

eLearning Content Management

There are many areas of concern that relate to the management of course content across all organizations and their specifications. These concerns can be categorized into the following areas:

- **Metadata** – how to describe eLearning resources in a consistent manner.
- **Packaging** – how to gather resources into useful bundles.
- **Learner Profiles** – how to share learner information across multiple system components.
- **Templates** – how to create easily reusable course structures.
- **Media Management** – how to store and manage reusable media content.
- **Source Code** – how to avoid complexity and legacy issues.

Metadata

Many developers argue that metadata content is the heart of eLearning. Metadata is helpful because it provides standard “buckets” for keeping data about almost any eLearning resource. For example, you can discover the amount of student contact time in a lesson, a brief description of the content, the language it was written in, who wrote it, and so on. This information is useful to others who may want to use this resource, and the information can be a consistent, sustainable data source for tracking throughout the design, development, delivery and maintenance life cycle.

It is important to know that learning content and catalog offerings must be labeled in a consistent way to support the indexing, storage, discovery (search), and retrieval of learning objects by multiple tools across multiple repositories.

Packaging

Industry use of the term “packaging” refers specifically to gathering and describing the resources for a course. However, “packaging” can also refer to the same aggregation process for almost any eLearning resource. For example, the IMS QTI specification can be considered a packaging specification for gathering individual items into pools and ultimately into a test. A larger packaging mechanism, such as IMS Content Packaging, could be used to gather multiple QTI files into a catalog of test or perhaps a course that includes multiple tests. Ultimately, the goal of content packaging specifications and standards is to enable organizations to transfer courses and content from one learning system to another. This is crucial because content can potentially be created by one tool, modified by another tool, stored in a repository maintained by one vendor, and used in a delivery environment produced by a different supplier. Content packages include both learning objects and information about how they are to be put together to form larger learning units. They can also specify the rules for delivering content to a learner.

Currently, the most relevant packaging specifications are the AICC Course Structure File (CSF) file format and the IMS Content Packaging Specification, which are explained and extended in the ADL SCORM document. The AICC Course Structure file provides advanced capabilities for representing lesson prerequisites, but the implementation requires a group of files organized as both Windows INI files (or similar) and comma-separated value (CSV) data files. For this and many other reasons, most vendors are moving towards XML-based formats, such as those specified by the IMS.

The IMS Content Packaging Specification describes an XML file with three major divisions:

- **Metadata** – descriptive information about the entire course, using IEEE LOM elements
- **Table of Contents** – the lessons or other entry points in to the resource used by the course
- **Resources** – a complete “packing list” of all the various files or URLs needed to deploy the course

The resulting XML file is called a “manifest.” Through the extensibility of XML and the mechanisms described by the IMS, you can create control documents that provide additional capabilities or clarifications to the core Content Packaging specification. The ADL has done this by defining a namespace for ADL-specific attributes and elements, making a schema document available. This document allows the validation of a manifest that follows both the IMS and the ADL specifications.

Learner Profiles

These standards allow different system components to share information about learners across multiple system components. Learner profile information can include personal data, learning plans, learning history, accessibility requirements, certifications and degrees, and assessments of knowledge (skills/competencies). In addition, systems need to communicate learner data to the content, such as scores or completion status.

Templates

Templates form the basis of repeatable, standard content development through definable structures that can be saved within the content development tool for future use. By using templates, content developers can set up custom frameworks within which all content resources can work. For organizations looking to rapidly develop a large number of courses within a short amount of time, the use of templates can help tremendously. Used properly, templates let course designers focus their creativity on unique content and interactivity, not on building the structure and handling administrative details. They also:

- Reduce the time, effort, and cost required to get a course up and running.
- Do not require a learning management system.
- Ensure visual and navigational consistency.
- Focus efforts on creative learning solutions.
- Ensure a complete structure for a course.

For organizations that have very strict technical standards (a good idea to have, given the many issues and concerns outlined in this paper) for publishing content, innovative templating can simplify testing and make the whole development process much quicker and easier.

Media Management

Before web-based development tools were created, course authors were tasked with having to locate media assets required for a course. Unfortunately for the author, media could be on another colleague’s machine in the same office or overseas, or on an unexposed server somewhere in another office. Since the advent of web-based tools, we have seen an introduction of the media library, which allows online, collaborative management of media assets within a single, virtual environment. By using a media library, organizations can allow resources all over the globe to contribute and access media assets within an organized structure. Within the media library, all categories of media asset can be stored and tracked, including:

- Audio (music, narration)
- Documents (PDF, scanned, Word, text)
- Images (clip art, photo, graphics)
- Multimedia (animation, simulation, video)

Source Code

In the past, typical eLearning courses have contained source code that was difficult to maintain/update should a coding resource or freelancer not be readily available after development was completed and the course rolled out. A development framework that allows non-programmers to assemble the same quality of eLearning breaks this requirement of having to rely on niche technical skills that may be difficult to re-acquire.

Beyond simple resource acquisition, however, is the issue of source code control and code archiving. If a development tool requiring any type of programming code is used, but is simple enough for non-programmers to use, there need to be mechanisms put in place to ensure that the source code is maintained by a version control system and older versions of the code archived appropriately. These mechanisms are not encompassed within the development tool itself, so it is crucial that someone with technical knowledge set up the relevant systems and have them be regularly used to protect your investment in the course functionality.



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<http://www.catavo.com> | sales@catavo.com | 630-393-0022

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