What is a Learning Object?

- The use made of the content objects, e.g., a lecture, PowerPoint presentation, essay, etc.
- A section of a course that can be stored and used again in another communication or learning product.
- A unit of educational content delivered via the internet.
- An collection of information objects assembled using metadata to match the personality and needs of the individual learner. Multiple learning objects can be grouped into larger assemblies and they can be nested within each other to form an infinite variety and size. Therefore there is typically a specified hierarchy of object groupings.

Gateway vs. Repository

- **Gateway**: A gateway is either hardware or software that acts as a bridge between two networks so that data can be transferred between a number of computers. For example, when you send an e-mail to a friend or when you log in to a Web site, there is a gateway that allows the connection to take place. Often, your connection to a Web site will involve many smaller connections to other servers along the way. In these cases, a number of gateways are used.

- **Repository**: A repository is either hardware or software that contains contents with metadata and retrieval interface.

Goal of Our R&D

- Clarify the requirements of metadata and controlled vocabulary for sharing and reusing learning objects for higher education worldwide.
- Develop a prototype of a test bed for sharing and reusing learning objects among multiple learning management systems.

Outline

- Concept of Metadata for Sharing Learning Objects
- Global Standards of Learning Object Metadata
- Mapping of Controlled Vocabulary
- Collaboration among Learning Object Repositories Worldwide
- Creative Commons & Copyright Handling
What is Metadata?

- Structured data about data that describe contents and/or nature of the original data. Examples are:
  - Book Catalog of Libraries that describes a book using metadata (Author, Title, Publisher, Publication Date, Size, etc.)
  - Phone Directory describes people and/or organizations by metadata (Name, Location, Phone Numbers, etc.)

Metadata?

Gateways and Repositories Globally Sharing and Reusing Learning Object

- MERLOT (Multimedia Educational Resource for Learning and Online Teaching)
- EduSource Canada
- EdNA (Educational Network Australia)
- ARIADNE (Alliance of Remote Instructional Authoring and Distribution Networks for Europe)
- NIME Glad (National Institute of Multimedia Education Gateway to Learning for Ability Development)

MERLOT

- Established 1996 by California State University in USA.
- Goal: Promote application of e-learning and application of IT on higher education
- Major Activities: Evaluate learning materials created by instructors of member organizations and feedback the result to the Organization (intend to influence the promotion of the instructor)
- Members: More than 20 university systems and academic organizations
- Collection: metadata and links to Approximately 10,000 online learning materials with evaluation information

http://www.merlot.org/Home.po
**EduSource Canada**

- Established 2002 in Canada
- Goal: Develop a test bed for interoperability among Canadian repositories of learning objects
  - Continuously develop and promote CanCore Protocol (Canadian standard of LOM)
  - Promote research on pedagogy, protocol, network engineering, hardware consolidation, quality management of services, rights handling
  - Provide nationwide test bed for testing peer review, content modification, user support, professional development, contents exchange
  - Transfer of outcomes through collaboration with other Canadian organizations

**EdNA**

- Established 1999 in Australia as a directory of distance learning programs
- Goal: Support and promotion of education, learning and training using the Internet
  - Develop services and tools in response to Australian curricula
  - Provide contents to educational institutions and government organizations in Australia

**ARIADNE**

Initial Phase: Develop a system for sharing learning resources and related tools during 1995-2000 as a collaborative research project of EC and Swiss government

Current Status: Established 2000 as an independent entity
- A Europe-wide repository of online learning materials for higher education
- Operate interface, tools and network responsive to multiple languages and cultures
- Provide free access for everyone to all kinds of higher education
- Promote development and international standardization of IEEE/LOM
NIME Glad

- Site for sharing and reuse of educational materials developed and distributed by colleges and universities in Japan.
- Offers e-Learning courses and syllabi published by Japanese colleges and universities.

IEEE/LOM elements used

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Conclusion

- Limited metadata elements of IEEE/LOM1.0 are actually used by major learning object consortia.
- Controlled vocabulary defined as value space of IEEE/LOM1.0 are expanded in response to local needs.
- Classification vocabulary has been uniquely developed and maintained reflecting local needs.
- Copyright handling of learning objects are left for external sites such as creative commons.