



National Science Digital Library *Reusability and Interoperability Workshop*

INTEROPERABILITY AND STANDARDS

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Agenda

- Introduction to SCORM
- Demonstration

Course Management Systems

- Over one-third of college courses use them*
- Over half of colleges have strategic plans to deploy them*
- Evolved using ‘course’ as the basic architectural unit
- Questions raised:
 - Can content be ported between course management systems?
 - Can content be developed that will run in any course management system?
- *IMS and SCORM address these issues*

*Campus Computing Survey Figures

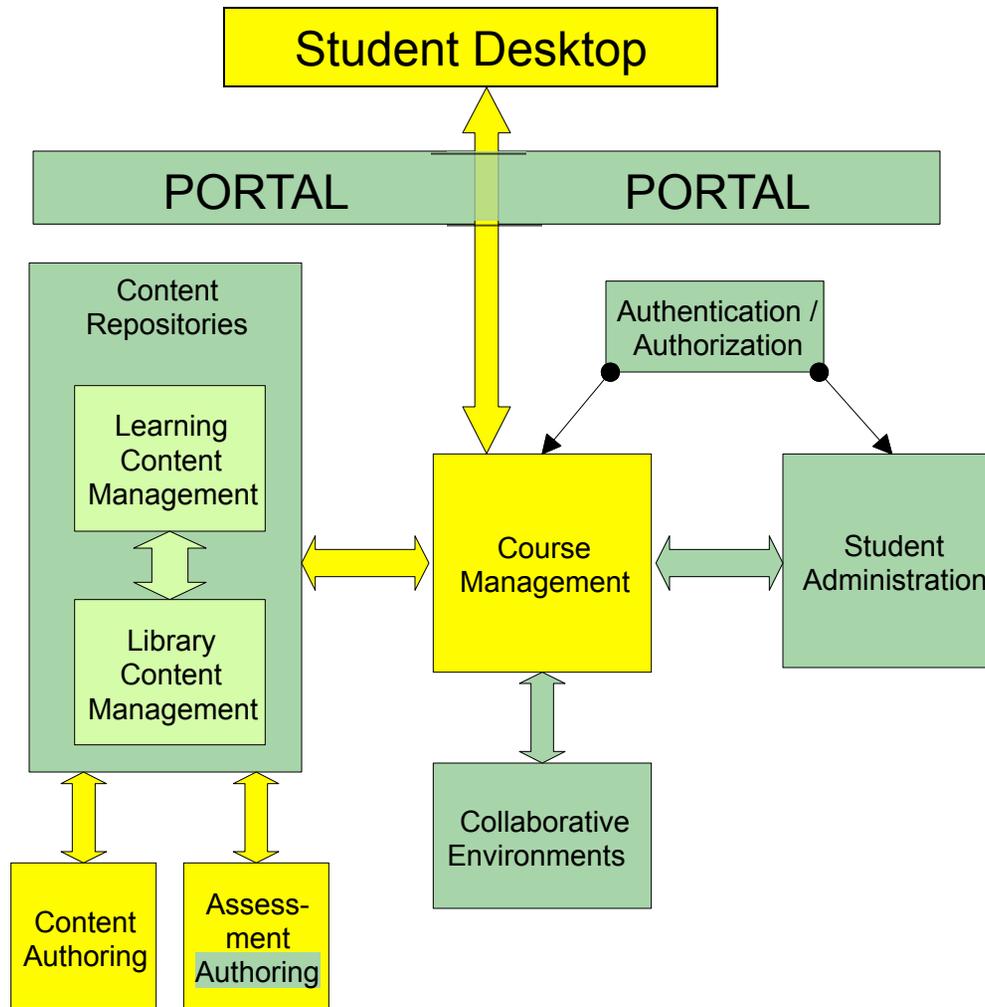
SCORM / AICC / IMS Adoption Estimates

Estimated Adoption Rates	Corporate LCMS / LMS	Authoring Tools (Corporate & Academic)	Course Management Systems
AICC specifications for content / LMS communication	80% - 90%	60% - 70%, including the products most commonly used	20% - 30%
SCORM	100%	70% - 80%, including the products most commonly used	40% - 50%
Various IMS specifications	No Data Available	No Data Available	60% - 70%

SCORM

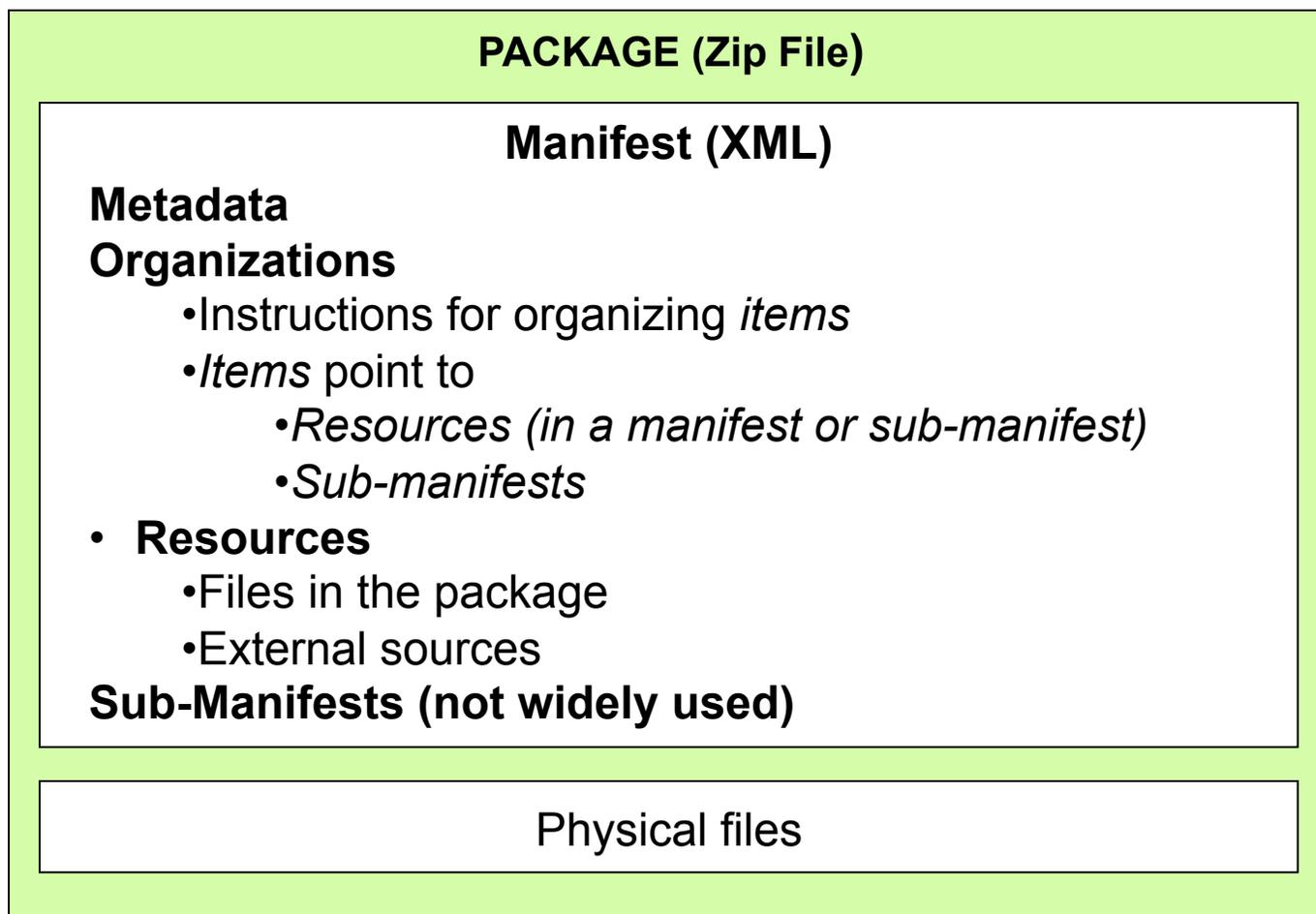
- Sharable Content Object Reference Model
- ADL - Advanced Distributed Learning Initiative
- Based on IMS, AICC, IEEE LTSC work
- Adopted by
 - Almost all commercial LMS / LCMS products
 - In some form by most Course Management Systems
- Components:
 - Packaging
 - Metadata
 - Sequencing
 - Communication between content and learning platform

Where SCORM Applies



- PACKAGING:
 - transport of content
 - Inclusion of metadata (LOM)
 - Definition of structure
 - Sequencing instructions (2004)
- RUNTIME COMMUNICATION:
 - Exchange of data between content and LMS (or CMS)

SCORM Transport – IMS Content Packaging



SCORM: Delivery Model

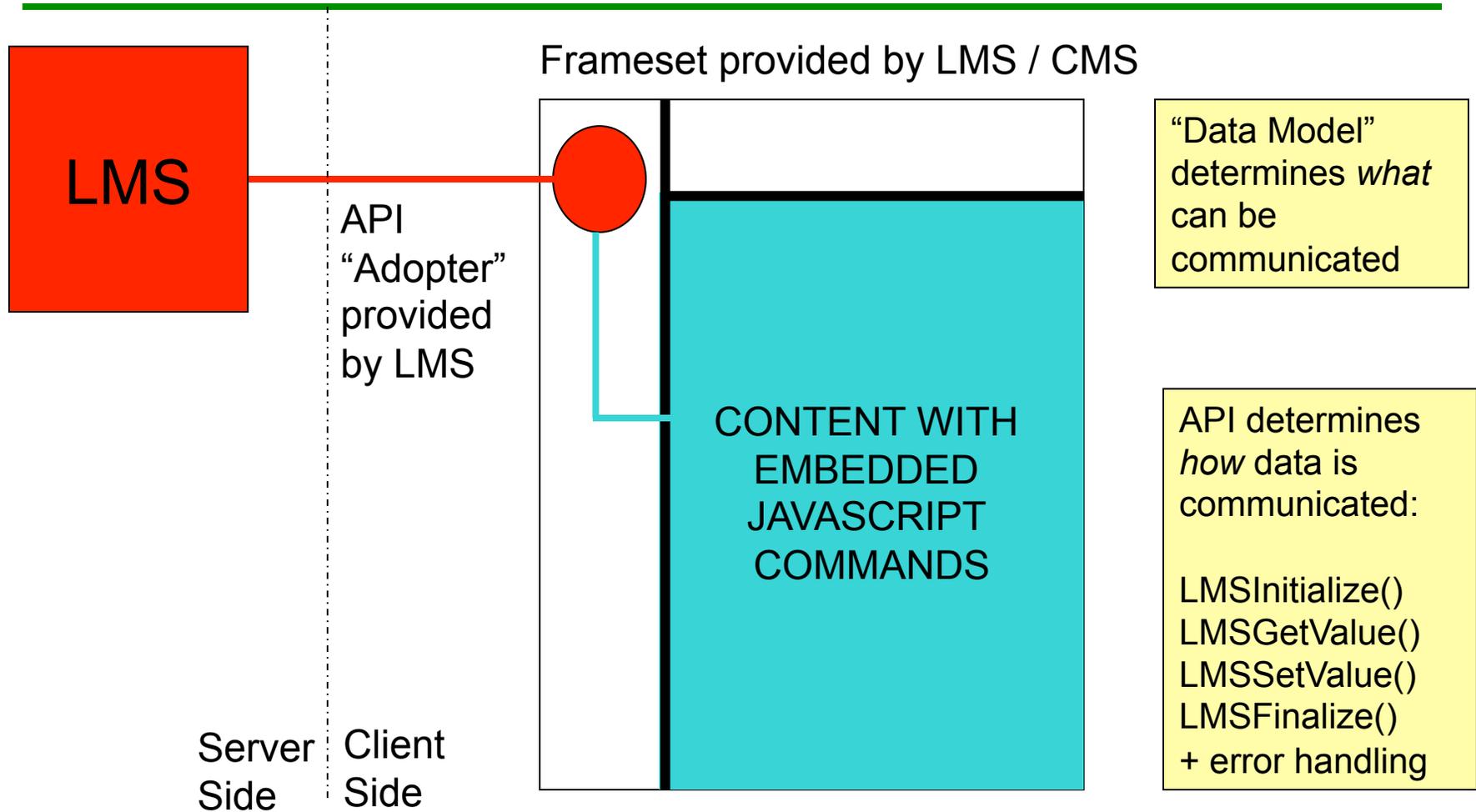
- Sharable Content Objects (SCOs)
- SCOs are delivered one at a time
 1. Platform delivers a SCO to student
 2. SCO runs in student environment and communicates with learning platform
 3. SCO signals that it is finished.
 4. Platform delivers new SCO
- Skillsoft Example:
http://www.skillsoft.com/demo/esh_getrain.asp

LMS / CMS determines the order of SCOs based on instructions in content package (including sequencing instructions in SCORM 2004)

SCORM: Communication

- Based on work of Aviation Industry CBT Committee (CBT = Computer Based Training)
- Enables content & delivery platform to exchange limited data:
 - The student's identity and certain preferences
 - Time spent in the SCO
 - Results of tests and test questions
 - Information about the student's achievement
 - “Bookmarks” that keep a student's place in a SCO

LMS/Content Communication via SCORM



Implications of SCORM

- Larger resources broken into self-contained sections
 - Sections provide their own navigation
 - Platforms provide navigation among sections
 - SCOs are learning objects in the Learnativity sense
- Content is external to platform
 - Quizzes, tests, chat rooms etc. are just content.
 - **Not the traditional view of CMS**
- Metadata is required
 - IMS Content Packages permit metadata at every level.
 - SCORM requires metadata for SCOs
 - SCORM does not solve the semantics issue

SCORM Tools

- Commercial CMS support SCORM in various ways:
 - Blackboard
 - WebCT
 - Angel
 - Desire2learn
- Authoring tools:
 - Macromedia products (some require free extensions)
 - Trivantis, ReadyGo, IBT Web Authoring, Impatica
 - Open source projects (e.g. RELOAD)



SCORM Demonstration



Demonstration Overview

- Purpose: Show how SCORM works
- Create content in an authoring tool
 - *Trivantis Lectora*
 - Incorporate communication with LMS through SCORM
 - Create a SCORM 1.2 content package for export
- Run content in a Course Management System
 - *Desire2Learn (hosted by Academic ADL CoLab at Wisconsin*
 - Import content package
 - Demonstrate LMS / Content communication
- More detailed demo of LMS / Content communication
 - *SCORM Detective - Flash content developed by Eric Rosen*

Content Creation in Trivantis Lectora

- Content/Information assets assembled
- Author a “pre-test” that generates a score
- Branching on pre-test score.
- Show SCORM / AICC* variables
- Create a SCORM 1.2 content package that contains a conformant SCO

*Aviation Industry CBT Committee: The SCORM Data Model derives from AICC work.



Import and Run Content in Desire2Learn

- Import of SCORM 1.2 Content Package
- Access content as a student
- Show communication
 - Name brought in from LMS
 - Score, status updated in LMS

<http://aadl.desire2learn.com/>

SCORM Detective

- Tool for testing conformance of an LMS with SCORM 1.2 spec
- Allows you to see:
 - What commands are available during SCO launch lifecycle
 - Data element actions allowed (read, write, r/w, none)
 - Whether LMS support for an element is required or optional
 - Real time display of LMS response to API commands
- Experiment with setting and getting values
- Exploring the SCORM / AICC variables

Sequencing

- SCORM 2004 Sequencing based on IMS 'Simple' Sequencing
- LMS controls SCO to SCO navigation
- A means to specify the sequencing of learning content:
 - Support for flow and choice
 - Limited support for adaptive learning
 - Score rollups
 - Integrates with content packaging

Discussion Topics

- General questions / comments concerning SCORM, Interoperability and related issues





Next: Guidelines - Interoperability