

CHAPTER 5

SYSTEM ANALYSIS AND DESIGN

5.1. Introduction

This chapter focuses on the system analysis, system design and implementation of the proposed integrated web-based directory and e-commerce system for agriculture-based food cottage industry.

The system requirements are determined in the system analysis phase. The system design provides an overview of both system models and architectural design for the proposed system to help users to understand the system.

5.2 Description of the Proposed System

Analyzing the current directory system and online shopping website to observe problems and blind spot might exist. With these findings, it was identified to propose a new system that is integrated as a solution to the existing problem and blind spot in the current system used.

The proposed system name is “The Agriculture Cottage Industry Directory and Shopping Online System” which offered an integrated web-based directory and e-commerce system for agriculture-based food cottage industry. This proposed system provided with a search engine based on the directory system and the online shopping that comes with the company details and photos of the products which offered by seller. In the directory system, user can search for the company by alphabetical letter based on the company name or user also can search from the location of the company. Moreover, seller can upload a location map of their company to facilitate users who wish to know or visit the company. Furthermore, the system will give an easy way to connect the seller and buyer directly and to have more information details about the seller and

product. Moreover, this system will contain important features such as secure login, feedback and directory system for the seller's location. The proposed system is developed to be user-friendly giving convenient, efficiency and cost effective for the user. Thus, in the presence of these features, it will make this system a better system than other existing systems. Since the system is user friendly, more complete with its details and this system makes easier for sellers and buyers to communicate and do the transaction.

5.3 Brief Overview of the Proposed System Functions

This system function consists of three sections; the administrator, the seller and the buyer. The first function is administrator module. In this section, the administrator will maintain the website, whereby, the administrator can add, update and delete data. The administrator will update the latest information about what happen in the website such as system updates.

The second function will be the seller's module. In this section, seller can provide much information about their company to promote to the buyer. The seller will be able to insert profile, location, product detail, images and company policy to the website. Besides that, seller can answer questions asked by the buyer through feedback page.

The last section is buyer's module. In this section, buyer will be able to go to the homepage that will allow them to view the directory system to search on the seller's company or product detail. After searching based on their interest, a list of product, or company name or location will be displayed based on the search requested. The buyer can continue choosing the product from one or many company. Buyer is allowed to pay the transaction by online payment, bank transfer or cash upon delivery. Finally, the customer will be provided with information such as latest news, FAQ and feedback.

5.4 Functional Requirement

Functional requirement definition is also known as user requirement. It is described in a simple language so that the user will understand the system without detail technical knowledge. Furthermore, how the system should behave in particular situations and how the system should react to the particular inputs are the statement of services must be provided by the system (Sommerville, 2009). Below are the user requirements for integrated web-based directory and e-commerce system for agriculture-based food cottage industry according to the user.

5.4.1 Administrator

In this section, the system administrator can maintain the website by adding, updating and deleting the data, such as updating news, information about cottage industry and share information about the administrator. They also can read and reply the feedback from the other user.

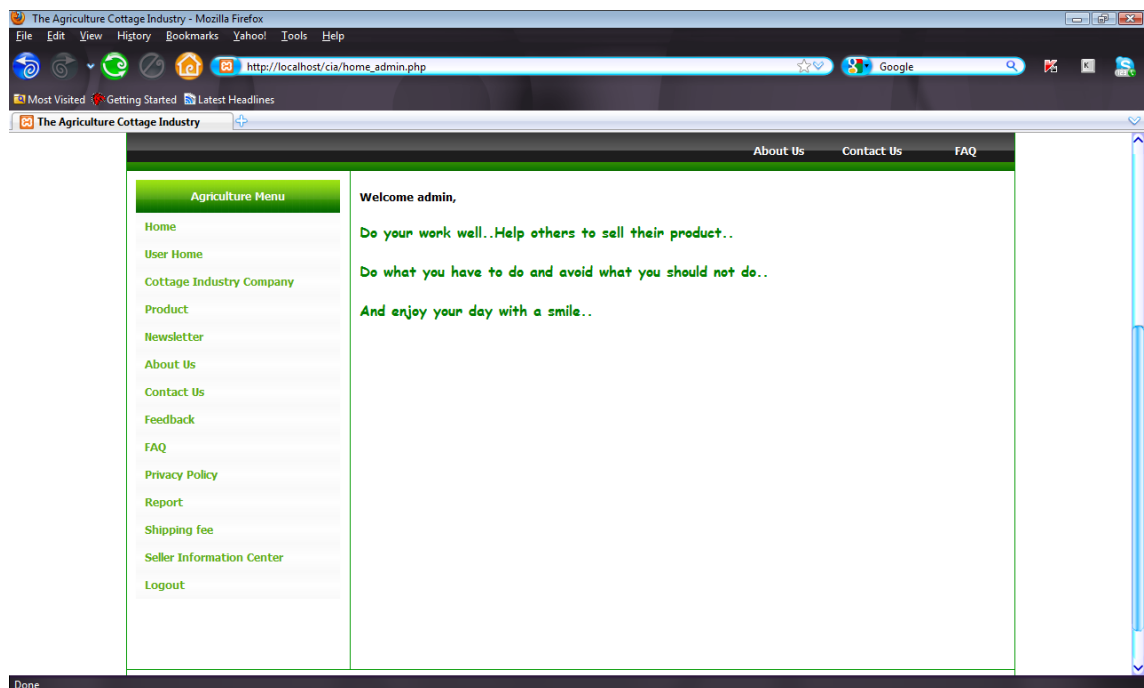


Figure 5.1 Main System Integration Web-Based Directory and E-Commerce System For Agriculture-Based Food Cottage Industry Administrator Section

5.4.1.1 Home

The home page of the administrator section shows the information about the admin main page. In this page, it shows a welcome greeting for administrator in charge.

5.4.1.2 User Home

In the user home page, the administrator can add, edit, delete and publish information to the buyer and seller home page.

5.4.1.3 Cottage Industry Company

At this page, administrator can add, delete, update and publish information that related to the cottage industry company information in general.

5.4.1.4 Product

In the product page at the administrator section, the administrator can view the entire product that was added by the seller. They cannot add or update the product, but administrator can delete the product item if the seller inserted an inappropriate data.

5.4.1.5 Newsletter

The newsletter page consists of news and latest information about the cottage industry. By this page, administrator can add, update, delete and publish the news and show to the seller and buyer home page.

5.4.1.6 About Us

The system administrator can add, update and delete the information about the administrator. It will be shown in the 'about us' in the home page.

5.4.1.7 Contact Us

In this page, the administrator can add, update, delete and publish the information about the admin contact information. In this case, it will help the seller and buyer to contact to the administrator easier.

5.4.1.8 Feedback

The administrator can view the feedback that was written from seller or buyer, but the administrator cannot write or reply the feedback. In the other side, administrator can delete the feedback that is written by user based on request from seller if the feedback is inappropriate.

5.4.1.9 Frequent Asked Questions (FAQs)

The frequent ask question can be added, updated and deleted by the administrator. In this section, the administrator will answer the most asked questions that are sent by the seller or buyer.

5.4.1.10 Privacy Policy

The privacy policy page will show the policy that regulated to the buyer and seller. In this page, the administrator also can add a new regulation, update the latest regulation or delete the unused regulation.

5.4.1.11 Report

This page will give report on seller facility memberships, where all new and existing members will be showed in this page. The administrator can view, search and print the report.

5.4.1.12 Shipping Fee

In the first part in the shipping fee page the administrator is allowed to edit the shipping fee, and in the second part in the shipping fee page, the administrator can update the shipping fee regulation information that is provided by seller.

5.4.1.13 Seller Information Center

The seller information center will provide all information and the guideline for sellers. In this seller information center administrator page, the administrator can add, update and delete the information.

5.4.2 User Home

User home is the main page of the system. All users which include seller and buyer will be directed to this page, administrator, non-member, seller and buyer. In this page, all the general information that users need and want to know is provided.

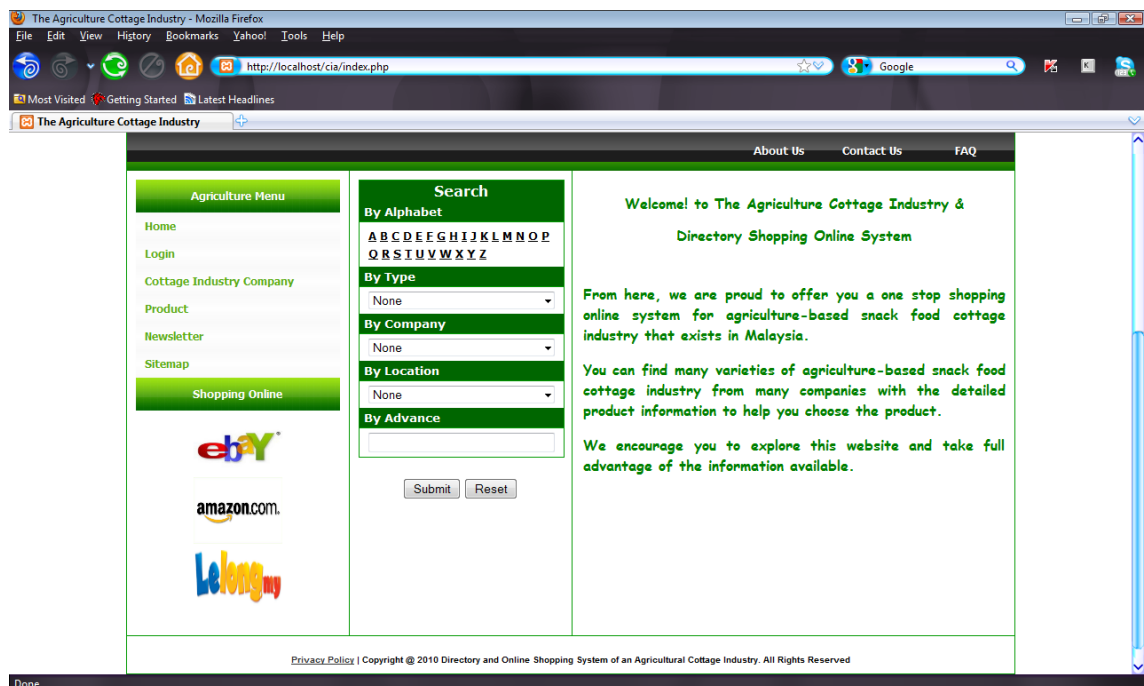


Figure 5.2 Main System Integration Web-Based Directory and E-Commerce System For Agriculture-Based Food Cottage Industry User Home Main Page

5.4.2.1 Home

In this page all users can use the directory system to search specific information about product based on alphabetical, by product type, by location, or by company name. There is also an advance search.

5.4.2.2 Login

All members need to go to this page into login to their account. The system has two users: seller and buyer. All users need to login to the system before allowed to use it for transaction, update the profile or to add or edit the products.

5.4.2.3 Agriculture-based Food Cottage Industry Information Page

This page will provide general information about the agriculture-based food cottage industry in Malaysia. This is useful information for people who have little knowledge about this cottage industry.

5.4.2.4 Product

The product page shows all the product information and products details that is offered by the seller. User can purchase the product after registering as a member.

5.4.2.5 Newsletter

The newsletter page will show news related to this cottage industry and its products.

5.4.2.6 Sitemap

Sitemap is the map of the whole system where users can use this features to know where the information they need is located easily.

5.4.2.7 Other Shopping Online Link

Other shopping online link is the links that will link directly between user and other online shopping websites. This link will simplify and help users to link to other related websites.

5.4.2.8 About Us

The about us page in the buyer section shows the general information about the administrator and information of the website.

5.4.2.9 Contact Us

The detail information about the administrator is published in this page. The buyer can see the contact detail and email address to contact the administrator.

5.4.2.10 Frequent Asked Questions (FAQ)

This FAQ page consists of frequent asked and answered question by the user to the administrator. This page is used to guide user who does not understand using the website.

5.4.3 Login

This login page is the access point for users to use the system. Before using the system, one has to register through the link that is provided in this page.

5.4.3.1 Seller

Not all the access can be used in the seller action. The seller still can add, update, delete and publish some of the information to the buyer. To access the seller

section, seller must be register as a member by registering in the registration form in the user home page.

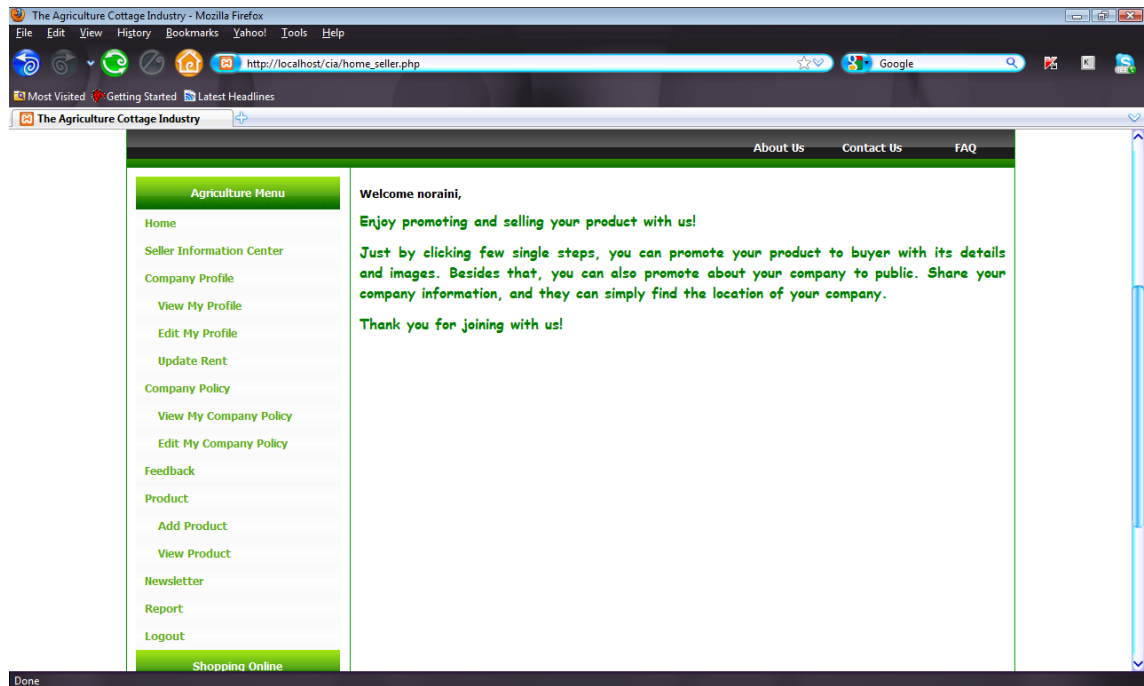


Figure 5.3 Main System Integration Web-Based Directory and E-Commerce System For Agriculture-Based Food Cottage Industry Seller Section

5.4.3.1.1 Home

The main home page in the seller section will show the directory system and latest news that was updated by the admin.

5.4.3.1.2 Seller Information Center

In this page, sellers can get the seller information and guidance to use the system provided by the administrator.

5.4.3.1.3 Company Profile

There are 3 modules from this feature, namely:

(a) View Profile

Seller can view their company profile from this as shown and seen by buyers.

(b) Edit Profile

On this page, seller can edit and update the personal data and the company information and they can change the company logo and the map of the company location. Furthermore, seller can change the user password as well.

(c) Update Rent

Seller can extend rent from this page. In this page, it will show the facilities options for seller to choose, how many months they want to extend their membership, after they chose the provided facility, member will be directed to the payment confirmation page and can do the payment transaction.

5.4.3.1.4 Company Policy

Every companies has their own company policy where the policy specified the responsibility of the seller.

5.4.3.1.5 Feedback

In this feedback page, sellers provide a feedback to buyers or potential buyers in order to improve their sales services.

5.4.3.1.6 Product

The product page is the main page for seller to promote their product. This page allows sellers to add new product, edit the existing product and delete product that no longer exists.

5.4.3.1.7 Report

Seller will get report from the transaction made by buyers. In this report page, seller can view and search report. Moreover, seller can print the report based on buyer transaction.

5.4.3.2 Buyer

In this section, buyer can search for the companies' information using the directory system. They can also search for the products that seller offered. Moreover, buyer can also purchase online using bank transfer or credit card payment.

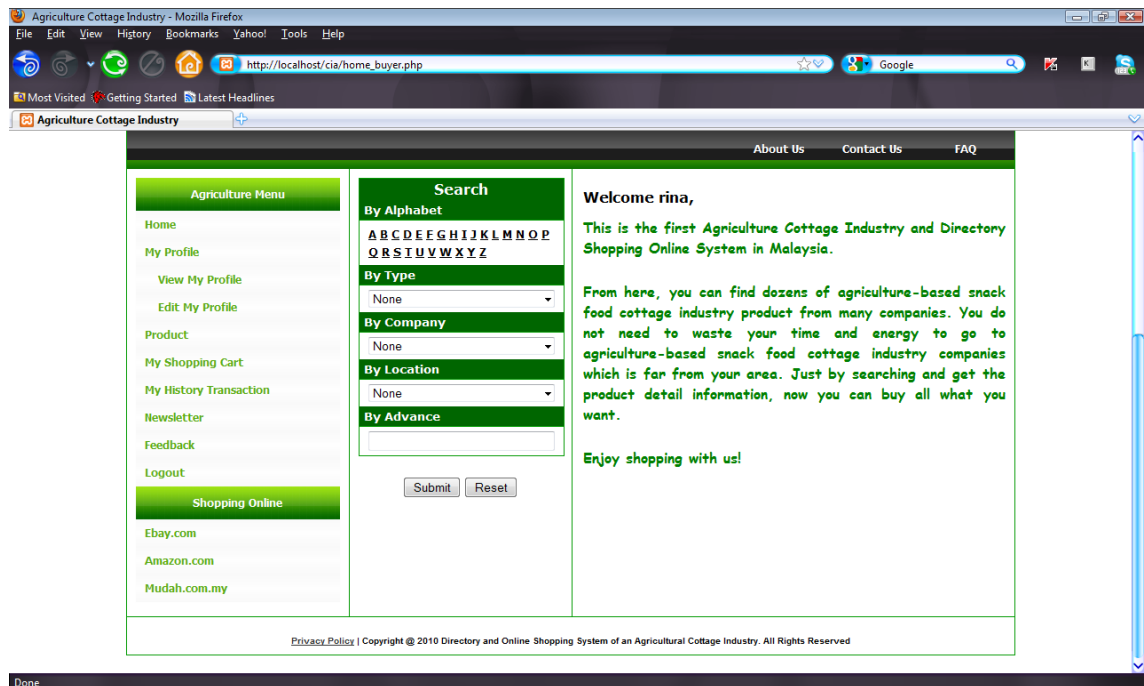


Figure 5.4 Main System Integration Web-Based Directory and E-Commerce System For Agriculture-Based Food Cottage Industry Buyer Section

5.4.3.2.1 Home

The home page in the buyer section shows the directory system of the industry companies in this business. This directory system helps users in finding company or

product that they were looking for. Moreover, the home page also show the latest news updated by the administrator.

5.4.3.2.2 My Profile

There are 2 modules from this 'My profile' feature:

(a) View Profile

Buyer can view their profile from this page.

(b) Edit Profile

Buyer can edit and update their personal data information or change the user password.

5.4.3.2.3 Product

Buyer can view all products from this site. The buyer be able to know the product detail and the company's profile detail. Moreover, buyer can choose the selected product that they want to purchase.

5.4.3.2.4 My Shopping Cart

The shopping cart can be used by buyers to temporarily store the product before making the payment transactions. However, this cart is only temporary, where after buyer made a payment, and then the shopping cart will be empty.

5.4.3.2.5 My History Transaction

My history transaction records all the details of purchase that has been done by buyer. Buyer can view, search and print the history transaction based on the date of transaction.

5.4.3.2.6 Feedback

In this feedback page, buyer can write a feedback to seller and ask about the company services or the company product. This feedback can be used as a reference to other buyers who want to buy product from that company.

5.5 Non-functional Requirement

Non functional requirement is requirement that is not directly concerned with the specific functions delivered by the system. It may define constraints on the system and relate to emergent system properties. Failing to meet a non functional requirement means that the whole system is unusable.

5.5.1 Ease of use

The system should be simple and easy to use. It should come with the FAQ for the guideline of a new user which cannot understand how to use the system.

5.5.2 Maintainability

The system must be easy to maintenance, in which the errors can be fixed as and when the problem comes up.

5.5.3 Respond time/speed

The system should be able to do the transaction process in a high speed and avoid unnecessary interaction.

5.5.4 Security

This system should have a security measurement to protect stolen data and exposure data from the unauthorized person. Only the authorized person can use the system using user ID and password to login into the website.

5.5.5 Functionality

The functional of the system is the most important thing that must be in the system. This function is to search and retrieve data from the database and display the output to users as the information.

5.5.6 User-Friendly

The proposed system is a user-friendly system. With button, pull down menus and easy navigation, everyone can use this system.

5.6 System Model

A system model is an abstraction of the system being studied rather than an alternative representation of that system. A representation of a system should maintain all the information about the entity being represented. An abstraction deliberately simplifies in picking out the most salient characteristic (Sommerville, 2007).

5.6.1 Structure Design

Proposed system structure design will show the overview of the entire system. This system allows an easy accessibility by user to obtain information. Seller would be able to assess the system to update information about their company, updating on products, company policy, feedback and report. In addition, seller can also update their rent facility to renew their membership. In addition, buyer can search various types of

information such as product information, company detail, latest news, shopping cart, history transaction and feedback for the company services. Furthermore, the administrator would be able to add, update and delete about information in the system. Administrator also is able to generate report from the seller membership.

The system has a simple structure diagram. The main part system of the system is divided into two (2) major section, Administrator section and User section as shown in figure 5.5.

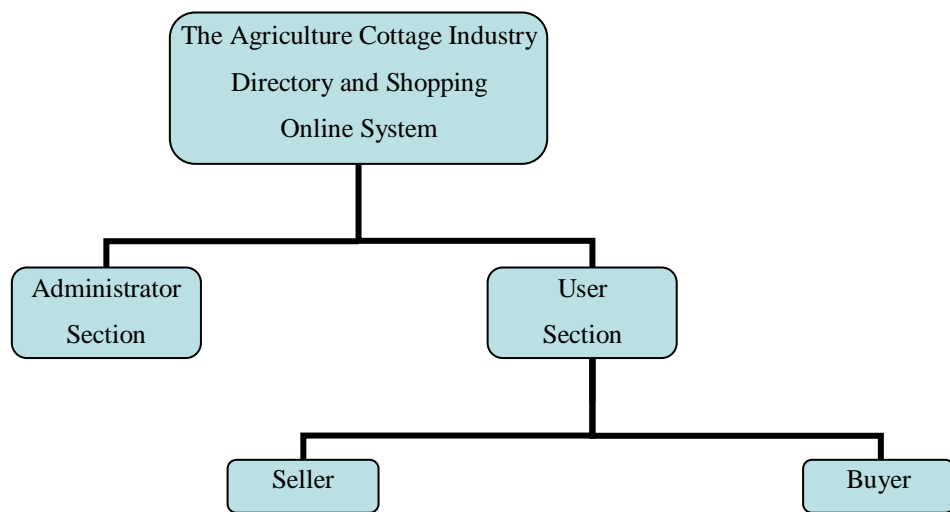


Figure 5.5 Structure Design of the Integrated Web-Based Directory and E-Commerce System for Agriculture-Based Food Cottage Industry

5.6.1.1. Structure Design for Administrator Section

There are thirteen modules in the Administrator section which are divided into sub-modules. The Administrator modules are home, user home, cottage industry, product, newsletter, about us, contact us, feedback, faq, privacy policy, report, shipping fee and seller information center. The structure design for the Administrator section is shown in figure 5.6.

5.6.1.2. Structure Design for User Section

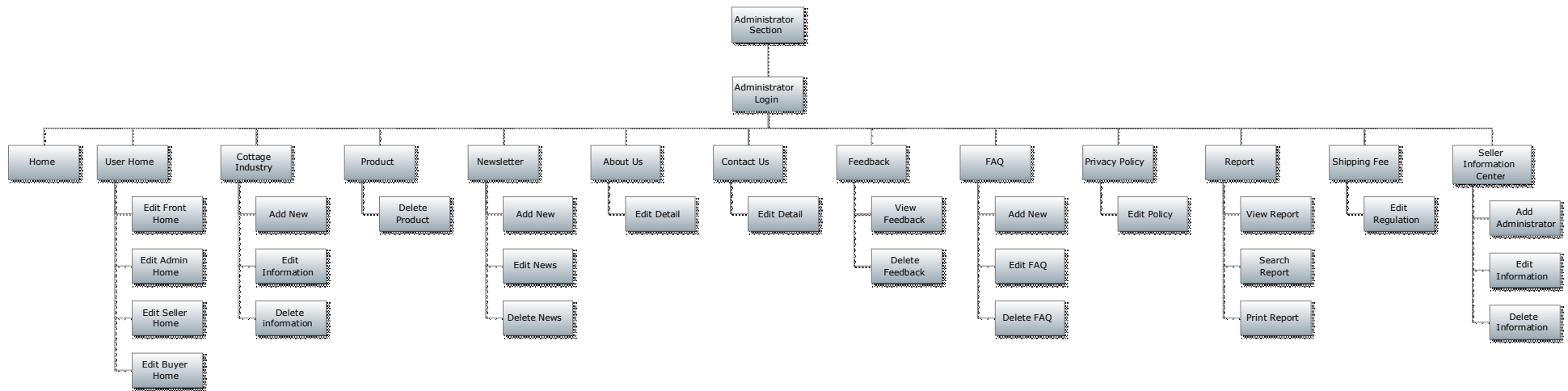
In the User section, there are eleven (11) modules which consist of home, login, cottage industry company, product, newsletter, sitemap, other shopping online, about us, contact us, FAQ and privacy policy. The structure design can be seen in Figure 5.7.

5.6.1.3. Structure Design for User Login Module

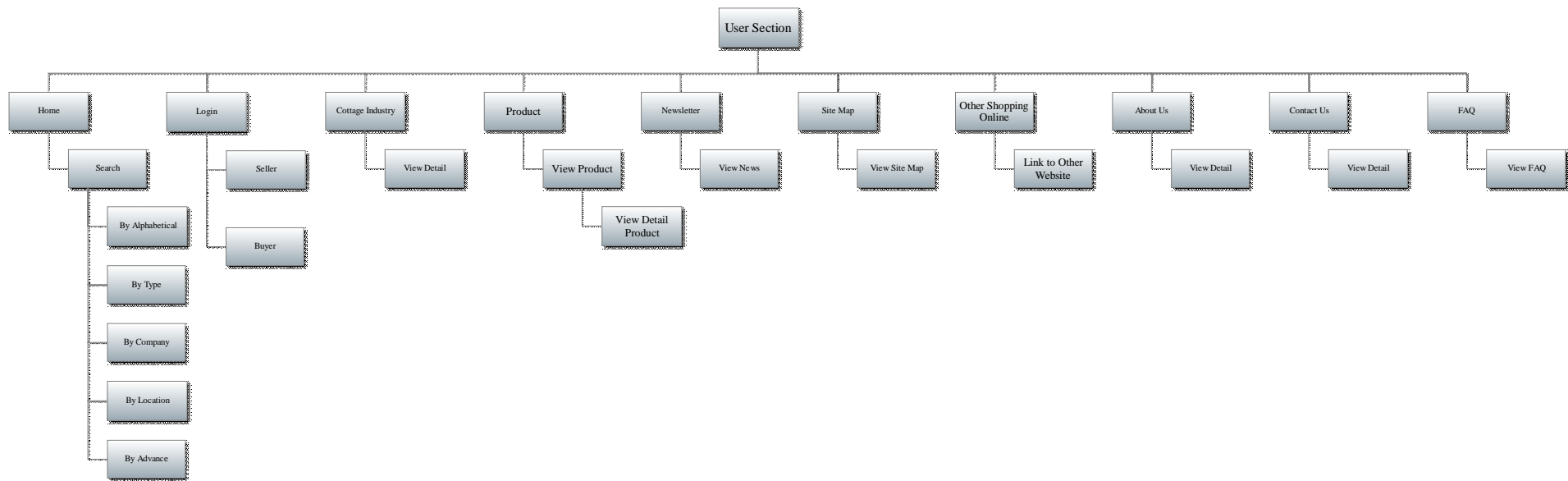
In the User section, the login module is divided into two (2) users: Seller and Buyer. There are seven (7) sub modules in the Seller Section, such as home, seller information center, company profile, company policy, feedback, product and report. In the other side, there are six (6) sub modules in the Buyer Section; home, my profile, product, my shopping cart, my history transaction and feedback. The structure design of the integrated web-based directory and e-commerce system for agriculture-based food cottage industry user login module is shown in Figure 5.8.

5.6.2 Context Diagram

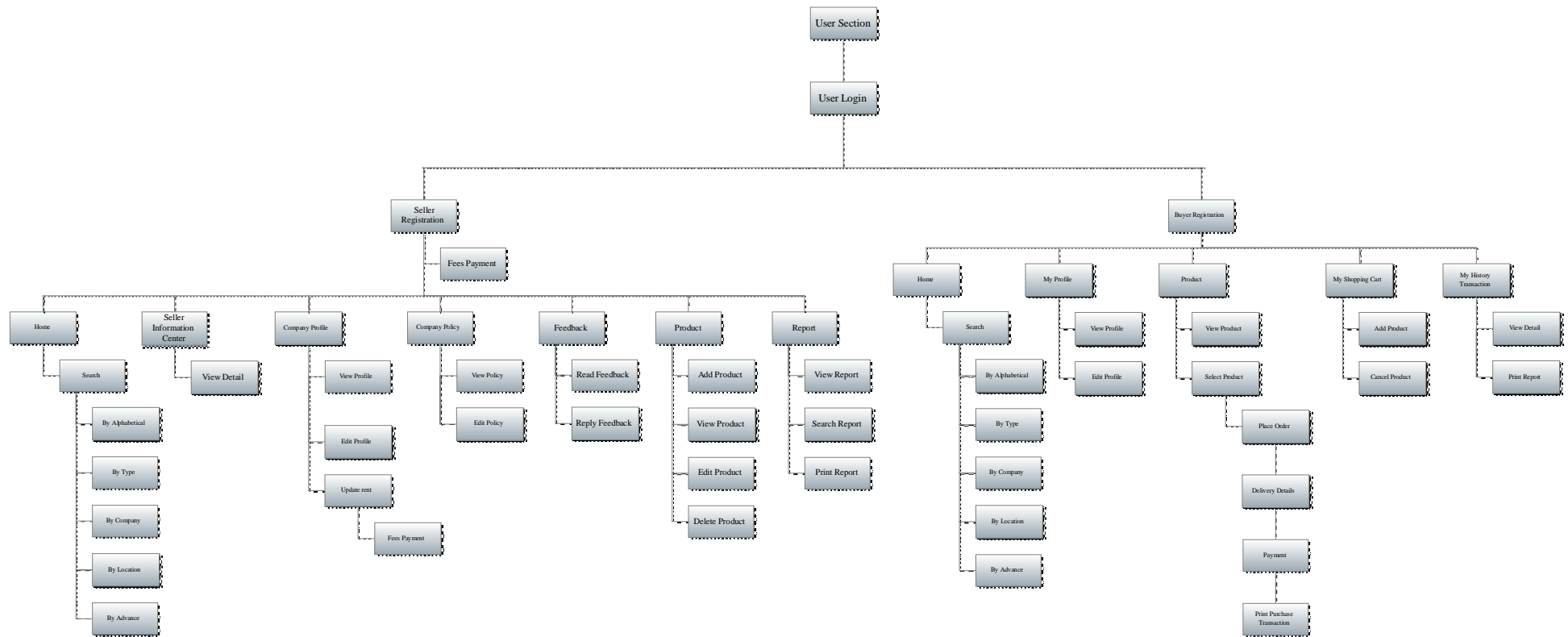
Context diagram is a data flow diagram (DFD) which represents of complete system. In the system, the context diagram shows the system boundaries, between administrator and users (non member, seller and buyer) and the system. The context diagram of the system is shown in Figure 5.9.



**Figure 5.6 Structure Design for Integrated Web-Based Directory and E-Commerce System
For Agriculture-Based Food Cottage Industry Administrator Section**



**Figure 5.7 Structure Design for Integrated Web-Based Directory and E-Commerce System
For Agriculture-Based Food Cottage Industry User Section**



**Figure 5.8 Structure Design for Integrated Web-Based Directory and E-Commerce System
For Agriculture-Based Food Cottage Industry User Login Module**

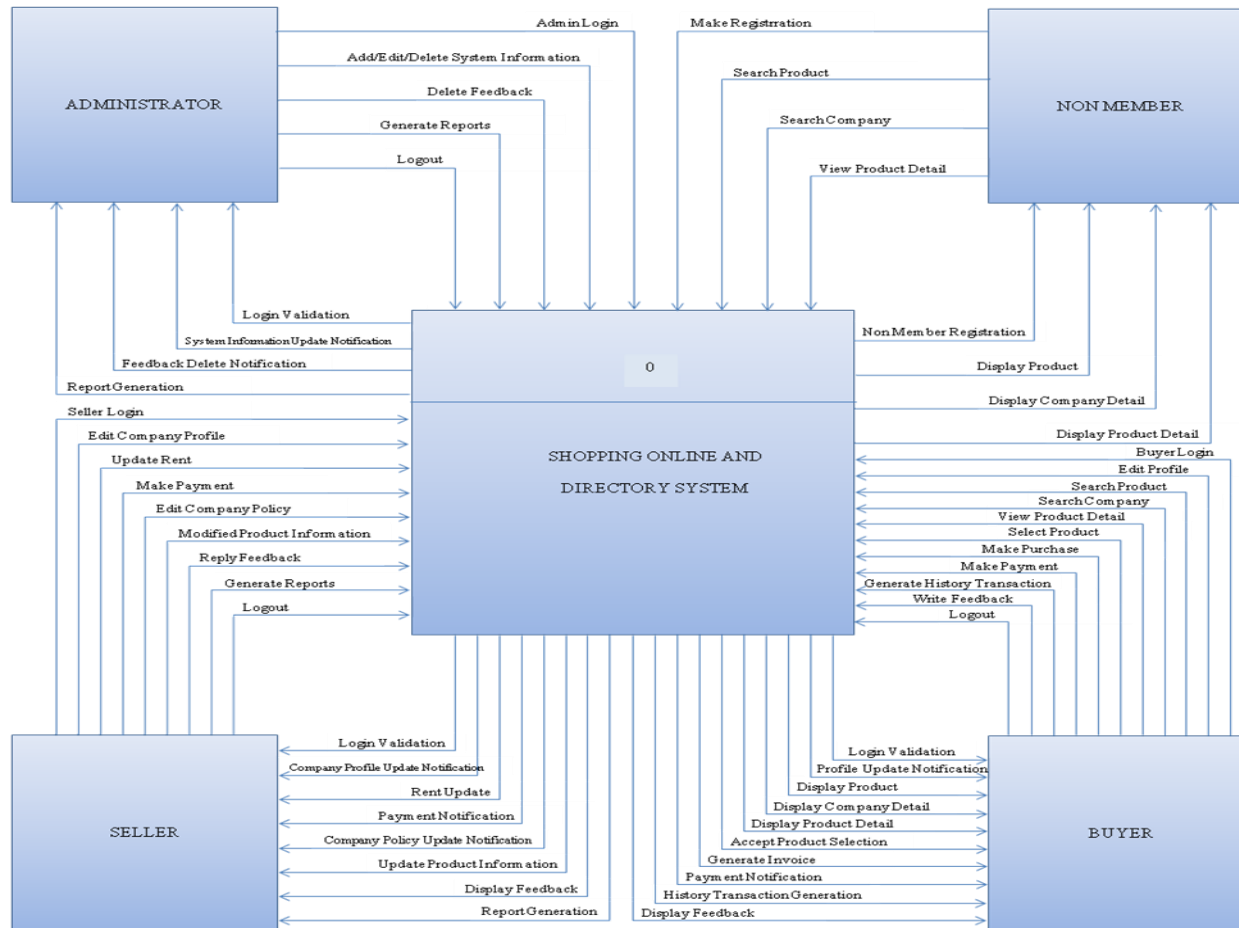


Figure 5.9 The Context Diagram of the Integrated Web-Based Directory and E-Commerce System For Agriculture-Based Food Cottage Industry

5.6.3 Data Flow Diagram

A data flow diagram (DFD) is a graphical representation of the “flow” of data through an information system. This data flow diagram (DFD) will be used for the visualization of data processing in the system. The data flow diagram (DFD) of the system is shown in figure 5.10.

5.7 Database Design

Database is one of the important components in system development. The function of the database is to organize data collection in a manner which involves data storage, data access, and data retrieve. This database system integrates collection of data, making it available to multiple applications in a variety of an organization. The purpose of the database design is to determine data requirement in the system, thus giving useful information generated to users.

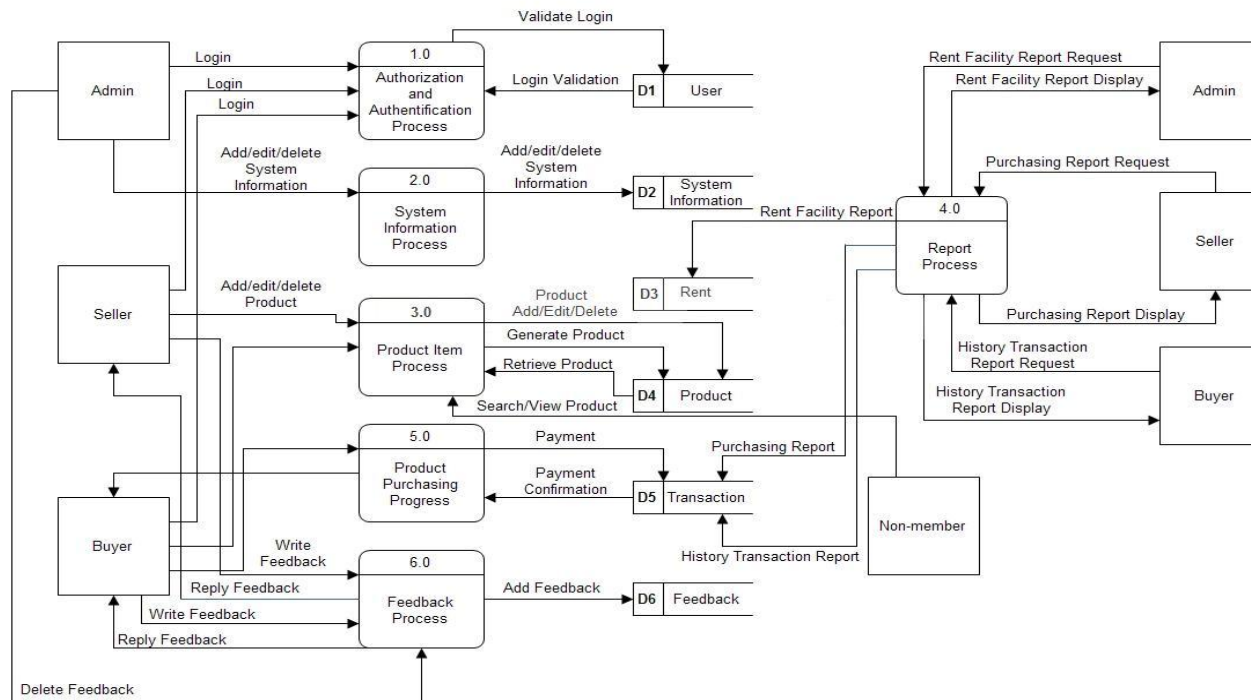


Figure 5.10 Data Flow Diagram Non-Member Perspective of the Integrated Web-Based Directory and E-Commerce System For Agriculture-Based Food Cottage Industry

5.7.1 Database Dictionary

In this system, the database consists of 32 tables and the tables structures. For further detail of the table please refer to appendix D.

5.8 Tools and Methodology Selection

In this part, the Tools and Methodology used will be introduced in developing the prototype system.

5.8.1 Tools Used

Tools used are the important part in developing the system, they will be related to the efficiency and the effectiveness of the system. In this system, an appropriate tool has been chosen.

5.8.1.1 Software Requirement

Hypertext Preprocessor (PHP) is a Hypertext Markup Language (HTML) script which integrates with and resides on the server (server-side HTML embedded scripting). PHP can create a variety of web-based applications, rang from simple web pages to complex applications that require connection to the database. In this system, PHP is used to generate to web page document which interpreted by a web server with a PHP processor module.

5.8.1.2 Scripting Language

JavaScript is a scripting language that is used to design a dynamic web page by web developer. JavaScript is also called a safe scripting language because the system control or hardware in the computer would not be accessed by this JavaScript.

Moreover, JavaScript is also an open source language that can be accessed by anyone for free.

5.8.1.3 Database Management

MySQL is an open source database which allows users to manage, update and retrieve data. MySQL function is as a SQL (Structured Query Language) itself and has been expanded at MySQL, is generally used in conjunction with PHP to create dynamic applications and powerful servers. Since MySQL is an open source database, everyone can use without purchasing any license.

5.8.1.4 Operating System

The operating system used for this project is Windows Vista. Since it is easy to use, windows vista has improved the new graphical user interface and it is safe to surf the net since windows vista enables one provide high level of security measures.

5.9 Hardware and Software Requirements.

To get the good quality and productivity in developing of system, choosing the right hardware and software is very important. The hardware and software used in developing in this system are discussed as below.

5.9.1 Requirement for System Development

The basic software and hardware used to develop this Agriculture-based Food Cottage Industry Directory System and Shopping Online System are as follow:

- a) Intel Centrino Duo
- b) 2 GB of RAM
- c) Hardisc Space

- d) Windows Vista
- e) Mozilla Firefox Version 3.6.3
- f) PHP
- g) MySQL
- h) Macromedia Dreamweaver

5.10 Human Computer Interaction (HCI) Factors

Research, planning and design are things that appear when you and your computer work together. This is called as Human Computer Interaction or HCI. As it implies, HCI has three important parts that involve all three of them, namely: user, computer itself and the interaction (Danino, 2001). This system was design based on the three (3) factors from HCI.

(a) The User

The experience of users on the internet usage has been taken into consideration while designing the system.

(b) The Computer

The user interface is important in designing a system. Users friendly and easy to use are the main points on the system. The combination of colours, button function icons and the output display must be considered.

(c) The Interaction

The future of the integrated web-based directory and e-commerce system for agriculture-based food cottage industry has been consulted with users. Thus, it will be easy for users to be familiar with the system.

5.11 Goals of Users Interface (Usability Factors)

There are several goals that must be achieved when designing the proposed system as listed below:

(a) Flexibility

The system is flexible to add new features, update any informations and delete any useless information.

(b) Learnability

The system was designed simply to be used by users. Users do not need extra time to learn how to use the system; even users are new with it.

(c) Forcing Function

Forcing function is needed to avoid the incorrect data entry from users.

5.12 Web Page Design Principles

The web page design principle is focused on the interface design a system. At this phase, the design can be deceptive difficult, as it involve achieving a good design that is easy to use and attractive, and delivers information. Following are the major principles in designing the system.

(a) Usability

All features in the system are usable. They are not only provided with pictures, but they also give so many information and interaction to be affected by the system.

(b) Alignment

Alignment is important for a website. A website that is without balance alignment and not consistently placed annoy users.

(c) Clarity (Sharpness)

It is important to keep a design sharply looking. The thing that connected to clarity is pixels.

(d) Consistency

Everything should be done correctly. The consistency in the design such as heading size, font choice, button styles, spacing, coloring and other design elements should be themed in the same manner between pages and on the same page.

5.13 Summary

This chapter discusses the system analysis and design analysis of the system. The system analysis will include recommendations and guidelines that recommended for the implementation of this integrated web-based directory and e-commerce system for agriculture-based food cottage industry. It will show all the requirements needed to develop the system. There are two necessary requirements in systems analysis, i.e. non-functional requirement and functional requirement. The functional requirement or user requirement uses simple language about the user needs in developing the integrated web-based directory and e-commerce system for agriculture-based food cottage industry so that users can understand without knowing the technical knowledge. While in the non-functional requirement are requirement that are not directly related to the system, such as user-friendly, security, and others.

The system model is a representation of a system to keep all the information represented. This representation of structure design, context diagram and data flow diagram. Structure design is a sequence of which is described in a hierarchical system, so the overall system function is shown in one figure. Context diagram shows the boundaries between administrators, users (non-member, buyer and seller) and the system itself. While data flow diagram showing data flow in the system through the information system. Furthermore, besides the three issues above, there is one other important component in implementing this integrated web-based directory and e-commerce system for agriculture-based food cottage industry, namely the database

design. Database design is one important component in the system, because it will organize all the data in a good manner which provide access to retrieve and use the stored data.

In the model system, the tools selection used is also very influential in developing a prototype of an integrated web-based directory and e-commerce system for agriculture-based food cottage industry. In addition, the Human Computer Interaction (HCI) is also necessary because it has three important roles that involve all three of them, they are: user, computer itself and the interaction.