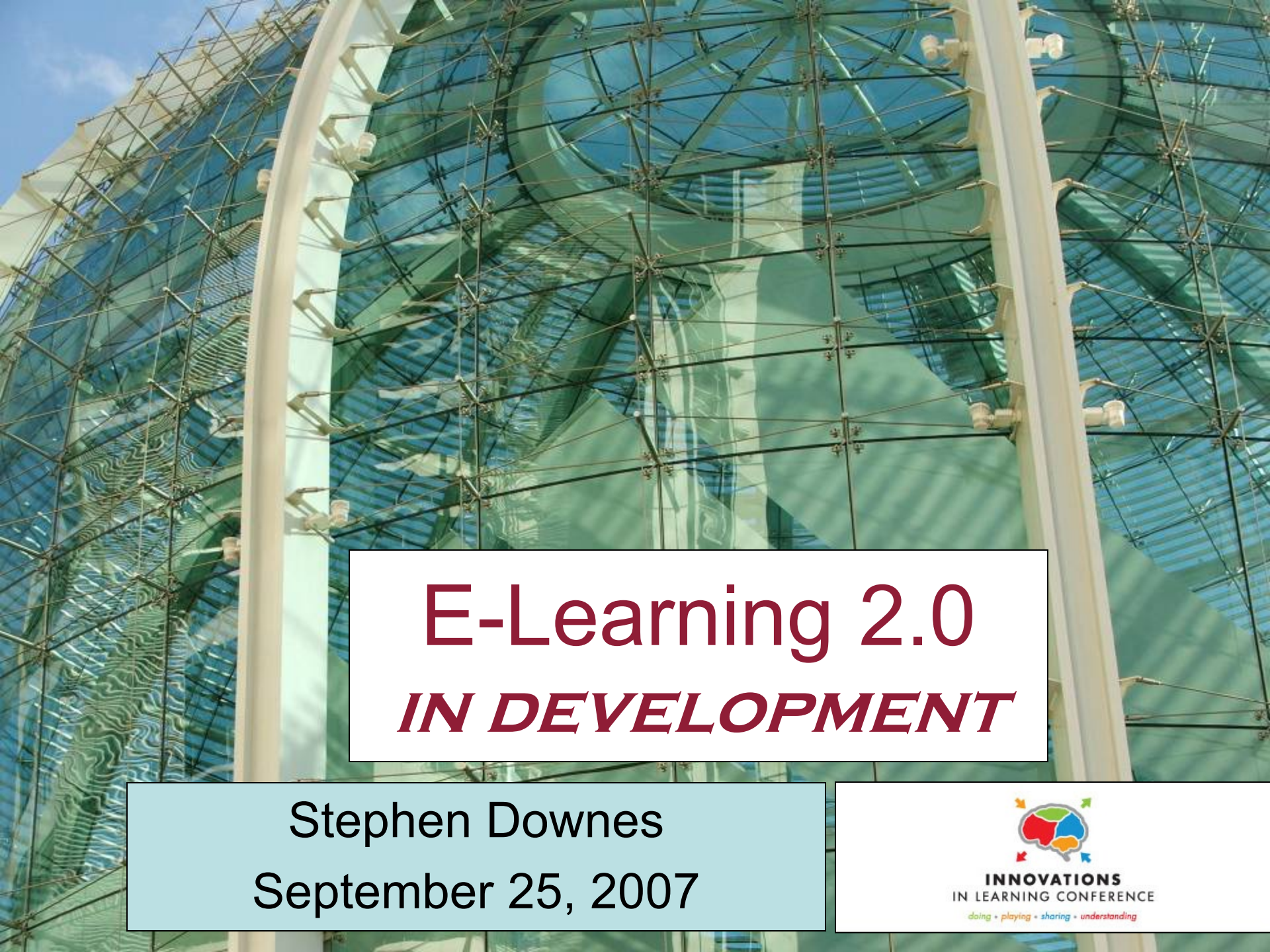


E-Learning 2.0

IN DEVELOPMENT

Stephen Downes

September 25, 2007

INNOVATIONS
IN LEARNING CONFERENCE
doing • playing • sharing • understanding

Overview

1. E-Learning in Development
2. The (Traditional) AI Approach
3. The Connectivist Alternative
4. Network Semantics
5. Web 2.0 - Core Technologies
6. E-learning 2.0
7. The Personal Learning Environment

1. E-Learning in Development

Online Learning

- Has been around since 1995 or so
- Really grew with the World Wide Web
- Has advanced tremendously

Many positive developments in the last few years worth sharing…

Open Source Applications

- Learning Management Systems
  such as Moodle, Sakai, Bodington, ATutor
- Development and CommunityTools
  such as LAMS, Connexions, ELGG, Drupal, WordPress
- Supporting Software
  such as Firefox, Thunderbird, OpenOffice, Audacity

Open Educational Resources

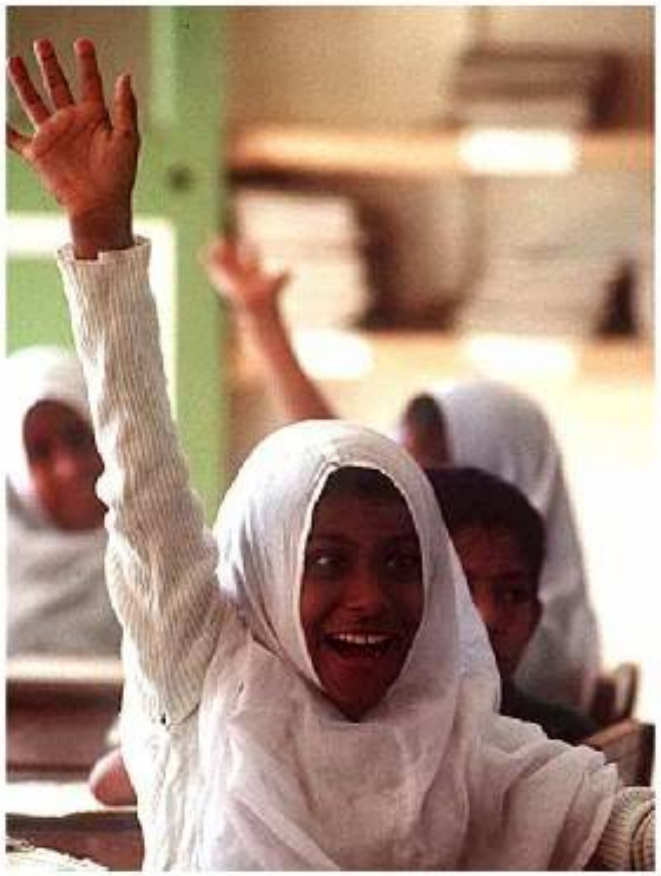
- MIT's OpenCourseWare project
  and the OpenCourseWare Consortium
- Open University's Open Courses
- OER initiatives
  Hewlett, Wellcome, OECD, UNESCO
- Creative Commons and CC materials
  in Flickr, Yahoo, Google, Wikipedia, Wikiversity, etc.

New Environments

- Multimedia explosion
  podcasts, vodcasts, YouTube, Slideshare, more
- Mobile computing
  mobile phones, PDAs, etc.
- The 3D web
  Second Life is a start, we will see more of this

Access…

- *One-to-one computing*
  such as the Maine laptop project, now spreading rapidly
- *One Laptop per Child*
  has launched – computers in Nigeria
- *Wireless access*
  3G networks, WLAN…



2. The Traditional (AI) Approach

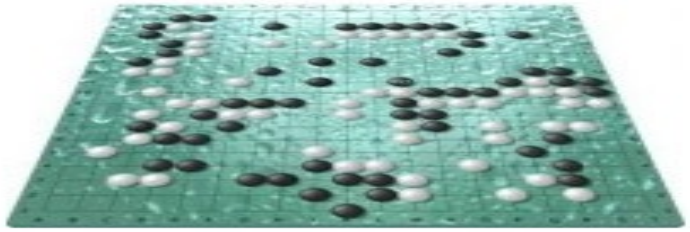
Expert Systems

- Two major aspects:
  - Representation
  - Inference engine
- Analogy: the wizard

http://en.wikipedia.org/wiki/Expert_system

http://www.atariarchives.org/deli/expert_systems.php

Properties of Expert Systems



- Expert systems are goal oriented
- Good expert systems are efficient
- Expert systems should be adaptive

http://www.expertise2go.com/webesie/tutorials/ESIntro/

AI Requires…

- Knowledge Acquisition
  - Subject matter expert
- Knowledge Representation
  - Eg. creation of resources
- Knowledge Encoding
  - Eg. creation of if-then structures

http://www.eco.utexas.edu/faculty/Norman/long.extra/Info.S98/Exp/intro.html

Learning Design

- to automatically “run” the sequence of student activities (facilitated by the educator via computers
  - James Dalziel

http://blog.worldcampus.psu.edu/index.php/2007/05/16/learning-design-and-open-source-teaching/

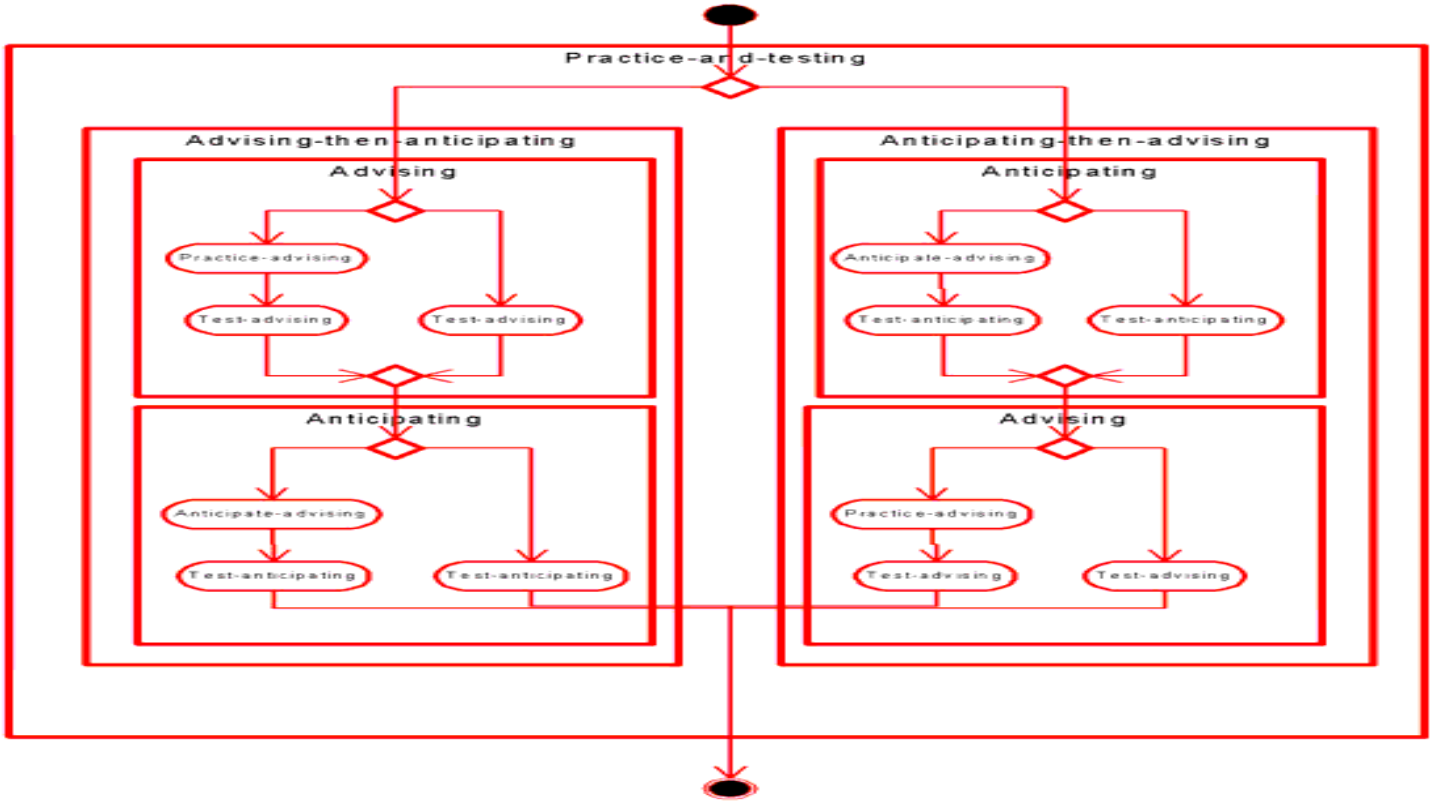
http://zope.cetis.ac.uk/lib/media/WhatIsLD_web.pdf

IMS Learning Design

- Based on Education Modelling Language (Rob Koper)
- Examples…
  - Programmed instruction
  - Role play
  - Competency-based learning
- Idea that LDs are “pedagogically neutral”

http://www.imsglobal.org/learningdesign/ldv1p0/imsld_bestv1p0.html

Competency-Based Learning



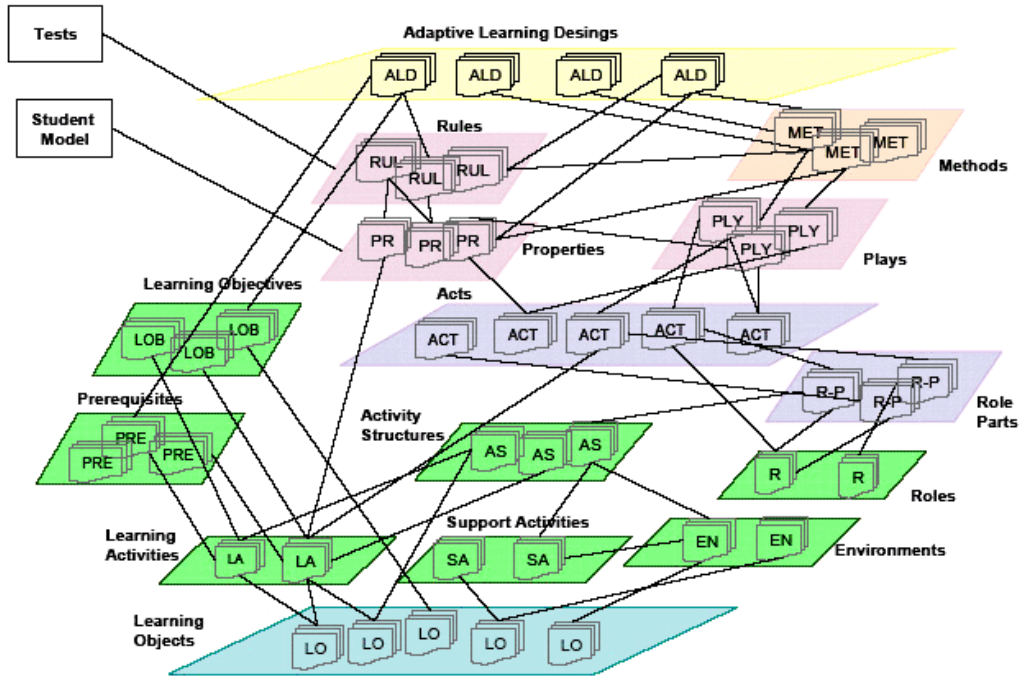
http://www.imsglobal.org/learningdesign/ldv1p0/imsld_bestv1p0.html#1505452

LD Tools

Nr.	*Tool Name*	*Link*	*Author*	*Levels*
1	**CopperAuthor**	www.copperauthor.org	OUNL	A
2	**Reload LD Editor**	www.reload.ac.uk/ldeditor.html	Reload	A,B,C
3	**ASK LDT**	www.ask.iti.gr	University of Piraeus	A,B
4	**Mot+**	www.licef.teluq.uquebec.ca/gp/eng/productions/mot.htm	University of Quebec	A
5	**Cosmos**	www.unfold-project.net:8085/UNFOLD/general_resources_folder/cosmos_tool.zip	University of Duisburg	A,B

Berggren et.al. http://jime.open.ac.uk/2005/02/

The Lego Metaphor



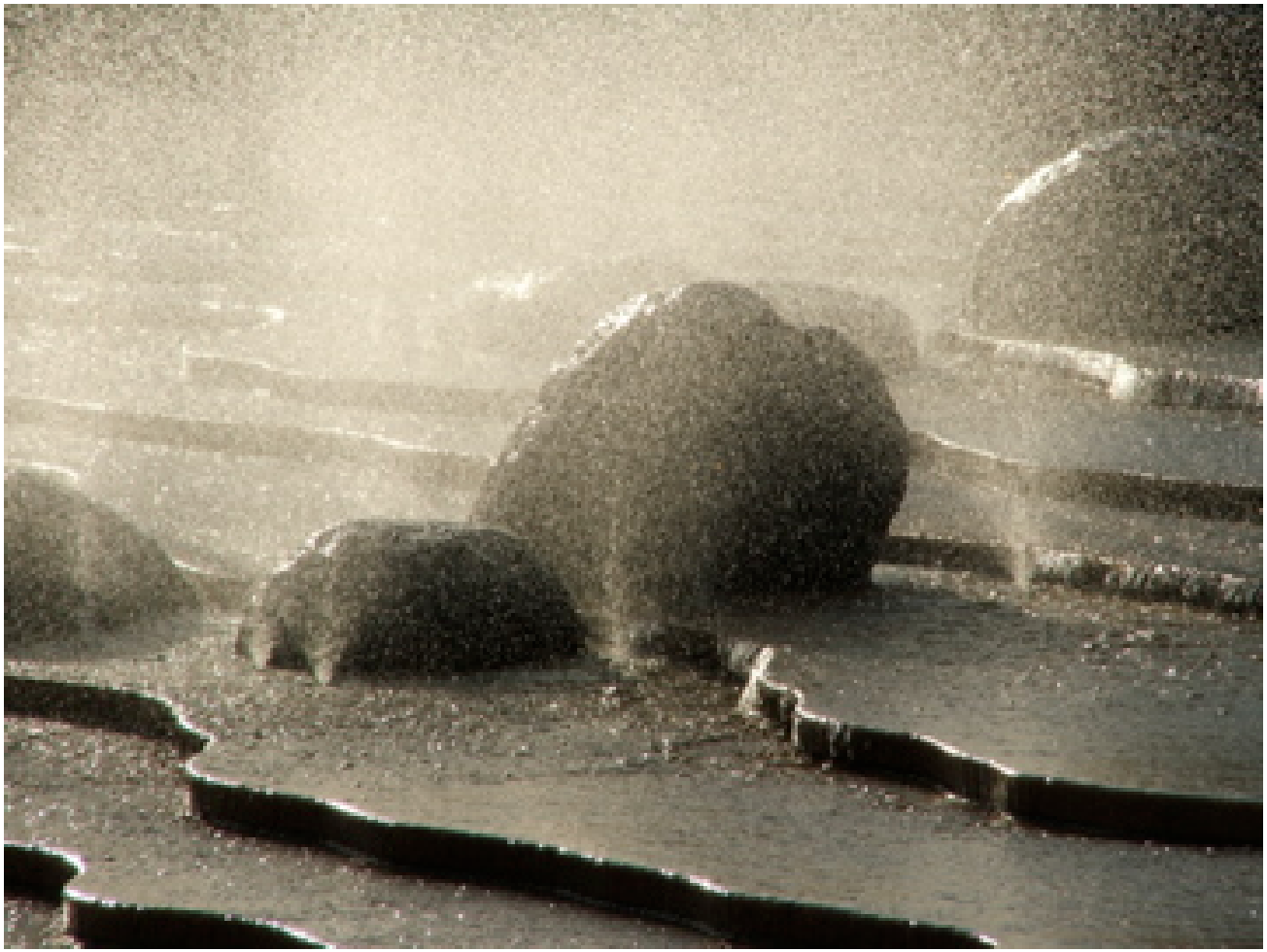
Berlanda & Garcia http://jime.open.ac.uk/2005/11/

The Learning Refinery

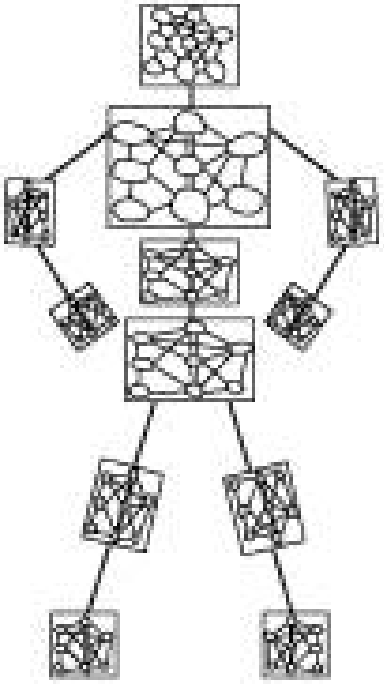
- LD but one element of a larger picture
- Includes Learning Objects, repositories, etc
- “LDs by themselves are of limited value without a bundle of surrounding documentation, metadata, and taxonomies”

Greller http://jime.open.ac.uk/2005/12/

3. The Connectivist Alternative



Connectionism



Minsky: Symbolic vs. Analogical Man: Top-Down vs. Bottom Up

http://web.media.mit.edu/~minsky/papers/SymbolicVs.Connectionist.html

Un…

As in, unorganized

As in *not* managed

Unconference

Messy vs. Neat

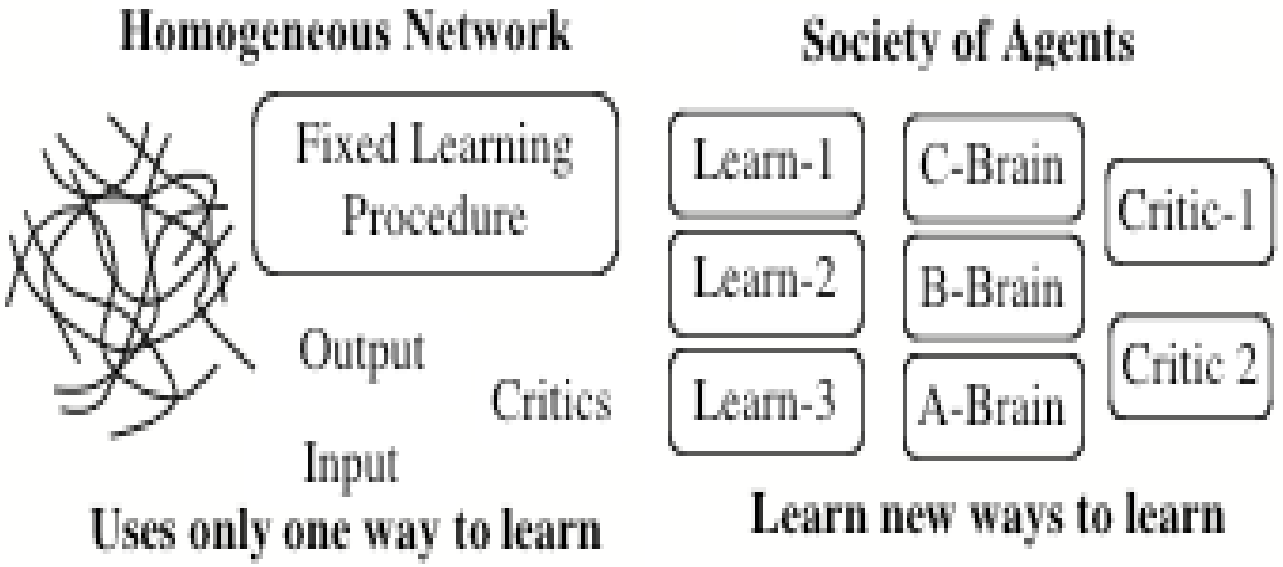
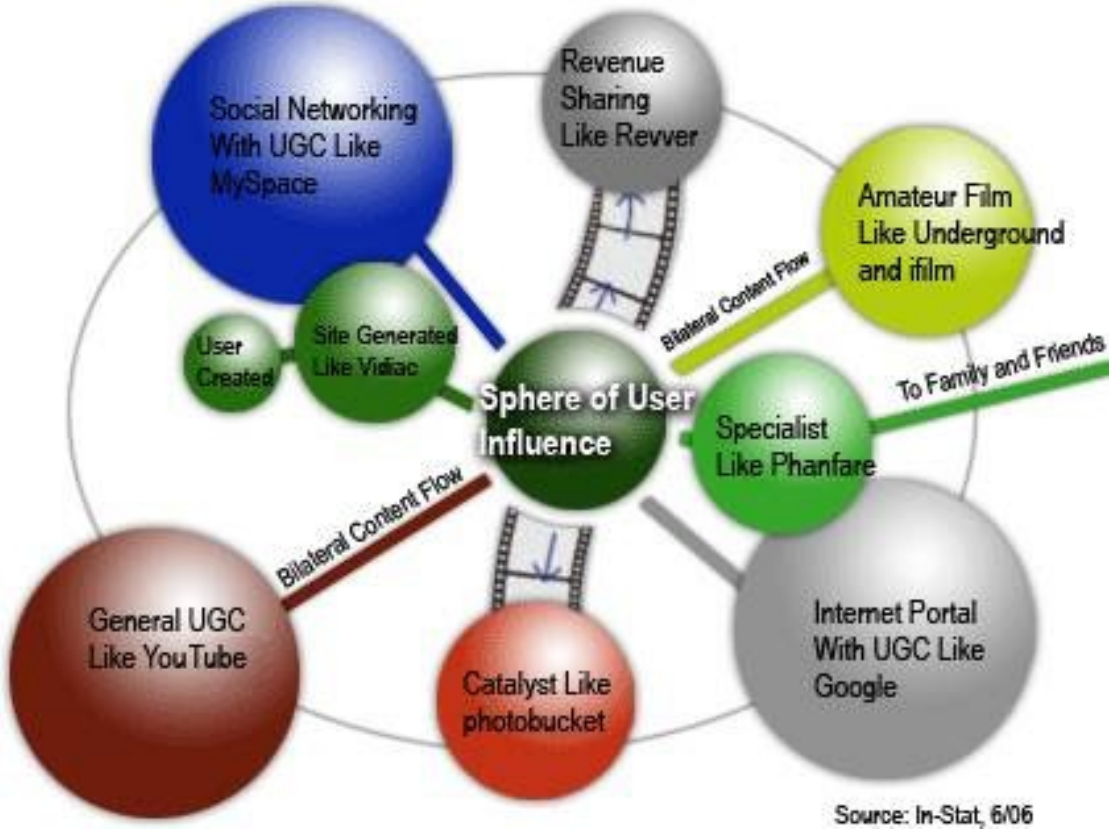


Figure. 7: Messy vs. Neat: Homostructural vs. Heterostructural

User-Generated Content



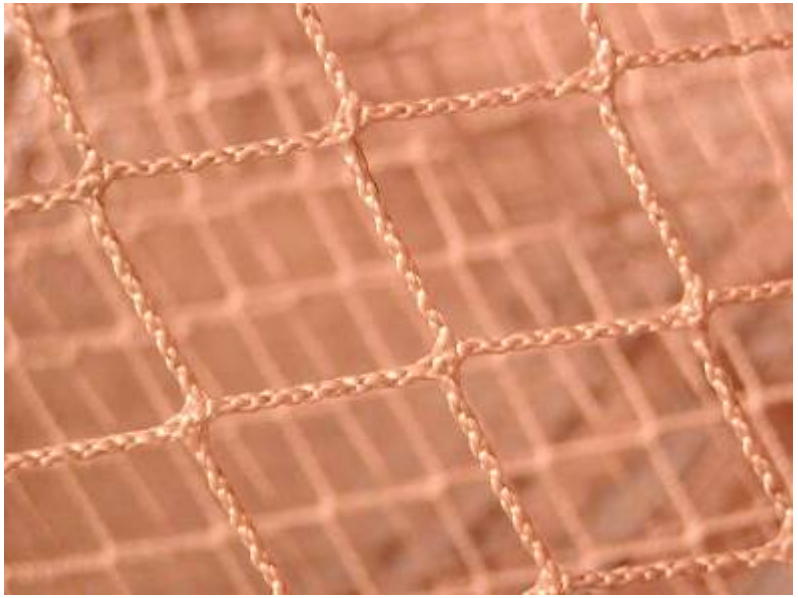
http://www.linuxelectrons.com/news/general/user-generated-web-content-will-grow-rapidly-through-2010

Flow

- IM and SMS expanded – Twitter
- Facebook ‘status’ updates – the now
- RSS, podcasting and other content feeds
- Mode – the idea of flow – how do you survive in a world of constant change? Stop thinking of things as static
-

Resources are like Patterns in the Mesh

the knowledge is in the network



Old: universals

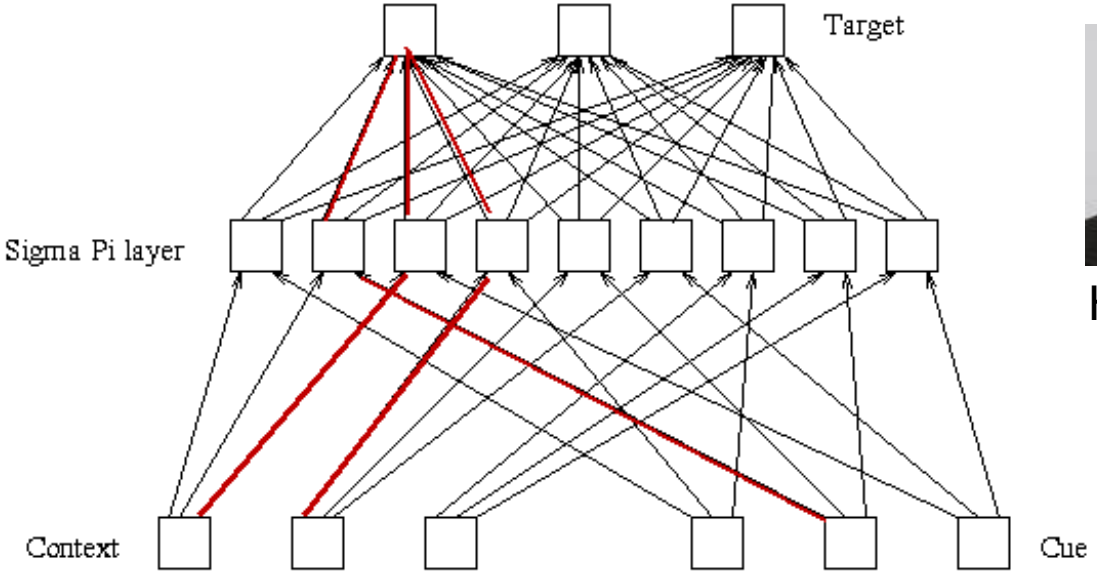
- rules
- categories

New: patterns

- patterns
- similarities

the knowledge *is* the network

stands for?

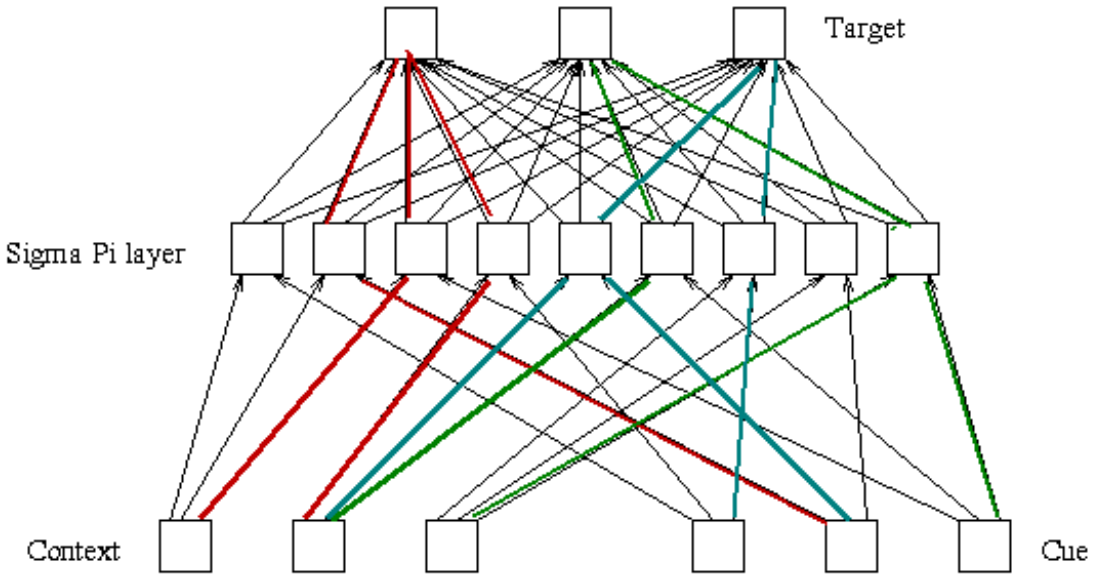


Hopfield

Or is caused by?

Distributed Representation

= a pattern of connectivity

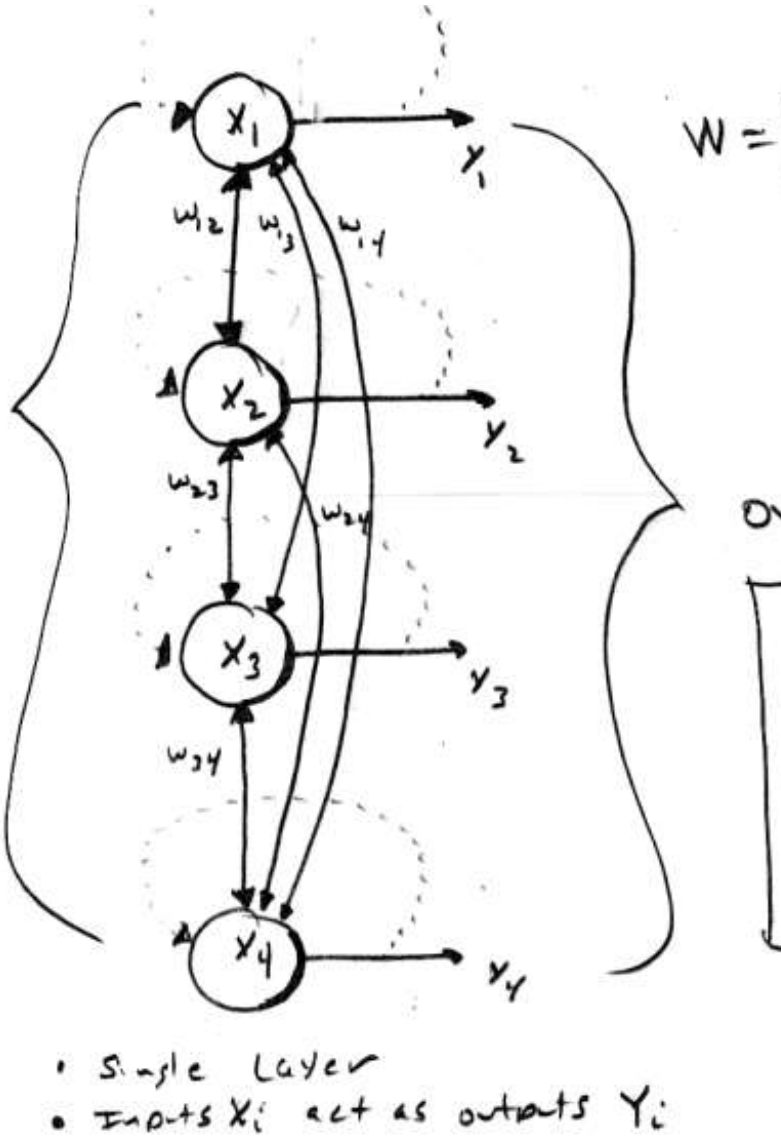

Target
Sigma Pi layer
Context
Cue


BRING BACK THE COUCH

This…

Network Learning

- Hebbian associationism
  - based on concurrency
- Back propagation
  - based on desired outcome
- Boltzman
  - based on ‘settling’, annealing



4. Network Semantics

Groups vs. Networks

- A *group* is a collection of entities or members according to their nature; what defines a group is the quality members possess and number
- A *network* is an association of entities or members via a set of connections; what defines a network is the extent and nature of this connectivity

Rethinking Learning

http://static.flickr.com/109/252157734_9e6c29433b_b.jpg

http://video.google.com/videoplay?docid=-41262409059125315 40&hl=en

Groups, Schools, Classes

- A group, in other words, is a ***school*** (of thought, of fish…) or a ***class*** of some sort.
- Or: classes and schools are just groups. They are *defined* as groups.
- Can we even think of schools – and of learning – without thinking at the same time of the attributes of groups?

A Group…

- A group is **elemental**, defined by mass and sameness – like an ingot of metal (Aside: democracy is a group phenomenon)

A Network…

- A network is diverse and changing, defined by interactions – like an **ecosystem**

  Can we achieve order, responsibility, identity in an ecosystem? Do we need the iron hand? (Aside: Solon, learning, justice)

The Semantic Principle

- Groups require unity, networks require diversity
- Groups require coherence, networks require autonomy
- Groups require privacy or segregation, networks require openness
- Groups require focus of voice, networks require interaction

http://www.downes.ca/cgi-bin/page.cgi?post=35839

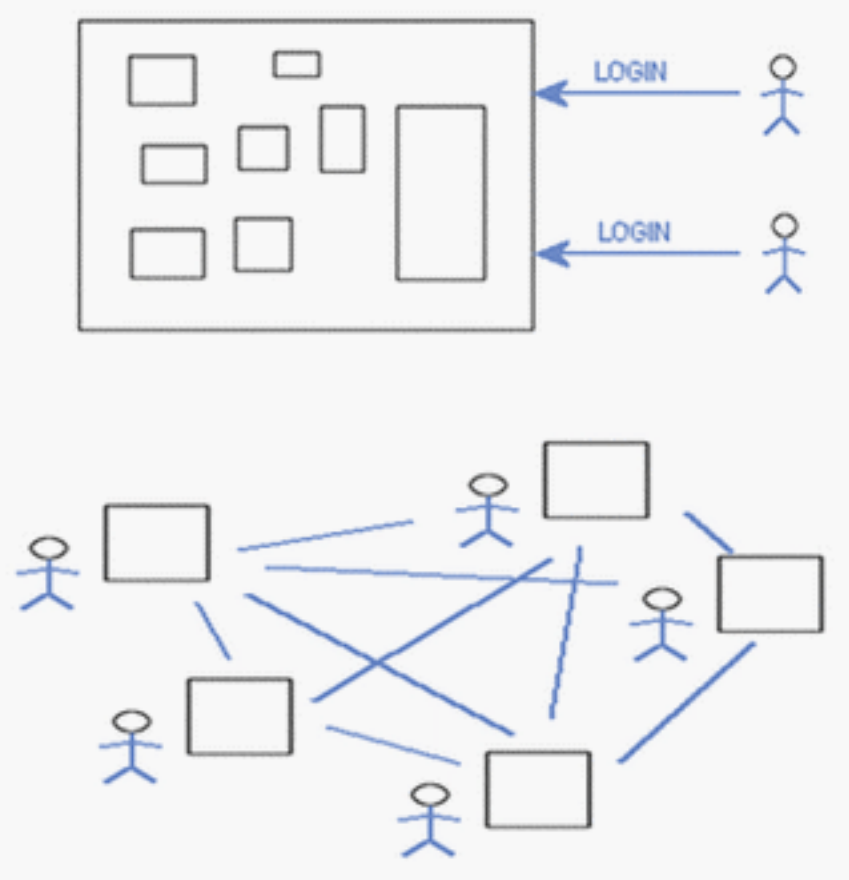
Networks Connective

Peer-to-peer

Conversation

Distributive

Emergent

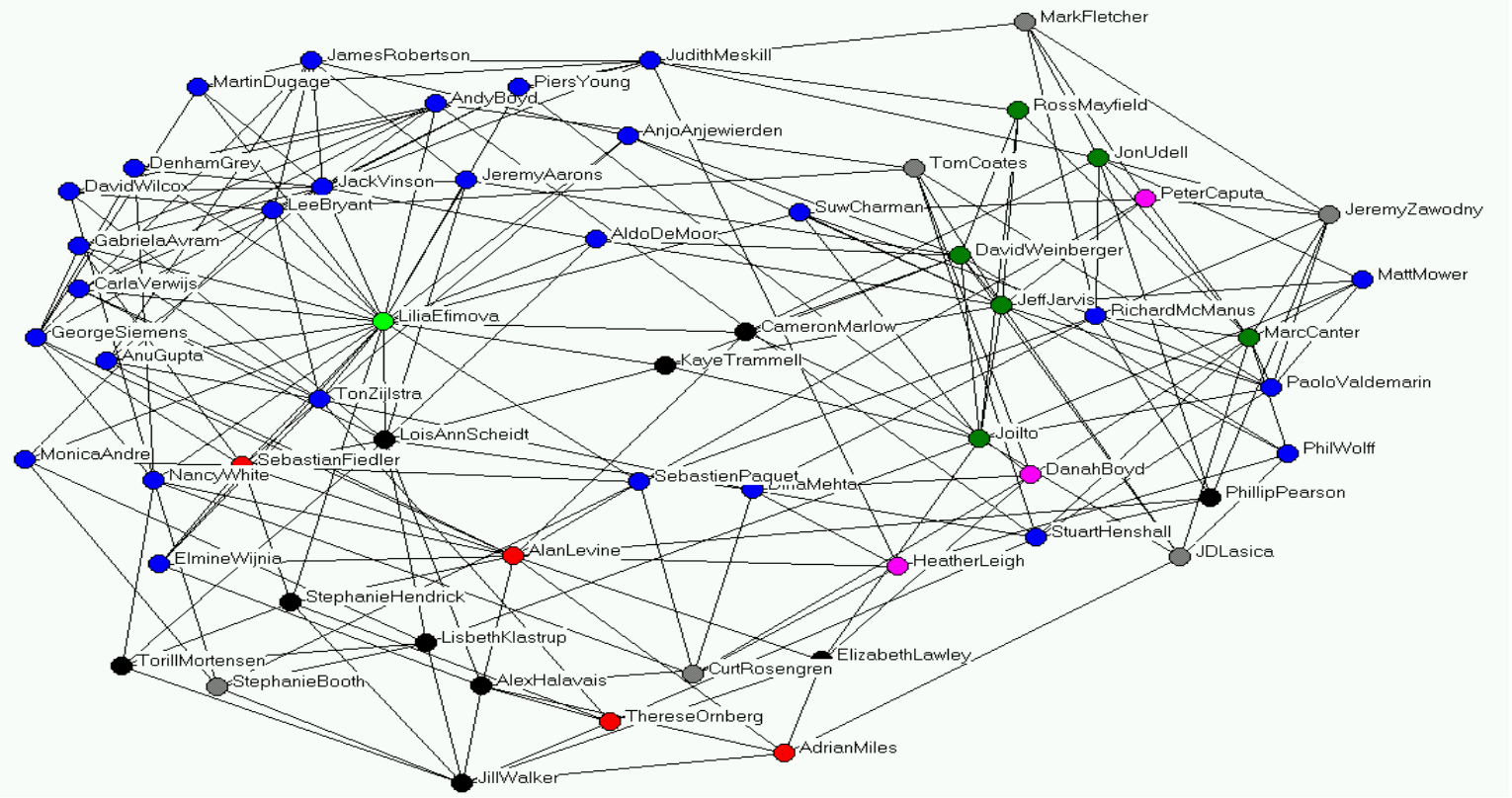


Why Networks?

- Nature of the knower: humans are more like networks
- Quality of the knowledge: groups are limited by the capacity of the leader
- Nature of the knowledge: group knowledge is *transmitted* and *simple* (cause-effect, yes-no, etc) while network knowledge is *emergent* and *complex*

5. Web 2.0 - Core Technologies

Social Networking



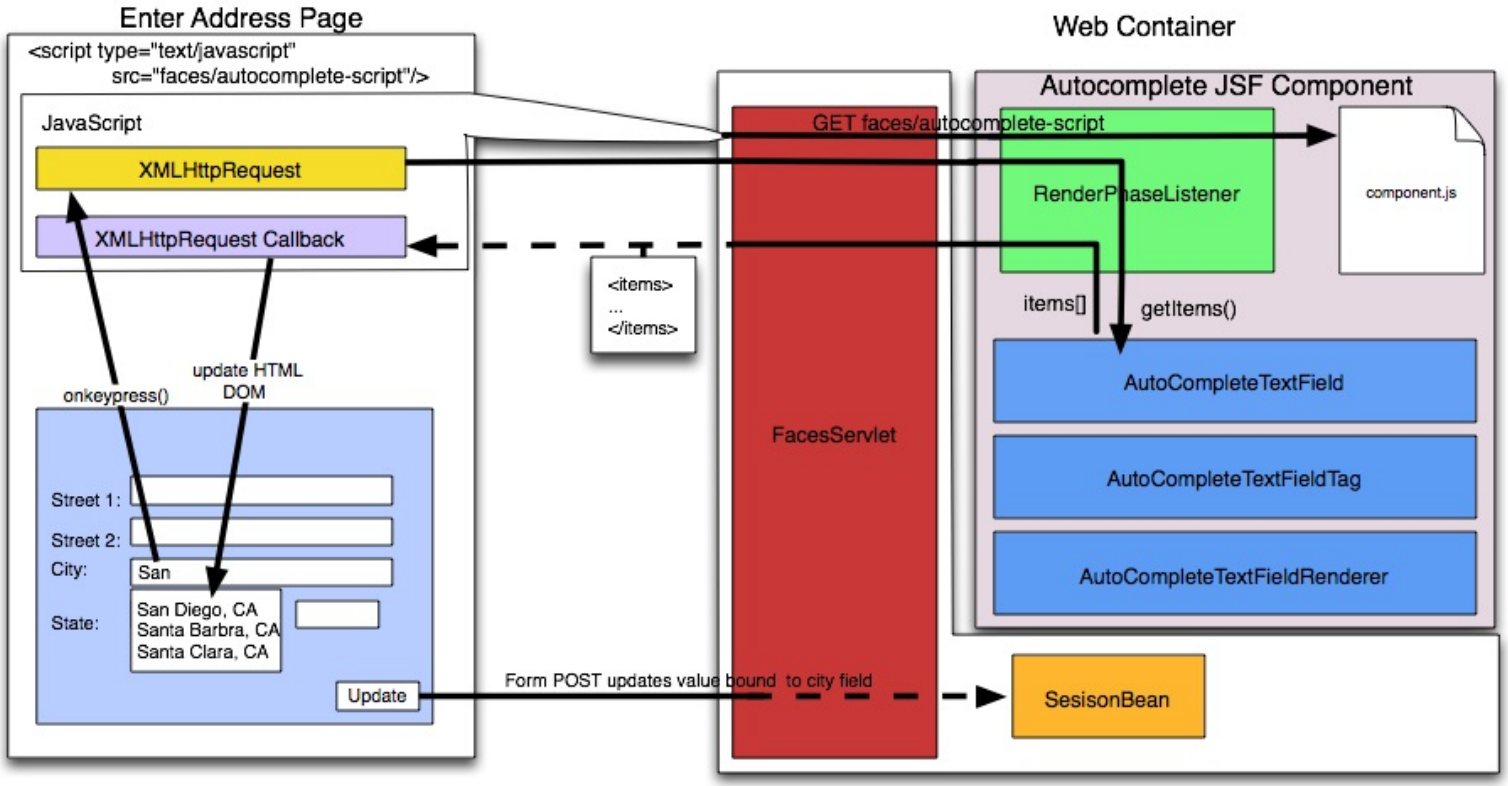
http://staffdev.henrico.k12.va.us/parents/socnetwork.htm

Tagging


Tagging
trepreneurship publishing technology design medium
ironment games wireframe sitemap user experience
ocess flow tagging card sort iasummit07 design
gn the box information architecture swimlanes rapid
UX methods digital ethnography analytics alignment
interaction design kano analysis tagging experience
aceted browse page description diagram facets links
iscellaneous web 2.0 movies adoption emergence
UX METHODS TRADING CARDS
13

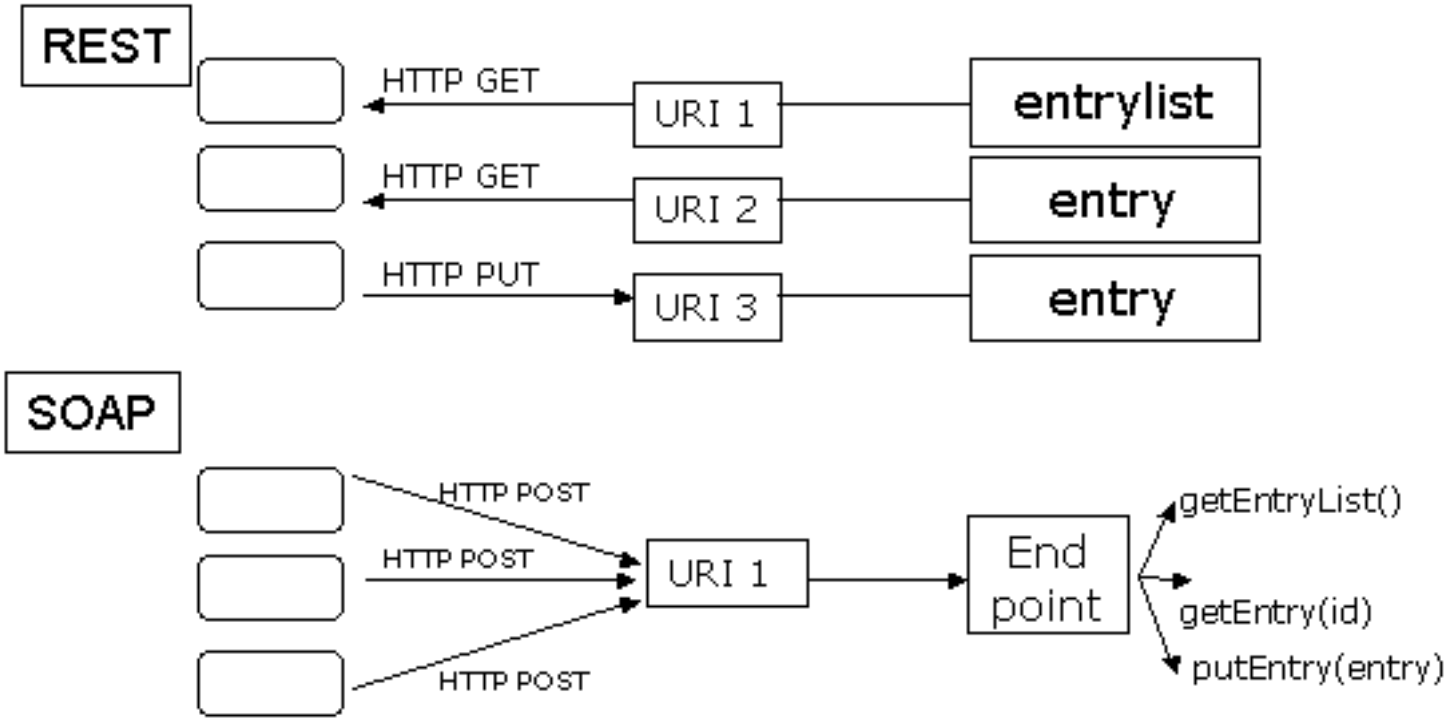
Asynchronous Javascript and XML (AJAX)

Jesse James Garrett in February 2005.



https://bpcatalog.dev.java.net/ajax/textfield-jsf/design.html

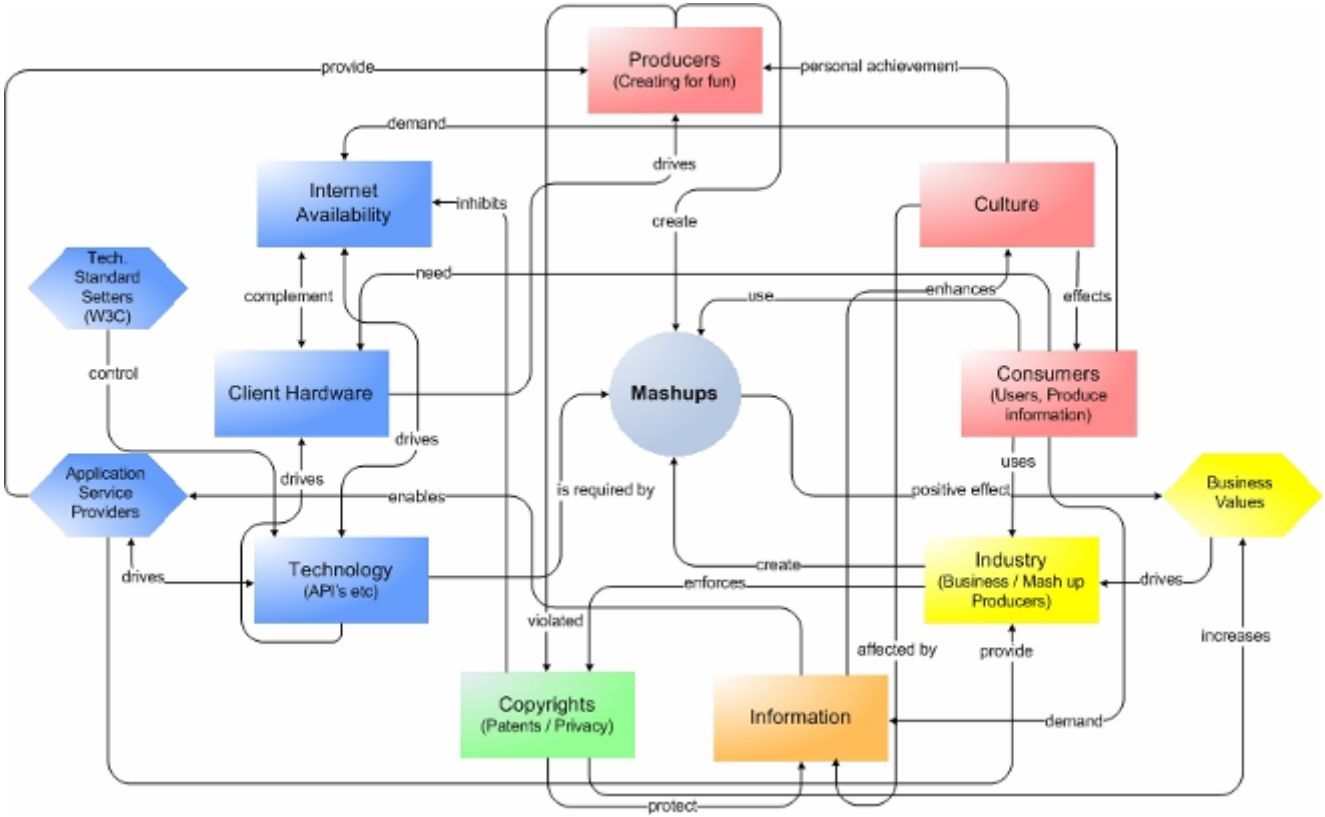
Representational State Transfer (REST)



- principles that outline how resources are defined and addressed
- looser sense: domain-specific data over HTTP

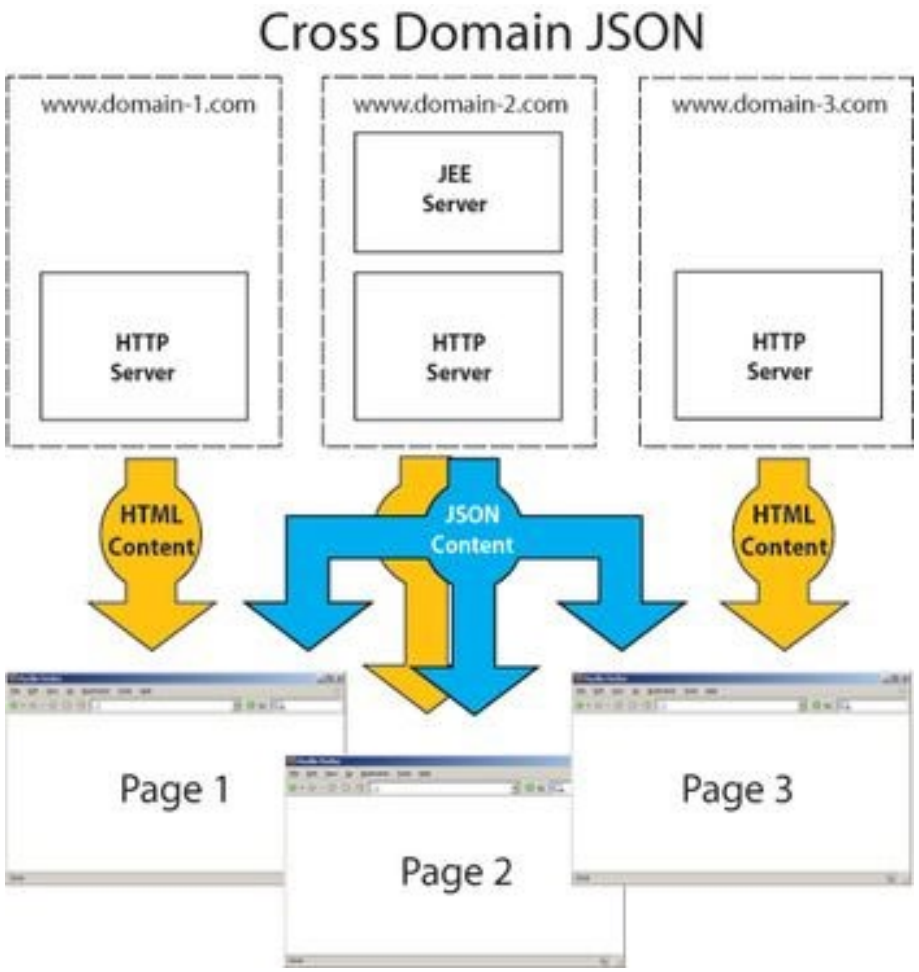
http://en.wikipedia.org/wiki/Representational_State_Transfer
http://itpro.nikkeibp.co.jp/article/Watcher/20060315/232492/

Application Program Interface (API) and Mash-Ups

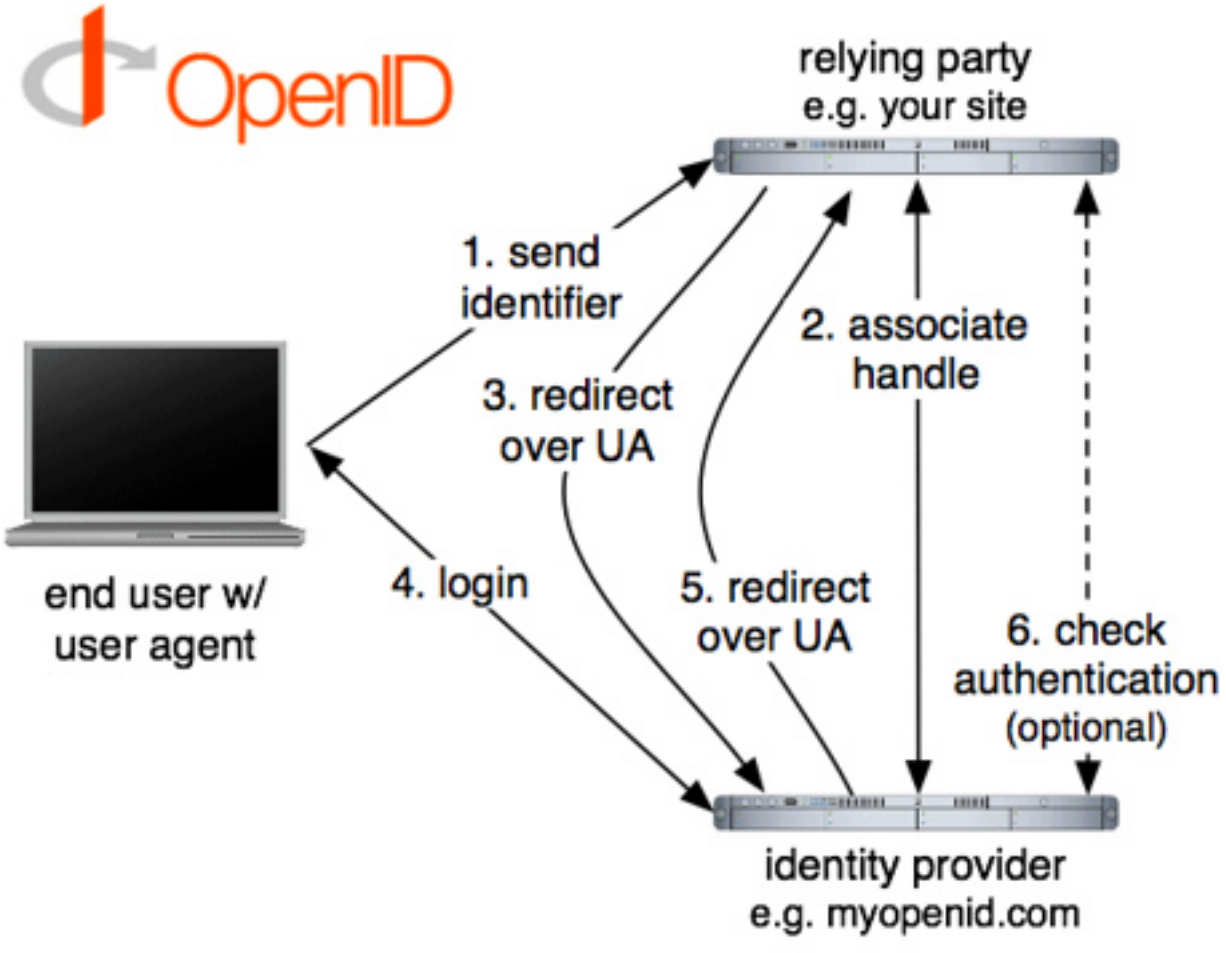


http://scenariothinking.org/wiki/images/b/b6/MashUpSysDiagramV6.0.jpg

Javascript Object Notation (JSON)



- OpenID



http://gabinetedeinformatica.net/wp15/2007/03/09/openid-nuestra-identidad-virtual/
http://www.funnymonkey.com/openid-in-education

Identity

- The idea: identity as personal, not institutional
- You own your data
- Identity 2.0 – Dick Hardt
  http://talk.talis.com/archives/2005/10/dick_hardt_on_i.html
  http://identity20.com/media/OSCON2005/
- OpenID http://openid.net/

No More Walled Gardens

- Social and content networks distributed across services
- But also… importantly… the walls or institutions and corporations are also less important

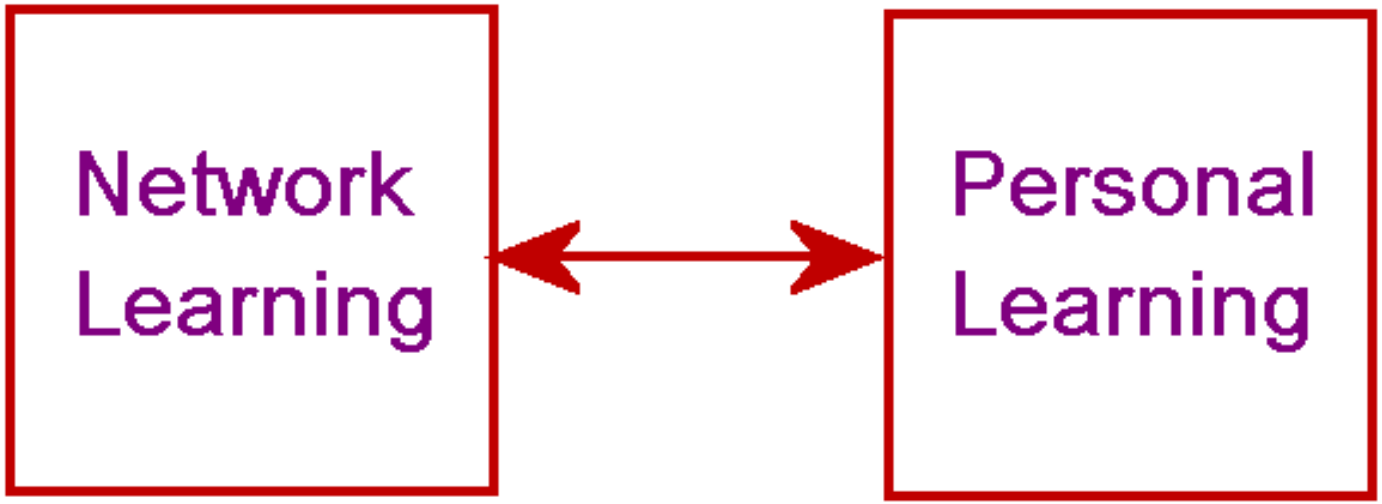
6. E-Learning 2.0

E-Learning 2.0

The idea is that learning is *not* based on *objects* and *contents* that are stored, as though in a library

Rather, the idea is that learning is like a utility - like water or electricity - that flows in a network or a grip, that we tap into when we want

The way networks learn is the way people learn…



- they are both complex systems
- the organization of each depends on connections

Connectivism (George Siemens)

The Concept

- Learner centered

Learning is centered around the interests of the learner

Learning is *owned* by the learner

This implies learner choice of subjects, materials, learning styles

- Immersive learning

This learning is immersive – learning by doing

- Connected Learning

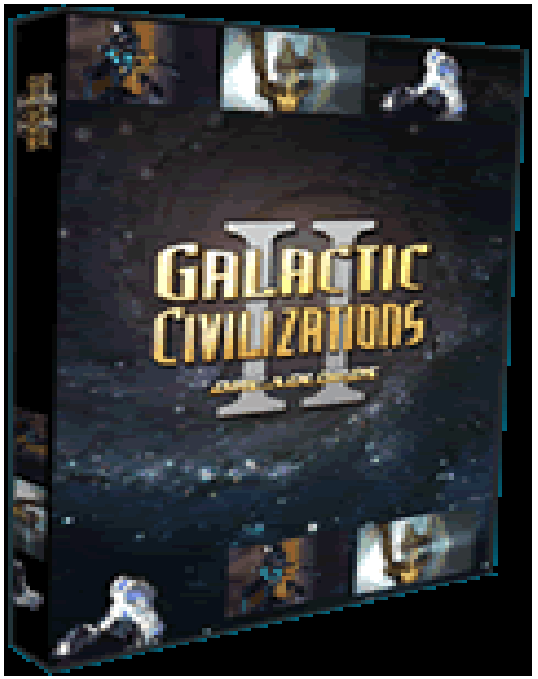
The computer connects the student to the rest of the world

Learning occurs through connections with other learners

Learning is based on conversation and interaction

Examples

- Game-based learning

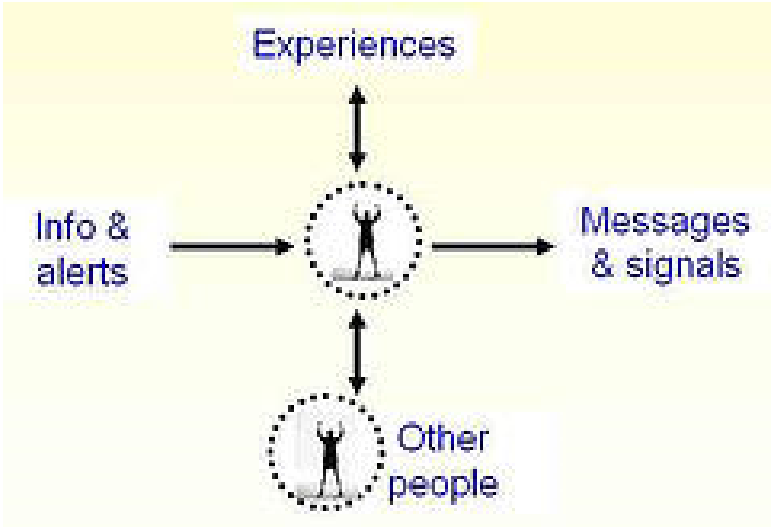


Types:

Branching, Spreadsheet, Quiz Game, Simulation Lab…

http://www.downes.ca/post/11

- Workflow (Informal) Learning



Types: EPSS, Community of Practice, Environment, Visualization…

http://metatime.blogspot.com/

- Mobile Learning

Examples:

Co-op learning, drill and flash-card, instant mesaging, field trips, resource capture (like this talk!)

http://www.pwlan.org.tw/ct.asp?xItem=200&CtNode=501&mp=5

Online Learning at the Crossroads

- On the one hand – we have developed tools and systems intended to support traditional classroom based learning

- On the other hand – we *could* (should?) be developing tools and systems to support immersive learning. We should be developing for dynamic, immersive, *living* systems…

First Iteration: User-Produced Media

- Blogs and Blogging
- Podcasting and Vodcasting
- Game mods and other multimedia

Web 2.0: The Learning Network

- The intersection between the worlds for education, work, and home
- Key requirement is easy-to-use tools and hosting services*
- *E.g. the “e-Portfolio-as-blog” approach

http://www.cetis.ac.uk/members/scott/entries/20050523083528

7. Personal Learning Environment

Content as Vocabulary

http://icanhascheezburger.com/

Content as Creation

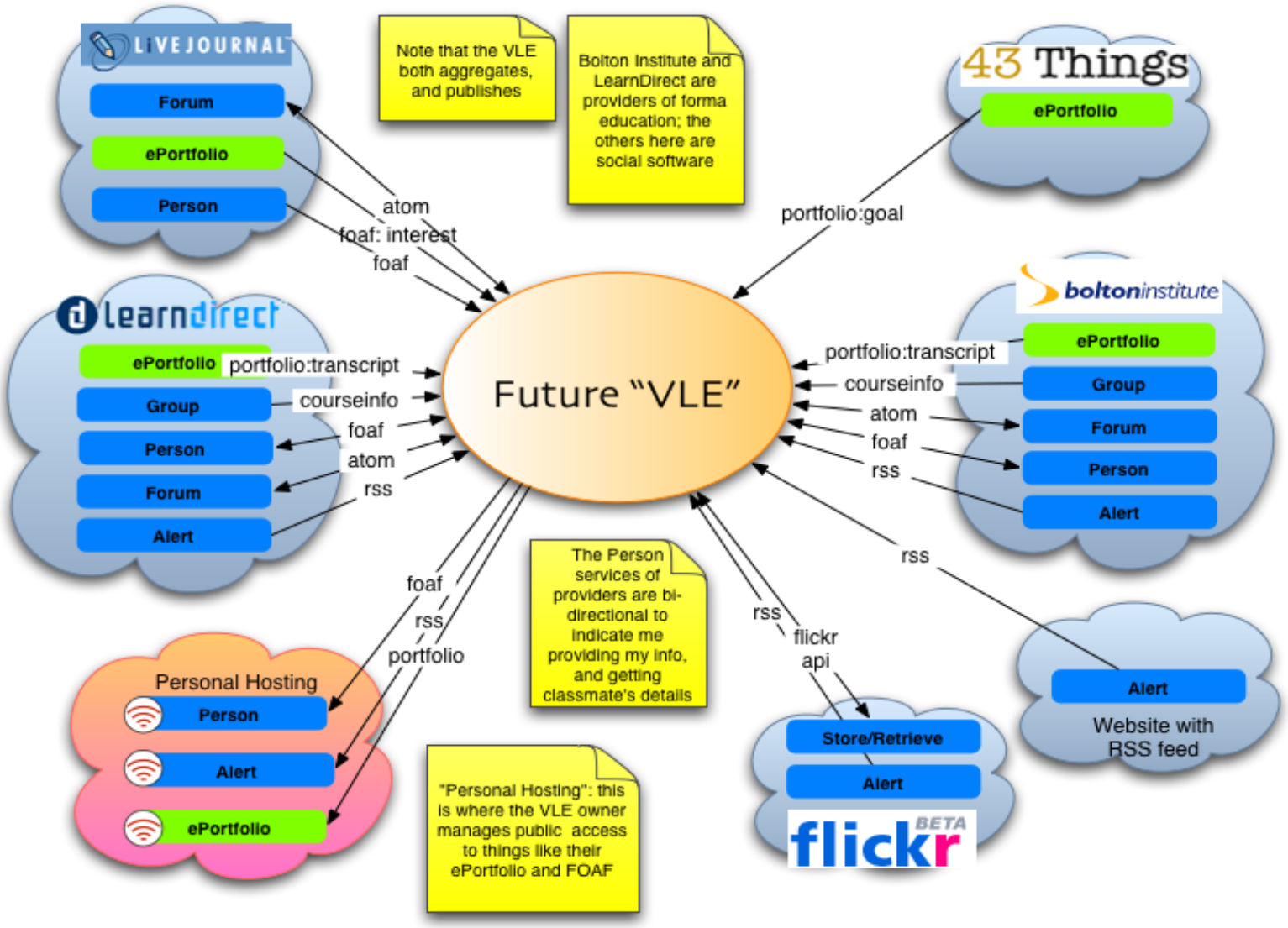
Aggregate

Remix

Repurpose

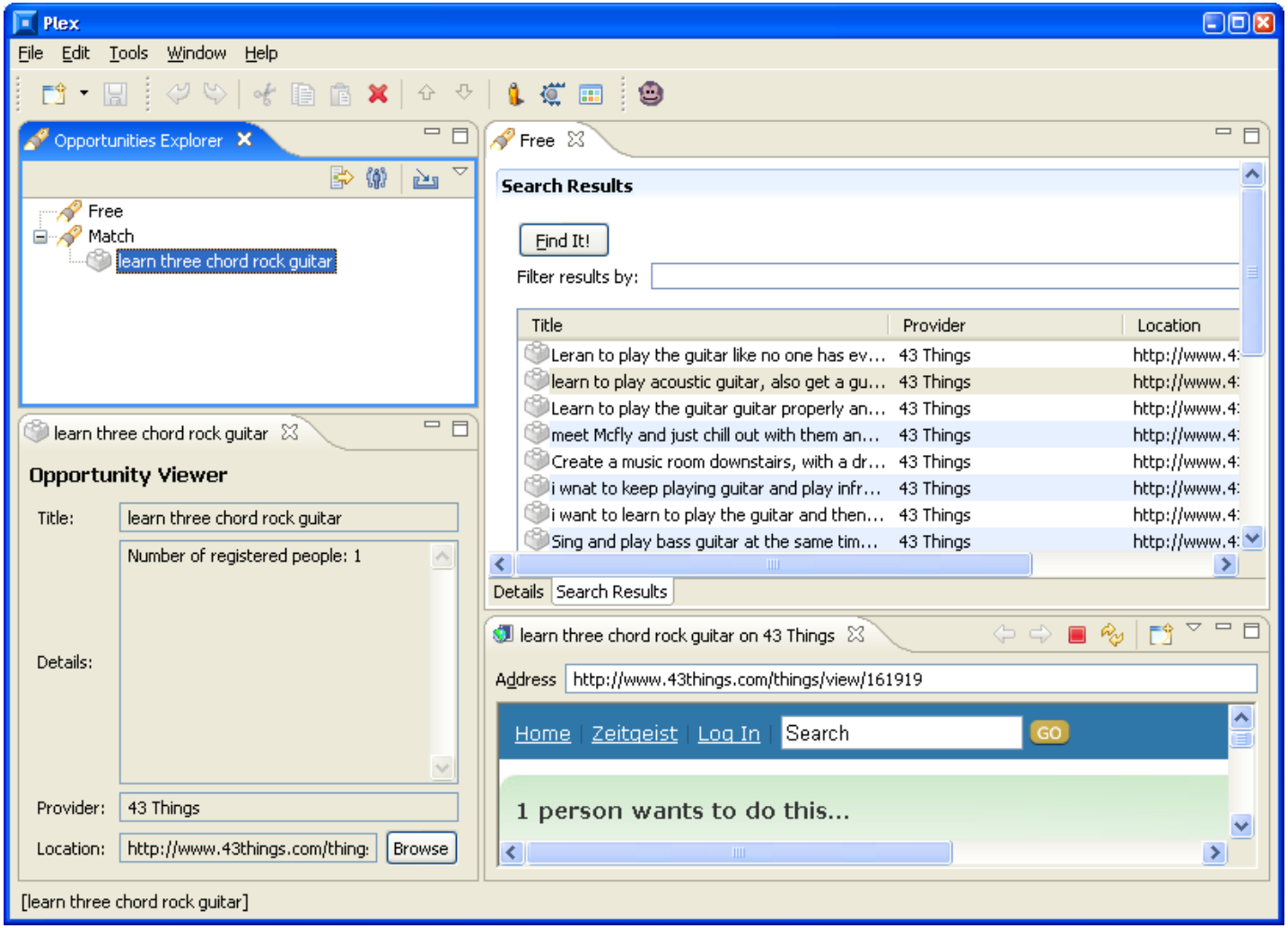
Feed Forward

The Idea of the PLE…



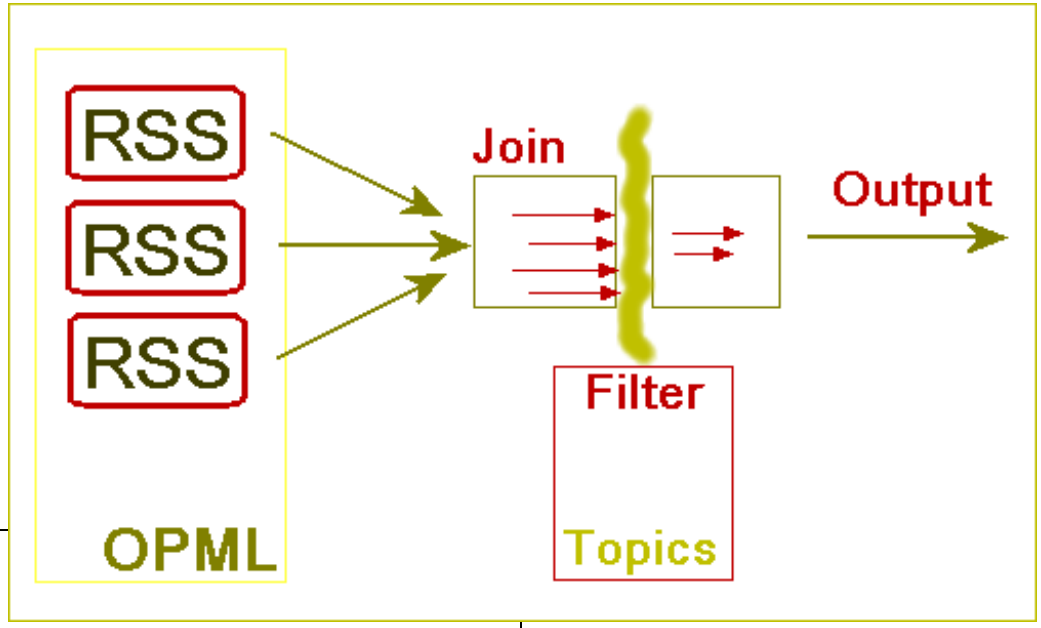
http://www.cetis.ac.uk/members/ple/resources/edf.ppt

Plex Personal Learning Environment Example



http://reload.ces.strath.ac.uk/plex/

Collecting and Filtering RSS



http://www.downes.ca/mygluframe.htm

MyGlu

By Stephen Downes

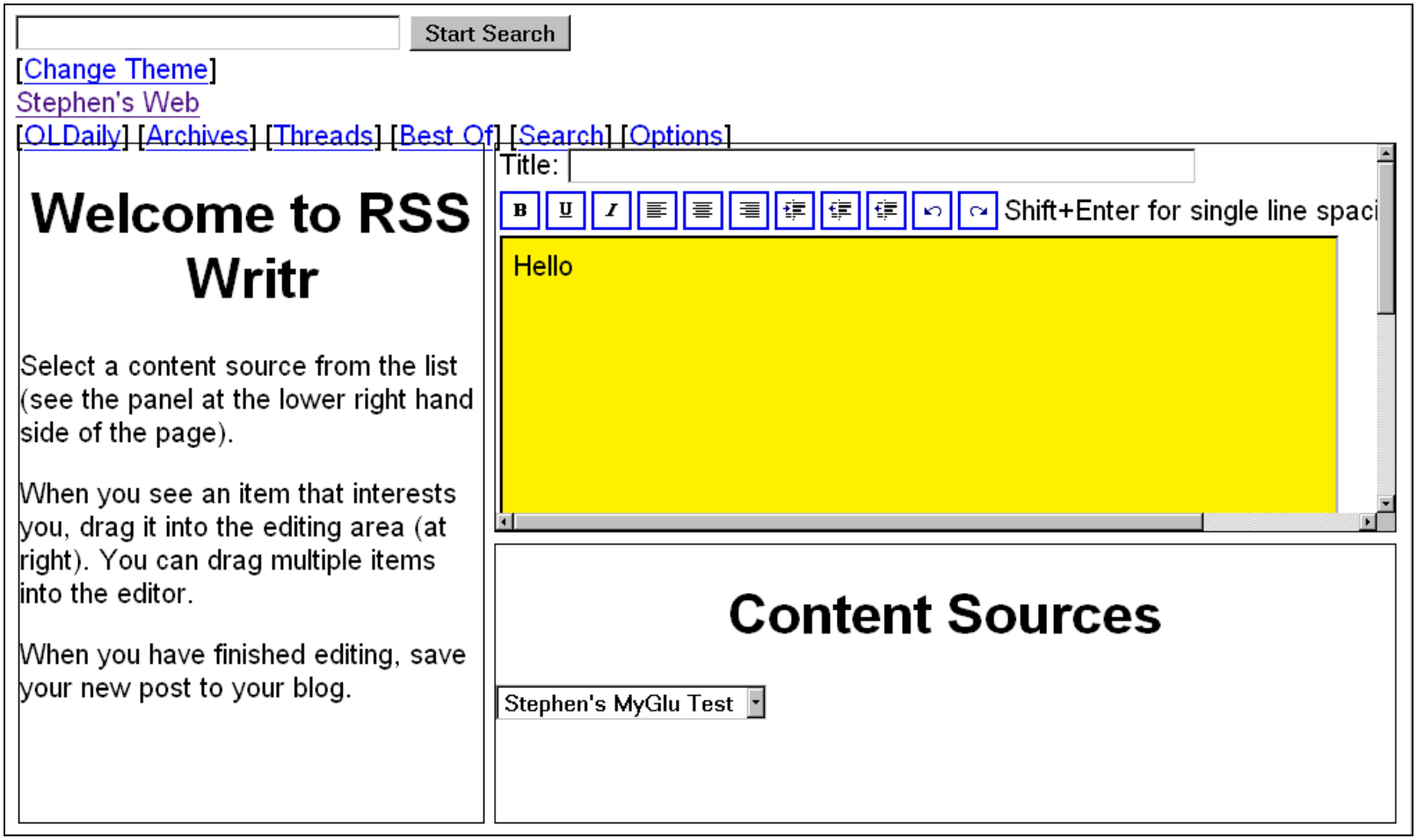
About

Force: 1

Harvesting http://del.icio.us/rss/Downes
Feedfile is: myglu/feedcache/del.icio.us_rss_Downes
No content. Harvesting from source.
URL: http://del.icio.us/rss/Downes
Parsing Feed=HASH(0x9f0f10c)

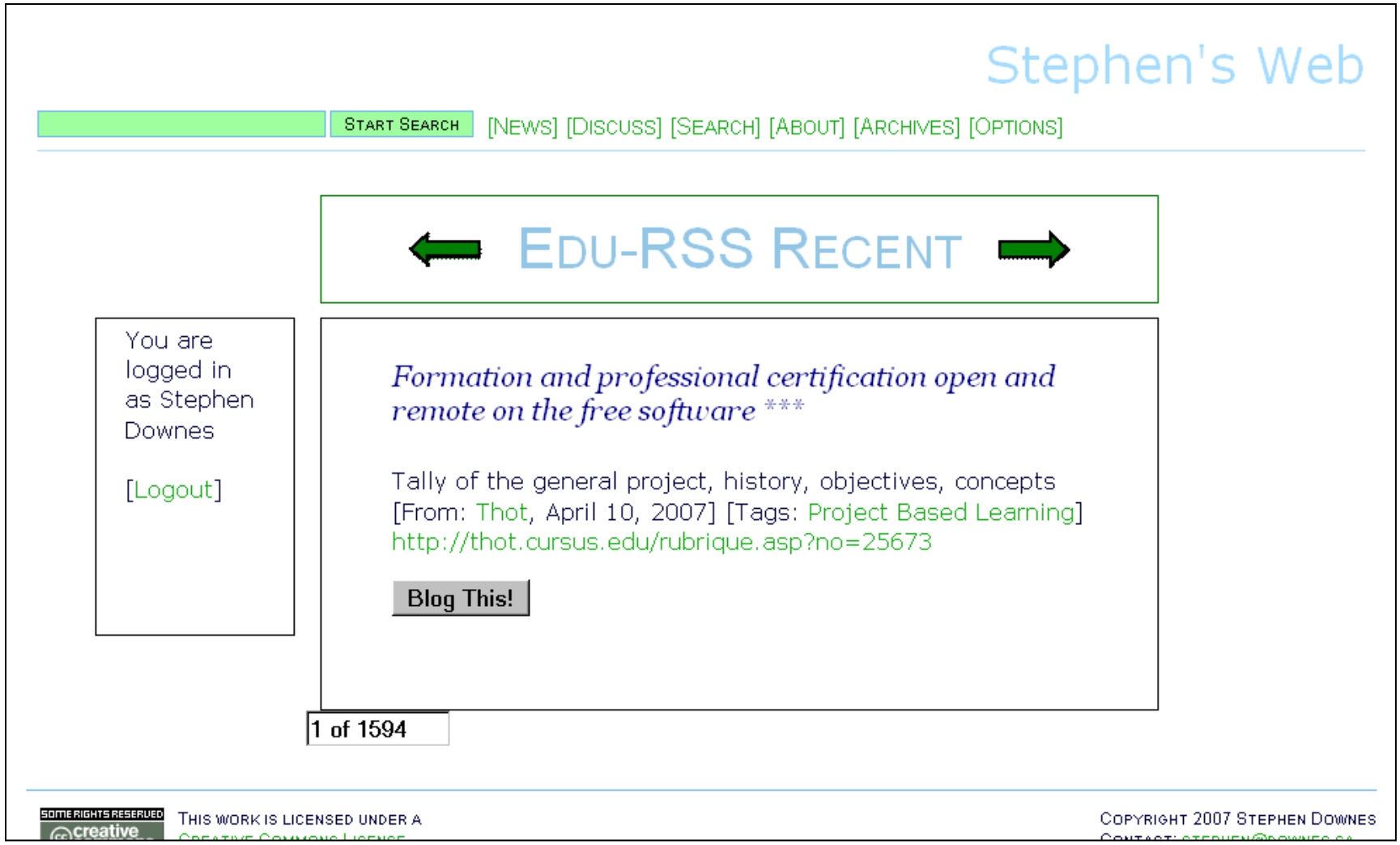
Harvesting http://www.downes.ca/news/OLDaily.xml
Feedfile is: myglu/feedcache/www.downes.ca_news_OLDaily.xml
No content. Harvesting from source.
URL: http://www.downes.ca/news/OLDaily.xml
Parsing Feed=HASH(0x9f0ef8c)

RSS Writr



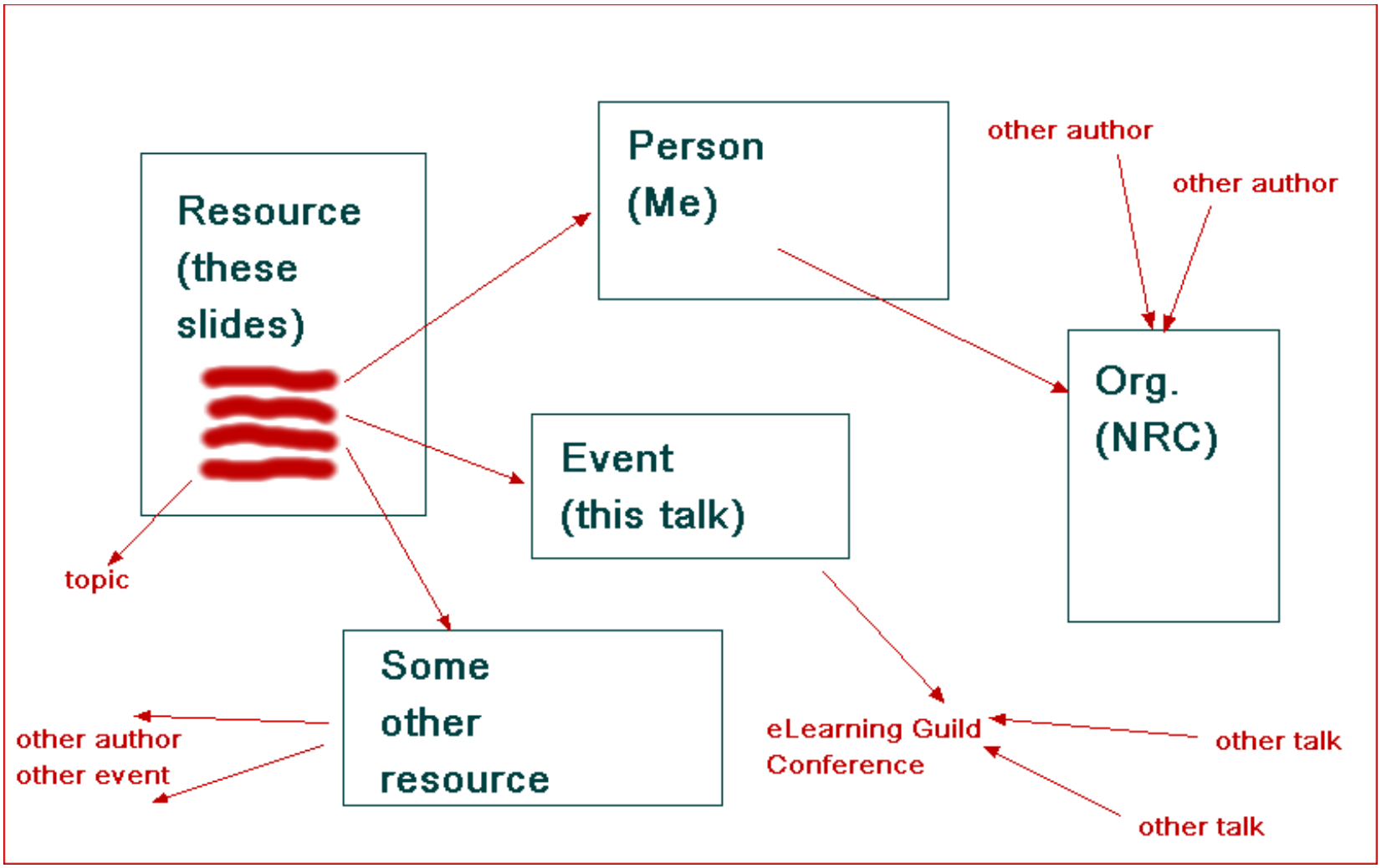
http://www.downes.ca/editor/writr.htm

Edu_RSS Viewer

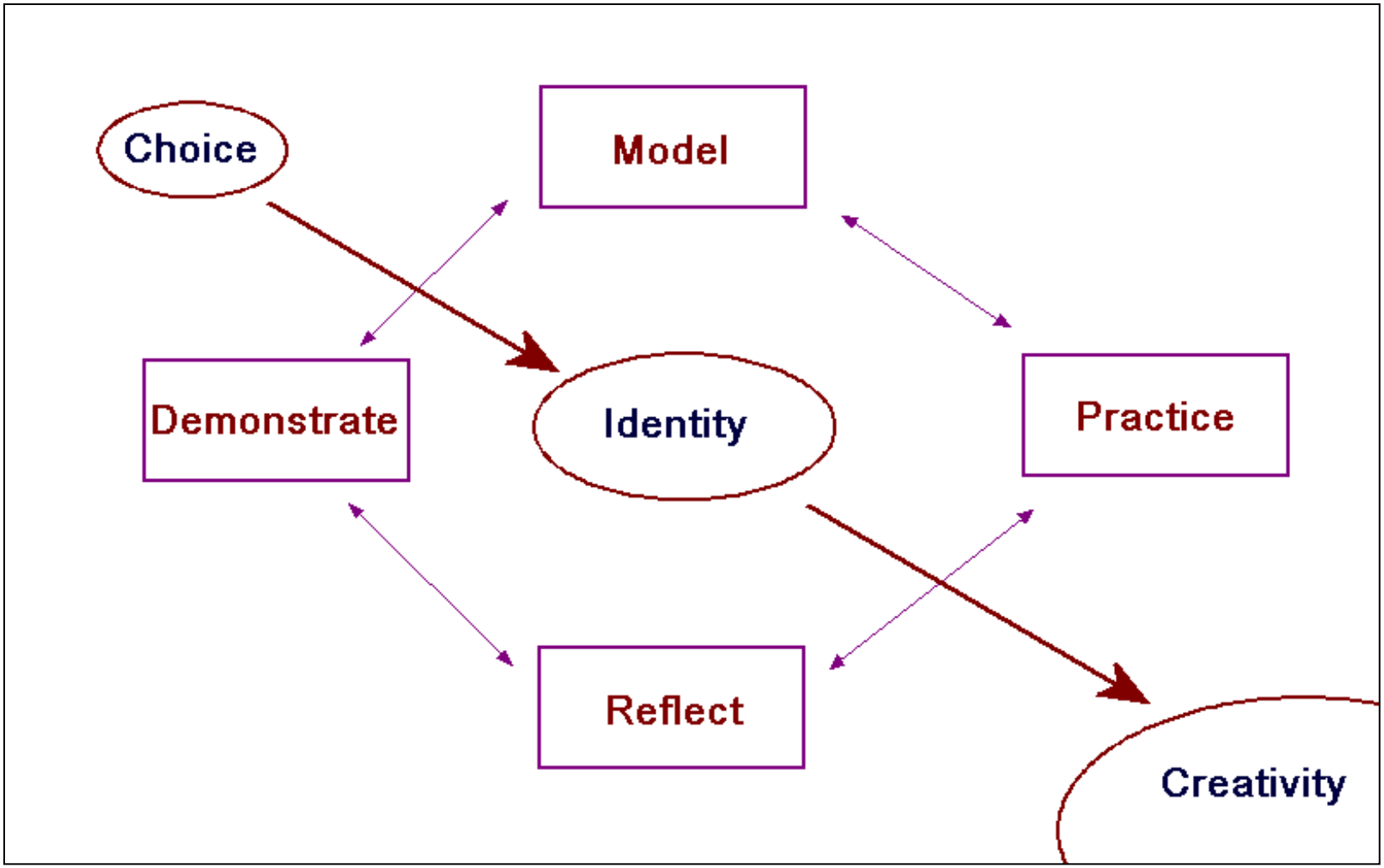


http://www.downes.ca/cgi-bin/page.cgi?action=viewer

Relations between Entities…



What is the PLE?



We can get an idea of what the PLE looks like by drilling down into the pieces…

The question is – how to transport and represent models that are actually used?

Model

- conceptual frameworks
  - wiki (wiki API, RSS)
  - concept maps (SVG, mapping format)
  - gliffy (SVG?)
- reference frameworks
  - Wikipedia
  - video / 2L 3D representation – embedded spaces

Demonstrate

- reference examples
  - code library
  - image samples
- thought processes
  - show experts at work (Chaos Manor)
- application
  - case studies
  - stories

The question is, how can we connect the learner with the community at work?

Practice

- scaffolded practice
  - game interfaces
  - sandboxes
- job aids
  - flash cards
  - cheat sheets
- games and simulations
  - mod kits
  - mmorpgs

The question is, how can we enable access to multiple environments that support various activities?

The question is, how can we assist people to see themselves, their practice, in a mirror?

Reflection

- guided reflection
  - forms-based input
  - presentations and seminars
- journaling
  - blogs, wikis
- communities
  - discussion, sharing

People talk about ‘motivation’ – but the real issue here is *ownership*

Choice – Identity - Creativity

- simulated or actual environments that present tasks or problems
- OpenID, authentication, feature or profile development
- Portfolios & creative libraries

Stephen Downes

http://www.downes.ca