

Web Course Management Software Recommendation

May 23, 2000

In December 1999 a committee was convened at the request of the Dean for Information Resources with the charge: *"Evaluate and recommend to Dean/Associate Dean of Information Resources web course management packages for installation and production rollout by Fall 2000."* The committee included: Matthew Barritt, Visiting Assistant Professor, Educational Technology; Bryce Bockman, Network Technician, Computer Center; Keith Folsom, Director of Systems & Communications; Layne Nordgren, Director of Multimedia/Library Systems; Patrick Seigler, Multimedia Librarian; Lindsay Tomac, Web Developer; and Bridget Yaden, LRC Coordinator.

Goals

The committee began work by developing specific goals related to the committee charge. Two major goals were developed for the evaluation/selection and implementation phases of the project:

1. Evaluate and recommend cost-effective web course management package(s) that best meet PLU faculty needs as listed below
 - Provide opportunities for faculty participation and input during evaluation and selection process
 - Target rollout by Fall 2000
 - Install hardware and software by July 2000
 - Run pilot courses and develop training workshops Summer 2000
 - Provide faculty training at Fall Faculty Conference workshops
 - Make available to faculty by Fall 2000
2. Develop training, support, and communication plans for Fall 2000 semester including:
 - Support area for "Quick-Starts"
 - Hands-on workshops
 - Showcases and testimonials of faculty implementations

This recommendation reports progress on the first of these goals.

Evaluation Process

We began the process with online research of Web Course Management software using overviews, reviews, and links to software vendors. A list of 24 packages for consideration was developed (see Appendix 1. Online Review of Web Course Management Packages). This was supplemented with a literature review (Appendix 2. Literature and Online References). After reviewing the literature and product web sites, we began brainstorming on what selection criteria were relevant to our specific PLU environment. Four salient criteria were developed:

1. Comply with standards for data exchange and portability
 - Provide data exchange pathways between web course management system and other campus database tools (such as Banner, Oracle, Perl, etc.; preferably using SQL) to enable functions such as populating student information into courses
 - Insure interoperability among base client platform and browser sets
 - Support Instructional Management System (IMS), Americans with Disabilities Act Accessibility Guidelines (ADA), and other relevant standards to insure access to and migration of course content
2. Provide basic levels of functionality with pathways for scalability and enhancements
 - Include basic functions such as discussion groups, chat, resource area, and file distribution (especially MS *Office* and Adobe *Acrobat* files)
 - Provide support for enhancements such as whiteboards, multimedia components (e.g. streaming media), calendars, assessment and reporting, grading, email list support, search function, bookmarks, and course/material archiving/reuse.
3. Personalization & Customization
 - Make ease of use for faculty and students a top priority
 - Provide options to customize and personalize interfaces as appropriate for students and faculty
 - Provide a variety of customizable templates
4. Provide common user interface for navigation features among courses

Methodologies Used for Evaluation

Landon, Bruce, and Harby (1999) suggest three options for evaluating web course management systems: 1. Review the technical and instructional specifications.; 2. Review by criteria; and 3. Review using custom application specifications. The process we used included all three options. We started by developing key desired components and criteria listed above (2), examined technical specifications (1), and identified those key customizations that were important to meeting the goals (3). We then loaded three software packages for demonstrations, *WebCT*, *Web Course in a Box*, and *Blackboard*. *Web Course in a Box* was purchased by *Blackboard* during the evaluation, effectively limiting the comparisons to two: *WebCT* and *Blackboard*.

Recognizing the complexity of the Web Course Management packages, we used a number of different methodologies to evaluate the packages:

Online and Literature Reviews - See Appendix 1. Online Review of Web Course Management Packages and Appendix 2. Literature and Online References

Faculty Focus Groups/Interviews - We met with four faculty currently using web technology to support student learning to discuss how they use technology and what functionality they would utilize in a Web Course Management package. These informal interviews and subsequent discussion provided background for the committee.

Examination of Sites Using WebCT and Blackboard - We examined sample sites and sites of other institutions using these packages. Patrick Seigler participated in an online course using *WebCT* during his MLS coursework.

Technical Interviews - Technical interviews were conducted with marketing and technical representatives from *Blackboard*, *WebCT*, and *Web Course in a Box* (See Appendix 4).

Students as Trial Subjects - Matthew Barritt ran an informal comparison with students between *WebCT*, *Web Course in a Box*, and *Blackboard*. This was done with the students in Education 449, a senior seminar for students in the School of Education enrolled in the Educational Technology minor. During one class session, students split into three groups and created a web space for a fictional course. Each group worked with one of the environments. Afterward each group presented to the class and all members of the class viewed each environment. During discussion at the end of this activity and in an informal vote all of the members of the class supported *Blackboard* as being the best. There was no interest expressed by these students in the other two environments.

WCM online course (See Appendix 5) - Lindsay Tomac participated in a three-week online course entitled, "Selecting a Web-based Course Management System for a College or University." The course was sponsored by the TLT Group (The teaching, learning, and technology affiliate of AAHE). Forty people from universities across the U.S. participated in the course, and we were able to benefit from their experience, questions, and challenges. The course included background information regarding WCM systems, conversations with administrators involved in selecting and implementing WCM systems, system considerations, accessibility issues for students and faculty with disabilities, interviews with representatives from *WebCT* and *Blackboard*, faculty experiences, and successful implementation of WCM systems.

Education 357: Elementary Education Term 2 - Two faculty used *WebCT* and came to the conclusion they would like to use something else. Administration of content was too cumbersome with *WebCT*.

While reviewing literature and online sources, we found the most common evaluations and comparisons to consist of binary data on whether or not a software package had a particular feature. In rare cases, the comparisons included qualitative assessments of each characteristic. Considering the total number of possible characteristics (hundreds), a thorough analysis would be a daunting task, especially considering that evaluation demos of the software are often very short (30 days). We chose to do an overall evaluation based on a list of our specific desired components and criteria. Though more difficult and qualitative, this methodology is much more likely to uncover differences in the software in respect to its ability to meet our desired outcomes.

Comparison of Desired Components

Comply with Standards for Data Exchange and Portability

- Provide data exchange pathways between web course management system and other campus database tools (such as Banner, Oracle, Perl, etc.; preferably using SQL) to enable functions such as populating student info into courses

<i>Blackboard</i>	<i>Web CT</i>
<p><i>Blackboard</i> is written in a combination of Perl and Java, though the upcoming release, Blackboard 5, will be entirely Perl based. The underlying database is the open, SQL compliant. <i>MySQL</i>. In addition to manually entering one record at a time, <i>Blackboard</i> can batch import data for users, courses, and course enrollment using defined fields in delimited .txt files. It also has a batch-remove user utility. The "Level One" Blackboard does not support a command line interface or API to this data. Though populating Banner data into the system would be relatively straightforward, synchronizing changes in users, passwords, courses, and enrollment data would be problematic and time-consuming. The Enterprise or "Level Three" product supports APIs as well as LDAP to provide more seamless data exchange and authentication. Email is fully integrated with the campus email system.</p>	<p><i>WebCT</i> is written entirely in Perl and uses Perl databases. It is not clear whether these databases are SQL compliant. In addition to manually entering one record at a time, <i>WebCT</i> can batch import data for users, courses, and course enrollment using defined fields in delimited .txt files. An API provides the ability to modify or query both the WebCT user and student databases directly without having to use the WebCT administrator or designer interface. This is one area where <i>WebCT</i> is much more desirable than <i>Blackboard</i> as scripts can be developed to automate the loading and synchronization of passwords, student, and course enrollment data. However there does not appear to be an API or batch load utility for importing course data. Filling in the Course data for large numbers of course would be tedious at best. Email is a push only system and not integrated with the campus email system.</p>

- Insure interoperability among base client platform and browser sets

<i>Blackboard</i>	<i>Web CT</i>
<p><i>Blackboard</i> can be used on standard web browsers that support Java. It has both text-only and GUI interfaces for each page.</p>	<p><i>WebCT</i> can be used by any standard web browsers; some applications like Chat and Whiteboard require Java-enabled browsers. It has only GUI interfaces for each page.</p>

- Support IMS, ADA, and other relevant standards to insure access to and migration of course content

<i>Blackboard</i>	<i>Web CT</i>
<p>IMS - Blackboard is one of the founding partners for developing the IMS standard. The software has some IMS components presently and more are being developed. It provides tools for exporting, importing, and archiving courses.</p> <p>ADA - <i>Blackboard</i> has both text and graphic interfaces for each page. It is fully ADA compliant for programs such as JAWs for the visually impaired. Rated 107 overall in accessibility study by Gay (1999) with rating of 27 for designer utilities and 17 for inherent features.</p>	<p>IMS - In a technical interview, they did not know about IMS. Though the company has indicated "support" for the IMS standard, it has not been implemented in any of the current products. There do not appear to be any tools for exporting, importing, and archiving courses so content would not be very portable.</p> <p>ADA - No text only pages available. Rated 19 overall (very poor) in accessibility study by Gay (1999) with rating of 13 for designer utilities and 6 for inherent features.</p>

Provide Basic Levels of Functionality with Pathways for Scalability and Enhancements

- Include basic functions such as discussion groups, chat, resource area, and file distribution (especially MS *Office* and Adobe *Acrobat* files)

<i>Blackboard</i>	<i>Web CT</i>
<p>Provides all of the above functions and very strong discussion space. Application sharing supported through Group Pages or Virtual Chat. Virtual "real time" space supported. Group browsing supported through White Board feature within Virtual Chat with (Tutor Net) (Horizon Live). Provides tools for student dropboxes as well as distribution of <i>Office</i> documents and other files. Instructor can determine how the interface will treat these files: open them directly, save them to disk, or open them internally without the original <i>Office</i> application being present. Scalable in three tiers</p>	<p>Provides all of above functions and a mediocre discussion space. Application sharing, virtual space, and group browsing are not supported. No student dropboxes. <i>Office</i> files available only with application or by save to disk. Not scalable like Blackboard; no scalability or options for portal or enterprise integration.</p>

(costly at levels 2 and 3) for portal integration and enterprise data exchange.	
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- Provide support for enhancements such as whiteboards, multimedia components (e.g. streaming media), calendars, assessment and reporting, grading, email list support, search function, bookmarks, course/material archiving/reuse.

<i>Blackboard</i>	<i>Web CT</i>
<i>Blackboard</i> includes multimedia support by accepting 36 different mime types. It has calendar support at student, instructor, and administrator levels. Good assessment and reporting tools are available, but not nearly as functional as <i>WebCT</i> . Great group and email list support. Supports word and content searching. It provides tools for exporting, importing, and archiving courses.	Multimedia "audio" and "video" tools allow the addition of multimedia clips to any page of content. No calendar function. Very strong assessment and reporting tools. No group email list support. Supports word searching, but not content searching. No tools for exporting, importing, and archiving courses.

Personalization & Customization

- Make ease of use for faculty and students a top priority

<i>Blackboard</i>	<i>Web CT</i>
Without exception regarded as the easiest and most intuitive interface for student and faculty. If rapid deployment and reduced training and support is a primary goal, there is no question that this product would be the clear choice. This assessment is supported by numerous other studies in print and on the web. On-screen instructions, training materials, and documentation are excellent. Would the system be easy enough to use that faculty with no web experience could set up basic functions with little or no assistance? The answer is an unqualified "yes."	Student area functional but basic. Instructor and administrator areas perceived by most as an arcane, non-web-like interface. The pages have many confusing, unintuitive buttons and require many levels of hierarchy to get particular tasks accomplished. Most institutions report days or weeks of training required for effective use. Would the system be easy enough to use that faculty with no web experience could set up basic functions with little or no assistance? The answer is an unqualified "no."

- Provide options to customize and personalize interfaces as appropriate for students and faculty

<i>Blackboard</i>	<i>Web CT</i>
My <i>Blackboard</i> for individual courses and messages. Calendar, task list manager, news, and weather available and more portal-like. Can make own home page and view course assessment scores.	My <i>WebCT</i> shows courses, announcements, etc. No calendar, task manager, news, or weather. My notes, my progress, and my grades show personal information.

- Provide a variety of customizable templates

<i>Blackboard</i>	<i>Web CT</i>
Uses one icon set among 11 alternative schemes. Instructors determine color and shape of buttons from numerous alternatives. Nice set of stock templates and color schemes. Default courses can be set up to have only selected features enabled. Provides customizable templates for My Blackboard and Course Index. Logos can be inserted in three different positions on each page.	Color schemes, banner, header, footer, and icons can be customized. Rather outdated graphics and color schemes. Administrator can use default template, make a new template, or clone from existing courses.

- Provide common user interface for navigation features among courses

<i>Blackboard</i>	<i>Web CT</i>
Consistent and intuitive interface for students, instructors, and administrators. Very good	User interface gets progressively worse from students to instructors to administrators. Poor

integration of online help, documentation, and context-sensitive examples. Great .pdf documentation at all levels.	implementation of online help and examples. Good .pdf documentation.
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Recommendations

Considering the criteria above, the consensus of the Evaluation Team is that none of the packages perfectly satisfy all criteria. However, we believe that *Blackboard 5 Level 1* meets the most critical criteria. It is our recommendation that *Blackboard 5 Level 1* be purchased and deployed for use by Fall 2000.

From an instructional standpoint, *Blackboard* is the only choice that satisfies ease of use criteria and would reduce the time and support needed for training. *Blackboard* is, without exception, regarded as the most intuitive and easy-to-use software package. After using both *Blackboard* and *WebCT*, it is clear that *WebCT* would require significantly more user support and training. While we can easily visualize faculty using *Blackboard* tools with little or no help, *WebCT* has a very steep learning curve and, as Matthew Barritt and his colleagues noted, it requires a greater investment of time for maintenance and upkeep of course materials.

It is desirable for the web course management software to run on hardware and operating systems similar to those already supported by Computing and Telecommunications Services. This would provide the added value of a proven track record of mission-critical vendor support and service for the hardware. Using similar operating systems would take advantage of current expertise, training, and programs such as Perl or command line scripts used for system management, maintenance, and backup. Though NT servers are in use, Unix is the preferred server operating system since it integrates better with other campus web and server resources. From a systems and data administration standpoint, *Blackboard Level 1* is disappointing in its inability to integrate with the current user account generation system or ePass and directory server support for populating and maintaining courses and users (Appendix 3). Though *Blackboard Level 3* reportedly provides these tools, there is a ten-fold increase in price. *WebCT* provides these system and interface tools. Though this aspect of *Blackboard* would likely be transparent to faculty, mechanisms for populating and updating the data would need to be established. Automated scripts are not as likely to be possible solutions leading to the need for staff time for loading and maintaining data. Furthermore, lack of LDAP integration would make the goal of one username/password challenging.

We realize that these integration tools are in their infancy and that larger institutions have devoted significant staff, computing, and financial resources for developing custom user interfaces and data exchange among various academic and administrative systems. We think that installation of *Blackboard 5 Level 1* will meet the needs of PLU and provide an opportunity to assess the role, usage, and importance of web course management technology in supplementing and enhancing the curriculum. Other studies such as that of the University of Pittsburg (1998) support our realization that a web course management package is a part of a larger context that includes not just hardware and software, but interactions with other systems, network access and bandwidth, faculty and student support, and training components. Starting small, with a careful eye on the long-term goals, we can strategically identify what system and data administration tools will best leverage our existing investment in information resources.

To provide adequate support and address data administration shortcomings, the following resources are recommended to support the deployment of *Blackboard*:

- **Banner Programming Time** - to extract student, course, and enrollment data and identify methods for tracking and updating changes.
- **Additional Student or Staff Time** – to maintain and update student data extracted from Banner.
- **A Student Position** – to specialize in supporting, developing training, and developing instructional materials to assist faculty in integrating web resources using *Blackboard*.

For the next year, we recommend the following actions:

- **Install and Implement Blackboard 5 Level 1** - Follow the attached timeline for implementation and training. Develop data administration, training, and support plans. Develop a communication plan to “roll out” this technology to the faculty.
- **Continue Investigating Integrated Campus Solutions** – Identify products (such as the more costly Blackboard Level 3 or portal solutions) or other mechanisms to integrate LDAP authentication and enterprise-wide mechanisms for populating and synchronizing users, courses, and enrollments.
- **Develop Benchmarks for Assessing Implementation Success and Additional Needs** - Identify relative success of project as measured by number of courses and faculty using the system. Identify additional functional needs. (See: The Institute for Higher Education Policy (2000). Quality on the line: benchmarks for success in internet-based distance education. p. 25)
- **Keep Course Materials Portable** - Evaluate systems of maintaining course resources that are portable and that can be archived (thereby protecting faculty investment in online materials)-

Appendices

- Appendix 1. Online Review of Web Course Management Packages
- Appendix 2. Literature and Online References
- Appendix 3. Web Course Package Choice: Systems Perspective
- Appendix 4. Technical Interview Topics
- Appendix 5. Web Course Management Online Course Excerpts
- Appendix 6. Comparing Individual Web Course Management Packages
- Appendix 7. Hardware and Software Costs of Web Course Management System

Appendix 1. Online Review of Web Course Management Packages

Compiled by Patrick Seigler

The following comparisons and overviews of web course management software were examined and a matrix of products reviewed was created. A list of products available for analysis was created and these products were evaluated based on the criteria that the group had selected as core requirements for the software package to be selected.

Web Course Management Software Comparison and Overview URL's

1. University of Texas Web Tool Selection Committee Report: Recommendations:
<http://www.utexas.edu/cc/cit/tools/recomm.html>
2. Marshall University Comparison of Online Course Delivery Software Products
<http://multimedia.marshall.edu/cit/webct/compare/index.htm>
3. Truman State University Web Course Management Tools Comparison Chart (Prof. Site)
<http://www2.truman.edu/~cpoyner/gridcomparingproducts2.html>
4. University of Manitoba Tools for Developing Interactive Academic Web Courses
<http://www.umanitoba.ca/ip/tools/courseware/evalmain.html>
5. Canadian Consortium: online educational delivery applications: a web tool for comparative analysis
<http://www.ctt.bc.ca/landonline/choices.html>
6. Information about project: <http://www.ctt.bc.ca/landonline/#topofform>
7. Comparison of On-line Education Systems
<http://www.spu.edu/~dwicks/comparison.htm>
8. University of South Florida Web Based Educational Environments Comparison Chart
<http://isis.acomp.usf.edu/Web-Based/comparison.html>
9. University of Pittsburgh Recommendations for a Course Management/Collaboration Tool
<http://www.pitt.edu/%7Ewashburn/RECOMND.PDF>
10. The Selection of WebCT at the University of Georgia
<http://webct.uga.edu/hostsys/cumrec/cumrec98.html>
11. Web-based Instructional Tools (Syllabus Magazine September 1998, Volume 12, No. 2
http://www.syllabus.com/sep98_magfea2.html
12. Evaluation and Selection of Web-based Management Tools (Sunil Hazari, Ed.D)
<http://sunil.umd.edu/webct/>
13. Wichita State University Web Course Comparison Matrix
<http://www.mrc.twsu.edu/mrc/im2/websystems.htm>

Web Course Management Software Overview

Courseware Demos

<http://www.utoronto.ca/cat/courseware/demos/index.html>

University of Illinois Integrated Course Management Software Overview

<http://illinois.online.uillinois.edu/Presentations/Integrated/index.htm>

Fred Beshears: New tools help instructors create and maintain course websites

<http://socrates.berkeley.edu:7521/articles/webct/NewToolsToHelpInstructors.html>

University of South Florida Review of Tools for Developing and Managing Online Courses

http://pdts.uh.edu/insite/elec_pub/HTML1998/de_barr.htm

Web Course Management Software Review Matrix

These are the top seven programs that were reviewed. I've created a grid that shows which studies evaluated the various programs.

<u>Study</u>	<u>CourseInfo</u>	<u>WebCT</u>	<u>TopClass</u>	<u>WCB</u>	<u>Learning Space</u>	<u>Web Mentor</u>	<u>SERF</u>
1		x	x	x	x		
2	x	x	x	x		x	
3		x		x			
4		x	x		x		
5	x	x	x	x	x		x
6							
7	x	x	x	x		x	
8	x	x	x	x			
9	x	x	x				
10		x	x	x	x		
11	x	x	x	x	x	x	
12	x	x	x	x	x	x	
13	x	x	x	x	x		x
Total:	8	12	11	10	7	4	2

Web Course Management Software Selections

The grid identifies which programs the various reviewers selected for use. Many of the comparisons did not pick individual winners, some chose multiple programs.

<u>Study</u>	<u>CourseInfo</u>	<u>WebCT</u>	<u>TopClass</u>	<u>WCB</u>	<u>Learning Space</u>	<u>Web Mentor</u>	<u>SERF</u>
1		x	x	x			
2		x					
3				x			
4							
5							
6							
7							
8	x*	x	x	x			
9	x	x					
10		x					
11							
12							
13	x						
Total:	3	5	2	3			

* = Indicates a preference for this package, but also recommends the others.

Appendix 2. Literature and Online References

Compiled by Layne Nordgren

Accessibility: Carter-Todd article

IEEE Learning Technology Standards Committee

Add EDUCAUSE articles.

Anderson, Margaret and Greg Ashley (1998). The selection of WebCT at the University of Georgia. Accessed online 12-17-1999 at <http://webct.uga.edu/hostsys/cumrec/cumrec98.html>

Anonymous. Online educational delivery applications: a web tool for comparative analysis. Accessed online 12-17-1999 at **Error! Bookmark not defined.**

Anonymous. Web course management tools comparison chart. Accessed online 12-17-1999 at **Error! Bookmark not defined.**

Anonymous. Online educational delivery applications: a web tool for comparative analysis. Accessed online 12-17-1999 at **Error! Bookmark not defined.**

Anonymous. Web course management tools comparison chart. Accessed online 12-17-1999 at **Error! Bookmark not defined.**

Anonymous. Web tool selection committee report. Accessed online 12-17-1999 at **Error! Bookmark not defined.**

Anonymous. Comparison of on-line education systems. Accessed online 4-25-2000 at <http://company.blackboard.com/press/comparison.htm>

Anonymous. Comparison of WebCT and CourseInfo. Accessed online 5-10-2000 at <http://software2.bu.edu/webcentral/research/courseware/>

Anonymous. Comparison of features, tools, specifications, support, and pricing. Accessed online 12-17-1999 at <http://www.mrc.twsu.edu/mrc/im2/websystems.htm>.

Balsera, Alicia F. (1998). Web-based educational environments. Accessed online 12-17-1999 at <http://isis.acomp.usf.edu/Web-Based/comparison.html>

Barron, Ann E. and Chet Lyskawa (1998). A review of tools for developing and managing online courses. Accessed online 12-17-1999 at http://pdts.uh.edu/insite/elec_pub/HTML1998/de_barr.htm

Beshears, Fred. New tools help instructors create and maintain course websites. Accessed online 12-17-1999 at <http://socrates.berkeley.edu>:

Cooper, Michelle (2000). Comparison of Blackboard, eCollege, eSocrates, and WebCT. Accessed online 5-10-2000 at <http://www.esocrates.com/LearningResources/ComparisonChart.htm>

Fredrickson, Scott (1999). Untangling a tangled web: an overview of web-based instruction programs. *T.H.E. Journal* June 1999: 67-77.

Gay, Greg (1999). Snow best practices. Accessed online 4-26-2000 at <http://snow.utoronto.ca/best.html>

Gray, Sharon (1998). Web-based instructional tools. Accessed online 12-17-1999 at http://www.syllabus.com/sep98_magfea2.html

Grozik, John A. (1999). Web Course in a Box (Version 3.0). *Media Review* Fall 1999 .

Hazari, Sunil (1998). Evaluation and selection of web course management tools. Accessed online 12-17-1999 at <http://sunil.umd.edu/webct> see references

Jafari, Ali (1999). The rise of a new paradigm shift in teaching and learning. *T.H.E. Journal* October 1999: 58-66.

Landon, Bruce, Randy Bruce, and Amanda Harby (1999). Comparative analysis of online educational delivery applications. Accessed online 12-17-1999 at <http://www.ctt.bc.ca/landonline/>

Marshall University's Center for Instructional Technology. Comparison of online course delivery software products. Accessed online 12-17-1999 at <http://multimedia.marshall.edu/cit/webct/compare/comparison.html> .

The Institute for Higher Education Policy (2000). Quality on the line: benchmarks for success in internet-based distance education. Accessed online 5-15-2000 at <http://www.ihep.com/quality.pdf>

The University of Manitoba. Tools for developing interactive academic web courses. Accessed online 12-17-1999 at **Error! Bookmark not defined.**

University of Pittsburg Computer Conferencing Selection Committee (1998). Recommendations for a course management/collaboration tool. Accessed online 12-17-1999 at **Error! Bookmark not defined.**

Appendix 3. Web Course Package Choice: Systems Perspective

Prepared by Keith Folsom

The table below summarizes the advantages and disadvantages of each web course package we investigated. From a purely systems administration point of view, *WebCT* was the most systems-friendly, in that it has a very nice programming interface that would allow us to integrate *WebCT* accounts with our existing ePass system. Unfortunately, from a usability standpoint, *WebCT* was far inferior to *Blackboard*. We decided that when choosing between password integration and usability, we wanted to favor usability. Thus, we chose *Blackboard*, which has no convenient way means for integration into our ePass system.

We have several schemes that might allow us to do some integration of the ePass system with *Blackboard*. If they don't pan out, we will fall back to a separate username/password for *Blackboard*. We believe this is workable, if not optimum.

Package	Advantages	Disadvantages
<i>Blackboard</i>	<ul style="list-style-type: none"> • Runs under the LINUX operating system. This allows us to install it on inexpensive hardware. • Integrates with our existing e-mail system. • Integrated web server (Apache). 	<ul style="list-style-type: none"> • Does not integrate into our existing ePass system. Each Blackboard user will need a Blackboard account with a new username/password. • No convenient hooks into the Banner system. • System-dependent, pre-compiled software.
<i>Web Course in a Box</i>	<ul style="list-style-type: none"> • System-independent code, runs under most UNIX systems that have a web server. 	<ul style="list-style-type: none"> • Does not integrate into our existing ePass system. • Does not integrate into our existing e-mail system. • Needs a separate web server. • No convenient hooks into Banner.
<i>WebCT</i>	<ul style="list-style-type: none"> • System-independent code, runs under most UNIX systems. • Integrates with our current ePass system, such that users wouldn't need to remember a new username/password. 	<ul style="list-style-type: none"> • Needs a separate web server. • No hooks into Banner. • Does not integrate into our existing e-mail system.

Appendix 4.

Technical Interview Topics

Developed by the Committee

The following criteria were used in technical interviews with *WebCT*, *Blackboard*, and *Web Course in a Box*.

OS

- Email package independent (need to use SAGE accounts)**
- Interfaces

Hardware requirements

- Platform
- Speed
- RAM
- Disk space

Perl-based scripting

IIS-based requirements

Client side programs should not be required**

Browser (client) **

- Netscape 4.0 and up
- Internet Explorer 4.0 and up

Platform (client) **

- Mac
- PC
- Unix

Authentication**

- LDAP
- NT
- Other?

Plug-in support

Database Interface**

- Extracts from Banner
- Format for import
- DB updates/deletions
- Support tab, comma, fixed access text files

Database interactions

- MS Office (Access, Excel)
- Cold Fusion

Demo alternatives

Current sites**

Tech support

Training options

Setup

Online help

STANDARDS

- IMAP
- LDAP
- SMTP
- IMS
- NNTP
- Text-based access
- HTML
- CSS
- MIME
- ODBC
- SQL compliant

****High priority consideration**

Appendix 5. Web Course Management Online Course Excerpts

Summarized by Lindsay Tomac

The following emails were extracted from a listserv used in a three-week online course entitled, "Selecting a Web-based Course Management System for a College or University." The course was sponsored by the TLT Group (The teaching, learning, and technology affiliate of AAHE).

From: Andrea Chappell <chappell@ist.uwaterloo.ca>

Hello,

I thought I'd jump in and describe my situation and see if anyone else is at a similar stage, with similar considerations.

I work in a central computing group at the University of Waterloo (<http://www.uwaterloo.ca>) in Waterloo, Ontario. In my current position I am part of a new Centre for Learning and Teaching Through Technology (<http://lt3.uwaterloo.ca>). In LT3 we are embarking on a project to select a WCMS.

I've perused some of the online comparisons and used some of the systems at the vendor sites. I have a few in mind for a short list.

My requirements would be long and likely would be similar to those of many others. However, I have a couple of integration considerations that are in a state of flux with many of these systems and I would like to find out more about them in this course. They include:

- integration with central ID/Authentication systems;
- integration with central student information systems (for population of course registrants ... for example, we will use PeopleSoft's, eventually);
- how well the products provide an entry point into the entire course system (like a portal, seeing all of "my" courses when I login);
- what the IMS strategy is for the system, and what in heck I should expect it to be!

Thanks, and looking forward to the "meat" of the course.
Andrea

From: Rick Lacy <lacy@usc.edu>

In general I concur with Chuck's remarks below. As your questions and knowledge evolve, you will want to contact the vendors directly and pose questions.

However, there are a number of useful comparisons around that can sharpen your sense of what to care about and what to ask, such as those at:

<http://www.ctt.bc.ca/landonline/>

For example, at this site that is listed there:

<http://www.spu.edu/~dwicks/comparison.htm>

You will find item #32 that compares 9 products along the lines of their IMS compliance. While neither BB nor WebCT is listed as non-compliant, the devil as ever appears to be in the details, as the reviewer does not regard those two as the same -- cf the quote below:

Blackboard:

Blackboard is the primary technical contractor to the EDUCAUSE Instructional Management Systems (IMS) project, helping create the industry-standard architecture for online learning technologies

WebCT:

Has announced plans to support but has not included any IMS features in the two releases since the announcement was made.

BTW, while IMS is very much a work in progress it is probably our best work in progress. Pls see www.imsproject.org. Among other things there is agreement in these areas:

Metadata stds for describing information (e.g. tags, descriptors)
(so you can search and find related information across systems)
Data exchange stds (so you can actually share data across systems)
XML is a proposed std.

So a product that allows you to create and export compliant metadata for your content, and supports XML forms of the metadata and content is one that is actively working towards compliance.

As for your other concerns:

- >- integration with central ID/Authentication systems;
- >- integration with central student information systems (for population of >course registrants ... for example, we will use PeopleSoft's, eventually);
- >- how well the products provide an entry point into the entire course >system (like a portal, seeing all of "my" courses when I login)

... these are all related to large/enterprise systems integration.

Many WCM products began as small systems unprepared architecturally and otherwise for those possibilities. They are now starting to grow to Enterprise level and beginning to offer more there.

CourseInfo (aka Blackboard), for example, has just released an Enterprise version of its software that supports much of what you want. It allows for LDAP and/or Kerberos integration, dynamic or snap shot integration with backend data systems, as well as "my courses" portal access to information (so the student goes to their web page to get to their courses and other info). These features as a whole only exist for the Enterprise version and not for the original version, although some may start to "leak" back into CI later on.

The devil is still in the details and as Chuck has said it is best to go to the vendor to get specific information -- for example, with CI, how easily and readily do they integrate with People Soft?

This would ultimately be true for all vendors under consideration.

For example, the quoted review above is Nov 99; things can/do move fast in this biz. In any contact with WebCT, you might check to see where they are at re: compliance.

The idea of a vendor panel below sounds like a really good one, one that could provide valuable exchange and discussion on some key questions.

r.

From: Casey Machula <Casey.Machula@NAU.EDU>

Based upon my experience here at NAU, I can't tell you much except that you should avoid PeopleSoft: it's been a costly disaster for us. I'm talking millions of wasted revenue.

From: Casey Machula <Casey.Machula@NAU.EDU>

Here are the problems we had with PeopleSoft at NAU.

In 1992, we started working with PeopleSoft to do online registration, with integrated support for payroll, admissions, etc. Since then, we've had three PeopleSoft teams come and go; and yet, it's still not working. Payroll uses PeopleSoft to run its system. But there are many problems: certain rules had to be rewritten to accommodate PeopleSoft software; for example, vacation leave had a limit of 150 days. Any more than that, and it disappeared. I heard some people grumble about paychecks missing money as well. My own beef with the system is that it lists me as "PhD/EdD." I have a PhD, not an EdD; and, I don't like the implication that I have an "EdD," whatever the hell it is. I got in touch with the payroll dept., from which the info is posted, and asked them to change it. They said that they couldn't, cuz it was a PeopleSoft predefined category.

As a programmer, I can't understand why this should pose a problem.

I hope this helps.

From: Rick Lacy <lacy@usc.edu>

Yesterday when I replied to Andrea I did so more or less directly, addressing her and using phrases like LDAP, Kerberos, etc that probably don't translate for some.

I want to follow up to make it clear that the concerns addressed did not reflect arcane "techno-topics" but general "nail on," important concerns that in one way or another will affect all those interested in developing WCM systems:

- integration with central ID/Authentication systems;
- integration with central student information systems (for population of course registrants ... for example, we will use PeopleSoft's, eventually);
- how well the products provide an entry point into the entire course system (like a portal, seeing all of "my" courses when I login);
- what the IMS strategy is for the system, and what in heck I should expect it to be!

In fact, I thank Andrea for raising these topics now as they will come forward in the session tomorrow as some of the important questions that will emerge when you experience growth in demand for WCM services. For example ...

Re: - integration with central ID/Authentication systems

If your WCM grows to thousands of users you have the burden of maintaining many accounts in that system as well as in other campus systems -- e.g., email. Among other things this increases support costs and undermines security. Andrea was rightly concerned with how WCM systems can be integrated into "central ID/Authentication systems" to avoid such problems. Not all of them can

be, and this might reasonably be a concern of yours in selecting a vendor

Re: - integration with central student information systems

As demand and use grows you will want/need to automate the creation and population of courses. This requires working with "central student information systems." Some systems may allow dynamic linkages (so as a student drops a course they dynamically are deleted from that course in the WCM system). Others allow for "snapshots" of the current registration status and periodically update the WCM based on this. Even without an "enterprise" version of one of our WCM's (CourseInfo), we have been doing batch loading of courses and students for some time -- based on extracts of the registrar's data. This has encouraged use and, we think, made support easier for us.

Re: - what the IMS strategy is for the system

While it is still a work in progress, requiring and looking for IMS compliance is an easy way to buy into trying to build a future in which we (as academics) can share and exchange course materials across campuses and WCM systems.

Along the same lines my own institution is participating in a project to try and better define cross campus standards around authentication -- so University X's students could potentially authenticate at our institution to use our resources and vice versa.

r.

From: "Jian, Ming" <JianM@wpunj.edu>

Charles Ansoerge mentioned in his interview introduction that three different WCS are available at UNL. Our university can not afford this luxury. We have to choose one, and we are now looking at CourseInfo and WebCT.

I have seen some comparisons of these two products. The consensus seems to be that CourseInfo is easier to use, while WebCT has more functionality. At one university which has both available, the faculty of science departments prefer WebCT, and those from humanity like CourseInfo better. What are your experiences with these two products?

Is anybody using CourseInfo Enterprise version? The systems integration is a strong selling point of this version. As we use Oracle instead of SQL, the compatibility of Enterprise version with both database software is a plus for us. But I don't know how well it integrates with ID/Authentication and SIS systems and whether the benefits of the Enterprise version will justify the high price for us.

From: Bill Thieke <thiekews@maple.lemoyne.edu>

Along the same lines, LeMoyne College is looking at the same software packages...We have found that our faculty, thus far, seem to have a strong preference for Courseinfo for its ease of use, but most agree that it doesn't have the flexibility found in WebCT. Also found out from our Rep from Courseinfo that they will be releasing a new version in late May that puts both the Enterprise version and the "regular" version in the same language (currently they are written using two developer codes!). This "in between" version will allow institutions to incorporate Plug-ins or add-ons to add enterprise-like functionality to the regular version without having to swallow the enterprise price tag...Needless to say this sounds intriguing! Regarding Enterprise, I know that Georgetown is currently using it and are quite happy with the software!

Bill

From: Rick Lacy <lacy@usc.edu>

Chris Geith wrote:

> Hello everyone!
>
> cms@online.rit.edu writes:
>> Along the same lines my own institution is participating in a project to
>> try and better
>> define cross campus standards around authentication -- so University X's
>> students could
>> potentially authenticate at our institution to use our resources and vice
>> versa.
>
> Rick, can you tell me more about this idea? Why would you want to do this,

Re: what

We are participating in a project called Early Harvest that includes authentication among its various middleware goals. For more on it, go to:

www.internet2.org

Choose middleware/early harvest to get to:

www.internet2.edu/middleware/earlyharvest

Re: why

The motivation is I think the same as the motivation for participating/interest in IMS, which is why I linked them in the previous email.

While many more immediate demands may still appear to be at the single campus level, there is growing need and value for cross campus exchanges of instructional resources (and other resources for that matter).

Standards for describing and exchanging content (IMS) and standards around authentication (e.g. Early Harvest if it "bears fruit") could facilitate such exchanges in

>> many aspects of distance learning
>> co-enrollment in courses by students from multiple institutions
>> sharing and cooperative access to instructional resources by different institutions
>> a market economy of licensed access to instructional resources by different institutions
>> access to instructional resources by non-traditional users
>> etc, etc

Basically, the demand for a substantive, robust Web Course Management system that we have been discussing further raises/forces the issues of scaling and of integrating information systems at the campus level. The next step is how to link up those hopefully more integrated campus systems to each other

r.

From: Mike Carlyle carlvlem@cofc.edu

Nancy Cooley interview was excellent. I finished last night. Still a day behind, because I could never get day 1 to work. Nancy indicated that School of Education was leading the way. Here at the College of Charleston, Academic Computing has taken a very active role in WebCT. WebCT was not chosen by any study or committee. It was selected here at this campus

because one professor in Computer Science applied for a grant. The Direction of Academic Computing supplemented the grant by purchasing the licensing for WebCT, by providing a server to run WebCT on, and supporting WebCT with technical support.

From: Mike Carlyle <carlylem@cofc.edu>

At College of Charleston we are using WebCT. The college has been depended upon SIS since the dawn of time and will continue to use this system into the next century. SIS is not able to transfer student, course, and professor data over to WebCT. SIS has to use a portal to accomplish this data transfer. Currently, a professor must manual, yep, typing, this information into WebCT. The college has selected a web portal called Pipeline. Pipeline will be on line sometime in the near future. Pipeline is an advertisement driven system. Ads are on every screen that is viewed which generate revenue for the designers of Pipeline each and every time a screen is accessed. So instead of trying to maintain the rule of having any item on a web page within two clicks, Pipeline has an incentive to have users viewing more pages than what will be necessary. Pipeline also becomes the first site users see instead of the college home page. Pipeline has resources that appear on the right side of the site. These resources also include Pipeline library services, this is not to be confused with the college's library services. The college library's web page is a link inside of the Pipeline resources link. When you log on to Pipeline, there is an ad, money passes to Pipeline for the page hit. The user clicks on resources, there is an ad, money passes to Pipeline for the page hit. The user clicks on Library Services, there is an ad, money passes to Pipeline for the page hit. Finally, the link to the college library's web site is seen. Another issue is that user's can fill out a survey in Pipeline that will gear what types of ads they see. No you can't turn off the ads. User survey statistics are sold. Good point of Pipeline, is it has no up front software cost.

From: "Shapiro, Peter" <ShapiroP@wpunj.edu>

At William Paterson University we have been using Top Class, and are seeking a new WCM system.

I'm responding because we are also "stuck" with SIS. Has the College of Charleston attempted to program a data dump to WebCT for registration?

For others out there, does anyone else use SIS and use another WCM system?

From: Mike Carlyle <carlylem@cofc.edu>

Currently, we have to get a tab or comma delimited data file from SIS for each course. The data file then can be imported into WebCT. If there are any problems with the data file, it may require it to be imported in to Excel or any other application that will allow you to view the data and make corrections. Then you can import it into WebCT.

As of about an hour ago, the decision was to table Pipeline. The committee on it was 2 in favor, 2 against, and 2 undecided. Committee is now looking at other options.

From: Rick Lacy <lacy@usc.edu>

"Shapiro, Peter" wrote:

> I'm responding because we are also "stuck" with SIS. Has the College of
> Charleston attempted to program a data dump to WebCT for registration?

I was tempted to ask the same question as above.

We too have an ancient Student Info system -- a PIC based system that goes well back into the 80's and at one time was novel (in the quaint way the now defunct CPM OS was novel)

In any case we are not likely to change it soon. Our Student Info people have developed over time programs for doing extracts from this database (for various units on campus). I assume as does the previous writer that the same could be true of the SIS database.

Like some other schools I am aware of we have used such extracts, modified with user acct data from our accts dept to support a batch load creation of courses and student accts -- in our case within our CourseInfo system (an older non-enterprise version).

As a further test, last January we generated a class web page for every spring undergraduate class and populated the classes with the enrolled students whose accounts matched on "userid" against their UNIX accounts. (BTW, CI 3.0 which we had at that time was not designed for this so we aren't recommending others do the same on that older version; we were testing ourselves, not so much them)

We will extend and deepen this capability as we move to an enterprise version of the software. But our PIC system will not go away soon. This means that we will not have dynamic updating of accounts and enrollments -- we will do it from "snapshots" based on the extracts and more automated updates of data, say once a day. This is not the ideal situation, but hardly a bad one.

The point is you could do some good work even with funky old back-end databases.

I have assumed these problems are fairly common based on my discussions with people at other schools who are meeting the challenges of scaling and this list-serv discussion only reinforces that suspicion.

r.

From: Shelia Owens <sowens@memphis.edu>

I'm definitely not able to discuss this from a "techie" standpoint; however, I am participating with a work team here. The University of Memphis is a beta test site for Campus Pipeline. We are also eternally wedded to SCT and SIS. We have authentication issues with Pipeline because we aren't using SCT synchronization for importing data and our IS staff has been performing bulk loads once a week. We're told this won't be a problem with the next release.

Currently, we are using CourseInfo for our web courses. To the best of my knowledge, student data is not being imported from SIS. Since we have a small program at this point, it's not been an issue. You've given me another question for my list to check out.

Appendix 6. Comparing Individual Web Course Management Packages

Compiled by Lindsay Tomac and Patrick Seigler

Lotus LearningSpace

<http://www.lotus.com/home.nsf/welcome/learnspace>

eCollege

<http://www.ecollege.com/company/>

- Whiteboard and application sharing not supported
- Installation: By hosting technologies at eCollege.com, educators can focus Information Technology resources on supporting faculty and students in their teaching and learning endeavors instead of managing, updating, and installing online education hardware and software. eCollege.com delivers the power and security necessary to provide quality online education to students in the most cost-effective manner.

WebCT

<http://webct.com/>

http://webctnewsletter.2portal.com/rs_public

<http://aboutwebct.com>

TopClass

<http://www.wbtsystems.com/>

- No accessibility adaptations
- Chat, whiteboard, application sharing not supported

Blackboard CourseInfo

<http://blackboard.com/>

IntraKal

<http://www.anlon.com>

- No info. on web about system requirements, interface, etc. VERY vague about what product does

Eduprise

<http://www.eduprise.com/>

- Must be hosted on their server

ClassNet

<http://classnet.cc.iastate.edu/>

- Only stores administration information, not class content

Asymetrix Learning System

http://www.gy.com/company/asymet_ad.htm

- Not available for Unix
- Need software to create courses

Arista Accredix

<http://209.235.35.129/home.cfm>

- Not available for Unix

- Targeted at businesses
- No mention of synchronous sharing

Convene

<http://www.convene.com/>

- Hosted on their server
- 6-wk. online facilitator training

Mallard

<http://www.uic.edu/depts/adn/itl/mallard/>

- Quiz program

Avilar WebMentor

<http://www.avilar.com/>

<http://www.avilar.com/avilar/msubfrm.html>

- Not available for Unix
- No mention of synchronous sharing

CyberProf

<http://www.howhy.com/home/obtaining/obtaining.html>

- It is still in early production -- they have not yet released v1.0.
- No mention of synchronous functionality.
- None of the links to sample courses worked
- Very basic
- Not as easy to use as BlackBoard

CyberClass

<http://www.einstruction.com/>

- Hosted on their server
- Students pay for disc to be able to use

FlexTraining

<http://www.ondev.com/trainingsite/default.asp>

- Not very configurable

WhitePine CuSeeMe Pro

<http://www.wpine.com/>

- Videoconferencing is the main function of the product
- Teleconferencing is one of the main features of the product

Virtual-U

<http://socrates.berkeley.edu:7521/wbi-tools/reviews/vu.html>

- No accessibility adaptations
- Chat, whiteboard, application sharing not supported

Rotor Learning

<http://id-www.ucsb.edu/detche/news/sync.dl.html>

- No information available about the software

Microsoft NetMeeting

<http://www.microsoft.com/windows/netmeeting/?RLD=52>

- Not WCM software

InterVu netPodium

<http://www.netpodium.com/>

- Very little info online
- One-to-many communication, not WCM

Magideas ClassWise

<http://www.classwise.com/frmain01.htm>

- Very little info online
- Doesn't seem to be full-featured system
- No usable demos

Eventware

<http://socrates.berkeley.edu:7521/wbi-tools/reviews/eventware.html>

- Designed for conferencing, not WCM

FirstClass

- Does not allow presentation of information including facilities for formatting, displaying, or showing course material over the Web
- Whiteboard, application sharing not supported

Appendix 7.
Hardware and Software Costs of Web Course Management System

#	Item	Cost
1	Micron NetFrame 3401 Server, 700 MHz Pentium III, 256MB RAM, Rack Mount Chassis, Tape Backup Unit, 4 hour service response	\$8,248.00
1	Blackboard Level 1 Site License	\$4,000.00
1	Blackboard Level 1 Support License (recurring)	\$1,000.00
1	Estimated Tax/Shipping @10%	\$1,324.80
	TOTAL	\$14,572.80