

Learning Application Suite – Creating and Playing SCORM Compatible Web and Computer Based Training

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Abstract

In the process of developing Web Based Training (WBT) applications, the Sharable Content Object Reference Model (SCORM) has become the most common eLearning standard making it possible to integrate eLearning objects from different sources in a common environment, but it is not intended to deliver offline Computer Based Training (CBT) on CD or DVD. CBT should also profit from the advantages that SCORM brings to the eLearning market and creators of eLearning courses could benefit from using the same technology for online and offline publishing. Our Learning Application Suite (LAS) is an approach to overcome this deficiency. It procures software tools to create SCORM content packages, and for playing them offline providing a fully fledged navigation among with other high level functions supporting the learning process.

1. Introduction

In earlier times the production of eLearning content concentrated on CBT distributed offline by CD or DVD. Online distribution of high quality eLearning content using video, audio, animation and interactivity has been impracticable for a long time due to bandwidth limitations, but new telecommunication technologies like DSL abolish these limitations. Today, Learning Management Systems (LMS) are preferably used to distribute eLearning content. These virtual learning environments work online via a browser and offer the freedom to learn when and where the learner wants to. Many different LMS exist today and each of them has individual advantages or disadvantages [1]. As a result of this diversity, SCORM of the Advanced Distributed Learning (ADL) Initiative [2] has been

developed in order to realize compatibility. It is considered a major step to establish common standards and specifications in the field of eLearning, based on the work of well known organizations like the Alliance for Remote Instructional Authoring & Distribution Networks for Europe (ARIADNE), Aviation Industry Computer Based Training Committee (AICC), IMS Global Learning Consortium Inc., and IEEE Learning Technology Standards Committee (LTSC).

2. eLearning content production

The main idea behind the SCORM concept is the organization and aggregation of independently produced Learning Objects (LO) bringing many advantages like flexibility, interoperability, reusability, adaptivity. The WBT author has the freedom to choose the best suitable authoring tool that complies with SCORM (e.g. Flash, Authorware, Director, Java, Powerpoint) for each LO inside the WBT, and he can choose any SCORM compatible LMS for distribution. Since the eLearning content is displayed by a web browser on the learner's computer, the only precondition is that all the necessary browser plugins are installed.

Adversely, the CBT production differs from that. The author chooses one adequate authoring tool to produce all the content pages, and he is stuck to it because the CBT needs some high level functions that can only be realized inside a single authoring tool like navigation, index, glossary, printing, subtitles, history, bookmarks, personalization, etc. That's why a CBT is usually monolithic, platform dependent and not very flexible, interoperable, reusable, or adaptable. Using SCORM in CBT production seems to be impracticable for many reasons but it can be suitable for both technologies, and the decision whether to publish an eLearning application for online or offline distribution should differ in no more than the push of a button.

To reach this goal there are two tools needed:

1. A *Builder* to import LO produced by different authoring tools, allowing organization, sequencing and metadata tagging, and then exports a SCORM compliant content package.
2. A *Player* that displays SCORM content packages without being connected online to a LMS and realizing the necessary high level functions.

3. SCORM deficiencies

With respect to the high level functions in a CBT, we think there are some features missing in the current SCORM 2004 3rd edition:

- Each LO should use audio to explain what the learner sees and the spoken text should also be readable (subtitles), searchable and consistent (position, text style, etc.) across the whole CBT, so it must be outside of the LO but inside the SCORM content package.
- Glossary entries for technical terms or important key words concerning a LO could enhance the value of the learning module.
- Like a thumbnail, each LO should have a typical picture (screenshot) that describes it.
- Not every page of a learning module should behave like all others. E.g. it could be useful to automatically go on to the next page after a certain time.
- Normally, different LO are independent from each other. But in some situations it could be useful to exchange information between LO like strings or numbers.

4. Related projects

Are there any tools on the market fulfilling our demands? We evaluated Dreamweaver MX2004, Reload 2.5.5, EClass.net 2.0, Trident IDE 2.0 and also took other evaluations into account [3]. The results of this survey showed some inadequacies of existing products, leading us to the decision to start our own project.

5. The LAS project

The LAS concept is shown in figure 1. It begins with the LO production using an optimal authoring tool. These are then imported from the Learning Application Builder (LAB) where they get organized, meta tagged, and sequenced by the CBT author. The user interface will make this process as easy as possible to clearly distinguish CBT from LO authoring. As a special feature the LAB can include subtitles, glossary and thumbnails inside the distributed

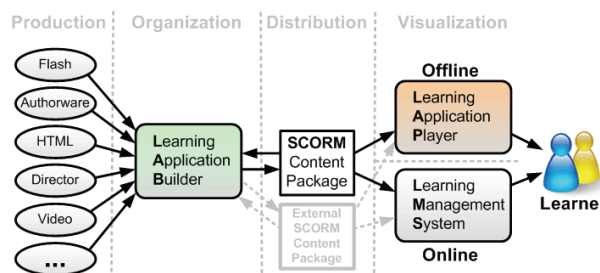


Figure 1. The LAS concept

SCORM content package, but these can only be used with our Learning Application Player (LAP) and will be ignored by any LMS. The LAP imports any SCORM content package and like an LMS it provides the interface to the learner implementing the demanded high level functions (navigation, personalization, sequencing, glossary, printing, subtitles, history, bookmarks, etc.), and visualizes the CBT using the rendering engine of the Microsoft Internet Explorer maintaining maximum compatibility. The only precondition is a proper installation of all needed browser plugins on the learner's computer.

The LAS prototype came into operation during the last semester eLearning course and did a very good job convincing us and our students from its high potential. The first LAS release will correct some minor bugs and can be expected soon.

6. Prospects

In future versions, the LAB will optionally integrate all needed plugins inside the SCORM content package and the LAP will check automatically, whether they need to be installed on the learners computer, or it optionally downloads them from the internet. It will also support multi languages on subtitles and audio. Using the C# programming language and .net, we are limited to Microsoft Windows today, but there is a good chance for future compatibility to other platforms using the open source .net library Mono [4].

7. References

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