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(Learning) Objects of Desire: Promise and Practicality

By [Lori Mortimer](#)

For years, the e-learning industry has anticipated the day when learners could personalize, assemble on the fly, and access e-learning on demand. Development teams would be able to build content a single time, store it electronically, reuse it, and deploy it in different formats with a simple button click. A small content piece--a learning object--would establish the foundation upon which these capabilities rest.

According to many e-learning professionals, that day has dawned. To others, it's still in the distant future. Who should you believe? You can decide for yourself, but I'll try to separate fact from fiction--promise from practicality--by examining the learning object concept and the technologies and standards that define, create, and use it.

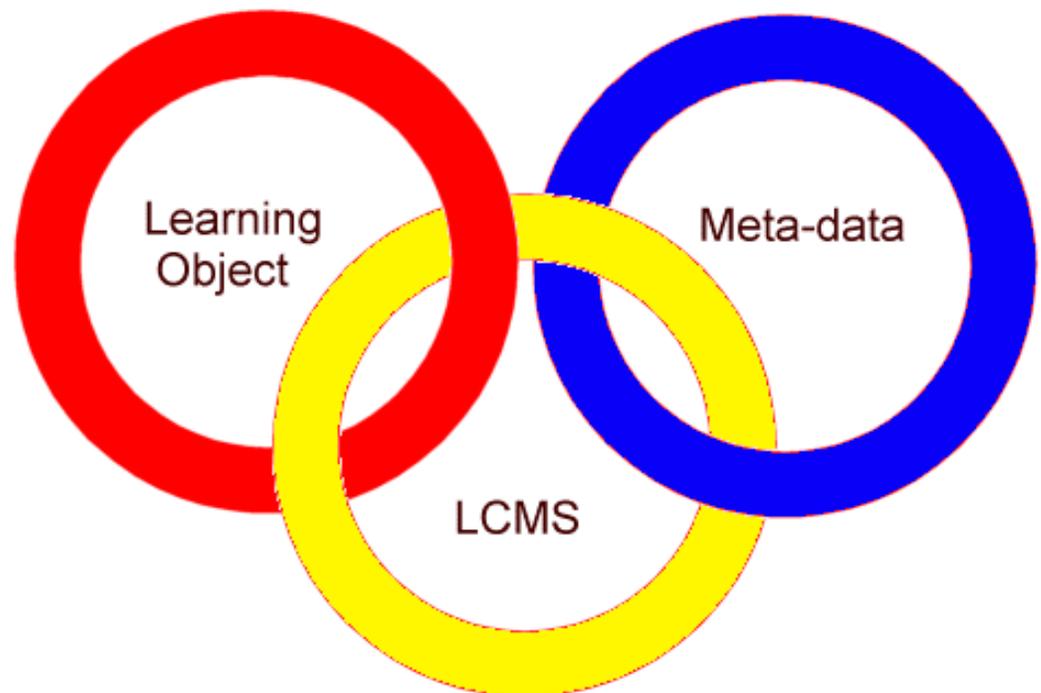
Promises, promises

At its most basic level, a learning object is a piece of content that's smaller than a course or lesson. But the learning object doesn't exist in a vacuum; it's one of three interdependent components:

- the learning object itself
- metatagging, or the standardized way to describe the content in code
- a learning content management system (LCMS) that stores, tracks, and delivers content.

Links

- [Sidebar: Development Efficiencies at Knowledge Impact](#)
- [LCMS Roundup](#)
- [The Evolution of the Learning Content Management System](#)



LCMS vendors and other learning object evangelists promise that when you combine those three components, the organization, developers, and the learner benefit.

Content developers benefit because they can build content once and reuse it in several courses and delivery media, and they can search for and use content that other developers have built and stored in the database.

The organization benefits because it's able to

- develop and deploy learning content quickly and efficiently
- port content easily between multiple LMSs or LCMSs
- reduce content development and delivery costs
- reduce maintenance time and costs.

Finally, the learner benefits because he or she can access

- individualized learning paths
- competency-based rather than course-based learning events
- content that has been adapted to his or her individual learning style
- immediate, just-in-time, just-enough performance support.

The elusive object

Learning object. Reusable learning object. Reusable information object. Shareable content object. Modular building block. Chunk. Nugget. Lego. Whatever. The list goes on, but each term is simply a synonym for what I'm calling a learning object.

But what is a learning object, exactly? It may surprise you that no single learning object definition exists within the e-learning industry. Learning objects are different things to different e-learning professionals. In fact, there seem to be as many definitions as there are people to ask.

But in general, learning object definitions cover the the following categories:

- **content:** a learning objective, the content and learning activities supporting that objective, and the assessment that's mapped to the learning objective
- **size or seat time:** a chunk of learning that takes no longer than 15 minutes to complete
- **context and capabilities:** a nugget of learning that can exist stand alone and be delivered to a learner on an as-needed, just-in-time, just-enough basis
- **tagging and storage:** a piece of content that's described with a standardized set of metatags.

What about standards?

Even industry standards, such as [SCORM](#), don't provide authoritative definitions. Rather, the standards provide a consistent framework for describing learning objects, without specifying what type of content or how much of it goes into a learning object.

For example, the current SCORM standard "tells you how learning content can be labeled so that it can be reused, but doesn't define what the structure is or what a learning object looks like," says Bryan Chapman, e-learning analyst at brandon-hall.com. "It's like the label on a can of food," he adds. The label doesn't dictate what to put in the can; it describes what's in the can.

Basically, the content model defines a set of metatags, or coded statements, for learning content. When you employ metatags, you mark the content with metadata, or information about itself, such as language, keywords, or interactivity level. Tags represent the specific criteria that LMSs or LCMSs use to search, organize, track, and deliver content to specific learners. Content gets tagged during creation or as it's imported into an LCMS. Some metatags are automatically generated by the LCMS; others are entered manually by filling out an electronic form.

The LCMS: object creation, storage, and delivery

Storing small objects in a database is nothing new. In the systems development and engineering fields, the object paradigm is used to manage large things. In general, the smaller the stored items, the more numerous the opportunities to reuse, track, and combine them. But to the training industry, electronic object storage and reusability are new concepts that have ushered in a new tool that turns course-based content development on its head--the LCMS.

A typical LCMS offers the following capabilities: content authoring or assembly, content management, workflow management, content storage, and content delivery. Most LCMSs store content in an XML database, but deliver it in HTML for Web browsers. Many are capable of delivering the content to other media, such as CD-ROM and print.

What benefits do LCMSs offer? You create and store content once, but deliver it many times, often simultaneously to different users. And the database stores content separately from presentation, which enables publishing of the exact same content in different formats.

Creativity runs amok!

According to Chapman, many people in the industry agree on a theoretical three-part learning object, which consists of a learning objective, content, and assessment. But he has found that among LCMS vendors, conceptually, learning objects aren't aligned with reality.

Brandon-hall.com reviewed 29 LCMSs for their report *Learning Content Management Systems: Comparative Analysis of Systems Used to Construct, Organize and Reuse Learning Objects*. Despite the theoretical acceptance of the three-part learning object, the systems reviewed "seem to be more flexible in their definition of a learning object than the conceptual model of what a learning object is." According to Chapman, that's a good thing. Without an arbitrary learning object definition, LCMS vendors have had the "chance to use their creativity in defining learning objects for their systems and how they can be deployed," he notes.

A standardized learning object would adopt a particular learning theory and respond to a set of business requirements. As a result, all learning content entered into a standards-compliant LCMS would follow the same instructional philosophy and have similar functionality to support it. But that's not good for learners or the industry. Instead, LCMS vendors have based their learning object definitions on different learning theories and individual cases.

From an instructional standpoint, Chapman identifies two learning object categories: prescriptive and adaptive. By far, prescriptive learning objects are the most common among LCMS vendors. Prescriptive learning objects focus on structure. In other words, all learning objects in that LCMS adhere to a particular instructional design structure and granularity. By contrast, adaptive learning objects focus on learners and can change according to the learner's profile and shifting needs.

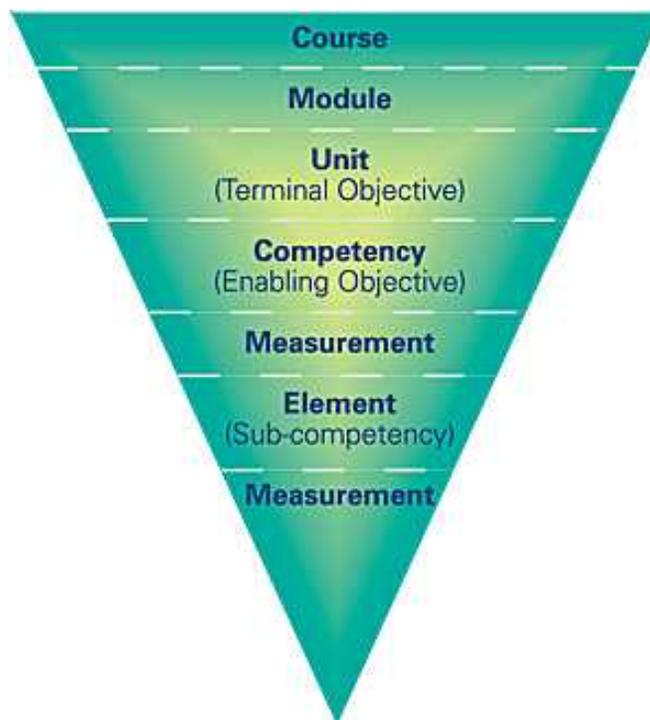
Adapting to learning styles. For example, Adaptive Tutoring Systems of Toronto, Canada, employs an adaptive learning object design. Its LCMS redefines a learning object on the fly, as the system monitors individual learner performance and adapts to an individual's learning style. President Bruce Miner says, "Our adaptive technology focuses on the learning style and context of the student. We ask, *How does the student learn best?* Then, we render the content that fits that style."

Adaptive Tutoring Systems uses artificial intelligence technology to track a learner's performance and preferences, continually update user profiles, and deliver learning objects accordingly. Developers save time and money by creating one learning object that addresses several learning styles. They don't need to create a different learning object for each learning style. For example, as the artificial intelligence system adapts to a visual learner, that learner will receive less text on the screen and will see graphics emphasized.

Also, the ATS system can deliver learning object content appropriate to the user's bandwidth, for example, reducing the video frame rate for learners with modems. "All this [bandwidth delivery] information sits inside the learning object," says Miner.

Competencies and learning objects. Generation 21's LCMS, Total Knowledge Management, falls into the prescriptive learning object category. But don't let the prescriptive tag fool you. TKM does allow some flexibility in design and delivery.

TKM specifies a content hierarchy, in which smaller content assets are combined into larger ones as you move from the bottom up. "A learning object is not just a small piece of content," says director of systems engineering Rich Sutton. "It can be a course, a module, a unit of instruction, or a competency, which is a skill or knowledge for a task."



Each TKM hierarchy level can be considered a learning object. That's because TKM can deliver any level individually, down to a single media object, such as a graphic or sound file. From an instructional standpoint, however, TKM considers the dynamic learning object at the competency level.

Within the hierarchy, a competency "should be measurable and have an objective associated with it," says Sutton. "The idea behind the system is to make those competencies digestible pieces of information. A competency could be a [step-by-step] procedure for how to change a tire, or [general] knowledge about how to change a tire," he adds.

In addition, even though the TKM learning object hierarchy is fixed, the system offers some adaptive delivery capabilities. Based on measurement items delivered during the learning experience, the system tracks how quickly each learner absorbs new information and skills. The system then dynamically modifies how and in what sequence it presents the learning object content to each learner.

A content framework. TopClass, the LCMS of WBT Systems of Waltham, Massachusetts, might technically fall into the prescriptive learning object category, but it doesn't seem to be a perfect fit. "What you don't get from us is a highly regulated, just fill-in-the-blanks architecture," says Duncan Lennox, WBT Systems CTO.

"Our philosophy is to provide a framework in which you can build your own set of learning objects, without imposing a particular instructional design philosophy or level of granularity," says Lennox. "We take a pragmatic approach. As an infrastructure company, it's not our place to enforce a particular ID philosophy on you, or impose a level of [learning object] granularity."

Like Generation 21's TKM system, TopClass implements the learning object concept through a "hierarchical structure, like Russian dolls. There are smaller objects contained in larger objects," he adds. But the hierarchy doesn't impose or recommend a smallest or largest object. In fact, TopClass lets you differ the granularity from learning object to learning object which means you don't have to settle on a single definition of a learning object. Instead, you can address the needs of the course developer, the content, and the audience on a case-by-case basis.

WBT Systems designed the TopClass authoring environment with non-trainers and non-instructional designers in mind in response to organizations that need to reduce course development time, Lennox explains. TopClass meets this need by "putting the tools directly in the hands of the SME," he says. TopClass's Publisher tool lets SMEs drag and drop such files as Word documents and PowerPoint presentations into the database. The idea behind the design is simple: The people creating learning content work in tools that they're familiar with, and then they migrate content to the repository for tagging, storage, management, and delivery.

Dissonant voices

Talking to LCMS vendors, demonstrates that standards-compliant learning objects and LCMSs can indeed deliver on their promises. But not everyone agrees.

"Reusable learning objects are incredibly over-hyped," asserts John Hartnett, president and CEO of BlueMissile, a Minneapolis-based WBT developer. Hartnett's clients aren't using learning objects, he says. "The only people talking about them regularly are people who have large systems to sell you."

Reusability itself is a flawed concept, according to Hartnett. "I'm not against the idea of an RLO," Hartnett asserts. "What I am saying is that there are almost none of them out there. Anyone who has the power and budget to generate their own training generally wants what they want, so they don't have to use what someone else built."

When asked about the portability of RLOs, Hartnett responds, "[It's] just another one of those myths." Despite SCORM and other standards aiming toward interoperability, system integration is more difficult than vendors let on, he insists.

"The reality is that each LMS vendor has its own internal procedures for how to upload, download, virus check, whatever. They are entirely different from each other. Those [system integration] procedures take just as much time to do as it would to just recreate the code. It's not an insignificant amount of work," he says.

As for standards, Hartnett adds, "from the view of the man on the street, they're a big pain in the butt. Most of my clients are doing their best to dodge the issue, so that they can just get on with the business of creating training."

Hartnett understands the arguments that support RLOs. He just doesn't think his typical customer will benefit from them "for several years." In the meantime, he tells his clients that they're far better served by spending money on the front end--on instructional and graphic design--and waiting for the standards to shake out before investing in an enterprise LMS or LCMS.

Promise and practicality

Lennox, of WBT Systems, believes that current LMS and LCMS technologies can--and do--deliver on their promises. But he agrees with Hartnett that most companies aren't yet ready to build and leverage large content libraries. "I disagree that the RLO is a myth, but I totally understand where [Hartnett's] frustration is coming from," says Lennox. "You have to separate the vision from the practicality of where it is today," he notes.

The vision predicts large repositories of interoperable, context-free, reusable content and management systems to handle the content. The practicality is that "most customers aren't in a position to take advantage of [the technology] today. It represents a big mental shift. It's complex, and they have to make the transition first to e-learning. They need a library of content that was designed to be reused. It takes time to build a library," Lennox adds. In general, he says, most companies are still adjusting to developing content for the Web. Once they're comfortable with that, they can start to think about delivering tailored content. Until then, they won't be ready to develop large libraries of reusable content.

In addition, companies may shy away from LCMS implementation because of what Lennox calls a hidden anxiety of job security. "LCMS vendors push cost savings, so people in training departments step away from the flame. They're worried that it will reduce headcount," he says.

Promises kept?

So, can learning objects deliver on the promises made by e-learning industry pundits and LCMS vendors? Yes, from a technical standpoint, they can. But we must judge their usefulness on a company-by-company basis. Some companies are ready to start building learning object libraries and implement large LCMSs (see sidebar). Many won't be ready for years, though. It's up to you to evaluate your company's readiness for learning objects, an LCMS, and a large systems integration effort. If you decide to go for it, be prepared for a long ride.

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