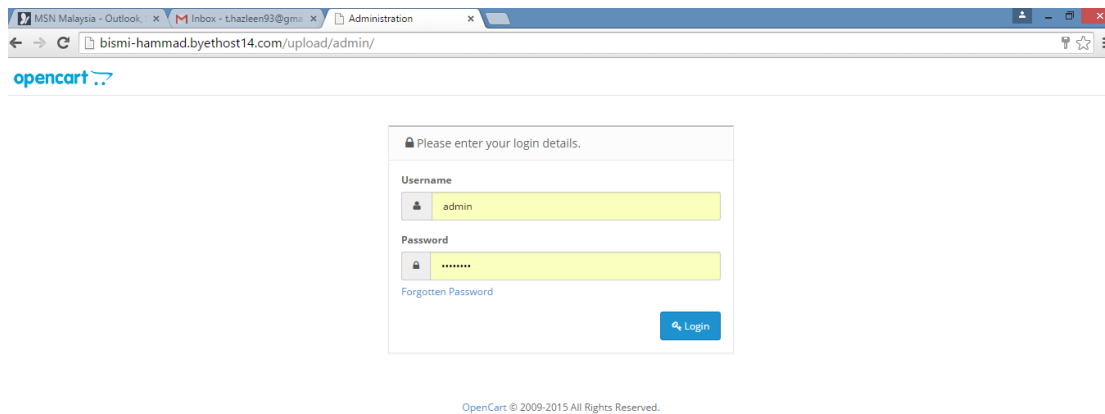
**Figure 14: Contact Us Page**

This page display the information of the store such as address, phone number, opening hours and comments made by the store owner.

### 4.3.2 Inventory Database System Interface

The interface design will show the layout of the interface that the shopkeeper will use when interacting with the system.

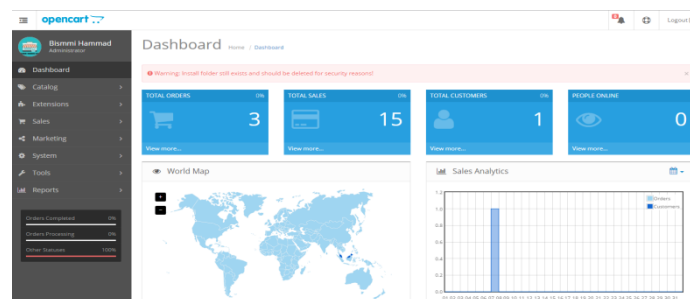
#### Authorized Staff Login Page



**Figure 15: Authorized Staff Login Page**

This page will prompt the authorized staff to login with valid username and password.

#### Seller's Dashboard



**Figure 16: Seller's Dashboard**

From the Administrator site, seller can view total order, total sales, add category, add product and add their respective information regarding the store.

## Manage Catalog

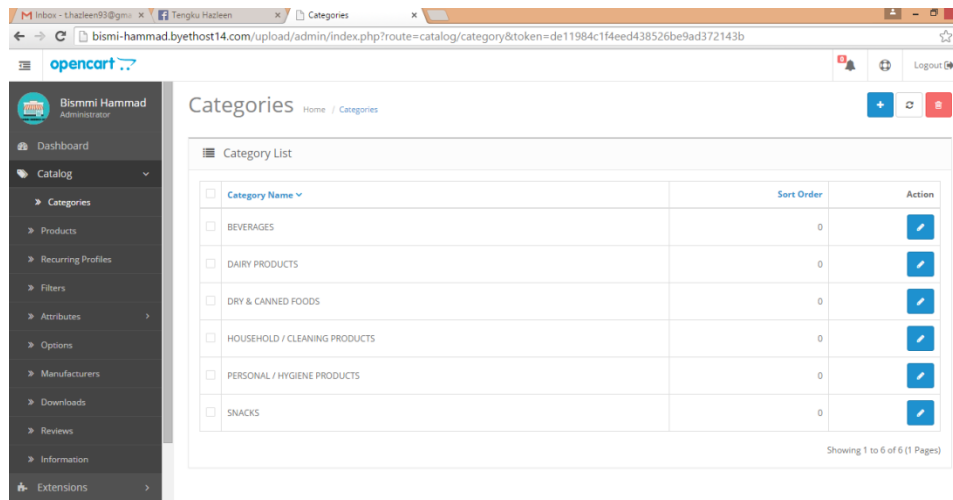


Figure 17: Manage Catalog

From this site, seller can manage the inventory in their shop. They can add product category.

## Product's List

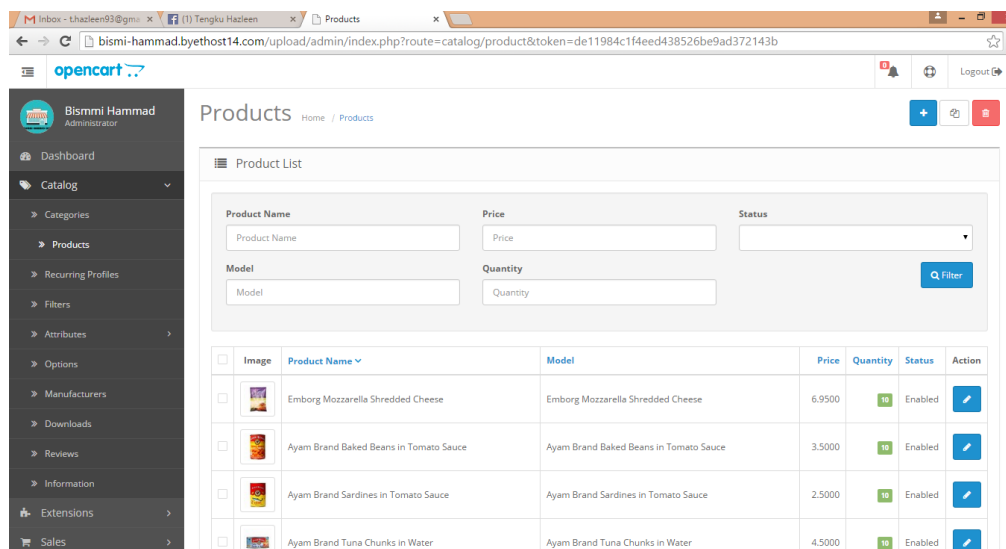


Figure 18: Product's List

Seller can manage their inventory in this page. They can add product details such as to upload product images, add product description and quantity.

## Order's List from Customer

Order ID	Customer	Status	Total	Date Added	Date Modified	Action
78	Shahfiq Nashrah	Pending	RM40.60	05/08/2015	05/08/2015	[View] [Edit] [Delete]
76	Shahfiq Nashrah	Pending	RM19.10	05/08/2015	05/08/2015	[View] [Edit] [Delete]
69	Aria Stevan	Pending	RM27.80	04/08/2015	04/08/2015	[View] [Edit] [Delete]
27	elin elin	Pending	RM13.90	03/08/2015	03/08/2015	[View] [Edit] [Delete]

**Figure 19: Order's List from Customer**

This page shows customer's order received by the seller. Seller can view order by order id, customer's name, the status of order, total sales order, date of order received.

## List of Customer's Order

Product	Model	Quantity	Unit Price	Total
Dasani Drinking Water	Dasani Drinking Water	1	RM13.00	RM13.00
Manigold Low Fat UHT Milk	Manigold Low Fat UHT Milk	2	RM6.10	RM12.20
Ayam Brand Baked Beans in Tomato Sauce	Ayam Brand Baked Beans in Tomato Sauce	3	RM3.50	RM10.50
Ritz Crackers	Ritz Crackers	1	RM4.90	RM4.90
			Sub-Total:	RM40.60
			Free Shipping:	RM0.00
			Total:	RM40.60

**Figure 20: List of Customer's Order**

This page prompt seller to view the list of product ordered by each customer and the total quantity and unit price per item. From here, seller can proceed the customer's order.

### 4.3.3 GOOD System Architecture

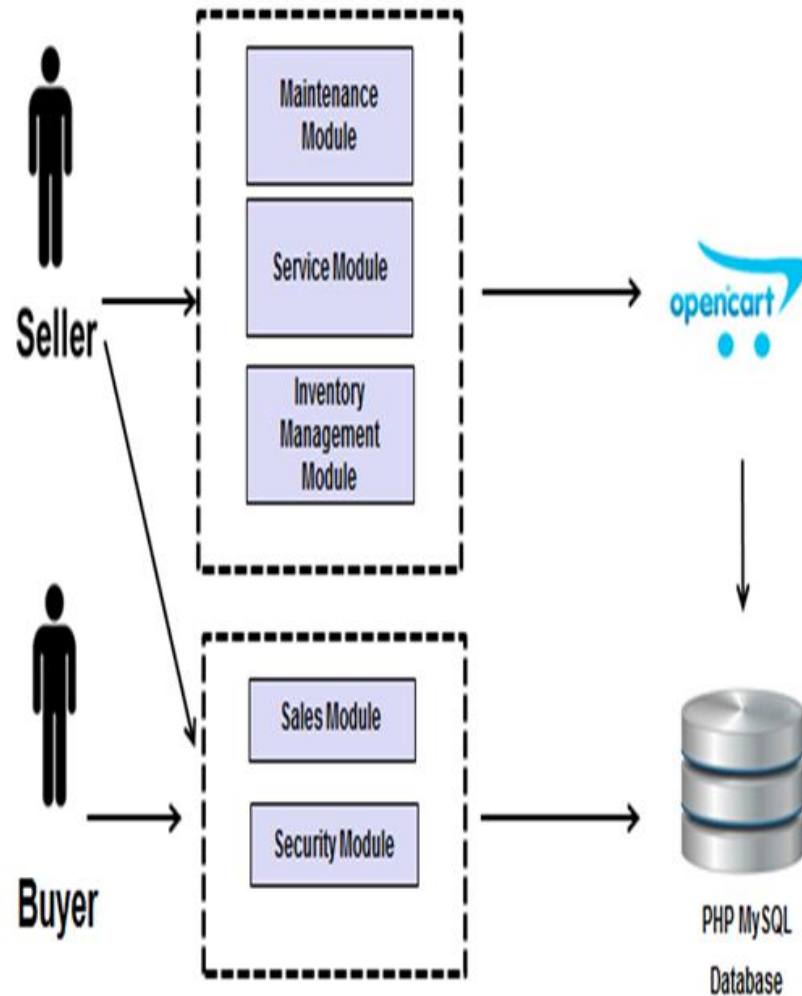


Figure above shows GOOD system architecture. There are 2 users for this project. There are seller and buyer. Seller is responsible for maintenance module, service module and inventory management module. Seller also can access to the sales module and security module of the project. Meanwhile, buyer can only have access to sales module and security module. This two users are connected to opencart system software and PHP MySQL database system.



### 4.3.4 Database Design

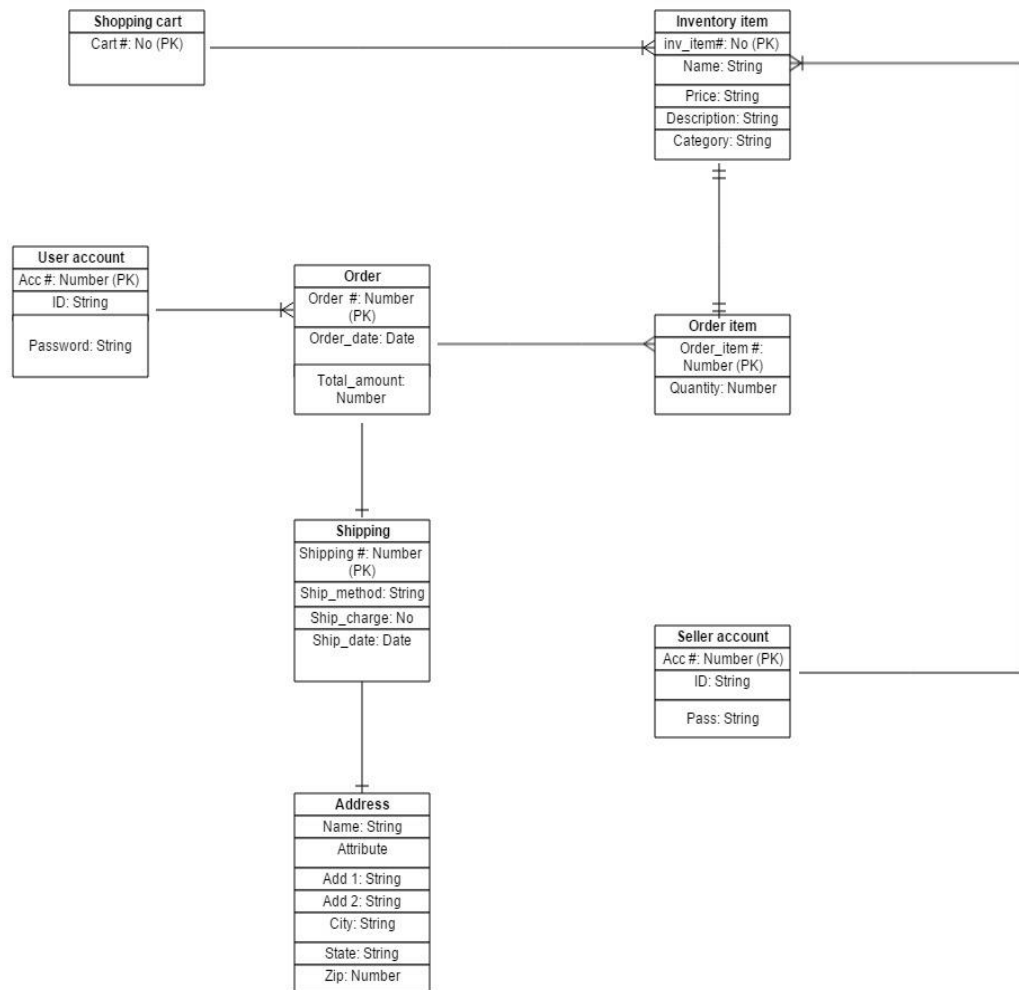


Figure above shows the database design of this project. There are total of 8 tables which have different entities that connected to each other. The 8 tables are shopping cart, inventory item, seller account, order item, order, user account, shipping and address.

## **4.4 TESTING**

Testing process is the crucial part in the process because it needs feedback acceptance from user before the final product is being finalized. Realizing the importance of testing, an interview and discussion has been conducted with the store's owner of Bismmi Hammad and few users to test the functionality and usability of the application. There are total of 20 respondents involved in the user acceptance testing process. These 20 respondents are picked randomly by the project developer herself.

### **4.4.1 Testing with Seller**

Based on the interview and discussion, the relevant findings from the seller are as below:

- “This is good application for my store. It helps customers to order their groceries online” said the shop owner.

### **4.4.2 Testing with User/Customer**

Based on the interview and discussion, the relevant findings from the customer are as below:

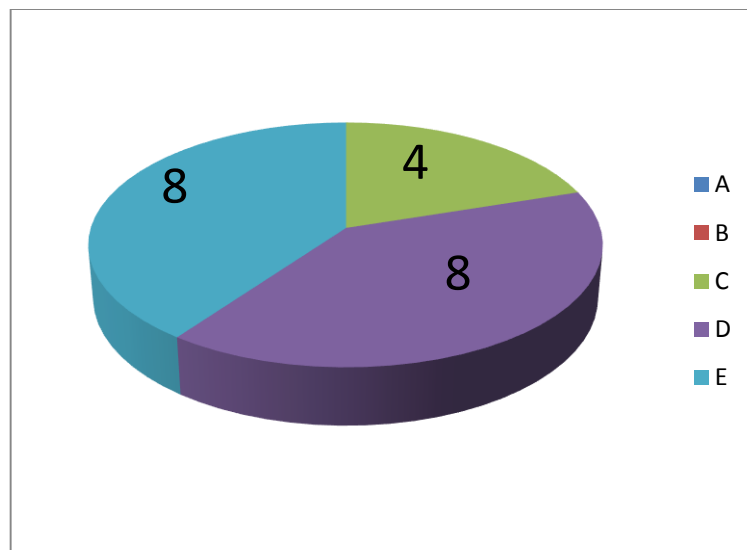
- One of the user said, “I believe this application is very convenient and it helps to save time and money”.
- Users are able to navigate the application with any instruction from the author because this application is very similar to any other e-commerce application available in the market.
- One of the customers said, “It will be great if you can add more categories and product items in the application in the future”.

Respondents is required to answer a survey regarding the attractiveness, ease of navigation and effectiveness of the application to enhance user experience in buying groceries online from Bismmi Hammad. All respondents are aware with the objective of the project as they had already been briefed before answering the survey.

Throughout the questionnaire distribute, the results are:

1) How do you rate the ease of navigation of the mobile application?

- a. Complicated      b. Difficult      c. Moderate      d. Easy      e. Very user friendly

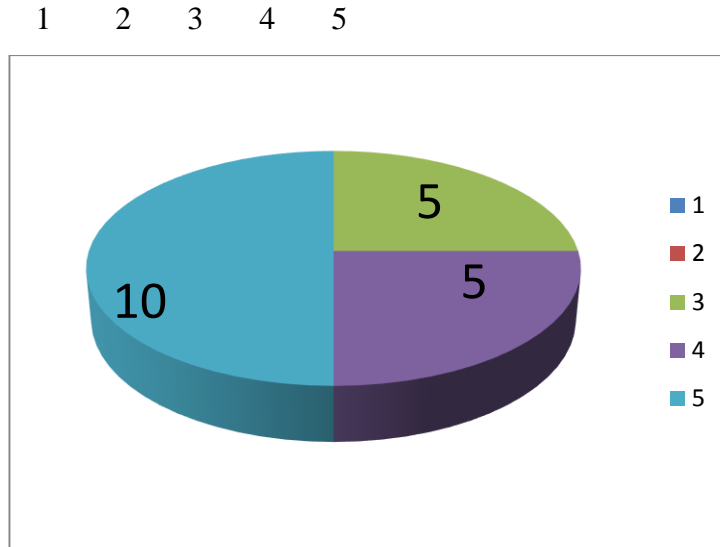


**Figure 21: Question 1**

Eight respondents agreed that the navigation of the application is very user friendly and can be easily used by all regardless of age, gender etc. Another 8 only categorized GOOD application as easy. However, 4 of the respondents rated this application's navigation as moderate.

2) How do you think the application would help you to buy groceries online from Bismmi Hammad store?

(Circle the following option with 1 being the less beneficial and 5 being highly beneficial)

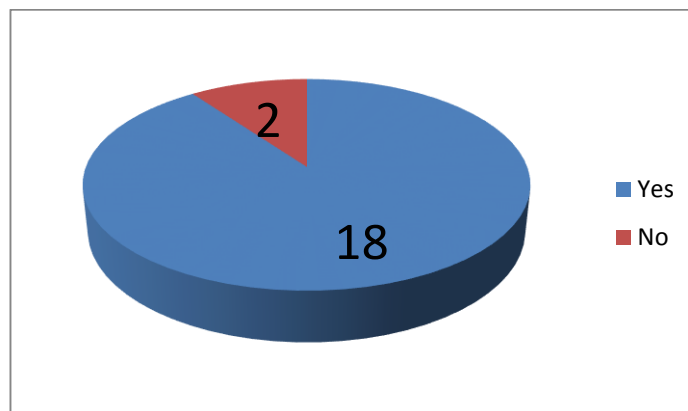


**Figure 22: Question 2**

Half from the total respondents agreed that this application is highly beneficial for customer to shop their groceries online from Bismmi Hammad’s store while another 10 respondents classified this application as only beneficial to customers. Overall, all respondents agreed that this application will definitely help customers to do their groceries shopping online.

3) Will you continue using the application in the future?

YES    NO



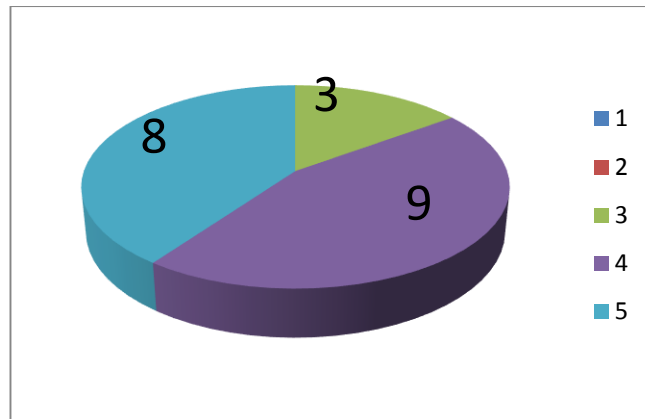
**Figure 23: Question 3**

18 respondents agreed that they will continue using the application in the future while another 2 still prefer conventional ways of doing groceries shopping.

4) What do you think about the user interface of the mobile application?

(Circle the following option with 1 being the less suitable and 5 being highly suitable)

1 2 3 4 5



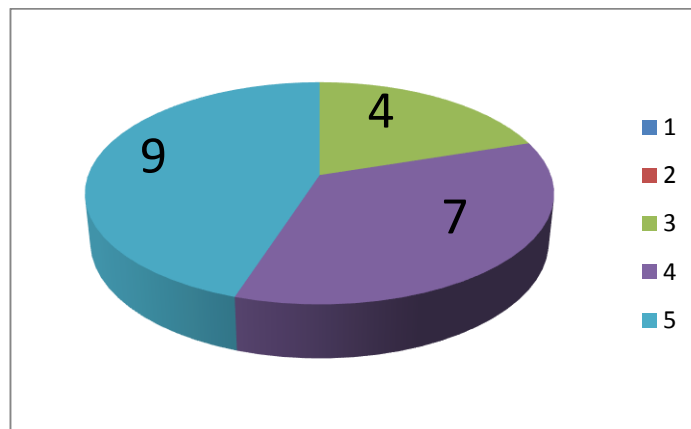
**Figure 24: Question 3**

Half of the respondents supported the user interface of the mobile application and stated that it is highly suitable for everyone from different background.

5) Do you think GOOD mobile application provides a good user experience which is to order groceries online?

(Circle the following option with 1 being the less friendly and 5 being highly friendly)

1 2 3 4 5

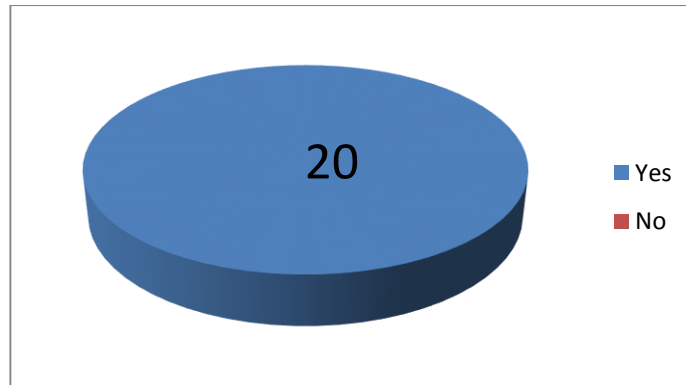


**Figure 25: Question 4**

More than half of the respondents agree that GOOD application provides a good user experience which to help them to order their groceries online.

- 6) Do you think GOOD mobile application follow the standards of e-commerce?  
(Note: E-commerce is a business transaction that takes place via internet (Mach & Cao, 2002)).

YES NO



**Figure 26: Question 5**

All respondents agreed that GOOD mobile application is following the standards of e-commerce.

The experimental result of the testing shown a satisfactory result where out of 20 respondents tested, mean of shows a good respond to the mobile application. In conclusion, this mobile application achieved its aim for customer their groceries online.

## CHAPTER 5

### CONCLUSIONS AND RECOMMENDATIONS

In conclusion, this project meets its objective to design a mobile application called GOOD for customer to order their groceries online from Bismmi Hammad's store. The online ordering platform has been implemented in many giant groceries company like Tesco yet such system has not been widely developed in SMEs business especially in local context. The administrator of the grocery shop will have the full control inventory database system where the customers can shop their groceries through *GOODS* mobile application. The choice of the topic was motivated by the author desire to apply the knowledge of Information System acquired during her studies in developing a real-world application that satisfies not only shop owner but also the customers.

The requirement were drawn from a careful analysis of the existing system in use and its problem, and the analysis, design and implementation were guided by the provision of a system that effectively and efficiently solves the problems identified. Considering on future environment changes, such tool will be very helpful and can be enhance more in future.

In order to enhance this project and to bring it one level up from current idea, the future recommendations are as below:

- To add more features like online payment gateway where customer able to pay their order online by using credit card.
- To get a support and funding from Malaysia SMEs corporation and officially host this mobile app as part of the initiative and support to help SMEs do their business.
- Expand the mobile application in the IOS operating system so that more people will be able to use the mobile apps.



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## APPENDICES

**Appendices 1: Users are trying the application by themselves.**



## **FINAL YEAR PROJECT: GOOD MOBILE APPLICATION OBSERVATION**

The objective of this questionnaire is to determine the fulfillment of functional requirement of the system application. Its aim for user evaluation to better provide further future enhancement on the application.

### **SECTION I : CUSTOMER DETAILS**

NAME	
AGE	
GENDER	MALE / FEMALE
OCCUPATION	

- 1) How do you rate the ease of navigation of the mobile application?  
b. Complicated                      b. Difficult                      c. Moderate                      d. Easy                      e. Very user-friendly
  
  - 2) How do you think the application would help you to buy groceries online from Bismmi Hammad store?  
(Circle the following option with 1 being the less beneficial and 5 being highly beneficial)  
1      2      3      4      5
  
  - 3) Will you continue using the application in the future?  
YES      NO
  
  - 4) What do you think about the user interface of the mobile application?  
(Circle the following option with 1 being the less suitable and 5 being highly suitable)  
1      2      3      4      5
  
  - 5) Do you think GOOD mobile application provides a good user experience which is to order groceries online?  
(Circle the following option with 1 being the less friendly and 5 being highly friendly)  
1      2      3      4      5
  
  - 6) Do you think GOOD mobile application follow the standards of e-commerce?  
(Note: E-commerce is a business transaction that takes place via internet (Mach & Cao, 2002)).  
YES      NO
  
  - 7) Please provide your comment / feedbacks.
-

**FINAL YEAR PROJECT: GOOD MOBILE APPLICATION OBSERVATION**

The objective of this questionnaire is to determine the fulfillment of functional requirement of the system application. It is aim for user evaluation to better provide further future enhancement on the application.

**SECTION II : SELLER DETAILS**

NAME	
AGE	
GENDER	MALE / FEMALE

- 1) How do you rate the ease of navigation of the website?  
a. Complicated                      b. Difficult                      c. Moderate                      d. Easy                      e. Very user-friendly
  
- 2) Do you think the website is useful to your daily work to process customer order?  
(Circle the following option with 1 being least useful and 5 being very useful)  
1      2      3      4      5
  
- 3) Will you implement the system in your shop in the future?  
YES      NO
  
- 4) Do you think the website follow the standard of your shop?  
YES      NO