

E-Learning 2.0

IN DEVELOPMENT

Stephen Downes
September 25, 2007



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 Community Tools**
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.



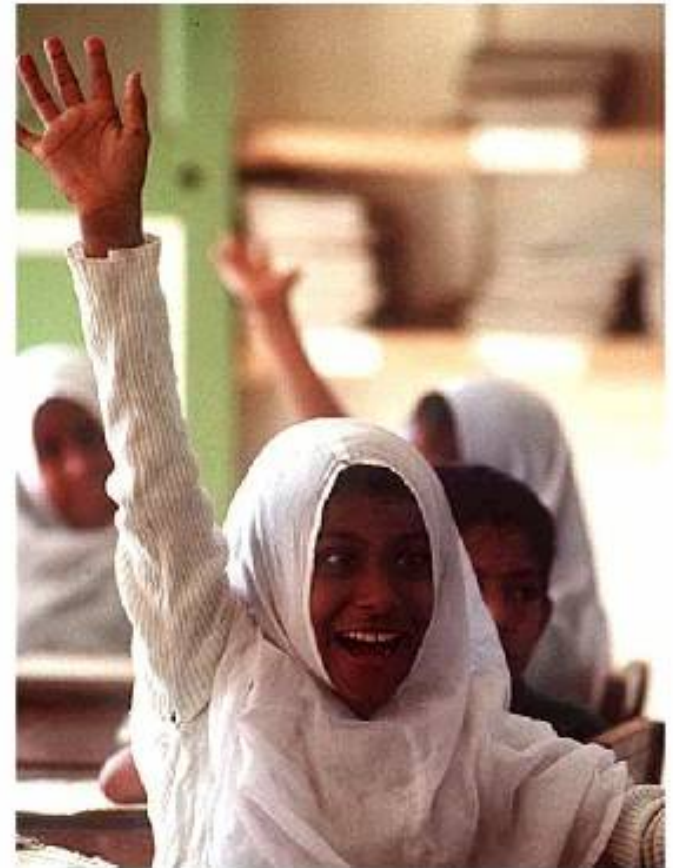
New Environments

- **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

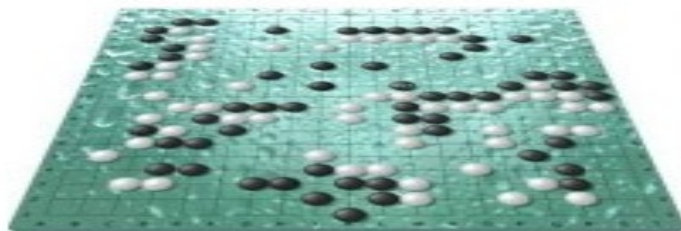
- Two major aspects:
 - Representation
 - Inference engine
- Analogy: the wizard



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



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/>

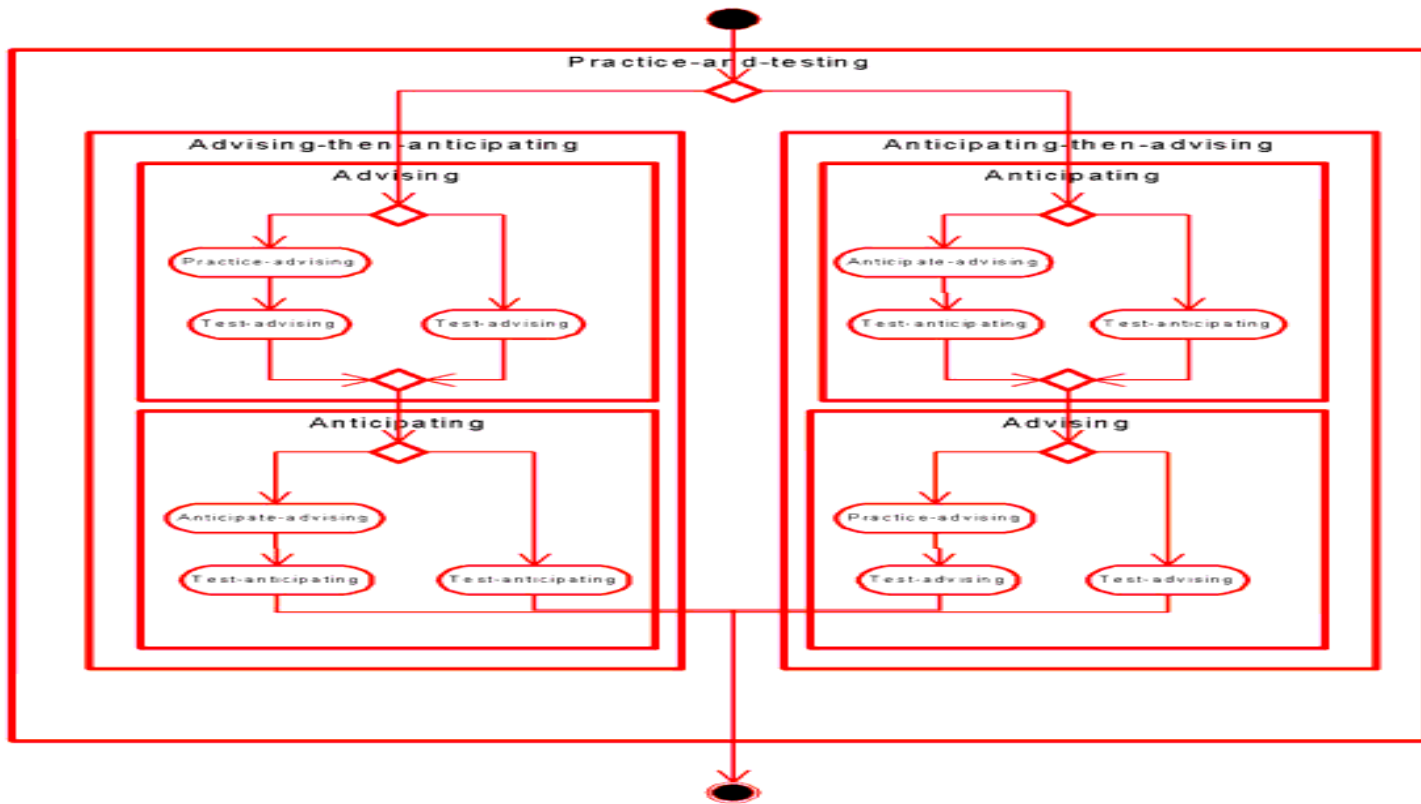
http://zope.cetis.ac.uk/lib/media/WhatIsLD_web.pdf

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/imslid_bestv1p0.html

Competency-Based Learning

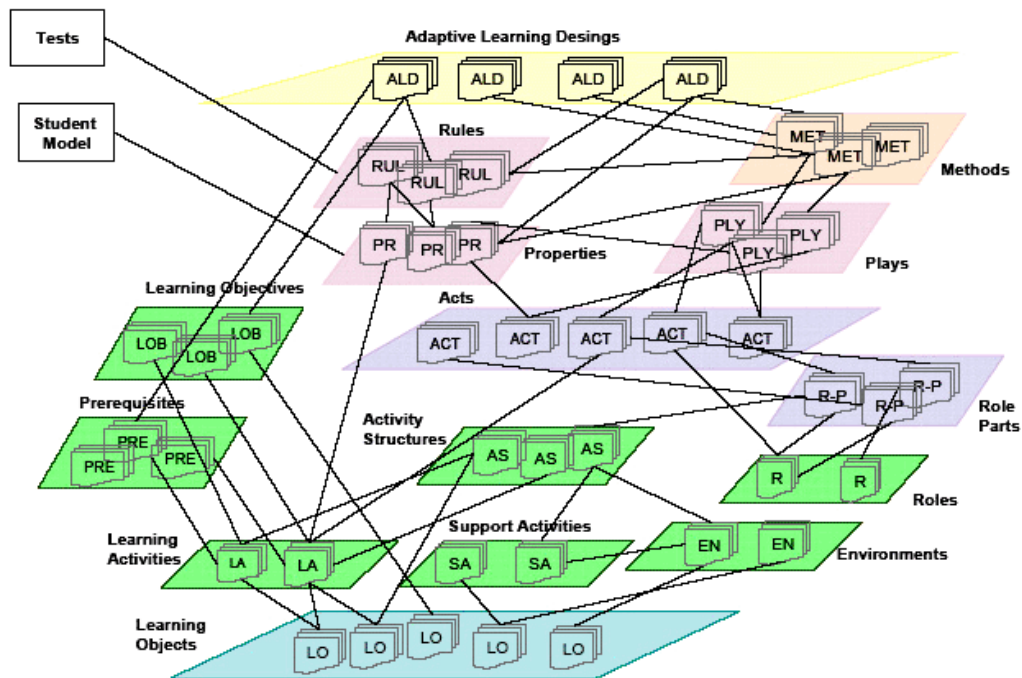


LD Tools

Nr.	<i>Tool Name</i>	<i>Link</i>	<i>Author</i>	<i>Levels</i>
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.itl.gr	University of Piraeus	A,B
4	Mot+	www.licef.teluq.quebec.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/>

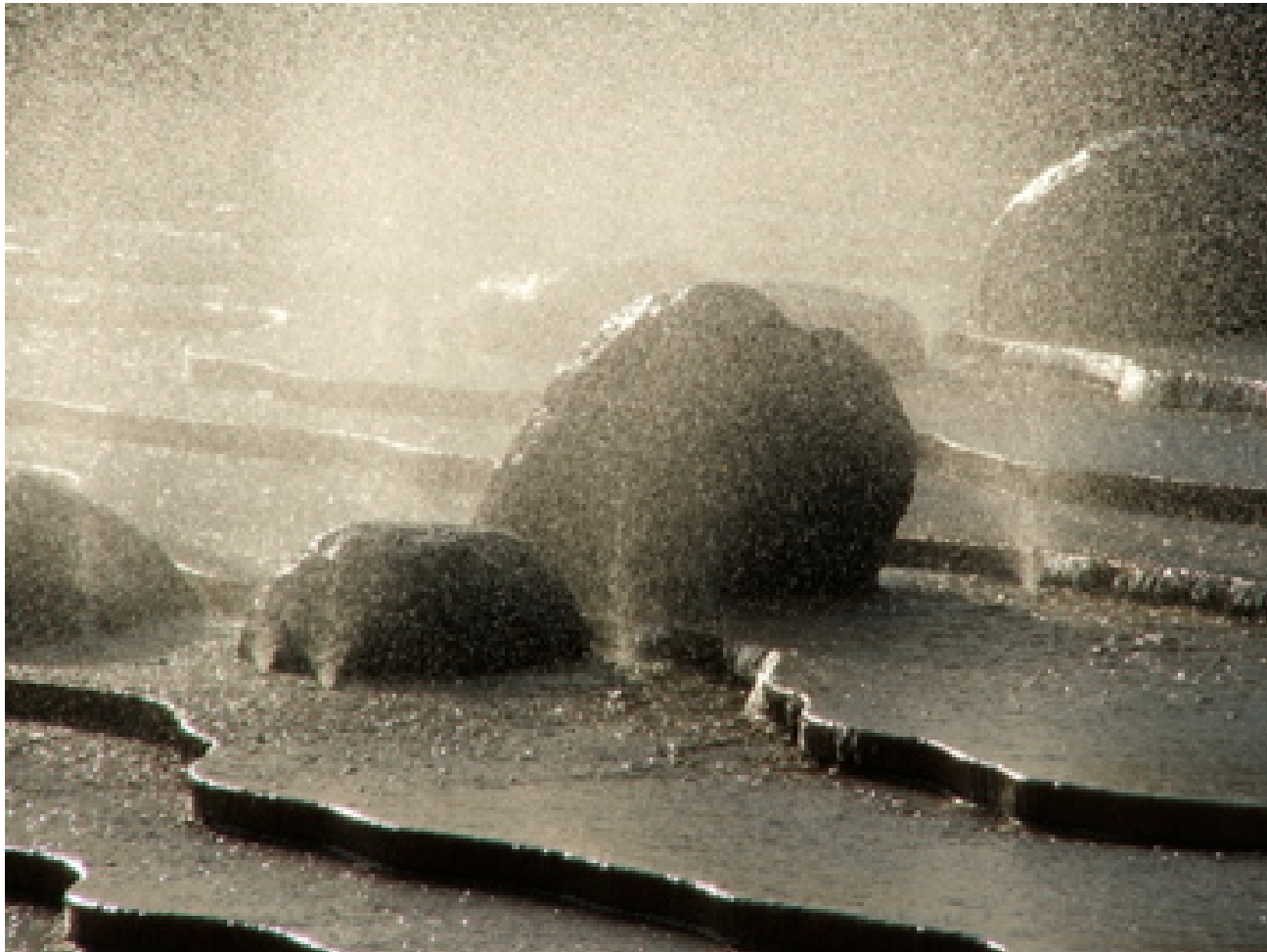
The Lego Metaphor



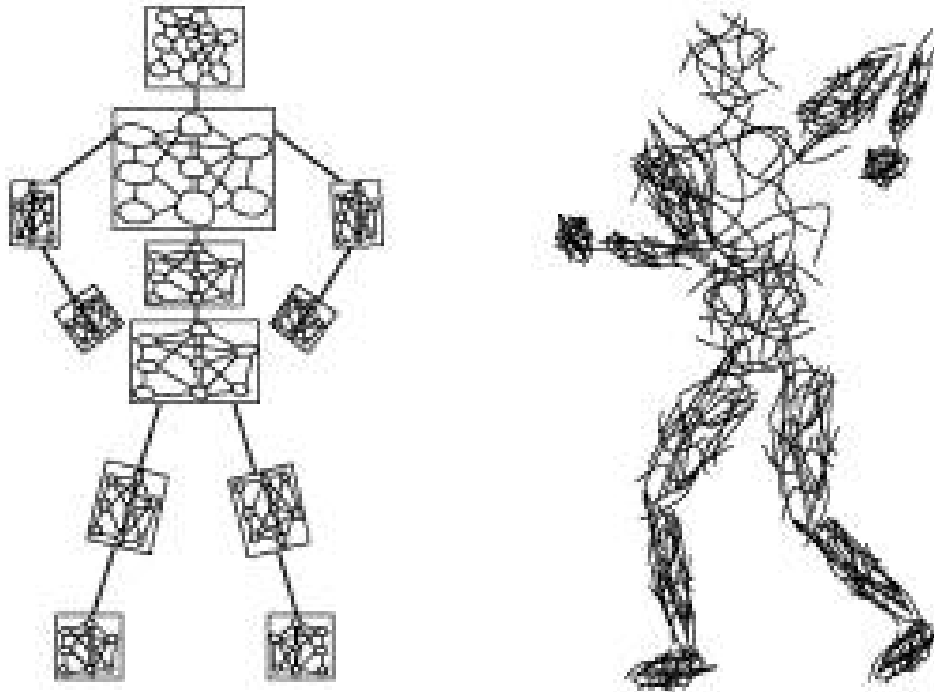
The Learning Refinery

- 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”

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

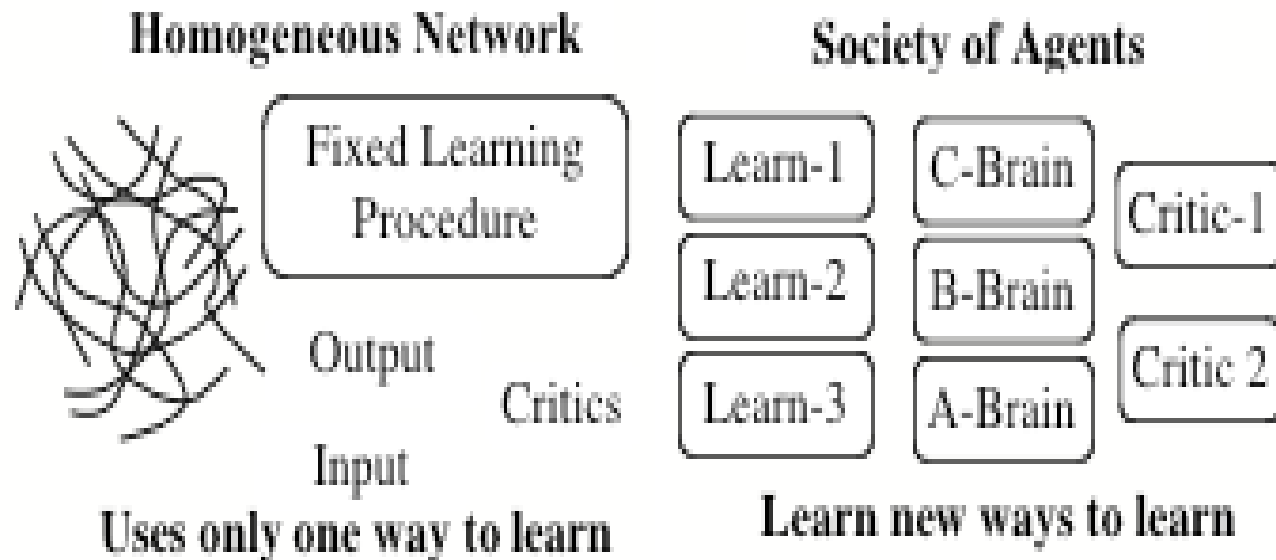
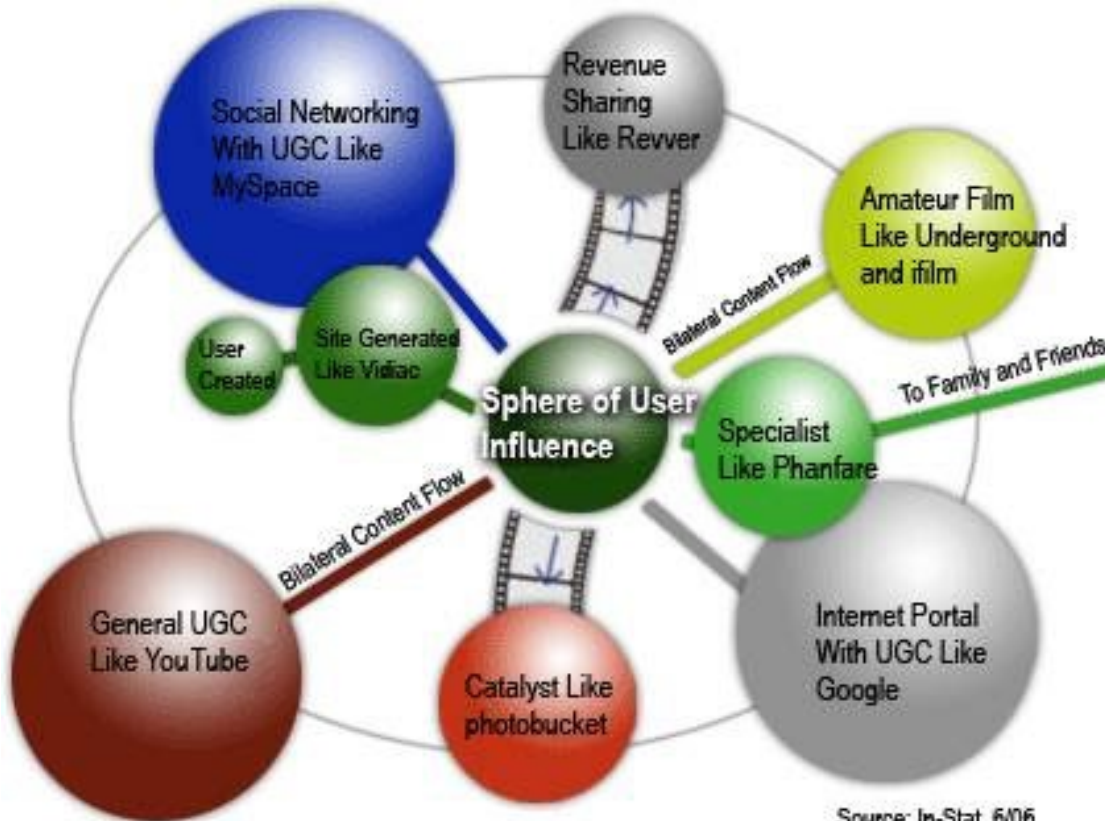


Figure. 7: Messy vs. Neat: Homostructural vs. Heterostructural

User-Generated Content



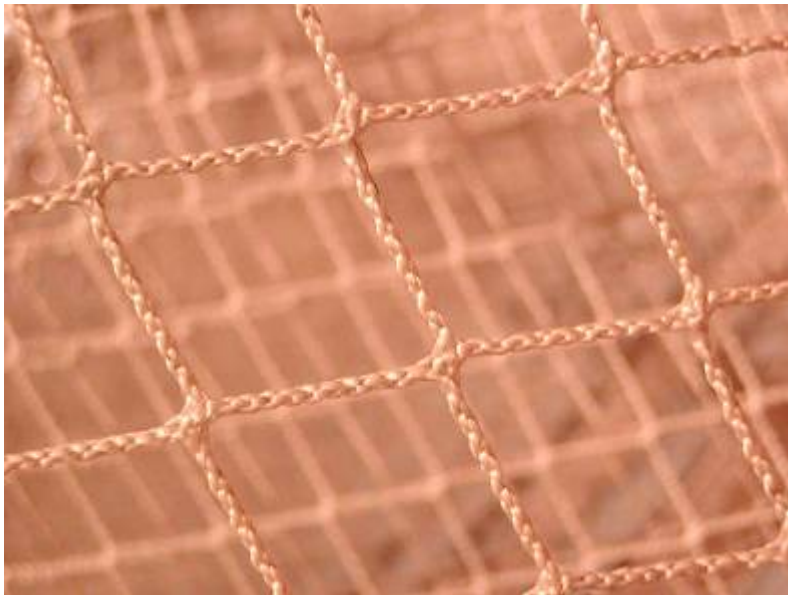
<http://www.linuxelectrons.com/news/general/user-generated-web-content-will-grow-rapidly-through-2010>

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

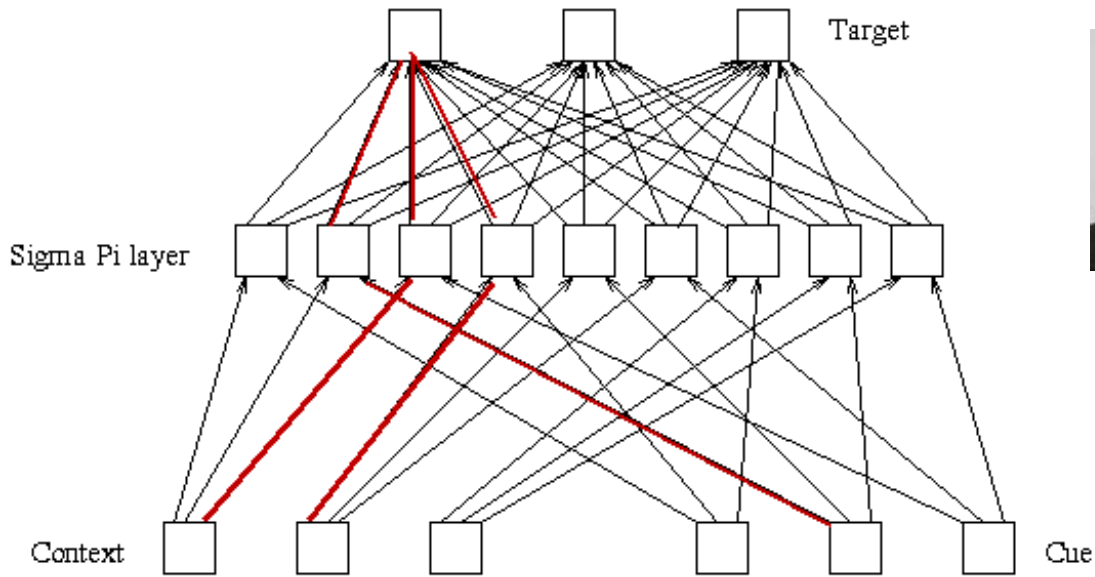
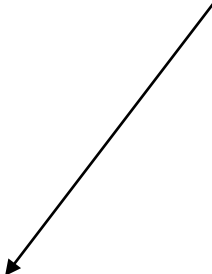
- rules
- categories

New: patterns

- patterns
- similarities

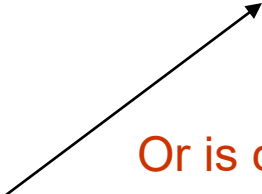
the knowledge *is* the network

stands for?



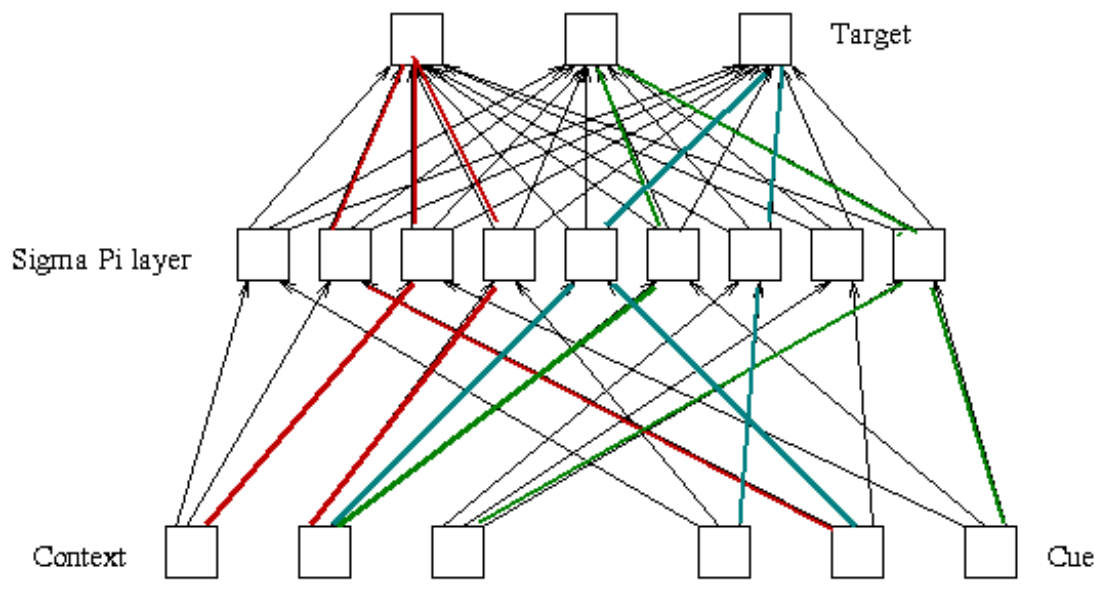
Hopfield

Or is caused by?



Distributed Representation

= a pattern of connectivity



↑

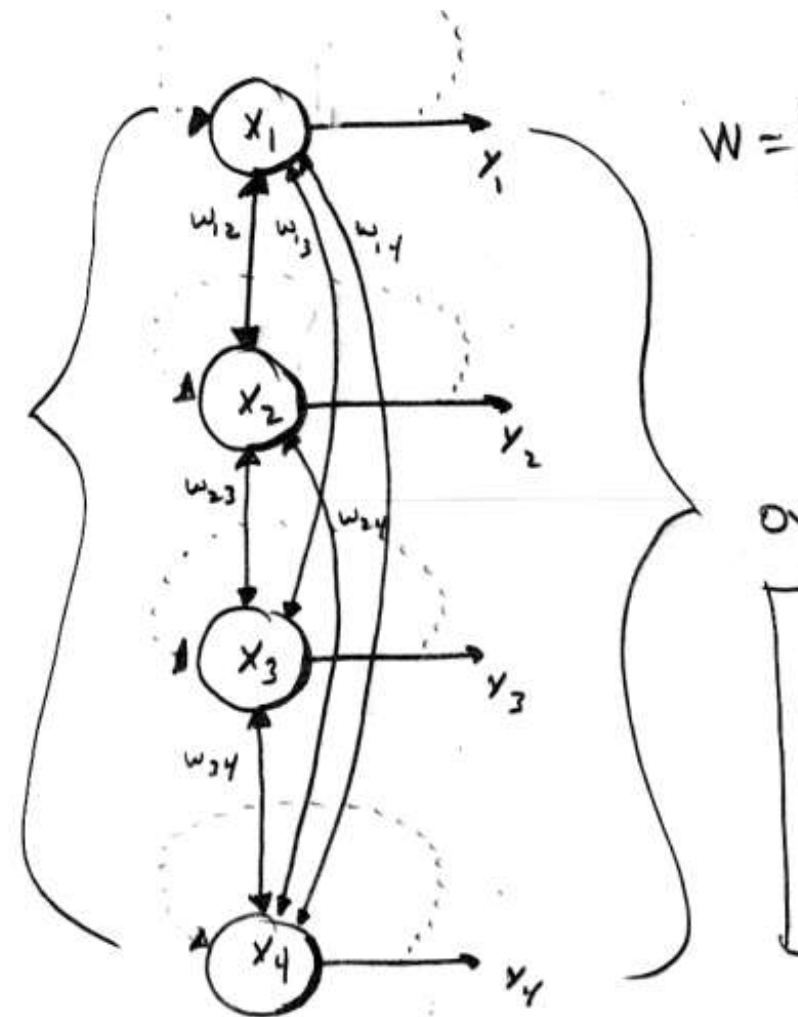
↑

↑

This...

Network Learning *Inputs*

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



- Single Layer
- Inputs X_i act as outputs Y_i

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=-4126240905912531540&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)

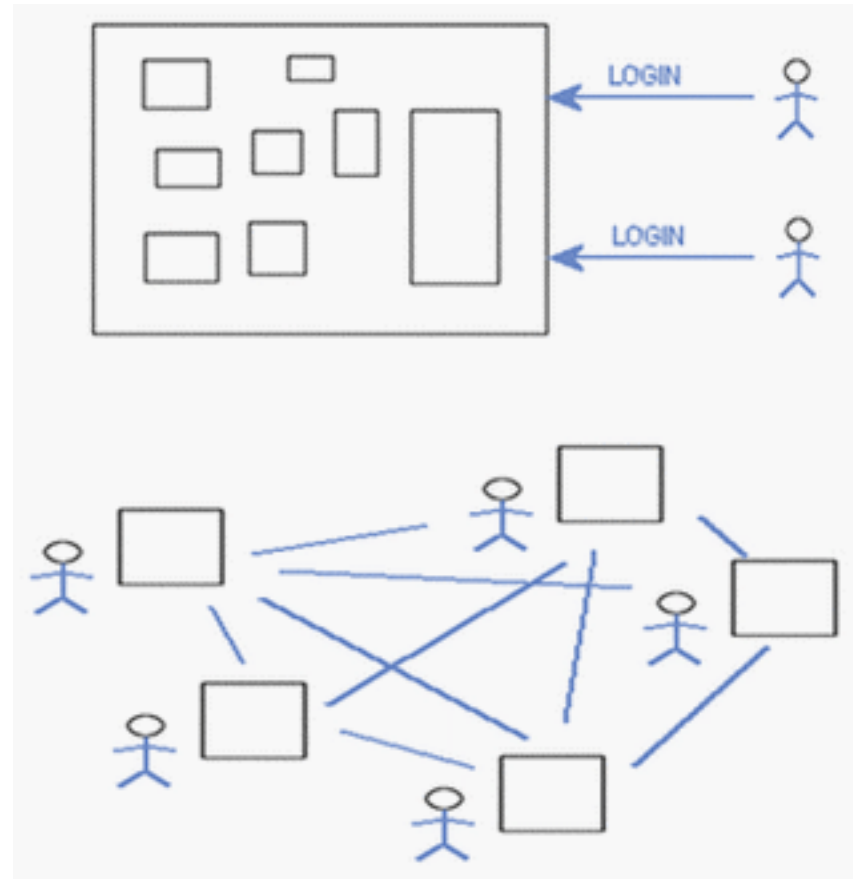
The Semantic Principle

- 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



Tagging

Tagging

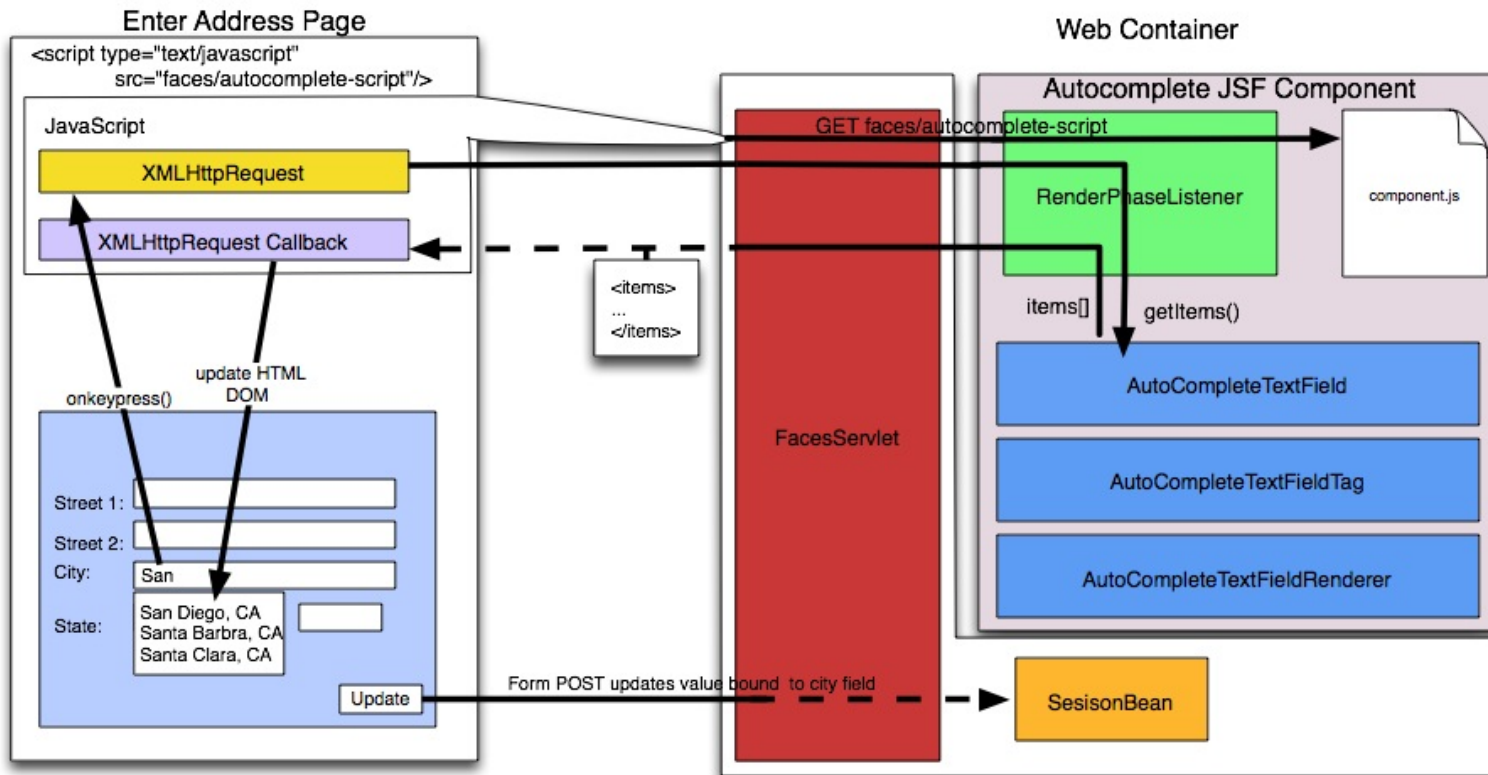
entrepreneurship publishing technology **design** medium b
ironment games **wireframe** sitemap user experience
process flow **tagging** card sort **iasummit07** design
gn the box **information architecture** swimlanes rapid f
UX methods digital ethnography analytics alignment m
interaction design kano analysis **tagging** experience
faceted browse page description diagram **facets links**
miscellaneous **web 2.0** movies **adoption** emergence m

UX METHODS TRADING CARDS

13

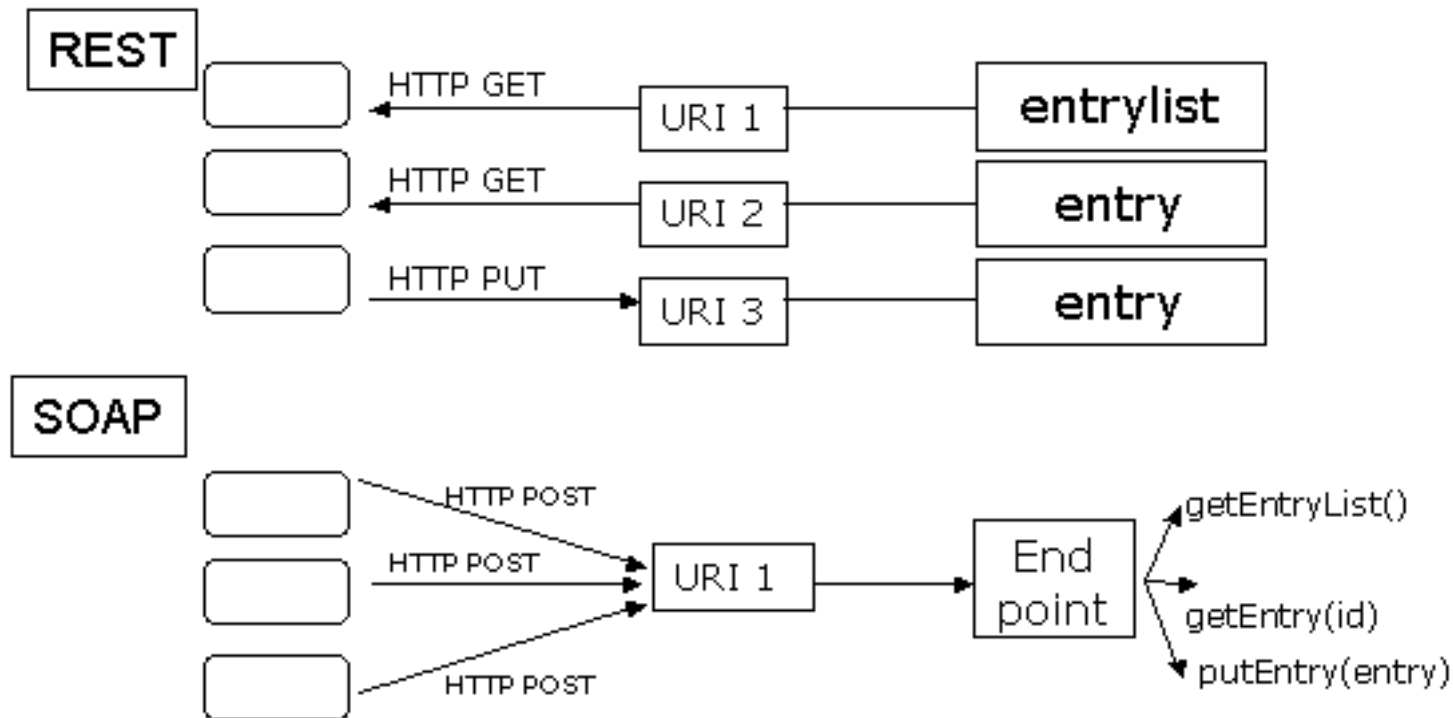
Asynchronous Javascript and XML (AJAX)

Jesse James Garrett in February 2005.



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

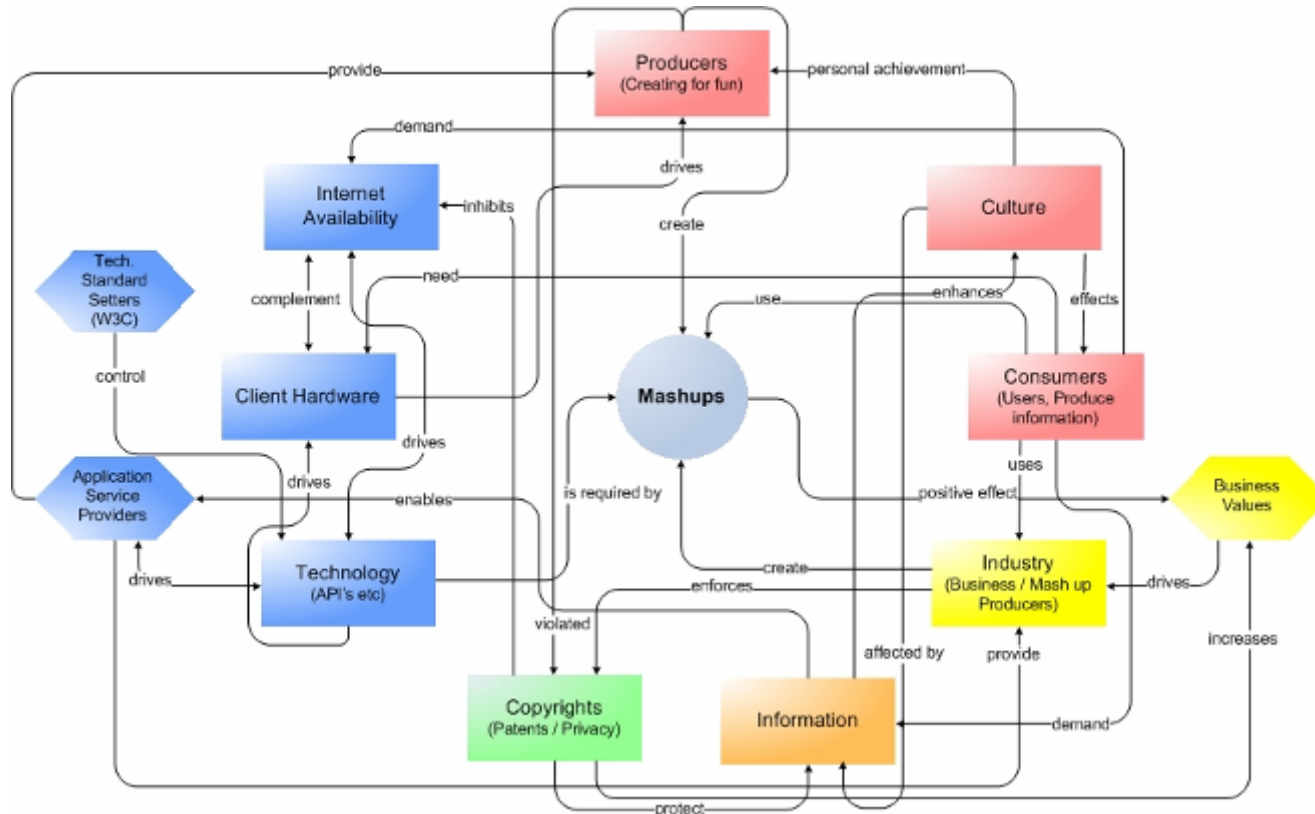
Representational State Transfer (REST)



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

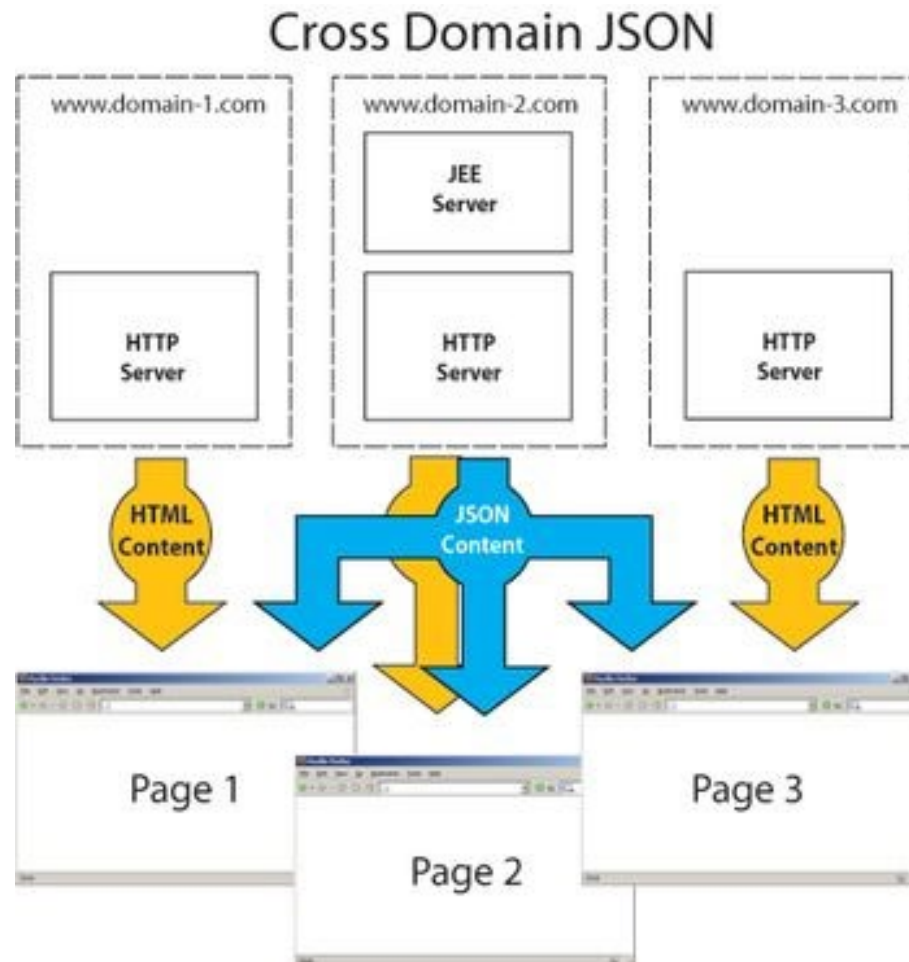
http://en.wikipedia.org/wiki/Representational_State_Transfer
<http://itpro.nikkeibp.co.jp/article/Watcher/20060315/232492/>

Application Program Interface (API) and Mash-Ups

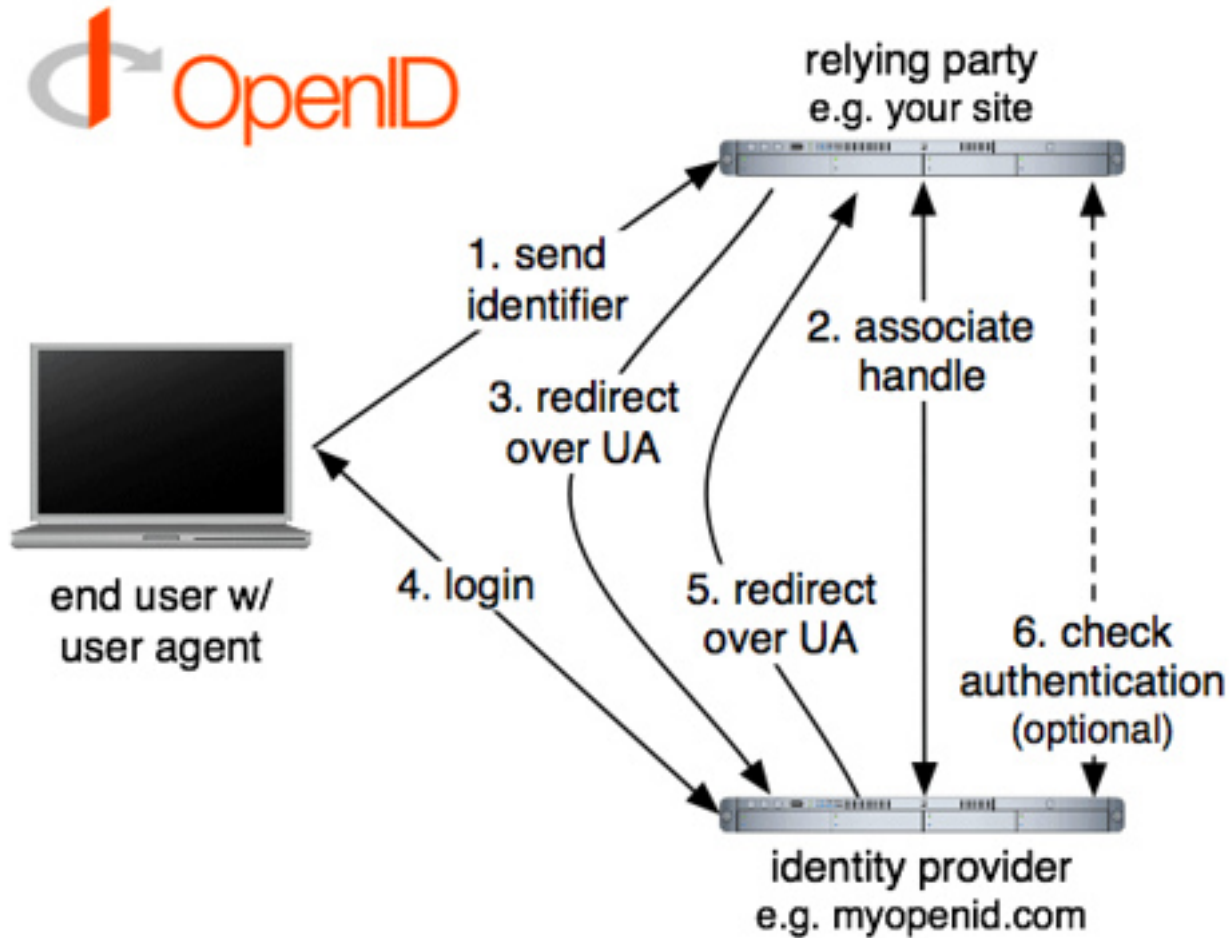


<http://scenariothinking.org/wiki/images/b/b6/MashUpSysDiagramV6.0.jpg>

Javascript Object Notation (JSON)



- OpenID



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

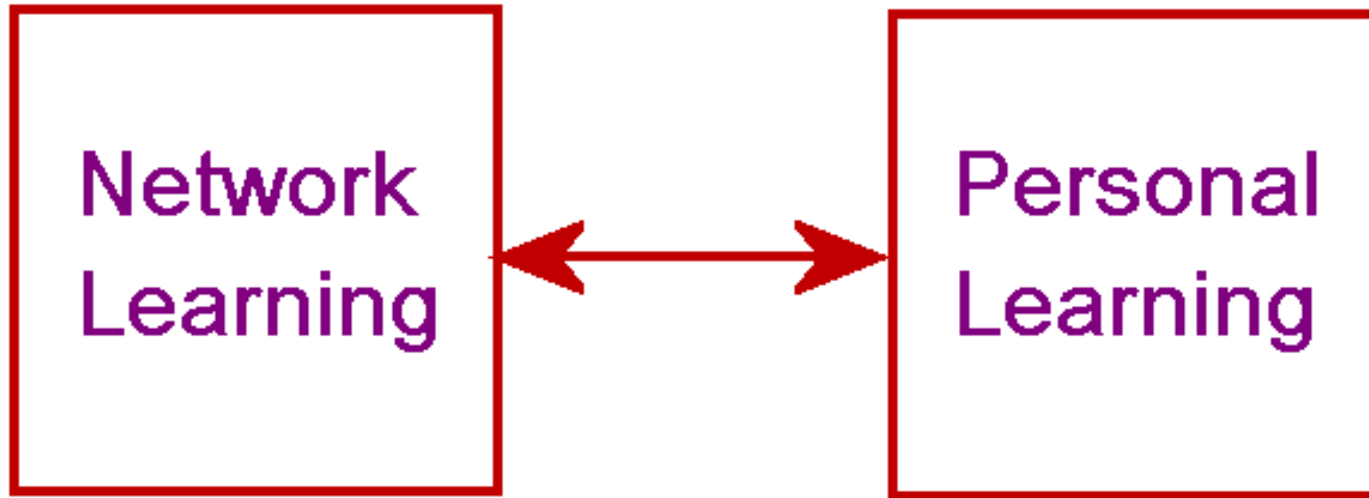
The idea is that learning is *not* based on *objects* and *contents* that are stored, as though in a library



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

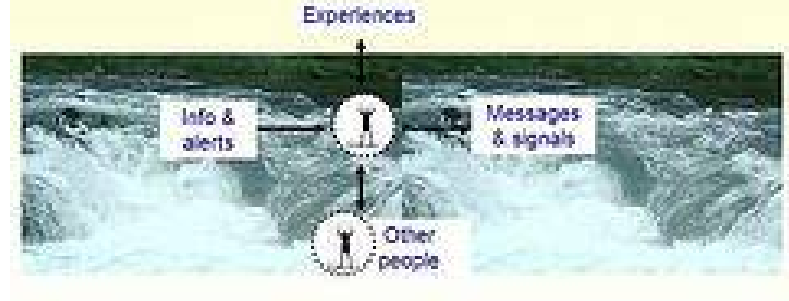
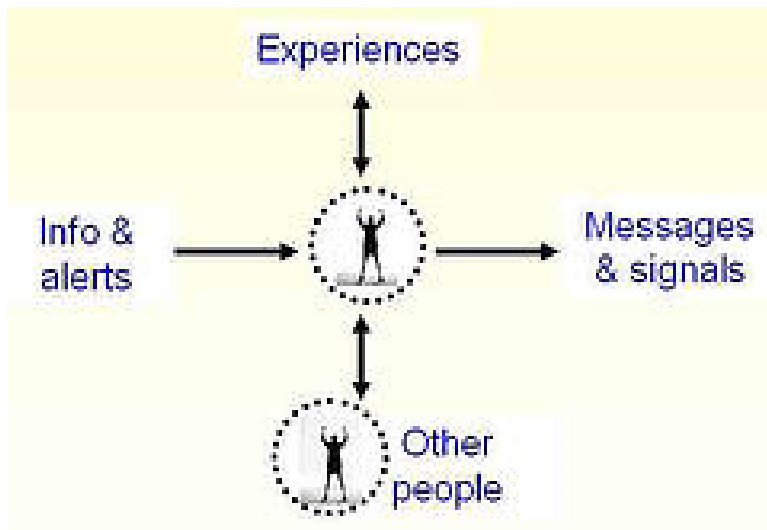


Types:

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 messaging, field trips,
resource capture (like this talk!)

Mobile Living

Easy Living

Make the convenient people's livelihood, build up high-quality national life.

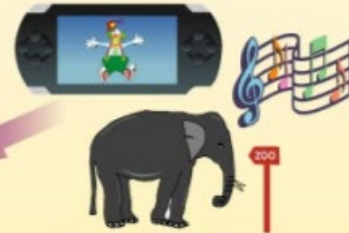
M-the people's livelihood

- Live information
- Convenience store
- Food court
- Buy ticket...



M-amusement

- Game
- Cartoon
- Music
- Food & Drink...



M-community

- Wireless internet access
- House monitor
- Community safety
- ...



M-care

- An exclusive SARS hospital
- Take care of old man live alone
- Family violence protection



Mobile Rescuer

Industry
to encourage business united
Application
to build working mode
Technology
to promote dual LAN integration

<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



Warrierz....c'mout an' playayyy...



Content as Vocabulary

<http://icanhascheezburger.com/>

Content as Creation

Aggregate

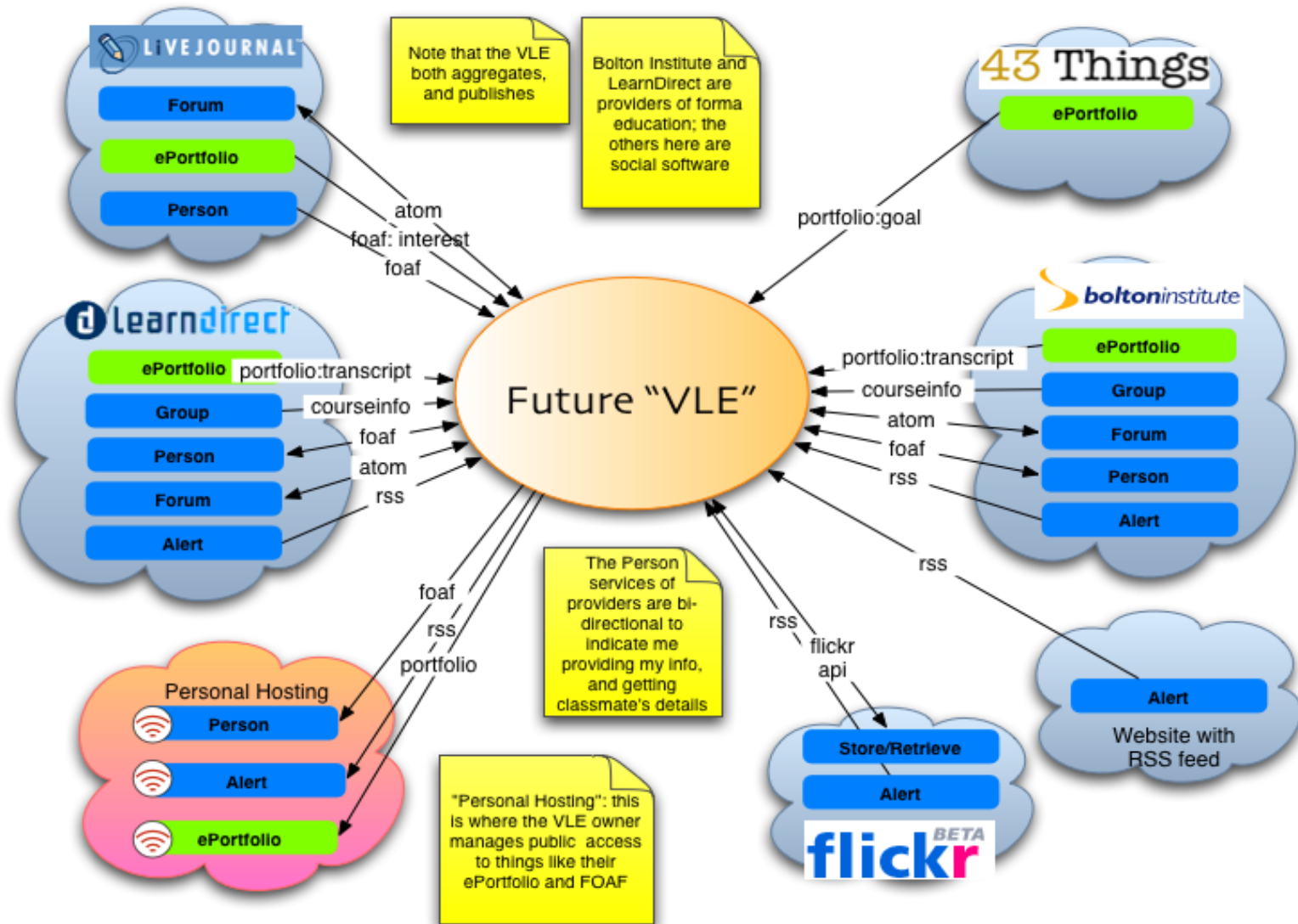
Remix

Repurpose

Feed Forward



The Idea of the PLE...



Plex Personal Learning Environment Example

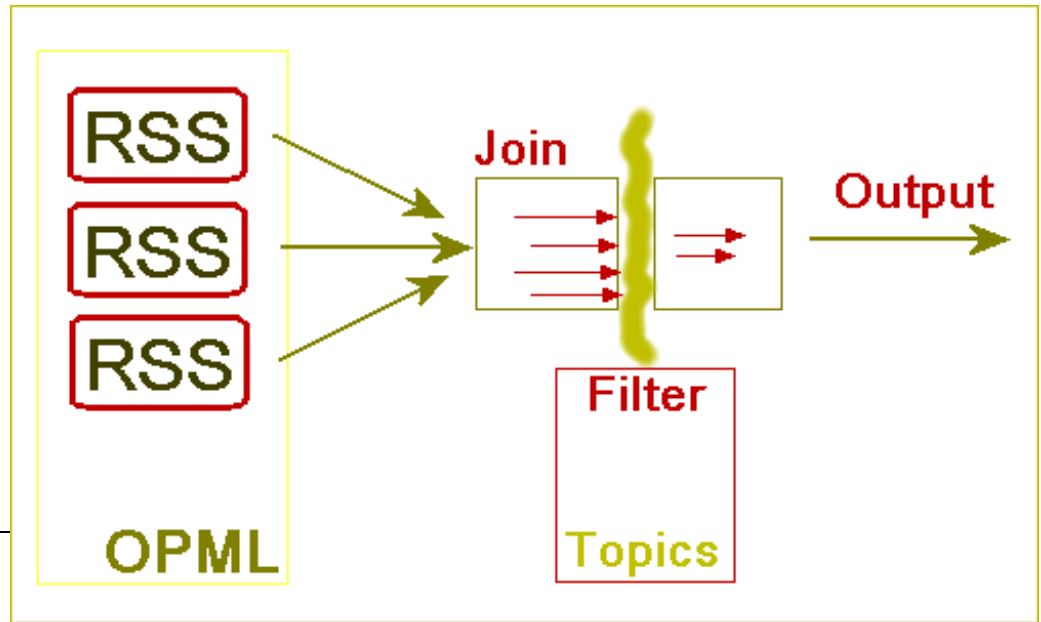
The screenshot displays the Plex Personal Learning Environment interface. The main window is titled "Plex" and contains several panes:

- Opportunities Explorer:** A tree view showing a hierarchy of opportunities. The selected item is "learn three chord rock guitar".
- Opportunity Viewer:** A detailed view of the selected opportunity. It shows the title "learn three chord rock guitar", the number of registered people (1), and the provider "43 Things". The location is "http://www.43things.com/thing:". A "Browse" button is visible next to the location field.
- Search Results:** A pane showing search results for the query "learn three chord rock guitar". It includes a "Find It!" button and a "Filter results by:" field. The results are displayed in a table with columns for Title, Provider, and Location.
- Web Browser:** A pane showing the details of the selected opportunity on the 43 Things website. The address bar shows "http://www.43things.com/things/view/161919". The page content includes a search bar and a notification that "1 person wants to do this...".

[learn three chord rock guitar]

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

The screenshot shows the RSS Writr web editor interface. At the top left, there is a search input field and a "Start Search" button. Below this are navigation links: [Change Theme], Stephen's Web, [OLDaily], [Archives], [Threads], [Best Of], [Search], and [Options].

The main content area is divided into two columns. The left column contains the heading "Welcome to RSS Writr" and three paragraphs of instructional text: "Select a content source from the list (see the panel at the lower right hand side of the page).", "When you see an item that interests you, drag it into the editing area (at right). You can drag multiple items into the editor.", and "When you have finished editing, save your new post to your blog." The right column contains a "Title:" input field, a rich text editor toolbar with icons for Bold (B), Underline (U), Italic (I), Bulleted List, Numbered List, Indent Left, Indent Right, Undo, and Redo, and a text area containing the word "Hello".

Below the editor is a "Content Sources" section with a dropdown menu currently showing "Stephen's MyGlu Test".



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

Edu_RSS Viewer

Stephen's Web

[START SEARCH](#)

[\[NEWS\]](#) [\[DISCUSS\]](#) [\[SEARCH\]](#) [\[ABOUT\]](#) [\[ARCHIVES\]](#) [\[OPTIONS\]](#)

 **EDU-RSS RECENT** 

You are logged in as Stephen Downes

[\[Logout\]](#)

*Formation and professional certification open and remote on the free software ****

Tally of the general project, history, objectives, concepts
[From: [Thot](#), April 10, 2007] [Tags: [Project Based Learning](#)]
<http://thot.cursus.edu/rubrique.asp?no=25673>

[Blog This!](#)

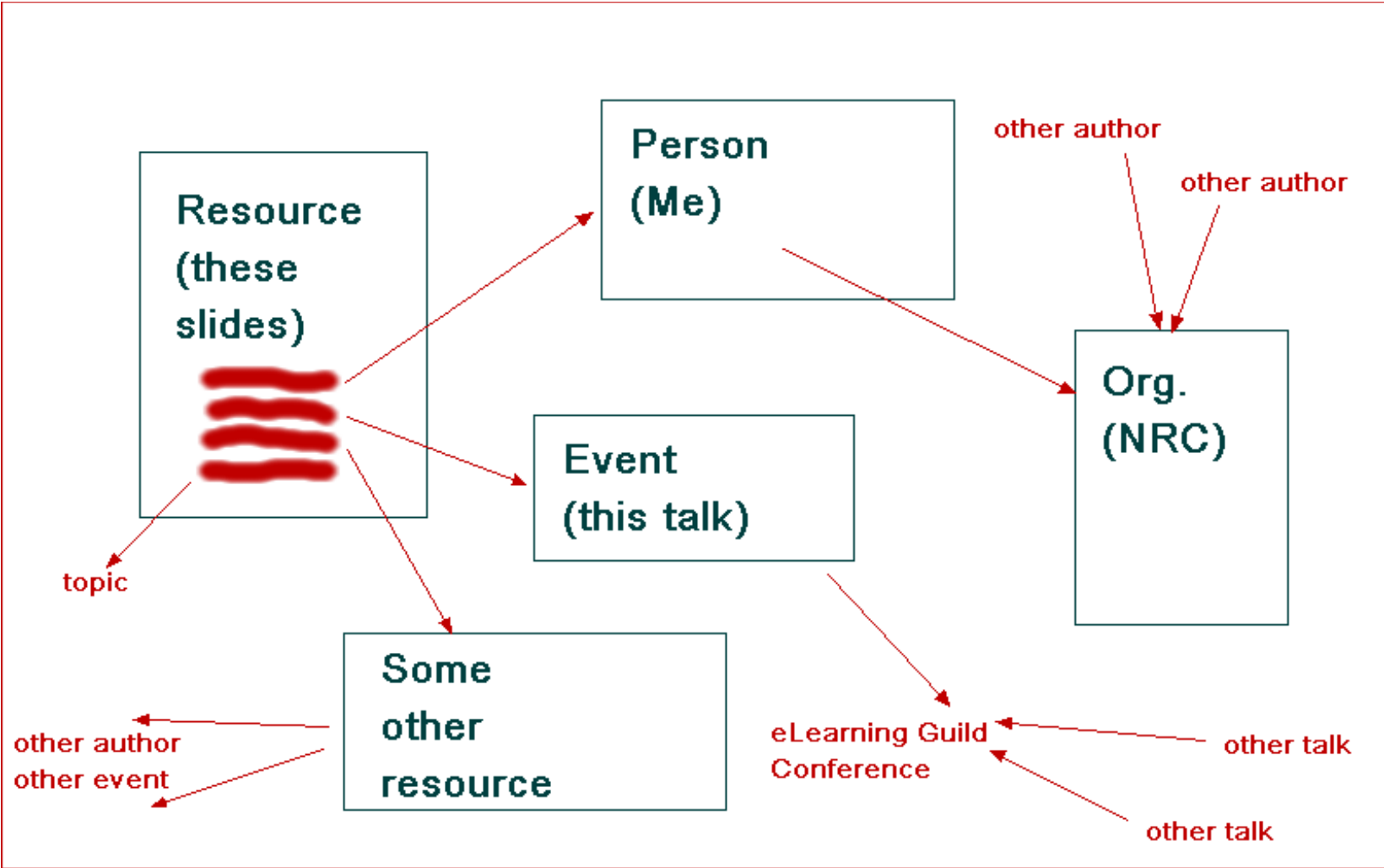
1 of 1594

SOME RIGHTS RESERVED THIS WORK IS LICENSED UNDER A [Creative Commons License](#)

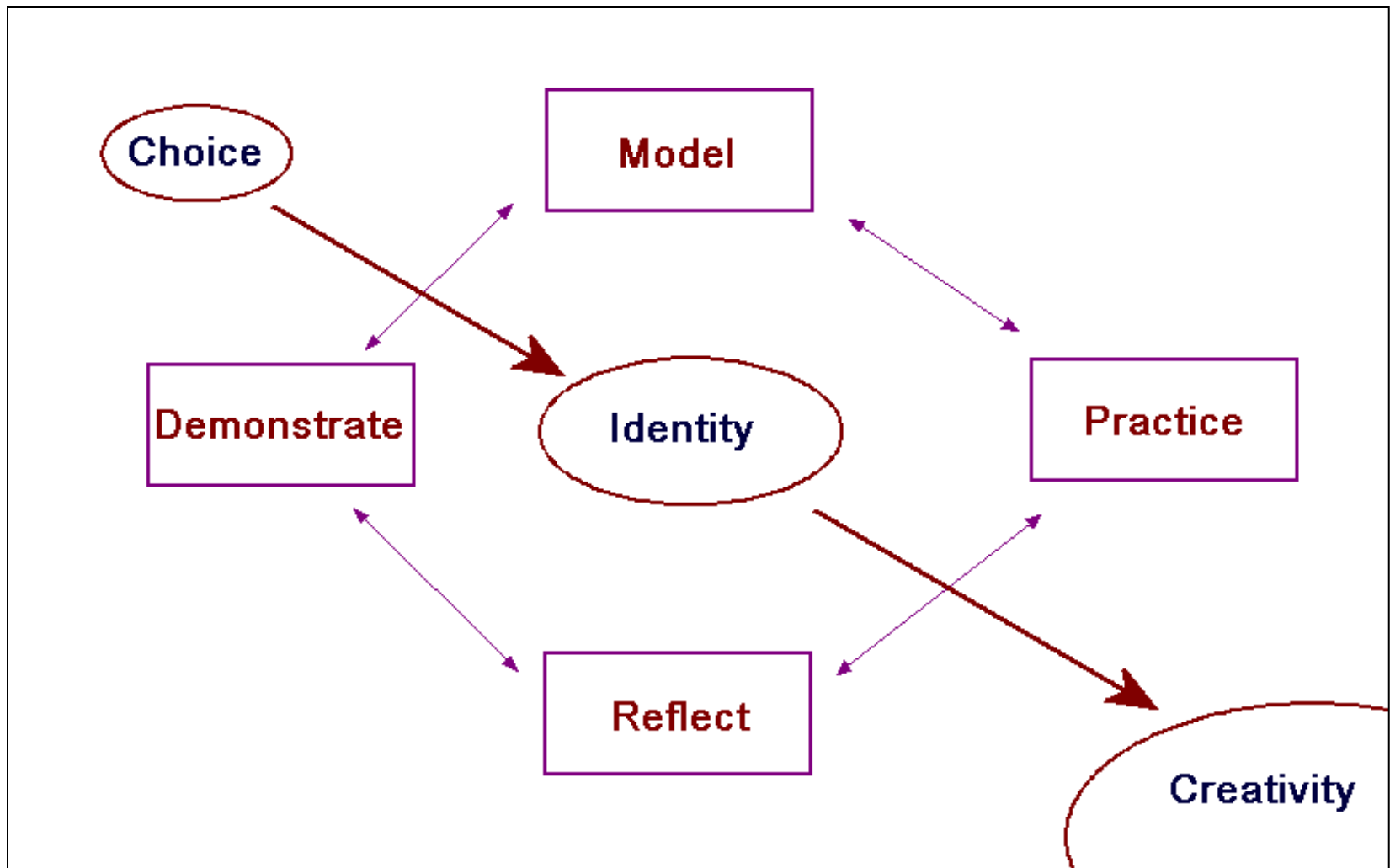
COPYRIGHT 2007 STEPHEN DOWNES
CONTACT: STEPHEN@DOWNES.CA

<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...

Model

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

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

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>