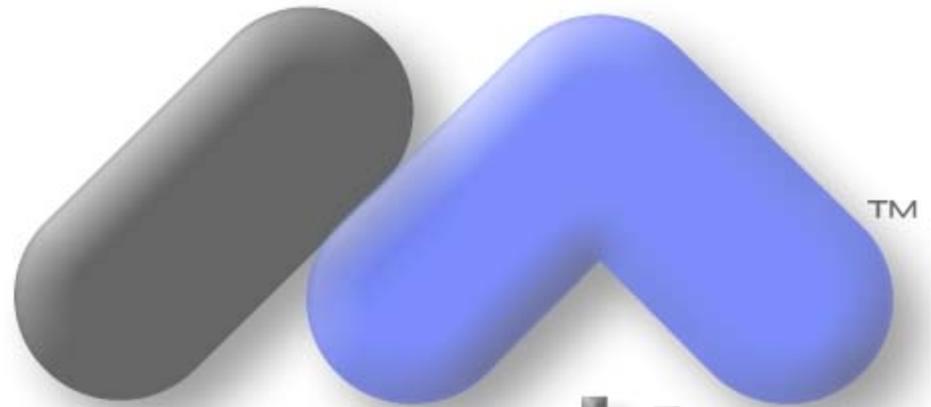


ADL SCORM and eLearning Standards: Putting it to Use

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macromedia

Overview

- Standards Summary
- Standards Organizations
- Explaining Standards Components
- Applying Standards in ISD Processes
 - Analysis & Design
 - Development & Implementation
 - Evaluation & Maintenance
- Where is it going— eLearning & Standards

Standards Summary

Nearly all e-learning specifications address:

- **Communication Protocol or API**

Methods for resources to communicate

- **Meta-data**

Means to describe resources in a consistent manner

- **Packaging**

Ways to gather resources into useful bundles

Interoperability is the goal.

Conformance is the key.

Standards Players

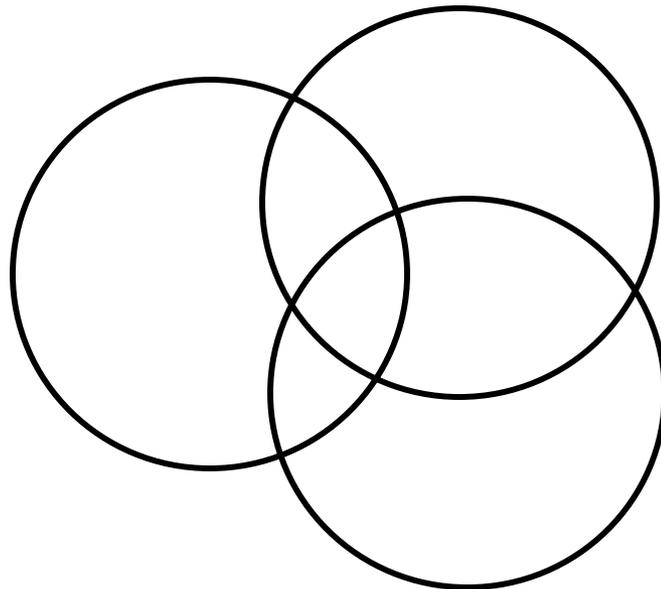
- **Aviation Industry CBT Committee (AICC)**
<http://www.aicc.org>
- **IMS Global Consortium**
<http://www.imsglobal.org>
- **Advanced Distributed Learning (ADL)**
<http://www.adlnet.org>
- **IEEE Learning Technology Subcommittee (LTSC)**
<http://ltsc.ieee.org>
- **ISO**
<http://www.iso.org>

Understanding the Players

- **AICC**- *Deepest history*
 - Compatible vs. Certified
 - LAN vs. HACP vs. API
- **IMS**- *XML Bindings & 6-9 Month Spec Cycle*
 - Meta data, Content Packaging & QTI
- **ADL**- *Pulling it all together; validate & apply*
 - Shareable Content Object Model (SCORM)
- **IEEE** Learning Technology Subcommittee (LTSC)
*LOM (Learning Object Metadata) and...
Fast track to international approval*

Standards Overlap & Interlock

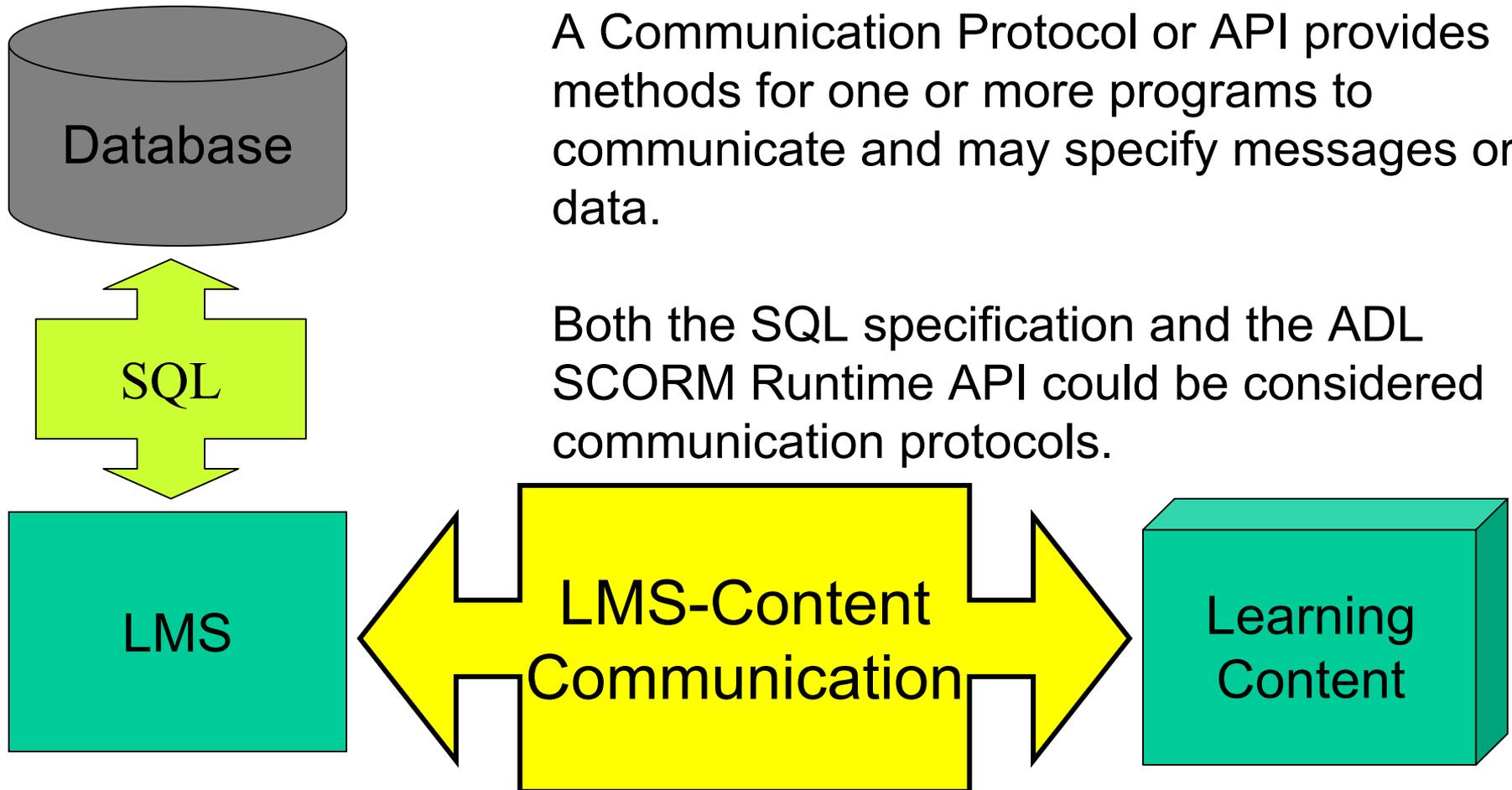
- **IEEE:** Learning Object Metadata
- **AICC-ADL:** Content Communication
- **ADL-IMS-IEEE:** Content Metadata
- **ADL-IMS-IEEE:** Course Metadata



Standards Components

- **Communication Protocol or API**
Methods for resources to communicate
- **Meta-data**
Means to describe resources in a consistent manner
- **Packaging**
Ways to gather resources into useful bundles

Communication Protocol or API



A Communication Protocol or API provides methods for one or more programs to communicate and may specify messages or data.

Both the SQL specification and the ADL SCORM Runtime API could be considered communication protocols.

Communication Protocols

- **AICC HACP**
 - Specifies data fields & formats
 - Uses HTTP POST Commands
 - Longest history, most widely supported
- **ADL SCORM API**
 - *Default* data elements are same as AICC
 - Uses JavaScript function calls
 - *Fastest rate of adoption*

Communication Protocols

Benefits:

- **Commoditization of Content**
Buy, beg or borrow common content—
Focus on content unique to your organization
- **Competitive Management System Environment**
Encourages efficiency & improvement in both content *and* LMS products
- **Production Efficiencies**
Debugging tools, support, communities, etc

Standards Components

- **Communication Protocol or API**
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Means to describe resources in a consistent manner
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XML— Meta-data & Packaging Tool

XML is a clearly defined way to structure, describe, & interchange data.

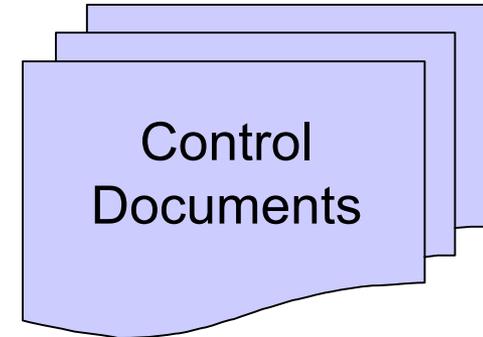
XML documents contain elements and attributes.

Why use XML?

- XML is easily readable by both humans & machines
- XML is object-oriented
- XML is a widely adopted information technology
- XML is global

XML— Data & Control Documents

```
<?xml version="1.0" standalone="no" ?>
<manifest identifier="sample1" version="1.1"
  xmlns="http://www.imsproject.org/xsd/ims_cp_rootv1p1"
  xmlns:adlcp="http://www.adlnet.org/xsd/adl_cp_rootv1p1"
...
  <metadata>
    <schema>IMS Content</schema>
    <schemaversion>1.0</schemaversion>
    <record xmlns="http://www.imsproject.org/xsd/
ims_md_rootv1p1" >
      <general>
        <title>
          <langstring xml:lang="en-US">Demo course
</langstring>
        </title>
        <description>
          <langstring xml:lang="en-US">Demo</langstring>
        </description>
```



Support files and interfaces that augment the data document (e.g., file.xml) by providing structure, naming conventions, data types, and transformation capabilities.

- **DTD** Data Type Definition- identifies elements & properties
- **XML Schema** a more flexible means of describing elements & properties, including data types

Meta-data

Commonly used formats (XML based):

- **IEEE LTSC 1484.12**
 - Learning Object Meta-Data (LOM)
- **IMS Global Consortium**
 - Content Meta-data (based on LOM)
 - Learner Information Profile
- **ADL SCORM**
 - SCO Meta-data, Raw media meta-data

Based on IMS specifications, extended & enhanced

Meta-data

Benefits:

- **Cataloging**
Facilitates search, *research*, use and *re-use*
- **Configuration Management**
Descriptive data and audit trail
- **Consistency**
Common fields and vocabulary across disciplines that touch resources throughout their life

Packaging

Commonly used formats:

- **AICC Course Structure Files (CSF)**
 - Collection of text files to describe a course
- **IMS Global Consortium**
 - Content Packaging (“manifest”)
 - Question & Test Interchange (QTI)
- **ADL SCORM**
 - Content Packaging Manifest

Based on IMS specifications, extended & enhanced
Successor to XML-based ADL Course Structure File

Packaging

Benefits:

- **Expressing Design**
Creates collections of learning objects and a representation of design intent
- **Archiving and Exchange**
A “bundle” format for storage or as a bridge between distant and different systems
- **Broad-level Meta-data**
Meta-data benefits expanded to cover aggregations or collections of resources

Vendors Supporting eLearning Standards



Smart**Force**.



AVALTUS.



Digital**Think**



IBM Mindspan Solutions

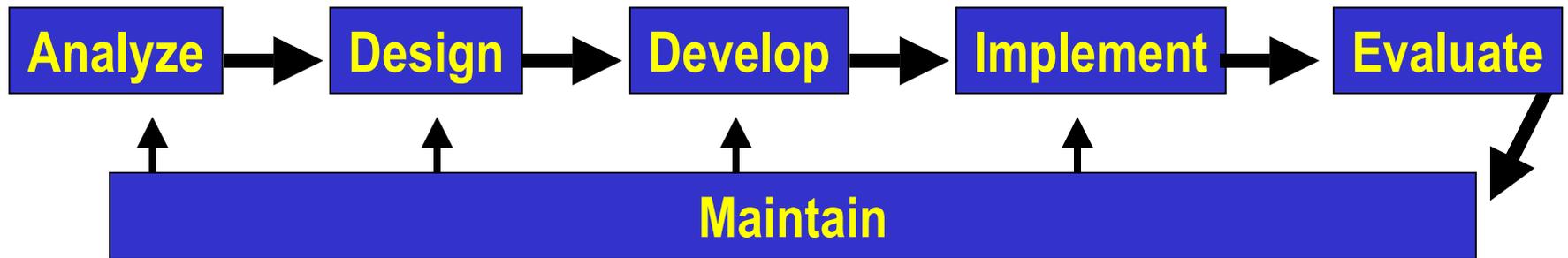


BOXER



Instructional Design Model

Classic “ADDIE-M” Model



ADL SCORM can provide benefits throughout the process.

Read “SCORM 1.2 Overview”

Standards: Analysis & Planning

Consider applying standards-based tools during planning & design to assist with metadata tagging

The screenshot shows the 'Authorware SCO Metadata Editor' window for a file named 'EQUIPM~3.xml'. The interface includes a menu bar with 'File', 'Edit', and 'Help'. The main area is titled '1. General' and indicates 'Page 1 of 2'. It shows the 'Edit language' set to 'Unspecified' and a note that asterisks denote required fields. The 'Title' field contains 'Sales Training' and the 'Identifier' field is empty. The 'Description' field contains 'Train dealer sales reps on top 10 technical features of laptop 2000 series.' The 'Catalog' dropdown is set to 'Sales Training', and the 'Entry' field contains 'Laptop 2000 series sales training'. A 'Select:' dropdown menu is open, showing 'New catalog', 'Product Training', and 'Sales Training' (which is highlighted). Below the main form is a navigation bar with tabs for '1. General', '2. Lifecycle', '3. Metametadata', '4. Technical', '5. Educational', '6. Rights', '7. Relation', '8. Annotation', and '9. Classification'.

Analysis & Planning Considerations

- Look globally, apply locally—*shareable content*
 - Related or broader audiences?
 - Just-in-time, Just-enough, Just-for-me
- Get data to establish needs & environment
- Establish data requirements for validation
- Review specifications & best practices
 - Meta-data elements (fields)
 - API data elements
- Identify your templates and tool set

Design Phase Considerations

- Modular over monolithic
- Think about levels of granularity & structure
 - Activity size (time, scope, objectives)
 - Activity type (assessment, tutorial, simulation, etc)
 - Aggregation-gathering smaller related activities
- Avoid contextual dependencies
- Leverage prerequisites and remediation
- Specify data collection requirements
- Begin generating meta-data *during design*

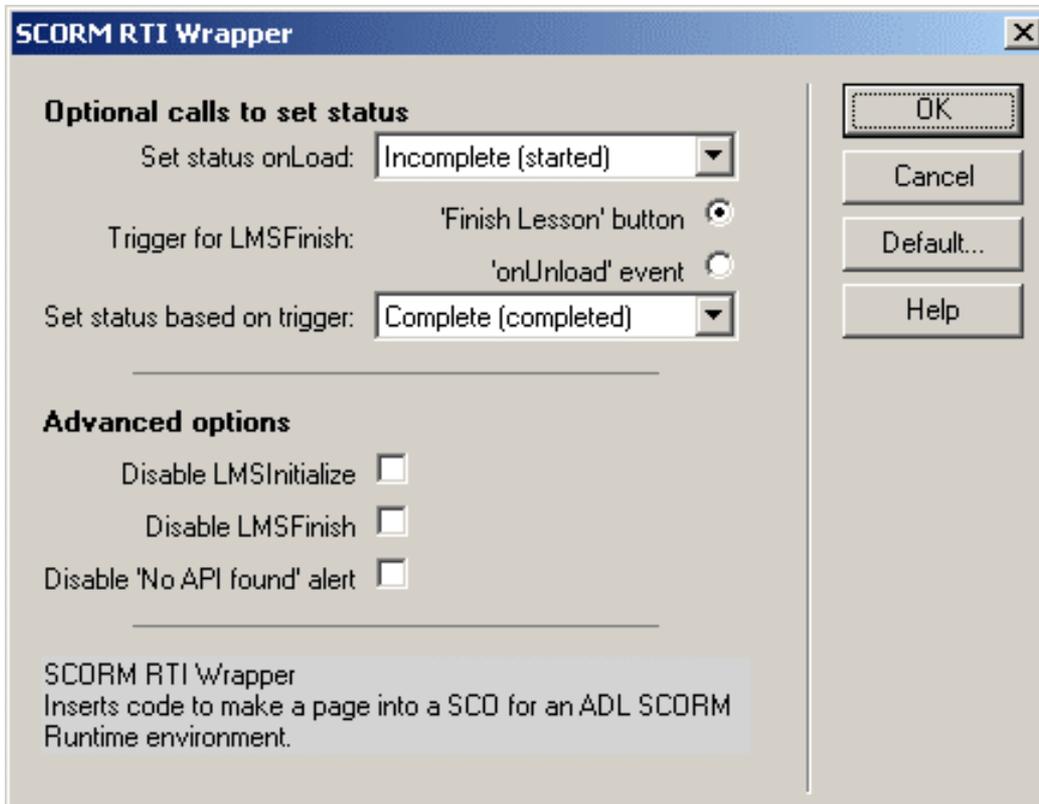
Read “SCORM 1.2 Content Aggregation Model”

Development Considerations

- Separate content, navigation, & branching
 - Allow for unanticipated learning and UI contexts
- Re-use, Repurpose & Adapt Existing Materials
- Use tools that support developer tagging and content management
- Surf your existing & in-work repository
- Implement data collection requirements
- Test with in a fully integrated delivery environment
- Refine templates and tools

Standards: Development Phase

Focus high-effort on high-value.
Re-use & re-purpose where it makes sense



Use standards as intended;
for efficiency, not for claims.

***Read "SCORM 1.2
Runtime Environment"***

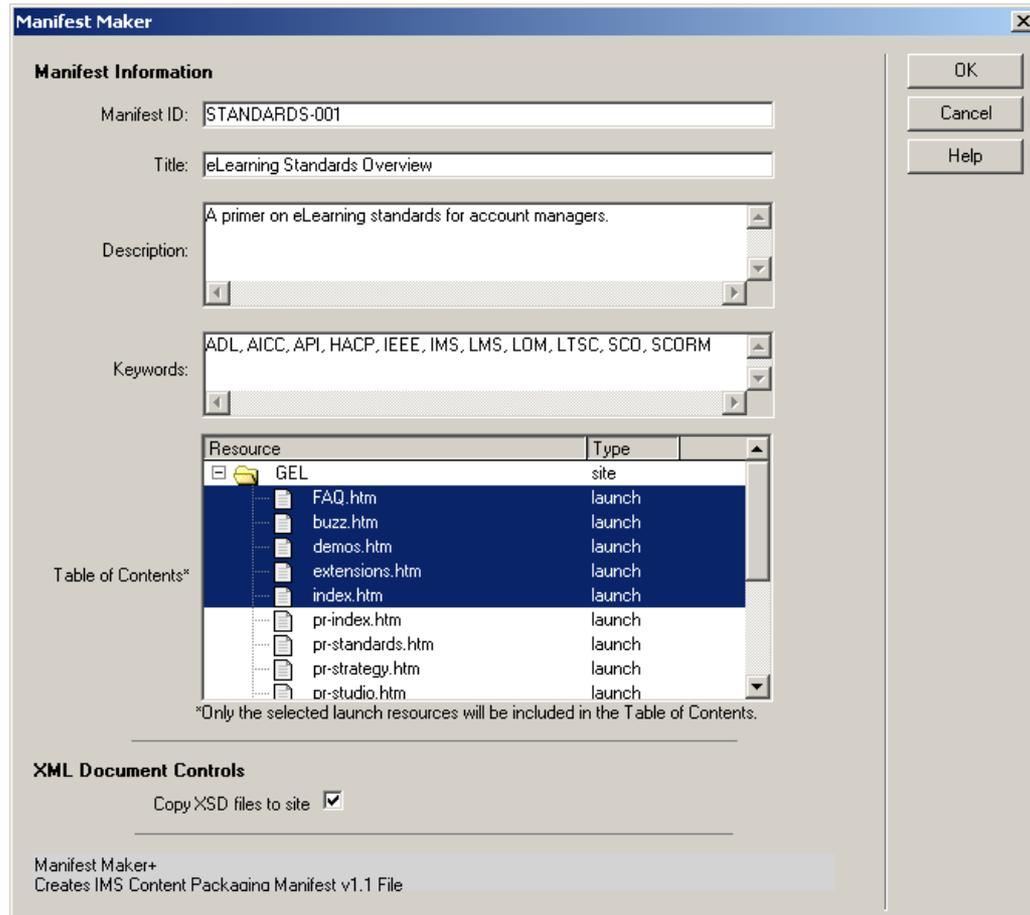
Standards: Implementation Phase

- Use meta-data & content packaging for publishing
 - Facilitates distribution, discovery, use & management
- Collect the data (AU/SCO to LMS, usage, etc) and use the communication API
- *All the Data*- observation, anecdotal & informal

Review “SCORM 1.2 Addendums”

Implementation Recommendations

Use tools to expedite tagging and packaging.
Customize or build as appropriate



Comment and *extend* your packages and metadata—even if you need to do it manually to start.

Manifest Maker [X]

Manifest Information

Manifest ID:

Title:

Description:

Keywords:

Table of Contents*

Resource	Type
[-] GEL	site
[-] FAQ.htm	launch
[-] buzz.htm	launch
[-] demos.htm	launch
[-] extensions.htm	launch
[-] index.htm	launch
[-] pr-index.htm	launch
[-] pr-standards.htm	launch
[-] pr-strategy.htm	launch
[-] pr-studio.htm	launch

*Only the selected launch resources will be included in the Table of Contents.

XML Document Controls

Copy XSD files to site

Manifest Maker+
Creates IMS Content Packaging Manifest v1.1 File

OK
Cancel
Help

Standards: Evaluation Phase

- Look at the data that is automatically collected (AU/CO to LMS, usage, etc)
- *All the Data*- include observation, anecdotal & informal sources
- *Trust but verify*
Skepticism is good, but trust the data
- Consider metadata about SCO's;
student performance is only part of the picture.

Standards: Maintenance

- Leverage modularity for changes
 - Add/removes SCO's, Create alternate curricula
- Use Packaging to publish/re-publish
- Leverage meta-data
 - Locate alternate materials
 - Track changes: *who, why, how*
- Be ready for infrastructure changes
 - Open standards and formats facilitate migration

eLearning: Where is it all going?

Everywhere...

- PDA's
- Phones
- TV's
- Game boxes
- Devices and more...



What are Standard Bodies working on now?

- **Broader definition of content objects**
 - Resources, Facilities, People, Equipment, “*Agents*”
- **Broader deployment options**
 - Blended delivery: Alternate devices, locations
 - Accessibility: W3C, Section 508; Localization
- **Tools to manipulate collections & sequences**
 - ADL and IMS “Sequencing Working Group”
- **Guidelines & Best Practices for Instructional Design**
 - AICC ISD Working Group
 - IMS Instructional Design Working Group