



# **LEARNING CONTENT MANAGEMENT SYSTEMS**

## **AN ANNOTATED REFERENCE**



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## INTRODUCTION

This short paper is an annotated list of some key sources on Learning Content Management Systems. It includes of 10 articles including a one to three star rating system to help the reader choose which articles to pursue. Where possible the actual articles have been attached (see pages 10 – 38).



## An E-Learning Industry Update

By Tom Barron

Barron, Tom. (2001). *An E-Learning Industry Update*. [on-line]. Available: <http://www.learningcircuits.org/2001/jul2001/barron.html> (article attached)

**Rating**  
☆☆

### Main Points

- The effect of the economy on e-learning
- The interest being shown in e-learning by the educational market
- Clear discussion on the market value of e-learning, the successes and bankruptcies
- Change in sales cycles and the effect of pricing
- Technology Shifts portion deals with the emergence of LCMSs and how they are faring in the market.
- Relationship of LCMSs to learning objects, ADL and SCORM
- Implications for those who adopt the technology early

### Why it is Worth Reading

- Very business focused article which, while it deals a lot with e-learning in general has some very good, specific points to make about LCMSs.

#### Ratings:

- ☆ Read if you must
- ☆☆ Worth the time
- ☆☆☆ Must read



<p><b>Learning content management systems Comparative Analysis of Systems Used to Construct, Organize, and Re-use “Learning Objects”</b></p> <p>By Bryan Chapman and Brandon Hall PhD</p>	
<p>Chapman, Bryan, and Hall Brandon. (2001). Learning content management systems, Comparative Analysis of Systems Used to Construct, Organize, and Re-use “Learning Objects” [on-line]. Available only through download from: <a href="http://www.brandon-hall.com/learconmansy.html">http://www.brandon-hall.com/learconmansy.html</a>.</p>	<p><b>Rating</b> ☆☆</p>
<p><b>Main Points</b></p> <ul style="list-style-type: none"> <li>• Examines the issues, benefits and pitfalls of LCMS products currently on the market</li> <li>• Explains the differences between LCMSs, LMSs, Content Management Systems and authoring tools,</li> <li>• Defines learning infrastructures and knowledge management</li> <li>• Compares the main LCMS tools on the market and ranks them on very relevant criteria</li> <li>• Also looks at:             <ul style="list-style-type: none"> <li>○ Content development and management</li> <li>○ Using previously developed content</li> <li>○ Repurposing content</li> <li>○ Requirement for adaptive learning</li> <li>○ Inconsistencies in delivery standards</li> </ul> </li> </ul>	<p><b>Why it is Worth Reading</b></p> <ul style="list-style-type: none"> <li>• This publication cost \$695.00 US. While it provides an excellent comparison, unless you are planning to purchase an LCMS the price is a little high. However, if you are in the market for an LCMS it is worth the investment.</li> <li>• Brandon Hall made his name with the Web-based training cookbook and is well respected in the industry. Over the last few years he has become a little more fluff and a little less substance but his publications are still well written and organized.</li> </ul>



**CONTENT MANAGEMENT: Coping with the Content Challenge: Definitions**

Coordinated by Jane Falla, Senior Editor

Falla, Jane, Ed. (2001). *Content Management: Coping with the Content Challenge: Definitions*. [on-line]. Available: <http://www.advisor.com/Articles.nsf/aid/FALLJ145> (article attached)

**Rating**  
☆☆

<b>Main Points</b>	<b>Why it is Worth Reading</b>
<ul style="list-style-type: none"> <li>• Defines content management in terms of who, what, where, why, how.</li> </ul>	<ul style="list-style-type: none"> <li>• Good read for someone new to the field. Remember that it is written by vendors.</li> <li>• Very short article</li> <li>• Has links to attendant articles on implementation, expectations, common traps, etc.</li> </ul>

**Learning Management and Knowledge Management: Is the Holy Grail of Integration Close at Hand?**

By Brandon Hall

Hall, Brandon (2001). *Learning Management and Knowledge Management: Is the Holy Grail of Integration Close at Hand?* [on-line]. Available: [http://www.brandonhall.com/public/whitepapers/lmkm/whitepaper\\_lmkm260101.PDF](http://www.brandonhall.com/public/whitepapers/lmkm/whitepaper_lmkm260101.PDF)

**Rating**  
☆☆

<b>Main Points</b>	<b>Why it is Worth Reading</b>
<ul style="list-style-type: none"> <li>• The confluence of knowledge management and learning management and the resulting larger vision.</li> <li>• Good discussion of the history of both knowledge management and learning management along with intellectual capital</li> <li>• Looks at obstacles from organizational and functional to concepts and technology</li> </ul>	<ul style="list-style-type: none"> <li>• Excellent background on the concepts, issues, and technology that has lead to the creation of LCMSs.</li> <li>• Good primer for someone new to the field.</li> </ul>



**Learning content management systems promise to change the way people learn online. Will they deliver?**

By Chris Jones

Jones, Chris. (2001). *Learning content management systems promise to change the way people learn online. Will they deliver?* [on-line]. Available: <http://www.onlinelearningmag.com/new/jun01/cover.htm> (article attached)

**Rating**  
☆☆☆

Main Points	Why it is Worth Reading
<ul style="list-style-type: none"> <li>• Difference between LMS, CMS, and LCMS and when each is the best tool for the job</li> <li>• Industry examples of the use of each tool</li> <li>• Set of questions to consider when deciding which you use and which to buy (taken from Brandon Hall's work)</li> </ul>	<ul style="list-style-type: none"> <li>• Extremely clear definitions of the terms and explanation of when and why to use each of the tool types.</li> <li>• Very nice use of industry cases to illustrate points</li> <li>• Well written and concise</li> <li>• Good article to give to a client to help them understand LMS, CMS, LCMS</li> </ul>

**Attack Spurring Interest in Online Courses**

By Mike Koller

Koller, Mike. (October, 2001). *Attack Spurring Interest in Online Courses*. [on-line]. Available: <http://www.internetwk.com/story/INW20011031S0003> (article attached)

**Rating**  
☆☆

Main Points	Why it is Worth Reading
<ul style="list-style-type: none"> <li>• Fear of terrorist activity and reluctance to have employees traveling will result in a "windfall" for e-learning and LCMSs as companies strive to manage effective asynchronous training.</li> <li>• Market growth could accelerate and reach \$11.7 billion in North America by 2005</li> </ul>	<ul style="list-style-type: none"> <li>• Interesting business perspective on LCMSs and e-learning in general</li> <li>• Always good to be reminded that, as with any other product, learning tools are driven by market forces</li> <li>• Unfortunately it degenerates into a marketing piece at the end.</li> </ul>



<p><b>LCMS = LMS + CMS [RLOs] - How does this affect the learner? The instructional designer?</b></p> <p>By Maish Nichani</p>		
<p>Nichani, Maish. (2001). <i>LCMS = LMS + CMS [RLOs] - How does this affect the learner? The instructional designer?</i> [on-line]. Available: <a href="http://www.elearningpost.com/elthemes/lcms.asp">http://www.elearningpost.com/elthemes/lcms.asp</a> (article attached)</p>		<p><b>Rating</b> ☆☆☆</p>
<p><b>Main Points</b></p>	<p><b>Why it is Worth Reading</b></p>	
<ul style="list-style-type: none"> <li>• Clear definitions of LMS, CMS, and LCMS</li> <li>• Definition of LMS includes relationship with content creation and the issues with using an LMS if reusability is key</li> <li>• Makes CMS very clear with explanations linked to the separation of content from presentation</li> <li>• Defines Reusable Learning Objects and links them to LCMSs</li> <li>• Excellent diagrams</li> <li>• Rounds it all out with some ideas on how all this affects instructional designers.</li> </ul>	<ul style="list-style-type: none"> <li>• Very clear and well laid out</li> <li>• Excellent diagrams</li> <li>• Good examples</li> <li>• Recommend reading this one after you have read the one by Harvi Singh</li> <li>• Good article to give to a client to help them understand LMS, CMS, LCMS</li> </ul>	

<p><b>A Look at E-learning Content Management Systems</b> <b>Interview with Duncan Lennox, chief technology officer, WBT Systems</b></p> <p>By Elsa Schelin</p>		
<p>Schelin, Elsa. (2001). <i>A Look at E-learning Content Management Systems Interview with Duncan Lennox, chief technology officer, WBT Systems.</i> [on-line]. Available: <a href="http://www.elearningmag.com/DuncanLennox.asp">http://www.elearningmag.com/DuncanLennox.asp</a> (article attached)</p>		<p><b>Rating</b> ☆</p>
<p><b>Main Points</b></p>	<p><b>Why it is Worth Reading</b></p>	
<ul style="list-style-type: none"> <li>• Difference in focus between LMSs and LCMSs (LCMSs being focused on the learner)</li> <li>• What types of companies benefit from an LCMS</li> <li>• How LMSs and LCMSs can interact effectively</li> <li>• Some background on the LCMS vendor council</li> </ul>	<ul style="list-style-type: none"> <li>• I included this article because it is a very nice example of a sales pitch being positioned as an informative article. It is very smooth but not necessarily accurate or the whole truth. Example: LMSs can be very learner-centric; this is not the sole territory of LCMSs.</li> </ul>	



<b>Learning content management systems</b> <b>New technologies for new learning approaches</b>	
By Harvi Singh	
Singh, Harvi. (2001). <i>Learning Content Management Systems</i> [on-line]. Available: <a href="http://www.elearningmag.com/issues/feb01/managementsystems.asp">http://www.elearningmag.com/issues/feb01/managementsystems.asp</a> (article attached)	
<b>Rating</b> ☆☆☆	
<b>Main Points</b>	<b>Why it is Worth Reading</b>
<ul style="list-style-type: none"> <li>• Why Learning Content Management</li> <li>• Costs</li> <li>• Difference between Learning Content Management and Content Management</li> <li>• Definition of LCMSs</li> <li>• Key attributes one should look for in an LCMS</li> </ul>	<ul style="list-style-type: none"> <li>• Singh's articles are always clear, well written, and focused</li> <li>• Excellent chart on old vs. new metaphors</li> <li>• Good graphics, especially related to defining a learning content management system</li> <li>• Good article to give to a client to help them understand LMS, CMS, LCMS</li> </ul>

<b>Interview with a content management heretic</b>	
By David Walker	
Walker, David. (2001). <i>Interview with a content management heretic</i> [on-line]. Available: <a href="http://www.shorewalker.com/pages/cms_orthodoxy-1.html">http://www.shorewalker.com/pages/cms_orthodoxy-1.html</a> (article attached)	
<b>Rating</b> ☆	
<b>Main Points</b>	<b>Why it is Worth Reading</b>
<ul style="list-style-type: none"> <li>• Web content management does not need to be as fancy and expensive as many vendors are proposing</li> <li>• Keep it simple and clean and make content accessible</li> </ul>	<ul style="list-style-type: none"> <li>• I have included this article because even though it focuses on web content management rather than learning content management some of the key points can be extrapolated to apply.</li> <li>• Besides, it is always nice to have a dissenting view!</li> </ul>



# Articles



## Learning content management systems New technologies for new learning approaches

By Harvi Singh

Available at: <http://www.elearningmag.com/issues/feb01/managementsystems.asp>

For e-learning companies, instructor led training (ILT) is an easy target. How can anyone who has ever used a spreadsheet fail to show that online learning experiences are far less expensive than ILT after travel, opportunity cost and logistics? It is hardly a fair fight. Consequently, e-learning companies and corporations have seized on the easy economic win, ignoring the fact that the real costs and process changes have shifted elsewhere. These shifts are profound and call forth new technologies, processes and, most importantly, new ways of thinking about how learning creates value for an organization.

In the ILT model, content creation is relatively cheap, but the distribution is expensive. Travel, facilities and scheduling are part of the cost, and the opportunity cost — the cost to take people out of the field — is even higher.

### ■ Figure 1: Old style and new style learning content creation

<b>Activity</b>	<b>Old Metaphor</b>	<b>New Metaphor</b>
Content creation	By instructor. Relatively cheap.	By ID, graphics, Web professionals. Relatively expensive.
Distribution	Expensive and complex	Internet cheap
Objective	Knowledge distributed for organization's benefit	Knowledge captured for organization's benefit
Learning model	Course oriented	Learner oriented
Deliverable	Courses	Learning objects
Updates	Rebuild and redeliver	Reassemble
Speed	Dependent on size of audience	Dependent on scope of content
Time to complete (typical)	4-6 months	4-6 weeks
Effectiveness measurement	Instructor observation	Assessments and interactive elements and tracking
Content sources	Create it all	Find and link to them

New style content creation begins with authored material, but can also draw on all of the resources of the Internet and on classroom sessions. This diversity can be overwhelming and calls for new ways to edit, store, select and package content of all types, especially online.

Comparatively, in the e-learning model, distribution is Internet-cheap. The cost has shifted emphasis to content creation and delivery. Since content is a key success factor for e-learning, the imperative need is for applications that help organize the development and deployment process. This is why content creation, management, personalization and delivery have become such important strategic issues in e-learning. It is where the value is generated, and also where the larger costs are incurred.

### WHY LEARNING CONTENT MANAGEMENT?

When automation becomes possible, we tend to address our current manual processes. Therefore, the first generation of e-learning technologies focused on ILT management and consolidated content from third parties. These activities were already established within the companies and the benefits were immediate.



As organizations have gained experience, new issues have emerged. Questions commonly asked include:

- How can we unlock our own knowledge?
- How can we structure this into focused, directed programs?
- How can we add in our third party purchases?
- How can we then achieve rapid updates, dissemination, management and utilization of that knowledge in an on-demand basis?

More than just knowledge management, company knowledge transfer requires the development and dissemination of content that is not only informative but also capable of ensuring effective learning (see Figure 1). It also requires the ability to measure the application of new skills and knowledge.

However, organizations are recognizing that producing online learning content with interactivity and multimedia components is an expensive affair. In addition, different parts of the organization with slightly different needs end up recreating similar content, resulting in escalated costs and increased time to deliver the content. Organizations are seeking learning content management solutions that help them reuse components of content (learning objects) to not only reduce the time and cost of content creation, but also to make it available to learners in a personalized manner. First generation e-learning products were never designed to accomplish these tasks.

### **EXISTING SOLUTIONS DON'T GO FAR ENOUGH**

Today's e-learning products are largely incomplete. On one hand, authoring tools have been optimized to create single instances of graphically attractive material. On the other hand, learning management systems (LMS) have focused first and foremost on the administrative aspects of class, student and instructor logistics. Each group has presumed that the other will manage and deliver instructional content — when, in fact, neither has done so. As a result, there is no coherent system designed to help companies collect, organize, manage, maintain, re-use and target instructional content.

The traditional authoring tools, for example, are adequate for single user authorship and small-scale development, but fall short when the scale and sophistication of content development and deployment increases. In particular, they become unwieldy when the number of departments, courses, subject matter experts (SME), authors and reviewers in an enterprise grows larger than 10. In other words, five SMEs plus five courses will produce a great deal of complexity and confusion.

Closer to home, learning management systems were designed to manage the complex logistics, resources and processes involved in the delivery of training events. However, a LMS is unequipped to handle the complexities of creation and delivery of online learning content. A LMS, at best, points to course files generated from traditional course files, but is not designed to address the issues of interactivity, scalability, reusability, personalization and the level of tracking capability required with online learning content (see Figure 2).

### **■Figure 2**



## LEARNING CONTENT MANAGEMENT IS DIFFERENT FROM CONTENT MANAGEMENT

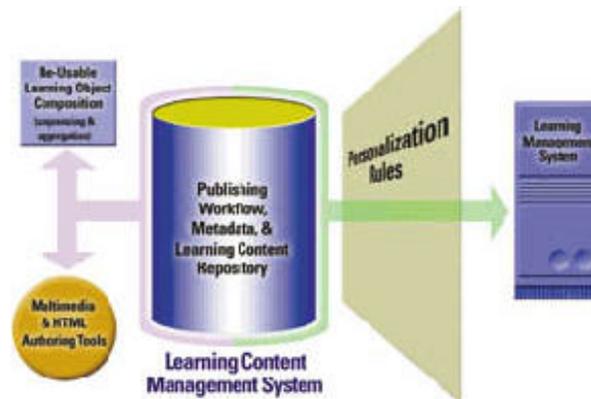
Companies such as Vignette and Eprise have become successful with "content management" solutions designed to manage Web site and e-commerce content. Some learning projects have tried to graft these solutions to a LMS. The outcomes and experiences of e-commerce and e-learning, however, are entirely unique and different. Features we take for granted, such as multimedia, interactivity, tests, simulation, remediation, bookmarking, annotation and numerous other specialized requirements are foreign to e-commerce-based content management. It's no surprise that these efforts are complex, and in the end, unsuccessful.

## DEFINING LEARNING CONTENT MANAGEMENT SYSTEMS

Learning content management systems (LCMS) are an emerging product category focused on controlling and organizing the work flows and resources of content management as well as personalizing the delivery. They look to fill the gap between authoring tools and LMS functionality with its own sophisticated structure.

Figure 3 shows where a LCMS fits within a comprehensive enterprise e-learning infrastructure.

■Figure 3



Various multimedia authoring tools may be used to create animation, graphics, HTML pages and audio or video assets that are then plugged into the online learning content.

Multimedia and information assets are then organized into small modules of instructional sequences called learning objects. Many instructional design models may be applied in the construction of learning objects.

These learning objects are then organized into sequences and combined with other forms of content — including assessment items — to fulfill a larger organizational objective, such as training on a new software version or customer service



procedures. The sequencing function supports the ability to create and deliver different learning programs based on factors, including the audience, job role, prior experience and experience, to name a few. This personalization function is a key to delivering a precise, relevant and targeted learning experience.

Learning content management systems play a crucial role in helping organizations build a common and centralized repository of learning content that can be shared and accessed by its creators and consumers throughout the enterprise. An advanced LCMS helps manage disparate sets of learning opportunities ranging from online to offline and from self-paced to collaborative. A Web-enabled LCMS is critical in helping index, organize, categorize, deploy and search learning offerings which may physically be located in heterogeneous and distributed servers inside and outside the firewalls.

In contrast, learning management systems manage users and communities (registration, assignment, approvals and reports) and let a learner search and launch learning resources stored and managed through the LCMS. The learning content management system renders the content and tracks learners' bookmarks, annotation, progress and test scores so that it can be passed back to the LMS for reporting purposes. Together, a LMS and LCMS deliver a complete learning solution.

### **KEY ATTRIBUTES OF A MODERN WEB-BASED LEARNING CONTENT MANAGEMENT SYSTEM**

Learning content management systems differ in levels of flexibility, ability to integrate with other systems and in the implementation of specific features. However, they tend to share the following characteristics:

#### **■ Centralized repository**

A key attribute of a LCMS is the use of a repository — a structured data storage system — that helps track and organize online learning content. A centralized repository allows the organization to put an arm around all the learning opportunities throughout the enterprise, even when they may be physically located in distributed locations. The repository needs to support rich set of content types such as documents, rich multimedia content and streaming data.

#### **■ Tagging and search**

Tagging and indexing the content ensures that content may be searched meaningfully. Each piece of learning content is tagged with meta-data (name, author, date, job, skill, etc.), so that it may be appropriately and consistently searched by both the content creators and consumers on the network.

#### **■ Shared and reusable resources**

According to the Advanced Distributed Learning (ADL) initiative, studies and field experience indicate that an environment where designers can share, reuse and easily modify shared media resources — such as graphics, custom templates and other "look and feel" elements — can save from 30 to 100 percent of the time and the cost of content development. Many LCMS environments allow for the reuse of company specific elements, like navigation bars, backgrounds and tables of contents, and the modification of these elements to support a specific application or objective.

#### **■ Reusable learning objects**



A complete LCMS provides the ability to manage content not just in a monolithic course format but also at a lower level of granularity through learning objects. Learning objects offer production efficiency on the side of content composition and precision in the quality of the learning experience. Learning objects add "just-enough" to the desire for "just-in-time" learning.

Organizations can save a tremendous amount of cost and time by re-using content and reducing redundancy in production of new courseware by reusing the content (by linking or copying content from existing courseware) at different levels of granularity (whole or part of the courseware structure).

#### ■ Publishing workflow

Content creation, review, publication and assignment to different audiences is a complex process, similar to the review stages of a document. Yet, learning technologies provide for little or no workflow management. A LCMS would also then manage the workflow through which content is reviewed, accepted and released for general access and consumption. These activities include:

- Communication between authors and reviews
- Ability for authors from remote sites to be able to access content
- Notification (update, review status), content expiration

#### ■ Support for industry standards

Finally, and perhaps most importantly, an e-learning product that does not support industry standards such as IMS (Instructional Management System) and ADL's SCORM (Sharable Courseware Object Reference Model) is a poor investment. The ability to support and manage internally and externally (third party) created learning content preserves the investment companies are making in learning content. Standards are the best way to achieve this.

#### ■ Learning content management helps deliver on the promise of e-learning

As we become more experienced in e-learning, the key issue is not access to the content, but access to the content that is relevant, focused and directly targeted to the task at hand. This force is driving organizations to look for ways to help manage learning content in a scalable, centrally managed environment. Their goals tend to be similar:

- Rapid content development through content reuse and templates
- Content development by multiple authors (SME, e-learning content developers)
- Workflow process through the life cycle of the content
- Consistent content indexing and search capabilities

Today, value in e-learning is created at least as much through the content as it is through the delivery of content. This has shifted the critical tasks away from logistics management toward content management. A learning content management system fulfills the promise of continuous and dynamic knowledge transfer within the extended enterprise and brings learning closer to the work at hand. **e**



## CONTENT MANAGEMENT

# Coping with the Content Challenge: Definitions

Seven content management players share their insights on what content management is, why it's important, and best practices for success. Here, roundtable participants offer their definition of enterprise content management.

Coordinated by Jane Falla, Senior Editor

WebSphere Advisor went directly to content management vendors to hear more about their solutions and philosophy. We created an online discussion database to join vendors in a "virtual" roundtable discussion. See the sidebar to find out more about the participants. In this installment, the participants share their thoughts on what content management is.

### Advisor: What exactly is enterprise content management?

Vendors' definitions of content management are as varied as their solutions, but several key themes consistently emerge. When defining your content management strategy, make sure you consider the following:

#### Who

- An effective content management system should enable content contributors and site administrators to easily create content and publish it to the Web, maintain workflow, manage version control and approval processes, and deliver content to multiple devices. -- Rogers
- Electronic content isn't just tied to the Web or to print. Increasingly, content must be created for multiple channels, including customers, business partners, and employees. -- King

#### What

- Content management is the collection of policies and technologies that guide and enable corporations to contribute, manage, and share their structured and/or unstructured information. -- Barnes
- Enterprise content management automates the production and exchange of dynamic, trusted content within and among organizations on a global scale. -- DeWalt
- Enterprise content management includes not only collaboration, contribution, publishing, and archival for the Web content deployed in sites. It includes management of the software code and integration with back-end and other enterprise systems. -- Stayner

#### Where

- A true enterprise content management and delivery system allows a company (from a central infrastructure) to acquire content from multiple sources, manage content according to business processes and objectives, and deliver the right content to the right person at the right time. The infrastructure must support the reuse of content across multiple business initiatives and the ability for the content to be delivered to multiple Web sites, wireless, and other devices. -- Krishna

#### Why



- The goal of enterprise content management systems (assuming the systems include the policies and the technologies) should be to maximize the value delivered by these information assets while minimizing the costs to maintain them. -- Barnes
- A content management system should enable an organization to save time and money, improve communication, strengthen business relationships, and increase revenue. -- Rogers
- Being able to create content for multiple use affects costs, and being able to use standard desktop tools affects publisher productivity. Creating content such as requests for quotes, inventory positioning, and data sheets helps businesses grow by effectively educating customers on which products or services to buy. -- King

## How

- Enterprise content management can be a misleading name. There's a great temptation for organizations (and even vendors) to think that ECM = content management + the enterprise -- that is, the established paradigms of Web-based, HTML-centric content management, with the added challenge of integrating a larger volume of content from throughout the enterprise. While the ability to integrate and manage large volumes of content is essential, the critical issue is the ability to combine content with Web (or Net) applications. An enterprise content management strategy should address the demand to productively integrate content, code, and presentation for the rapid development and deployment of applications. Organizations that fail to do so will have replaced the Webmaster bottleneck of the 1990s with an even more expensive and disruptive Net app development bottleneck. -- Walters
- Enterprise content management solutions must provide a single point of control for managing traditional content such as HTML components, both static (file-based) and dynamic (database-based) components, XML/XSL, GIFs, PDFs, etc., along with code ranging from light functionality (servlets, applets, scripts) to more advanced functionality (such as Enterprise JavaBeans) as a single logical entity. In addition, ECM systems must integrate tightly with solutions along the Web value chain, including traditional interactive development environments such as VisualAge Java, authoring tools, to application servers such as WebSphere, testing solutions, customer relationship management, and help desk solutions. -- Stayner

## Size up the solutions

Vendors differentiate their products based on:

- Performance and scalability of their applications
- Richness of functionality
- Commitment to open standards
- Ability to integrate back into and out of the enterprise
- Ease of use
- Ability to control site behavior from the management interface
- Dynamic content delivery capability to multiple sites and devices worldwide -- Krishna



chose not to participate.



## Learning content management systems promise to change the way people learn online. Will they deliver?

*By Chris Jones*

Remember the rules for Concentration, the classic children's game? Pairs of cards are placed face-down in random order, and players must rely on their memory to find the matching pairs. Now take that one step further and imagine having a million cards in front of you, with your job dependent on how fast you can find each card's twin. Sure, you could search through the battleship-sized room and finish by 2008, but if you're like most people, you'd look for a more efficient way to complete the task.

Anyone who develops e-learning may feel like they, too, are playing a game of Concentration. The reason? They've amassed so much content they can no longer keep track of where it's all located. So how do you eliminate the guesswork — and save precious time? Enter the learning content management system (LCMS), a complex piece of software that labels learning objects (PowerPoint slides, video clips, illustrations, quiz questions, even course modules), then organizes and delivers them in infinite combinations.

In a sense, these systems give e-learning designers X-ray vision, allowing them to get their hands on just the video clip they need without having to go through a lengthy process of elimination looking for it. If you think about what that could mean for the efficiency of course development or for the promise of online courses that adapt to people's learning preferences, you can see why some are touting the LCMS as the next big thing in e-learning.

But what if you've already spent thousands of dollars on a learning management system (LMS)? How can you justify purchasing another big piece of software? And isn't course management what LMS vendors have been promising all along?

### Identity crisis

Even though they are often confused for one another, LMSs and LCMSs have very different functions. LMSs make the process of scheduling classes, creating catalogs and registering learners more efficient. LCMSs, on the other hand, focus only on delivery. "In the broadest terms, the LMS helps get you to the classroom door and the LCMS manages the experience inside the classroom," says Duncan Lennox, chief technology officer and co-founder of WBT Systems, an LCMS vendor in Waltham, Mass.

Companies that sell LCMSs have united to make that distinction clear. In November 2000, Michael Thomas, director of partner alliances at WBT Systems, helped found an informal consortium that includes his organization and five others: Avaltus, Global Knowledge, Knowledge Mechanics, Leading Way and Peer3. (There are a number of other LCMS vendors that are not presently part of the consortium, including MindLever and KnowledgeXtensions.) The consortium came up with the LCMS label in an attempt to describe what they do and legitimize their place in the market. Industry watchers are starting to take notice. Technology research firm IDC in Framingham, Mass., released a report on LCMSs in late May. Brandon-hall.com, a Sunnyvale, Calif., e-learning consultancy, will come out with one later this summer.

Even though most LMSs can do some content management and most LCMSs have some classroom management capabilities, experts warn against working with vendors



who say they can do it all. "These systems do one or the other well," says Bryan Chapman, an e-learning analyst who has been following the LCMS market for brandon-hall.com. That may change, but for now, he recommends incorporating both systems into your e-learning strategy or deciding which one is more important to your organization.

## Real results

Wes O'Brien, president and chief operating officer of Precision Response Corp. (PRC), a 14,000-person call-center training and consulting company in Fort Lauderdale, Fla., had to make that decision late last year. "We've been doing [training] for 20 years, and we're content-rich today," he says. "Where we really need help — and I think a lot of companies are in the same position — is converting our existing content and having it managed for us."

About six months ago, PRC started using an LCMS from Salt Lake City-based Avaltus to deliver training to call-center workers. Before purchasing the system, course developers spent a lot of time recreating the same lesson for different clients, O'Brien says. For instance, several call centers might require training on a generic topic such as how to use speed dial, but each would want the course tailored to the industry they served.

With the LCMS, core online content becomes reusable. Course designers create templates for industries such as telecommunications or food service, and the LCMS automatically reformats the core content to fit into them. They also can use the LCMS to plug reusable objects into versions of a course geared toward visual, auditory or sensory learners.

O'Brien says the cost savings associated with using the LCMS have been significant. More importantly, he has noticed improved results among call-center employees. "People just learn faster and better when the right presentation of training materials is created for them," he says.

The idea of more efficient content delivery might sell you on an LCMS, but that's not this technology's biggest advantage. An LCMS, more than any other tool, allows you to adapt to the unexpected. Chapman says he often hears from people who are worried about having to make their online courses work on wireless devices such as cell phones and PDAs (personal digital assistants) two or three years from now. "That's what content management systems will do for you. They allow you to store your content separately from your logic so you can reuse it later," he says.

WBT Systems' Lennox believes LCMSs are "probably the most fundamental change to how people have learned since the creation of the university." That may sound a bit like marketing hyperbole, but the early adopters of WBT Systems' TopClass, including PricewaterhouseCoopers (PWC), say it may not be far from the truth.

PWC began using the LCMS in the summer of 1999 to deliver a required auditing course to all of its U.S. consultants. Training managers estimate the return on their investment in the system will reach \$800,000 over the first four years. Those savings, they say, will come from reduced travel costs, fewer audit failures because of inconsistent training, and less work developing courses, as the LCMS allows them to reuse portions of the content.

## Acronym headache



Now that you understand the difference between an LMS and an LCMS, let's add another acronym to the mix: CMS or content management system. In the mid-1990s, Webmasters at large media sites became frustrated because they couldn't handle the volume of stories, photos, ads and other content. So they borrowed an idea from large daily newspapers — using a single database to manage all content — and created the first Web CMSs.

Web CMSs are now standard issue at most big Web sites. At nytimes.com, for example, multiple editors and writers can contribute stories and photos without requiring a single person to post it all. So when the bureau chief in Beijing finishes editing an article about the Chinese Olympic bid, he places it on the CMS. The CMS then routes the story to the appropriate places so it can be included in the print and Web versions of the newspaper. The Webmaster simply verifies that the story is in its appropriate place before it goes live.

CMSs also allow for the creation of individualized Web pages. Sites such as Yahoo!, for example, use a CMS to fetch and deliver precise pieces of information that correspond to personalized data you enter (where you live, your interests, etc). That way, when you log onto your personalized Yahoo! page, up pops your local news, weather and virtual football picks.

So why choose an LCMS over a CMS to manage your learning content? It depends who you ask. WBT Systems' Lennox says CMSs cannot work as well for learning because they are designed for basic information transfer. They simply identify the user and deliver pieces of content associated with that user. E-learning, on the other hand, requires systems that account for such complexities as a course's level of difficulty, whether a learner has completed the necessary prerequisites and whether that person learns best by reading, listening or doing.

"When you're using a Web CMS, you really don't care very much whether people took the content, whether they understood it, how effective it was and so forth," says Lennox. "When you're delivering learning, those issues become fundamental."

On the other hand, consultant Chapman has seen companies successfully use CMSs to deliver their learning content. But, he says, getting these systems to do the job requires quite a dramatic engineering effort.

Avaltus' chief technology officer, Corey Catten, believes the best thing that could happen would be a partnership between LCMS vendors and CMS vendors. CMS vendors, he says, know how to access every piece of information across an organization. Not only that, but they've more or less figured out a standard way to tag each bit of data using XML (extensible markup language). By incorporating the CMS tagging standards, LCMS vendors could produce powerful systems that would allow course designers to assign instructional value to content. "All of a sudden you have the ultimate reusable information system. That's really what we're marching towards," Catten says.

Rory Staunton, an industry analyst with Strategy Partners International, a Berkshire, England, consulting firm with expertise in content management, agrees. He cautions buyers about doing business with LCMS vendors that don't have plans to work with CMS players such as Broadvision or Vignette. "If the clever guys start now, they'll be able to exploit this technology by merely becoming a partner with one of these companies," he says. "Within 12 months, [developing content management yourself] is going to be like competing with Microsoft for word processors."



Chapman says if the fledgling LCMS vendors can close the loop on what the established CMS vendors have developed, they will offer the best systems for delivering content to learners in an intelligent way.

Regardless of the way these systems' struggle for market share plays out, the promise of content management means trainers will be able to focus more on course development — and less on divining information using their Concentration skills.

### **Comparison shopping**

In the market for a learning content management system (LCMS)? Bryan Chapman, an analyst with research firm brandon-hall.com, has been studying these systems and suggests getting answers to the following questions before buying:

1. How fast is it? Some systems process massive amounts of content better and faster than others.
2. How does it store and organize data? Keep in mind that not all LCMSs have the same search functions or organizational tools, nor do they define learning objects the same way.
3. Does it have multiple output formats? LCMSs may be able to reorganize content for the Web, but not all can take the information and put it into PowerPoint or Word without additional work. The difference lies in how they use XML (extensible markup language). If you plan to reuse content in other formats, systems that use XML to categorize content work better with courses developed in XML than those created in HTML.
4. Does it play well with your learning management system (LMS)? Even if you don't have an LMS, you may decide you need one later on. So make sure your LCMS can function with these training administration systems.
5. Does it support third-party courses? Some LCMSs cannot combine off-the-shelf and custom-built content as easily as others. Chapman recommends looking for a system that can.
6. Is it compliant with IMS content tagging standards? If not, you won't be able to move content easily from one LCMS to another. A good explanation of IMS tagging standards can be found at [www.imsproject.org/metadata/mdbest01.html](http://www.imsproject.org/metadata/mdbest01.html).
7. How creative are the templates? All LCMSs have templates for creating content, but different systems allow different amounts of interactivity.
8. Does it allow changes to the content? "With LCMSs, the theory is that I can change the content and leave everything live," says Chapman. But the ease of live changes varies from system to system.
9. Does it allow multiple contributors? Some LCMSs let you peek into the system to see which developers are working on what. Some even block people from working on certain parts of the course.
10. How much does it cost? These systems are so new that the vendors themselves are still figuring out pricing, Chapman says. But don't expect to get away cheap, as these systems are likely to cost as much as a learning management system.



## **A Look at E-learning Content Management Systems** **Interview with Duncan Lennox, chief technology officer, WBT Systems**

By Elsa Schelin

**e-learning:** I've heard a lot of buzz surrounding the emerging e-learning content management systems (LCMS) segment. Can you explain what an LCMS is and how it differs from a learning management system (LMS)?

**Lennox:** LMS vendors address how you administer and run a learning business, whether it be customer education or employee training. How do you take the process that is associated with running a learning organization, scheduling classes, signing people up for class - how do you apply technology to that?

The LCMS space is all about putting the learner at the heart of the process. How can we use technology to drive the learning process?

Fundamentally at the highest level, the initial benefits of a LMS are cost-displacement issues, whereas the LCMS space is all about focusing on the notion of what we call reducing time to performance. How can we speed up the process of getting people up to speed on the particular things they need to know in order to do their jobs? That's where the concept of personalized learning on demand comes in - how do you get to people the specific information they need, tailored based on their past experiences and history, and the job and role they need to perform in their organization? Fundamentally, it's all about speed.

**e-learning:** What types of companies can benefit from an LCMS?

**Lennox:** Three types of companies benefit the most from reducing time to performance: Companies that have rapid and frequent product introductions, companies that have employee turnover, or those who are growing and adding employees rapidly, and those that have regulatory or compliance - type requirements where there's a need to ensure that people are actually taking the learning material - you can track and test them on it.

One of WBT's clients is Nokia. They benefit from LCMS capabilities because they have rapid and frequent product introductions. When they're going to introduce a brand new mobile telephone, there's a period of time during which that's the latest and greatest technology, and it's ahead of what one of their competitors may be doing. There's a premium during which Nokia can sell a lot of those telephones and they can extract the maximum value out of it, whilst its competitors are trying to catch up. By definition, the faster they can get their own folks and their extended enterprise - their partners, their dealer networks - trained on this new product, the more they can sell and the faster they can sell. It's fundamentally all about speed and turning around information.

You just can't turn around content fast enough in CBT or a classroom environment. In a classroom environment, it takes too long to get all of your employees to the classroom because they've got to travel and there are only a certain number of instructors. On the CBT side of things, it takes too long and it costs too much money to build that kind of courseware - so again you can't turn it around fast enough. (We're talking about taking six or nine months to build a piece of CBT, but this is information we need to turn around in 30 days.)

**e-learning:** How do you see LCMSs interacting with learning management systems?



**Lennox:** I see the technologies as being very complementary. I don't see them as being competitive to each other. They solve different business problems. They are closely related and there's a lot of power in leveraging the two technologies together as well - that's why we have partnered with Saba, and we've done a lot of work to integrate the Top Class and Saba platforms together.

At the highest level, one can think of an LMS as getting you to the classroom door. An LCMS manages the experience inside the classroom (the online, Web-based classroom). In our integration with Saba, for example, it allows a learner to go to Saba to log on, to do some skills - gap analysis, for example, to identify a course, and to sign up for that course through Saba. Then when they actually go into the course and they're taking the course, all of the personalized learning, all of the testing, all of the tracking and so on, is done by Top Class. Then when they finish that course, their completions and certifications are passed by Top Class back to Saba to update their skills profile. So we're blending the two technologies together.

Because we're solving different problems it's beneficial that we work together and provide an overall integrated learning solution. A lot of customers are starting e-learning at different phases and have different needs. A lot of our customers aren't using an LMS right now, but they are looking to use one in the future. The same goes with a lot of LMS customers that haven't yet adopted a LCMS. A lot of people who have adopted an LMS are realizing that while it solves a key problem for them, there's a whole other area and a whole other business problem associated with the migration to e-learning that it doesn't solve, that they're looking to LCMSs for help.

**e-learning:** How did this all come about? Can you talk about the LCMS vendor council?

**Lennox:** What started to happen about nine months to a year ago, as we were talking to our customers, we started seeing that they had certain expectations of an LMS - master catalog and registration, resource scheduling, competency and skills management. While the customers all agreed that these functionalities were necessary, they told us that those were not the reasons they bought our product. They bought our product for the learning product architecture - for the ease of converting content from existing forms and reusing it. They also bought the product for the testing engine and the collaboration engine.

We were providing a different value proposition and solving it as a different business problem that was complementary to, but different from, what the LMS vendors were doing. We decided to get together with some of the vendors that are in this emerging LCMS space, and we realized that we had a common set of functionality and a common set of business problems that we were all solving, that was quite different from the LMS vendor.

Michael Thomas, director of global alliances for WBT, has taken the lead on forming the LCMS vendor council. All the companies got together and had conversations to determine they were solving a different business problem and that they were providing a different solution than the LMS vendors. All the other LCMS vendors were hearing the same things in the marketplace that we were, and rapidly coming to the same conclusion.

The marketplace is really focusing on LMS vendors right now. So the LCMS vendors decided to work together using common terminology to explain to people what LCMSs



do. People are starting to understand the value of the LCMS as a unique segment in the marketplace.



**Wednesday, October 31, 2001, 4:40 PM ET.**

## **Attack Spurring Interest in Online Courses** **By Mike Koller**

A new report claims that the terrorist attacks of Sept. 11 will prove a windfall for learning management and learning content management systems providers.

Market growth could accelerate and reach \$11.7 billion in North America by 2005, according to Kinetic Information and Collaborative Strategies.

The report, entitled, *Capturing the E-Learning Opportunity 2002*, predicts a stronger union between enterprise content management and hosted Web-based learning services.

Such a link "will appeal to customers' eagerness to gain access to all relevant learning materials while addressing the all-important bottom line and concerns over travel safety," according to the study.

One provider of online education content is Cognito, Inc.'s University of the Net, which serves up courses in topics as diverse as real estate, insurance and safety training.

"There's been a spike in interest" since the Sept. 11 attacks, said Cognito founder and president Robert Davis. "Our business partners who send people paper tests through the mail are now asking us to come up with Web-based versions of those tests to avoid sending stuff through the post office."

University of the Net has seen heightened interest in safety training courses as well, primarily because it assiduously gathers student performance data.

Employees come to the online course provider because it automates record keeping on student performance, which enables course administrators to quickly see which employees are competent to go out and handle a particular task.

"People are interested in that data in a way they were not interested in it before because (before Sept 11) they had a hard time envisioning a situation in which their employees would encounter safety problems," Davis said. "They knew what chemical exposure their employees would meet on the job because they were in a particular industry, but with the possibility of chemical attacks, all bets are off, and so things you never thought could happen suddenly seem possible."

The training content is delivered to students through their browser, where they interact with it and send back the results, which are recorded.

University of the Net has 57 hours of content online now, in such topics as Emergency Medical Services training and safety topics required by the Operational Safety and Health Administration and the Department of Transportation.



## LCMS = LMS + CMS [RLOs] - How does this affect the learner? The instructional designer?

- Maish Nichani ([maish@elearningpost.com](mailto:maish@elearningpost.com)), May 2, 2001

Going by the current buzz in the industry, a pattern seems to be emerging that follows the above equation. Before we discuss what this means to the learner, or the instructional designer, let us first try to understand this equation. To make it simple, I am going to treat this more from the content side, and less from the management side.

Btw, as [Mindlever's](#) Harvi Singh has already done a fantastic job of [outlining](#) the LCMS (Learning Content Management Systems), you might want to read that article first.

### What is a LMS (Learning Management System)?

A LMS's objective is to simplify the administration of learning/training programs within an organization. For employees, it helps them to gauge and plan their learning progress, and to communicate and collaborate with their peers. For administrators, it helps them to target, deliver, track, analyze, and report on their employees learning "condition" within the organization. Most LMSs don't have the ability to *create* instructional content, and that is why most LMS vendors either provide additional content creation tools, or collaborate with content providers to provide complete solutions. Standalone content creation tools like Macromedia's [Dreamweaver](#) can also be used to create customized content.

From the Figure 1, it is clear that the smallest self-contained piece of instruction in the LMS is the course itself. Thus, if there is to be any reusability, it would have to be at the course level (one course --> many learners).

LMS Links:

- Learning Circuits: [LMS Guess](#)
- IMS Project: [New Features for Learning Management Systems](#)

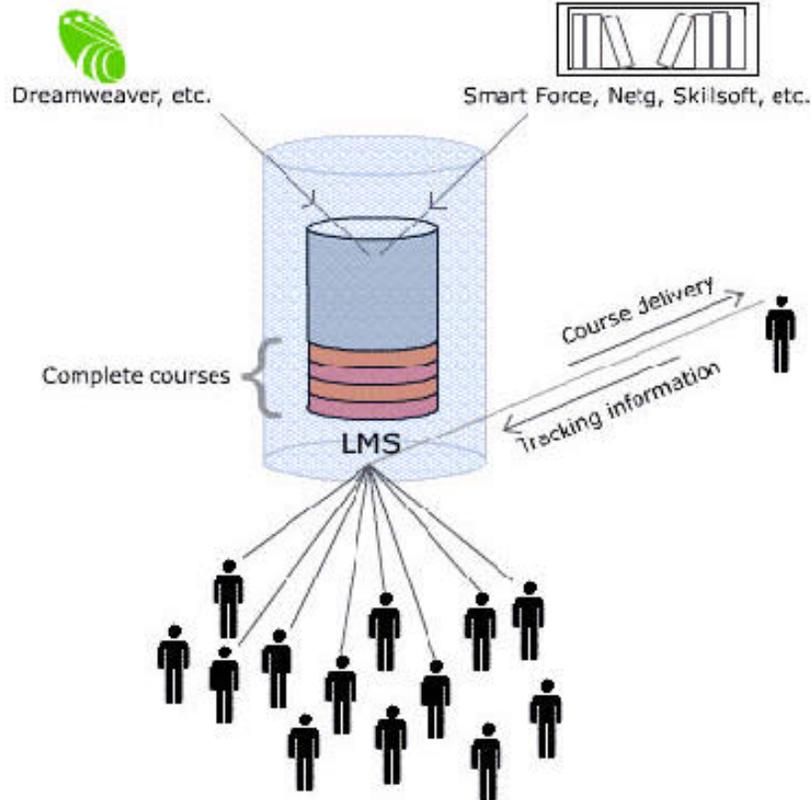


Figure 1: LMS

### What is a CMS (Content Management System)?

This is a term which is commonly used in the online publishing industry. Its objective is to simplify the *creation* and administration of online content (articles, reports, pictures, ad banners, etc.) used in publications. For example, let's consider a fictitious news website called AlphaBetaNews.com. This news site has 100 reporters scattered all over the country. In order to avoid a publishing nightmare, there has to be some means to manage all the articles that the reporters send in each day. This management is enabled by the the CMS by:

- Separating content from presentation: Reporters just need to concentrate on delivering their content (e.g. By uploading MS-Word documents or by entering directly into a web template) and not worry about layout considerations of their article like where the image will appear, how big the headlines will be, etc. All such presentation, and layout considerations are taken care of by the publishing templates. These are layout and presentation blueprints that would make sure that Reporter25's article and Reporter88's article have a consistent look and feel to them.
- Enforcing workflow processes: The articles sent in by the reporters are first approved by editors before publication. And when they are published, the articles are kept "live" for a particular period of time, after which they are backed up and archived.

In a CMS complete articles are assembled from several self-contained chunks called



"content components". The content components for a technology news site like [www.zdnet.com](http://www.zdnet.com) would be somewhat different from a financial news site like [www.redherring.com](http://www.redherring.com). For example, stocks chart and graphs would be part of the core content components for Red Herring, and not of ZDNet. The advantage of having these content components is that they provide a personalized reading experience (personalized assembly). For example, a user can choose to have only his portfolio of stocks displayed in the stocks chart component.

From Figure 2, it is clear that the smallest self-contained piece of information is the content component. Thus, in this case the reusability would be at the content component level (one content component --> many articles --> many readers).

These content components when used in the learning domain are called "learning objects", or reusable learning objects (RLOs)

CMS Links:

- Shorewalker: [Content management links](#)
- Microsoft: [Content management](#)
- KM World: [Sampling of Content management providers](#)

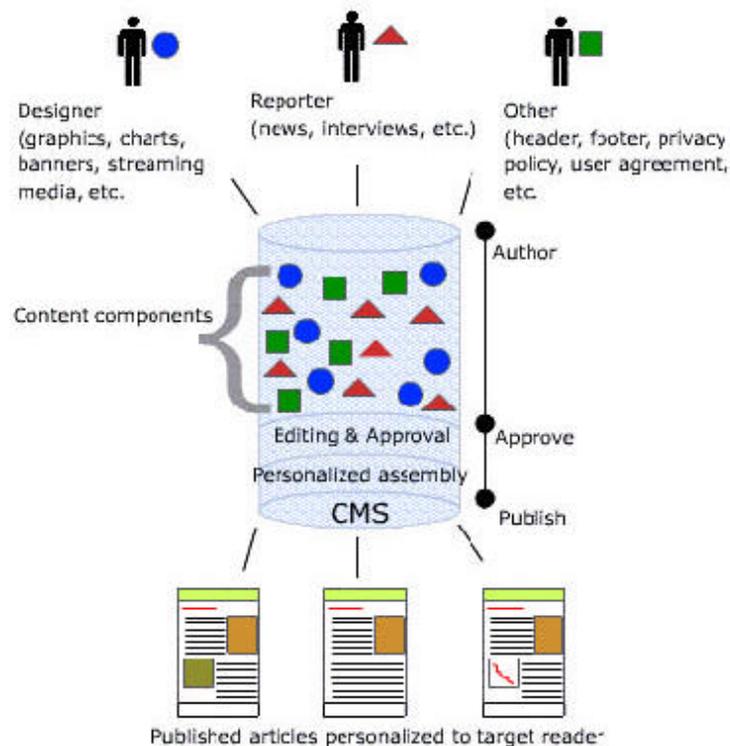


Figure 2: CMS

### What are RLOs (Reusable Learning Objects)

There are many definitions of RLOs. Some equate a RLO to a single graphic or video file. Others equate a RLO to a small piece of instruction that targets a specific performance goal. For example, Netg [defines](#) their RLO as:



the smallest independent instructional experience that contains an objective, a learning activity and an assessment.

The "objective" is the instructional objective, or performance goal, that the RLO aims to achieve. The "learning activity" is the body of the RLO -- it's the instructional strategy that the RLO uses to satisfy the instructional objective. The "assessment" part tests the mastery over the subject matter.

Since RLOs are the smallest self-contained chunks of instruction, they can be mixed and matched to create larger personalized instruction sets (courses, lessons, tracks, etc.) much the same way as content components are mixed and matched to create personalized articles.

Here's a question: How do you create a RLO? Or, in technical terms, How do you populate your database with RLOs?

Answer: Databases can be populated by:

- buying RLOs off-the-shelf from companies such as [Netg](#), and [SmartForce](#)
- leveraging on your subject-matter expertise and creating them yourself

When you have to create a RLO yourself, you could either use proprietary applications (e.g.. Both [Saba](#) and [Docent](#) have such applications), or you could create it directly on the web, by using forms. [Mindlever](#) even has tools, called Learning Object Composers, that are integrated with common applications such as MS-Word and MS-Power Point to create RLOs!

RLO Links:

- Fastrak Consulting: [Objects of interest](#)
- Learning Circuits: [Primer on Learning Objects](#)
- Reusability.org: [The Instructional Use of Learning Objects](#)
- Stephen's Web: [Learning Objects](#)

### **So finally, What is a LCMS (Learning Content Management System)?**

LCMS is a system (mostly Web-based) that is used to author, approve, publish, and manage learning content (more specifically referred to as learning objects).

A LCMS combines the administrative and management dimensions of a traditional LMS with the content creation and personalized assembly dimensions of a CMS.

In a LCMS (see Figure 3), you would have libraries of RLOs that can be used either independently, or as a part of larger instruction sets (one RLO --> many courses --> many learners).

Just like in a CMS, there would be workflow processes around a LCMS too:

- Instructional designers would create either new RLOs targeting specific



performance goals, or new courses by assembling already created RLOs

- Editors (senior instructional designers/ learning officers) would go view the submitted RLO/course, and either approve or reject it. If approved, the RLO/course would be made available to all to use, otherwise it would be sent back for revision
- Personalization rules would set in, targeting the new RLOs/courses to those who fit (or, have subscribed to) its profile
- RLOs and courses that have outlived their usefulness would either be backed up and archived, or just deleted from the repository

LCMS Links:

- e-learning Magazine: [Learning content management systems](#)

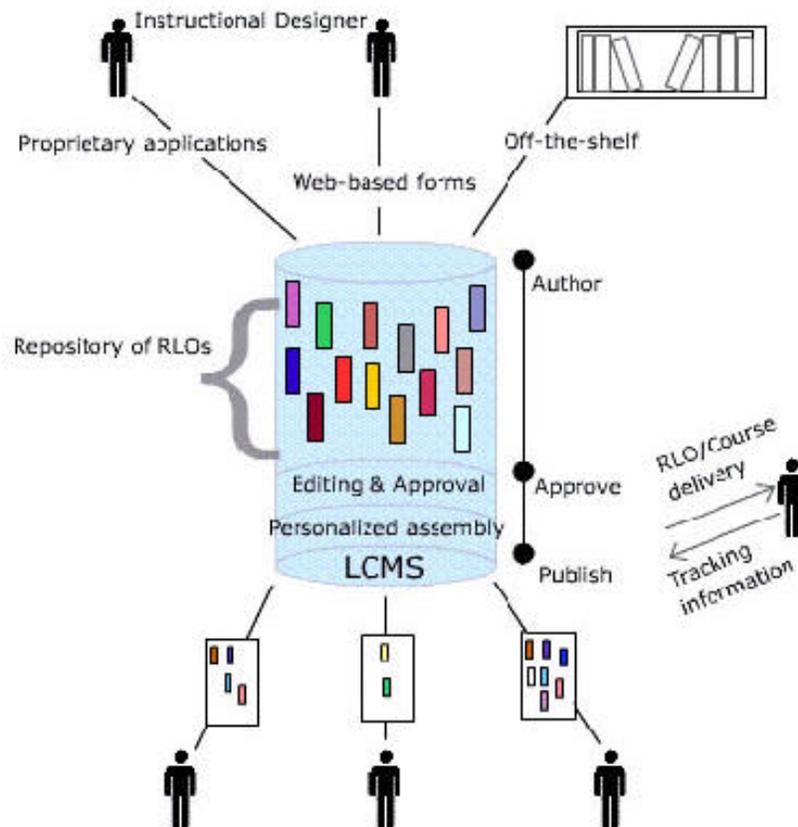


Figure 3: LCMS

### What does all this mean to the learner? The instructional designer?

Firstly, the LCMS caters to the learner's need to be instantly gratified. As mentioned above, RLOs can be created by resident instructional designers, who can react quickly to any foreseeable knowledge gaps. For example, if there is a product launch due in a month's time, the training department can expect a knowledge gap to exist in the sales department with regards to this new product. Using the LCMS, resident instructional designers could consult with subject matter experts and quickly create new RLOs (or courses) that would target this gap. For the sales reps. this instruction is of high value as



it is available when they need it the most - no more waiting for mass training sessions.

Secondly, with the LCMS, learners not only get the instruction when they desire (a.k.a. just-in-time learning), but they also get only that portion of the instruction that they desire (a.k.a. granular learning, or just-enough learning). And this is a big thing. Going by the same product launch scenario, if there was a mass training session for the sales reps, many would have to sit-in for the entire training session that might span a whole day or more, when all that they really needed was a particular 20 minutes portion of that session. The LCMS and the RLOs cater to this need to have just-enough instruction.

Thirdly, the learner is able to personalize his learning experience. Think of the [Amazon.com](http://Amazon.com) type of personalization model and visualize this change: books equal RLOs. Now, when you browse for RLOs (or courses), you will get recommendations based on your previous RLO requests. You can see the reviews and comments of other RLO users before you make your own choice. You could search by category, author, ratings, etc. Put simply, you could personalize the entire RLO catalogue to suit your needs.

For instructional designers, this object-oriented means of creating instruction presents a paradigm shift in thinking about instruction sets. In [this](#) article for [imsproject.org](http://imsproject.org), Steven Schatz, outlines this shift:

For instructional designers, the idea of knowledge bits [RLOs] requires a small but immense change in thinking. Instead of looking at trainings as linear processions with a beginning, middle and end, we must now look at trainings as clusters of independent, stand alone bits of knowledge. They are certainly related to each other and they may be viewed together, but they may also be viewed singly. Just as you can enter a web site at any page and leave at any point, so too can training consumers. Lose the notion of a class of eager learners trapped before you for a day. These new consumers of training can come in at nearly any point in the training, stay as long or as short as they wish and leave when either when they are bored or when they have learned what they want. Bits of the training may be used in dozens of different trainings for different people. Designers will now develop instructional goals, piece together knowledge bits based on those goals and develop clear navigation. A much greater emphasis must be placed on developing clear instructional goals, for it will be these goals which guide what should be offered. In addition, navigation becomes crucial. Trainings must be developed to allow, indeed to help the learner get to exactly the point they wish, and then helping them learn and understand that exact piece of information, knowing that once they get what they want, they will leave - no evaluations...no thanks...no flowers.

Let's build a table showing what an instructional designer has to do to provide those learner advantages listed above.

To deliver this learner advantage...	The instructional designer has to



	"assembly" mindset. Just as programmers rapidly create applications by assembling existing software components (objects) and build only those components that are not available, instructional designers will have to rapidly create courses by assembling existing RLOs and build only those RLOs that are not available.
Just-enough learning	start thinking of designing RLOs as self-contained instructional "chunks", rather than designing -- as Mindlever's <a href="#">Harvi Singh</a> would put it -- monolithic courses. Further, these RLOs would have to make sense in multiple contexts.
Personalized experience	do an additional step of <a href="#">meta-tagging</a> the RLOs. This is something that I have not covered in this article. But the concept is quite simple. Think Amazon.com again. Just as books are meta-tagged with information on the book like author, publication date, publisher, ISBN number, etc., RLOs too need to be meta-tagged with information on the RLO like author, publication date, category, instructional objective, etc. And this is duty of the instructional designer. These meta-tags help in targeting a particular RLO more effectively, resulting in a higher degree of personalization.

Concluding, the LCMS and the RLO present the next wave of LMSs. In this wave, organizations will have greater control over their instructional content, resulting in better customization of their learning programs. For the learners and the instructional designers, this would result in a stronger collaborative relationship aimed at increasing organizational performance.



# Interview with a content management heretic

By: David Walker

***Ovum's Alan Pelz-Sharpe wonders: just how fancy does your Web content management system really need to be?***

The economics of managing Web content grow ever more intriguing. As Web sites grow, organisations seek ways to control that growth while helping their staff publish the right material as easily as possible. Various consultancies see organisations stumping up an annual sum between \$US3 billion (Yankee Group) and \$US5.3 billion (Ovum) by 2004 for software that simplifies the management of Web site material. But at the same time, consultants have started pointing fingers at the many weakness of current content management systems. Earlier this year, Forrester Research warned that today's CMS offerings are "immature", and predicted that "owner satisfaction will be short-lived". Now Ovum's Alan Pelz-Sharpe is treating the current crop of content management systems with even less respect. A senior consultant with the UK-based IT consultancy, Pelz-Sharpe has his name on a string of expensive reports on Web content management, document management and workflow. Yet he voices opinions which would have been heretical just a year ago.

## **Orthodoxy: You must have sophisticated Web content management**

Pelz-Sharpe: In fact, a high-cost system may cost far more than it gives you. "A lot of the time, there's no business value", he says. The business's intranet, for instance, may be a collection of disparate documents; even its public Web site may have inconsistencies. "Does that really hurt? For some companies it's absolutely critical, but for a lot of companies less focused on delivering content, it's not hurting them."

## **Orthodoxy: You can buy systems that will solve all your content management problems**

Pelz-Sharpe: In fact, most available content management systems leave you with a lot of work to do. "Most vendors don't have the full solution," he says. A year or two ago, vendors could skate over that in sales presentations. Now buyers are wising up to the systems' weaknesses. The market leader, Vignette, has created enough disappointment that Pelz-Sharpe acknowledges it risks creating ill-will.

## **Orthodoxy: Content management systems must use XML**

Pelz-Sharpe: Measured against the hype surrounding its initial release, XML has made little impact on businesses. Right now, it leaves many crucial content management questions unanswered. A few years from now, says Pelz-Sharpe, XML will be viewed as "just another tool". For now, most organisations will continue to put their content in that proven 1970s-era container, the relational database.

## **Orthodoxy: Content management systems must use Java**

Pelz-Sharpe: "A lot of this stuff is over-engineered." In fact, lightweight scripting tools better suit content management in all but the largest and most complex sites. The well-regarded but expensive Java content management system OpenMarket has helped automate Web sites such as The Age and the Financial Times. But as Pelz-Sharpe notes: "There are only so many FT.coms out there." Most businesses need a cheaper, simpler solution, probably Microsoft-based. (Microsoft is responding: it last month bought the NCompass content management system.)

## **Orthodoxy: Content management systems must personalise pages, catering to an "audience of one"**

Pelz-Sharpe: Today's sites often aim to create unique Web experiences for each visitor - but this personalisation just doesn't work. Personalisation's cheer squad loves to point to Amazon.com, but Pelz-Sharpe argues the online book store has enjoyed a uniquely long learning curve, large budget and rich stream of purchase data from book-buyers. Almost every other business will do better to segment its audiences into broad groupings - the well known market segmentation approach - rather than catering vainly to "audiences of one".



## **Orthodoxy: Intranet content management should "e-enable" the business at every level**

Pelz-Sharpe: The most successful intranet users are addressing not complex needs but simple ones - like helping users find out how much holiday leave they have. "It's very simple stuff. You can do it and cut costs. You start to get buy-in with these simple things. The problem for the (intranet system) vendors is that they are brilliant, but they are delivering far too much."

"Keep it simple" hasn't been popular advice during IT's heady dot-com years. In Web content management, at least, it may be making a comeback.



## An E-Learning Industry Update

By Tom Barron

*The numbers from market leaders show strength amid a sea of technology weakness. That's because e-learning is able to demonstrate its value even in a cost-cutting climate. But the downturn is hastening a consolidation that's inevitable as the industry matures.*

The e-learning field picked a tough time to hold a coming-out party.

The recent economic slump has collided headlong with rising awareness of the benefits of online learning as a source of competitive advantage. A broadening body of successful case studies from large-scale e-learning implementations have fostered a positive buzz around the field. Providers of learning technologies have been increasingly able to demonstrate cost-savings and broader benefits, develop integrated offerings, and propose innovative ways of applying e-learning. Training professionals, while suspicious of marketing claims and "total solution" promises, have become enthusiastic about the medium's potential. The term "e-learning" is now widely recognized in both corporate and consumer circles, and recent trade and consumer press coverage of the field has been markedly more enthusiastic than earlier accounts.

At the same time, use of e-learning in higher education is exploding, with nearly half of U.S. colleges now providing some form of distance learning (see "[Universities Discover E-Learning](#)"). That figure is expected to grow to nearly 90 percent by 2004, according to one industry forecast. Strong growth in the higher-education segment is seen as a catalyst for further gains in the corporate e-learning arena, which is projected to grow to \$20 billion by 2005 from roughly \$3.5 billion in 2000.

However, those positive developments come amid a backdrop of sour economic news in the United States and, to a lesser extent, in Europe--two areas which are e-learning's primary incubators. The fledging industry has seen the same valuation drop in publicly held stocks and abrupt scarcity of venture capital that plague others in the IT arena. The financial fragility of many firms in the sector, particularly privately funded startups, is evident in a recent string of bankruptcies, mergers, and acquisitions. The length of the current slowdown and venture capital skepticism for IT firms will determine the fate of many smaller e-learning providers. It will also affect the budgets and purchasing patterns of corporate training departments and business units seeking to adopt e-learning technologies.

	Jan 2001	Feb 2001	Mar 2001	Apr 2001	May 2001
<b>Bankruptcies</b>	Learning Brands		Headlight Virtual Heaven		Pensare
<b>Acquisitions</b>		Intellinex Acquires Teach.com	Learncom Acquires TrainSeek	SmartForce Acquires ICGlobal	Centra Acquires MindLever Saba Acquires HPT
<b>Mergers</b>				Learn2.com Merges with	



				EStamp	
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### **Sector-defying performance**

Fortunately, the economic slowdown, while troublesome for cash-poor startups in the IT sector, appears not to be affecting revenues of e-learning providers to the same degree as other IT areas, at least during the first five months of the year. Recent quarterly filings by three of the largest public e-learning providers--SmartForce, Saba, and Docent--reveal strong earnings despite the tech sector's valuation drop and industry-wide cost-cutting. SmartForce posted revenues of \$61 million in the first quarter of the year, up 115 percent over the same quarter last year, pushing the company firmly onto profitable ground. Saba's fiscal third quarter, which covers the period from December through February, saw revenues increase 179 percent over the comparable prior quarter on revenues of \$14.5 million. And Docent's first quarter revenues of \$7 million represent a ten-fold increase over its comparable quarter last year and a 26 percent gain over the fourth quarter of 2000. Strong quarterly results were also posted by Centra Software, DigitalThink, and SkillSoft.

Of course, not all public e-learning providers have fared so well. Learn2.com's first quarter revenues of \$5.6 million represent only a 2 percent gain over the comparable prior quarter, though cost-cutting helped it increase profits 24 percent over the previous quarter. Caliber Learning Network, which delayed release of its Q1 2001 results until late May, saw its revenues decline 32 percent over the first quarter of the previous year (the company has since suspended operations). VCampus eked out a 15 percent gain in its first quarter revenues over the comparable prior quarter on revenues of \$1.8 million.

The solid performance of many public firms is in striking contrast to their stock prices, many of which saw reductions of 50 percent or more between December 2000 and February 2001. Some have since recovered ground, while others are fighting to maintain their listings on the major exchanges. Market leaders have seen their stock prices rebound to their initial public offering (IPO) levels, and one--SkillSoft--climbed to record highs on investor confidence in its content-focused business model. Others have seen sharp devaluations that reflect market doubts about second-tier players in the crowded vendor arena.

Stock valuations aside, vendors report steady demand among buyers despite the economic weakness. They attribute this to both increased recognition of e-learning 's potential and to the growing breadth of their e-learning sales and distribution channels. Their bullish outlook is borne out by some recent buyer surveys. Some 85 percent of 300 U.S. and Canadian organizations recently surveyed by research firm Taylor Nelson Sofres reported plans to increase their e-learning investments this year.

A more bankable indicator of demand can be found in the number of significant e-learning contracts signed in the first quarter. They include several multimillion dollar deals won by Saba, SkillSoft, SmartForce, THINQ, and VCampus, among others. Saba reported four contracts with a first-year value of more than \$1 million, while SmartForce won five contracts above that threshold for its latest fiscal quarter. SkillSoft scored a contract with a leading telecommunications company valued at more than \$3 million. NETg secured a contract with Nestle worth \$2.3 million, VCampus won a contract with the federal government valued at \$4 million, and THINQ inked a contract to provide its e-learning portal to Eastman Kodak's 80,000 employees. These large outlays contribute to the perception that e-learning is more "downturn-proof" than other sectors of the Internet economy.

There is also evidence that the venture capital drought for private e-learning providers is beginning to ease. Industry-wide investments by U.S. VC firms in the quarter totaled \$14.5 billion, comparable to 1999 outlays, though only half the level achieved in the first quarter of 2000, according to VC research firm VentureWire Group. However, a string of announcements beginning in March point toward renewed liquidity of private capital targeting e-learning. Recent



VC beneficiaries include THINQ (\$20 million fourth round investment), Knowledge Impact (\$24 million mezzanine round), Plateau Systems (\$18 million first round), Knowlagent (\$11 million series B round), and Global Learning Systems (\$10 million second round).

Still, it's clear that e-learning firms are taking no chances and are cutting costs to preserve cash while the economic outlook remains murky. Despite record revenues, several public firms have cut staff in recent months, fearful of missing financial analysts' estimates or time-to-profitability forecasts.

### **Purchasing trends**

The figures above paint a picture of the e-learning market's relative strength in a difficult period for Internet-related software firms. But the economic downturn has clearly had an impact on purchasing behaviors. At a recent E-Learning Forum meeting, a monthly gathering of e-learning developers and users hosted by the Learning on Demand program of SRI Consulting Business Intelligence, financial analyst Trace A. Urdan of investment bank W.R. Hambrecht + Co. and other analysts described some key shifts among e-learning buyers in today's market. They include the following:

**Demonstrating e-learning's cost-savings is becoming a higher priority.** Tightening corporate budgets have forced publicly traded vendors to return to an emphasis of cost savings realized when e-learning replaces instructor-led training (particularly when it entails employee travel). The cost-savings argument resonates strongly among buyers working within this year's more rigid budgetary confines. Less emphasized in the current climate are more long-range and less tangible "top-line" benefits, such as competitive advantage and recruiting and retention.

**Sales cycles are lengthening.** More requests for proposal (RFPs) are being sought by buyers, and vendors are increasingly asked to submit to comparison tests before winning contracts. This can be attributed to increasing caution and sophistication on the part of buyers as they attempt to sort out various vendor claims and scrutinize technologies.

**Price is becoming a bigger factor for e-learning buyers.** Urdan's research, as well as our own conversations with decision makers behind recent contract awards, reveals growing emphasis on price as a factor in contract awards. One *Fortune* 150 firm SRI spoke with said budgetary constraints made price one of three key factors together with content breadth and quality of service in its selection process. Hambrecht's Urdan affirmed the growing price competition, citing Microsoft's recent switch in vendors from Click2learn to SmartForce for its value-added reseller e-learning program as an example of a pricing-based decision.

**Uncertainty favors market leaders.** As is often the case in young, fragmented industries facing tough economic conditions, buyer concern over long-term prospects of various vendors is benefiting perceived market leaders. The demise of two prominent e-learning companies, Headlight and Pensare, along with several smaller providers in recent months has exacerbated those concerns among buyers.

**Buyers are concerned about standards and content quality.** Concerns about obsolescence and vendor solvency is driving interest in interoperability standards for e-learning content. Content vendors report growing queries on whether their content complies with e-learning standards published by [AICC](#), as well as interoperability specifications under development by a consortium led by the U.S. government. Buyers are also becoming more aware of content quality and its impact on the success of e-learning initiatives. Content providers that satisfy interoperability requirements while offering more advanced, interactive content stand to benefit from those concerns.

**Buyers are interested in integrated, end-to-end solutions.** Increasingly evident among buyers is awareness of the difficulties in integrating separate, stand-alone e-learning components into a well-functioning system and the desire for a combination of management capabilities, content, and authoring tools. It's unclear, however, whether this trend favors end-to-end providers, such



as IBM Mindspan Solutions, or combinations of products integrated by LMS vendors or third-party consultants.

This issue was debated at the E-Learning Forum meeting, where consultants from two global consulting firms argued the advantages of the "best-of-breed" model in terms of the ability to tailor a solution for organizations. Others noted the costs incurred in pursuing such integration, the headaches involved with multiple vendors, and the uncertainty that such integration efforts will succeed.

This is the subject of debate in the broader e-business arena; Oracle recently announced a packaged e-business applications suite that CEO Larry Ellison said would negate the need for custom integration for its enterprise offering, which critics say dramatically increases costs of enterprise software rollouts. Hosted solutions, which can provide integration of technologies from multiple vendors, is another promising avenue for buyers looking to sidestep the integration conundrum.

## Technology shifts

Technology innovations continue to reshape the e-learning landscape. Chief among them is the emergence of a new category of e-learning technology, dubbed Learning Content Management Systems (LCMS). Such systems allow creation of content in the form of [learning objects](#) (LOs), conversion of existing content from a variety of formats into LOs, and use of database repository to manage and serve LOs based on learner needs. By shifting from linear courses toward modular content, LCMS allow learning to be tailored for individuals based on needs assessment and skill profiles and reused in various combinations for different audiences, such as technical staff, sales staff, and executive staff.

The LCMS moniker has been adopted by a group of six companies, the LCMS Vendor Council, to distinguish their products from broader Learning Management Systems (LMS) that have dominated buyer interest over the past year. The group, which includes WBT Systems, Avaltus, LeadingWay, and others, commissioned a white paper from IDC that provides an overview of the technology (the paper is available on the Websites of Vendor Council members). Some LCMSs, such as that of WBT Systems, have LMS features such as learner registration, course delivery, course tracking, and reporting functions, and can function as a stand-alone LMS. Their strength, however, is in providing a framework for authoring and managing content in LO formats. LCMS capabilities will likely be added to LMS platforms through integration--as is the case with WBT's LCMS, which has been integrated with Saba--or by acquisition. One leading LCMS developer, MindLever, was recently acquired by Centra Software.

A key driver of LO technology is the U.S. government, which is marshalling support for e-learning technology interoperability standards through its [Advanced Distributed Learning](#) initiative. ADL's Sharable Content Object Reference Model ([SCORM](#)) specification establishes a methodology by which content can operate over various SCORM-compliant LMS systems. In the past year, ADL has captured broad industry backing critical to the success of its effort, mostly due to the substantial e-learning market the federal government represents.

ADL, together with five developers of e-learning technology and the standards body [IEEE](#), recently launched a task force to further drive innovation based on interoperability and learning object methodologies. The Customized Learning Experience Online (CLEO) Lab, established in April, will be a test-bed for furthering development of e-learning standards and emerging technologies in the areas of performance support, simulation, and intelligent tutoring. Cisco Systems, Click2Learn, IBM Mindspan Solutions, Microsoft, and NETg will lend their systems and expertise to the effort.

The use of synchronous or "virtual classroom" tools as a means of creating learning content is another growing trend, one that answers the need of organizations to create content quickly and inexpensively. More recently, synchronous tools have been integrated with LCMSs to allow synchronous sessions to be "chunked" into LOs and managed accordingly. The appeal of the



technology combination explains the recent purchase of MindLever by Centra, which subsequently unveiled a combined platform.

There is also growing interest in harnessing collaborative technologies, particularly those in the emerging realm of peer-to-peer (P2P) networking, to bolster e-learning. As discussed in a recent LoD report, collaborative tools are seen as a way of improving the learner experience by fostering a shared learning experience and peer learning opportunities. More recently, P2P technologies have been envisioned as a means for content developers to share learning resources and collaborate on content development. If efforts to create e-learning standards succeed, it is conceivable that learning objects could be "traded" over Napster-style P2P systems, an idea promoted by one prominent industry observer. However alluring for in-house content developers, there's no obvious business model for such an approach and many potential obstacles.

Development of LO methodologies, LCMS s, and collaborative technologies pushes e-learning closer to the realm of knowledge management, and a convergence of the two disciplines around object technologies is in its formative stages. The e-learning market stands to gain from the perceived alignment of the two fields due to the higher profile that knowledge management enjoys among "c-level" officers, such as chief executive, chief financial, chief technology officers. Less clear is how quickly demand for combined e-learning and knowledge management offerings will grow, how such a merger will impact the competitive landscape, and what role content providers will play in that arena.

Each of these developments, together with growing sophistication of content and content authoring capabilities and expanding Internet bandwidth, provides fresh opportunities to leverage e-learning.

#### **Implications for adopters**

These are stressful times not only for e-learning providers navigating the economic downturn but also for adopters of e-learning, who are understandably concerned about the financial viability of their vendors. As evidenced in Web discussion boards that center on e-learning, the recent economic slowdown has increased interest in issues such as return on investment, interoperability efforts, and the financial health of various vendors.

Adopters of e-learning can limit the headaches they may face in the event a vendor is swallowed by a larger firm or disappears from the landscape by verifying vendor compliance with existing interoperability standards from AICC and draft standards and specifications from IMS Global Learning Consortium and ADL Initiative. Though they're still in early stages, compliance with these standards and specifications will reduce the effort needed to adapt custom content to different systems.

Buyers of e-learning products and services should ask providers for evidence of their financial health in addition to testimonials from existing customers. Suppliers and buyers should discuss arrangements available to maintain support of a company's e-learning implementation in the event of a merger, acquisition or bankruptcy.

Perhaps most important for e-learning buyers is to make sure they have clear ownership of custom content, learner records, and other material developed in conjunction with third-party e-learning developers. In cases where such material resides on a vendor's server, such as in hosted offerings, buyers should discuss transfer of such material in the event of a bankruptcy-- ideally prior to selecting a vendor.

The e-learning field faces more growing pains as it matures from "high-concept" to "business-as-usual," and a cottage industry of contenders inevitably winnows. But the industry's resilience in the face of the recent economic downturn, based on its ability to demonstrate value for adopters, bodes well for its long-term prospects.