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IMS CC & SCORM Demonstrator 2.0

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Summary

Deliverable D3.6 provides an overview of further tools for creating content packages in different formats such as SCORM or Common Cartridge. These content packages must be validated and tested before they can be used for education.

Because ASPECT is a Best Practice Network, tool development was not initially intended by WP3. The main part of this workpackage was the evaluation of existing tools for every step of creating content packages.

Section 2 updates the information about SCORM and Common Cartridge tools presented in deliverable 3.3. The new commercial authoring tool Soft Chalk is introduced and the editor function of the LMS Tutor is described. A German tool for creating QTI tests and questionnaires has now been translated into English, so that content providers can use it.

Section 3 covers import and export into the learning management systems ATutor and Moodle. While working with ASPECT teachers, some experience has been gained with importing Common Cartridges in Moodle.

A key part of this deliverable is section 4 which looks at new tools developed by the University of Koblenz, Knowledge Media Institute. The new IMS Common Cartridge web based validator is introduced. Deliverable 3.3 described the Rustici Software TestTrack to test SCORM packages. This software has now been extended to include a workspace for playing SCORM packages which is a part of the player section 5.
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1 Introduction

The objective of WP3 within the ASPECT project is to foster the adoption of standards and specifications for educational content use. The approach is to: bring all content partners up to speed on a range of standards and specifications; propose a methodology for ways these standards and specs can be applied to resources developed by ASPECT partners; provide technical support and training; and investigate the strength and weakness of different standards’ based solutions.

The demonstrator website constructed by WP3 should provide the content provider with information and links about tools. The first version of the demonstrator was described in deliverable 3.3 with the focus on Common Cartridge and SCORM specifications and scenarios for their use.

After some experiences with tools and the use of specifications, one issue was how to create a Common Cartridge with an editor and how to import these cartridges into learning management systems. Another issue was the implementation of QTI in Common Cartridge. Some of the content providers began to create QTI questionnaires and asked for QTI tools to prepare questionnaires in Common Cartridges. In response, the demonstrator has new parts including QTI used in Common Cartridges and the import/export of content packages into LMSs.

This document updates the information in deliverable 3.3 and the tools at the demonstrator website.
2 Authoring Tools

In Deliverable 3.4 MS Semblio, the successor of MS Grave, was introduced but the promised version with an addition to the MS Office suite has not been released so far. Nevertheless, a new tool for developing content packages is available and the editor function in the LMS provides the functionality for the enlargement of existing content packages.

2.1 SCORM and Common Cartridge Editors

In the past, some of tools were released either for SCORM or for Common Cartridge. Now some editors allow the user to decide how to package their content. The Save option still saves the content as html or in the tool’s preferred format, but the export function gives the user a possibility to export their package as a SCORM 1.2, SCORM 2004 or Common Cartridge package.

2.1.1 New commercial software: Soft Chalk (SCORM and Common Cartridge)

Figure 1 Soft Chalk

Soft Chalk is a new editor for creating interactive web lessons for e-learning scenarios. Users can develop course contents in html format and export them to Common Cartridge and SCORM without any knowledge of programming or HTML. This software is for local installation and easy to use.

The user can - like in every word processing application - create his content. The program provides

- functionality for interactive learning games: customizable flashcards, image labeling, image hotspot activities, matching games, crosswords and more.
• functionality for assessment activities including six question types: multiple choice, multiple answers (more than one correct answer), short answer, true/false, matching, and ordering.
• functionality for text: pop-up text annotations to define terminology or enhance the interactivity of your lesson content.
• functionality for keyword search: digital media repositories
• functionality for web-based lessons: web-based widgets including polls, surveys, blogs, videos, wikis and others.

If the user wants to choose one of these functions, he has to use “Insert” in the menu and select what he wants to add to his content. The following screenshots present the functions in Soft Chalk.

Figure 2: Activities in Soft Chalk

Figure 2 shows some activities such as Crossword, Hot Spot, Jig Saw or Photo Album and more functions, which can be added to learning contents. For maths there is an editor to insert formulas and special characters.

Figure 3 presents the six question types: multiple choice, multiple answers, short answer, true/false, matching, essay and ordering for questionnaires.
The menu “Tools” contains a spell check, a style builder to prepare the header or footer of a new page, the media search and the library. There is a preview so that the lessons can be checked.

Soft Chalk files are stored in html format but can be exported in SCORM 1.2 and SCORM 2004 format, as a Common Cartridge or as an executable lesson for Windows or OS X. This is very flexible and makes it easy to publish the courses in LMS or on other web based sites.

The menu “Properties” provides special functions. The user is able to define an output language for SCORM, state multiple/single/unlimited attempts, and can add metadata to the content. Adding metadata to the package will help users find the content package in repositories. It can be done by filling in a special form.
Soft Chalk products allow instructors to create content for e-Learning and classrooms in K-12, higher education and corporate training.

The prices for a licence depend on the licence type. Students get a licence for $150. The price for a government or military licence is $850 and for educational use $595. Other licences are also available.

To download a free 30-day trial go to [www.softchalk.com](http://www.softchalk.com).

### 2.1.2 Creating content with ATutor (SCORM, Common Cartridge and QTI)

ATutor is an open source Web-based Learning Management System for developing and delivering online courses. The LMS must be installed on a server. Educators can assemble, package, and redistribute Web-based instructional content, import pre-packaged content, and conduct their courses online. The actual released version is 2.0 and open source.

Presented to the University of Bologna for the paper and presentation of the AccessForAll implementation, ATutor won the IMS Best in Show Award 2009 for Best Personalized Learning Solution.

ATutor supports the following accessibility standards:
• W3C WCAG 1.0
• W3C WCAG 2.0
• W3C ATAG 2.0
• US Section 508
• Italy Stanca Act
• IMS AccessForAll 2.0
• ISO FDIS 24751

and supports these interoperability standards:

• OpenSocial 1.0
• OAuth Authentication Protocol
• IMS Content Packaging 1.1.2+
• SCORM Content Packaging
• SCORM 1.2 LMS RTE3
• IMS Question Test Interoperability (QTI) 1.2/2.1
• IMS Common Cartridge 1.0
• W3C XHTML 1.0

How to create courses with ATutor

Users need to create a profile before working with ATutor. This allows them to set options for displaying content, tools and general settings of ATutor. After logging in, a user is shown his start page.

The start page displays the user’s courses and all available actions to edit existing courses, create new courses or launch them.

Creating new courses can be done without any knowledge of html. Users just fill in the forms, write text and upload content files like pictures or documents. Before importing an existing
SCORM or Common Cartridge course, the user has to create a new course. Content packages are handled like content, which must be uploaded. For more about import and export functions see section 3.

The next figure shows a selected course. The included pages of the course are displayed in the left menu. The “Home” of every course offers a forum, links, glossary, chat, surveys and more.

**Figure 7: A course in ATutor**

The working area in figure 8 shows a page which can be edited here. To edit a page or add a new page or folder, one can use the short cuts at the upper right hand side under the log-out button.
The user can choose between a visual editor and a plain text editor and select some properties. Another important function is the creation of surveys or assessments. The tab Tests and Surveys (also reachable via the menu button “Manage”) includes the comprehensive function “Tests & Surveys”. The four tabs separate the Questions from the tests or surveys. To structure it, the user can define categories of questions and assign the questions to the categories. New tests or surveys must be applied. The next step is to add the questions from the Questions Database to a test or survey. Figure 9 shows some types of questions.

The aim of this unit is not the substitution of the textbook, but rather being a complement to it. The stress is on the computer simulation capabilities to carry out experiments that provide the user with an understanding that would require a larger abstraction effort by other means. The text is mostly reduced, trying to keep the self-consistency in the development, and textbook reading are recommended when necessary.
The option “Import Questions” allows the user to upload and import questionnaires. Also courses or questionnaires can be exported in QTI 1.2.1 and QTI 2.1.

About ATutor

ATutor is currently released as version 2.0 and has adopted the IMS/SCORM Content Packaging specifications, allowing content developers to create reusable content that can be swapped between different e-learning systems. Content created in other IMS or SCORM conformant systems can be imported into ATutor and vice versa. ATutor also includes a SCORM 1.2 Runtime Environment (LMS RTE3) for playing and managing SCORM based Sharable Content Objects (SCOs).

For more information go to [http://www.atutor.ca](http://www.atutor.ca).

2.1.3 Common Cartridge Builder (Common Cartridge)

The Common Cartridge Builder is an Adobe AIR application that allows users to assemble a Common Cartridge by dragging and dropping files from a local file system onto the application. The user may then rename and/or rearrange the file structure. This application is Beta version 1.0.5 and provided AS IS.
Figure 10 shows the working area in Common Cartridge Builder. The files which will be included in the package are placed on the left hand side. On the right hand side the properties of the files and a content description can be added or edited.

For downloading the latest version go to https://www.learningcomponents.com/apis.php.

2.2 **Onyx Editor 2.3 (QTI)**

The Onyx Editor is a Java-based, desktop application for creating and editing tests and surveys based on the IMS Question and Test Interoperability specification (QTI) 2.1. This authoring tool makes it easy to implement multimedia-based designs for multifunctional tests.

The software is easy to install and is based on the German language but, if the operating system is English, the language will be displayed in English. Figure 11 shows the working area and a test with a section and a multiple choice question. New sections or questions can be added by using the right mouse button.
Figure 11: Working area of the Onyx Editor 2.3

On the left hand side, the structure of the test is listed; the right hand side allows user to describe the questions and prepare the answers or upload some pictures. The test can then be launched in a preview window.

The editor allows importing of IMS QTI v1.2 from Blackboard. The developers of Onyx are working on an export and import function for OLAT QTI v1.2 file.

Onyx also provides an interface for the Alfresco learning management system, based on the earlier Alfresco document management system.
The Onyx Editor is a part of the Onyx Testsuite and is developed by BPS Bildungsportal Sachsen GmbH. The Testsuite includes the editor, a player, the reporter to evaluate the results of tests and a plug-in to integrate the Testsuite into a LMS.

For more information go to http://elques.bps-system.de.
3 Experiences with LMS

In order to support reusability and interoperability, content packages are created using standards. Now it is necessary to import them into different Learning Management systems and see how they work.

3.1 ATutor

In section 2.1.3 the new learning management system ATutor was introduced. Further details about importing and exporting content packages are below.

As described above, a new course must be created before importing content packages. ATutor provides for the import and export of course content as IMS Content Packages, IMS Common Cartridge or SCORM packages.

Exported content packages can be viewed offline, and transferred to other systems that will import IMS conformant content. If enabled, students can also export content for offline viewing. An entire course, a chapter, or a single page of content can be exported as an IMS Content Package or Common Cartridge. Exported packages are archived into single zip files.

To export content, select the scope by choosing an option from the “What to export” menu. Select the checkbox to export AccessForAll adapted content as an IMS AccessForAll integrated content package or Common Cartridge, if adaptations exist for the content being exported. Using Export will generate a downloadable zip file.

The figures 13 and 14 show the import/export function and the path where to find it.

Figure 13: Export with ATutor
To import content into ATutor, it must conform to IMS content packaging or IMS Common Cartridge 1.0 specifications. Before importing, specify where in the course structure the new content is to be placed by using the “Import into” menu.

Now the content zip file must be selected from the local file system, either by typing the path into the “Upload a Content Package or Common Cartridge” text field, or by using the “Browse” button.

Select the checkboxes to Import available Tests, or Import available AccessForAll content, if they are included with the package being imported. QTI test packages should be imported through Tests & Surveys if they are not part of a content package.

Using Import will upload the zipped content into the course, and unpack it into the specified location in the course. Now the content can be used and edited like the content created with ATutor.

To import a SCORM package 1.2, the user will find another option in the menu called “Manage”. There is a special part for SCORM packages, see figure 15.
In the current version of ATutor, only SCORM 1.2 packages can be imported. As described before, the user is allowed to select a zip file from the local computer or insert a URL where the package can be found. A click on the button “Import” starts the upload.

3.2 Moodle

Moodle is a learning management system or a virtual learning environment (VLE). It is a free web application that educators can use to create online learning sites. The focus of the Moodle project is to offer tools to manage and promote learning courses, scale large deployments and manage very large numbers of students. Moodle provides blended teaching and self based learning with online courses. Communities can use forums, databases and wikis for common learning.

The ASPECT project has organized three teacher workshops for a group of 40 teachers from four countries that examined how teachers searched for and discovered resources for their school lessons. One part of this work was to test how teachers imported their resources into Moodle.

The following pictures show how to work with the import and export functions of Moodle.
To import a content package, the user has to create a new course. Figure 16 presents the working area of Moodle with the opened menu for adding or creating courses. The button “Add a new course” opens the form to build the new course. The format for the import can be chosen.
To import a SCORM package, the format must be “SCORM format”. Figure 18 shows the “Edit course settings” form. After selecting “SCORM format”, the view changes to the special SCORM view of a course and the SCORM package upload can be done here.

General settings are for the description and upload of a SCORM course, other settings are for the learning environment of the student.

The format for a Common Cartridge import can be “Topics format” or “Weekly format”, which is set by default. The example at figure 19 shows the weekly format. For every week, settings like resources and activities are possible. The last possibility of the menu “Add a resource” is “Add an IMS Content Package” which means choosing a Common Cartridge import.
Moodle has no special export function for content packages but the export of QTI questions is possible.

4 Validators

This section introduces newly developed validators for testing and correcting cartridges. Application profiling is supported by a new vocabulary management tool that allows users to add vocabularies to application profiles.

4.1 IMS Common Cartridge Test System

A new web-based validator has been developed by IMS. The tool provides an easy validation for Common Cartridges without any registration or login procedure. This tool is free of charge and validates cartridges for conformance with the IMS Common Cartridge Specification 1.0.

The user can decide, if she wants to upload a complete cartridge for validation, to upload just the manifest file, paste XML code into the system or validate by URI. Four tabs allow an easy access to all features.

There is also a web service that can take direct input or one or more URLs separated by commas. A link to the web service can be found in the description of the validator “How to use the validator”, see figure 20.
After a validation, the test system generates a log file. If the test system finds errors, it corrects some of them and allows the new cartridge to be downloaded. Figure 21 shows a validated and corrected cartridge that is ready to be downloaded. The complete report follows the download-link of the corrected cartridge. A list with validated files and detailed information follows.

The report is subdivided into four sections:

- Resource Validation Results
- Schema Location Results
- Schema Validation Results and
- Schematron Validation Results.

In every section, the messages are distinguished between

- Warnings
- Errors
- Fatal Errors
- Exceptions and
- Messages.
Figure 21 shows the report of a corrected file. The tested files are valid. The results of all four test-categories are listed below.

The validator can be found under [http://validator.imsglobal.org/](http://validator.imsglobal.org/).

### 4.2 Content Package Referencer Tool

ContentPackageReferencer was developed at the University of Koblenz-Landau, Knowledge Media Institute, for testing content packages for incorrect references. It inserts missing file references in a content package manifest file and warns the user if a file exists in the references of the manifest file but not in the content package. The tool also allows you to format for printing the manifest files in your content packages. ContentPackageReferencer is published under a Creative Commons License ([http://creativecommons.org/licenses/by-nc-sa/2.5/legalcode](http://creativecommons.org/licenses/by-nc-sa/2.5/legalcode)).
The referencing procedure is carried out in three steps:

- First, the existing references in the manifest file are checked against all files in the package and a list of missing files is generated. The missing references are inserted as new resource tags into the manifest file.
- Second, the existing references in the manifest file are checked against all files in the package and a list of all files that do exist in the manifest file but not in the content package is generated. The superfluous files are not deleted from the manifest file by default because this could destroy references in the organizations’ part of the manifest file.
- Nevertheless, users receive at least a warning that contains all invalid files. The tool allows users to delete all of the invalid resource or file tags by using a special option.
that is described in more detail in the next sections. If a user wants to delete just some of the tags, this can be done manually.

Besides repairing broken references, ContentPackageReferencer is able to print the manifest files of content packages in an indented and line-wrapped way. Users can either choose to repair content packages (print friendly format of the manifest files is included in this) or not to repair content packages but to format for printing their manifest files.

The actual version of ContentPackageReferencer is able to work in command line mode (for Windows, Linux and Mac) or in graphical user interface mode (only for Windows). For detailed information download the documentation, [http://www.aspect-project.org/node/39](http://www.aspect-project.org/node/39).

### 4.3 VocabularyManager

VocabularyManager is a tool for inserting vocabularies into users’ application profiles. It was developed at the University of Koblenz, Knowledge Media Institute (IWM). VocabularyManager allows a user to insert vocabularies that are located on his hard disk, available via the ASPECT Vocabulary Bank for Education or available via a web page link. VocabularyManager is published under a Creative Commons License ([http://creativecommons.org/licenses/by-nc-sa/2.5/legalcode](http://creativecommons.org/licenses/by-nc-sa/2.5/legalcode)).

VocabularyManager mainly works in four steps after the user has selected an application profile for inserting vocabularies.

- First, the VocabularyManager unzips the profile into a temporary directory.
- It searches for already existing vocabularies in the Vocabularies folder and parses the vocabularies.xml file.
  - If there are vocabularies that exist in the Vocabularies directory but not in the vocabularies.xml, the tool parses these vocabularies for their name and identifier and inserts new entries into the vocabularies.xml.
  - If the vocabularies in the Vocabularies directory are not placed in separate folders as described in the specification, the tool generates new folders for each vocabulary and copies the vocabularies into these.
- VocabularyManager provides three different dialogs for inserting vocabularies from the local hard disk, the Vocabulary Bank for Education and from web pages.
  - Inserting vocabularies from the hard disk is done by copying the selected vocabularies into the temporary profile folder. Additional information about the vocabulary (e.g. its name, ID, type, URL etc.) can be stated in appropriate textboxes. It will be inserted into the vocabularies.xml on saving the profile.
  - Downloading vocabularies from the Vocabulary Bank for Education is realized by generating a link out of the vocabulary authority, the vocabulary identifier and an optional vocabulary revision number. The file that is found under the link can be downloaded and saved to the temporary profiles’ folder. If it is not a VDEX file, it will be deleted.
o Downloading vocabularies from web pages works in a similar manner to downloading vocabularies from the Vocabulary Bank for Education. The only difference is that the link will not be generated automatically but has to be stated manually.

- The last step consists of two smaller steps.
  o Firstly the information about all vocabularies is saved to a new vocabularies.xml file.
  o Then the whole profile is zipped and described with the name of the old file plus the suffix “_vocabularies.zip”.

Figure 23: Loading a profile into VocabularyManager

The development of VocabularyManager is nearly finished and the tool will be published in October 2010.
4.4 Generic Test System

The Generic Test System developed at the Knowledge Media Institute (IWM), University of Koblenz, has undergone some major changes. For one thing, it is now able to configure itself. On starting the system, it will check if the necessary graphics libraries are in a specified folder. If not, the system will be analyzed and the correct graphics libraries will be copied into the specified folder automatically. When the Generic Test System is started for the second time, the appropriate graphics libraries will be loaded. This has a number of advantages. First, the Java Virtual Machine (JVM) that is registered for double-clicking will be used. Second, there are only three different versions of the Generic Test System: versions for Windows, Linux and Mac. Third, the process of building the Generic Test System is a great deal easier than before.

![Figure 24: Testing vocabulary constraints in test documents](image)

Another important change concerns the testing of constraints. A constraint defines additional conditions that have to be matched against the content of a test document. The test system for constraints that looks for specific content in documents has been updated significantly. Previously, only a File Constraints’ Test System for checking file constraints for validity was in place. Currently, there is a General Constraints Test System, which extracts the content from documents and calls several Specific Constraints Test Systems for doing the actual constraints’ testing (that means validating the condition). The content that the general test
system has to look up is defined by XPath-expressions that match every occurrence of the content in the document. At the moment, there are two Specific Constraints’ Test Systems: a File Constraints’ Test System that existed before and a new Vocabulary General Constraints’ Test System. The latter is user-defined. The reason for keeping the content extraction and the actual test separate from each other is to facilitate the introduction of new constraint types.

The File Constraints’ Test System checks document content with respect to a File Constraint. Testing a document’s constraints (if found) works as follows: the General Constraint Test System generates a specific file – the so-called Instance Constraints’ File – that contains the content that was found in respect to the constraint plus additional information (e.g. the line number of the original document where the constraints’ test occurred). The General Constraints’ Test System then calls the test system that handles the specific constraints test (in this example the File Constraints Test System) and passes the information about the test via the Instance Constraints’ File on to the test system. The File Constraints’ Test System does the actual testing and eventually generates additional tests that may be necessary. The File Constraints’ Test System checks for the size, mime type and extension etc. of the test document. It also creates the report file. An important improvement of the new File Constraints’ Test System is the consideration of URLs. This means, that the paths to the test documents are interpreted as URLs. While doing a File Constraints’ Test, the test system checks the files that lie in place of the URL.

The Vocabulary Constraints’ Test System checks document content with respect to a Vocabulary Constraint. It works mainly like the File Constraints’ Test System mentioned above. The Vocabulary Constraints’ Test System is called by the General Constraints’ Test System, if the General Constraints’ Test System encounters a vocabulary constraint in the test document. It gets all important information via the Instance Constraints’ File that is generated by the General Constraints’ Test System. After a short preprocessing of all vocabularies, that includes caching them in a data structure, the Vocabulary Constraints’ Test System runs the actual test. It checks for every vocabulary constraint in the Instance Constraints’ File, if the vocabulary exists in the cached data structure and if the vocabulary contains the term

**Figure 25: Test results of a Vocabulary Constraints Test**
identifier. There are three possible cases: either the vocabulary does not exist; or the vocabulary exists but the term identifier does not exist in the vocabulary; or the vocabulary exists and the term identifier exists in the vocabulary. The constraint test only proves true in the last case.

The new version of the Generic Test System is currently tested while it is used to produce specific LODE ILOX Test Systems as described in the next Section.

**Figure 26: Detailed test results of a Vocabulary Constraints Test**

### 4.5 LODE ILOX LRE Application Profile Test System

The IMS LODE Information for Learning Object eXchange specification (LODE ILOX) specification is currently under development. It defines a generic format for the description of copies and versions of learning objects. The LODE specification is described in detail in [IMSLODE] (http://www.imsglobal.org/lode.html). This document contains the LODE information model with a variety of additional conditions and a reference to a binding using an XML Schema.

The LRE Metadata Application Profile (see [LRELODE]), developed in the ASPECT project, defines further restrictions that are expected to be valid in the most common use cases. Many of those conditions cannot be described in an XML Schema and therefore cannot be tested by XML Schema validation. This applies in particular to the use of vocabularies. Often the prescribed vocabulary to be used for values in one field depends upon the value of another field. The challenges this poses for conformance testing have been discussed in detail in
ASPECT D3.2.2 Sections 4 and 5.1. The concepts described in that deliverable have been implemented and applied to produce test systems for the LODE ILOX Application Profile.

The LODE ILOX profile is a domain profile consisting of a profile of the LODE ILOX schema as base schema and a profile of the IEEE LOM Metadata specification. The profile refers to vocabularies which are maintained in the Vocabulary Bank for Education (VBE).

The standard, fully automatic process of creating test systems starts by applying a packager to an application profile encoded with the SchemaProf tool. This packager packages the profile with an unconfigured test system bundle. It turned out that the resources of the ASPECT project do not permit integration of vocabulary profiling into the SchemaProf tool. Therefore, as a preliminary solution, an intermediate manual step has been introduced between the production of the SchemaProf profile and the generation of the testing software. This process:

- Gets required VDEX vocabularies from the Vocabulary Bank for Education, the local disk or from a URL and inserts them into the SchemaProf profile. The Vocabulary Manager is described in Section 4.3
- Modifies the SchemaProf profiles so that they match the needs of the revised generic test system which handles vocabulary testing in a new way as described in Section 4.4.

The LODE ILOX test system has been used in conjunction with the aforementioned documentation and with a set of data containing built-in errors as follows. The encoding of the profile in SchemaProf led to requests for clarification which resulted in an improvement of the documentation. The reports of the test system on the error data were examined to determine whether errors were reported when in fact none existed and which of the built-in errors have been detected. This analysis led to an improvement of the SchemaProf encoded profile and, as a consequence, to improvements of the test system. This process is ongoing in collaboration with the IMS LODE specification group.

### 4.6 Testing Common Cartridges with QTI2 (experimental)

Version 2 of the IMS QTI specification is currently under revision by an IMS Working Group which met in Koblenz August 2\textsuperscript{nd}, 2010 at the IMS Quarterly Meeting. The QTI Working Group intends to define for future use in Common Cartridges a profile of QTI2 which corresponds to the profile of QTI 1.2 which is part of the current Common Cartridge specification. First experimental cartridges with QTI 1.2 assessments replaced with QTI2 assessments were presented at that meeting. The ASPECT project also provided a first system for testing those cartridges at the meeting. It is intended to continue this cooperation with the QTI Working Group as the respective QTI2 profile is defined.
5 Players

This section introduces the adapted tool SCORM Cloud, formerly called Test Track) from RUSTICI.

5.1.1 SCORM Cloud Test Track (SCORM)

In deliverable 3.3 we presented Test Track for testing SCORM packages and reporting runtime behaviour of courses. The Rustici Software Company broadened their software to a larger environment for launching and testing SCORM packages, called SCORM Cloud. Test Track, as a part of SCORM Cloud is expanded to a test area for SCORM packages. Some pictures with descriptions will explain the new version of Test Track.

After logging in, the user sees his workspace with an overview about recent courses, recently active users, recent activities and his work area called realms on the right hand side. New courses can be uploaded here.

Recent courses can be started here by clicking on the names of the courses. All active users are listed. Selecting a user opens her profile by switching to the people area of SCORM Cloud.
The list of the recent actions shows the latest changes by the user. More details of the user’s actions can be displayed by choosing “go to History” or the button “History” on the right hand side. The part “History” displays information belonging to the event history.

Every call of a course triggers a switch from the home page to the library where information about the selected course is available. Tags can be added to a course for describing the course content.

Note that courses can be imported into SCORM Cloud, but not exported!
New learners can be invited to join a course by selecting a course and clicking on “invite”. A new window that contains an email form with an invitation and a link to the course appears. After inserting the learner’s email address, the form can be sent.

** Dispatches  

A new feature of Test Track is the so-called "Dispatches" module. Here the user can create dispatches which allow users to play SCORM Cloud contents in another LMS. The dispatch must be imported into the LMS. Destinations and tags must be defined initially.

If the content is to be sent to more than one place, so-called destinations help users to know where exactly the content is sent to. On creating the destinations, it is also possible to prevent people at the defined destination from launching the content and, therefore, to protect the content. More about Dispatches can be found at the right hand side of SCORM Cloud.
Application as Add-on

SCORM Cloud was developed to be integrated into other applications. SCORM Cloud allows import and delivery of SCORM and AICC content in the context of a user’s application.

Every application has a unique identifier used to establish its identity when connecting to and communicating with the SCORM Cloud. So-called secret keys are passwords needed to authenticate an application identifier to the SCORM Cloud.
SCORM Cloud add-ons are available for Moodle, Sakai, Dokeos and ILIAS. The add-ons make it possible to use the functionality of SCORM 2004. The SCORM Cloud integration delivers SCORM conformance but SCORM Test Track does not test for strict conformance to the standard. 

*Strict conformance testing is done by the ADL Conformance Test Suite!*
6 Conclusion

At the start of the project the evaluated tools have been made to develop SCORM, QTI or Common Cartridge conformant content packages. Previously, the import of these content packages into Learning Management Systems was a problem. At the present time we are witnessing a trend toward more flexibility in creating content packages. Some LMS are offering editor functions for their learning contents. The export and import of Common Cartridges or SCORM packages is now possible in some LMS or Learning environments.

Content providers gained experience with content packaging and tools. Now they can explain their requirements in detail to tool developers or implement what they need.

The current deliverable describes some new tools and the enlargement of existing tools which will provide the lifecycle of content packages. This means creating, playing, exporting and importing them into other systems for further education.
## References

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<th>Reference</th>
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<tbody>
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