

Keynote Address
15th International Conference on Conceptual Structures
Sheffield, July 2007 / www.iccs.info



Hypermedia Discourse: Contesting Networks of Ideas & Arguments

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KNOWLEDGE MEDIA
KMi
I N S T I T U T E



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Maarten Sierhuis (NASA)
Jeff Conklin (CogNexus Inst.)
Michelle Bachler (Open U.)

Scholarly Ontologies Project:

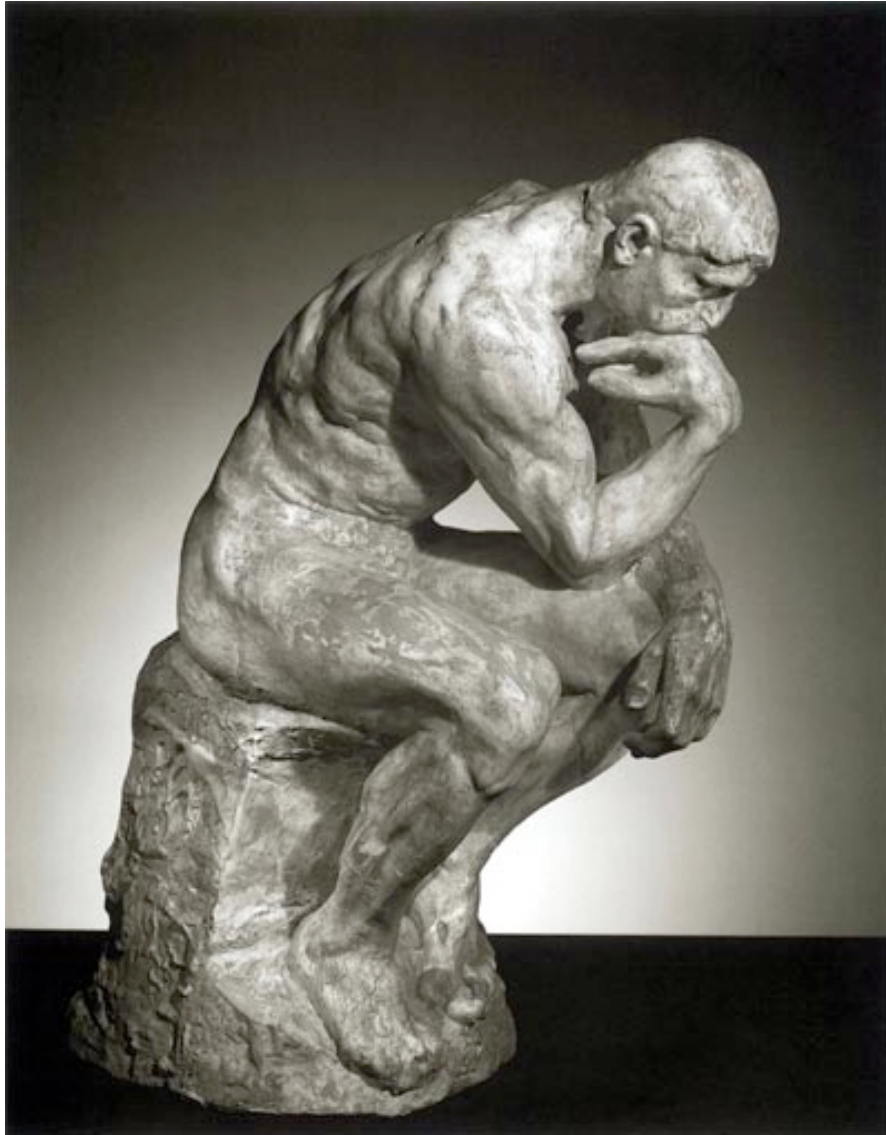
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Bertrand Sereno
John Domingue
Enrico Motta

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THE WILLIAM AND FLORA HEWLETT FOUNDATION

Ideas...



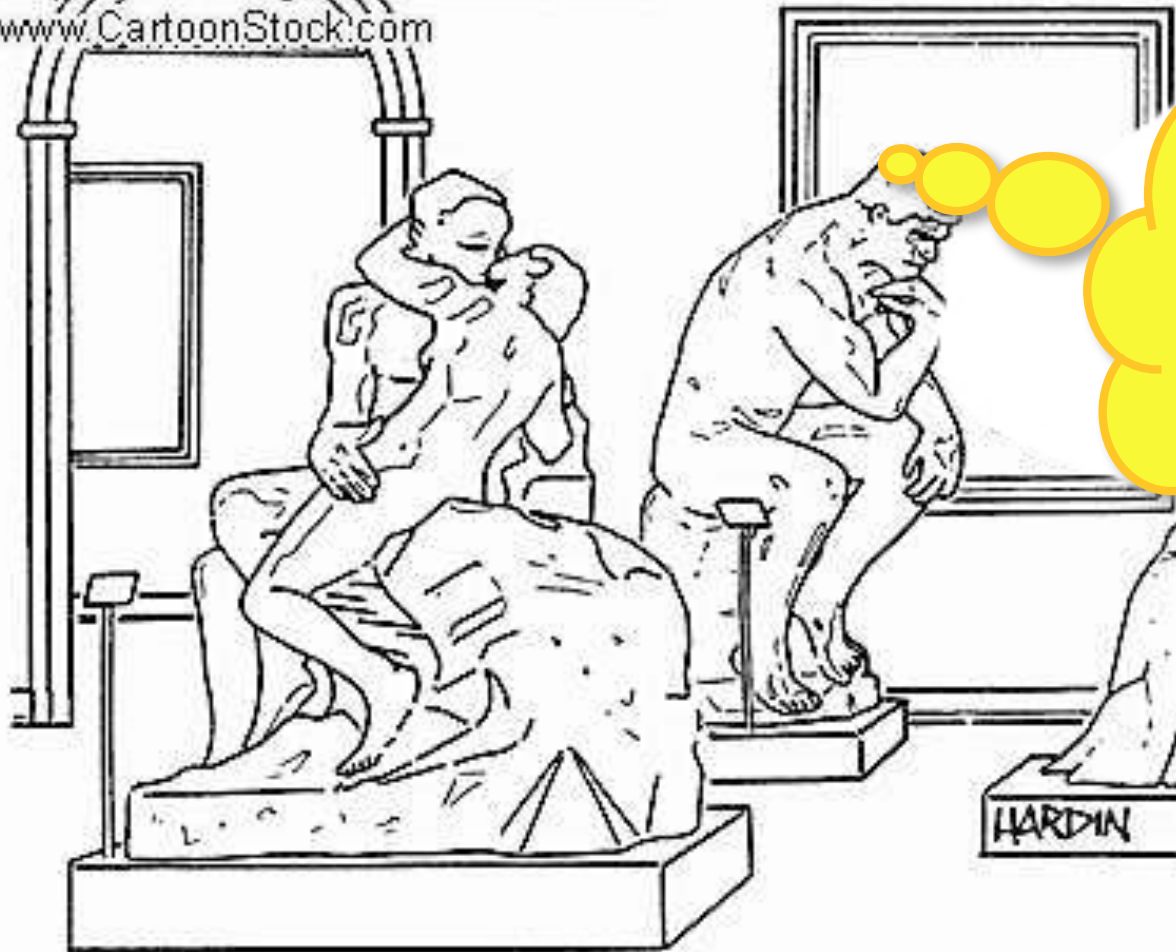
**Foundations for
Civilization...**

**Weapons of Mass
Destruction...**

Ideas... (aren't everything)

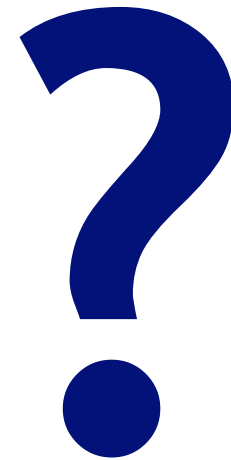


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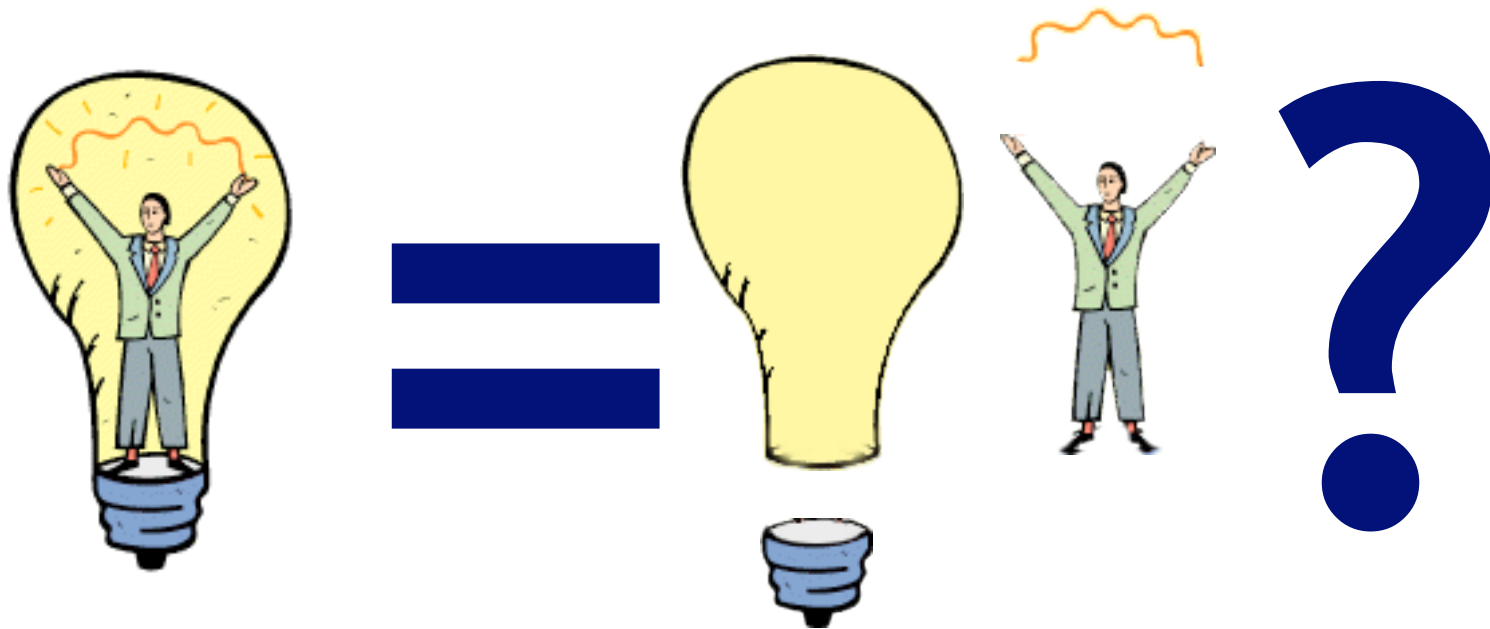


So what's
he got that
I haven't
got?

Significance?...



Significance?...



Significance?...



<http://flickr.com/photos/pewari/354960548>
<http://flickr.com/photos/voetmann/274550156>
http://flickr.com/photos/notorious_indian/540058288



Significance?...

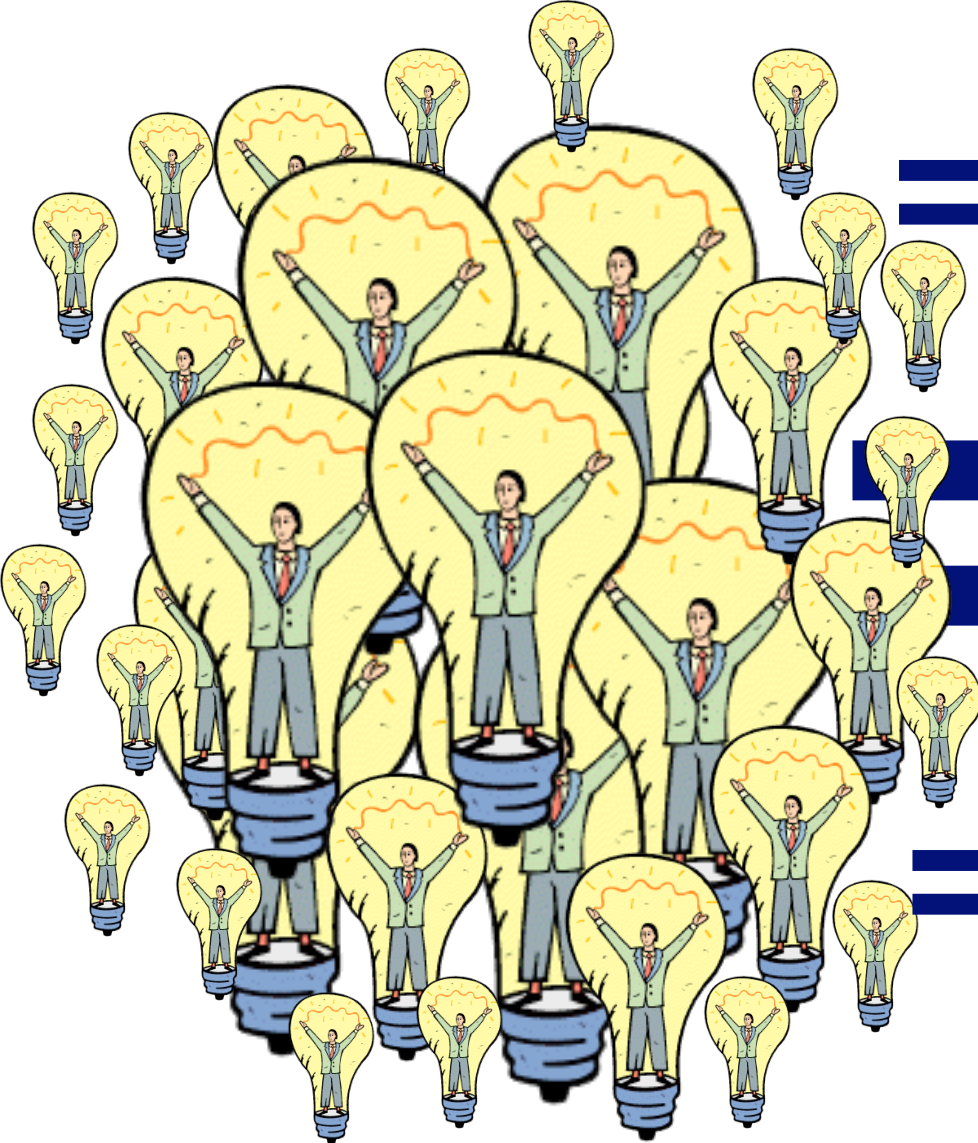
context



=

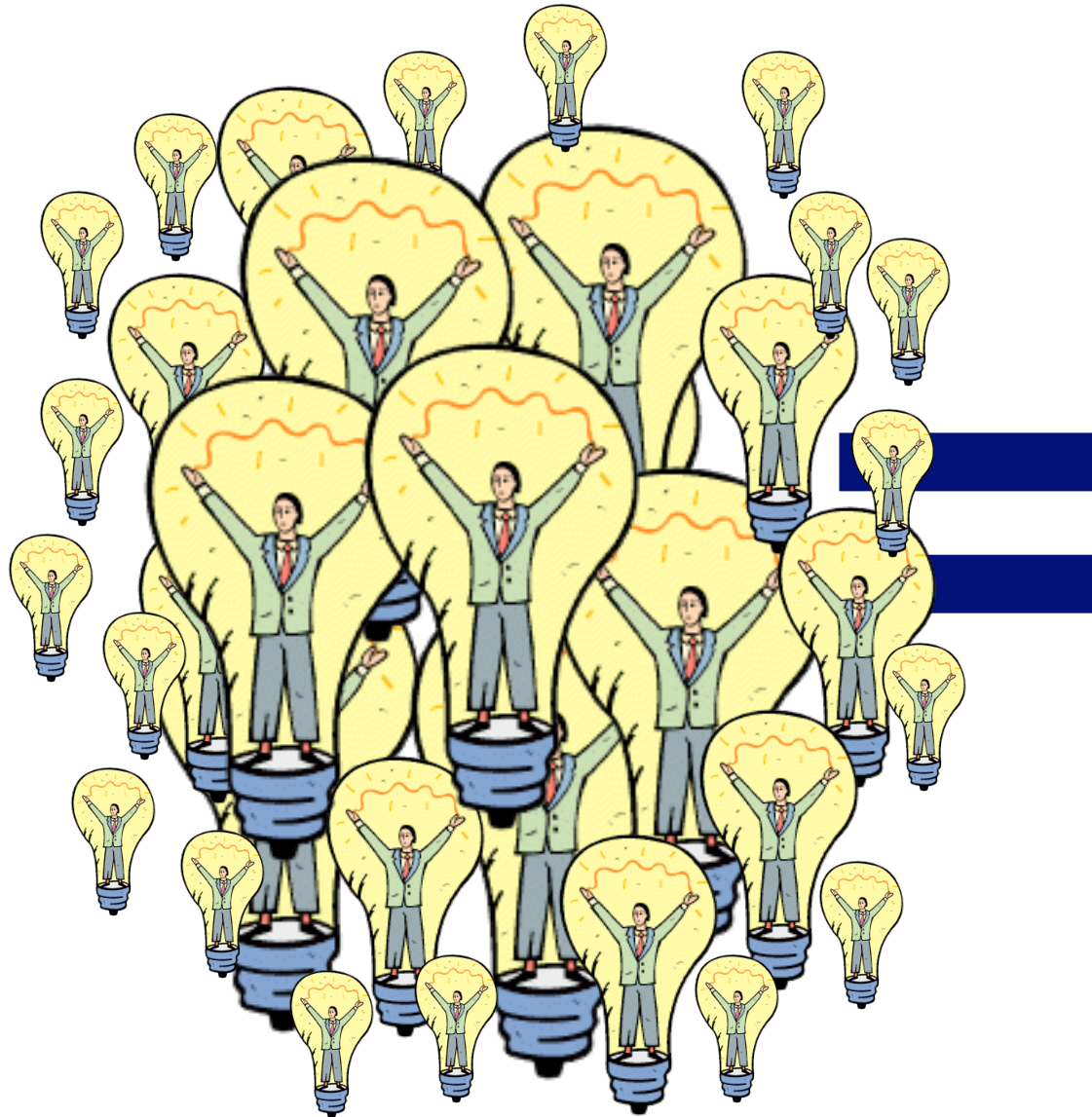
?

Significance?...



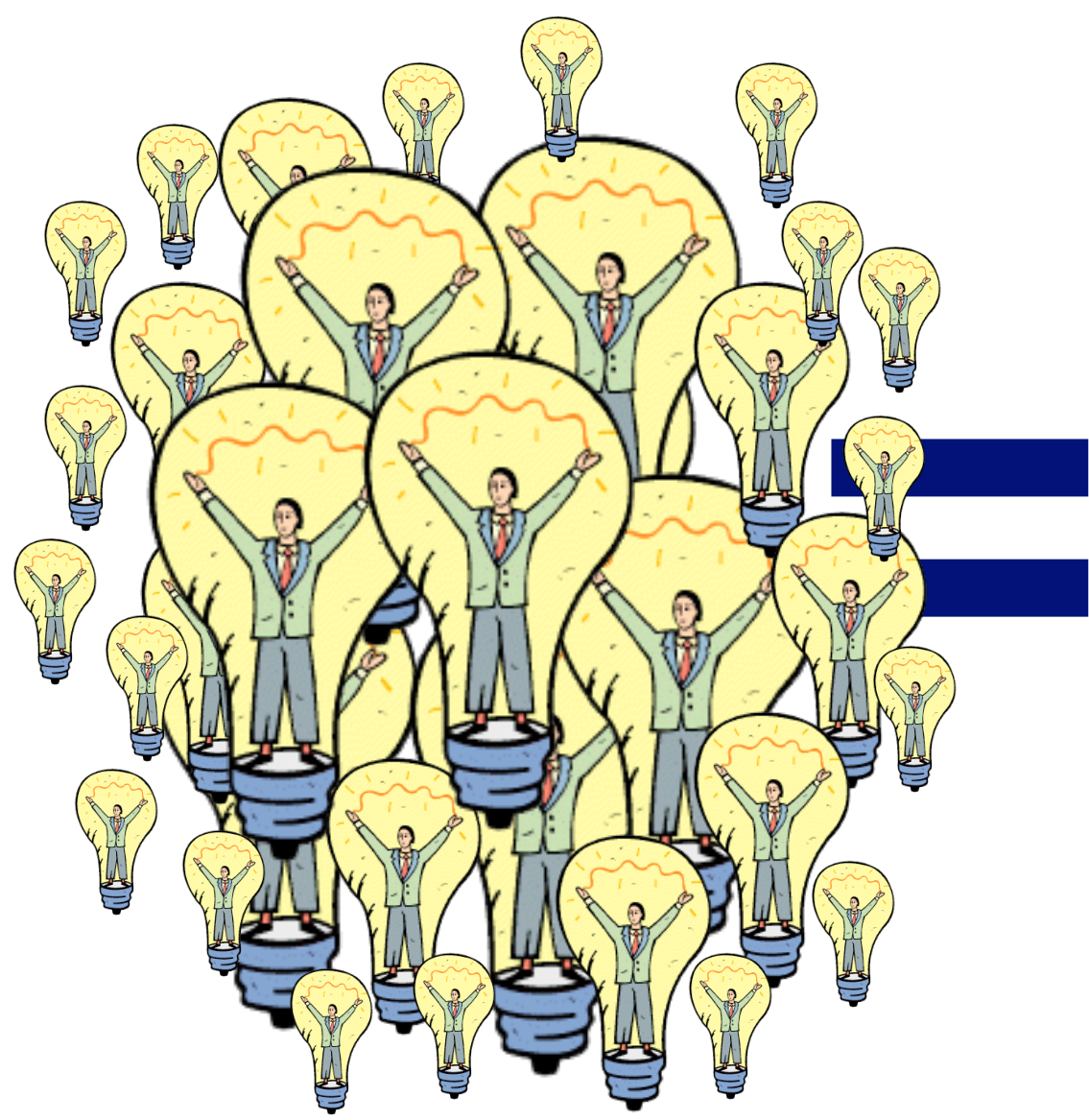
= ? = ?
= ? = ?
= ? = ?
= ? = ?
= ? = ?

Significance?...





Significance?...





Our context (1)

“I want to talk about the challenge of our generation. [...] Our challenge, our generation’s unique challenge, is learning to live peacefully and sustainably in an extraordinarily crowded world.

“The way of solving problems requires one fundamental change, a big one, and that is learning that the challenges of our generation are not us versus them, they are not us versus Islam, us versus the terrorists, us versus Iran, they are us, all of us together on this planet against a set of shared and increasingly urgent problems.”

Jeffrey Sachs: 2007 Reith Lectures
<http://www.bbc.co.uk/radio4/reith2007>

Doug Engelbart (cont/d)



- Engelbart (1963): *A Conceptual Framework for the Augmentation of Man's Intellect*
- A concept structure (...) is something that can be designed or modified, and a basic hypothesis of our study is that **better concept structures can be developed** —structures that when mapped into a human's mental structure will significantly improve his capability to comprehend and to find solutions within his complex-problem solving situations.

Englebart (1963— reprinted in Greif, 1988: p. 54)



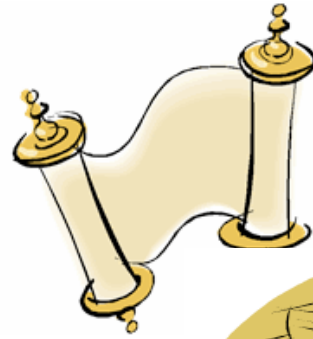
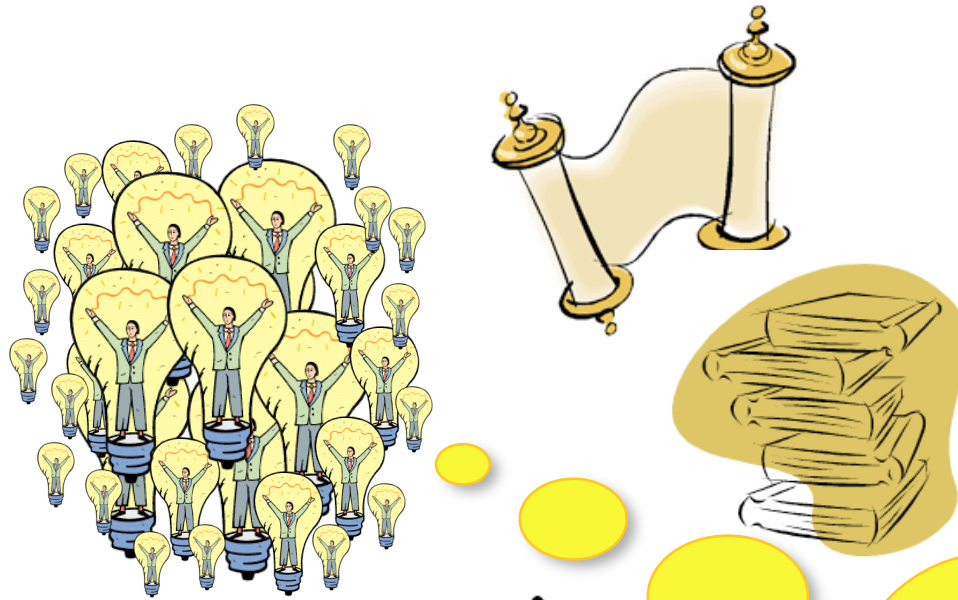
Our context (2)

“With these “minds”, a person will be well equipped to deal with what is expected, as well as with what cannot be anticipated; without these minds, a person will be at the mercy of forces that he or she can’t understand, let alone control.

“The disciplined mind... the synthesizing mind... the creating mind... the respectful mind... the ethical mind.”

Howard Gardner: Five Minds for the Future.
Harvard Univ. Press, 2006: p.2

Hypermedia Discourse Research



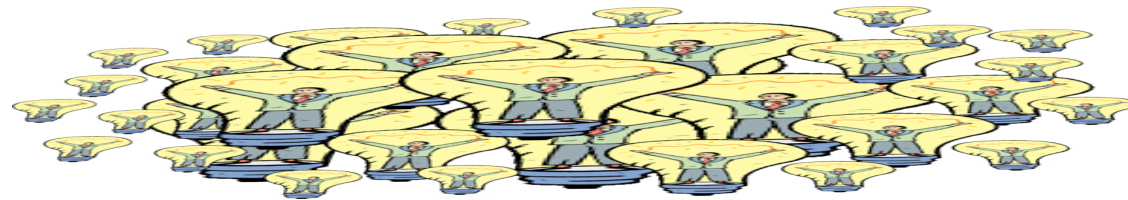
published claims
and arguments as
hypermedia
discourse
networks



team deliberations
as hypermedia
discourse networks

Scaffold emergent
models of
contested worlds
by scaffolding
discourse
about them...

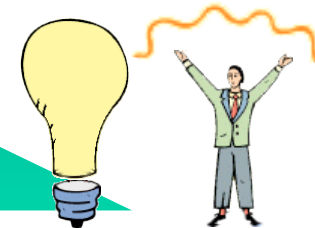
The missing layer: “Web Pragmatics”



significance?

semantic web

grounded in a consensus domain model
minimising inconsistency, ambiguity, controversy



metadata

grounded in a consensus domain model
minimising inconsistency, ambiguity, controversy

resources

documents, datasets, etc...



Hypermedia

Discourse



Hypermedia

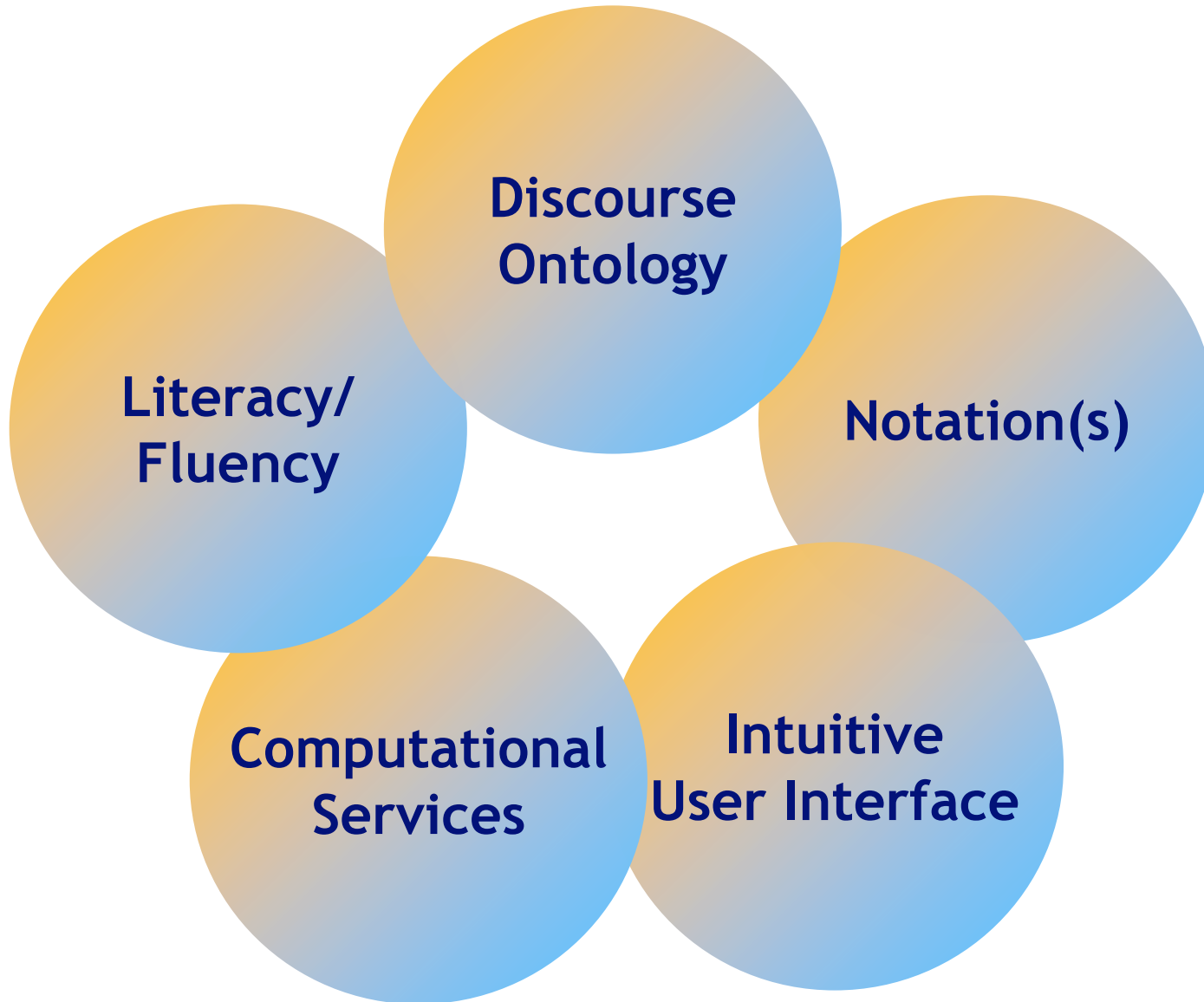
- Modelling *discourse relations*
- Expressing *different perspectives* on a conceptual space
- Supporting the *incremental formalization* of ideas
- Rendering *structural visualizations*
- Connecting *heterogeneous* content

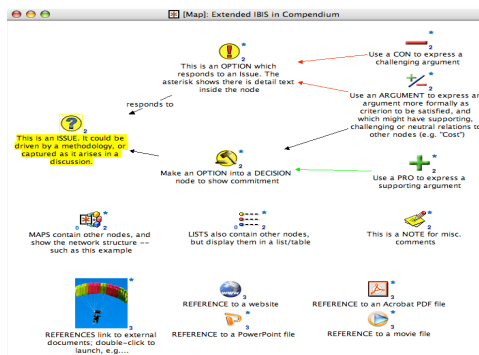


Discourse

- Verbal and written workplace communication
- Discourse communities: “making and taking perspectives”
- Dialogue
- Argumentation
- Claim making
- Analytical narrative
- Meetings

Hypermedia Discourse research

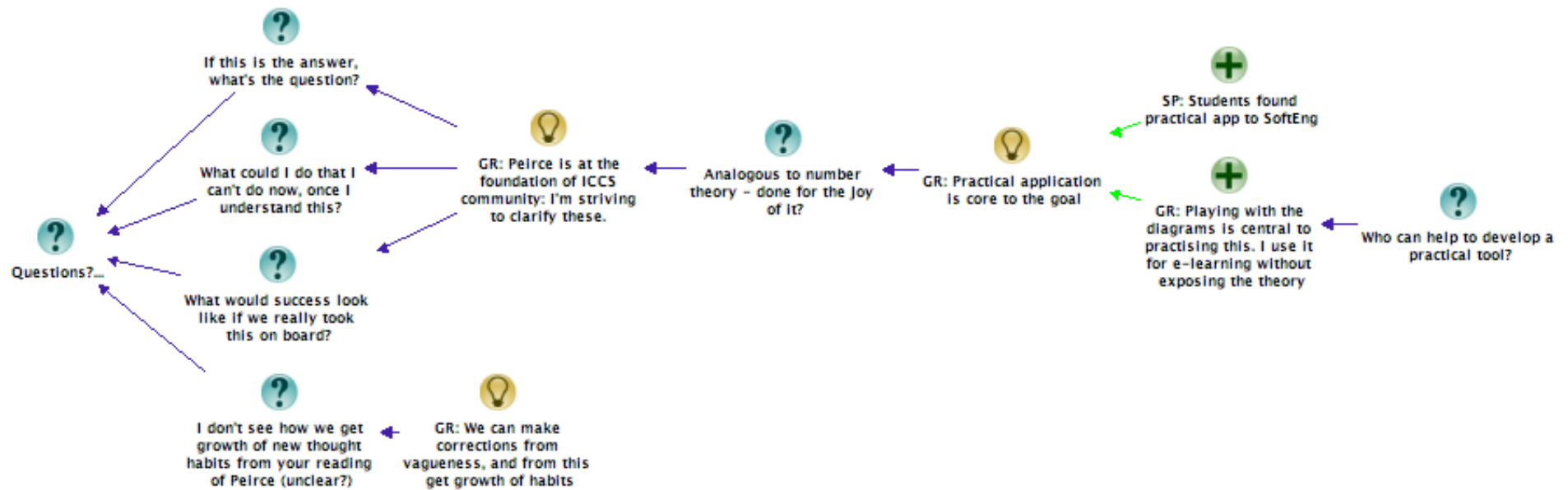




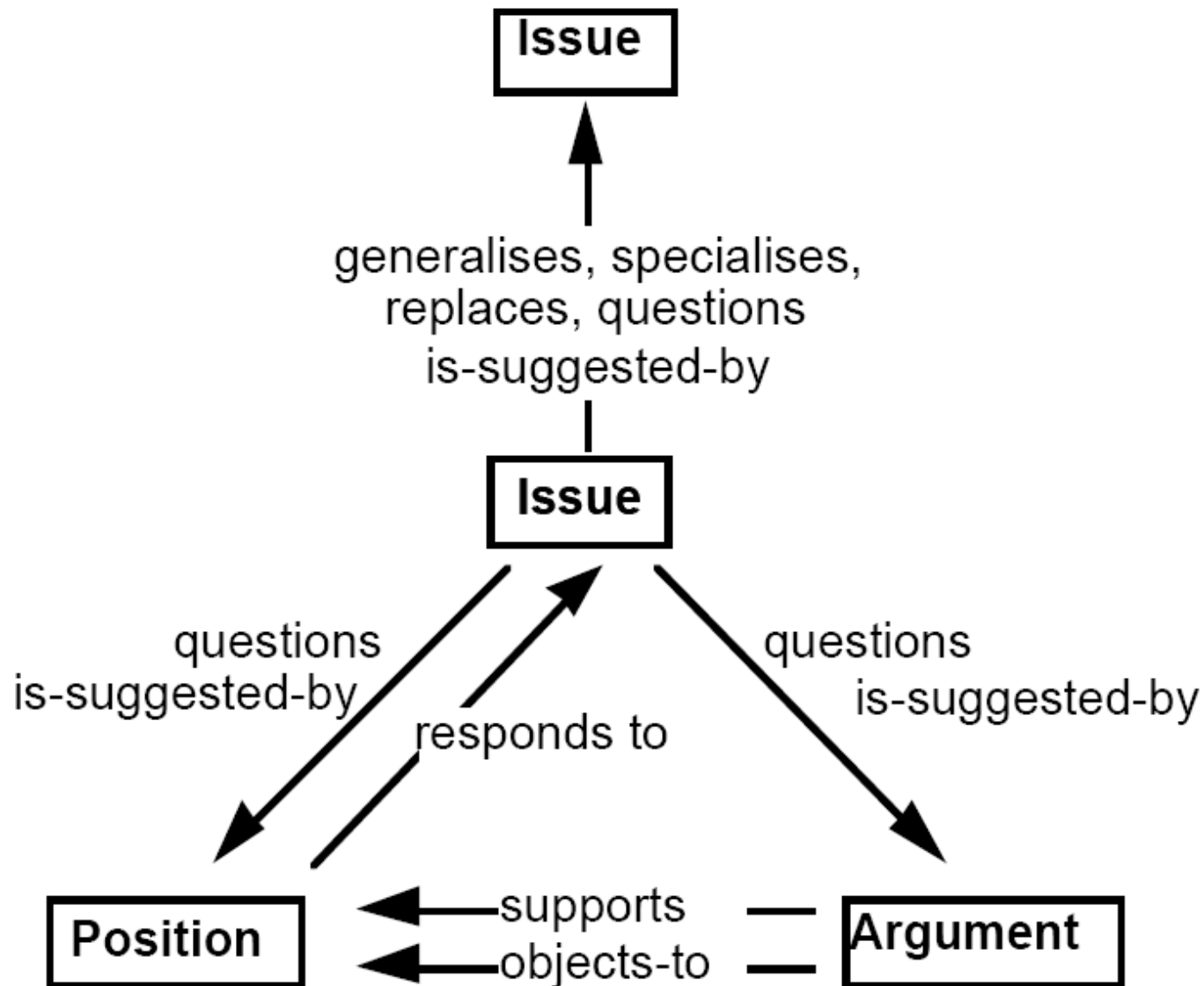
Compendium

- personal or group concept mapping
- real time meeting capture
- participatory modelling
- discourse as semantic hypertext

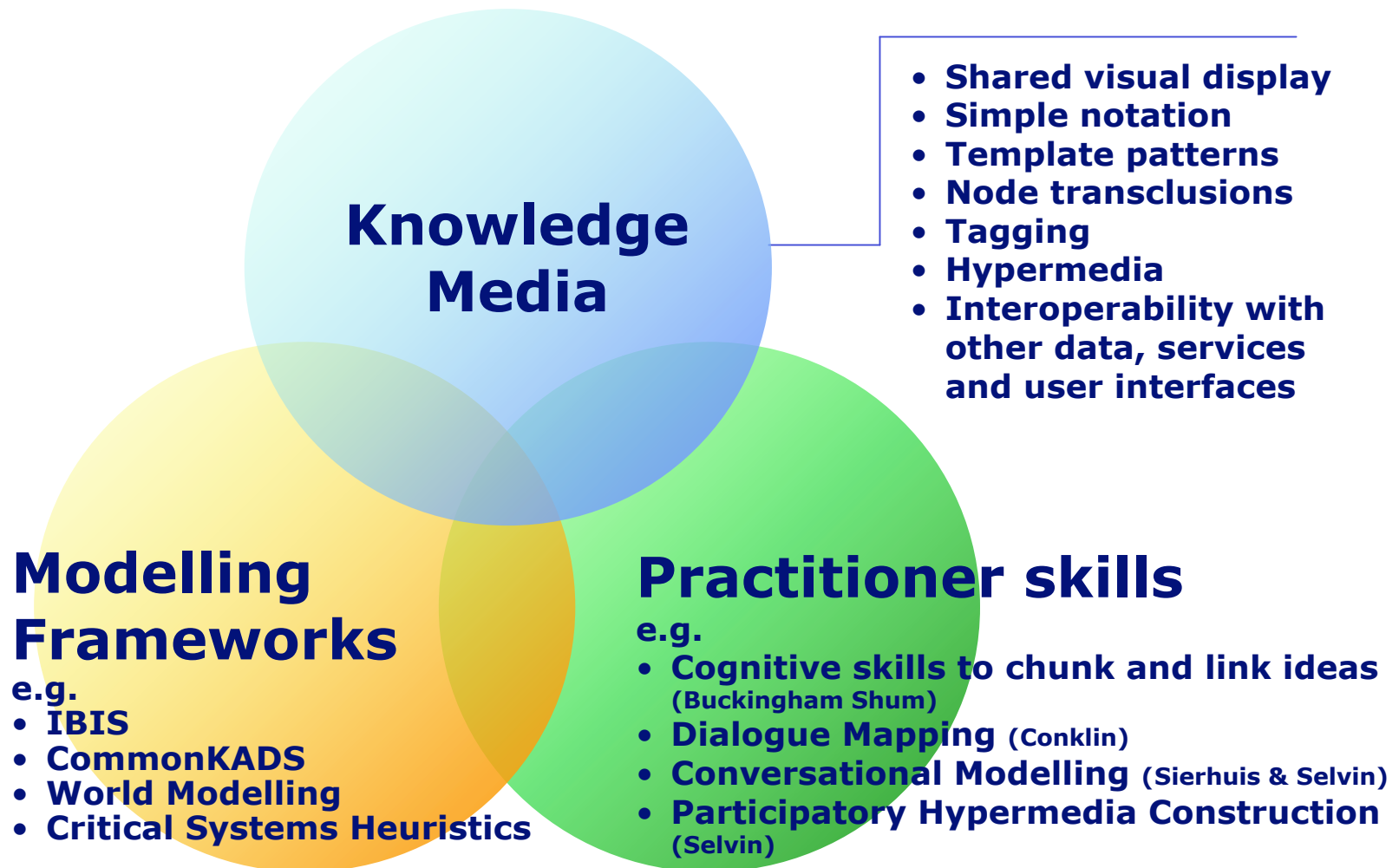
Dialogue Map fragment: Gary's keynote Q&A



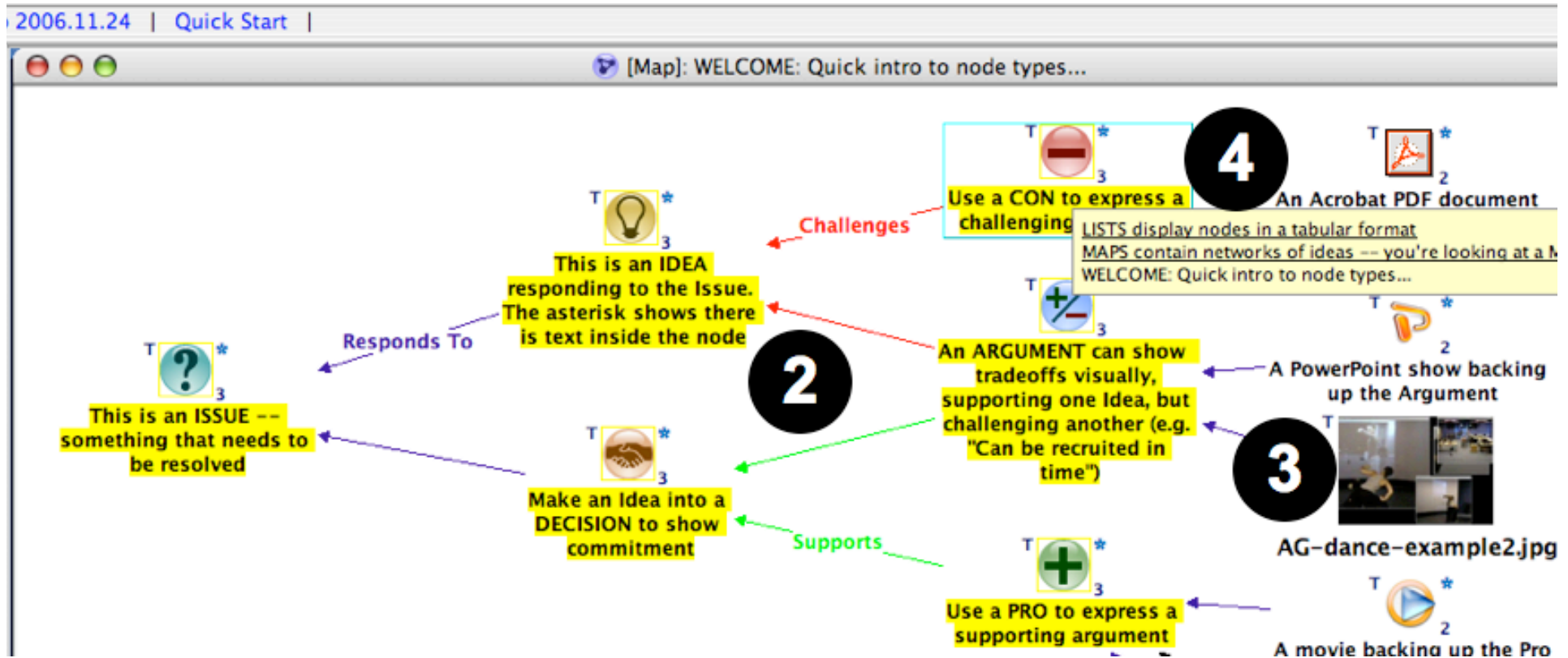
Discourse grounded in Horst Rittel's IBIS: Issue-Based Information System



Key elements of Compendium



Compendium: hypertext discourse mapping/conceptual modelling



Compendium: hypertext discourse mapping/conceptual modelling



Home Window | Maps... | Memetic Final Workshop 2006.11.24 | Quick Start |

Tags View

1

Make Tag(s) Make Group(s)

- e-Science User Adoption (5)
- Ecosystems (3)
- Example Tag (17)
- Example Tag - Answer/Idea (1)
- Example Tag - Argument/Constraint/Goal
- Example Tag - Con (1)
- Example Tag - Issue/Question (1)
- Example Tag - Pro (1)
- group (11)
- ID (2)
- Infrastructure (39)
- knowledge (1)
- KNOWLEDGE MAPPING
- LabSpace (34)
- location (0)
- Meeting Attendee (0)
- Mimesis (1)

5

[Map]: WELCOME: Quick intro

2

Challenges

Responds To

Supports

This is an IDEA responding to the Issue. The asterisk shows there is text inside the node

This is an ISSUE -- something that needs to be resolved

Make an Idea into a DECISION to show commitment



MAPS contain other nodes, and show the network structure -- such as this example



LISTS also contain other nodes, but display them in a list/table



This is a NOTE for misc. comments



REFERENCES link to external documents; double-click to launch, e.g....



REFERENCE to a website



REFERENCE to a PowerPoint file



REFERENCE to an Acrobat PDF file

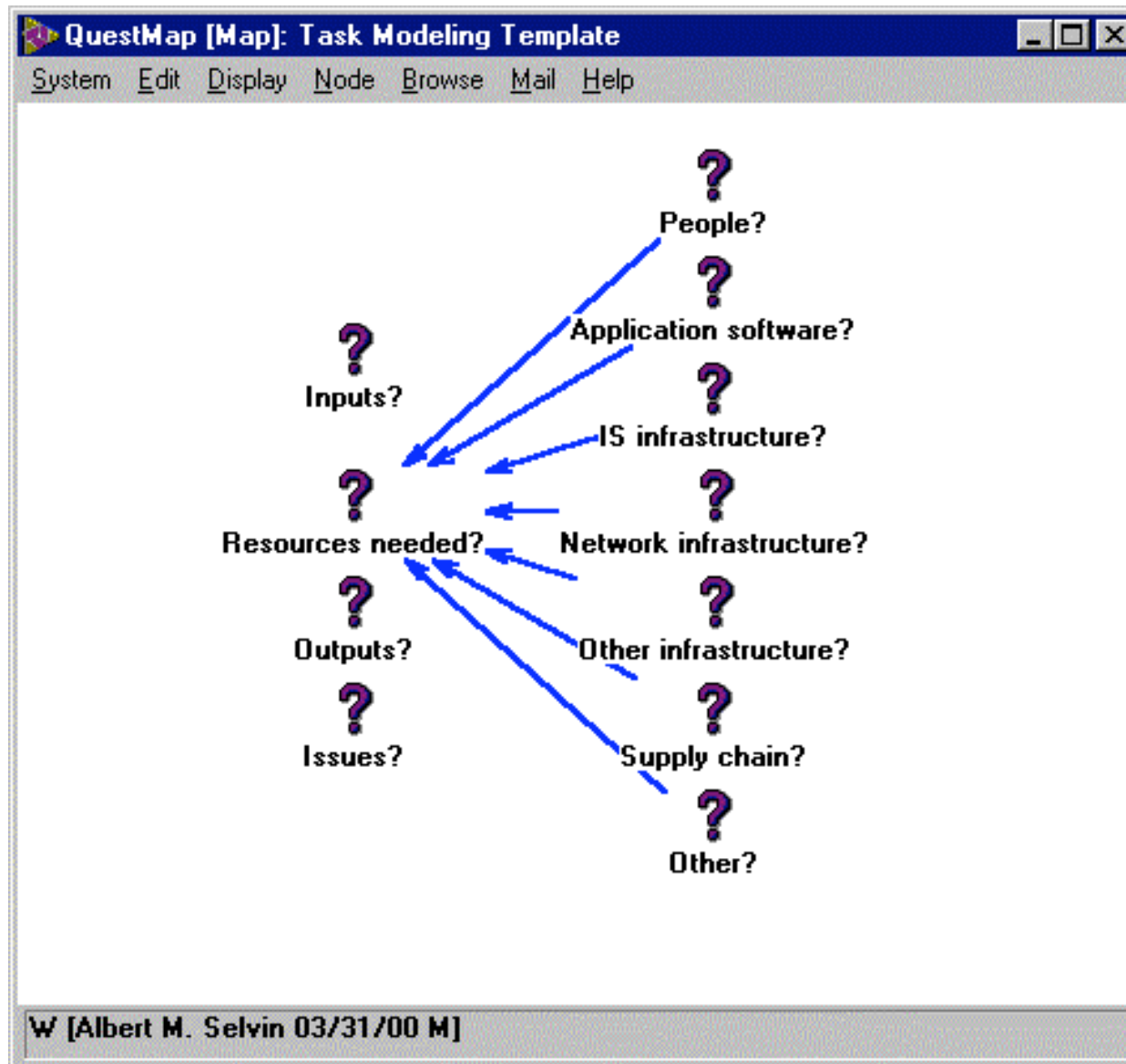


REFERENCE to a movie file

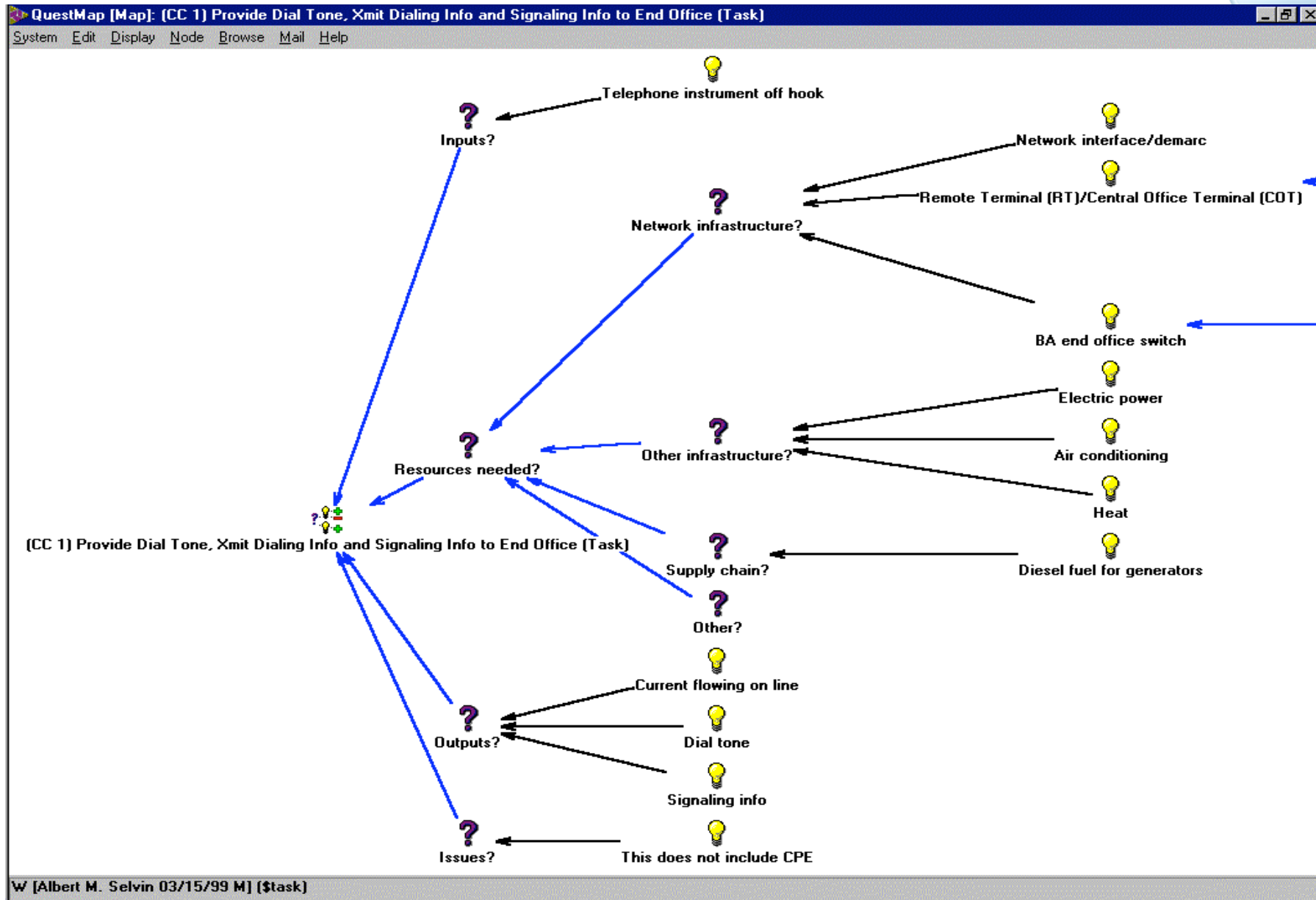


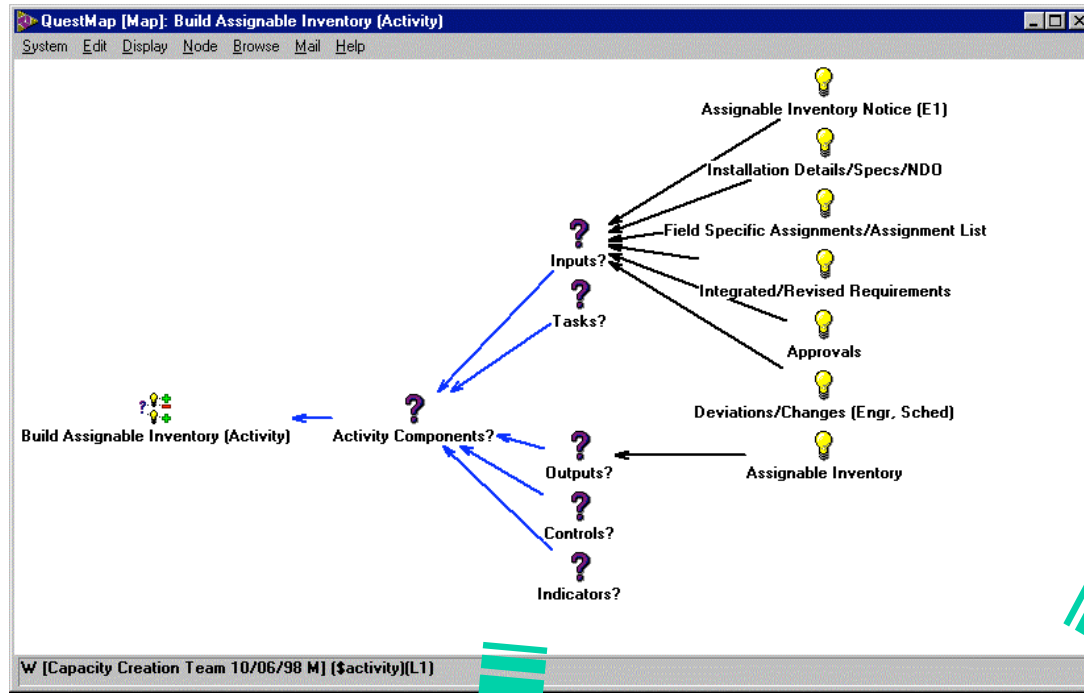
Modelling using Issue-templates

Modelling organisational processes in Compendium using a *Template*

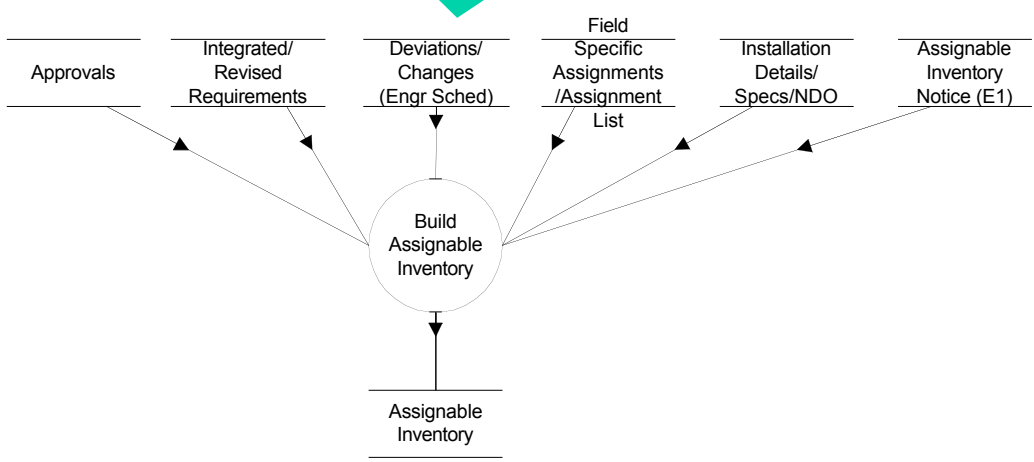
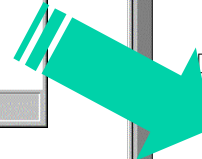


Completing a Compendium template





Generating Custom Documents and Diagrams from Compendium Templates



Microsoft Word - CCPFM0022299.doc

File Edit View Insert Format Tools Table Window Project Compendium Help

© Bell Atlantic

Network Engineering and Planning

Activity	Build Assignable Inventory
Activity Description	(L1)
Activity Components	
Inputs	<i>What is provided</i>
	Assignable Inventory Notice (E1) Need to reconcile whether this gets generated in "John's" process or "Jack's" process.
	Installation Details/Specs Engineering vendor's detail engineered specification used by the installation vendor to install/remove equipment.
	Field Specific Assignments/Assignment List Equipment location and assignment termination data. Based on the configuration requested via the CCR and is specific to the equipment placed in the office. Terminations, shams, cable lengths, unusual conditions, DCS, power (train, heat dissipation, etc.). The assignment terminations and equipment locations determined for the ER. Also includes "in-assignments."
	Integrated Requirements Any requirements added to the CCR that weren't there originally associated with or related to the CCR. Revised Requirements or supplements to Requirements that may require pricing of supplements to Previous Pricing or authorizations
	CM Consented CCR
	Deviations/Changes (Engr. Sched) Schedule, quality, equipment, building, frame, floor space, power. Deviations identified on the job. Unforeseen conditions at the job site or with the job that were identified after the job was engineered or before/after installation start (e.g., building or job-related conditions, customer initiated requests).
Outputs	<i>What is received</i>
	Assignable Inventory

Last Updated: April 11, 1999 Page 67 Capacity Creation FMO

Page 67 Sec 1 67/107 At 5.4" Ln 16 Col 69 REC TRK EXT OVR WPH

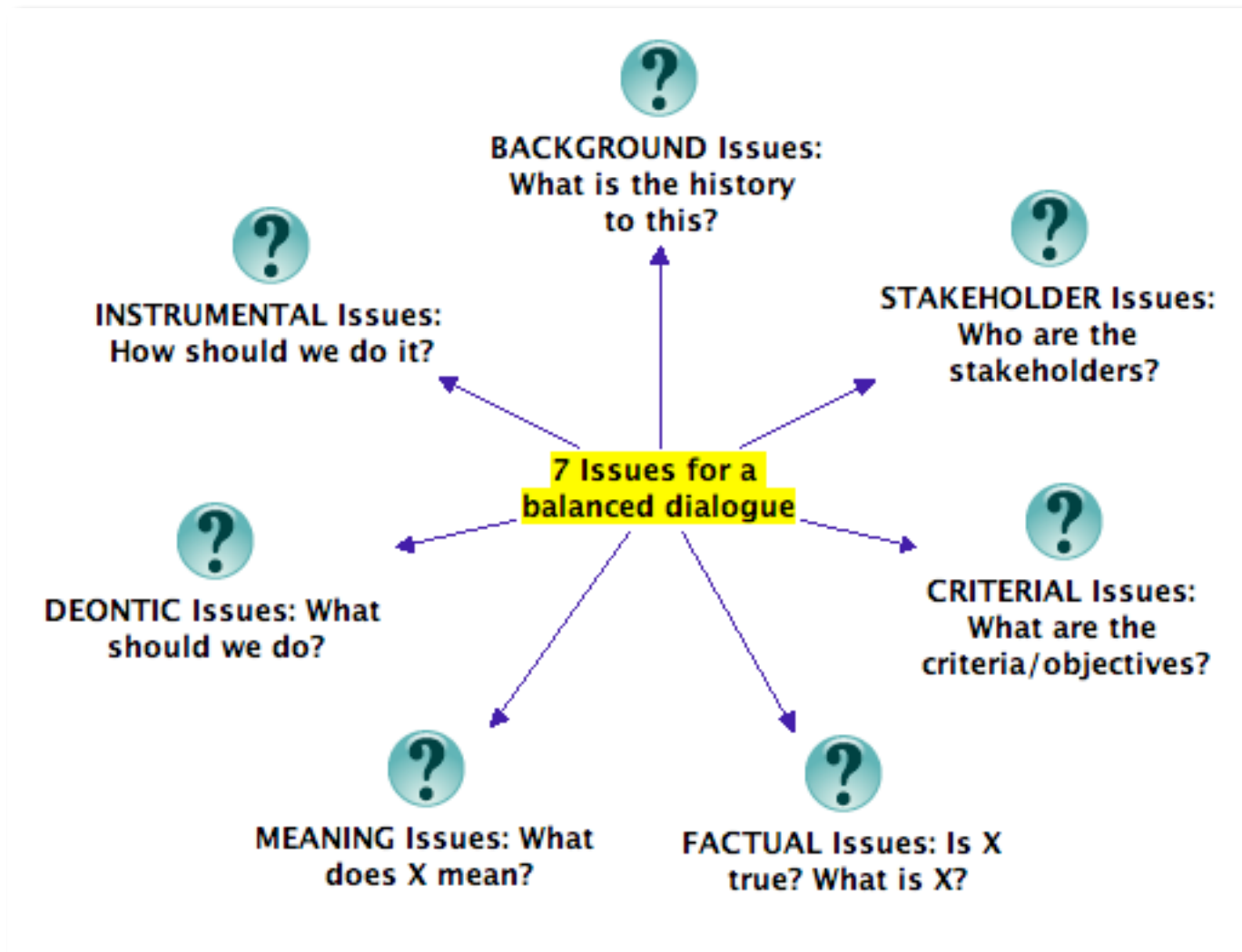


Structure management in Compendium

- **Associative linking**
nodes in a shared context connected by graphical Map links
- **Categorical membership**
nodes in different contexts connected by common attributes via metadata Tags
- **Hypertextual Transclusion**
reuse of the same node in different views
- **Templates**
reuse of the same structure in different views
- **HTML, XML and RDF data exports for interoperability**
- **Java and SQL interfaces to add services**

Heuristic for balanced Dialogue Mapping

(from Jeff Conklin's book "Dialogue Mapping", 2003)



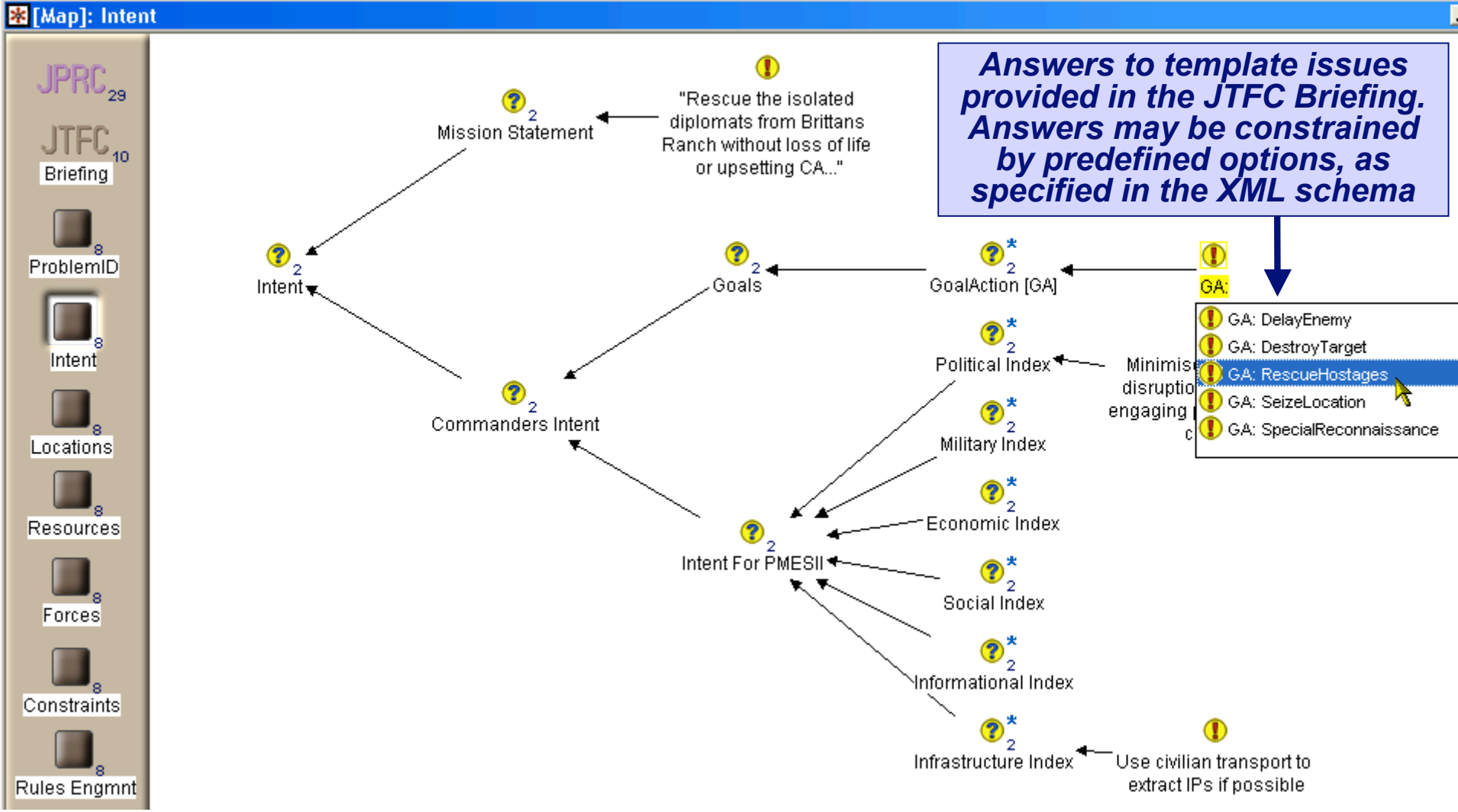


Using Compendium for personnel recovery planning

*Example of Conversational Modelling:
real time dialogue mapping combined with model driven
templates (AI+IA)*

Co-OPR Project (with Austin Tate):
<http://www.aiai.ed.ac.uk/project/co-opr>

Mission Briefing: *Intent* template



Capturing political deliberation/rationale



Compendium - Co-OPR Expt. B 2004.11.16

File Edit Map Format Tools Favorites Workspaces Window Help

[Map]: COA-2.1: Coalition D.I.m.E. (US; UK; AU)

JPRC 16 94
 MAP: COA-3
 COA Comparison

PMESII effects?
 IP capacity?
 RM R. Superiority?

1. Safe return of hostages
 Do not destabilize region
 Ensure safe retrieval of hostages
 Maintain good relations with nations
 Reinforce rule of law
 Preserve regional stability
 Be prepared for coalition follow-on
 Do not disturb CA balance of power or govt structure
 No hostage can be harmed

Rescue Mech.
 General issues
 Support
 IP

Need to focus on Cebesoy
 Focus on President Melen
 Contact senior military command structure to exert pressure via State Security Council

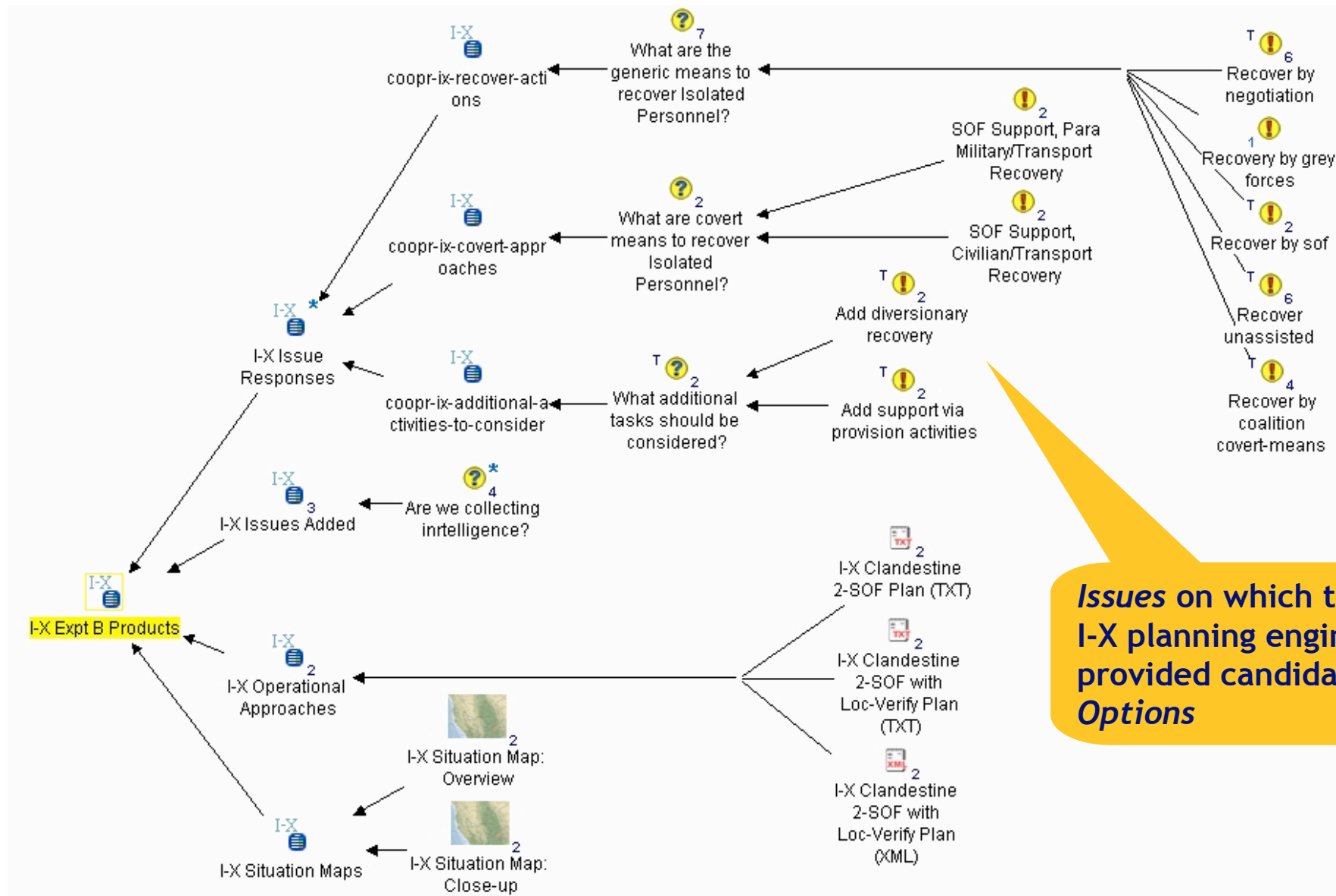
[Map]: Analysis of approaching Cebesoy

Should we approach Cebesoy to bypass the president to defuse the situation?

- + Cebasoy has contacts with several ambassadors
- CA has rejected all diplomatic approaches and offers of assistance
- ? Calif gov't lacks lift to move troops: Can we offer CA C130s or large trucks?
- ?* Can we offer economic inducements?
- + Tell Cebesoy that we know what he's doing
- + Admiral: We can contact Cebasoy and offer him help in
- Cebasoy is not a stable person --
- ? Do we go public about what we know about the conspiracy?
- PolMil: We can't go public outside of notifying President etc.
- ! Public diplomacy, propaganda would be counter-productive

Dialogue Map capturing the planners' discussion of this option

Planning Engine input to Compendium





Modelling a document corpus: The Iraq Debate

17 75

 What is Global Argument.net?

8 75

 Navigating these Argument Maps

11 75

 One War, Many Theories
 Michael Cohen

55 75


 Who are against the war?






















39 75

 Who are pro war?

18 75

 What concepts can help us to understand the war?

43 75

 How could the Iraq invasion be understood?

<p>3  Prof.international affairs 25 2003 Feb Walt [-]</p>	<p>3  Editor/commentator 25 2003 Mar AliTank [-]</p>	<p>3  Political philosopher 23 2003 Aug Gray [-]</p>	<p>3  Moral philosopher 11 2003 Sep Gaita [-]</p>	<p>3  Prof sociology 13 2003 Nov Mann [-]</p>	<p>3  Academic/commentator 23 2003 Dec Chomsky [-]</p>	<p>3  Historian/journalist 18 2003 Dec Chomsky [-]</p>	<p>3  Writer/commentator 23 2003 Dec Chomsky [-]</p>
<p>3 Iraq: The War Debate</p>	<p>3 The price of occupying Iraq</p>	<p>3 'Bush and Blair deceived about its impact on Iraq'</p>	<p>3 The war against Iraq was not a last resort</p>	<p>3 The Incoherent Empire</p>	<p>3 Iraq, War Profiteers...</p>	<p>3 Who are against the war? What are the war's causes? What ethical principles are at stake? What are the war's effects? See all the Reference Source G2 Power [-]</p>	<p>2 Manne [-]</p>
<p>3  Int.relations academic/editor 20 2002 Sep Harries [-]</p>	<p>3  Academic/author 30 2003 Feb Mearsheimer [-]</p>	<p>3  Prof political science 35 2003 Feb Waltz K. [-]</p>	<p>3  Int.relat academic/commentator 21 2004 Mar Fukuyama [-]</p>	<p>3  Former Aust foreign minister 19 2004 Jul Evans [-]</p>	<p>3  Political philosopher 30 2001 Elstain [-]</p>	<p>3  Prof.political science 32 2003 Nov Walzer [-]</p>	<p>3 On Prudence and Restraint in Foreign Policy</p>
<p>3 Keeping Saddam in a Box</p>	<p>3 Deterrence and Rogues</p>	<p>3 Roundup: Historians' Take on the News</p>	<p>3 invasion of Iraq was illegal</p>	<p>3 Just War and Human</p>	<p>3 Arguing about War</p>	<p>3 Author/former adviser to US sect state</p>	
<p>3  Academic/author 19 2002 Pollack [+]</p>	<p>3  Journalist/commentator 28 2003 Feb Kristol [+]</p>	<p>3  Journalist 32 2004 Jan Friedman [+]</p>	<p>3  Philosopher 23 2004 Feb Scruton [+]</p>	<p>3  Journalist/commentator 19 2004 Jun Krauthammer [+]</p>	<p>3  Author/former adviser to US sect state 16 2005 Jan Kagan [+]</p>	<p>3 The Threatening Storm The Case for Invading Iraq</p>	
<p>3 Iraq: The War Debate</p>	<p>3 Liberal Hawks Reconsider the Iraq War</p>	<p>3 Kant and Iraq</p>	<p>3 http://kmi.open.ac.uk/projects/compendium/iraq</p>				



Large scale NASA e–science field trials: Interoperability with other databases, software agents and collaboration tools

www.kmi.open.ac.uk/projects/coacting/nasa

Clancey, W.J., Sierhuis, M., Alena, R., Berrios, D., Dowding, J., Graham, J.S., Tyree, K.S., Hirsh, R.L., Garry, W.B., Semple, A., Buckingham Shum, S.J., Shadbolt, N. and Rupert, S. (2005). **“Automating CapCom Using Mobile Agents and Robotic Assistants.”** *1st Space Exploration Conference, American Institute of Aeronautics and Astronautics*, 31 Jan–1 Feb, 2005, Orlando, FL. Available from: AIAA Meeting Papers on Disc [CD-ROM]: Reston, VA, and as Advanced Knowledge Technologies ePrint 375: <http://eprints.aktors.org/375>

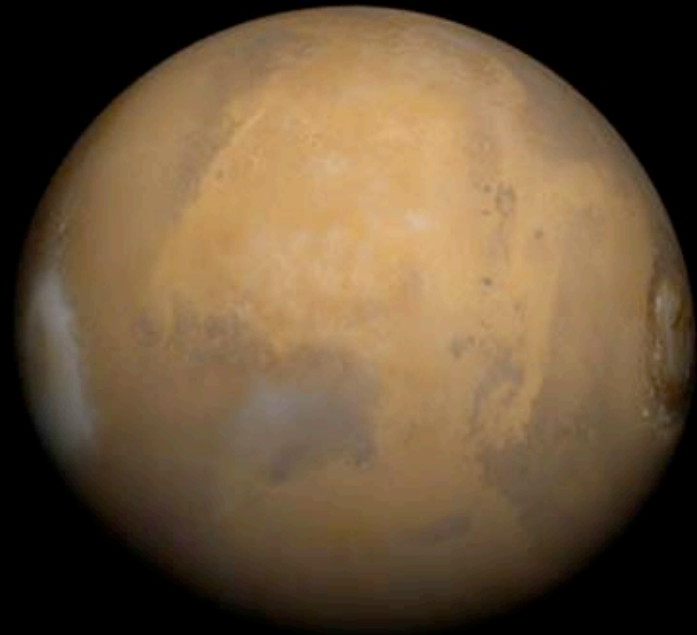


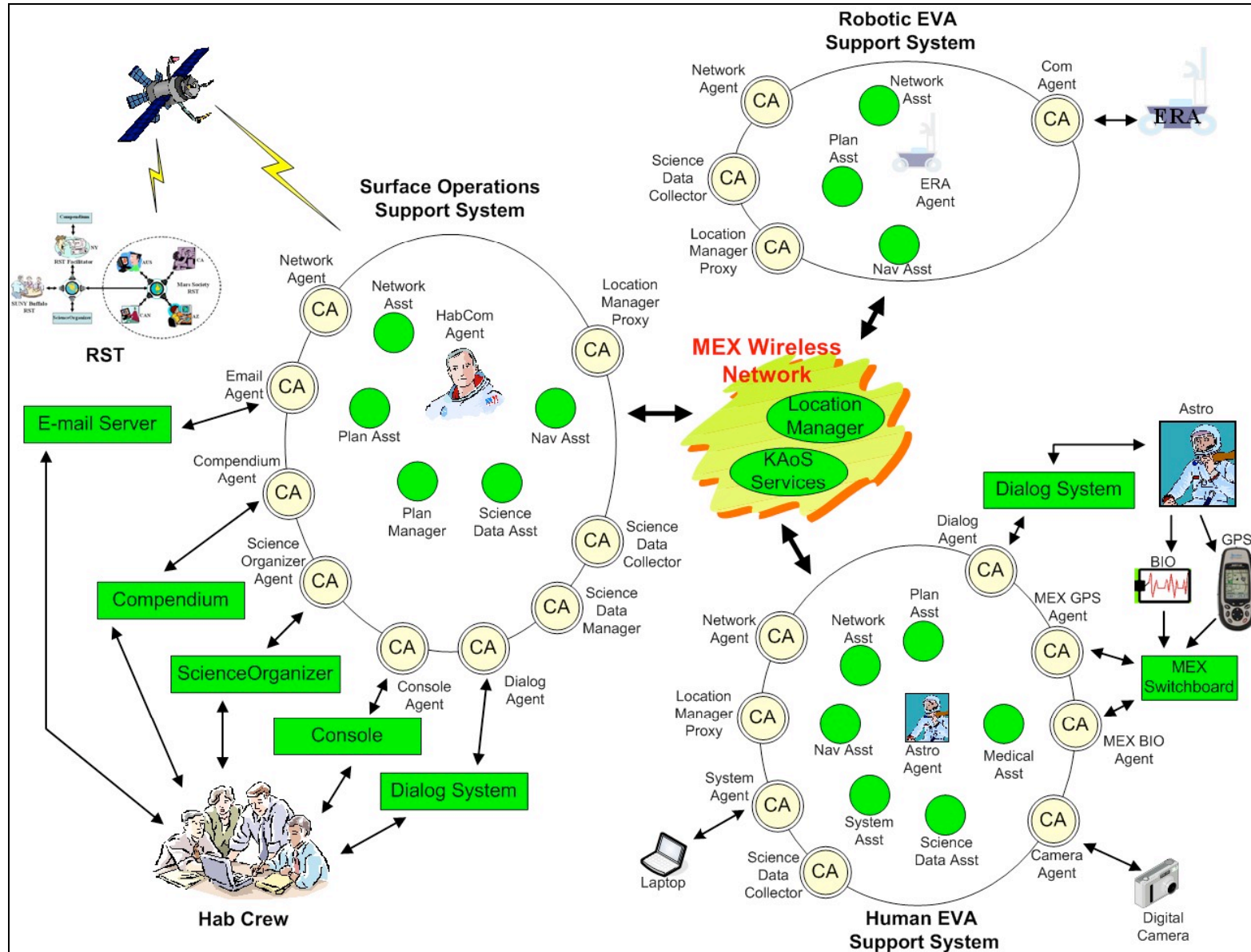
Image Credits--- Mars: NASA/JPL/MSSS; Earth: NASA/JSC; Composite: MSSS

NASA e-science field trials (2004 and 2005)



**Distributed Mars-Earth planning and data analysis tools
for Mars Habitat field trial in Utah desert, supported from US+UK**

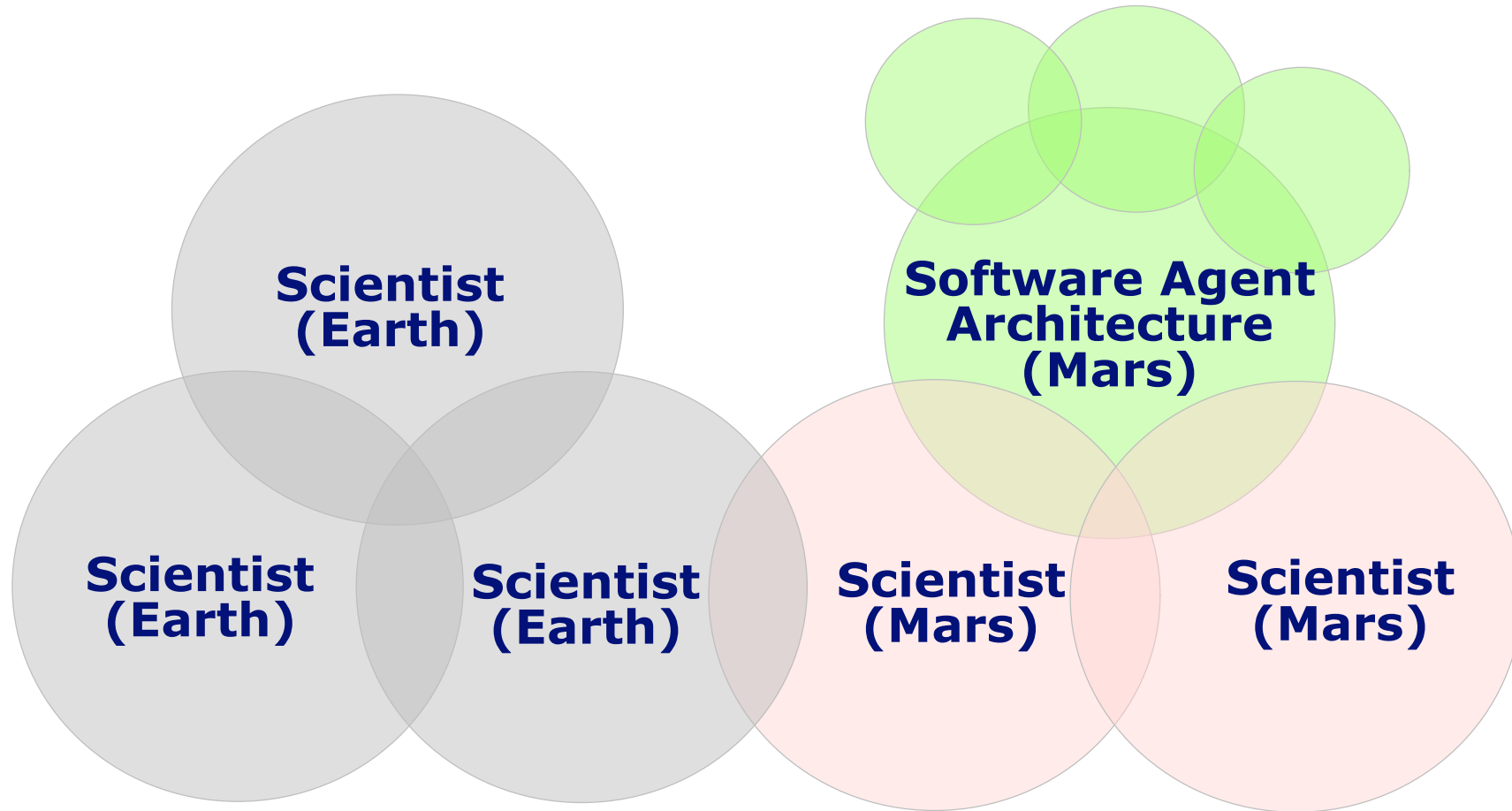
NASA Mobile Agents Architecture



Collaboration Configuration

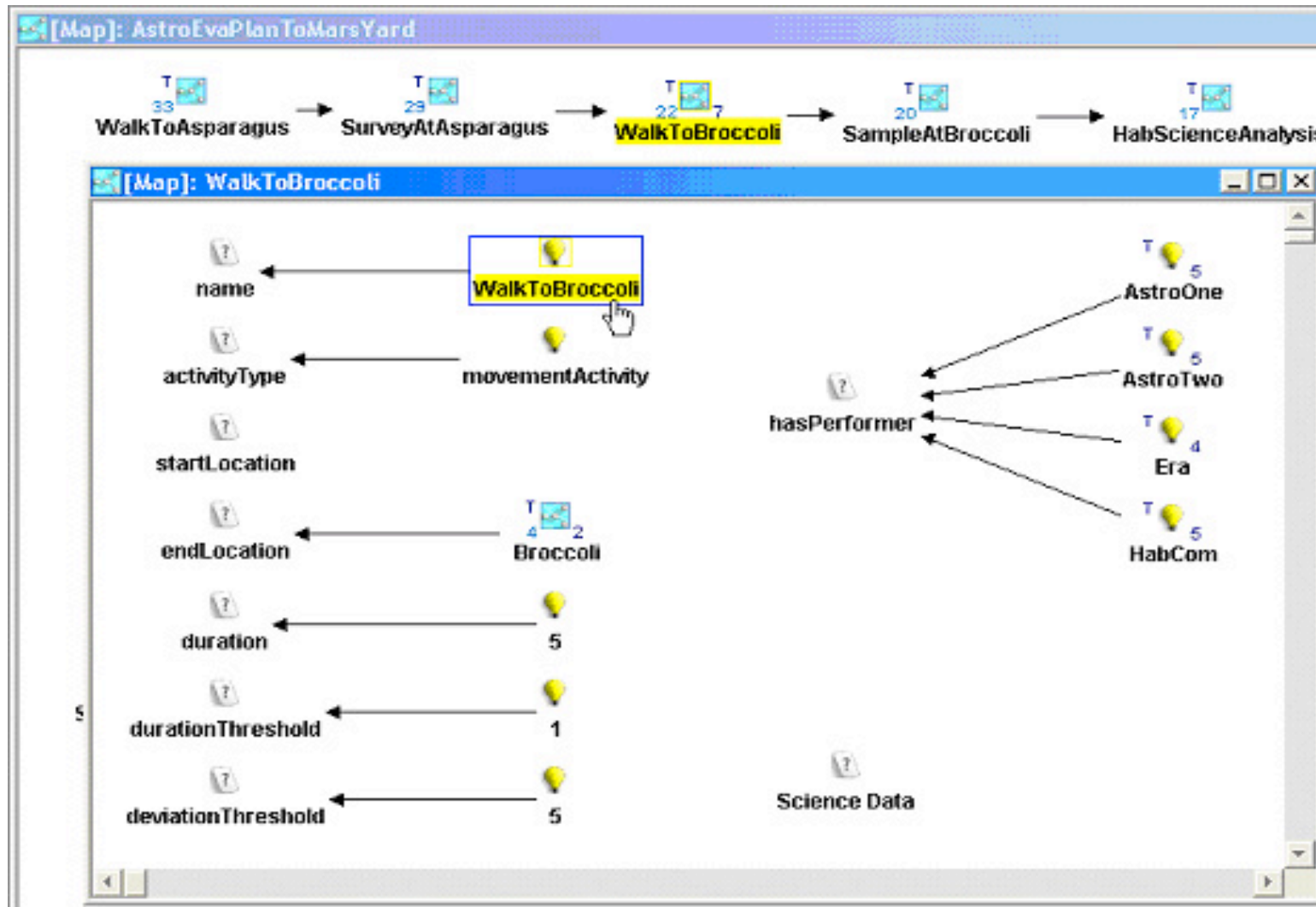


Compendium used as a collaboration medium at all intersections:
humans+agents, reading+writing maps



NASA testbed:

Compendium activity plans for surface exploration, constructed by *scientists on 'Earth'*, interpreted by *software agents on 'Mars'*

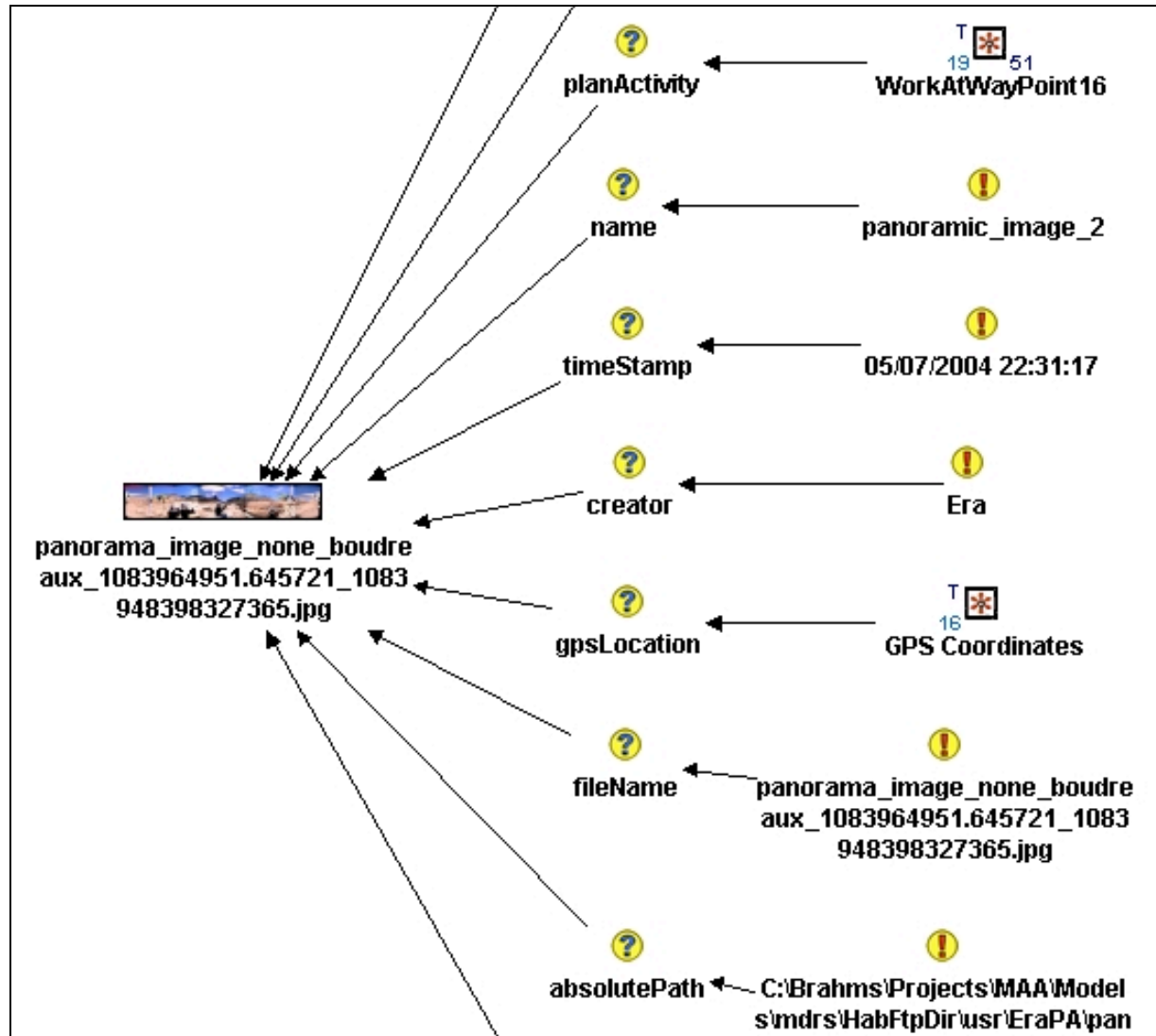


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University, Southampton
University
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permission

The Compendium nodes and relationships in this plan were interpreted by Brahms software agents for monitoring and coordinating astronaut and robot activity during surface explorations.

CoAKTiNG NASA testbed:

Compendium science data map, generated by *software agents*, for interpretation by *Mars+Earth scientists*



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University
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The Compendium maps were autonomously created and populated with science data by Brahms software agents that use models of the mission plan, work process, data flow and science data relationships to create the maps.

CoAKTinG NASA testbed: Compendium-based photo analysis by *geologists* on 'Mars'



Compendium - NASA MDRS Crew29 FINAL

File Edit Map Format Tools Favorites Workspaces Window Help

75% 1:1

[Map]: Brent's Analysis

(In Brent's map) Please verify that the Rock and Back Hill location names are correct, as Sci Org says they are Red and Rock

LOCATION: Rock Hill

LOCATION: Gap between Rock Hill and Back Hill

LOCATION: Back Hill

Mosaic of Rock Hill w/ Abby and Boudreaux for scale

dsc02581.jpg dsc02590.jpg dsc02589.jpg

voice_note_2004-3-29_22-40-25.wav

Context photo of Sample RK/M1/01 (SEE TAG for more detail)

dsc02587.jpg

Summary of Field Work at Rock Hill

(In Abby's map) Which of these 4 samples came from the rock perspective photo in Brent's map?

OBSERVATION: Rock Hill looks to have two layers not three as observed in Panoramas

Did not get to sample the reddish hills off to the north (left side in photos)

dsc02585.jpg

Close up photo of sample RK/M1/01

NOTE ON SAMPLE BAG Naming:

voice_note_2004-3-29_22-22-35.wav

This photo is v good - links Outcrop to the Rock perspective, and we are excited to incorporate it into the methodology :-)

Not a good photo - sampling area is out off

This is my bad for not being clear that the sample that i took here is the broken fragments of the sandstone to

dsc02596.jpg dsc02595.jpg dsc02594.jpg

dsc02592.jpg

dsc02593.jpg

dsc02589.jpg

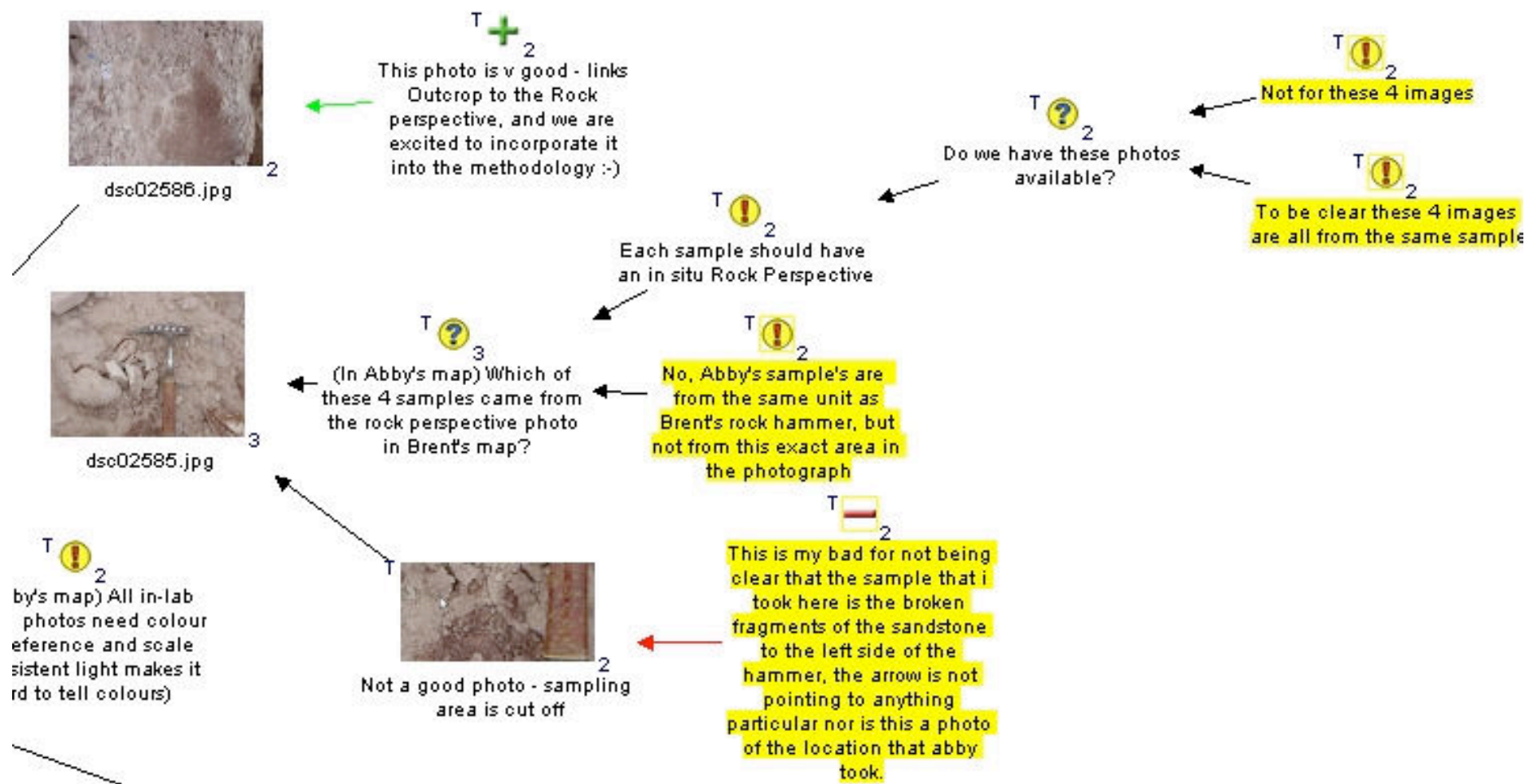
dsc02597.jpg

dsc02598.jpg

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NASA testbed:

Compendium scientific feedback map *from Earth scientists to Mars colleagues*





Using Compendium to map and automatically index replayable video conferences

CoAKTinG Project: www.aktors.org/coakting

Memetic Project: www.memetic-vre.net



Collaborative sensemaking in e-Science:

Meeting Replay tool for *Earth scientists*, synchronising video of *Mars crew's* discussion as they annotate their mission plans

[Map]: Lith Canyon EVA Segment 1 Crew Planning Meeting 05/03/04

lithseg1wproute.jpg

WayPoint0
WayPoint1
WayPoint2
WayPoint3
WayPoint4

Where should Boudreaux take Panoramas?

Where should Boudreaux take Pictures?

Start Boudreaux Watch me when descending into the canyon starting at Fossil Hill

You can have Boudreaux take a picture of AstroOne at any time after that

Make sure that Boudreaux is in line of sight from AstroOne. Thus move it to

Title: Lith Canyon EVA Segment 1 Planning Meeting - 3rd May 2004
Date: Tue May 4 00:37:00 2004
Participants: [Maarten](#), [Brent](#), [Abigail](#), [John](#)

Current Speaker: Maarten
Nodes: Make sure that Boudreaux is in line of sight from AstroOne. Thus move it to WP 2 and 3 at appropriate times

Video **Playing** 00h 29m 09s **Pause**

Group Sync Offline Online
Mode Master Slave
Receiving Yes No

Agenda
Compendium
Abigail
Brent
John
Maarten

NASA MR Clip: 00:50

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Memetic Meeting Replay

The CoAKTinG project's results are now mainstreamed in the Access Grid by the JISC Memetic VRE project





◀ [back](#) Title: [Memetic Meeting 2005-12-15 \(1\)](#)
 Date: 15 Dec 2005, 09:37
 Participants: Michelle Bachler, Simon Buckingham Shum, Clara Mancini, Danusz Michaelides, Andrew Rowley, Roger Slack

Agenda	
Compendium	██████████
Michelle Bachler	██████████
Simon Buckingham Shum	██████████
Ben Juby	██████████
Clara Mancini	██████████
Danusz Michaelides	██████████
Andrew Rowley	██████████
Roger Slack	██████████

Memetic Meeting Replay

The CoAKTiNG project's results are now mainstreamed in the Access Grid by the JISC Memetic VRE project

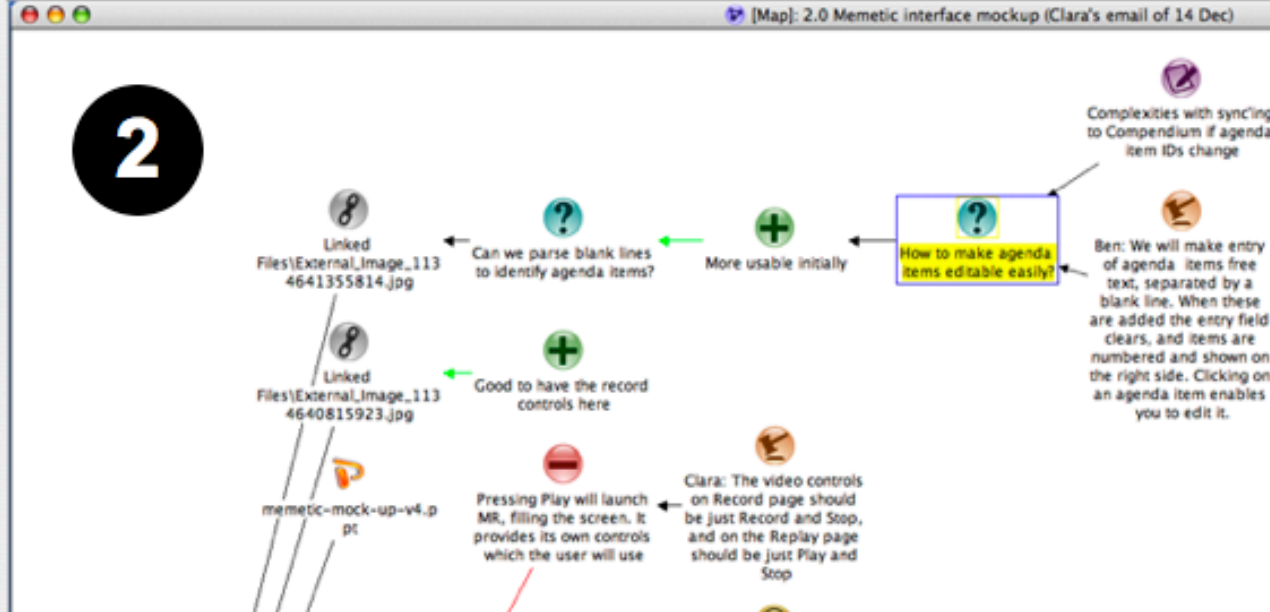


File Edit View Format Tools Favorites Workspaces Window Help

[Map]: 2.0 Memetic interface mockup (Clara's email of 14 Dec)

2



back Title: [Memetic Meeting 2005-12-15 \(Imported\)](#)
Date: 15 Dec 2005, 09:37
Participants: Michelle Bachler, Simon Buckingham Shum, Ben Jubu, Clara Mancini, Danius Michaelides, Andrew Rowley, Roger Slack (sites)
Speaker: Ben Jubu
Agendum: 2.0 Memetic interface n
Events: Selecting node
Nodes: ? How to make agend

Agenda	Compendium	Michelle Bachler	Simon Buckingham Shum	Ben Jubu	Clara Mancini	Danius Michaelides	Andrew Rowley	Roger Slack

3



Compendium 'literacy'?

**...understanding how to write, read,
talk and think in hypermedia IBIS**

**...approaches from consultancy in the
field, and video analysis in the lab...**

Literacy: significant user community



www.CompendiumInstitute.org

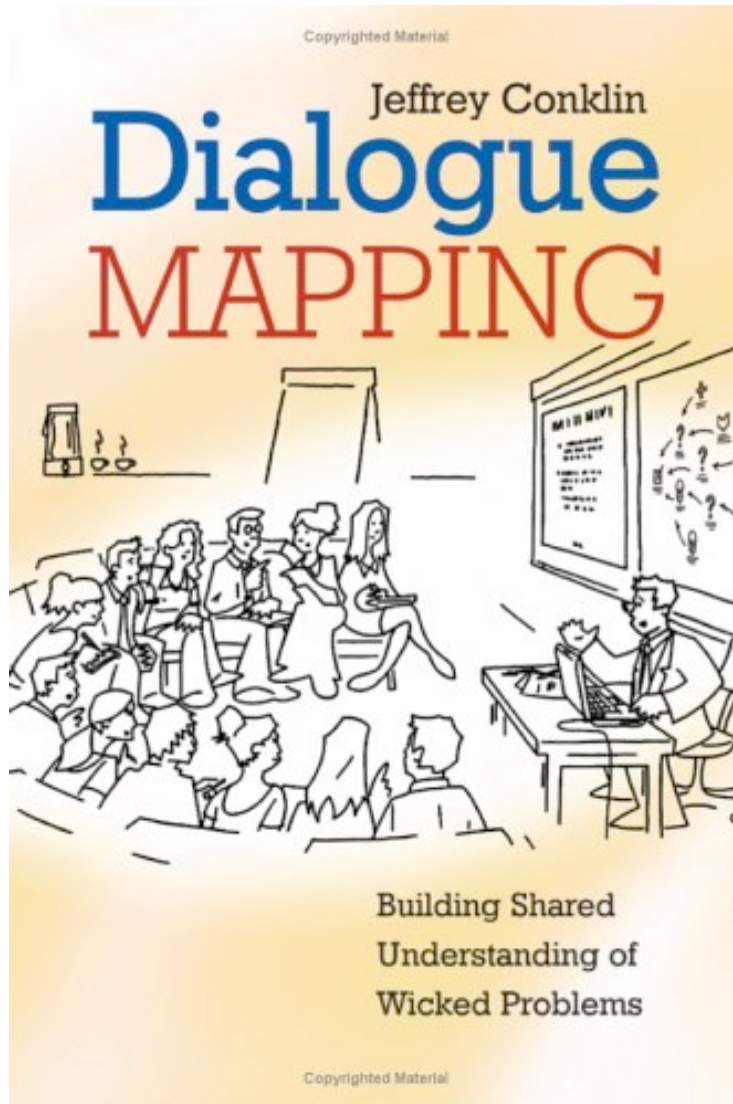
The image shows a screenshot of a web browser displaying the Compendium Institute website and a workshop page. The browser window has multiple tabs open, including 'Compendium Institute' and 'http://kmi.open.ac.uk/projects/compendium/workshop2005/...'. The main website page features a navigation menu with links for Home, Tools, Library, Training, Community, Download, Developers, and Support. Below the menu, there is a section titled 'Compendium Institute' with a sub-header 'The Compendium Institute is an open forum for the ongoing development of the Compendium methodology. We are currently investigating support our activities. These currently include the maintenance of semiformal gatherings of the community, the authorship of and certification, and the authorship of...'. A sidebar on the left contains links for 'Compendium Institute News', 'About Compendium', 'Associated Institutions', and 'Acknowledgements'. Below the sidebar, there is a section titled 'About Compendium' with text describing the methodology: 'Compendium has three key elements and analyzed, a methodology that allows of tools for quickly and easily sharing group. The process enables people to participate in the discussions, and share representative practice -- an approach crucial in keeping...'. At the bottom of the sidebar, there is a section titled 'The Community Showcase' with a link to 'Visit the Community Showcase'. The main content area on the right shows a 'Compendium Institute Workshop 2005' page with a grid of images showing workshop activities, including presentations and group discussions. The images are arranged in a 3x3 grid, with the top row showing a presenter at a whiteboard, the middle row showing a group of people in a meeting, and the bottom row showing a presenter at a whiteboard. The workshop page also includes a navigation menu with links for 'Day 1', 'Day 2', and 'About the Workshop'.



Literacy: Cognitive task analysis

- **Cognitive tasks involved in using a graphical argumentation scheme** (Buckingham Shum 1996)
- **Affordances of graphical DR for coordinating group design** (Buckingham Shum et al 1997)

Literacy: the craft skill of IBIS mapping in meetings: “Dialogue Mapping”



Jeff Conklin:
CogNexus Institute:
www.CogNexus.org

Literacy: expertise analysis

(Albert Selvin)



- *What is the nature of expert human performance in creating and modifying real time conceptual structures for groups?*

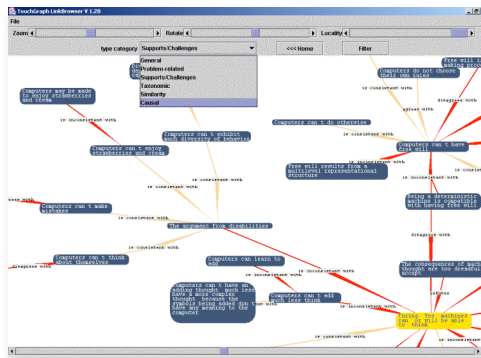
- **The NASA knowledge mapper role:**

- Listening and interpreting
- Intervening in 'normal' conversation flow
- Getting validation for captured material

} Conventional
facilitation
skills

- Building hypertext representations on the fly
- Interrelating data and objects
- Adding metadata
- Software-specific skills

} Knowledge
media
facilitation
skills



Scholarly Ontologies Project

- Web publishing of scholarly claims and argumentation
- discourse as semantic hypertext

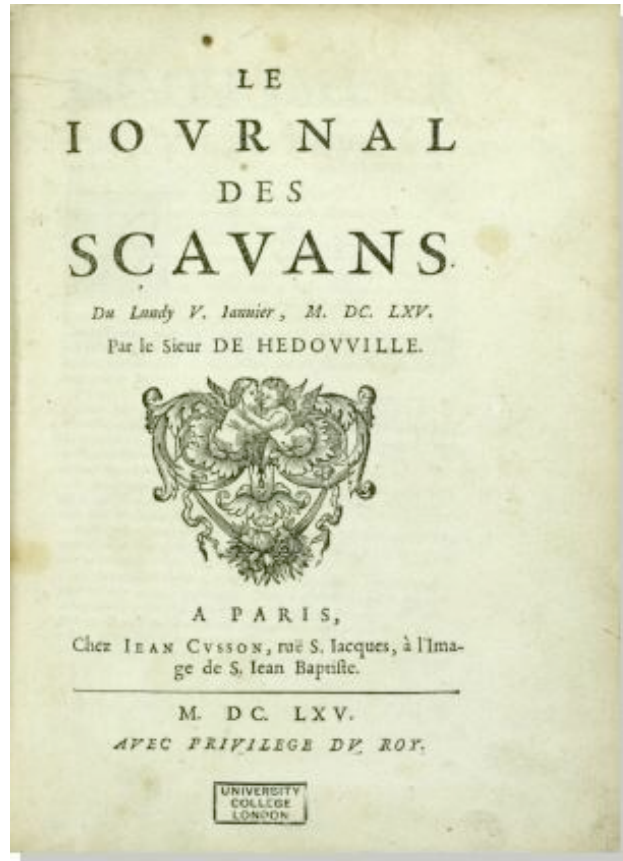
Will scientific publishing in 2020 still depend solely on the reading, writing, and discovery of written texts?

What might a more network-centric complement look like?

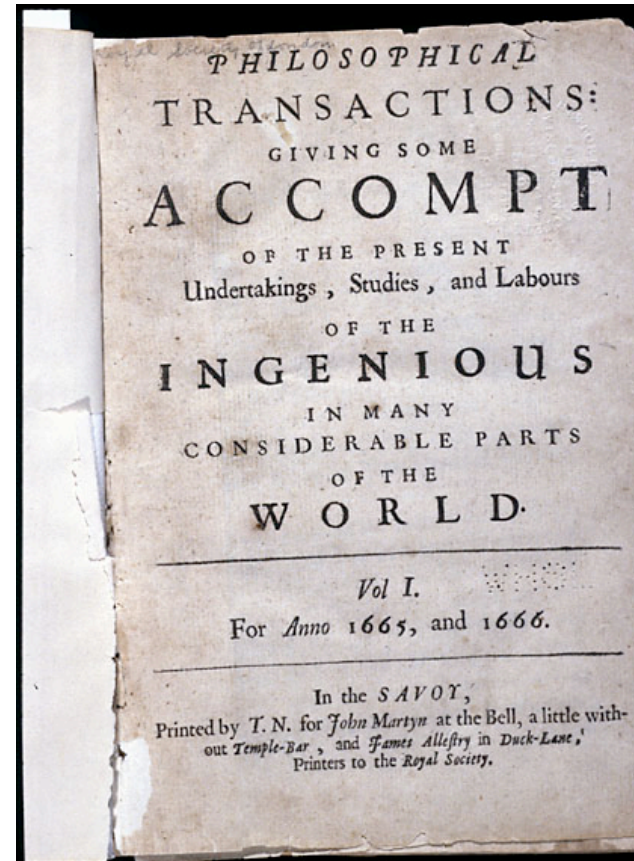
In Gutenberg's shadow (or standing on his shoulders)



Newspapers + Invisible Colleges = Scholarly Journals



Le Journal des Sçavans
January 1665



*Philosophical Transactions of
the Royal Society of London*
March 1665




Jumping forward 342 years...

2007: Ideas are now digital



...digital paper!

	Conceptual Structures at Work	
	12th International Conference on Conceptual Structures, ICCS 2004, Huntsville, AL, USA, July 19-23, 2004. Proceedings	
	Book Series	Lecture Notes in Computer Science
	Publisher	Springer Berlin / Heidelberg
	ISSN	0302-9743 (Print) 1611-3349 (Online)
	Volume	Volume 3127/2004
	DOI	10.1007/b98793
	Copyright	2004
	ISBN	978-3-540-22392-4
	Subject Collection	Computer Science
SpringerLink Date	Tuesday, June 29, 2004	

[Editorial View](#) | **[Expanded List View](#)** | [Condensed List View](#)    

26 Items

First | **1-10** | 11-20 | 21-26 | Next

Access to all content Access to some content Access to no content

1. A Cartesian Closed Category of Approximable Concept Structures [Add to marked items](#)

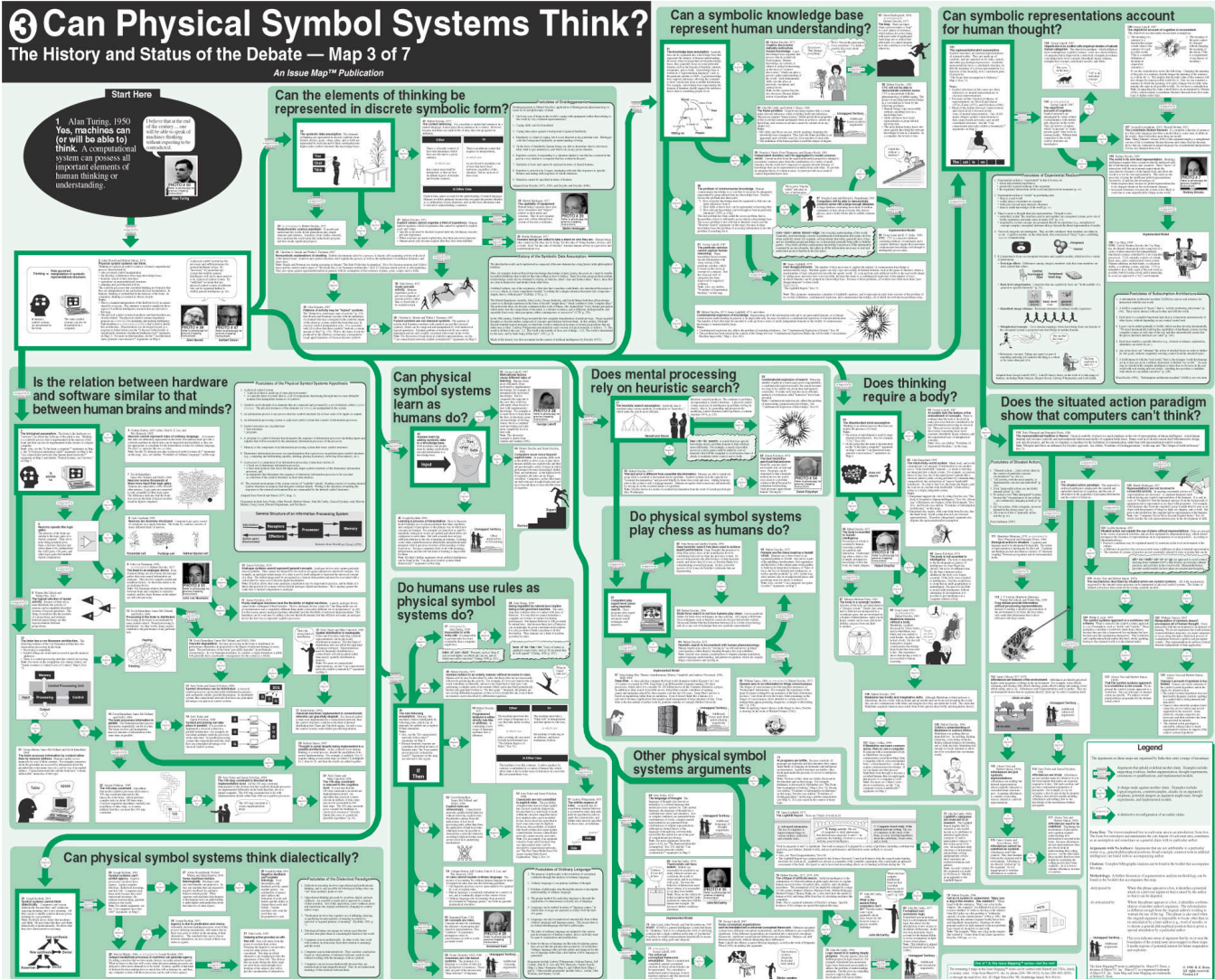
Category	Concept Lattices and Concept Graphs
Pages	170-185
Authors	Pascal Hitzler and Guo-Qiang Zhang
Subject Collection	Computer Science
Text	PDF (214 kb) HTML

2. A Priorean Approach to Time Ontologies [Add to marked items](#)

Category	Reasoning with Conceptual Structures
Pages	388-401
Authors	Peter Øhrstrøm and Henrik Schärfe
Subject Collection	Computer Science
Text	PDF (228 kb) HTML

What if we could get search results like this?...

“What is the Turing Debate?”



One of seven maps in the *Mapping Great Debates: Can Computers Think?* Series. MacroVU Press. www.macrovu.com (Horn, 2003; Yoshimi, 2006)

Can Physical Symbol Systems Thin?

The History and Status of the Debate — Map 3 of 7

An Issue Map™ Publication

Start Here

1 Alan Turing, 1950
Yes, machines can (or will be able to) think. A computational system can possess all important elements of human thinking or understanding.

I believe that at the end of the century ... one will be able to speak of machines thinking without expecting to be contradicted.



PHOTO # 50
Alan Turing

Can the elements of thinking be represented in discrete symbolic form?



23 Robert Dreyfus, 1972
The context sensitivity. The analogue to contextual sensitivity in a natural language. It must place these sentences in a context. It must be because he has seen a pile of dirt, that he says it is a pile of dirt.

Either	Or
There is already context of fact that determines which fact we refer to in a given sentence.	There is an arbitrary context that implies an interpretation, in which case...
...in which case...	...we do not need to generate a set of facts that have that context, say on the basis of the situation. This is not an act of free choice.

24 Robert Dreyfus, 1972
It is either Case

This is a false either-or because for the ordinary setting of most of the facts that we use the problem because they are not in the same context but a combination of past situations, and so that have elements that are not in the same context.

Postulates of Dreyfus's epistemology:

1. The basic way of being in the world is coping with equipment rather than reflecting on the world by the use of formal representations.
2. Coping skills can't be formalized.
3. Coping skills require a background of power of flexibility.
4. Flexibility is a kind of coping that is not directed at any particular task. It depends on the background flexibility as a background of coping.
5. On the basis of flexibility, humans being able to describe what is relevant, what is important, and what to do in any given situation.
6. Regular systems of responding to a situation cannot be used but have occurred in the past in a way that is a response that has worked in the past.
7. Flexibility to learn and cope can be analyzed in terms of shared features.
8. Together to attend to a target, regularity is what allows us to specify features and dealing with equipment to deal with situations.
9. Situations must be specified in terms of States.

Adapted from Dreyfus (1972, 1985) and Dreyfus and Dreyfus (1986).



PHOTO # 23
Herbert A. Simon

25 Herbert A. Simon, 1973
Explicit systems cannot organize a field of experience. Human beings organize a field of experience that contains objects by explicit goals and rules.

• Explicit goals must be described in general terms, but human beings do not do this. They are not explicit about their goals.

• Human beings are not explicit about their goals because they have to deal with a field of experience that is not explicitly defined.

26 Marvin Minsky, 1967
Humans beings are called to take a stand on who they are. Human beings take a stand on who they are by being "in the state" of being a human, doctor, and so forth. Such "in the state" of being a human being is a particular and unchangeable way.

27 John Denno, 1977
Complex people activity. Human beings organize a field of experience that contains objects by explicit goals and rules.

• Human beings are not explicit about their goals because they have to deal with a field of experience that is not explicitly defined.

History of the Symbolic Dismissal Assumption

The idea that the world can be reduced to a set of discrete objects has a long history in the philosophy of science.

But, for example, to see that the knowledge, knowledge of play, justice, the good, is not to be reduced to a set of discrete objects is to see that the knowledge could only be obtained by seeing in what is called "the state" of being a human, doctor, and so forth. Such "in the state" of being a human being is a particular and unchangeable way.

John Denno (1977) argued that the idea that a machine could think, which is the idea of the Symbolic Dismissal Assumption, is a kind of "in the state" of being a human, doctor, and so forth. Such "in the state" of being a human being is a particular and unchangeable way.

The Symbolic Dismissal Assumption, which is the idea that a machine could think, which is the idea of the Symbolic Dismissal Assumption, is a kind of "in the state" of being a human, doctor, and so forth. Such "in the state" of being a human being is a particular and unchangeable way.

28 John Denno, 1977
Pattern of activity may be "typed" systems. The "structure" of activity may be "typed" systems. The "structure" of activity may be "typed" systems. The "structure" of activity may be "typed" systems.

29 Marvin Minsky, 1967
Humans beings are called to take a stand on who they are. Human beings take a stand on who they are by being "in the state" of being a human, doctor, and so forth. Such "in the state" of being a human being is a particular and unchangeable way.

30 Marvin Minsky, 1967
Humans beings are called to take a stand on who they are. Human beings take a stand on who they are by being "in the state" of being a human, doctor, and so forth. Such "in the state" of being a human being is a particular and unchangeable way.

2 Allen Newell and Herbert Simon, 1976
Physical symbol systems can think. Thinking is a physical symbol system in a broad computational sense. It is a system that can be described by:

- a formal computational system
- a set of data structures
- a set of operations on these data structures
- a set of goals and procedures

The physical symbol system hypothesis is a physical symbol system that is used to justify that the hypothesis that machines can think is not contradicted by the fact that machines are not conscious.



PHOTO # 29
Allen Newell



PHOTO # 27
Herbert Simon

Is the relation between hardware and software similar to that between human brains and minds?

31 Herbert A. Simon and Allen Newell, 1976
Postulates of the Physical Symbol Systems Hypothesis

1. A physical symbol system is a system that can be described by:
 - a formal computational system
 - a set of data structures
 - a set of operations on these data structures
 - a set of goals and procedures
2. Symbols can be thought of as elements that are connected and processed by a set of operations called a control structure. The physical structure of the elements and the control structure are the hardware and software of the system.
3. An information processing system is a physical symbol system that consists of information processing.
4. An information processing system is a physical symbol system that consists of information processing.

32 Marvin Minsky, 1967
Humans beings are called to take a stand on who they are. Human beings take a stand on who they are by being "in the state" of being a human, doctor, and so forth. Such "in the state" of being a human being is a particular and unchangeable way.

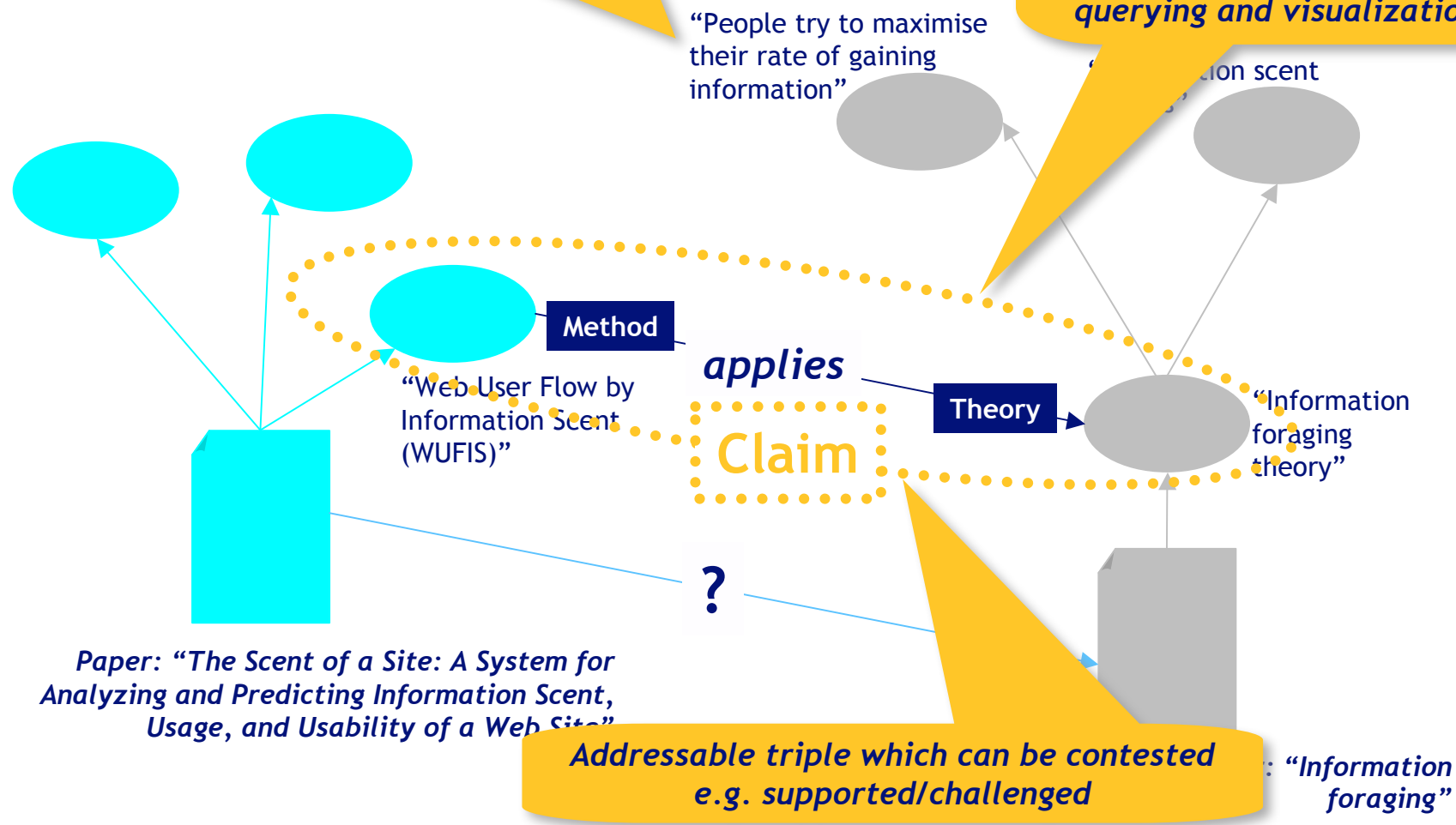
33 Marvin Minsky, 1967
Humans beings are called to take a stand on who they are. Human beings take a stand on who they are by being "in the state" of being a human, doctor, and so forth. Such "in the state" of being a human being is a particular and unchangeable way.

Beyond document citations...



These annotations are freeform summaries of an idea, as one would find in researchers' journals, fieldnotes, lit. review notes or blog entries

Making formal connections between ideas creates a semantic citation network → novel literature navigation, querying and visualization

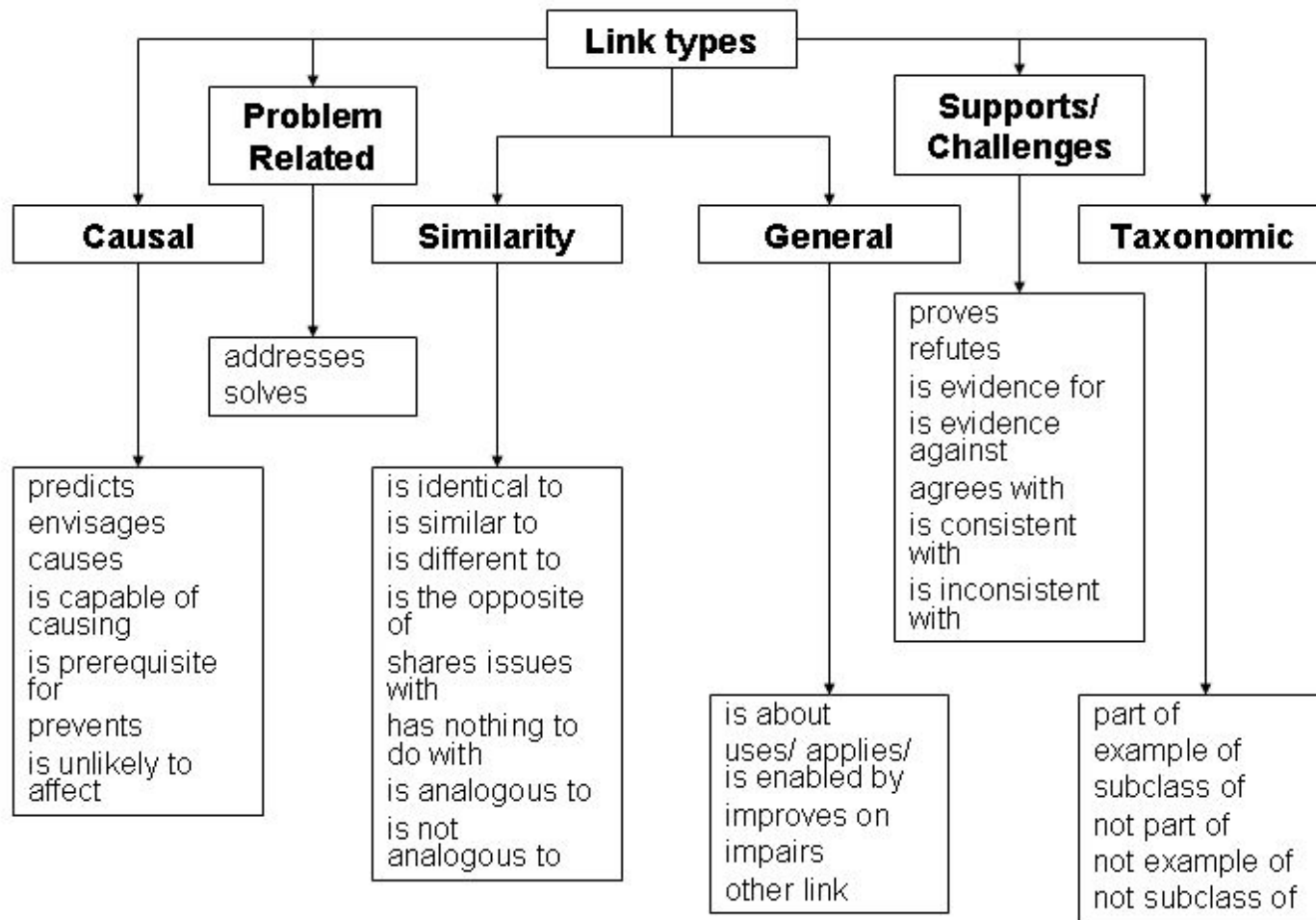


Paper: "The Scent of a Site: A System for Analyzing and Predicting Information Scent, Usage, and Usability of a Web Site"

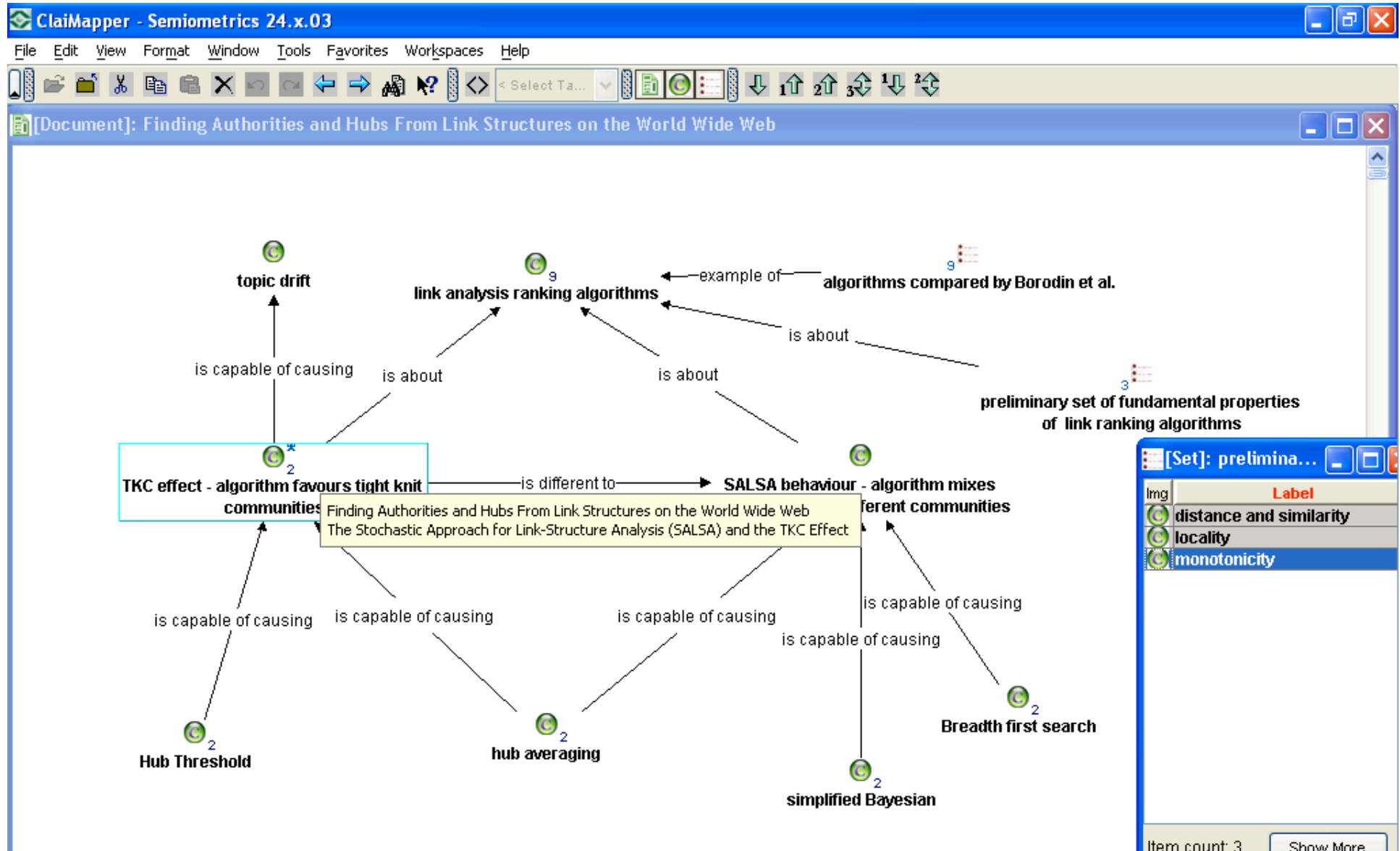
"Information foraging"

Combining formal relations with the expressive freedom of ‘folksonomies’

Relational classes and dialects (KMi Scholarly Ontologies project)



If we model concepts in a literature as concept maps... (KMI's ClaiMapper, built on Compendium)



“Semantic del.icio.us”: KMi’s ClaimSpotter assigning *and* linking freeform tags



ClaimSpotter 0.4.5 | Annotate

http://127.0.0.1/claimspotter/0.4.5/index.php?user=1&document=1#section-H-1

Login History Add a document Standard Alternate .dot Export Help About

More Ideas Concepts: All Relations: Argument Zones: Importance: >5 Term(s): trust find clear Reset

Show: Notes: Concepts: Claims:

Document

TABLE OF CONTENTS:

- Abstract
- Introduction
- Information Analysis in TRELIS
- Source
- Attribution and Description
- Deriving an Assessment about a Source
- Helping Users Select Sources
- Related Work
- Conclusions
- References

INTRODUCTION

The **Semantic Web** can be described as a substrate to support advanced functions for collaboration (human-human, computer-human, computer-computer), sharing of Web **resources**, and **reasoning** about their content [3]. The markup languages that are being proposed for the **Semantic Web** will be the basis to develop reasoners, proof checking and derivation tools, and many other functions such as Web services.

The **Semantic Web** will also be the basis for the Web of Trust, which will provide mechanisms to handle authentication, permission, and validation of attribution in a Web where, by design, anyone can contribute content, links, and services.

A lot of current emphasis on the Web of Trust is in accessing **resources**, specifically authentication and permission issues. Digital signatures and public keys support authentication. Proofs are another important technology in the Web of Trust, since permission schemes are often described with rules and statements (e.g., anyone working for company C should be allowed to **access** D) and will need to rely on proofs that can reason about the rules and conclude whether **access** should be granted. An important issue with respect to both authentication and permission is checking that a document can be attributed to the source specified. For example, if Joe Doe writes an article and publishes it claiming Henry Kissinger as the author, it should be possible to check the truth about the document’s authorship.

concepts

Type	Label	Copy in...
remove n/a	Trellis	[X] [X]
remove n/a	ix of formal and human language	[X] [X]
remove n/a	Representing trust	[X] [X]
remove n/a	Semantic Web	[X] [X]
remove n/a	measures of trust in the content	[X] [X]
remove n/a	Trusting different information sou	[X] [X]

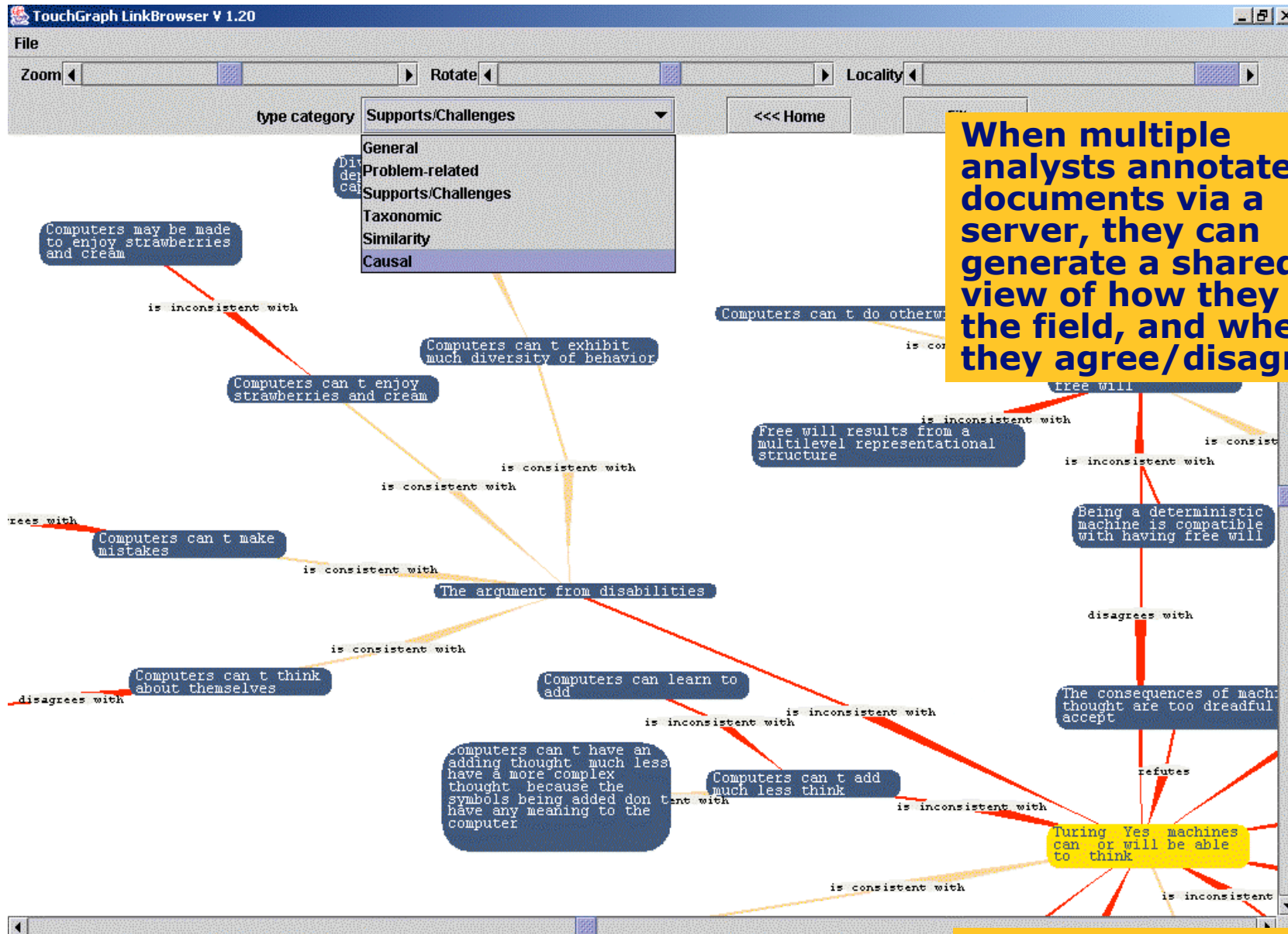
claims

Source	Relation	Destination
Trellis	is about	Trusting different information
n/a		n/a
Concept		Concept
some evidence	is evidence against	[claimNumber29
n/a		n/a
Concept		Link

Submit Reset

Sereno, B., Buckingham Shum, S. and Motta, E. (2007). Formalization, User Strategy and Interaction Design: Users’ Behaviour with Discourse Tagging Semantics. Workshop on Social and Collaborative Construction of Structured Knowledge, 16th Int. World Wide Web Conference (WWW 2007), Banff, 8-12 May 2007. http://www2007.org/workshops/paper_30.pdf

Visualising claims and arguments



When multiple analysts annotate web documents via a server, they can generate a shared view of how they see the field, and where they agree/disagree

“Semantic Google Scholar” KMi’s ClaimFinder



find **discover** **advanced** **claiMaker**

machine learning

Perspective In contrast agree

Neural network text categorizer Depth
















machine learning Depth



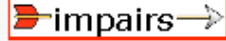




[About](#) - [ClaiMaker](#) - [Problems](#) - [Help](#)



Semantic Literature Analysis [ClaimFinder expt: 1:59:17]

Problem: “What advantages and disadvantages does CiteSeer have compared to the ISI citation databases?”







The key issues you are concerned with:		The related issues you may be concerned with:	
817	ISI citation databases   	951	CiteSeer is less accurate than Science Citation Index   
		819	There is a higher proportion of conference paper citations in CiteSeer than in SCISEARCH   
		820	CiteSeer and SCISEARCH contain similar proportions of journal articles amongst the most cited articles   
		950	CiteSeer can index a wider range of material than Science Citation Index   













The following claims disagree ...				
1	CiteSeer is less accurate than Science Citation Index  		CiteSeer can index a wider range of material than Science Citation Index  	 9280  2













“What papers contrast with this paper?”

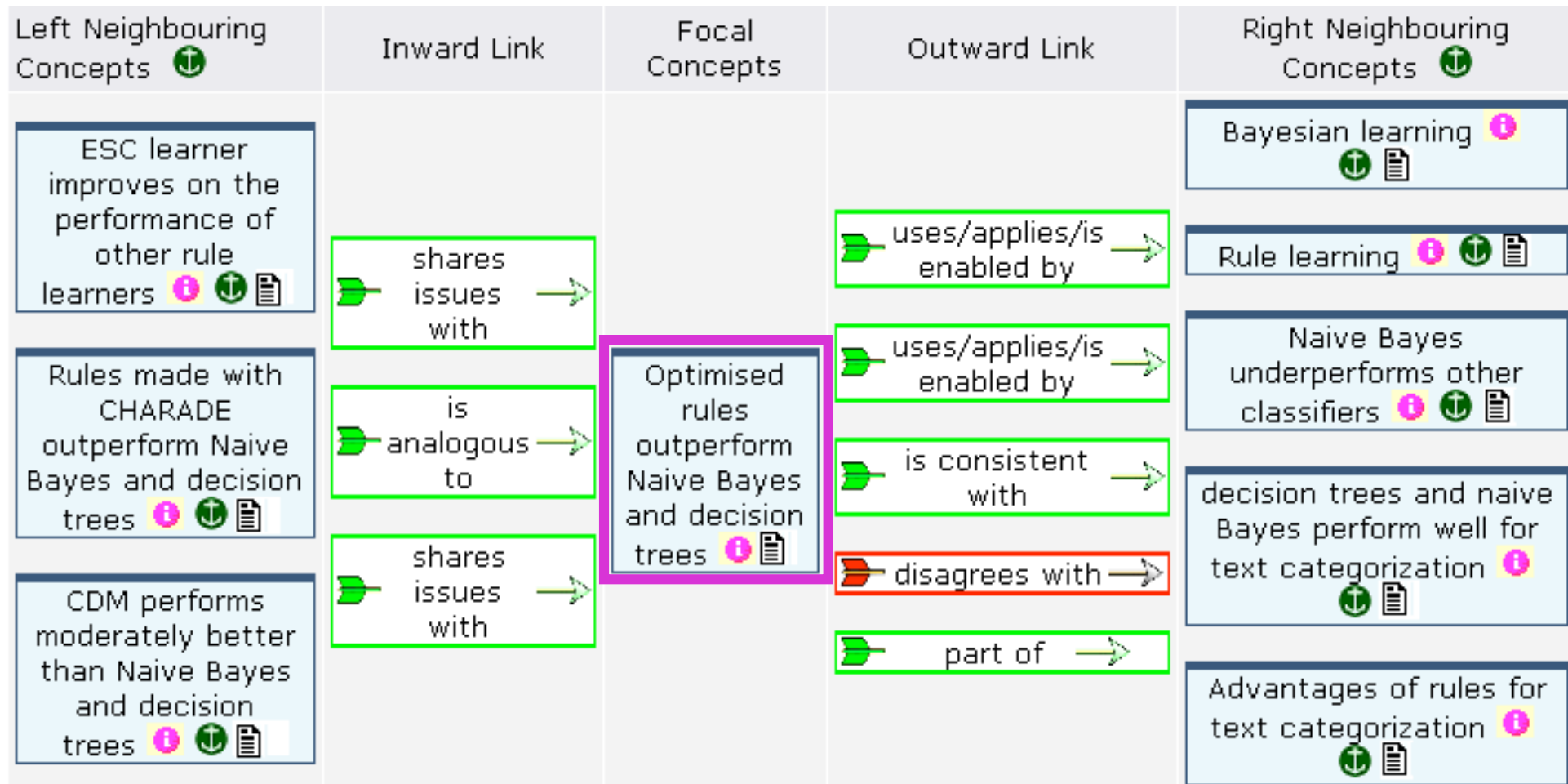
1. Extract concepts for this document
2. Trace concepts on which they build
3. Trace concepts challenging this set
4. Show root documents

The key issues you are concerned with:	
445	Decision Forest classifier   
446	Decision Forest classifier improves on C4.5 and kNN   

The related issues you may be concerned with:	
446	Decision Forest classifier improves on C4.5 and kNN   
515	Instance based learning   
511	Decision tree learning   
277	decision trees and naive Bayes perform well for text categorization   

The following claims disagree ...				
1	Optimised rules outperform Naive Bayes and decision trees   	 disagrees with 	decision trees and naive Bayes perform well for text categorization   	 3621  2

Focusing on a concept incoming+outgoing links



“Semantic Google Scholar” KMi’s ClaimFinder



find **discover** **advanced** **claiMaker**

machine learning

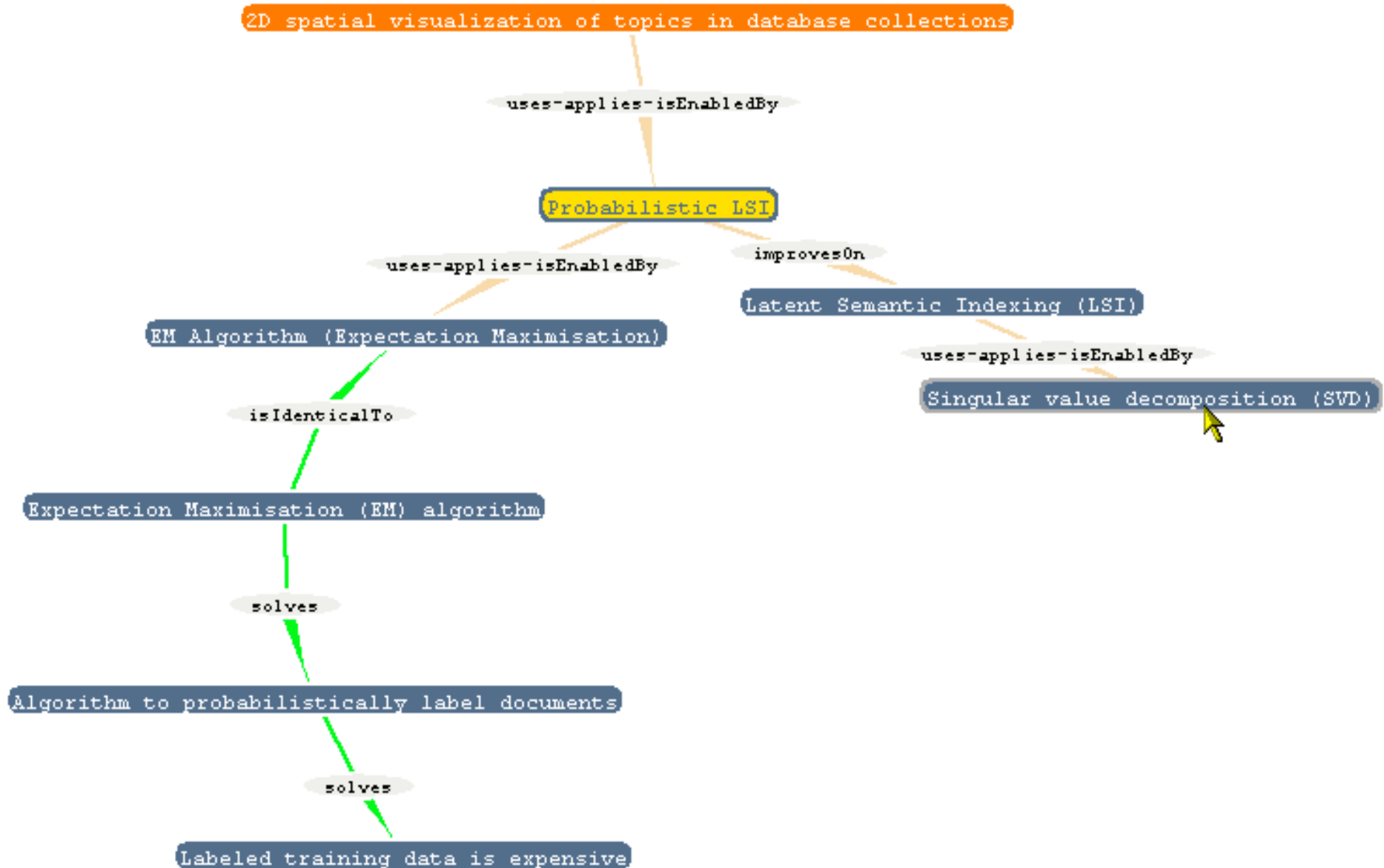
Perspective In contrast agree

Neural network text categorizer Depth

machine learning Depth

[About](#) - [ClaiMaker](#) - [Problems](#) - [Help](#)

Lineage tree (the roots of a concept)



Example: 'argumentation' on YouTube



national front Counter demo 15/06/07



Movie posted by National Front on YouTube to demonstrate their activities

Example: a “scientific argument” on National Front website



www.natfront.com/prejudic.html

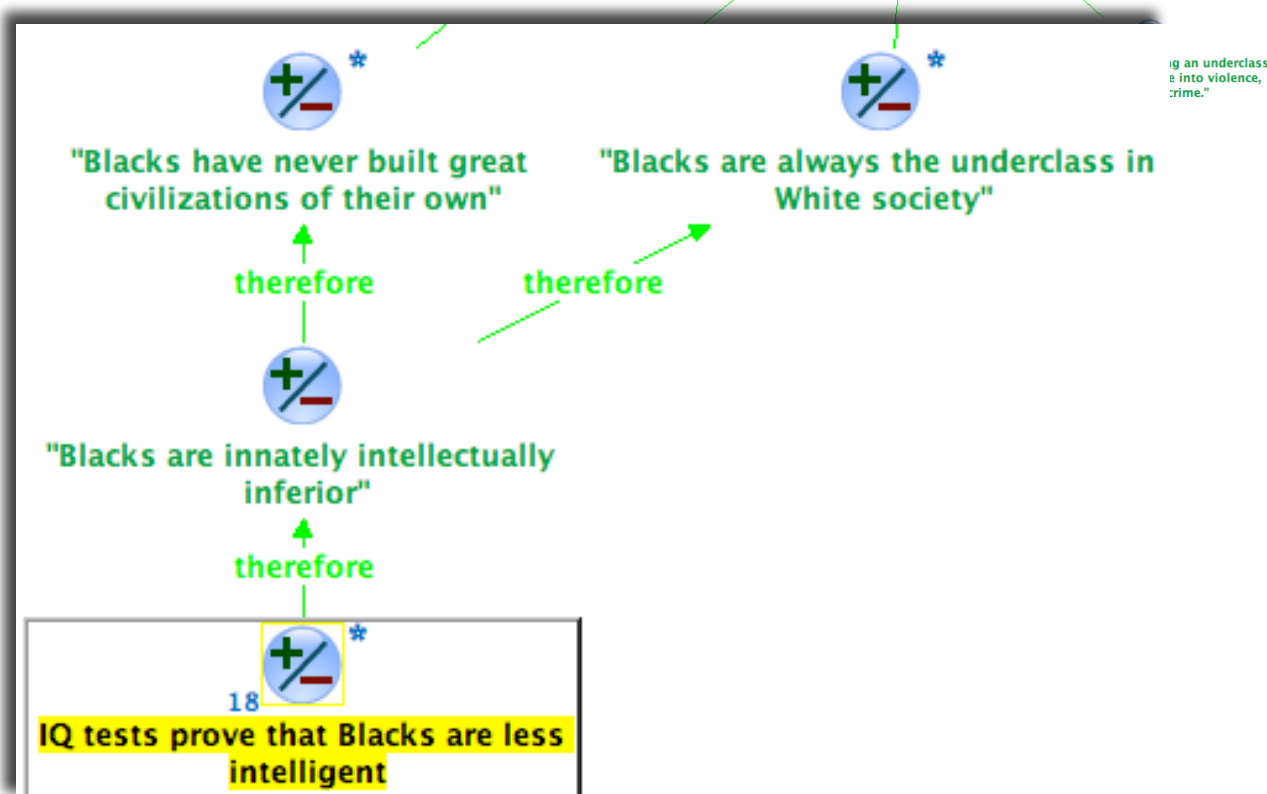
Patterns of Prejudice

A revised and updated version of an article by Steve Brady which originally appeared in *Vanguard* magazine in April 1987.

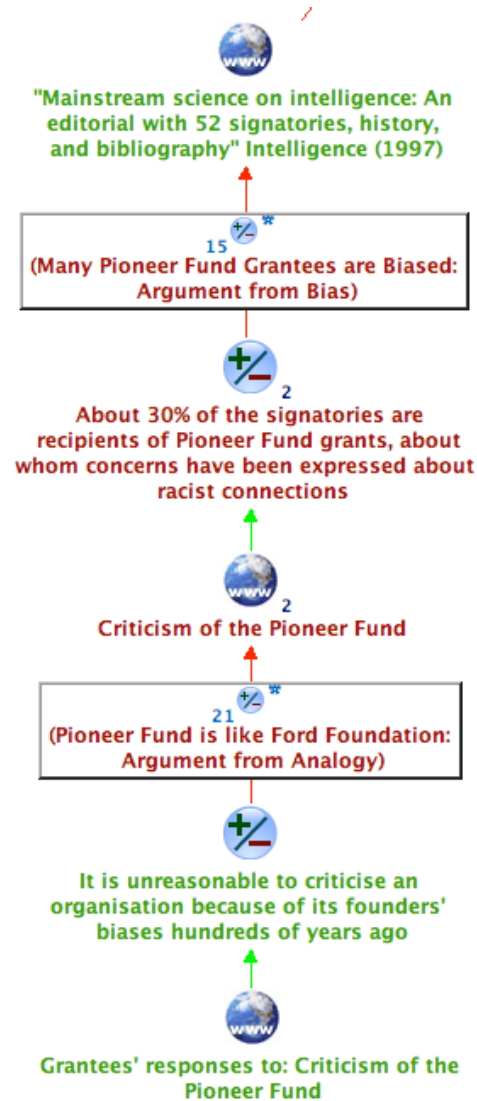
One of the favourite accusations thrown at the National Front by its multiracialist critics is that we are simply a bunch of bigots, that our stance on race, at the core of our political philosophy, is just ignorant prejudice against people whose skin colour is no more than a superficial manifestation. Is this so? Are our racial policies merely the product of prejudice, or are they instead based on sober realism and the courage to face facts?



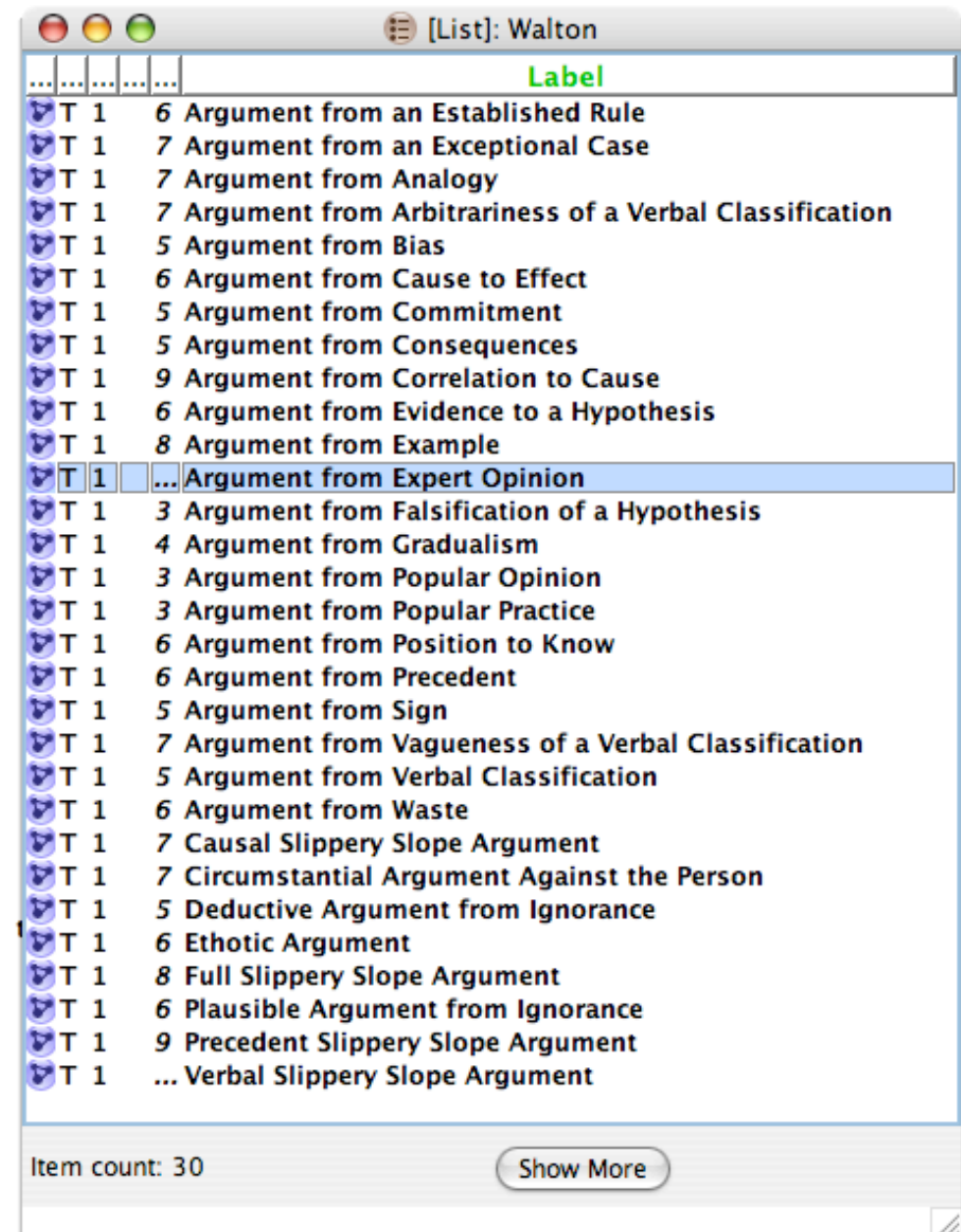
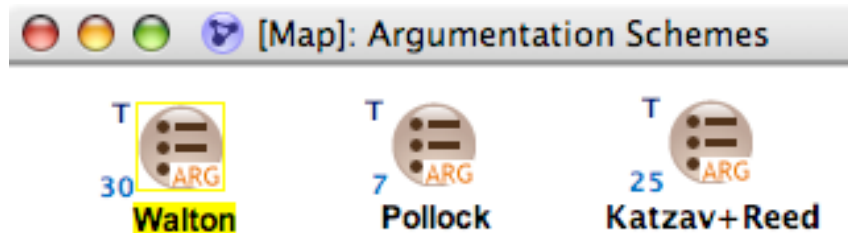
Mapping the structure of the National Front's "negro intelligence" argument



Refuting the NF “negro intelligence” argument using argument mapping



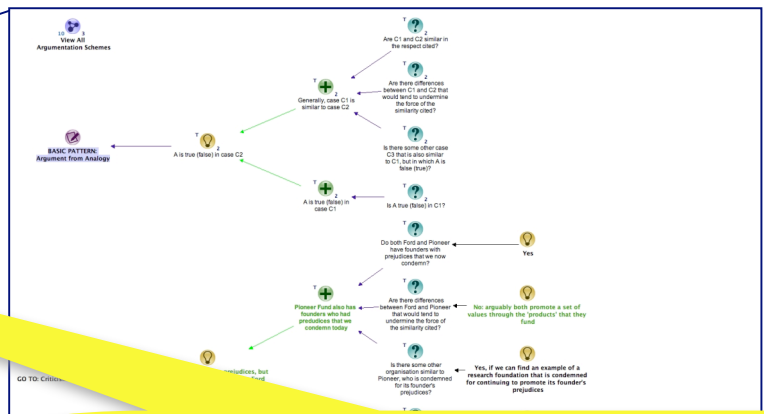
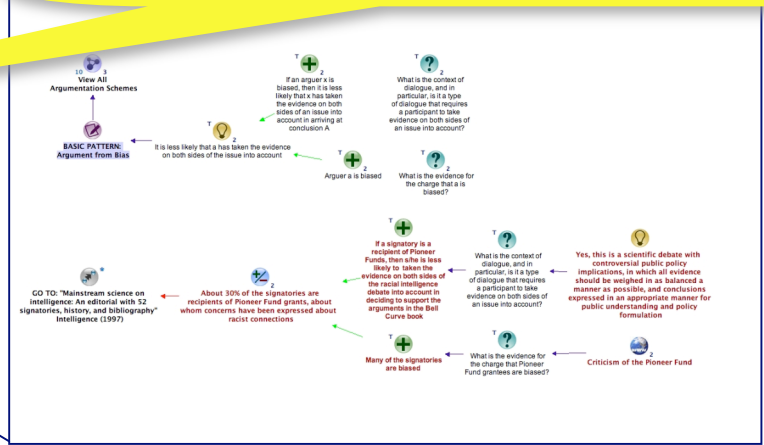
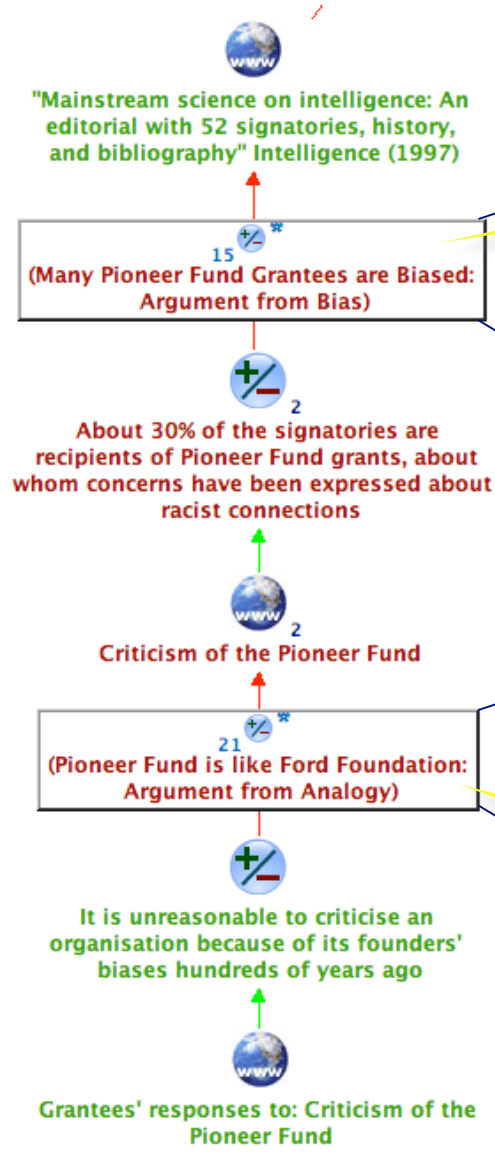
Importing an Argumentation Scheme as an IBIS template



Refuting the NF “negro intelligence” argument using argument mapping



The structure of an “Argument from Bias” can be exposed..




The structure of an “Argument from Analogy” can be exposed..





Template for an "Argument from Analogy"


10 3
View All
Argumentation Schemes



BASIC PATTERN:
Argument from Analogy

T  2
A is true (false) in case C2

T  2
Generally, case C1 is similar to case C2

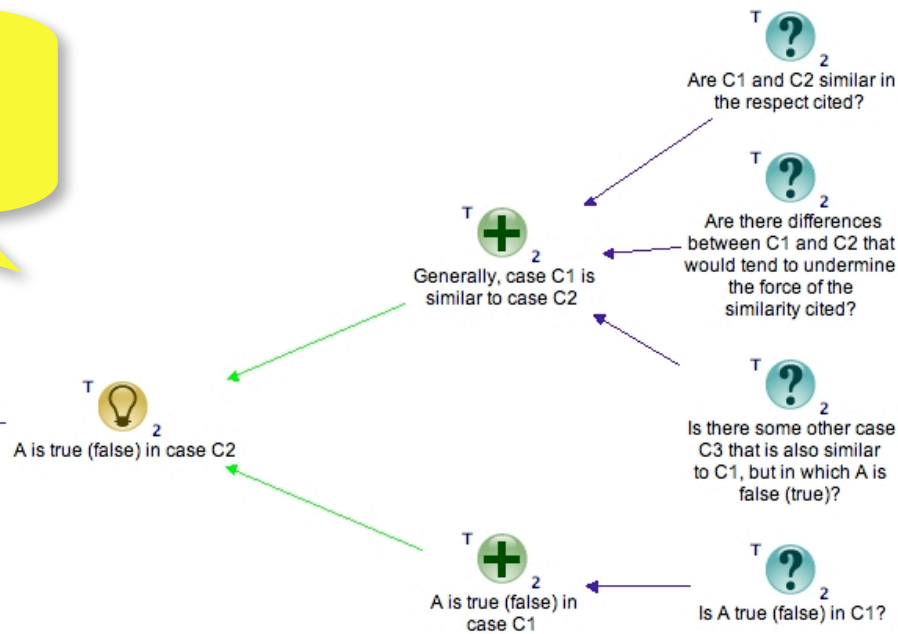
T  2
Are C1 and C2 similar in the respect cited?

T  2
Are there differences between C1 and C2 that would tend to undermine the force of the similarity cited?

T  2
Is there some other case C3 that is also similar to C1, but in which A is

Template for an "Argument from Analogy"

BASIC PATTERN:
Argument from Analogy



Instantiating the "Argument from Analogy" template

GO TO: Criticism of the Pioneer Fund

Henry Ford held dubious prejudices, but we do not use these to condemn Ford Company today

We should not condemn the Pioneer Fund today for the prejudices that its founders held

Pioneer Fund also has founders who had prejudices that we condemn today

Do both Ford and Pioneer have founders with prejudices that we now condemn?

Are there differences between Ford and Pioneer that would tend to undermine the force of the similarity cited?

Is there some other organisation similar to Pioneer, who is condemned for its founder's prejudices?

Does this vindicate Pioneer Foundation from condemnation of its founder's prejudices?

Yes

No: arguably both promote a set of values through the 'products' that they fund

Yes, if we can find an example of a research foundation that is condemned for continuing to promote its founder's prejudices

No: unlike the Ford Foundation, Pioneer Fund continues to fund work that reinforces its founder's prejudices

Semiosis

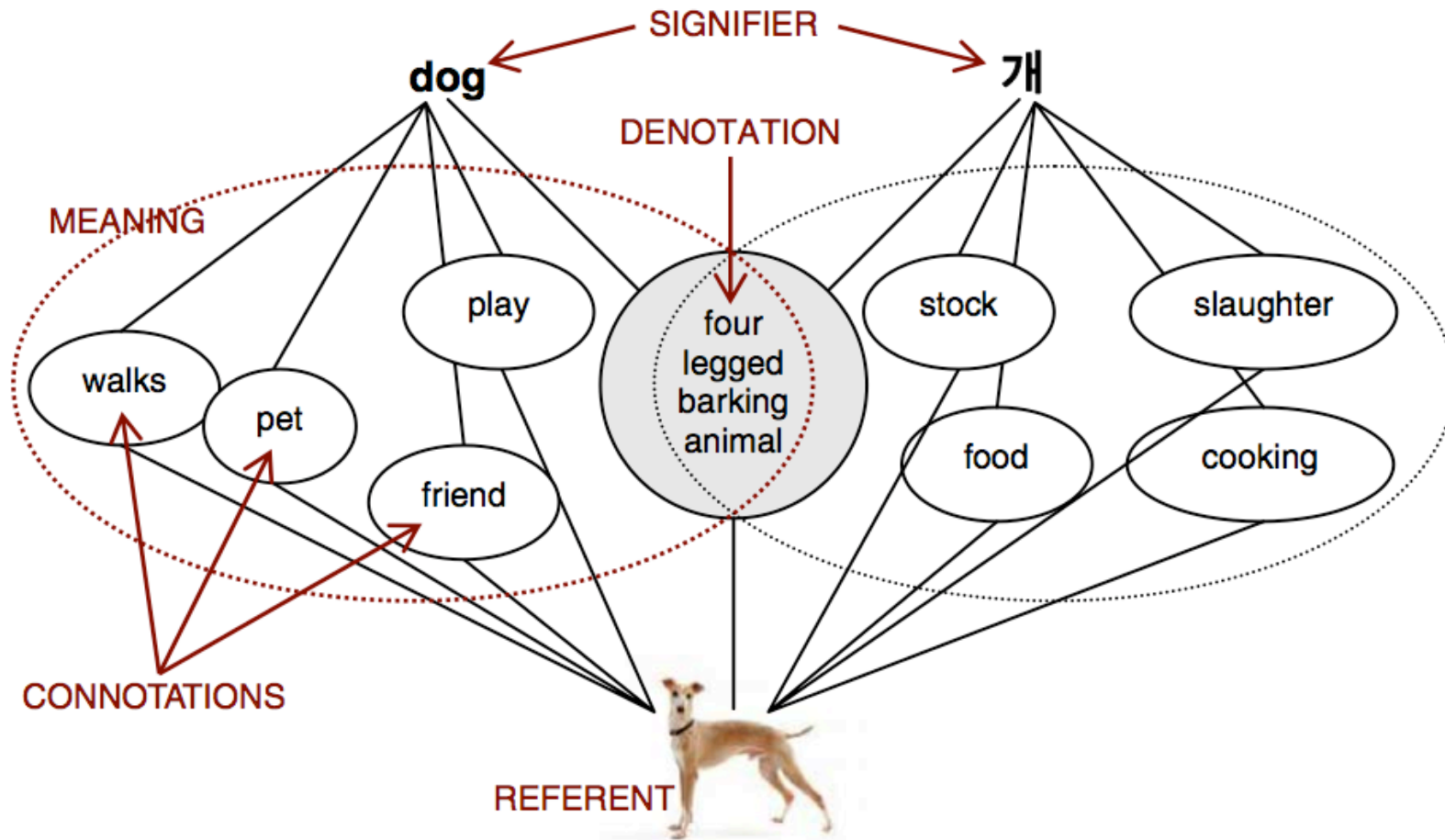


Fig. 1. The components of a sign system.

Semantic annotation as semiosis in the Scholarly Ontologies project

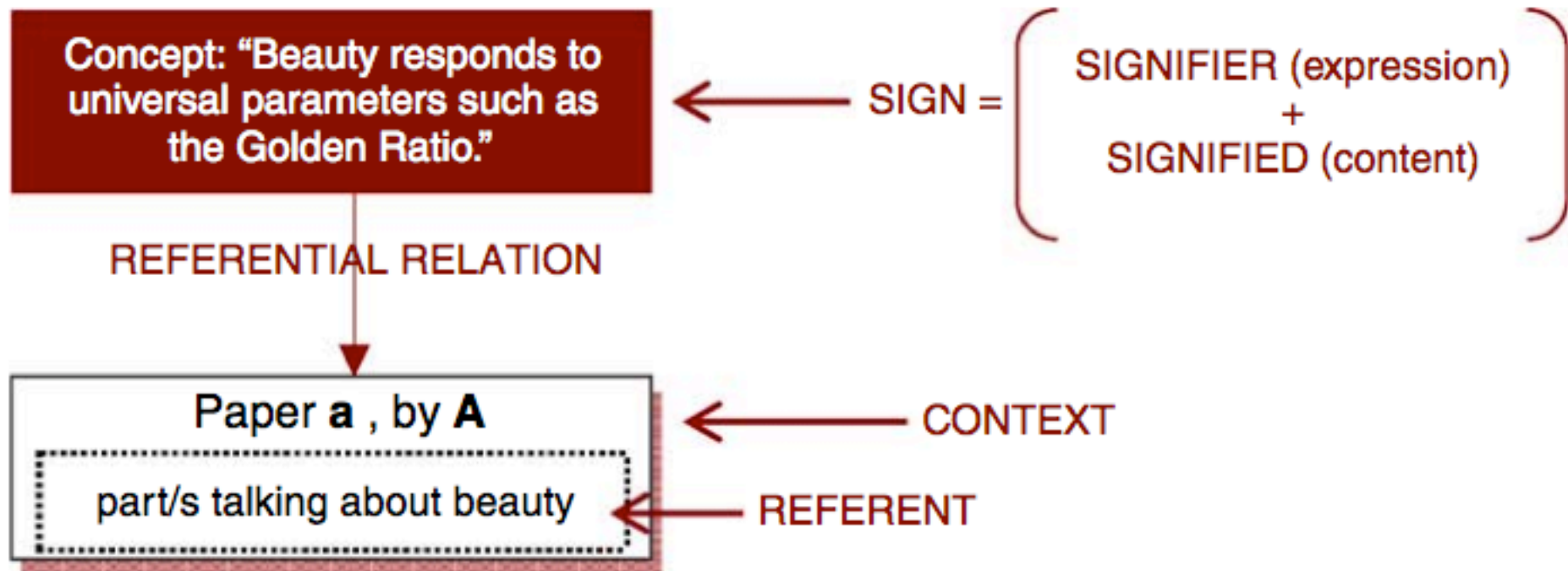


Fig. 4. Semiotic analysis of a ClaiMaker's primary claim.

Primary and secondary claims as semiotic and discourse moves

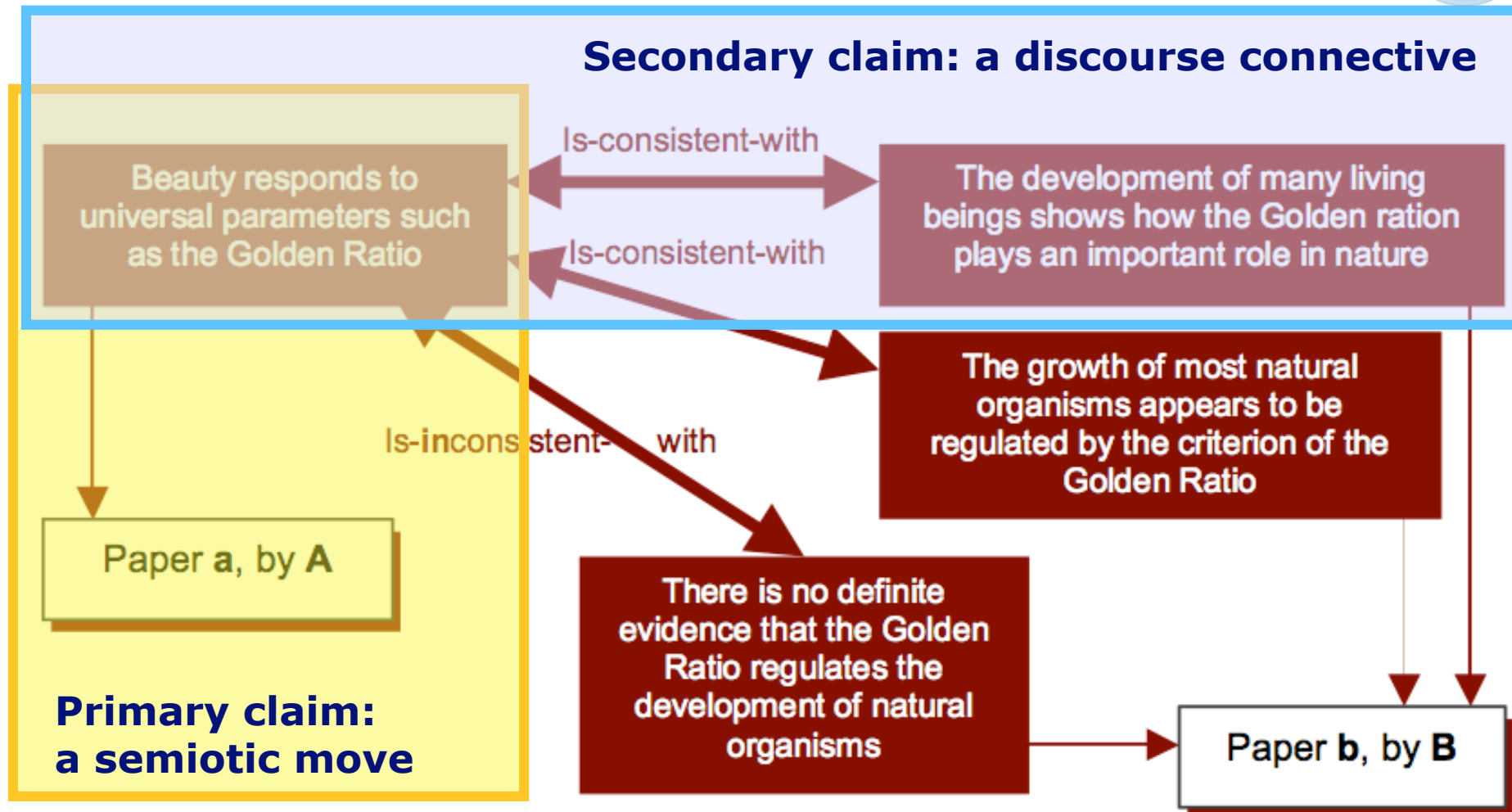


Figure 5. An example of different and even contradictory claims anchored in the same sources (referents).

Cognitive Coherence Relations

The hypothesis:



- Our symbol systems are shaped by, and designed to convey, conceptual structures: *coherence*
- There may be some core, primitive *coherence relations* that manifest consistently across symbol systems and communities
- Symbol systems can therefore be analysed for *patterns* indicating coherence relations
- In written and spoken language, the *cohesive devices* are evidence of underlying conceptual structures
- If we can codify these, we could therefore have computationally tractable representations with psychological reality



Cognitive Coherence Relations

C. Mancini, S.J. Buckingham Shum / *Int. J. Human-Computer Studies* 64 (2006) 1154–1171

1165

Table 4

Louwerse's analytic and cognitive parametrization of coherence relations, derived from those categories that are represented in most text coherence theories (table taken from Louwerse 2001).

Type	Polarity	Direction	Examples
Causal	Positive	Backward	<i>A because B</i>
		Forward	<i>A so B; because A, B</i>
		Bi-directional	—
	Negative	Backward	<i>A although B</i>
		Forward	<i>A nevertheless B; although A, B</i>
		Bi-directional	—
Temporal	Positive	Backward	<i>A before B; after A, B</i>
		Forward	<i>A after B; before A, B</i>
		Bi-directional	<i>A while B; B while A</i>
	Negative	Backward	<i>A until B</i>
		Forward	<i>until A, B</i>
		Bi-directional	—
Additive	Positive	Backward	—
		Forward	<i>A moreover B</i>
		Bi-directional	<i>A similar B; B similar A</i>
	Negative	Backward	—
		Forward	<i>A however B</i>
		Bi-directional	<i>A alternatively B; B alternatively A</i>



Cognitive Coherence Relations

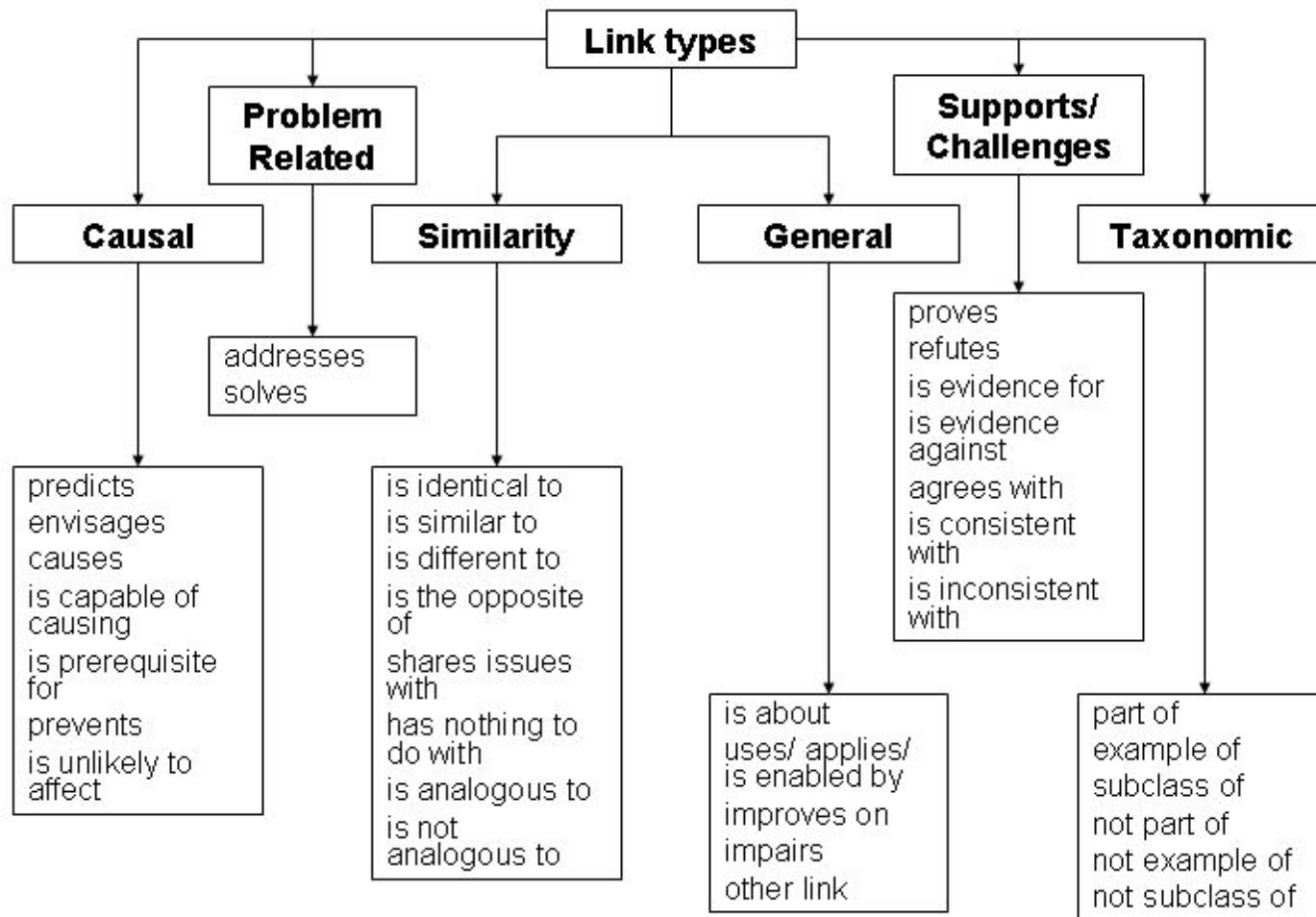
Table 3

Sanders, Spooren and Noordman's taxonomy resulting from the combination of the four parameters, and the prototypical relations for which the taxonomy accounts (table from Sanders et al., 1993)

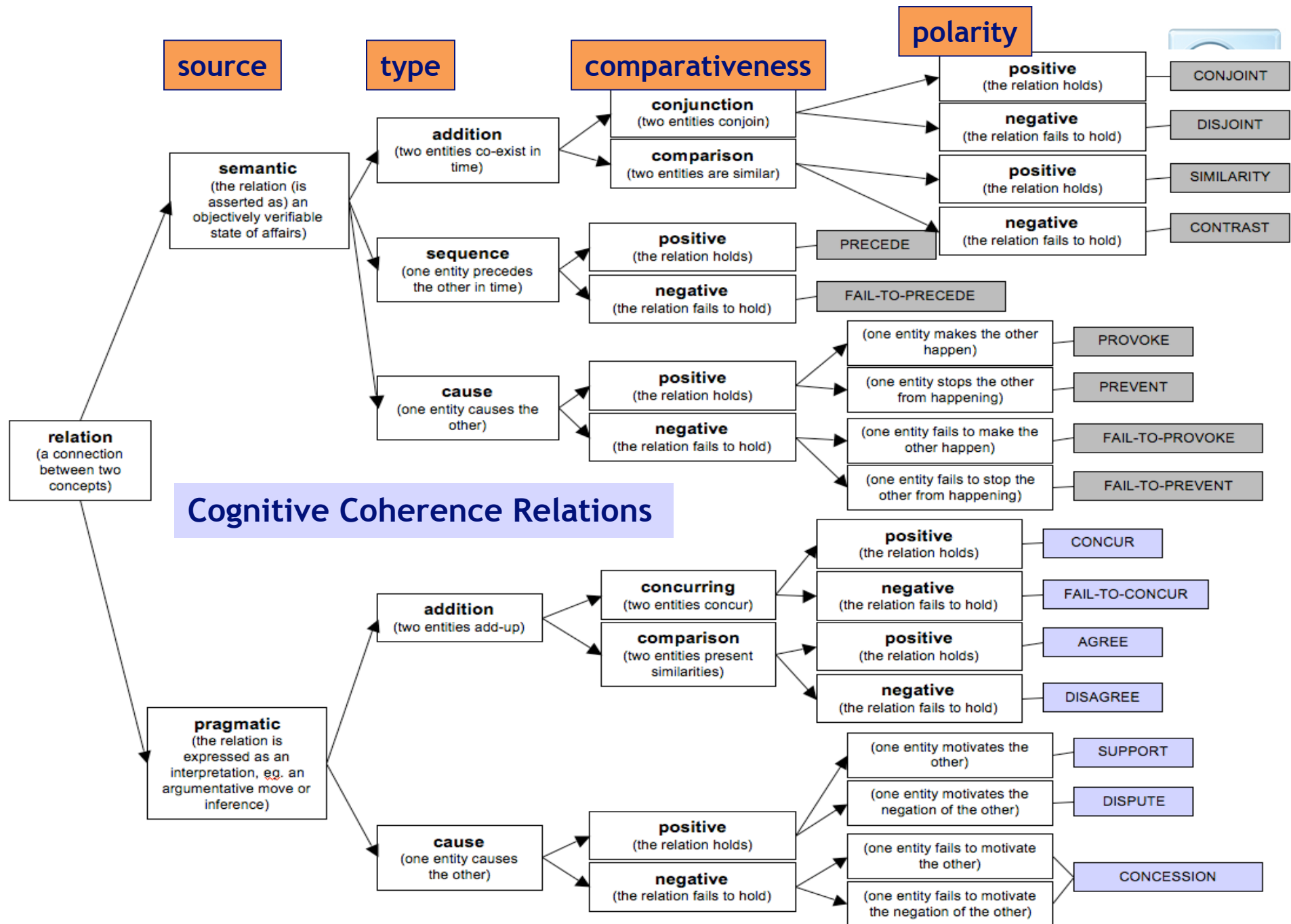
Basic operation	Source of coherence	Order of segments	Polarity	Class	Relation
Causal	Semantic	Basic	Positive	1a	<i>Cause-consequence</i>
				1b	<i>Condition-consequence</i>
Causal	Semantic	Basic	Negative	2	<i>Contrastive cause-consequence</i>
Causal	Semantic	Non-basic	Positive	3a	<i>Consequence-cause</i>
				3b	<i>Consequence-condition</i>
Causal	Semantic	Non-basic	Negative	4	<i>Contrastive consequence-cause</i>
Causal	Pragmatic	Basic	Positive	5a	<i>Argument-claim</i>
				5b	<i>Condition-claim</i>
Causal	Pragmatic	Basic	Negative	6	<i>Contrastive argument-claim</i>
Causal	Pragmatic	Non-basic	Positive	7a	<i>Claim-argument</i>
				7b	<i>Claim-condition</i>
Causal	Pragmatic	Non-basic	Negative	8	<i>Contrastive claim-argument</i>
Additive	Semantic	—	Positive	9	<i>List</i>
Additive	Semantic	—	Negative	10a	<i>Opposition</i>
				10b	<i>Exception</i>
Additive	Pragmatic	—	Positive	11	<i>Enumeration</i>
Additive	Pragmatic	—	Negative	12	<i>Concession</i>

Returning to the relational classes and dialects derived in a data-driven, bottom up manner...

(KMi Scholarly Ontologies project)



...we can now locate these within a 'relational design space' defined by CCR dimensions...



Returning to Gardner's *Five Minds for the Future...*



Perhaps Hypermedia Discourse tools provide a way to move fluidly between the different minds:

- a way to provide representational scaffolding for **disciplined** modelling
- but permitting the **creative** breaking of patterns when needed, and the forging of new **syntheses**
- a way to show **respect** for diverse stakeholders' concerns by explicitly integrating them into the conversation
- a way to bring into an analysis 'messy' requirements such as **ethical** principles, as well as hard data and constraints

We have some evidence from our case studies that we're on the right track, but there remains much to do.



Ongoing research challenges...

- **Hypermedia Discourse at Net scale:**
 - developing a Web 2.0 style walk-up-and-use tool to scaffold analysts in the creation of semantic networks for deliberation and argumentation
- **Cognitive Coherence Relations patterns**
 - modelling such structures at the CCR level to validate the hypothesis that there are generic 'coherence patterns'
- **Maturing the Compendium community of practice**
 - working on a deeper understanding of 'fluency'
- **These ideas/tools and the CS community?...**

2nd International Conference on the Pragmatic Web

Tilburg, The Netherlands (22-23 Oct. 2007)
www.PragmaticWeb.info

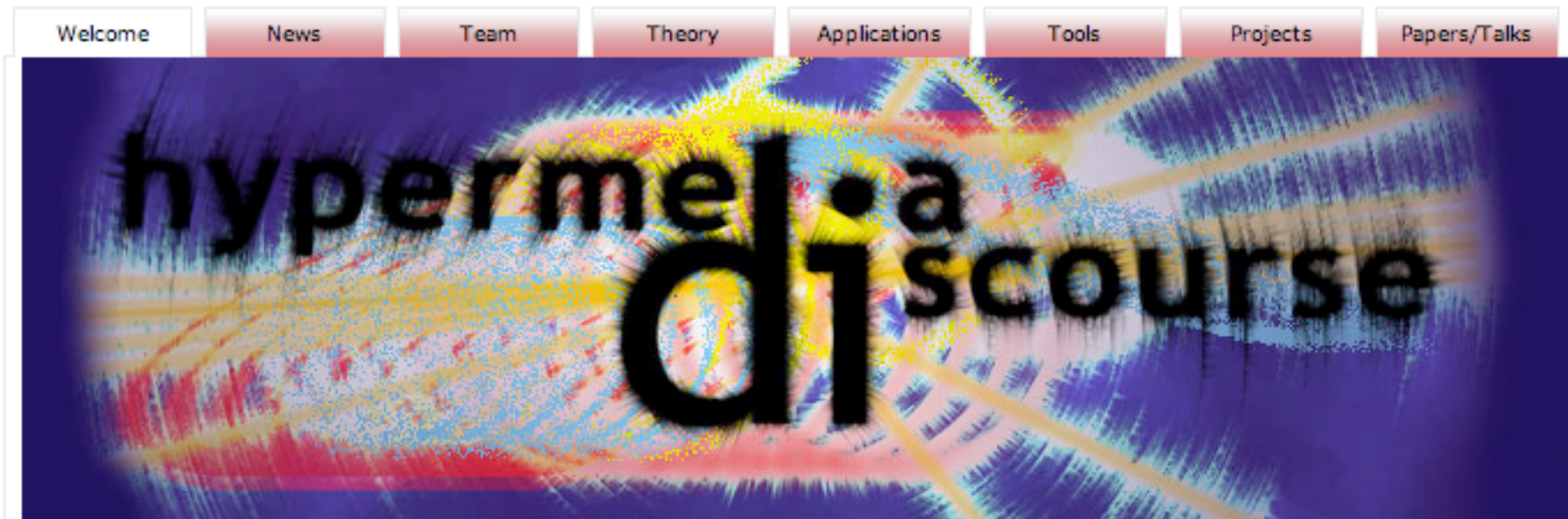


web pragmatics?

the Pragmatic Web?

pragmatic webs?

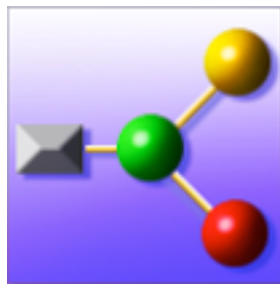
“THE PRAGMATIC WEB CONFERENCE is a unique forum to envision and debate how the emerging social, semantic, multimedia Web mediates the ways in which we construct shared meaning. While there is much research and development into topics relevant to this challenge such as collaboration, usability, knowledge representation, and social informatics, the Pragmatic Web conference provides common ground for dialogue at the nexus of these topics.”



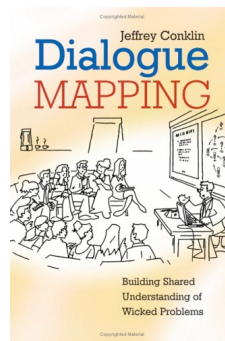
Hypermedia Discourse project:

community / theory / software / screencasts / case studies / user studies

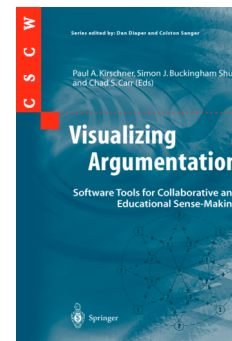
www.kmi.open.ac.uk/projects/hyperdiscourse



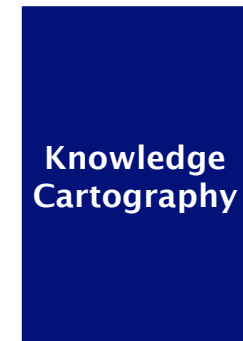
Compendium Institute
www.CompendiumInstitute.org



Dialogue Mapping
www.cognexus.org



Visualizing Argumentation
www.VisualizingArgumentation.info



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