



Monarch Media, Inc., Business White Paper

Open-Source Learning Management Systems: Sakai and Moodle

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Executive Summary

As education and training become more critical to success, organizations are struggling to find the right blend of people, protocols, and systems to manage their learning programs. During the past 15 years, learning management systems (LMS) have become important for eLearning providers as platforms to handle course registration, content storage and delivery, assessments, administration, and reporting.

The LMS market, however, has remained highly fragmented. No single vendor has gained dominance, and analyst firms that track this industry, such as Bersin & Associatesⁱ, report that customers can choose from dozens of different providers. Each vendor may target different types of organizations — including multinational corporations, universities, government agencies, and nonprofits — and all have strengths, weaknesses, and costs.

Today, more than 40 percent of U.S. training organizations report that they have an LMS installedⁱⁱ, but levels of satisfaction, return on investment, and effectiveness vary, making selecting the right tool for your situation a complex process.

In this environment, open-source LMS solutions have been steadily gaining ground on their commercial counterparts. Many of these open-source platforms got their start in academia, but they have made inroads in the government, non-profit, and corporate markets. Today, the top open-source LMS options provide:

- Feature-rich toolsets;
- Enterprise-grade stability, scalability, and security;
- A high degree of control and flexibility; and
- Generally lower long-term costs than commercial options.

This white paper provides an overview to help you decide if an LMS is right for your organization. It will also explore the strengths and weaknesses of open-source LMS solutions overall, and Moodle and Sakai, two of the most popular open-source offerings, in particular.



Introduction to the LMS

The LMS category includes applications that go by a variety of names, including virtual learning environments, course management systems, and collaborative learning environments. The different commercial and open-source platforms also vary in terms of capabilities and features. Nevertheless, according to the American Society for Training and Development (ASTD)ⁱⁱⁱ, a robust LMS should be able to at a minimum do the following:

- Centralize and automate administration;
- Offer self-service and self-guided services (such as learner self-registration for courses);
- Rapidly assemble and deliver learning content;
- Consolidate training initiatives on a scalable Web-based platform;
- Support portability and standards, such as SCORM; and
- Personalize content and enable knowledge reuse.

Common functionalities included in most enterprise-grade LMS solutions today also include:

- Content management features that provide control over the storage, aggregation, retrieval, and delivery of learning materials. LMS administrators can also create catalogs and match learners — or groups of learners — to courses;
- Rebranding and customization options;
- User management tools allowing administrators to categorize users and assign them to roles and groups;
- Assessment creation, grading, and tracking features;
- Collaboration tools, such as email, wikis, discussion boards, and chat;
- Reporting and analytics about system and course usage, learner progress, assessment results, and more; and
- Security features limiting access to authorized people and roles.

These lists are by no means comprehensive. Many organizations also need their LMS to integrate with other software systems, include ecommerce capabilities, manage competencies, or meet a variety of other requirements. The high-end learning management systems available — including several open-source offerings — offer toolsets to meet these requirements and more.



An LMS is not a substitute for instructional design when it comes to planning your curriculum and courses.

What Your LMS Won't Do

One thing that most LMS applications don't do terribly well is actually creating the content for your courses or trainings. An enterprise LMS can store and deliver materials developed in a variety of different formats — everything from MS Office documents to Flash-based videos and applications — but you will generally have to develop these files using separate, dedicated content authoring software.

Also, an LMS is not a substitute for instructional design when it comes to planning your curriculum and courses. Many LMS platforms have tools to assist with this process, such as lesson builder or planner features. However, creating a truly effective eLearning program still requires considerable planning and expertise.

Hosting Options

Another issue organizations must consider when investing in or switching to a new LMS is deciding whether or not to take on the complexity and expense of installing the application on their own servers vs. subscribing to a software-as-a-service (SaaS) option.

An installed LMS generally gives organizations the greatest degree of control and responsibility for stored information, which may be the critical factor when dealing with sensitive data. In many cases, however, a vendor-hosted LMS may be the more cost-effective option, as it frees up an organization from having to commit equipment and personnel to store, maintain, and update the application.

Luckily, most commercial and open-source LMS platforms today offer both options. In fact, this is one area where selecting an open-source LMS may offer more flexibility, as you will be less reliant on a single company or distributor network to host, maintain, customize, or update your system.

Evaluating Costs and ROI

As an enterprise software tool, an LMS can be quite expensive, and the costs aren't usually limited to acquiring the software package. Commercial LMS vendors generally charge an ongoing annual license, maintenance, or subscription fee based on the number of users in your organization.



The key to successfully selecting and implementing an LMS is careful planning.

In addition, most LMS installations require significant customization or other services up front. These may include branding, integration with other software systems, one-time installation charges, data migration or uploading, and more.

Finally, the total cost of ownership of an LMS can include many related expenses, including:

- Service and support agreements;
- Consulting;
- Training;
- Servers and other IT equipment;
- Upgrade costs; and
- Staffing.

According to a 2010 eLearning Guild survey^{iv} of 909 of its members, the cost to acquire, customize, and install an LMS, depending on the size of your organization, its existing resources, and its needs, can range from less than \$10,000 to more than \$1 million. After that, the ongoing annual maintenance costs can again vary from less than \$10,000 to more than \$250,000 per year.

Despite these costs, however, multiple studies have found that for the majority of organizations, an LMS does provide a positive return on investment. It can increase the productivity of instructors and training managers, improve learning results, and reduce costs of compliance, among other outcomes.

Planning Is Key

With such variability in functionality, cost, and hosting options, the key to successfully selecting and implementing an LMS is careful planning. It's critical to evaluate your organization's needs and requirements, as well as budget, staffing, and other available resources. Careful consideration of all these factors will help you decide if an open-source LMS may be the best option.

Open-Source Overview

Open-source solutions are software for which the source code is provided under a license that permits users to access, change, and improve it. Most open-source software is free to use in an unlimited manner, although the specifics of the soft-



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ware license can vary from application to application.

The open-source movement has experienced sustained growth since it was formalized in 1998. Today there are open-source solutions for everything, from computer operating systems, such as Linux, to complex business applications, such as customer relationship management, content management, and learning management systems.

The Open-Source LMS

According to an analysis conducted by Epic Performance Improvement (Epic)^v, there are more than 50 open-source LMS platforms available. Of these, however, only a few have the functionality and capacity to be truly considered enterprise-grade solutions.

Epic's study also found that open-source LMS are being used in a range of environments, including:

- Large corporate enterprises;
- Small- and medium-sized businesses (SMB);
- Government and public sector agencies;
- Primary and secondary education;
- Learning project-specific situations; and
- Higher education.

The most popular open-source solutions all started out primarily aimed at — and in some cases developed by — the higher education market. Both Sakai and Moodle, for example, have their roots in academia, and continue to be dominant players there.

The more successful open-source LMS applications, however, have gradually expanded beyond their higher education roots, usually by first making inroads in the government and non-profit markets and then moving into corporate training departments.

Benefits of an Open-Source LMS

Although no open-source LMS platform is perfect for every organization or situation, some of them compare quite favorably to their commercial counterparts and offer a number of advantages, including:

- Ease of customization — because their code is open,



It can cost just as much to install and customize an open-source system as a commercial one.

it can be easily accessed and modified to meet specific organizational needs, such as interacting with other enterprise systems, including ERPs and HR software packages. They can also be easily rebranded.

- Extensibility through third-party add-ons.
- Ease of localization — again, the open-source code can be easily modified for use in languages that most commercial vendors would ignore.
- Flexibility to host, customize, develop, and obtain services, training, and support from a variety of vendors rather than from a single company.
- No licensing costs, leaving more budget for system tailoring and often reducing total product lifespan costs.
- Generally faster bug fixes, new version releases, security patch releases, and feature upgrades.
- Protection from commercial product offering disruptions or discontinuations caused by vendor collapse, mergers, and acquisitions.

Weaknesses and Risks

Despite these advantages, open-source LMS solutions have their problems. First, despite the free source code and lack of ongoing licensing costs, it can cost just as much (and sometimes more) to install and customize an open-source system as a commercial one. Organizations also generally have to budget as much for technology infrastructure, system maintenance, staffing and administration, training, and support, as they would for a commercial product.

In addition, although most high-end open-source platforms are managed by nonprofit foundations that provide clear product roadmaps, good documentation, and core development teams, some less popular solutions may lack these.

Choosing an Open-Source Option

When evaluating open-source LMS platforms, organizations should apply the same criteria as they do when evaluating commercial offerings. They should start by carefully considering all needs and requirements, as well as their budget and resource availability, and then evaluate solutions based on those criteria.

For open-source platforms, Epic's open-source LMS analysis^{vi} determined that there are several additional factors that should be considered:



There are significant differences in the underlying technologies and approaches of Moodle and Sakai.

- The solution should have a license approved by the Open Source Initiative.
- There should be an active developer community.
- There must be stable, released versions already available.
- The open-source LMS should be SCORM compliant.
- There should be published details about previous adopters.
- There must be a stable organization supporting the platform's ongoing development.

Although there are about a dozen open-source LMS solutions available that meet all these criteria, the remainder of this white paper focuses on two of the most popular — and highly rated — options: Moodle and Sakai.

Moodle vs. Sakai

Despite common origins as LMS solutions designed primarily for the education marketplace, there are significant differences in the underlying technologies and approaches of Moodle and Sakai.

Meet Moodle

Martin Dougiamas, an Australian graduate student, originally developed Moodle in 1999 as a course management system. The platform was released to the public in 2002, initially with only the education market in mind.

Moodle's source code is written in PHP, a common, free scripting language that was originally developed for building dynamic Web pages. The Moodle Trust oversees the platform's core development, but the software is designed to be highly modular, and numerous developers and organizations have created plug-ins and other add-ons to increase functionality over the years.

Moodle is thought to be the most popular of the open-source LMS systems in use today. According to the Moodle Trust, as of the end of October 2010, there were more than 49,600 registered sites using Moodle to offer almost 4 million courses to 38 million users worldwide.



Moodle's ease-of-use focus makes it ideal for lower resource organizations, such as schools, nonprofits, small businesses, and local government agencies.

Moodle Strengths and Weaknesses

Much of Moodle's popularity rests on its ease of use. As an LMS, it provides a robust toolset, particularly thanks to plug-in modules that greatly increase its functionality. Moodle's feature set includes:

- Site management and administrator tools;
- A variety of user management options, including multiple authentication options, online profile building, and role-based assignments and permissions;
- Registration and enrollment tools and plug-ins; and
- Course management and communications options, including chat, forums, wikis, assessment builders, and more.

Despite all these features, Moodle's core design is meant to be as simple and efficient as possible. This strategy has paid dividends in the form of high satisfaction ratings among Moodle users. Research from the eLearning Guild^{viii} has found that its members rate Moodle tops among LMS platforms when it comes to satisfaction with ease of use, ease of installation, and time to implement.

Moodle also has its detractors, however. Some power LMS users complain that its interface design doesn't offer enough options for rebranding and customizing its look and feel without extensive coding work.

Users also argue that Moodle relies too heavily on third-party add-ons to create functionality rather than including it as part of the core product. This can increase the workload for maintaining and updating the software as new versions are released.

Finally, Moodle lacks a full-featured competency development and management toolset, which is required by many large corporate clients. Although there are workarounds that can allow some competency tracking and reporting, Moodle is hurt in certain markets where robust competency management is a requirement.

Despite these limitations, in the right setting, Moodle is an ideal LMS solution. Its ease-of-use focus makes it ideal for lower resource organizations, such as schools, nonprofits, small businesses, and local government agencies. Moodle is also perfect for rapid deployment needs, where an organization requires an LMS to deliver and track a training or learning program on short notice or on a project basis.



Sakai's reputation for higher-end features, scalability, and security have made it popular with large universities that need a robust solution.

Meet Sakai

In contrast to Moodle, Sakai was developed on a more centrally planned model. Funded by a Mellon Foundation grant, Sakai was built by a consortium of five large U.S. universities, including Michigan, Stanford, MIT, UC Berkeley, and Indiana. It was based on existing tools contributed by each of the founding institutions.

Sakai was released to the public in 2005 and is managed today by the Sakai Foundation, which oversees its development and project roadmap. The application is programmed in Java and designed to be a service-oriented application suite.

As a newer platform, Sakai has not yet achieved the large penetration outside the higher education marketplace that Moodle has gained. Its reputation for higher-end features, scalability, and security, however, have made it popular with large universities that need a robust solution, and it is beginning to make inroads in the government and public sector markets as well.

Sakai Strengths and Weaknesses

Sakai was conceived as a collaborative learning environment, and its collaboration tools do indeed cover the full gamut offered by most commercial solutions. Sakai offers four main categories of features and tools:

- General collaboration features. These range from course announcements to Wikis to RSS feeds, covering most common Web-based collaboration and communications tools.
- Teaching and learning features. These course management and learning tools allow instructors to build and plan lessons, create and grade assignments, develop and offer tests and other assessments, and share files via a drop box.
- Portfolio tools. These feature offerings are designed to help users create, publish, share, and view portfolios of work. They include a variety of templates, matrices, and wizards to make portfolio building easy.
- Administrative management. Sakai's toolkits offer robust options for managing accounts, user roles and date, site setup and editing, and data integration and warehousing tasks.



For higher education, many government agencies, small- and medium-sized business, and nonprofits, either Sakai or Moodle can be a great solution.



Analysts and users consistently rank Sakai at or near the top among open-source LMS platforms for its reporting features, the ease with which it can be customized and rebranded, and its collaboration tools.

On the negative side, Sakai's critics point out that it, like Moodle, lacks comprehensive competency profiling and management, which makes it unsuitable for some large enterprise environments. It also can be challenging to integrate Sakai with other enterprise software systems, such as talent management, other HR software suites, and ERP solutions.

Sakai's greater complexity also makes it more challenging to install and set up than Moodle. This makes it less suitable for simple, rapid deployment projects that require an LMS.

Final Thoughts

An open-source LMS solution isn't right for every situation or customer. Large organizations that require competency profiling and tight integration with a wide variety of other systems will probably want to stick with the commercial enterprise offerings.

However, for higher education, many government agencies, small- and medium-sized businesses, and nonprofits, either Sakai or Moodle can be a great solution. Both have the scalability and capacity to handle large-scale installations for more than 200,000 users. Both offer rich feature sets, excellent administration and management tools, and enterprise-grade security.

Just as important, both platforms are managed by foundations with clear and intriguing product roadmaps. These ongoing development plans will let Sakai and Moodle capitalize on new developments in Web and learning technology, such as the growth of social media.

In the end, deciding which solution is better comes down to your organization's needs. If customization, reporting and analytics, and collaboration are high priorities for your eLearning initiative, Sakai is probably your best option. If you're looking for ease of use, extensibility, and a wide base of other customers — as well as support and service vendors — Moodle may be ideal.

Regardless, open-source platforms have reached a level of maturity that make them worth evaluating if you're considering investing in a new or upgraded LMS. The benefits they offer in terms of lower costs and greater flexibility could make them a great solution for your organization.

About Monarch Media

Monarch Media is an industry leader in delivering eLearning solutions across the globe. For more than 13 years, we have helped leading government agencies, companies, universities, and nonprofits accomplish their training and learning goals by developing education software solutions, building online courses, deploying and hosting learning management systems, and creating Web-based training materials. Monarch Media is a California corporation with small-business, woman-owned, and green-business certifications, and is a member of the eLearning Guild and the IMS Global Learning Consortium.

Monarch Media specializes in open-source platforms that provide enterprise-grade functionality, scalability, security, and stability. Open-source platforms also offer cost savings and tremendous flexibility in terms of customization, hosting, support, and service.

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