AUTOMATED EXAM PROCEDURES CONTROLLER

MUHAMAD HAFIDZ AL-FATAH BIN BADARUDDIN

INFORMATION AND COMMUNICATION TECHNOLOGY
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Final Report

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by

Muhamad Hafidz Al Fatah Bin Badarudin

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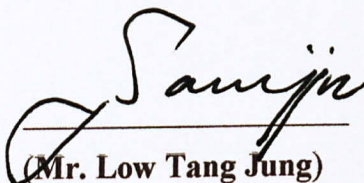31750 Tronoh
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CERTIFICATION OF APPROVAL

AUTOMATED EXAM PROCEDURES CONTROLLER

By

Muhamad Hafidz Al Fatah bin Badarudin

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Approved by,

(Mr. Low Tang Jung)

UNIVERSITI TEKNOLOGI PETRONAS

TRONOH, PERAK

July 2010

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.

MUHAMAD HAFIDZ AL FATAH BIN BADARUDIN

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Firstly, I would like to express my gratefulness to God; for upon HIS willing and blessing, I managed to complete this project within the specified time. My greatest gratitude to my parents who is keeps supporting me until the very end of the project. Most and foremost, many thanks to my final year project's supervisor, Mr. Low Tang Jung for all the guidance in my Final Year Project, valuable insights and also for resources and tips he gave in making this project successful. Not to forget to my seniors and friends who have been sharing their ideas and resources to make this project go on.

ABSTRACT

The purpose of this project is to develop a system that will overcome some irregularities encountered on the examination process flow at UTP. It is aimed to develop a system that has a programmable set of general procedure of instructions that can be repeated in all exams. This system is built to create a consistent exam process flow such as instructions for time reminder, commencement of exam and stop writing announcement that will be automated.

The system is able to capture some other inputs from keyboard for direct information input such as to display written announcements and making changes to exams paper into the system.

The system was developed using a Prototyping System Modeling, which can provides flexibility during the development phase by evolving the modules and prototypes to the next level. The system was developed in two (2) consecutive semesters. The first part (first semester) was basically the initiation, research and design of the system whereas the second semester is more on the development and testing of the prototype for a more complete final product.

The system is expected to enhance the current version by introducing more standardized and organized Web Based applications that have more realistic features. The system can be implemented in UTP on basic supporting software such as a Web browser and Macromedia Flash on Windows platform.

TABLE OF CONTENT

LIST OF FIGURES AND TABLES

LIST OF ABBREVIATIONS AND NOMENCLATURES

UTP = Universiti Teknologi PETRONAS

PHP = Hypertext Preprocessor

HTML = HyperText Mark Up Language

PC = Personal Computer

EU = Exam Unit

EH = Exam Hall

AEPC = Automated Exam Procedures Controller

CHAPTER 1

INTRODUCTION

1.0 Introduction

1.1 Background

It has been a common practice since the founding of University Teknologi PETRONAS (UTP) that every semester is closed with a series of final examinations. On these exams, the students are evaluated and tested on the knowledge acquired during the whole semester.

Each of these exams is carried out in the Examination Halls (EH) and each hall can accommodate students of more than one subject and exams of different time frames. There are set of regular procedures executed by invigilators during the examination day. Similar situations happen in each examinations whereby chief invigilator, course lecturer or any appointed invigilator will stand in front of EH announcing the correction of the paper and be listened by affected and unaffected candidates.

1.2 Problem Statements
- Interruption to students that are not related to amendments announced by invigilator(s) or lecturer(s).
- Different accent spoken by different lecturer makes the student confuse and hard to understand the announcement.
- Difficult for invigilators to capture the student attention whenever the examination started. If the announcement on certain question changes which

1

affect major number of student in one hall and most of the students is not paying attention to the announcement, it will be hard for invigilators to explain it to each student if they raise their hands and asking explanation on the question changes later.

- Repeated announcement from invigilators may disturb or made the student feel annoyed.
- Irregularities in dismissing and permitting candidates to leave EH due to different ways in conducting the process by invigilators.

1.3 Objective

- To create a web based computerized system to control UTP examination flow by using PHP platform.
- Standardize the basic tasks of the invigilators.
- Automate the basic announcements in the examination flow.
- Provide a more efficient and effective way to announce changes on examination papers during examination.
- Create an active time display for better viewing in large EH.

1.4 Scope

- The scope is focusing on UTP examination flow control at UTP EH which can fit more than 100 students / candidates.
- The target users are the invigilators, lecturers and students.

1.5 Feasibility Study

1.5.1 Technology and system feasibility

The system will require a Xampp, software for running desktop as local server, desktop or laptop, web browser and notepad application. The university has provided the facilities and application for student to use it

at Academic Building Block 1 and 2. Microsoft Project and Visio needed to build Gantt Chart and System Diagram respectively.

1.5.2 Economic feasibility

This system will not require much hardware and software so it is practical to accomplish this project without cost problems.

1.5.3 Legal feasibility

Automated Exam Procedures Controllers can be developed legally as it does not violate the rules and regulation of Universiti Teknologi PETRONAS. The data input from the user which are mainly the examination procedures and course questions are being inserted during the examination time and no question leakages issue will rise.

1.5.4 Operational feasibility

Human effort especially voice will be reduced by using this system and all the possible procedures which include voice announcement will be handle over by the system. The announcement or question correction made during the examination display will be projected on the screen repeatedly and student will see it clearly without the need to call the invigilators to explain the corrections announced earlier.

1.5.5 Schedule feasibility

Gantt chart of this system has been made, all the track and progress of the system development must be followed as per the schedule in FYP Gantt chart in the Appendix section.

3

CHAPTER 2

LITERATURE REVIEW AND THEORY

2.0 Literature Review

University examination procedures controllers are mainly been set and used at all universities around the world. Below are some literature reviews regarding the ways of examination procedures based on their guidelines and the message announcement system.

2.1   Faculty of Art, York University, Toronto, Canada

The examination process rule states that students should not leave the exam room temporarily except to use the washroom facilities or for reasons of illness. The students who leave for other reason must be provided adequate supervision by invigilators.

If any student who reports being too sick to start or finish an exam, immediately refer to their family and doctor, and advise them to contact the Registrar's Office within one working day of the end of the exam. Do not push a student to sits the exam if sickness or other severe pressure will likely to impact the student's performance.

The Chief Invigilator should seize their answer book and the not permitted material being used as the candidate should be permitted to continue the exam with new book given. This action should be recorded on the cover of the impounded book. The Chief Invigilator should report the incident to Mathew

4

Harper, Student Relations Advisor, in the Office of the Dean at extension 20782 within one working day of the end of the exam.

If a student arrives at the EH within the first half an hour of the start of the exam, they will be allowed to enter and write the examination, with completion time as originally scheduled and no extra time is given. Students who arrive later than this may not be allowed to enter the EH. They should be advised to contact the Registrar's Office within one working day of the end of the exam.

After The Examination

Invigilators should collect all exam question papers, used and unused exam books. Besides that, they should return any unused examination books to the Registrar's Office (Suite A, WOB) within one working day of the end of the exam. This must be completed during the half-hour timeslots. It is important to NOT leave unused exam books in the exam room or outside of exam booklet distribution locations for obvious security reasons. [1]

2.2 Message Announcement System (US Patent No. : 6856258)

This is a system patented under United States Patents. It is used for broadcasting announcements at predetermined locations which has an autonomous announcement computer at each predetermined location.

In a message announcement system for broadcasting event announcements at predetermined locations, a method for editing and broadcasting event announcement comprising the steps of:

a) The announcement stored in an autonomous announcement computer at each predetermined location, which also comprises the event announcements and associated event announcement identifiers;

5

b) After receiving an event announcement command, the system will broadcast the stored announcement at the predetermined location; and

c) Any process of editing event announcements which been stored at the announcement computers can only be done by using a master computer in connected to every announcement computers. [2]

2.3 Automatic Message Announcement System (US Patent No. : 4276572)

This invention is about an automatic message announcement system, which is used to automatically announcing messages at the train station area.

Regularly, train information is announced at the platforms of any train station. The announcements are usually done by a station master of the relevant platform, but recently such activities have been handled out automatically for manpower saving purposes.

In the case of an two ways platform which allows departure or arrival of "up-trains" on one side and "down-trains" on the other, both an up-train and a down-train often arrive at the same time, or one train leaves as another train arrives. In such cases, existing automatic announcement service systems cannot perform sufficiently. For example, if an up-train has arrived and immediately after that a down-train arrives, existing automatic announcement service systems will announce the arrival of the up-train and then announce the arrival of the down-train. In this system, messages of predetermined length are recorded onto a magnetic tape and relevant messages are all announced in accordance with the approach, arrival and departure of trains.

Therefore, if the arrival of the down-train is announced after completion of the announcement for the arrival of the up-train, as explained in the above example, a

significant time may have passed after the down-train has arrived at the platform. This delay may be unpleasant to the passengers, and such announcement services cannot be said to be sufficient. Such disadvantages are also observed during announcements for train departures and approaches, in addition to the case of train arrivals. [3]

2.4   Digital Announcement System

2.4.1 System Concept

The system has capability to display the time on the LED display once the start button is pushed. At the mean time, the infrared interceptor is initiated, and is constantly checking if its infrared ray is intercepted, and if it does, the system will be triggered to announce the time of interception to the runners, and make a record of the time interception into the system. The runner should also be able to spot the time they took on the LED display. If the STOP button is pressed, the timer should stop timing and record the time of disconnection on the system. When disconnected, the infrared interceptor and LED display are also to be off.

2.4.2 Working Principles

Background knowledge about the workings of each component in the system is required if this system need to be implemented. Therefore, it is important to have the knowledge on controlling of the LED display, the voice synthesizer, the infrared interceptor, and the keypad, and finally we will show a flowchart on integrating these devices.

2.4.3 Voice Synthesizer

There is a need to store a digit from 0 to 9 in human voice and depending on the situation in order to announce the time of interception to the runners in 2.4 kilometer (Km) run, it should announce the correct time by searching the location of the voice segment corresponding to the correct digit as in Figure 1 below.

As being found in the research, the average human voice frequency is estimated at 2 KHz to 4 KHz. Therefore, this system need to sample at a Nyquist sampling rate of f(sample)>2*f(voice)=8KHz. The minimum sampling frequency as 8 KHz has been chosen and with this frequency, it implies that the voice should be sampled every 1 / 8KHz = 125 µs.

The voice obtained (equivalent to a particular digit) can also be broken down into different syllabus, and each syllabus should take up equal frequency of sampling. For example, the rate of sampling a particular digit of 3 syllabuses will have each syllabus taking up 8000 / 3 = 2667 Hz. [4]
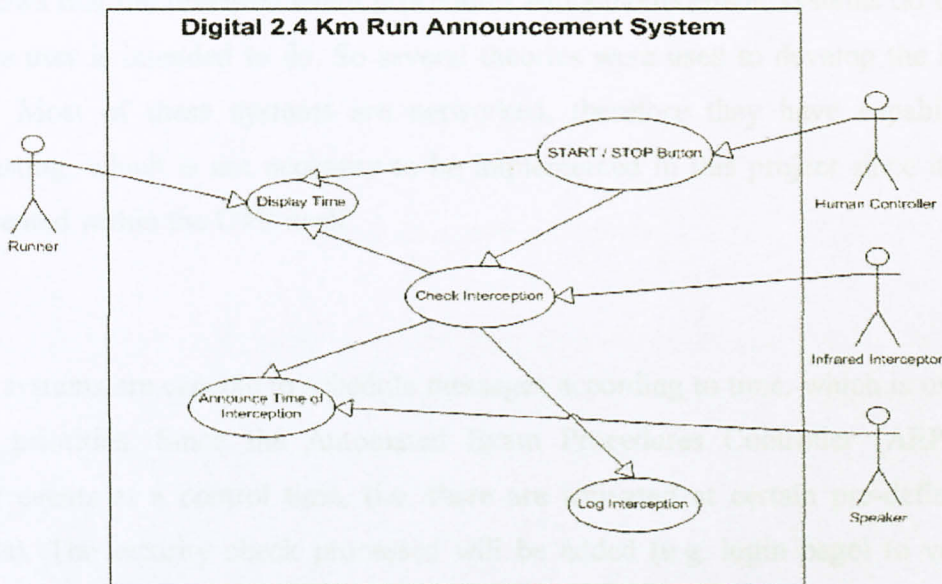

Figure 1: Digital Announcement System Use Case Diagram

2.5　Analysis of Literature Review

This project is based on two different ground of studies which are to find how other universities conduct their final exams and the other part was the study of concepts behind announcement system to see whether it can be applied to this project. The main concern with the exam invigilation processes at various universities is that these processes are quite similar to the basics exam procedures implemented at UTP. For this reason, there is no decision on changing the UTP basic examination flow to be adopted in the project.

Regarding the announcement system, almost all the systems use the same steps to incorporate the new messages to be transmitted or announced. Most of the messages are stores in the memory while there is also one part that can accept the message customization on the spot, before the message is entered into voice production process.

This shows that the reviewed exam procedures and announcement systems do basically what the user is intended to do. So several theories were used to develop the intended system. Most of these systems are networked, therefore they have capabilities of broadcasting, which is not necessity to be implemented in this project since it will be implemented within the UTP itself.

All the systems are capable to schedule messages according to time, which is one of the project priorities. Since the Automated Exam Procedures Controller (AEPC) may execute events at a control time, (i.e. there are activated at certain pre-defined time intervals). The security check processed will be added (e.g. login page) to verify the users of the system and to have a better authorized control of the system.

CHAPTER 3

METHODOLOGY

3.0 Methodology
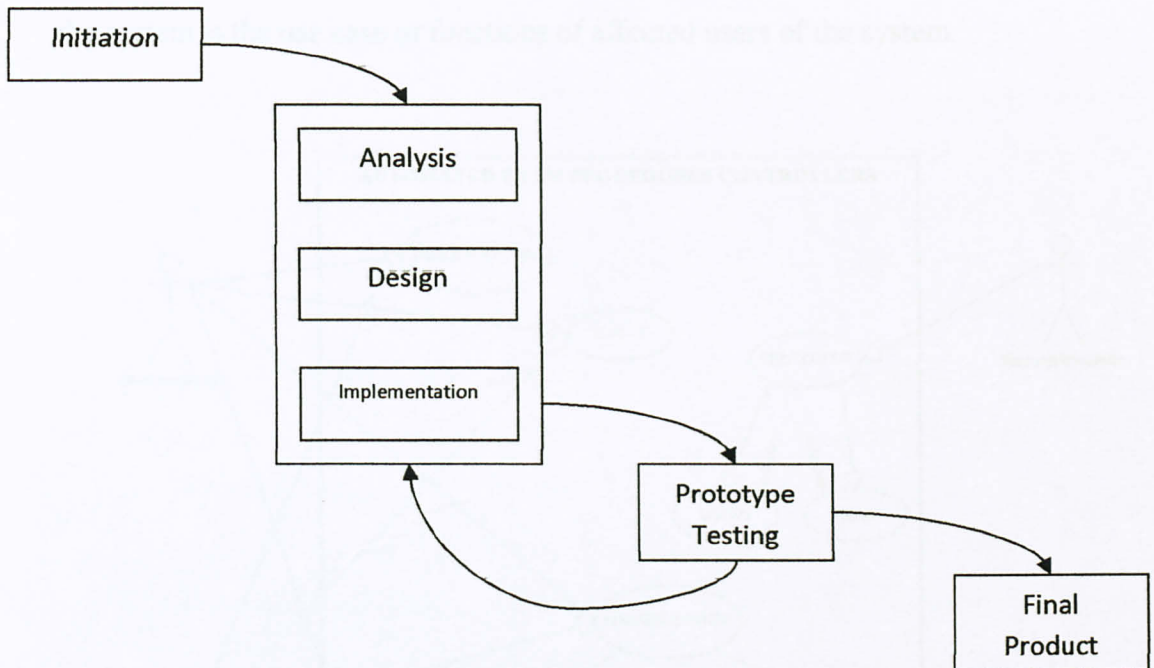
Figure 2: System Modeling

The methodology will be used is Prototyping System Modeling as in Figure 2. There are six (6) phases of this model which are Initiation, Analysis, Design, Implementation, Testing Prototype and Final Product.

3.1 Initiation

At the initial stage, the criteria and the expected functionalities of the website have been list out to ensure the system can be partially functioning. Several essential data on the examination procedure has been collected from the Examination Unit.

3.2 Analysis

Thorough analysis and research at this stage is done to improve the user functionalities. Risk assessment will be conducted to help forecasting future problems that may arise, and to provide possible solutions as well. The analysis of the system is the use case or functions of affected users of the system.

Figure 3: Use Case Diagram

Figure 3 shows several functionalities of the use case which are:

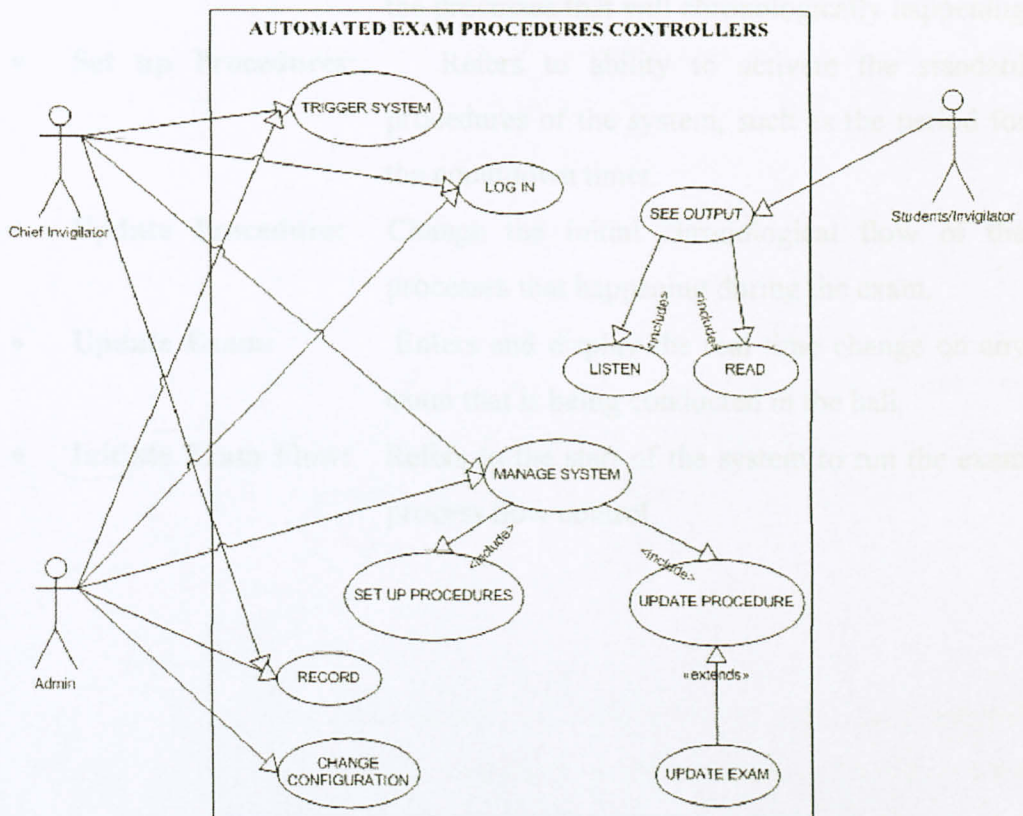- **Actors:** The Use Case diagram has four main actors that can perform different actions on the system. They are Students, Invigilators, Chief Invigilator and the Administrator.

- **Log In:** The user need to enter the username and password to gain access to the system.

- **Read:** Able to see the result produced from the processes, such as viewing the time and question changes made on the exam screen.

- **Listen:** Listening to an audio instruction through speakers (i.e. pre recorded announcement).

- **Manage the System:** Refers to the capability of being able to control the processes that will chronologically happening.

- **Set up Procedures:** Refers to ability to activate the standard procedures of the system, such as the period for the countdown timer.

- **Update Procedure:** Change the initial chronological flow of the processes that happening during the exam.

- **Update Exam:** Enters and display the real time change on any exam that is being conducted in the hall.

- **Initiate Exam Flow:** Refers to the start of the system to run the exam process flow control.

3.2.1 Software Modules

AEPC was designed and developed in modules. It consists of three main modules which were developed and tested separately and then integrated with the others to form the final product.

The main modules are:

i.   Time Module

It is essential for this system to have Time Module to fulfill the requirements and functions related to time display and time controlling. This module will display the current time and countdown timer for users to see the remaining examination time. This will be the main reference to trigger the events that are scheduled to be executed when certain predefined time is reached during the examination flow. In order to accomplish this task, the system will refer to the countdown timer periodically for time controlling and the input module to obtain the information to be triggered when the desire or scheduled announcement time is reached.

ii.   Input Module

The input module will handle all the instructions entered by the chief invigilator or the administrator which enable and set the system to follow the orders. This module also meant to capture and find the file locations to carry out other instructions (e.g. read update of an exam introduced into the system from an external device).

iii.   Output Module

The output module will convey to the candidates and invigilators the instructions communicated by the invigilators or a lecturers.

There are two basic types of output; voice output that is coming from a set of speakers or audio devices and visual output that is displayed by projector to the big screens in the EH.

Figure 4 shows the interaction between Time Module, Input Module and Output mode. Input Module is having two-way communication with both Input Module and Output Module whereas the Input Module is passing the data and information to the Output Module directly.

```
┌─────────────────────────────────────────────────┐
│                  ┌──────────────┐                │
│          ┌──────▶│ TIME MODULE  │◀──────┐        │
│          │       └──────────────┘       │        │
│          │                              │        │
│          ▼                              ▼        │
│  ┌──────────────┐            ┌──────────────┐    │
│  │ INPUT MODULE │──────────▶ │ OUTPUT MODULE│    │
│  └──────────────┘            └──────────────┘    │
└─────────────────────────────────────────────────┘
```
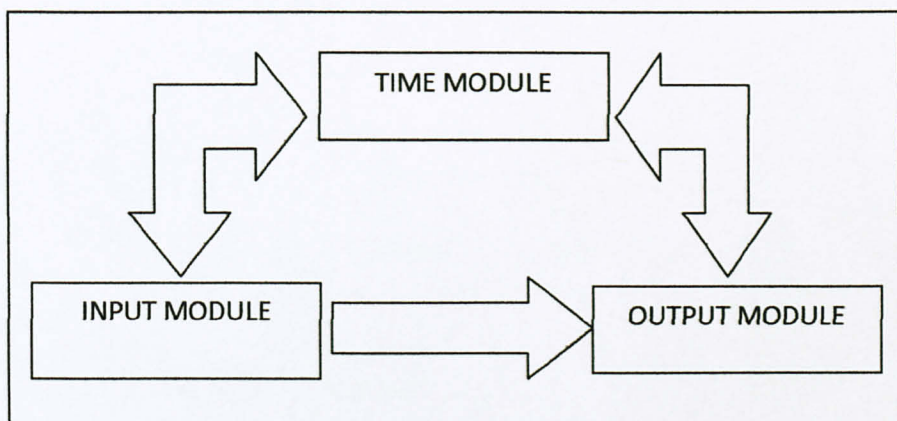
Figure 4: Interaction between System Modules

Modules Interaction Process:

The interaction between the three modules as in Figure 4 is basically as follow:

- The time module may trigger the input module to handle an input process when certain time is reached and this may trigger the output module if there is any information needed to convey to the candidates in the hall.

- The time module may also directly interact with the output module to display the time and the countdown timer after being triggered.

- The input module may also interact with the output module to display the result on the process already executed by the modules.

- The input module may also interrupt output module process to output an unplanned process, for example when inserting the question changes into the upload display box to be displayed immediately.

3.3 Design

At this phase, the system is designed and modeled. The purpose of the design is to create the system architecture, a suitable development methodology for the type of system to be developed. A use case diagram must be used to get the better understanding of the functions to be performed by different actors.

The system architecture below shows the connection between the invigilators, exam units department and the system that stored in the server. The Examination Unit (EU) handles the exam procedures, venues, and all the matters pertaining the final examinations such as the examination questions and answer booklets and the invigilators in charge arranged by the EU. The chief invigilator, lecturer or administrator's task execution in EH are monitored directly by the EU, any problem or report can be directly send to EU within seconds. Data entered by the invigilators into the system will be recorded in the server while the computer is connected to the projector to show the clock and countdown timer, and the exam question changes looping display, which will projected on to the big screen in front of the EH.

Screen   Projector   Computer   Server   Computer

Chief Invigilator / Lecturer / Admin
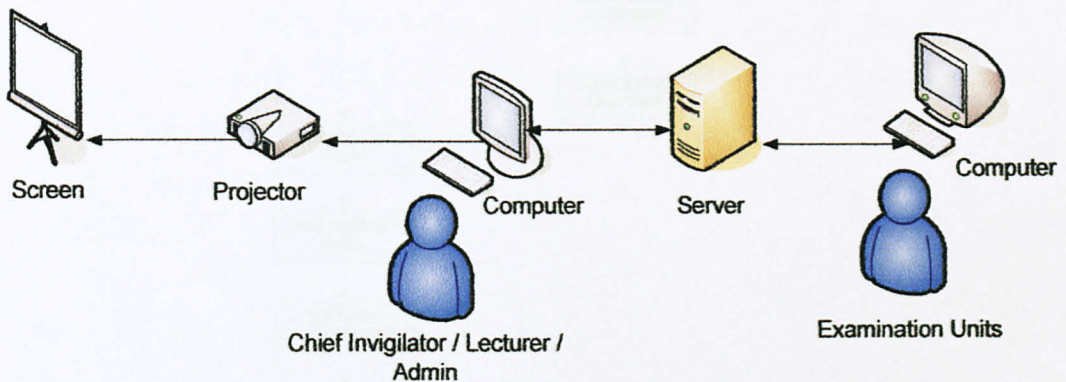
Examination Units

Figure 5: System Architecture

A module diagram such as flow chart can be created at this level to help getting better understanding of the system flow.
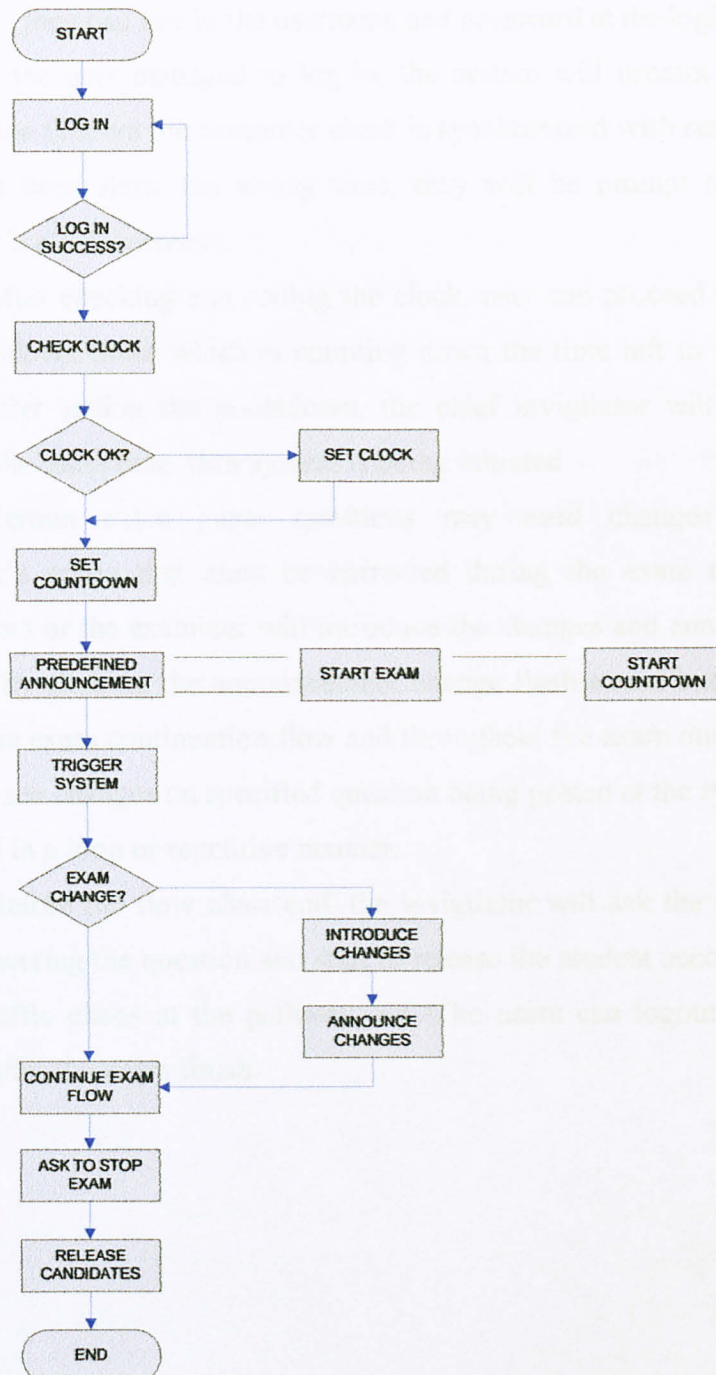

Figure 6 : System Flow Chart

Figure 6 is the flow chart of the system developed. User will be asked to enter their username and password. If the user has not yet registered, they can do so by clicking register now button. After registered, they can key in the username and password at the login page.

If the user managed to log in, the system will prompt to check whether the time on the computer clock is synchronized with real time. If the clock does show the wrong time, they will be prompt to set the computer's clock correctly.

After checking and setting the clock, user can proceed to setting the countdown timer which is counting down the time left to finish the exam. After setting the countdown, the chief invigilator will start the exam at the same time, thus system is being initiated.

Certain exam paper questions may need changes i.e. the examiner's errata that must be corrected during the exam time. The invigilators or the examiner will introduce the changes and announce the changes by clicking the announcement change flash sound button. Next task is the exam continuation flow and throughout the exam duration, the user can see changes on specified question being posted at the system and it will be in a loop or repetitive manner.

Before the flow chart end, the invigilator will ask the student to stop answering the question and start to release the student accordingly to avoid traffic chaos at the pathway out. The users can logout from the system after the exam finish.

3.4 Implementation

This is the time to implement and assembled or integrate all the modules, which are time, input and output modules as well as the design of all interfaces for the system.

The programming tasks starts at this stage. The system clock was developed by creating the JavaScript and getting the hours, minutes and seconds from the local system (local computer). Some coding parts regarding the looping of the announcement and the clocking system has been modified and restructured to suit the system functions.

Looping announcement part should be in looping flow structure and the students can see the question changed or any announcement made repeatedly displayed at the screen in front of EH. The clock system can be set, start, stop or turning the alarm on. The alarm is used to alert the invigilators and the students that the time is running.

Flash sound button for predefined and user defined announcement was made to reduce the invigilator's effort on using their own voice from the start of examination procedure until dismissing the student from the EH.

The module for invigilators attendance functionality has developed at this stage. It is important to record the present of all invigilators at the EH. The administrator can insert their names into the database and display it in EU which will be synchronized with this AEPC that is used at EH.

3.5 Testing Prototype

At this phase, testing the program code and modules were done to ensure all the required resources are working and compatible with the system requirements. When these individual modules are working properly, they need to be assembled and test as a prototype. The prototype was tested based on four main functionalities; *clock and countdown timer* by inserting the time and click the count down button for testing the counting down process. Then, *looping announcement* is tested by inserting the question changes data and the looping display at the main page. Another important functionality is *flash sound button*, after record the announcement and embedded into flash sound button, the flash sound is tested by clicking play, pause and stop buttons. Lastly, the *invigilator's attendance system* is tested by inserting different users (invigilators) and time. The output in the attendance table list was monitored.

3.6 Final Product

The final product is the result of all the modifications and changes made after the testing. A system with clock function, looping announcement, flash sound announcement and invigilator's attendance was finally put in place.

Future enhancement for voice recording and standardize English accent voice or customize by using local accent for the system can be developed for future versions.

CHAPTER 4

RESULT AND DISCUSSION

4.0 Result and Discussion

The developed system is able to improve the way of conducting examinations at the EH. The system certainly provides a more organized and a compliment to the current exam system.

Figure 7: Registration Page

Figure 7 shows the Registration Page where the user can register their full name, staff id, username, password, email, phone number and select the department. After

registration with their details, the user can login by entering the username and password they entered earlier.

At this point, the display of digital clock and countdown timer as shown in Figure 8 will be displayed. The clock system is using the HTML script and synchronizes with the desktop or laptop computer. If the time in the system is not the same with the hall clock (assuming the hall clock is correct and running), the user can correct it by setting the watch to the hall clock time. If the clock reaches countdown of last 30 minutes of exam time, the clock will automatically show pop-up message notify the students that there are 30 minutes of time remaining to finish the examination period. Announcement is made at this time automatically.
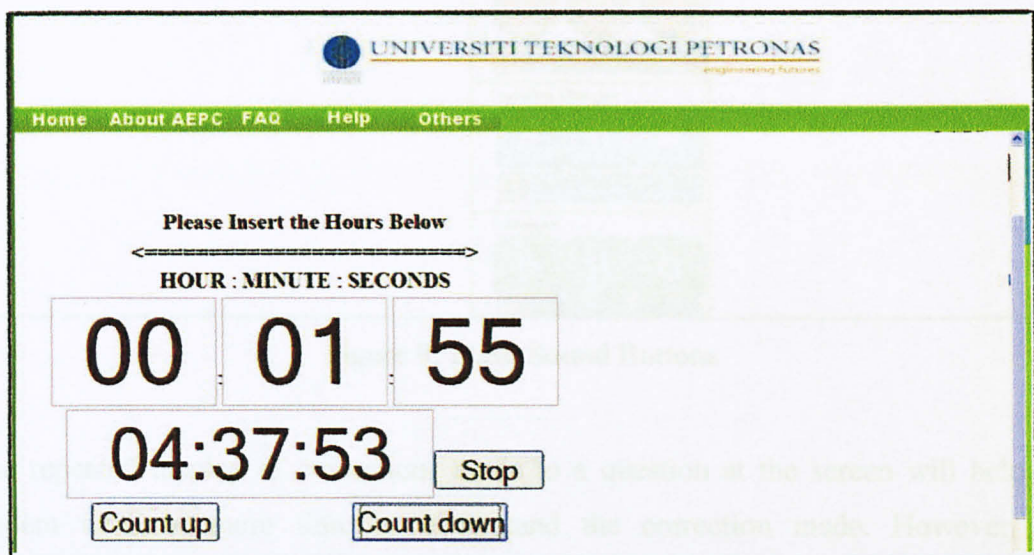

Figure 8: Digital Clock and Countdown Timer

Students must not be disturbed too much during examination flow. To minimize the impact of the disturbances, the flash button which produces beep sound has been created and the students can get attention on the question changes within several seconds of time interval as shown in Figure 9. There are two types of predefined announcement, they are standard announcement and user defined announcement. If the invigilator need to announce the rules and regulation in the EH, he or she can simply click the general announcement play button to automate the announcement.

Figure 9: Flash Sound Buttons

The repeated display of corrections made to a question at the screen will help the student to have more time to understand the correction made. However, the invigilator needs to upload the changes in the system as in Figure 10. Later it can be displayed on the display board as in Figure 11. The traditional announcement of question corrections does have many disadvantages such as when the student is concentrate in answering the questions and thus may miss the announcement, the student need to alert the invigilator to get the corrections on the affected question. The bigger font text size of question changes on the screen display does not produce

sound and it help to keep the student calm and can concentrate on answering the question.

Figure 10: Repetition Announcement Upload Form

Figure 11: Repetition Announcement Display

The attendances of the invigilators page are developed and the interface is as in Figure 12 below. Home page for invigilator's attendance was made up and it will list and notify the affected invigilators. If they want to confirm their attendance, they have to log in using own ID and confirm it by clicking attend button.
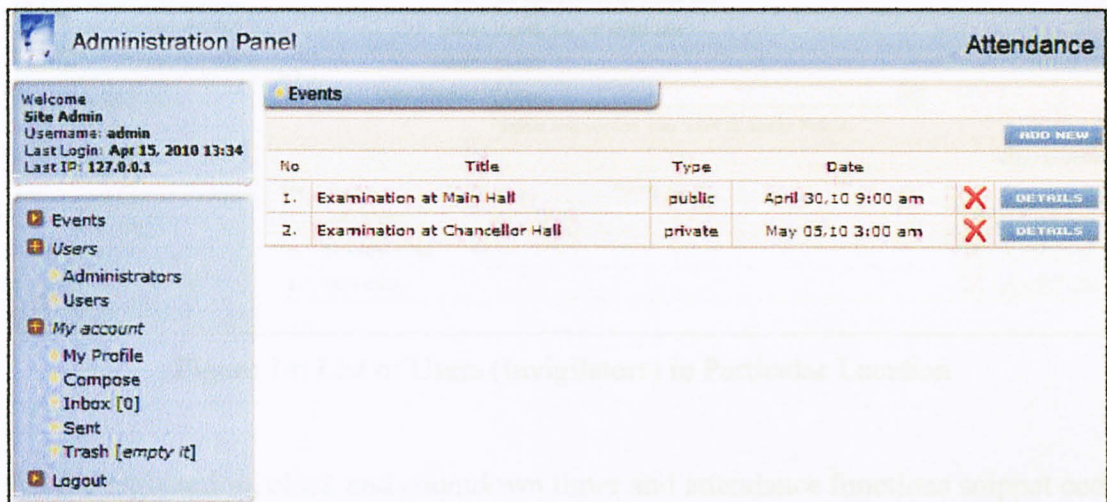
Figure 12: Home Page of Attendance System

At Figure 13, the detail page of the Examination event is being displayed and it shows the title, date, time, public (public or private display), view section (by users or even details), and description while in Figure 14, the invigilators name list shows in alphabetical order.
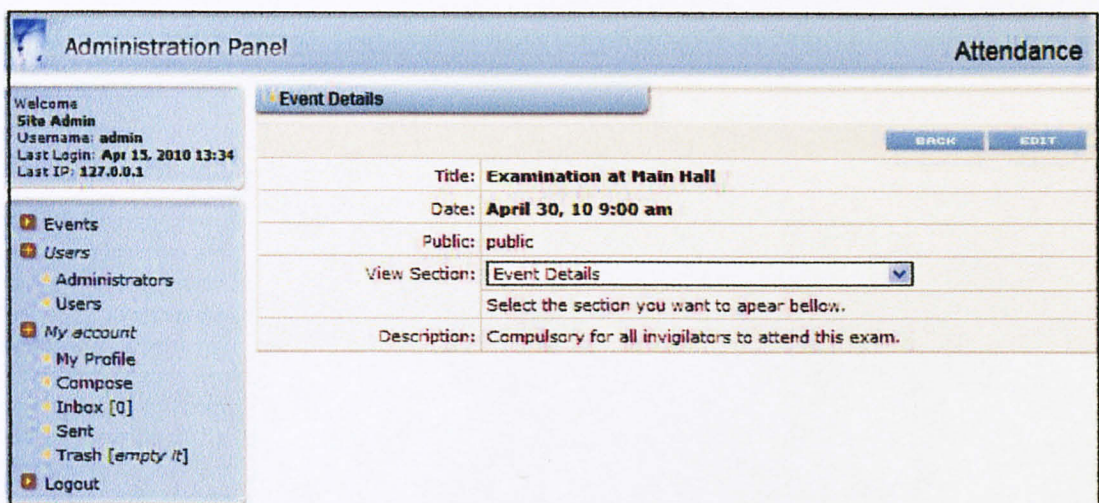
Figure 13: Event (Exam) Details

25

Figure 14: List of Users (Invigilators) in Particular Location

All the registration, clock and countdown timer and attendance functions snippet code can be refer to at the Appendix Page.

Below is example the map of EH environment. It shows the traditional analog clock stands in front of EH and the screen projectors are not fully utilized. Figure 16 shows the expected or proposed environments which display the digital clock on the screen in front of the EH.

Map of the EH
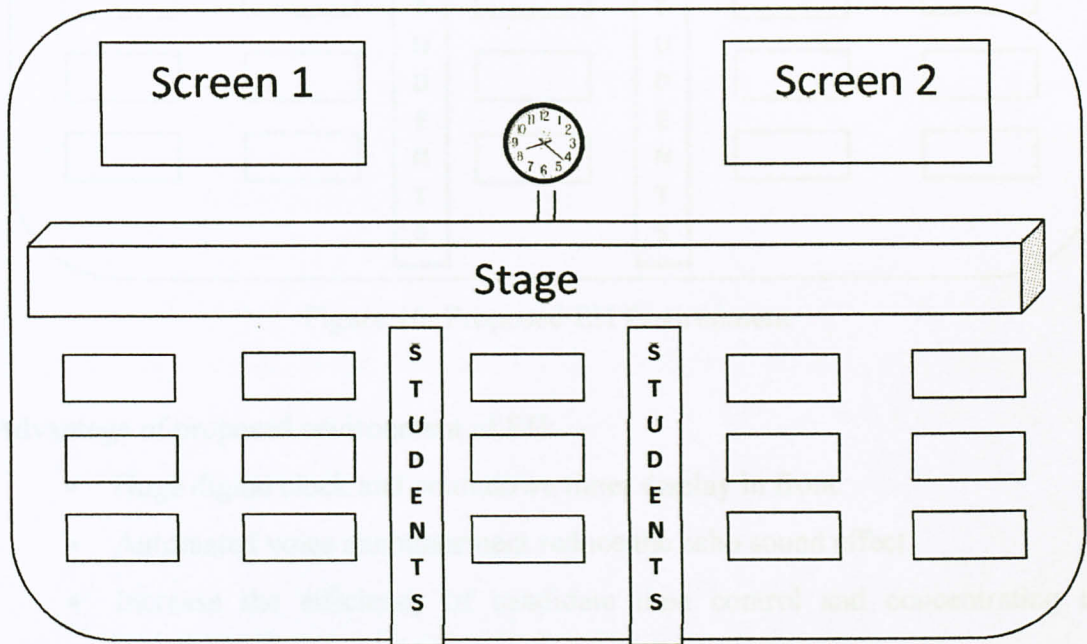
Figure 15: Current Environment

Drawback of the current environment of EH:

- Small clock being displayed at the front of exam halls.
- Echo sound of announcement made student confuse.
- Huge size of EH make the invigilators difficult to reach all students at one time.
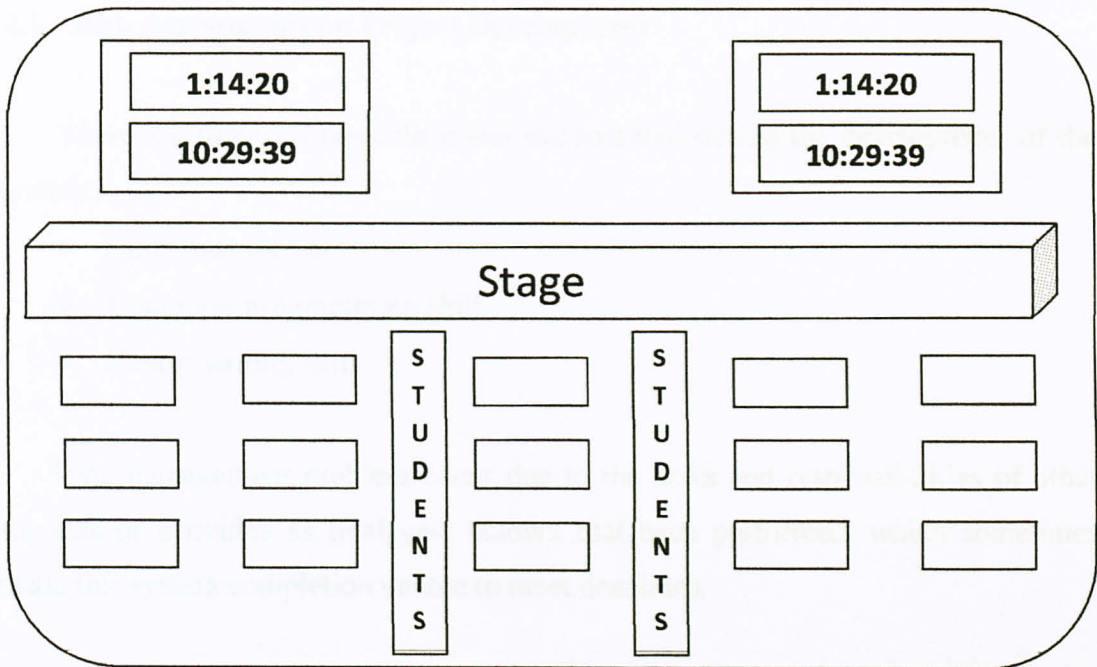
Figure 16: Proposed EH Environment

Advantage of proposed environment of EH:

- Huge digital clock and countdown timer display in front.
- Automated voice announcement reduce the echo sound effect.
- Increase the efficiency of candidate time control and concentrating in answering the exam questions.

4.1 Risk Assessments on Project Development

There are three (3) possible issues encountered during the development of the system:

- Time management
- Computer programming skill
- Report writing skill

Time management problem occur due to the tasks and responsibilities of other subjects or activities as final year student that been performed, which sometimes made this system completion unable to meet deadlines.

The technical problem is related to the programming language or any design approach that was needed to develop the system. It may be solved by doing some extra research or get advice from the supervisor or other lecturers who are knowledgeable on the matter.

Another issue is the report writing skill and scheme which can be solved with the correct guidance of the supervisor, other lecturers or an English technical writing book.

The development process can also be time consuming if an individual lack of the skills and/or ability to use the required software. For example, the tools used for drawing the user interface. If the developer doesn't have enough skills on the software, it may slow down the development process and make it more difficult.

4.2   Development tools

For the development of the project, tools being used as follow:

➢ Hardware

  - Computer (Windows XP Operating System, Intel Centrino Duo Processor, 1.5 GB RAM memory)
  - Microphone
  - Speakers

➢ Software

  - Microsoft Visual Studio 2005
  - Xampp MySQL Database (Database)
  - Microsoft Visio (System flow chart and use case diagram)
  - Microsoft Project (Gantt chart timelines)
  - Microsoft Word 2007 (Writing reports)
  - Microsoft Power Point (System presentation slides)
  - Reutera Flash Sound Buttons (Sound recording)

CHAPTER 5

CONCLUSION

5.0 Conclusion

The system is expected to have good functionalities and features which allow the invigilators to have better control as compared to the existing exam control system. It has standard programmable and timed announcement features.

The tools required for developing the two main functionalities are notepad for creating and storing the PHP and JavaScript Scripting language, Web Browser for running the system, Microsoft Visio and Project to build the System Diagrams and Gantt chart respectively and also Xampp application for acting as local server inside the PC.

This new system will enhance the exam flows efficiency in time control by displaying the countdown timer and also display exam question changes repeatedly on the projector screen in front of EH.

Whenever new question changes are made to the examination paper (issued by lecturers or invigilators), the affected students will be notified on the screen, so the system is providing visual changes in exam questions more effectively.

Finally, a smoother examination flow control is expected from the system as it reduces the human effort especially in using their own voice for making announcements.

5.1 Future Enhancement

There is intention for this system to have its own recording functionality to simplify the current recording methods that using machine voice. A recording function to record the user's voice announcement and convert it into ".wav" file can be created and integrated into this system.

Another problem arise regarding the accent and the speed of the machine voice need to be improved to get the maximum satisfaction for the users. This system should produce standard English accent. Option for any country to customize the announcement voice by using their local accent could be an added advantage.

REFERENCES

[1] York University, Faculty of Art, Toronto, Canada. "Exam Invigilations Instructions" Retrieved from http://www.yorku.ca/sosc/faculty_policies/course_matters/pdf/ examinvigspring02.pdf on 18 February 2010

[2] Kirschner, M.D., Yungwirth, V. 2005. "Message Announcement System", Retrieved from
http://www.patentstorm.us/patents/6856258/fulltext.html, US Patents Online on 18 February 2010

[3] H.Yoshiro, S. Akira et al. 1979. "Automatic Message Announcement System", Retrieved from http://www.patentstorm.us/patents/4276572/fulltext.html, US Patents Online on 8 March 2010

[4] FlashG, 2007. "Digital Announcement System", Retrieved from http://www.creativediy projects.blogspot.com/ on 12 April 2010

[5] Registration Page, PHP Script Guidelines, Retrieved from http://www.php.net/ on 2 February 2010

[6] Neil9999, 2004. Clock Timer Page, Retrieved from http://www.codingforums.com/archive/ index.php/t-36572.html on 30 January 2010

[7] Mobiuska, 2008. Repetition Announcement Display, Retrieved from http://www.sanalkurs. net/forum/java-ve-javascript/opencube-com%27un-js%27i-hakkinda-yardim/ on 28 January 2010

[8] Attendance System, Time and Attendance Program, Retrieved from http://timeattendance.us/ on 12 April 2010

Snippet Source Code

1.0   Countdown Timer

```
<script type="text/javascript">
var hv;
var mv;
var sv;
var timer;
var timer2;
function set(){
hv=document.getElementById("h").value*1;
mv=document.getElementById("m").value*1;
sv=document.getElementById("s").value*1;
}
function countdown(){
if(sv!=00){
sv--
}
else if(mv!=00){
mv--
sv=59;
if(mv==29){
alert("You have 30 minutes time remaining, now you are not allowed to leave the exam
hall!")
}
}
else if(hv!=00){
hv--
mv=59;
sv=59;
}
else{
alert("Finished counting down!")
clearTimeout(timer2);
}
if(sv<10){
sv2="0"+sv;
}
else{sv2=sv}
if(mv<10){
mv2="0"+mv;
}
else{mv2=mv}
if(hv<10){
hv2="0"+hv;
}
else{hv2=hv}
document.getElementById("h").value=hv2;
document.getElementById("m").value=mv2;
document.getElementById("s").value=sv2;
}
function thetime(){
var d=new Date();
var hours=d.getHours();
var mins=d.getMinutes();
var secs=d.getSeconds();
if(hours<10){
hours="0"+hours;
}
```

2.0   Repetition Loop Anouncement

```
<div><div><div id="vscroll0" style="display:none;z-index:0;"><ul>
   <li        delay=2>3/12/10       -        <a       href="sample_link.html">International
Business</a><br><br></li>
   <li delay=2>3/12/10 - <a href="sample_link.html">GAB 3063</a><br><br></li>
   <li delay=2>3/12/10 - <a href="sample_link.html">Question 1) How can the exporter be
guaranteed against non-payment by the importer? Explain</a><br><br></li>

   <li delay=2>3/12/10 - <a href="sample_link.html">Question 2) Explain how World Bank
deines income level of a country</a><br><br></li>
   <li   delay=2>3/12/10   -   <a   href="sample_link.html">Question   3)   Discuss   why   the
inforamtion   on   a   country's   income   level   is   important   to   international   business
people.</a><br><br></li>
</ul></div></div></div>
<script language="JavaScript">
function vscroll_data0()
{
   this.enable_visual_design_mode = true;
   this.container_width = 500
   this.container_height = 230
   this.top_pause_offset = 10
   /*--------------------------------------------
   Timing and Animation Speed
   --------------------------------------------*/
   this.initial_scroll_delay = 0
   this.animation_delay = 20
   this.animation_jump = 2
   this.animation_delay_mac = 100
   this.animation_jump_mac = 10
```

3.0   Flash Sound Button

```
<td      colspan="4"      align="center"><object      classid="clsid:D27CDB6E-AE6D-11cf-96B8-
444553540000"
codebase="http://download.macromedia.com/pub/shockwave/cabs/flash/
swflash.cab#version=6,0,29,0" width="311" height="163">
<param name="movie" value="flashsoundbutton.swf">
<param name="quality" value="high">
<embed src="flashsoundbutton.swf" quality="high"
pluginspage="http://www.macromedia.com/go/getflashplayer"
type="application/x-shockwave-flash" width="311" height="163">
</embed></object></td>
</tr>
```

4.0   Attendance System for Invigilator

```
<table border="0" cellpadding="3" cellspacing="0" class="FormElement">
        <tr >
                <td height="23" rowspan="2" valign="top" style="padding-top:5px"
                class="FormElementTitle" ><img src="images/dot.gif" width="1"
                height="1">Public:</td>
                <td class="FormElementContent">

                <table cellspacing=0 cellpadding=0 align="left">
                        <tr>
                                <td></td><td>
                                <select class="FormItemSelect" onchange=""
                                 name="event_public" id="event_public" style="width:
">

                                <option value="0"
selected="selected" >private</option>

                                <option value="1"  >public</option>

                                </select>
                        </td><td></td>
                        </tr>
                </table>
                </td>
        </tr>

        <tr >
                <td class="FormItemDescription">Select public if you want the event to
apear
                on the public page or private if you want to be accesible only from
the admin
                panel.</td>
                </tr>

        </table>


        <table border="0" cellpadding="3" cellspacing="0" class="FormElement">
                <tr >
                <td      height="23"           valign="top"      style="padding-top:5px"
                class="FormElementTitle"  ><img   src="images/dot.gif"   width="1"
                height="1">Description:</td>
                <td class="FormElementContent">
        <table cellspacing=0 cellpadding=0 align="left">
                <tr>
                        <td></td><td>
                        <textarea   class="FormItemTextarea"   name="event_description"
rows="8"
                        cols="60"></textarea>
                        </td><td></td>
                        </tr>
                </table>
                </td>
                </tr>

        </table>
```

FYP Gantt Chart

	ⓘ	Task Name	Duration	Start	Finish	Pre
1		☐ Final Year Project (January 2010 & July 2010)	196 days	Mon 2/1/10	Mon 11/1/10	
2		☐ Initiation	5 days	Mon 2/1/10	Fri 2/5/10	
3	▦	List criteria & expected funtionalities	5 days	Mon 2/1/10	Fri 2/5/10	
4		☐ Analysis	5 days	Mon 2/1/10	Fri 2/5/10	
5	▦	Risk Assesment	5 days	Mon 2/1/10	Fri 2/5/10	
6	▦	Create Use Case Diagram	5 days	Mon 2/1/10	Fri 2/5/10	
7		☐ Design	5 days	Mon 2/1/10	Fri 2/5/10	
8	▦	Create Flow Chart	5 days	Mon 2/1/10	Fri 2/5/10	
9		☐ Implementation	190 days	Mon 2/1/10	Fri 10/22/10	
10	▦	Development of Registration Page	20 days	Mon 2/1/10	Sun 2/28/10	
11	▦	Development of Clock and Countdown Timer	40 days	Mon 2/1/10	Fri 3/26/10	
12	▦	Development of Looping Announcement System	1 day	Mon 2/1/10	Mon 2/1/10	
13	▦	Development of Attendance System	169 days	Tue 3/2/10	Fri 10/22/10	10
14	▦	Development of Voice Synthesization	115 days	Mon 5/17/10	Fri 10/22/10	
15		☐ Prototype Testing	185 days	Mon 2/8/10	Fri 10/22/10	
16	▦	Load Tesing - testing with real data	184 days	Tue 2/9/10	Fri 10/22/10	
17	▦	Feature testing - testing the functionality of each function	185 days	Mon 2/8/10	Fri 10/22/10	
18		☐ Final Product	1 day	Mon 11/1/10	Mon 11/1/10	
19	▦	Product Released	1 day	Mon 11/1/10	Mon 11/1/10	

Timeline headers: February, March 1, April 1, May 1, June 1, July 1, August 1, September, October
1/24 2/7 2/21 3/7 3/21 4/4 4/18 5/2 5/16 5/30 6/13 6/27 7/11 7/25 8/8 8/22 9/5 9/19 10/3 10/1