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Working together building Australia's knowledge networks

Metadata for Educational Resources: Theory & Practice

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Overview of Presentation

- **Theoretical Perspectives**
 - **Dublin Core - IEEE LOM**
 - **Common Principles**
 - **Online Learning**
- **Practical Commentary (Australian experiences)**



Keywords - Keyphrases

Chinese

Ministry of Education

Distance Learning

Learning Technology

Standards

Standardisation (Standardization)

Cooperation, Collaboration

Sharing

CDLTSC

Regulatory Framework

Quality Assurance

Computer Networks

Localisation (Localization)

Internationalisation (... ization)

I18N, L10N, WTO

Training

Enterprise

Challenges ...



Keywords – Keyphrases (2)

Australian

Ministries of Education

Distance Learning (history)

Learning Technology

Standards

Standardisation (Standardization)

Cooperation, Collaboration

Sharing

AICTEC - SSC

Interoperability Framework

Quality Assurance

Networks (leverage)

Localisation (Localization)

Internationalisation (... ization)

I18N, L10N

Content

Online Services

Challenges ...



Theoretical Perspectives

Describing Educational Resources – two approaches

- for networked discovery and retrieval

DCMI approach: EdNA, GEM, Canada SchoolNet, etc.

Resources may have been originally “purposed” as **educational** resources, or maybe not.

- for management & deployment of learning objects

IEEE LTSC LOM approach: IMS, ADLNet, ARIADNE, etc.

Resources “purposed” or designed as learning objects.

Framework originally conceived to support learning management systems.



Common Metadata Principles

- **Refinement** - qualification of elements & values
- **Extensibility** - additional elements & qualifiers
(domain-specific or local use)
- **Modularity** - syntactic interoperability
(e.g., *Lego*TM, atoms)
- **Multilingual** - internationalization key component of standardization
(the Web itself is a multilingual platform)



Theoretical Perspectives (2)

Online Learning – two (generalised) approaches

- specifying a well-structured learning environment

Learning Management Systems

Managed Learning Environments

(engineered approach)

- harnessing online capability

Expeditionary

Networked

Leverages best-of-breed

(innovative approach)



Educational metadata in Australia

From online resource cataloguing

To developing and managing learning objects
AND providing integrated online services



Some Key Initiatives in Australia

- **Education Network Australia (EdNA)**
<http://www.edna.edu.au/> & <http://standards.edna.edu.au/metadata>
- **National Library of Australia – Metadata Guidelines**
<http://www.nla.gov.au/metadata.html>
- **Australian Government Locator Service (AGLS)**
http://www.naa.gov.au/recordkeeping/gov_online/agls/summary.html
- **Australian Museums Online (AMOL) DiscoverNet**
<http://amol.org.au/discovernet>
- **Learning Resource Exchange (LRX)**
<http://www.lrx.com.au/>
- **Le@rning Federation (SOCCI)**
<http://www.thelearningfederation.edu.au/>
- **Collaborative Online Learning & Information Services (COLIS)**
<http://www.colis.mq.edu.au/>
- **Australian ICT in Education Committee (AICTEC)**
<http://www.aictec.edu.au/>



Education Network Australia

- National collaboration of education & training authorities (representing school education, VET, & higher education)
- Initiated in 1995
- EdNA Online launched 1997
 - as a directory service
 - 'white list' of curriculum support resources
 - platform for communities of interest, professional associations
- Metadata standard based on unqualified DC (Aug 1998)
<http://standards.edna.edu.au/metadata/>



EdNA Metadata Standard (1)

Guiding Principles:

- targeted resource discovery of online educational resources
- interoperable with DCMI
- collaboration to achieve & maintain cross-sectoral consensus on a national education metadata framework
- adoption & promotion of the use of authoritative Australian classification schema wherever possible

Key Achievement: Signed-off by all stakeholders



EdNA Metadata Standard (2)

Guiding Principles:

- accommodation of local values, such as state-specific learning outcomes information
- provision of guidance regarding recommended best practice
- alignment & positioning with other national and international standards and schema (including intellectual property)

Key Issue: maintaining a balance between **generality** & **specificity**



EdNA Metadata Standard (3)

Meanwhile...

- **mid 1998:** IMS releases its first specification (meta-data)
 - based on LOM (v 3.5)
- Education stakeholders view LOM as unwieldy, over-specified
- DC-Education Working Group forms
- Resource discovery and managed learning viewed as discrete functions

But ...

- **1999:** Recognition that high quality (Australian) learning content is in short supply



Le@rning Federation

- **Schools Online Curriculum Content Initiative (SOCCI)**
<http://socci.edna.edu.au/>
- **Initial discussion papers & planning in early 2000**
- **Collaboration of all schooling systems with Commonwealth Government**
- **AUD\$68 million**



Le@rning Federation Aims

- **Develop a body of nationally-funded curriculum content, suitable to each state and territory**
- **Develop this content within a framework that supports distributed access**
- **In the longer term, use the framework and the content to stimulate further contributions to the pool of material, meeting agreed standards**



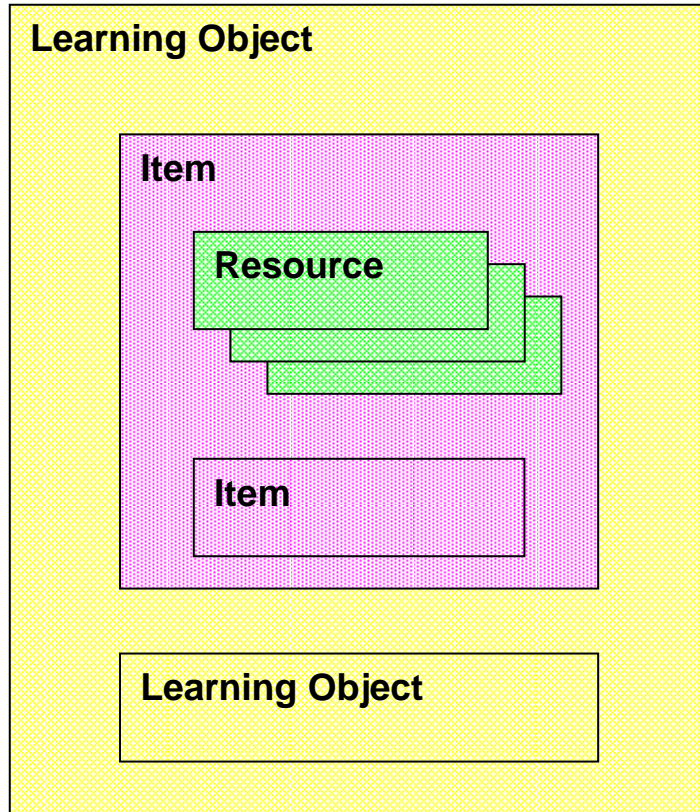
Learning Object Model (1)

Learning Federation approach will:

- maximise opportunity for customisation of **Learning Objects** by teachers to meet the learning needs of classes, groups or individual students
- meet the needs of diverse learners and learning contexts
- be based upon learning object information model consisting of 3 entities, all of which will be associated with metadata



Learning Object Model (2)



Resource: basic digital asset

Item: container for a collection of resources that have no educational integrity

LO: an item or collection of items or other LO's that have educational value



Learning Object Model (3)

Learning Objects will consist of one or more files:

- **stand-alone**
- **as a component of a learning sequence that**
 - may be created during the development process
 - later constructed by the end user to suit their specific learning and teaching requirements.
- **includes metadata to describe the content**



Context for LF metadata

- Foundation of EdNA Metadata Standard support
- Requirements for retrieval of learning objects drove a review of the EdNA metadata standards for the Initiative
- States & Territories have independent curriculum governance. All agree on 'outcomes' approach but have different curriculum frameworks. Learning objects need to correspond to these curriculum frameworks
- **Delivery** of the learning objects (& provision of retrieval tools) will be undertaken by each State and Territory as part of their own online curriculum services



LF Educational metadata (draft)

- **Subject**
(Schools Online Thesaurus
based on SCIS Subject Headings)
- **Curriculum**
 - Learning Area
 - Strand
 - Content
 - Process
- **Audience**
 - Type
 - Sector
 - User level
- **Resource type**
 - Student activity
 - Learning design
- **Typical learning time**
- **Annotation**
- **Rights**



LF Application Profile (draft)

Application Profile draws from:

- DCMES, v1.1
- DC Qualifiers (2000-07-11)
- EdNA Metadata Standard, v1.1
- IEEE LTSC LOM, draft v6.1
- Open Digital Rights Language, draft 0.9



LRX : Learning Resource eXchange

- A federated (or 'union') database of metadata about learning objects held by 11 Australian universities
- A cataloguing tool to enable learning object creators to create metadata in the required standard format
- A searching tool to enable learning object users to locate useful learning objects held on LRX system catalogues
- A collaborative effort for the purpose of exchanging re-usable learning objects, for free or by trade, by utilising the LRX Service offered by the University of Sydney.



COLIS

Collaboration of five Australian universities – Macquarie, Newcastle, New England, Southern Queensland, and Tasmania.

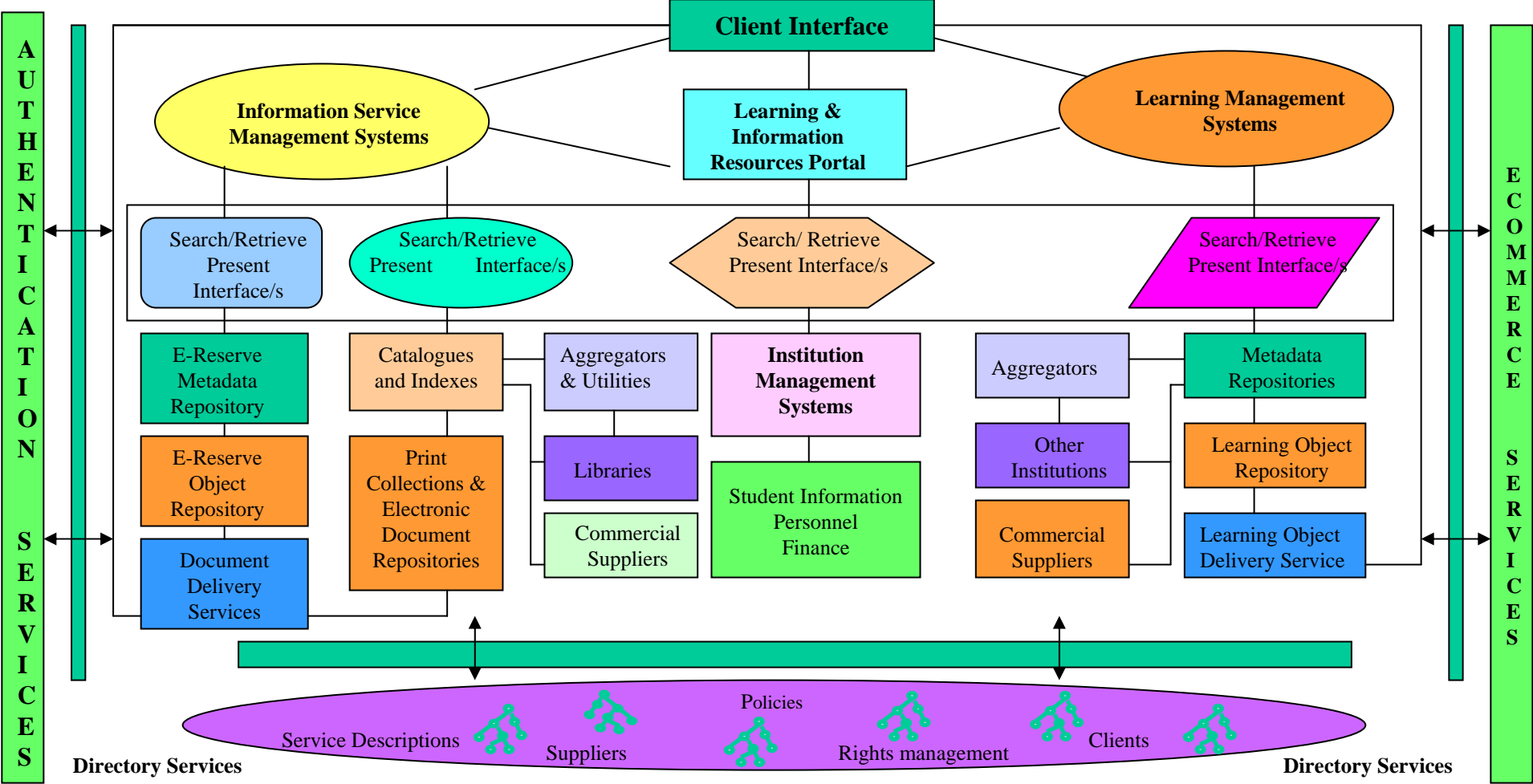
Goals:

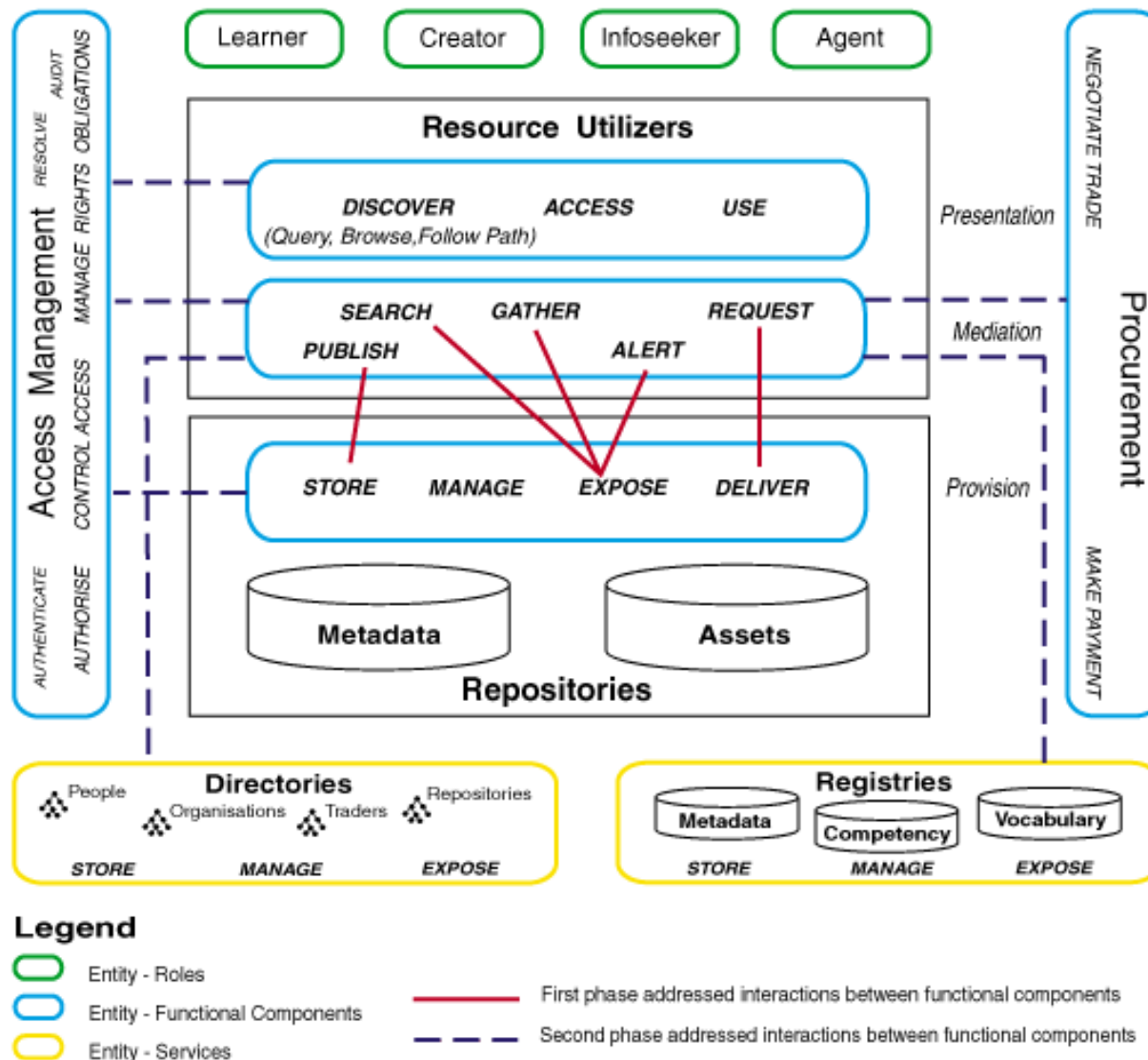
- Establish a test-bed for the development of **collaborative online learning and information services**
- Develop scalable standards-based model for institutional interoperability enabling seamless sharing of online learning and scholarly information
- Contribute more fully to the work of the IMS Global Learning Consortium
- Strengthen links with industry



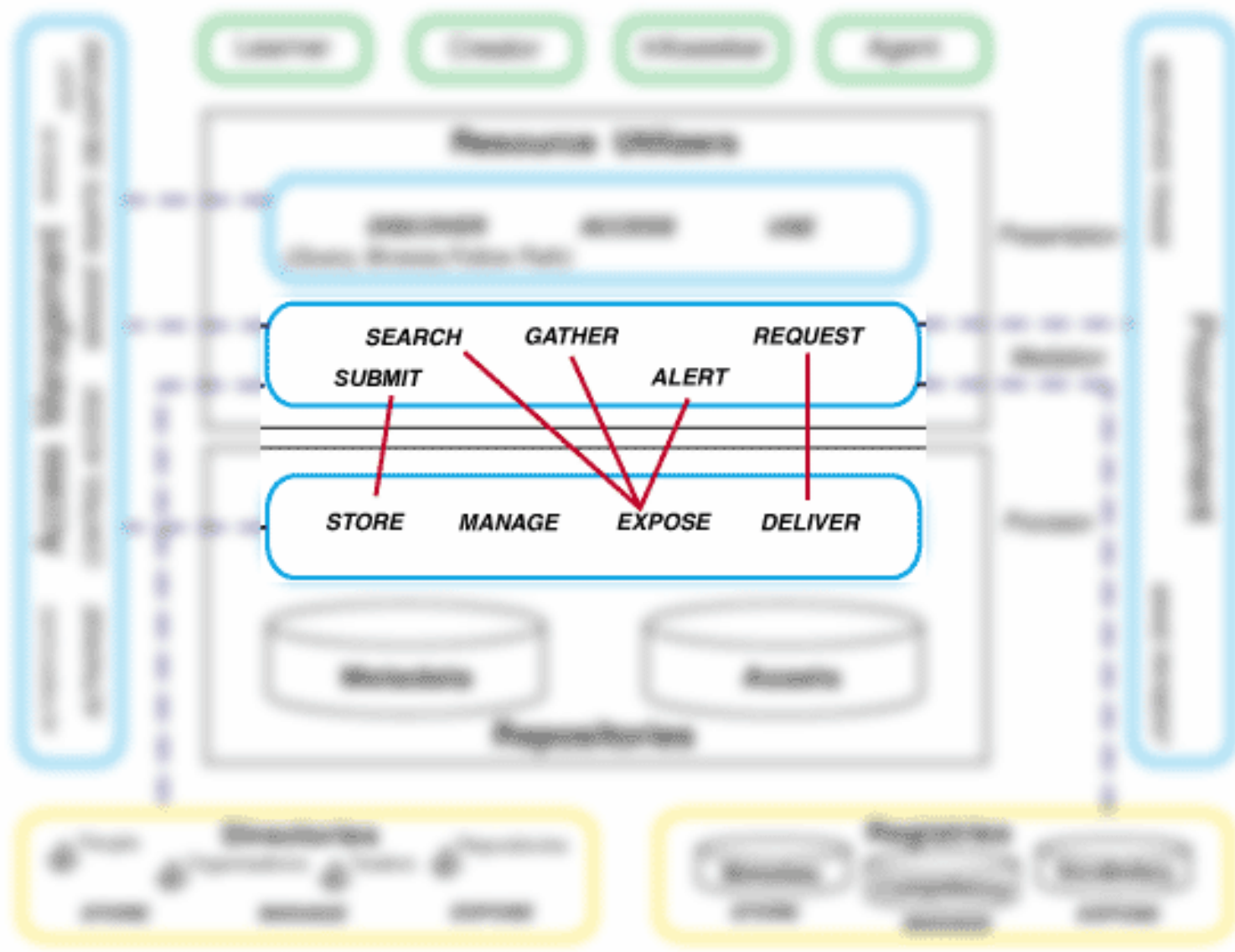
Distributed Learning & Information Discovery Functional Model

Source: Neil McLean, Kerry Blinco - Macquarie University, Australia



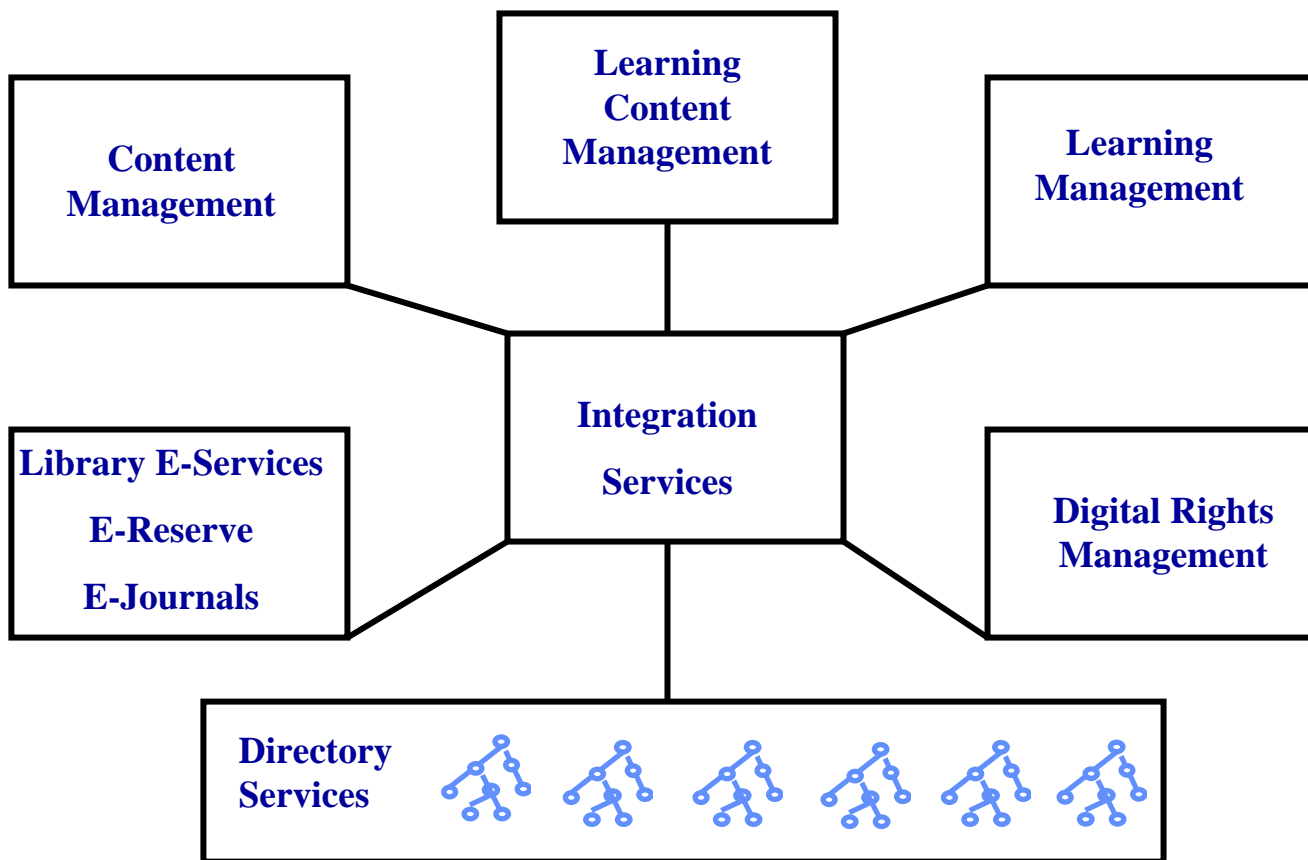


Source - IMS Global Learning Consortium



Source - IMS Global Learning Consortium

Systems Chunks in COLIS Learning Space Application Integration



Source - Neil McLean, Macquarie University

Developing Framework

Metadata: for what purpose?

- **discovery**
 - accessibility (where does it fit?)
 - basic rights management
- **business specific**
 - learning object management
 - rights management (transactions, tracking, ...)
- **administrative**
 - resource cataloguing & management
- **technical**
 - run-time environments, etc



Developing Metadata Framework

- Alignment with international standardisation efforts
- Systems convergence and interoperability
- Development of Schemas & Application Profiles

And also

- Ongoing recognition of layers of interoperability ...



Developing (Interoperability) Framework

Stakeholder Engagement:

- **Political** – Establishing ground rules for mutual benefit
- **Semantic** – Common understanding & vocabularies
- **Technical** – Systems exchanging data, services
- **Geographic** – Local, Regional, National, Global



Thankyou!