# Interactive Shopping Directories System

# (InterShop System)

## Final Project Dissertation

Pepared by

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CERTIFICATION OF APPROVAL

**Interactive Shopping Directories System**

**(InterShop System)**

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Aizat bin Azmi

A project dissertation submitted to the
Information & Communication Technology Programme
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in partial fulfilment of the requirement for the
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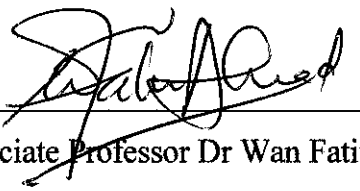
Approved by,



(Supervisor, Associate Professor Dr Wan Fatimah bt Wan Ahmad)

UNIVERSITI TEKNOLOGI PETRONAS
TRONOH, PERAK
JANUARY 2012

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 herein have not been undertaken or done by unspecified sources or persons.

Prepared by,

(Aizat bin Azmi)

**ABSTRACT**

Interactive Shopping Directories System (from herein will be referred simply as InterShop System) is a web-based system developed with the main purpose of providing interactive shopping mall directory. Shopping can sometimes be time consuming; due to the wandering around the shopping mall looking for specific items and with the possibility of the stores not selling it or maybe just ran out of stocks. The main highlight of InterShop System is that the user can search the product that they want to purchase and getting detailed information about the item such as what shops are selling it, the price and more details about the item. The system also will provide user with interactive mall layout, where the user can easily navigate to find the facilities or shops location within the mall. On the management side, Intershop System will enable the mall owner to manage the layout of the mall, updating list of stores and updating the mall news to be read by the customers who are using the system. The store owners meanwhile will have the benefits of easily managing their stores information and updating the product lists that the stores are offering. The system was built using the iterative and incremental methodology and the testing period with the users produced good result as majority of the testers believed that the system helps in shopping more efficiently.

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# CHAPTER 1
# INTRODUCTION

## 1.1 Background

To some, window shopping can be considered as an alternative way to fill up leisure time while for others shopping can brings forth opportunities to discover and purchase new products or services. It can be said that by purchasing local products, via shopping for example, can help strengthening a country's economy while at the same time giving merchants or traders opportunities to make a living.

Shopping activity has been traced back to ancient Rome, in where there was Trajan's Market with tabernae (ancient Rome single room shop) that served as retailing units. Shopping lists are known to be used by Romans as one shopping list was discovered at a wall dated back to 75–125 AD and written for a soldier. [ABC.net, 2001]

Fast forward to present day, there are some evolutions in the way people shop for goods. Before this, shops are scattered around the place or maybe placed in a shop lots. Then comes along shopping mall or supermarket, a place where a lot of shops providing goods and services are placed under one roof. Not only that, shopping mall also include other facilities such as parking lots, entertainment with the likes of karaoke, cinema and so on. Shopping mall such as Berjaya Times Square revolutionized the local shopping mall, as it was officially certified as the fifth largest building in the world and the home to Asia's largest indoor theme park. [Berjaya, 2011]

Then come along a new revolution which is called the online shopping trend, dubbed as home shopping by some. With the rapid growth of technology and the reduced cost of having computer and internet facilities at home, thus come new trend of shopping. User no longer have to come out of the comfort of their home to purchase items, instead they could just order the products from the internet and make payment online, then wait for the items to be delivered straight to their home.

## 1.2 Problem Statement

Wandering around the shopping mall looking for specific items to be purchased sometimes could be frustrating and a waste of time. Looking for a 7 meter long LAN cable at a shopping mall for example, will require the customers to go to every computer shops in the mall. It may ends up in disappointment because all of the shops are only selling 5 meter LAN cable since 7 meter LAN cable is out of stock for example.

Even though one could take the initiative to call the shop before going to the mall, sometimes the inexperienced sales assistant also may not know the item being asked for or simply mistaken it for another product. Surely, this situation will result in loss of time and effort for both sides of the parties.

To counter the problems mentioned above, why not use online shopping? Some people will not resort to use online shopping as it eliminates the ability to view and inspect the item in physical before buying it, thus this will open up the possibility of purchasing defective items. The practice of transferring money to stranger's account and expecting the product to be shipped then is very risky. The buyer will have the possibility being cheated by the so called honest seller. The buyer also will lose the possibility to negotiate face to face with the seller; with the chances of getting the products at much lower initial price might be higher.

Thus, having relating to the problems stated above, a system is planned to effectively help in making the user shopping experience a better one. The idea for InterShop System comes to mind.

## 1.3 Objectives

The objectives of this project are:

- To study currently available shopping directory system and what are functionalities could be added to enhance it usability.
- To develop a system that provide interactive layout of the shopping mall with search capability for specific items – quantity left, price offered and what shops selling it.
- To conduct usability testing on the system to gain feedback from users regarding the system usage and performance.

## 1.4 Scope of Study

The research will be based on usability of the interactive shopping directory in helping the users to find the products they want in real time. The design and ease of use will be the main priority in the development of the system.

The target audiences for this project can be divided into two groups. The first one is obviously the shopping mall customers, where they are the one that will be using InterShop System for product searching and mall navigation. The second group is the store owner / mall owner as they are the one involved in updating the database of the system for use by the customers.

Before developing the system, study on the currently available shopping directory will be done. Aspects to be included in the studies will cover the usability and the functions of the currently available shopping directory adopted by shopping malls in Malaysia and on what aspects can be improved in order to meet the objectives of InterShop System.

# CHAPTER 2
# LITERATURE REVIEW

The preparation done for writing the literature review involves reading materials regarding Human Computer Interface and also subjects dealing with database. This is because the system function by receiving input from the users, which then will process the input and access the database so that it will able to produce the result or output desired by the users.

## 2.1 Researches on User Interface and Interaction

Designing Tangible and embodied interaction (TEI) is currently a recognized field of research and design practice that focuses on new possibilities for interacting with computational objects within the physical world. TEC will need the developers to design new types of interaction that enable the user to directly interface with the computer in ways that require fewer mediators and that fit better with human natural abilities. [Baskinger, 2010] For example, the current console video games have a way for interaction, such example is Nintendo Wii that is using motion sensor. Possibility of using touch screen for InterShop System could comply with this TEI field of research.

Others findings found is about visual analytics, which defined as "The science of analytical reasoning supported by interactive visual interfaces" which according to [Thomas, 2005], visual analytics provides a scientific perspective on human interaction with complex graphical displays. This article discusses the ways in which visual analytics research contributes to ongoing efforts in HCI interaction that address cognitive task performance and how it is affected by highly interactive "human-information communication" with visualization of data, information, and knowledge. The whole article is the summarized by saying the challenges posed by visual analytics will require HCI practitioners and researchers to expand their collaboration with cognitive scientists and visualization and computation researchers.

This is important for designing how the InterShop going to visualize the information so that the user could understand it easily.

Another journal is regarding a topic titled, "Towards designing more accessible interactions of older people with Digital TV". This topic states that in order to design an appealing high tech system for public usage, the system usability also have to consider about the older generation, who could not be tech savvy enough to use the produced system. Even though this journal is intended for usage of Digital TV, in a way it also could be applied for InterShop System. What they have done is that by using user centered design approach, they tested the Digital TV with 40 older people (20 living in Spain, 20 living in Brazil), ranging from 65 to 80 years old which will include older people with low education levels, and with some previous experience with information technologies. The main results of this test can be divided into three groups: (A) identification of the interaction barriers that hinder more and less severely the everyday interactions of older, people with DTV - prototypes related to communication and access to online information, about health; (B) examination of how older people interact with and use some DTV, services in real-life settings; and (C) exploration of cultural differences in interaction barriers and use of DTV amongst older people living in developed and underdeveloped countries. [Ferreira, 2011]

## 2.2 Researches on User Inputs

Users input during testing also is crucial in getting to know what the users really wanted with the system. In this proposed thesis, the researchers examines possible exploitations of shared user modeling in order to improve the accuracy and scope of models used for personalization within the system to improve the accessibility and usability of software applications. Shared user models can increase the accuracy and depth of data used to adapt the interfaces and user interactions. According to [Montague, 2011], user models are structured data sources for representing user characteristics such as interests, preferences and domain knowledge. All the data is recorded in context of the system it was stored for, and self-contained within the application. Shared user modeling expands the range of variables being recorded,

and centralizes the location of user model to allow multiple applications to make use of the same data. Among notable applications that have been using this model is Facebook.

Even though a developer has spent a lot of time designing the best possible interface so that the user could understand and successfully use it to get their desired result, it is finally up to the how user give their input to the system, which will determine the quality of the output. The relationship between data accuracy and the resulting information accuracy is of great interest in numerous problem domains. According to [Gelman, 2011], nearly all researchers have embraced the popular belief in GIGO (Garbage In, Garbage Out), which indicates a strong positive link between input accuracy and output accuracy.

## 2.3 Research on Risks of Online Shopping

One study even supported the argument that buying items online is not very preferable as there are many risks involved. This study [Featherman, 2011] examines the intangibility of e-services context and clarifies why business-to-consumer services are made more intangible when they are virtualized and offered as Internet e-services. This research specifically develops theory to explain how and why an eservice's intangibility can increase consumer beliefs that it is risky to use. These consequents of an e-service's intangibility are important to clarify because eservice's usage is based in part on beliefs that they are safe and easy to use. More specifically, the performance, financial, and privacy risk were most affected by consumers' experience of mental intangibility regarding the eservice. The article then closed by saying an eservice's intangibility may indirectly impede consumer usage of a range of e-services. Thus, InterShop system can eliminate this feeling of insecurity as the system is does not provide online shopping but rather give out information regarding the specific items that the user need to purchase at the shop offering it.

## 2.4 Researches on Integrating Technologies in Business

Another study [Hopper, 2010] proved that by integrating technology elements into business, it could help the business in positive ways. The importance of the association between information systems (IS) and the business has been emphasized for over a decade. To date, no observed study has explored the impact of the association of IS and marketing, despite initial indications that such an association could impact favorably upon business performance, such yielding more profits. Such IT elements are for example the usage of Internet as marketing tools, the usage of computers for CRM and such. It was found that IS-marketing alignment had a positive impact on both business performance and marketing performance, and that marketing performance in turn had positive impact on business performance.

Another study [Burley, 2009] highlights the importance of implementing information technology in social entrepreneurship. Information sharing is identified according to this study as the most critical role of IT in support of social entrepreneurship. Using information sharing, the shop owners for example could get to know what the item most searched by users of Intershop System, thus is making them able to offer the products at more attractive prices so that the need of the users could be satisfied. Other shop owners also could compete in term of prices because anyone that have access to Intershop System will be able to take a look at which shop is offering the lowest price for specific items. Using this system, both side of the parties will gain positively, as the customers will get the most value for their money and certainly more choice for them when shopping and for the sellers they could compete with others sellers in a healthy ways and also the could get to know the latest demands from the customers.

The usage of InterShop in this context could greatly benefits the owners of the shopping mall by providing a more organized ways for the shop owners to promote and showcase their products, while at the same time providing a feeling of more organized shopping mall layout, which is easy for the user to navigate through. The system also could probably be integrated with optional functionalities, such as digital

CRM forms, in receiving feedback from the users regarding the services of the shopping mall and the system itself, as reference for future improvisations.

## 2.5 Researches on Workloads Sharing and Server Mapping

Since the system will installed in many kiosk scattered around the shopping mall, maintaining the availability of the system with customer usage is not an easy task to do. A lot of the kiosk could be accessed at the same time, thus increasing the workloads on the servers. A study by [Gyarmati, 2010] suggested that by implementing Scafida algorithm network topology, one could reduce the workloads on data centers or servers. By implementing this topology also it is hoped that there will be fewer hops between servers making it more resilient to link failures. The only drawback is that while implementing this topology, one need to keep in mind that there limited number of ports between servers and switches in the network link. This will result in highly scalable and flexible design based on the result show in the study.

A study by [Lee, 2011] also centered on how to manage the workloads between servers. Different from L. Gyarmati that use Scafida algorithm, G. Lee study introduces the Infrastructure as a Service system that able to allocate resources independently of its needs and being completely unaware of the hosted applications requirements. The architecture uses a prediction engine, explained in the study journal, with a lightweight simulator to estimate the performance of a given resource allocation and a genetic algorithm to find an optimized solution in the large search space. The result shown in the study proves that by adopting this system in a network structure, the rate of job completion of the applications in the network increased by 59%.

## 2.6 Researches on Usability Testing

The next three journals and studies will be regarding usability and testing. Based on a study done by [Bak, 2008], this paper reports from a combined questionnaire survey and interview study of obstacles for deploying usability evaluation in software development organizations. The survey and interview however was conducted in a limited geographical area. The purpose of the questionnaire survey was to determine whether software development organizations in that
area were evaluating the usability of their software and to identify key obstacles. At the end of the study it is revealed that 29 of 39 software development organizations conducted some form of usability evaluation. The main purpose of the interview study was to gain more knowledge regarding obstacles found while conduction usability testing. The study result can be summarized to say that the understanding of usability evaluation is a major obstacle. Furthermore, the two most significant obstacles were resource demands and the mindset of developers. These obstacles were not only an obstacle for more organizations to deploy usability evaluation, but also a concern for the software development organizations, that had deployed usability evaluations in their development process.

The next study about usability is by [Hornbaek, 2008]. It discusses the utility and impact of a usability evaluation depending on how well its results match with the business goals of the system under evaluation. The study proposes a simple method that requires active consideration of a system's business goals in planning and reporting evaluations. The technique is tested in an experiment with 44 novice evaluators using the think aloud testing method. The evaluators considering business goals report fewer usability problems compared to evaluators that did not use the technique. The company commissioning the evaluation, however, assesses those problems 30-42% higher on four dimensions of utility. The study also discuss on how the findings may generalize to usability professionals, and how the technique may be used in realistic usability evaluations. More generally, the study also discusses on how the results illustrate one of a variety of ways in which business goals and other facets of a system's context may enter into usability evaluations.

The last study regarding usability testing is written by [Hollingsed, 2007] which study describes that usability inspection methods, such as heuristic evaluation, the cognitive walkthrough, formal usability inspections, and the pluralistic usability walkthrough, were introduced roughly around fifteen years ago. Since then, these methods, analyses of their comparative effectiveness, and their use have evolved in different ways. The study then track the opportunities of the methods and analyses, looking at which led to use and to further research, and which led to relative methodological dead ends. The study then conclude by saying that Heuristic evaluation and the cognitive walkthrough appear to be the most actively used and researched techniques. While the pluralistic walkthrough remains a recognized technique, although not the subject of significant further study. Formal usability inspections appear to have been incorporated into other techniques or largely abandoned in practice.

These usability research is important as it will implemented and become useful later when doing stage 4 of the Intershop System development, which is testing, that focused on usability testing.

# CHAPTER 3
# METHODOLOGY

The project development cycle will basically be divided into four main phases. Phase 1, is mainly about researching work. Subsequent phases, appropriately named Phase 2, 3 and 4 will focus on the development stage. Phase 2 will focus on planning and design, Phase 3 will focus on the development of the system itself while Phase 4 will be about testing and evaluation of the system. As a frame of reference for the development stage, a Gantt chart is created, which will be shown at the end of the report.

The software development process will adopt iterative and incremental development style. This software development cycle will start from planning, analysis & design, implementation, testing, evaluation and finally deployment of the finished product. One of the main reasons this development style is chosen instead of for example the Waterfall model, is because this model will allow the developer to repeat the development cycle over and over, so that with each cycle of development, developer could then modify the system and adjust accordingly based on input from the earlier version of the system.

Tools/equipment required:

- Notepad++
- MySQL
- EasyPHP

## 3.1 Phase 1: Research and Literature Review

The project is initiated with a detailed background study and research on the currently available system related to the shopping directory system. Focus of the study is to find the weakness of current directory system and what could be added to enhance its usability.

To see what kind of shopping directory already available and currently used in Malaysia, two well known shopping malls in Malaysia, Sunway Pyramid and Berjaya Times Square are chosen for research.

First off, in Sunway Pyramid this kind of shopping directory is provided for its customers use, refer to Figure 1 below.

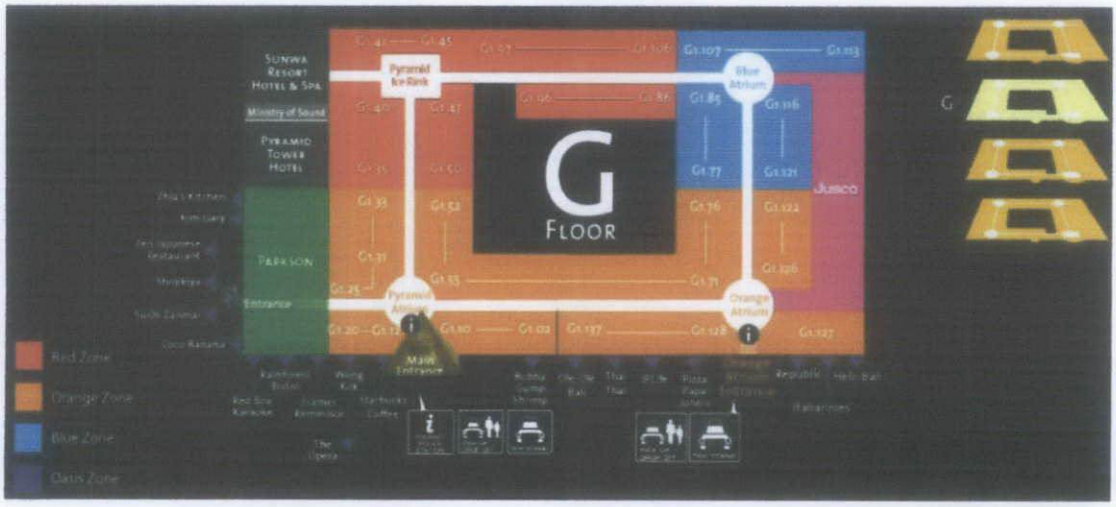



*Figure 1, Sunway Pyramid shopping directory screenshot.*

Based on Figure 1 above, Sunway Pyramid divides itself into 4 major sections, in which each section provide different kind of products. One section, named Marakeesh, is home to shops that are selling Arabian styled goods, for example Muslims goods, Persian imported carpets and so on.

There is also Asian Avenue, home to Asian branded goods, and a section devoted to electronic products. This kind of layout helps out user in finding the products that their want just by going to the right section of the mall. The shopping directory is digital and with touch screen capability, making it easier for the user to use the system, plus the interface also is neatly designed and easy to understand.

Now looking at Berjaya Times Square shopping directory as shown with Figure 2 below, do note that Times Square does not divide itself into sections, as the shops inside are located not according to type of goods / services they are offering. Plus, the shopping directory also is just big boards with list of shops. This will make it harder to user as they cannot filter the shops according to types and making it harder for them to navigate through the shopping mall.

| | |
|---|---|
| Royal Selangor Pewter | G1.39 |
| S&J Gift & Collection | LG2.73 |
| SKO Concept Store | F1.AV.56 |
| stiQie | F1.AV.173 |
| **Haircare & Salons** | |
| A Cut Above :: Sunway Pyramid | G1.110 |
| A Cut Above Academy | F1.19 |
| a cut above and acedamy | F1.19 |
| A-SALOON | F1.77 |
| APT Professional Team | F1.AV.03 |
| Gallerie Salon | LG2.53 |
| Re:Style | F1.19 |
| Snips | LG1.101 |
| Trim N Shave Barber Saloon | B1 |
| X-Cut | F1.AV.20 |
| **Health & Fitness** | |
| CELEBRITY FITNESS EXPRESS | LG3.01 |
| Fitness Concept | LG2.75 |
| Kettler | LG2.78 |
| Ogawa | LG2.132 |
| OSIM | LG2.70 |
| OTO Bodycare | LG2.12 |
| Phiten | F1.23 |
| TAKASIMA | F1.33 |
| Weider | LG2.143 |
| **Health Care** | |
| Caring Pharmacy | LG2.77 |
| Cosway | LG2.28 |
| Eu Yan Sang | LG2.129 |
| Forest'Secret | LG2.83 |
| GNC | LG2.02 |
| Guardian | LG2.06 |
| Himalaya | LG2.130 |
| Koong Woh Tong | LG2.131 |
| Lo Hong Ka | LG2.29 |
| Purple Cane | LG2.108 |
| Watsons | LG2.67 |
| **Home & Living** | |
| ACE Hardware | LG2.147 |

*Figure 2, Berjaya Time Square shopping directory screenshot.*

Digital version of shopping directory is a must as shopping mall nowadays tends to have many outlets located in their premise. The owner of the mall then could always easily update the shopping directory to provide the user with latest mall layout.

Some improvements can be made on current shopping mall directory. Both of the shopping directories did not offer the choice for user to search for the items that they want to buy. Intershop System will add this capability and also providing the user with the items information such as prices, quantity left and what shops are offering the items. After the user select a shop that they want to purchase from, the nearest route to the shop from user current location will be highlighted on the shopping mall map for the user to follow.

### 3.2 Phase 2: Planning and Design

The second stage will kick start the development stage. In this stage, what programming language and tools suitable for the development will be chosen, particularly by doing testing of the available resources to see which method will suit the developer best and what kind of tools and algorithm that can provide the desired interface and system design.

During this stage also, interface design is one of the main concern. The design should comply with Human Computer Interaction standard in order for it to be accessible for everyone. The flow of the system then will be explained to give better view on how the system is supposed to work.

1. The first issue is the homepage design as shown in Figure 3, which will be shown first to the user by default. The homepage will show the mall layout in the center, together with the navigation buttons which will activate the main functionalities such search for items, search for shops etc.

2. The second design is for the search items page, refer to Figure 4, where the user can filter their search according to their needs and the result will be displayed below in a list form for easier navigation, with all the information about the items.

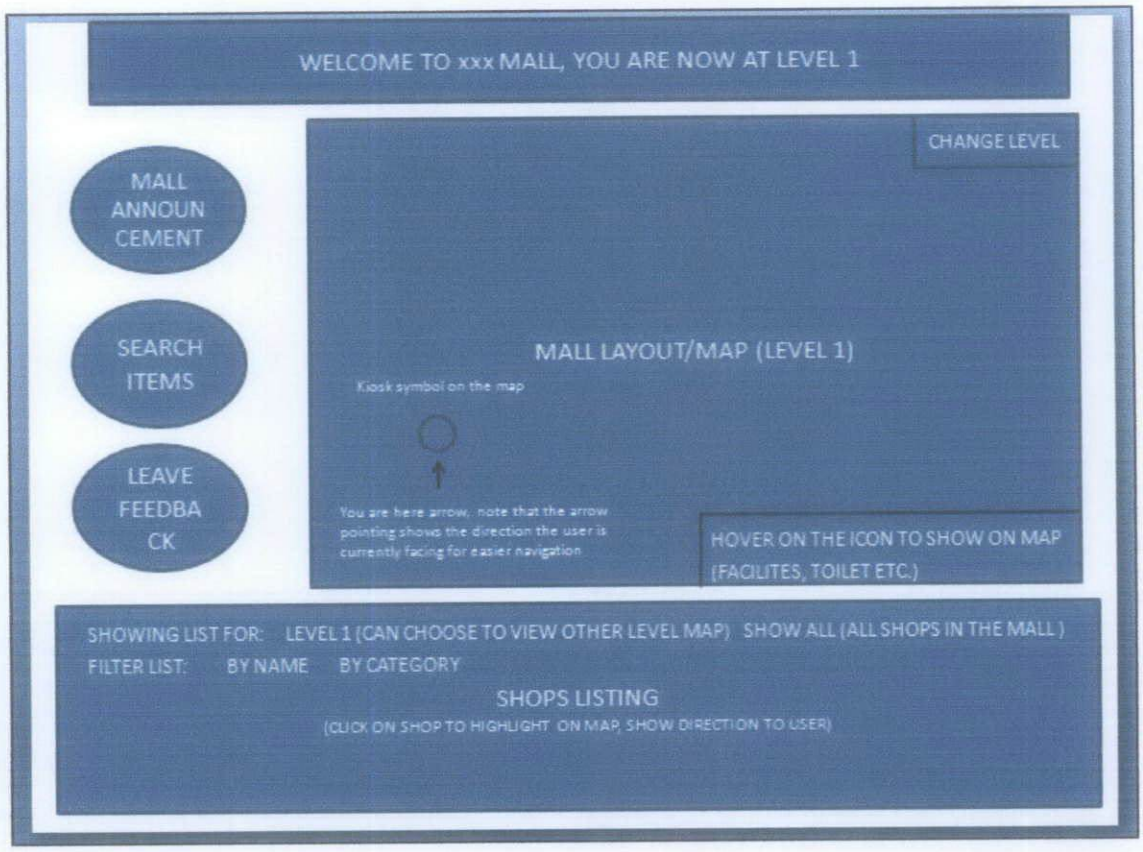



*Figure 3, InterShop System homepage design sketch.*

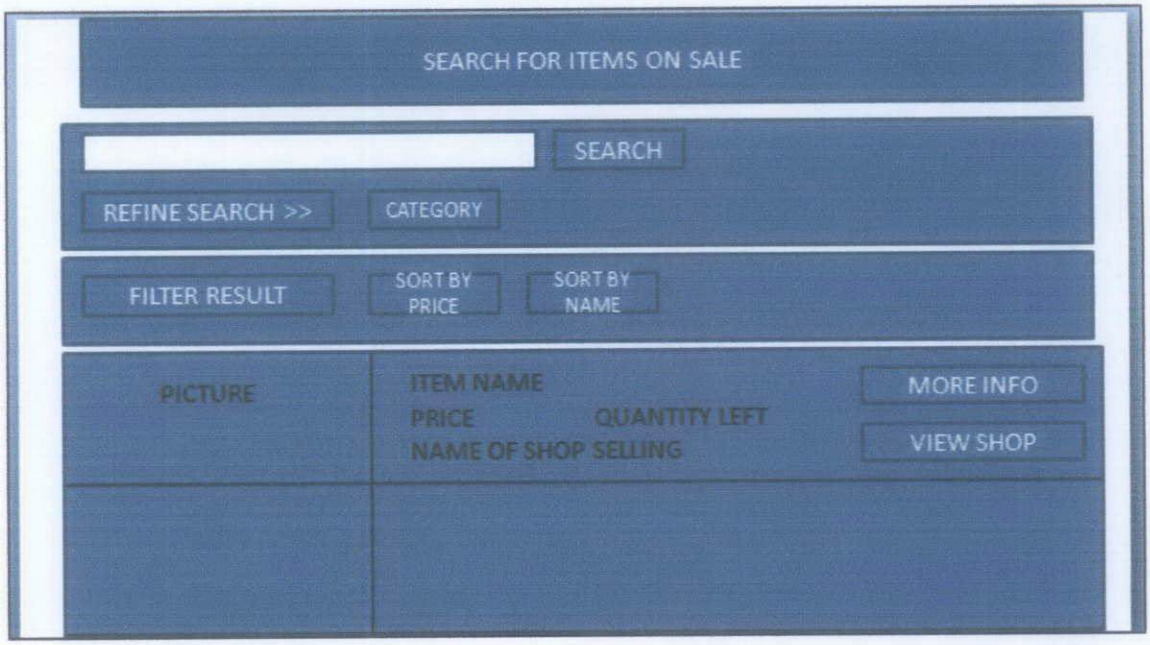



*Figure 4, InterShop System search item page design sketch.*

3. The next area need to be designed is of course the news announcement page and the customer feedback page. The mall news/announcement page (refer Figure 5) is designed a la blog style for easier navigation and readability, while the customer feedback page (refer figure 6) is designed so that it is easier for user to reply the survey / questions given.

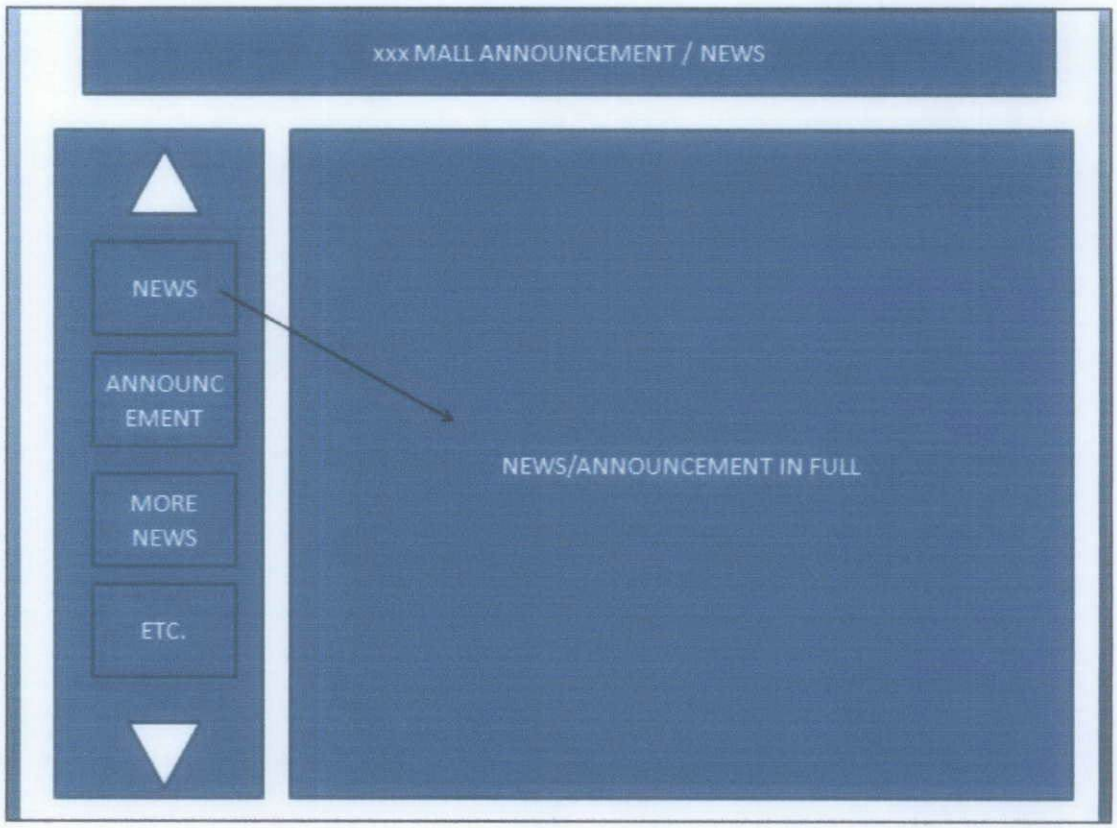



*Figure 5, InterShop System mall news page design sketch.*

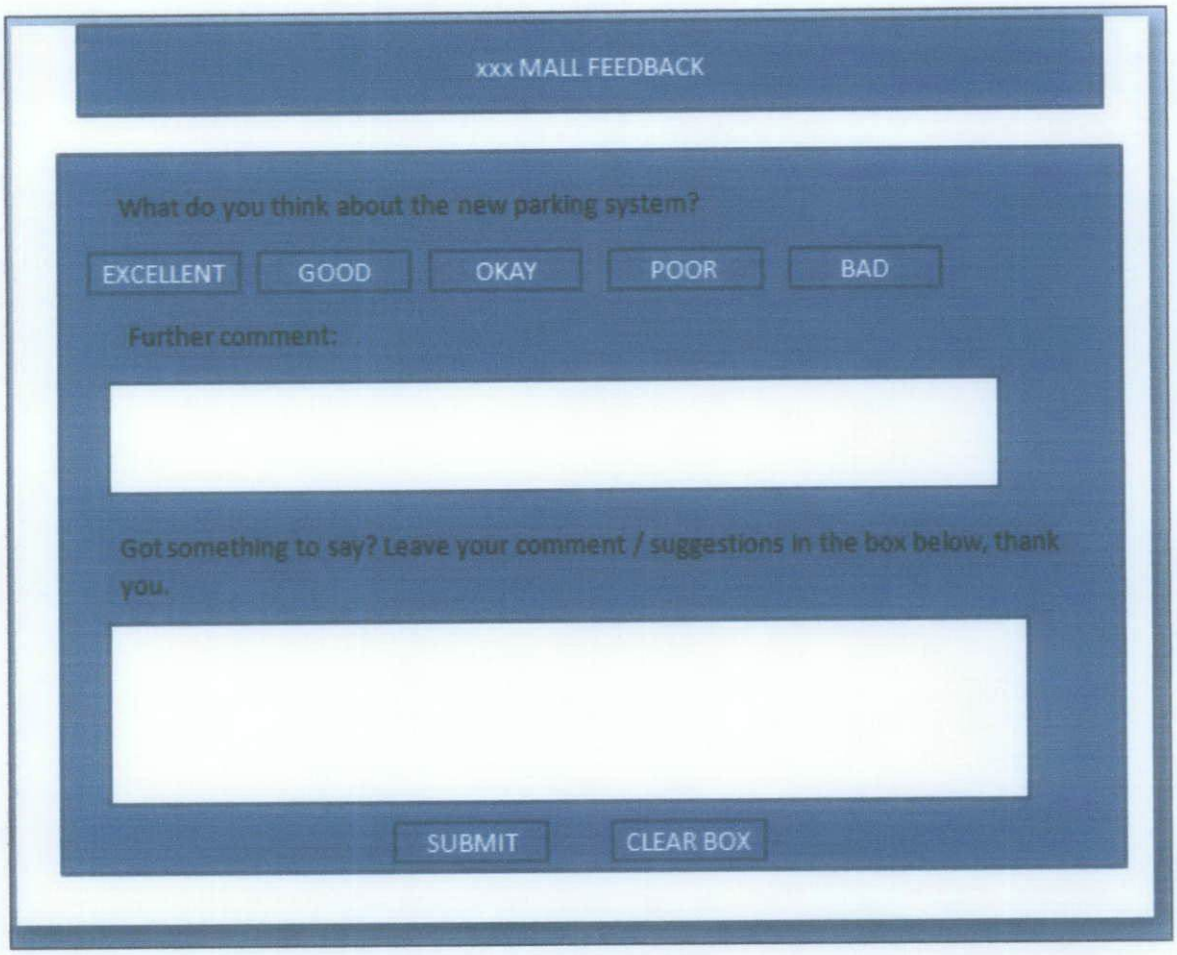



*Figure 6, InterShop System feedback page design sketch.*

### 3.3 Phase 3: Development

All the codings for the system were written in PHP using Notepad++ on a computer running on Windows 7 operating system. The main browser of choice is Mozilla Firefox, with Internet Explorer and Google Chrome being used as references and bug checkings. MySQL is used to run the database and easyPHP is chosen for portability.

The local server will run with IP address 120.0.0.7 using port 80.

### 3.4 Phase 4: Testing and Evaluation

Prototype of the system will be tested so that it will able to meet and achieve the project objectives. Testing is important in order to find if there are any bugs or problems with the software. Testing also serves to see if the part coded will work and function properly. If there are need to further develop and adjustment to be made, it will be listed down for future development cycle or version work reference. As part of the iterative and incremental software development cycle, the phase will repeat from phase 4 back to phase 1 again (iterative), with each cycle will further enhance the initial system state (incremental).

20 students of Universiti Teknologi Petronas were invited to test the system, composed of students from Technology background (BIS and ICT students). All of the students taken for testing sessions are part time shoppers themselves and have prior experiences of using existing shopping directory system used by current shopping malls in Malaysia. During the testing sessions, feedback on usability and interface, easiness to search for products and whether the system will be useful in real life situation are the key feedback points.

The system were tested on various computers as easyPHP enables portability, meaning by storing the system in an USB drive the system can be run from any computers (running Windows operating system).

The testing sessions were not done in one shot, instead it goes on from October to December. One of the reasons of this is to comply with the iterative and incremental development style.

# CHAPTER 4
# RESULTS AND DISCUSSION

On this chapter, the outcome of the project is discussed. The first part will discuss about the system itself. The second part will discuss how the usability testing was conducted and what are the feedbacks received from the testers regarding the system created.

Intershop System will have two kinds of interfaces, one for the customers to use (called front-end) and other one is for the administrators to update and manage the database (called back-end).

## 4.1.1 Customer side interface (Front-end)

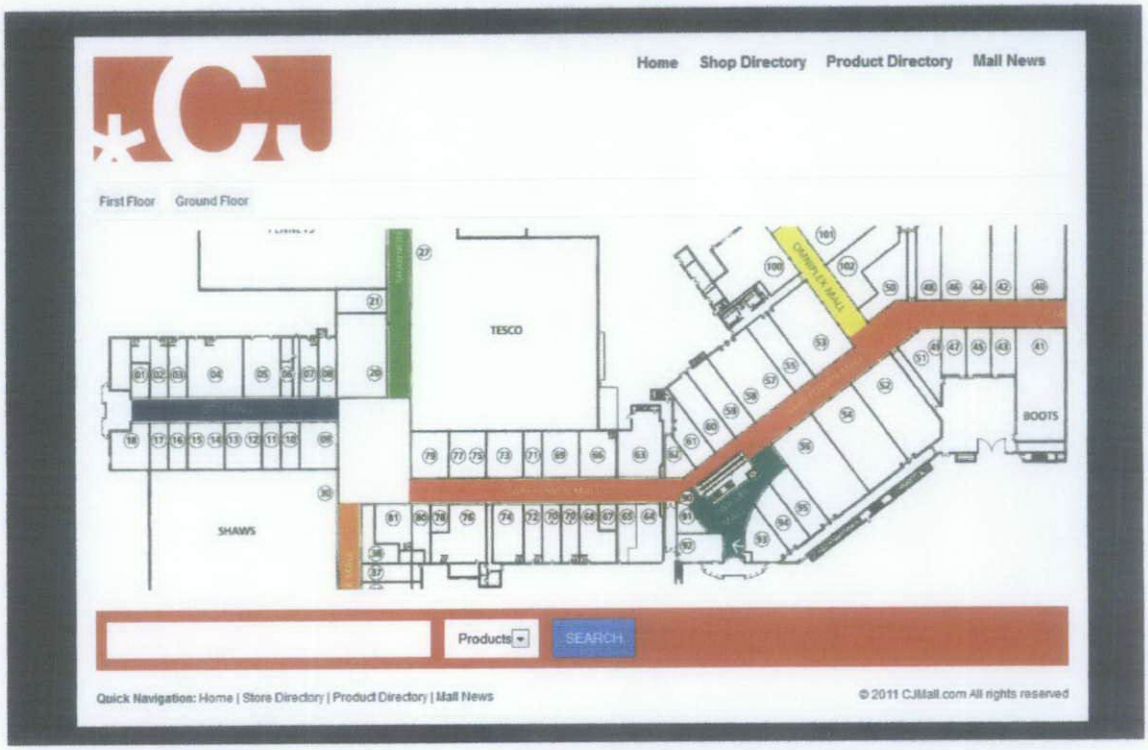



*Figure 7, InterShop System main page.*

Figure 7 shows the main page for Intershop System as perceived on the customer's side. The system (for this project) is designed for use in a fictional CJ mall which is represented by the top-left logo. On the top right corner is the main navigation bar, where the user could simply click on Home to return to the homepage, Store Directory and Product Directory which will make the stores/products to be listed below the mall layout once clicked.

There is also Mall News link and Feedback, where the user could click in order to read the latest mall announcements and also provide feedback on customer survey or questionnaires. Below the mall layout is the Search bar, where the user can search for products or stores.

Figure 8 shows the phase when Store Directory in the main navigation bar is clicked, it will list down the stores available in the mall, but when the user use the Search bar to search for store, the search engine will try to find the matching keyword entered while returning the search result in the similar manner like below. Do note that the current store list is viewed in List mode, and user can change it to thumbnail view.

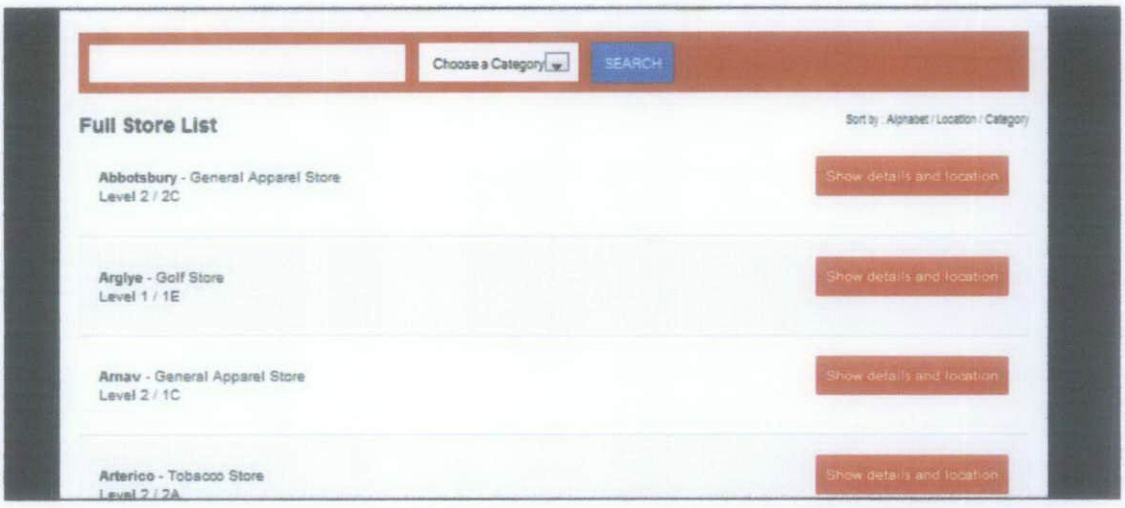



*Figure 8, Shop directory.*

Figure 9 is showing the Product Directory in action, and remembers that by using the Search bar to search for product also will return result similar to the figure below. The user can still change the viewing mode to List view if they desire.

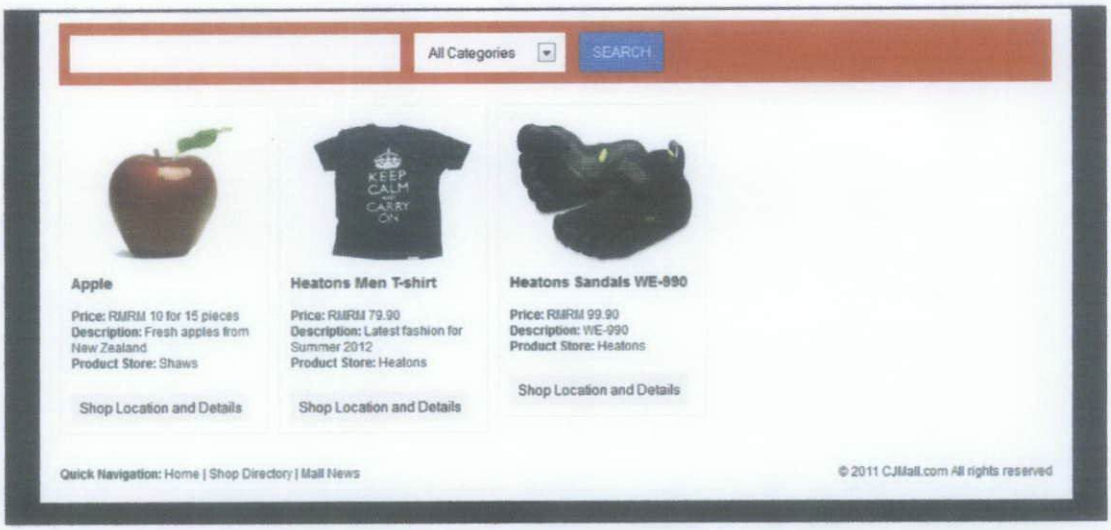



*Figure 9, Product directory.*

There is a button next to the product (or shop if the user is viewing the shop directory page), which is Show details and location. By clicking this button, the user will view the store that is selling the product, what other products the shop is also selling and showing the store location, refer to Figure 10.

Figure 10 shows the page for Heatons store in details, and in the center the location of the store will be revealed to the user so that it will be easier for the user to head to the said shop. Below the location will be the list of other products that the store is also selling.


*Figure 10, Store details.*

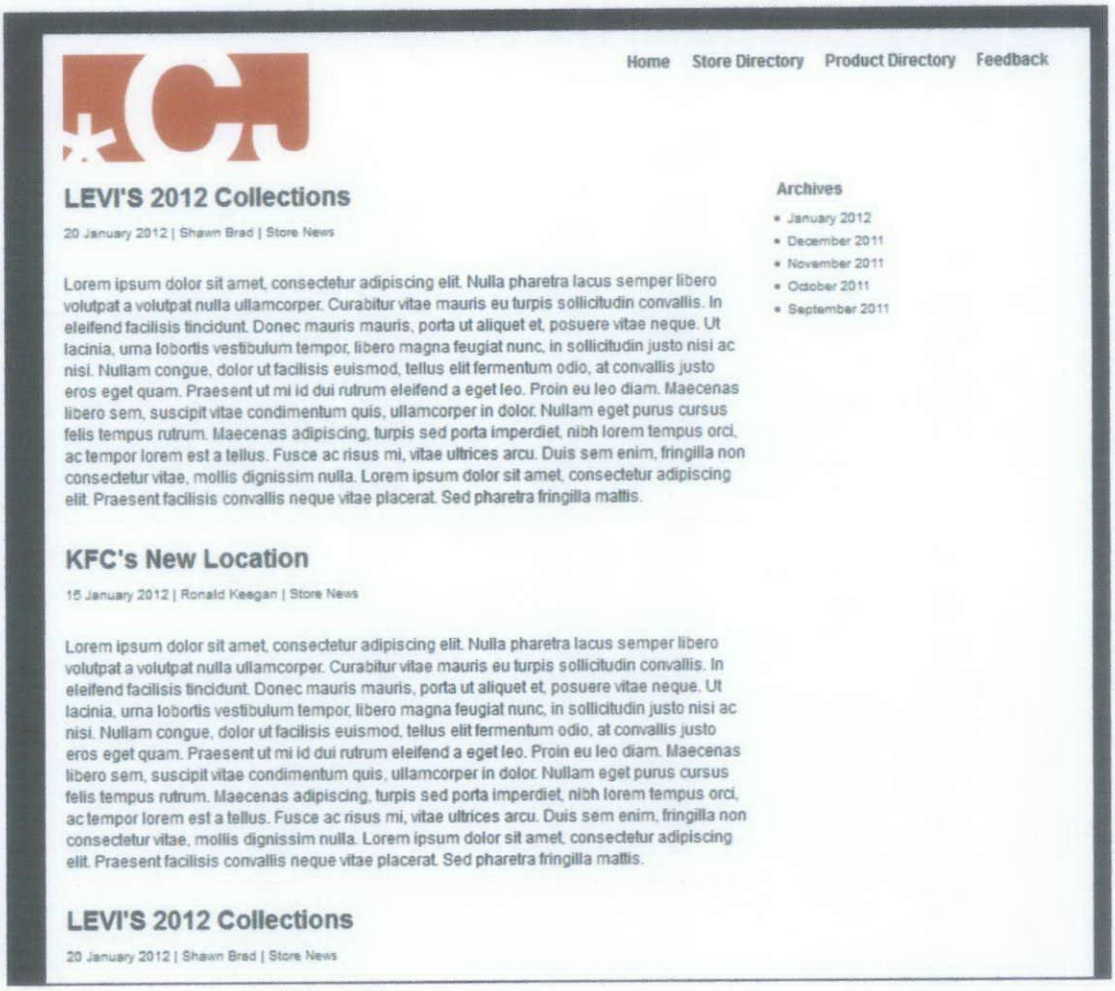



*Figure 11, Mall news page.*

Figure 11 will be shown when the user clicked on Mall News link at the main navigation bar, which shows the latest information the mall will have to offer in blog offer for easy readability. This section is still under progress and might be heavily modified in the next version to improve on the aesthetic feature and include mock news or announcements.

Finally, for the Feedback section SurveryMonkey survey is embed directly on the page. All the users' feedback will be stored at SurveyMonkey server for easier management.

### 4.1.2 Administrators side interface (Back-end)

The Dashboard, refer to Figure 12, is where the mall owner and shop owner could log in to access the database. Once again, this Dashboard is designed for a mock CJ mall, as shown by the logo.

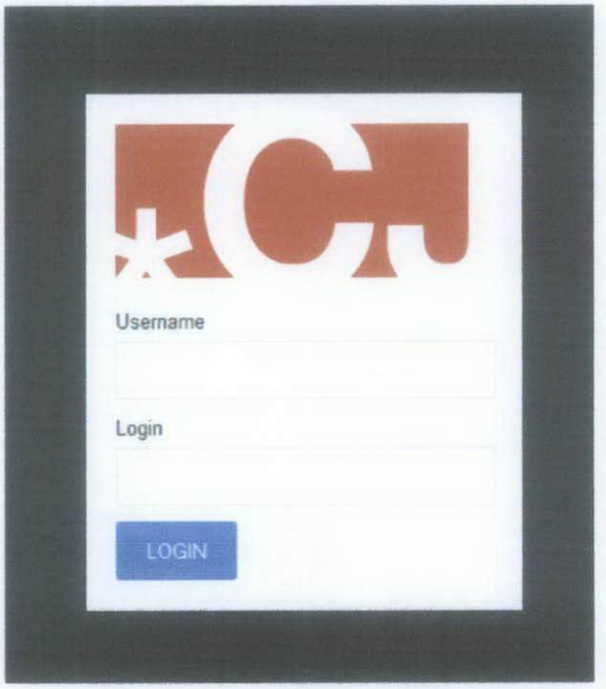



*Figure 12, Dashboard login page.*

The mall owner or the administrators account are the one responsible for maintaining the database for the layout of the mall, the stores available inside the mall and its location and also the management of accounts for the store owners, such as account creation and deletion.

Figure 13 shows the home page for the administrators, and screenshots of the functionalities available. Also shown below is the Manage Directory page, where the admins could edit the layout of the mall, such as addition or deletion of stores or adding maps to show the location of the stores.

Figure 14 is the Manage Shop page, where the admins could assign the owner of the store, so that the owners could log in with their accounts and edit their stores information.

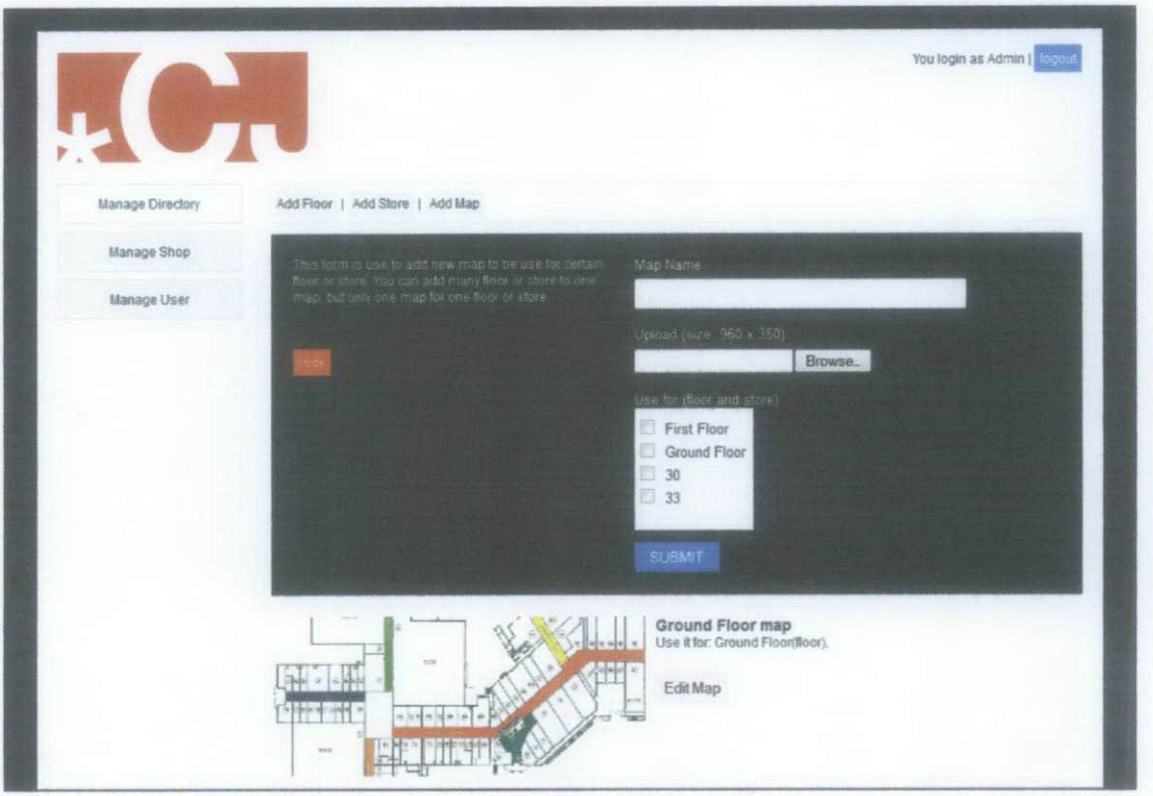



*Figure 13, Manage directory page.*

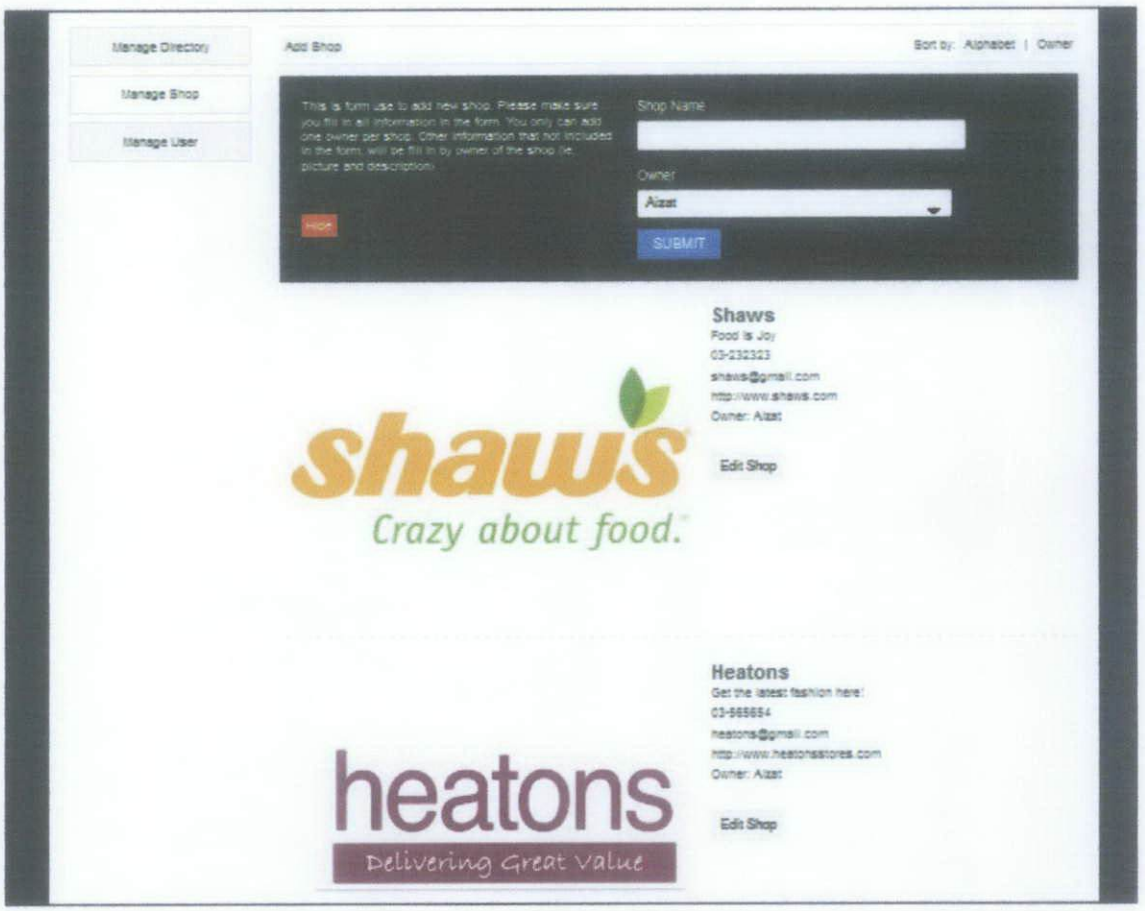



*Figure 14, Manage shop page.*

When the store owner login to the Dashboard using their account, the owner could then proceed to update the information about their shop (Figure 15) or edit the products available (Figure 16) complete with details about the said products.

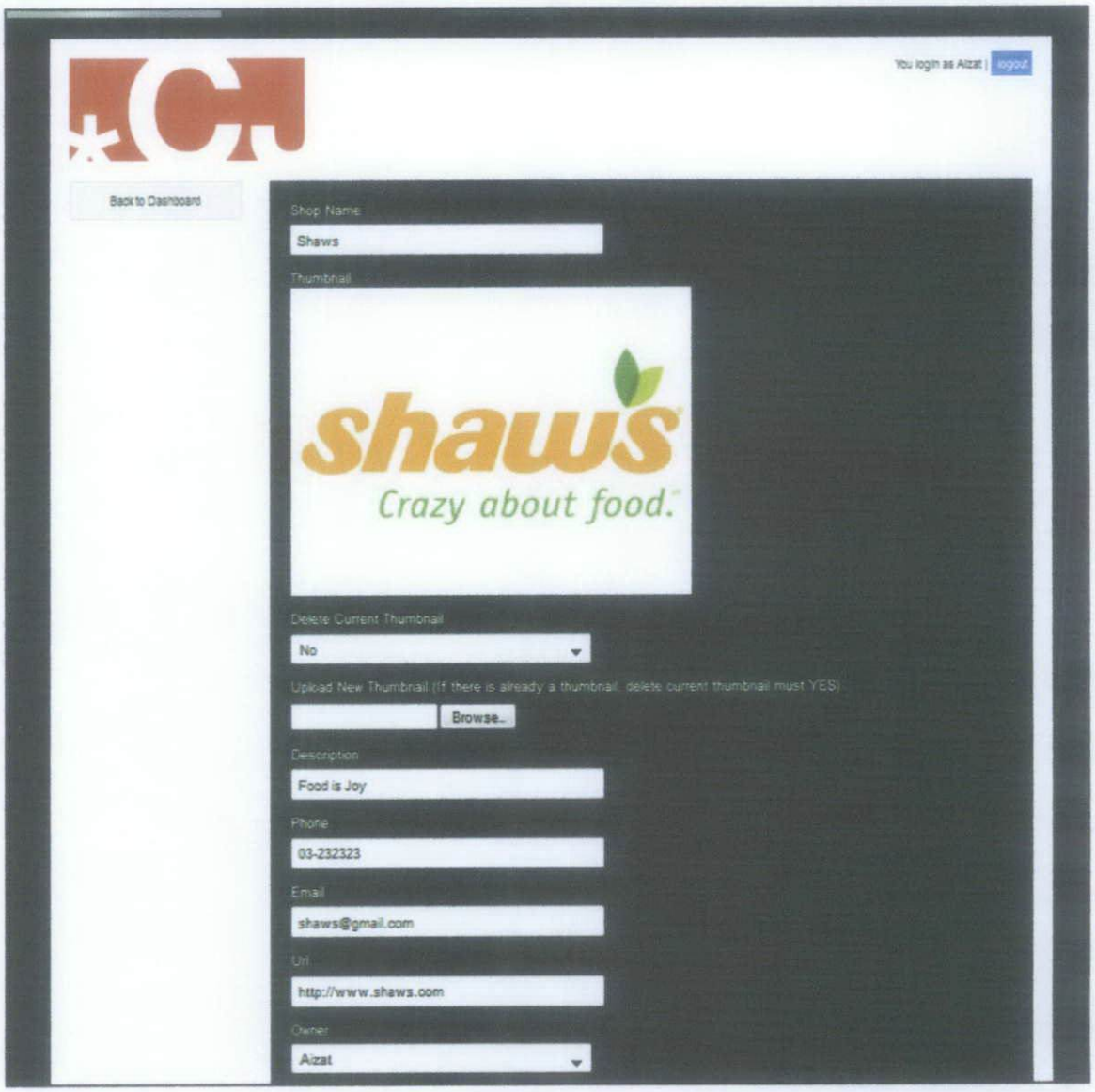



*Figure 15, Shop edit page.*


*Figure 16, Manage product page.*

## 4.2 Usability Testing and Feedbacks

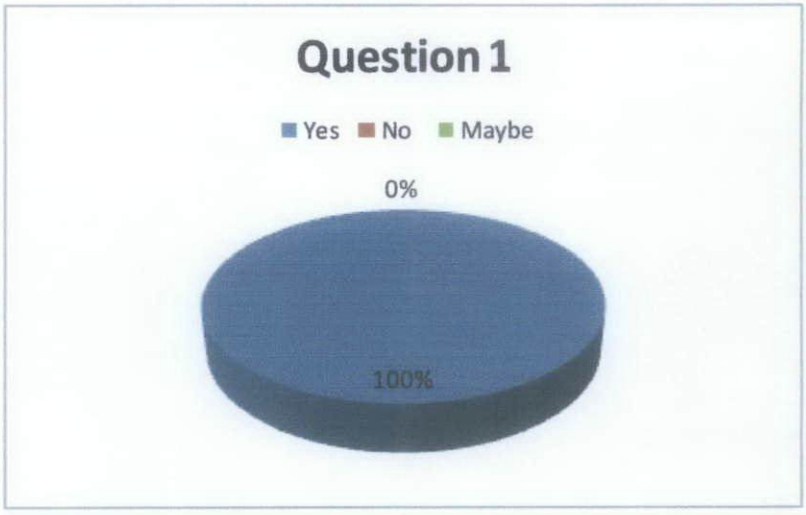
Twenty UTP students had undergone usability testing for InterShop System, and their feedbacks were recorded using the form attached at Appendix 2.

As stated before in Methodology section, all of the students taken for testing sessions are part time shoppers themselves and have prior experiences of using existing shopping directory system used by current shopping malls in Malaysia.

The system were tested on various computers as easyPHP enables portability, meaning by storing the system in an USB drive the system can be run from any computers (running Windows operating system).

The testing sessions were not done in one shot, instead it goes on from October to December. One of the reasons of this is to comply with the iterative and incremental development style.

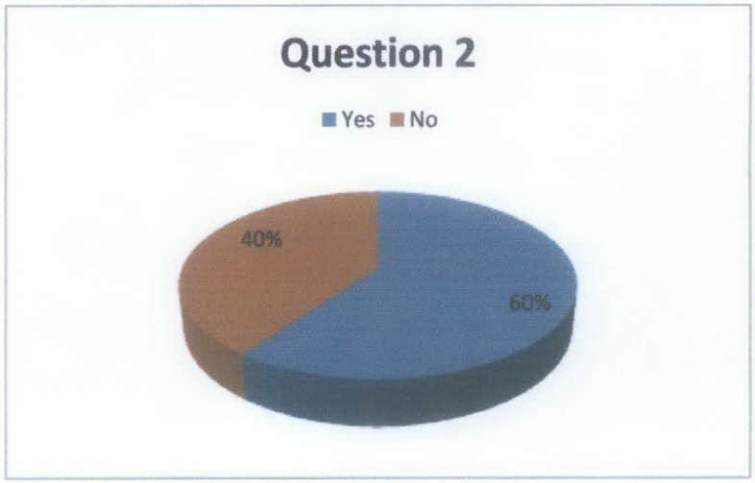
1. **By using the system in real life, do you think it will helps in locating and purchasing products more easily?**




All of the testers agreed that by using the system it could help them to shop more efficiently because it eliminates the need for wandering around the shopping mall looking for the products they want to buy.

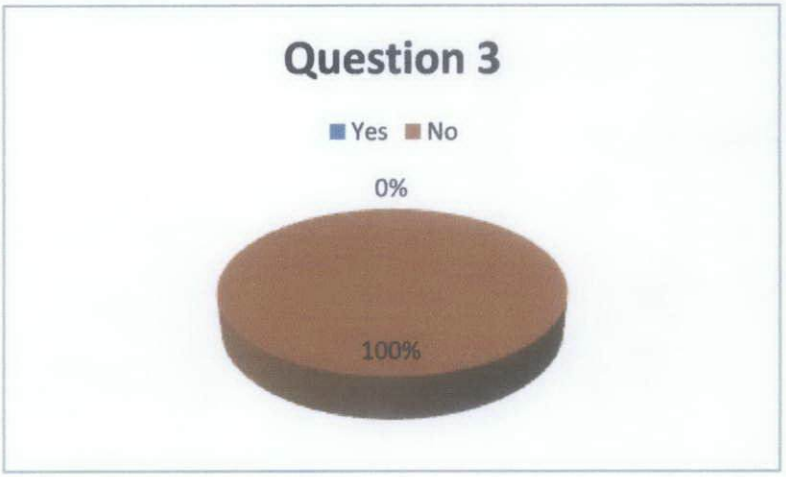
If the products are out of stock, they will know immediately by using the search function.

2. **Do all of the system functions work?**



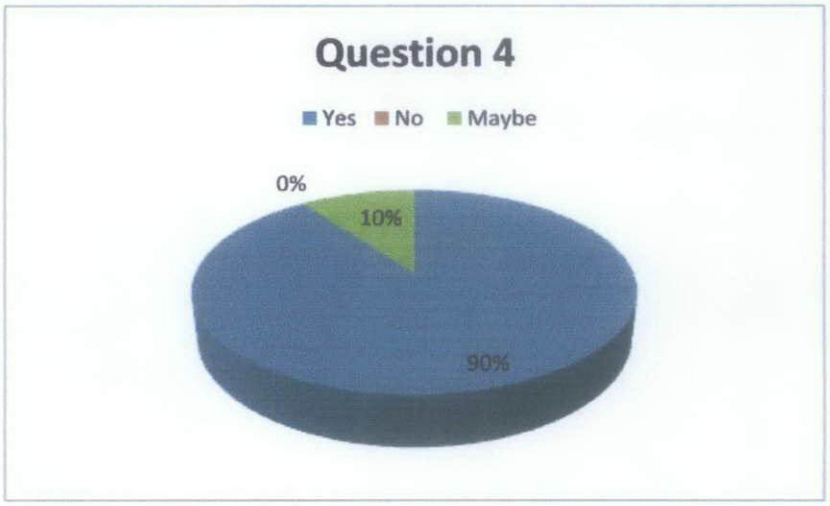
For Question 2, some of the users replied that certain functions of the system are notworking. This is because during the testing period done for certain users, the Feedback and Mall News function are still in development.

**3. Do you encounter any bugs / errors while using the system?**




No bugs or errors were found during the testing period. However, during the development period, several bugs were found and fixed.

**4. What do you think about the interface design? Is it user friendly enough?**



2 of the testers replied that InterShop System could use different style of background as the current background for the system is simple black. Almost all of the testers agreed that the interface is simple enough to understand and the minimalistic approach is easy to the eyes.

5. **Do you have any opinions / comments about the system?**

Half of the users suggested and agreed with the idea to implement touchscreen functionalities to add additional appeals to the system. Other than that, the testers suggested that the system be launched for use in real life business quickly as they found it to be helpful for shoppers.

6. **What functions will you recommend to be added to the system to enhance its usability.**

As stated in Question 5, the testers suggested to implement touchscreen functionalities to the system. Other suggestion being that a specialized kiosk for the system to be designed so that people will notice where is the system located in a shopping mall.

# CHAPTER 5
# CONCLUSION

## 5.1 Summary

Intershop System would bring benefits to two sides, mainly the customers and the mall owners (the management).

The customers could save a lot of time by shopping more efficiently by using Intershop system. No more they have to wander about in a shopping mall looking for certain items that they wanted to purchase, instead they could just search for it and go straight to the store to purchase the said items. The customers also have the advantage of comparing the prices of items between shops that are selling it so that they could gain the best deal.

Navigating around the shopping mall also will be easier due to the path shown on the map when the store detail is chosen. The Mall News and Feedback section also will provide a platform for the user to express their feelings about the mall services.

For the owner or management side of the mall, Intershop System obviously will help them manage the layout and stores in the mall easier. Should there be changes in store location or ownership for example, it could be edited simply with only a few clicks away. Business performance could be improved if the mall adopted this system as the customers could prefer to shop at mall using Intershop System as will assist them in shopping.

The management also could do analysis on what items are the most being searched so that they could stock up more on the said items to maximize profitability. The Feedback function also will give them input on what need to be improved in the mall, and using the Mall News page they could communicate with their customers.

Meanwhile for store owner, the system could serve as chance for them to showcase their latest product offerings to the customers. The product listing also will boost healthy competition between the store owners to show to the customers who will offer the best deal.

## 5.2 Recommendations for Future Work

One of the recommendations should the system be worked on further is to integrate the working system prototype into a touch screen mechanism, should there is enough time and expertise to work towards that direction. The integration of touch screen function arguably will add more appeal to the system plus easing the user in navigating through the system interface.

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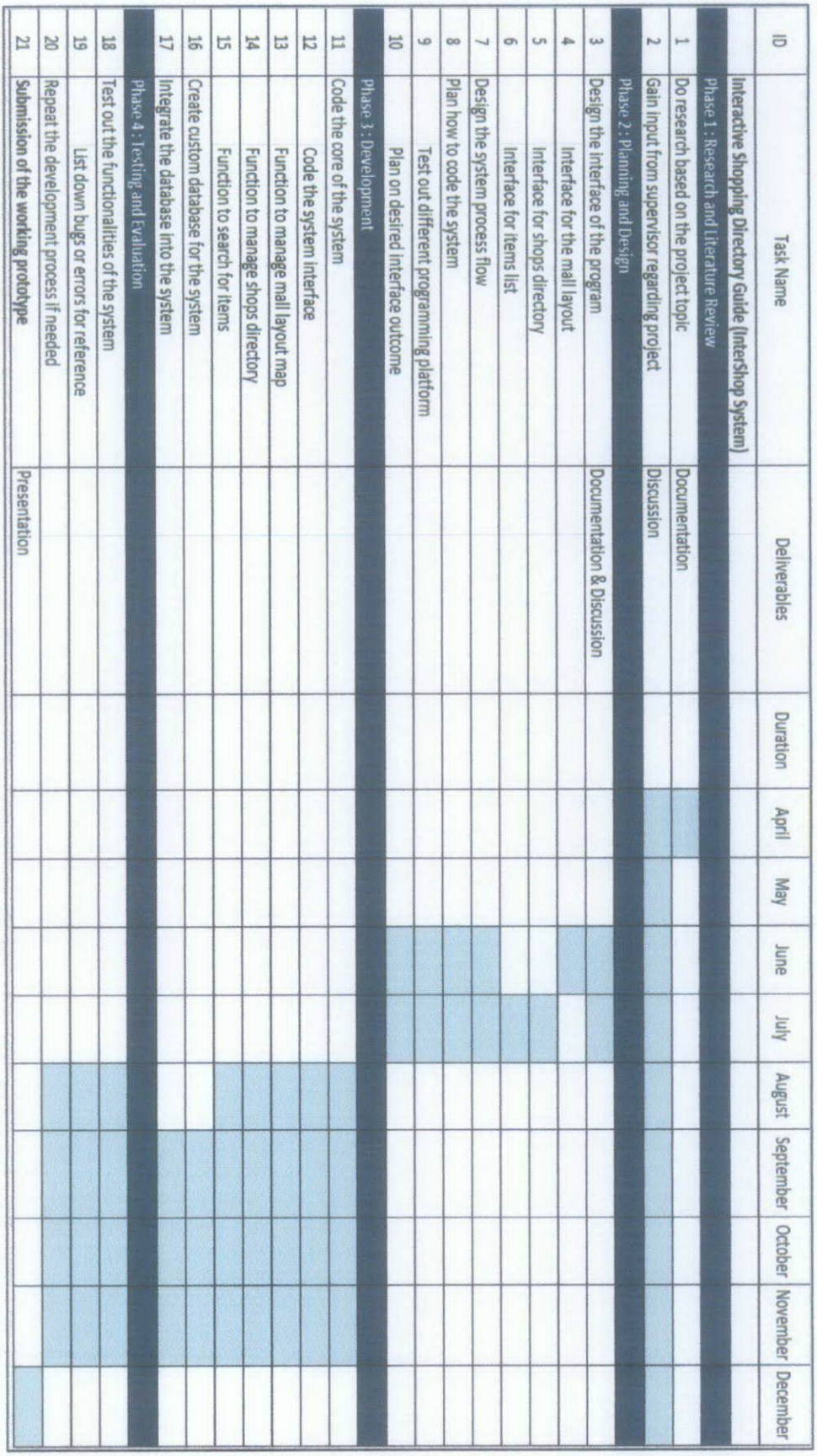
# APPENDICES

## Appendix 1: Gantt Chart for InterShop System Project




*Appendix 1, Gantt chart for InterShop System project.*

## Appendix 2: Usability Testing Feedback Form

**USABILITY TESTING FEEDBACK FORM**

**Project Title**: Interactive Shopping Directories System (InterShop System)

**Instruction**: Answer all of the questions based on your experience after testing the system.

1. By using the system in real life, do you think it will helps in locating and purchasing products more easily?

2. Do all of the system functions work?

3. Do you encounter any bugs / errors while using the system?

4. What do you think about the interface design? Is it user friendly enough?

5. Do you have any opinions / comments about the system?

6. What functions will you recommend to be added to the system to enhance its usability?

*Appendix 2, Usability testing form.*