



*Bringing Education Online™*

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Blackboard Product Strategy & Vision  
White Paper on  
Building Blocks (B<sup>2</sup>) Initiative

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# *Blackboard Product Strategy & Vision White Paper on Building Blocks (B<sup>2</sup>) Initiative*

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**T**his document offers Blackboard's clients insight into the company's evolving corporate and product strategy. The document iterates the Blackboard® corporate vision and product strategy and summarizes recent advances toward achieving that vision on behalf of our customers, partners, investors, and employees.

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## **BLACKBOARD VISION AND PRODUCT STRATEGY**

Blackboard was founded in June 1997 with the clear vision of transforming the Internet into a powerful environment for teaching and learning. We believe that education is fast becoming a dominant use of the global network, rivaling commerce and communications in scale. However, the Internet is simply the medium. To bring education online, a clear industry-standard platform needs to be established in the marketplace. Tool and content developers, instructors, system administrators, and students must embrace online learning with the confidence that e-Learning styles and techniques will seamlessly transfer to the Internet from the classroom, that technical fragmentation will be eliminated, and that as the industry evolves, rebuilding e-Learning systems will be unnecessary.

Consider the world of operating systems and the power of a few clear standards, such as Windows, Linux, and MacOS. Using this paradigm, we describe Blackboard as an "e-Learning infrastructure" company. We seek to become the industry-standard technology powering e-Learning in the academic marketplace consisting of schools, colleges, and universities, as well as in the organizations that serve them, such as publishers, test preparation companies, and other education service providers.

The use of the Internet for education among academic institutions has exploded. Blackboard is uniquely positioned to be the industry-standard platform for bringing education online by powering more than 1,000 live institutions, serving 3.5 million active users in more than 70 countries, generating more than 200 million page views per month, and servicing an additional 5,500 institutions that use Blackboard's Web site, Blackboard.com<sup>SM</sup>.

Since Blackboard's launch in June 1997, our selection as primary contractor to the IMS industry standards project, and the release of our first e-Learning platform in June 1998, Blackboard has executed a simple three-tiered product strategy:

1. Deliver easy-to-use, intuitive tools for instructors, students and administrators;

2. Offer an effective suite of best-of-breed pedagogical tools, enabling true teaching and learning innovation on the Web.
3. Provide scalability, integration, flexibility, and customizability and fulfill the mission critical need for an all-encompassing teaching and learning solution through enterprise capabilities.

In every release of the Blackboard platform (previously Blackboard CourseInfo™) since its development at Cornell University, Blackboard has sought to expand features, while simplifying the user's experience and enhancing our technology back-end for scalability.

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## KEY MILESTONES ACHIEVED IN BLACKBOARD 5

With the release of Blackboard 5™, the company advanced toward its strategic goal of becoming an educational operating system. By re-architecting the platform using next generation technologies and a code base that offers the first enterprise-grade academic e-Learning platform on the market, Blackboard is poised to become the industry-standard. Blackboard is the first course management system developed out of academe to make this strategic investment. Other key milestones achieved through the Blackboard 5 release include:

1. *End-to-end solution with intuitive modularity:* Course management system coupled with academic portal technologies, email readers, community and organization tools; and, extended academic resource functionalities, provide a comprehensive online campus environment with a highly intuitive, modular interface.
2. *Enhanced support for large-scale implementations:* An increased capacity for growth and flexibility through enhanced system administration, individualized database

optimization, and updated distributed hardware architecture and load-balancing schemes.

3. *Support for multiple databases and multiple operating systems:* An individualized operating system testing and optimization for Sun Solaris, Linux, and Microsoft Windows NT/2000 operating systems, as well as SQL Server 7 and Oracle databases.
4. *Modular and flexible system architecture:* New object oriented application logic with detachable sub-systems for individualized integration, scalability, customization, and support.
5. *Greater institutional integration:* Increased branding, sponsorship, graphical workflow customization, and enhanced support for leading enrollment and student information systems, as well as proven single sign-on authentication of disparate campus Web systems.
6. *Simplification and increased consistency:* Improved Blackboard graphical interfaces and a decreased number of graphical screens provide the user with a consistent way of working with the system.

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## THE BUILDING BLOCKS (B<sup>2</sup>) INITIATIVE

Blackboard's new Building Blocks (B<sup>2</sup>) initiative builds upon the strategic advances of Blackboard 5 and once again sets the bar for our product vision. It capitalizes on our original standards work developed with IMS and is based on our vision of an industry-standard operating system for e-Learning. B<sup>2</sup> is Blackboard's roadmap for achieving the development of an e-Learning platform, with an ultimate value not only in providing essential teaching and learning tools (such as discussion boards, quiz generators, etc.), but also in offering a widely sup-

ported technology foundation to assemble the best Blackboard-enabled tools and content that meets the individual needs of our client institutions.

By marrying ease-of-use, pedagogical effectiveness, and enterprise technology, B<sup>2</sup> takes its place as the fourth pillar in Blackboard's product strategy. This initiative has six major components.

1. *Expand Platform System Services:* Develop a broad suite of underlying system services that allow for greater extensibility and provide access to a finer granularity of application logic for the integration and customization of System security, user roles and enrollment, rights management, transaction processing, and many others.
2. *Develop Supported System Interfaces:* Create written specifications and interfaces that integrate with additional tool suites and administrative systems, allowing end users to interact with Blackboard platform services, such as security and enrollment; centralized reporting and statistics; and, user profile data.
3. *Standards Adoption:* Provide programmatic system interfaces that are supported by industry standards, including content specifications and standards such as IMS, AICC, SCORM and Microsoft's LRN, as well as interoperability with JASIG, Oracle and Microsoft portal technologies.
4. *User Interface Extensibility:* Develop flexibility in the graphical interface to meet multiple needs and to provide the internal capabilities needed for ADA (accessibility) compliance, multiple-language and international uses, distribution on PDAs and other handheld devices, as well as creating graphical interfaces for easy and seamless end user tool additions.

5. *Provide Developer Tools for Industry Use:* Provide tools that link services and interfaces in a programmatic way, allowing for third party development on the Blackboard platform, such as custom tools, modules, and content.
6. *Promote Blackboard through Partners:* Work with major publishers, tool vendors, and others to provide recommended and unique Blackboard-enabled products that satisfy a variety of pedagogical needs. Our goal is to offer a wide range of solutions on Blackboard that clearly differentiate the platform in the market and serve faculty and system administrator needs.

The B<sup>2</sup> Initiative brings Blackboard closer to its strategic vision:

- ◆ Enable instructors or end users to select from multiple Blackboard-enabled pedagogical tools (virtual chat, team teaching tools, assessment engines or simulations).
- ◆ Extend the pedagogical experience by automatically integrating the tracking and reporting of Blackboard-enabled tools into a centralized area for increased user customization.
- ◆ Provide an instructor or end user with the ability to search for and configure educational content through public and private content repositories that can be used to tailor and populate content into courses or communities.
- ◆ Provide "anytime, anywhere" wireless access through palm-type and next generation Internet appliances and devices.
- ◆ Offer multiple language support.
- ◆ Integrate with a customized development tool that adapts to diverse pedagogical needs for learning flow, assessments, and evaluations.
- ◆ Satisfy each user's need through the same core technologies and architecture.

- ◆ Provide graphical modules that can be customized to current Blackboard-enabled university systems and applications.
- ◆ Enable institutions to capitalize on Blackboard's future-oriented architecture and customization options.

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### THREE KEY SUCCESS FACTORS – TOOLS, SERVICES, AND INTERFACES

While ease-of-use, feature-rich tools, and enterprise technology remain guiding lights for Blackboard, it is clear that a new paradigm is emerging for e-Learning infrastructure in education. The future envisioned by schools, colleges, and universities, as well as our partners, revolves around the notion that flexibility and choice must allow a virtually unlimited spectrum of options from which our clients can configure and operate their respective e-Learning environments. To achieve this goal, Blackboard will position itself as an enabling technology – a platform that powers an underlying architecture, and an “operating system” for e-Learning upon which educational content and tools are assembled to meet a specific pedagogical or institutional need. The “cookie-cutter” or simple all-in-one course authoring system approach offered by others in the industry will no longer be a viable solution for dynamic e-Learning organizations. We believe the Blackboard platform will become an underlying “middleware” system, with a variety of user interfaces and configurations that represent the core technology and functionality of a specific institutional implementation of an e-Learning environment.

To consider the implications of this vision, it is helpful to think of the Blackboard e-Learning platform as comprised of three major components: tools, services, and interfaces.

1. *Tools*: At its core, Blackboard is a dynamic collection of application tools. These tools can be described in four categories: productivity tools; communication and collaboration tools; assessment and evaluation tools; and content management tools.
  - Productivity tools are those that assist users through the educational experience, such as calendars, tasks, address books, and information services.
  - Communication and collaboration tools consist of asynchronous discussion boards, email and user group areas, as well as synchronous tools such as virtual chats, whiteboards, and application sharing.
  - Assessment and evaluation tools can be as diverse as a simple question pooling function, or an answering of a simple question, to the creation of a highly complex test.
  - Content management tools provide areas in which users create, share, and display a variety of content types.

From the uploading of a single file to the full development of an online course, Blackboard consistently works to maintain key best-of-breed tools that provide the depth and breadth of functionality necessary to enable significant capabilities for creating and managing an online teaching and learning solution.

It is clear that academic institutions and e-Learning organizations are looking for specialized product capabilities in each class of tools to meet their diverse needs. It is expected that over time a broad range of pedagogically useful tools will be developed by individual organizations. This will be critical for providing growth and differentiation between organizations within the e-Learning marketplace. Blackboard seeks to foster this diversity by serving as a springboard for new product and market innovation.

2. *System Services:* Central to the management of a dynamic collection of tools is interoperability, interactivity, and connectivity. Blackboard's system services include the underlying infrastructure of an e-Learning platform that tracks what users do, manages rights and permissions, secures content, customizes experiences by roles, and reports performance on assessments. System services create a seamless experience across tools and content and allow an instructor to view a wide range of data about a student's experience from postings on a discussion board, to grades on a quiz, to submission of a paper. Each of these activities utilizes different tools and is managed by a core set of services that create a convenient and integrated experience. Within our service architecture, we believe that securing content and tracking performance are critical keys to encouraging compelling, interactive online content. These services provide seamless access to functionality within the Blackboard platform. Through such access and integration of services, the Blackboard platform enhances flexibility, customizability and addresses the diverse needs of e-Learning organizations.

3. *Interfaces:* As we continue to develop our core technology and provide support to our customers, it becomes increasingly critical that a growing number of APIs or supported interfaces are developed. Interfaces are the means by which services are made available to custom tools while still protecting core technology from individualized changes and maintaining consistency across implementations for common support practices and upgrade paths. Key interfaces in current Blackboard implementations, such as APIs, include: the enrollment interface that provides connectivity from an administrative system to the Blackboard enrollment procedures; and the security or session interface that allows for single login capabilities. These interfaces, created with a uniform

## THE BENEFITS OF TOOLS, SERVICES, AND INTERFACES

### EXAMPLE: CUSTOM CONTENT SIMULATION

A content developer builds a virtual biology lab using multimedia content and assessment functionality. After she develops the lab, she uses the Blackboard content interchange package to move the lab into the Blackboard platform. She then uses the Blackboard open grade book interface for reporting performance data to the Blackboard grade book as the lab is running within the Blackboard window to provide consolidated reporting by student and grade item (Blackboard knows how to "listen" to the data being reported and store it accordingly). In addition, she uses Blackboard's "role" system service to customize certain features for instructors and students, allowing instructors to modify the lab and students to interact with the lab. Finally, she relies on Blackboard's security and permission rights services to protect her intellectual property and can therefore make the lab available to the broader Blackboard community via content metadata and Blackboard's resource service.

standard, provide third-party developers a universal way to interoperate with the Blackboard platform. Interfaces serve as more than a connection to external systems, they enable users to modularize internal tools and enhance functionality and customization. Our move in this direction will empower clients and business partners alike to easily and successfully build custom tools onto the Blackboard platform.

While achieving mission-critical thresholds for scalability is a big focus for Blackboard in the near term, the major long-term innovation offered by our new architecture is the separation of the three major areas described above,

## THE BENEFITS OF TOOLS, SERVICES, AND INTERFACES

### EXAMPLE: CUSTOM COMMUNICATION

Campus A has adopted Blackboard as the standard e-Learning platform, and the science and math disciplines require a specialized collaborative tool for mathematical notation, which Blackboard does not currently bundle with its system. The campus reviews several potential Blackboard-enabled collaborative science tools, selects one, and registers it with the platform. Faculty can now replace, or add to, the generic Blackboard suite of collaboration tools to enable specialized communication with mathematical symbols – allowing end users to benefit from centralized tracking role-based features, and single login capabilities.

making the “operating system” concept a reality. Unlike competitive products in the market, Blackboard has invested heavily in developing a true platform where the real value proposition builds on a feature-rich set of tools and functionality. The platform provides an underlying architecture of flexibility that builds on our middleware of services, and interfaces to assemble a full spectrum of the right set of e-Learning capabilities that makes sense for our clients.

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## CONCLUSION

Whether used to enhance traditional classroom teaching and learning or for distance education, the Internet has forever transformed the way we teach, learn, and transfer knowledge in the digital age. Although a great deal has been accomplished during the past few years, in truth our industry is still at the “Model T” stage. Blackboard’s work is truly prologue to the future of e-Learning technology.

Blackboard has achieved success by focusing on three key foundational pillars: ease-of-use, enterprise-grade product architecture, and effective, pedagogically oriented teaching tools. The recent release of Blackboard 5 builds upon this foundation by providing a sophisticated architecture for integration with administrative systems, support for multiple relational databases, portal technologies, and modularity within the Blackboard platform. The next phase of this evolution is embodied in the Building Blocks Initiative (B<sup>2</sup>). By building a sophisticated product infrastructure that integrates tools, services, and interfaces, Blackboard will be taking a significant step toward the vision of providing the industry’s leading academic operating system and bringing education online.

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For more information regarding Blackboard's products and services,  
please contact us at 1.800.424.9299 or visit [www.blackboard.com](http://www.blackboard.com)



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