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Proceedings of the 20th Annual Conference of the Australasian Society for Computers in Learning in Tertiary Education (ASCILITE)

Adelaide, Australia
7–10 December 2003

Editors
Geoffrey Crisp, Di Thiele, Ingrid Scholten, Sandra Barker, Judi Baron

Citations of works should have the following format:

Author, A. & Writer B. (2003). Paper title: What it's called. In G.Crisp, D.Thiele, I.Scholten, S.Barker and J.Baron (Eds), *Interact, Integrate, Impact: Proceedings of the 20th Annual Conference of the Australasian Society for Computers in Learning in Tertiary Education*. Adelaide, 7-10 December 2003.

ISBN CDROM 0-9751702-1-X WEB 0-9751702-2-8

ascilite
Australasian Society For Computers
In Learning In Tertiary Education

Published by ASCILITE www.ascilite.org.au

ANALYSIS & DESIGN OF A WEB-BASED MARKING SYSTEM

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Abstract

This paper is concerned with the analysis, design and later on the implementation of a Web-Based Marking System to enhance the lecturer teaching and learning activities. Web-based marking system is to be developed using web-based performance supports system and developed especially to support the need of a flexible and mobile way of keying in marks by the lecturer. The system can be accessed through the Internet and or the intranet; hoping that the lecturer can improve their performance by using the marking system from anywhere, anytime and can eliminate some of the problem faced in the current process of keying in marks. It will be enhanced with the use of knowledge management capability applied in the sub-system of the system.

Keywords

Electronic Performance Support System (EPSS), Web-Based Performance Support System (WBPSS), marking system, knowledge management, teaching and learning

Introduction

Electronic Performance Support System (EPSS) approach was first introduced by Gloria Gery in 1991; since then has gained much attention especially when our every job is depending too much in computers, hardware, software and the Internet. Web-based marking system will be in web-based environment; where users can access it remotely from anywhere at anytime of the day. Information technology (IT) can enable great improvements and as a key 'enabling' technology, offers strategic opportunities and long-term competitive advantage. An essential element to IT implementation is ensuring that the right information is available at the right place and right time. IT has a proven track record in improving efficiency in many industries and organizations; and will also impact on decision-making process. In teaching industry most has used or planning to use web-based learning or training application to teach their staff or students. Two related project in EPSS were undertaken in the Singapore Polytechnic; web-based performance support especially for new lecturer and the redesigning of a departmental WWW site for supporting students. The web-based support for new lecturer is also called e-mentor is an intranet-based application; provides all task-related information and teaching/learning resources. While the student support system purposes are to support and enhance the existing information seeking for the students.

Problem Statement and Analysis

One of the most important things in educational institutional other than teaching and learning is a marking system. The development of the system is based on the observation in the School of Engineering & Information Technology (SEIT). At the end of every semester students need to know their carry marks for the course that they have registered. The carry marks usually consist of 50% of the total 100%. The 50% consist of assignments, quizzes, mid semester exam and also project. Since the marking format in a university is flexible and can be changed anytime depending on the lecturer, marking system is

needed to calculate the carry marks as well as for the student to access the information online. Problems also arise when the lecturer is not in the university and need to key in the marks; or have an important announcement to be made to his/her students. This is especially when the institution doesn't have any system to support the process and facing the problem especially during the keying in of marks period at the end of every examination week. This project has made the project done by Singapore Polytechnic as a basis; based on electronic performance support system; with the hope that it will help lecturers to organize their marking scheme and at the same time can help the students to get their carry marks online. The systems will also look into helping lecturer to manage and organize their timetable; consultation hour, having discussion or forum with students, and also among the lecturer. The system will specifically looks into the problems faced by the lecturer at the end of the semester to key in carry marks of the students taking his/her courses. This paper will primarily report on the analysis and design of the system.

Electronic Performance Support System (EPSS)

The concept of Electronic Performance Support System (EPSS) is relatively new for most organizations and most definitions and usage of EPSS is fairly recent. EPSS movement began in 1991 with the arrival of Gloria Gery's book, Electronic Performance Support Systems: How and Why to Remake Workplace Through the Strategic Application of Technology (Galagan, 1994). Since then EPSS has become a hot topic for organizational development and performance technology so as to training development. An EPSS is software or a software component that can help to improve performance (Miller, 2000); Bill Miller defines EPSS as an electronic support system in any computer software program component that improves employee performance by either: (1) reducing the complexity of number of steps required to perform a task (process simplification); (2) providing the performance information an employee needs to perform a task; or (3) providing a decision support system that enables an employee to identify the action that is appropriate for a particular set of conditions. From a systems point of view an EPSS is defined as a human activity system that is able to manipulate large amounts of task related information in order to provide both a problem solving capability as well as learning opportunities to augment human performance in a job task by providing information and concepts in either a linear or a non-linear way, as and when they are required by a user (Banerji, 1995). Another useful definition had been given by Beacham, according to him a distributed performance support system is an integrated and globally accessible collection of electronic tools that can be used (as and when required) at particular points of need (within a workgroup or an organization) in order to improve human performance within a given job/task domain. This definition is distinguishing between 'stand-alone' support and 'distributed support' that could be realized through the used of computer network systems such as the Internet. From the definitions one can say than an EPSS is software or organizational tools available to provide continuous support for a given task in an integrated electronic environment where user can easily accessing it. It is structured to provide immediate access to information, guidance and assistance on-line.

Types and Components of an EPSS

The concept of EPSS is evolving and developing; it should contain hypermedia, hypertext, multimedia or computer-based instruction components. Three basic types of EPSS are first software enhancement; making changes to an existing software environment, second navigational performance support system; uses existing software applications in combination with a custom program and third is integrated performance support system; software program that contains both performance support and business application functions. EPSS as a computer software program or component that improves employee performance, it should enable an employee to perform a task in less time, with fewer errors, with better result and with less training or external support. According to Gery (1991), Ladd (1993), Raybould (1990) an EPSS typically includes the following components:

- **Tools**: the use of productivity software (word processing, spreadsheet, etc) used with templates and forms
- **Information base**: an online reference information, hypertext online help facilities, statistic databases, multimedia databases and case history database

- **Advisor**: an interactive expert system, cased-based reasoning system, or coaching facility that guides a user through performing procedures and making decisions
- **Learning experience**: computer based training such as interactive tutorials, as well as multimedia training using simulation and scenarios.

The combination of all these components into a well designed systems make a powerful performance support system.

Web-Based Performance Support System (WBPSS)

WBPSS is a web version of EPSS; integrates tools, knowledge and learning experiences to improve performance and support users access using web browser. WBPSS is a web-based system that provides on-demand access to information, job aids, and context-sensitive training (Kilby, 1999). As the Internet, WBPSSs uses TCP/IP and HTTP protocols to transport information from a central network application server to Web clients and back. The interface for the system could be the familiar unmodified Web browser, a Web browser customized with special features, or a unique Web application. Just as with EPSS, some WBPSSs They will be designed so as to appear to be a single, though massive, application. Navigational features, visual design, and information organization will be uniformly applied. In other WBPSSs, the components may be designed independently and only linked by a central menued application. Web-based performance support systems may be designed using existing or easily created performance enhancing components:

- Task Related Information Resources
- Knowledge Assets & Management System
- Wizards Job Aides Templates & Cue Cards
- Context Sensitive HELP!
- Artificial Intelligence & Expert Systems
- Agents
- Productivity Software
- Web-Based Training

Most common web-based performance support system required to incorporate four types of services (Banerji, 1999):

- Authoring services: concerned with the adding and updating a variety of documents in the web pages. The environment provides appropriate tools for staff to edit and organize the information based on contents, semantics, exercises, bibliography, announcements, links and so on.
- Information access and retrieval services: related to multiple representations, navigation and search mechanisms for all document classes.
- Communication and collaboration services: include features such as group discussion, news, mailing list, and frequently ask questions (FAQs).
- Management services: concerned with the organization and storage of documents, documents' coherence and accesses right.

Systems Architecture Design

The concept of a Web-Based Performance Support System is applied in the development of Web-Based Marking System. It allows the system to be accessed via the WWW environment. The WWW is no longer about simply distributing information or static HTML files but provides dynamic contents. Active Server Pages (ASP) is a programming model that allows interactive web pages to be created on the web browser. The architecture is shown in Figure 2 below:

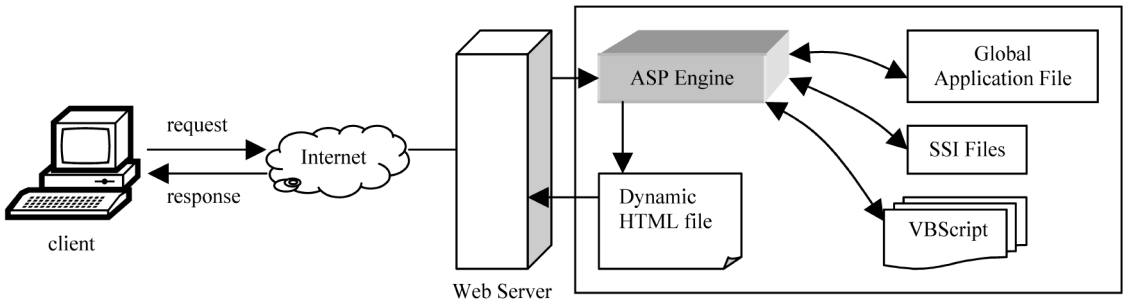

Figure 2: ASP Architecture

The Web-Based Marking Systems is divided into three major modules; administration modules, lecturer module and students' module. All of these modules can be accessed through the Internet and Intranet; which makes a web browser as the medium between users and the system. Figure 3 shows the environment for the system. There are three main categories of users in the system; administrator, lecturer and students. Each has their level of access to the system. The administrator can update existing data and add new data to the system; only an authorized user can do this. For example, a lecturer can only access the lecturer's module and the same thing happens in other modules. User can change their password and personal detail.

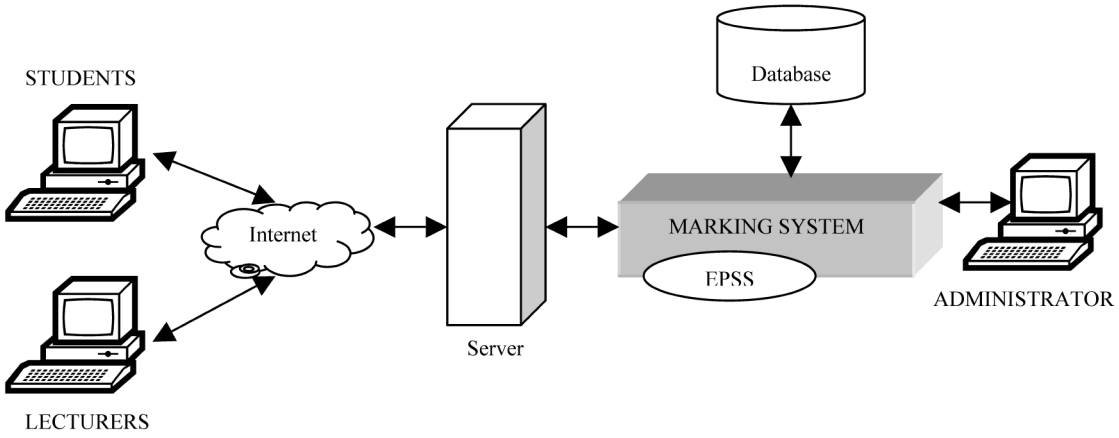

Figure 3: Web-Based Marking Systems Environment

Searching process can be done easily in the system; student and lecturers can search the information they need. Timetable and detail courses information can be retrieved and accessed in each module. Announcement and forum columns are also included to support the communication between the students and lecturers, lecturer to lecturer and among the student themselves. Marking calculation formula is designed in an easy format so that the lecturer can change it easily. Lecturers are to choose and decide which quizzes, assignments, project and mid term to be publish and to be put in the result calculation. The result being key in can be seen by lecturers and students. The interface to assign new calculation formula will be easily modified by the lecturer so as the interface to assign percentage for each courses assessment marks. The students can only see their carry marks for the semester and usually they can get their marks before final exam started or before the withdraw week ended. This can help the student to decide whether to drop the course or not.

Conclusion

An electronic performance support system (EPSS) is an interactive computer-based environment that is intended to facilitate and/or improve human problem solving capability within some target application domain. The nature of an EPSS facility will therefore depend upon whom it is intended to serve and the

job tasks for which it is to be used. In this paper we discuss one way in which computer technology can be used to create an electronic performance support system (EPSS) that simultaneously fulfils the need of both staff and students. The EPSS is based upon an online marking system where lecturer can access to key in marks and also for students to access to inquire their carry marks at the end of every semester. The marking system can be expanded to various aspects and ability to help the user to use the system.

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