

Learning Networks and Connective Knowledge

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Cognitivism

- The idea that there is *something* that is, say, a belief
- And that this belief *represents* something, is *about* something
- And the belief takes on a *concrete form*, eg., sentences in the brain

Communication Theory

- The idea that things (beliefs, say) flow through a *channel*
- Effective communication maintains the *integrity* of these things as they flow (in number and in quality)
- Transaction: the *checksum* theory of communication

Emergentism

- At heart: no isomorphism between belief and object – knowledge as patterns
- Support from philosophy (supervenience), computer science (connectionism) and mathematics (graphs and networks)
- Grounded in observation in neuroscience

Distributed Representation

- O'Reilly (eg) - Functionalist architecture over distributed representation
- Functionalism – meaning as function, meaning as *use*
- Distributed representation – meaning arises not from a single unit but a network of interconnected units
- Concepts exist in no particular place

Pattern Recognition

- Is non-causal – patterns must be *recognized*
- Recognition necessarily occurs from a point of view or context
- No guarantee (or even requirement) of sameness

Implications

- Knowledge is subsymbolic
 - Knowledge is distributed
 - Knowledge is interconnected
 - Knowledge is personal
 - Knowledge is emergent
-
- To 'know' something is to have a belief you can't not have

Context Dependence

- Wittgenstein – meaning is use
- Quine – indeterminacy of translation
- Hanson – context-dependence causation
- Lakoff – culturally-bound categories
(Women, Fire and Dangerous Things)
- Van Fraassen – to ask ‘why’ is always also to ask ‘why not this’ (cf. Derrida, traces?)

Network Structure

- No sense to ‘meaning as representation’
- Meaning: product of network structure
- Networks: three major parts
 - Entities (that can have values)
 - Connections (over which signals can be sent)
 - Signals (that can change values)

Network Semantics

- Density – number of connections per
- Speed – may also be measured in ‘hops’
- Flow – a measure of information, number of signals
- Plasticity – how frequently connections change
- Connectedness - function of density, speed, flow and plasticity

A Basis in Pragmatics

- Context – localization of entities
- Salience – relevance or importance of message
- Emergence – development of patterns in the network
- Memory – persistence of patterns of connectivity

Connectivism

- Learning is a process of connecting specialized nodes or information sources.
- Capacity to know more is more critical than what is currently known
- Nurturing and maintaining connections is needed to facilitate continual learning.
- Ability to see connections between fields, ideas, and concepts is a core skill.

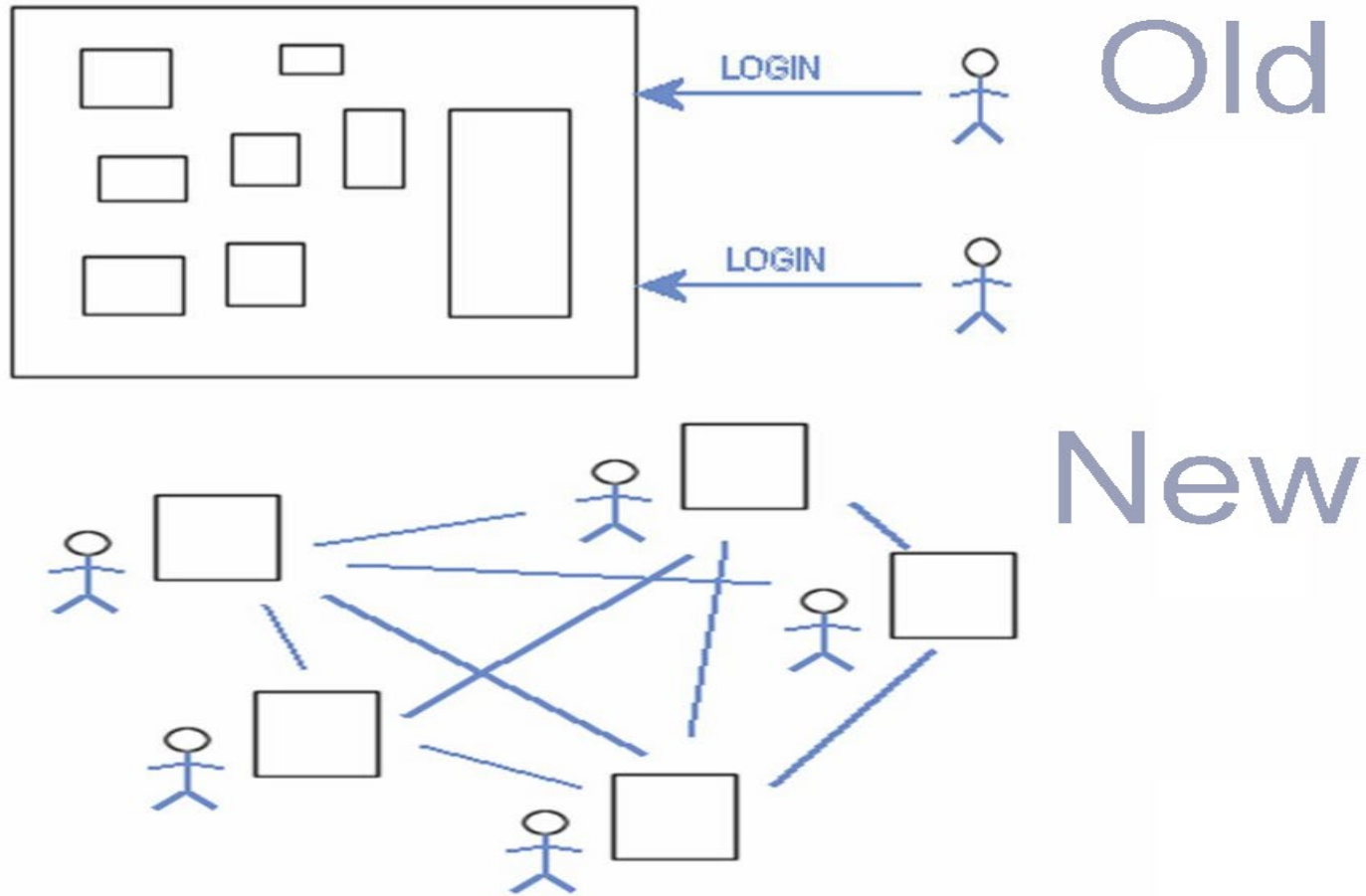
Practice

- Content authoring and delivery – blogging, podcasting, YouTubing, more...
- Organize, Syndicate Sequence, Deliver
- Identity and Authorization - DDRM – Creative Commons, ODRL, OpenID, LID
- Chatting, Phoning, Conferencing - ICQ, AIM, YIM, Skype and more...

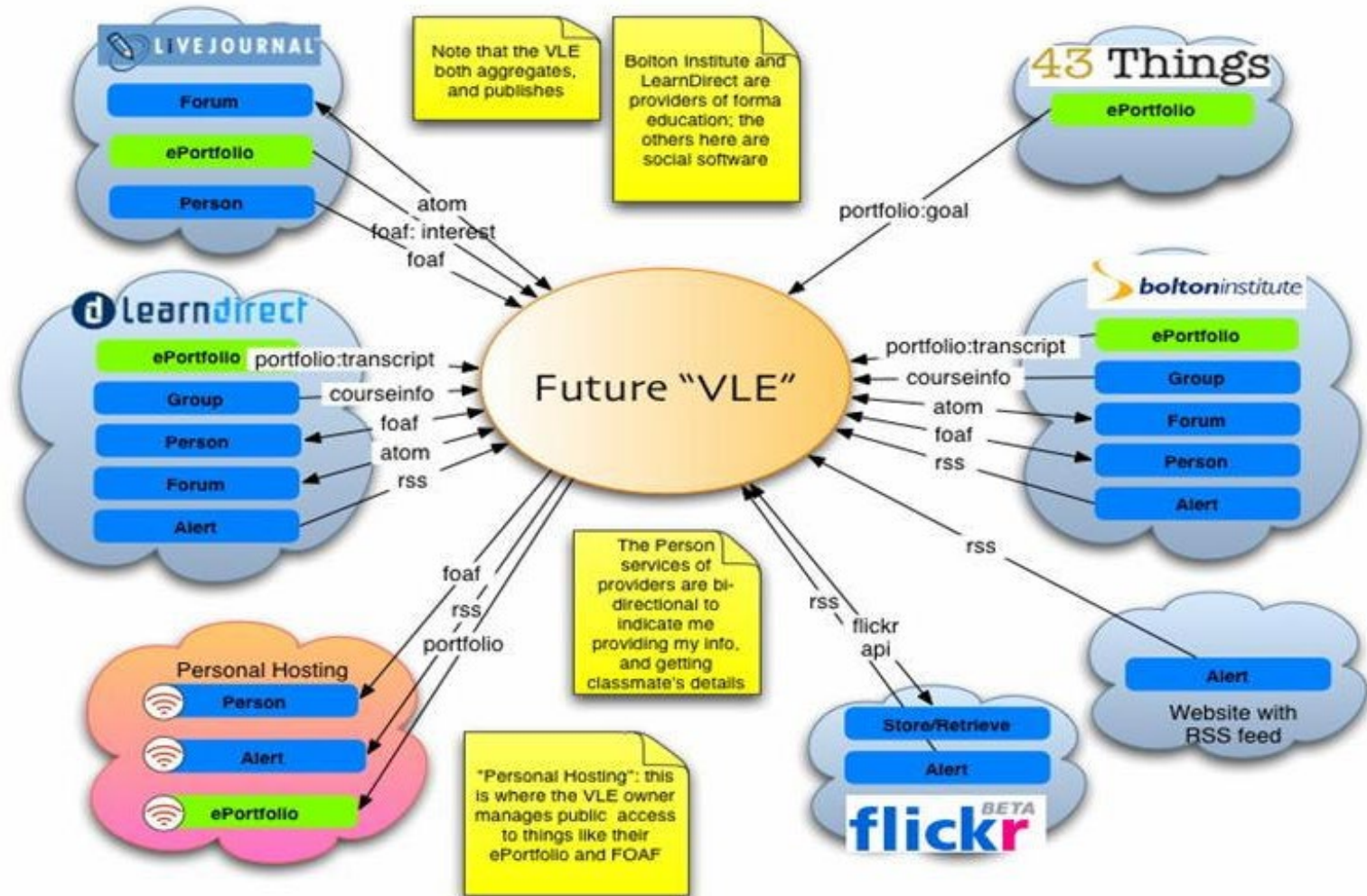
Web 2.0

- Britannica Online → Wikipedia
- personal websites → blogging
- screen scraping → web services
- publishing → participation
- directories (taxonomy) → tagging ("folksonomy")
- stickiness → syndication

E-learning 2.0



PLE, the Future VLE



The Ecosystem Approach



Example

The screenshot displays the Adobe Premiere Pro 6.0.1 interface. The main window is titled "Project: Maine.D" and contains a "Bin" panel on the left with a tree view showing "Bin 1", "Media", and "Movies". The "Media" panel shows a list of clips:

Bin	Clip Name	Media	Notes
	a 00-Clip-40	Movie 720 x 480 (0:00:00) 5997, 29.97 fps 32000 Hz - 16-bit - Stereo Average Data Rate: 10.25MB per second	
	a 00-Clip-40	Movie 720 x 480 (0:00:00)	
	Clip 01	Movie 720 x 480 (0:00:00)	
	Clip 04	Movie 720 x 480 (0:00:00)	
	Clip 05	Movie 720 x 480 (0:00:00)	
	Clip 07	Movie	

The "Monitor" window shows a close-up of a man's face. The "Timeline" window shows a multi-track layout with Video 2, Video 1A, Video 1B, Audio 1, Audio 2, and Audio 3 tracks. The Video 2 track contains two pink transition boxes labeled "Beach cross-dissolve" and "Garden cross-dissolve". The Video 1A track contains a green clip labeled "a 00-Clip-40" and a blue clip labeled "Clip 09". The Video 1B track contains a green clip labeled "Clip 05". The Audio 1 track contains a green clip labeled "a 00-Clip-40" and a green clip labeled "Clip 09". The Audio 2 track contains a green clip labeled "Clip 05".

The "Effect Controls" panel on the right shows the "Cross-dissolve (RT)" effect selected. The "Transitions" panel on the right shows a list of transition options, including "Cross-Dissolve (RT)", "Other Dissolve", "Free-Additive Dissolve", "Rackwork Invert", "Inic", "Inic Cross (RT)", "Inic Dissolved (RT)", "Inic Points (RT)", "Inic Round (RT)", "Inic Shapes", "Inic Square (RT)", "Inic Star (RT)", "Map", and "Page Peel".

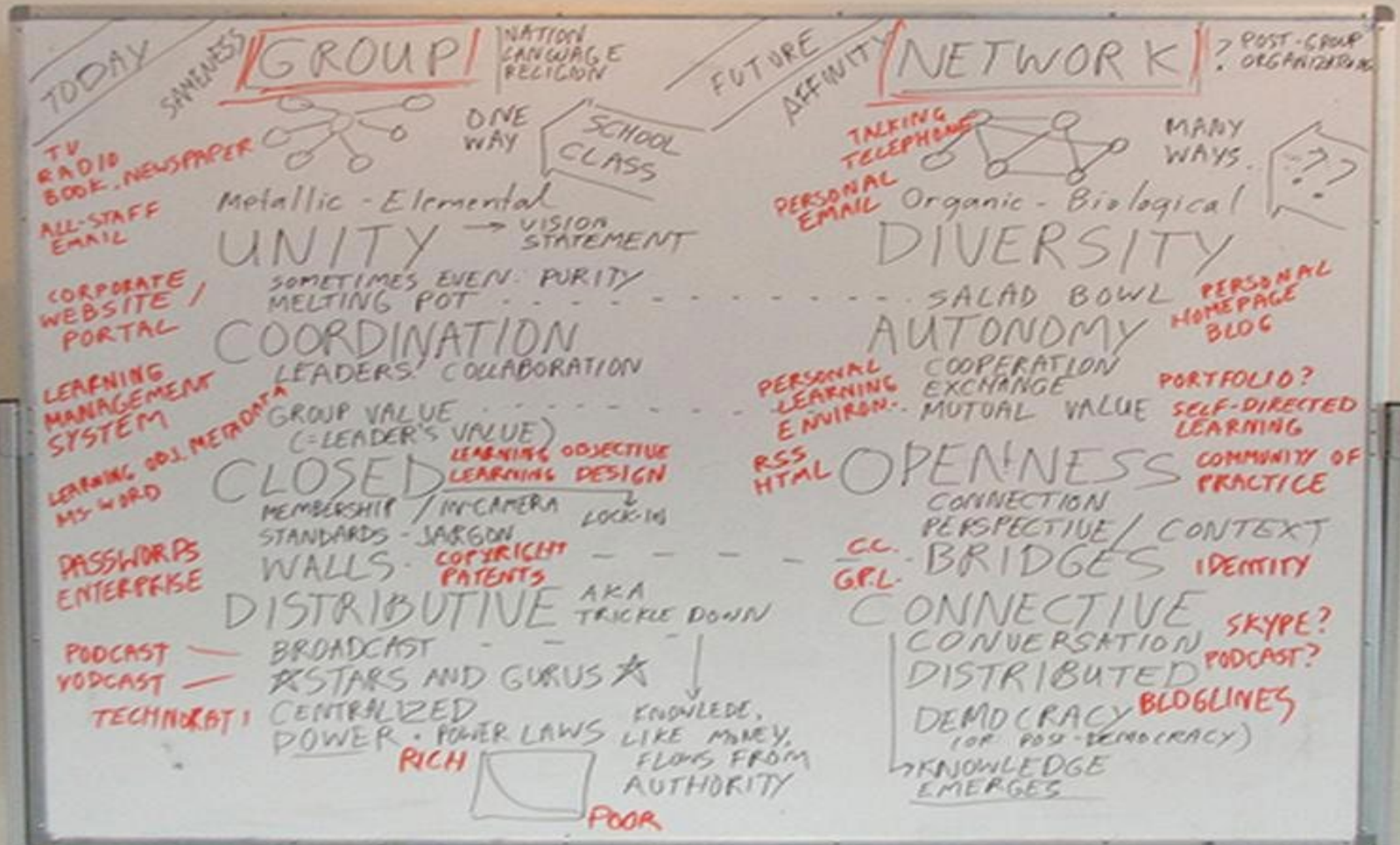
Core Principles

- Effective networks are *decentralized*.
- Effective networks are *distributed*.
- Effective networks *disintermediated*.
- Content and services are *disaggregated*.
- Content and services are *dis-integrated*.
- An effective network is *democratic*.
- An effective network is *dynamic*.

Cascade Phenomena

- The bandwagon effect
- Like a plague, like social psychosis (same principles are in effect)
- No guarantees of truth – the response to cascades will not be based in truth per se
- The response is *methodological* – we construct the network in such a way as to discourage cascades

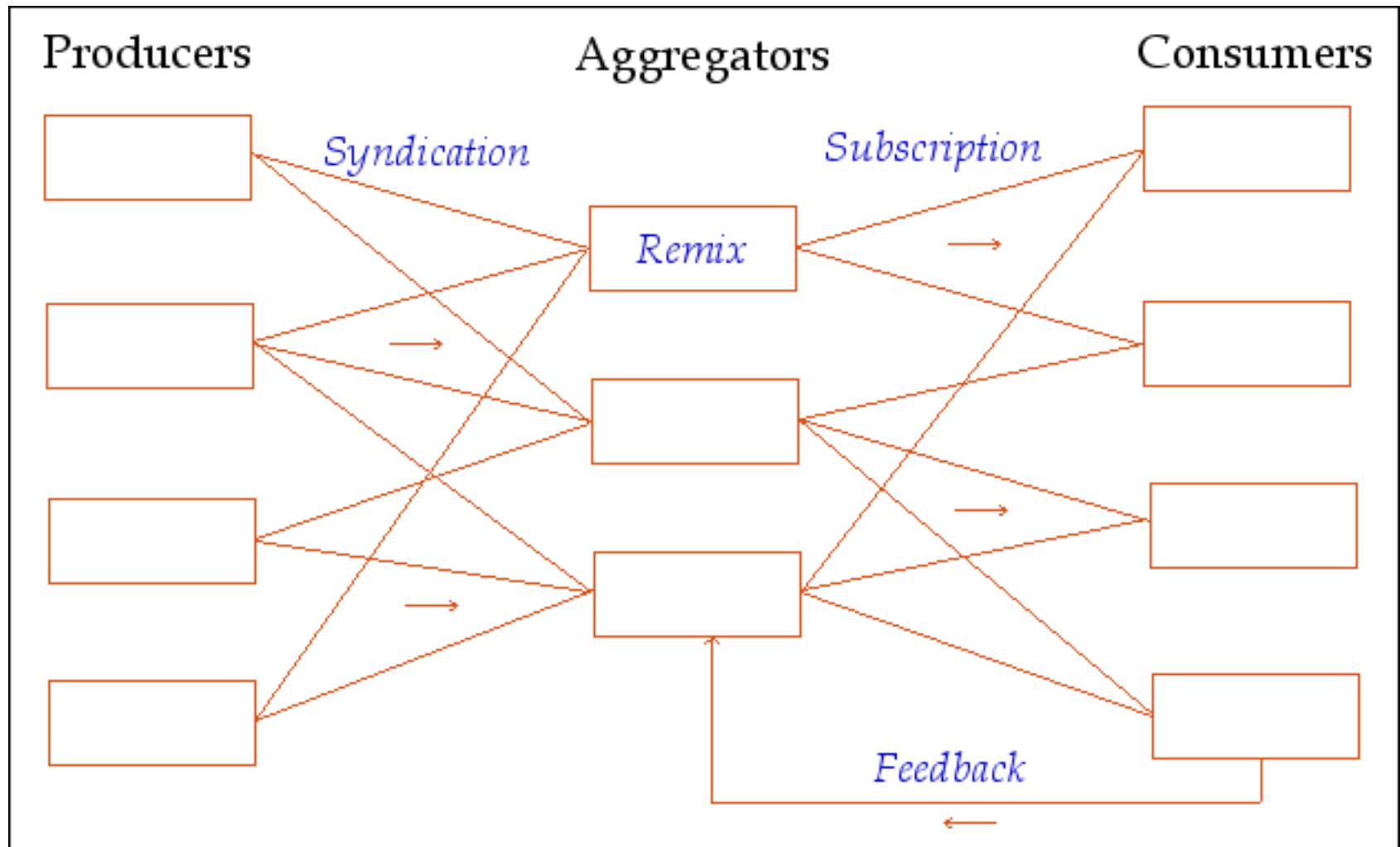
The Semantic Condition



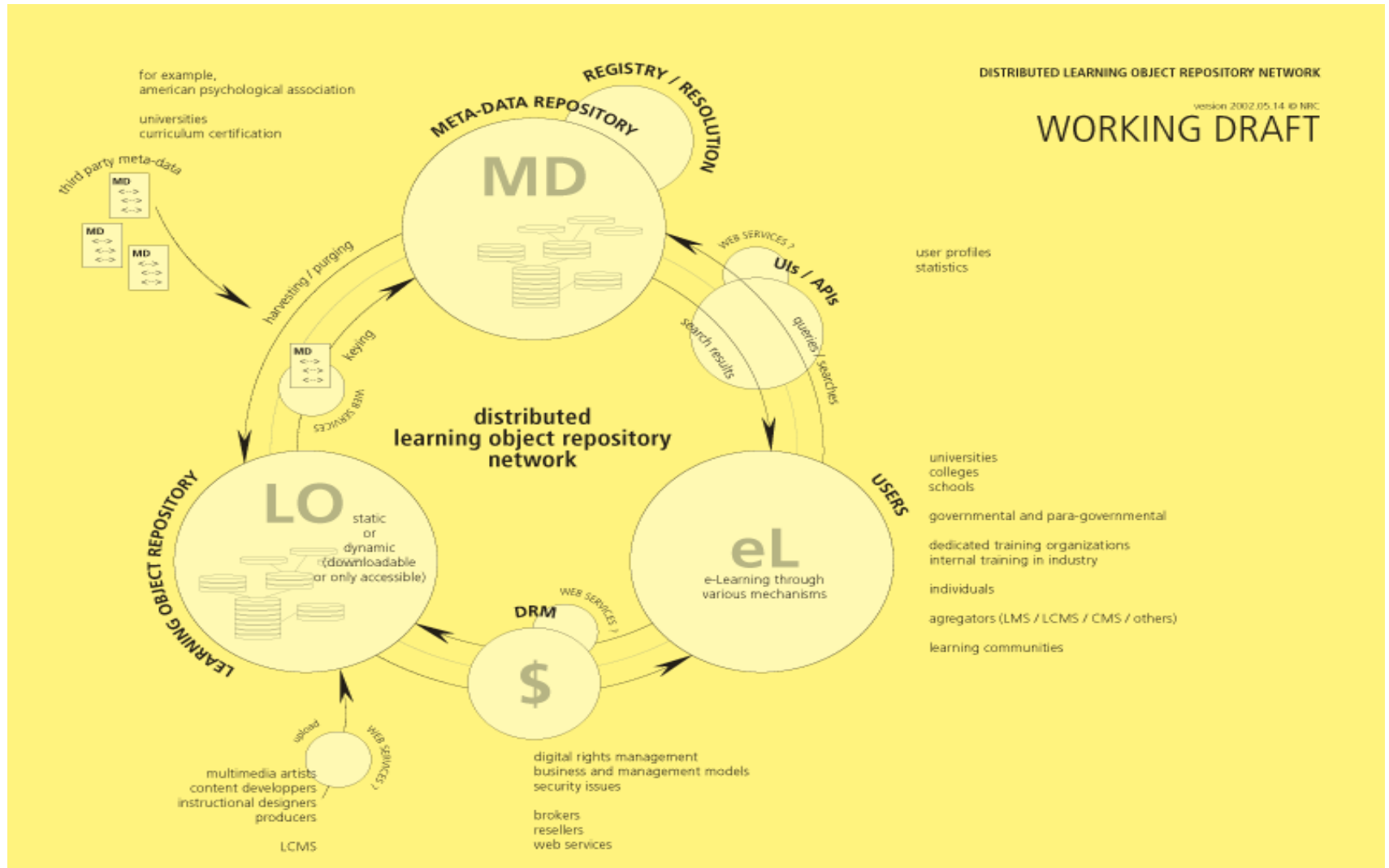
A Network Pedagogy



Aggregate, Remix...



Aggregate, Remix...



Non-Causal Knowledge

- People always want empirical data
- But what if the entities you're measuring don't exist
- What if what you're measuring can't be measured
- There is no 'belief' properly so called to be measured
- Modeling and simulation, not measuring

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