IMPLEMENTATION OF VIDEO FEEDBACK TO ASSIST THE LEARNING OF PRESENTATION SKILLS

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ABSTRACT

This paper describes the implementation of an online video resource for both postgraduate and undergraduate students with the aim to improve the learning of presentation skills. As part of the final year project in this last academic year, presentations were recorded at the start of the second semester. These were then made available to the students during week eight of the semester over the web via student specific portal pages. The student's marks and feedback from the lecture assessors on the presentations were also made available. The students were also recorded during their final presentations at the end of the semester. The changes in student grades were examined and compared to those over the previous six years when such feedback was not available. The resource was also designed to aid lecturers to view presentations they may have missed and enter marks for their allocated students.

INTRODUCTION AND RATIONAL

This project was implemented during the 2007/2008 academic year in Dublin City University. Development began during the first semester with the design of the EngPresent software and the recording of the first set of final year project presentations. Assessment of student presentations is currently implemented in various undergraduate modules in second, third and fourth year. Students' presentations were recorded and made available online. Although the students all present in the lecture theater in front of each other, each student's presentation was only accessible to themselves via their own personal username and login. By having the presentation available to them they can see what was good and bad with their individual style. They can also see the lecturers marking for the various aspects of the presentation, including preparation, opening, closing, rapport, and ability to convey the technical content. Comments on good and bad aspects of the students' performance were also provided in this feedback.

Different students have different learning styles. These include visual, auditory and kinesthetic. The provision of video learning resources has been shown to improve student learning as it targets the auditory and visual learner [1]. The provision of a variety of learning media has also been shown to engage students better than conventional single mode delivery [2].

RESOURCES AND METHODS

Presentations were recorded using a Sony Handycam SR190 which produces high quality MPEG-2 video, at a resolution of 720x576. Sound was recorded using either the built in microphone on the camera or a plug in variety that was attached to the student's lapel. From a practical implementation point-of-view, it was deemed suitable not only to compress the video, but also to change the video format. A typical presentation video lasting 13 minutes would have a size of approximately 550 Mb. This equated to approximately 0.7Mb/sec (42Mb/minute). Even with this MPEG-2 compression, this presented some obvious dilemmas in relation to hard disk storage and web streaming. For online streaming, further compression was recommended. In order to provide a front-end Graphical User Interface (GUI) for the work SUPER (Simplified Universal Player, Encoder and Renderer) was used. SUPER is a freeware application which acts as both a player and encoder for virtually all popular video formats, [3]. This software allowed for the encoding of the presentation videos to be uploaded to the EngPresent application. EngPresent is a web application developed using Apache Struts open source framework for Java EE web applications. The format chosen was to produce the videos as Adobe Flash video files (SWF). There were a number of motivations behind this decision:

a) **File Size:** Flash video produced with Super, with a resolution of 384x288, resulted in the average file size for a 13 minute presentation of 33MB. This equated to approximately 0.042MB/sec (2.5MB/minute), or 6% of the size of the original MPEG-2 video files.
b) **Video Quality:** Despite the considerable hard disk and bandwidth savings, discernible video quality is not affected to any significant extent. Presentation text and diagrams were clear.
c) **Browser Compatibility:** Flash as a format has created market dominance, with claims from Adobe that 99.3% of all internet desktop users have the Flash Player installed. Flash is frequently preinstalled on both Windows & Mac computers (unlike both Windows Media Format and Quicktime).

A screenshot of the SUPER application is shown in Figure 1. Apache Tomcat is a Java servlet and JavaServer Pages container developed by the Apache Software Foundation (ASF). For the purpose of this project, Tomcat provides the "engine" to host the business logic of the EngPresent application. It provides a number of services such as hosting, communication, security, database connection pooling and authentication. The core business logic of the EngPresent application provides implementation for the core aspects of the EngPresent system:

a) Authentication, role management and login
b) Personalised pages for both staff and students
c) Facility for searching and viewing recorded presentations
d) Facility for viewing marking of individual presentations

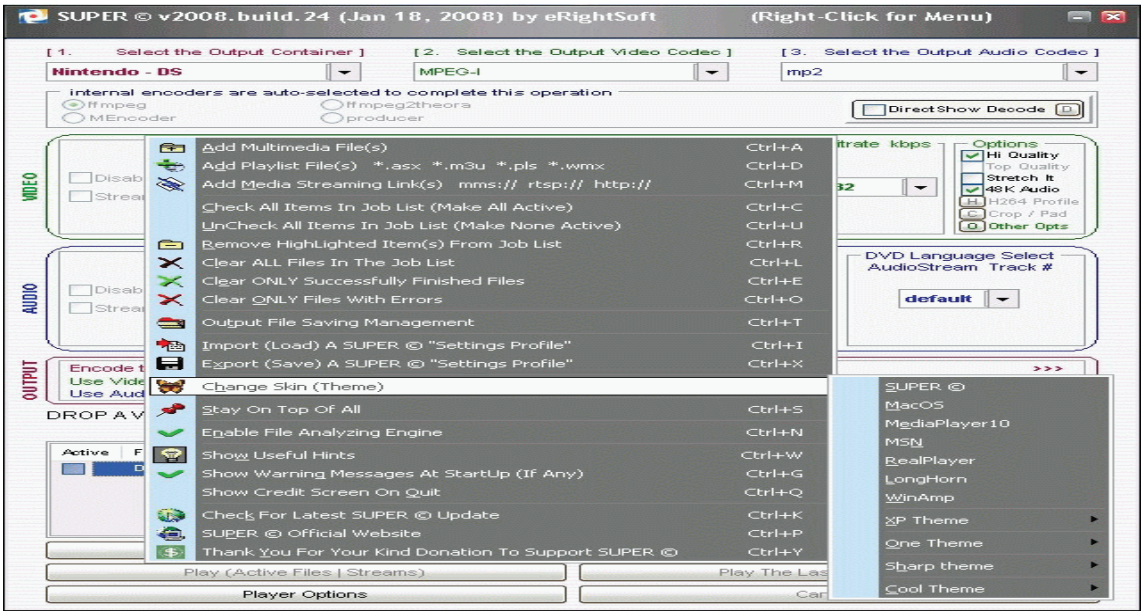

Figure 1 Screenshot of SUPER video application.

Persistent data storage is handled via a pool of open JDBC connections communicating with an Oracle database. Oracle was chosen as the relational database management system (RDBMS) of choice for this project. The role of the RDBMS is to typically provide a persistent data store in tabular form. The decision to use Oracle as the RDBMS of choice was based on two principal factors: a local site license for the product and previous technical experience in deployment and utilisation. One of the more stringent requirements of the project was to provide the user interface via "thin" browser clients. A "thin client" is one which depends primarily on the central server for processing activities and principally focuses on conveying input and output to and from the remote server. Re-stating, the overall application should function on base installs of typical browsers, such as Internet Explorer, Firefox, Opera and Safari. To achieve this aim, the client user interface was developed using a combination of XHTML (eXtensible Hypertext Markup Language) and CSS (Cascading Stylesheets). For the most part, a standard install of any browser provides the platform for supporting the UI, with one important exception: video display. Video display provides some difficulties in any web-based application system. Conventional video files can be viewed in two ways: with a helper application that is launched by a Web Browser, or, when the appropriate plug-in is installed, directly in the browser's window. The later option was chosen, with the Adobe Flash Plug-in selected for the medium of video delivery.

Once the EngPresent application had been rolled out, every student presentation was recorded, edited and uploaded for lecturers to view. This allowed academic staff to view presentations that they missed and to either grade them or gain an insight into work carried out by the student. Once all of the student marks were uploaded to the system, students could view the recording of their presentation/questions and could then see their associated results for each graded section and overall. Also students were given critical

breakdown of their presentation as a whole. Suggestions on how to improve their presentation technique accompanied this breakdown and it was hoped would lead to an improved performance in their second presentation on the same topic later on in the academic year. The marks achieved from previous years have been compared to the marks achieved with the new implementation of presentation skills learning. The presentation skills marks were expected to be higher in final year students after being trained with the new proposed method. Figure 2 shows a screenshot of the current setup of the EngPresent application. This is what the student would see when viewing his or her presentation. Information such as the presenter ID and group information is also given along the side. The overall mark is given at the bottom of the page with a link to a more in depth breakdown of the marks awarded. It is in this section that the student can view the positives and negatives as perceived by the examiner and also the suggestions on how to improve their presentation technique.

Figure 2 Screenshot of the EngPresent web interface for students.

RESULTS

Feedback from staff who used the system was very positive and many believe that the system had great potential to become a powerful tool for them and the students to utilise. They believed that it was a good investment to develop such an application and that

student grades would improve in terms of the quality of their presentations. Figure 3 shows the actual results for the average percentage awarded for quality of presentation only over the last six years. Diamond points represent the overall first semester presentation mark and the square markers represent the overall second semester presentation results. From this graph we can see no clear difference after the implementation of the new system in 2007/2008. The results from 2007/2008 are based on the results of 47 final year students. Further analysis with larger sets of students will need to be carried out to understand why this is so and also a larger group of students in subsequent years will be examined.

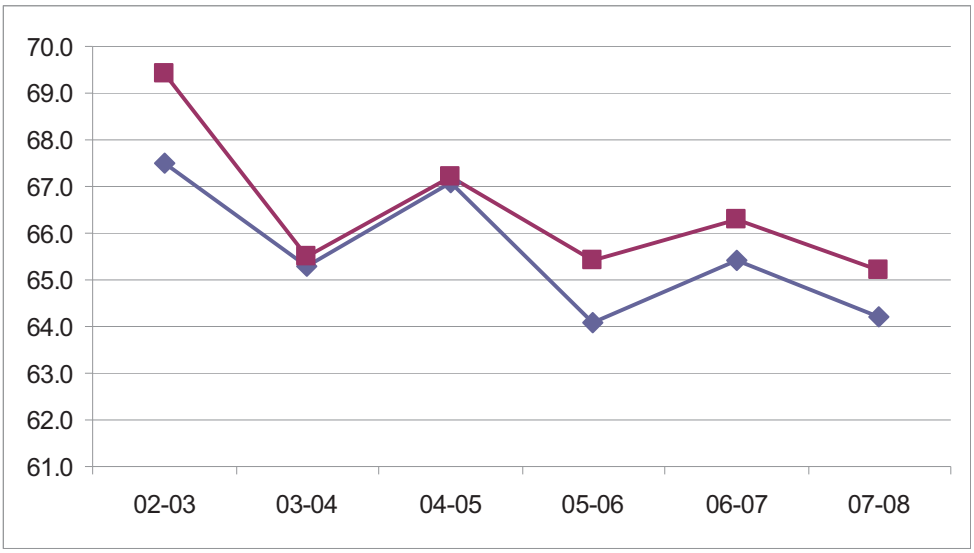

Figure 3 Shows the total average marks awarded for Quality of presentation for first (blue) and second (red) semesters for all disciplines from 2002 to 2008

DISCUSSION AND CONCLUSIONS

Figure 4 shows the currently deployed version of the EngPresent system. There are a number of limitations associated with this implementation. Principal among these are:

1) Video recording is performed manually, involving an individual to act as videographer,
2) The data from printed marking sheets must be inputted into the system manually, involving a considerable amount of time for one individual, and
3) Video compression and conversion, while handled as a batch job through Super, involves manual file naming and uploading to the application server.

In effect, the current system provides a software front-end to what is largely a manual process. Figure 5 shows the intended next format for EngPresent. This includes a more rounded fully automated system with the compression and encoding being done on the server. In the future it is envisaged that once the presentations have been uploaded that lectures could also input their marks rather than having to send them to a systems administrator to input. Also the flash video format produced by SUPER has no facility for rewinding and fast forwarding when watching videos, which is an addition that could be examined through Flash manipulation.

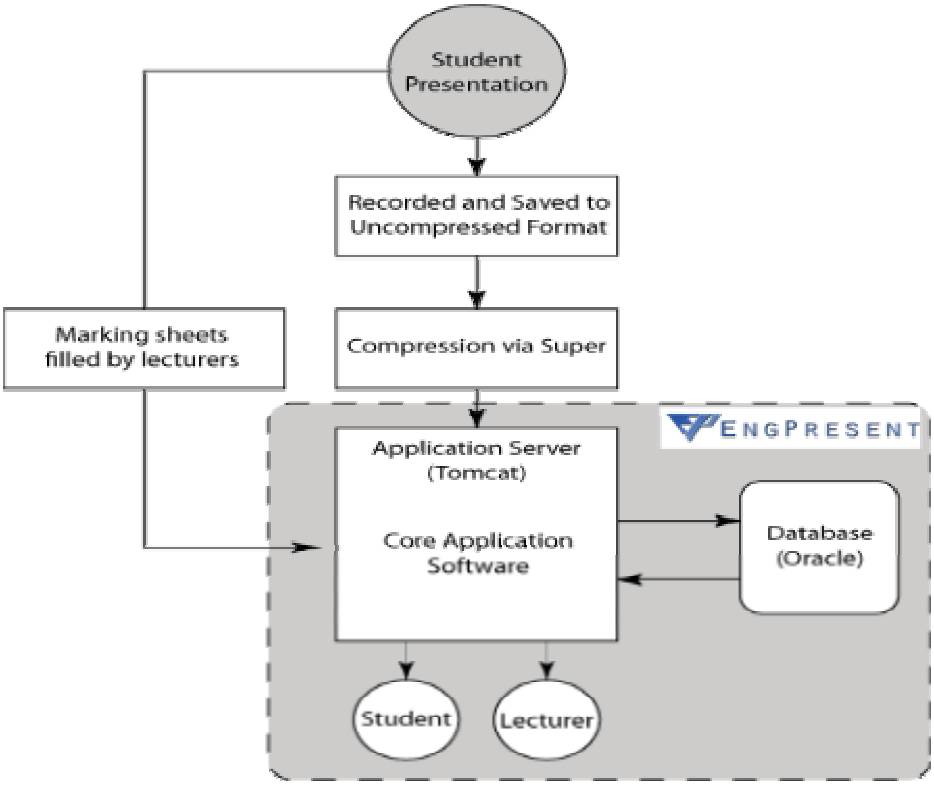

Figure 4: System overview of EngPresent as it exists now.

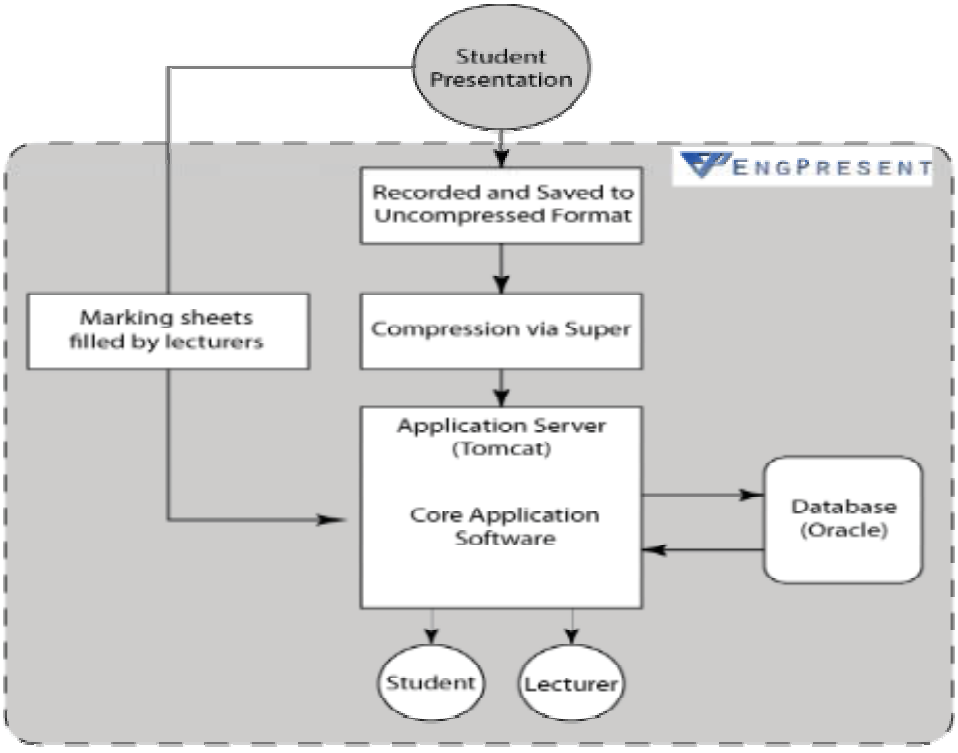

Figure 5: System overview of future development on EngPresent.

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