

CHAPTER 3

METHODOLOGY

3.1 Introduction

This section contains discussion on (a) tools used to collect data and (b) system development. The important part of developing a website is planning of the implementation phase. This part can be done by choosing the correct methodology that fits with the project. A methodology is important to make sure that the project activities work in a line. Further discussion is in section 3.3 and the system detail is in chapter 5.

The data for this research were gathered by using quantitative method. Additional sources used in this research were from primary and secondary sources. Primary source consists of questionnaire related to the agriculture-based food cottage industry which is concentrated to the seller. Secondary sources were taken from books, journals, conference papers and websites.

3.2 Data Gathering Methodology

The data gathering is a research's effort to collect field data needed to support the research questions or hypotheses. The field data collection is very important to obtain the analysis and conclusions of research findings. The data gathering for the web-based directory and e-commerce system for agriculture-based food cottage industry is discussed below.

3.2.1 Quantitative Methodology

Quantitative data are data consist of numbers in the truest sense. Thus, various mathematical operations can be performed on quantitative data. Because the measurement of quantitative research on the observed phenomena is important, so that

data collection is done by using questionnaire and structured interviews based on the measurement of the variables studied which then generate quantitative data (Harahap, 1992; Santoso, 2010).

A survey taken from a population to study the attitudes, opinions, numeric descriptions or quantitative descriptions from this population. A statement will be taken from the results of these studies. At the time of the survey, generalization and samples of a population can also be identified, but the basic purpose of this study was to examine the impact of the intervention of a result and other factors that may affect the results of these studies. Each individual is randomly assigned by researchers to create a group (Creswell, 2003).

3.2.1.1 Questionnaire

The methodology used in gathering information to develop the prototype of the system was questionnaire. The questionnaire include seeking the seller information, marketing strategy, selling transaction and problems faced by seller. There are two sets of questionnaires used. The first set of questionnaires was distributed to seller to gather information about business carried out by the sellers, the second set of questionnaires was distributed to seller and buyer to get the feedback on the system testing after the prototype is completed. The types of questions used in the questionnaire are:

(a) Open-Ended Questions

Open-ended questions are questions that allow respondents to give answers that are not limited and spontaneous, so they can avoid the bias that might arise from the responses of the respondents. In other words, respondents can freely provide the answer for more than two or three words (Reja et al., 2003; Chitwood, 1997).

(b) Close-Ended Questions

Close-ended questionnaire provided questions to the respondents which could not be altered or responded to. In general, the answer given to close-ended questions is "yes" or "no." It is also known as saturated type questions. Moreover, for assuming, probing, or leading questions, the options will fall into close-ended questions compared to open-ended questions, because these questions will limit respondents to the set of alternatives offered (Reja *et al.*, 2003; Chitwood, 1997).

3.2.1.2 Structured Interview

Structured interview is the other method used to gather information regarding to the web-based directory and e-commerce system for agriculture-based food cottage industry. The structured interview is based on the existing questionnaire which would be distributed to users. Furthermore, it was conducted in consideration of some users were not willing to be bothered by filling out the questionnaire that was distributed, they preferred to be asked directly.

Structured interview is an interview where someone asks the other person a list of questions that have been determined. If the respondent does not understand the questions asked, the person who asks the questions (the interviewer) is allowed to explain about these questions (<http://www.sociology.org.uk/methsi>). Moreover, in this interview, all respondents will be asked the same question in the same order (United States Office of Personnel Management, 2008).

3.2.2 Unit Analysis Discussion of Data Collection

In developing the prototype system, the data need to be collected from reliable respondents. In this research cottage industries in Bangi, Sepang, Banting, Sungai Besar and Sabak Bernam were visited to be observe the business transaction between seller

and buyer in natural environment. As known, Bangi, Sepang, Banting, Sungai Besar and Sabak Bernam are center areas of production of agriculture-based food cottage industries in Malaysia. The questionnaire was collected in one and a half month, from 22nd February 2010 until 2nd of April 2010 in these five areas.

There were 30 agriculture-based food cottage industries which involved in this research, some of them were well known in the community but some were still very small industry. Some of the popular cottage industries were:

(a) Fazz Enterprise (M) Sdn. Bhd.

Fazz Enterprise was located in Lot 1454, Jalan Cempedak, Kanchong Darat, Banting. It was founded by Haji Mahmudin Bin Abas in 1983. Before he started his business, Haji Mahmudin Bin Abas worked in a factory, and then had a side business of making chips from cassava, banana and yam which grow around his house and used his backyard as their factory. Since the response of these chips is very good in society, then Haji Mahmudin Bin Abas decided to resign from his work and then invented a machine to support his production efforts.

In 1995, Fazz Enterprise expanded its business to the overseas, such as Singapore, Australia and United Kingdom, but in 2001 it had to stop its selling to those countries because there were not enough raw materials to fulfill customer demands that have been increase for few years. Since 2000, Fazz Enterprise only has been focusing to the domestic market; it has its own store called Krepek House which is located in between Haji Mahmudin Bin Abas' house.

(b) Jamirah Food Industries (M) Sdn. Bhd.

Ahmat Termizi Dollah Kusni found Jamirah Food Industries in 1986. Starting only with RM50 as a capital and using a borrowed frying pan and no experience,

Ahmat Termizi Dollah Kusni now become a success business man in the agriculture-based food cottage industries. Ahmat Termizi Dollah Kusni has run this business for 50 years with three times stumbled on his way. But, with his persistence and patience, the stumbling has opened the way to achieve success in this business in 1996. This agriculture-based food cottage industry located in Lot 815, Jalan Mempelam, Kampung Bukit Bangkong, Sepang.

Today, almost 20 percent of the industry production is going to foreign market. Such as tapioca chips, now it was distributed to Vietnam, Dubai, Australia and United Kingdom.

(c) **Jaez Industries (M) Sdn. Bhd.**

Jaez Industries (M) Sdn. Bhd. is a local agriculture-based food industry which produces of halal products. It was found in 1993 by Haji Jamaluddin Bin Haji Abd. Aziz. With the help of Business Development Manager, Zaihan Bin Kaswar, Jaez industry has developed rapidly. At the beginning, Jaez Industry only produced snack foods such as cassava chips, but now, they have been developed other products as, soft drinks, which are highly favored by the community. Now, Jaez Industry has two mills to support the production of its products, to fulfill the customer demand, and it also has its own store to sell its products. Moreover, it has its own retailers to market its products.

There are two types of questionnaires that were distributed to the respondent, which were:

- (a) First questionnaire was distributed to thirty (30) owners of the agriculture-based food cottage business. The first questionnaire will gathered data about the ownership of this business, problems faced, marketing strategy and information

about internet usage and the existing online marketing websites. There were thirty respondents that would be asked to fill the questionnaire.

- (b) The second questionnaire is for the system testing. Questionnaire would be distributed after the development of the prototype of the web-based directory and e-commerce system for agriculture-based food cottage industry had been complete. There were ten (10) questionnaires would be distributed to sellers and other ten (10) questionnaires for buyers to get their feedback about the prototype of the web-based directory and e-commerce system of agriculture-based food cottage industry. The seller mentioned was the owner of the agriculture-based food cottage industry, and the buyer would be addressed to the consumer of these agriculture-based food cottage industries.

3.2.3 Type of Questions

The question in this questionnaire has several sections, from general questions to more specific questions. In the first questionnaire, the questions were divided into four sections, namely Section I - Background, Section II - on Experience on Selling Product, Section III - on Experience on Internet Usage and Section IV - on Suggestion.

In short, there are three sections in the system testing questionnaire that would be distributed to seller and buyer. In addition, same with the first questionnaire, in this system testing questionnaire, the questions would be from general questions to more specific questions, such as, Section I – Overall Agreement with the Proposed Design, Section II – Responses to the Specific Questions, and Section III – Overall Issues and Problems, Comments and Suggestions. For this questionnaire could be seen in appendix B.

3.2.4 Analysis Processing Data Method

This research was using SPSS to process questionnaires data that has been distributed to the users. SPSS will convert the questions in the questionnaires into statistical data that is more readable. According to Santoso (2010), SPSS is an application program that has a high capability in statistical analysis along with data management system in the graphical environment by using descriptive menus and simple dialog boxes, which is easy to understand how to operate.

SPSS can read various types of data or enter data directly into the SPSS Data Editor. However the structure of the raw data file, the data in SPSS Data Editor should be established in the form of rows (cases) and columns (variables). Case contains information for one unit of analysis, while the variable is the information gathered from each case. The processing data for this questionnaire is using descriptive statistical data processing, as it will explain or describe the characteristics of data, such as how the data average is and how far the data varies from the average. Furthermore, the results of the analysis data will appear in the SPSS Output Navigator.

3.3 System Development

Information system is an arrangement that consists of several components such as people, events, data, hardware, software, and integrated network that serves to support and improve day-to-day operations of a business, also provide information for problem solving and decision making by managers (Shelly *et al.*, 2008; Ghezzi *et al.*, 2002).

3.3.1 System Development Life Cycle

Development of a system will go through a gradual development and evolution. It starting with the ideas and the availability of software and hardware, the design and

implementation phases and finally sending to the customer. This cycle has several stages that every stage is one part of the system or related systems (Ghezzi *et al.*, 2003).

There are five stages in the waterfall model, they are Requirement Analysis, System Design, Implementation, Integration and Testing, and Operations and Maintenance. As same as the name waterfall, then the stages are arranged in a multilevel model, every stage in this model is carried out sequentially, one before the others. Furthermore, from one stage we can return to the previous stage. As an example the testing/verification phase cannot be started before the previous phase has been completed, the implementation phase (Sommerville, 2007).

According to Sommerville (2009), waterfall model has an advantage which facilitates the developers, since the documentation produces at every stage suitable with other engineering processes. On the other hand, the waterfall model is less flexible for each different phase, so a strong commitment must be applied because of the beginning of the development planning system.

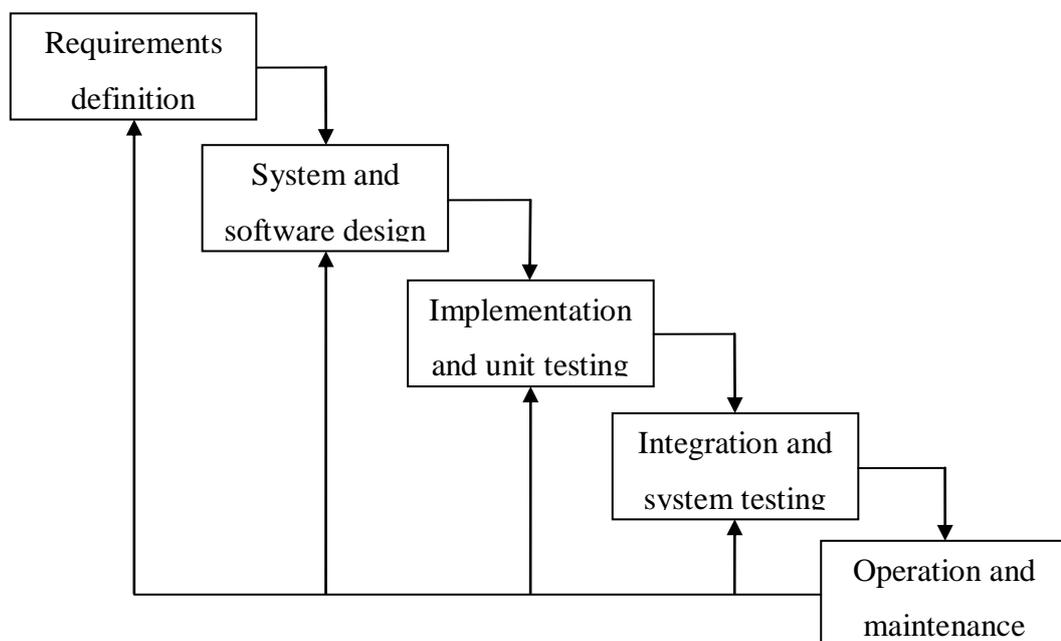


Figure 3.1The Waterfall model of the Software Lifecycle (Sommerville, 2007)

The **requirements definition** is where the system should be established based on the buyer and seller requirements goals. After conducting a complete requirement, research must identify the problem that might come with the requirements.

The **system and software design** is an important phase from all the phases. It is the fundamentals of the system planning. This phase would draft out how the system will be, how changes should be made in this phase, so there will be no other changes during the other phase or at the final phase.

Implementation and unit testing is a phase where web-based directory and e-commerce system is realized as a set of programs. In this phase, gathering information from the existing system is important to find out whether it is beneficial to carry out a new system.

The next phase after implementation and unit testing is the **integration and system testing**, in which the agriculture directory system and shopping online will be integrated and tested as a complete system by a prototype system. This prototype system is to ensure that all the requirements have been met. The prototype system will deliver to seller and buyer to see whether they were satisfied with the requirements.

The last phase in the waterfall model is **operation and maintenance**. In this phase, the web-based directory and e-commerce system will be installed into a practical use. The maintenance phase involves error correction which was not discovered in the previous phases of the lifecycle.

As known, the System Development Life Cycle (SDLC) is a stage of process designing system, where in the SDLC also contains certain stages. So as SDLC was used to approach pattern to cope with / anticipate the risks that arise from a system. The more integrated SDLC, the more prepared for the system to overcome a risk that might arise. Moreover, it used to make sure how the system works and proves to make it

better. By using this SDLC system, it was expected for the new system to provide an excellent solution to improve errors or lacks that exist in the earlier system.

3.3.2 Prototype

Prototype is a software development that has been widely used. With the existence of this prototype, developers and customers can interact with each other and understand what the customer wants in the development of the system. Not infrequently happens if a customer only rough outlines of what they want without giving details the requirement for the output. To obtain results in accordance with customer wishes, there must be good cooperation between the developers and the customers themselves. Developers need to know what the customer wants in detail (Ghezzi et al., 2003).

3.3.3 Technical

Technical sections that required in the development of a web-based directory and e-commerce system for agriculture-based food cottage industry are the requirement for software and hardware to support the needs of development. Software and hardware used in developing the web-based directory and e-commerce system for agriculture-based food cottage industry are as follows:

- (a) Intel Centrino Duo
- (b) 2 GB of RAM
- (c) Hard disk space
- (d) Windows Vista Home Basic
- (e) Mozilla Firefox Version 6.3
- (f) PHP

(g) MySQL

(h) Macromedia Dreamweaver

3.4 Summary

This chapter discusses the methodology used to support the development of this web-based directory and e-commerce system for agriculture-based food cottage industry research project. The data collections used quantitative methods such as questionnaires and field observations. To obtain the data collection, researchers used two questionnaires. The first questionnaire distributed to the owners of the agriculture-based food cottage industry company was to collect information about agriculture-based food cottage industry entrepreneurs and to find out the problems faced by the entrepreneur, to know the marketing strategies used and about the internet usage; while the second questionnaire distributed to the sellers and buyers for the system testing from the prototype that has been created. Furthermore, the questions contained in the questionnaire divided into two types of questions, i.e. open-ended questions and close-ended questions. In addition, the interview also conducted on respondents who did not want to fill out the existing questionnaires, so it must be carried out by structured interviews based on questions that are listed on the questionnaire.

The data collection conducted in the vicinity of Malaysia, namely in Bangi, Banting, Sepang, Sungai Besar and Sabak Bernam. Those areas were chosen because they were the center agriculture-based food cottage industry productions in Malaysia.

System development life cycle used, is the waterfall model consisting of Requirement Analysis, System Design, Implementation, Integration and Testing, and Operations and Maintenance. Moreover, software and hardware are needed to support in developing this web-based directory and e-commerce system for agriculture-based food cottage industry.