

Management of Multimedia in E-Learning Environments

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Session: Tools, techniques, and best practices of engineering education for the digital generation

Abstract- E-learning and distance education are growing very fast. Finding the best way to deliver quality education needs us to think how we can improve and manage the content of documents especially multimedia.

The importance of using multimedia for E-learning is the key factor of success for any E-learning system. There are many tools available to create media such as images, audio and video. However, documents that include several forms of media at the same time might distract the student during the learning process.

We believe that loading several forms of media in the same page but not in the same time can be achieved by providing synchronization to these media through services that support all the requirements that media need. In this paper, we will discuss and examine some of multimedia applications that can provide support for E-learning system.

1. INTRODUCTION

The application of information and communications technology to education and training, both in the corporate and public sectors is now a big business on a global scale [1]. The World Wide Web and web-software have created the possibility of delivering compelling electronic-learning to new groups of learners, and give us the chance to deliver content that is truly interactive and media-rich.

We are looking to create websites that are truly interactive to deliver High Distance Education Quality (HDEQ). This can be done by integrating our site with different multimedia that have the ability to deliver HDEQ and fast services for groups of learners. It is important to understand that every media you add to your webpage and the type of the tools that you are using to add the media will affect the speed of services that we are looking for, also how to manage the

number of media in the webpage plus the architecture of the group of media in the same webpage or even in the web site. To determine how well they fit our application requirements and development capabilities we will discuss some tools in section 2, 3 and 4 that are used to add multimedia to a website and what is the primary use for each one of them.

2. E-LEARNING MODE

There are two types of learning mode; synchronous and asynchronous [6]. In the asynchronous E-learning mode all the e-learning materials are archived and stored, so they can be accessed at any time which implies that little bandwidth is needed. The synchronous E-learning (real time) mode means to transfer information without delay. Support of real-time interaction can be achieved by not only interfacing with simple text form but also by interfacing with audio hide resources, application sharing, and whiteboard media. It also allows checking attendance by teacher, floor control for question/answer and supporting toolbox for the convenient interactive learning [6].

3. AUTHORWARE

Authorware is widely used in the teaching field and was used to develop many multi-media teaching CD-ROMs. Authorware is based on advanced technology, fully functional, and has a good interface [2]. Authorware can be integrated with multiple formats of external images, audio, text and video. Although Authorware is a good tool to create multimedia courseware, it is not good enough for distance education or e-learning systems that are using networks or the Internet because Authorware's web player is not preinstalled on major browsers and operating systems which is time consuming to download and install. Furthermore, Authorware does not support or provide tools that help the programmer to write code instead of drop and drag buttons which restricts the programmer. The main problem with Authorware is that distance education using broadcasting system allows teaching of several students at the same time, but the interaction of several students at the same time and the interaction between teacher and students are impossible and it is merely a method of transferring information or knowledge that cannot provide additional assistance immediately according to students' comprehension level of content being taught [3].

4. DIRECTOR SHOCKWAVE

Web based multimedia tutorials are being developed for use in several undergraduate courses in Electrical Engineering and Computer and Systems Engineering at Rensselaer [5]. These interactive learning modules (ILMs) are created with the Director authoring environment and can be deployed using a standard Web browser with Macromedia's Shockwave plug-in as the interface [5]. The Director Shockwave is a good tool for creating and developing e-learning web-based material with multimedia contents. There are set of features and attributes that make Director Shockwave useful for creating and synchronizing different type of media. One feature allows synchronization of set of medias on the web by grouping them. Director Shockwave has script language called Lingo which provides an ability to control the media and control the flow of the different medias. This feature allows the instructor to enable or disable some features of the course medias during the online class. These features are good for creating and maintaining rich medias. The disadvantage is that the instructor(s) cannot track the student data or the interactivity between the students themselves or between the student and the instructor.

5. MACROMEDIA FLASH

A multimedia learning object is defined as an animation that includes a combination of text, graphics, sound, and video packaged together. Unlike the standard lecture mode, learning objects allow flexibility and round-the-clock access to the students. Students typically run the learning objects from a compact disc (CD) or from a website [6]. At present time, the Macromedia Flash was established as a standard for creating of interactive multimedia animations for web or CDROM. Basically, Macromedia Flash is a vector-drawing editor [7]. The Macromedia Flash has a time line that can contain multiple layers as Director Shockwave. The main domain of Macromedia Flash is animation [7]. The usage of vector graphics in animations results in very small files. It is possible to synchronize medias and make interactive animations by using the Macromedia Flash ActionScript language. Macromedia Flash 5 can also make animations on the fly by Macromedia Generator tool [7]. The date for generating animations can input from ODBC or SQL databases [7]. From the result of using vector graphics in animation resulting very small files that can be used on the web and performing a good job for delivering rich-media over low bandwidth connections. Macromedia Flash is an excellent software that allows stepwise analysis of each operation or explanation [7]. Interactive multimedia enables the web presentations to be

dynamic and presents information in a nonlinear format that is easier to comprehend for the learners. Macromedia Flash is available on most systems and the web sites. The disadvantage for Macromedia Flash is that we can not track the student data and it does not provide any support for digital video. Moreover, the interactivity between the students themselves or between the students and the instructor are missing.

6. BUILDING AN INTERACTIVE COURSE WITH RICH MULTIMEDIA

To build an interactive course with rich multimedia is a hard task (Fig. 1). Merely flinging media on the web pages and other materials without any controls and management will not create web site that is truly interactive to deliver High Distance Education Quality (HDEQ). However most educators agree that, in the design and development of educational material, attention must be focused on learner’s requirements and characteristics, defined in terms of contents (what to learn) and of learning styles (how to learn) [1], [2].

7. MULTIMEDIA MANAGEMENT

To control and manage multimedia that is related to the online course, the need of the session access is essential (Fig. 2). The instructor creates initial session (session manager) that gives him/her the ability to control all the sessions that are created during the online connection to the course, which means that all the students connected to the course environment can be controlled to access a specific media or restrict it. Also, initial session allows admission of late comers and early withdrawal of students. This capability of the initial sessions allows a better utilization of bandwidth [5].

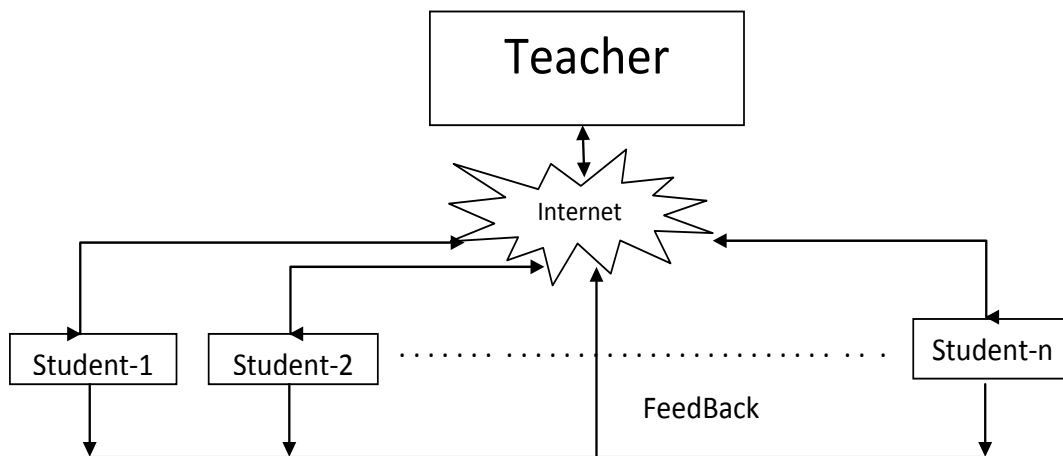


Fig 1: Interactive Course with rich Multimedia.

8. MULTIMEDIA ORDER

There are many reasons for tracking data about multimedia order that can be controlled by the instructor for an online-learning course. If the course is mandatory or it is required to meet an order or compliance requirements, you will need to monitor and track learners' progress and which type of media they are looking for. Another approach is to reorder the flow of different types of media by implementing some form of knowledge management to see what is the common request of media from the student's side.

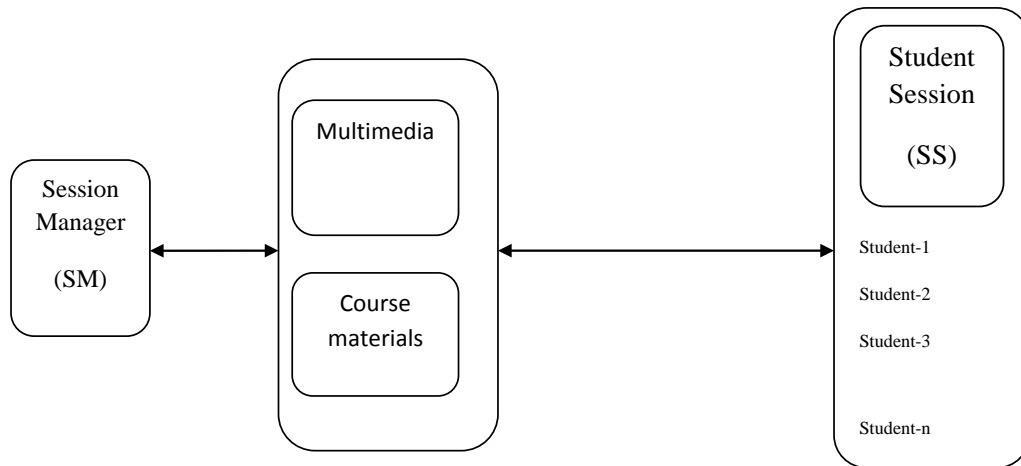


Fig 2: Multimedia Management System (MMS)

9. CONCLUSION

The importance of using multimedia for E-learning is the key factor for any E-learning system. However, documents including all media at the same time will affect the course and the student, leading to less comprehension from the student side. In this paper, we proposed an e-learning environment containing rich media. The proposed multimedia management gives the ability to control and manage the access and the order of the media that are provided during the online course.

We present three tools that are used to design the courses with rich media. We explain for each tool its strengths and weaknesses and how we can improve it to help us creating an interactive multimedia course.

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