Multimediated Curricular Development Applications

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Abstract

This study approaches the issue of integrated system and management applications within the engineering curriculum using Multimediated technologies for classroom delivery. Three components of the technology are used in this approach. 1)Client/server systems are used to build information literacy across the engineering curriculum. 2)Multimediated applications and examples including the use of the Internet for functional management related topics within the systems curriculum are developed 3)Expanded use of rapid data retrieval applications for image storage and graphical application development are implemented.

Introduction

Curricular applications and the instructional process are becoming increasingly information driven. Many different types of disciplines are integrating computer based products and applications into the teaching methodology. This paper discusses the development of Multimediated tools for management based applications within the engineering curriculum.

Students that are traditionally trained in the engineering disciplines have limited exposure to the management process and in particular to the information systems approach to developing integrated courses that are tied together via a Multimediated environment.

The objectives of this study are threefold. 1)Use of client/server systems to build information literacy across the engineering curriculum. 2)Develop Multimediated applications and examples including the use of the Internet for functional management related topics within the engineering curriculum. 3)Expand the use of rapid data retrieval applications for image storage and graphical application development.

A dynamic database is in the process of being developed for use across the engineering curriculum to support many of the discipline specific applications proposed I this study. This project creates easy to access data modules for instructors of various disciplines and provides options for database modification for the use of customized assignments. A Multimediated format for classroom delivery is also implemented.

Hardware

To provide the initial implementation for this set of applications a LAN attached PC environment was facilitated. The primary network host was a Pentium based machine (P-133) with ample hard disk service to support numerous curricular activities, video capture and image storage. This system was fully ether net compliant to support the needed telecommunications service for Internet directed access.

Each PC workstation had sufficient memory (16-32 Mb) to allow for relatively seamless application migration. Graphics capability were provided by extended graphics monitors. Video capture and full feature editing applications were also part of the desktop platform. lt is also assumed that all student machines had sound cards, speakers, CD-ROMs and microphone attachments. In essence all features of multimedia delivery from a hardware perspective were available for student/project team/instructor development and training.

Software

Application products used in this project ranged from basic text processors and spreadsheets to video capture and editing tools. A basic decision was made to provide students with current software products so that various levels of information and data applications would be supported as well as decision based applications such as data modeling, LP, statistics

and mathematical programming.

Graphical presentation software was provided to allow for the classroom material to be delivered in a mediated format. The ability to present materials from different formats enhanced the learning process, particularly as the interdisciplinary approach to systems processes and management applications were presented.

An Internet browser and HTML authoring software was also available to allow for a more robust set of information sources to be applied to course content. Students having the exposure to Web page development and editing as well as various graphical formats further supported the systems approach to management based applications within the technical curriculum.

Management Focus

Integrated curricular models have been used in various disciplines ranging from mathematics, to business to basic humanities. In this application the concept of systems applications within selective areas of the engineering curriculum will be used to teach information management. As noted earlier the fact that many aspects of engineering and other technical disciplines are highly dependent on information management activities, in particular for production applications, inventory problems, scheduling matters and process design. It is imperative that engineering students have an exposure to information management techniques.

Data management and the supporting aspects of data sufficiency, currency, timeliness, and access are discussed and presented from a systems management perspective. This implies that the student is able to apply these concepts to discipline specific problems that may manifest themselves in the Industrial, Electrical, or Chemical engineering areas among others. Mastering the related data and information issues will allow for the student to integrate the systems approach information management into the engineering discipline.

In this Multimediated framework it is important to develop a perspective that moves the student from a level of data literacy which implies the use of basic data applications for subsequent data manipulation and retrieval to a level of information literacy. Information literacy allows the student to migrate from data manipulation activities to decision making applications. The concepts of decision management and decision support are presented in the Multimediated format.

Information literacy is the output product of this project. This allows the student to apply computing skills, technical (major) knowledge, problem solving techniques and the systems approach into one integrated package. The use of multimedia as a classroom delivery tool enhances the learning process.

Implementation

An initial offering of the Multimediated information management course was offered in the Fall semester on a limited subscription basis. This offering was designed to determine hardware and software needs as well as evaluating the overall network, NOS, LAN and the required support system for a more complete offering. A second offering of this course was provided in the Spring semester. The Spring offering was designed to gauge the flexibility of the various applications as the assignments were created independent of major. In other words the template for the cross disciplinary database(s), teaching materials, support infrastructure and project time lines were prototyped.

This second offering included the use of a class Web page to provide for a more broadly based information dissemination and retrieval location. Commercially available software was demonstrated to evaluate the properties of data and information literacy. The evaluation of the spring offering is continuing to be assessed. The preliminary feedback appears to be positive with the majority of students indicating that a transition from data to information literacy was attained. Secondarily many students felt that once the learning curve was broached the assignments and projects were attainable within the semester time line.

Information Context

The approach of integrating multiple data sources that span various disciplines to provide a decision focus was the theme of this project. Students for the most part were able to negotiate the data migration issue as they gradually made the transition to information applications and subsequent decision making. The context of information needs and the relevancy of the decision problem were understood by students.

A specific deliverable by each student group was a multi mediated project that was discipline oriented. This allowed students to assess data management practices with a “real type” problem and develop a solution that encompassed multimedia for the presentation. For all practical purposes the project brought together the information management practices in a decision framework within a multi mediated environment.

Direction

It is the intent to expand the offering of this approach to encompass a more integrated format that will include data management, decision making, business applications and discipline oriented projects on a continuing basis. This would allow for the modification of the student projects over a period of semesters to introduce any emerging technologies that impact upon information management to be incorporated into the classroom process. Also as new multimedia tools (both hardware and software) become available these products can be used as well.

Network video conferencing and Group Decision Support Systems (GDSS) would be the next two concepts that would be included into this course. At present software is being evaluated for GDSS and hardware systems are being tested for video conferencing. These two concepts would bring together the idea of project development in a team approach that is geographically separated. This concept again tries to introduce the “real world” experience of interdisciplinary approaches to information management and decision making.

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