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From Discovery to Innovation...

Learning Object Repositories in Canada

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0. Overview

1. Discussion of Problems and Issues in E-Learning
2. Some Thoughts Toward an Infrastructure



1. Problems and Issues

- In general the issues have to do with system architecture and resource based on what I call the “**silos model.**”
- On this model, resources are not designed or intended for wide distribution. Rather, they are located in a particular location, or a particular format, are intended for one sort of use only.
- The silos model is dysfunctional because it prevents, in some essential way, the location and sharing of learning resources.



1.1 Proprietary Standards

- A standard is proprietary when it is secret or when patents, copyrights or other restrictions prohibit its use.
- The use of a proprietary standard divides a distribution network
- Risks of proprietary standards:
 - Lack of support in new software
 - Licensing terms may change
 - Standards holder enjoys technological advantage
 - Choice of viewing software may be limited



1.2 Strict Standards

- It may be the case that the standard is too limiting for widespread use. (e.g. Criticisms of SCORM)
- In a similar manner, transport protocols may also be too strict.
- If the standard is too complex, use of the standard requires an involved process or development tool.



1.3 Monolithic Solutions

- Learning content management systems have become tightly integrated monolithic software bundles
- Purchasers of such systems are as a consequence committed to a single solution for all aspects of learning management – 3rd party solutions cannot be ‘plugged in’.
- Issues:
 - Purchasers buy more than is desired
 - No means to outsource services



1.4 Closed Marketplace

- Exists when an owner of a learning content management system has only a limited selection of content to choose from.
- Usually established *via* exclusive licensing deals
- Issues:
 - It is difficult to access content from different libraries
 - It is difficult for new content providers to distribute their material
 - The system tends to favour large distributors, large institutions



1.5 Disintermediation

- A system is disintermediated when there is no form of assessment or review guiding the selection of learning resources.
- Some efforts to provide intermediation. Eg. Merlot's peer review process – but these are limited to a single repository and select body of reviewers
- Review often used as a 'gate-keeping' process, causing significant backlog
- In many system, no review available at all



1.6 Selective Semantics

- The tendency to view the network of learning objects and repositories as a stand-alone service on the world wide web, not integrated with or compatible with many other resources and services available
- An issue mostly of perception rather than implementation
- A network, for example, that standardized on SCORM would preclude from consideration resources which are useful to course designers but which may not be described as learning objects *per se*.



1.7 Digital Rights Mismanagement

- Major issues:
 - No simple DRM solution has been widely implemented.
 - In many implementations, digital rights management has been conflated with the idea of digital rights enforcement
 - Often a requirement to use specialized technology, software
 - Typically necessary to negotiate access with each separate supplier
 - No trusted fiduciary agents



2. Some Thoughts Toward an Infrastructure

- The Vision Committee is establishing design principles to govern the development of an architecture
- The purpose of the principles is to guide the description of the components employed, the standards followed, and the principles governing the operation of the network.
- These principles are considered essential to the development of a national network of learning objects within the parameters described in the previous section.



2.1 Standards and Standards Compliance

- The protocols used are described, documented, and freely available to the public at large
- The protocols developed or used shall be royalty-free
- The project will strive to achieve a higher level consensus regarding protocols among core participants where possible, but will not impose it as a condition for entry among all participants.



2.2 Infrastructure Layer, Service Layer

- *Infrastructure layer*: the set of components that provides end-to-end functionality
- Will be developed and distributed as royalty-free open source software
- *Service layer*: a set of components with increased functionality over and above the the infrastructure layer.
- May be developed as free and open applications, or may embody commercial and proprietary components



2.3 Distributed Architecture

- Not as a single software application, but rather, as a set of related components
- Any component may be replicated and offered as an independent service, allowing multiple instances of each component
 - This allows users to select only those components they need to use
 - It also allows for choice in the selection of instances of any given component



2.4 Open Marketplace

- Any provider of learning materials may prepare and distribute learning materials through the network
- No prior restraint imposed on the distribution model selected by participants
 - Free content
 - Fee-based or licensed content
 - Co-op network content
- Multiple parties may provide metadata describing a given learning resource
 - Evaluations, annotations, certifications



2.5 Open Rights Management

- Where possible, the acquisition of rights and the exchange of funds will be automated
- Multiple digital rights models
- No single rights agency governing all transactions
 - Distributors, users will be able to select *agents*
- Should assert individual rights and preferences on behalf of users
 - For example, to express technology choices, content choices, privacy choices



2.5 Creating the Network

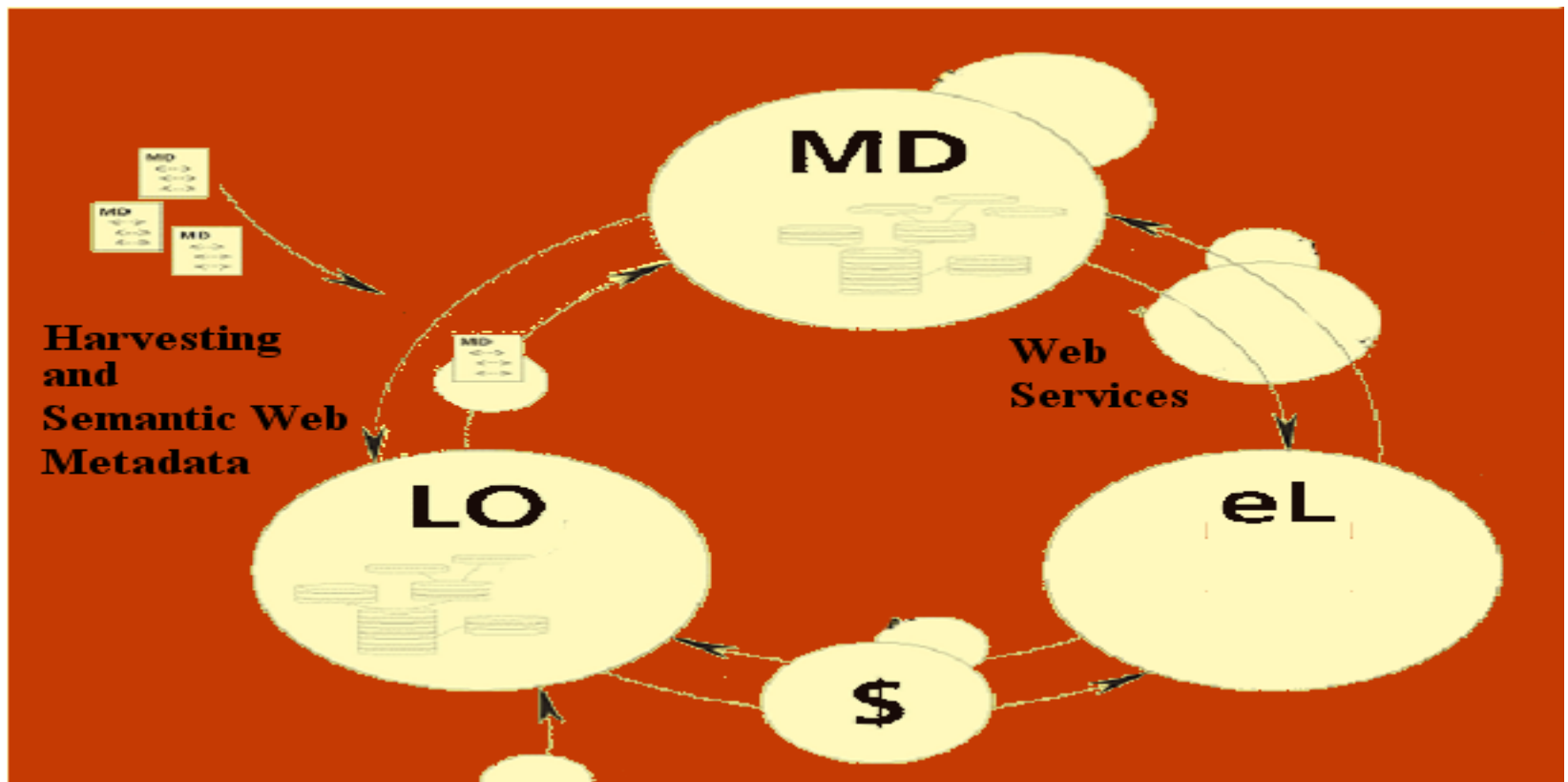
- Three major steps:
 1. Separating the functionality of an LCMS / LMS architecture into distinct, stand-alone components that communicate over TCP/IP
 2. Allowing (encouraging) the development of multiple instances of these components
 3. Providing indexing or registries of these instances



2.6 Core Components

- *Learning Object Repository* – hosted by vendors on vendor sites, provides vendor metadata and learning object servers
- *Metadata Repository* - hosted elsewhere, harvests metadata from vendors and amalgamates, allows queries from eLearning systems.
- *eLearning system* - queries metadata repository, user selects resource, retrieves resource from learning object repository, displays

Core Components (2)





2.7 Contrast to Library Model

- Most implementations view learning objects as though they were books in a library that are acquired, indexed and deployed
- This implementation views learning objects as online services and includes:
 - Learning objects, properly so-called
 - Other academic work, such as journal articles
 - In-person classes and seminarsAccess to instructors, coaches and tutors



2.8 Secondary Components

- These include:
 - A system of third-party metadata
 - A digital rights system
 - A learner (user) information system
 - A reporting or tracking system
- Major features:
 - The components are optional: you develop (or buy) them and use them only if you need them
 - For any given component, select one of many instances
 - These components may reside outside your own system



Resources

- This Paper: <http://www.downes.ca/files/canarie.ppt>
- The Learning Object Economy – http://www.downes.ca/files/Learning_Object_Economy.htm
- Design and Reusability of Learning Objects in an Academic Context - <http://www.downes.ca/files/milan.doc>
- EduSource – <http://www.edusource.ca/>
- Stephen Downes – <http://www.downes.ca>

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