

SCORM 101

Before we start

- *Learning and Content Management Systems*
 - *different forms of content*
 - *different forms of interaction*
- *Content on one system not easily ported to another*
- *Content components could not be easily reduced*
- *Similar to the software world – code written for one platform may not work on another or pieces may not be reusable*

Solutions

- *In the software world*
 - *Objects made code reusable and accessible*
 - *Enterprise Application Servers made entire applications reusable*
- *In the e-learning world*
 - *Standards such as HTTP made content transparent/interoperable*
 - *SCORM “application servers” make content reusable*

The general idea

- *Plug and Play architecture*
 - *You plug in the conformant content and the LMS shall play it!*
- *Standardized means of describing capabilities and interacting with the “container”*
- *Interoperable with different platforms and technologies*
- *Content that is reusable in different learning contexts in part or whole*

What is SCORM

- *Sharable Content Object Reference Model*
- *Top level requirements*
 - *Accessibility*
 - *Interoperability*
 - *Durability*
 - *Reusability*
 - *Cost effectiveness*

Accessibility

- **The ability to locate and access instructional components from one remote location and deliver them to many other locations.**
- *Rich, standardized meta-data is associated with the content, containing information about subject matter, design, rights, technical, and pedagogical aspects, and enabling sophisticated searches across distributed repositories.*

Interoperability

- *The ability to take instructional components developed in one location with one set of tools or platform and use them in another location with a different set of tools or platform.*
- *standard means and vocabulary for the exchange of data between the materials a learner is working on and the management system that is monitoring their progress.*

Durability

- **The ability of an instructional component to withstand technology changes without redesign, reconfiguration or recoding.**
- *new course is SCORM conformant so you'll be better able to navigate the next technology change*

Reusability

- **The flexibility to incorporate instructional components in multiple applications and contexts.**
- *meta-data capabilities enable the location and legitimate use of learning materials*

Cost Effectiveness

- **Increase learning effectiveness significantly while reducing time and costs.**
- *Interoperability, reusability, and durability help to control **costs**, enabling more to be done with a given level of resources.*
- *Any time/anywhere delivery, tailored instruction, and the ability to make better use of instructor contact time help increase the **effectiveness** of online training and education.*

SCORM Basics

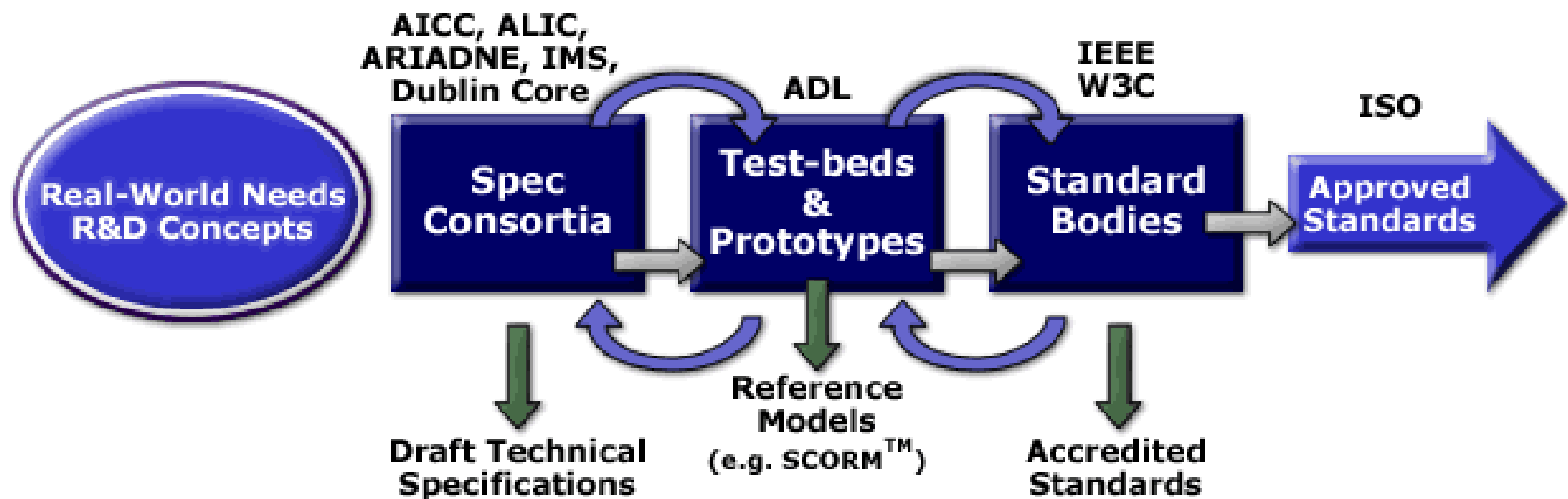
- *Origin*
 - *United States Department of Defense (DoD) established the Advanced Distributed Learning Initiative in 1997*
 - *to promote cooperation between government, industry and academia to develop e-learning **standardization**.*
 - *to meet the need for a common, Web-based framework that permitted interoperability of learning tools and content on a global scale.*
- *As one of their goals (Development and Implementation guidelines), they developed the Sharable **Content Object Reference Model***

SCORM Basics

- *The SCORM is built upon the work of key specifications and standards consortia, such as IEEE, AICC, IMS, ARIADNE and others, to create one unified "reference model" of interrelated technical specifications and guidelines.*
- *First released in January 2000, the SCORM continues to evolve through cooperation among industry, government and academia.*



The Standards Process



SCORM Basics - ADL

- *The **ADL Co-Laboratory** in Alexandria, Virginia is the operational command post of the initiative and coordinates communication across the ADL Co-Lab Network.*
- *The **Joint ADL Co-Laboratory** in Orlando, Florida was established to promote collaborative development of ADL prototypes and ADL systems acquisitions, primarily among the Department of Defense components.*
- *The **Academic ADL Co-Laboratory** serves as an academic partner and ADL link to test, evaluate and demonstrate ADL-compliant tools and technologies to enhance teaching and learning.*

How SCORM is different

Traditional Methods	SCORM
<i>LMS Specific</i>	<i>Transparently used by compliant LMS</i>
<i>Content is hard to locate</i>	<i>Content is easy to search for and categorize</i>
<i>Proprietary learning mechanisms</i>	<i>Generic learning mechanisms</i>
<i>No standard design</i>	<i>Highly formalized design</i>
<i>Highly Customizable for specific needs</i>	<i>Limited by the state of the standard</i>

System Specific

- *In the real world, complex e-learning content often works only with the system it was originally designed for, and might not work at all with other systems.*
- *Learning Management Systems add extensive functionality but are often not interoperable with other systems*

Access & Retrieval

- *Since content is highly structured, it becomes easy to manipulate*
- *To make it easy for search engines to locate content, we use TAGS to identify key attributes of the content*
- *Specialized repositories of content thus access content based on identifiers of content rather than the content itself - metadata*

Learning Mechanisms

- *Mechanisms that foster learning interactions*
- *Learning Interaction examples:*
 - *Browsing content*
 - *Taking tests*
 - *Updating profile*
 - *Viewing performance*
 - *Planning your work schedule*

Learning Mechanisms

- *Key factors:*
 - *Level*
 - *Range*
- *Handling learning mechanisms*
 - *Transitory and persistent mechanisms*
 - *Generic vs Proprietary mechanisms*

Design

- *Key factors*
 - *Instruction/Interaction design*
 - *Technical design*
 - *Deployment design*
- *For any model to be generic it must lay down detailed guidelines and provide for conformance testing to designers*
- *Must also fulfill the promise of being generic to design and accommodate existing design models*

Customizable

- *Must be customizable for the end user as well the instructor or the content developer*
 - *Can it take care of needs such as learner tracking?*
 - *Can it respond to different learning styles?*
- *Mechanisms and structures have to evolve to take care of this in a generic manner*
- *A proprietary solution would solve a much more specific need*

Enter SCORM

- *Content is a collection of RAID objects*
- *These objects have a distinct protocol and vocabulary when interacting with the LMS container*
- *Ensuring SCORM compliance for your content is a cost effective proposition*

SCORM

- *Content has*
 - *Structure*
 - *Hierarchy/Aggregation*
 - *Defined interactions with parent learning management system*
- *Defined through a structured framework*
 - *The Content Aggregation Model*
 - *The Runtime Environment Model*

Limitations

- *SCORM is an evolving standard*
- *Kind of restrictive right now*
- *Esoteric – hard to get things to work rightaway*

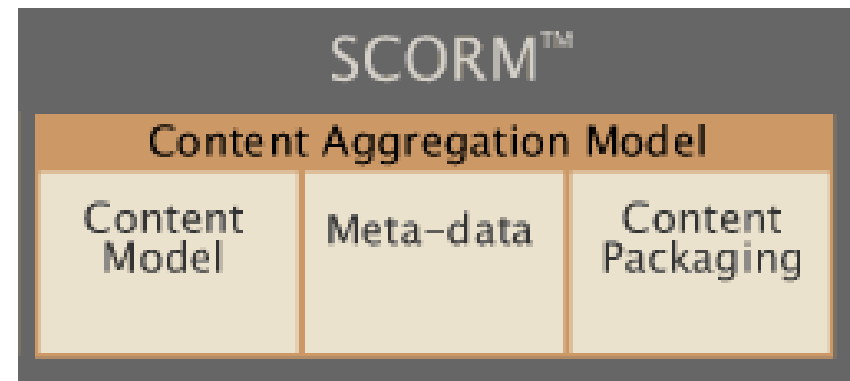
- *But very powerfully backed by industry and government because of it's promise*

SCORM Components

- *Content Aggregation Model (CAM)*
 - *provides a common means for*
 - *identifying and describing learning content,*
 - *aggregating content into learning experiences and*
 - *moving content between systems and repositories*
- *Runtime Environment (RTE)*
 - *Communication layer and common data scheme/vocabulary for*
 - *launching*
 - *communicating with and*
 - *tracking content*

SCORM-CAM

- **Meta-data Dictionary**
 - *Provides a common nomenclature for describing learning resources so you can effectively locate the ones you need from within multiple large collections*
- **Content Packaging**
 - *Defines how to package learning resources for movement between different environments*
- **Content Structure**
 - *Defines how to represent a collection of instructional assets so they can function together as a meaningful learning experience.*
- **Meta-data XML binding**
 - *A specification for how to represent (bind) meta-data elements in XML. With the information in the form of XML, it can be moved from place to place and used by different systems*



SCORM CAM – Content Model

- *Content Model*
 - **Assets** – *text, images, sound, media, web pages and assessments that can be delivered via a Web client.*
 - **Sharable Content Objects (SCOs)** – *A collection of one or more assets that can be launched by and communicate with a Learning Management System.*
 - **Content Aggregation** – *An organization of assets and SCOs into a cohesive unit of instruction.*

SCORM CAM - Metadata

- *Metadata*
 - *Information Model & XML Binding*
 - *Describes and identifies the resource*
 - *Gives the history of the resource and documents who created or altered it*
 - *Provides technical information about the resource*
 - *Describes the pedagogical characteristics of the resource*
 - *Provides intellectual property rights and usage information*
 - *Tells how a resource works together with other resources*

SCORM CAM – Content Packaging

- *Content Packaging*
 - *Content Structure*
 - *Content Hierarchy*
 - *Context Specific Metadata*
 - *Sequencing and Navigation*
 - *Packaging*
 - *IMS Content Package*
 - *Content Packaging Information Model*
 - *CP XML Binding*

SCORM RTE

- **Launch and Communications API**

- *A mechanism for a communicating the state of the learning resource (Is it running? Is it finished?) and enabling the transfer of information (e.g. students name, progress) between an LMS and learning content*

- **Data Model**

- *A common set of data elements, ensuring that essential information can be collected and tracked by different learning management systems*

