Technology Enhanced Learning:
Conformance - European Requirements & Testing

D5 – Test System Requirements Document

Title: D5 – Test System Requirements Document

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Summary: This document defines the requirements for the test system.

It covers all the requirements for the system essential, important and desirable, which are needed to develop the functional system. The requirements cover those needed for the application profiles defined in D4 and for as wider range of other related profiles that partners believe they will need to test for conformance.

1 REVISION HISTORY

Version Number	Release Date	Comments
0.1	15 March 2004	Table of contents plus initial form
0.2	20 March 2004	Table of contents plus initial form in TELCERT template
0.4	17 April 2004	Includes UfI requirements and priorities
0.5	19 April	Includes Fraunhofer IGD requirements and priorities
0.6	6 May 2004	Further revisions from UfI
0.7	25 May 2004	Includes Koblenz priorities
0.8	29 May 2004	Incorporates revisions from all partners
0.9	9 June 2004	Incorporates further revisions
0.99	25 June 2004	Further minor revisions and renumbering of requirements

2 EXECUTIVE SUMMARY

2.1 Purpose

The purpose of the test system is to provide a reduction in the testing and development footprint for course development. The test system delivered by the TELCERT project will sit alongside existing test tools, supplementing them as appropriate. It is important that any test system is not considered solely in isolation from other components that exist in the deployment environment.

2.2 Background

TELCERT requires this because, the big problem that is incurred with testing is that it is very labour and time intensive. Testers have to take every route through the content to see if errors occur. A major objective should be to eliminate or reduce this. Particularly, automation so that testers do not have to spend days working on content is desirable. It is not expected that any test system can eliminate the need for human testing, but any contribution is a step in the right direction and provides a foundation upon which further progress can be built.

Any solution that TELCERT proposes should be capable of operating in both a standalone capacity or alongside UfI's existing systems. This ensures a maximum amount of flexibility when it comes to deployment.

3 TABLE OF CONTENTS

4 INTRODUCTION

4.1 Requirements overview

This section is an overview summary of requirements for the test system. The big picture here is detailed more finely in the following sections.

Ultimately, the end user part of the test system is a web based application (potentially an XML based web service – although this is by no means a requirement). The system will be available to the user via a login process that is controlled by username and password (Ideally this authentication information can be taken from existing systems, or be standalone).

Upon logging in, the user will be presented with options to view the various profiles and specifications that are supported, and the tests that apply to them. Users will able to view the results of tests that have already been performed on content. Users will also be able to run the tests against content, and the results of those test runs can be saved for later use. Users will be able to select a subset of the tests to be performed if they so desire; and users will have the options to stop the testing process once it has commenced. Users will be able to choose to test content against the base specification or a derived application profile.

Users themselves will be members of groups, and results can be published at a group level to allow other members of the group to view the results of the testing. Users will be able to load their target content either from a number of different sources – at the very least via local upload or by providing a URL to a web server.

Throughout this process, version control is important. Where content is tested, version numbers will be assigned by the user, so that developers can see which version of their content has been tested against which version of the profile (and also which versions of the tests have been run).

In addition to the test system which is described above and aimed at content developers, there will exist a number of other web based tools that will allow administrators extra functionality. Specifically, administrators will be able to allow access to the test system for users, put users into groups, remove users from groups and remove users from the test system.

Administrators will not be able to run system tests, but will be able to view the specifications and profiles that are supported, as well as the tests that apply to them. Administrators will be able to add new profiles and specifications, and delete those profiles that are no longer required. Administrators will also be able to attach and remove tests from profiles and specifications. It is envisaged that a separate tool will be made available to allow the creation of test definitions. This tool may be a standalone tool or part of the administration interface.

4.2 Adopted Methodology

This user requirements document defines the consensus on the user requirements for the TELCERT Test System. As such it incorporates the requirements of all the partners and to ensure that each partner may use the system to undertake the testing that they need.

In order to achieve consensus there have been several drafts on which all the partners have been encouraged to comment and add any user requirements that they may have. To this end

the Open Group defined the type of information and structure that the user requirements document should contain in order for them to be able to build the test system.

Following this each of the partners contributed their requirements to the document, together with the priority that they assigned to that requirement (essential, important but not essential, desirable).

The document has then been reviewed several times by each of the partners who have added and amended requirements as appropriate.

It is still necessary to agree which of the requirements will be included in the Phase 1 development of the system

4.3   Structure of this Document

The structure of the rest of this deliverable consists of:

Section	Summary Description
3 Specifications to be tested	This section defines the specifications which the test system must support and form the basis for the application profiles which will be tested. It should be noted that conformance testing should be possible against specifications as well as against application profiles.
4 Application Profiles to be tested	This section details the application profiles that the Phase 1 test system must support. These application profiles must all be profiles of specifications that are defined in section 2.
5 System Requirements	This section describes the systems on which the test system must run including hardware, operating systems and software (both server and client side)
6 General Requirements	This section describes a variety of miscellaneous requirements including: • Data formats • Transport protocols • File systems • Programming languages
7 Functional Requirements	This section describes the functionality of the test system, what the user may do and how they interact with the system
8 Tests	This section defines how tests are executed
9 Quality of Service; For hosted service	This section defines the run time quality of service definition for the test suite.
10 Documentation	This section defines the documentation that is needed with the system
11 Assumptions	This section lists the key assumptions that have been made throughout the document

4.4   List of Acronyms

Acronym	Expansion
API	Application Profile Interface
CMI	Computer Managed Instruction
FE	Further Education
HTML	HyperText Markup Language
HTTP	HyperText Transfer Protocol
IIS	Internet Information Server
LMS	Learning Management System
LOM	Learning Object Metadata
ODBC	Open Database Connectivity
QTI	Question and Test
SCORM	Sharable Content Object Reference Model
URL	Uniform Resource Locator
WSDL	Web Services Description Language
XML	eXtensible Markup Language
XSD	XML Schema Definition

4.5   Definitions

Term	Definition
Priority	The importance given to any requirement
Priority 1	The requirement is essential. Unless this requirement is met the system will not meet the partner's needs, or the system can only be used with difficulty
Priority 2	The requirement is important, but not essential. The system is usable without the requirement but would be significantly enhanced by its inclusion
Priority 3	The requirement is desirable.

5 SPECIFICATIONS TO BE TESTED

This section defines the specifications which the test system must support and form the basis for the application profiles which will be tested. It should be noted that conformance testing should be possible against specifications as well as against application profiles.

ID	R01
Phase	1
Description	The test system must be able to test against the following specifications in the manner defined in D06: • SCORM 1.2 (without testing the Runtime) • IEEE LOM Metadata • IMS Metadata • IMS Content Packaging (Version 1.1.3 and earlier) • IMS LIP (version 1.0)
Deliverable	End User Test system
Dependencies	None
Acceptance criteria	Test content will be made available by the partners who wish to have that specification included to test that the test system is capable of testing against these specifications. For each specification, reference content which is conformant in all categories will be produced, as will content which is known to fail in certain areas. The test system must find the correct errors (or lack thereof) for each piece of control content.

Priority	Partner	Priority
	EifEL	1
	Uni Ko-Ld	1
	FhG/IGD-R	1
	UfI	1

ID	R02
Phase	2
Description	The test system must be able to test against the following specifications in the manner defined in D06: • SCORM 1.2 Runtime • IMS Metadata • IMS Content Packaging (Version 1.1.3 and earlier) • IMS LIP (version 1.0)
Deliverable	End User Test system
Dependencies	None
Acceptance criteria	Test content will be made available by the partners who wish to have that specification included to test that the test system is capable of testing against these specifications. For each specification, reference content which is conformant in all categories will be produced, as will content which is known to fail in certain areas. The test system must find the correct errors (or lack thereof) for each piece of control content.

Priority	Partner	Priority
	EifEL	
	Uni Ko-Ld	
	FhG/IGD-R	
	UfI	1

ID	R03
Phase	2
Description	The test system must be able to test against the following specifications. These might not be XSD documents, but could be UML models (XMI?) • IMS Learning Design • IMS Question and Testing Interoperability • IMS Simple Sequencing • SCORM 2004 • IMS Reusable Definition of Competency or Educational Objective This list is subject to change and represents current thinking.
Deliverable	End User Test System
Dependencies	None
Acceptance criteria	Control content will be made available as in R01. The test system should identify the correct errors in the correct places.

Priority	Partner	Priority
	EifEL	2
	Uni Ko-Ld	2
	FhG/IGD-R	2
	UfI	2

6 APPLICATION PROFILES TO BE TESTED

This section details the application profiles that the Phase 1 test system must support. These application profiles must all be profiles of specifications that are defined in section 2.

ID	R04
Phase	1
Description	The test system must be able to test against the following application profiles • UfI Community Application Profile • Uni Ko-Ld Community Application Profile • French, German and British EDS Application Profile The system must be able to Import and test against as defined in D06 any of the following application profiles together with their given specification. Currently this in the form of an XML document.
Deliverable	End User Test System
Dependencies	TELCERT Deliverable – Phase 1 profiles
Acceptance criteria	As for R01, control content will be produced for each of these profiles. The system should report the correct errors in the correct places.

Priority	Partner	Priority
	EifEL	1
	Uni Ko-Ld	1
	FhG/IGD-R	1
	UfI	1

ID	R05
Phase	2
Description	The test system must be able to test against the following application profiles • UFI FE Phase 2 Profile, comprising of individual profiles of specifications that will be included in phase 2 of the project. At this time this is not a concrete list.
Deliverable	End User Test System
Dependencies	TELCERT Deliverable – Phase 2 Profiles
Acceptance criteria	As for R04, control content will be produced for this profile, and the system should report the correct errors in the correct places.

Priority	Partner	Priority
	EifEL	1
	Uni Ko-Ld	1
	FhG/IGD-R	1
	UfI	

7 SYSTEM REQUIREMENTS

This section describes the systems on which the test system must run including hardware, operating systems and software (both server and client side)

7.1 Server Hardware

ID	R06
Phase	1
Description	The server component of the test system must run on: • i86 • Sparc servers • Mac servers
Deliverable	End User and Administrator Test System
Dependencies	None
Acceptance criteria	The software will be loaded onto the appropriate platform; and the self test for the system will be run. This should report that the system is successfully installed, and that a generic content test has been passed.

Priority	Partner	Priority
	EifEL	1 – PC 3 – Mac 3 – Sparc
	Uni Ko-Ld	1 – PC 3 – Sparc 3 - Mac
	FhG/IGD-R	1 – PC 2 – Sparc servers 3 – Mac servers

| | UfI | 1 - PC |
| | | 1 - Sparc servers |

7.2   Software

ID	R07	
Phase	1	
Description	The test system must be able to interface to all required third party software. The list of software that is required to be interfaced to is defined within separate requirements of this document.	
Deliverable	A test system that can interface to all required third party software	
Dependencies		
Acceptance criteria	Check that all interfaces in the system function correctly	
Priority	Partner	Priority
	EifEL	1
	Uni Ko-Ld	1
	FhG/IGD-R	1
	UfI	

ID	R08
Phase	1
Description	All third party software components used within the test system must be freely available.
Deliverable	A test system with only freely available third party software components
Dependencies	
Acceptance criteria	Check that all third party components are freely available

Priority	Partner	Priority
	EifEL	1
	Uni Ko-Ld	1
	FhG/IGD-R	1
	UfI	

7.3   Server O/S

ID	R09
Phase	1
Description	The server must run on the following Operating Systems: • Windows XP • Linux Standards Base conformant system (see http://www.opengroup.org/lsb/cert/cert_prodlist.tpl) • Mac OS X 10.2 with Java version 1.4.1 • Mac OS X 10.3 with Java version 1.4.2
Deliverable	End User and Administrator Test System
Dependencies	None
Acceptance criteria	Install and execute the test suite on all of the stated platforms and make sure that they work correctly

Priority	Partner	Priority
	EifEL	1 - Win32 1 - Linux (SuSE, Redhat, Mandrake) 2 – Unix / MacOS X
	Uni Ko-Ld	1 – Win32 1 – Linux 3 – MacOS X

	FhG/IGD-R	1 - Win32
		1 - Linux
		2 – MacOS X
	UfI	1 - Win 32
		1 - Linux – Redhat
		2 - Unix – Solaris

7.4 Server Third Party Software

ID	R10	
Phase	1	
Description	The Server web engine must be capable of running on the Apache web server The server web engine must be capable of running on IIS.	
Deliverable	End User and Administrator Test System	
Dependencies	None	
Acceptance criteria	All third party software that is used on the server in support of the developed test system will be checked.	
Priority	Partner	Priority
	EifEL	1 – Apache 1- 3rd party libraries free 1 – 3rd party DB free 3 – IIS
	Uni Ko-Ld	1 – Apache 1- 3rd party libraries free 1 – 3rd party DB free 3 – IIS
	FhG/IGD-R	1 – Apache 1 – third party libraries free 1 – third party DB free 2 – IIS

	UfI	1 – Apache
		1 – third party libraries free
		1 - third party DB free
		2 – IIS

7.5   Client software

ID	R11
Phase	1
Description	Clients for the test system should be able to run within the following browsers: • Internet Explorer 6 • Opera 7 • Mozilla/Netscape 7 • Internet Explorer 5 (Macintosh) • Safari (Macintosh) • Linux KDE Konquerer • Any HTML 4 compliant web browser
Deliverable	End User and Administrator Test System
Dependencies	None
Acceptance criteria	The test system will be tested with all of the above browsers, and should work in the same way on all of them.

Priority	Partner	Priority
	EifEL	1 – Win32: IE6, Mozilla 1 – Linux: Mozilla 1 – Mac: Safari, Mozilla, IE 2 – Win32: Opera, IE5 3 – Linux: Konquerer 3 – any HTML4 browser

	Uni Ko-Ld	1 – Win32: IE6, Mozilla
		1 – Linux: Mozilla
		1 – Mac: Safari, Mozilla
		2 – Win32: Opera, IE5
		3 – Linux: Konquerer
		3 – any HTML4 browser
	FhG/IGD-R	1 - Any html 4 compliant web browser
		1 – Internet Explorer
		1 - Mozilla/Netscape
		1 – Internet Explorer (Mac)
		1 – Safari (Mac)
		2 – Opera
		3 – Sun Java Desktop Browser
	UfI	1 - Internet Explorer 6
		1 - Opera (firebird)
		1 - Internet Explorer 5 (Macintosh)
		1 - Safari (Macintosh)
		2 - Sun Java Desktop System Browser
		3 - Any HTML 4 compliant web browser

8 GENERAL REQUIREMENTS

This section describes a variety of miscellaneous requirements including:
- Data formats
- Transport protocols
- File systems
- Programming languages

8.1 Data Format

ID	R12	
Phase	1	
Description	All result data should be available / exported as valid XML and XSD schemas must exist for them	
Deliverable	End user test system	
Dependencies	None	
Acceptance criteria	Files of exported data will be checked, and should be valid XML. As the only data likely to be exported are test reports and test definitions, XSD schemas will exist for these. Therefore this requirement will be met if the exported data conforms to those schemas.	
Priority	Partner	Priority
	EifEL	1 - Database free 2 – data exported as XML 3 – data stored as XML
	Uni Ko-Ld	1 – DB free 2 – XML 2 – XML export
	FhG/IGD-R	1 – Database free 2 - XML

	UfI	1 - Database free
		2 – data exported as XML
		3 – data stored as XML

ID	R13
Phase	1
Description	All data must be transported either within the file system, or remotely over the HTTP protocol. (see R14) Again, this applies to external communications. Where the system developers have decided that they will use a database (for example), then the best method of communication should be used to query it. This may be ODBC or something else that does not operate over HTTP.
Deliverable	All external communications are via the file system of HTTP
Dependencies	None
Acceptance criteria	Firewall software does not detect any non-HTTP calls
Priority	Partner	Priority
	EifEL	2
	Uni Ko-Ld	2
	FhG/IGD-R	2
	UfI	2

ID	R14
Phase	1
Description	Content will be 'loaded' onto the system via two potential routes: • Reference to content already present on a web server (via a URL) • Local upload into a temporary repository.
Deliverable	End user test system
Dependencies	None
Acceptance criteria	Control content will be situated in both locations, and the test system should be capable of finding both.

Priority	Partner	Priority
	EifEL	1
	Uni Ko-Ld	1
	FhG/IGD-R	1
	UfI	1

ID	R15
Phase	1
Description	Profiles, specifications and tests will be located in repository that will be available to the test system (this could be as simple as them being located on the local file system). The administrator must be able to upload new profiles, specifications and tests to the system
Deliverable	End user and administrator test system
Dependencies	None
Acceptance criteria	A control specification, profile and test will be uploaded to the repository. This should then be available to end users to test against.

Priority	Partner	Priority
	EifEL	2
	Uni Ko-Ld	1
	FhG/IGD-R	2
	UfI	1

8.2   Programming Language

ID	R16
Phase	1
Description	The executable code for the test system must be written 100% in Java version 1.4
Deliverable	Java test system components
Dependencies	None
Acceptance criteria	The system must be written in java

Priority	Partner	Priority
	EifEL	1
	Uni Ko-Ld	1
	FhG/IGD-R	1
	UfI	1

8.3 Extensibility

ID	R17
Phase	1
Description	The test system must be written in such a way that it can be easily extended in the future. It must allow for additional specifications, functional profiles, functionality etc… • Import of new application profiles, specifications and tests should not require a programmatic code change • The addition of new functionality should be possible if the need arises. (any mechanism can be used to support this)
Deliverable	Test system that can be easily extended
Dependencies	None
Acceptance criteria	Control tests, specifications and profiles will be uploaded into the system (as R11).

Priority	Partner	Priority
	EifEL	1 – new profiles 2 – new functionality
	Uni Ko-Ld	1 – new profiles 2 – new functionality
	FhG/IGD-R	1 – new profiles 2 – new functionality
	UfI	1 – new profiles require no code changes 3 – addition of new functionality should be possible

8.4   Standards Support

The following requirements define the standards that the test suite must conform to. This has no relation to the standards that we are testing. These standards are the actual standards that the test suite use to implement the testing.

ID	R18
Phase	1
Description	The following standards must be supported • ISO 13210:1999: Requirements and Guidelines for Test Methods Specifications and Test Method Implementations for Measuring Conformance to POSIX Standards«
Deliverable	Test system
Dependencies	Standards used
Acceptance criteria	An audit of the software produced should show conformance to the standards used.

Priority	Partner	Priority
	EifEL	
	Uni Ko-Ld	
	FhG/IGD-R	
	UfI	

8.5   Installation self-test

ID	R19	
Phase	1	
Description	When the test system is installed it checks that it is correctly installed and reports any errors	
Deliverable	Test system	
Dependencies	None	
Acceptance criteria	Reports any errors on installation	
Priority	Partner	Priority
	EifEL	3
	Uni Ko-Ld	
	FhG/IGD-R	1
	UfI	

9 FUNCTIONAL REQUIREMENTS

This section describes the functionality of the test system, what the user may do and how they interact with the system

9.1 User Interface

ID	R20
Phase	1
Description	The test system must have a web interface… • This interface should be HTML based and not make use of java applets. Thus avoiding incompatibilities between browsers and the like
Deliverable	User interface
Dependencies	None
Acceptance criteria	Browser logs will be interrogated; no java applets should be visible.

Priority	Partner	Priority
	EifEL	2
	Uni Ko-Ld	1 – HTML interface 2 – not using java applets
	FhG/IGD-R	1
	UfI	2

ID	R21
Phase	1
Description	The test system must have an interface to allow creation of test sessions. Details are…

In terms of look and feel, simple web forms are appropriate. In particular, details of the implementation should be hidden from users. They should not be typing in xml statements!

We think that a user should be able to:

1) Log in to the system using username and password

2) Choose an application profile (or specification), set of tests (creating a test configuration) and then upload or otherwise link to their content.

3) Content to be tested must be marked by an identifier and a version number. {input as part of the upload process}

4) Run the content against the test configuration, generating a test report.

5) The test sessions being run should be able to be paused, resumed, or cancelled prior to completion

6) For a given 'run' of the tests, version identification and tracability are important. Version identification and tracability should apply to test cases, application profiles and the content.

7) Test results must be able to be exported (as xml)

8) a run configuration must be able to be saved and protected. |
Deliverable	End user test session creation system
Dependencies	none
Acceptance criteria	The creation etc. of test sessions
Priority	Partner	Priority
	EifEL	1

	Uni Ko-Ld	1 – 1, 2, 3, 4, 6, 7, 8
		2 – 5
	FhG/IGD-R	1
	UfI	

ID	R22
Phase	1
Description	The test system must have an interface to allow creation of test sessions. Details are: • User enters a human readable name for the test session • User select the profile or specification from a list of supported specs/profiles. • User provides the content to be tested, either as a reference to content within a repository, or via a local upload. • User is presented with a list of tests that are to be performed. The user may choose which of the tests are to be performed. • If test parameters are required at this stage, then they are entered now. • With specification/profile, content and test set in place, user commences the test session. (Which runs, and then a report is generated).
Deliverable	End user test session system
Dependencies	Test parameter code
Acceptance criteria	Clean run through, of taking the system with no test sessions and then creating a new one on control content.

Priority	Partner	Priority
	EifEL	1
	Uni Ko-Ld	1
	FhG/IGD-R	1
	UfI	1

ID	R23
Phase	1
Description	The test system (end user interface) must present a top level menu structure for users to use when navigating the system. This menu system must include all the functional areas that users will interact with. (testing, specifications, etc). The test system (Administrator interface) must present a top level menu structure for administrators to use when navigating the system. (as per the above, but with different options available).
Deliverable	User interface
Dependencies	None
Acceptance criteria	All screens should be initially reachable via from a top level menu. (With the exception of generated screens).

Priority	Partner	Priority
	EifEL	1
	Uni Ko-Ld	1
	FhG/IGD-R	1
	UfI	1

ID	R24
Phase	1
Description	The test system must have an interface to allow deletion of test sessions. Details are… • Users will be presented with a list of their test sessions (identified by the human readable name), and a colour coded icon (or background) to indicate the status of the test session [completed all passed; completed with failures etc]. A button to delete the test session must be available. • Clicking on the button should prompt for confirmation before anything is deleted.
Deliverable	End user test session system
Dependencies	None
Acceptance criteria	The test session created in R22 will be deleted

Priority	Partner	Priority
	EifEL	1
	Uni Ko-Ld	1
	FhG/IGD-R	1
	UfI	2

ID	R25
Phase	1
Description	The test system must have an interface to allow input of test parameters. Details are… • input of values for any variables in any of the test cases is required. In this case, users will be presented to override the default parameters as described in R22. • Content is only client side
Deliverable	Test parameter
Dependencies	Full enumeration of all test parameters at global and test level.
Acceptance criteria	One test should have configurable parameters. All identified global parameters should have configurable parameters (default values for tests are configured by the administrator, and should reflect 'normal' conditions).

Priority	Partner	Priority
	EifEL	1 – input values 1 – variations 3 - client side content
	Uni Ko-Ld	1 - input values and parameters 3 – content only client side
	FhG/IGD-R	1 – input values 1 – variations 2- client side content
	UfI	1 – Input values 1 – introduce variations 2 – content is only client side

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ID	R26
Phase	OUT OF SCOPE BUT INCLUDED FOR COMPLETENESS
Description	The test system must have an interface to allow input of test parameters. Details are… • Introducing variations in way tests are run (for example – introducing keystroke errors; varying the communication speed (ie system should not be based on running on an ADSL line), simulation of communications delays and failures). • Content is only client side
Deliverable	System noise library.
Dependencies	.
Acceptance criteria	

Priority	Partner	Priority
	EifEL	1 – input values 1 – variations 3 - client side content
	Uni Ko-Ld	1 - input values and parameters 3 – content only client side
	FhG/IGD-R	1 – input values 1 – variations 2- client side content
	UfI	1 – Input values 1 – introduce variations 2 – content is only client side

ID	R27
Phase	1
Description	The test system must have an interface to allow the user to view the test logs. Details are… • Log entries should be summaries at the top level, and then allow a user to drill down into them, showing more detail • Logs should be able to be viewed, deleted, protected • An initial test report must be generated when the test session has completed. This should show the name of each test, and a colour coded icon (or background) to indicate the status of the test. • Users must be able to "drill down" into the test logs from this report. • If the test session has been saved, then the report will be saved with it. Users must then be able to view the report from their list of saved sessions.
Deliverable	Test report and logging
Dependencies	Test execution system
Acceptance criteria	Results are viewable as described after test session has run. Results are viewable in saved test sessions for those sessions that have had some tests executed.

Priority	Partner	Priority
	EifEL	1- view / delete / protect 1 – colour coded status of test 2 – summary and "drill down"
	Uni Ko-Ld	1- view / delete / protect 1 – colour coded status of test 2 – summary and "drill down"

FhG/IGD-R	1 – view/delete/protect
	2 – log summaries
UfI	1 – view / delete / protect logs
	2 – logs should be summaries with the ability to "drill down"

ID	R28
Phase	1
Description	The test system must have an interface to allow the user to view a test's details at any time. This must include, • The test strategy (including scope of the test) • Test traceability • Test source • Test assertion • Results criteria
Deliverable	Test information system
Dependencies	None
Acceptance criteria	Test details can be viewed from the top level, via their relationship with the profile or specification, or when tests are selected.

Priority	Partner	Priority
	EifEL	1
	Uni Ko-Ld	1
	FhG/IGD-R	1
	UfI	1

ID	R29
Phase	1
Description	The test system must have a secure interface to allow: Import of tests from a repository of tests [assumed that this is populated by a tool for creating tests]
Deliverable	Test information system
Dependencies	None
Acceptance criteria	Tests can be imported and used
Priority	Partner	Priority
	EifEL	1
	Uni Ko-Ld	1
	FhG/IGD-R	1
	UfI	1

ID	R30
Phase	1
Description	The test system must have an interface to allow: Import of application profiles from a repository of application profiles, or via local upload to such a repository.
Deliverable	Test system administrator tool.
Dependencies	None
Acceptance criteria	A test profile will be uploaded to the system by the administrator.

Priority	Partner	Priority
	EifEL	1
	Uni Ko-Ld	1
	FhG/IGD-R	1
	UfI	1

ID	R31
Phase	1
Description	Tools must exist to create, update and delete tests for profiles / specifications For any profile in the system, the administrator must have the ability to add and remove tests for that profile / specification. {ideally, tests will automatically be generated when profiles are uploaded}
Deliverable	Test system administrator tool
Dependencies	None
Acceptance criteria	For a test profile, the administrator will attempt to remove the test. For a test profile, the administrator will attempt to add a new test.

Priority	Partner	Priority
	EifEL	1
	Uni Ko-Ld	1
	FhG/IGD-R	1
	UfI	1

ID	R32
Phase	1
Description	Where operations take a long time, a graphic or some other message must be displayed to end users to inform them of this. This should apply to any operation where the response time is greater than 5 seconds.
Deliverable	Test System (end user and administrator)
Dependencies	None
Acceptance criteria	The system will be tested with a stop watch to ensure that all screens are processed in the correct time.
Priority	Partner	Priority
	EifEL	1
	Uni Ko-Ld	1
	FhG/IGD-R	1
	UfI	1

ID	R33
Phase	1
Description	The test system must allow users to view details of the application profile or specification that they wish to test against. both a human readable version and an XML version should be presented where both are available.
Deliverable	End user tests system
Dependencies	None
Acceptance criteria	Users will be available to view the details of all application profiles and specifications on the system; a new one will be uploaded and users will check that it is visible.
Priority	Partner	Priority
	EifEL	2
	Uni Ko-Ld	2
	FhG/IGD-R	1
	UfI	2

ID	R34
Phase	1
Description	The test system must have an interface to allow test sessions to be published to group level. Group members will be able to view the session, but only the author can 'run' the test session; similarly, authors can unpublish test sessions from the group level.
Deliverable	End user test system
Dependencies	Test session system
Acceptance criteria	An author in a group will publish a test session. Another user in that group will attempt to look at the test session. Once this has been viewed, the author will unpublish the results, and the second user should not be able to see them.

Priority	Partner	Priority
	EifEL	3
	Uni Ko-Ld	2
	FhG/IGD-R	3
	UfI	2

ID	R35
Phase	1
Description	The test system must have an interface to allow the creation, update and deletion of users and groups Administrators must have the option to create new groups. The group will have a human readable name, a short description to describe the purpose of the group, and a list of users that are members. New users will be created by the administrator and have a human readable username, a password, a forename, surname and email address. Users will then be assigned to groups. A user may be a member of more than one group. Administrators will be able to edit the details of users and groups; delete groups (which will not delete the associated users) and delete users.
Deliverable	User management system
Dependencies	None
Acceptance criteria	Creattion, updating and deletion of users and groups with the assigned rights

Priority	Partner	Priority
	EifEL	2
	Uni Ko-Ld	2
	FhG/IGD-R	2
	UfI	2

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ID	R36
Phase	1
Description	The test system must present an interface or interfaces to allow the export in XML of: • Test Definitions • Test Results • Test Logs
Deliverable	Export system
Dependencies	None
Acceptance criteria	The data will be exported and then checked.

Priority	Partner	Priority
	EifEL	1
	Uni Ko-Ld	1
	FhG/IGD-R	1
	UfI	1

9.2   User Management

ID	R37
Phase	1

Description	Each user of the test suite must be able to 'log in' so that they have their own area.
	
	There needs to be a hierarchy of users, and a mechanism for creation of user groups.
	
	(we see that we might need for companies that develop content, a group for their development department that has results visible to developers, but not to QA people, and vis versa).
	
	• System administrator accounts exist, and these are able to create and delete users and groups.
	
	• User that may be given any of the following rights (and if able to create groups or users may also assign any of the rights that they have, but no others):
	
	    • Manage users (create, modify, change rights and delete)
	
	    • Manage groups (create, modify, change rights and delete)
	
	    • Assign users to groups
	
	    • Publish profiles
	
	    • Define publication rights for results
	
	No user or group should have more rights than a user or group that is above them within the hierarchy.
	
	Test sessions can then be 'published' to and used by a group of users.

Deliverable	End user test system
Dependencies	None
Acceptance criteria	The various user interface tests should confirm if the user management system is working.

Priority	Partner	Priority
	EifEL	1

	Uni Ko-Ld	1
	FhG/IGD-R	1
	UfI	1

ID	R38	
Phase	1	
Description	Each users area must be separate and secure from others so that confidentiality of tests and results are maintained	
Deliverable	End user test system	
Dependencies	None	
Acceptance criteria	The various user interface tests should confirm if the user management system is working.	
Priority	Partner	Priority
	EifEL	1
	Uni Ko-Ld	1
	FhG/IGD-R	1
	UfI	1

ID	R39
Phase	1
Description	The test system must allow multiple users test sessions to be run concurrently
Deliverable	End user test system
Dependencies	None
Acceptance criteria	Two users, A and B on different accounts will be logged into the system and testing simultaneously.

Priority	Partner	Priority
	EifEL	1
	Uni Ko-Ld	1
	FhG/IGD-R	1
	UfI	1

9.3   Execution Rules

This section describes the way in which the tests must be executed.

ID	R40	
Phase	1	
Description	The test system must allow tests to be run automatically without user interaction.	
Deliverable	End user test system	
Dependencies	None	
Acceptance criteria	A user will select one of these automatic tests and a report will be generated without further interaction.	
Priority	Partner	Priority
	EifEL	1
	Uni Ko-Ld	1
	FhG/IGD-R	1
	UfI	1

ID	R41
Phase	1
Description	The test system must allow tests to be executed with user interaction.
Deliverable	End user test system
Dependencies	None
Acceptance criteria	A user will select a manual test and a report will be generated after further interaction.

Priority	Partner	Priority
	EifEL	1
	Uni Ko-Ld	1
	FhG/IGD-R	1
	UfI	1

ID	R42
Phase	2
Description	The test system must include a component that passes communications between a learning management system (LMS) (or other system which interacts with the learning object) and a client under test, acting as a proxy. This must be a configurable option
Deliverable	End user test system
Dependencies	None
Acceptance criteria	Presence of a configurable option, and then checking within the target LMS (or similar system) that the call was received.

Priority	Partner	Priority
	EifEL	1
	Uni Ko-Ld	
	FhG/IGD-R	1
	UfI	1

9.4   Test Session Management

ID	R43
Phase	1

Description	Users must be able to select which tests they require by,
	
	   • Specification
	
	   • Application profile
	
	A given specification or application profile must have a test set associated with it by the administrator. Users will have the options to choose within that test set which individual tests that they wish to perform.

Deliverable	End user test system
Dependencies	None
Acceptance criteria	After selection, the test system only performs selected tests, and marks in the report those tests that have not been carried out.

Priority	Partner	Priority
	EifEL	1
	Uni Ko-Ld	1
	FhG/IGD-R	1
	UfI	1

ID	R44
Phase	1
Description	A system generated identifier for the test sessions is required A human readable name for the test configurations is required Thus a user can give a test configuration a human readable name (which may or may not be unique), and uniqueness is preserved by the system.
Deliverable	End user test system
Dependencies	None
Acceptance criteria	Users will be able to see a list of human readable names to describe their test sessions.

Priority	Partner	Priority
	EifEL	1
	Uni Ko-Ld	1
	FhG/IGD-R	1
	UfI	1

9.5   Test Reporting

This section defines the test reports that must be made available from the test system.

ID	R45	
Phase	1	
Description	Each test must have a complete log of all testing activities	
Deliverable	Test log	
Dependencies	None	
Acceptance criteria	This log is visible via drill down from a general top level report.	
Priority	Partner	Priority
	EifEL	1
	Uni Ko-Ld	1
	FhG/IGD-R	1
	UfI	1

ID	R46
Phase	1
Description	Each test must result in a verdict of one of, • Pass – The test was executed and resulted in correct behaviour. • Fail – The test was executed and resulted in incorrect behaviour. • Untested – The test has not been executed. • Unsupported – The device under test does not support the specific area that this test is testing. • Unresolved – The test was executed but there was not enough information gained to give a pass/fail verdict.
Deliverable	Test report system
Dependencies	None
Acceptance criteria	Only verdicts on the list should appear.

Priority	Partner	Priority
	EifEL	1
	Uni Ko-Ld	1
	FhG/IGD-R	1
	UfI	

ID	R47
Phase	1
Description	There must be a summary of the results available for each test session. Users should be allowed to drill down into the detailed results of each test
Deliverable	Test report
Dependencies	None
Acceptance criteria	As discussed in previous sections on user interface.

Priority	Partner	Priority
	EifEL	2
	Uni Ko-Ld	2
	FhG/IGD-R	1
	UfI	1

9.6   Test Automation

The test system needs opportunities to integrate with other technologies/services which may be interested in using a testing service in an automated manner. For example Learning Object Repositories may offer a test system based service which checks automatically the conformance of learning objects against a predefined number of profiles once an object has been uploaded.

Thus the test system must be able to conduct automated testing (see also R40 and R41) and provide interfaces to interoperate with other technologies.

ID	R48	
Phase	2	
Description	The test system offers interfaces which can be used by other technologies to conduct automated testing (example scenario: test data will be submitted from the other system to the test system, test will be executed, reporting results will be submitted back to the other system) 1 XML based Web Services Interfaces (WSDL) 2 Simple HTTP Post-Request Interfaces	
Deliverable	Test system	
Dependencies	none	
Acceptance criteria	All output is in XML, and XML is accepted for input via HTTP-post	
Priority	Partner	Priority
	EifEL	2 – Web Services 2 – Simple HTTP
	Uni Ko-Ld	
	FhG/IGD-R	1 – Web Services 1 – Simple HTTP
	UfI	

9.7   Logging

The following defines the functionality and information that must be present within the test logs in order to be able to create any required test report.

ID	R49	
Phase	1	
Description	The result log of each test must be stored in a separate XML file Files should be written to once [system only] and then able to be read but not editable by users or groups. Test log format is an implementation issue – however, XML is agreed as the common format for export	
Deliverable	Test log	
Dependencies	None	
Acceptance criteria	Log is viewable.	
Priority	Partner	Priority
	EifEL	1 – written to once 2 – separate XML file
	Uni Ko-Ld	1
	FhG/IGD-R	1 – written to once 2 – separate XML file
	UfI	1 – files should be written to once 2 – results of each test in a separate XML file

ID	R50
Phase	1
Description	A test log must include the following information • Start and end times for the test • version numbers of content, profile and test • All transactions • All errors • All parameters set • Unique Identifier of test • User identifier • Result • Optional comments provided by test or tester
Deliverable	Test log
Dependencies	None
Acceptance criteria	The log will show all of the categories described

Priority	Partner	Priority
	EifEL	1
	Uni Ko-Ld	1
	FhG/IGD-R	1 - for all except: 2 – User identifier (should be implicitly indicated by test identifier)

	UfI	1 - Start and end times for the test
		1 - version numbers of content, profile and test
		1 - All transactions
		1 - All errors
		1 - All parameters set
		1 - Unique Identifier of test
		2 - User identifier

9.8   Conformance Test Support

ID	R51	
Phase	OUT OF SCOPE BUT INCLUDED FOR COMPLETENESS	
Description	Users must be able to submit their test results to a certification authority. Details are… • It must be possible to send results to conformance authorities which are demonstrably the test results that have not been interfered with.	
Deliverable	Secure test results that can be shown not to have been interfered with	
Dependencies		
Acceptance criteria		
Priority	Partner	Priority
	EifEL	1
	Uni Ko-Ld	1
	FhG/IGD-R	2
	UfI	

ID	R52
Phase	1
Description	The test system must provide the same results from each separate run of a test session in an error free scenario with no 'noise'
Deliverable	Test system
Dependencies	None
Acceptance criteria	Test sessions will be run multiple times, and the results examined for test content. The errors under each test should be the same given no random errors.

Priority	Partner	Priority
	EifEL	1
	Uni Ko-Ld	1
	FhG/IGD-R	1
	UfI	1

9.9 Localisation

ID	R53
Phase	2
Description	• The user interface of the test system must be localisable to different: 1. languages 2. time zone formats
Deliverable	User interface
Dependencies	None
Acceptance criteria	The default user interface is English. It can be localized to German, French and Italian schemes.

Priority	Partner	Priority
	EifEL	1 – languages 3 – time zone formats
	Uni Ko-Ld	
	FhG/IGD-R	1 – languages 2 – time zone formats
	UfI	

10 TESTS

This section defines how tests are executed

ID	R54
Phase	1
Description	Each test must be defined by an XML document See earlier as regards export of data. This is otherwise an implementation issue. Provided test details can be exported in XML then there is no requirement on how the tests are represented internally.
Deliverable	Tests
Dependencies	None
Acceptance criteria	A test will be exported and should conform to the xsd for tests.

Priority	Partner	Priority
	EifEL	2
	Uni Ko-Ld	2
	FhG/IGD-R	2
	UfI	2

ID	R55
Phase	1
Description	Each test must define the following, • The test strategy • Test traceability • Test source • Test assertion • Results criteria (what constitutes as a pass, fail etc) • preconditions
Deliverable	Test definition
Dependencies	None
Acceptance criteria	The test definitions exported should contain all of the above data.
Priority	Partner	Priority

Partner	Priority
EifEL	1
Uni Ko-Ld	1
FhG/IGD-R	1
UfI	1

11 QUALITY OF SERVICE; FOR HOSTED SERVICE

This section defines the run time quality of service definition for the test suite.

ID	R56	
Phase	1	
Description	The test system must be backed up at least daily There should be no loss of service during backup	
Deliverable	Nightly back up	
Dependencies	None	
Acceptance criteria	Evidence of usable backups will be checked.	
Priority	Partner	Priority
	EifEL	1
	Uni Ko-Ld	1
	FhG/IGD-R	1
	UfI	1

ID	R57
Phase	1
Description	The test system must be available 24/7 365 days a year.
Deliverable	Test system availability
Dependencies	None
Acceptance criteria	A script will check that the system is functioning each day.

Priority	Partner	Priority
	EifEL	1
	Uni Ko-Ld	1
	FhG/IGD-R	1
	UfI	1

ID	R58
Phase	1
Description	The test system must be made available so that users can access it over the internet.
Deliverable	Test system
Dependencies	None
Acceptance criteria	The system should be available via the WWW.

Priority	Partner	Priority
	EifEL	
	Uni Ko-Ld	1
	FhG/IGD-R	1
	UfI	1

12 DOCUMENTATION

This section defines the documentation that is needed with the system

12.1 User documentation

ID	R59	
Phase	1	
Description	A full user guide must be created for the final test system (this should include maintenance details) A Draft usable user guide should be produced for the interim system for partners to user	
Deliverable	User documentation	
Dependencies	System exists	
Acceptance criteria	The document should be an accurate reflection of the system, and be free of grammatical errors and spelling mistakes. The manual should also be translated into HTML and used as a source of online help.	
Priority	Partner	Priority
	EifEL	1
	Uni Ko-Ld	1
	FhG/IGD-R	1
	UfI	1

ID	R60
Phase	1
Description	Documentation for writing new tests must be created
Deliverable	Documentation
Dependencies	System exists
Acceptance criteria	The document should be an accurate reflection of the system, and be free of grammatical errors and spelling mistakes. The manual should also be translated into HTML and used as a source of online help.

Priority	Partner	Priority
	EifEL	1
	Uni Ko-Ld	1
	FhG/IGD-R	1
	UfI	1

12.2 Set-up documentation

ID	R61	
Phase	1	
Description	Full documentation for installing the test system must be created	
Deliverable	Installation guide	
Dependencies	System exists	
Acceptance criteria	The document should be an accurate reflection of the system, and be free of grammatical errors and spelling mistakes.	
Priority	Partner	Priority
	EifEL	1
	Uni Ko-Ld	1
	FhG/IGD-R	1
	UfI	1

13 ASSUMPTIONS

This section lists the key assumptions that have been made throughout the document

The following assumptions have been made within this document

- Test system is correctly installed

- Hardware and software for testing that is specified in the requirements will be made available to the Open Group for testing, or testing will be undertaken by partners who have such equipment

- "Control" content is available to be run at any time – to validate past installation that the test system is working correctly.