

CERTIFICATION OF APPROVAL

**Interactive Emergency Escape Plan
(IEEP)**

By

Hazahamima Binti Miskam

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Approved by,

(Pn. Aliza Binti Sarlan)

**University Technology of PETRONAS
Bandar Sri Iskandar
31750 Tronoh
Perak Darul Ridzuan**

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1) Computers

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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 acknowledgement, and the original work contained herein have not been undertaken or by unspecified sources or persons.



HAZAHAMIMA BINTI MISKAM

Information Communication Technology

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ACRONYMS

EEP	Emergency Escape Plan
ERP	Emergency Response Plan
IEEP	Interactive Emergency Escape Plan
SDLC	Systems Development Life Cycle
UTP	Universiti Teknologi PETRONAS

ABSTRACT

The complete emergency response plan outlines the course of action to be taken in the event of an emergency and the course for each office to follow in their recovery to normal business operations. The plan is intended to provide an orderly and efficient transition from emergency to normal conditions. Establish the threshold at which emergency response is triggered and determines who in the various locations authorizes the response. To improve the efficiency, the Interactive Emergency Escape Plan or IEEP is suggested software that provides a training simulation with an interactive element. The purpose of this project is to implement the real emergency situation in to simulation mode. It is designed by considering the cost, area and the time limitation that involved in the ERP traditional training.

CHAPTER 1

INTRODUCTION

1.1 Background of Study

It is actually very interesting and convenient to apply an interactive element in the Emergency Escape Plan or EEP in UTP as substitute to the traditional training conducted by the fire brigade. The component of interactive can be integrate into the system as an individual training in purpose that user can remember the nearest path of the evacuation route when there is a fire and also the explanation on how to use a fire fighting equipment. This can be done when user explore themselves through the system that has user interface and interactive element. For each building in new academic block nowadays is only provided by a layout of Emergency Escape Plan that shows the evacuation route and the location of the fire fighting equipment.

1.2 Problem Statement

In UTP new academic block, each building is provided by the Emergency Escape Plan layout situated at the entrance to the lift door for each floor. This static emergency escape plan is used by all resident to guide them during the emergency but at the same time this static emergency escape plan layout has a limitation where the employee need to go to the location to know about the evacuation route.

Although, the traditional training that been provided by the fire bridged to increase retention, it increase cost and a lot of time required to conduct training. This project is proposing to develop an Interactive Escape Plan. To reduce this problem, the training session is actually can be implemented in the virtual world or simulation with an interactive way.

1.3 Objective

- To develop an interactive Emergency Escape Plan to simulate an emergency evacuation during fire as well as the location of the fire fighting equipment.

1.4 Scope of study

- To study on interactive element or component to be integrated to the system.
- To develop a prototype of Interactive Emergency Escape Plan for UTP specifically for Building 2. This Interactive Emergency Escape Plan is used by user with the purpose to give an experience during the emergency situation. Each user can involve in this Interactive Emergency Escape Plan through the simulation mode assume that they are in the real world. The user can choose the starting point or area of the fire occur and they have to find the right way or escape corridor by following the exit sign using a mouse as a navigation device.
- The target user of this system is for UTP staff specially for those who wants to explore as an individual training specially when they cannot attend or not available during the fire fighting training which conducted by the fire brigade.

CHAPTER 2

LITERATURE REVIEW

2.1 Introduction

The emergency planning process has evolved significantly and taken on more importance in the last decade as a result of emergencies and disasters having a greater impact on government and industry. Today, organizations have an abundance of emergency planning resources and training options available to them. Cooperation between government and industry in the planning process is also high. Consequently, there presently exists an excellent opportunity for organizations to increase their level of preparedness [Ernest, 2001].

Most experts today advocate a comprehensive "all hazards" approach to emergency preparedness. A comprehensive emergency response plan that takes into account potential natural, technological, and man-made threats and involves key personnel in the planning process can assist an organization to systematically manage emergencies in an effective and efficient manner. The planning process is a key element that forces managers and their staff to explore viable options that can be employed in the event of an emergency or disaster. These contingencies can ultimately help to save lives, reduce property loss, as well as lessen an organization's potential liability.

The complete emergency response plan outlines the course of action to be taken in the event of an emergency and the course for each office to follow in their recovery to normal business operations. The plan is intended to provide an orderly and efficient transition from emergency to normal conditions, provide specific guidelines appropriate for complex and unpredictable occurrences, provide consistency in action, prevent activity inconsistent with University philosophy and present fixed or mechanical portions of the

emergency response. This leaves those in charge free to manage the specifics of the actual crisis at hand and to establish the threshold at which emergency response is triggered and determines who in the various locations authorizes the response [Linda, 2004].

2.2 Interactive in the Emergency Training

A study by the US Department of Defense found that interactive training was roughly 40 percent more effective than traditional training with a retention rate that was 30 percent greater than a learning curve that was 30 percent shorter [Shulman, 1992]. This is further supported by a number of other studies, which have shown interactive training increases retention, decreases cost and reduces the amount of time required in training sessions. Increasing flexibility in work schedules and location of work will demand more flexible means of delivering training courses and will require the provision of just-in-time distributed learning that is tailored to individual needs [Isakowitz, 1992].

The literature further points that multimedia should be viewed as an enabling tool, which could help executives to manage staff training and education. Many large corporations use their network structures particularly their Intranets (Internal Internets) to design and develop self-paced training packages for their staff (a generic term used for such an approach is Electronic Training or E-Training). Amongst the advantages of E-Training one could point to the convenience it offers staff to go through the material at their convenience and a suitable pace [Dastbaz, 2003].

Furthermore, multimedia interactive enhanced training packages could use video, audio and animation to create a richer learning environment. Training on the use of sophisticated equipment could be simulated and users could easily master the use of such equipment inside computer-simulated

environment. Therefore, the comparison between traditional Emergency Training with the Interactive EEP is as Table 1 below.

Table 1: Comparison between traditional ERP training with the Interactive EEP

Traditional ERP Training	Interactive EEP
<ul style="list-style-type: none"> ▪ Involved large amount of costs when there are a training that require two times a year. 	<ul style="list-style-type: none"> ▪ Decrease costs and the user can involve with the emergency situation with the several of time.
<ul style="list-style-type: none"> ▪ Limited area to show the real emergency situation or point to start the fire. 	<ul style="list-style-type: none"> ▪ The user is given a choice to choose the appropriate area as a point to start the fire.
<ul style="list-style-type: none"> ▪ Increases the amount of time required in the training sessions. 	<ul style="list-style-type: none"> ▪ Reduces the amount of time required in the training sessions.
<ul style="list-style-type: none"> ▪ Need to follow the ERP training sessions that set by the administrator. 	<ul style="list-style-type: none"> ▪ Just-in-time distributed learning that is tailored to individual needs.

2.3 Action and Interactive

There are three simplistic division sorts of activity that a human being can engage in [Elsom, 2001]:

- Thought is something that they do to themselves. An individual can engage in some sort of internal process (of a mental nature) which has an outcome of changing their internal (mental) state.
- Action is something that they do to an object in the world. The effect is that something in the world has been changed. An obvious example would be opening a door or pressing a key or clicking a mouse button.

The change that arises in the world is a direct consequence of your action. Actions may also be performed upon themselves or on other humans.

- Interaction is a somewhat more complicated phenomenon. It can clearly state that it involves the participant in going outside the individual. It is not possible to interact with one party. It is more than action in that it implies a two way process. At a simple level, the individual can interact with an object: can turn the wheel of the car and it can resist them. This is the most basic form of the interaction. At a more sophisticated level (but still non-human) give a query to a search engine which can return an outcome from a search which can then refine to produce a new query. This is, at some level interaction. A more sophisticated sense is the interaction which occurs between two human beings. Engage in some activity in order to bring about a change in the internal state of some other human. That person can respond by trying to modify the internal state. This is another level of interaction and is different from two human thumping each other on the football pitch.

Interaction is complex and there are several definitions and distinguish between physical interaction and communicative interaction [Ed, 2004]:

- Physical interaction corresponds to things which achieve related changes in state in the physical world.
- Communicative interaction concerns things which could achieve changes of state in the mental world.

From the way that have used these terms, it is clearly the case that objects can act upon each other and can have physical interaction, but not communicative

interaction. Humans can engage in communicative interaction, but quite commonly resort to physical interaction [Elsom, 2001].

2.4 Physical Interaction

Many people who talk about interactive system have a model which encompasses the physical level of the system. It is possible to take a set of written text and place it upon a screen with controls (commonly labeled previous and next) which allow the user to move through the pages. In fact many people have done exactly this without worrying about why they do it or whether it is interesting. In effect, they have created a worst medium than the one that they started with. Even at this level it is possible to produce high quality physical interaction, but bear in mind that this is not making use of the potential of the computer as a controlling mechanism. It is emulating the physical world and treating the computer as an object. This is not to imply that all systems that work at such a level are pointless, but the careful thought needs to be put into their design. For the purposes of interactive, the system that provides only physical interaction is not sufficient [Ben, 1998].

In going beyond an interactive delivery system, the level must be a system that permits physical interaction with the information channels. These channels are to some extent, coordinated in a multimedia system, and hence the physical interaction is likely to control multiple channels together rather than a single channel. For the purposes of Interactive Multimedia, such active observation is not interactive in the desired sense. Communicative interaction is actually more interesting [Elsom, 2001].

To make the system reliable with the user, the consideration of the human factor must be as a main focus. According to the previous research from Elsom, there is a model about the human information processor as discuss in the session below that can be relate between the system development with the

human interaction as well as the information that the human can capture from the system itself.

2.5 Human Information Processor

There are many different varieties of psychological models and different approaches to understanding what humans are. The cognitive models: those which focus upon mental processes and reasoning. From within these it will examine a well-known model often referred to as the Human Information Processor. This has been chosen because it is compatible. Therefore, the figure below shows the basic components of Human Information Processor model in its simplest form and how they connect with each others.

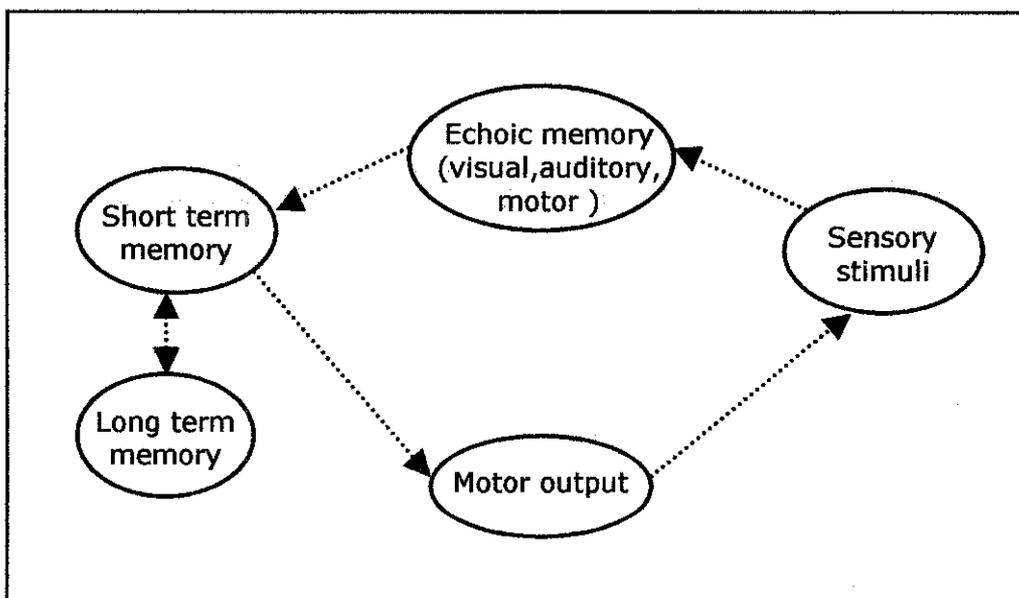


Figure 1: Human Information Processor

From the Figure 1, it shows that to the left we see the sensory stimuli through which input comes to the brain. The different senses can be thought of as the modalities of communication with the human. These sensory stimuli transfer directly to small, specialist information stores which are referred to as echoic memory. This part of memory is very short-term storage which simply retains the image in an unprocessed form. It is like remembering a number by

shouting across a valley and waiting to hear the number echoed back-hence the name. There are different echoic memories for each modality, and they have slightly different properties in terms of how much they can store and how quickly they can be updated. It is the use of these systems which enable us, for example, to perceive a moving image out of the individual still frames of a film.

The next element in the diagram is the working memory or short-term memory. This is a place with a larger, but still limited, capacity for storage. It can be thought of as analogous to the scrap of paper that one may produce workings on while calculating a complex sum. It is a key component in any conscious, active reasoning processes in which we engage. For the purposes, a very point is that this information is encoded in some form- it is no longer the raw stimulus that was in echoic memory. Consequently, some translation has gone on between echoic and short-term memory. A process has been applied which took the raw data, decoded it in some way and re-encoded it in a format suitable for humans to keep in their memory. There may have been several such decoding processes operating upon one echoic memory. There might, for example, be a speech analysis process, a music understanding process, and a sound effect interpreting process all operating to decode the auditory stimulus. This idea should be very familiar: these are the channels of communication.

The decoding process is also constrained by the available size of short-term memory. There is a famous result in psychology which claims that short-term memory can contain seven things. This is known as 'the magic number 7 plus or minus 2' [Elsom, 2001]. Various applications of this for interface design and it is important factor in designing the content of multimedia system. In particular, while there are seven 'things' in the short-term memory, the actual nature of a thing is less clearly defined. By careful organization we can group simpler items into more complex ones and the more complex one becomes a thing, so more information can be accessed in the short-term memory. This

process of gluing things together is referred to as chunking and the things are commonly called chunks.

The third component in the diagram is the long-term memory. This is where humans store things which they retain over significant periods of time. The learning process involves making changes to what is in this memory. When we are engaged in reasoning, the model suggests that we retrieve information and procedures from long-term memory into short-term memory and carry out the reasoning using those components. When we 'forget' something and are able to recall it later, it is because we are temporarily unable to find it in the long-term memory. Imagine that there are a lot of things in there, and it is easy to put something down and forget where to have left it. Consequently, ways of organizing and structuring this knowledge are extremely important to our effectiveness as reasoning machines.

All of the output channels of the human being are contained in the motor output box. Whether it talks or kick, the effect is still achieved through muscular control.

CHAPTER 3

METHODOLOGY

3.1 Procedure Identification

The author decided to implement with prototyping approach as it is deemed more suitable for the project. Prototyping is the process of building a model of a system. In terms of an information system, prototypes are employed to help system designers build an information system that intuitive and easy to manipulate for end users. Prototyping is an iterative process that is part of the analysis phase of the systems development life cycle.

3.2 Prototyping in SDLC

Issues about going through the SDLC center around two interrelated main concerns. The first concern is the extended time required to go through the development life cycle. As the investment of analyst time increases, the cost of the delivered system rises proportionately.

The second concern about using the SDLC is that user requirements change over time. The two concerns are interrelated, because they both pivot on the time required to complete the SDLC and the problem of falling out of touch with user requirements during subsequent development phases.

To overcome these problems, prototyping is an approach used to complement the SDLC model. This way, it effectively shortens the time between ascertainment of information requirements and delivery of deliverable of a workable system. With prototype, users can actually see what is possible and how their requirements translate into hardware and software.

3.2 Tools Required

3.2.1 Hardware

- Personal Computer
- INTEL PENTIUM IV 2.4Ghz Processor
- 512Mb of Memory
- 120Gb Hard Drive
- CD/DVD ROM

3.2.2 Software

- Windows XP Operating System

- Macromedia Flash MX Professional 2004
 - Is the industry standard tool for creating effective rich content across desktops and devices. Designers and developers use Macromedia Flash MX 2004 to accelerate projects while maintaining a high degree of creative control.

- Swish Max
 - Is Flash creation to create stunning fully interactive Flash animations. Hundreds of new effects can be applied to text, graphics and images. The developer can also create and distribute the own effects.

- Adobe Photoshop
 - Adobe Photoshop is a graphics editor developed and published by Adobe Systems. It is the market leader for commercial bitmap image manipulation

CHAPTER 4

RESULTS AND DISCUSSIONS

The EEP system is an interactive learning module which has been developed to assist the learning and increase retention for UTP especially in Building 2. The purpose of developing the system is to reduce the cost of training where the staffs do not have to attend for manual training which is high in cost and time consuming so it allow staff to train themselves at any time of their preferred.

4.1 Data Gathering and Analysis

Gathering information also must be completed before the second phase to be started. There are many ways to gather the information; a lot of times to be spend with user or respondent in order for project information's collection. Some of the practical method to be use is questionnaire. In order to have better results in this project development, questionnaires has been done in order to have a better view regarding the end-users' satisfactory, hence helps so much in realizing the project. The detail of the testing and the testing questionnaire will further discuss in the Pilot Testing section.

4.2 Functionality of the System

The system of an interactive EEP is actually having four functionalities which are:

- 1) Home
- 2) Fire Fighting Equipment Location
- 3) Emergency Escape Plan Layout
- 4) EEP Training Simulation Walkthrough

The interface design for each element is showed and described in more detail in the Project Storyboard section.

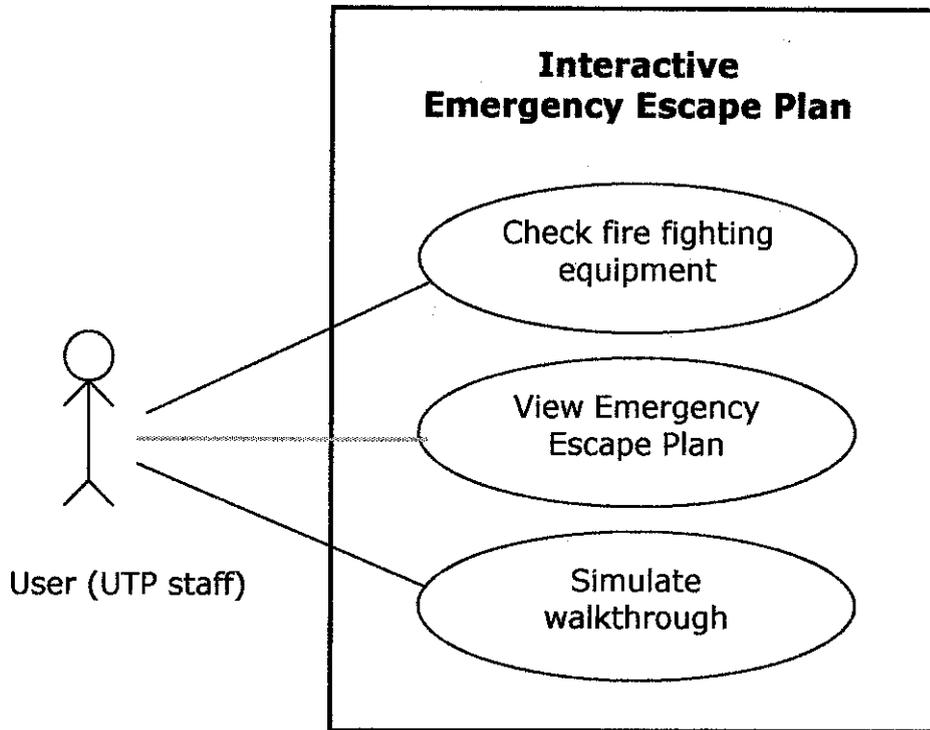


Figure 2: Use Case of an Interactive EEP

Figure 2 shows the relationship between the user and the three main system functionalities of the Interactive EEP. The target user here is the UTP staff itself especially who works in Building 2. It is because all the reference for Emergency Escape Plan layout for all level of the floor is based on the Building 2 new academic block.

4.6.1 The Functionality of Home / Main Page

The main page of the system is actually home for the other pages or menus of the system. The user can easily click the button Home and the system will link the user to the main page of the system. The purpose is to provide the user a direct link without using the previous button or next button.

4.6.2 The Functionality of Fire Fighting Equipment Location

The Fire Fighting Equipment location is function as it gives a feedback to the user by blinking the target location. The user can also click the target location and it will link the user to the next page of the system that shows the brief description on how to use the fire extinguishers when the condition of the fire is not too critical.

4.6.3 The Functionality of Emergency Escape Plan layout

The Emergency Escape Plan Layout will function as the user can see an arrow moving and it shows the path that the user should know as an evacuation route during a fire.

4.6.4 The Functionality of EEP Training Simulation Walkthrough

Basically, the EEP training simulation walkthrough is develop as a substitute from the traditional training which normally conducted by the fire bridged. In the EEP training simulation walkthrough, the user is given an experience to the real situation when there is a fire in the certain place according to the selected starting point. The starting point is divided into four levels, which are ground floor, first floor, second floor and third floor. After user select the level of the floor, the system will provide feedback for the shortest route and also alert user the fire fighting element at the nearby for evacuation. Therefore, interactive elements that included in this functionality are:

- User can identify the starting point.
- The system will provide feedback for the shortest route.
- The system will alert user the fire fighting element at the nearby for evacuation.

4.6 Project Storyboard

4.3.1 Interface for the Main Page (Home)

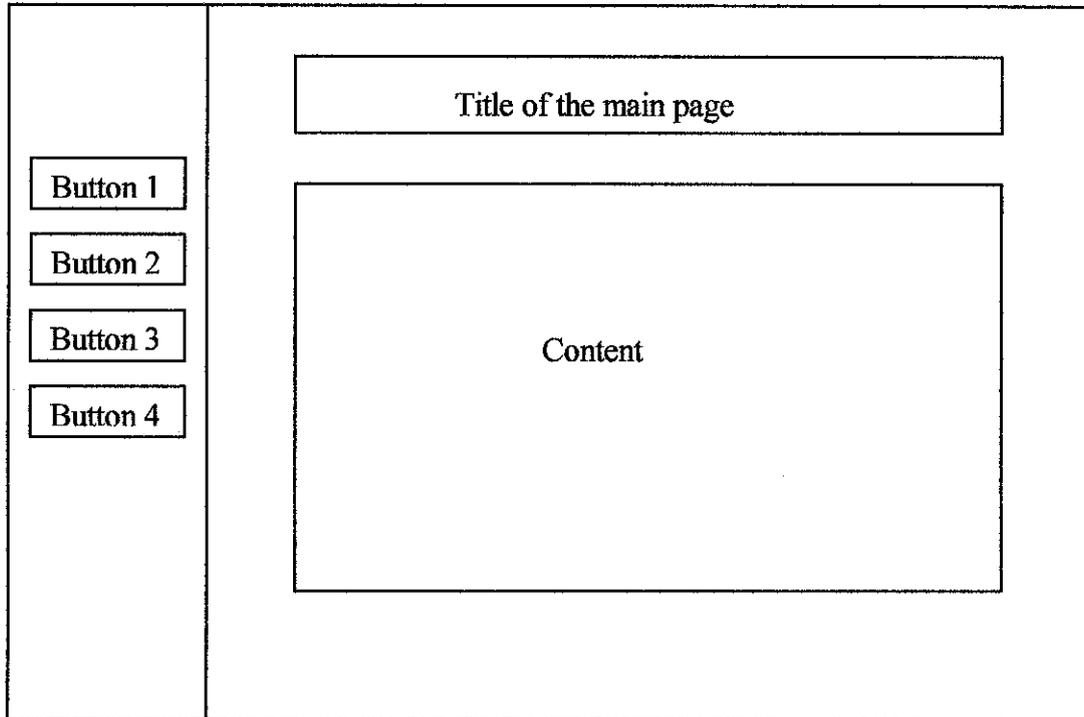


Figure 3 : Main Page (Index 1)

Description:

Button navigation : - Button1 for Home
- Button 2 for Fire Fighting Equipment Location
- Button 3 for EEP Training Simulation Walkthrough
- Button 4 for Emergency Escape Plan Layout

The content of the main page is the introduction of the software.

4.3.2 Interface for Fire Fighting Equipment Location

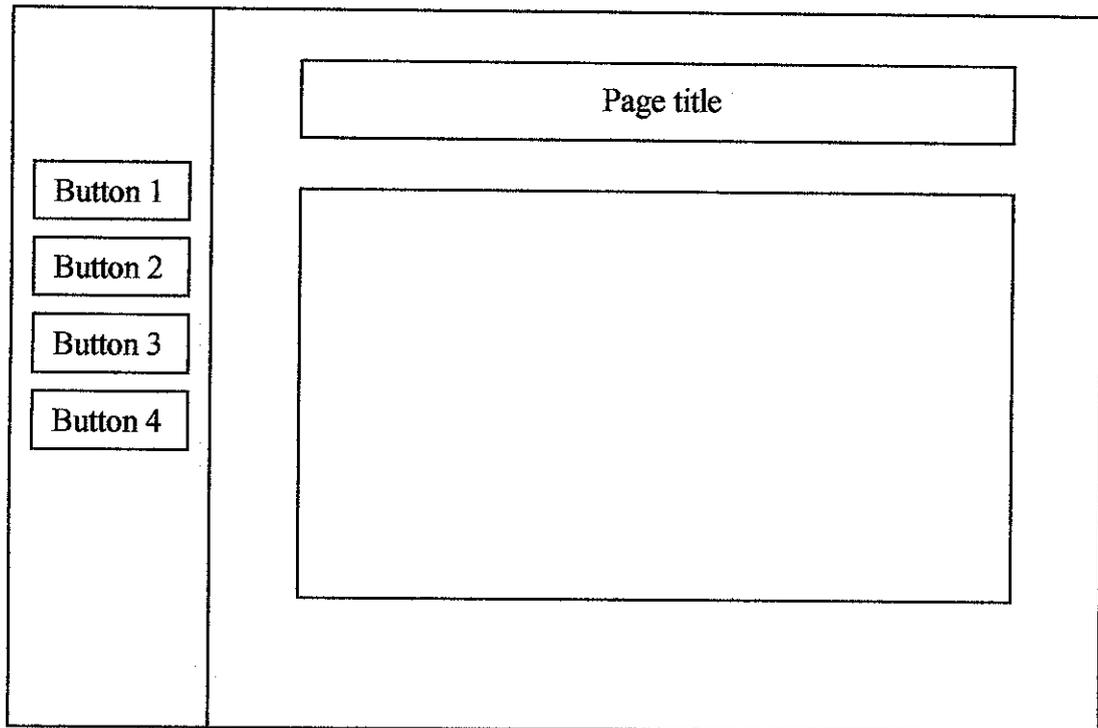


Figure 4 : Fire Fighting Equipment Location (Index 2)

Description:

- Button navigation :
- Button1 for Home
 - Button 2 for Fire Fighting Equipment Location
 - Button 3 for EEP Training Simulation Walkthrough
 - Button 4 for Emergency Escape Plan Layout

The page of Fire Fighting Equipment Location includes the blinking element that shows the location of the fire fighting equipment.

4.3.3 Interface of EEP Training Simulation Walkthrough

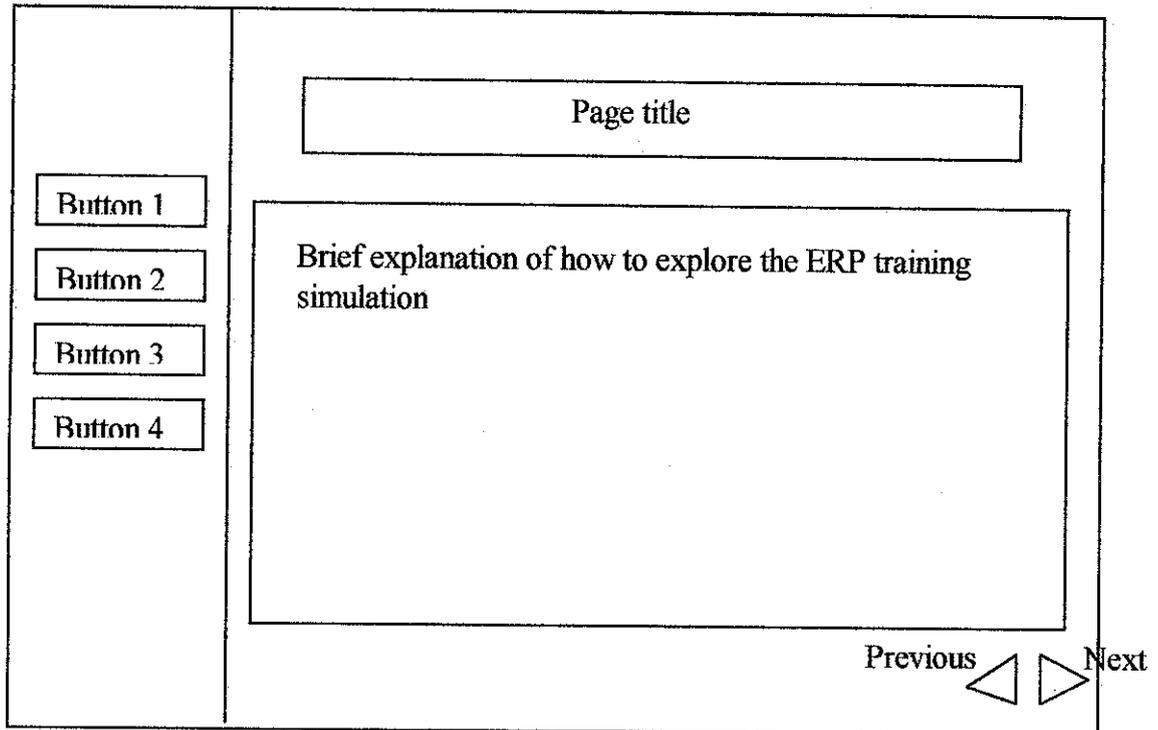


Figure 5 : First page of EEP training simulation walkthrough (Index 3.1)

Description:

- Button navigation :
- Button1 for Home
 - Button 2 for Fire Fighting Equipment Location
 - Button 3 for EEP Training Simulation Walkthrough
 - Button 4 for Emergency Escape Plan Layout
 - Button Previous
 - Button Next

The page of EEP Training Simulation Walkthrough is consisting of two pages; first page is the brief explanation about how the user can explore the simulation. The second page is the interface for the ERP interactive.

4.3.4 Interface of EEP Training Simulation Walkthrough

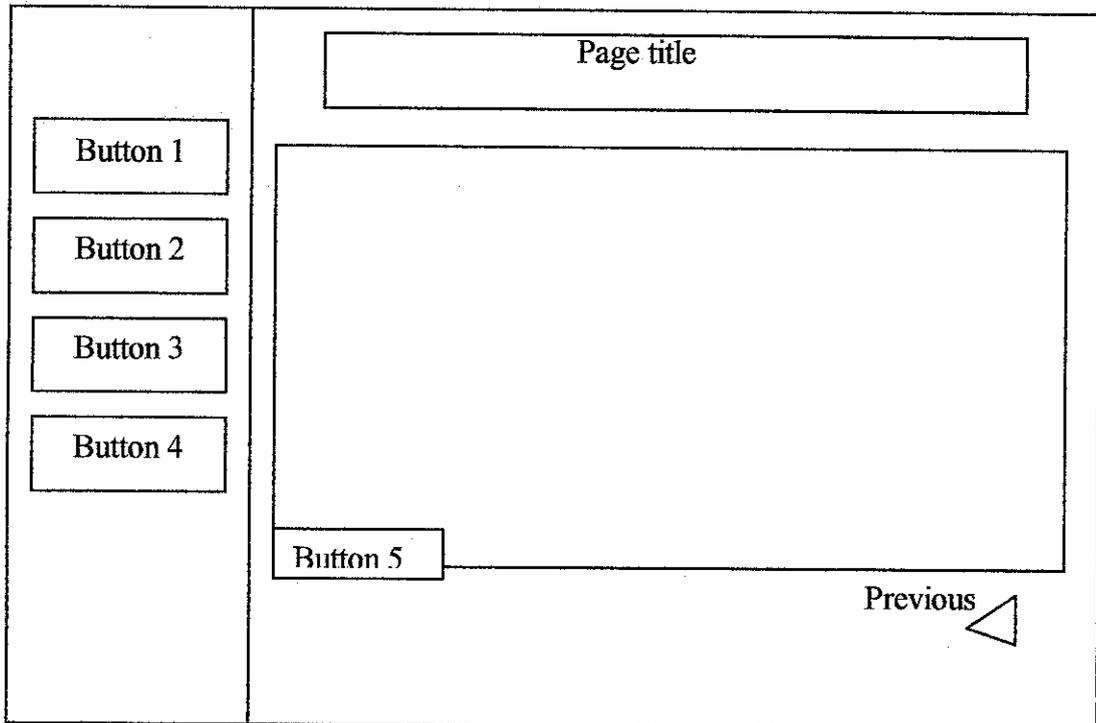


Figure 6 : Second page of EEP Training Simulation Walkthrough (Index 3.2)

Description:

- Button navigation :
- Button1 for Home
 - Button 2 for Fire Fighting Equipment Location
 - Button 3 for EEP Training Simulation Walkthrough
 - Button 4 for Emergency Escape Plan Layout
 - Button 5 for Select the point to start fire
 - Button Previous

This is the second page of ERP training simulation walkthrough. In this page, there is an additional button (Button 5) that allows the user to select the point or area to start the fire. By using a mouse as a navigation device, the user tries to escape from the fire according to the exit sign that will appear on the scene.

4.3.5 Interface for Emergency Escape Plan Layout

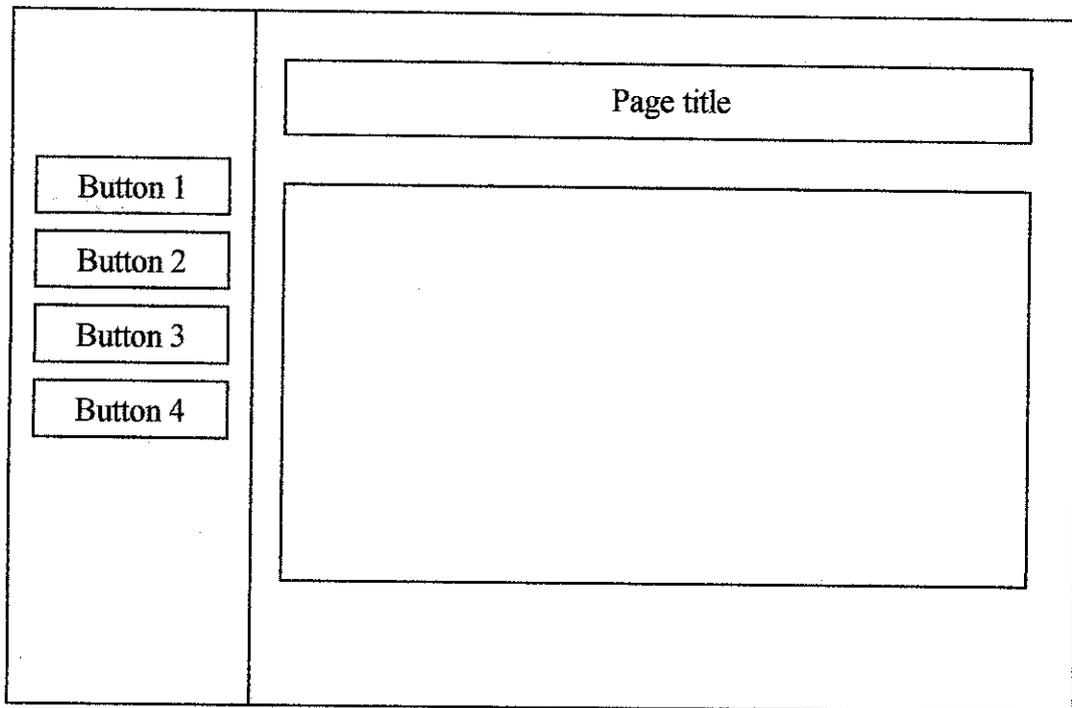


Figure 7 : Emergency Escape Plan Layout (Index 4)

Description:

- Button navigation :
- Button1 for Home
 - Button 2 for Fire Fighting Equipment Location
 - Button 3 for EEP Training Simulation Walkthrough
 - Button 4 for Emergency Escape Plan Layout

In this page of an Emergency Escape Plan shows the sketch of the plan layout in more detail.

4.4 Project User Interface Snapshot

4.4.1 Interface for the Main Page

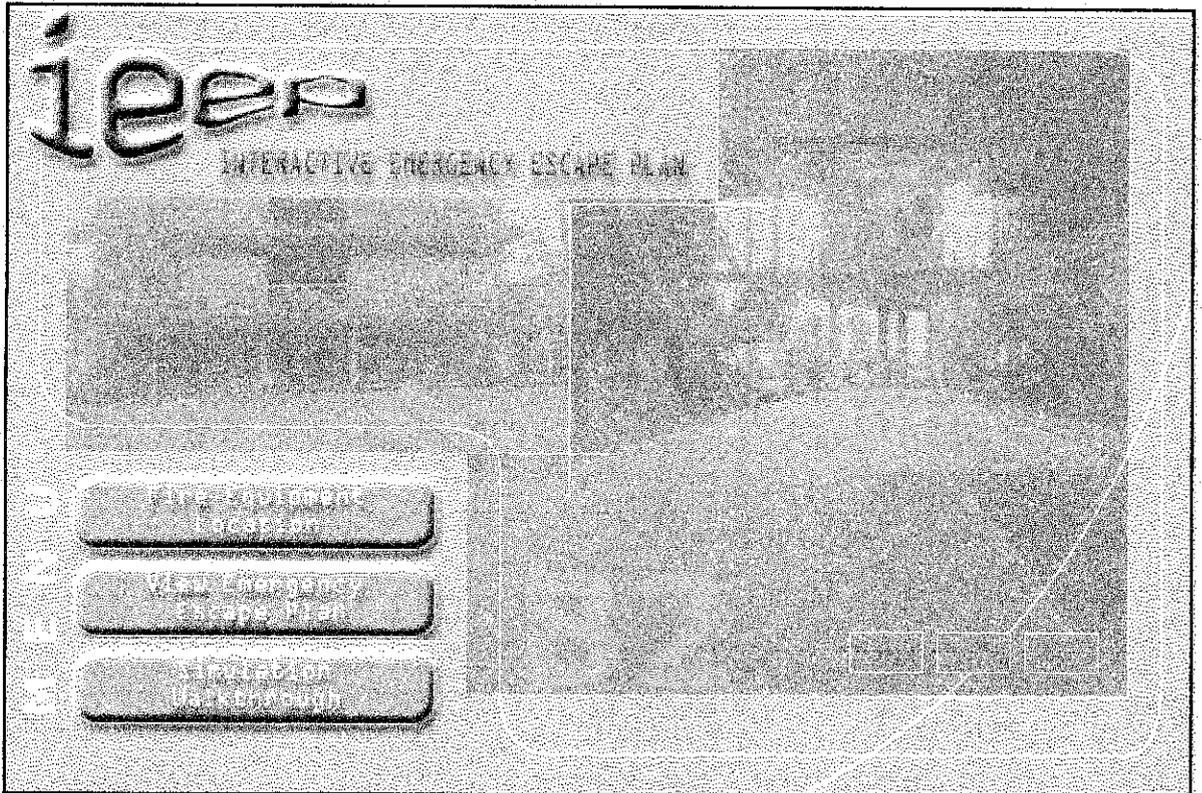


Figure 8: Snapshot of the Main Page (Index 1)

This is the main page of the Interactive EEP. The main page of the system is actually called Home for other page of the system. There are three main buttons for user navigation which are Fire Equipment Location, View Emergency Escape Plan and Simulation Walkthrough. The user can easily navigate through the system according to the flow of the functionality to get better understand or jump through the selected functionality. For additional information, the Index here means the page number of user's link.

4.4.2 Interface for Fire Fighting Equipment Location

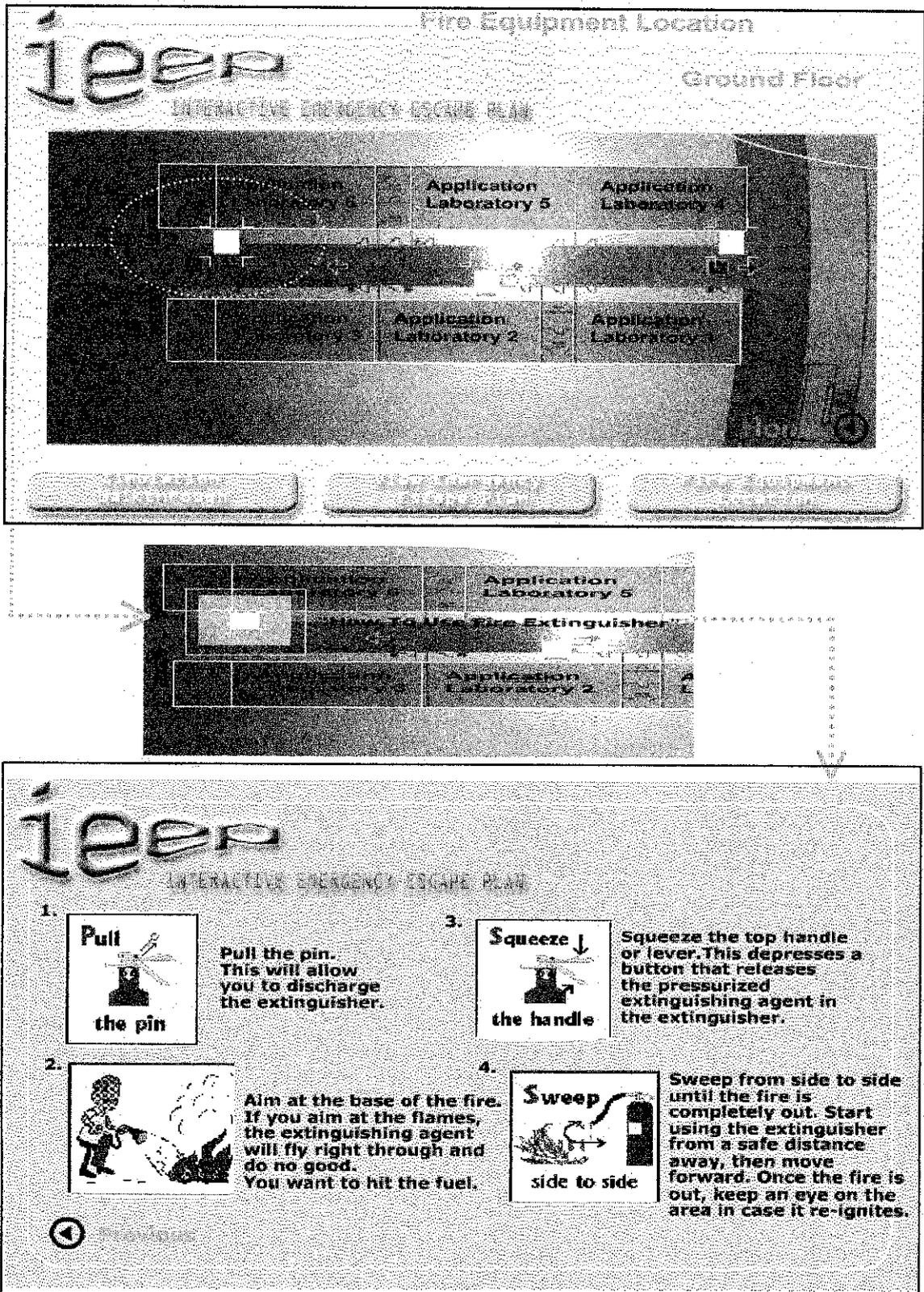


Figure 9: The Snapshot of Fire Fighting Equipment Location

By using the user interface as showed in Figure 9, the user can identify the specific location of the nearest fire fighting equipment according to the level of the floor selected by user. In addition, user also can have an interactive with the equipment by clicking at the selected equipment to get the information on how to use the equipment.

4.4.3 Interface for EEP Training Simulation Walkthrough

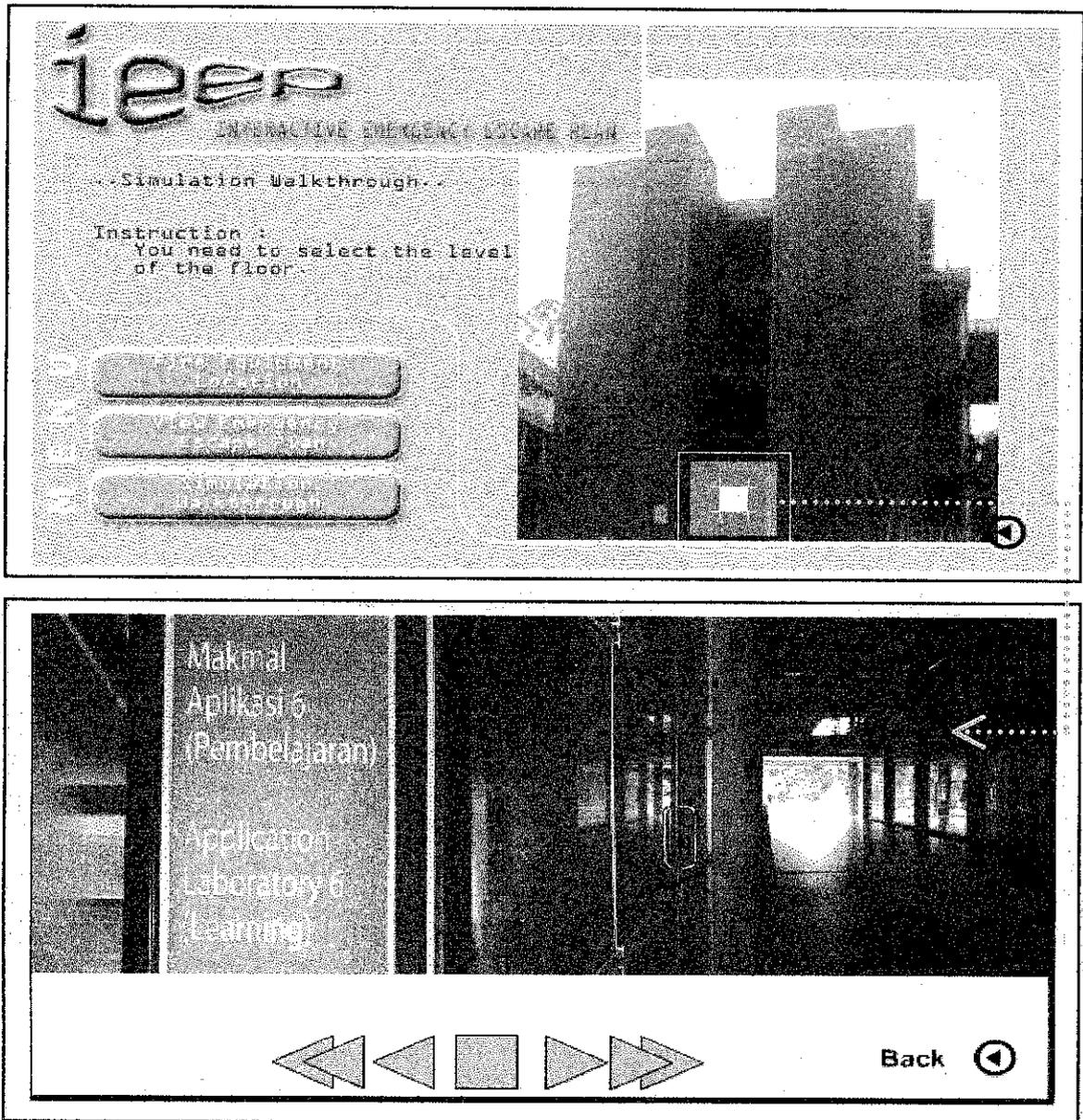


Figure 10: The Snapshot of IEEP Training Simulation Walkthrough

The IEEP Training Simulation Walkthrough as showed in Figure 10, it gives user as an individual training to find the shortest path of the evacuation during a fire. The system will guide the user during this session.

Before user explores into the Simulation Walkthrough, they need to select the level of the floor. For Building 2, there are four levels, which are ground floor, first floor, second floor and third floor. The ground floor until the second floor it consist of the student laboratory and for the third floor it consist of the lecturer's room.

For additional information, there is a user navigation button, which used in Simulation Walkthrough session.

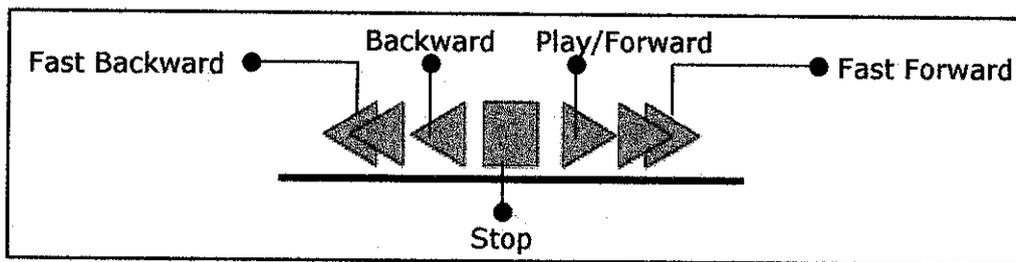


Figure 11: User Navigation Button

The Back button in Figure 10 is actually link the user to the main page of the IEEP Training Simulation Walkthrough.

4.4.4 Interface for EEP Layout

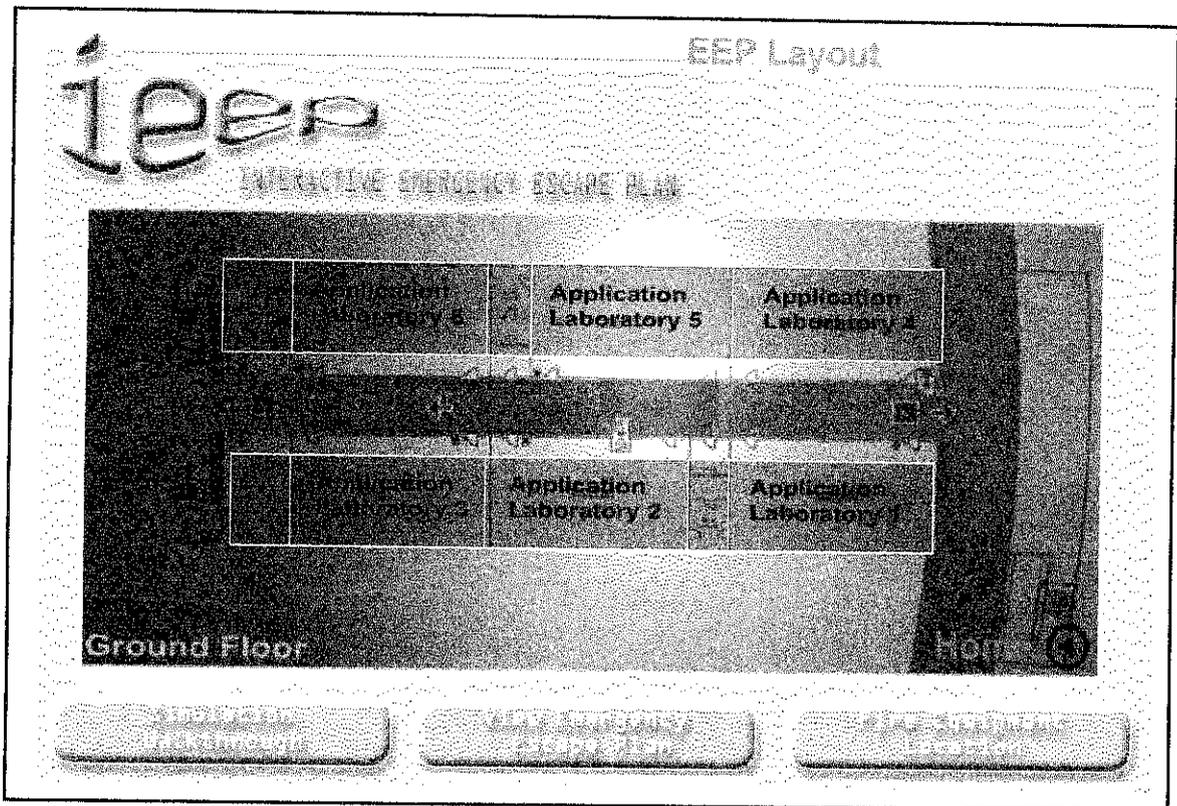


Figure 12: The Snapshot of EEP Layout

In the EEP Layout the user can see an arrow moving to show the user the right evacuation route during a fire. In this session, user can see the entire layout of escape plan from the upper view.

4.5 Site Map of Interactive EEP

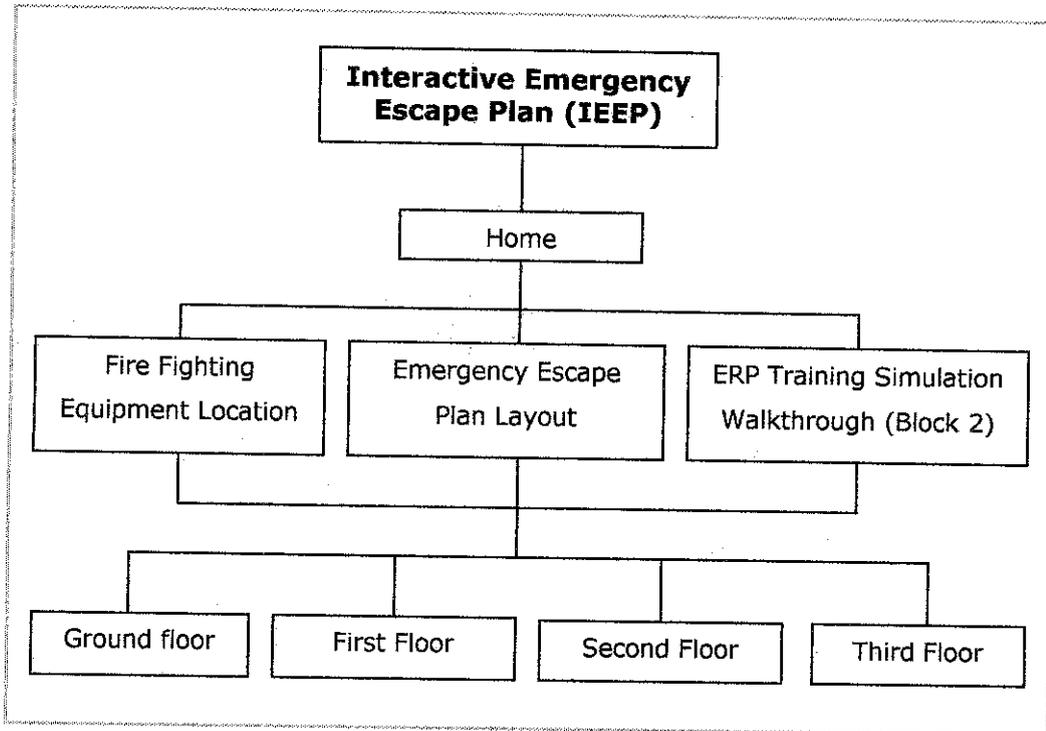


Figure 13: Interactive Emergency Escape Plan Window Navigation Design

Figure 13 shows the site maps of the system or the flow of the navigation design for IEEP. Basically the three main functionalities of the system are based on the level of the floor selected by user. Each level has a different layout of the emergency escape plan. Thus, the evacuation route for each level is also different.

4.6 Testing Implementation

Thorough testing will be needed as to ensure the product's reliability and correctly functional. In this section, the testing would be regarding the ability of the interaction between the user and the design itself.

Regarding human-computer interaction concept, user will be asked on their satisfactory about the creativity and interactivity of the design. These aspects to be concern are the interface interactivity and the reliability of the design, whether system really works according to the user interaction.

The author chooses a pilot testing which consist of the group of student to see how the system works and to test the interactive elements in the system.

4.6.1 Pilot Testing

Pilot testing which is designed to identify hidden issues and eliminate surprises well before going live with the new systems. Pilot testing is sometimes used prior to the purchase as a final test of the software's ability to meet the group of user requirements. More often, it is used after the purchase as an addition to the training activities with the chosen solution.

4.6.2 Testing Questionnaire

This questionnaire is done in order to test the functionality and how far the interactivity of the system itself, in order to prevent the system from being not appropriate for usage by the end-user. Below are the questions asked in the questionnaires: -

Question 1

User Interface Design

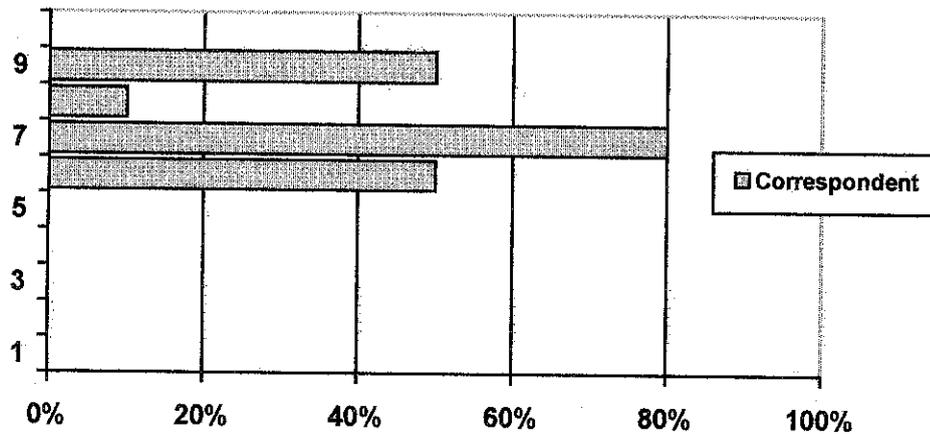


Figure 14: User Interface Design Correspondent Graph (1: Worst; 10; Best)

From this figure above, majority of the correspondent (80%) has given the rate of 7 out of 10 for this system regarding its user interface design. This is because from some of their opinion, the user interface is simple, and interactive.

Question 2

Interactivity Element

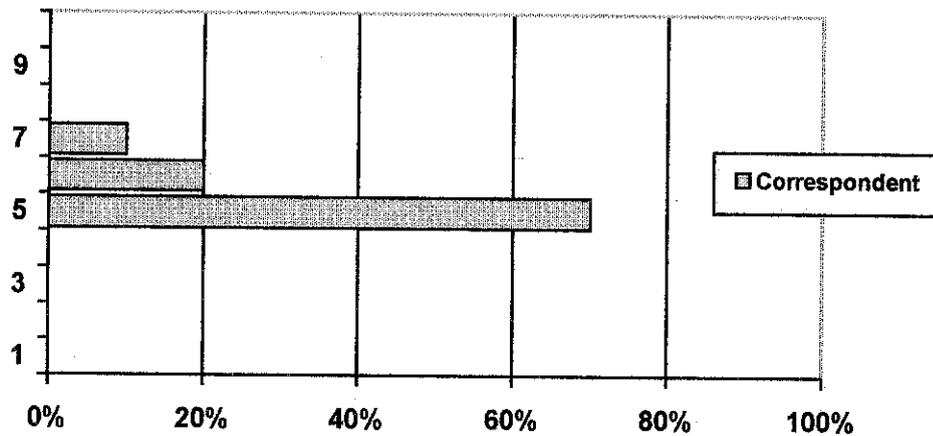


Figure 15: Interactivity Element Correspondent Graph (1: Worst; 10; Best)

From this figure above, majority of the correspondent (70%) has given the rate of 5 out of 10 for this system regarding its interactive element. From the results obtained, this system should improve in term of user interactivity.

Question 3

User Navigation Design

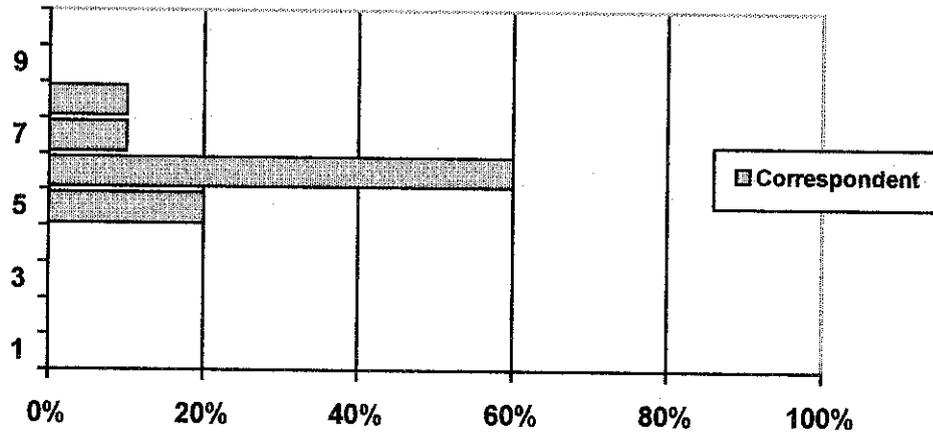


Figure 16: User Navigation Design Correspondent Graph (1: Worst; 10; Best)

From this figure above, majority of the correspondent (60%) has given the rate of 6 out of 10 for this system regarding the user navigation design (the link from page to page efficiency). From the results obtained, this system can be easily navigated by user.

Question 4

Product Evolvement

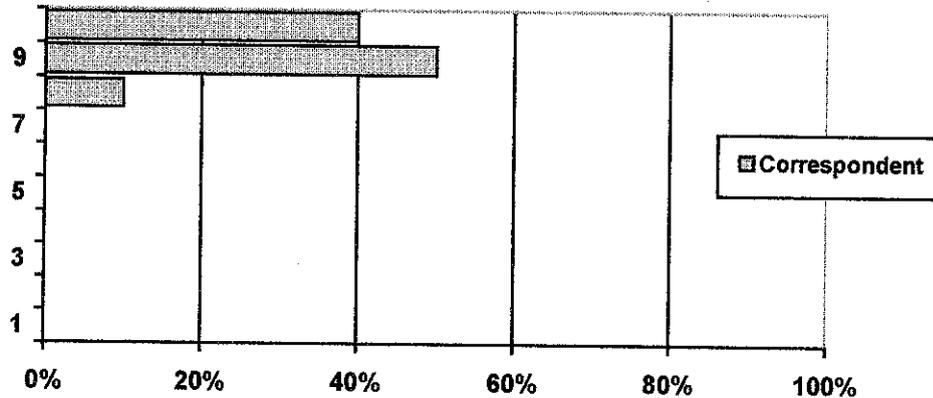


Figure 17: Product Evolvement Correspondent Graph (1: Worst; 10; Best)

From this figure above, majority of the correspondent (50%) has given the rate of 9 out of 10 for this product to evolve in the future. From some of the correspondents' point of view, this product can also be made as virtual reality, as to make the system more realistic especially for the Training Simulation Walkthrough.

4.7 Limitation

The IEEP system is not complete 100 percent because of the software and hardware limitation. The major problem that leads to the limitation is when the developer wants to import the image in format of jpeg into the scene of Macromedia Flash. The software will automatically convert the imported image into bitmap formatted which means that the size of the image become larger and disturb the system to run smoothly. The hardware itself also leads to the problem because of the limited memory storage that can be support all size of the image.

CHAPTER 5

CONCLUSION AND RECOMMENDATION

As a conclusion, the IEEP system is not complete and not fully covered the objective specially to simulate an emergency evacuation during fire. This is because of the software and hardware limitations. Macromedia Flash is actually suitable to develop an interactive environment but at the same time it has a limitation in term of importing images. For future development, it is necessary for the developer to choose software that supports an interactive element as well as the 3D environment in purpose to develop a realistic situation of emergency evacuation.

Actually, the strength of the system is it can be a substitute for the traditional training for fire escape conducted by the fire bridged. The system can be easily installed to the user personal computer that meets the minimum requirement to the system for running smoothly. The learning of the system is based on individual view especially when they do not enough time or not available to attend the traditional training. The most important part of the system is simulation walkthrough where the user will explore in how to find the escape walkthrough when there is a fire. The simulation walkthrough for escape is based on the level of the floor. Basically the escape walkthrough is different from another level.

The enhancement of the system is essentially recommended, as this is the new environment from reality to virtual. For future enhancement, it is good for the development on interactivity between user and the fire equipment as they can learn how to implement the fire equipment in the system itself. Then the system has the potential to be a fully interactive in environment of the virtual reality.

REFERENCES

Sources from Article

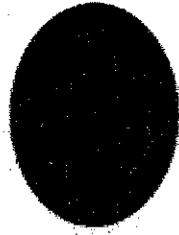
- [1] Dastbaz, Mohamad. (2003). Application areas for interactive multimedia system. Designing Interactive Multimedia System, 11.
- [2] Ernest Vendrell, G. (2001). Developing the Emergency Response Plan.
- [3] Isakowitz, R. (1992). Education for the year 2000. A whole new game. Computing Canada, 18 -19.
- [4] Linda Bucy. (2004). Emergency Response Plan for Business Operations Recovery. The Office of Sponsored Programs Virginia Polytechnic Institute and State University, 231-5281.
- [5] Mark Elsom, Cook. (2001). What is interactive multimedia? Principles of Interactive Multimedia, 8.
- [6] Shneiderman, Ben. (1998) Designing the user interface, Addison-Wesley.
- [7] Shulman, R.E. (1992). MM... A high-tech solution to industry's training malaise. Supermarket Business, 47.

Sources from Internet

- [8] ActionScript.org. "Collision Detection." Macromedia Flash Resources and Tutorials. Available:
http://www.actionscripts.org/tutorials/intermediate/Collision_Detection/index2.shtml. 29 March 2006.
- [9] ActionScript.org. "Game with Laser." Macromedia Flash Resources and Tutorials. Available:
http://www.actionscripts.org/tutorials/intermediate/Game_with_laser/index.shtml#. 29 March 2006.
- [10] ActionScript.org. "Virtual Reality Tours in Flash." Macromedia Flash Resources and Tutorials. Available:
http://www.actionscripts.org/tutorials/advanced/Virtual_Reality_Tours_in_Flash/index2.shtml 29 March 2006.
- [11] CBT Cafe. "Flash MX: Using Templates." Flash Tutorials. Available:
<http://www.cbtcfe.com/flash/index.html>. 27 March 2006.
- [12] DeimonHigh.com. "Lighting Effect." Adobe Photoshop Tutorials. Available:
http://www.daimonhome.com/tutorial/Ligthing_Effect_Tutotial.php. 3 April 2006.

- [13] Emergency Management. "Building Fire Protection." Property and Buildings Department, University of Melbourne.
Available:
<http://www.pb.unimelb.edu.au/emergency/emergencies/fire/firesystems.html>. 27 March 2006.
- [14] ESH Safety Training. "Fire Extinguishers Training." Oklahoma State University.
Available:
<http://www.pp.okstate.edu/ehs/MODULES/exting/index.htm>. 30 March 2006.
- [15] Fire Safety Technical Guide. "Fire Safety Legislation." University College London.
Available:
http://www.fsiuk.co.uk/fire_safety_legislation_regs.htm. 30 March 2006.
- [16] GreyCobra.com. "Photoshop Tutorials".
Available:
<http://www.greycobra.com/tutorials>. 3 April 2006.
- [17] GreyCobra.com. "Smoke Animation." Adobe Photoshop Tutorials.
Available:
http://www.greycobra.com/tutorial/Smoke_Animation/2/. 3 April 2006.
- [18] Jeffrey Bardzell. "Building a Flash Video Simulation." Macromedia Press. (17 Jan 2003).
Online.InformIT.
Available:
<http://www.peachpit.com>. 27 March 2006.
- [19] This Old House. "How to Choose and Use Fire Extinguishers." Tools and Materials.
Available:
<http://www.thisoldhouse.com/toh/knowhow/tools/article>. 3 April 2006.
- [20] U.S Department of Labor. "Evacuation Plans and Procedures eTool." Occupational Safety & Health Administration.
Available:
http://www.osha.gov/SLTC/etools/evacuation/portable_about.html. 27 March 2006.
- [21] Webwasp.co.uk. "Tweening Shapes." Flash Tutorials.
Available:
<http://www.webwasp.co.uk/tutorials/a04-shape-tween/images/mx/shape-mx.php>. 3 April 2006.

APPENDICES



**UNIVERSITI
TEKNOLOGI
PETRONAS**

JANUARY 2006 FINAL YEAR PROJECT

**INTERACTIVE EMERGENCY ESCAPE PLAN
(IEEP)**

TESTING QUESTIONNAIRE

HAZAHAMIMA BINTI MISKAM

6050

INFORMATION COMMUNICATION TECHNOLOGY

hazahamima@yahoo.com