Learning Technology Standards and Digital Repositories Interoperability

Lorna M. Campbell, lmc@strath.ac.uk

CETIS http://www.cetis.ac.uk

CETIS: Supporting the UK FE/HE community

- Centre for Educational Technology Interoperability Standards.
- Funded by the Joint Information Systems Committee (JISC).
- Support UK Higher and Further Education.
- Advises Universities and Colleges on the strategic, technical and pedagogic implications of learning technology standards.
- Represents UK FE/HE on international learning technology standards bodies.
- Manages the Special Interest Groups (SIGs).

The CETIS SIGs

- Accessibility SIG.
- Assessment SIG.
- Educational Content SIG.
- Learner Information Package and Enterprise SIG.
- Metadata SIG.
- FE Focus Group.

The CETIS SIGs

- Established to support the UK FE/HE sector's uptake and implementation of interoperability specifications.
- Track the development of standards and specifications.
- Advise the sector on the relevance of different standards and specifications.
- Channel sector's requirements back to CETIS and international standards initiatives.
- Support communities of practice.

The Metadata SIG

- Focuses on learning object metadata…
  - IEEE Learning Object Metadata
  - IMS Learning Resource Meta-data
  - Dublin Core Metadata
- …and digital repositories interoperability.
- Coordinated by Phil Barker, Herriot-Watt University.
- Website: http://www.cetis.ac.uk/metadata/
- Mailing list: http://www.jiscmail.ac.uk/lists/cetis-metadata.html

Further information

The CETIS website:

- http://www.cetis.ac.uk/
- Hosts websites for all the SIGs.
- Regular updates of latest developments in the field of learning technology standards.

What are learning technology standards and specifications?

- Standards and specifications that are designed to facilitate the description, packaging, sequencing and delivery of educational content, learning activities and learner information.

Why do we need learning technology standards and specifications?

- To prevent content becoming “locked in” to proprietary systems.
- To ensure educational content is durable and reusable.
- To enable educational content & learner information to be shared.
- To facilitate interoperability.

Who is developing LT interoperability "specifications"?

- IMS Global Learning Consortium.
  - http://www.imsproject.org/
- European Centre for Standards/Information Society Standardisation System Learning Technologies Workshop (CEN/ISSS WS-LT).
  - http://www.cenorm.be/isss/Workshop/LT/Default.htm
- Dublin Core Metadata Initiative.
  - http://dublincore.org/
- Advanced Distributed Learning (ADL).
  - http://adlnet.org/

Who is developing LT interoperability standards?

- Institute of Electrical and Electronic Engineers (IEEE) Learning Technology Standards Committee (LTSC).
  - http://ltsc.ieee.org/index.html
  - Digital Rights Expression Language Study Group.
  - http://ltsc.ieee.org/sg1/index.html
- International Standards Organisation (ISO) Sub Committee 36 (SC 36).
  - http://www.iso.org
- National standards bodies e.g. BSI, DIN, AFNOR.

IMS Global Learning Consortium

- http://www.imsproject.org/
- Learning Resource Meta-data.
- Question and Test Interoperability.
- Learner Information Packages.
- Competencies.
- Simple Sequencing.
- Content Packaging.
- Learning Design.
- Accessibility.
- **Digital Repositories Interoperability.**

IMS Digital Repositories Interoperability

- V1.0 Public Draft specification.
- Released August 2002.
- Team leads: Dipto Chakravarty, Artesia Technologies & Jon Mason, DEST.

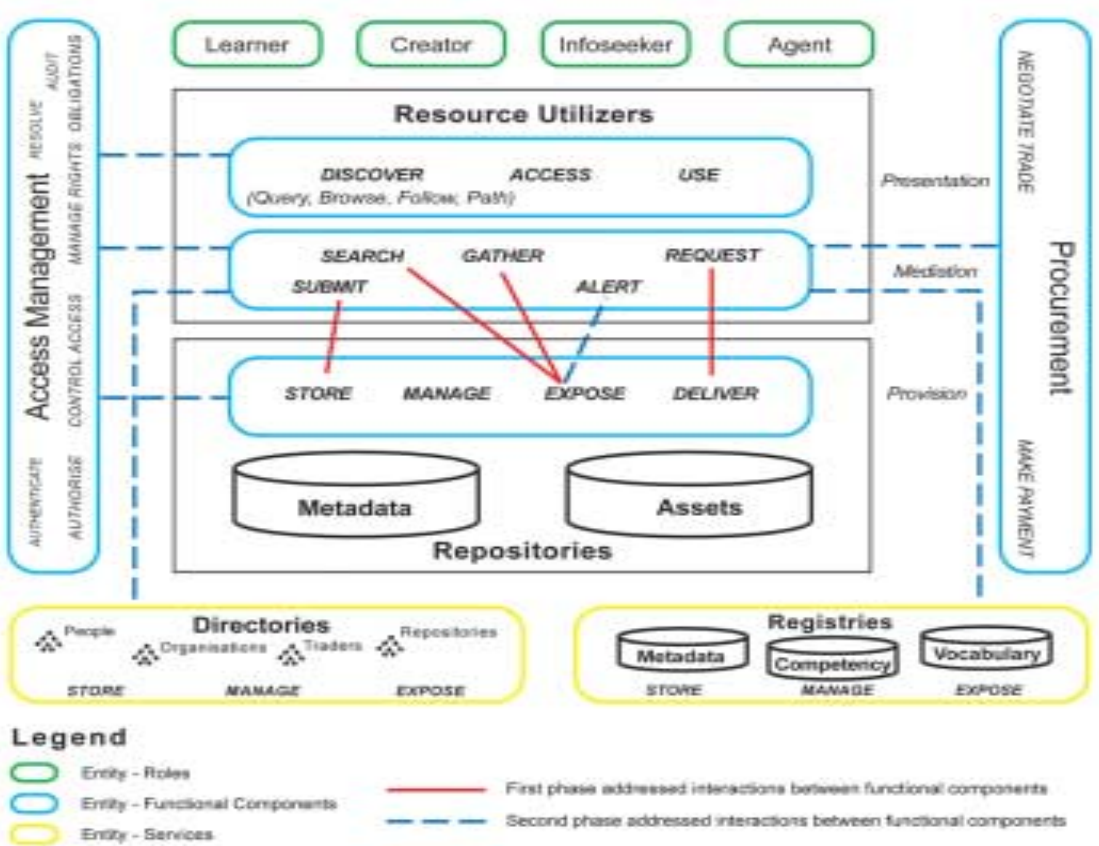
IMS Digital Repositories Interoperability

- Aims to provide recommendations for the interoperation of the most common repository functions.
- Digital repositories are defined as being any collection of resources that are accessible via a network without prior knowledge of the structure of the collection.
- Repositories may hold assets, meta-data or both.

IMS Digital Repositories Interoperability

- The specification is intended to utilize schemas already defined elsewhere (e.g., IMS Meta-Data, Content Packaging, Z39.50), rather than attempt to introduce any new schema.

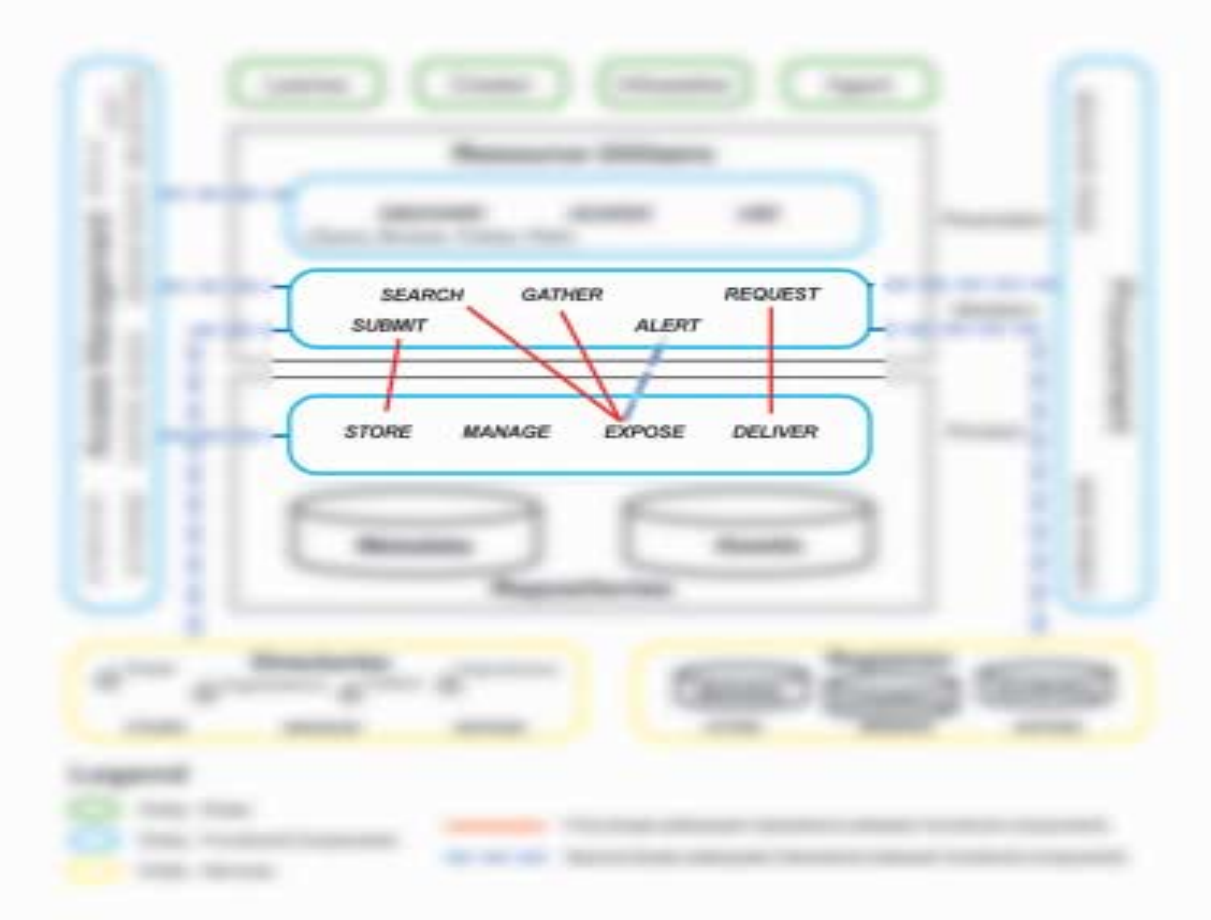
DRI functional architecture



Core functions

- Defines the core functions between the Mediation and Provision layers of the DRI functional architecture.
  - Search / expose
  - Gather / request
  - Submit / store
  - Request / deliver
  - *(Alert / expose)*

DRI architecture core functions



Search / expose

- Defines the searching of meta-data associated with content exposed by repositories.
- Recommendations for query language:
  - XQuery for searching IMS (XML) meta-data.
  - Z39.50 for searching library information.
  - SOAP messaging with or without attachments.

Gather / expose

- Defines the soliciting of meta-data exposed by repositories and the aggregation of meta-data for use in subsequent searches.
- Recommendations for “pull” gather:
  - Open Archives Initiative (OAI).
- Recommendations for “push” gather:
  - This is a basic case of the “alert” function & is not explored in detail.

Submit / store

- Refers to moving an object to a repository from a network-accessible location & how the object will then be represented for access.

Submit / store

- Recommendations for Submit function
- Existing repositories:
  - May use established means e.g. FTP.
- Recently developed learning object repositories:
  - Transmit IMS Content Packages using SOAP messages with attachments.

Submit / store

- Recommendations for Store function
  - The repository should present IMS Content Packages at “some level of its operation.”

Request / deliver

- Request function allows a utiliser that has located a meta-data record via the Search function to access the resource described.
- Deliver refers to the response from the repository which provides access to the resource.

Request / deliver

- Exclusions from V1.0 specification:
  - Deals only with Request and Delivery of online resources from object repositories.
  - Digital rights management.
  - Verification, e-commerce payment and processing.

Request / deliver

- Request / deliver mechanism begins with a pointer to the location of a resource.
  - IMS meta-data element 4.3 <location>.
  - Element may list locations or methods which resolve to locations.
    - E.g.DOI or OpenURL.
    - Location returned should resolve to a URL.
- Linking to the URL initiates the Request.
  - Protocols used to deliver the learning object will include:
    - http & ftp.

Future considerations

- Gives an indication of the Working Group's thinking on various issues that are currently out of scope.
  - Registries and directories.
  - Digital rights management.
  - Location and resolution services.
  - Request / deliver services.
  - Web services.
  - Recommendations regarding GUID allocation.
- Working Group invites comments and feedback on these issues.

Further information

- IMS Global Learning Consortium website.
- http://www.imsproject.org/digitalrepositories/index.cfm
- IMS Digital Repositories Core Functions Information Model.
- IMS Digital Repositories Core Functions XML Binding Specification.
- IMS Digital Repositories Core Functions Best Practices and Implementation Guide.
  - Includes “Future Considerations”.