

First Aid Online System

By

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Dissertation submitted in partial fulfillment of the requirements for the
Bachelor of Technology (Hons)
(Business Information Systems)

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CERTIFICATION OF APPROVAL

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Arina Binti Mohamad Johari

A project final report submitted to the
Information System Programme,
Universiti Teknologi PETRONAS
in partial fulfillment of the requirement for the
BACHELOR OF TECHNOLOGY (HONS)
(BUSINESS INFORMATION SYSTEMS)

Approved by,

.....
(Puan Mazlina Binti Mehat)

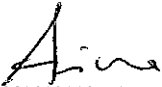
UNIVERSITI TEKNOLOGI PETRONAS

TRONOH, PERAK

DECEMBER 2006

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 reference and acknowledgements, and that the original work contained herein have not been undertaken or done by unspecified sources or person.



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(Arina Binti Mohamad Johari)

ABSTRACT

A study shows that there are more percentages of people who less being educated about first aid than the percentage of people who have being educated about first aid. After have gone through several actions in observing the problems occurred to this matter, the author has decided to provide a first aid system for those who want to ensure that they are well educated about first aid and its activities.

This system is provided to the Malaysian people especially to the working people who have less time to go for first aid training and to those who are least aware of the appropriate actions to be taken when facing any emergency cases. The author provides useful information and beneficial first aid activities in the system and also interesting features that can help users educate themselves.

In order to achieve the objectives in developing a useful system, the author has used a prototyping-based methodology as her guideline to develop the system. In the planning phase, the author has gathered all information about first aid. The information was gathered from the experience in attending first aid training at KLCC during her internship. The author analyzed the problems by interviewing the participants who attended the training and also NIOSH (National Institute of Occupational Safety And Health) in order to get a better idea on what problems need to be solved. After that, a system was designed and implemented to improve the problem occurred. Next, the author has done testing on the system by using a user acceptance test with NIOSH trainers and colleagues. After finish doing the testing, the author has done some changes in order to get a better result of the system.

In the report, the author also has included interfaces of the system. This is to get a better idea of what she has done for the system. While developing the system, there are some limitation occurred such as time frame to finish the system. As for recommendation, the author has suggested several things that need to be improved such as additional features need to be put in the system.

ACKNOWLEDGEMENT

First of all, the author would like to express her most appreciation to her supervisor **Puan Mazlina Binti Mehat** for her guidance in assisting the author through out the project development. The author also would like to thank NIOSH trainers, **Encik Yunus Ripin** and **Encik Mohd Amin** who willing to help her in giving ideas from their working experience in first aid. Both Puan Mazlina and the NIOSH trainers have given the author a great opportunity to work with her as well as giving opinions for the project.

The author would like to express her appreciation to people who have contributed through out the completion of the Final Year Project (FYP). It has been a pleasant experience to work with peers who have given their support and invaluable assistance.

Last but not least, the author would like to express her special thanks to her family for persistent supports and prayers in any undertakings.

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CHAPTER 1

INTRODUCTION

1.1 Background of Study

Every year, National Institute of Occupational Safety And Health (NIOSH) will conduct first aid training at respective companies such as PETRONAS. The training involves the explanation of first aid's theories and also there would be some demonstration conducted by one of the NIOSH staffs. The training is good to be implemented as NIOSH conducts a beneficial training for the participants. The activities that they conduct during the training are Cardiopulmonary resuscitation (CPR), Heimlich Manoeuvre where it is an effective treatment for choking, treatment of wounds and bleeding and bandage. These are some of the first aid activities that they usually have during the training. The maximum participants can be up to 50 people per training in order to be properly trained by NIOSH staffs. The staffs will brief the participants regarding first aid in the first session and for the second session; the participants have to do the first aid practical exercise. First aid information is included in the NIOSH website. However the information is not sufficient to educate the user. It only provides first aid question and answer session, and information on buying a first aid kit only.

1.2 Problem Statements

1.2.1 Problem Identification

Based on the current situation, NIOSH only organizes first aid training to respective companies once a year. The training is very beneficial to participants as it can help the participants to be aware of the first aid. Then, people can be mentally prepared before they handle an emergency for example controlling their emotions and think before take an action. However, the first aid steps might be forgotten when needed as it is not being commonly practiced. The importance of knowing first aid becomes meaningless. This is because, if people do not have the first aid skill, they cannot preserve life. They cannot pay strict attention to safety. Then, they cannot prevent illness or injury from worsening such as fail to treat multiple injuries in sensible order of priority. After that,

they cannot reduce pain, fail to promote casualty's recovery such as arranging for appropriate medical attention and also they do not manage to care for the unconscious victims. Furthermore, participants tend to forget if the first aid practically handled just once and that is why they cannot create awareness about first aid in themselves. This is not a good practice for them because if there is any emergency that needs first aid, they do not remember the steps used in overcome in such of the situation.

1.2.2 Significant of the Project

Based on the problems occurred, a system is proposed to help NIOSH giving better training to their participant. This system also would help the participants by having great training through the system and at the same time make the system usable to them to educate themselves regarding first aid after the training end. It involves a continuous process of educating people in providing a better understanding of first aid as an overall concept and practicality. The system will be more thorough in terms of its functionality and ability to assist the NIOSH in educating their participants and ability to promote the participants in having an education of first aid.

1.3 Objectives and Scope of Study

1.3.1 Objectives

The objectives of this project are to help the user to gain knowledge in first aid using a system. Once the user has gained the knowledge, they can apply it in the future emergency cases. Then, it also helps NIOSH to promote different kind of training which are practical training and training through system. So by having this system, user can browse it anytime they want either in the office or at home.

1.3.2 Scope of Study

This application is based on learning first aid through an appropriate system which needs an interaction from NIOSH and the first aid users with the system. This system provides a few functions in order to make the first aid users be more aware of first aid and fully utilize the system. The system contents are designed by following the first aid

activities that is provided by NIOSH. This system will be an online learning kiosk where the participants are able to educate themselves about first aid.

The author provides and has designed several functions in the system. Those functions are:

- **Registration and log in user's function**

For this function, the author puts it in a page where user can register to answer the scenario test page and give feedback through feedback page. This function is linked to database using PHP MySQL.

- **Video demonstration**

The author includes this function in the system where users are able to download the demonstration videos which are CPR demonstration video and choking video. This function is placed in the system where the author places the video file in the same file as the rest of the functions and contents.

- **Bulletin Board**

This function is for the NIOSH administrator to post any news related to first aid and first aid members can read the news.

- **Feedback or comment message from participants to NIOSH administrator**

This function can help the users in asking any questions regarding first aid to the expert or the users can also send comments about the usability of the system. Once the user has registered, the user can give comment that will be transferred to database for the administrator to track.

- **Categorization of users skill**

This function is to categorize users who have different skills in applying different first aid activities. Basically, the system provides several scenarios. In each of the scenarios, users will be given a few questions to see whether they understand the first aid activities or not. The questions provided are regarding first aid facilities should be used in related situation. Then, the type of treatment should be given to the victims based on the scenarios given. The system also provides potential injury and how to reduce it based on the scenario given to the users.

CHAPTER 2

LITERATURE REVIEW AND THEORY

2.1 Importance of first-aid

Death that based on cases like drowning, suffocation and trauma could occur before the victim reaches the hospital. Such these cases could be prevented if the family physicians give proper help to the victim. In order to determine the higher chance of survival of the victim, the family physicians must be able to play their roles effectively. Therefore, it is essential for them to have a good knowledge on first aid and have the confidence in performing it. As stated by Dr Shaukat Ali, Neurophysician of the Jinnah Postgraduate Medical Centre (2005), family physicians must be aware of emergency treatment and should provide knowledge of the first aid to the patients at the earliest so that one person's life can be resolved. However, it is better if the family or society members are equipped with first aid training.

Another respective person who is specialized in this medical area, Dr Balaji Sadasivan, Senior Minister of State for Health and Information, Communication and the Arts stated that the audiences should be trained in first aid techniques so as to be prepared for emergencies (as sited in Saravanan, 2005). As Dr Balaji said in his keynote address, "First aid readiness is the key towards a community that is prepared for disasters. It is timely that the people have this competition at a time when they have been made acutely aware of terrorism and natural disasters around the world."

The Senior Minister of State observed that accidents and disasters are not always foreseeable, for which reason the community must always be prepared. Dr Sadasivan added that greater recognition of its efforts is needed to increase awareness of first aid skills and techniques. He said that first aid skills have tremendous significance in emergencies. For example, the chances of surviving cardiac arrests decrease by 10% per minute without intervention. So delivery of cardiopulmonary resuscitation (CPR) within 10 minutes of cardiac arrest makes the difference between life and death. So the ability of family physicians to identify life threatening situations and quickly response to it appropriately is very importance to determine the survival of the victim. Certain measures such as CPR have to take place immediately in dealing with these situations.

2.2 Learning styles through system

Based on the research on learning, people learn differently and that they prefer to use different type of resources. Nowadays, there are many learning styles which can be used by people to gain knowledge. One of learning styles that can be found is through education systems. As stated by Declan Kelly and Brendan Tangrey (2004) stated that education systems can support users to learn first-aid adequately in such a learning environment (education systems). Furthermore, it also stated that there are many different types of learning styles in learning first-aid. Those are learning through text, learning through audio video and learning by having practical. From these learning styles, all of them are suited with the user's learning behavior in order for them to learn better through system. By having educational systems, it can provide users with information that can help them to receive, perceive, understand and process the information simultaneously. So as a result, people can learn more effectively, in terms of time manner, it is very efficient as people can use it anytime they want and the most importance part is that the knowledge gained continues captured in people's mind.

CHAPTER 3

METHODOLOGY

3.1 Procedure Identification

The author used a prototyping-based methodology (refer to Appendix Figure B) for her to develop the system. This methodology contains planning phase, analyzing phase, designing phase, implementation phase, system prototype phase and evaluating the finish product phase. The duration of the project to be finished is seven month (refer to Appendix Figure A).

3.1.1 Planning phase

Before developing a system, the author had gathered information needed so that she can develop it. Therefore, she compiled the information gained from her experience in assisting first aid training conducted by NIOSH in KLCC during her industrial internship with PETRONAS Corporate HSE. The author had observed several problems that occurred in the training. The author had interviewed several training participants with the purpose of getting their opinion and feedback about the training.

3.1.2 Analyzing phase

After conducted interviews with the training participants and also the NIOSH trainers, the author believed that she needed to come out with solutions to overcome with the problems occurred (refer to chapter 1 1.2 problem statements). To solve the problems, she went to see NIOSH trainer (Encik Mohd Yunus Bin Ripin) to highlight to him on the participants' opinion and ideas regarding the training. The author suggested to develop a first aid system and several functions (refer to 1.3.2 Scope of study) needed to be placed in the system. Upon their agreement, the author developed the system and continue updated them on any progress during development process.

3.1.3 Designing phase

After the author analyzed the elements that must be covered in the analysis phase, the author designed the features and functions of the new system to overcome the problems occurred. In the designing part, the author had designed the system interface first (refer to the screen shot in chapter 4 result and discussion). The author had included several content management, media such as demonstration videos, images and also icons so that the system would be effective for the user to use. As for the video part, the author went to NIOSH office which is situated in Bangi for video shooting assisted by the NIOSH trainers. Once finished shooting the videos, the author put the video file in a file that contains all first aid system file in her computer. It is because, when users click on the video link, the video can be played and downloaded successfully.

3.1.4 System prototype

This system prototype was designed during the development process (refer to chapter 4 to see the screen shots).

3.1.5 Implementation and testing

After the system prototype was created, the author did a usability testing in order to get the opinions from the respective people.

3.1.6 Analyzing, designing & implementation

Once the NIOSH trainers and public who did the test on the system, the author did some modification and added new contents required by them. The modification processes were done iteratively in order to get a complete system.

3.2 Tools Used

1) *Macromedia Dreamweaver*

The software helps to create and design features, tables, add text and import demonstration videos from other file.

2) *Apache*

Software that can act as the platform to open the PHPmyAdmin to view database and able to display first aid system in the web.

3) *PHPmyAdmin 2.3.2*

It provides an authorization controlled by an authorized person to secure the data. It also provides function such as importing and exporting data into SQL statement or in Excel format for backup process.

4) *MySQL 4.0.0-alpha-nt running on localhost as root@localhost*

The system is stored in the organization server after NIOSH approve the system to be implemented in their organization. The authorized person can update current data, insert new data of new registration members, create table and drop table statement.

5) *Adobe Photoshop*

This software is used to design the first aid images before export them to Macromedia Dreamweaver.

CHAPTER 4

RESULT AND DISCUSSION

4.1 Conduct testing on the system

For this project, the author had applied the prototyping-based methodology (as discussed in chapter 3) in order to keep her in a sequence manner to develop the project.

After finish developing the system, the author had performed usability testing. Due to time constraint, the testing part was conducted in different situation which involved the NIOSH trainers and random users. With the NIOSH trainers, the author met them in person and showed the system interface using her workstation. So, NIOSH trainers were test on the system which involves the linkage of the system interfaces, the alignment of the images in each of the pages, icons and buttons that should be placed accordingly. They also had viewed and suggested questions that need to be added in the categorization of user skill's function. Furthermore, they also checked on the contents whether it is suitable for the users to gain knowledge in first aid or not. For users' part, the author asked 10 randomly picked user to do the checking. To do the testing, the author distributed questionnaire to the users (refer to Appendix Figure E). All of them managed to answer it. Basically, the questionnaire asks about the usability of the system and function user's interaction with it.

The first function involves is registration for the first aid user. So, in the questionnaire, the author had asked for their opinion whether the details of the registration is suitable or not. All of them (100%) stated that the details are suitable especially the company detail (refer to figure 1.1). This is because, it is easy for the NIOSH administrator to organize the data in the database and furthermore users from various companies will register to this system. So, the users could be differentiated based on the company detail.

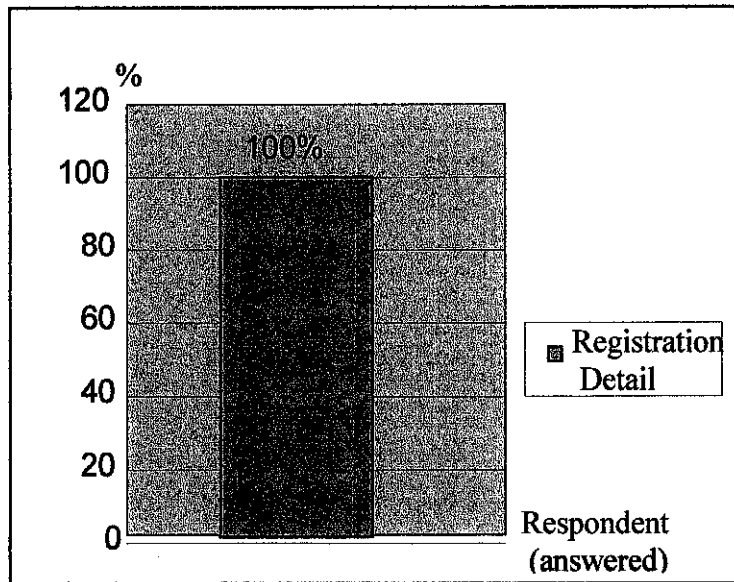


Figure 1.1 shows a graph that contains the percentage of user rating based on their testing on the registration function.

For the download video function, the author had asked about the appropriate use of the video to the users and also the image of the video when it is played. 80% of the evaluators saying that the videos are suitable for the users to learn as it is easy to understand and the videos contain the significant steps to do first aid activities which are the CPR and choking (refer to Figure 1.2). Another 20% stated that for the CPR, they would prefer a step-by-step video showing each CPR activities. For example, they want to have a video file that contains the first step in doing CPR. Then, continue with the next video file of the second step in performing CPR. This is because to them, by having these step by step demonstration videos, they get better understanding on the activity.

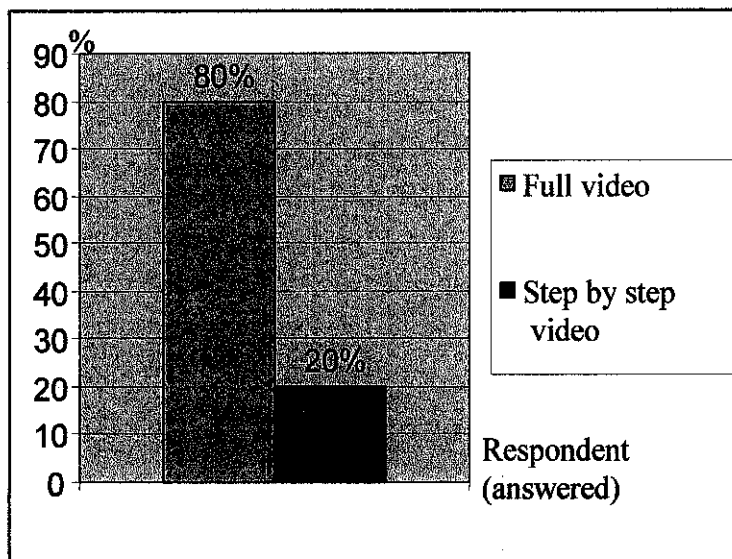


Figure 1.2 shows that 80% of the evaluators are agreed with the full demonstration videos and 20% of them prefer to have a step by step CPR video.

As for the image of the videos, 100% of them are agreed and like the resolution of those videos when they are played.

For the feedback function, it has been tested and it seems like the function is well-integrated with the database. This is because, after the evaluators had sent their comments regarding the system, there was a message saying that the comment has successfully been submitted to the database. So it means that the function is functioning well in the system. As for the categorization of user's skills function, the evaluators did a testing by answering the questions provided in the system. There are a few samples of first aid questions that they were required to answer. After finished answering the questions, they got their score rate, their level achievement and also the correct answers were provided to them when those particular questions they answered were wrong. All of them were agreed with the questions given. They believed that they had gained more knowledge after answering the questions by getting to know their score and their level achievement. They also believed that first aid participants will perform better in first aid activities after

the participants see their own level achievement and can improve better and better in the future.

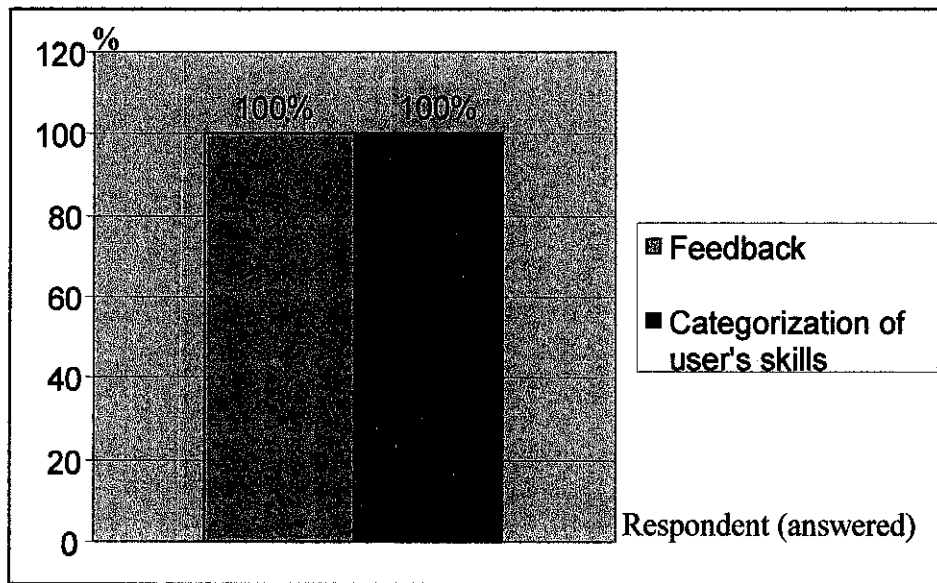


Figure 1.3 shows a graph that represents feedback function and categorization of user's skills function. Both functions were given 100% because all of the evaluators have tested the functions and both of them run successfully.

4.2 Screen shot of the system

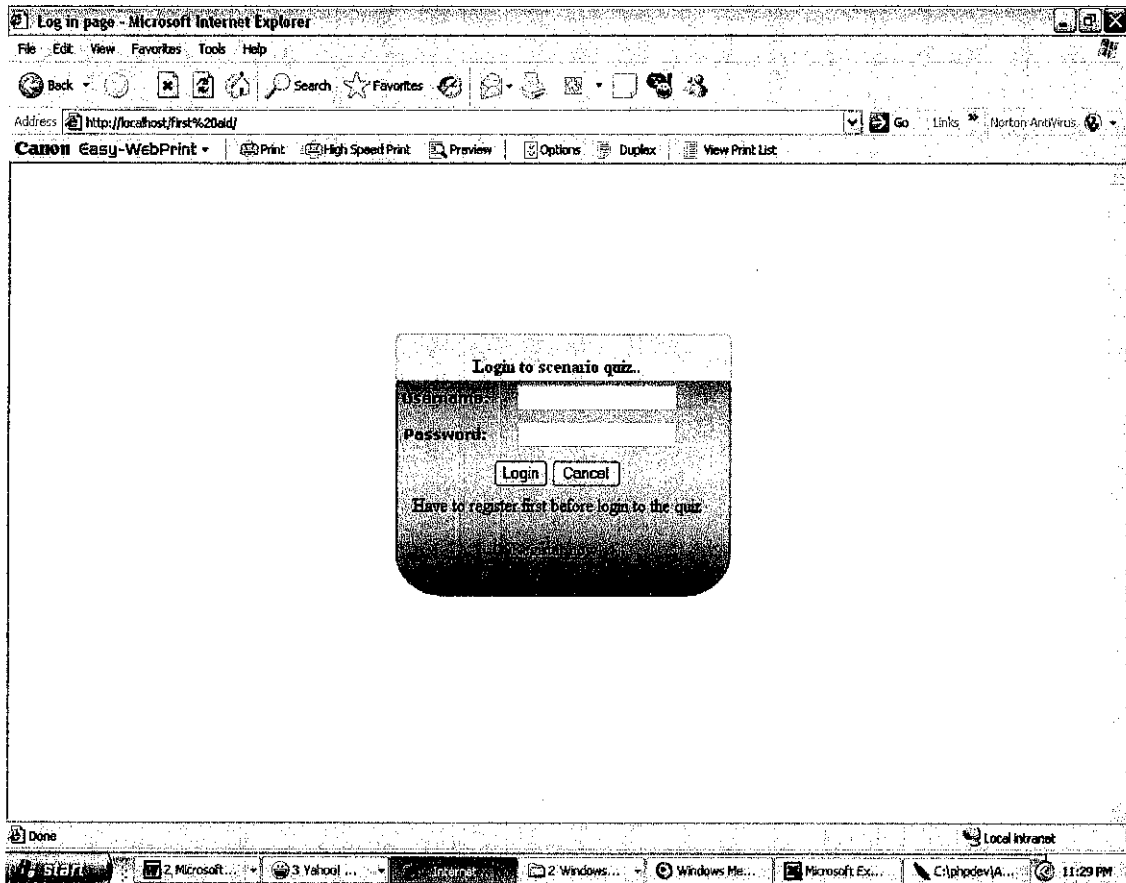


Figure 1.4 shows the login page where participants can insert their registered username and password. In this page also, the author included hyperlink of registration for non members.

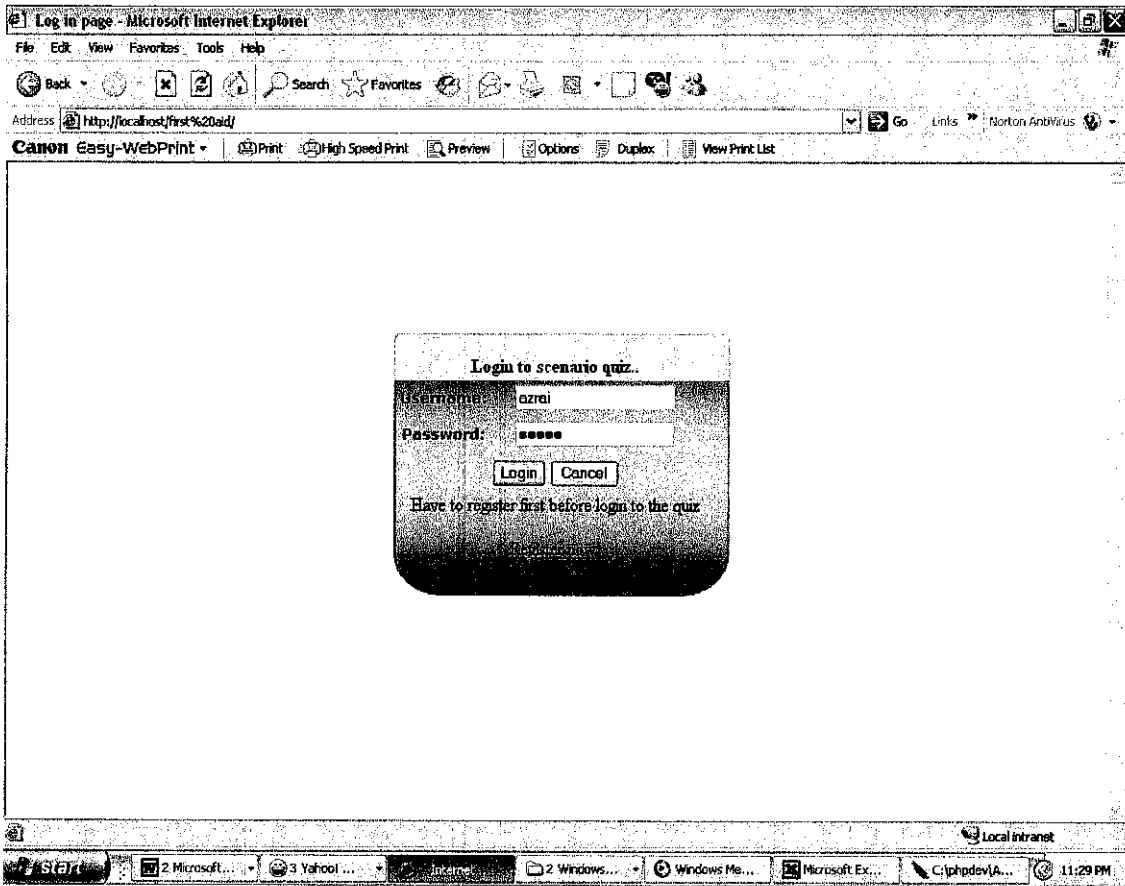


Figure 1.5 shows registered participants enter their username and password in the column given.

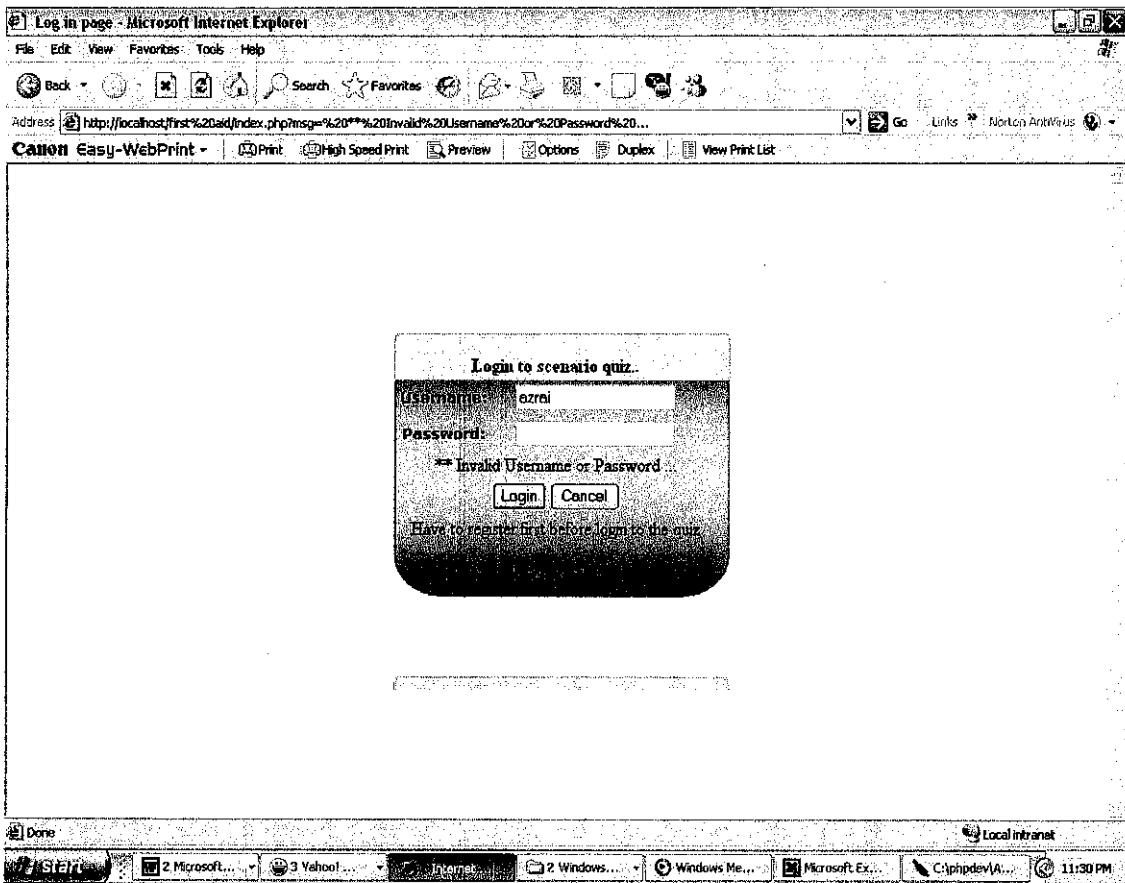


Figure 1.6 shows an error message will appear if the system does not recognize the unregistered username and password entered by the users.

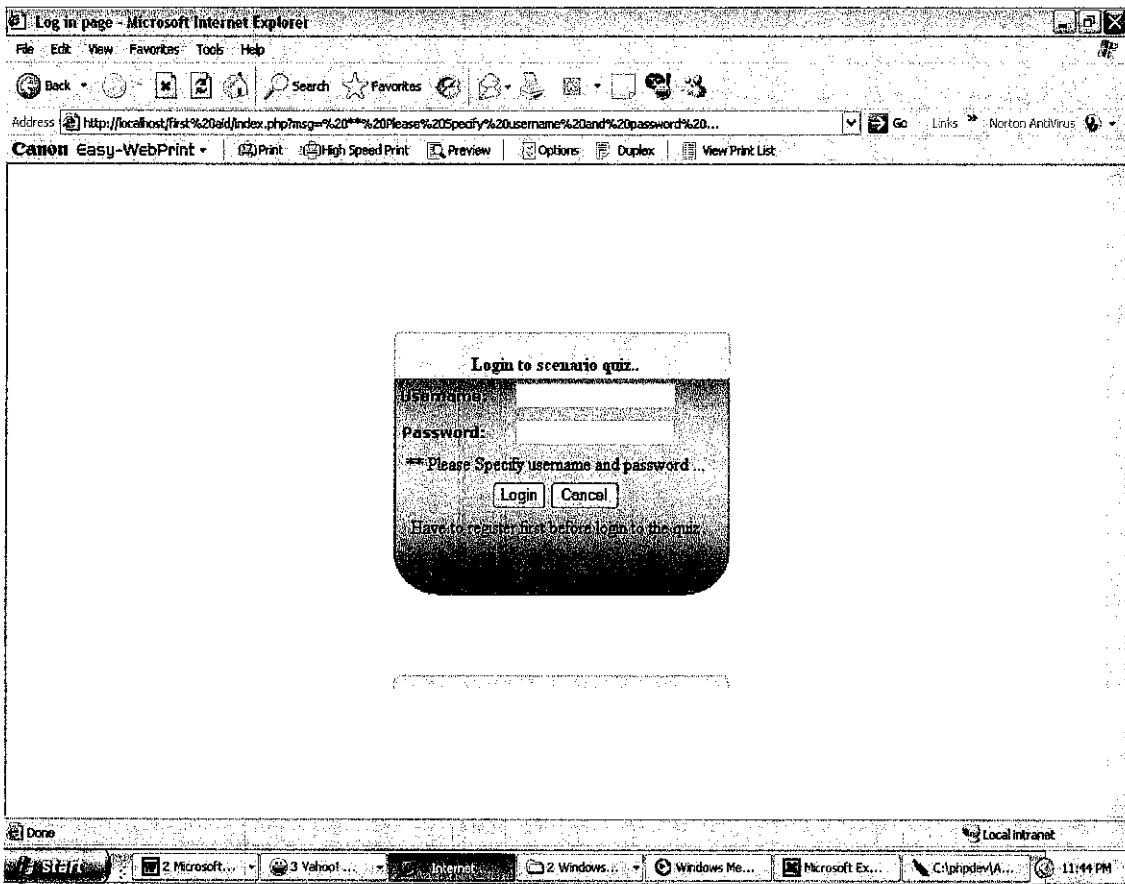


Figure 1.7 shows that participants do enter neither username nor password. But they only enter the login button.

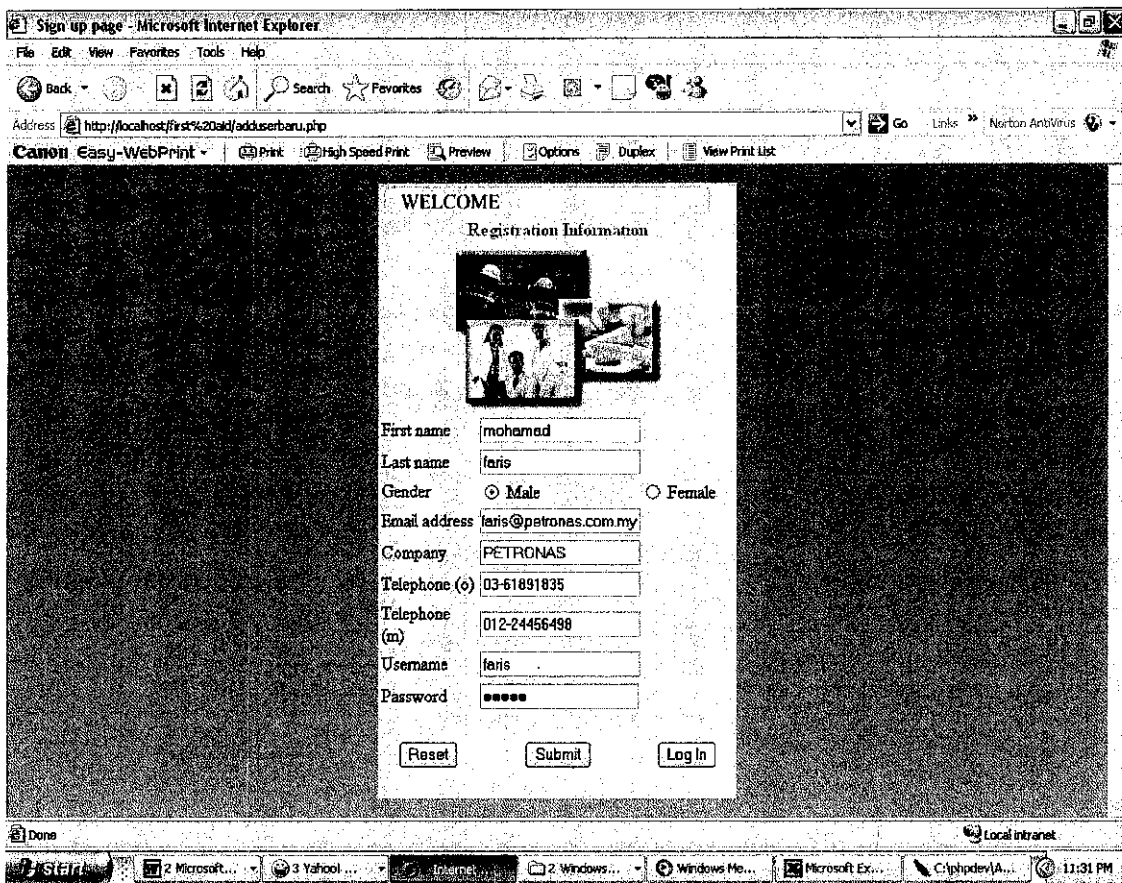


Figure 1.8 shows that new user registers to be the new member

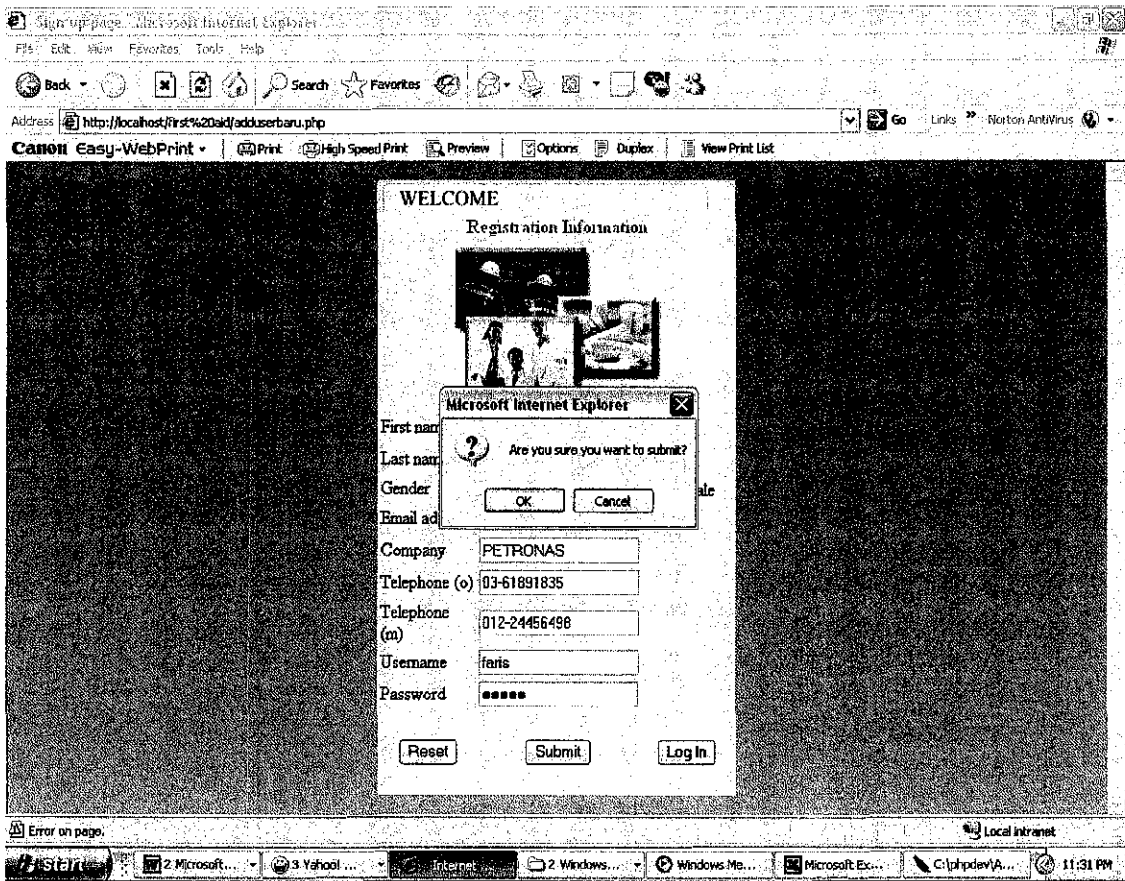


Figure 1.9 shows a message to make sure if the new user wants to submit the data or not.

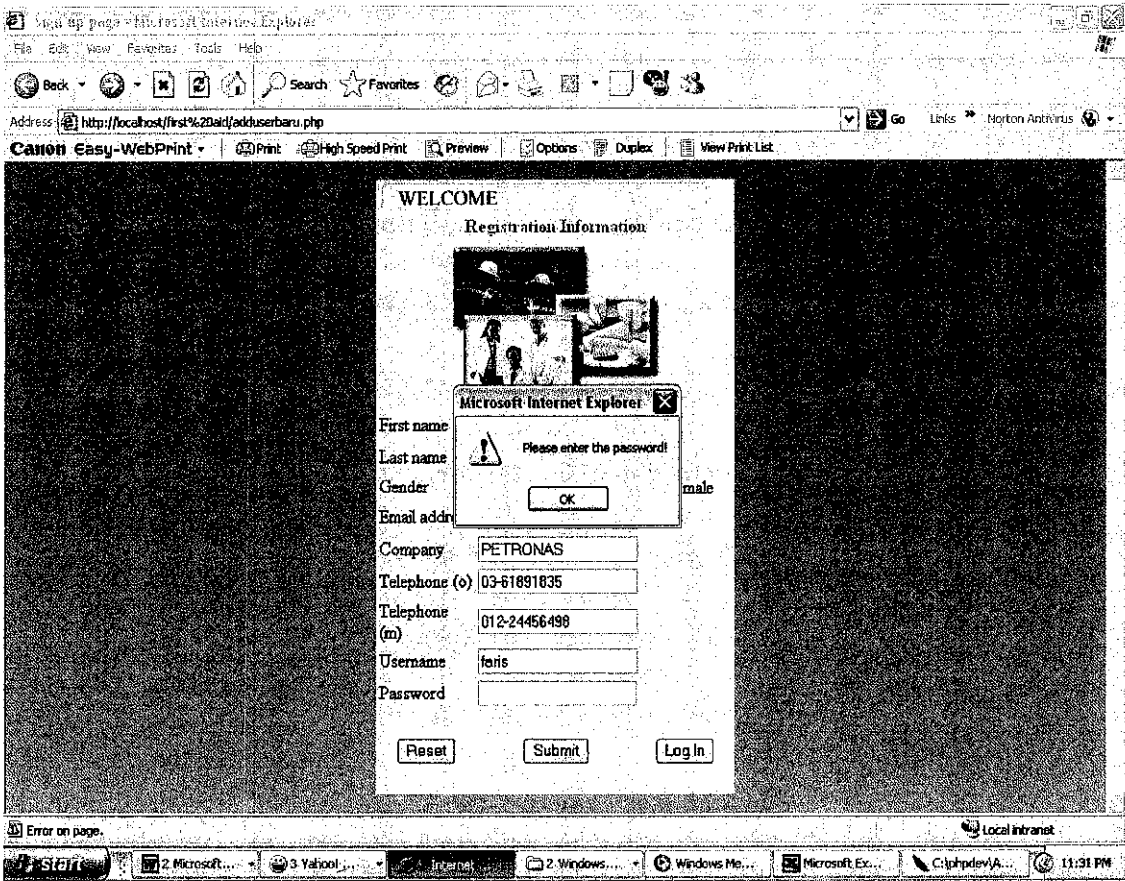


Figure 2.0 shows an error message will be given to the new user if he or she does not insert any data to those columns in the registration form.

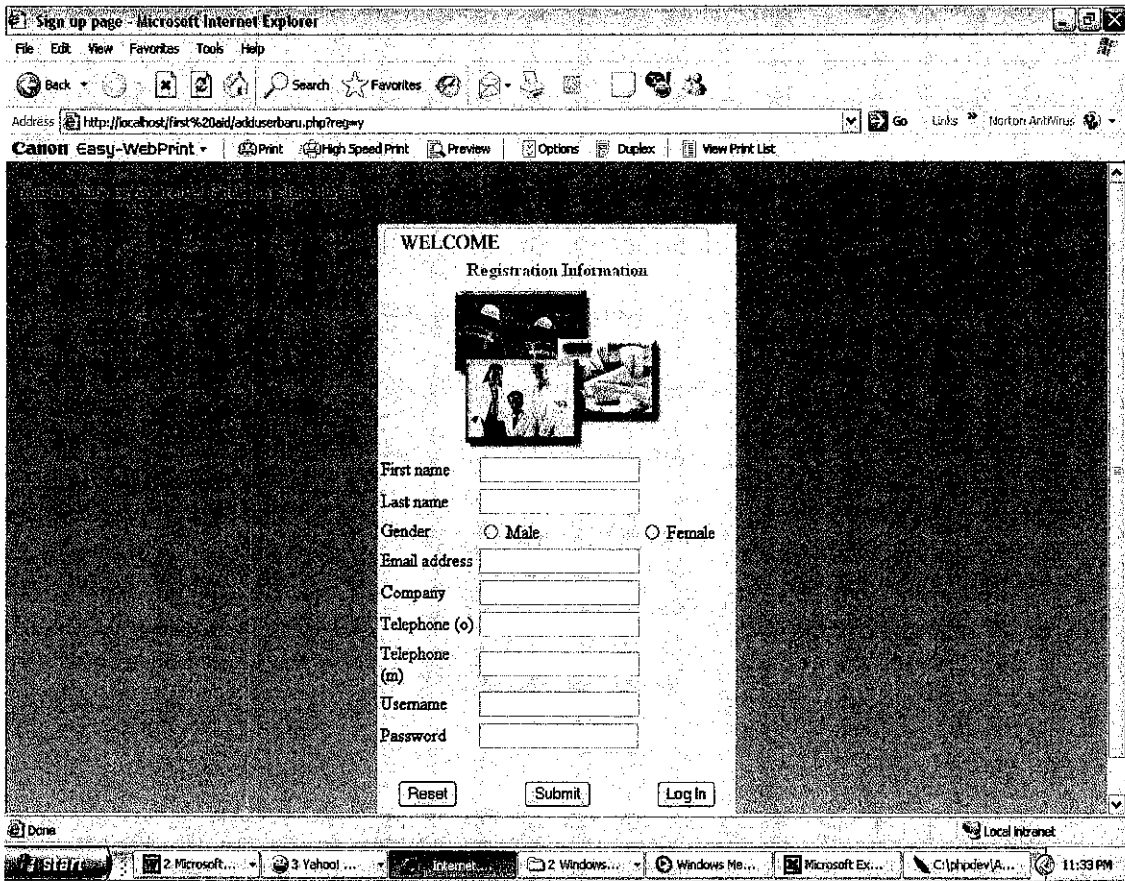


Figure 2.1 shows that the data is successfully submitted to the database and now new user becomes new member.

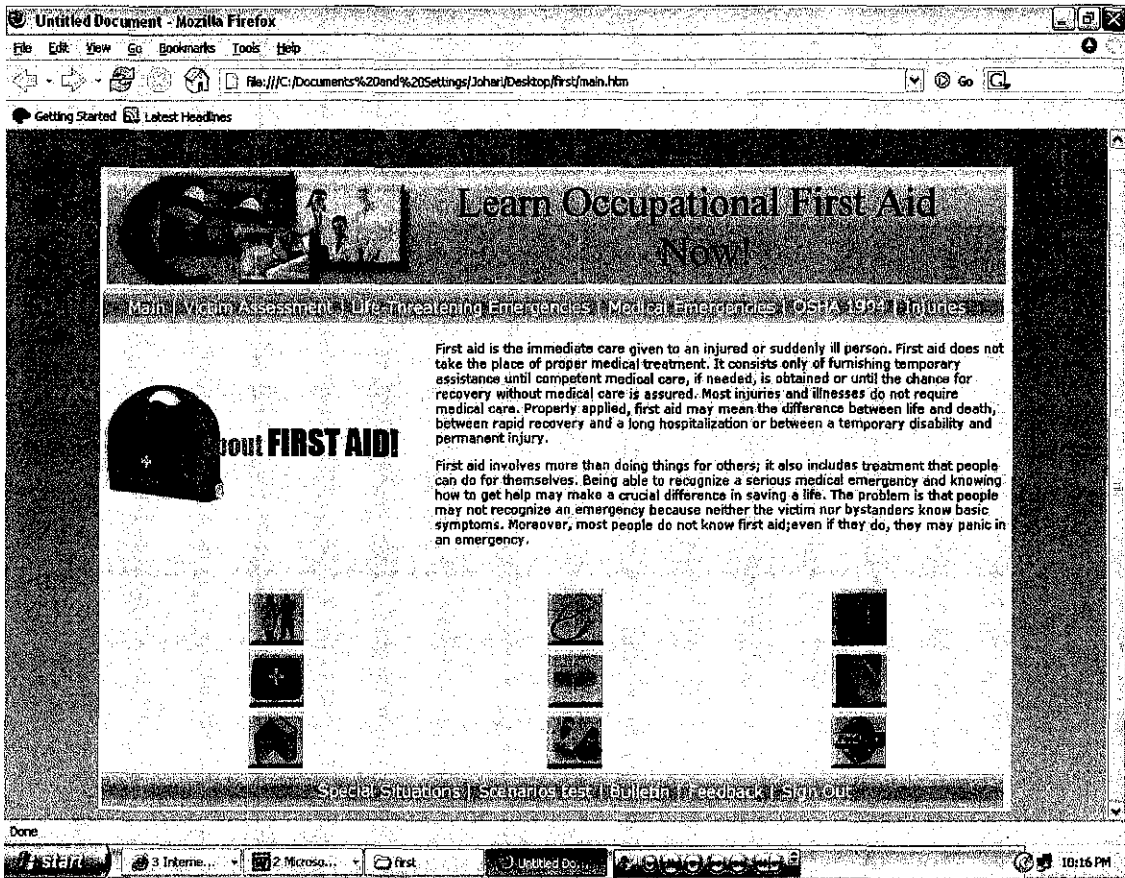


Figure 2.2 shows that the first aid user can view the main page of the system

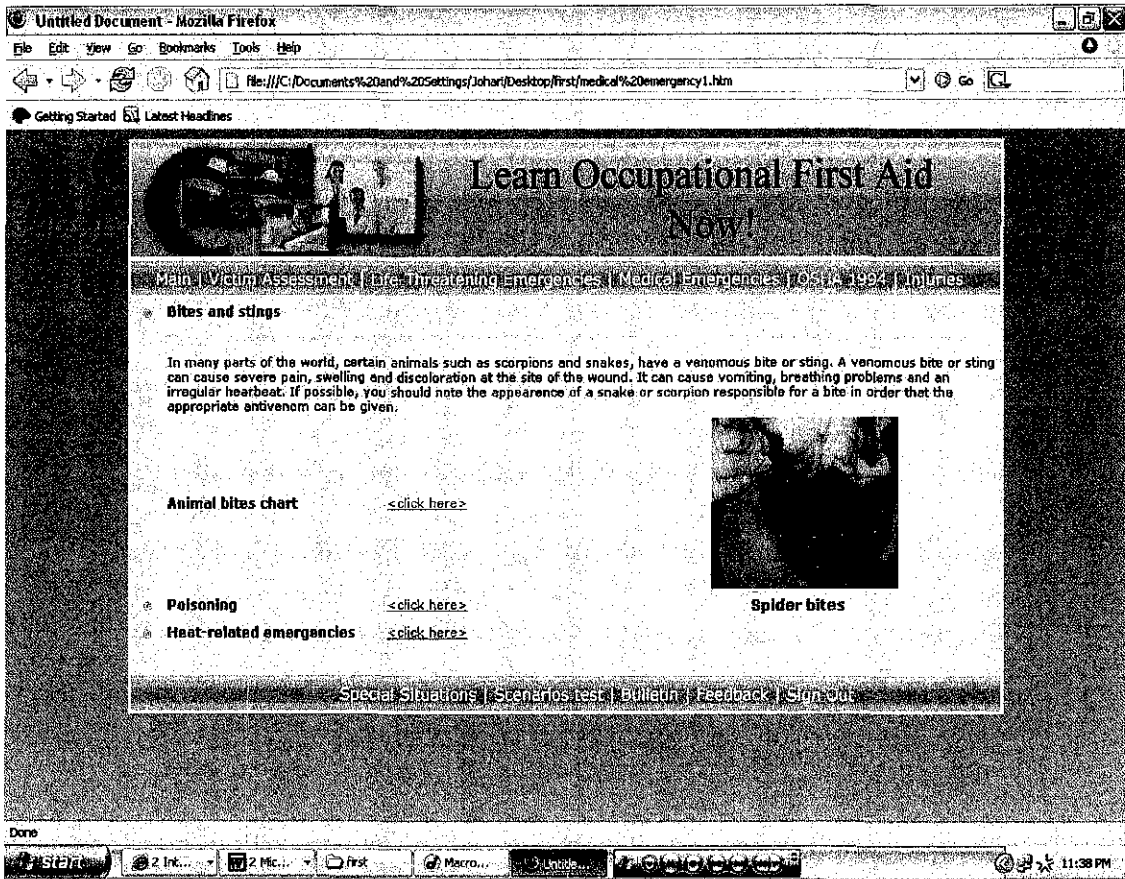


Figure 2.3 shows first aid content in the system where participants can view and learn after login to the system.

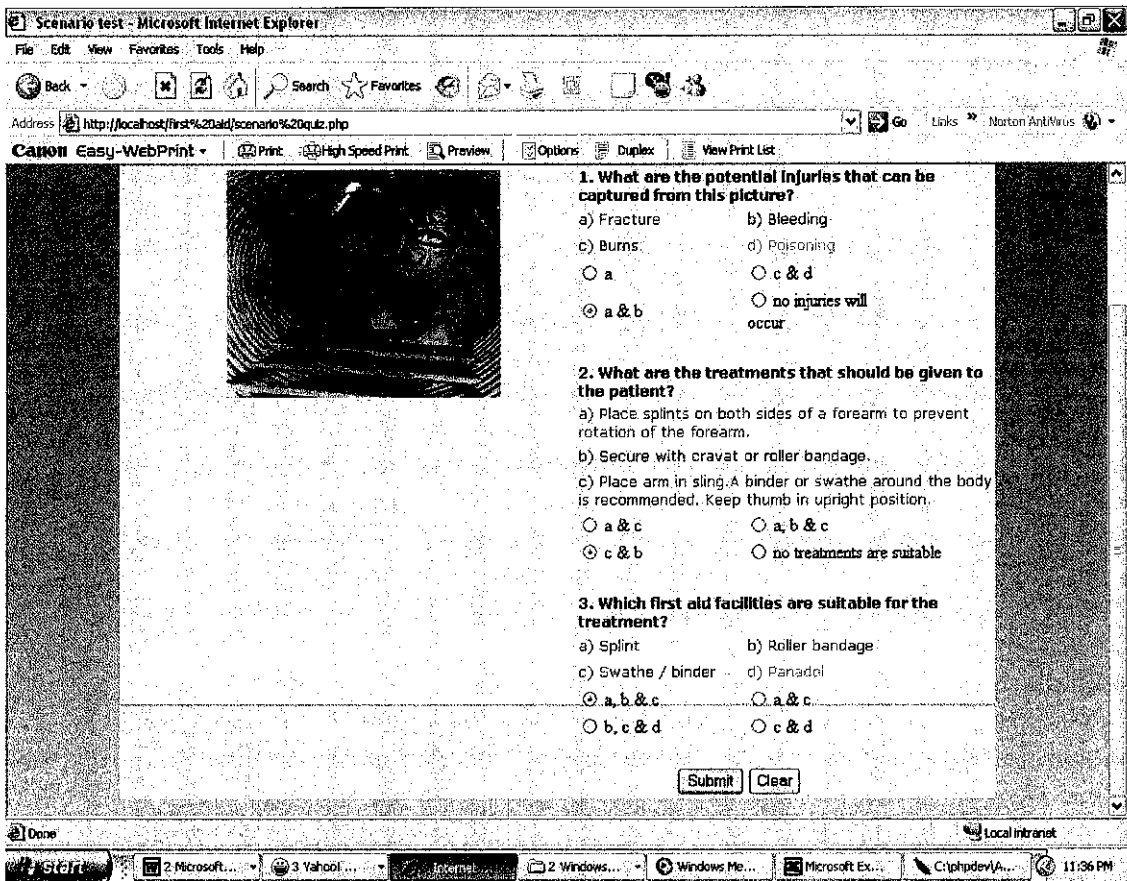


Figure 2.4 shows questions answered by the participants

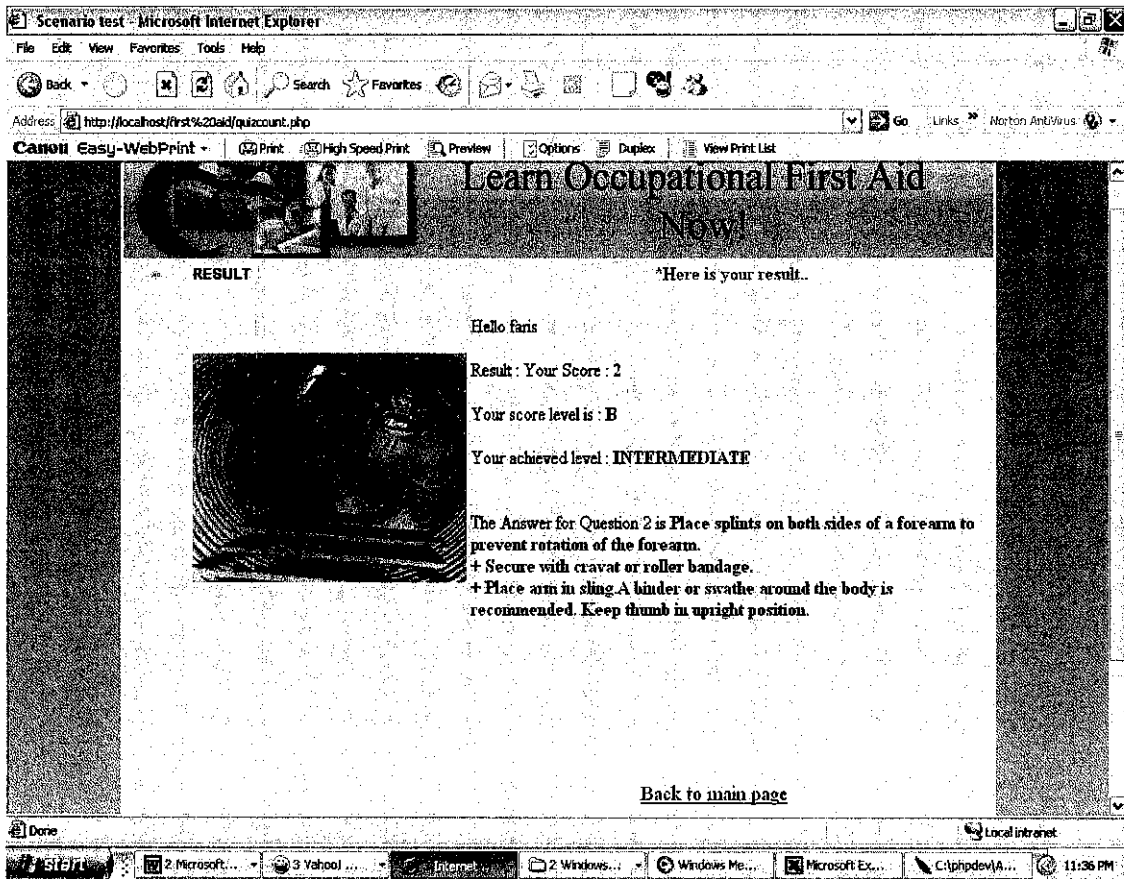


Figure 2.5 shows the result of that particular user. The viewer can view the rating score, his or her achieved level and also can view the correct answer if he or she answers the questions wrong.

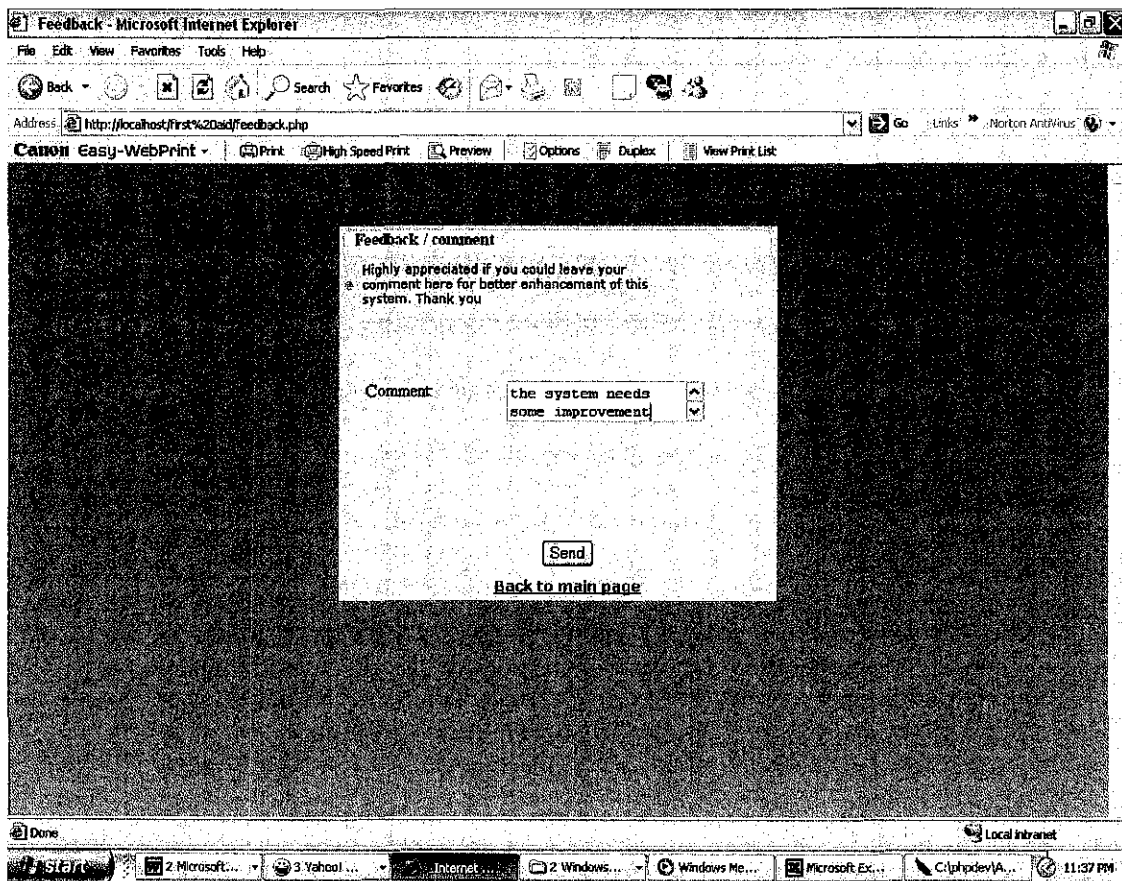


Figure 2.6 shows a feedback page where participants can give comments about anything regarding the system.

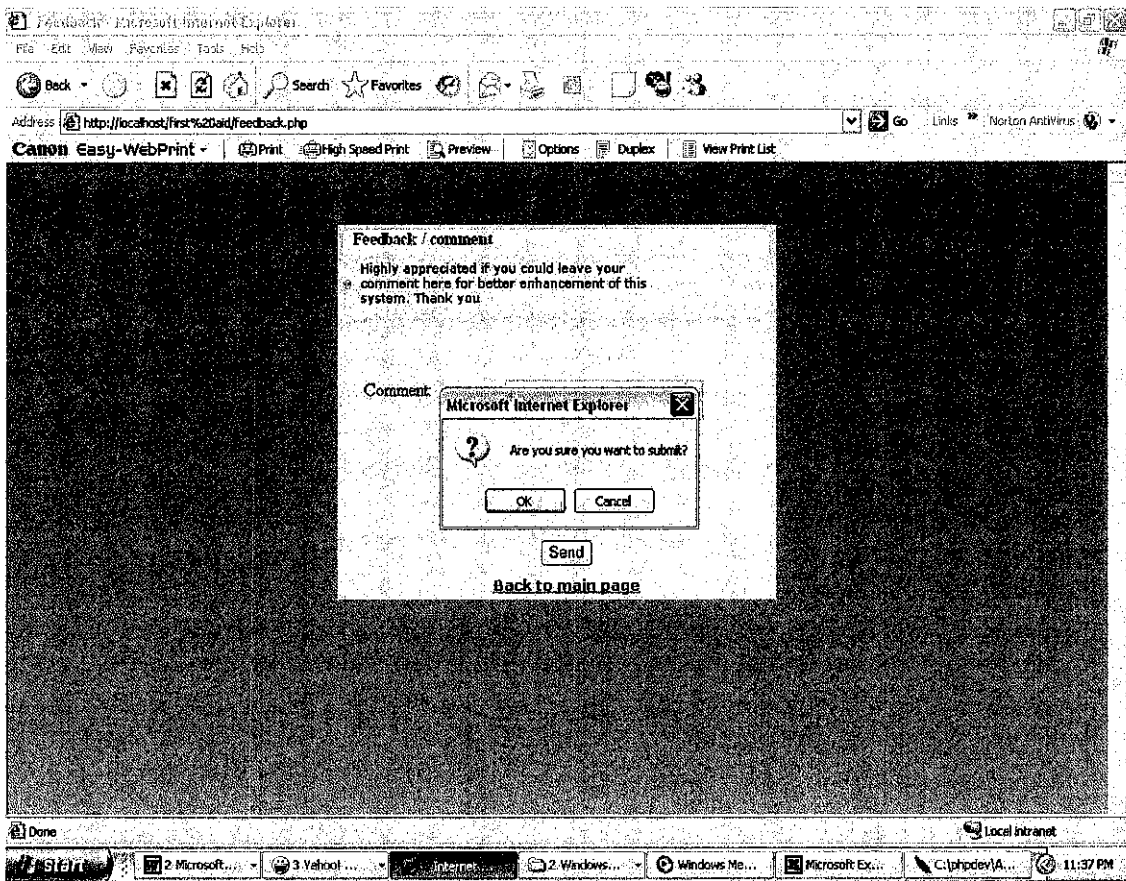


Figure 2.7 shows a message given to participants to confirm the comment given by them.

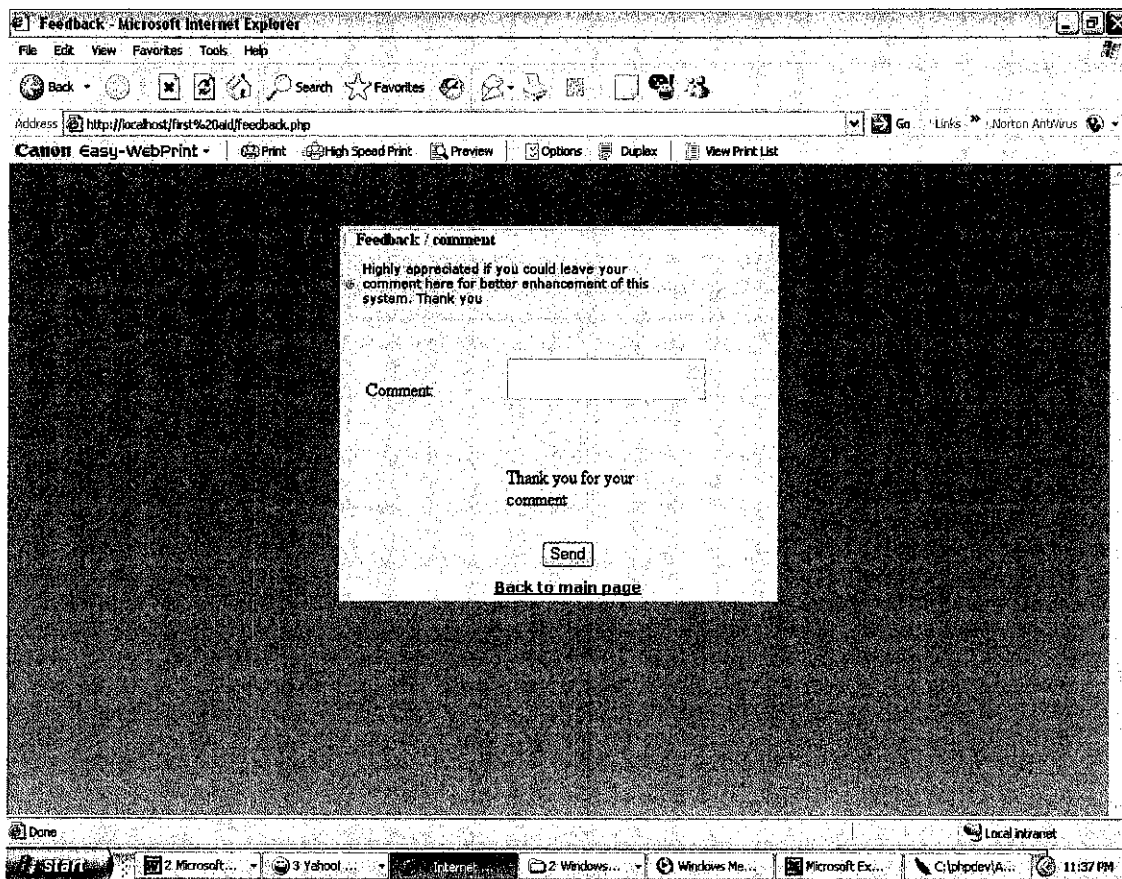


Figure 2.8 shows a message where participants know that the comment has been submitted successfully.

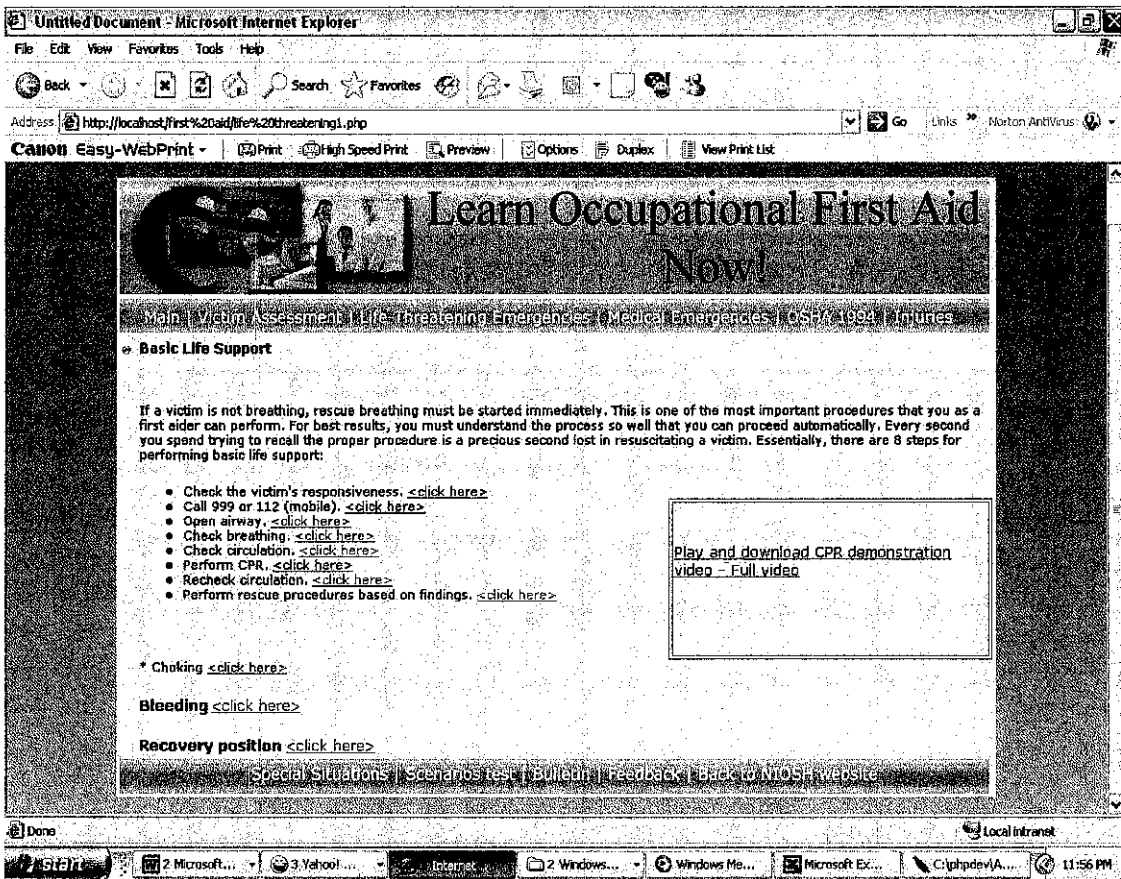


Figure 2.9 shows the link where participants can download and play the video demonstration.

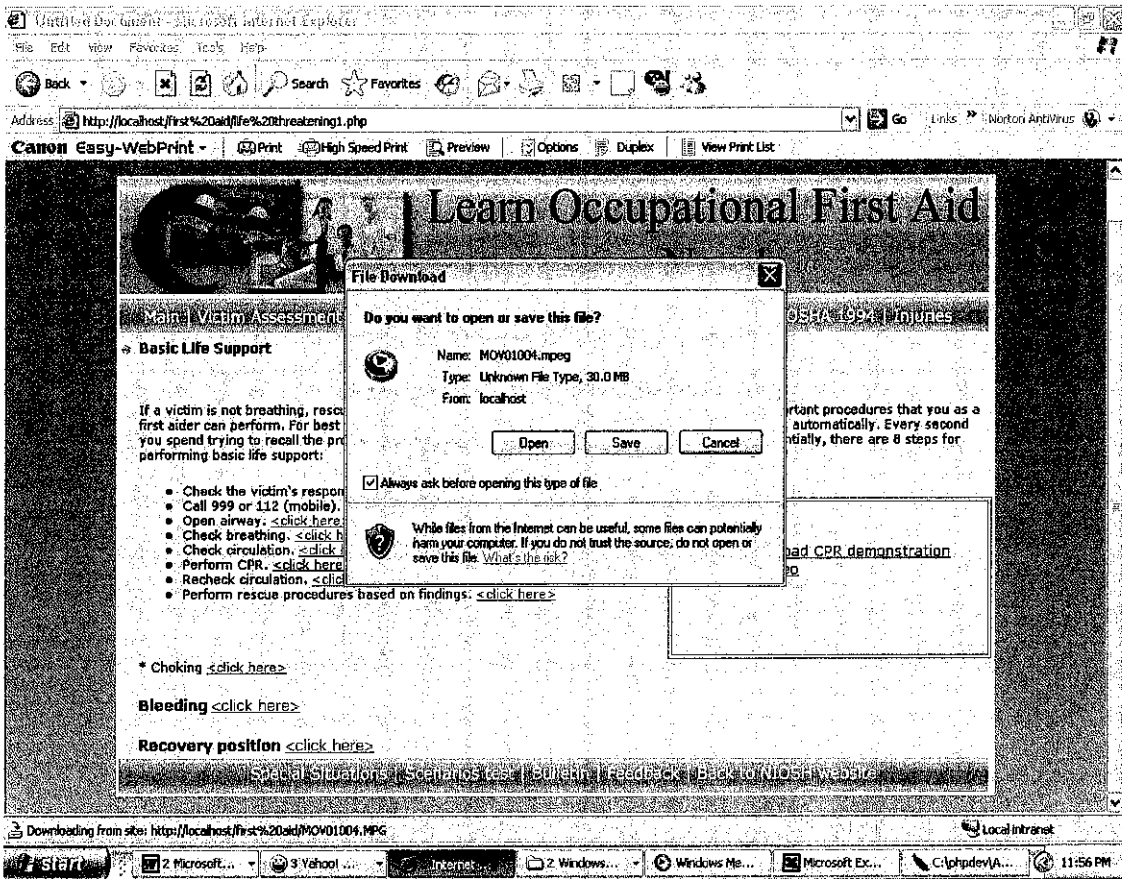


Figure 3.0 shows a pop up message asking whether participants want to play or download the video.

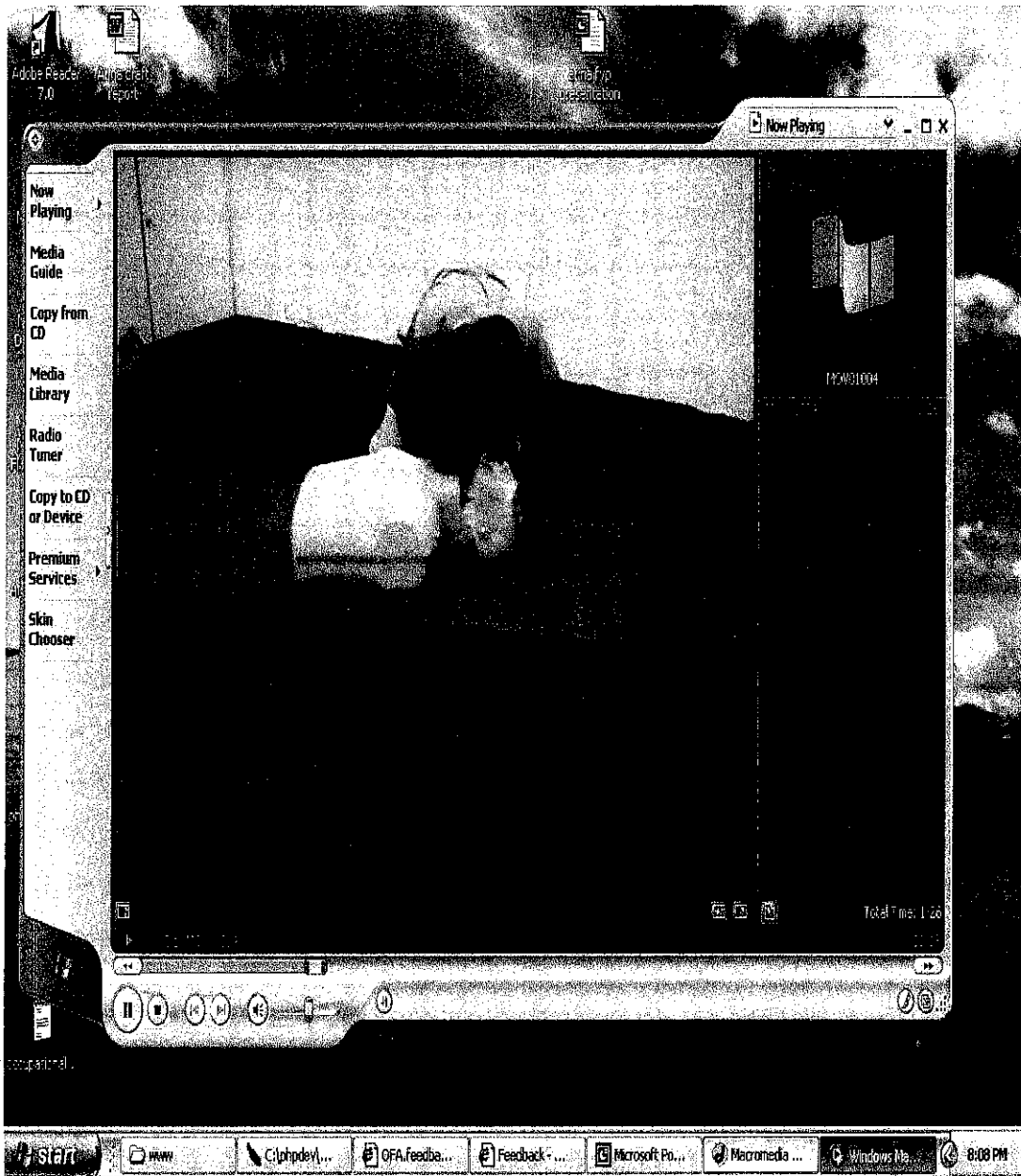


Figure 3.1 shows a video demonstration is displayed in participant's workstation.

CHAPTER 5

Conclusion and Recommendation

After has gone through the development process, the final year project has reached its objectives in providing the first aid knowledge to the user through system. This can be seen by the testing (refer to chapter 4) that has done by the author. With the system interface (refer to chapter 4) provided in this report, it gives a clear idea what knowledge it can provide to the user. Although the system is completed, but there are rooms for improvement and some recommendation is listed by the author in order to enhance the system in the future. The list of recommendations is as below:

- **Graph needs to be implemented from database result.**

- This recommendation is needed as first aid user needs to see their performance in having first aid knowledge. This graph will be generated at the end of the month for each month. The graph will be created using PHP language and will connect to the database result.

- **Develop a webmaster page**

- Develop a webmaster page to ease him or her to do the viewing, adding, editing and deleting job. Currently, the author only put data into database (PHPmyAdmin). So instead of viewing from the PHPmyAdmin, the webmaster can have its own page where he or she has to log in using assigned username and password and go through the whole system.

- **Video need to be upgraded**

- Based on the testing conducted by the evaluators, some of them has recommended to have a step by step video in order for the first aid user to be more understandable in applying first aid activities in case if there is emergency occurs.

- **Apply user acceptance testing**

- The purpose of wanting to have this type of testing is because; this product will be owned by NIOSH as NIOSH is a client. The author as the developer needs to make sure that everything in the system runs well and let NIOSH does the testing.

As referred to the recommendation above, it is hope that the system will be more beneficial to be used in the future.

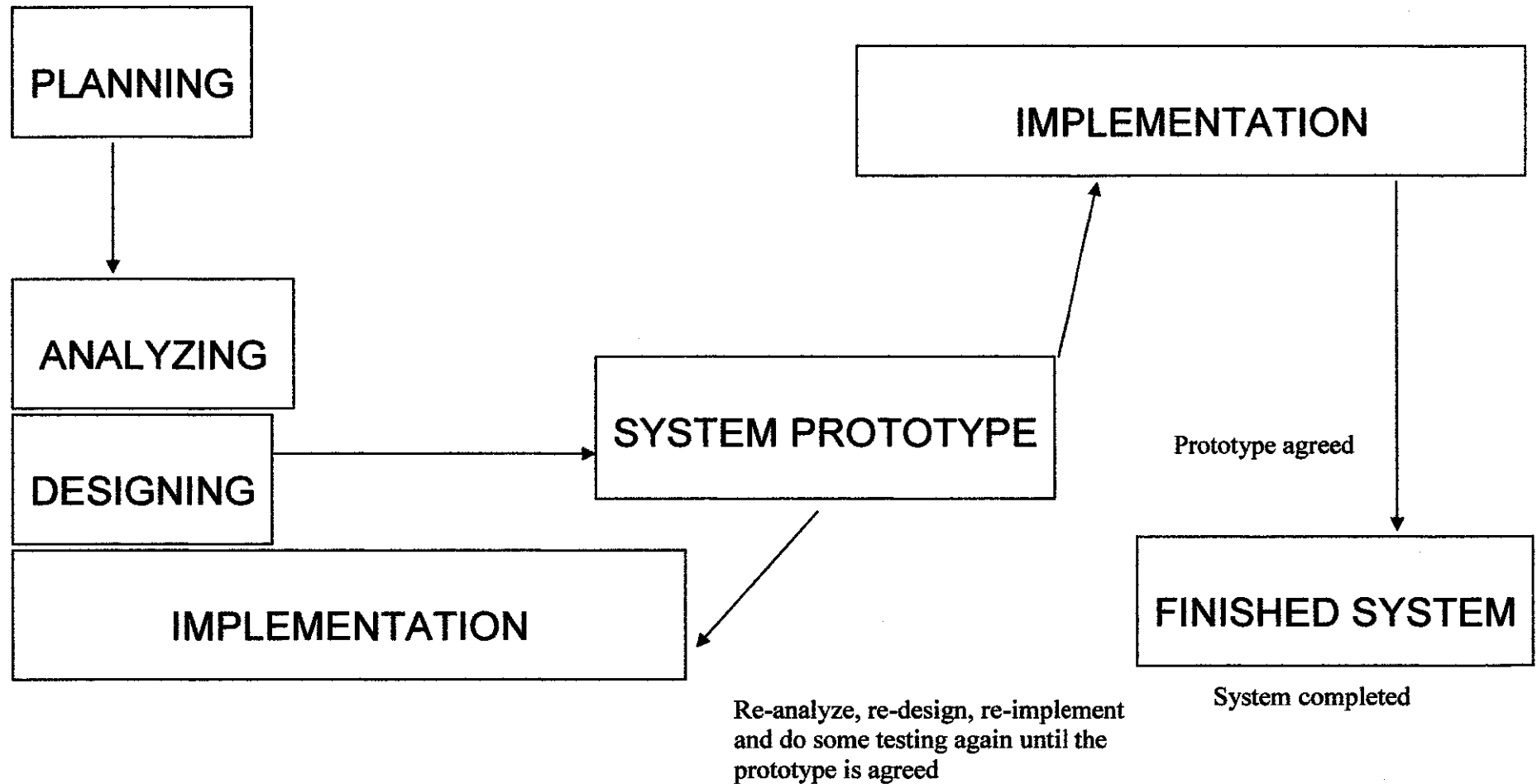
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3. Saravanan Govindan (2005), *When Saving Lives Is All That Matters*

APPENDIX

ID	Task Name	Start	Finish	Duration	Gantt Chart Timeline																											
					Mar 2006				Apr 2006				May 2006				Jun 2006				Jul 2006				Aug 2006				Sep 2006			
					3/8	3/12	3/19	3/26	4/2	4/9	4/16	4/23	4/30	5/7	5/14	5/21	5/28	6/4	6/11	6/18	6/25	7/2	7/9	7/16	7/23	7/30	8/6	8/13	8/20	8/27	9/3	9/10
1	PLANNING	2/27/2006	3/10/2006	10d	[Bar from 3/8 to 3/18]																											
2	Plan a system to be developed for FYP	3/10/2006	3/10/2006	1d	[Bar at 3/10]																											
3	ANALYZING	3/13/2006	4/14/2006	25d	[Bar from 3/13 to 4/8]																											
4	Analyzing problems occurred in current situation	3/13/2006	3/15/2006	3d	[Bar from 3/13 to 3/15]																											
5	Analyzing the functions for the system	3/16/2006	4/14/2006	22d	[Bar from 3/16 to 4/7]																											
6	DESIGNING	4/17/2006	5/5/2006	15d	[Bar from 4/17 to 5/1]																											
7	Design system interface	4/17/2006	4/20/2006	4d	[Bar from 4/17 to 4/19]																											
8	Design registration and log in function	4/21/2006	4/21/2006	1d	[Bar at 4/21]																											
9	Design demonstration video	4/24/2006	4/26/2006	3d	[Bar from 4/24 to 4/26]																											
10	Design bulletin post	4/28/2006	4/28/2006	1d	[Bar at 4/28]																											
11	Design feedback form	5/1/2006	5/2/2006	2d	[Bar from 5/1 to 5/2]																											
12	Come out with system prototyped	5/8/2006	5/10/2006	3d	[Bar from 5/8 to 5/10]																											
13	IMPLEMENTATION Do implementation on the prototype and some testing on it	5/15/2006	6/30/2006	35d	[Bar from 5/15 to 6/19]																											
14	Design categorization user's skills	7/17/2006	7/21/2006	5d	[Bar from 7/17 to 7/21]																											
15	ANALYZING, DESIGNING & IMPLEMENTATION These processes are used in order to get a better result on the system	7/24/2006	9/22/2006	45d	[Bar from 7/24 to 9/8]																											
16	FINISH PRODUCT This is to confirm that the system is completed	9/25/2006	9/25/2006	1d	[Bar at 9/25]																											

Figure A shows a Gantt chart of the feasibility analysis within scope and time frame during project development



-Source from System Analysis & Design, An object-oriented approach with UML by Alan Dennis, Barbara Haley Wixom and David Tegarden.

Figure B shows a Prototyping-based model that guide the author in having a proper schedule within the final year project period

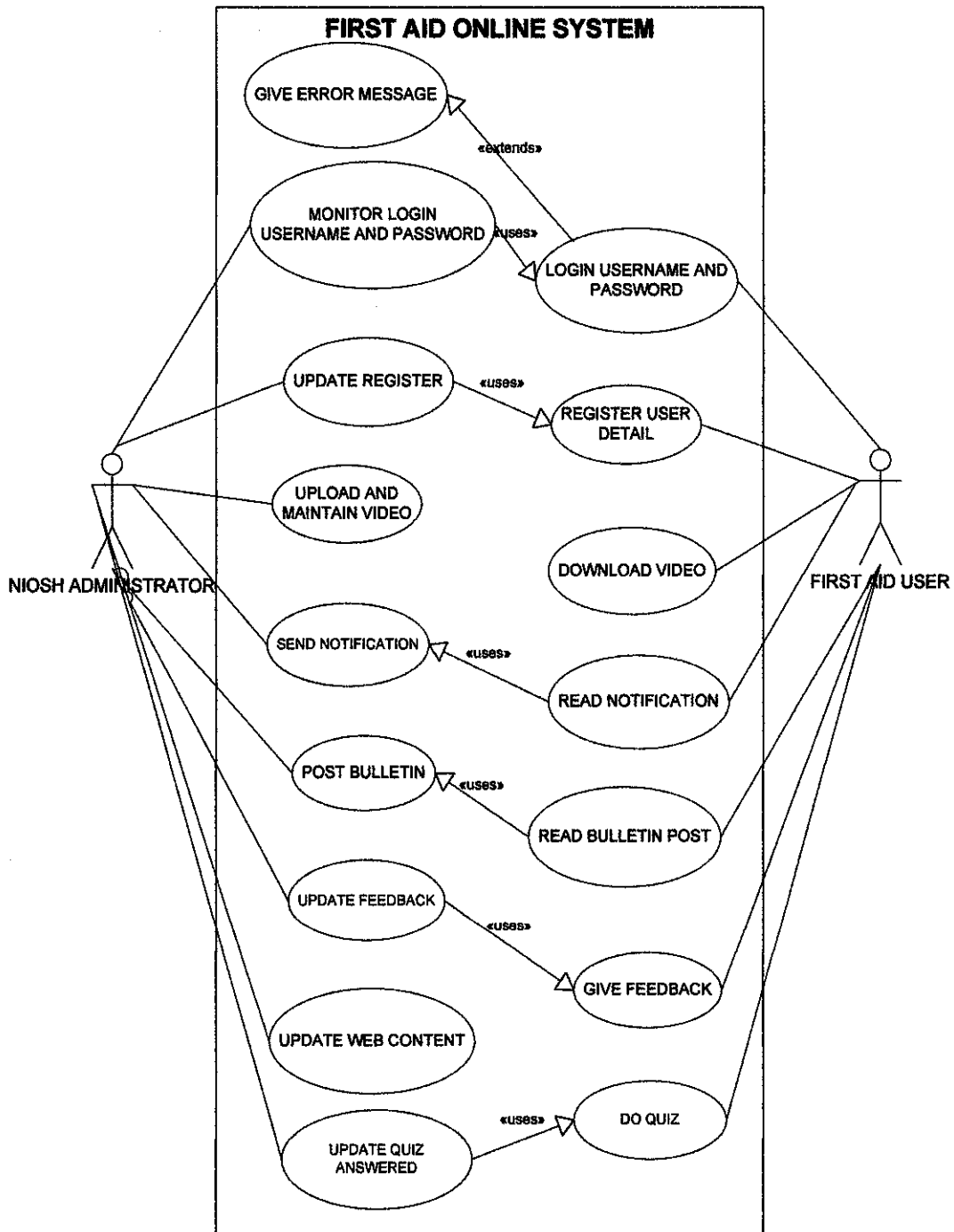


Figure C shows a use case diagram of first aid online system

Relational database for First aid online system

user (fname, lname, gender, email_ID, company_ID, office_tel, mobile_tel, username, password, access)

quiz (username, quiz_score, score_ID, level_ID)

score_rate (score_ID, score_range, score_level)

level_achievement (level_ID, level_name)

feedback (feedback_ID, username, comment)

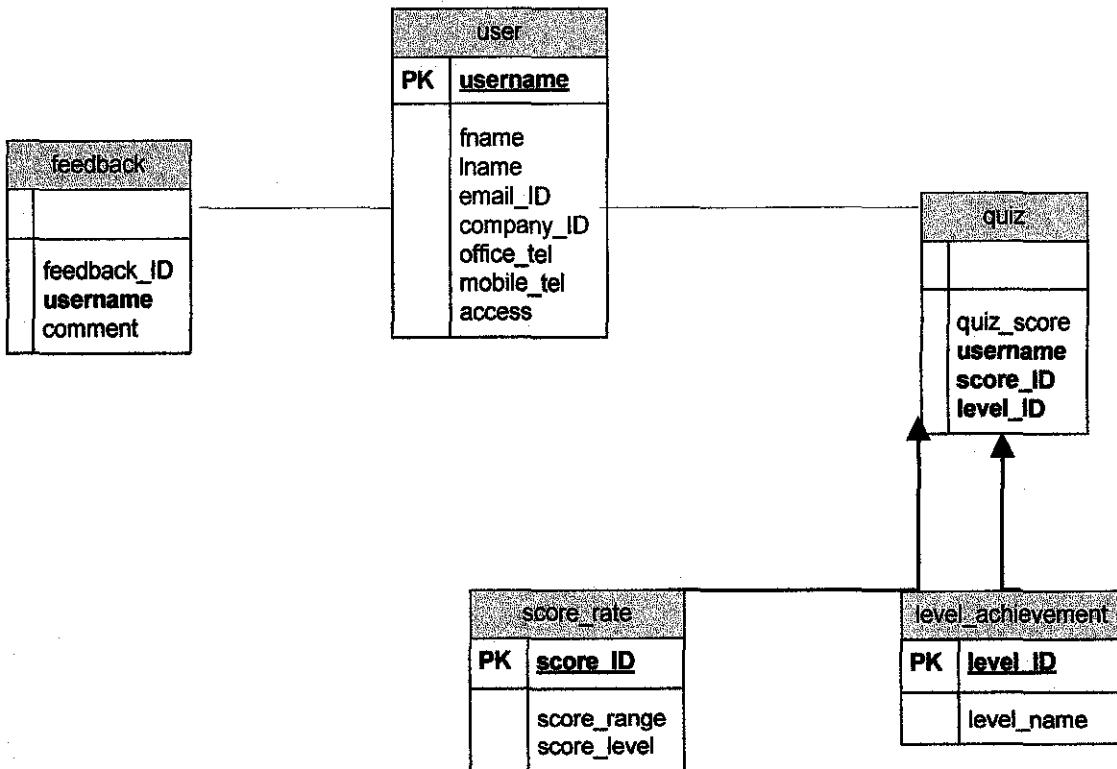


Figure D shows both relational database and an ERD diagram for the database to work in the system

Questionnaire on first aid system

Circle only one answer

This questionnaire is to assist in evaluating the effective of system functions usage to the user. The questionnaire will serve as a guidance to determine the user's opinion after using the system.

1) Do you think that the details are suitable for registration or not?

Yes	No
-----	----

Comment: _____

2) Do you think that the video provided are suitable for user to learn?

Yes	No
-----	----

Comment: _____

3) Is the feedback function integrates well with the database?

Yes	No
-----	----

Comment: _____

4) What do you think about the questions in the scenario test? Is it enough or need to add?

Yes	No
-----	----

Comment: _____

5) Do you think that the scenario test performance runs well?

Yes	No
-----	----

Comment: _____

Figure E shows a sample questionnaire conducted by the author to test the system