

Blackboard Content System

Product Overview White Paper

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Blackboard

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DOCUMENT PURPOSE AND SCOPE

This white paper provides an overview of the Blackboard Content System™, its applications, core functions, and system architecture. The Blackboard Content System is a powerful software solution that benefits students, faculty and campus IT administrators by lowering the costs and making it easier to manage learning content, digital assets and e-Portfolios in an enterprise learning environment. It provides the Blackboard Building BlocksSM architecture for customization and interoperability and a scalable, modular design that allows for integration with course development, student information, and community systems, as well as authentication infrastructure and security protocols. A partnership of ten premier academic institutions helped design and refine the Blackboard Content System specifically for the needs of educational institutions. The Blackboard Content System is being used at academic institutions throughout the world.

About Blackboard

Blackboard Inc. develops, licenses, and supports enterprise software applications for the global education market. Working in concert with more than 2,600 client-institutions and dozens of technology partners, the company is committed to enabling client innovation and to enriching the educational experience through information technology. Blackboard's suite of enterprise applications includes the *Blackboard Learning System*™, *Blackboard Community System*™, *Blackboard Transaction System*™, and its newest solution, the *Blackboard Content System*™. Through the use of proven third generation enterprise technology and Building Blocks capabilities, Blackboard's suite of applications is architected to deliver a flexible, customizable, and seamlessly integrated operating environment for e-Education.

THE CHALLENGE OF ACADEMIC CONTENT MANAGEMENT

There has been explosive growth in the world's use of digital content, nowhere more pronounced than at colleges, universities, school districts and other educational organizations. At a typical school, thousands of instructors, students, researchers and academic support personnel create, store, package, transmit, and share digital content, transforming it into usable knowledge. Today, thanks to digital technologies, instructors are developing better course materials more easily and in less time, while students tap vast networks of global resources. Multimedia assets can now be easily incorporated into learning, researchers can collaborate despite geography, and countless new applications are being explored and implemented every day.

In the four years since Blackboard first released its pioneering Learning System, the software has been used by more than 2,600 institutions around the globe to generate millions of pages of electronic course materials. From simple online syllabi to vast libraries of reusable learning objects, the online knowledge bases and learning assets of colleges and universities have grown dramatically in both size and sophistication, bringing unique management challenges at all stages of the teaching and learning cycle. As a result:

- Instructors and administrators now desperately need a mechanism to easily and effectively share and reuse content across sections, courses, organizations, research projects and institutions.
- System administrators need solutions that ease the burdensome processes and costs of managing and providing computing resources for a system with such large volumes of content assets.
- Students need better ways to track and navigate learning resources and to showcase the work products and milestones of their educational careers.

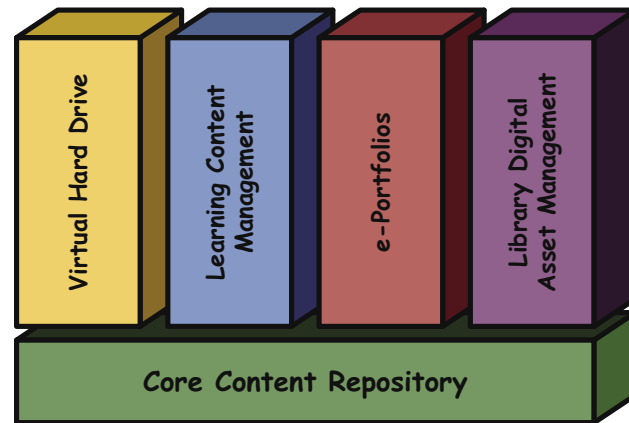
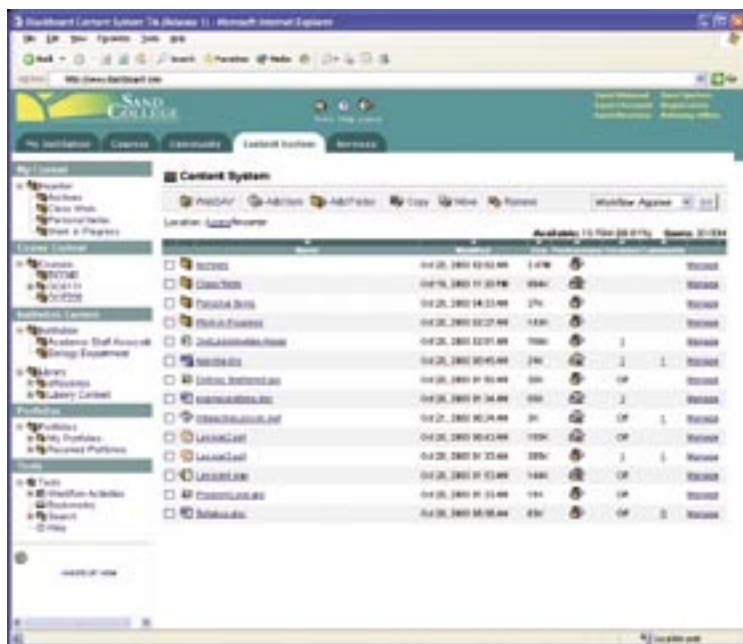
Management challenges resulting from the explosion of digital content are not only hampering the ability of IT departments to offer routine support, they can also impair the ability to provide new services and solutions. For example, while numerous institutions are beginning to offer network file storage space as a service to students, current technologies are unfriendly to end users, costly and hard to administer. Or consider electronic portfolios, also called e-Portfolios, which are coming to be seen as a highly valuable application for a wide variety of uses in higher education. e-Portfolios are simply too costly to implement without a clear, controlled, easily-managed system for reusing content and maximizing storage resources.

To say that there is a content management challenge on the typical campus is an understatement. Unfortunately, typical content management products have proven wholly unsatisfactory for the particular needs and complex demands of educational environments. The Blackboard Content System addresses these challenges with a solution specifically designed for the unique challenges of academic institutions, offering functionality that goes far beyond that of a standard content management system. Compatible with other popular educational software systems, compliant with educational standards, and scalable from departments to statewide university systems, the Blackboard Content System helps students and faculty tap the full pedagogical value of digital assets.

OVERVIEW: BLACKBOARD'S CONTENT MANAGEMENT SOLUTION

With digital content becoming increasingly central to effective teaching and learning, the Blackboard Content System offers the features and functionality necessary to move e-Education beyond course development or simple web page creation.

At the heart of the Blackboard Content System is the Core Content Repository which stores linkable, reusable content objects, controls access to these objects, and provides scalable, robust features for effectively managing them. A browser-based interface similar to Windows Explorer allows for browsing, accessing, and sharing content, as well as for searching, linking and re-use of each user's content. Content can be searched across an extensible metadata schema, and the system offers permission-based access and versioning with check-in/check-out capabilities for group collaboration, as well as importing and exporting SCORM/IMS or standard ZIP files. System administrators and content owners have powerful controls over security, access and permissions.



The Blackboard Content System incorporates application capabilities in four key areas:

- Learning Content Management, to easily, economically and effectively share and reuse single files or large volumes of content assets across sections, courses, organizations, departments and institutions.
- e-Portfolios allow students and faculty members to assemble, present and share information online for documenting academic growth, career evaluation and course preparation.
- Virtual Hard Drives economically accommodate the broad content storage needs of individual users in the digital education environment. Unlike other products or even homegrown solutions that provide users with centralized storage resources, the Blackboard Content System is the only one that offers a truly user friendly interface—the same interface students and instructors are already using every day with their other Blackboard systems.
- Library Digital Asset Management creates an interactive environment for faculty to search, access and incorporate digital library resources in course preparation.

LEARNING CONTENT MANAGEMENT

Suppose an error is found in the core syllabus being used for 27 sections of Calculus 201. Normally, a small typo would mean a lot of work since someone would have to update 27 separate courses to make that one correction 27 times. Not to mention that those 27 files are taking up valuable storage space.

The Blackboard Content System offers a better solution by separating the display of content from its centralized management, enabling students and faculty to have granular control over which content objects they share and who they share them with. Using the Blackboard Content System, our Calculus update becomes no problem at all since the syllabus is now just a single content object stored once and linked virtually to all 27 sections of the course. Fix the typo in one place and the change appears in all 27 instances. From a single file space, an individual piece of content can be shared with an entire class, the entire school or just one user.

“The ability to efficiently create, access and share content through the Blackboard Content System has drastically reduced our administrative overhead and made course preparation considerably more manageable for our faculty. In just four months, we can already see a significant increase in productivity that is tangible both financially and academically as our students and staff become more fully immersed in the e-Learning experience.”

—Patty Herkins
 Manager, Technology and Computing
 The University of California College Prep Online

Using The Blackboard Content System: Enhancing the Student Learning Experience

Gayle is a senior biology major working with four classmates on a Genetics term project. This morning, before going to class, she accesses her Blackboard Virtual Hard Drive from the computer in her dorm room to compile several spreadsheets of lab results. She works for a while, then signs off and leaves for her first class.

After lunch, Gayle heads for the computer lab to get some more work done. Again accessing her Virtual Hard Drive, she completes her spreadsheets and inserts them into the project report, currently in its third version. She reformats the tables, adds explanations and captions, then uses the workflow tool to send the report to Bob, who will create graphics from her data. She also sends it to the other group members who offer suggestions and changes, creating a new version of the report document. All comments are time stamped and tracked individually by author, with older versions of the document maintained for progress reviews or to revert to a past form if desired.

The success of this report is extremely important to Gayle. As a senior, she has already begun applying to graduate schools. Her work has produced some impressive results, showing her to be a detail-oriented scientist and effective team player who has experience on a significant research project. Once the paper is done, she will add it to her Blackboard e-Portfolio and submit it to her academic advisor for review.

Using the e-Portfolio interface, Gayle's advisor will make comments, including a suggestion that in addition to the report she break out the spreadsheets separately to highlight her particular contributions, annotating them with the process she used for data collection. Gayle updates the e-Portfolio based on those comments and adds the new section, all without having to duplicate the spreadsheets for the new area. Soon, she will share the e-Portfolio with the graduate school admissions board. Once she graduates, she will be able to take a digital copy of her e-Portfolio with her, keeping it active and adding new work as her career progresses.

“Using the Blackboard Content System has been fantastic for us. We are conducting a very large project using the Blackboard Content System in which we are consolidating all of our information about using Blackboard and making it accessible from a central location. This information includes tip sheets on best practices for creating courses in the Blackboard Learning System. In addition to enabling us to share best practices and other documents about how our faculty, students, and staff use Blackboard, the Blackboard Content System has cut in half the time we spend communicating with the production team while creating and revising the information for this project.”

—JoAnna Hunt
Application Systems Administrator
Seneca College of Applied Arts & Technology

There are multiple ways to share content using the Blackboard Content System including sharing via a course, by permission, and by passes.

- When building a course, whether using the Blackboard Learning System or another tool, instructors can add learning content from the Blackboard Content System. Whether added to just one section or many, a learning object is stored only once and linked virtually to all of the courses. Whenever a change is made to an object, all of its instances are updated automatically
- An author or owner can also grant access to a given object, folder, or to all content objects within a folder using permissions. The owner can decide what level of access to provide—read, write, remove and manage—and whether to provide that access to certain individual users, to members of courses (including specific roles such as student or instructor), to groups of users by Institution Role, to members of course or organization groups, or to all users with accounts on the system.
- Passes allow students and faculty to share their content with users outside of the university in a controlled manner. For example, a professor may be working on a research document in collaboration with colleagues at other institutions. She simply creates a pass that is valid for a specific time period and emails it to her co-authors. They receive a virtual link allowing them to work together on the document, and only that document.

Extending beyond content sharing to collaborative content development, the Blackboard Content System offers some of the most powerful collaboration tools available, including:

- Versioning allows users to automatically archive, track and access previous versions of their files. The system creates separate copies after each collaborator makes changes, and users can go “back” and access older copies from before the changes were made, providing an automatic backup for overwritten files. The history function provides a view of all of the versions that have been created, along with creation date, author and other information.
- Content Tracking features create an “audit trail” which captures and displays information on all actions that have been performed on a piece of content, including when read, modified, copied and when comments were added. For every activity it also captures the username of the person who performed the action, the date and time of the action, the IP address of the user and which version of the content the action was performed on.
- Workflow features provide the ability to route content to other users and offer intuitive processes that encourage people to use the system's available tools. Users can create a Workflow Activity associated with any item, designating settings that can include priority, deadline and permissions.

Using The Blackboard Content System: Facilitating Teaching and Research

Ron is one of three history instructors developing a new Survey of Middle Eastern Culture to be introduced as a special seminar for non-majors. Using collaboration features of the Blackboard Content System, he and his colleagues have been developing a planning document and course outline during the past two weeks.

Now that the major topics and approach have been agreed upon and approved, Ron begins developing and storing the course content in the Blackboard Content System. He uses the course planning document developed with his colleagues as a foundation for creating the syllabus and other handouts. When he is ready to build the course in the Blackboard Learning System, Ron simply links to the various course content objects that are stored in his Virtual Hard Drive, including text, photos, music, even streaming video.

The course materials in the Blackboard Learning System include links to several articles stored in the library section of the Blackboard Content System. Copyright clearance for these materials has been completed and the librarians have put the materials in the course's e-Reserve folder in the Content System. Ron simply adds a link to the course and students can access the e-Reserve materials directly.

Once Ron has completed the master version of the course, he asks his system administrator to copy it for the 12 sections that will be taught that semester. He lets the other instructors know that their sections are ready and includes all of the master materials. He also emails a colleague at a neighboring school about the new course. The two met recently at a conference and expressed interest in creating a seminar like this one. Since the colleague does not have a user account in the Blackboard system at Ron's institution, he simply sends a pass that will grant his friend access to the course materials for review and comment.

As a final step, Ron also adds selections from the course materials to his e-Portfolio. He recently sent a proposal to a book publisher on this subject and will use the course both as an outline and to show the publisher the work he has already done.

Later that day, one of the other instructors realizes that the wrong text is appearing in one of the course handouts. She visits the course content area in the Blackboard Content System to access the master version of the course, makes the change to the file and the corrected document appears immediately in all 12 sections of the class.

Content navigation and discovery features in the Blackboard Content System are every bit as compelling as its storage and collaboration functions:

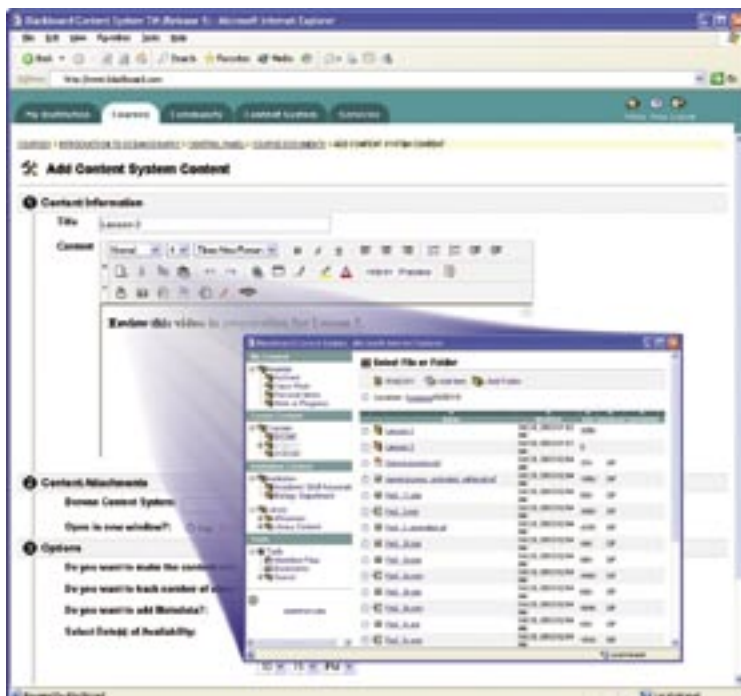
- **Learning Objects Catalog.** The Blackboard Content System is a robust repository for an institution's learning objects. Learning objects can be whole lessons, such as Macromedia® Flash® files and Microsoft® PowerPoint® presentations, or individual assets such as images. In the traditional model of managing course content, instructors build courses using their own content. The Blackboard Content System expands this model through the use of the Learning Objects Catalog. Learning objects can be found by navigating the category structure, or by searching the metadata on each object. For example, an instructor may wish to place material on the Civil War in his course. The instructor can browse the History categories to locate any objects that are applicable to his particular course topic.

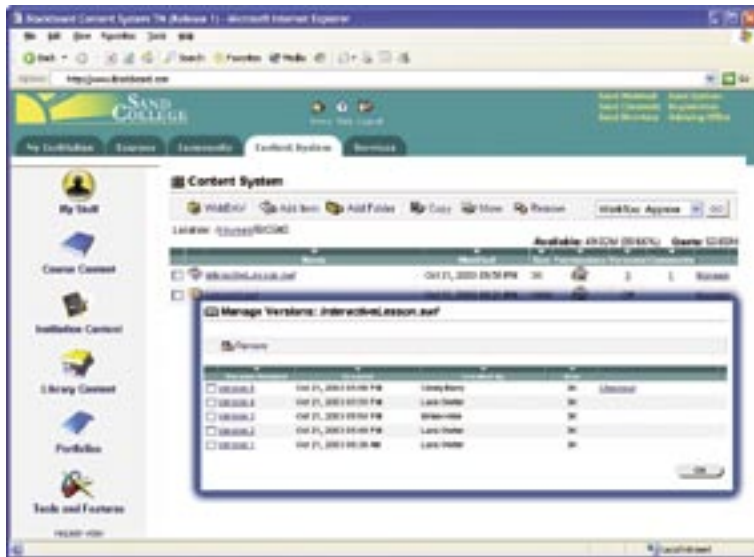
The Learning Objects Catalog functionality in the Blackboard Content System enables users to search the catalog or browse through categories to find items they might wish to reuse. System administrators define the catalog categories that fit the institution's particular needs and determine which users are allowed to submit learning objects into the catalog. A separate set of Catalog Managers are responsible for approving or rejecting submissions, ensuring proper categorization, and ensuring the overall integrity of the catalog.

- **Searching.** The flexible and powerful search interface allows users to search the full text of all items in the system and to search by learning objectives and other structured content metadata or properties, such as file size and creation date. The system will automatically scan Microsoft® Office, Adobe® PDF, and other file types, and "smart searching" ensures that results will only include content which the user has permission to access. Searches can be saved and modified for later use.
- **Bookmarking.** As an aid to content navigation, bookmarks enable users to easily flag and find content they are working with at any given time.

E-PORTFOLIOS

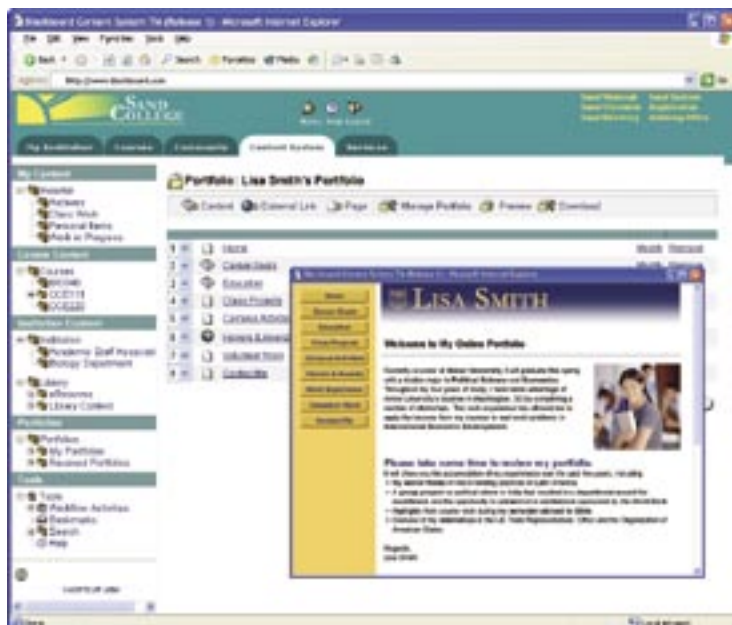
Numerous educational institutions are beginning to implement a powerful new application called Electronic Portfolios, or e-Portfolios, for their community members. Just as an artist puts together a portfolio of work samples, an e-Portfolio allows students and faculty members to collect, store and package milestones and proof-points of their academic, creative, or professional progress. Students develop e-Portfolios to enable learning assessment in their courses, support career development, meet certification requirements and pursue advanced study opportunities. Faculty e-Portfolios are





used to document academic growth and professional advancements and as tools in recruitment, tenure and promotion. Through e-Portfolios, faculty are also able to manage a public Web site for publishing their research and scholarship.

Unique functionality in the Blackboard Content System enables users to create multiple e-Portfolios for different audiences and to share them with users both inside and outside of the institution. The Portfolio Creation Wizard offers a simple, intuitive way to create portfolios, walking users through the process of adding content pages, choosing color themes, setting up the portfolio menu and adding a welcome page. Portfolio Page Templates offer different “look and feel” options and enable institutions to require certain types of information depending upon the type of portfolio, such as resume or self evaluation. A number of pre-defined Portfolio Page Templates



are included, and institutions can easily develop their own templates and add them to the system. Users can create custom portfolios by combining templates with their own content.

Once created, portfolios can be shared just like any other content hosted in the Blackboard Content System. Portfolio owners can make their portfolios available online to individual users in the system, to groups of users by course or to users outside of the institution. Portfolios can also be downloaded and burned to a CD-ROM.

VIRTUAL HARD DRIVE

Many institutions are beginning to offer network file storage space as a service to students, and many more want to add this capability. Unfortunately, available technologies for doing so have been difficult to administer, complicated to use and often functionally inadequate. Management difficulties have led to inefficient use of people and hardware resources, ultimately resulting in increased costs. Worse, usability challenges and unfamiliar processes and interfaces reduce their use and acceptance by end users. Network-based systems, for example, require users to be on campus or to use a secure VPN (Virtual Private Network) connection—limitations that most users are not willing to accept. Another alternative, FTP (File Transfer Protocol) sites are not intuitive to the average faculty member or student. Many users bypass network file storage systems by emailing large documents to themselves and other users, which unnecessarily strains hardware resources.

With the Blackboard Content System, students, staff and faculty members can have their own electronic repository, called a Virtual Hard Drive, which they can use to collect, manage and share digital content. Best of all, this personal Virtual Hard Drive is accessible from anywhere at any time either through the system’s intuitive Web interface—the same user-friendly interface they are already comfortable with from the other Blackboard systems in use—or via Web Folders. Web Folders exploit WebDAV technology, which is a popular protocol in educational circles for collaborative editing and management of files on remote Web servers. Through Web Folders, users can add multiple files and folders to the system at one time using drag-and-drop, and they can open and edit files stored on the system directly through their desktop applications such as Microsoft® PowerPoint® and Macromedia® Dreamweaver®.

After logging in to the Blackboard platform, users navigate to the Blackboard Content System tab where they see a clear, organized interface with key file management functions easily accessible from a single page. Content is organized into “Collections” that include:

- My Content. Every user can have his or her personal content storage area.
- Course Content. When a course or organization is created in the Blackboard Learning System, a corresponding content area is created in the Blackboard Content System.

- **Institution Content.** For storage of content or information that is to be shared across the institution, such as that for various academic departments or business offices. For institutions running the Blackboard Community System, owners of tabs and modules can store, manage and update their institution content in the Blackboard Content System.
- **Library Content.** Librarians can add subject-specific content and create electronic reserve documents called "e-Reserves".

Institutions can create additional Collections as desired, for example within a law or medical school or for satellite organizations.

When users access their Virtual Hard Drives, they only see the names of files, folders, and collections to which they have been granted access. For example, a graduate student who is working as a teaching assistant in Psychology 101 will see that course collection appear under his Course Content area. The next semester the collection will be replaced by Psychology 102 when he is a teaching assistant for that course. The system can be configured so that a My Content area is created automatically whenever a new user is added to the Blackboard platform, with access and permission settings defaulting to the pre-defined characteristics for that type of user (for example, student, TA, or professor.)



LIBRARY DIGITAL ASSET MANAGEMENT

As online learning has grown, so has the recognition of the critical role that Library collections play in providing valuable e-Learning content. Libraries need ways to integrate their collections into the content used in online courses, but to date the management challenges have been extremely daunting.

Take e-Reserves, for example, which are digital versions of copyright-cleared reserve readings that many libraries create for faculty and students. For legal reasons, librarians must be exceptionally careful about who has access to these materials, for how long and for what use. The Blackboard Content System allows librarians the level of control they need so that copyrighted digital content is used properly. It also enables the integration of e-Reserve resources into online courses so that students and instructors no longer have to use hard copy reserves or log in to separate e-Reserve systems.

Another powerful feature of the Blackboard Content System of particular interest to librarians is its sophisticated Metadata tagging capabilities that allow unstructured content created for courses to be integrated into the overall knowledge collection of the institution. Any piece of content stored in the Blackboard Content System can be tagged using metadata that meets industry standards, including IMS and Dublin Core.

Additional Library Digital Asset Management features in the Blackboard Content System include:

- Integration of e-Learning with library resources.
- The ability for instructors to access and assign e-Materials from their course environment.
- Course environments can be populated with materials from subject-specific library collections.
- Librarians can manage library content for use in courses.
- Library searches can now include content housed in the Blackboard Content System.

“The Blackboard Content System enables National University to meet state teacher accreditation requirements. We have customized the Blackboard Content System’s e-Portfolio tool to designate the materials students need to upload to meet state standards. Students love the e-Portfolios. The flexibility of the Blackboard Content System is a great benefit—students can give access to their e-Portfolios to whomever they choose, including potential employers. Faculty can automatically access students’ work. Over 3,000 students will be using the Blackboard Content System next year. We also plan to use the e-Portfolio for faculty dossiers.”

The transition to the Blackboard Content System was very easy for students. Blackboard is very user friendly, and students are already familiar with online courses taught using the Blackboard Learning System.”

—Pam Montroy
 Director of User Services and Internal Systems
 Spectrum Pacific Learning Company
 An Affiliate of the National University System

ENTERPRISE SYSTEM ADMINISTRATION

Student Information Systems

Blackboard administrators can configure SIS integration agents according to either snapshot or event-driven criteria. With snapshot integration, administrators use a command line interface to update the Blackboard database, automatically synchronizing data and performing logic based on the desired criteria. The event-driven manager provides a collection of Java classes that programmers can use to insert, update, delete, or actively disable information based on an institution's unique configuration specifications.

Clients who have already integrated the Blackboard platform with their student records or human resource systems do not have to complete any additional work to ensure that their data is integrated with the Blackboard Content System, which takes advantage of the data that is already populated in the Blackboard platform.

Authentication and Security

In addition to providing Building Blocks integration agents for leading information systems, the Blackboard platform provides pre-configured, customizable integration for leading identity management/authentication protocols. By integrating the Blackboard environment with a standard authentication protocol, administrators reduce help-desk requests for password information and significantly reduce overall help desk overhead.

To leverage previous investments, clients implementing the Blackboard Content System can also take advantage of existing integration with identity management/authentication systems. Once a client has integrated the Blackboard platform with an external authentication system such as LDAP or Microsoft® Active Directory®, their Blackboard Content System will also be integrated.

The content that students, faculty and institutions store in the Blackboard Content System is often sensitive and confidential, particularly in situations in which the content is the work product of research efforts. As a result, the Blackboard Content System ensures the security of the files by enabling the institution to run the system under SSL (Secure Socket Layer) technology.

System Management Utilities

Blackboard system management utilities provide administrators with a flexible and robust environment for effectively managing and generating system analytics and utilities through the following core functions:

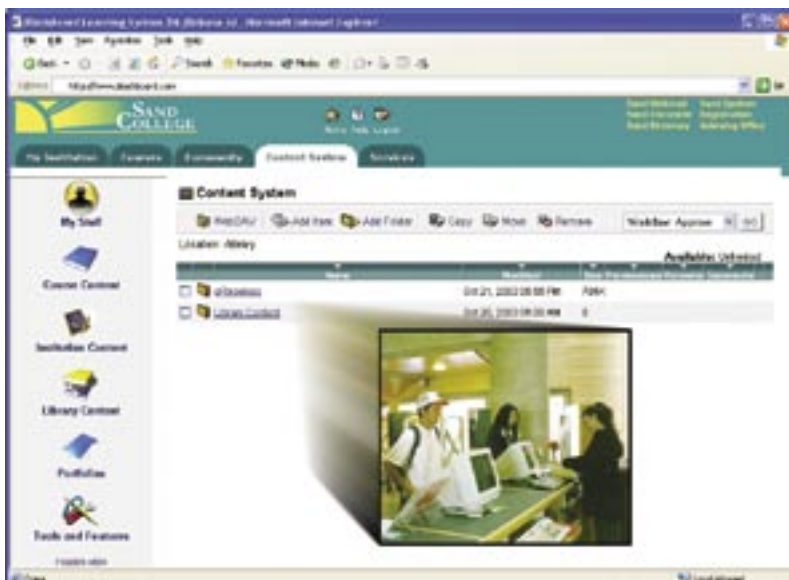
- Manage Web Folder settings to ensure optimal system functionality and performance
- Application and system activity logging for optimization, monitoring and diagnosis
- System reports to measure level and type of usage on the system
- Full system backup/restore processes

In addition, administrators can define disk quotas and bandwidth settings for users, courses, organizations and the institution to manage computing resources and network utilization and costs. Disk quotas enable administrators to appropriately allocate file storage space and plan for system growth. By controlling bandwidth settings, administrators can guard against system abuse such as students using their Virtual Hard Drive space as an MP3 share drive.

System Configuration and Design

The Blackboard platform provides administrators with a broad range of functionality and options for how to present the system to users, the network, other IT systems on campus and other enterprise systems critical to maintaining an integrated e-Education environment. Following are some of the core functions available to administrators:

- Customization of the Blackboard Content System pages and menus
- Flexible configuration of the Blackboard Content System tools including versioning, e-Portfolios and content tracking.
- Customization of the Content System tabs and modules



“The promise of better integration between our library resources and academic course work has been one of the most exciting aspects of implementing the new Blackboard Content System. With features like e-Reserves made so easy to use, our instructors and librarians will be able to work together more effectively than ever before, sharing materials, collaborating, and complementing each other’s work without giving up control of their respective content.”

— H. David Lambert,
Vice President and Chief Information Officer,
Georgetown University

BLACKBOARD BUILDING BLOCKS®

Growing out of a commitment to promote an open environment for platform customization, flexibility and interoperability, the Blackboard Building Blocks architecture provides clients with an e-Education platform that can be customized to meet unique academic and administrative needs and requirements. The Blackboard Content System contains a robust set of Building Blocks Application Programming Interfaces (APIs). These APIs can be used to develop additional solutions by customizing the Blackboard Content System’s bookmark, workflow, metadata and e-Portfolio functionality.

To support an institution’s unique pedagogical objectives, the Blackboard Building Blocks architecture allows administrators and end users to seamlessly integrate homegrown, open source or commercially licensed applications and system services. In addition, Building Blocks technology can be deployed to facilitate integration between the Blackboard system and an institution’s student information systems, security and authentication protocols. This supportable framework for platform customization not only provides flexibility and choice, it also maintains the integrity of Blackboard’s core applications, ensuring seamless platform upgrades and cross-application compatibility.

Through the Blackboard Building Blocks Program, clients can customize their end-user environment by integrating tools, content, and commercially licensed, open source, or homegrown interfaces and extensions. Among the many pedagogical and administrative benefits of Building Blocks Application infrastructure are:

- Plan and develop freely distributed or commercially supported applications as extensions to the Blackboard platform

- Leverage the Blackboard Developers Network, providing access to documentation and a community of Blackboard Building Blocks developers
- Dynamically extend and enhance the Blackboard environment

SYSTEM ARCHITECTURE

The Blackboard Content System has been architected to deliver a responsive, highly scalable system that allows for minimal downtime and, when necessary, speedy recoveries. Designed to support a wide range of configurations ranging from a single server to a farm of application and database servers attached to a storage area network, the Blackboard Content System features a modular architecture that can meet a wide variety of deployment and configuration parameters. Tested and designed to support large scale implementations of tens of thousands of users, the Blackboard Content System offers enterprise-critical technology, including application and database load balancing, fault-tolerant fail over, and dozens of additional architectural components designed to ensure system performance and uptime. The following techniques can be used with the Blackboard Content System in order to optimize system performance and reliability:

- Increase individual server capacity
- Load balance (cluster) application servers for improved performance and reliability. They must share a SAN (Storage Area Network) or NASD (Network Attached Storage Device) for file storage.
- Provide a second database server for automatic fail over (Microsoft SQL Server only)

COMMITMENT TO STANDARDS

Blackboard is a strong advocate for open industry standards in the areas of system interoperability through IMS, SIF, OKI and the e-Portfolio Consortium, as well as content specifications such as IMS, AICC, SCORM and Microsoft’s LRN. As a result of these initiatives, the Blackboard Content System is a flexible and reliable platform for the development of content in multiple formats. All of Blackboard’s content management and content development tools are IMS compliant, ensuring seamless content portability within the Blackboard platform or externally to other IMS compliant e-Learning applications.



*Collection.
Sharing.
Discovery.*

SUMMARY AND CONCLUSIONS: FROM CONTENT TO KNOWLEDGE

“The modern university looks forward,” wrote Thomas Huxley in 1892, “and is a factory of new knowledge.” In today’s networked world, that means universities have also become content factories generating billions of bits, bytes, files and folders of digital content. As modern academia becomes more and more reliant upon e-Education, modern academic computing departments are looking forward as well, developing new and better services to help their constituents turn information and ideas into transferable, usable knowledge. Meanwhile, they must do it while maximizing scarce resources and satisfying cost-conscious administrators.

The Blackboard Content System provides a core set of content management functions that form a foundation for some of the most forward-looking e-Education services available today, including:

- Learning Content Management, to easily share and reuse large volumes of content assets.
- e-Portfolios, for students and faculty members to document their academic and career growth.
- Virtual Hard Drive, to economically accommodate institutional storage needs.
- Library Digital Asset Management, to incorporate library resources in course preparation.

Content Management in an academic environment goes far beyond simply creating and storing Web pages. Generic content management solutions simply cannot satisfy the demanding needs, diverse users or prodigious volumes of content produced by a typical educational institution. Developed in conjunction with ten of the most forward-looking educational institutions, the Blackboard Content System has been designed to meet and exceed the needs of education. It provides powerful tools for institutions, students and instructors in their efforts to enhance learning, share information and advance knowledge.

**TO LEARN MORE ABOUT THE
BLACKBOARD CONTENT SYSTEM,
PLEASE VISIT OUR WEBSITE:
WWW.BLACKBOARD.COM**





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