

eLearning Organizations and Specifications

Before an eLearning guideline can become a “standard,” it is called a “specification.” Specifications are reviewed by an accredited organization, such as the IEEE.

It is important to understand that while the standards these organizations define are, in fact, labeled as **standards**, they generally start out as a specification, which is a detailed, exact statement of the functional requirements and particulars for something to be built, installed, or manufactured. For a specification to reach the status of an accredited standard, it must receive some sort of stamp of approval from an accrediting body.

If a specification is certified by an accredited body such as IEEE, it is referred to as a *de jure standard*. Most eLearning standards fall under the designation of *de facto standard*, however, meaning they exist when a critical mass chooses to adopt and use a specification. In the realm of eLearning standards, this acceptance typically happens at a point where critical mass encompasses a user base not large enough to have “worked out all the kinks” in the standard. So the standard really is loosely set, and should actually be considered a set of “guidelines.” This is especially true since we know that LMS’s differ in how they interpret the guidelines. The two most popular and adhered to standards in the eLearning space, AICC and SCORM, are important enough to allow for more detail in the following sections. Keep in mind, though, that these are **very** technical standards, and deal with many diverse technical considerations such as applets, data definitions, HTTP protocols, and internet communication standards.

The following summaries explain the organizations and their key contributions to eLearning.

Aviation Industry CBT Committee (AICC)

www.aicc.org

Created in 1988, the AICC is an international group of technology-based training professionals that creates CBT-related guidelines for the aviation industry. The AICC publishes a variety of recommendations, but its standards with the most impact on the eLearning arena are its computer-managed instruction (CMI) guidelines.

For instance, the AICC CMI001 Guidelines for CMI Interoperability provides guidelines to help create content that will communicate with the broadest base of CMI and learning management systems (LMS). This group also encourages sustained training through the aviation industry both now and in the future.

Advanced Distributed Learning (ADL)

www.adlnet.org

ADL is a government-sponsored organization that researches and develops specifications to encourage the adoption and advancement of eLearning. The purpose of ADL is to ensure access to high-quality education and training materials that can be tailored to fit individual needs and made easily available. ADL’s combination of research and recommendation helps turn the specifications into standards.

The most widely accepted ADL publication is the ADL Shareable Content Object Reference Model (SCORM). The SCORM specification combines the best elements of IEE, AICC and IMS specifications into a consolidated document that can be easily implemented. ADL adds value to existing standards by providing examples, best practices and clarifications that help suppliers and content developers implement eLearning specifications in a consistent and reusable way.

Institute for Electrical and Electronic Engineers Learning Technology Standards Committee (IEEE LTSC)

www.itsc.ieee.org

The IEEE is an international organization that develops technical standards and recommendations for electrical, electronic, computer and communication systems. Within the IEEE, the Learning Technology Standards Committee (LTSC) provides specifications that address best practices, which can be tested for conformance. Basically, they wrote the standard on how to write standards.

The most widely acknowledged IEEE LTSC specification is the Learning Object Metadata (LOM) specification, which defines element groups and elements that describe learning resources. The IMS and ADL both use the LOM elements and structures in their specifications.

IMS Global Consortium (IMS)

www.imsproject.org

The IMS is a consortium of vendors and implementers who focus on the development of XML-based specifications. These specifications describe the key characteristics of courses, lessons, assessments, learners and groups. In addition, the XML specifications and Best Practices Guidelines provide a structure for representing eLearning metadata (defined as data about the data). This group offers a disciplined approach for describing the various resources and provides a common set of elements that can be exchanged between multiple systems and products.

AICC Detail

The AICC standard was originally developed for the aerospace industry and gradually expanded its scope to become one of the most widely used standards for eLearning. Its present significance is more historic, yet since there are still a great many forms of LMS, ready-made content or development tools that support this standard, in selecting an LMS or development system it is still worthwhile ensuring that it supports AICC. For purchasing ready-made content, it is recommended to ensure the SCORM standard, which is of significant advantage for the content user.

According to AICC, content is divided into assignable units in the LMS often termed as "lessons." As concerns the LMS, this is a unit that cannot be divided any further. These assignable units usually contain a comprehensive overview assembled from several pages, chapters, etc. In addition to the actual content, it has integrated into it the controls for navigation through the lesson. Assignable units can be assembled into courses that can furthermore be optionally divided into blocks to be "stacked" into several levels. Between the lessons and the blocks in the course, it is possible to define the logical conditions of the transitions between them on the basis of the results of the student during the lessons.

There exist various levels of AICC standard support. A good LMS and good content should mutually communicate not only data concerning the lesson activation, such as who activated it, the time of activation, time of study, score achieved, point for continuation, but also the interaction of the user with the lesson, the values corresponding to the test questions inside the lesson, time spent on individual test objectives within the lesson, etc.

SCORM Detail

The Sharable Content Object Reference Model (SCORM) was first developed by the U.S. Department of Defense (DOD) to address training development and delivery inefficiencies across its service branches. eLearning content was being developed on different platforms, using different standards and specifications, and delivered on different, incompatible systems. To address these costly inefficiencies, the DOD knit together the best emerging eLearning specifications with those developed in the prior decade by the AICC. The result was a field-tested common reference model published by ADL.

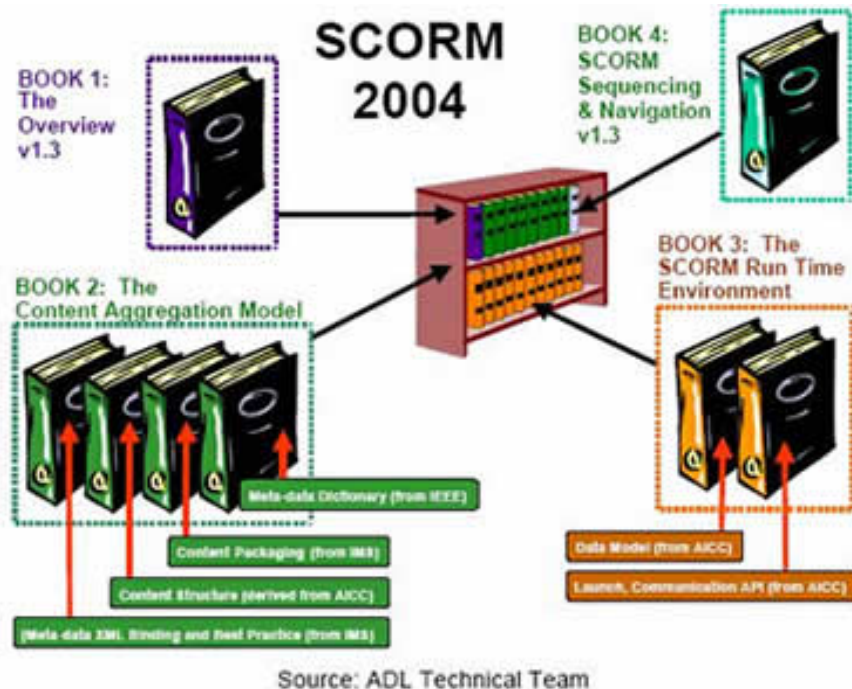
The SCORM standard is focused on enabling the plug-and-play interoperability, accessibility, and reusability of Web-based learning content. Based on accepted technology standards, including XML and JavaScript, SCORM is fast becoming the de facto eLearning technology standard widely embraced and supported today by world-leading corporations, universities, system providers, and content vendors.

The SCORM standard comprises of four major elements. Book 1 of SCORM provides an overview. It contains high-level conceptual information, the history, current status and future direction of ADL and SCORM, and an introduction to key SCORM concepts.

Next, SCORM lays out its Content Aggregation Model in Book 2, which describes the components used in a learning experience, how to package those components for exchange from system to system, how to describe those components to enable search and discovery, and how to define sequencing rules for the components. The Model includes a metadata dictionary based on IEEE, content packaging guidelines and XML binding and best practices from IMS, and content structure specs from AICC. ADL's contribution to its development was to make the language describing these guidelines from various standards bodies consistent.

Book 3 of SCORM, which is derived from IMS guidelines, outlines how to sequence and navigate learning objects. It describes how SCORM-conformant content may be sequenced to the learner through a set of learner-initiated or system-initiated navigation events.

Finally, Book 4 of SCORM covers the run-time environment. It describes the LMS requirements in managing the run-time environment, such as the content launch process, standardized communication between content and LMSs, and standardized data model elements used for passing information relevant to the learner's experience with the content.



ADL's latest release, SCORM 2004 2nd Edition Documentation Suite, offers clarifications and details to the overview. One new area covered in SCORM 2004 that is garnering some attention is the Content Object Repository Discovery and Registration/Resolution Architecture (CORDRA), which is a model for indexing stored content. CORDRA describes how to design and implement software systems for the purposes of discovery, sharing, and reuse of learning content through the establishment of interoperable federations of learning content repositories. It's important to note that CORDRA is not an actual repository of content.

SCORM 2004 also addresses the use of intelligent tutoring systems (ITS). ITSs are computer software systems that seek to mimic the methods and dialog of natural human tutors, to generate instructional interactions in real time and on demand. Specifically, ADL is actively engaging in research and implementation of the digital knowledge environment of the future in the areas of standards and authoring tools that give instructors the ability to create ITS functionality within a virtual training environment.

What the Future Holds

As new versions of standards emerge—and new product releases conform to them—increased functionality between systems grows. Supporters of eLearning standards are looking forward to some new developments among key players in the standards movement. For example, standards followers are excited about AICC's recent release of CM1010—Package Exchange Notification Services (PENS), which is an interoperability guideline that defines an interface between authoring tools and LMS systems to automate publishing and testing of learning materials accessed thru LMS systems. PENS was actually developed by various suppliers, including Macromedia, Pathlore, Plateau, Documentum, and QuestionMark, and is also being reviewed by the ADL as complementary technology to SCORM.

Other developments catching the attention of standards adopters are the reorganization of IMS. Following a six-month strategic planning effort that involved meetings with industry leaders and a survey of key decision makers in the IMS membership, the Board and staff of the Consortium have realigned the

eight-year-old organization. Participants in the IMS Global Learning Consortium (IMS/GLC) have reconfigured their international organization to accelerate the adoption of innovative online learning technology and techniques in the education and training industry. In addition to conducting face-to-face and virtual meetings of its Project Groups and inaugurating alt-i-lab, an annual workshop where decision makers evaluate technology and develop strategy for products and programs, IMS/GLC has released 15 technical specifications that are in wide use across the industry. Profiles of IMS specifications constitute the content description and sequencing component of SCORM 2004 and underlie UKLeaP, the forthcoming British Standards Institute standard for describing learner information.

More interesting, players from both AICC and ADL are working on the convergence of a new communication method for testing whether products and objects conform to standards. The current standards testing environment requires that every piece of content test against every LMS. The new model inserts a communicator tool into the process that would enable all content to be tested against a single server that checks for the different standards—provided that every LMS uses the same service.



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