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ASPECT

Intermediate Evaluation Report for Content Use

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1   Executive Summary

The ASPECT Best Practice Network provides support to content providers building content packages using open specifications. WP3 provides support to content providers (in WP5) via workshops, tools and information about content packaging and using specifications.

This report is a brief description of the supportive activities of WP3. Updates since the last best practice report, respectively since the release of past Deliverables, are highlighted in ***bold italics***). Furthermore it reports on the experience gained by the project's content providers and draws conclusions for their further support.

2   Supportive Activities and Resources

Since the start of the project in September 2008, WP3 has organised three workshops and produced three deliverables to support the work of ASPECT content providers.

2.1   *Workshop in Leuven, Belgium, December 1st/2nd 2008*

The first ASPECT Workshop in Leuven focused on content, tools and scenarios with emphasis on providing an introduction to the main content packaging specifications by:

- Warwick Bailey
- Ingo Dahn
- Daniel Rehak

Further steps have been:

- Plugfest involving presentations of content and testing content packages
- Sessions: Discovering content, dealing with packaged content, exchanging content

The workshop provided detailed information on SCORM, Common Cartridge and QTI and enabled content providers to begin working with the specifications.

2.2   *Deliverable 3.1 Best practice report for content use*

Deliverable 3.1 presents the content providers' level of knowledge and experience of content packaging. The first part in this deliverable provides an introduction to:

- Standard organizations (IEEE, CEN/ISSS, LETSI, ADL)
- Application profiling
- Specifications (SCORM , Common Cartridge, QTI, DRM approaches)
- Use of specifications in the Consortium and beyond (two content audit surveys)

This part serves also as an introductory reading and orientation. An evaluation of the use of specifications presents the current state of the awareness of the specifications. The first content audit survey included questions about content characteristics, metadata, implemented standards, content packaging, quality management and underlying technology. The second survey included sections on:

- Organisational considerations
- Tools and standards
- Technical issues
- Use of content standards and specifications
- Testing of standards' compliance
- Certification of standards' compliance
- Business models and rights

The results of the content audit surveys enabled WP3 to determine how to best support each content provider.

2.3 Deliverable. 3.2.1 Conformance Testing Tools version1

In this document the focus is on conformance testing tools. The principles of data conformance testing are described in the first Section. This includes an introduction to profiling possibilities, to application profiles and domain profiles as these are crucial to adapt specifications to particular national, sectoral or community needs.

The next major part of the deliverable explains how the LRE Metadata Domain Profile has been encoded in a machine readable form. This profile is used by ASPECT partners in work package 2. Testing for standards includes:
- Specifying data conformance
- The SchemaProf application profiling tool
- Profiling the LRE metadata specification
- The IMS generic test system and the ASPECT LRE metadata test system
- Third party test systems for SCORM and Common Cartridge

This Deliverable included the delivery of the machine readable ASPECT LRE profile V4.0 developed with the SchemaProf tool. This profile was internationally registered with the IMS Application Profile Registry. Based on this profile a conformance test system was generated. It was made freely available in V0.5 to all content providers through the *Tools* section of the ASPECT web site.

KU Leuven then tested the new SchemaProf application profiling tool. The content providers used the third party test systems to test their content packages.

Update: Based on feedback of content providers a revised version 0.6 of the ASPECT LRE Conformance Testing Tool has been made available on the ASPECT web site. It captures more errors and is now usable in standard circumstances without any special configuration. These improvements have been made to the generic test system and will therefore be available also for future test systems for other application profiles, in particular for the future IMS Common Cartridge V1.1 Test System.
KOB received from ADL a new version of the SCORM Conformance Test System and reported its positive experience back to ADL prior to the release of the system. The new SCORM Data Conformance Test System is much easier to install than the previous version.
KOB is offering ASPECT content providers sample SCORM testing and support in installing the test system on their premises.

2.4 Workshop for content providers in Munich, Germany, May 14th/15th 2009

The workshop in Munich helped clarifying the work that needed to be undertaken by the content providers. The LRE metadata profile XML binding was explained on the first day by Joris Klerkx, KU Leuven. The role of the content providers in ASPECT was described by David Massart, EUN.

1st day: ASPECT architecture (WP2):

- Basic workflow
    - metadata and controlled vocabularies
    - resource identification
- Advanced workflows
    - packaged content
    - access control
- Bindings and validation

Tools for content packaging were presented on day two. The main points are:

2nd day: Packaging and content production (WP3)

- Production workflow when putting in place packaged content (Open University)
- Authoring tools for SCORM and CC: MOS Solo, Office add-ons, RELOAD (Patricia Heckmann, KOB)
- Presentation of players (Warwick Bailey, Icodeon)
- Conversion from SCORM to Common Cartridge and validation of content packages (Codeplex by Microsoft, http://www.codeplex.com/scorm2cc)

All these tools are freely available; the use of commercial tools was not considered.

2.5 Deliverable 3.3 IMS CC and SCORM Demonstrator v1.0

The main part of the Deliverable is the *Demonstrator* site at the ASPECT website which is then documented in D3.3.
The main parts are:

- Scenarios
- Authoring tools
- Validators
- Players

Scenarios were provided to help users getting started planning how to develop content packages. Introductions are provided on how to use all tools. For all tools the demonstrator web site provides introductions how to use them. All tools can be obtained through links provided. Some of the tools are web based and require a registration. The use of validators is illustrated and information about the Icodeon player is provided. Further information about the SCORM certification program and IMS membership is also included.

Update: New information and tools will be added during the rest of the project. See Section 3 for an updated tools' status.

2.6 Workshop for content providers in Aarhus, Denmark, November 16th, 2009

The workshop in November was for developers to obtain a better understanding of how to use the tools and create Common Cartridges with their own resources. In preparation of the workshop content providers used the Icodeon converter to produce Common Cartridges from their existing SCORM packages. These converted cartridges were used as starting points of the workshop.

The Common Cartridge player from Icodeon was presented by Warwick Bailey. All participants validated their content packages, uploaded them and tried to play them with the new player. Some examples of how to add functionality to cartridges, beyond those available in SCORM, were presented and some problems with using the tools were solved.

Participants in the workshop

- Svetlana Kubilinskienė
- Milena Jorge
- Jernej Južna
- Alenka Kavčič
- Magyar János
- Pascal Craeye
- Laurens Verschuere
- Friedhelm Schumacher
- Alice/Alex
- Tomasz

Description:

- Brief status of conversion process
- Authoring and running converted Common Cartridge packages: adding functionality to converted packages
- Authoring and running Common Cartridge packages: developing packages from scratch - tools and XML
- Authoring and running SCORM packages: developing and testing SCORM packages
- Discussion: tools, experiences, benefits of packaged formats

The main aim in preparing a workshop was to provide support to those content providers who were unsure how to get started. Converting of SCORM packages into Common Cartridges was successful.

Following the workshop, the participants were asked to provide feedback on the tools available. While no particular problems with the tools have been reported, a need was articulated to have more free tools for packaging and playing IMS Common Cartridges offline. These requests have been forwarded to the respective IMS Workgroup.

3 Tools Provided

In the meantime some of the tools described in deliverable D3.3 have had new releases. All tools are listed below with information about updates or new releases if available (text in **bold italics**).

3.1 SCORM Editors

3.1.1 MOS Solo

MOS Solo from MindOnSite is an application to create learning courses, presentations, assessments and surveys. All created courses are SCORM 2004 conformant. The courses can be viewed in a browser. MOS Solo is a tool designed to build easy and fast content packages. It is possible to add pages, several documents, pictures, Flash files and activities with a simple right mouse click. A preview function helps to control the state of a course.
This is a tool easy to use for everyone. http://www.mindonsite.com

Update: A new version (032) is available; MindOnSite has a new website but now only in French. The update has no impact of working with the tool.

3.1.2 RELOAD Editor

RELOAD is a project funded under the JISC Exchange for Learning Programme. The project focuses on the development of tools that are based on emerging learning technology interoperability specifications and is managed by the University of Bolton. The RELOAD editor provides support for IMS Metadata, IEEE LOM, IMS Content Packaging 1.1.4, SCORM 1.2, and SCORM 2004. There are versions for Windows, Mac OS X and Linux. It is Java based and for a local installation.
This is a developer tool for professionals.

Update: There will be a new release in a few weeks. A new ADL Testsuite is also available.

3.2 Common Cartridge Editors

3.2.1 MIR Common Cartridge system

MIR is a simple and user-friendly web-based tool to build content packages in Common Cartridge format and play them. With a few clicks it is possible to create a folder, upload the resources, give the cartridge a name and build the new cartridge. A registration is necessary to use the tool. (http://dev.learngauge.com/MCCR/)

Update: No update or new release for the player or the authoring tool is announced.

3.2.2 Common Cartridge Builder

The Common Cartridge Builder is an Adobe AIR application that allows users to easily and quickly assemble a Common Cartridge by dragging and dropping files from a file system onto the application. The tool supports Common Cartridge v1.0 and is eta. (https://www.learningcomponents.com/apis.php)
This tool is for a local installation and requires Adobe AIR (http://www.adobe.com/products/air).

NEW. This tool is developed by Learning Components

3.2.3 Learning Components authoring tool

The LC IDE (Instructional Development/Design Environment) is a web-based tool to build Common Cartridges. With drag and drop functions, is it easy to use. As a special feature it allows to define rule driven runtime adaptation, i.e. the content presented can depend on the results of tests. A special Mime Type is used for these rules. As this is not part of the Common Cartridge specification, a special interpreter is needed to make use of this feature, for example the Learning Components integrated player.
Registration is necessary to use the tool. (https://www.learningcomponents.com/)

No update or new release.

3.2.4 Learning Essentials for Microsoft Office

Learning Essentials includes curriculum-based templates and toolbars for Microsoft Office Word, PowerPoint and Excel, plus academic tutorials from leading educational publishers. (http://www.microsoft.com/learningessentials/default.mspx

No update or new release. However recently Microsoft has released a Common Cartridge Packager under the name of Semblio. Semblio is currently under test at KOB before adding it to the ASPECT Demonstrator web site.

3.3 Validators

3.3.1 RUSTICI Software "TestTrack" for SCORM content packages

The SCORM TestTrack from RUSTICI Software is an online tool to test SCORM packages and validate them. TestTrack has complete support for SCORM 1.1, 1.2 and SCORM 2004(2nd and 3rd edition). The use of the tool is free with some space and support limitations.
http://testtrack.scorm.com/test-track/test-trackbase/Signin.aspx

No update or new release.

3.3.2 Common Cartridge IMS testing tool

The CC testing tool is for validating cartridges. It is easy to use and for a local installation. After extracting the zip-file, the tool can be run. Versions for Mac, Linux and Windows are available. The tool is available for Members of the IMS Common Cartridge Alliance.

Update: No update or new release. However there is a new Common Cartridge Test System for the yet unreleased version 1.1 of the specification. This version is used during the specification work. It is available to IMS members.

3.3.3 ADL Test Suite

The SCORM 2004 4th Edition Test Suite (Self Test) contains the compliance testing software, procedures and supporting documents for organizations to perform self-testing on LMSs, SCOs and Content Packages.
The tool is for local installation and requires a special version of Java. It is a tool for experts/developers to test SCORM packages. Developers mostly use it in combination with the RELOAD Editor to create comprehensive content packages.
Further Test Suites for other SCORM versions are available at the ADL website.
http://www.adlnet.gov

Update: A new version is available for download. Problems with special Java versions have been solved. It is important to carefully follow the installation instructions; an environment variable and path must be set!

3.4   Players

3.4.1 ICODEON player

During this stage of the project, players will be available for ASPECT partners from ICODEON. Common Cartridge and SCORM player are web-based tools. Technical Support from ICODEON Customer Support is given. With login data from ICODEON it is possible for users to upload and play their own content.
ICODEON Common Cartridge player (http://www.common-cartridge.com/
ICODEON SCORM player (http://www.scormlive.com/)

Update: ICODEON Players have been available since 8th November 2009. Login data have been sent by ICODEON to the project partners.

3.4.2 MOS Player for SCORM

The authoring tool for SCORM packages from MindOnSite described above is one tool of a family of tools. Mind on site has also MOS Chorus, a LCMS and MOS player for free download. http://www.mindonsite.com/

No update for the player.

4   Practice, Experience and Problems

In order to support content providers using the aforementioned tools, WP3 partners offered help on any problem that might occur with short notice. As well as this, the aforementioned workshops offered opportunities to overcome problems by means of guided hands-on activities. The following sections summarise the problems encountered. They are also intended as supportive reading for content providers intending to gain experience with any of these tools.

4.1   Problems highlighted at the workshop in November 2009:

MIR – Common Cartridge authoring tool and player:
Problem: After a registration, no actions are possible for a user.
Solution: The administrator has to set a role for a registered user. After choosing one of the three roles, (student, instructor, administrator) the user is able to work with the tool.

RELOAD Editor - SCORM authoring tool
Problem: Some partners do not understand the way to work with RELOAD.

Solution: The RELOAD Editor has several templates. Opening one of these templates and filling it with a users own resources helps users to understand what happens if content packages are created with this editor.

Converting SCORM to Common Cartridge with the Icodeon Converter
Problem: Converted CC packages do not work properly on the ICODEON platform
Solution: According to the SCORM specification, all files in a Content Package must be referenced in the file *imsmanifest.xml*. If SCORM packages are not conformant in this respect, the cartridges obtained by conversion shall be incorrect as well. Running the converted cartridge through the IMS Common Cartridge Test Tool will report missing or misspelled references. These should be corrected in the *imsmanifest.xml* of the SCORM package and the conversion should be re-done.

Running Variants of IMS Test Systems
Since all these test systems are instances of a generic test system, the following solutions apply to all of them.
Problem: The system blocks.
Solution: The report directory should not contain the program directory if it is to be cleared at startup.
Problem: An XML file is reported to be invalid, though another validator claims it to be correct.
Solution: Some XML producing software puts additional invisible characters, so called Byte Order Marks, before the first opening tag. These characters must be removed.
Problem: It is reported that some schemas, for example xml.xsd, could not be found.
Solution: This indicates a problem with the local internet connection. If this is a permanent problem, the internet access of the tool may need to be configured to use a specific port permitted by the local system administrator.

4.2 Needs of the content providers:

Content providers indicated the need for powerful Common Cartridge Builders and editing tools. Also better support for editing standard conformant content for Common Cartridges, like QTI assessments and weblinks, is requested. Ideally these tools should be available for free.

These comments and needs of the content providers have been communicated to IMS. Regrettably, developing such tools goes beyond the mission of ASPECT as a Best Practice Network with limited development capacities.

5 Conclusions

Existing tools for SCORM and Common Cartridge support a complete workflow from the creation of content through conformance testing to rendering. These have been collected on the ASPECT demonstrator web site, together with support materials. For the more recent case of Common Cartridge, as compared with SCORM, there is still a need for additional offline tools and free players.

Three workshops have been held to explain the essentials of these specifications and to demonstrate the use of the available tools. To obtain more experience, the content providers

should continue to use the tools available and build SCORM and Common Cartridge content packages in support of their customers and users. The help provided by WP3 partners can then concentrate on providing support in order to rapidly overcome any technical problems that might emerge with individual partners. Once technical problems and problems of tool usage are out of the way, development can go further to exploit the specific advantages of the SCORM and Common Cartridge specifications.

In parallel it would be desirable to gain more experience in using assessments encoded in accordance with the QTI specification.

By proceeding in this manner, WP3 will be able to bring the valuable experience gained in ASPECT into the further development of specifications at ADL and IMS.

6 Annex: Experiences from Content Providers

6.1 Partner: University of Ljubljana (UL)

"So far we managed to convert and test only 6 typical SCORM packages. As they were typical representatives of our packages, we do not expect other significant problems with the rest of the packages."

What tools did the content provider use to build CC and SCORM packages?
Our SCORM packages were built with the use of RELOAD editor with some manual adjustments of the manifest file. We will use SCORM2CC tool to convert those packages into CC format.

Do they have problems with the tools? (What kind of problems?)
Yes, we had some problems. Conversion with SCORM2CC does not produce useful CC package if there are files in SCORM that are used as content but not referenced in the manifest file. We will rebuild SCORM packages to reference all the needed (and used) files in the manifest and then run the conversion to CC again.

Did they use their own resources for building CC or SCORM packages?
Yes, we used our own resources.

Was the validation of the CC or SCORM packages ok?
Our SCORM packages are valid (tested with ADL Test Suite for SCORM). The converted CC packages did validate as well.

Do the CC or SCORM packages work/play in a player?
SCORM packages work in Moodle (LMS) and RELOAD player. Converted CC packages do not work properly on ICODEON platform (missing some functionality/content due to the file reference problem).

In which format are the own content packages of the content provider?
SCORM 1.2 and 2004

What kind of information or help do they need to go further with building content packaging in CC SCORM format?
We have complete tool-chain for SCORM (builder, editor, validator, player). We are missing some tools and information to fully work with CC. Namely, for CC we have only very basic builder, no editor, player is only available as web service (ICODEON platform), and there is no support for building CC specific content (QTI assessment, weblinks...)

Any comments?
Now we can prepare the CC packages (convert from SCORM) of our content, but no special CC functionality is included. We would need more powerful CC builder to prepare the CC packages form scratch.

Also, we preferred all CC tools (builder, validator, player) to be freely available as well as easy to use, since our goal is that teachers are able to prepare (or change and manipulate) CC packages of their own content by themselves (as they can do now with SCORM packages).

6.2 Partner: Ministry of Education in Lithuania (CTIE)

They bought 669 SCORM courses from different vendors and all these packages can be rendered in Moodle. After they followed ASPECT training, they tested their SCORM courses and discovered that only 97 packages (all from the same vendor) were OK .They talked to the other vendors who were totally ignorant of the existence of these tests (they only checked their packages against Moodle). Only the 97 valid SCORMs can be converted into IMS CC and played in the Icodeon player.

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