

LCMS and LMS

Taking Advantage of Tight Integration

August 2001

Raghavan Rengarajan
Chief Software Architect
Click2learn, Inc.



MAKING KNOWLEDGE A TANGIBLE ASSET.

Abstract

Learning Content Management Systems (LCMS) and Learning Management Systems (LMS) represent two distinct but complementary product categories. Each has unique strengths and value propositions, and one does not replace the other. At the same time, a tightly integrated LCMS and LMS solution may offer unique benefits that surpass the value offered by each system separately. This paper analyzes the relationship between the two systems and discusses the advantage of a tightly integrated LCMS and LMS solution, ideally from the same vendor.

What Is an LMS?

An LMS essentially helps manage an organization's learning activities and competencies. The activities managed by the LMS could vary from instructor-led classroom training to educational seminars to Web-based online training. From an end-user point of view, an LMS provides an effective way to keep track of individual skills and competencies, and provides a means of easily locating and registering for relevant learning activities to further improve the learner's skill levels. An LMS also provides access to online courses for which the user registers. Administratively, an LMS makes it easy to enter, track, manage, and report on learning activities and competencies in an organization.

In essence, an LMS primarily focuses on competencies, learning activities, and the logistics of delivering learning activities. An LMS does not focus on creation, reusability, management, or improvement of content itself.

What Is an LCMS?

In contrast, an LCMS helps create, reuse, locate, deliver, manage, and improve learning content. Content is typically maintained in a centralized content repository in the form of small, self-describing, uniquely identifiable objects, or *learning objects*, each of which satisfies one or more well-defined learning objectives. Each learning object may have been created from scratch or by re-purposing existing knowledge documents in other formats. An LCMS may locate and deliver a learning object to the end-user as an individual unit to satisfy a job-specific need or deliver the learning object as part of a larger course, curriculum, or learning activity defined in an LMS.

An advanced LCMS tracks the user's interactions with each learning object and uses this detailed information to deliver highly personalized learning experiences while providing authors with rich reports for analyzing the clarity, relevance, and effectiveness of content, so it can be improved on an ongoing basis.

Some leading-edge LCMS products go even further to enable powerful collaboration and knowledge-exchange paradigms in the context of learning objects, and empower users to collaborate with each other as well as with subject-matter experts on specific learning objects. These knowledge exchanges are also captured, archived, and made easily available to future users to expand and supplement the knowledge encapsulated by that learning object.

An LCMS essentially focuses on creating, reusing, locating, delivering, managing, and improving content. In certain cases, the focus also extends to fostering knowledge communities and capturing the unstructured knowledge around the learning object in a tangible form. But an LCMS does not deal with competency management, the extensive administrative functionalities of managing learning activities, or the logistics of these activities.

Where Do LMS and LCMS Meet?

Though Learning Management Systems and Learning Content Management Systems fundamentally differ in focus, they address complementary aspects of the same high-level goal: *to accelerate knowledge transfer*. In achieving this goal, they share common ground in three key areas:

Content

Content is a key ingredient handled by both LMS and LCMS. The LMS manages, prescribes, delivers, and tracks online courses, which are typically composed of learning objects that were created and defined in the LCMS. The LMS and LCMS both monitor the delivery of content but at different levels of granularity. An LMS concentrates on course-level tracking, particularly completion status and rolled-up scores. In contrast, an LCMS employs detailed tracking at the learning-object level not only to trace user performance and interactions at a finer granularity, but also to provide the metrics that help authors analyze the learning object's clarity, relevance, and effectiveness.

Users

Users play a central role in both LMS and LCMS. Independent of whether the resource is a learning object, an online course, an expert, or some other form of learning activity, an important common goal of products in both categories is delivering the learning resource to the user in the most effective way possible. A typical LMS maintains a rich profile of each user, including organizational affiliations, job role, preferences, competencies, skill levels, participation in past learning activities, and so forth. Users typically go to the LMS to manage their current competency status, analyze their skill gaps, and register for learning activities that will help them reduce their skill gaps against an aspired career path. An LCMS focuses on delivering a personalized experience to the user that provides just enough content to address the person's individual needs, just when he or she needs it. An LCMS may also enhance this experience by customizing the content based on a user's profile or by offering rich collaborative and knowledge-exchange capabilities around the content. The key difference is that the LCMS takes advantage of all the information available about the user to offer a personalized experience when delivering a learning object, while an LMS typically maintains the user profile information and makes it available to the LCMS to deliver the personalized experience.

Administration

An LMS and LCMS share varying degrees of administrative interests in content as well as users. An LMS typically offers detailed user administration including user profiles, competencies, roles, and organizational properties, but only high-level content administration and tracking. In contrast, an LCMS offers extensive content administration and tracking at fine levels of granularity. However, the LCMS pays more attention to the interactions between user and content than the actual administration of users themselves. Irrespective of the administration's sophistication and focus, products from both categories have built-in administrative features to manage users and content. Customers have the substantial practical challenge of sharing these administrative interests across an LMS and LCMS, and ensuring the administrative process flows consistently and smoothly between the two systems.

Why Is Tight Integration of LMS and LCMS Important?

When a customer deploys both an LMS and an LCMS product to derive the value each promises, a smooth and tight integration is not just a convenience, it's an absolute requirement. Because the LMS and LCMS share different levels of administrative interests in the same entities, lack of smooth integration between the products results in a broken solution with administrative conflicts.

In addition to resolving the administrative conflicts, a tight integration of LCMS and LMS products from the same vendor can offer unique benefits beyond those offered by the individual products.

A working solution out-of-the-box

Though it is possible to create integrated solutions based on LMS and LCMS products from different vendors, this is usually achieved at a much higher level by tweaking the user interface (UI) to include cross links between various features across the products. The integrated solution often behaves as two different products co-existing in the same deployment, each providing access points to the other. Even this level of minimal integration cannot be taken for granted. Given the complications of shared administrative interests between an LMS and LCMS, the customer must often invest substantial time and effort to achieve integration.

LMS and LCMS products from the same vendor are usually well integrated to begin with, enabling the customer to deploy a working solution with the combined LMS and LCMS offerings right out of the box. Even when the customer purchases one product and later decides to expand the deployment capabilities with the other product, buying LMS and LCMS products from a single vendor simplifies this expansion effort and requires virtually no further integration investments or delays.

While many vendors guarantee some level of integration between their LMS and LCMS products, some vendors raise the quality of integration by building their LMS and LCMS products based on a common architecture and schema. Products from such vendors essentially behave as a single product when deployed together, offering the highest level of consistency in all areas of deployment, including user interface, functionality, schema, administration, and maintenance. If the deployment of one product is expanded to include its complementary counterpart from the same vendor, there is often no need to migrate user data or any other tracked data. Users continue to access the deployment as they had previously, and the deployment magically starts offering more capabilities.

Common content repository

LMS and LCMS products from the same vendor may share a common content repository. This powerful feature offers certain unique benefits:

- The content repository is consolidated in a single location, essentially guaranteeing uniform administration and maintenance of the repository.
- The ongoing extra effort to ensure content consistency and integrity across the two systems is completely eliminated.
- A single content repository enables the unique identification and access of learning objects across the two systems based on a common name space. This allows the author of a learning object to define prerequisites in terms of other learning objects in the LCMS without questioning whether the LMS will recognize and honor these prerequisites.
 - With separate content repositories, even if the name space that uniquely identifies the learning objects is somehow standardized across the two systems, the customer must ensure that all prerequisites defined for a learning object in the LCMS are indeed published into the LMS repository for the LMS to successfully honor these prerequisite specifications. A single content repository shared between the LCMS and LMS completely eliminates this issue.
- Common content repositories enable authors to update learning objects in the LCMS once, without propagating the change to all learning activities and curriculums that use that learning object in the LMS. All usages of the learning object automatically adopt the updated version from the common repository. This is particularly important for deployments containing frequently updated content.

Unified schema

LMS and LCMS products that are tightly integrated at the database level, and are based on a common unified schema, have a distinct advantage because each product leverages in real-time all data tracked by the other product. The current industry standards, such as AICC and SCORM, enable LCMS and LMS products to exchange content packages and simple sets of tracked information such as completion status and scores. However, both LMS and LCMS are often interested in other common information for which no standards exist, such as detailed user profiles, competency definitions, organizational affiliations, job roles, learning objectives, the mapping between learning objectives and learning objects, and the detailed tracking of interactions between a user and a learning object.

LMS and LCMS products that share a common schema can leverage this common data regardless of which product tracked which piece. For example, when delivering a learning object to a user, the LCMS could take advantage of the personal information maintained by the LMS to offer the user a highly customized experience. Similarly, the LMS could maximize the detailed tracking by the LCMS to offer rich reports that help measure and improve the health of the entire solution.

Advanced personalization

Tight integration of the LMS and LCMS can enable several advanced personalization capabilities that are not easily achieved through either product alone. For example:

- The LCMS can use the user information available in the LMS, such as profile, preference, job role, and competency data, to deliver a customized track of the learning object to the user automatically.
- The LCMS can also analyze trends by correlating the user properties from LMS, the tracks chosen by corresponding users in the LCMS, and the details on their performance in those tracks.
 - Learning-object authors can use this kind of trend analysis to understand how the tracks they create are used in the real world. Such analysis also provides a more accurate profile of the real audience for each personalized track. Authors can use this information to fine-tune the track or create new personalized tracks to address the needs of users with specific profiles.
 - The LCMS can also use the results of this trend analysis to prescribe an appropriate track to future users automatically based on their profile. The LCMS becomes an intelligent system that learns, based on real data, what worked for whom and then uses this information to help future users.
- When an LMS has real-time access to all learning objects managed by the LCMS, the LMS can dynamically build personalized curriculums and learning activities to match a specific user's needs and profile. A dynamic curriculum built for a user by the LMS can include an assortment of learning objects based on the learning objectives associated with each learning object. The curriculum may include a blending of learning objects to be delivered by the LCMS as well as other learning activities such as seminars, workshops, and so forth that may be available outside the LCMS.

Better insight for improving content

The granularity of tracking in an LCMS helps content owners gain insight into the clarity and effectiveness of their learning objects. The amount and nature of peer collaboration, and the amount and nature of additional help users seek from knowledge experts in the context of a learning object, provide great insight into the clarity and completeness of the learning object. Correlating this data with the user profile, job role, competencies, and skill levels available in the LMS provides valuable insight into the types of users who find the content effective or who have difficulty with the content. Further correlating this data with the curricula or learning activities in the LMS that included the learning object can reveal where the learning object should be

included in future and also help fine-tune the learning object's prerequisites. This analysis may also provide insight into how the learning object's prerequisites depend on the audience's characteristics.

Capturing intangible knowledge

Structured knowledge that satisfies a specific set of learning objectives is often well defined and managed as tangible learning objects in an LCMS. However, in this fast-moving knowledge economy, an equally important challenge is to capture the vast amount of unstructured, intangible knowledge in an organization and make it readily available to increase on-the-job productivity. Intangible knowledge is often buried in a person's head and in what one knows beyond what is available in formally documented knowledge. LCMS and LMS products recognize this challenge and often facilitate the transfer of intangible knowledge through methods such as discussion forums, chat rooms, and study groups. While most products facilitate knowledge transfer beyond formal training, very few offer a built-in mechanism that actually captures the transferred knowledge and makes it readily available for future reference. Some advanced LCMS products not only capture transferred knowledge, but also automatically associate the knowledge with specific learning objects and provide meaningful context for future reference to this unstructured knowledge. If these LCMS products are part of a tightly integrated LMS and LCMS deployment, the context of the unstructured knowledge captured can in turn be used to create new learning objects and improve existing learning objects. In essence, this helps capture the intangible and unstructured knowledge in an organization and transform it into a tangible asset.

Other key benefits

The tight integration of an LMS and LCMS from the same vendor can offer other unique benefits:

- Integrated security with common roles and privileges honored by both the LMS and LCMS provides a single logon and uniform access model to all capabilities across both systems. This uniformity provides a better user experience and simplified administration.
- Tight integration unifies administration and maintenance of the two systems, resulting in reduced maintenance cost.
- Uniform search capabilities across both the LMS and LCMS.
- With products from the same vendor, the integration is likely to be preserved through future versions of the LMS and LCMS products. Issues involved in upgrading the integrated deployment are resolved as part of the product release. Integrating LMS and LCMS products from different vendors would likely involve substantial additional integration work when upgrading to future versions of each product.

Tight Integration ≠ Proprietary

A tight integration of LMS and LCMS products from the same vendor doesn't have to mean a proprietary solution that locks down customer investments. The key is to make sure the integrated products are based on an open, flexible, modular architecture and are compliant with available industry standards.

The architecture should guarantee that the integrated product suite features well-defined interfaces that make it easy to work with other enterprise products. At the same time, the integrated product should guarantee its standards compliance; that is, that it can manage and use standards-compliant learning objects created by external systems as well as standards compliant off-the-shelf courses. The product should also guarantee that all learning objects created with the product are similarly standards-compliant and can be easily exported and published to other standards-compliant learning systems.

The Sharable Content Object Reference Model (SCORM) is emerging as the de facto standard for learning objects, so the integrated product must also be able to create SCORM-compliant

content as well as manage, play, and track SCORM-compliant content created by other systems.

Where to Go from Here?

With so many vendors offering a variety of LMS and LCMS products with varying capabilities, it can be challenging to shop for an integrated LMS/LCMS solution. The goal of this article has been to educate customers on the relationship between LMS and LCMS, why it makes sense to choose a tightly integrated LMS/LCMS product suite preferably from the same vendor, and what to look for in a well-integrated solution.

The new Aspen Enterprise Learning Platform from Click2learn offers a tightly integrated LMS/LCMS product suite based on leading-edge technology that helps the customer make knowledge a tangible asset. To learn more about Aspen, please visit the product section at <http://www.click2learn.com>.