CHAPTER 6
SYSTEM IMPLEMENTATION AND USER TESTING

6.1 Introduction

In this chapter, system implementation and user testing will be discussed. The aim of system implementation is to build a real system by using the codes based on the system design that has been discussed in the previous chapter. In the other hand, user testing purpose is to test the system after being developed in order to know if the system works properly. The process has a variety test to explore the function or to identify the problems. This phase is usually executed after the system has been ready as a whole system and distributed to users to take part of testing. Furthermore, testing experiments must be done intentionally to make mistakes in order to see if there is a mistake which should not exist or if an error does not exist which there should be.

6.2 System Implementation

In this phase, the design will be converted into program codes. Modification and revision from the previous design can be changed since the design will be put into a real working system. Moreover, to have a success system implementation design, testing, modification, debugging, system integration and verification must be executed. A huge effort has been spent in this phase.

6.2.1 Guidelines on how the system can be implemented

The guideline on how system implemented, is discussed below.

(a) Plan a system for the agriculture-based food cottage industry to market the product via online.

(b) Analyze the problem, feature requirement advantage by using shopping online.
(c) Evaluate the existing system flow and transaction.
(d) Designing the requirement and the flow for the system.

6.2.2 Features and Components of the Prototype

In system analysis, the system is divided into smaller modules or components so that the system is easy to manage and to develop into a working system faster and easily. It would be easy to develop the appropriate interface for the system based on the components. The system has 2 sections and 2 sub sections, namely administrator section and user section. Moreover, the 2 sub sections are under the user section, namely seller and buyer.

6.2.3 Interface Design

The further explanation of the interface design for the system is attached in the following appendix E (administrator section), F (user section), G (seller section) and H (buyer section).

6.2.4 Sources Codes

The source codes for the system are attached in the following appendix I (administrator section), J (user section), K (seller section) and L (buyer section).

6.3 Testing

Testing is a process to ascertain whether the system works according to planning and meeting of all the existing requirements of the user, which are seller and buyer. Testing has been conducted not only when the system has been completed, but also carried out during the development of the prototype system. All functions have been tested one by one to make sure everything works in manner.
6.3.1 Unit Testing

Unit testing is a code written by developers, which is used to test a small section or specific area from the functionality of the codes that will be tested. Unit testing is done to prove whether the code has been written to function in accordance with the will of the programmer. This testing occurs while the software is being developed and after completed.

In unit testing, test cases are designed to ensure that every single unit decision applied to the same design in each unit design specifications. In specification tests, experiments have to do the correct testing and the incorrect one. In the correct testing, unit tested should do what it is supposed to do, and the incorrect testing, unit tested should do what it is not supposed to do. The unit testing for seller login module and unit testing for seller facility payment is shown on Table 6.1 and Table 6.2.

**Table 6.1 Unit Testing for Seller Login Module**

<table>
<thead>
<tr>
<th>Test Procedure</th>
<th>Output/Error</th>
<th>Output Analysis</th>
</tr>
</thead>
<tbody>
<tr>
<td>Login as a seller with the correct user name and password.</td>
<td>Seller is directed straight to seller home.</td>
<td>Directed successfully to seller user home after system verified the validity of user name and password.</td>
</tr>
<tr>
<td>Login as a seller with the incorrect user name and password.</td>
<td>Error message is displayed.</td>
<td>Login is denied and the error message displayed for the wrong username or password.</td>
</tr>
<tr>
<td>Login as a seller without filling the user name and password.</td>
<td>Request message is displayed.</td>
<td>Login is denied and the request message displayed requesting to insert username and password.</td>
</tr>
</tbody>
</table>
### Table 6.2 Unit Testing for Seller Facility Payment

<table>
<thead>
<tr>
<th>Test Procedure</th>
<th>Output/Error</th>
<th>Output Analysis</th>
</tr>
</thead>
<tbody>
<tr>
<td>Registering as a seller and pay the facility fees with the correct credit card number.</td>
<td>Seller is directed straight to payment confirmation page.</td>
<td>Directed successfully to seller payment confirmation page after the system verified the payment.</td>
</tr>
<tr>
<td>Registering as a seller and pay the facility fees with the incorrect credit card number.</td>
<td>Error message is displayed.</td>
<td>Payment is denied and the error message displayed for the wrong credit card number.</td>
</tr>
<tr>
<td>Registering as a seller and pay the facility fees without filling the credit card number.</td>
<td>Request message is displayed.</td>
<td>Payment is denied and the request message displayed requesting to insert the credit card number.</td>
</tr>
</tbody>
</table>

### 6.3.2 Acceptance Testing

Acceptance testing provides the opportunity for users, sellers and buyers, to test the functionality and usability of the system which has been completed. Users will test the interaction using database systems, using network communication, or interaction with other hardware or other applications. System has been tested with data supplied by user and compared to simulation tests. The purpose for acceptance testing is to reveal errors and omissions in the system requirements because the data that used for exercise are different with the data used on the system testing. It will also reveal requirement problems in the system, where the features do not really need by users or the performance of the system is less acceptable.

#### 6.3.2.1 Analysis of Seller Acceptance Testing

Ten entrepreneurs from the agriculture business carried out the system testing. The testing was conducted in their own offices in Banting, Sepang, Sungai Besar, Sabak Bemam and Bangi. There were three (3) parts in the seller system testing questionnaire, i.e. section I asked about the overall opinion with the propose design, section II is about
the responses to the specific questions and the last section was about the overall issues and problems, comments and suggestions. The testing questionnaire can be seen in appendix B and results can be seen as below.

- **Overall Design**

  As shown in Figure 6.1, 70% or seven (7) respondents had rated the overall design of the proposed system as good, 20% or two (2) respondents had rated as excellent and other 10% or one (1) respondent rated it as average. This shows that most of the respondents are satisfied with the overall design of the proposed system.

![Overall Design Rating](image)

**Figure 6.1 The Overall Design Rating**

- **Functionally Features**

  Based on Figure 6.2, 50% of respondents rated the system functionality is very helpful and the other 50% of respondents rated the features are helpful. This shows that the respondents are satisfied enough with the existing system functionality.
• **Features Usage**

In this question, the respondents were asked whether the features of the proposed system useful. Based on the rating that was given by the respondents, all 10 respondents or 100% rated the features of the proposed system are useful (see Figure 6.3). This also shows if the objectives of developing a one-stop system that provides product and company information has been met.

![Figure 6.2 The Seller Features Functionally Rating](image)

![Figure 6.3 The Seller Features Usage Rating](image)
• **System Testing**

The proposed system was tested by respondents to check whether the system works accordingly. As we can see in Figure 6.4, 70% respondents certified the proposed system works accordingly good. 20% respondents certified that the system works excellent and 10% respondent certified it as average. This means that the system has successfully met the user requirement.

![Figure 6.4 The Seller System Testing Rating](image)

• **Familiarity of Usage**

![Figure 6.5 The Seller Usage Familiarity Rating](image)
Based on Figure 6.5 above, 50% or five (5) respondents evaluated the familiarizing of usage of the system as excellent, 30% or three (3) respondents evaluated as good and the rest (20%) as average. This shows that the functions of the system has managed to improve usage compared to the existing system. Nevertheless, the objective of developing a user friendly one-stop directory system and online shopping system are met.

- **System Helpfulness in Daily Operations**

![Bar Chart](image)

**Figure 6.6 The Seller Helpfulness System in Daily Operation Rating**

As we can see in Figure 6.6 above, 70% or seven (7) respondents rated that this system is excellent and helpful in their daily operation in promoting and selling their products. 20% or two (2) respondents rated this system as good enough in helping them in daily operation. The reason why the one (1) respondent (10%) gave poor rating is because there is no internet connection in this respondent area. The telecommunication company does not provide the internet line and furthermore the signal for internet broadband is very poor. Thus, the system will not help this respondent at all in the daily operation. Thus, the objective in identifying problems encountered by the cottage industry entrepreneur has been met.
• **Attractiveness of the Interface Design**

Based on Figure 6.7, 50% respondents have rated the interface design as excellent and the other 50% respondents rated as good. This shows the system has successfully met one of the requirement design guideline which is consistency.

![Figure 6.7 The Seller Attractiveness of Interface Design Rating](image)

The next question is the question that can be found in section II of the testing questionnaire. The question discussed were about the specific question about the system.

• **Error Notification**

This part tested for the error entry. Incorrect data that should not be used by the system is purposely inserted to see if the error notification message works accordingly. As seen in Figure 6.8, ten (10) respondents or 100% agreed that the notification message works accordingly.
In this this part, respondents were asked whether they can view all data (new and existing data). Based on Figure 6.9, all the respondents said they can view all the data. This shows the system is successful in retrieving data that has been inserted and stored into the system.

The next discussion is from Section III of the questionnaire. Section III is about overall issues and problems, comments and suggestions. The respondents were
asked about overall issues and problems, comments and suggestion for the prototype of
the system.

- Issues and Problems

![Issue and Problems](image)

**Figure 6.10 The Seller Issues and Problems**

Ten (10) respondents were asked if there is any issues or problems faced in using the proposed the system. Based on Figure 6.10, 70% of seven (7) respondents rated that there is no issues or problems in using the system, but the other 30% or three (3) respondents rated there might be a problem facing with the system. Two (2) out of three (3) respondents who rated there might be an issues and problems in this system mentioned that not everyone can access the internet and not everyone has an internet access in their place. Moreover, one (1) out of three (3) respondent who rated there might be an issues and problems faced explained that the problem is by being a member, because seller has to pay to register as a member. Not every entrepreneur has enough capital to spend on this. But over of all, there is no crucial issues that might be faced by this system.
• **Comment and Suggestion**

The respondent were asked for any comment and suggestion to improve this system. Based on Figure 6.11, seven (7) respondents or 70% said they did not have any comments. There are three comments and suggestion from three (3) respondents, where one respondent suggested to make an interface design a little bit colourful, another respondent said the administrator or the owner at this website should make an advertisement to public and when the respondent see this system, as a good opportunity to help the entrepreneurs of agriculture cottage industry to expand their market, and the third respondent suggested that there should not be any fees becoming a member, and the owner of this website can take commision 1% or 2% of the total payment for products purchased. These comments and suggestons will be taken into consideration to improve the system development in the future.

![Figure 6.11 The Seller Respondents Comments and Suggestions](image)

• **System Usage**

The respondents were asked whether they will use the system if it is made available. 80% respondents are willing to use the system and 20% respondents claim that they will not use the system (see Figure 6.12). The reason was asked why these
respondents are not willing to use the system, it is because they do not want to pay the registration fee for being a member and also because their area does not have an internet connection yet and the respondents cannot use the internet broadband.

![System Usage](image)

**Figure 6.12 The Seller System Usage**

### 6.3.2.2 Analysis of Buyer Acceptance Testing

To fulfill the requirement in system testing, ten (10) testers from the buyer side were also invited to carry out the system testing. The testing was conducted in Banting, Sepang, Sungai Besar, Sabak Bernam and Bangi. The respondents who were chosen were buyers who purchases products from the entrepreneur’s shop located in their factory. Three (3) sections in buyer system testing questionnaire needed to be filled based on the system testing. In section I they were asked about their opinion with the proposed system design, section II is about the responses to the specific questions related to the business and in section III is about overall issues and problems, comments and suggestions. The buyer system testing result can see as follow:
• Overall Design

![Overall Design Chart]

Figure 6.13 The Buyer Feature Functionality Rating

Based on Figure 6.13, 30% respondents rated the overall design of the proposed system as excellent, 50% respondents as good and the 20% as average. From this rating, it shows that almost all respondents are satisfied with the overall system.

• Functionality Features

![Functionality Features Chart]

Figure 6.14 The Buyer Features Functionality Rating
From Figure 6.14, four (4) respondents (40%) rated the functionality features of the system was very helpful and six (6) respondents (60%) rated as helpful. The system functions in doing the business transaction, even though for new buyers.

- **Features Usage**

![Features Usage Graph](image)

**Figure 6.15 The Buyer Features Usage Rating**

The buyer was tested on the usage of the system features. Based on the testing, all ten (10) respondents agreed that the features on the system are useful. The feature helps them in doing the daily business operations. The buyers rating for features usage can be seen in Figure 6.15.

- **System Testing**

All ten (10) respondents were asked to test the proposed system. This test aims to check whether the system works accordingly. The test result in Figure 6.16 shows that 30% of the respondents claimed the system works excellently, 50% claim it is good and 20% claimed it as average. This can be concluded that the system works accordingly as intended.
• **Familiarity of Usage**

Based on Figure 6.17, the familiarity system usage was tested on the respondents. After respondents tested the system, three (3) respondents (30%) stated that the system was excellently familiar; five (5) respondents (50%) stated that the system was good in familiarity and two (2) respondents (20%) stated that the system was easy enough to use. Thus, the objective of developing a user-friendly one stop directory system and shopping online system are fulfilled.

![Figure 6.16 The Buyer System Testing Rate](image)

![Figure 6.17 The Buyer Usage Familiarity Rating](image)
• **System Helpfulness in Purchasing the Products**

![Bar Chart](image)

**Figure 6.18 The Buyer Helpfulness System in Purchasing the Products**

Based on Figure 6.18, 30% or three (3) respondents answered that this system will excellent to help buyers in marketing product purchase because they do not need to travel miles away just to buy the product, as they can simply clicks few buttons to purchase the product. 60% of six (6) respondents answered that this system is good enough to help buyer purchasing the product. The rest 10% or one (1) respondent answered this system is average in helping buyers to purchase the products.

• **Attractiveness at the Interface Design**

![Bar Chart](image)

**Figure 6.19 The Buyer Attractiveness of Interface Design Rating**
This part discusses the attractiveness of the interface design of the system based on the buyer’s view. From Figure 6.19, the graph shows that 50% of respondents agreed that the interface design was excellent, 40% of respondents rated it was good and the 10% rated it was average.

The next questions in section II, discusses about the specific question about the specific question about to the system.

- **Error Notification**

  Based on Figure 6.20, the incorrect data entry were tested. The incorrect data that should not be inserted were forced to be inserted as to be tested to make sure for error notification. All respondents were tested about the system and all the ten (10) respondents agreed that the system error notification works accordingly.

![Figure 6.20 The Buyer Error Notification](image)
• **Data View**

In this part, respondents tested the system to check whether the data can be viewed. As seen in Figure 6.21, 100% of the respondents claimed they can view the data whether the data were new or existing data. This means that the system has successfully stored data that were inserted to the system.

![Data View](image)

**Figure 6.21 The Buyer View of the New and Existing Data**

The next discussion is from the questionnaire in section III. The respondents were asked about any issues and problems, comments and suggestions for the prototype of the system.

• **Issues and Problems**

Respondents were asked about issues and problems that might exist using the system. As seen from Figure 6.22 below, 70% respondents stated that there is no issues or problems faced in this system, but on the other hand 30% respondents conveyed that there might be some issues and problems faced in the future, such as whether seller uploads all their products that they produced so buyer know all the product they have, and another respondent impeached about the payment system, such as whether the
payment system is convenient for both sellers and buyers. All these issues and problems that have been taken into consideration for the system feature development.

![Pie chart showing issues and problems]

**Figure 6.22 The Buyer Issues and Problems**

- **Comment and Suggestions**

  Comments and suggestions were asked to the respondents. The result can be seen on Figure 6.23, six (6) out of ten (10) respondents said there is no comments or suggestions for this system and the four (4) out of ten (10) respondents give their comments and suggestions for this system. Some of the suggestions are to make sure that sellers will upload and advertise all their products. Another suggestion is to add more features, such as forums. In addition, a respondents commented that this system is only useful and profitable if people buy in a big quantity. If the buyer only buy in small quantity, buyer will end up paying more expensive. These comments and suggestions have been taken into consideration to develop a better system in the future.

- **System Usage**

  The final question was about the respondent willingness in using the system if this system is available. Based on Figure 6.24, 80% or eight (8) respondent stated that if
they will use the system and the other 20% or two (2) respondent stated that they do not want to use the system. The reasons gave by the two respondent who do not want to use the system is because respondent prefers to buy directly from the shop. Another respondent said because in this system, the buyer can only see the picture and cannot taste the product, so buyer does not know which product has a better taste.

Figure 6.23 The Buyer Comments and Suggestions

Figure 6.24 The Buyer System Usage
6.4 Summary

This chapter discusses the system implementation and system testing of the system. In the system implementation, design will be converted into program codes. In the implementation phase, design, testing, modification, debugging, system integration and verification must be fulfilled. After the prototype development of the integrated web-based directory and e-commerce system for agriculture-based food cottage industry and implementation system is completed, the system will be submitted to users to do the acceptance testing. The aim is to determine whether users will accept or reject the prototype that has been developed.

Acceptance testing was carried out to sellers and buyers. Based on the analysis of seller acceptance testing, most of respondents like the overall design of the proposed system, including for the features functionality and features usage. The system also works accordingly and it is a user-friendly system. Moreover, based on the respondents’ feedback, this proposed integrated web-based directory and e-commerce system for agriculture-based food cottage industry will help seller in their daily operation. Furthermore, most of respondents think there will be no issues and problems faced in the future for this proposed integrated web-based directory and e-commerce system for agriculture-based food cottage industry, and few respondents suggest to make the design a little bit colorful. Finally, most of respondents said if this proposed system is available, the respondents are willing to use the system to help them in marketing and sell their products.

The buyer acceptance testing result has almost the same result with the seller acceptance testing result. Most of respondents rated the overall design was good, and the features functionality and the features usage are also very helpful to help respondent discovering the agriculture integrated web-based directory and e-commerce system for agriculture-based food cottage industry. Moreover, most respondents stated that the
system works accordingly and the usage is user-friendly. Furthermore, respondent also mentioned that this proposed integrated web-based directory and e-commerce system for agriculture-based food cottage industry will help them in purchasing the products, thus they do not need to travel miles away just to buy the products. And the final respond was most of the respondents willing to use the proposed integrated web-based directory and e-commerce system for agriculture-based food cottage industry if the system is available.