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# Course Management Systems (CMS)

EDUCAUSE Evolving Technologies Committee

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## Introduction

Course Management Systems (CMS) have become ubiquitous on our campuses and have evolved from relatively simple HTML based one-way communication tools between faculty and students to multifunctional, some might say, enterprise level applications.

This paper will take an inventory of the options or alternatives available to those who are looking to acquire CMS. It will list some things to look for and what to guard against. It will also look at the relevance of CMS to the higher education enterprise, what challenges and what future issues may develop.

Although course management systems are frequently used for distance learning purposes, this paper will not closely examine that particular kind of usage and focus instead on the uses in traditional bricks and mortar type institutions.

## What is a CMS?

At its simplest a course management system is a tool that allows an instructor to post information on the web without that instructor having to know or understand HTML or other computer languages. A more complete definition of a CMS is that it provides an instructor with a set of tools and a framework that allows the relatively easy creation of online course content and the subsequently teaching and management of that course including various interactions with students taking the course.

## Why are CMS Important to Higher Education?

Information technology has been used in various forms in higher education for over half a century, virtually from the moment the first mainframes were invented. Indeed computers were used in research and computers resulted from research in university laboratories. As the underlying technology has matured, and the importance of the role of a particular system has grown on our campuses, many systems have moved from stand-alone, home-grown systems to enterprise level systems largely developed and supported by commercial vendors. Over the past 10 years, we have witnessed this transition with administrative systems adopting ERP systems from companies such as PeoplesSoft and SCT.

Course management systems (or learning management systems) are taking on a similarly important role in the academic enterprise of teaching and learning that ERP systems have in the administrative world. A CMS may contain aspects of administration (class rosters, recording of grades) but also deal directly with core aspects of teaching (it may contain learning objects, class exercises, quizzes and tests). It may contain tools for real-time chats or asynchronous bulletin board type communications. Just like an administrative ERP relates to various aspects of higher education administrative functions (finance, HR,

SAS, grants, etc) the CMS is poised to have an impact on all aspects of teaching and learning and student teacher interaction.

The implication that CMS are as critical to the teaching and learning enterprise as ERP are to the campus administrative effort means that CMS must be available 24 hours a day, seven days a week, like email and the web, because both faculty and students will be using the CMS at all times. It means that the effort invested in the selection and subsequent care and feeding of these systems will be comparable to the efforts expended on ERP and that the CMS is the next critical application for the higher education IT organization to worry about.

## What Are The Implementation Challenges?

Although CMS are becoming more ubiquitous there have been some issues that have hampered the more widespread adaptations of these tools by institutions of higher education and, once a system has been brought to campus, the widespread use by faculty and students.

Early CMS pricing appeared relatively affordable. As functionality increased and vendor's solutions were linked to institutional administrative systems, prices went up. This caused some resistance and also created the push for open source solutions – although the latter may in fact be a false illusion of cost savings. Relative to administrative ERP implementations, course management systems appear quite affordable but, most importantly, they represent a previously unbudgeted expense which lies at the heart of the price resistance.

Another source of resistance is that the early commercial CMS solutions were (and to some degree still are) closed proprietary systems. Although vendors now claim standards compatibility there are still significant hurdles to overcome when moving content from one vendor application to another. This too has led to a call for standard compliant open source solutions.

Finally some faculty members are resisting adopting CMS for any number of reasons. That resistance, as Richard Katz points out in "Balancing Technology and Tradition, the example of course management systems" (<http://www.educause.edu/ir/library/pdf/ERM0343.pdf>) will be overcome as the systems become more robust and flexible and as the faculty become more experienced in their use. Student demand for faculty use of CMS is another likely reason why faculty are increasingly adopting these tools.

## Who Are The Major CMS Vendors?

The most significant vendors by volume and size are WebCT ([www.webct.com](http://www.webct.com)) and Blackboard (<http://www.blackboard.com>). There are many other vendors in this market place such as desire2learn (<http://www.desire2learn.com/>), a system in use at the University of Wisconsin at Madison. For a fairly complete listing of vendors and product overviews as well as product comparisons please visit <http://www.edutools.info/course/productinfo/index.jsp>. Anyone interested in CMS should visit this site as it offers a wealth of information which goes far beyond the scope of this paper.

Meanwhile some institutions in the USA have created various open source products which are providing an alternative to commercial vendors. (Note: open source, while free in that no up front license fees are assessed, does not imply that there are no costs. Arguably the cost of open source software equals the cost of commercially available software because of the need to hire developers to install and then maintain the software.) Examples of open source CMS are CourseWorks (from Stanford University) and CHEF (from Michigan) and Stellar (from MIT). On a much smaller scale, Middlebury College is in the process of developing Seque (<http://segue.middlebury.edu/>).

Finally, some institutions, rather than purchasing a CMS or adopting an open source solutions, have used a combination of homegrown solutions plus vendor supplied solutions which together add up to some or all of the functionality found in complete CMS.

## What Are The Rules of Thumb for Judging Among Them?

If the inevitability of a CMS on a campus is a foregone conclusion, the next question is one of how to select the right one. Hanson and Robson argue that "Rather than starting with a list of features, the framework begins with the [teaching and learning] processes that course management technology supports."

(<http://www.educause.edu/asp/doclib/abstract.asp?ID=ERB0314>). There are two complementary approaches to judging CMS products. The first is to develop a list of features that you think you want and/or need and to then judge the products implementation of those features against that list. A second approach is to focus instead on the educational processes in which the CMS will be engaged, and from that analysis map the major functions of the CMS against those processes. As part of that process, many schools (especially larger schools) go through the formal process of creating an RFP to which vendors respond. Many of those RFPs are available and serve as excellent guides to the evaluation process. It is also critical to agree up-front on this evaluation process, and to figure out the appropriate role for the various stakeholders, who include student, faculty, IT staff, and the registrar.

## When Will CMS Become Essential on Campuses?

They already have. According to Kenneth C. Green, the use of CMS is increasing rapidly (see <http://www.campuscomputing.net/archive/educause-2002-Session.pdf> for further information). In 2002 approximately 30% of all courses offered in 4 year institutions used a CMS. This was up from about 15-20% in 2000. In a study performed at Williams, Brandeis and Wesleyan University, faculty use of web pages for their courses hovers around 70% of the courses they teach. The implication is that as CMS become easier to use and as CSM gain more acceptance amongst faculty, that percentage is bound to go up even further. Resistance by faculty to using CMS appears related to ease of use whereas, at least anecdotally, student demand appears to push faculty toward CMS use. Furthermore, the new generation of faculty who themselves went through college and university with ever increasing amounts digital content at their disposal, are likely to adopt a CMS for their teaching from the start. This trend is very unlikely to be reversed.

## How are CMSs Evolving?

As the market for these products improves, and as the underlying technology matures, CMS are becoming increasingly more sophisticated both in their architecture and in their feature set. On the one hand, there is a strong shift to a more open architecture for these systems, which will in turn allow for the creation of a marketplace of third-party applications that can be integrated into the core system as modules. On the other hand, there is also a trend to enable increasingly seamless integration with other major campus information systems: the student record system, the campus portal, and the library system. For example at the University of Minnesota, the university portal system (Metadot) links not only to a student portal user's courses but also to any unseen assignments or unread discussion group entries generated in the WebCT system. Another trend is the development of a library of sophisticated curricular materials developed by educational and academic publishers that can be imported and delivered via these systems.

## What Are The Issues To Be Addressed?

The key issues that are not yet resolved include:

**Interoperability:** it is presently very difficult to share content between these systems from different vendors.

**Content management:** as more and more materials live within these systems, there needs to be a way to manage and share these materials within our institutions and among our institutions.

**Cost:** with a small number of vendors, the pricing for these systems is not yet predictable. Also, IT organizations have not yet stepped up to the staffing and other maintenance costs associated with running yet another mission-critical application.

**Assessment:** In what concrete ways do these systems improve teaching and learning on our campus? What is the ROI? As we spend increasingly more time and money supporting and using these systems, it is important to be able to document the value that they add to the educational process.

## Where Are The Likely Impacts In The Coming One to Three Years?

Course management systems are likely to become as commonplace as email and the web. No institution of higher education will be able to do without either an open source or commercial version of the software. Increasingly, the boundaries between the CMS and other institutional systems will become blurred. Much as the OKI initiative envisions, CMS vendors will try to have either provide end to end solutions and/or they will adhere to standards such as those offered by OKI, IMS, SCORM (Shareable Courseware Object Reference Model) and others. As mentioned before, we need to take care in how we budget for these systems, and prepare ourselves for this new architecture that will allow for an increasingly integrated information environment.

## Conclusion

Course management systems have become part of the higher education landscape and are likely to occupy an ever increasing and prominent role in the teaching and learning process. IT organizations must adjust their operational and budgetary processes to accommodate this relative newcomer to the 24 by 7 application mix.

## Related EDUCAUSE2003 Sessions

- **Corporate Workshop**

[Blackboard Inc., An EDUCAUSE Platinum Partner -  
Introducing the Blackboard Content System](#)

2:15 p.m. - 3:05 p.m. Wednesday

Educational Technologies, Web Content Management

- **Poster Session**

[Impact of a Course Management System on a University](#)

- **Poster Session**  
[Campus: Case Study](#)  
4:55 p.m. - 6:10 p.m. Wednesday  
Educational Technologies, Teaching, Learning, and Technology
- **Poster Session**  
[POLIS \(Project for Online Instructional Support\): Integrative and Adaptable Instructional Technology](#)  
4:55 p.m. - 6:10 p.m. Wednesday  
Educational Technologies, Instructional Technology, Teaching, Learning, and Technology
- **Preconference Seminar**  
[Seminar 15A - The Functional Value of IMS Specifications](#)  
[PLEASE NOTE: Separate registration and fee is required to attend this seminar.](#)  
8:30 a.m. - 12:00 p.m. Tuesday  
Distributed Learning, Educational Technologies
- **Poster Session**  
[Impact of a Course Management System on a University Campus: Case Study](#)  
4:55 p.m. - 6:10 p.m. Wednesday  
Educational Technologies, Teaching, Learning, and Technology
- **Poster Session**  
[Inspiring Faculty to Use a Course Management System](#)  
4:55 p.m. - 6:10 p.m. Wednesday  
Educational Technologies, Faculty
- **Current Issues Meeting**  
[Course Management Systems: Futures](#)  
4:55 p.m. - 6:10 p.m. Wednesday  
Educational Technologies
- **Track Session**  
[Creating Open Source: Issues, Processes, and Promises from Stanford's CourseWork CMS](#)  
8:10 a.m. - 9:00 a.m. Thursday  
Applications Development, Educational Technologies, Technology Selection
- **Poster Session**  
[Assessing Blackboard as a Tool for Learning: Student Attitudes and Use Patterns](#)  
4:55 p.m. - 6:10 p.m. Thursday  
Educational Technologies, Learning, Teaching, Learning, and Technology
- **Poster Session**  
[The Next Generation of Course Management Systems: Intelligent, User-Friendly, Integrated](#)  
4:55 p.m. - 6:10 p.m. Thursday  
Educational Technologies
- **Track Session**  
[Authority of Consensus: Next-Generation Course Management System Features](#)  
8:10 a.m. - 9:00 a.m. Friday  
Educational Technologies
- **Track Session**  
[Setting a Next-Generation CMS Strategy](#)  
9:30 a.m. - 10:20 a.m. Friday  
Educational Technologies