

**CERTIFICATION OF APPROVAL**

**E-Consultation for Skincare Products via Intelligent Agent Technology**

By

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## **CERTIFICATION OF ORIGINALITY**

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



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MALINIE BINTI JAMALUDDIN

## ABSTRACT

Intelligent Agent technologies are becoming viable solutions to many problems related to E-commerce technologies that are not as user friendly as they seem. The skincare industry is continuously serving customer through consultation by humans. However, human beings have limited capability in fulfilling one's request. With these being said, this Final Year Project focuses on finding an intelligent agent that provides electronic consultation for the skincare industry. The main objective of this project is to create a flexible consultation environment for skincare's customers. This will result in a higher level of satisfaction and experience just like the current system. The methodology used for this project is the waterfall development-based technique which comprises of requirements analysis and definition, system design, implementation and testing, verification and maintenance. The tools used are Macromedia Dreamweaver MX, Adobe Photoshop, Pandorabots free web hosting, Oddcast Inc.'s VHost™, AIML, Apache Web Server and PHP. Based on the work carried out, it is found that although the usage of agent technology is a natural evolution of e-commerce, to effectively build and deliver an agent technology into an e-commerce websites requires rethinking and re-evaluating the human-computer interaction in the new environment. Second round of surveys were conducted to help determining whether users will be interested in the technology. It is found that the concept of an Agent Technology might be an interest to users, provided it can assist them in consultation process. Agent Technology will be even easily acceptable if it is able to provide almost the same consultation experience based on the current consultation style, and able to provide an interactive discussion environment to users. Those who disagree prefer to stick to current style or might reject technology changes. Users are very concern with the reliability of the system as this will be the main factor whether the information provided by the agent technology is reliable or not. As a conclusion, more researches are expected to be carried out by technologists to further understand the acceptance on an agent technology and thus implementing it in various industries throughout the world.

## **ACKNOWLEDGEMENT**

In the name of God, the most gracious and the most merciful, I would like to thank Him for giving me the strength, skills, knowledge, patience and good health in completing my research and final year project. The success of this work depends on the contribution of many people. Therefore, I would like to take this opportunity to acknowledge and recognize the contributions of these individuals.

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# **CHAPTER 1**

## **INTRODUCTION**

### **1.1 BACKGROUND OF STUDY**

This Final Year Research Project is focused on researching an intelligent agent that provides electronic consultation for the skincare industry. This agent technology is mainly used to improve customer service and reduce customer reliance on human operators. By using artificial intelligence techniques, the agent technology will be able to provide answers to service inquiries.

Intelligent agent technologies are becoming viable solutions to many problems related to E-commerce technologies that are not as user friendly as they seem. Moreover, skincare industry is continuously serving customer through consultation in limited time. With the combination of these two elements, perhaps the field of e-commerce in Malaysia will be attractive and becomes a powerful tool in human's life.

### **1.2 PROBLEM STATEMENT**

#### **1.2.1 Problem identification**

Taken from the definition that is being defined by Wikipedia, the free encyclopedia, the term agent technology refers to a software agent that exhibits some form of artificial intelligence. While the working of software agents used for operator assistance or data mining (sometimes referred to as bots), are often based on fixed pre-programmed rules, "intelligent" here implies the ability to adapt and learn.



The need of an agent technology arises from the fact that human beings have limited capability in fulfilling one's request. Besides that, by having an agent technology, it will create a positive effect on the user's subjective experience of the system. For instance, as defined by Doris M. Dehn (1999) by having this technology, the website will be more attractive compared with the current one that the skincare industry actually facing now.

### **1.2.2 Significance of the project**

The system is an addition to the current e-commerce method where users will be able to interact with an agent technology that will consult customers in the skincare industry. The usage of this technology eliminates the need for traveling and one can operate anywhere and anytime within the comfort of their homes or offices. Furthermore, Nikos Karacapilidis (2001) had appointed that this agent technology will create more interesting activity as moreover analysts predict, agent-mediated electronic commerce would further revolutionize Internet commerce.

## **1.3 OBJECTIVES AND SCOPE OF STUDY**

- To create a flexible consultation environment for skincare's customers where the implementation of just-in-time consultation is applied. This will result in a higher level of customer's satisfaction and having similar experience as using the current system.

### **1.3.1 The relevancy of the Project**

With the increasing use of online shopping nowadays, the opportunity of implementing the agent technology in e-commerce will be on the rise and some of the skincare industries from other countries are ready to implement this. Basically, this

project will revolve around a lot of research of the technology involved, as it includes the limitations and advantages in implementing an agent technology. In this proposed study, the just-in-time concept is applied where customers will be able to get consultation they want anytime as the internet operates 24/7 and changes dynamically. Although there are a lot of constraints involved in this project such as limitation of knowledge in skincare industry, it will definitely become an issue in the future as people adapt to changing environment.

### **1.3.2 Feasibility of Project within the Scope and Time Frame**

Initial feasibility of the project can be evaluated through economic, technical and schedule factors.

- **Economic Feasibility**

This application supports feasibility in terms of economic by increasing effectiveness and productivity of current e-commerce system in Malaysia. With this application, the buying process will be more efficient, thus enhancing the flexibility of buying and selling process.

- **Technical Feasibility**

This application can be implemented practically using available technology and expertise. The skills and information to develop this application is available on the Internet and other sources of information.

- **Schedule Feasibility**

The author has schedule to the time given according to the suggested milestone that can be viewed from the Final Year Project Guidelines. Please refer to Appendix A for the proposed project timeline.

## **CHAPTER 2**

### **LITERATURE REVIEW AND THEORY**

Information on products is one of influencing factors in buying product. Communication between sellers and customers may help disseminate the information effectively and educate the customer on the product. In the advent for Information Technology, information asymmetry has been reduced. Customer want to know about one product and the physical shop is not the only resources. The information flow can happen online and in getting consultation, agent may replace human. Research done by Takeuchi, A & Nagaoa (1993) has shown that people are accustomed to interact with other humans but with the availability of the human like characterization, it is actually a one good method for autonomous agents to solve the customer's problem.

Agent technology hopefully can be accepted as one of the technologies that can manage to cope with inefficiency of human beings time management. From the previous history, Goh (2003) had defined that online shopping and online banking have eliminated the need to travel and one operates within the comfort of the home or office. It would be rather hard to get fully satisfaction from the customers upon this new technology, but from the previous pattern, the usage an agent technology will be able to be part of the e-commerce field. Furthermore, it is recognized that the previous facility is not necessarily user friendly and convenient as one may think. According to the technology research firm, Forrester Research (2001), one of the comments stated that the current web service is "DUMB, BORING and Dusty". This can be seen by looking into the human's frustration in dealing with uncertain and unreliable unknown

systems. In particular, when the retailer is far away and e-mail messages are not instantly responded.

Intelligent agent is viable solutions to many current problems in today's complex e-commerce website. From the current trend, the present problems in today's are mainly due to the fact that many current e-commerce technologies are not user friendly as it seems. Users prefer to have "someone" to guide them on online activities as being defined by the Online Shopping Advice. The problem is much similar to the current skincare websites. The usage of the agent technology will enhance the service available at any skincare websites.

According to Alexander and Brian (2004), agent adoption is influenced by perceived innovating characteristics such as relative advantage, compatibility, ease of use, results demonstratability, image, visibility, trialability, and voluntariness. Moore and Benbasat's (1991) have listed the perceived characteristics of innovating and it is presented below:

- Relative advantage is the degree to which an innovation is superior to the ideas, practices, or objects it supersedes
- Compatibility is the degree to which an innovation is consistent with the existent values, previous experiences, and current needs of adopters
- Ease of use is the degree to which an innovation is perceived as being relatively difficult to understand and use
- Results demonstrability is the degree to which the benefits and utilities of an innovation are readily apparent to the potential adopter
- Image is the degree to which innovation usage is perceived to enhance an adopter's image, prestige, or status in his or her social system
- Visibility is the degree to which the results of an innovation are visible to others

- Trialability is the degree to which a potential adopter believes that an innovation may be experimented with on a limited basis before an adoption decision needs to be made
- Voluntariness is the degree to which innovation use is perceived as being voluntary, or of free will.

Consistent with Kleinschmidt and Cooper's (1991) argument, it is hypothesized that the implementation of stand-alone agent systems can lead to great commercial success and reduced risk. Stand alone agent products employing leading edge technologies and targeted to new markets correspond to architectural innovations. This describes the impact of degree to which they will be adopted by end users, as well as the kind of innovations these agents would represent influenced by the perceived innovating characteristics.

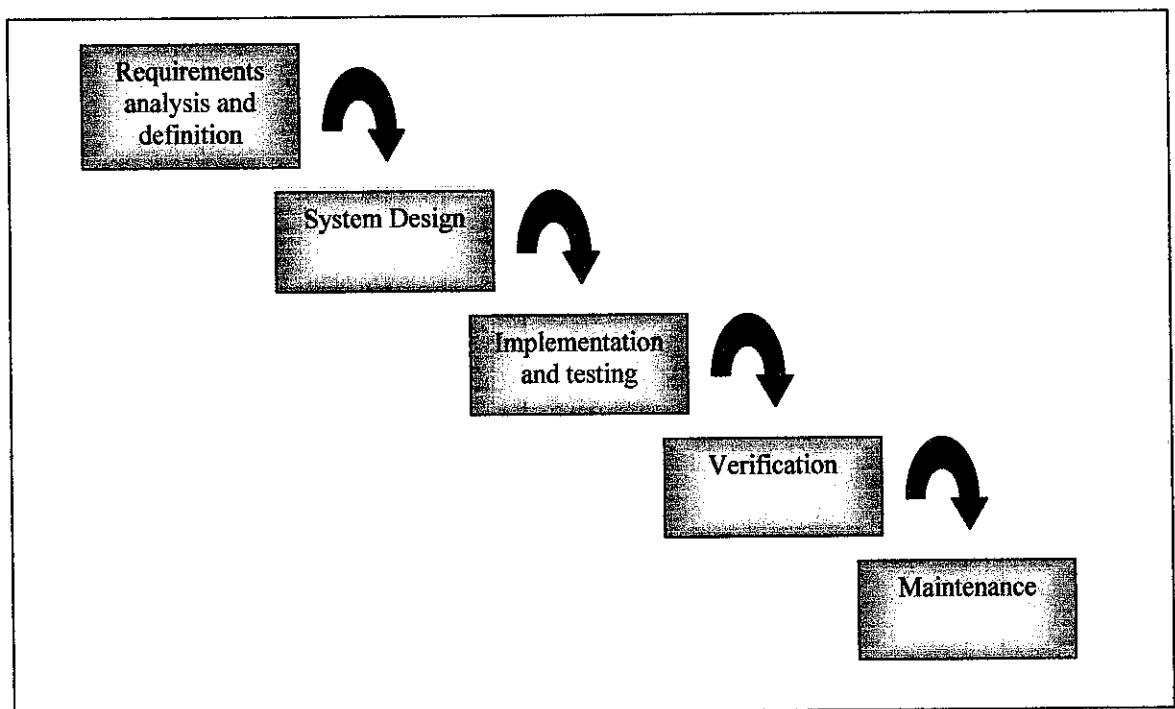
A finding by McBreen (2001) has shown that the interaction between humans and computers are already strongly biased to interpret the behavior of synthetic human like features as life like and believable. By having this fact, Malaysians will most probably will accept this new method of consultation for the skincare industry.

According to the latest information retrieved by the Pandorobot's website (2006), over 6,000 companies use Oddcast's and Pandorabots products today including Coca-Cola, Pontiac, ESPN, and other world renowned brands. The products are being deployed for marketing, sales, content and training. So from this achievement, this tool is the most reliable platform in order to build the agent technology for the skincare website.

## CHAPTER 3

### METHODOLOGY/PROJECT WORK

#### 3.1 PROCEDURE IDENTIFICATION



**Figure 1** Waterfall Development-Based Model

The methodology that has been used in this project is the waterfall development-based where the process model is discrete development stages that are specification, design, implementation, testing and maintenance. In principle, one stage must be complete before progress to the next stage is possible. In applying this development, there is

iteration between stages. Further explanation of each stage to be related with this final year project can be further explained below:

- Requirements analysis and definition

The application services, constraints and goals are established by doing research.

Some of the methods research that has been done is:

- searching for relevant literature review to be included as the supporting information
- justify on the current situation of the skincare industry in Malaysia
- user's evaluation towards this technology (refer to chapter 4.1)
- justify the functional and non functional requirements

- System design

The systems design process partitions the requirements to the real application. In this part, the author established overall system architecture. The system design involved identifying and describing the fundamental software system abstractions and their relationship. The system then developed according to stages and units. First, the system's architecture was developed and next the author developed the user interface of the system by using defined storyboards. Please refer to Appendix B for the navigational diagram, Appendix C for the storyboard and Appendix D for the entity relationship diagram (ERD)

- Implementation and testing

For this stage, the author implemented the development of the system. As defined in the later part, the system design is transformed into lines of programming code. The development of this system required a web server and database server to be installed and configured. For this stage, it consumed a longer period as much of the time has



been allocated for developing the skincare website. All the functions that managed to be completed were tested with random data.

- Verification

As for the preliminary research, real users were tested to check on their knowledge in the skincare industry. Participants were selected randomly as to achieve the concept of their understanding towards applying an agent technology in the current skincare website. Once the development part has been done, the system design is considered as a set of application of program units. The agent is now able to answers all the related questions in skincare industry. Unit testing involves verifying that various questions meet the customer's specification. The individual program units or programs are integrated and tested as a complete application to ensure that the system requirements have been met. After testing, the application was tested with the selected real customers. As for this part, field experiment was done to the users and the users were selected randomly. This type of experiment was selected due to the time constraints and the availability of the participants. (Refer to chapter 4.3)

- Maintenance

Maintenance involves correcting errors which were not discovered in early stages of the life cycle, improving the implementation of system units and enhancing the system's services as new requirements are discovered. Errors that were made are:

- The agent failed to answer some of the user's questions on the skincare products.
- The agent failed to explain to the user's confusion whenever the agent were asked questions that beyond its ability.
- The agent cannot answers some of the user's questions pertaining to its social skills.

However, below were some improvements done to the website:

- agent's brain in terms of its personal conversation with the users and products
- Additional contents at the website were added
- The agent's social skills; agent is able to answer questions that are not related to the skincare products such like greeting and farewell to customer.

Overall, by applying this methodology, it contributed to several advantages to the author and the application proposed. The advantages are:

- Its ability to identify system requirements before programming begins: As this project has its time constraints, requirements need to be defined properly so that there were only minor changes involved at the end.
- It minimized requirement changes as the project proceeds; with this advantage, the author was able to complete the entire task according to the time frame.

### 3.2 TOOLS/ EQUIPMENT REQUIRED

These were the tools used through out the project:

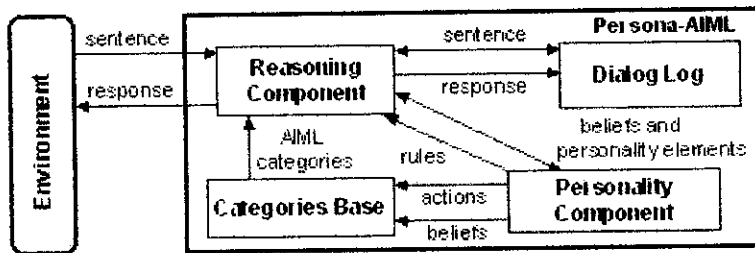
NO	ELEMENTS	TOOLS
1.	Website development	<ul style="list-style-type: none"> <li>• Macromedia Dreamweaver MX</li> <li>• Adobe Photoshop</li> <li>• Apache Web Server</li> <li>• PHP</li> </ul>
2.	Agent development	<ul style="list-style-type: none"> <li>• Pandorabots free web hosting</li> <li>• Oddcast Inc.'s VHost™</li> <li>• AIML</li> </ul>

**Table 1.0** Tools and utilities

### 3.3 THE AGENT TECHNOLOGY

There are number of agent technology currently being used in e-commerce, e-learning, e-government and similar environments. This agent technology that is being implemented in this skincare website communicates using AIML that facilitate high level corporation. The architecture and explanation on other tools are presented below.

- **The Agent-AIML Architecture**



**Figure 2** The Agent AIML Architecture

The figure represents the agent AIML architecture for the creation of agent technology using the AIML scripting. The AIML counts on four components that are categories base, personality component, dialogue log and reasoning component. This architecture has been tested and it is a flexible architecture. Preliminary experiments done by Adjami(2004) revealed satisfactory and very encouraging results in what concerns the coherence of the agent's behavior.

- **Web Hosting-Pandorabots**

Pandorabots is the place where anyone can create and unleash virtual personalities. Pandorabots is an experimental software robot hosting service based on the work of Dr. Richard Wallace and the A.L.I.C.E./AIML free software community.

From any browser, the author will be able to create, design and publish the agent technology. The agent technology available to anyone via the Internet and can be accessed through a website that is to be built.

Therefore, the development of a website that consists of the agent technology can be forecasted completed on time due to facilities that are provided in the web hosting.

- **AIML (Artificial Intelligence Markup Language)**

The Artificial Intelligence Markup Language is a derivative of XML (Extensible Markup Language). Its goal is to enable pattern-based, stimulus-response knowledge content to be served, received and processed on the Web and offline in the manner that is presently possible with HTML and XML. AIML has been designed for ease of implementation, ease of use by newcomers, and for interoperability with XML and XML derivatives such as XHTML.

AIML objects are made up of units called topics and categories, which contain either parsed or unparsed data. Parsed data is made up of characters, some of which form character data, and some of which form AIML elements. AIML elements encapsulate the stimulus-response knowledge contained in the document. Character data within these elements is sometimes parsed by an AIML interpreter, and sometimes left unparsed for later processing by a Responder.

The most important units of AIML are:

- `<aiml>`: the tag that begins and ends an AIML document
- `<category>`: the tag that marks a "unit of knowledge" in an Alicebot's knowledge base
- `<pattern>`: used to contain a simple pattern that matches what a user may say or type to an Alicebot
- `<template>`: contains the response to a user input

As applying this technology into the free webhosting, the agent technology will be more intelligent and capable to have a mind like other human operator.

- **Oddcast Inc.'s VHost**

Oddcast Inc.'s VHost™ platform that allows the author to publish flash-based interactive characters onto the skincare website.

Recently added Text To Speech capabilities have made the VHost platform uniquely suited to the needs of the skincare website that is to be built. A speaking virtual character (called a 'VHost') provides a much-needed visual embodiment to an otherwise faceless bot.

An integration of Oddcast and Pandorabots technology now allows Pandorabots users to easily add a VHost to the agent technology. Oddcast has made available to Pandorabots users several VHosts that allow author to publish the agent technology at no cost. These free VHost characters are for demonstration purposes and may be used for up to 500 text to speech streams per month.

This technology will allow the author to completely customize the agent technology in terms of its face, hair, eyes, voice, clothing and expand the author's imagination to life.

- **Other existing web hosting – Microsoft Agent**

Microsoft® Agent is a software technology that enables an enriched form of user interaction that can make using and learning to use a computer, easier and more natural. Due to this fact, though it is a web hosting specialized for an agent programming, it is more suitable in assisting user on how to use a software or completing a task rather than Pandorabots that is more user friendly and will able to converse with the user.

The usage of agent technology is a natural extension of e-commerce and has the potential to make the consultation towards skincare products even more widely available and accessible than going to the available skincare counter at the market.

The role of flexibility of the agent technology in the consultation process is a critical success factor.

It is within this context that the agent technology can contribute to the quality of e-commerce nowadays. It offers opportunities to optimize interaction between the skincare company and its customers. The availability of internet also makes it possible to provide the consultation service to the customers that are either without the facilities of transportation or continually on the move (for example business professionals).

Whether as a form of basic information delivery for customers of all ages or as a form of professional development for the skincare vendors, agent technology represents services “on the go, anytime, anywhere consultation.”

However, a lot of factors need to be taken into consideration such as cost-effectiveness and user acceptance before the usage of agent technology becomes a common thing in the future.

### **3.3.1 Requirement Analysis – Functional Requirements**

The functional requirements for this application describe what the system should do. These requirements were depend on the software that is being use, the expected users of this application and the general approach towards this system. Functional requirements for an application may be expressed in a number of ways. Here are the functional requirements for the application, used for the customers to answer all their questions pertaining to the skincare products:

- The agent technology will be able to answers and consults anything that about the skincare’s product.
- The user interface for the agent technology shall be implemented as effectively as possible.

As for the features, the agent technology allows the customers to have a conversation virtually over the internet. It will only focus on information related to skincare field. The agent technology will also be able to have basic conversation like other human beings have done. If the agent technology is served with questions that it might not be able to answer, it will then reply politely telling the customers that it is incapable of helping the customer. There will be a dialogue box showing the conversation between the user and the agent technology. The agent technology also has an added feature of being capable to generate facial expression. This is to increase the human computer interaction included in the website. By having these features, it will definitely overcome the problem statement specified above.

### **3.3.2 Requirement Analysis – Non-Functional requirements**

The types of non-functional requirements are:

- **Product requirements** – These requirements specify the product behaviors. As for this application, this product should be able to answer the customer's questions pertaining to skincare. The agent should have answers to all the questions effectively and will answer in an appropriate way if the agent cannot solve the customer's questions. Whatever the question is, the agent also needs to respond in a smart way as if like the real human operator.
- **External requirements** – This broad heading covers all the requirements that are derived from factors external to the application. These include interoperability requirements that define how the system interacts with the customers. Below are some metrics involved in specifying the non-functional requirements:

- Speed

The process of answering the customer's question should not take a long time. This is due to the naturality of human's behavior that sometimes can not tolerate too much delay.

- Ease of use

The application should be as simple as possible so that the customer's will not waste their time in figuring on how to interact with the agent technology.

- Reliability

As the system involves with the skincare industry, the information should be reliable same as how the human operator giving out the information at the counter. Therefore, the agent needs to be trained in order to achieve reliability in it.



## **CHAPTER 4**

### **RESULTS AND DISCUSSION**

#### **4.1 USER EVALUATION-PRE TEST**

Throughout the analysis process of this project, the author finds out that although the usage of agent technology is a natural evolution of e-commerce, to effectively build and deliver an agent technology into a e-commerce websites requires rethinking, re-evaluating the human-computer interaction in the new environment.

The author research is aimed at understanding interaction experience in using an agent technology by examining a broad range of aspects of customers, their environments, and relationships. This research is broken into two main areas: understanding of interaction experience in the enhancement of the current websites and the reliability of an agent technology.

To understand the interaction experience in the new environment, two important components are examined:

- Understanding of the skincare's customers – including their characteristics, psychological (affective and cognitive) and physical capability.
- Understanding of the agent technology environment – the motivations and circumstances surrounding of the agent usage and adoption and how and why people adopt the agent technology.

### **4.1.1 Method of Gathering User and Task Data**

The purpose of the questionnaire is to elicit information on the effectiveness of applying the agent technology in as a consultation tool. It is an excellent way of obtaining either quantitative or qualitative data, since the user responses are written and can be tallied to illustrate user preferences. Questionnaires can only evaluate user's opinions about the implementation of an agent technology. Please refer to Appendix E for the questionnaire sample (Pre-test).

### **4.1.2 Research Design**

A research design is logically designed plan allowing the author to derive appropriate conclusions from her initial research question. After deciding the appropriate techniques, the author made the following decisions:

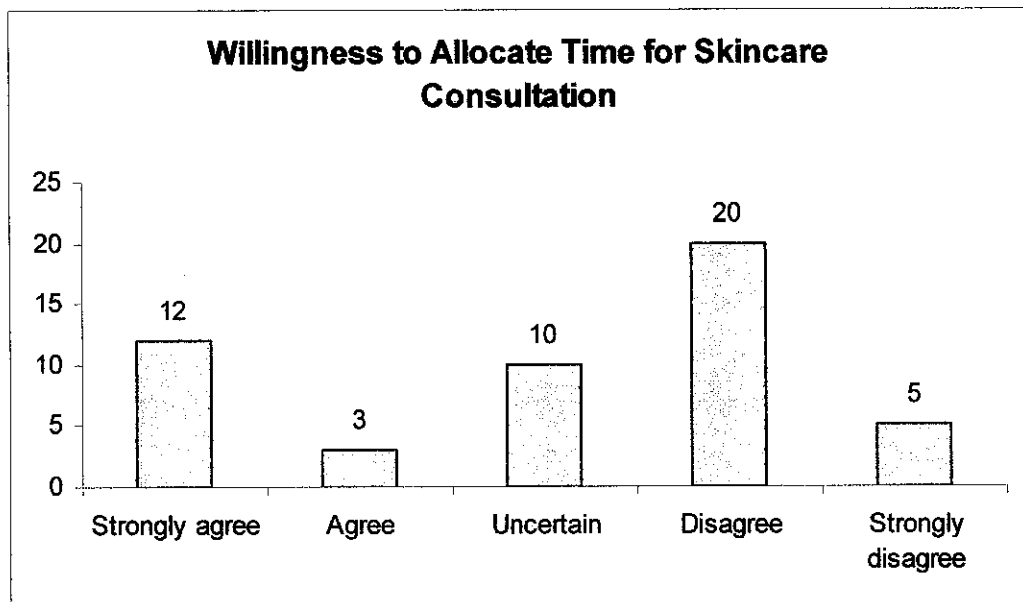
- The appropriate number of participants would be between 50 people in total, which is composed of skincare customers.
- Since time was a limiting factor, it would be most appropriate to have only one round of survey
- Structure questions would be used for the questionnaire to allow participants to provide analyzable data on what the author realized would be an enormous body of information.

### **4.1.3 Reactions to the Idea of Implementing Agent Technology In E-Commerce**

First responses to the idea were mixed, as many were immediately accepting, some were immediately rejecting. Irrespective of their initial view, most responded with questions about nature, format and purpose of implementation the agent technology. Respondents are quite difficult to adapt with the agent technology, largely because it

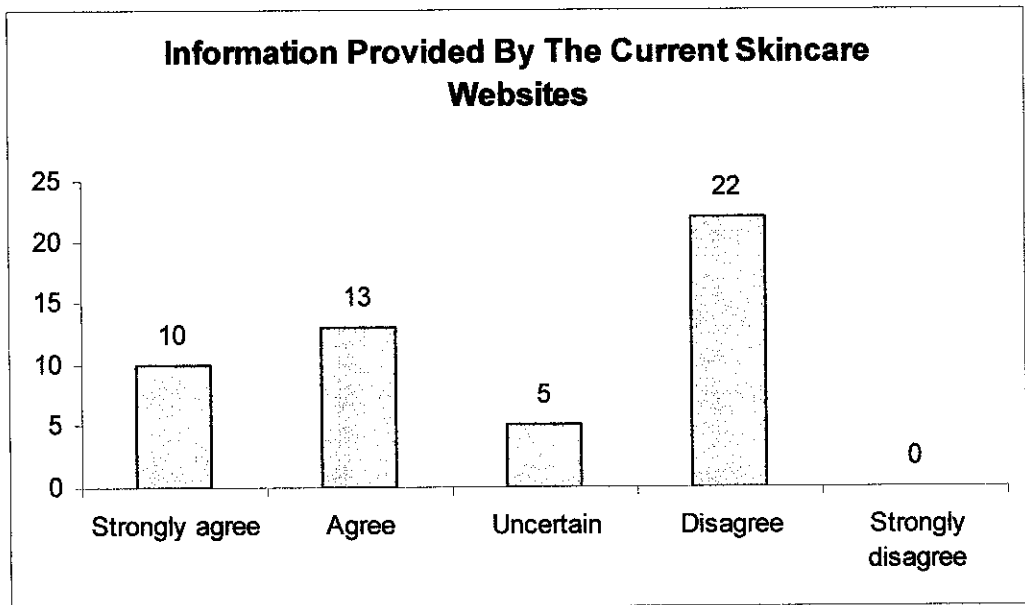
was still a new concept in skincare industry in Malaysia, and this was used for the remainder of the discussions.

The initial tendency was for the respondents to consider the benefits and drawbacks of the implementation of agent technology for themselves as individuals. Those initially most favorable towards the idea argued that they would benefit from it. However, the ones that disagree towards the idea argue that they would benefit more from the traditional consultation at the counter system.



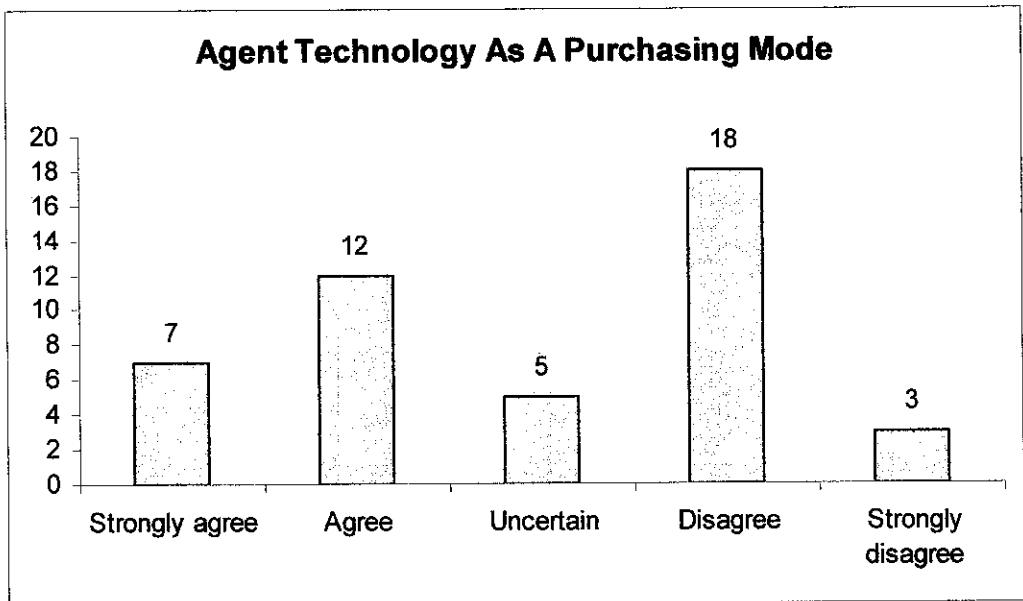
**Figure 3** Willingness to Allocate Time for Skincare Consultation

Generally, all the participants are using skincare products. Majority of them prefer to have consultation before purchasing any skincare products. Unfortunately, most of them did not have an appropriate and enough time to go to the counter to get the consultation as shown in Figure 3. This due to their hectic lifestyle and most of the time are being use for their careers, studies, family and other activities.

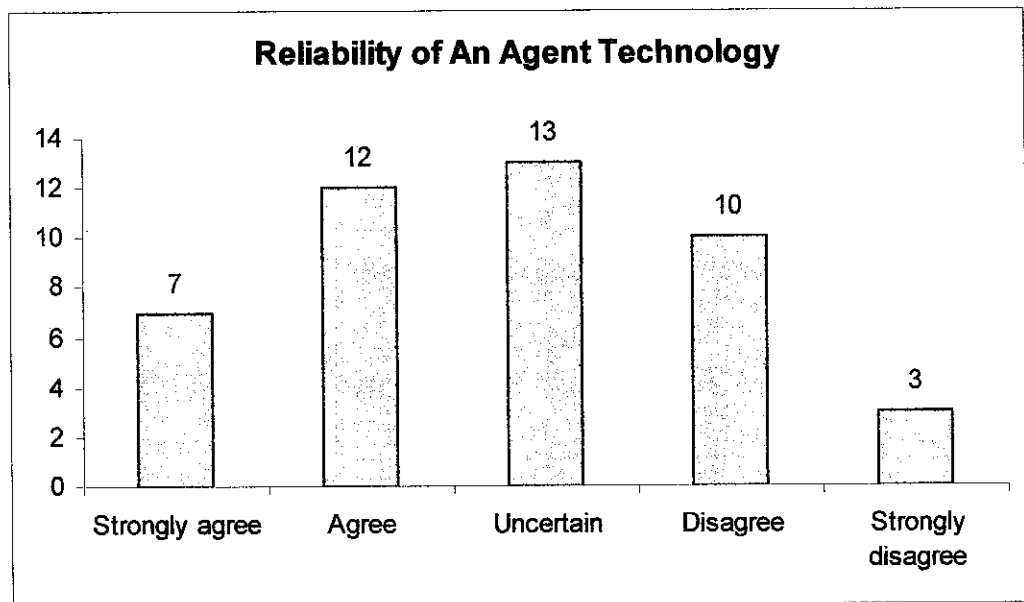


**Figure 4** Information Provided By Current Skincare Websites

Research from the questionnaires had shown that the current websites equally provide enough information. This is shown in the Figure 4 where the total number of users that agree with the statement is almost the same as the one that disagree with the statement. Most probably by having an agent technology, the numbers of viewers can be increased.



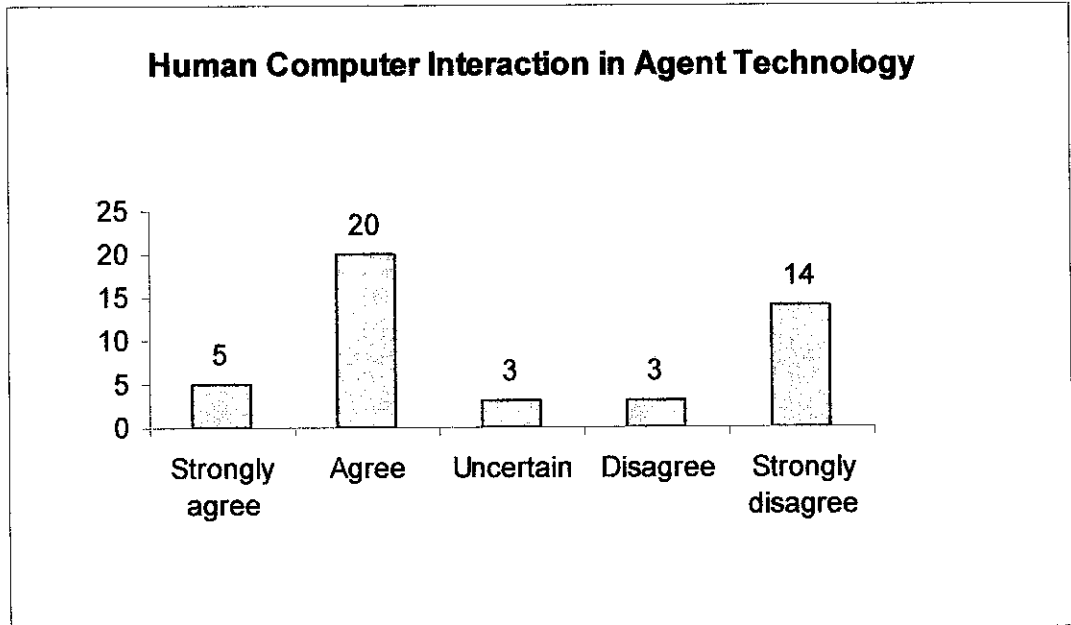
**Figure 5** Agent Technology as a Purchasing Mode



**Figure 6** Reliability of an Agent Technology

Generally, as for Figure 5 and Figure 6, most of them disagree with the idea of implementing the agent technology as the purchasing mode. This is most probably that they are new with this term and they do not see a clearer view of the advantages of implementing this technology. Latest, from the Vhost website, McAfee's virtual salesperson managed to increase online sales by 10%. So, this is shown that by using

an agent technology, it will increase the purchase mode among the users. Besides that, the users also demand for reliability of information since skincare consultation will effect on the usage of the skincare products and it is rather critical for human's life



**Figure 7** Human Computer Interactions in Agent Technology

Furthermore, if the agent technology is going to be implemented in the skincare websites, majority of the participants expect a maximum adoption of human computer interaction in it. This can be proved from the Figure 7.

#### **4.1.4 Conclusion Derived From questionnaires**

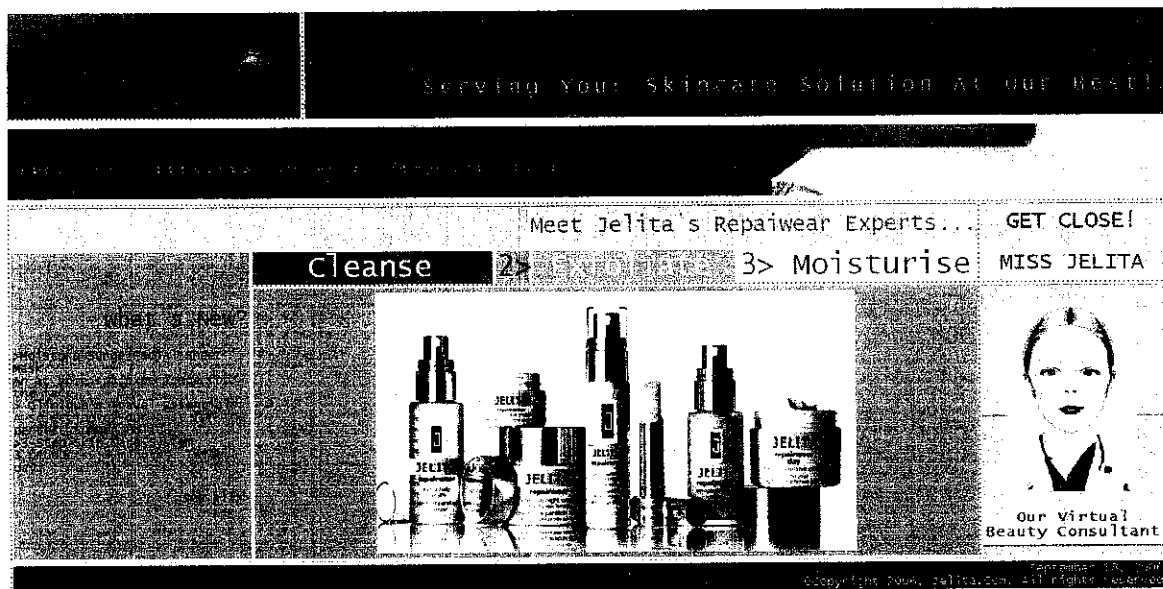
After analyzing the survey data, the author found that the concept of implementing an Agent might be an interest to the users, provided that it can assist them in consultation process. Apart from it, Agent will be more easily acceptable if it is able to provide almost the same consultation experience based on the current consultation style, and able to provide an interactive discussion environment to the users. Those that disagree prefer to stick to current style or might resist to technology changes. Users are very

concern with the reliability of the system as this will be the main factor whether the information provided by the agent technology is reliable or not.

## 4.2 USER INTERFACE DESIGN

During the beginning of design phase, the interface of the website focusing on the main function that is the development of the agent was carried out. The first step was to build the story board in order to make sure all the functions are not left behind when the development of the system starts. The storyboards only illustrate not only the position and basic layout but also the link from one webpage to another webpage. After completed the designing of the layout, the XHTML and the interface code using PHP control took place.

- Main page

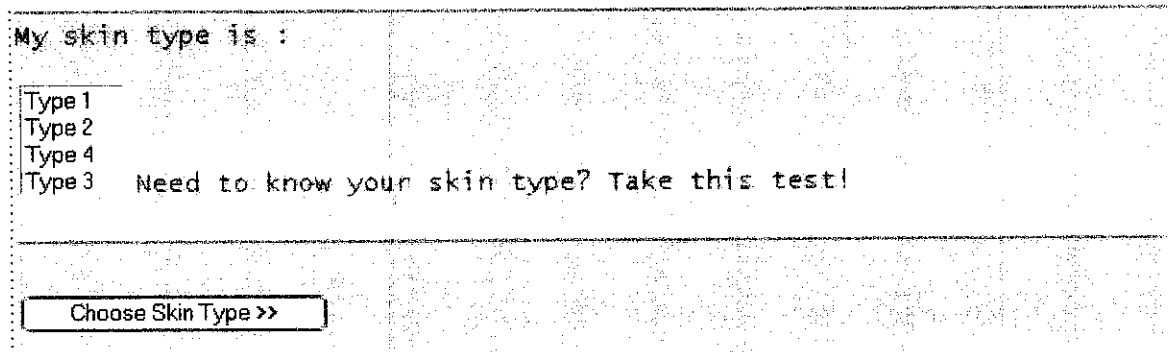


**Figure 8** Main Page

Anyone who browses into this website will get the view of the home page as shown above. This page is being set as the default page for this website where it will be the first page for user once they are accessing this website. This page also displays other

links to other webpages for user to navigate according to their preferences. To be connected with the agent, the user can simply click on the image of the agent and can be linked to the next process.

- Skin finding page



**Figure 9** Skin finding page

In order to interact with the agent, the user needs to specify their skin type. This can be done by reading the explanation of each skin type written in the text above or take a simple test provided by this website to determine the skin type.



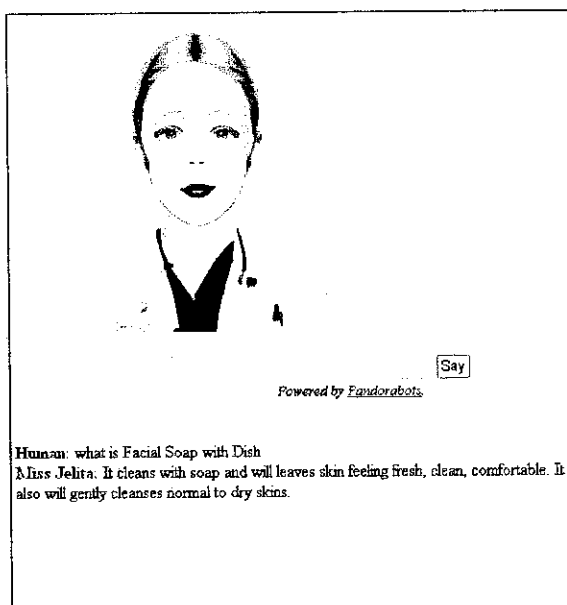
You have chosen skin TYPE 1



**Figure 10** Product proposed page

Then, this website will link the user with the proposed products that best suits their skin type. User will be able to ask the virtual agent any inquiries regarding the products proposed. This can be easily done by clicking the link provided at the bottom of this webpage as shown in Figure 10.

- Agent page



**Figure 11** Agent Page

The last and final webpage developed for this skincare is the agent website. Once user clicks the link, the user will be directed to the webpage where they can interact with the agent. Users can text in any relevant questions regarding the products and the agent will answers it similar to the human operators that are available at the counter.

### **4.3 USER EVALUATION-POST TEST**

In order to analyze the effectiveness of the proposed website among users, a survey was conducted. The purpose of conducting this survey is to study on the acceptance of users towards the new developed website. It is also to see or measure on how far the project meets its objectives.

#### **4.3.1 Method of Gathering User and Task Data**

This survey was done in a type of field experiment. This experiment was done in a natural environment in which work went on as usual but treatments were given to one or more groups. In executing the survey, a total of 40 sheets of questionnaires was given to respondents that were divided into groups. The types of groups that involved in this post test were:

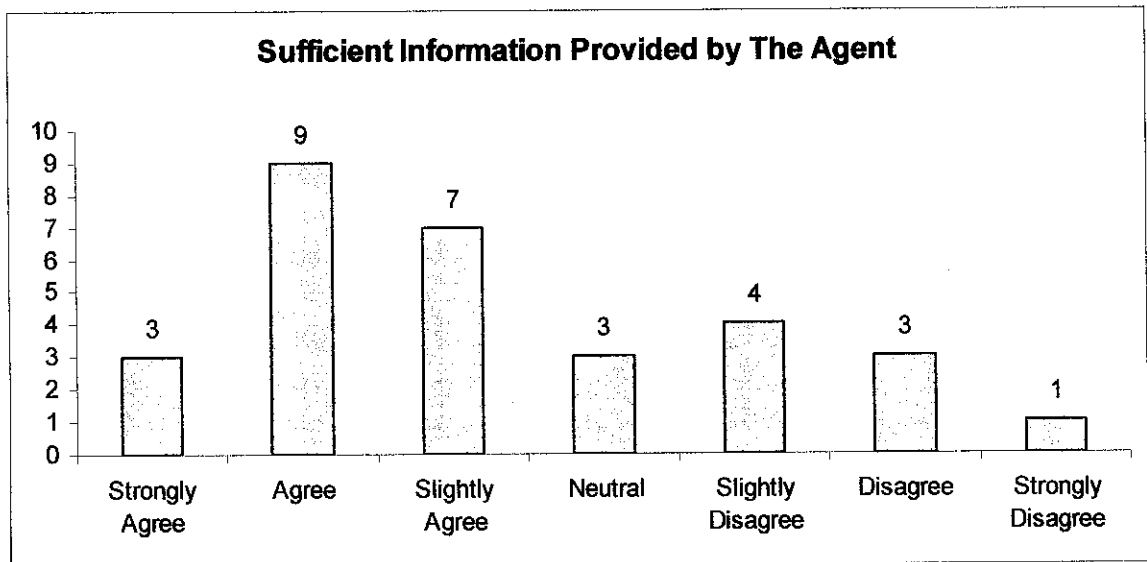
- I. 10 female respondents, randomly selected students from UTP
- II. 10 female respondents, randomly selected aged between 30-45
- III. 10 male respondents, randomly selected

Please refer to Appendix F for the questionnaire sample (Post-test).

### 4.3.2 Reactions to the new Website, Implementing Agent Technology In E-Commerce

The results of the questionnaires are as follows:

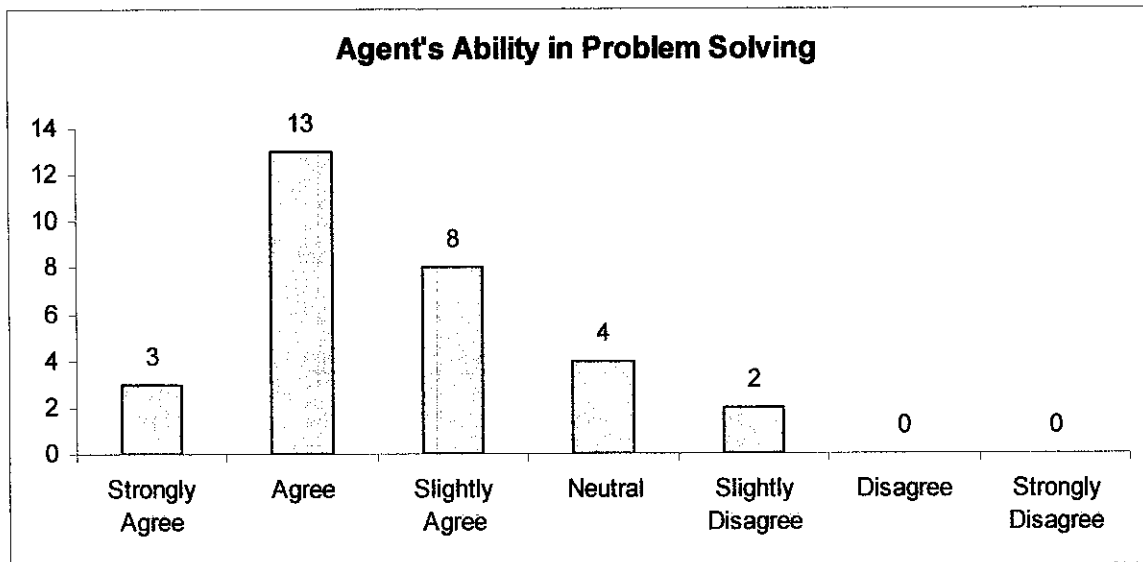
#### Question 1



**Figure 12** Sufficient Information Provided by The Agent

From the observation, majority of the participants agreed that the agent technology managed to provide information that they were looking for, particularly on the skincare products. Some of the users were not really satisfy with information provided by the agent. This problem occurs because users expected that the agent is to be skin expert and should be able to answer to dermatological problem, which is beyond the scope of this project.

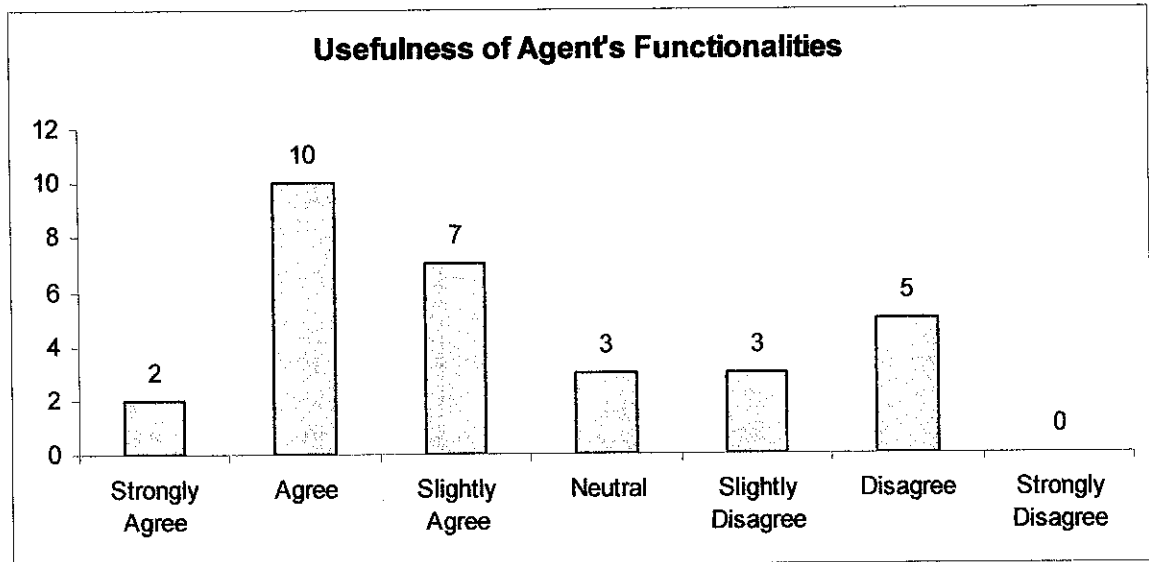
Question 2



**Figure 13** Agent's Ability in Problem Solving

From the figure above, most of the users were satisfied with the role of the agent technology in solving their inquiries on the skincare products. This is because that the agent's brain was well-trained and had gone through several in-house testing before it was being released for real testing for the users. So, an agent technology can be concluded that it can be a useful medium in fulfilling customer's needs provided that the agent is programmed with necessary and relevant information in having consultation with the customers.

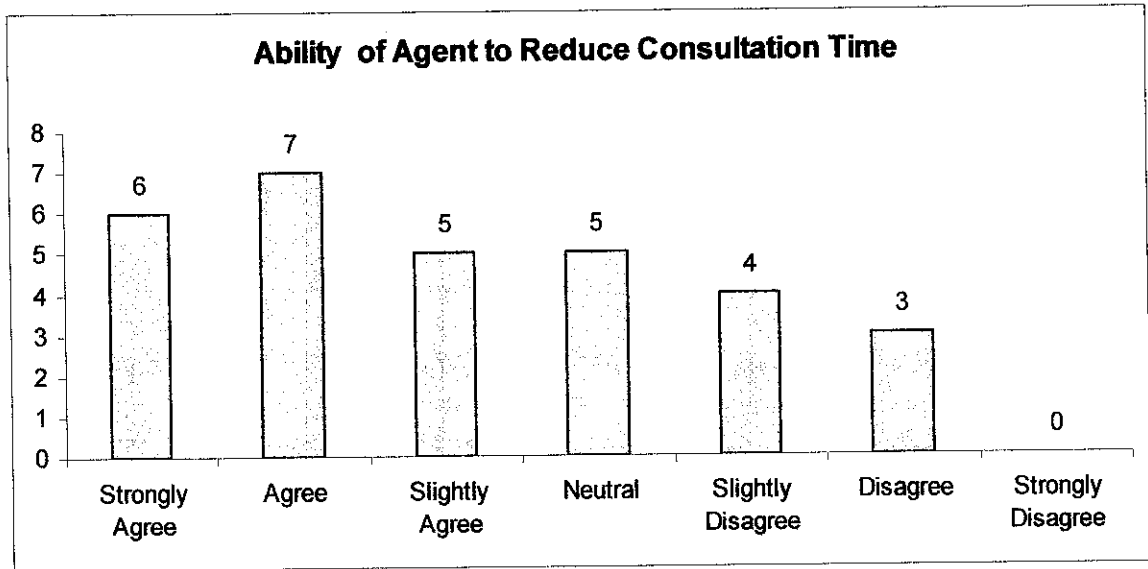
### Question 3



**Figure 14** Usefulness of Agent's Functionalities

Most of the participants agreed that the agent's functionalities are useful for the skincare users. This means that the function of the agent in the website works well. Almost certainly, the majority of the users were able to adapt with the new technology in the skincare industry and do not rely fully at the human operators. The rest that disagree with this technology were probably comfortable with the current system of having consultation at the beauty counter rather than having it virtually.

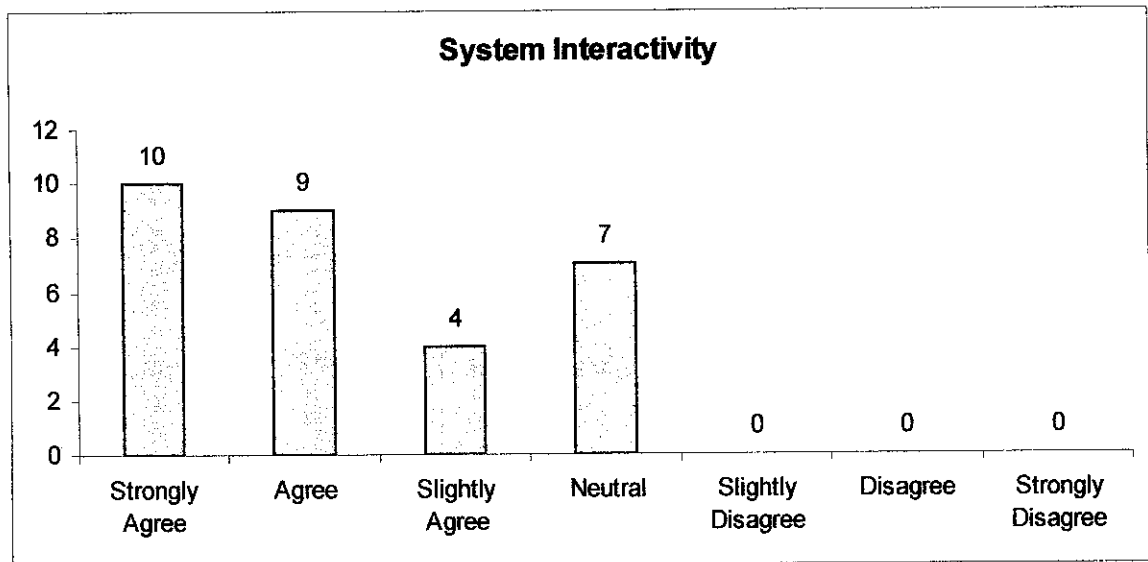
Question 4



**Figure 15** Ability of Agent to reduce consultation Time

The participants involved in using the new website realized that the agent technology really helps in saving their time. Rather than going to the counter, the participants also believe that the agent technology acts an alternative way in having consultant with the beauty consultant. This can be proved by the large number of participants as shown in the figure above that agree with this technology as it is able to save their time.

Question 5

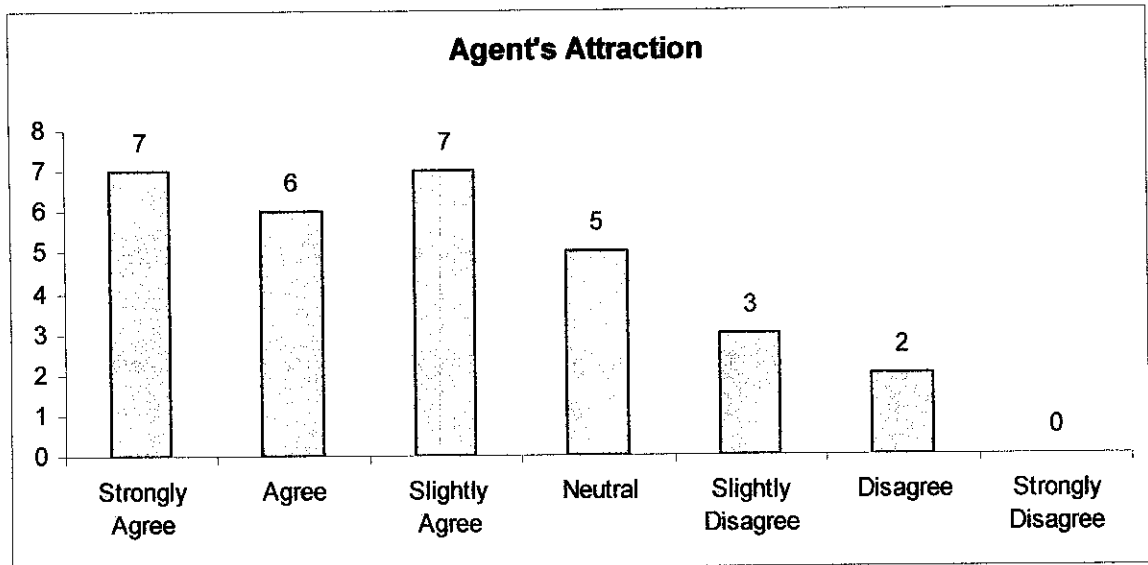


**Figure 16** System Interactivity

None of the participants disagree with the interactivity in the web site. Some of the participants favor in the website's theme color and the arrangement of text in the website. They have no problem in navigating from a web page to another web page and all of them have used their majority of time in having consultation with the agent while accessing the website.



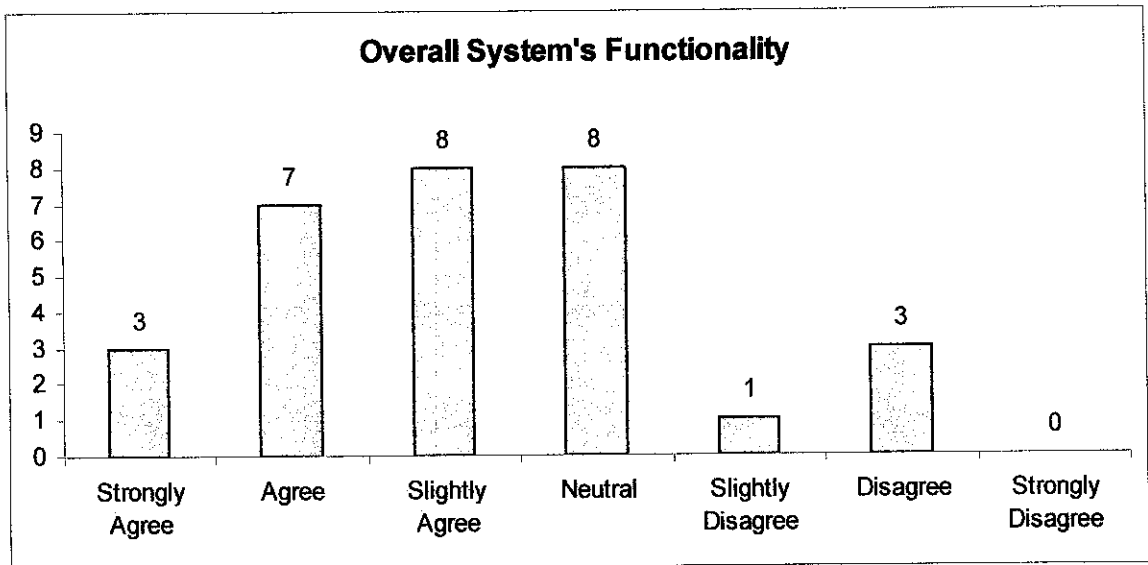
Question 6



**Figure 17** Agent's Attraction

Majority of the participants believe that an agent technology will be able to be an element of attraction in a website. Although the technology is kind of new, it will definitely attract more users visiting the website. Users will want to have experience having virtual conversation over the internet and therefore any websites that adopt this technology will be able attract more users.

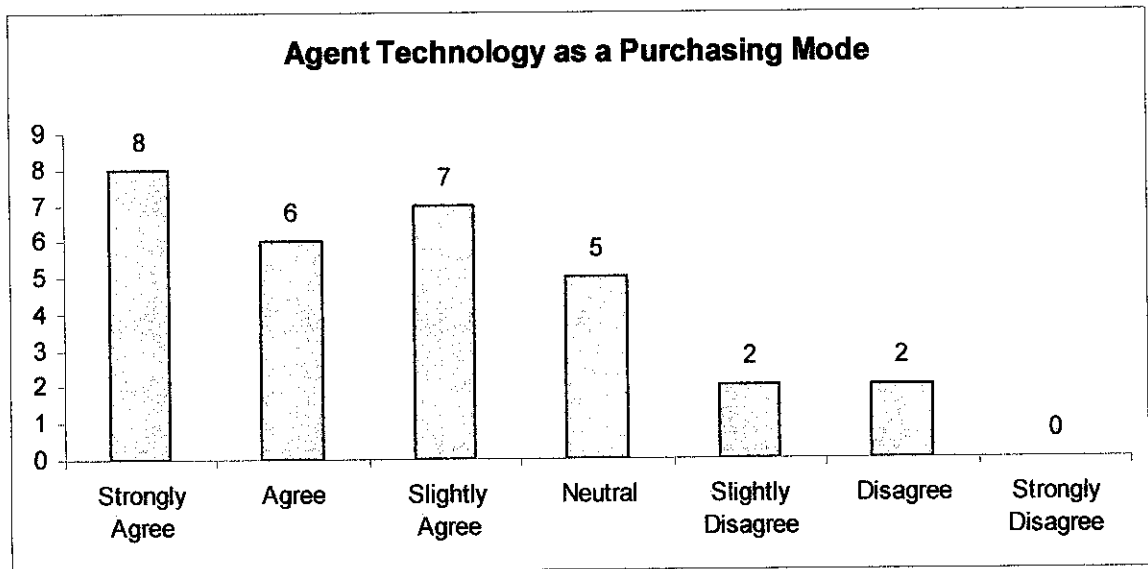
Question 7



**Figure 18** Overall System's Functionality

From the observation, most of the users were happy with the overall system's functionalities. Those who disagree with this website were more particular as they came from an IT background and they tend to detect flaws in the website easily. However, from the results, it shows that the system managed to overcome the problem statement as stated in Chapter 1.

Question 8



**Figure 19** Agent Technology as a Purchasing Mode

Lastly, an agent technology is able promote purchasing mode among the users. As shown in the figure above, minority of them felt that the agent technology failed to attract them in buying the products. Most probably, they did not get the information they wanted at first and this has results in low level of their purchasing mode.

#### **4.3.4 Conclusion Derived From questionnaires**

After analyzing the survey data, the participants have clearer view on the concept of an agent technology compared with the pre test done previously. The author felt that the community is able to accept the agent technology as a virtual beauty consultant to them. As for the participants, they have realized that the technology is able to provide the consultation services 24/7. Besides than that, the overall website managed to be accepted by them as it includes the agent and relevant information in it. The agent page is beneficial for them in order to get the information they wanted without going through the text by text information in the website. The agent technology also is very practical method to be included in any skincare websites.

## **CHAPTER 5**

### **CONCLUSION AND RECOMMENDATION**

This research provide user with a new look on shopping style, where they can have the consultation they want via internet. Users can have a virtual discussion where it has the same capability like the human operators at the counter. This in turn introduces the concept of flexibility. This project can help user to know more about the skincare products that they are about to use. Most importantly, this website can be used anywhere and at anytime.

During the research on the application of the agent technology, the author faced a lot of challenges and problems which at times hindered the research period of this application. Lack of resources and time is the main limitation factor in the research and study of this application. Apart from that, unavailability of participants for the survey process also posed a problem to the user.

Overall, it can be said that all objectives are achieved. Development of the website is also being rectified to be effective that it can reduce the hassles of the human operators in entertaining all of their customers. The author believed that she managed to explore the possibility of consultation via an agent technology in Malaysia.

However, despite that the fact that every problem statements and objectives has been addressed, this system has its own limitations. For recommendation, the system can be enhanced more in terms of its user friendliness. Users who accessed the website should be addressed by the agent technology as it will results in closer connection between both parties. The system should also include a shopping cart so that users will be able to buy the products online while having conversation with the agent. Finally,

from time to time, the agent's brain should be trained more so that user's inquiries could be solved without any difficulties.

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# APPENDIX A





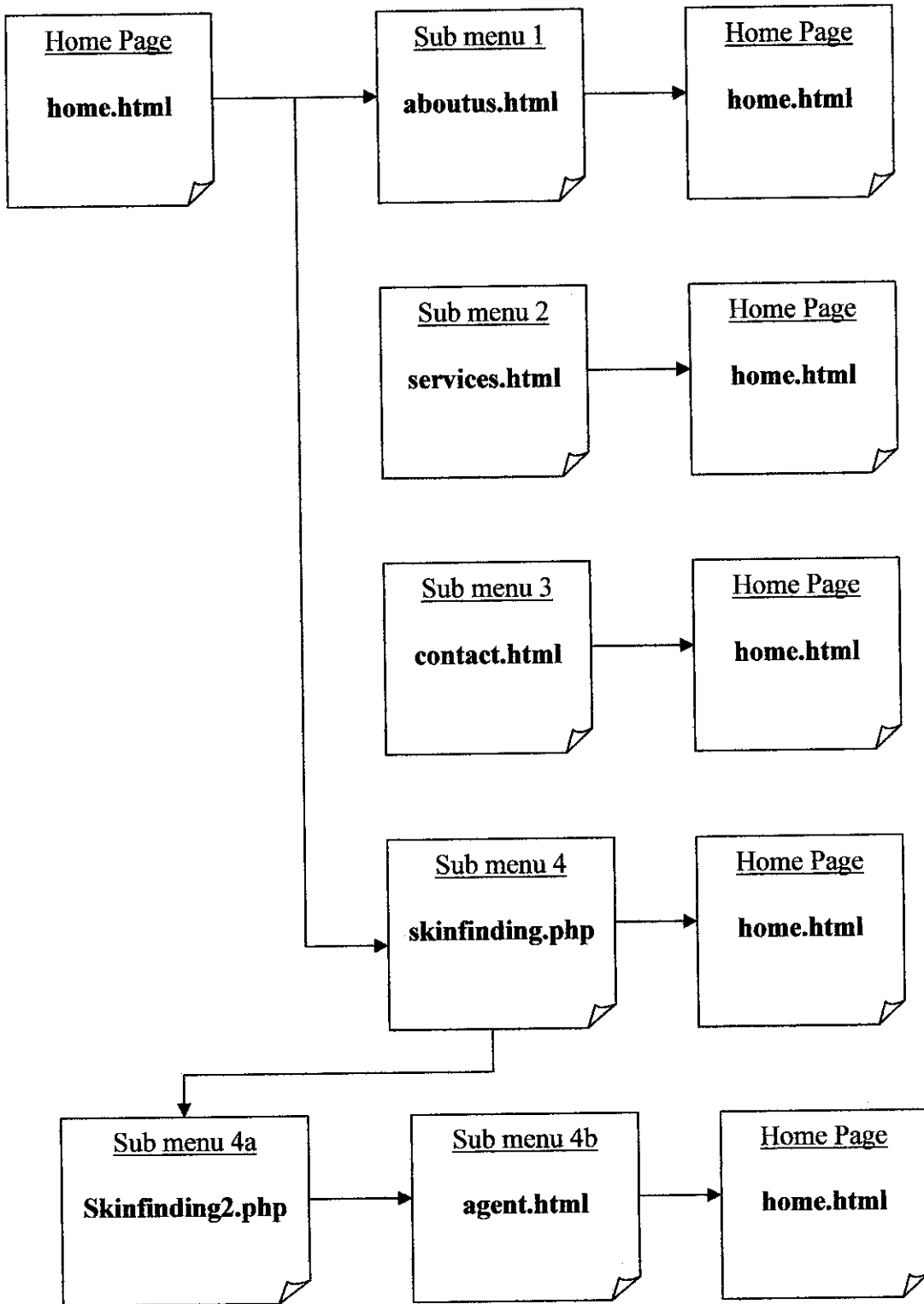
Project timeline and Milestone (FYP Part 2)

	1	2	3	4	5	6	7	8	9	10	11	12
1. System and Website Development (continue)												
• Programming and coding												
• Database management												
2. Submission of progress report			•									
3. Implementation and testing												
• Set up system												
4. Verification												
• User Acceptance Testing												
• Problem Identification												
5. Maintenance												
• Correcting error												
6. Submission of Final Draft							•					
7. Final Report								•				
8. Exhibition										•		



## APPENDIX B

Navigational Diagram



## APPENDIX C



## Storyboard

- Default page for abouts.html, services.html, contacts.html and home.html

<Image>	<Company's Motto>			
	<Link 1> <u>abouts.html</u>	<Link 2> <u>services.html</u>	<Link 3> <u>contacts.html</u>	<Link 4> <u>home.html</u>
Text and Images	<Text and Images>  <u>skinfinding.php</u> <Agent's Image>  <Link 5>			
	<Date>			

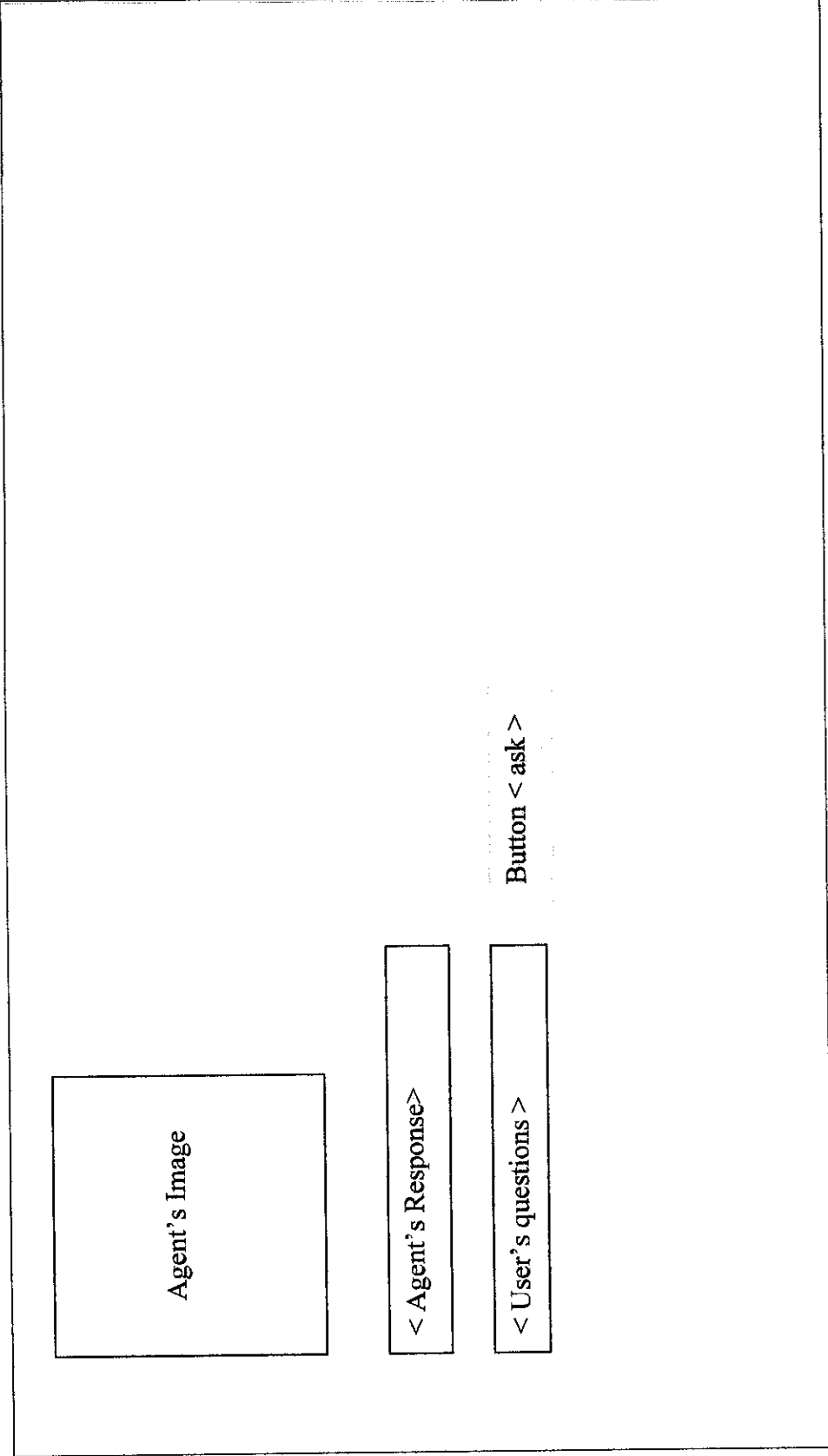
- skinfinding.php

<Image>	<Company's Motto>			
	<Link 1> <u>aboutus.html</u>	<Link 2> <u>services.html</u>	<Link 3> <u>contacts.html</u>	<Link 4> <u>home.html</u>
Text and Images	<p>&lt;Description of skin types&gt;</p> <div> <p><u>Type 1</u></p> <p>-----</p> <p><u>Type 2</u></p> <p>-----</p> <p><u>Type 3</u></p> <p>-----</p> <p><u>Type 4</u></p> <p>-----</p> </div> <div style="border: 1px solid black; padding: 5px; width: fit-content;">       &lt;select skin type&gt;     </div> <div style="text-align: center;">       Button &lt;select&gt;     </div> <div style="border: 1px solid black; padding: 5px; width: fit-content; margin-left: auto;">       Description of skin types     </div>			
	<Date>			

- skinfinding2.php

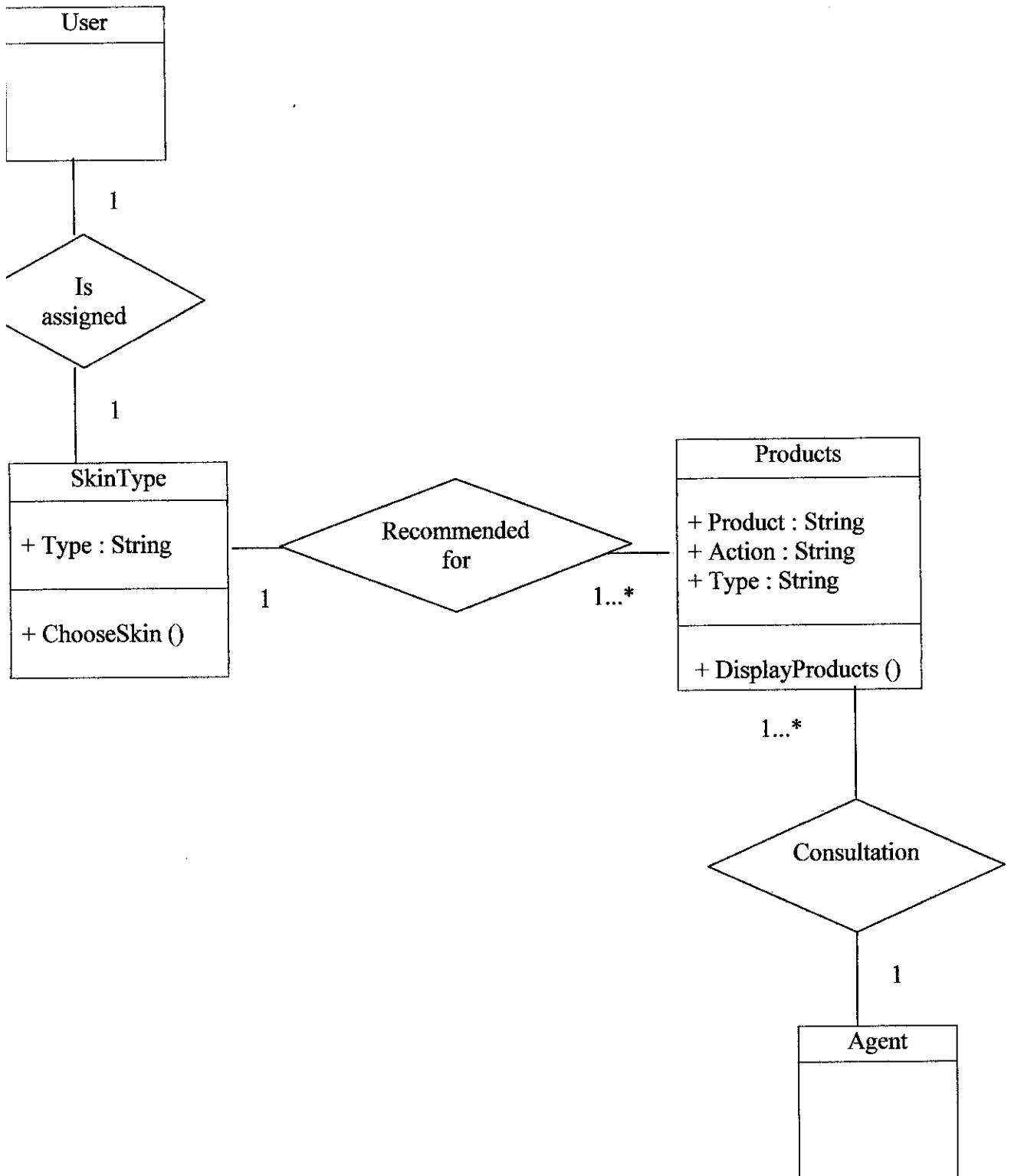
<Image>	<Company's Motto>			
	<Link 1> <a href="#">aboutus.html</a>	<Link 2> <a href="#">services.html</a>	<Link 3> <a href="#">contacts.html</a>	<Link 4> <a href="#">home.html</a>
Text and Images	Skin type chosen <Type 1>			
	1> CLEANSE -----	2> EXFOLIATE -----	3> MOISTURISE -----	
			Proposed Products	
			<Link 6 > <a href="#">Agent.html</a>	
	<Date>			

- Agent.html



## APPENDIX D

# Entity Relationship Diagram (ERD)



## APPENDIX E

The purpose questions is to elicit information on the efficiency and user acceptance of an Agent Technology. The questions are based on your opinion about the system after the experience and evaluation on the new website. Tick the most appropriate response into the boxes.

### Section 1: Personal background

1. Gender
  - Male
  - Female
  
2. What is your age grouping?
  - 18-25
  - 25-40
  - 41-50
  - Over 50
  
3. Do you use any skincare products?
  - Yes. Brand: \_\_\_\_\_
  - No
  
4. What is your level of computer knowledge?
  - High
  - Moderate
  - Learning
  - None

### Section 2: Current situation of skincare industry

1. Would you need for a consultation before purchasing any skincare products?
  - Strongly agree
  - Agree
  - Uncertain
  - Disagree
  - Strongly disagree
  
2. You have appropriate and enough time in going to the skincare counter?
  - Strongly agree
  - Agree
  - Uncertain
  - Disagree
  - Strongly disagree



3. Do you think that the existing skincare websites provide you with enough information?
- Strongly agree
  - Agree
  - Uncertain
  - Disagree
  - Strongly disagree

### Section 3: User-acceptance on an agent technology

1. Do you think an agent technology have the potential to be a common thing in the future?
- Strongly agree
  - Agree
  - Uncertain
  - Disagree
  - Strongly disagree
2. Would you consider an agent technology to be part of your purchasing mode?
- Strongly agree
  - Agree
  - Uncertain
  - Disagree
  - Strongly disagree
3. Agent technology is convenient for reliable information
- Strongly agree
  - Agree
  - Uncertain
  - Disagree
  - Strongly disagree
4. Interactivity in e-commerce can be met by an agent technology
- Strongly agree
  - Agree
  - Uncertain
  - Disagree
  - Strongly disagree
5. For the usage of agent technology, it is necessary to use maximum quality of human computer interaction
- Strongly agree
  - Agree
  - Uncertain
  - Disagree
  - Strongly disagree

6. Additional comments on the implementation of an agent technology:

---

## APPENDIX F

The question below asks about the effectiveness of using the website that includes an agent technology. The questions are based on your opinion about the system after the experience and evaluation on the new website. Tick the most appropriate response into the boxes.

SECTION ONE: About yourself and your knowledge on Agent Technology

Please circle the numbers representing the most appropriate responses for you in respect of the following items.

1. What is your age grouping?

- 18-25 years old
- 25-40 years old
- 41-50 years old
- Over 50 years old

2. Your computer skills

- High
- Moderate
- Learning
- None

3. Your gender

- Male
- Female

4. Do you know anything on Agent Technology?

- Strongly agree
- Agree
- Slightly agree
- Neutral
- Slightly disagree
- Disagree
- Strongly disagree

SECTION 2: About the effectiveness of using the proposed skincare website that has an agent technology included.

1. Do you think that the agent technology able to provide you the information wanted on skincare products?

- Strongly agree
- Agree
- Slightly agree
- Neutral

- Slightly disagree
- Disagree
- Strongly disagree

2. Do you think that the agent is able to solve any of your problems in skincare products?

- Strongly agree
- Agree
- Slightly agree
- Neutral
- Slightly disagree
- Disagree
- Strongly disagree

3. Do you think that the agent's functionalities are useful for the skincare user?

- Strongly agree
- Agree
- Slightly agree
- Neutral
- Slightly disagree
- Disagree
- Strongly disagree

4. Do you think that the agent is helping you in terms of saving more time?

- Strongly agree
- Agree
- Slightly agree
- Neutral
- Slightly disagree
- Disagree
- Strongly disagree

5. Do you think that the system is interactive compared with a system that does not include an agent technology acting as a virtual beauty consultant?

- Strongly agree
- Agree
- Slightly agree
- Neutral
- Slightly disagree
- Disagree
- Strongly disagree

6. Do you think by using an agent technology, it will attract more users visiting the website?

- Strongly agree
- Agree
- Slightly agree
- Neutral
- Slightly disagree
- Disagree
- Strongly disagree

7. Do you feel that the proposed skincare website with an agent technology is more practical than the ordinary skincare website?

- Strongly agree
- Agree
- Slightly agree
- Neutral
- Slightly disagree
- Disagree
- Strongly disagree

8. Are you satisfied with the system's functionality?

- Strongly agree
- Agree
- Slightly agree
- Neutral
- Slightly disagree
- Disagree
- Strongly disagree

9. Does the agent technology able to increase your level of purchasing mode towards the skincare products?

- Strongly agree
- Agree
- Slightly agree
- Neutral
- Slightly disagree
- Disagree
- Strongly disagree

10. Additional comments on the implementation of an agent technology and your recommendations for future enhancement:

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