Standards for interoperability of eLearning systems

Introduction

The goal of the TELCERT project was to introduce technology innovations in the tools and test systems that underpin conformance and certification of e-Learning tools and content as compliant to industry standards and specifications. These new tools promote interoperability and provide confidence that the elements of learning content or the learning management systems will work together by design. The end result the TELCERT project sought to achieve was a reduced need for expensive and time consuming adaptations and re-engineering of learning content and management systems.

The focus on interoperability for the project was motivated by the increased importance in reusing and combining various learning elements in different ways to meet diverse learning needs and to create more adaptable learning systems. This was seen as the key to realising economic benefits from better and more widely available education in developed and developing nations.

Standardization Challenge

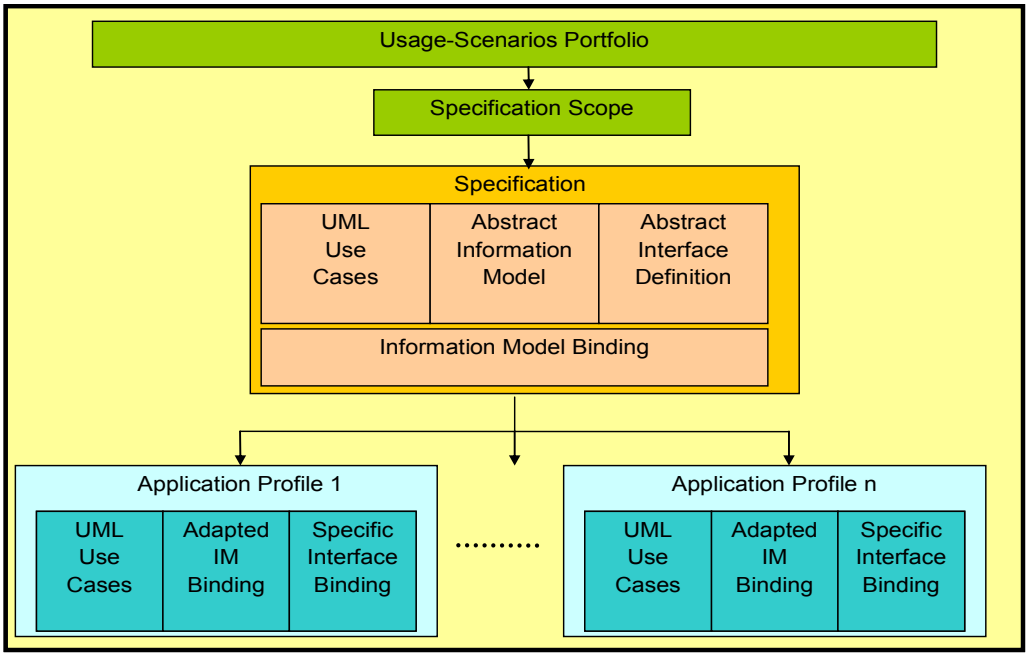
At the heart of achieving interoperability is the ability to verify that learning content and management systems conform to standards and can interoperate through common interfaces and formats. The adoption of conformance and certification programmes for eLearning has been held back by two major technology barriers:

- Test systems have traditionally been custom designed, expensive to develop, and unable to accommodate the variety of learning standards and specifications and the differing needs of the various learning communities.
- Communities for learning define their requirements and variations to specifications in different ways.

It has therefore been impossible to design common testing tools without a consistent way to describe and accommodate these variations.

Standardization Path

The TELCERT Test System verifies that eLearning content conforms to the profiled specification and provides information for establishing product certification programmes. The system can be reconfigured automatically from any XML-based profile information. The IMS standards organisation provides many of the industry specifications used for eLearning today. TELCERT targeted the IMS specifications as



one eLearning standards that would be supported using the new tools and technologies developed within the project. The project followed a set of action steps leading to improvements to the existing IMS standards.

Step 1: Participate in ongoing standardization processes

The technologies developed within the project provided tools for certifying conformance to the IMS eLearning standards. It was therefore important that project partners be deeply involved within the IMS standardization processes in order to understand the intention of the specifications for which conformance technologies were being developed and to be able to provide an accurate representation of the specifications requirements in the project conformance tools.

Step 2: Understand existing features and validate standards usage

The project invested resources to fully understand how the various learning communities were using the IMS eLearning standards and the types of systems that were being prototyped and developed. The project partners participated in several learning communities workshops and worked closely with publishers to identify the most widely used features within the standards, as well as the elements of the specification that were essential in ensuring interoperability.

Step 3: Confirm consistency of existing standards

The project in developing the profiles and tools to verify IMS standards conformance gained a deep knowledge of the specifications and the various development paths and options provided for within the specifications. The IMS specifications were found to be largely consistent, however several areas were identified within the specifications where clarifications or a more precise text were needed in order to avoid different interpretations that would both prevent conformance checking and also give rise to the creation of incompatible content or systems that were intended to be compliant to the standard.

Step 4: Submit revisions or clarifications to improve existing standard

To enable the creation of conformance and certification programmes using TELCERT technologies, the project worked closely within the IMS organisation to address the areas within the specifications where clarifications were needed. This strengthened the specification and created greater opportunities for exploiting the project technologies.

Standardization results

The TELCERT project has created a set of tools that allow learning communities to localise international specifications for eLearning content and services, and enable publishers to create interoperable products. The work within the project required a deep analysis of existing IMS standards specifications for eLeaning and in undertaking this process the project identified several areas where ambiguities existed in the specifications. These ambiguities would potentially create a situation where eLearning content or products had interpreted the specifications in different ways creating conflicts and preventing interoperability.

In order that the conformance and verification technologies developed within TELCERT could provide clear indications to users and publishers that eLearning content and systems were conformant to IMS standards and interoperable, the ambiguities within the specifications were brought to the attention of the IMS standards grouping and clarifications were suggested and agreed. This helped to strengthen the IMS specification by making it more precise, ensured greater interoperability of eLearning content and systems, while also creating further opportunities for TELCERT technologies to be utilised for industry conformance and certification programmes amongst different learning communities and regions.

Key Learning Points

The experiences and insights gained by the TELCERT partners that others in IST projects may find useful include the following:

- Get involved early in the standardization processes of the standards bodies. The participation in various working groups requires some time to gain familiarity and to be able to operate at the same level of understanding as the existing working group members.
- Industry initiatives to be successful require momentum where there is sufficient interest and participation from different communities to sustain the establishment of a new programme. Participation in workshops and events to create awareness and demonstrate demand for interoperability and standardization is important.
- Work within the existing standards processes. Groupings have invested time in specifications and when changes are needed, it's better to work within the existing community than to fragment and create conflicts or unendorsed alternatives.