The Learning Content Management System

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Over the past twenty years or so, industrial society has gone from being deprived of data to being overwhelmed by it. This turn of events has largely been the result of more affordable computer hardware and software, and, more recently, ubiquitous Internet penetration. The transition corporations have made from mainframes to client/server to networked computers has resulted in knowledge workers spending more time sorting through information than actually using it to do their jobs better. In this current state, a user who sets out to learn something that will truly increase productivity and provide the organization with competitive advantage often comes up empty-handed. This inability to access data usually happens for one of two reasons — either the information is improperly stored and indexed or the user overlooks it among the clutter. Corporate investment in information technology has also led to a new delivery method for corporate training that both rivals and complements classroom-based instruction: elearning. While some companies employ elearning to realize cost savings (e.g., reduction in travel expenses, opportunity costs of taking someone offsite, fewer instructors and administrators needed), others are using the technology to take a new approach to or view of learning. Training and human resources (HR) departments have gone from purchasing one-off elearning courses for a select few to implementing learning management systems that keep track of what large audiences within an organization have learned in online and offline classes and what individuals need to learn to perform better.

The Challenge

Up to this point, most elearning has been consumed by learners in the form of full, off-the-shelf, or slightly customized courses. The experiences provided by these courses are instructionally sound and typically general enough to provide content vendors with large prospective customer bases — a build-once, sell-many model. However, corporate customers also need a way to efficiently turn their proprietary knowledge into effective elearning content. Although general knowledge provides a necessary baseline, proprietary knowledge provides companies with competitive advantage. Furthermore, organizations need a mechanism for managing and delivering elearning content in a digestible form to the end user who can immediately apply it to perform better — enter the learning content management system to help speed individuals' time to performance and perpetuate organizational success.

This paper provides definition of a learning content management system (LCMS) and discusses how such a tool can provide or-

ganizations with a competitive edge by helping to mitigate certain business problems with measurable results. The document also distinguishes LCMSs from learning management systems (LMSs) and content management systems (CMSs) used for general Web-based content.

Training and Beyond: Solving Business Problems with Learning Content Management Systems

Organizational structures are flatter today than they were 15 years ago. Enterprises are more open to sharing information with all of their constituents (e.g., suppliers, partners, and customers). LCMS tool can be used to facilitate communication to all these audiences through effective learning experiences. From a business perspective, an LCMS may benefit the enterprise in the following ways:

• **Learning in context.** An LCMS selects the learning objects and puts them in a sequence determined by the learner's query, job role, prior experience, and/or some kind of pre-assessment. Content presented to a learner re-

flects the individual's needs and organization's objectives. This approach ensures that knowledge workers spend time learning the information they need, not looking for it or sitting in a classroom hoping the instructor will eventually present it. An LCMS allows for nonlinear "search learning"; that is, a user who has a learning need can immediately seek the requisite information to fulfill that need and subsequently be directed to other relevant resources.

• **Using one application to educate disparate audiences.** A clear benefit of an enterprise having a central repository of learning objects is that certain objects will be applicable to different learning audiences. The launch of a new product, or a new release of a software product, is a good illustrative example of this benefit. Traditionally, the process of developing and delivering education for a new product has been disjointed. The training department creates classroom content that it pushes onto sales and marketing personnel. In turn, the marketing department creates brochures and online demos for the benefit of resellers and prospective customers.

Customer service representatives answer questions from potential customers and provide post-sale support to software buyers.

Moreover, the software application may even come with some form of electronic performance support attached to it that will help customers when they are having trouble using the application to perform a specific task. Since an LCMS manages content primarily in the form of XML, it becomes much easier to automate translation from elearning to other forms of structured knowledge such as company white papers, marketing brochures, and product data sheets.

An LCMS can add consistency and enhance efficiencies of new product education. Since much of the software information needed by the different audiences described above is the same (e.g., price, value to the customer, features, and functions), many learning objects need only be developed once. These objects can then be disseminated to different audiences.

The same object used to teach resellers about the new file sharing function of the application as part of a classroom-based course may be published in a manual used by customer support to answer incoming calls and may be called up from the repository by the software's electronic support system when users run into trouble. The LCMS acts as a single source that can be leveraged by the enterprise to create, manage, and update content for all these learning events rather than leading separate development efforts.

• **Future-proofing an organization's content.** By separating content from the presentation layer through the use of XML, the content will still be reusable even if delivery methods change radically down the road (i.e., a disruptive instructional technology is developed). So the content in an off-the-shelf Accounting 101 course will not have to be reinvented just because a new delivery medium is adopted by the organization.

This separation also allows authors to update courses without having to know how to write code. They need only know how to use the templates provided by the authoring application. In the software product example above, a learning content management system can be leveraged to efficiently develop and manage learning content for a future release of that product. Typically, a course designed for the new version will contain many of the same elements as the course designed for the previous version. Rather than creating a new course from the ground up, authors may use many of the same objects while eliminating those objects that are no longer relevant and replacing them with new objects created by a person or persons who were properly trained to use the authoring tool.

• **Ensuring consistency of learning in a global enterprise.** While centralization seems to imply rigidity, an LCMS' authoring application and dynamic delivery interface help mitigate the issue by allowing for localization, which may increase learner retention. For example, a large auto manufacturer that is drastically changing the design of its best-selling sport utility vehicle may need to communicate the implications of the changes

to its windshield wiper suppliers. Part of this communications effort might be teaching the engineers who design these wipers about new windshield specifications and the consequential need for new wipers.

This effort may involve developing a course that uses many of the same video elements but requires text- and audio-based content to be done in different languages because wiper suppliers are located in Germany, Japan, and India. Different objects may be used for each supplier, and the delivery interfaces may also reflect disparate stylistic and learning preferences of local cultures.

However, the material and the quality of the learning experience will be consistent.

Learning Content Management Systems and Learning Management Systems Are Different and Complementary

Does adding a "C" to the LMS acronym make the LCMS a different animal? No, but the distinct strengths of the two clearly set them apart. Simply put, LCMSs and LMSs do different things. The value proposition of an LMS is cost-efficient training administration. An LMS takes a centralized, organizational approach to learning in that it schedules and registers students for full online and offline courses, launches elearning courses, and tracks learner progress through these courses.

User success is determined by a linear, sequential path through course content and assessment. It also provides learning administrators with the ability to track classroom-based resources (e.g., ensuring that the appropriate lab equipment is available for a hands-on networking class).

More sophisticated LMSs allow for competency mapping. An LMS measures an individual's competency level via skill-assessment tests and then guides the user to the most appropriate course(s) to fill any skill gaps. In this way, an LMS automates the traditionally time-consuming and labor-intensive process of manually matching individuals, and it may even provide a tangible, comprehensive career devel-

opment path for members of the organization.

While LCMSs do offer organizations some basic catalog and registration functions, these functions are not as robust as those offered by an LMS, and they are focused solely on elearning content. However, an LCMS allows an organization to do more extensive tracking of learners' interaction with this content than the top-level tracking allowed by an LMS. Tracking in an LMS is typically limited to course completion and rudimentary test results. The focus of an LCMS is to manage and deliver content that the learner needs when he needs it. The LCMS tracks individual user access to every learning object, allowing organizations to determine how people are learning and to filter out content that is either not being used or not instructionally sound. LCMSs and LMSs are not only distinct from one another; they also complement each other well. When tightly integrated, information from the two systems can be exchanged, ultimately resulting in a richer learning experience for the user and a more comprehensive tool for the learning administrator. An LMS can manage communities of users, allowing each of them to launch the appropriate objects stored and managed by the LCMS. In delivering the content, the LCMS also bookmarks the individual learner's progress, records test scores, and passes them back to the LMS for reporting purposes. Two of the key benefits of using learning objects, interoperability and reusability, are based on XML standards and described by standard metadata defined by learning standards bodies.

The origin of learning standards can be found in government, which has historically demonstrated a need for standardization of design and implementation of training solutions, many on a large scale. The interrelated specifications developed by several of these bodies, including the Advanced Distributed Learning Network (ADLNet), the Aviation Industry CBT Committee (AICC), the Institute of Electrical and Electronics Engineers (IEEE), and the Instructional Management System Global Learning Consortium (IMS)

have resulted in the Sharable Content Object Reference Model (SCORM). This standard, of which several revisions are forthcoming, is designed to enable the interoperability of Web-based learning content so that it may be used and reused across multiple environments and products. Several large enterprises already recognize the benefits of utilizing best of breed content across platforms regardless of who created it. The federal government has already declared that any elearning provider that wants to do business with it must be SCORM-compliant, thus driving its acceptance as the de facto standard for elearning. LCMS vendors realize the importance of standards to the success of their products and services, and they have been active participants in the standards efforts.

Learning Content Management: A Link Between Knowledge Management and eLearning

Elearning is a subset of technology-based training (TBT) that also includes CD-ROM and other technology-delivered training. TBT is a subset of all training, which also includes instructor-led training (ILT) and text-based training.

Vendors, analysts, and chief knowledge officers (CKOs), among others, are now calling for the convergence of knowledge management and elearning. A major ideological distinctions currently exist between the two areas of practice:

• Perhaps the most fundamental difference lies in the way learning content and knowledge content are packaged. Knowledge content neither contains the precise behavioral objectives for which learning content strives nor employs the instructional design methodologies that learning content does.

• eLearning and knowledge management are often inspired by different levels in the organization. eLearning is viewed as a tactical solution to a specific problem and is often initiated at the sub-executive level. Knowledge management on the other hand is viewed as strategic, is less specific in its objectives, and is often initiated at the highest level of the enterprise (or by a large consult-

ing firm that has the ears of C-level executives). Knowledge management as a formal "process" that evaluates an enterprise's organizational processes, people, and technology and develops a solution that leverages the relationships between these components to collect and share the right information with the right people at the right time.

An LCMS can contribute to each of these aspects of a knowledge management program in the following ways:

• **Content management.** A formal process of converting, collecting, and organizing intellectual assets of a corporation in one location in the form of learning objects is essential to ensuring that knowledge is captured and disseminated efficiently. This process reduces the time and costs spent by individuals replicating work others have done and the time spent searching for specific information or expertise within the organization. It also prevents this know-how from leaving the enterprise due to turnover.

• **Learning.** Since the intelligence of people is both the raw material and end product of any knowledge management system, it is in the best interest of the organization to ensure that an efficient and flexible learning environment is available to its members. The "just-the-right" learning delivered by an LCMS is clearly beneficial to an organization's knowledge management program.

• **Expertise tracking.** If an enterprise is to take advantage of its human capital, it must determine who knows what and where the individual can be found. An LCMS can help learners locate content authors.

• **Collaboration.** Formal and informal interactions between these experts and "greenhorns" often result in a conveyance of knowledge. An LCMS can facilitate collaboration by providing the user of a learning object(s) with the author's contact information. Then, the user can follow up to discuss unresolved issues and share new insights. In these ways, an LCMS bridges a gap between knowledge management and elearning, particularly when dealing with an organization's proprietary learning content. With an LCMS, members of the enterprise may act as both

content authors and users. An author may be, among other things, a subject matter expert, a knowledge manager, a trainer, or a business unit manager within the organization..

Conclusion
Vendors in the LCMS segment can further entrench elearning into the corporate backdrop by allowing organizations to leverage one application to educate a variety of student communities — employees, partners, suppliers, and customers. An LCMS compresses the time required to develop learning content. Through the use and reuse of learning objects, this technology delivers targeted learning, thus shortening a learner's time to proficiency. The net result of this is increased organizational productivity.

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