

Elements of a Distributed Learning Object Repository

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- Part A:

The Learner's View

First, Let's Get the Technological Environment Right

- What it's not (necessarily)...
 - Institution owned computer in a lab row on row
 - Desktop connected by (thin) wires to the wall
 - Telephone with a little tiny screen (*a la* Cisco's Val Stoyanov)
 - Internet Explorer or other HTML Browser

When You Start Up Your Computer, It May Be...

- A laptop, handheld, large wall screen, household appliance, public terminal....
- Wherever you are
- Automatically connected to the internet via 10/100 m wireless (or optional plug-in)
- Aware of its environment (eg., of the presence of optional video display nearby)
- Yours

Your 'Learning Application' May Be...

- PDA, laptop, desktop, appliance interface, pop-up from software application
- A web browser
- Your email client
- A custom 'learning browser'

You Will See...

- Messages, news and other communications
- Or listings of new and current learning materials (*a la* OLDaily)
- Access to (what are now called) learning object metadata repositories
- Learning suggestions based on context (e.g., your microwave will offer cooking lessons, your fishing rod will offer fishing lessons)

The Paradigm Application...

- ... in this scenario is the *Learning Object Browser*
- It may be a hosted website, but is more likely to be a stand-alone application specific to your internet access device
- Most importantly, it is yours, you configure it, you establish the options

Functions of the LOB

- *Find* learning opportunities (note that I did not say courses, content or learning objects)
- *Retrieve* specific learning instances (which may be courses, content, objects, applications, interactions, testing, more...)
- *Play* learning instances either directly or via a nearby device

Finding Learning Opportunities

- *Push* (from them to you)
 - A lot like email newsletters (or even the late unlamented PointCast)
 - Based on *your* preferences (= subscriptions)
- *Pull* (from you to them)
 - You choose from a list of (what we now call) learning object metadata repositories
 - You search or browse, and select

Your Preferences, Your Selection

- Initially, set by you:
 - Your language, your topics of interest, your subscriptions, your choice of media, your rights broker, your repository list, your personal info
 - System-Aware: knows your OS, the time, etc
- Layered over by external agencies
 - For example, your employer may add (with your permission) certain subscriptions, topic preferences, rights and payment schemes

Selecting Your Learning

- Your preferences (plus overlays) determine your learning choices (as they are matched with metadata about learning provided from selected repositories)
- A *course* on this model is simply nothing more than a set of (possibly sequenced) learning option preferences (and corresponding repositories)

Accessing Your Learning

- Metadata about learning opportunities provides your LOB with:
 - The location of the learning opportunity
 - Any rights or permissions required to access it (including the cost, if there is one, and the paying agent (such as your employer or your school), if there is one
 - You simply select, your LOB does the rest

When You Select...

- If payment is required, you will be requested to send permission to your broker (note: *not* their broker)
- Your broker will execute a B2B and (as appropriate) return a key
- You will request the learning application (learning object) from the vendor, and provide the key

Interactions

- There may be interactions between your LOB and the learning vendor...
 - The vendor will tell you *what* information it is asking for (e.g., name, age, prior learning, etc)
 - This information is already stored in your personal profile (located on *your* machine)
 - Information is returned to the vendor only when you give your permission

Spawns

- The learning vendor may wish to provide additional learning opportunities:
 - Follow-up learning options
 - Other learning on similar topics
 - Access to value-added services, such as personal communications with a tutor
 - Certification and other tests
- Spawns are added with your permission

Playing the Learning App

- Though we call them ‘learning objects’ and think of them as ‘chunks’ of content, they are really self-contained applications
- They may require a pre-installed viewer (e.g. a browser, Acrobat Reader (ugh!), etc)
- But more frequently, learning applications will be more like self-contained applications that you download and run

Redirecting

- You may choose to redirect the learning application to a preferable viewer
 - For example, instead of playing on the tiny screen on the microwave, you may want your cooking lessons to display on the large kitchen wall screen
 - Some learning will require specific display hardware (and so you won't be able to access unless the hardware is present)

Reporting

- People who pay for learning (such as schools, parents, employers) may want you to report your learning
- If a reporting function is added to your personal preferences, then data from the learning application is delivered
- This is handled by the learning object's 'wrapper' or 'run time environment'

- Part B:

The System View

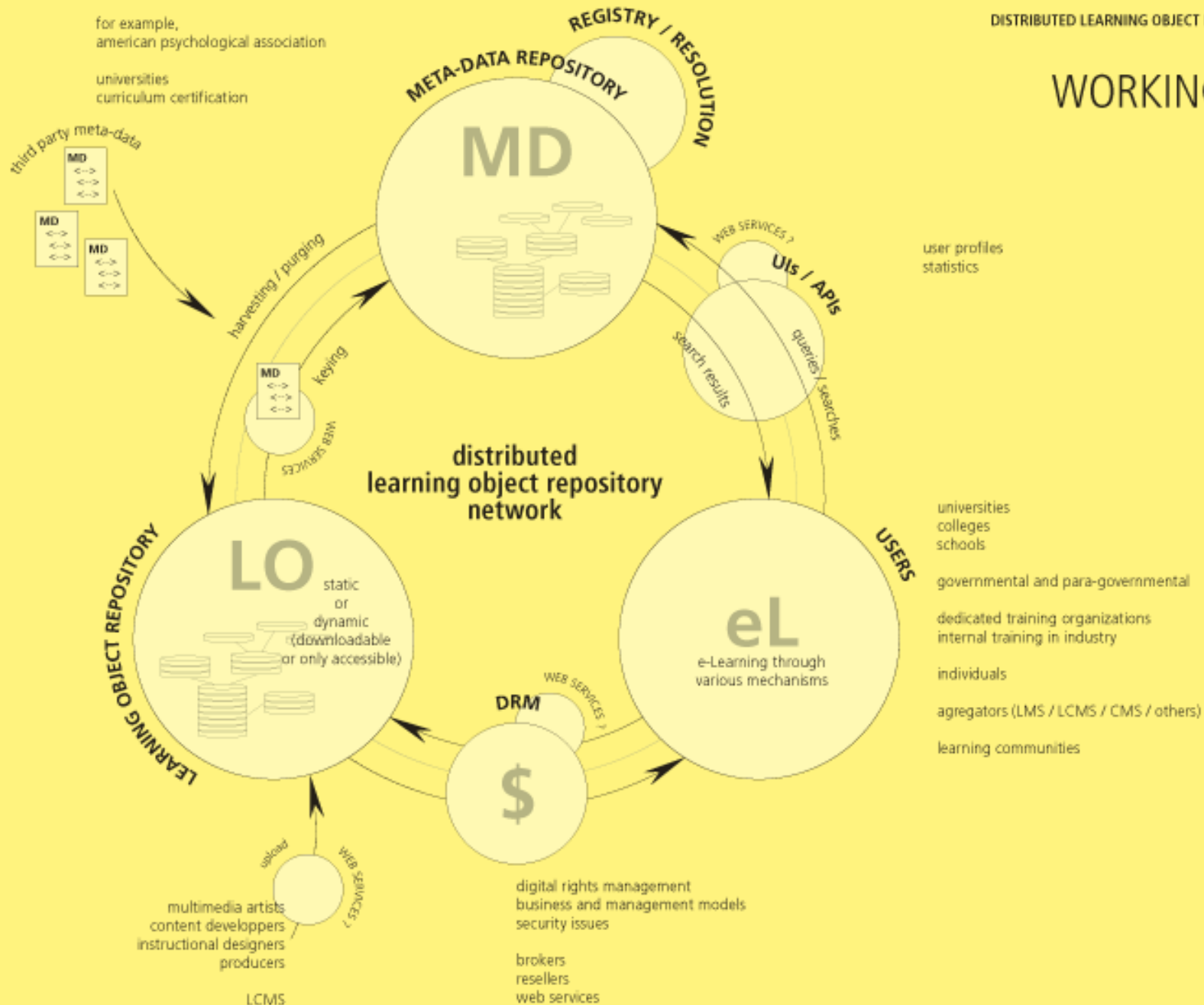
Why Cisco's Plan Won't Work

- Today we saw the large-system approach described by Cisco's Val Stoyanov... But
 - There's no room in this system for your golf lessons, or for your high school course
 - The Cisco approach is completely unsustainable for small companies or schools
 - You get only a limited set of 'Cisco approved' or 'LMS approved' learning vendors

The Distributed Learning Object Repository Network

- Multiple vendors, each managing their own learning object repository (specifically, something like an application service) and their own metadata
- Multiple metadata repositories, each harvesting metadata from selected vendors and providing pull and push services
- Third party metadata services

WORKING DRAFT



Learning ‘Content’ Providers

- Create learning objects (which may be content, activities, discussions, real-time tutors, whatever) and place them on an application (or web) server
- Create learning object metadata describing the learning objects on the same or different server

Creating Learning Objects

- Vendors will almost always use an authoring tool (such as Dreamweaver or Macromedia MX)
- The objects may allow for run-time formatting (and thus will be written in, e.g., EML)
- Have a run-time ‘wrapper’ added (preferably at the time of delivery)

The Learning Objects...

- Are delivered when requested by a learning object browser (a distributed network and caching system may apply, but is not necessary)
- May require the presentation of a key or some other information
- When delivered, interact with LOB for formatting and reporting functions

Learning Object Metadata

- Describes the learning object
- May be in a standard format such as IMS, AICC, SCORM, CanCore...
- Incorporates standards ‘extensions’ to:
 - E.g. Library of congress for subject classification
 - E.g. Rights management company for pricing and use information

Harvesting

- Metadata is ‘harvested’ from vendor web sites my metadata repositories (probably using OKI harvesting protocols)
- Harvesting is like ‘crawling’ or ‘spidering’ – the repository accesses the vendor’s site and automatically retrieves the information
- Vendors may restrict who harvests; harvesters may selected sites to harvest

Third Party Metadata

- Third parties may act just like vendors in that they may provide metadata about learning objects
- Common third party metadata includes:
 - Evaluations
 - Certifications
 - Annotations
 - Rights information

Metadata Repositories

- Should be thought of as *independent* from learning object vendors – they play the role of a portal or an aggregator
- Repositories retrieve metadata about learning objects (identified by either a key or URI) and join it into a single file
- Metadata repositories provide access to LOBs and similar devices

Why Do It This Way?

- An open marketplace – anyone can be a learning object vendor – will result in greater content options and (hence) more realistic pricing
- Learners integrate learning from multiple sources – not locked in to certain vendors or repositories (creates choice and options)
- Does not require a large scale investment