Multimedia Presentation Systems (MPS)

By

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the requirements for the
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CERTIFICATION OF ORIGINALITY

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

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MOHD. FAKHRI. B. MOHD. NOOR

CERTIFICATION OF APPROVAL

Multimedia Presentation Systems (MPS)

Research on "MULTIMEDIA PRESENTATION AND VIDEO STREAMING TECHNOLOGY"

By,

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1833

Dissertation submitted in partial fulfillment of the requirements for the BACHELOR Of TECHNOLOGY (Hons)
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Abstract

The purpose of this research and software development is wanted to enhance the content deliverance of the knowledge among the UTP community. Directly to that reasons, the Multimedia presentations system hopefully will fulfilled this purpose. This research paper will be started on discussing about the problem statement of this project. Problem statement will be referred by the author as a material for the use of analyzing and designing the requirement of the systems. This paper will also discuss about the methodology which been used throughout the entire of development process of the system. This project paper will discuss more on the hybrid methodology as the overall process of system development is based on this methodology. As the process of developing the system is nearing to the completion stage, the overall performance of this system will be discuss on the discussion and result part of this paper. That part will discuss about the problem which occurred during the development of the process and series of testing for the system. As a conclusion, this project will be referred as new tools of combined technology of information deliverance for the UTP community. This project will be a starting point of enhancing the ways of interaction between the lecturer and student during their study.

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Firstly, I would like to express my gratitude to Allah, for His grace I was able to accomplish this project. I believe He has blessed me with sufficient strength and wisdom for me to carry out and complete this project

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Thank you also to all my friends for their generous help support. To my housemates, thanks a lot for the spirit.

Last but not least, I would like to thank individuals such as the lab technician, other lecturers and students whose names are not mentioned but involved directly or indirectly in the success of this project.

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CHAPTER 1

INTRODUCTION

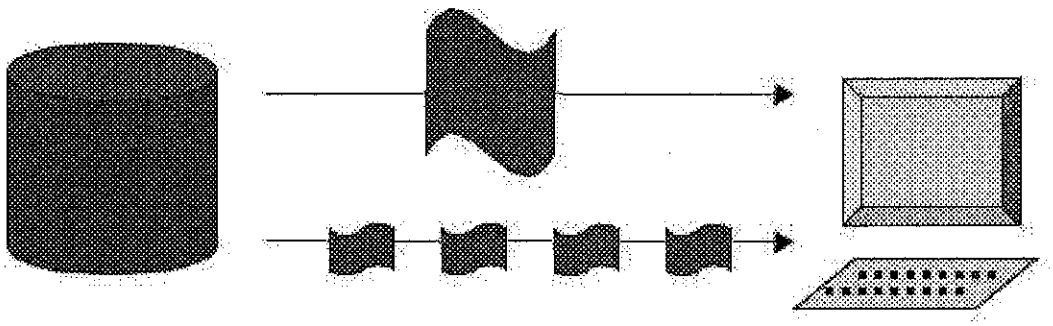
1.0 Background of the study

Streaming video provides a continuous digital video and/or audio signal across a data network. As a viewer, you typically make a web browser-based player connection to a streaming server to receive a **webcast** (live program) or **video-on-demand** (previously recorded program).

This project will implement the used of video streaming as a main element of information deliverance. This project will use two method of video streaming which are video on demand and live streaming. The used of those methods is important as a reference by the developer to meet the requirement of the system. This system will be provided on the web – based as a platform and user need to browse to the website (UTPStream.com) in order to view all the streaming contents.

After the implementation of this system has been complete, user (UTP lecturer and students) will get a better understanding of any lecture material or video contents which streamed from the server. The implementation of this system will also overcome the issues of user storage as the program is sent from the server to user player in a continuous fashion, as opposed to having the entire program downloaded before viewing can begin. Viewing begins much quicker with streaming. No copy of the entire program is stored on the computer being used for viewing.

In the following graphic, the cylinder represents a server and the tan rectangle a personal computer. The top line shows the process for the typical file transfer: request asset, receive entire asset, then play asset. The lower line shows the process for streaming: request asset, start transmission, start playing, continue sending "chunks", end transmission, end playing.



Each viewer receives his or her own stream from the server, so bandwidth can be an issue for popular webcast. Different viewers can start the same video-on-demand program at any time.

1.1. Streaming Conventions and Architectures

The ITS Streaming Video Service supports MPEG, MP3, QuickTime, Real, and Windows Media for video-on-demand. MPEG-2 is only available for on-campus viewers (because of bandwidth requirements). Web casting is currently being offered in Real and QuickTime.

Which convention to select depends on several factors, including audience location, what streaming players your audience is most comfortable using, and what tools you are most comfortable using in preparing a streaming program. It is investigating **transcoding** equipment that would allow us to record/store in one format, but deliver multiple formats in real-time.

Multimedia Presentations Systems (MPS) will allow lecturers giving their lecture from anywhere as long they are connected to UTP network. This application will keep the communications between the lecturer and their student better rather than current situations.

This application will ease the task of UTP lecturers in giving the lectures to their student. In fact, if any circumstances that the lecturers cannot deliver their lectures on certain time. This application might be the best solution for the lecturers in order to keep their lecture schedule on a right track.

MPS will come with two packages, which are streamer package and web-portal. The reason why this application must be separated into two packages is because to avoid any misconception during the development phase of application and to ease to

develop the applications. For the first mode, the lecturers can record their speech and upload to a server. Then, the author can download the file using from the MPS websites into their pc. Second mode, lecturers have to announce their time lectures on the websites provided such as UTP e-learning and by using Fireserv server streamer, the audio/video will be stream to UTP network and students can get the stream using any media player tools such as Winamp and windows media player.

1.2. Problem Statement

The technologies of video streaming currently are allowing the developer to create a system, which enhances the delivery of information for the UTP students. By providing such systems like MPS, it can improve the way of UTP lecturers in delivering their lectures rather than textual slide show presentations. This will enhance the way of content delivery for UTP students and improve the level of knowledge for them.

In some cases where the lecturers have to postpone their lectures because of some difficulties or problems occurred, by having this system, the continuity or progress of the lectures can be guaranteed and it's minimize the problems for the lectures to catch up with the time constraints in completing their lecturing schedule. This will also reflect to the student's performance on those subjects by getting enough information provides for that particular subject.

This situation happened when some lectures have to attend on any training or team building during the lectures week and this situation can't be avoided because they also need to meet some performance level set by the University itself.

Perhaps, with the development of MPS, this problem can be reduced and improve the performance for both sides.

1.3. Significant of the project

By allowing lecturer to give their lectures from the office or uploading the audio/video file to the server, MPS can offer the flexibility of reaching their students

in alternate ways. The lecturer is not needed to attend a class for delivering their lectures, but only with doing some video or audio record about the lectures, student can still hear or watching the lectures. This application will stream the audio/video format to all the students, which connected to the UTP networks.

This technology is not only can be used for the education part, but it also can be used for an entertainment or edutainment thing which's suits with the UTP rules and regulations. For an example, the radio or television station can be formed because the UTP network facility is able to meet the requirement of this technology.

1.4 Objectives and Scope of Studies

1.4.1 Objectives

- To maximize the use of UTP network.
- To invent a new ways of delivering the lectures using a audio/video streaming technologies.
- To give an opportunity for the UTP student to views anything on a video streaming from entertainment to education sources..
- To provides an alternates ways on delivering the lectures.
- To enhance the ways of current delivery information contents.
- To provide continuous learning process for the UTP students

1.4.2. Scope of Studies

The relevence of this project is going to help both lecturer and student to keep their lectures session right on track without worrying any delay or posponing the lecture sessions.

In order to develop this applications, the author has to develop the prototype version of this system. This is important because the author need to get some idea's from the prototype version before developing the real model.

CHAPTER 2

LITERATURE REVIEW

2.0 Web-based audio and video presentations

There are several argument in this application, since the MPS is web-based audio and video presentations, the developer of the systems has covered some issues which been identified during developing the systems.

According to Johnson (1998), there is a lack of a theoretical framework and applicable empirical research to guide the development of Web-based video materials. He stated that the available literature consists mostly of recommendations and guidelines stemming from direct user trials and classroom experiences. This also seemed to be the case for audio presentations.

Download time seemed to be the major concern associated with audio and video presentation, but quality was a close second. For example, to facilitate faster and easier retrieval times of video clips over the Internet, the number of frames per second is usually reduced. However, with reduced frame size poor quality of motion and sound becomes a distinct possibility rendering video clips intending to display rapid movement (e.g., running horse) or close-ups of a complex object (e.g., sculpture) quite useless (Johnson, 1998).

With regard to audio presentations, file size reduction might not only make it more difficult to hear sounds appropriately, but it might also make it harder to evaluate any accompanying text, graphics, or video (Nielsen, 2000). In one study, individuals were asked to evaluate the same graphics first displayed with poor quality sound, then with good quality sound (Nielsen, 2000). Users insisted that the graphics were better when viewed with the good quality sound.

On the other hand, not reducing frame size enough can result in another factor associated with decreased task satisfaction -- a lengthy download time (Johnson, 1998). Johnson and Kavanagh performed an evaluation of casual browsers and observed that only two out of ten individuals were actually willing to wait for 90

seconds while a video file downloaded to their computer (as cited in Johnson, 1998). The remaining individuals decided to interrupt the download. None of these users bothered to fully retrieve a video file with a download time of over three minutes. Clearly, this type of behavior might negatively affect learning if students refuse to wait until some of their materials are fully downloaded.

In contrast, Johnson found that adults with a clear task are more tolerant of retrieval delays than casual browsers (as cited in Johnson, 1998). Johnson and Kavanagh, however, cast some doubt on this finding when they noticed generally negative attitudes toward a lengthy download time in children, even in children deemed task-oriented (as cited in Johnson, 1998). Johnson (1998) defended his earlier findings by suggesting the possibility of a difference in adult and children's attitude toward retrieval delays. But he admitted that with so little research available in this area, it is dangerous to generalize beyond the experimental conditions of the investigations.

The new streaming media (video with sound), such as RealProducer (RealNetworks Incorporated, 2000) is designed to make video and sound available instantly without forcing the user to wait until the move or audio clip has fully loaded to the computer. This reduces the response time significantly, but it is still limited to the data delivery rates of the Internet connection (e.g., dial-up or cable modem).

Hecht and Klass (1999) conducted a case study in two research classes at Illinois State University to determine whether streaming audio and video technology could be used for primary instruction in off-campus classes. One class exhibited a host of technical problems such as blank screens, lack of audio, power outages, and server crashes. This course was a doctoral-level research design and statistics class divided into two sections, with 25 students from Thailand in one section and 14 distance education students from the United States (U.S.) in the other one.

A combination of Real Player (RealNetworks Incorporated, n. d.) and Multichat (MultiSoft Corporation, n. d.) was used to transmit audio and video, as well as synchronous communication between students and instructor. While technology problems for the group from Thailand appeared to have been related mostly to power outages and server crashes, some of the students from the U.S. experienced a host of network congestion problems which prevented smooth streaming of the class videos (Hecht & Klass, 1999).

On the other hand, a graduate-level qualitative research class exhibited relatively few technology glitches and most students were satisfied with the mode of delivery (Hecht & Klass, 1999). This was a course delivered simultaneously to 20 on-campus and 20 off-campus students using RealPlayer (RealNetworks Incorporated,). The off-campus students had the option to either join the class in real-time over the Internet or watch a video of the class at a later time, also over the Internet. According to the researchers, the reason this course exhibited fewer technical problems might have been due to the instructor's experience with this type of technology (Hecht & Klass, 1999).

In general, due to the level of technology available on most home computers, some experts recommend limiting online video clips to less than one minute in length, or using print or audio narration together with pictures or slide shows (Kaplan, 1998; Kruse & Keil, 2000; Nielsen, 2000). Should, however, lengthy video presentations become necessary, it is best to segment the presentation into individual topics that can be accessed by the users in the order and at the time desired (Nielsen, 2000).

Kruse and Keil (2000) and Johnson (1998) further caution that video and audio presentations should not be used unless they add significant value. For example, many times video clips only contain "talking heads" and audio presentations consisting of the instructor merely reading the already printed material (Mason, 1997).

Interactive computer video conferencing provides the opportunity for students to see, hear, as well as interact with their instructor and each other. That means students can observe the instructor demonstrate the operation of tools and equipment, show skills that the students are required to emulate, conduct experiments, as well as do just about anything else they would normally do in a classroom-based course (Oliver, 1994). Although, interactive computer conferencing software is improving all the time, slow dial-up modems and microprocessors still severely limit the quality of picture and sound on home computers (Abrams & Haefner, 1998; Driscoll, 1998).

2.1 Web Browsers and Related Tools

Many students first become familiar with the WWW through Web-based instruction (Ratner, 1998); therefore, technology must be incorporated with the novice user in mind. Novice Web users need to be instructed on how to use a Web browser, a search

engine, or how to install a plug-in. They also need to be shown how to recognize and deal with Internet connection problems (Ratner, 1998).

Web browser features are not always intuitive, and novices accessing Web-based instruction can exhibit decreased levels of comprehension because many do not know how to use a browser efficiently (Ratner, 1998). For example, Ratner (1998) evaluated the usability of Netscape Navigator by asking participants to perform certain tasks. Undergraduates and postgraduate students at the University of New Mexico (UNM) interacted with five features of the browser starting on the UNM home page. Only about one-third of the subjects had prior experiences with the World Wide Web. The results indicated that the participants' actual performance was low, although, perception of usability was very high. Even the more experienced Web users had problems with the two more difficult tasks - increasing the size of the display font to large and looking for Web sites related to "Psychology" (Ratner, 1998). Both novices and experts did not know that in order to change display features the "Preferences" option in the "Edit" menu has to be accessed. Furthermore, novices and experts alike could not distinguish between a search on the university Web site and one on the World Wide Web. Thus, when looking for Web sites relating to "Psychology", most participants searched the university site. Only a very few actually found the browser's search icon to access the search engines (e.g., Yahoo, AltaVista, Lycos, Google) which facilitate a WWW search (Ratner, 1998).

Other problems which prevented novice Web users from focusing on the tasks included computer failures, broken Internet connections, and unfamiliarity with technical jargon such as browser, Web address, navigate, hyperlink, and home page (Ratner, 1998). In general, novices had to have an experienced user nearby to assist them with their tasks because they did not feel confident using the WWW without help.

2.2 Plug-ins

In order to play video and/or sound clips, view special documents, or access proprietary databases and graphing tools, plug-ins are usually required (Kruse & Keil, 2000). Web browsers, generally, allow the download and installation of plug-ins to individual computers. Plug-ins acts as a separate application and even opens a second browser window. They are automatically used by the Web browser whenever

necessary. Among popular plug-ins are Acrobat Reader (Adobe Systems Incorporated, n. d.) to present original documents, RealPlayer (RealNetworks Incorporated, n. d.) to accommodate streaming video and audio, or Shockwave Player (Macromedia Incorporated, n. d.) to allow for sophisticated animation, multi-user games, and sound.

Johnson and Kavanagh recommended furnishing links to the appropriate plug-in and providing users with directions on how to set it up on their computer (as cited in Johnson, 1998). The reasoning for this is that a search for the appropriate plug-in and for set-up directions might reduce the user frustration substantially, especially if the task is important to success in the course.

2.3 Problems encountered

Occasionally, students encounter technical issues related to hardware and their own level of expertise. For relatively non- technical students, the frustrations involved in solving technical problems may seem overwhelming (Bischoff, 2000). Students may become so discouraged with their inability to set up an Internet connection to the school's server, for example, that they simply give up entirely instead of reaching out for technical assistance. Technical issues can often be resolved by the instructor or by the school's technical staff. However, the students have to know that individuals are available to help them in case of technical problems.

2.4 Delivery of the Content

More so than in face-to-face instruction, the way the subject matter is presented must entice students in Web-based courses to become interested and learn (Holmberg, 1995; Moore & Kearsley, 1996). While some distance instructors believe that textbooks are sufficient to facilitate learning, some experts dispute this belief (e.g., Holmberg, 1995; Moore & Kearsley, 1996). They feel that textbooks only give facts, but are not designed to guide or teach. Therefore, in addition to the textbook, distance instructors must develop their own instructional materials to simulate the presence of a human guide and teacher (Holmberg, 1995). Specifically, instructional materials should be written in clear, somewhat colloquial language to promote feelings of empathy, consideration, and personal relations between the instructor and the students (Holmberg, 1995; Moore & Kearsley, 1996).

There are many models describing how to develop instructional materials to facilitate learning. However, it is Robert Gagné's model that distances educators such as Holmberg (1995) and Moore and Kearsley (1996) point. It includes the following instructional events: (a) gaining attention; (b) specifying what is to be learned; (c) reminding learners of past knowledge; (d) presenting the content; (e) providing guidance; (f) requiring practice; (g) giving feedback; (i) enhancing retention and transfer; and (h) testing comprehension . While instructional events should be used in all courses regardless of delivery mode, a concentrated effort must be made in a Web-based course to include them. The reason for this is that one or more events may be forgotten especially during Web-based course development because the instructor's focus is often heavily skewed toward technology aspects of the course.

With respect to gaining students' attention, lesson-related links to relevant Web pages or linking the course to real-life work might be one way to achieve this goal in Web-based instruction. Furthermore, learners in both the classroom and the Web-based environment should be told the purpose of a lesson and what they have to know by the end of the instruction. By making clear learning outcomes, students will significantly improve their performance in many cases.

For all learners to retain information in long-term memory, they must link new information with related information stored in long-term memory. Therefore, if prerequisite knowledge is readily available to students, the learning of new tasks is often much simpler. In the Web-based classroom this can be accomplished by providing online tutorials or lecture notes from earlier chapters (Ritchie & Hoffman, 1997).

After new knowledge has either been presented or students have been inspired to discover the knowledge, examples to illustrate the concepts should be provided, and the students must get the chance to apply the new information (Dick & Reiser, 1986). Finally, students should get feedback on how well they have learned a skill. In Web-based instruction, weekly online quizzes could be conducted or at least questions should be asked to determine how well students have learned the material (Ritchie & Hoffman, 1997). Feedback should be conducted in a timely, clear, and diplomatic manner from the teacher and peers (Holmberg, 1995; Moore & Kearsley, 1996).

Feedback is an important part of instruction because if students internalize a wrong idea or process, learning will have been compromised (Bischoff, 2000; Dick & Reiser, 1986; Mory 1996; Schwartz & White, 2000).

The importance of feedback in Web-based streaming courses was illustrated in a case study by Hara (1998) who found that technology problems, ambiguous instruction, and inadequate feedback were a major source of on-going frustration for the students. She concluded that in at least four students these frustrations may have inhibited their educational opportunity based on the facts that two students claimed that they would not take another distance course in the future, while two other students withdrew from the course. Stevenson, Sander, and Naylor (1996) also supported Hara's findings. They concluded that timely and encouraging feedback on assignments directly affected distance education students' general sense of satisfaction with the course.

Instructors must also provide remedial activities for the unsuccessful learners, as well as enrichment for those who are successful, if appropriate (Dick & Reiser, 1986). The remedial activities should be directly geared toward difficulties the students have with the original instruction. The enrichment activities, on the other hand, should extend the learner's knowledge of a topic, but should not be portrayed as punitive. In the Web-based environment, remediation may be achieved by referring students to online tutorials or tutors or simply back to the lesson, provided appropriate hyperlinks exist. Enrichment, on the other hand, may consist of nothing more than lesson-related links to relevant Web pages (Ritchie & Hoffman, 1997).

It is also recommended that students are tested to find out to what degree they have internalized new knowledge (Dick & Reiser, 1986). Asking questions during the course of a lecture, assigning projects, or conducting formal testing are common assessment procedures. In Web-based instruction, asking questions and assigning projects can be accomplished via bulletin board and e-mail, and formal testing can be carried out online using documents written in JavaScript or in a face-to-face environment with the instructor or a proctor present.

A discussion of learning styles was also deemed appropriate for the present study because the development of Web-based course materials should be based on knowledge of how human beings learn (James & Gardner, 1995). There exists no universally accepted definition for learning style; however, the way individuals react

to their learning environment is an essential component (James & Gardner, 1995). For example, James and Blank (1993) defined learning style as "the complex manner in which, and conditions under which, learners most efficiently and most effectively perceive, process, store, and recall what they are attempting to learn" (p. 47).

In the current study, a learning style model presented by James and Gardner (1995) consisting of the perceptual, cognitive, and affective dimension was investigated to determine if it could be used in the design of Web-based instruction. The perceptual dimension identifies information that is to be integrated into an individual's brain through the senses. Subsequent processing of this information then occurs in the cognitive dimension. The affective dimension deals with that part of an individual's personality that relates to emotion.

James and Gardner (1995) presented several strategies to Web-based instructors to compensate for differences in learning styles among students. For example, to address the perceptual dimension, instructors might want to supplement printed materials with pictures or graphs, or provide opportunities for learners to interact with other learners. Several strategies are also available for addressing the cognitive dimension, such as structuring of content into small units, requiring active learner participation, supplying learners with a flowchart illustrating the major components of the course, and providing easy-to-use study guides. Lastly, to attend to the variations among students in the affective dimension, instructors may want to: **(a) introduce themselves and the students in the course; (b) use an empathetic and informal communication style; (c) keep up consistent interaction with and among students; and (d) provide for personalized communi cation** (Holmberg, 1995; James & Gardner, 1995; Moore & Kearsley, 1996).

2.5 Study conducted

Hecht and Schoon (1998) conducted a case study in an off-campus research and statistics course in which the interactive computer conferencing software CUseeMe version 3 (CUseeMe Networks Incorporated, n. d.) was used to conduct class. Although the off-campus students used state-of-the-art school district computers with a high speed connection to the Internet, the first four months of the course were still plagued with non-transmitting audio, out-of-sync audio, and slow transmission speeds degrading the audio and video quality to a point where neither was coherent. While

later sessions were running quite smoothly due to better technology support, minor software glitches, such as computers disconnecting from the conference or system crashes, continued to interrupt the presentations (Hecht & Schoon, 1998).

Wulf and Schinzel (1998) also experimented with interactive computer video conferencing by attempting to teach a course enrolling students from five German universities with a videoconferencing tool. Likewise, uncountable technical problems occurred which "challenged the patience and motivation of the participants" (p. 2). This occurred despite the fact that the course was presented at each university with adequate Internet access available (Wulf & Schinzel, 1998). In summation, the researchers blamed a "deficiently designed" tool and wondered whether the technological problems of this particular videoconferencing tool can ever be overcome.

CHAPTER 3

METHODOLOGY / PROJECT WORK

3.0 METHODOLOGY

By having a research and developing the multimedia presentations system (MPS), its needs the student to adapt software engineering paradigm as a discipline that integrates the process, methods and tools in developing the whole systems. Student used System Development Life Cycle (SDLC) to ensures consistency and reproducible in the development area. SDLC also reduce risk associates with mistakes and shortcuts and enable to produce complete and consistent documentation for the projects. Planning, Analysis, Design and Implementation are four basic terms in SDLC. These terms are used according to SDLC model such as Waterfall Model, Spiral Model, Hybrid Model, or Prototyping. Each model has own advantages based on the project specification and requirement.

Building a system based on the network application needs a repetitive model combined with prototyping. Hybrid model is the best project development life cycle methodology. Iterative development ensures system is developed according to the module and constant review and testing are key element in the development process. Therefore hybrid model is suitable in the development process which allows the student to review each stage in the development process and testing procedures upon to the network environment model.

The development process begin with the student will play the role of the knowledge engineer in defining problems, objective and requirement. This is achieved by soliciting the domain expert on the knowledge where knowledge is plays an important part on the development. Knowledge is both the understanding on the main problem and the rules to solve it. Network procedures and student's supervisor are the domain expert that will serve as the main reference in understanding the requirement and procedure.

Design and module development are the next procedures in the development process. The applications will be identified based on the revised user and system requirements

for the MPS. The contents of the streaming videos will be streamed using the identified application of the streaming videos. The process will be show in the following diagram, which mention pictorially about the flow of the systems.

3.1 Project Phase

3.1.1 Project Planning

In project planning phase, the student has done some research in searching suitable topic for the Final Year Project. Then, student proposed the topic to the FYP committee in order to get the approval before proceed to the next step. There were three topic has been proposed to the FYP committee and the committee has selected Implementation of Multimedia Presentation Systems as the student Final Year Project. After the FYP committee has approved the topic, the student discussed the topic with the FYP coordinator for further information about FYP. Then student continue to the next step in completing the Final Year Project.

3.1.2 Preliminary Study

In preliminary study phase, student starts the project with do research on the topic. The research is done using several data gathering method such as surveying, internet searching, e-mail, experience from the industrial internship, and also from the books, magazines and journals. The preliminary study discussed about the overview of the topic, Implementation of the Multimedia Presentation Systems. Student only focused on questions of what is MPS, what are the advantages of MPS, types of video streaming, and many more which not detail on the MPS itself. Student gathers the data and information about MPS and then the information will be translated into a physical looks of the systems. The study focused on research part of the FYP and the streaming videos technology. From this preliminary study, student took all the information and knowledge of MPS and brings it to the next phase, Feasibility Study.

3.1.3 Feasibility Study

Feasibility study is one of the important parts in the project planning. In feasibility study, the student must consider some constraints in completing the project. Three most important constraint for the project are time, scope and cost. Time is the highest priority where student must determine all the tasks must accomplished in order to complete the project. From the tasks, student must determine time needed for each of the tasks. Gantt chart is the tool that student used in planning the time frame for the project. The time given from the FYP committee is fixed and student must overcome and managed effectively for successful of the project. Scope of the project has been determined earlier at the preliminary phase. Scope is important where it can guide the student in completing each tasks and objective of the project. Student must determined topics that related to the project and the MPS. The topics have been discussed with the supervisor to get more details on the FYP requirement. Cost is considered as own cost where student will used own money to overcome cost occurred during the progress of the project. From the feasibility study, student will know the feasible of the project, how to manage time which has given by the FYP committee in order to complete the project, the scope regarding project research and system development and cost that will occurred and how to manage it.

3.1.4 Project References Research

This phase involved student in data and information gathering from various sources such as Internet, e-mail, books, magazine and journals. The finding must be related to the topic, Multimedia Presentation Systems. From the finding, all these material (data and information) will be used in completing the project and to support the system development.

3.1.5 Prepare the Preliminary Report

Preliminary report is the final output from the project-planning phase. In the preliminary report, it discussed the objective of the project, introduction of the

project, scope, methodology being used for the project, literature review to support the project, discussion and recommendation for the project. To write down the report, student must follow the guidelines, which have been provided earlier by the FYP committee. The report submitted to the FYP supervisor for marking and other detail explanation if needed.

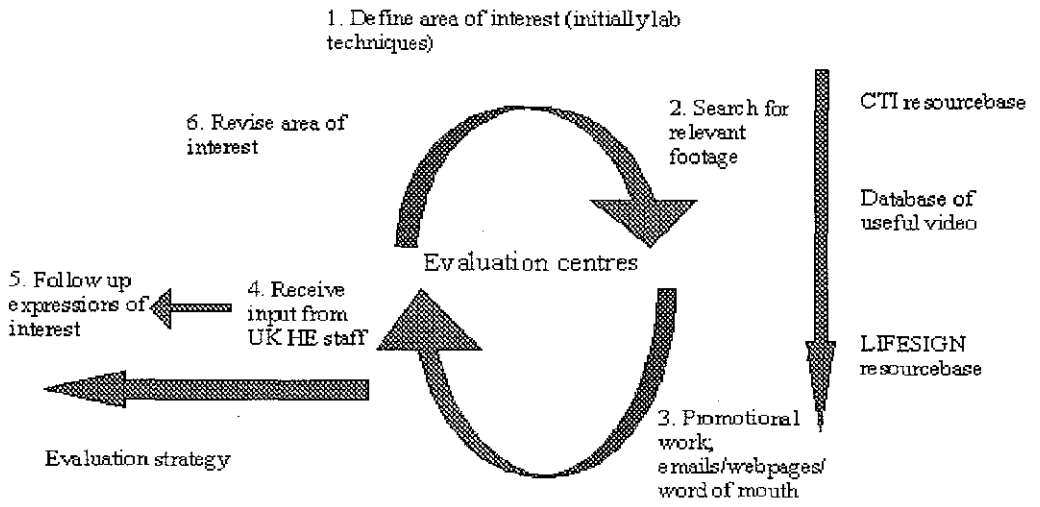
3.1.6 Project Analysis

Project analysis phase involve analyze problem statement from the preliminary report and solve it as the project's product. Student specified certain problem and aimed to solve the problem as the project objectives. The final outcome of this project analysis phase would be the completion of system requirement documentation which detailed about the problem analysis, requirement analysis and specification and, data process and object modeling. The analysis phase will include the analysis for the application of streaming video,

3.1.6.1 Identify application of streaming video.

The applications will be identified based on the revised user and system requirements for the MPS. The contents of the streaming videos will be streamed using the identified application of the streaming videos. The example of the identifying process will be show in the following diagram, which mention pictorially about the flow of the systems.

Needs analysis cycle



Flow of the diagram

The analysis has been done and the developer will identify defined area of interest for the systems.

The developer will search the identified items in order to move into the next phase of the identifying analysis cycle.

After the completion of second phase of this system, the developer will refer to the project supervisor in order to get an opinion about the identified applications. On this phase, there will be some changes to be made in order to meet the expectation of the project supervisor.

On the next phase of the application identifying process, the identified application will be re-asses by the project supervisor in order to check the suitability of the applications toward the systems.

If there's no change to be made on identified applications, the application will be used for the rest of the systems development and will be assessed through evaluation process throughout the development of the project. But, if there's a change's to be made, the application will be revised on the next phase of the application identifying systems.

On the revise area of the applications phase, the applications will be revised for the last time whether it does really need to be used or not for the whole of the project development process.

3.1.6.2 Design, implement and evaluate the use of streaming video.

Interactions between MPS groups are co-coordinated by the project developer and this ensures that developments link evaluation needs, availability of content, rights clearance, and use of MPS resources and cataloguing of video streams

3.2. Problem analysis

Problem analysis is done in order to get well known with the problem statement, which stated earlier in the preliminary and feasibility study. The analysis shows the relevancy of the topic with the current problem. From the analysis, student divided into two parts, the research and the system development parts. Student must divide these two parts equally and time must be managed carefully as the time constraint is very limited.

In research part, student must identify the overall problem in current ways of delivering the lectures in UTP. To make the case or the problem more detail, student has selected University of Technology Petronas (UTP) as the entity of the business in the research. Since UTP has the network facilities, which satisfied the need of this project, this system would give a big impact in order to enhance the knowledge sharing among UTP lectures and students. . In term of video streaming, its deliver a graphical image, which streams across over the network and this is a new ways of delivering the information rather than current textual slide presentations.

For the system development part, student identified what the functionality of the system and the requirement needed to accomplish the system. In the MPS, the system will be able for the user to view the video contents of the lectures from their pc. But, the expert system will shows the availability of the preferences whether it is suitable or not for the MPS implementation. The systems developer will use the streaming technology, which streams the video contents for the views of the students. Student

firstly has to identify the knowledge of MPS and converted it to the systems, which satisfied all the requirements from the sides of the systems and user itself. The problem arises how to create the architectural design for the systems and designing the video streaming deliverance.

Every problems and the results which been face during the development of the systems will be logged into a weekly report as a reference for the supervisor and the developer. This will give an instance feedback for the developer while developing the systems to be a source of information to detect any malfunction or error of the systems

3.3 Requirement Analysis and Specification

In requirement analysis and specification, student identified several requirements in developing MPS. Student did a research on MPS implementation, architecture of MPS, hardware and software needed. From the research, student change all the information to the requirement information where these information's are become requirement in the system. Each of the information will be used as the system requirement and functionality. Basically, the requirement if the system will determine the functionality of the system itself. Thus, student must find out the requirement and specification clearly and analyze it in order to get the system fully functioning as stated in the objectives of the project.

3.4 System Requirement Documentation Submission

The output of analysis phase would be the submission of system requirement documentation. In this documentation, student will explain more detail about the FYP than the preliminary report. The report specified more detail on system flow model, database architecture and the technical review of MPS.

3.5. Project Design

This design phase will include four main sub phases, which are architecture design, interface design, database design, and testing and debugging phase. The project phase is the most important phase in project development where if the project design failed,

the other phases in the project development cannot be continued. Student must keep alert in this phase and the outcome from this phase, design and requirement review will be used in the development phase later.

For the Project design phase, it will be divided into a two sections. The first sections of project design phase is the Interface and evaluation programme design and second, systems architectural design.

3.5.1 Design of evaluation programme for each intervention or change;

- Specify area of interest
- Identify source of information and support
- Agree the scope of the evaluation
- Agree time-scales

3.5.2 Analyze existing element of taught programme

In order to have a good video-streaming source for the educational purpose, the questions of what could be done better using streaming video must be answered. All the elements such as expert review, educational literature, survey methods; focus group, user- requirement analysis, interviews, confidence logs, attitude surveys must be satisfied.

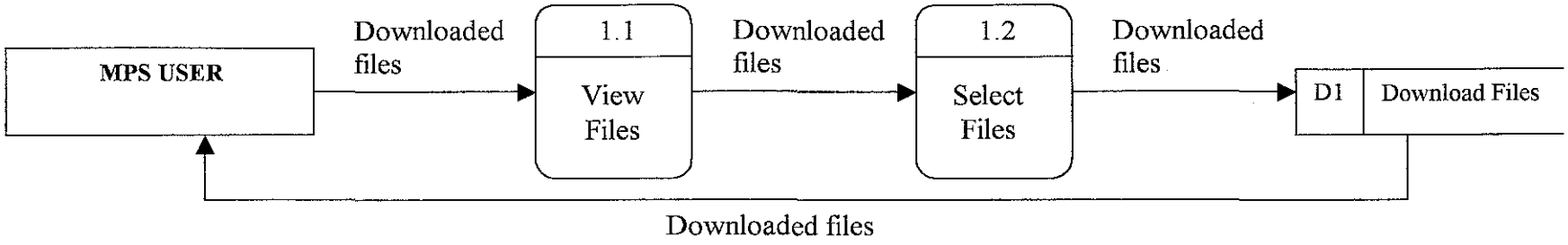
The developer must identify the use of existing video resources and convert into streaming video.

3.5.3 Architectural Design

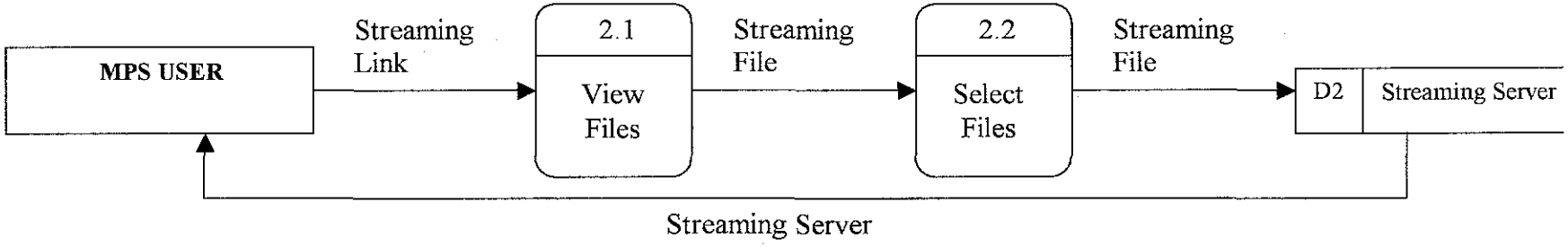
In architecture design, student use the system flow model in designing the system. Student designed system architecture model, which is adopted from the generic expert system. (The architecture consists of two parts; the first is the front-end architecture where the student uses a websites as the user interface for the system. The second part is the back-end architecture where student using streaming servers and web server as their back end programs.

The back-end program will determine the best solution based on the facts and rules that have been determine by the streaming technologies and UTP network capabilities.

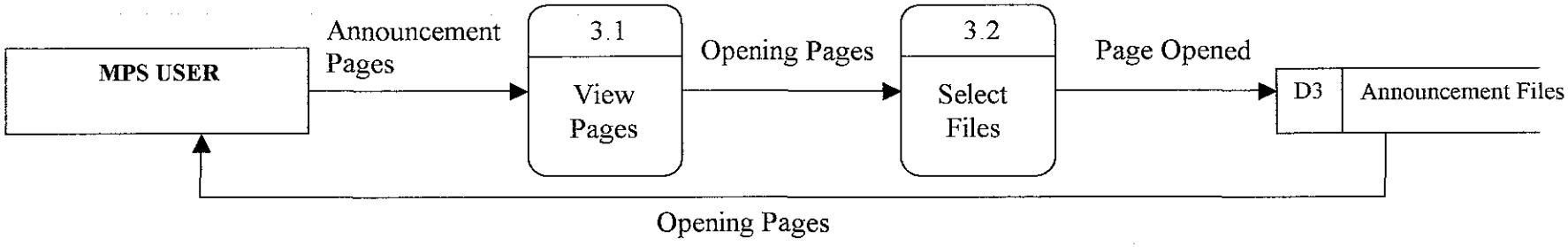
The systems architectural design for the main applications of the systems will be as follows:



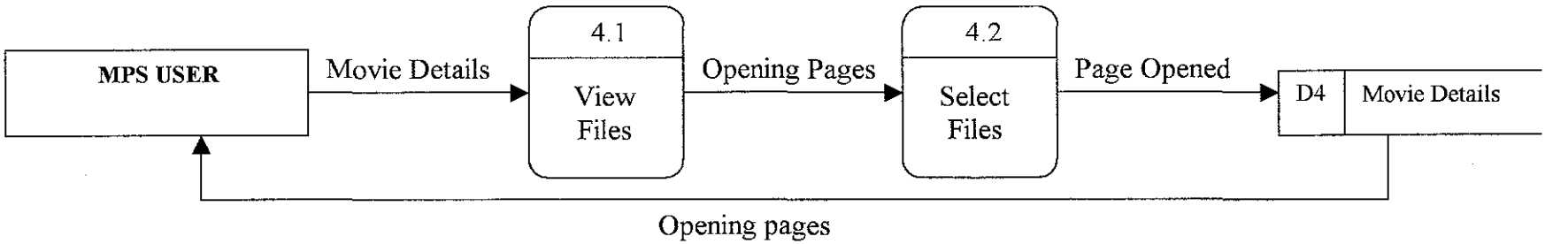
Level 1 of the Request Download process for the MPS websites



Level 1 of the Request Streaming process for the MPS



Level 1 of the Request Announcement process for the MPS websites



Level 1 of the Request Movie Details Page process for the MPS websites

3.5.4 Interface Design

In interface design phase, student designed storyboard for the MPS. The storyboard shows how the interface for the system will be. The system use macromedia Dreamweaver and Adobe Photoshop as the interface authoring tools. (*Refer figure*).

3.6. Testing and Debugging

Testing and debugging procedure is done when the whole MPS architecture is completed. The purpose of this phase is to test whether the server is functioning as the student expected to test the streaming movie is completely done through the network, flow of the system and the interface. The test and debugging phase only focused on the small units of the system. This phase also sometimes called unit testing. After this phase is successful, the integration testing will be take place in order to make sure the system is function as the requirement and objectives.

3.7 Tools

For the audio/ video streamer the tools needed are as follows:

3.7.1 Web cam

This hardware will be used for the live lectures streams and pre-recorded lectures video.

3.7.2 FIREserv server

This server will be used as a streamer for the MPS video contents and the website server.

3.7.3 Macromedia Dreamweaver

It's a web page/application authoring tools, which used to design for the platform page of the MPS.

3.7.4 Adobe Photoshop 7

This pictures authoring tools is used for the design phase of the MPS. Adobe Photoshop will be used to design the interfaces of the system and

3.8 Features

All the features, which featured on this system, will be discussed on this sub topic

3.8.1 Upload pre-recorded video

For the time being, only the administrators will do the uploading part of the pre-recorded video before its going to be streamed on the websites.. The recorded video will be ready to be streamed or downloaded by a student after the file successfully uploaded into a server.

3.8.2 Live encoded audio/ video streams

This features will used a web cam as a video input; the streamer will encode the live video and stream a video over the network. Clients can connect to the streams using any media player.

3.8.3 MPS websites

This application will be used as a platform in order to integrate all the applications used this system. MPS websites also can be used for the lecturers to announce any live video sessions or any uploaded video file to the server for the used of their students

CHAPTER 4

RESULT AND DISCUSSIONS

4.0 UTP Network Testing Result

There's some testing has been done in order to get information about the bandwidth provided on the UTP local network. By using a Fireserv server it's allow the developer to detect the transfer rate of the video streaming from the server to the client who connected to the server. The results of the bandwidth are showed on the table 1.

Table 1 will shows a simple spreadsheet that calculates the required bandwidth for each scenario. This type of calculation should be done before implementing streaming video, to ensure that the network can support the expected traffic load.

Table 1

Parameters		
Simultaneous Sessions	3	sessions
Session Bandwidth (Kbps)	300	Kbps
Average number of receivers	20	Receivers
Real-Time Video/Audio Sessions		
Server sends	(sessions * bandwidth)	900 Kbps
	Client receives (bandwidth)	300 Kbps
Video-on-demand Sessions		
Server sends	(sessions * bandwidth * receivers)	18,000 Kbps
	Client receives (bandwidth)	300 Kbps

** This test was held during the peak hour of UTP network usage on 12th march 2004 approximately from 12.00 a.m. to 3.00 p.m.*

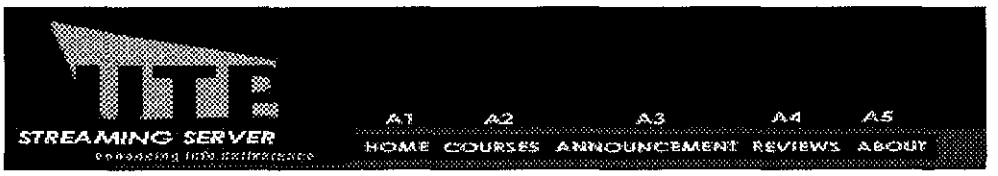
Many organisations have their networks protected with a firewall and, even if normal Web traffic is allowed, special provision may have to be made to allow access to the ports used to receive streaming video. Since UTP students can reach into a server which located inside the UTP firewall, it would be a great deal for all UTP students to use MPS as their supportive knowledge. The same applies when serving video to the Internet from inside a firewall.

Despite the problems, our experience of streaming has shown that it is practicable to deliver multimedia broadcasts across local and wide area networks, providing the end user is connected to the network with a reasonably fast connection such as Ethernet, DSL or cable modem.

This report has concentrated on the technology needed to produce and deliver multimedia, and in particular video presentations. However, careful consideration should be given as to whether video is needed as part of a multimedia presentation. Although easy to produce, a continuous shot of someone talking direct to camera is technically demanding on bandwidth and probably adds relatively little to the presentation. In particular, when producing material for education and training a combination of slide shows, animation and recorded computer session together with a commentary is easier to deliver and in many cases more effective than full motion video.

4.1 User Interface Testing

4.1.1 Link and Debugging testing



As the websites having a some features such as video streaming and announcements for the viewers, the developer have put the at the first page of the systems 5 linkage button. As a results, the viewers will have a clear view about the overall contents of the systems.

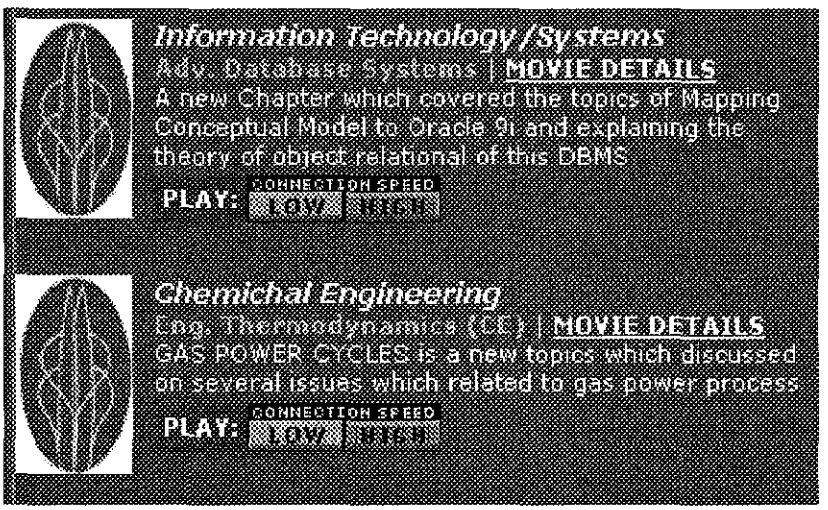
4.1.2 Link Testing Results

4.1.2.1 Button A1

When the user press the button A1, it will bring back the user into the first page of the systems. This button will link the pages to the first pages when the user need to go back to the systems home. For an example, when the user was on the announcements sections, the button will bring the user back to the first page.

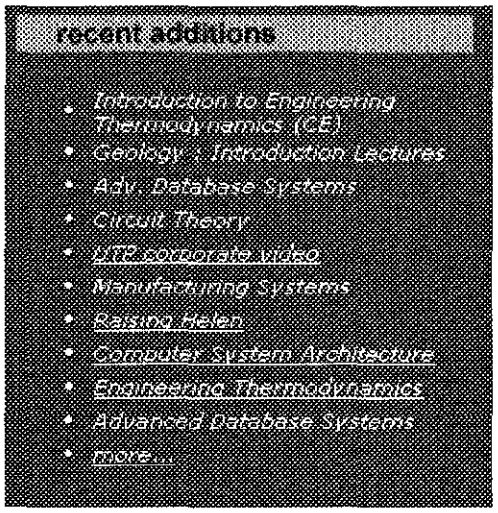
4.1.2.2 Button A2

This button will bring the user into the pages which shows the informations about the video contents uploaded for each course. This pages will be a reference for each viewers from different courses to review the video contents of the systems. This also will ease the user to ident ify their own video streaming contents which categorized into a courses. The examples the on the informations that the user will get by browsing this pages will be as follows:



4.1.2.3 Button A3

This button will link the user to the announcements page, this page will give a user an information about the uploaded video contents. This page will keep the viewer updated with the recent addition of the video contents. This pages has already been tested and the result of the test was not fully satisfied because some errors has been detected especially in linking the file to the user. The snapshots of the announcements will be as follows:



4.1.2.4 Button A4

This link has been successfully done and there's no error has been detected during the testing phase of this page. This page will include all the reviews which been made by the viewers of the video contents, but there's some problem occurred since the user requirements of this systems keep changing. The developer of this system would reconsider the availability of this pages and its need some revision for the requirement of this pages onto the systems.

4.1.2.5 Button A5

This link will include all the necessary informations about the systems application. All informations which importants toward the development of this system will be iincluded into this pages such as the name of developer, supervisor of the projects and also acknowledgements.

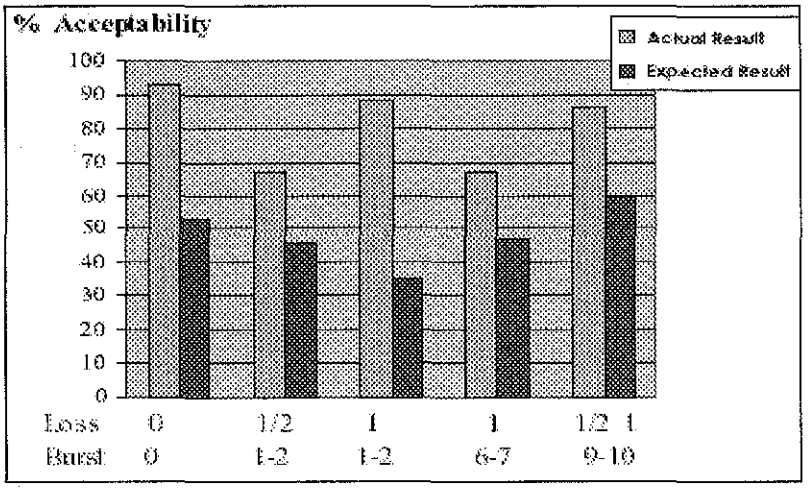
4.1.3 Overall Results of Interface Testing

Since the sytems has not fully tested by the developers, there's some minor error has been detected while the system was set up on the server. The performance of loading time also a minor problems of this systems, since the capability of the server itself and network performance still need a further riviews by the developers.

4.2 Server Performance Testing Results

On the April 1, 2004, the server was testing and the server was up for about 4 – 5 hours. The responses to the questionnaire (see Appendix I) showed that all subjects were aware of both audio and video errors present in the test sequences. Subjects reported four types of errors: video pauses; blockiness in the video; loss of audio; and audio-video asynchrony. Of these errors, loss of audio information was considered to be the most serious by 14 subjects, 6 subjects identified video errors as the most serious, with 4 subjects reporting audio and video errors to be equally serious. The majority of the results from each test day for the applications were collected and averaged across respondents for each question. Figures 6 and 7 shows the mean responses to the overall quality and acceptability questions for the applications. Questions 1 ('Overall Quality') and 4 ('Acceptability') were the most critical for comparison with the expected results. Further, the MPS application was rated better during the test day. However, quality responses for MPS applications showed little variation between conditions. The performance of MPS suggests that it is able to accommodate losses in the network (e.g. the server or application may use

some packet retransmission method to overcome data loss) up until a certain level of network performance occurs, at which point the application fails to transmit any meaningful data. Thus, MPS appears to operate on an all or nothing principle whereby performance is relatively immune to packet loss when losses can be accommodated. However, when the system is unable to recover losses it breaks down completely. The acceptability responses for Application A show no easily explainable trend: for a single burst size performance is more acceptable with a 1% loss than with a 1/2 % loss. The acceptability data reinforces the view that the application or server incorporates some mechanism that attempts to overcome packet losses.



(the graph shows the results of acceptability percentage of the system based on correspondent answers of the questionnaire)

This is the results of FIREserv server during the testing phase

The server testing questionnaire has been attached on the appendix setions (refer appendix)

4.3 Advantages of MPS

- To maximize the use of UTP network

- To innovate a new ways of entertainment which integrates the used of internet/ intranet as a medium.

- To give an opportunity for the UTP student to views anything on a video format from entertainment to education

- The user can view video clips of any size without having to download video files in advance and does not have to be concerned about data storage requirements.

- For the end user, the tedious downloading of large files is avoided, enabling the listener/viewer to access music, for instance, almost instantly. The penalty for this convenience is reduced replay quality.

- Streaming uses compression techniques, the effects of which can easily be heard at lower bit rates. Some music types fare worse than others, with material having much high frequency content such as snare drum being particularly affected. Stage width/depth and pan information is impaired, with exact centre-stage voices in stereo 'confusing' some codecs, causing glitches.

4.4 Reasons of implementing MPS

4.4.1 Scalability

User can ignore the problems of storage since the video format can be stream from the websites.

4.4.2 Availability

The UTP intranet facilitates will allow students to access into the MPS applications in any times. MPS also provides the environments where all people will keep their information updated from times to time because the contents of the knowledge which bring by the video format are easily absorbed by a students rather than conventional textual slideshow.

4.4.3 Flexibility

Allows lecturers to alternate their ways in giving the lecturers, as a result, a variety of knowledge sharing between students and lecturers can be achieved an make a learning process among UTP students become more interesting

4.4.4 Performance

Streaming videos are ideally suited to creating productions on the UTP network. Unlike textual information and still images, streaming videos effectively convey unique performance information in a dynamic and

captivating manner, engaging the viewer with sight, sound and motion. By providing a more powerful and compelling user experience, streaming videos satisfy the UTP students who thirst for information and help to drive increased their knowledge.

CHAPTER 5
CONCLUSIONS

5.0 Conclusions

There's a lot of ways to improve the usage of UTP network and after a series of research and surveys, I've discovered the ways on how to stream the video content through UTP network facilities. These applications will streams the video format to all UTP students connected to the UTP networks.

By implementing and integrating the systems into the UTP network it will be the best solutions for the lecturers when they having a problem to deliver their lectures. Without being hesitated with the lectures schedule, lecturer can still deliver the lecture using MPS as their alternate ways. By providing this system, it will enhance the performance of both sides' students and lecturers, at the same time, the level of understanding for student about the lectures will be high. They can review the lectures on a video format with a good understanding by playing the video of lectures.

As a suggestions for making this application will benefited both parties, its can be integrated with UTP E-learning web sites in order to maximize the capabilities of the system itself.

5.1 Recommendations

After some revisions of the systems details, function, design and architecture, there is still a room of improvement for the system to be more efficient in providing the service for the UTP community. The discussions of the system enhancement will be discussed on following topics.

5.1 Future Enhancement

As for now, the system is not equipped with the user log in applications. There is no need for any viewers of the websites to log on onto the website and they can browse

to any pages they want and there is also no user level restrictions as the log on applications do.

For the enhancement of this system, the author would recommend further development on user log in system because it will create more functions for it. As times to times, the requirements will keep changing because of its availability of handling the needs of the user. Some requirements might change and needs further enhancement on it. For an example, the requirements of the database or server performance, in order to cope the need of client demands.

5.2 Uploading functions

There is also a suggestion for the systems to provide another application which enable the upload mode of the video files to the server. This can be done by providing the functions of uploading video for the user who have an account on the website and also ease the task and shorten the time of administrators and lecturers in editing phase of video contents.

The Multimedia presentation systems should also be enhanced from time to time when there is a new requirement for the system came. The enhancement can be done by the developers itself or by the system administrator who has a permission to do so. The system administrator must ensure that the content of the video streaming is always updated in order to attract the user to frequently access to the portal.

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