

The Managed Learning System:[®] A Framework for the Future of Educational Technology

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When the No Child Left Behind (NCLB) Act was signed into law in early 2002, educators and school administrators found themselves faced with a daunting task of meeting new reporting requirements and complying with mandated standards for teaching and learning. These new challenges have arisen at a time when many school budgets are already stretched to the limit. At stake are large amounts of state and federal money that could be withheld if schools fail to meet the requirements of NCLB.

Four key issues define the problems that are urgently confronting our nation's schools and school districts. These issues are:

- **Alignment** with federal and state educational standards has become a major issue. What should students know and at what grade level should they know it? What constitutes a “highly qualified” teacher? How do you find content that embodies these standards?
- **Assessment** is viewed as a way of testing whether standards are met. Does the prescribed content produce the desired results?
- **Access** demands that all schools provide quality education, regardless of geography or the wealth of their communities.

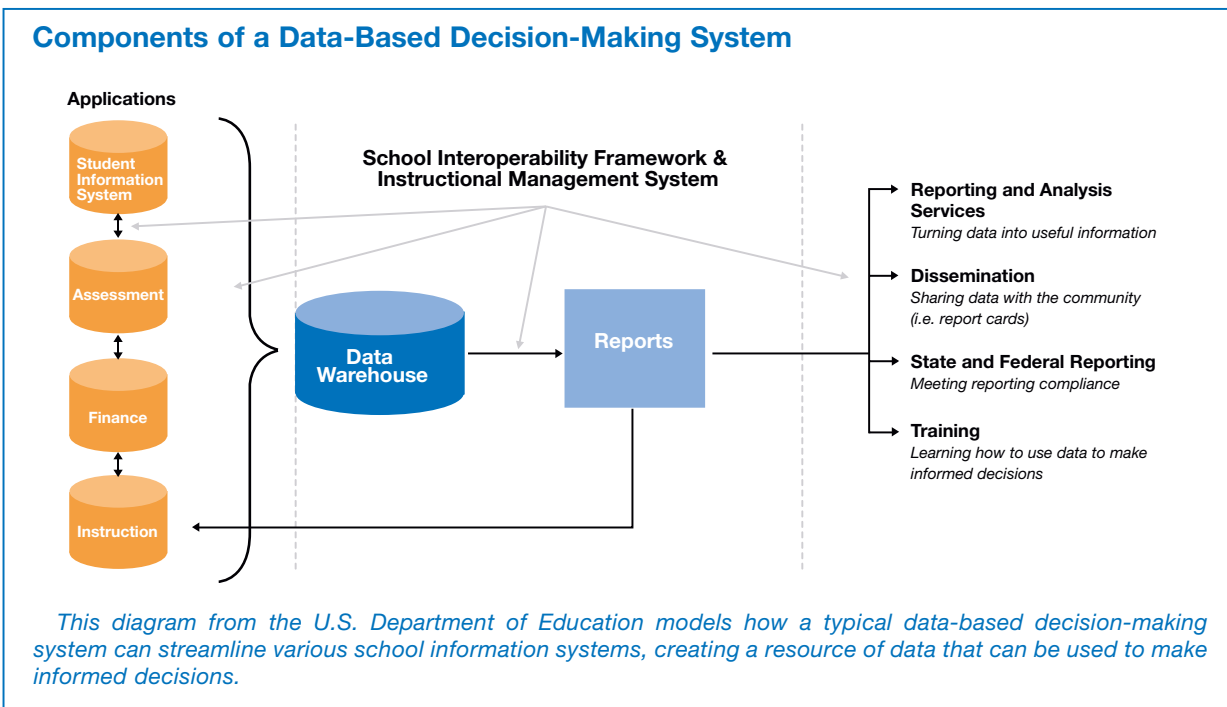
- **Accountability** says that schools and school districts must be able to show — in detail — that they are not only teaching to high standards, but also achieving high levels of student performance over time.

Until very recently, truly workable, broad-scale technology solutions for managing the flood of information that characterizes the educational enterprise have remained on the distant horizon. That is now changing — and changing rapidly.

There is now a unified solution that enables schools to address the full range of business, reporting and educational requirements imposed by NCLB. Equally important, this solution allows schools to build upon the systems already in place and to position themselves for future growth and technological advancement.

Introducing the Managed Learning System[®]

A group of leading technology innovators has now combined resources and expertise to provide a comprehensive and integrated solution to the challenge that faces America's schools — the **Managed Learning System[®]** (MLS). Based on a scalable, open standards technology framework, MLS



Source: U.S. Department of Education Office of Educational Technology
www.ed.gov/technology, www.nclb.gov

enables K-12 organizations to leverage and deploy their own Web-based technology-enhanced learning environment. This flexible, powerful solution is a framework that enables schools, educators and providers of educational content and tools to work together and manage information in ways that ensure no child is left behind.

To accomplish this massive effort, a team of industry leaders has pooled resources and expertise. The team includes Intel, Microsoft*, Dell*, BearingPoint*, Riverdeep* and JES & Co.* These high-tech visionaries cover all the areas necessary to ensure system interoperability by design: chip manufacturing, operating systems and software, hardware, systems integration, content development and implementation. MLS draws upon state-of-the-art technology from each team member so all parts of the complex puzzle work together to achieve the desired goals.

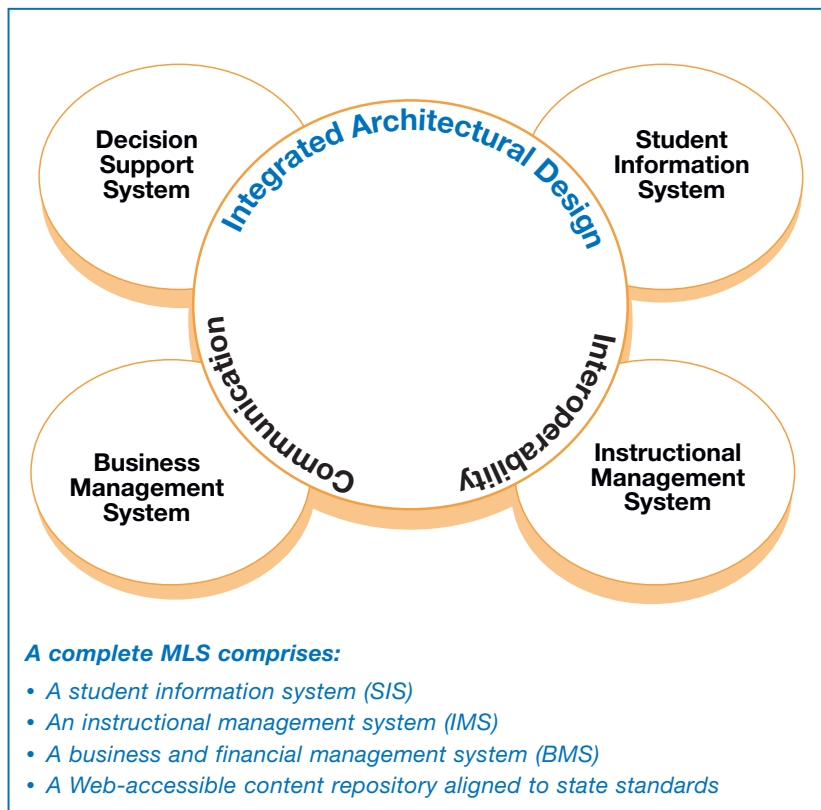
The **Managed Learning System**[®] represents innovation on a grand scale. It is useful to teachers in the classroom, for teaching and assessment, and equally useful to administrators who are ultimately responsible for accountability and reporting. In addition, MLS promotes parental and community involvement by creating powerful communication links.

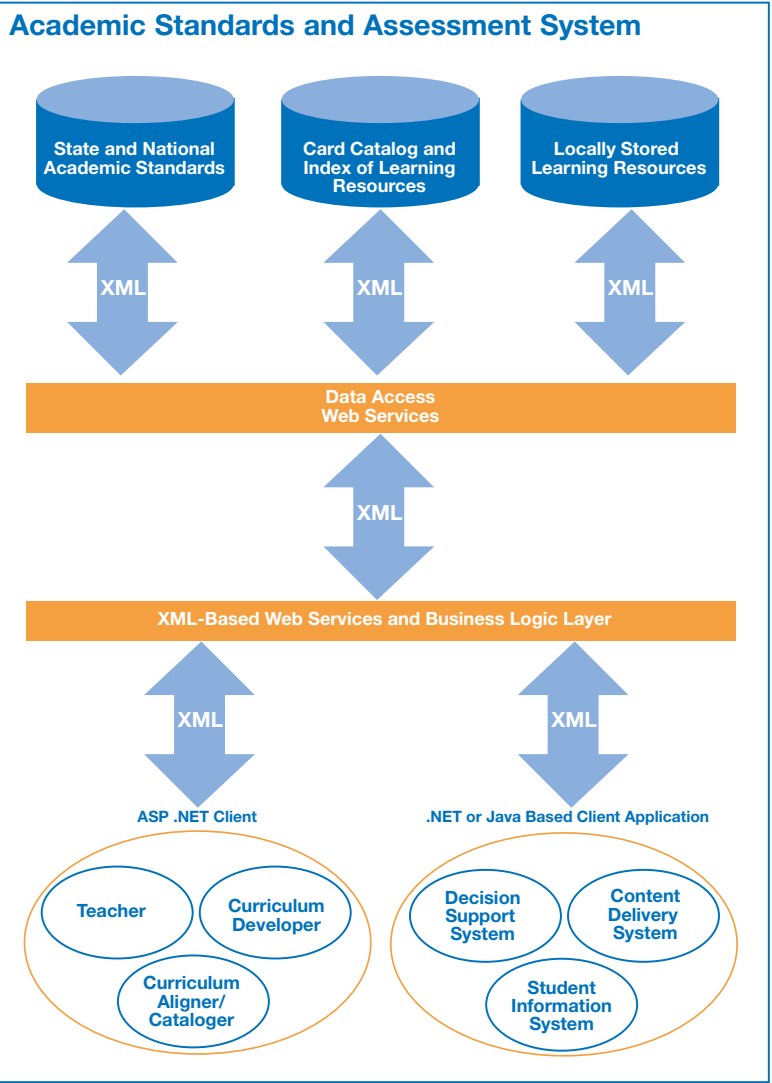
MLS is designed to respond intelligently to the full range of demands placed on educators by NCLB, using technology to find, catalog and deliver quality educational learning resources, while demonstrating that technology positively impacts student achievement. The system provides information management tools that are seamlessly integrated, easy to learn and use, reliable and affordable. It is based on open-architecture and non-proprietary standards for data interchange and business process integration. Interoperable systems that work together as a result of standards-based design are the core of MLS, helping create

research-based solutions to the critical issues of alignment, assessment, access and accountability.

The Solution Overview

Educators using the MLS solution can create, share and retrieve XML-based records that facilitate management of information about such things as lesson books, lessons, documents, online courses, pictures, video and audio clips, Web sites, pieces of paper — or anything else a teacher could use in the classroom. These learning objects can be cataloged to include alignments to state and national academic standards. In addition, XML-based records allow educators to find resources and assess whether the learning objects meet targeted teaching goals with applicable standards and teaching methods.





Because the MLS solution is based on industry standards for delivering an interoperable, scalable architecture that complies with federal academic requirements, it enables schools to use the best available technology to:

- Manage and catalog resources.
- Build back-end accountability to decision and information support systems.
- Share aligned curriculum, lesson plans and other resources with other schools, districts and state education agencies.

Affordable for even the smallest districts and scalable to regional, state and national deployments, the MLS solution has been designed to qualify for federally subsidized funding through the E-rate program.

A Team of Giants

The list of companies that have joined forces to create MLS is a veritable who's who of high-tech innovators. Each team member is a recognized leader that brings specialized expertise and knowledge to the process. The power of MLS is attributable in no small part to the strength of its creators and their vision. Interoperability by design is enhanced by the inclusion of world-class participants with expertise in hardware, operating systems and software, interactive curriculum development and systems integration.

Dell Computer brings to the collaboration a well-deserved reputation for high-quality, reliable Intel-based computers. "Dell has had a long-standing commitment to the education market," notes Karen Bruett, Dell's Director for Public Marketing. "We chose to become part of the MLS team because we saw that our philosophy of open architecture and adherence to industry standard technology would directly benefit the

K-12 market by lowering total cost of ownership, helping to ensure scalability, and ensuring that all major parts of a school's information system can talk to each other."

The backbone of the MLS is Dell's industry-standard servers and storage. Because these are proven products currently in use, there are no special problems that first have to be solved before schools can begin to tie content and assessment packages back to state standards.

The use of open standards assures that hardware and software components within a technology structure can

communicate with each other. By contributing to interoperability, Dell components lower deployment costs and help to make integration of data systems faster and easier.

“Scalability is another key consideration,” Bruett points out. “MLS is designed to handle the work load as the number of users increases. Scalability means that the cost per user should decline as the number of users increases. By designing in an open architecture, MLS increases scalability — so schools can build as they grow, rather than having to make a huge investment up front.

Microsoft Corporation joined in developing the MLS framework to create a “showcase example” of how Microsoft’s .NET* technology and Class Server* curriculum management platform can help school districts, teachers and students improve K-12 education.

“A key component of the MLS framework is an instructional management system, usually deployed at the district level and based on Microsoft’s Class Server,” says Jason Palmer, Microsoft’s Education Solutions Manager. This powerful Web-enabled software is designed for schools and delivers key benefits to teachers, students and parents, allowing high levels of teacher creativity and student learning — all within a standards-aligned curriculum. Class Servers make it easy for administrators to have secure integration and interoperability with systems already in use at the school.

“Class Server was built to meet the requirements of No Child Left Behind,” Palmer notes, “as well as the specific needs of school district administrators, teachers and students. When deployed as part of a complete **Managed Learning System**[®], Class Server enables the regular delivery of self-grading tests and standards-aligned lessons over the Web. Tests and lessons are tracked digitally, and results flow through the MLS based on open-standards, making it easy for teachers to track and improve student performance against local standards in real time. In addition, district administrators can create reports that measure student performance and enhance large-scale, data-driven decision-making.”

Class Server enables students to access homework and assignments anywhere, anytime from any Web browser. In addition, Class Server saves time for their teachers, so they can provide students with more individualized and immediate feedback. Class Server has the power to do for teachers what Microsoft[®] Office has done for office workers.

Intel provides the affordable architecture-based systems that create the responsive performance needed to manage rich, multimedia educational content and enhance the effectiveness of teachers and administrators.

Intel technology ensures that MLS servers are robust, with uncompromising reliability, scalability and performance. Intel offers solutions derived from a wide range of available software. In addition, Intel provides standard building blocks for a highly cost-effective open, layered, modular infrastructure.

“The technology industry must continue to focus on solutions that provide educators a better way to educate our children and to make better data-driven decisions,” says Tom Lacey, President Intel Americas. “These technology solutions must solve today’s challenges and lay a solid foundation for education’s future needs. The solutions must make the educators’ jobs easier and not add to the already heavy burdens they bear. The bottom line is that the quality of education and the education process for our children should be a top priority for every company.”

Riverdeep is a leading publisher of K-12 interactive curriculum used in over 70 percent of the nation’s classrooms, featuring the Destination* series and other titles. The company offers a wide variety of engaging, research-based online and CD-ROM solutions that meet the mandates of No Child Left Behind.

Riverdeep’s award-winning Destination Reading^{TM*} and Destination Math^{TM,*} operate on the MLS framework and provide research-based, standards-aligned interactive curriculum. The Destination MathTM Series is a carefully sequenced, comprehensive curriculum that spans grades K-12.

The Destination ReadingTM Series is a comprehensive, research-based literacy program that enables all students to

succeed, whatever their learning style. Destination Reading supports the Reading First mandates of NCLB and is grounded in the most current scientific research on early literacy.

MLS combines the Destination Series with a powerful system of online assessment and electronic lesson plans aligned to state frameworks. It allows teachers to manage class and student assignments, track individual progress, create custom diagnostic tests and automatically generate prescriptive assignments based on each student's unique areas of need.

According to Riverdeep's David McLaughlin, "The Destination series, with its interactive content, provides careful sequencing of skill development so that each new skill builds upon prior skill learning." When brought into the MLS framework, these programs help offer educators the dynamic content that helps ensure no child is left behind.

BearingPoint provides system integration services that help schools, districts, and state-level agencies to realize the benefits of the MLS solution quickly and effectively. "MLS is the first truly integrated approach to achieving the vision of NCLB," says BearingPoint's Michael Johnson. "Until now, the critical elements of student information, curriculum and performance tracking were defined as separate solutions. MLS brings those solutions together to offer educators and administrators a coherent solution."

Recognizing that each deployment is tailored to meet the needs of a specific organization, BearingPoint's system integration offerings provide a range of services, including:

Feasibility planning to determine the need for and potential benefits of implementing the MLS solution. BearingPoint is experienced in assessing organizations from a variety of perspectives relevant to the MLS solution and helping build a business case for adopting the MLS capabilities.

Implementation services and project management services from BearingPoint provide the peace of mind that comes with knowing an MLS solution is based on best practices, business strategy and processes, and current education trends and mandates.

"Our role is to assist schools in installing MLS," Johnson explains, "and to optimize the solution to accomplish compliance with NCLB."

JES & Co. is providing project management services for the most comprehensive full-scale installation of an MLS solution. "Our company helps technology leaders add value for education customers who are implementing technology plans," says JES & Co.'s Diny Golder-Dardis. "We administer education programs and consult to departments of education at the state and regional levels throughout the United States on projects that integrate technology with administration, content and curriculum.

JES & Co. is working with the MLS team to address the complex task of deploying the most significant full-scale system based on the MLS framework, Oklahoma's VISION Project. "The goal of the Oklahoma VISION project is to deploy an MLS solution capable of delivering Web-based, standards-aligned curriculum to all 500 Oklahoma school districts, serving more than 600,000 students," Golder-Dardis says. The company's white paper, *Managed Learning Systems: Defining and Validating New Methods of Delivery and Accountability*, is the first in a series of monographs addressing the complex task of building a seamless system that address fully and affordably the reporting, accountability and content delivery requirements of the No Child Left Behind Act.

Case Study

MLS in Action: The Oklahoma VISION Project

Since 2001, MLS partners working with project manager, JES & Co., have demonstrated the potential of Web-based instruction as the “early adopters” of the Virtual Internet School in Oklahoma Network (VISION) project. In nine districts, standards-aligned mathematics curriculum is being delivered over the Web by Microsoft® Class Server. An academic standards and assessment system (ASAS) developed by JES & Co. provides the Web-accessible database used to catalog, store and search standards-aligned content.

Using the MLS framework as the core of the VISION project, Oklahoma has developed convincing evidence that integrating technology into the classroom can positively impact student achievement. Convinced of the value of the architecture and overall solutions approach, Oklahoma is working to expand their standards-based curriculum management solution to include additional educational materials.

The goal is to have all of Oklahoma’s 500 school districts tied into a statewide system that will meet the VISION project goals for students, teachers, local schools and districts. In addition, this statewide system will allow the Oklahoma State Department of Education to serve schools throughout the state and manage and analyze statewide learning assessments.

In Western Heights, Oklahoma, teachers are using the MLS-based system to boost student performance and simplify curriculum development. Jennifer Colvin, a seventh- and eighth-grade math teacher from Western Heights, says “Teachers are enthusiastic about system features such as the instant feedback provided by Class Server. It automatically grades math work and gives students instant feedback. That is amazing. You normally can’t do that unless you are teaching one-on-one.” Colvin also notes that the system facilitates collaboration by giving teachers the ability to share ideas and resources.

“This ability to share and integrate resources is very powerful,” notes Joe Kitchens, Superintendent of the Western Heights School District in Oklahoma City. “Teachers around the state can share materials, lesson activities and methodology and access content from commercial publishers.”

After watching teachers in his district and from around the state use Class Server, Kitchens says, “The proficient users have become content developers and are using Class Server as a robust development tool. They use it to integrate communications tools like videoconferencing, Web communications and audio chat into their lesson plans and, at the same time, individualize learning for their students.”

As Oklahoma’s VISION project makes clear, the visionary MLS solution helps educators, content providers and standards-based software meet the reporting and accountability requirements of NCLB, while offering teachers the ability to align and deliver academic curriculum, learning resources, and assessments with rigorous academic standards. Affordable, flexible and scalable, MLS is today’s answer to meeting the future demands of the K–12 enterprise.



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