

WEB-BASED COURSES PRODUCTION AUTOMATION

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Abstract: This work presents the process we implemented to develop our Web based courses using multimedia elements. We present the reasons we have decided to automate the production of our courses and present too a tool we developed to provide this automation.

1 – Introduction

Nowadays the challenges of teachers and educators are enormous on facing the new technologies and their applications on education. A new world is appearing when we talk about the education using networks technology, which creates a distance-learning environment. We must have a lot of attention in not transferring the current models to the Web but we have to research, create and develop a new model, a new paradigm to the distance-learning process.

In the learning process probably one of the most relevant aspects is the degree we manage to interact and maintain the student attention and concentration. If we consider that in this new environment we can not see and feel the reactions of our students, the problem of maintaining he/she attention becomes strongly bigger.

One possible solution to resolve this problem is the employ of multimedia elements in Web courses as an enriching and improving agents in this process. When we use elements such as video, audio, pictures, animations, etc in a logical disposition during the course we can induce he/she interest and attention and also induce he/she action of searching relevant information that is logical distributed among the course. In fact to produce a course using multimedia elements we have the same process of producing a theater script, when at each instant the scriptwriter must plan every elements that are appearing to the spectator.

When doing the analogy of writing a script being the same process of planing a Web based course we can see that is very difficult for a teacher to do a good course by himself because he is not prepared to this job.

A teacher is concerned in teaching the content of its course, which are the best strategies to transmit he/she knowledge, which are the best strategies to provoke student's interest and how is the best way to evaluate he/she's students. Another aspect is that the teacher is not prepared to do this in an efficient and high quality way, he/she loses a lot of time to achieve modest results.

Considering all these aspects we concluded that teachers must focus their activities in transmitting he/she knowledge and experience. Of course they participate of the course construction process but they don't need to lose time in manufacturing the educational contents.

In next sections we present the methodology and tools used in the automation of the process of constructing our Web based Courses with multimedia elements and present also the infrastructure we created to provide the production automation of our courses. Our description is focused on video production and utilization but we have basically same conclusions when considering audio elements.

2 – The Automation Process

When considering the time necessary to produce a Web-based Course using multimedia elements like video, audio, animations, pictures, etc we realize that if don't automate totally or some parts of the production process we spend an extraordinary amount of time that practically forbid this production.

In our first experience in producing a course that uses a small video of a simple classroom explanation we took about 2:30 Hs (two hours and 30 minutes) to produce a 15 minutes (fifty minutes) video with low quality. This low quality was due to the fact that our teacher was not familiarized with the lights and a camera at his face; at that moment he should be more an actor than a teacher. So he spent a lot of time to prepare his speech, it was not his natural way of speaking and giving classes and the result was that for students it wasn't an attractive and stimulating way of learning. Another relevant aspect of this experience was that it was done with one of our most motivated on Web based Courses teachers, that means that we probably got our best results in this production format.

Analyzing this experience we decided to try another strategy and started to record our classrooms in real time. This procedure consists in during the regular class we totally record it. At the beginning our teachers were a little embarrassed but after some classes they became very comfortable with lights, microphones and cameras.

To prepare the classroom environment we created a team with undergraduate art students focused on movies. These students are responsible not only for the classroom preparation and record but also to do all necessities procedures to publishing the classroom on the Web.

This procedure consists in hardware and software compressions and editions of video/audio signal. The first step is a phase where a hardware compression of the video signal occurs. The video signal gets into the computer by a hardware interface that submits the signal to a compression algorithm that implements the preliminary phases of MPEG.

The second step consists of editing this signal when teacher's pauses, undesirables' interruptions and any other changes are done. At this time is very important these student's experience because the quality of the final classroom depends directly on their job.

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On the third step occurs the process of rendering the signal that consists basically in time machine processing and is a very time consuming task. In fact is the longest task of all this process. On the last step the second compression occurs when the signal is submitted to a software algorithm, in our case MPEG4 or Indeo.

After having the digital video signal disposable we have to publish it on the Web. This is not an easy task to do because there are many phases to have a video disposable on the Web. At the same time we believe that accomplishing the classroom video we have to offer also others material like texts, pictures, PowerPoint transparencies, animations, links to other sites, etc. So the only way to automate this process was to develop a tool that makes easier all this process and publish all this material without the need of computer professionals. With this tool we get not only a efficient way to publish by everyone the Web classroom but also we don't need any extra work from the teacher whom can only direct the construction of he/she's course.

In next section will present some features of this tool.

3 – Functional specifications

The tool we've developed has some main specifications that we'll present now:

3.1 - Choosing a template

This is a very important feature of the tool because it provides the flexibility of choosing which elements the user wants to put in its seminary. We have developed some templates we consider important for our proposes As you can see in Figure 1 There are many options the user can choose including options without video but only audio, options without text that is any option useful to the user. For our proposes the template we prefer is the one that synchronizes video, power point transparencies exported to GIF format, text synchronized with the video (Figure 2), that is, the text accompanies the audio part of the video and also our template permits the user to configure an animation. We've implemented this functionality in a way that is very easy to introduce a new template with new elements if someone needs.



Figure 1



Figure 2

3.2 Synchronizing the events

Our tool provides a synchronization mechanism used in the streaming server's event feature. The commands, which come with the stream, are used for changing the slides, scrolling the text or start animation interpreted by JavaScript. This happens when you're watching the seminar. When you're producing it you just press a specific button whenever you want an action to happen that is whenever you want to generate an event.

The synchronization consists in watching the video or listening to the audio and pressing a specific button whenever an event (change slide, scroll text, start animation...) is desired to happen in the final presentation. As the tool is very easy-to-use, not only the teacher is able to produce he/she's course. Besides, this process lasts approximately the video or audio duration, thus there is more time left to concentrate in the content preparation.

3.3 Files importation

It supports the automatically importation of files from others programs like PowerPoint, Word etc and permits an automatic format adjustment. On this feature the teacher can use all its material already done.

3.4 Reusability facilities

On Figure 3 we can see the screen when the user select all its material; he can select how many files he wants and he can browse his material in any place. Notice that he can browse even elements that belongs to other teachers or for example, belongs to an ambience of a department that can construct a library of courses or modules. In future a teacher can construct a course using not only his/her material but integrates material of many people.

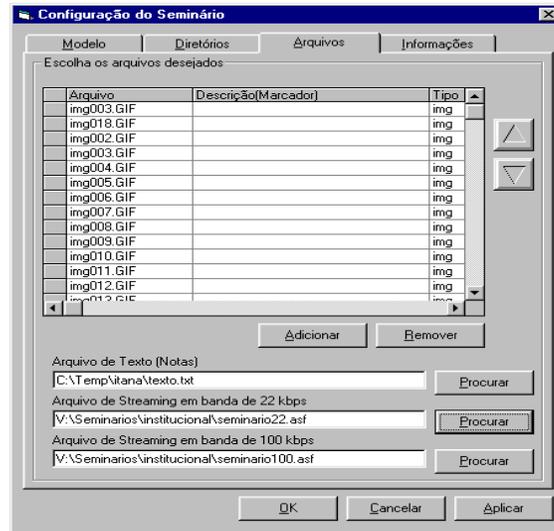


Figure 3

3.4 Synchronization

When all the elements and files were given it's possible to start the synchronization. Toll's user starts the video and every time he/she wants to generate an event press the associated button. That means if he/she wants to change a PowerPoint transparency when some action occurs they press the left button and, if he/she wants to move the text press the right button.



3.5 Publishing

The tool publishes automatically the final seminar. The user has only to give the directory where he wants to put his seminar and automatically the tool will place it there. Notice however that as the seminar is based in a streaming server technology the video must be published in a directory of this server.

As showed we can see that a person that is not concerned with subject can make and publish a course by himself.

The only problem we have in using this tool is that sometimes the content is so difficult that it becomes very difficult to synchronize the elements the teacher programmed. To solve this problem we use again some strategies used when making a film that consist in during the classroom recording we take note the instants the events like changing PowerPoint transparencies occur.

4 – Conclusions

We have already produced five 40 hours graduated courses in this format, using classrooms video, PowerPoint transparencies, texts and sometimes animations and we have concluded that we need a multidisciplinary group to provide a richer material. As we are engineering teachers we are not prepared to produce a good material some student's reports showed that the final quality of the multimedia elements is very important because it's interferes directly with student's course appreciation and profit.

The only way to achieve an efficient course production process is to automate as many phases as possible we can because it's the only way to achieve a cheaper, quicker and efficient process.

Finally we believe that even doing all this automation a course using multimedia elements is still a very time consuming task.

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