
THE NEED FOR GLOBAL CONFORMANCE PROGRAM FOR E-LEARNING TECHNOLOGY

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Introduction

This paper highlights the need and resulting benefits of constructing a coordinated, global conformance program to ensure interoperability of e-learning goods and services. It then goes on to describe initial efforts already underway to establish such a conformance program, in collaboration with key players and communities around the world.

Conformance Testing

Virtually everyone will, in some aspect of life, rely upon recognition of a brand or trademark in making a purchase decision at some time or other. This applies just as much, if not more so, to software, information services and multimedia content as these goods have the added feature that they are ‘experience goods,’ i.e. in order to evaluate them, the user needs to have already made a purchase so that they can experience using the product. Suppliers attempt to address this issue for potential purchasers by providing information through advertising, trial versions of the software and distribution (often from a web-site) of detailed technical specifications. In spite of these efforts on the part of vendors, there is still a significant market for independent third parties, offering comparative reviews of similar products and generating revenue from a mix of advertising and/or cover price (e.g. in the case of magazines).

All of the above activities are aimed at persuading, or helping the prospective purchaser to determine the **fitness for use** of the product in terms of its functionality and utility to the purchaser.

For technology-based products, there is often a further dimension resulting from the requirement that compatibility or interoperability is assured with complimentary products, possibly offered by other vendors. Given the technical nature of the products in this category, it is unrealistic to expect the prospective purchaser to evaluate products to a sufficient level of detail. A widely established solution to this problem is that vendors adopt a common specification or standard and apply a trademark indicating their successful conformance to this standard. The standard may be based upon a technology implemented by a powerful supplier in the market. However, new technology developments are often driven by consortia comprised of key players, who collaborate in constructing a specification, which can then be used by all. In either case, the outcome is a **technical specification**, which all developers can adopt in pursuing interoperability with each other's products.

For the user community, the value is less the specification, than a corresponding **conformance program**, which governs and polices the trademark indicating conformance has been achieved. For obvious reasons, such a conformance program is normally administered by a trusted third party organization, that is able to deal with vendors in an impartial manner. There are some common features of such conformance programs:

- The conformance program offers a trademark, which is recognized by purchasers and therefore valued by vendors and relates to a relevant technology specification;
- Conformance must be measurable against clearly specified criteria;
- Testing related to conformance must be subject to QA procedures to ensure consistency in their application and interpretation of test results.

Examples of technologies, which are implemented across vendor's products and subjected to some form of independent scrutiny, fill our everyday lives. It is a testament to their success in achieving interoperability between complimentary products that we spend so little time thinking about them.

e-Learning Conformance Testing

Not surprisingly, as the e-learning industry has developed, similar needs have emerged and initiatives launched to address these. E.g.

- IMS (<http://www.imsglobal.org>) is producing a growing number of specifications whilst collaborating with leading communities and vendors in developing a global conformance program.
- MERLOT (<http://www.merlot.org>) is a US-based HE consortium by which tutors can exchange online content which is subjected to peer review to gauge its fitness for use.
- AICC (<http://www.aicc.org>) have generated CBT specifications and operate a certification scheme for conforming content.
- ADL (<http://www.adlnet.org>) have produced their SCORM specification whilst constructing a pilot test suite with which to test conforming content.
- SIF (<http://www.schoolsinterop.org>) have developed a specification for schools administration systems and plan to launch a related testing service for vendors in the US.

From the present experience of adoption of IMS specifications, it is clear that it is not a case of one size fits all. Various communities are taking the IMS specs as a core, which they then adapt to meet local need through:

- Extension - e.g. creating additional data elements and/or fields to support local functionality;
- Translation - re-implementation in local language;
- Adaptation - replacement or extension of vocabularies and their data structures to match local practice.

Given how rooted education is in culture and language, this should come as no surprise. In Europe, harmonization is proceeding across many fronts, most notably with the recent introduction of the single currency. But education remains a preserve of the member states.

The IMS Global Conformance Program

The IMS Global Learning Consortium has recently focused its attention upon putting in place a conformance program by which to evaluate the growing number of e-learning products, which claim to implement the IMS specifications. Membership of IMS is comprised of system vendors, publishers, and government agencies from around the world. With this cross-section of players in the marketplace and its global reach, IMS is an attractive vehicle by which to develop a conformance program able to:

1. Identify underlying core e-learning technology which has global applicability;
2. Address the need or local adaptation in terms of extensions to core data models, utilization of regional vocabularies to reflect local practice and implementation in local language.

There are thus a number of communities (acting collectively as Conformance Authorities), who might seek to offer conformance assurance against their own criteria for implementing the IMS specs, e.g.:

- Government agencies responsible for national education and training;
- Global corporations and consortia wishing to harmonise corporate training worldwide, say in a particular domain;
- Public sector communities (e.g. healthcare, military).

In turn, participation in a common Conformance Program not only ensures focus on the growing number of specs being adopted, but also offers significant economies of scale in terms of implementation of the common core of any test capability.

Benefits the IMS Conformance Program

Conformance Authorities

- Sharing cost of developing the conformance program and test suites;
- Reducing the cost of local testing by sharing test suites and program tailoring;
- Encouraging vendors to provide high quality, conformant products across markets.

Suppliers

- Advantage over competitors who are not compliant
- Reducing the cost of conformance;
- Encouraging buyers to set consistent conformance requirements and testing procedures.

Fund-Holders and Purchasers

Ultimately, the real measure of the effectiveness of the Conformance Program will be the degree to which it addresses the needs of the purchasers and users of this technology. From their perspective, the Conformance Program should:

Reduce the risk and cost to educational institutions, government and commercial educators in deploying distributed learning systems and content*, by ensuring interoperability between *conforming* content and *conforming* distributed learning products.

* N.B. In this context, content may refer to instructional content, assessments and accreditation data (e.g. competency/learning objective models).

If this objective is met, then there will be greater confidence in committing funds for online learning as purchasing requirements will be more clearly defined and understood and future-proofed at least in the short to medium term. This can only act to increase the demand for online learning products and services, to the benefit of suppliers and those defining corporate, national or sector policy in this area.

Structure and Operation of the IMS Conformance Program

IMS is currently recruiting interested parties to participate in the initial planning phase for conformance. A key task for this phase will be to explore alternative approaches to the structure and high-level operation of the program. The following outlines some key functions and responsibilities to be addressed for conformance within the context of IMS core specifications whilst also servicing local extensions. The planning phase will refine how these functions can best be implemented as a cohesive program.

Consider converting these bullet lists to paragraphs. The non-parallelism of them makes them awkward.

IMS Conformance Committee

- Stakeholders in conformance constitute the IMS Conformance Committee (CC) to share development of a consistent overall conformance program, core test suites and tools for testing
- The CC facilitates development and sharing of local extensions and application profile test suites
- CC registers users and protects the integrity of core program, test suites, and certification logo or trademark.
- CC evolves and maintains core program, test suites, and tools

Conformance Authorities

- Conformance Authorities (CA's) may be independent government, professional, or commercial bodies with specific technical, policy, or other conformance requirements
- CA's collaborate via CC to define and manage a common conformance policy, core test suites, and conformance program

- CA's register all localization or application domain extensions to a shared repository maintained by CC
- CA's authorize and supervise administration of conformance tests
- CA's may cooperate via the CC to develop test suites for extensions

Testing Organizations

- CA's (or authorized 3rd parties) conduct conformance testing
- Administer conformance tests using core and extension tests
- Report test results for certification purposes
- Provide testing data to CC for quality assurance of conformance program
- The ADL SCORM reference model provides an alternative scenario of a localization case. SCORM exploits a number of IMS specifications, which are adapted to address the needs of the military community. In fact, the ADL technical team are active participants within IMS and, along with the MIT OKI, are collaborating with IMS on a common architecture. With the growing number of military procurements for e-learning services which make reference to SCORM, there is a clear need for a mechanism to measure conformance for this distinct community. However, much of the underlying technology is common with other communities exploiting the IMS specifications. Recognizing this synergy with the needs of other communities, the ADL have committed to participation in the IMS Conformance Program and are making the SCORM pilot test suite available to the program as a starting point for testing.

Conclusion

The stage of e-learning technology development, combined with the growing scale of procurements which are intending to utilize these technologies seem to confirm that it is timely to be putting in place a conformance program which can aid suppliers and purchasers alike in ensuring interoperability of goods and services on offer. The general principles behind such conformance programs have been outlined, along with some of the key requirements, which are specific to the e-learning community. Principally, these embody the desirability of utilizing pervasive, core underlying tests and testing procedures across the globe to exploit economies of scale and ensure choice in the marketplace, combined with regional/sector specialization to address cultural, linguistic and custom constraints. A perspective on the possible structure and operation of a conformance program have been outlined, based on discussions involving participants from ADL, AICC, MERLOT and SIF, along with key vendors and user communities around the globe.

The IMS would welcome input, feedback and direct participation from organizations interested in conformance and from government agencies with particular responsibilities for policy formation or procurement management in this domain.

e-Learning Market Projections

To give some indication of the scale of this sector over the next few years, below are some indicative figures drawn from recent surveys of the e-learning domain.

IDC estimates that over half of all corporate e-learning expenditure is spent on content development. The US e-learning market for 2001 was estimated by IDC to be \$4bn. Expenditure on online learning in the UK would reach £59m in 2001 and by 2004 IDC estimated that this would rise to £311m. Corporate customers will account for much of this spending, attracted by the flexibility and savings that can result from well-designed e-learning systems. The breakdown of e-learning expenditure by IDC is estimated to be broadly 53% content, 12% delivery, 35% services.

According to Keynote Research the corporate e-learning market in the UK would be £148m in 2001, £286m in 2002, £550m in 2003 and £1bn in 2004. This is a 93% annual compound growth rate.

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