Hypermedia Discourse & Human-Agent Knowledge Cartography

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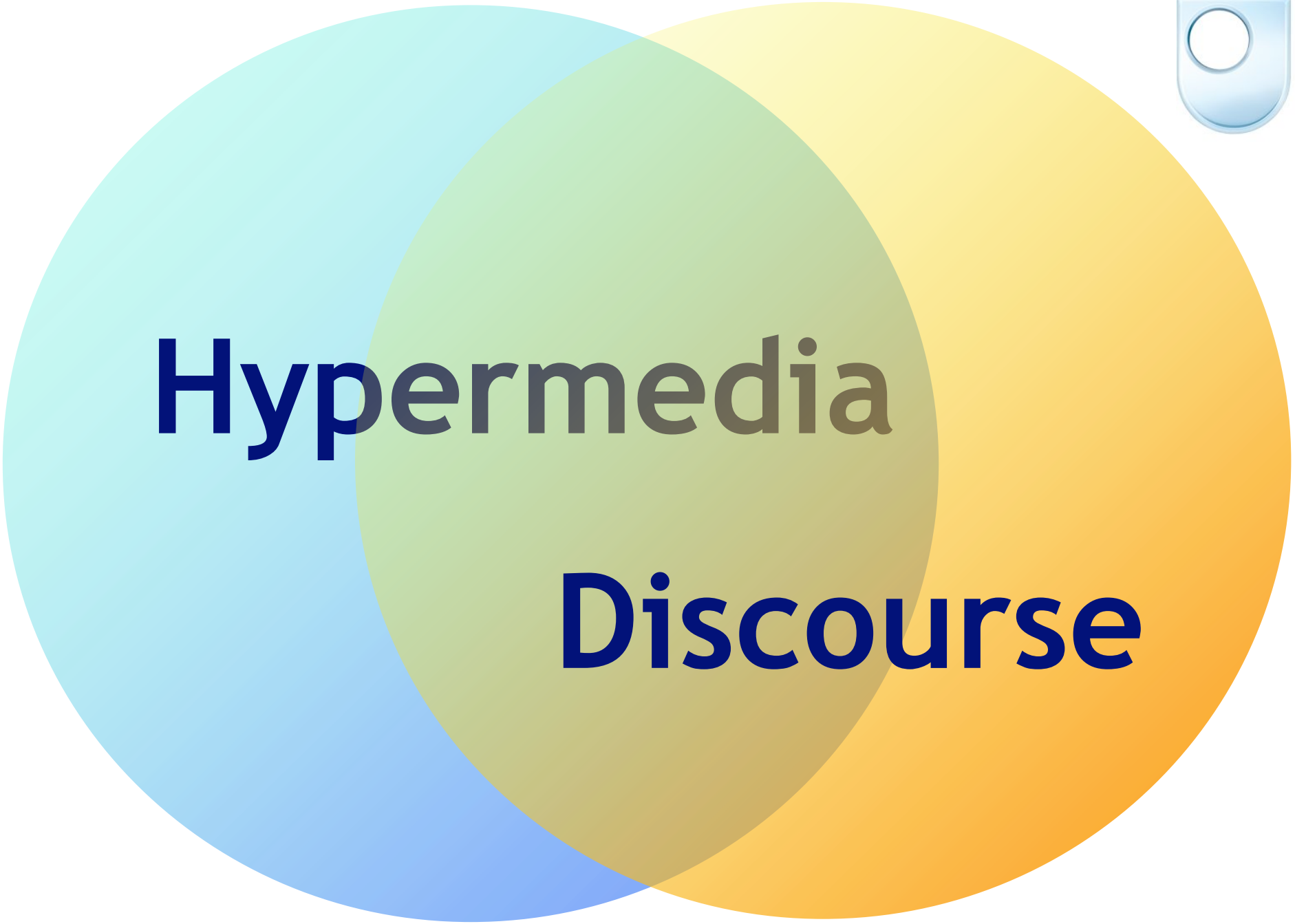
sbs@acm.org

KNOWLEDGE MEDIA
KMi
INSTITUTE


Hypermedia
Discourse

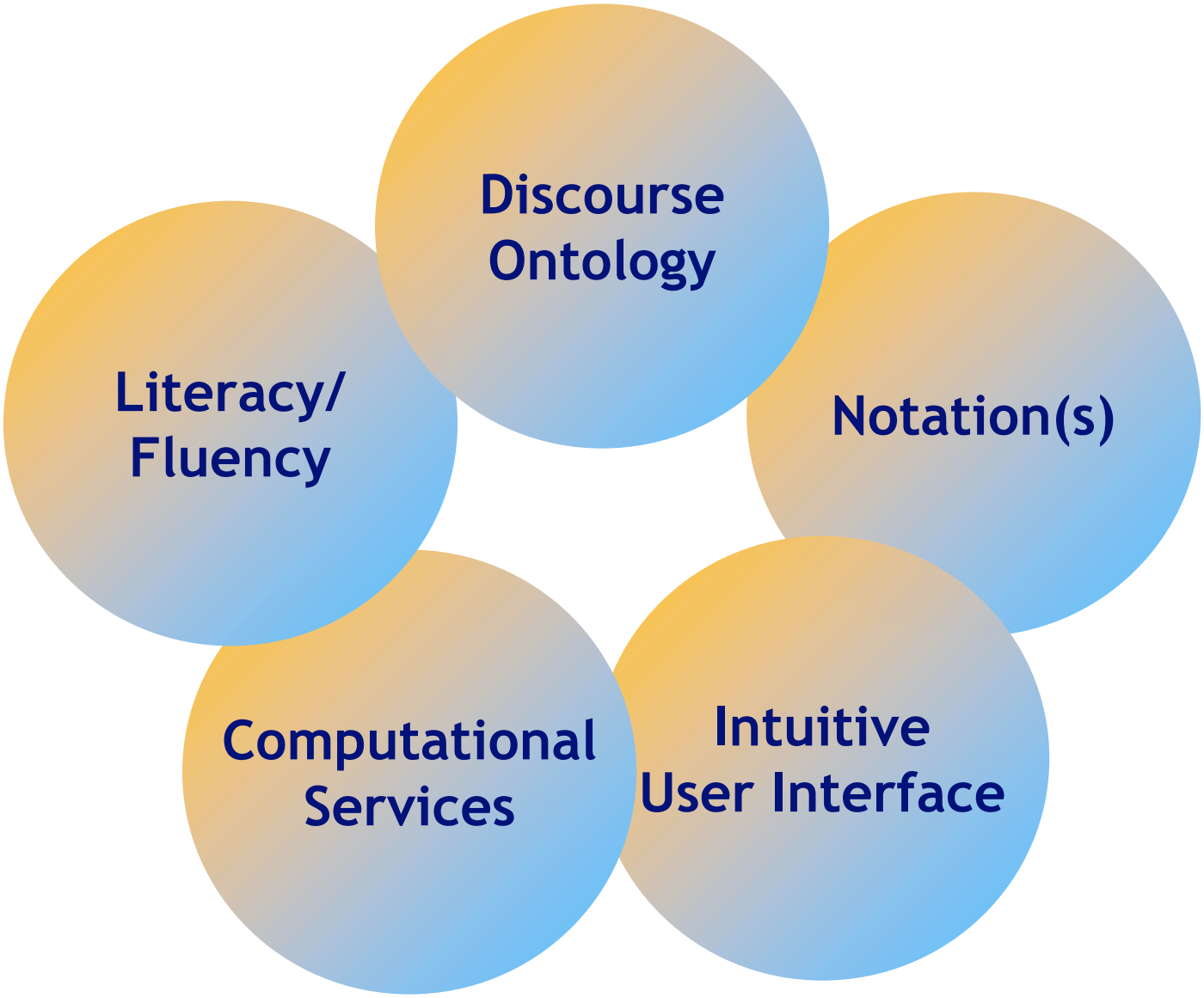
Hypermedia

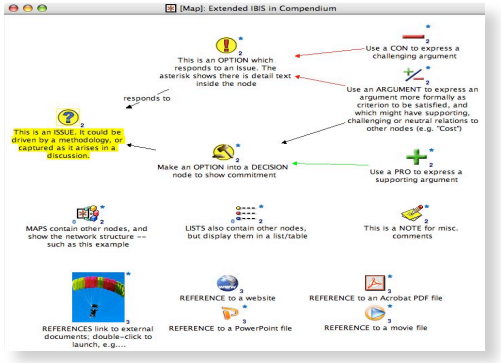
- Modelling *discourse relations*
- Expressing *different perspectives* on a conceptual space
- Supporting the *incremental formalization* of ideas
- Rendering *structural visualizations*
- Connecting *heterogeneous* content

Discourse

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

Hypermedia Discourse research

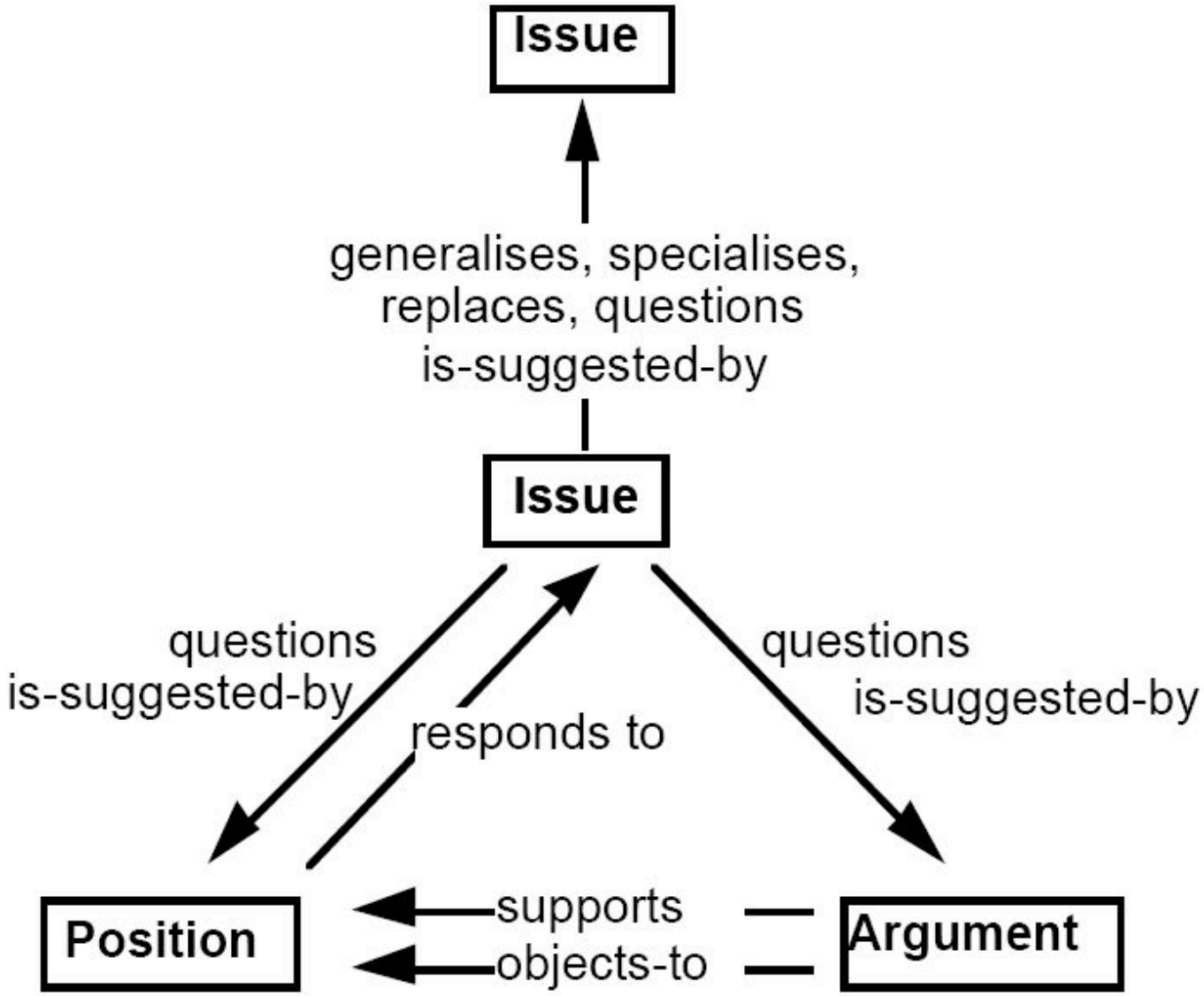




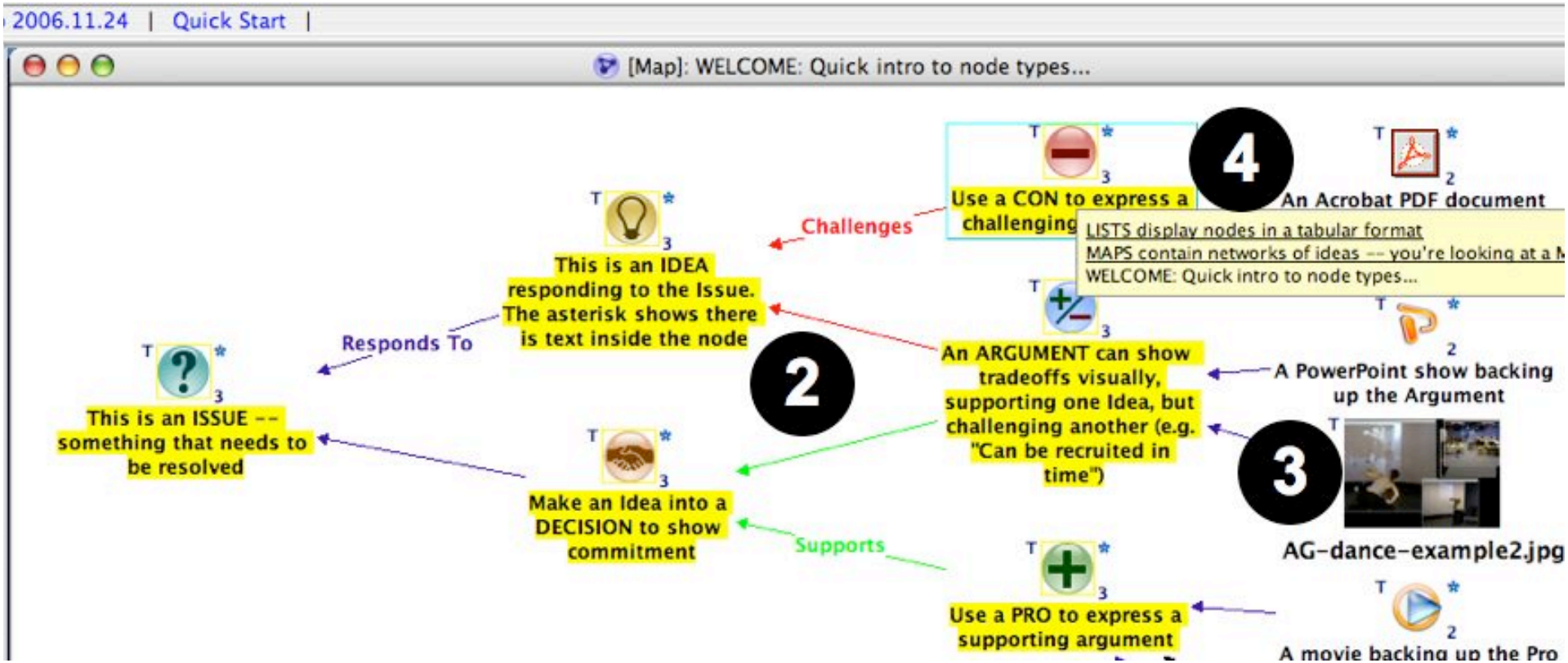
Compendium

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

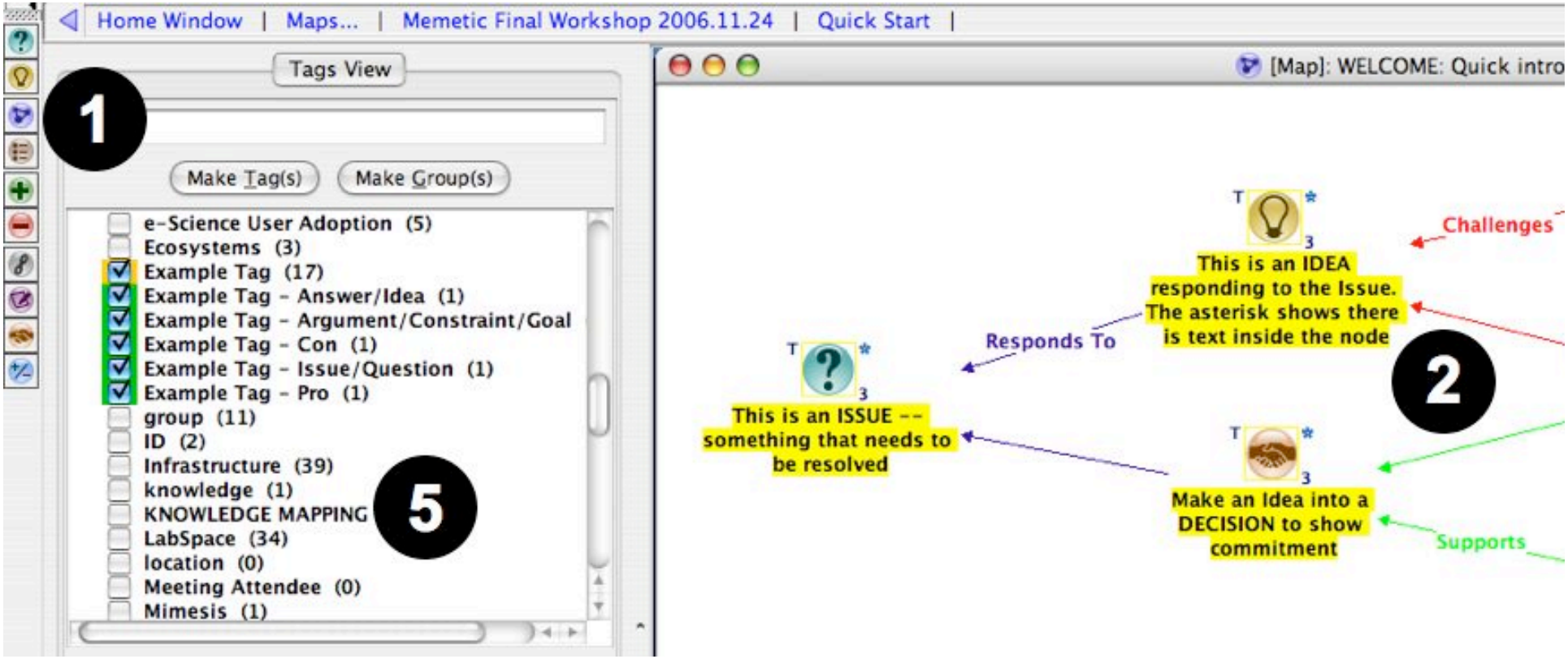
Discourse grounded in Horst Rittel's IBIS: Issue-Based Information System



Compendium: hypertext discourse mapping/conceptual modelling



Compendium: hypertext discourse mapping/conceptual modelling



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

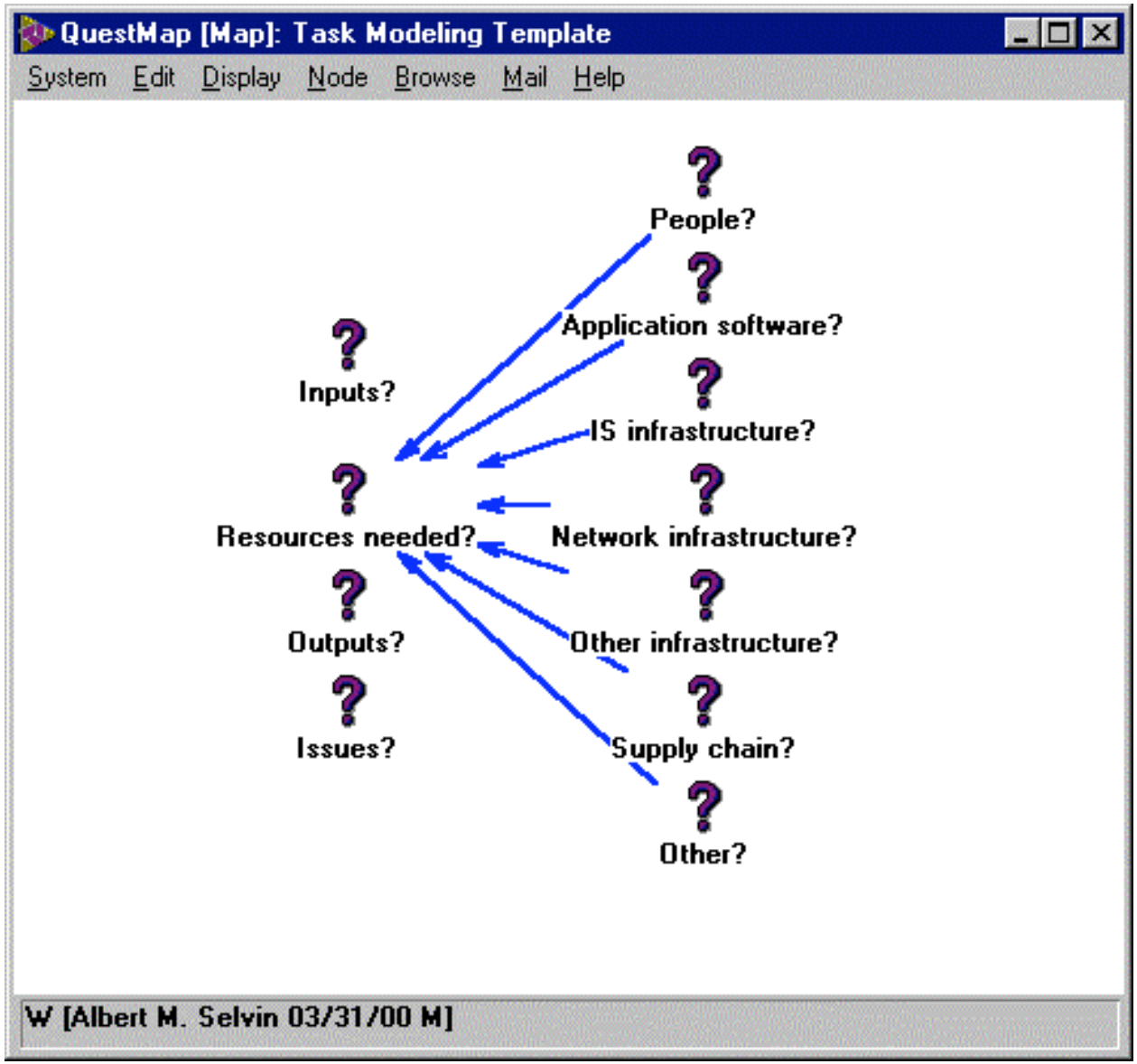
REFERENCE to an Acrobat PDF file

REFERENCE to a PowerPoint file

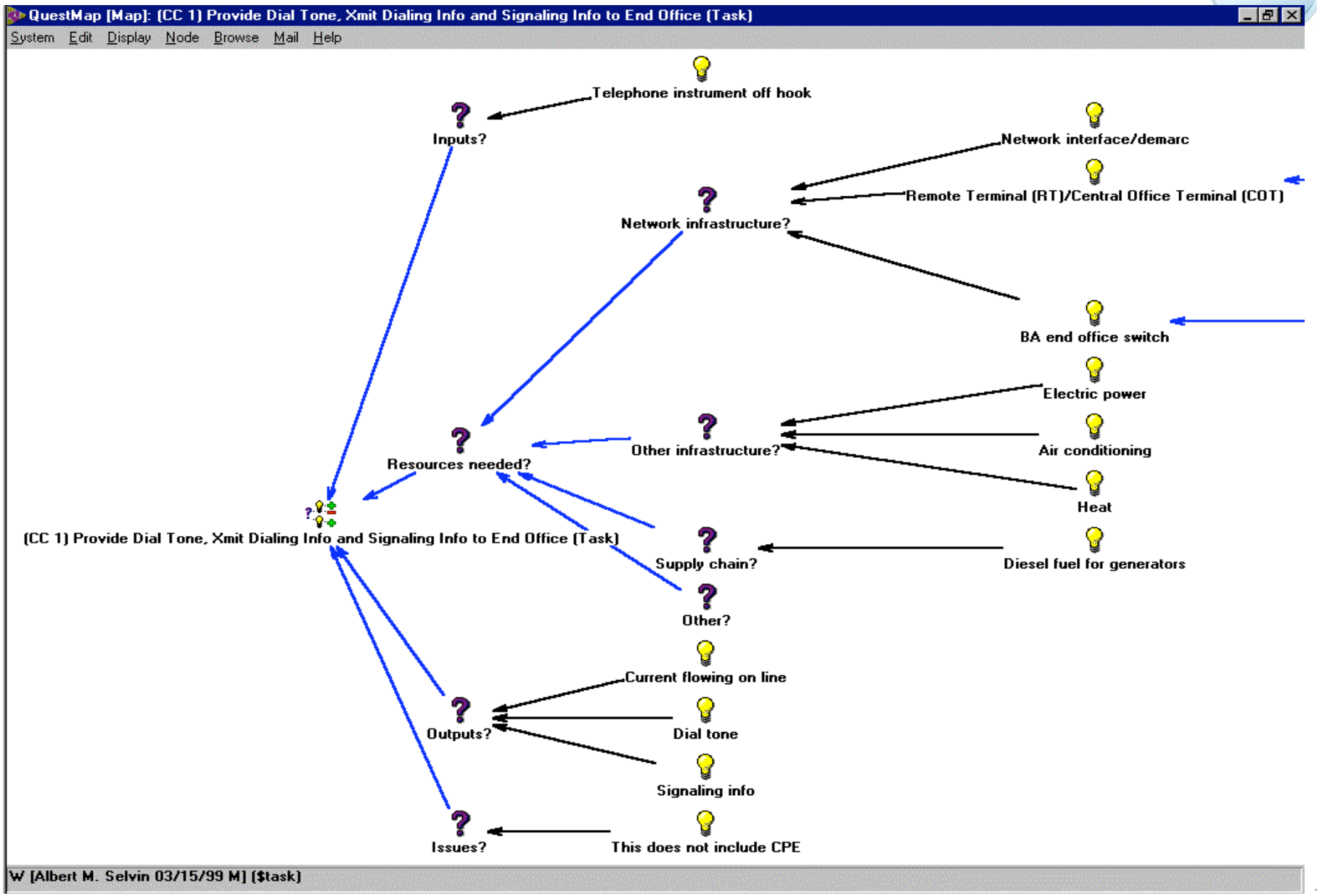
REFERENCE to a movie file

Modelling using Issue-templates

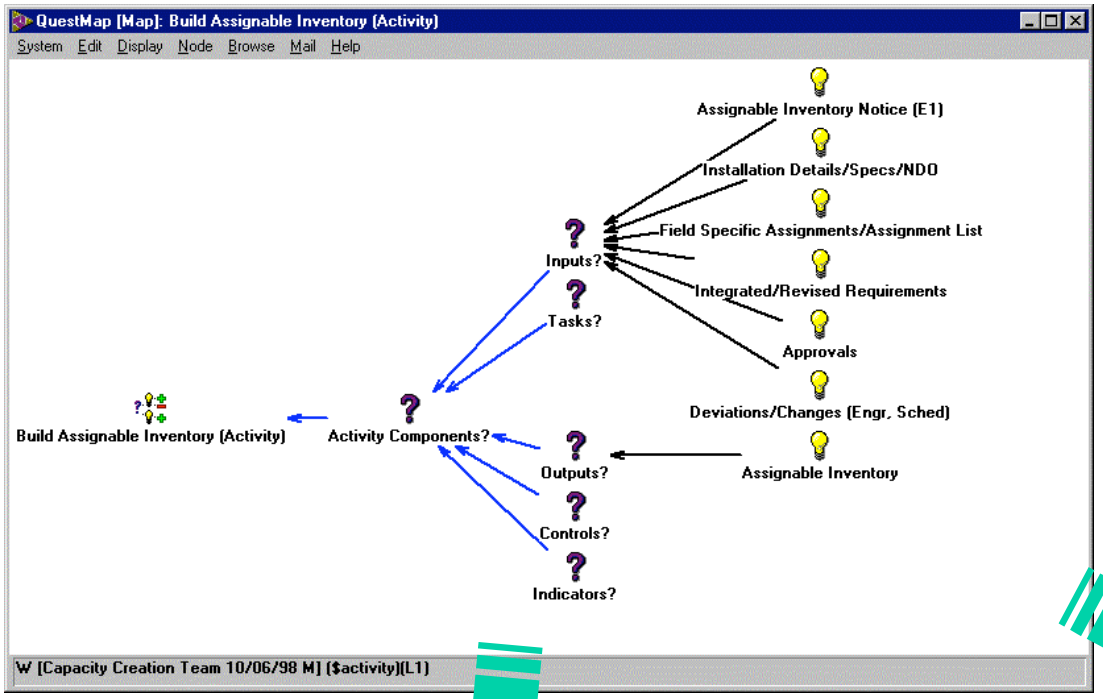
Modelling organisational processes in Compendium using a *Template*

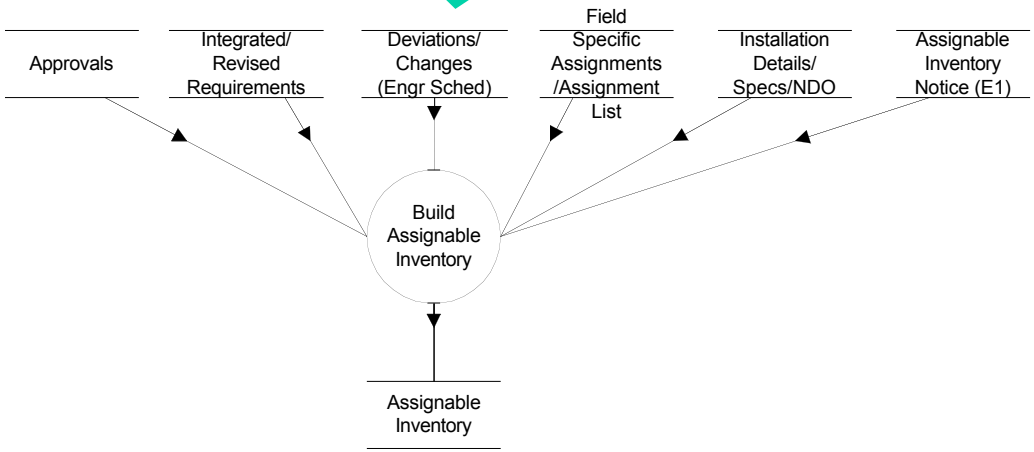


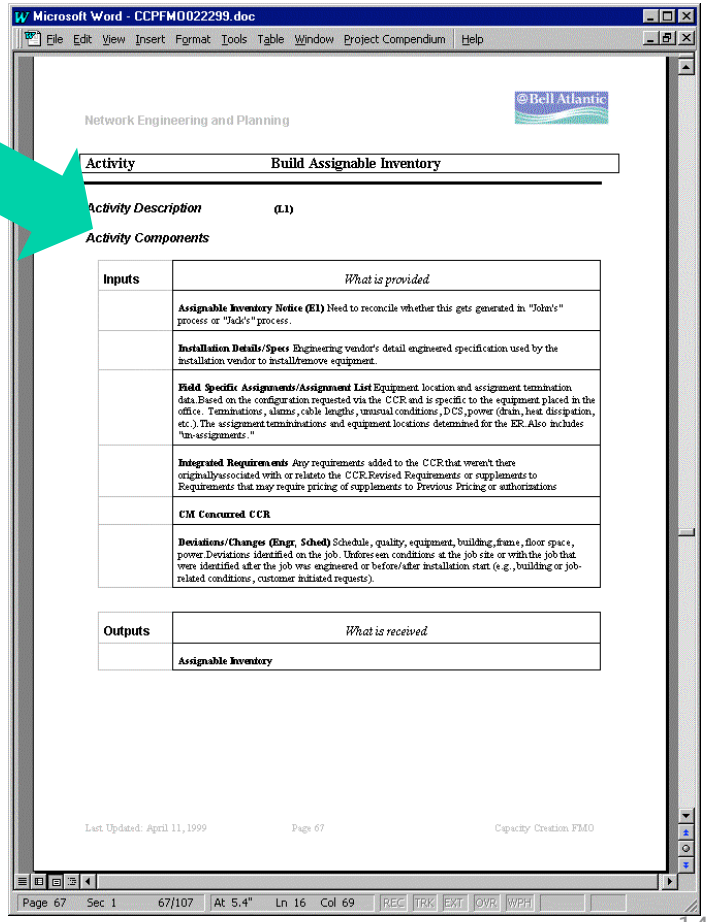
Completing a Compendium template



Generating Custom Documents and Diagrams from Compendium Templates







Structure management in Compendium

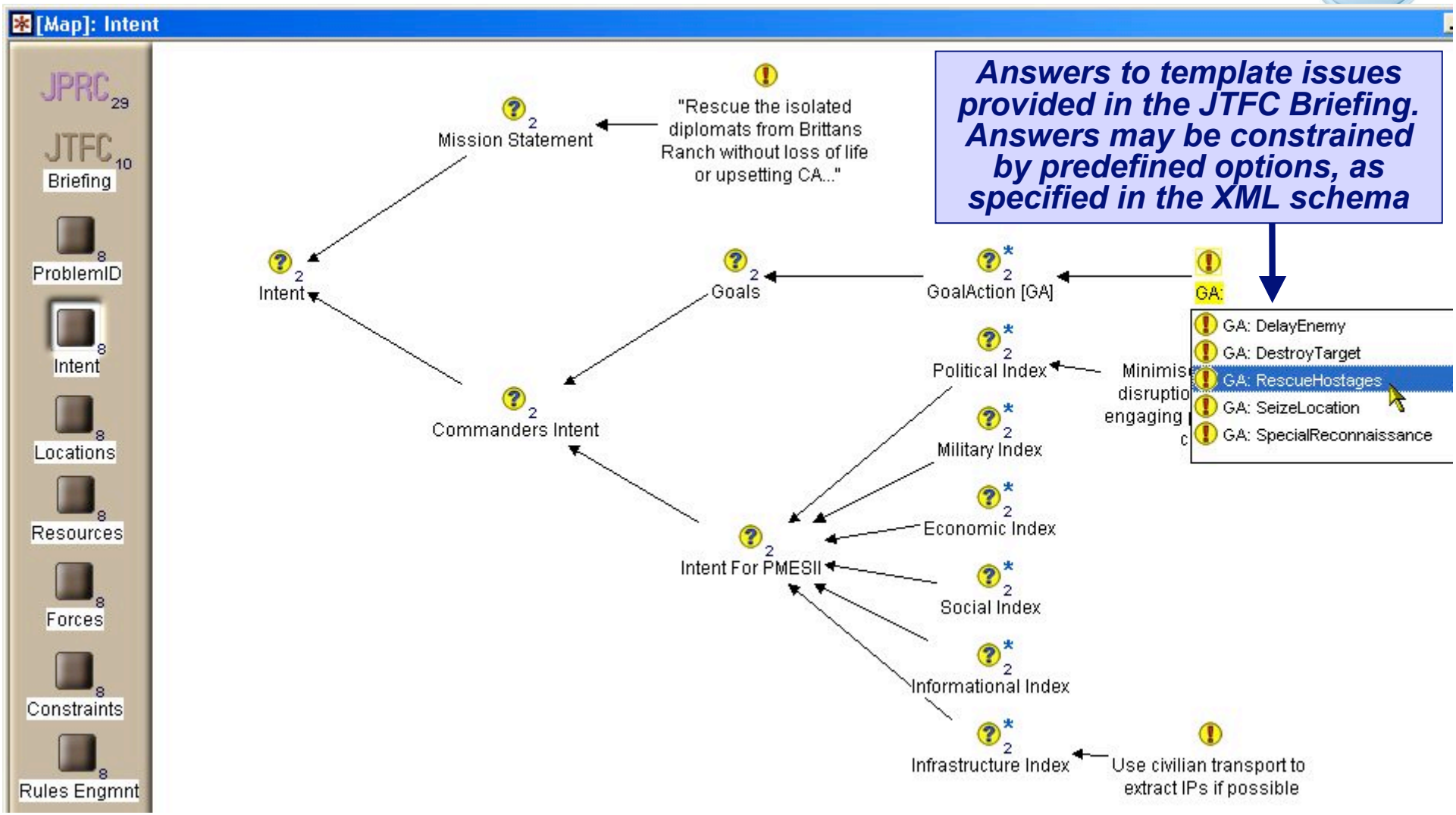
- **Associative linking**
  nodes in a shared context connected by graphical Map links
- **Categorical membership**
  nodes in different contexts connected by common attributes via metadata Tags
- **Hypertextual Transclusion**
  reuse of the same node in different views
- **Templates**
  reuse of the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

Using Compendium for personnel recovery planning

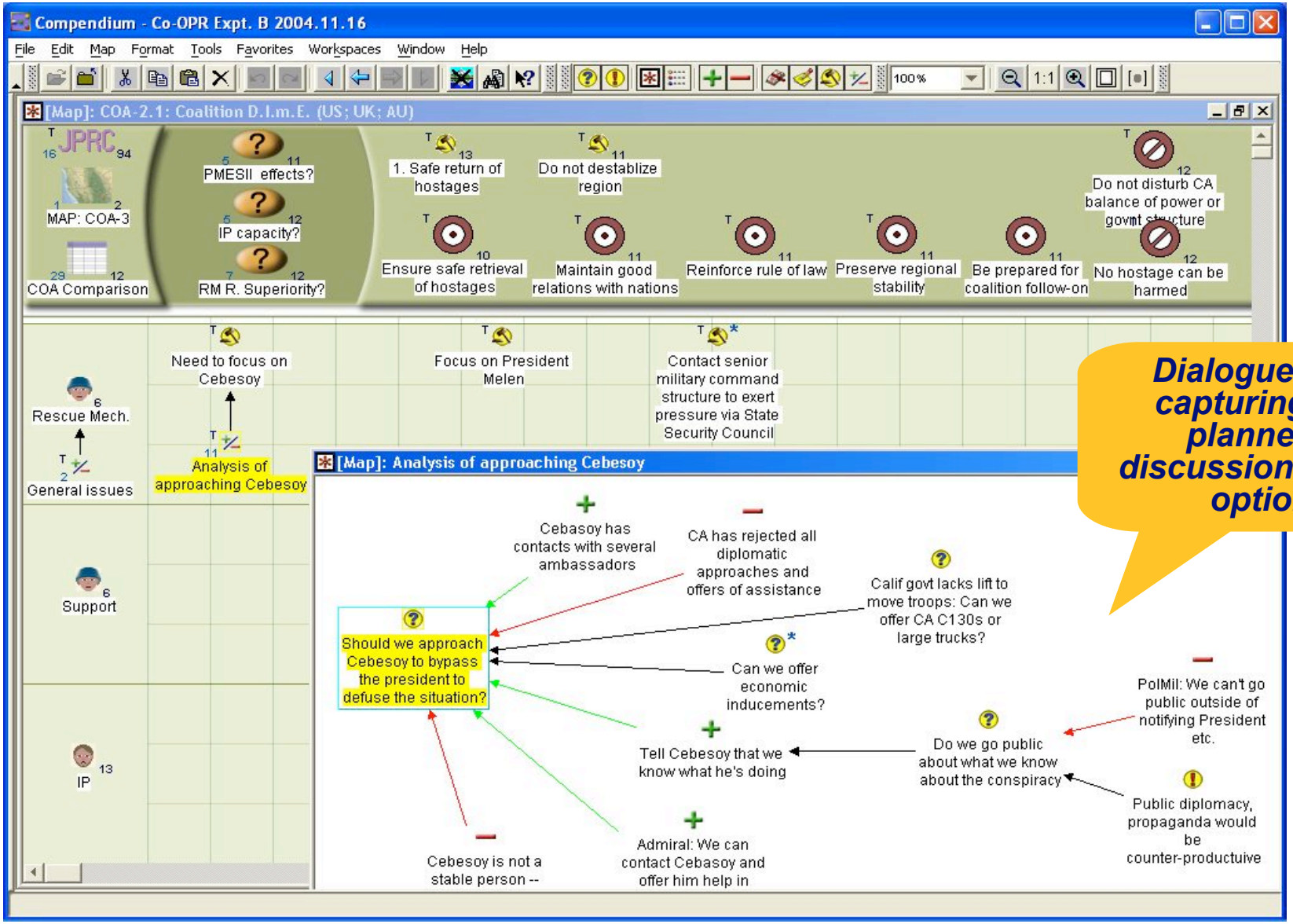
Example of Conversational Modelling:
real time dialogue mapping combined with model driven templates (AI+IA)

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

Mission Briefing: *Intent* template

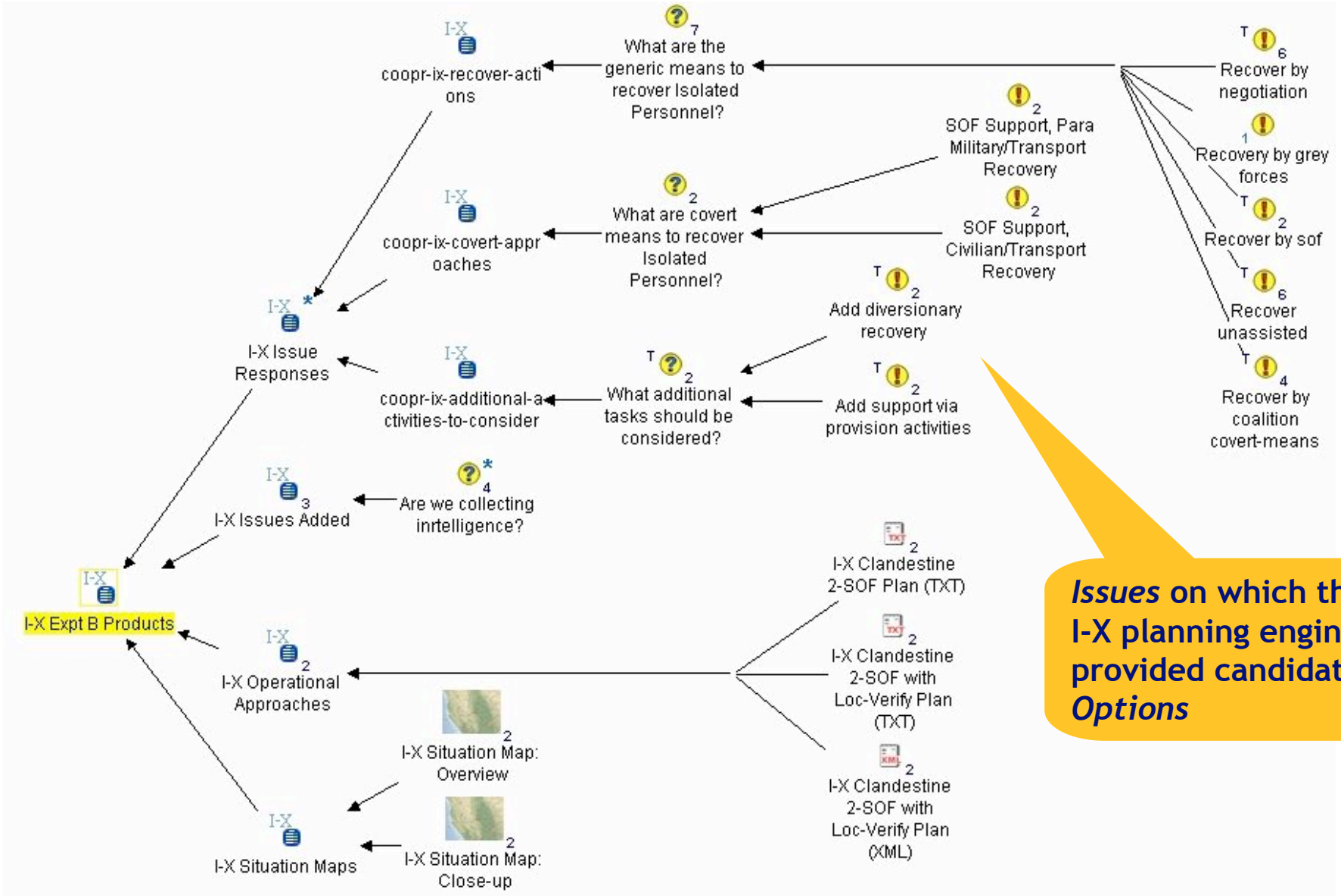


Capturing political deliberation/rationale



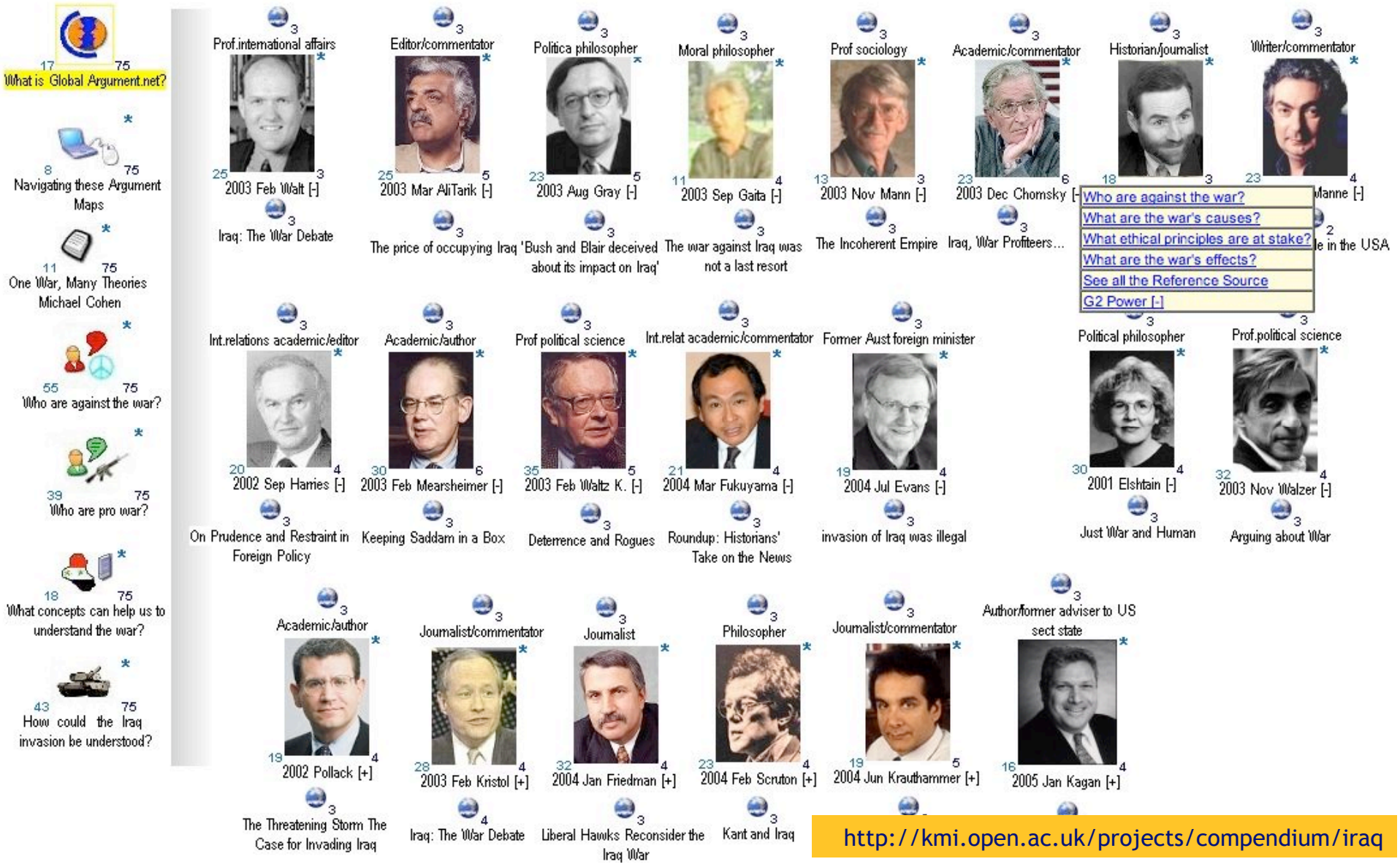
Dialogue Map capturing the planners' discussion of this option

Planning Engine input to Compendium



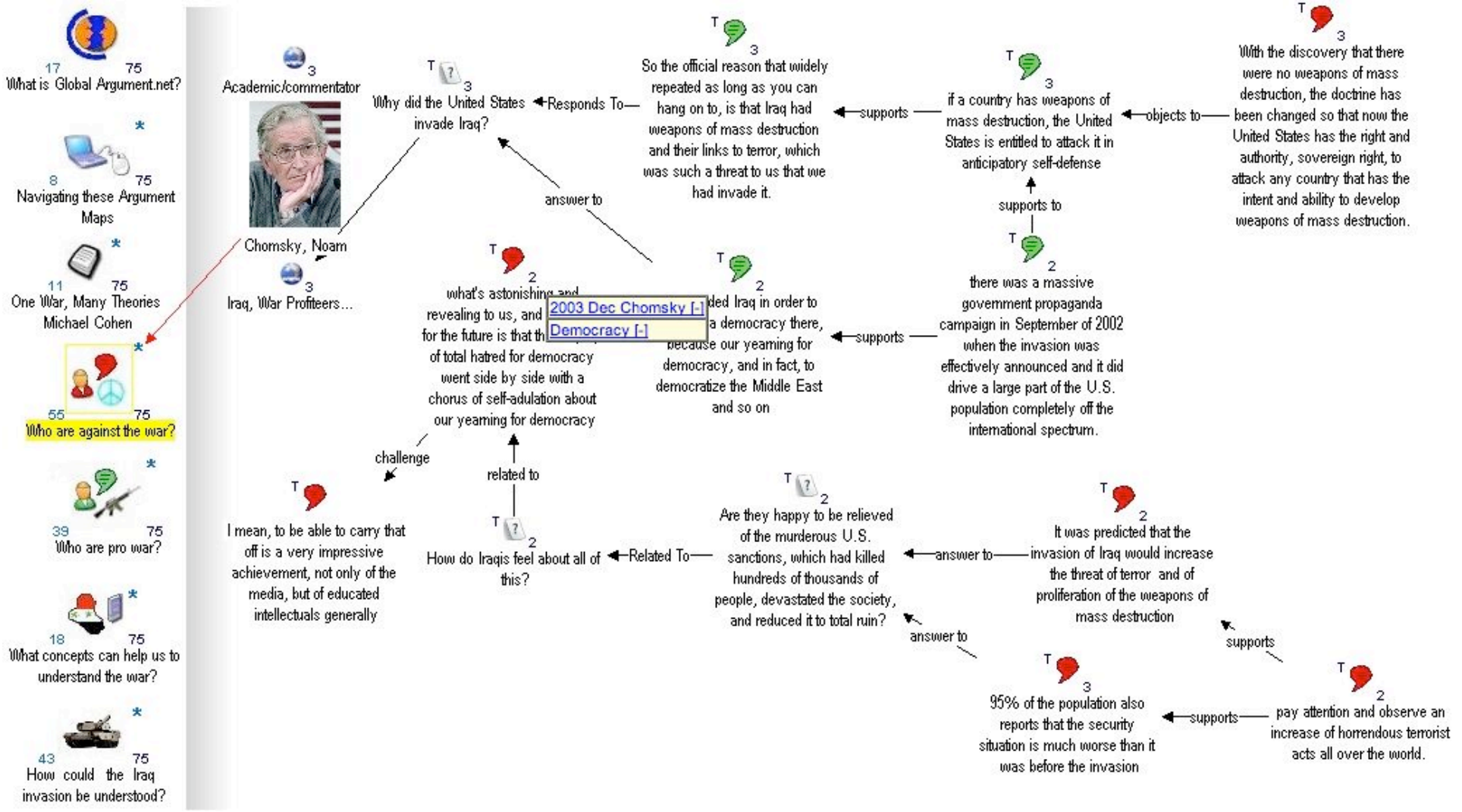
Issues **on which the I-X planning engine provided candidate** ***Options***

Modelling a document corpus: The Iraq Debate



http://kmi.open.ac.uk/projects/compendium/iraq

Annotating a document corpus: Chomsky's article in the Iraq Debate



http://kmi.open.ac.uk/projects/compendium/iraq

Large scale NASA e-science field trials:

Interoperability with other databases, software agents and collaboration tools

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

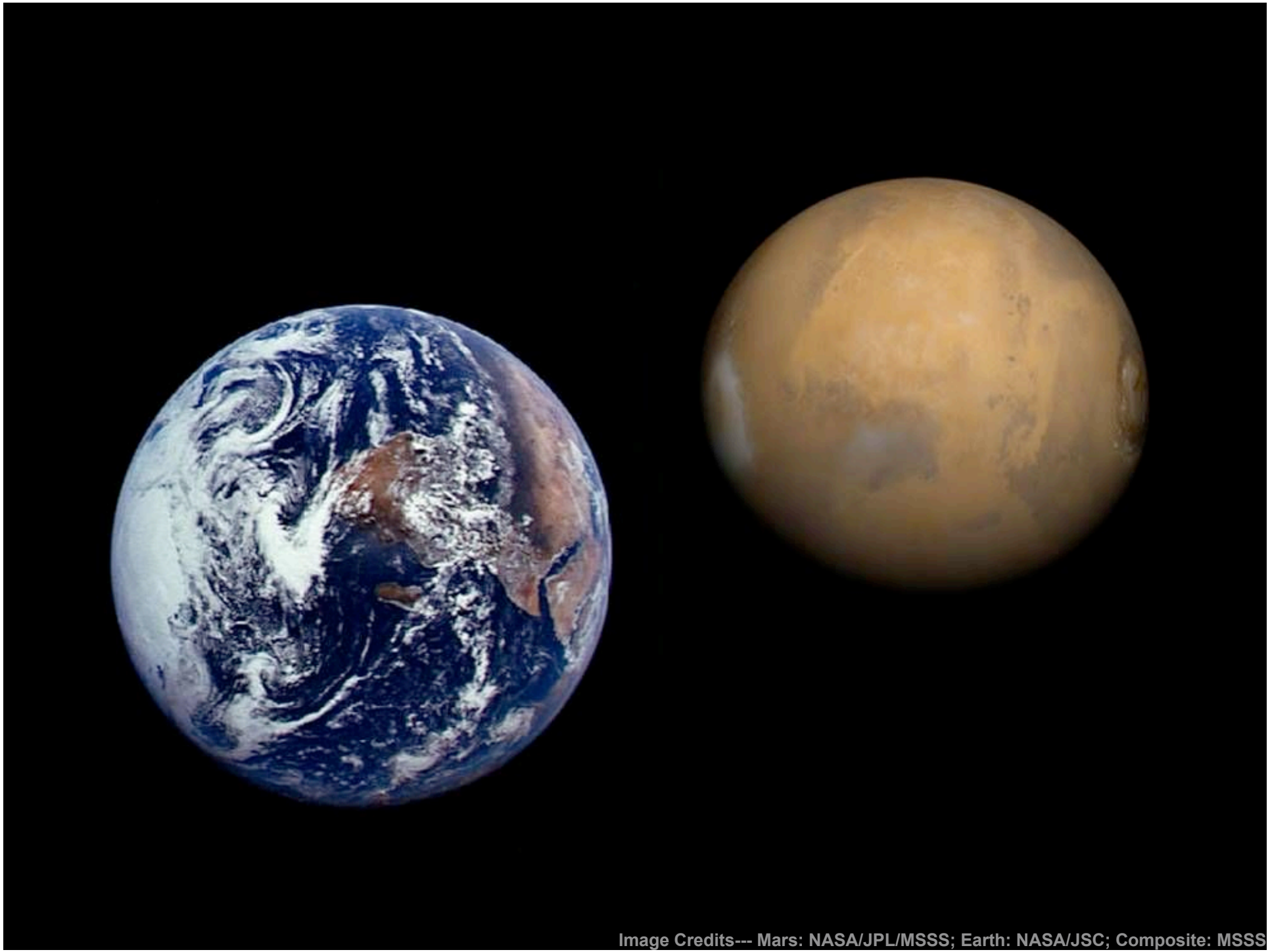


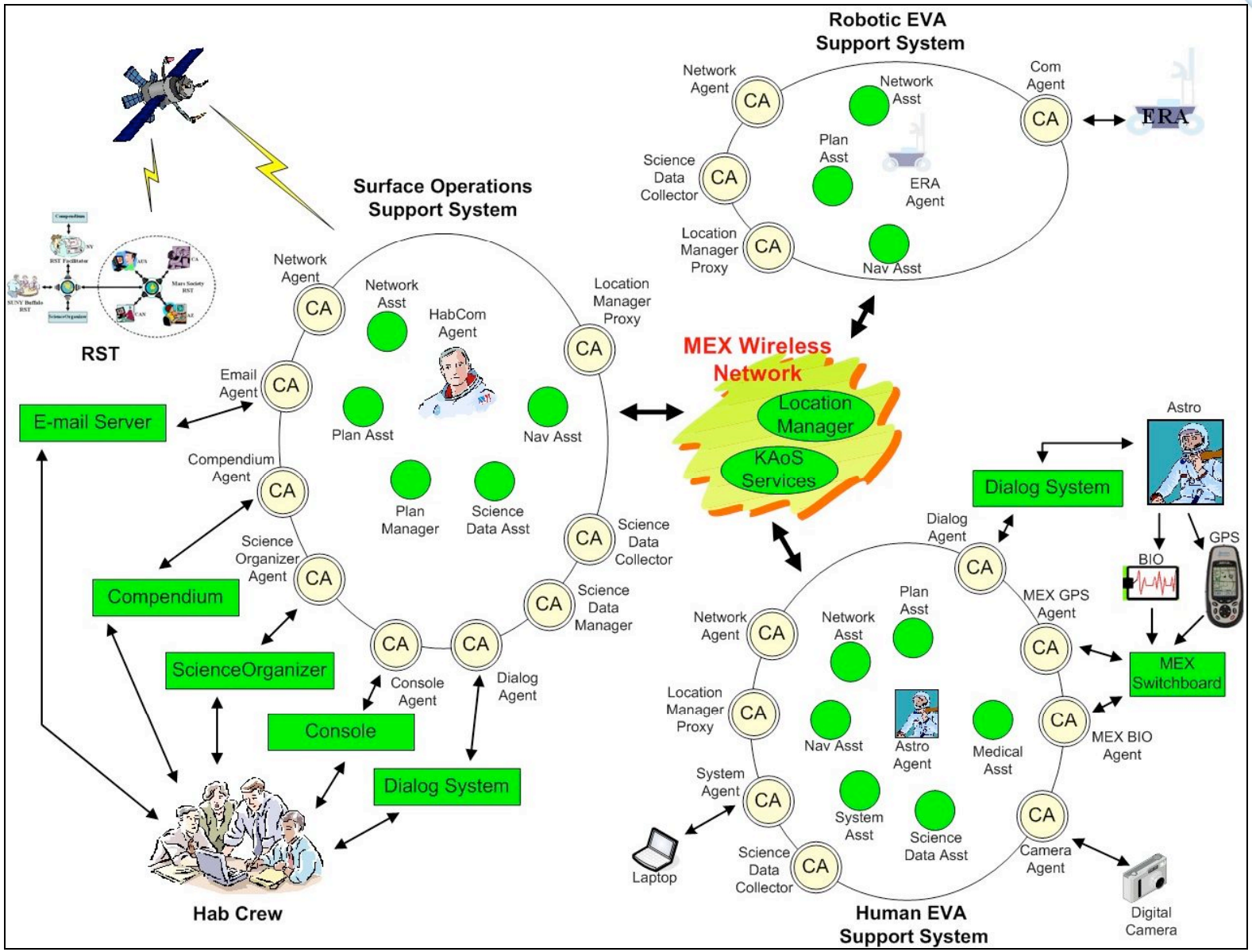
Image Credits--- Mars: NASA/JPL/MSSS; Earth: NASA/JSC; Composite: MSSS

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

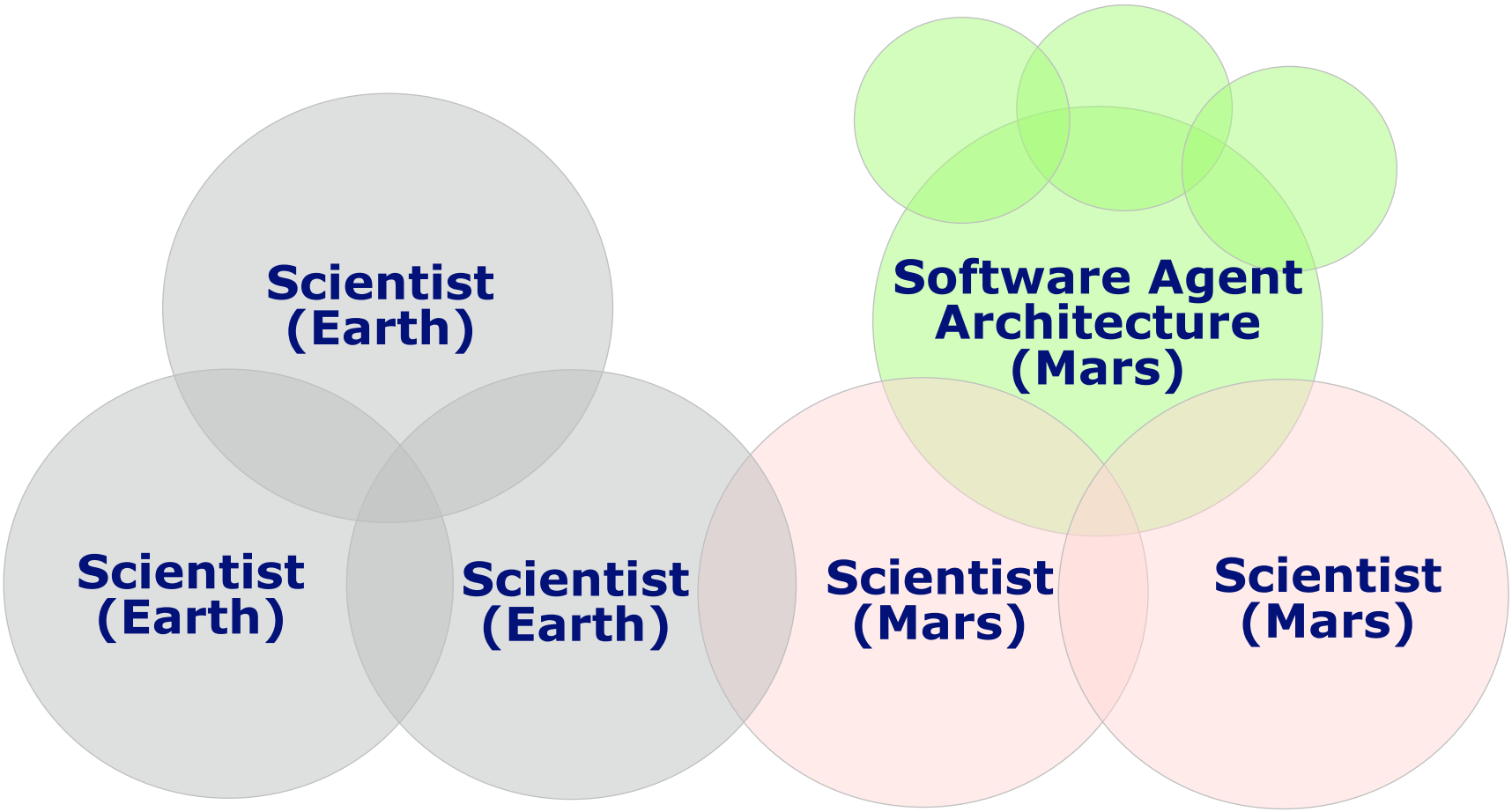
www.kmi.open.ac.uk/projects/coakting/nasa

NASA Mobile Agents Architecture



Collaboration Configuration

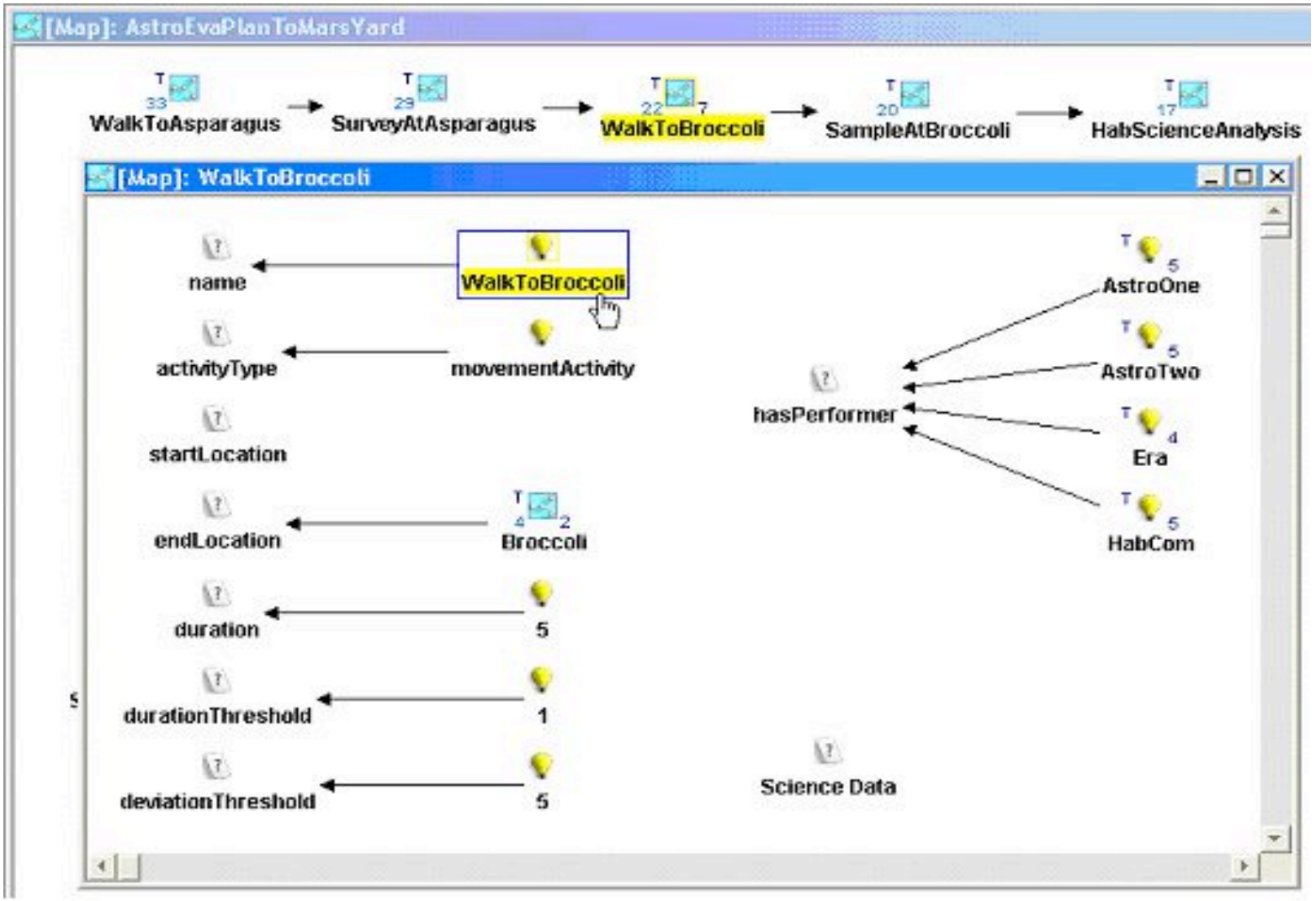
Compendium used as a collaboration medium at all intersections: *humans+agents, reading+writing* maps



RST-telecon-2005-04-11.i.avi
00:49:08

NASA testbed:

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

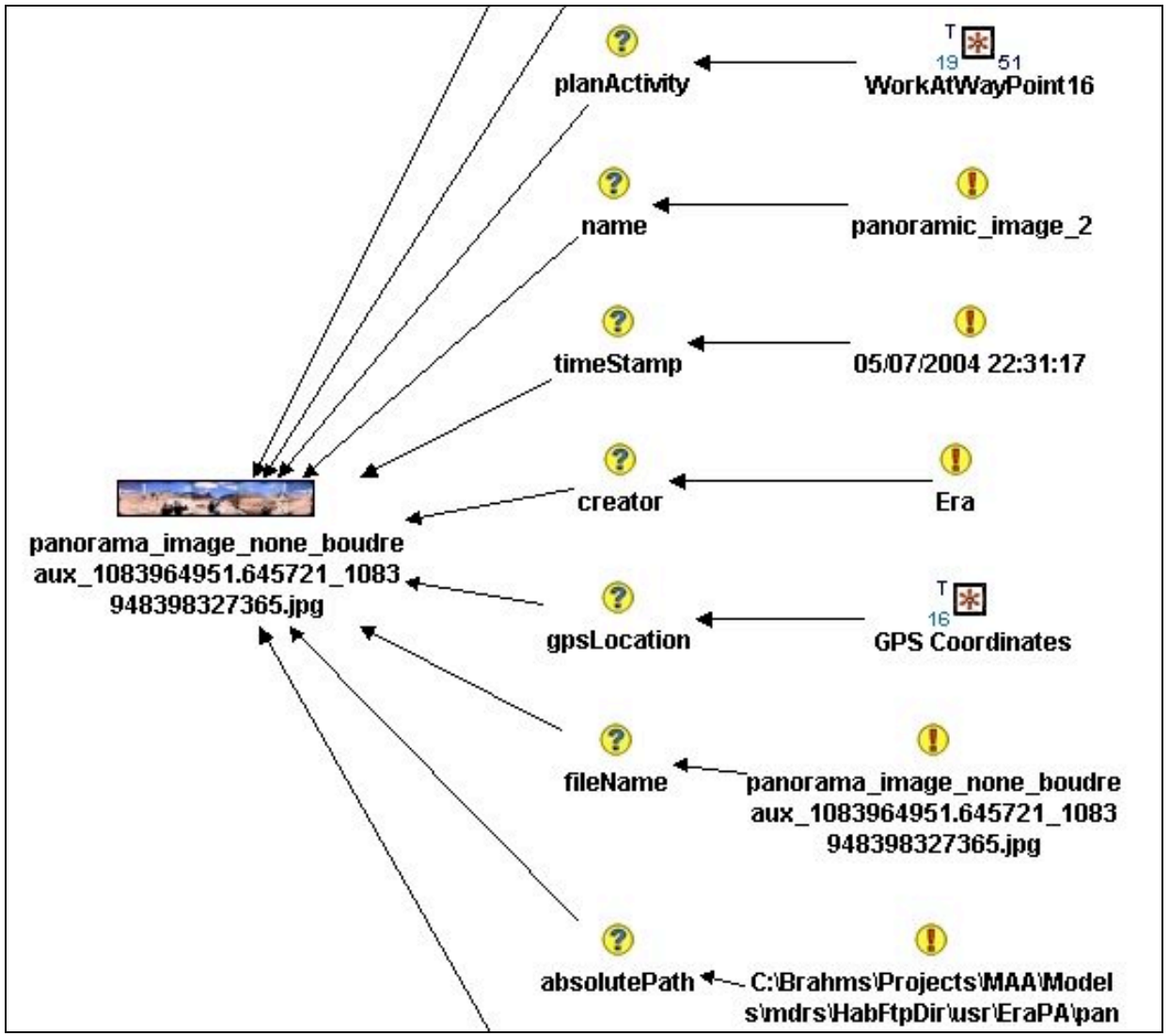


The Compendium nodes and relationships in this plan were interpreted by Brahms software agents for monitoring and coordinating astronaut and robot activity during surface explorations.

RST-telecon-2005-04-11.i.avi
1:11:57

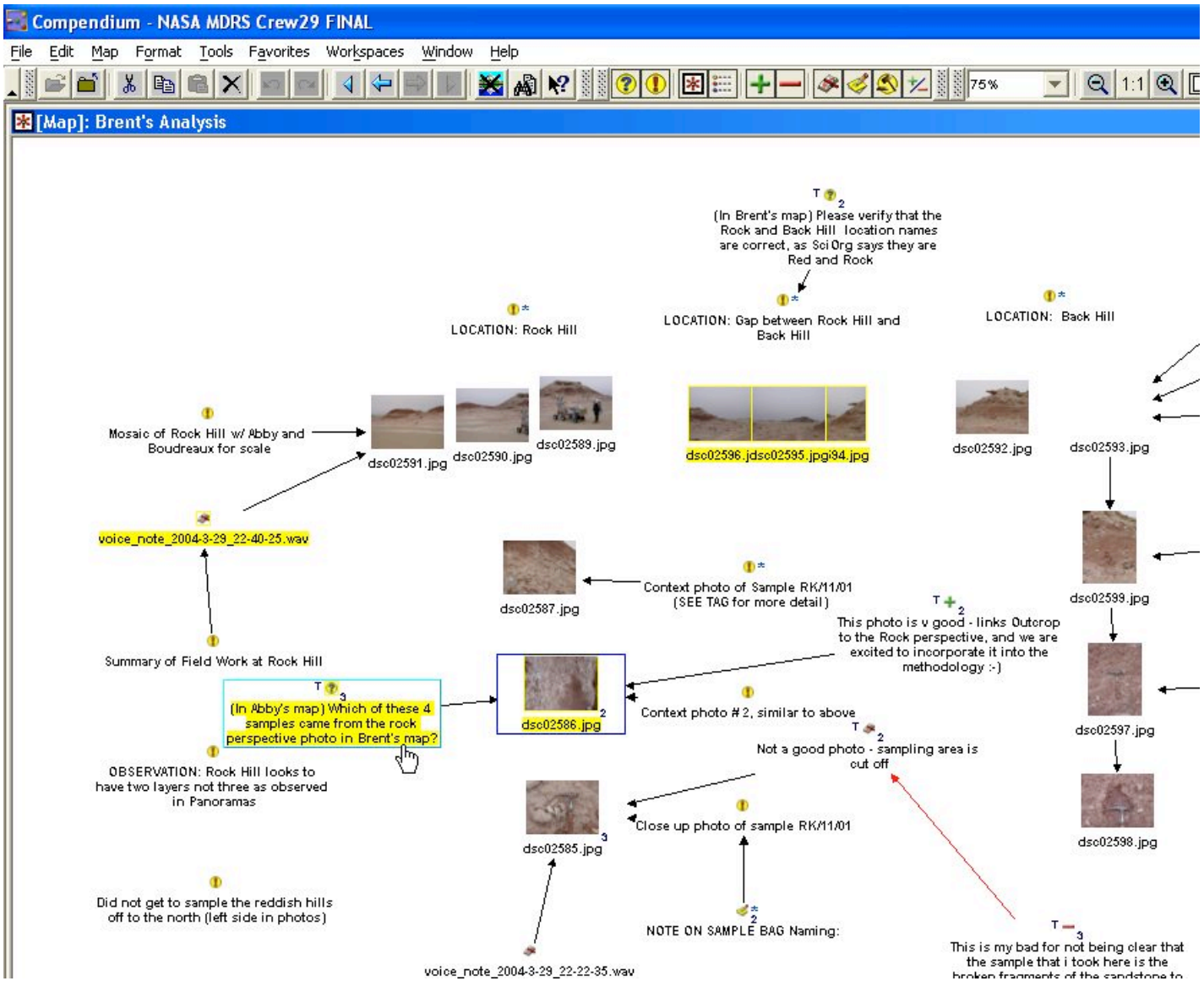
CoAKTinG NASA testbed:

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



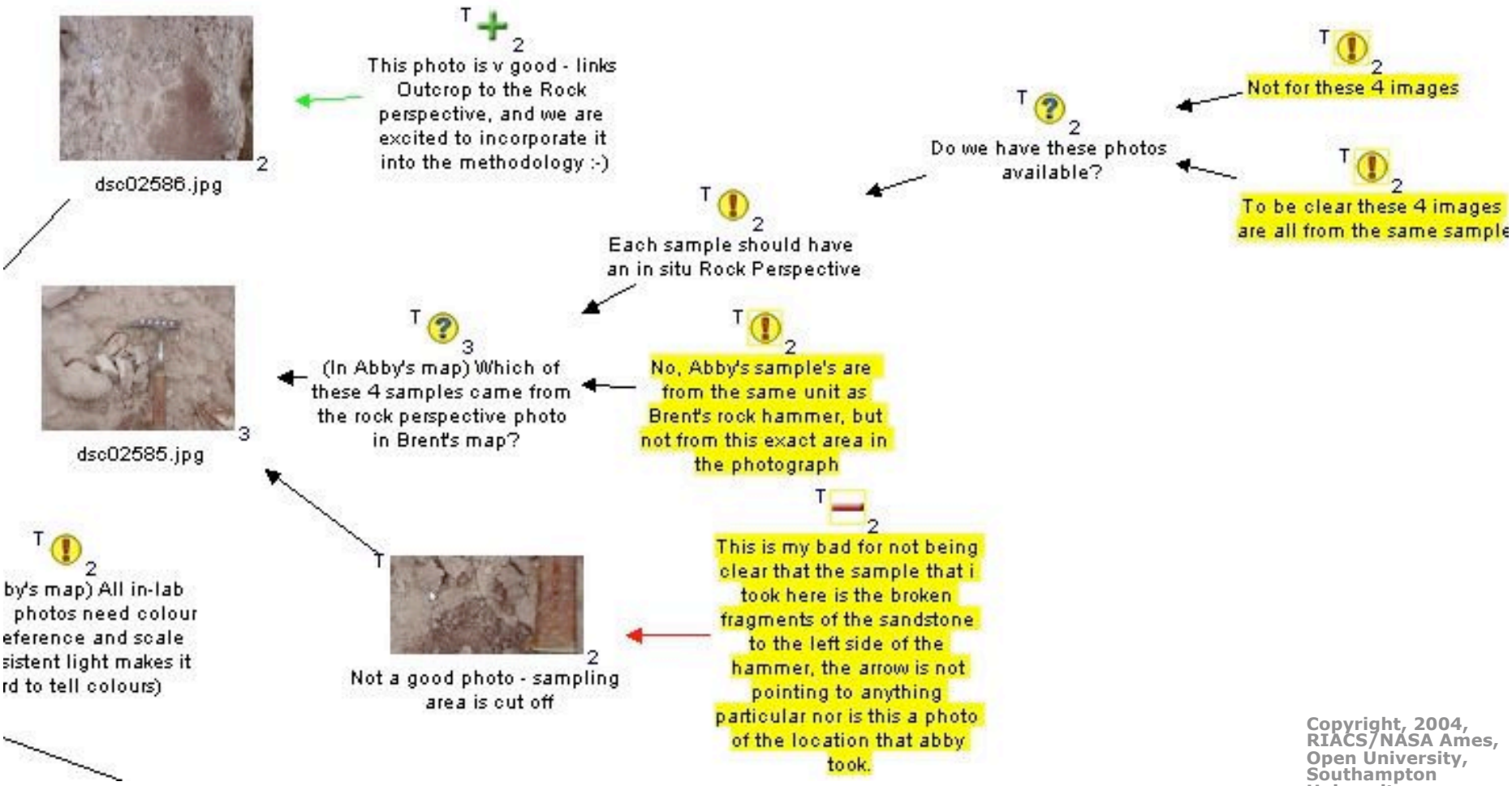
The Compendium maps were autonomously created and populated with science data by Brahms software agents that use models of the mission plan, work process, data flow and science data relationships to create the maps.

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



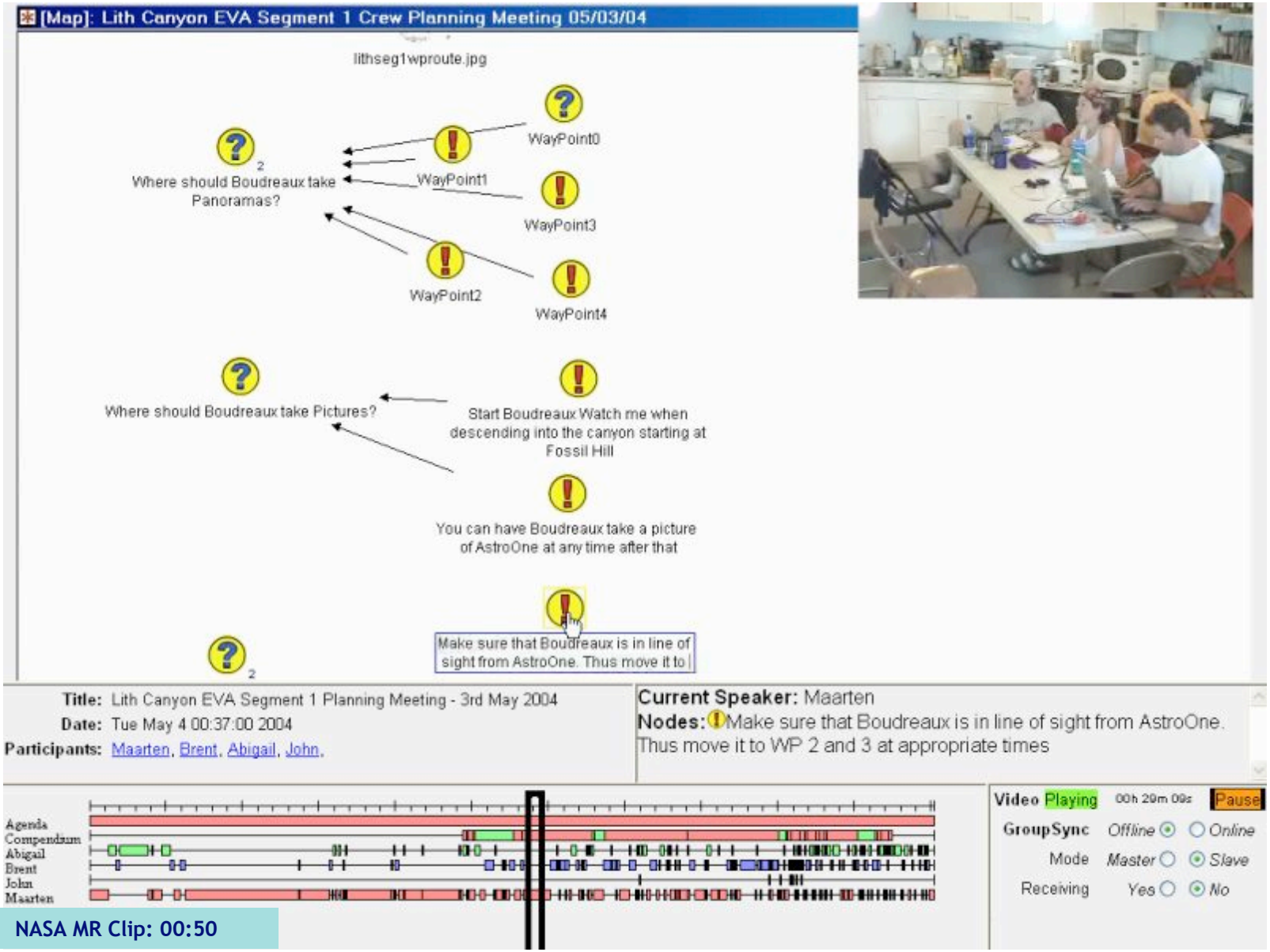
NASA testbed:

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



Collaborative sensemaking in e-Science:

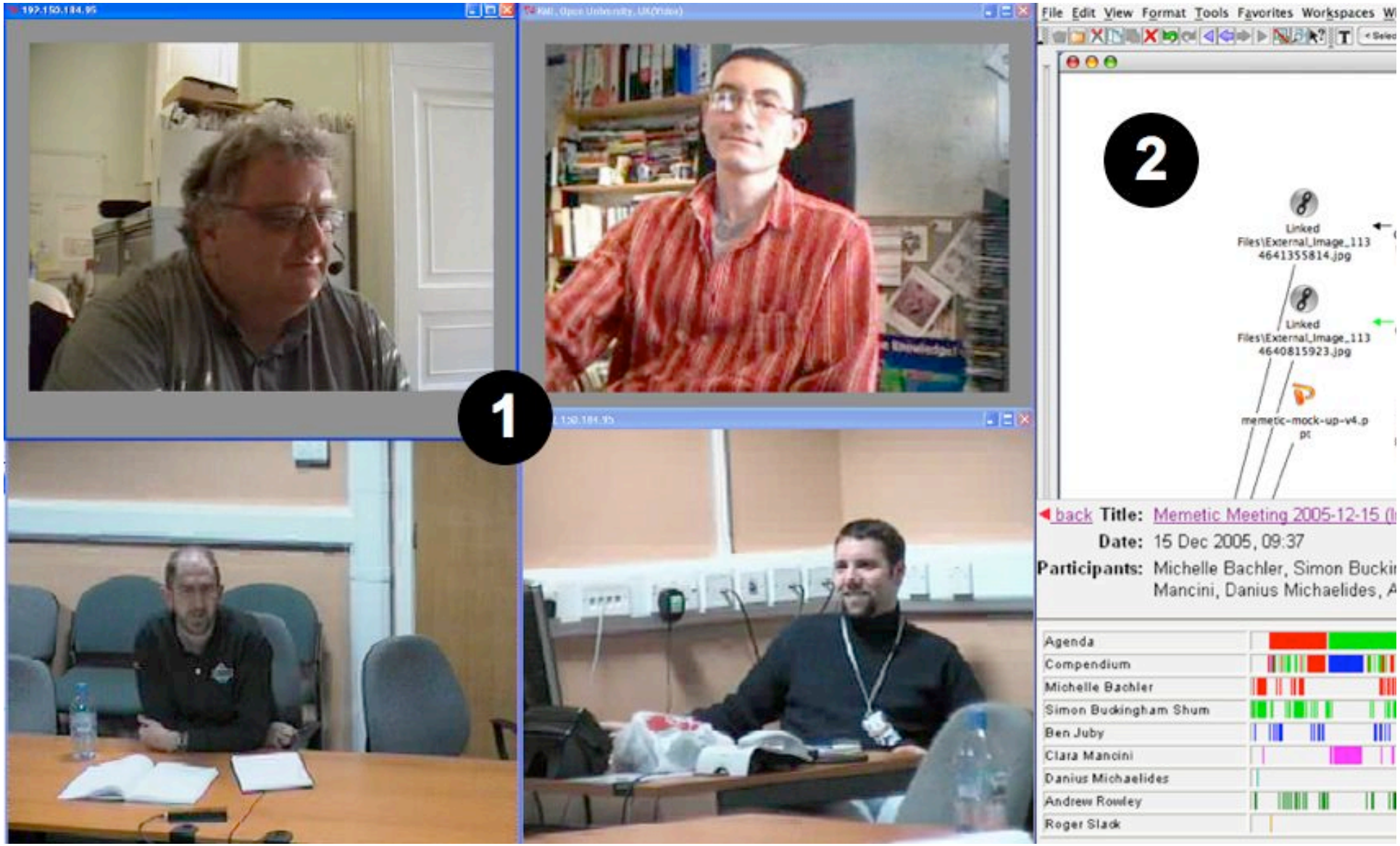
Meeting Replay tool for *Earth scientists*, synchronising video of *Mars crew's* discussion as they annotate their mission plans



NASA MR Clip: 00:50

Memetic Meeting Replay

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



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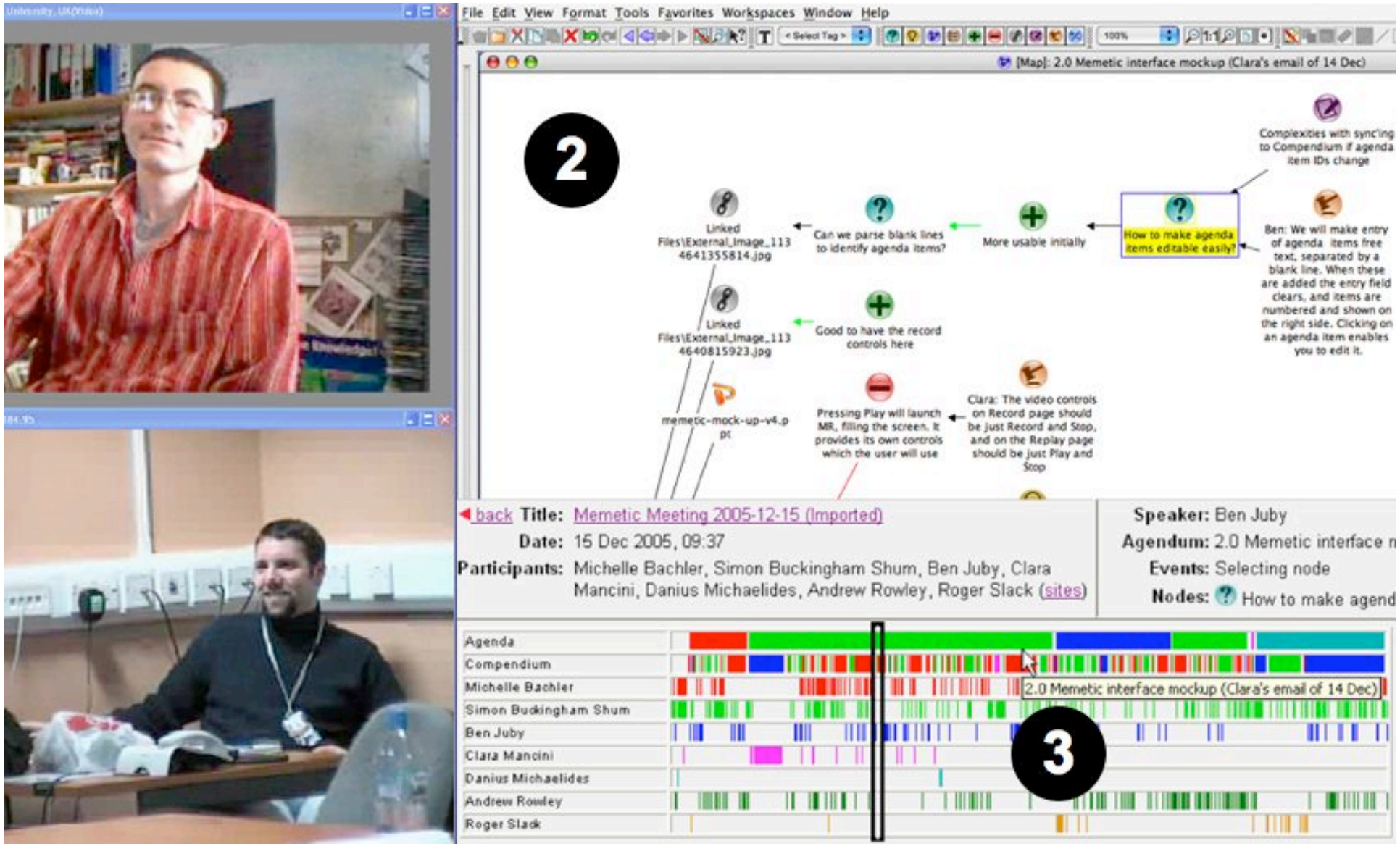
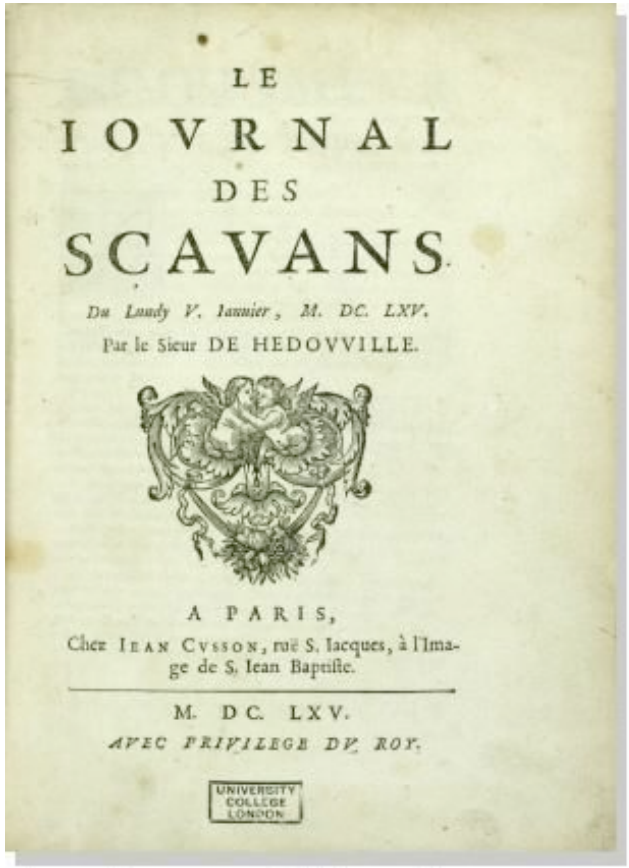


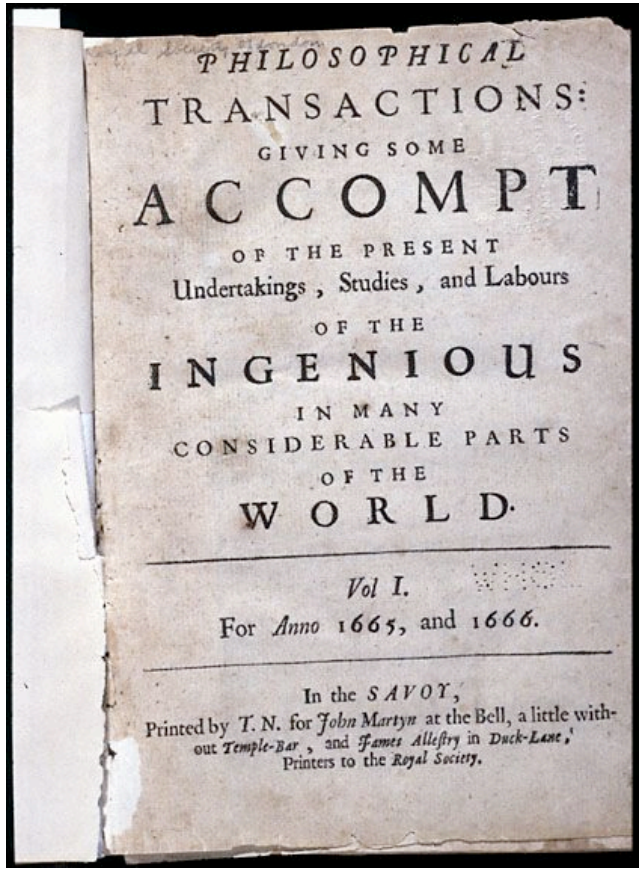
In Gutenberg's shadow
(or standing on his shoulders)

[Information Technology] + [Social Networks] *= Knowledge Medium*

Newspapers + Invisible Colleges = Scholarly Journals


LE
IOVRNAL
DES
SCAVANS.
Du Lundy V. Ianuier, M. DC. LXV.
Par le Sieur DE HEDOVVILLE.
A PARIS,
Chez IEAN CVSSON, ruë S. Iacques, à l'Image de S. Iean Baptiſte.
M. DC. LXV.
AVEC PRIVILEGE DV ROY.
UNIVERSITY COLLEGE LONDON

Le Journal des Sçavans
January 1665


PHILOSOPHICAL
TRANSACTIONS:
GIVING SOME
ACCOMPT
OF THE PRESENT
Undertakings, Studies, and Labours
OF THE
INGENIOUS
IN MANY
CONSIDERABLE PARTS
OF THE
WORLD.
Vol I.
For *Anno* 1665, and 1666.
In the *SAVOY*,
Printed by *T. N.* for *John Martyn* at the Bell, a little without *Temple-Bar*, and *James Allestry* in *Duck-Lane*,
Printers to the *Royal Society*.

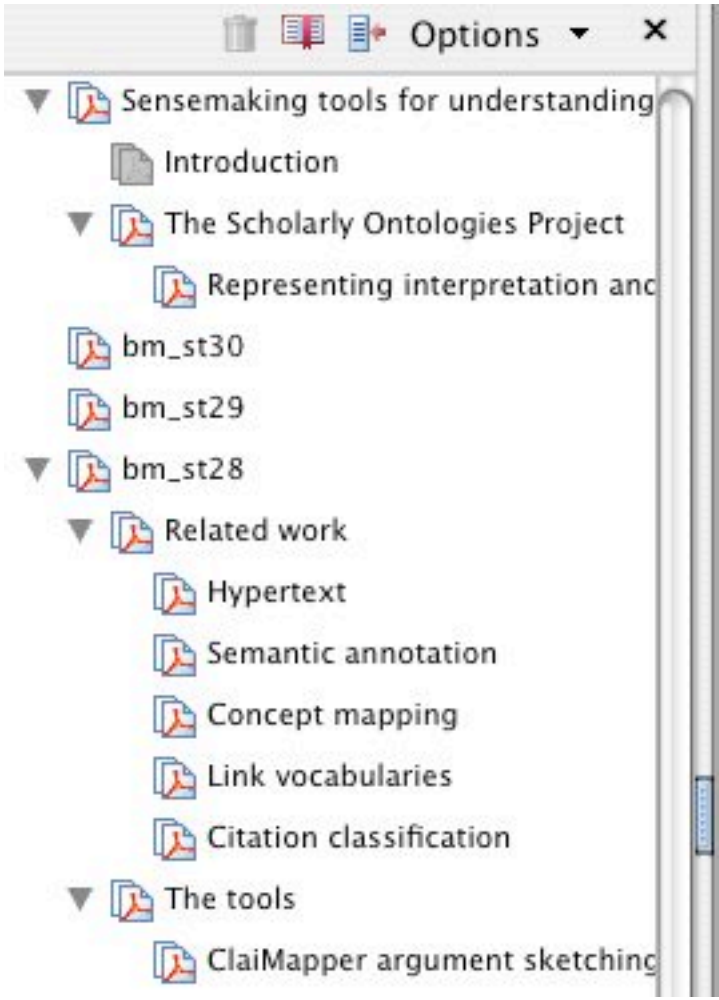
Philosophical Transactions of the Royal Society of London
March 1665

Jumping forward 343 years…

Buckingham Shum, S. (2007). **Digital Research Discourse?** Computational Thinking Seminar Series, School of Informatics, University of Edinburgh, 25 Apr. 2007. http://kmi.open.ac.uk/projects/hyperdiscourse/docs/Simon-Edin-CompThink.pdf

2008… Ideas and arguments (=knowledge claims) are now digital…

…digital paper!



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Int. J. Human-Computer Studies 66 (2008) 420–445

International Journal of Human-Computer Studies

www.elsevier.com/locate/ijhcs

Sensemaking tools for understanding research literatures: Design, implementation and user evaluation

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Received 25 October 2006; received in revised form 25 July 2007; accepted 18 September 2007
Available online 16 November 2007
Communicated by E. Motta

Abstract

This paper describes the work undertaken in the Scholarly Ontologies Project. The aim of the project has been to develop a computational approach to support scholarly sensemaking, through interpretation and argumentation, enabling researchers to make claims to describe and debate their view of a document's key contributions and relationships to the literature. The project has investigated the technicalities and practicalities of capturing conceptual relations, within and between conventional documents in terms of abstract ontological structures. In this way, we have developed a new kind of index to distributed digital library systems. This paper reports a case study undertaken to test the sensemaking tools developed by the Scholarly Ontologies project. The tools used were ClaiMapper, which allows the user to sketch argument maps of individual papers and their connections, ClaiMaker, a server on which such models can be stored and saved, which provides interpretative services to assist the querying of argument maps across multiple papers and ClaimFinder, a novice interface to the search services in ClaiMaker.

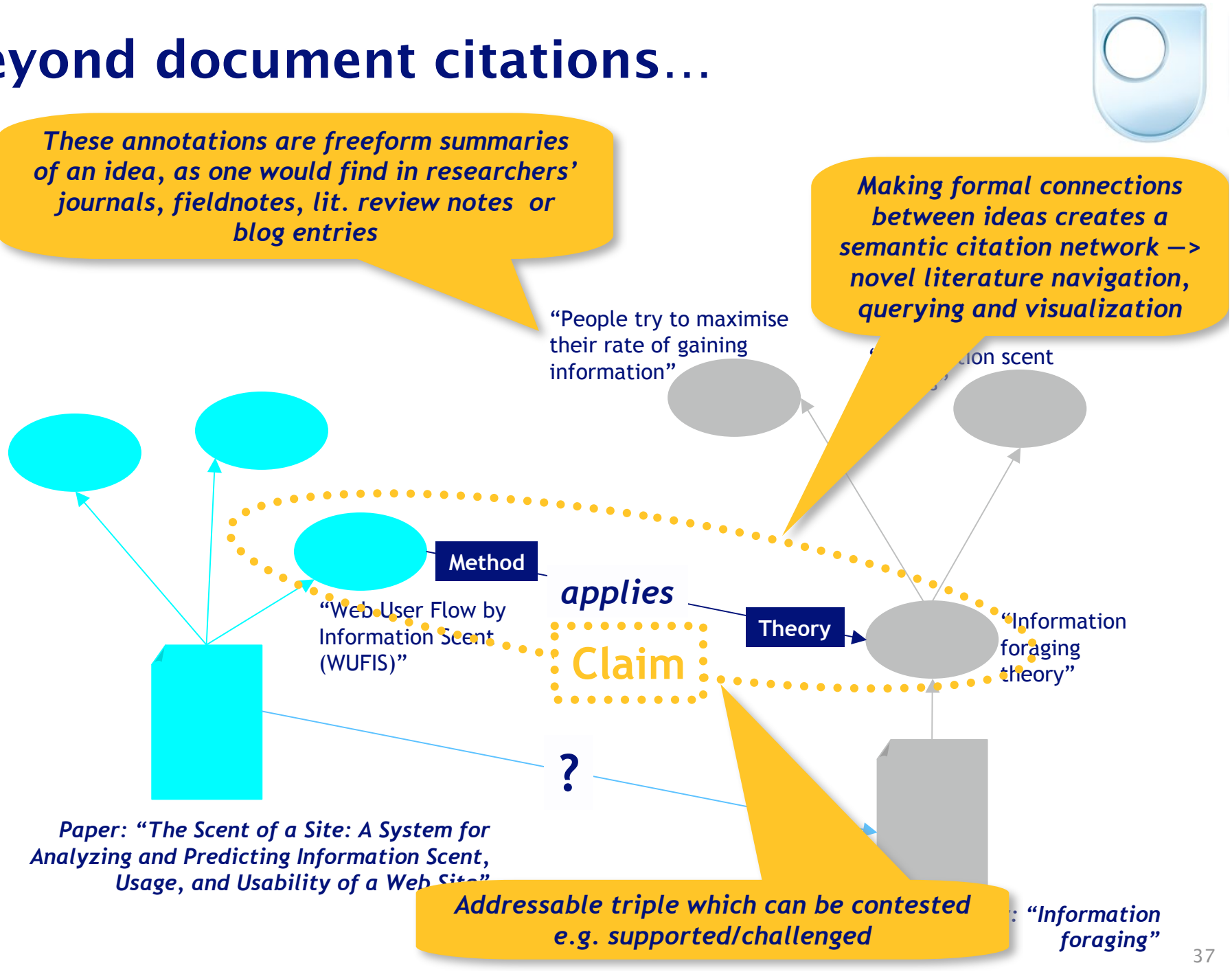
Keywords: Modelling interfaces; Search interfaces; User studies

1. Introduction

Researchers are benefiting from improved access to

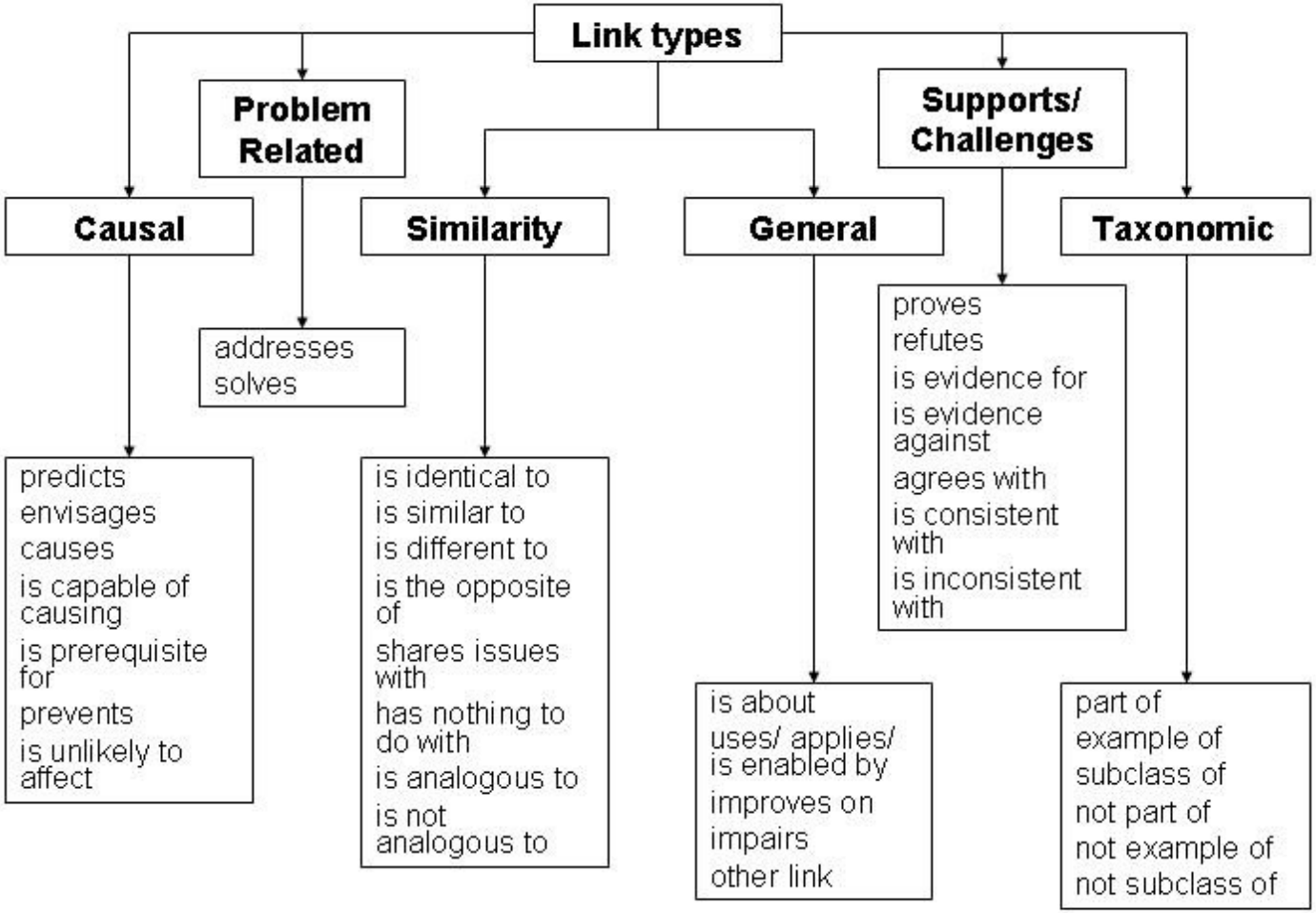
'sensemaking' we refer to Weick's (1996) work on how individuals and groups construct meaning when confronted by complex, sometimes contradictory information

Beyond document citations…

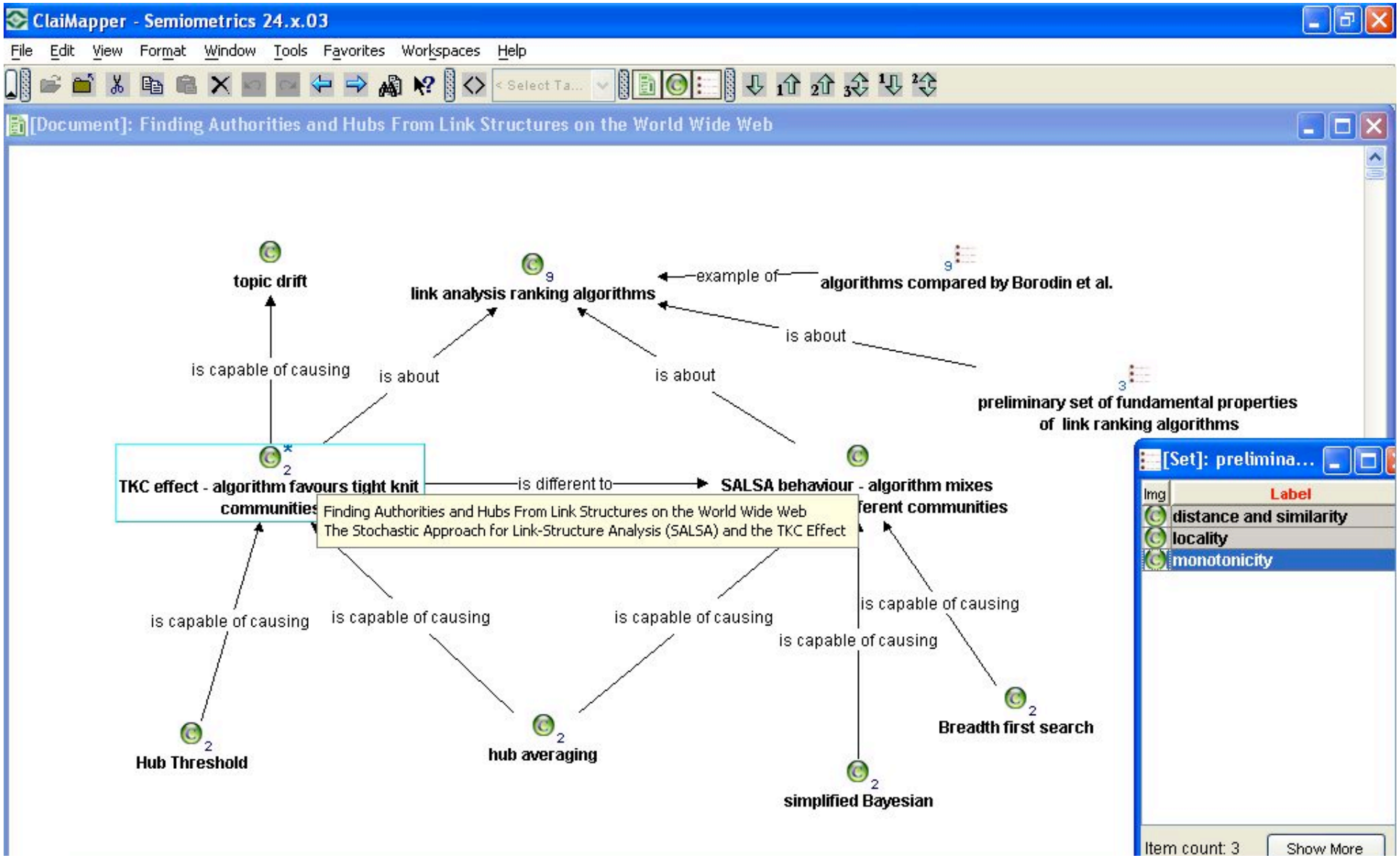


Combining formal relations with the expressive freedom of 'folksonomies'

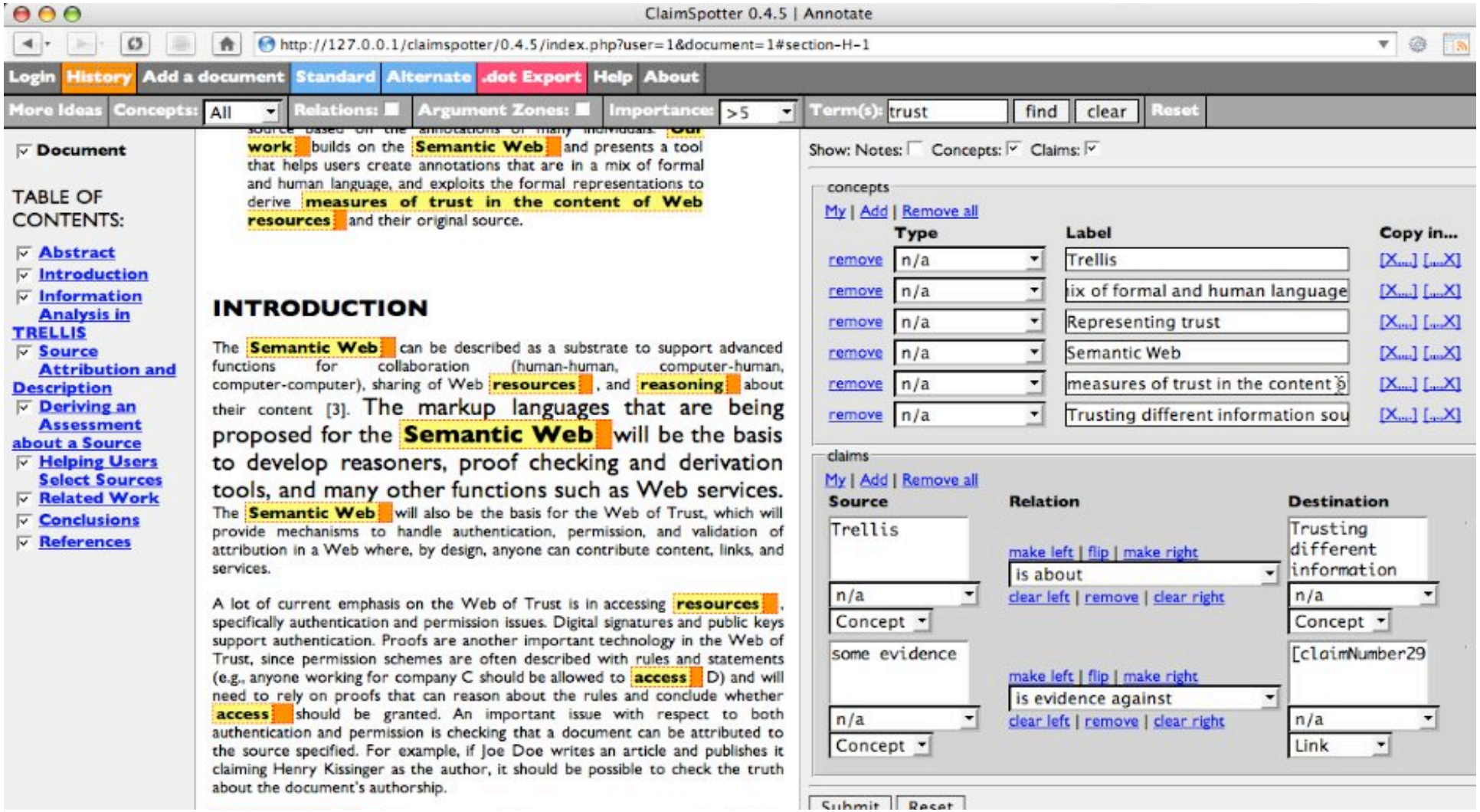
Relational classes and dialects (KMi Scholarly Ontologies project)



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

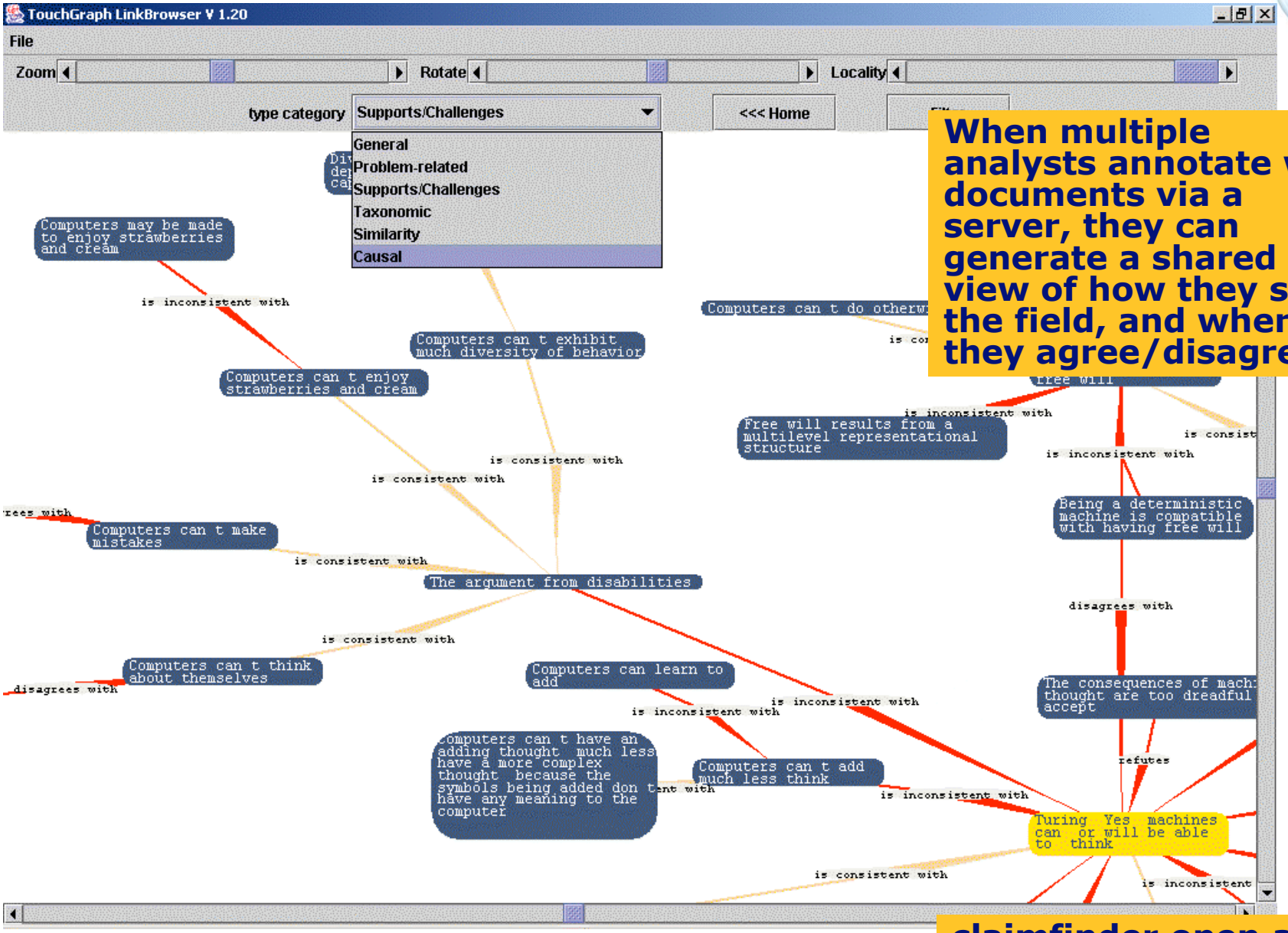


"Semantic del.icio.us": KMi's ClaimSpotter
assigning *and* linking freeform tags



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

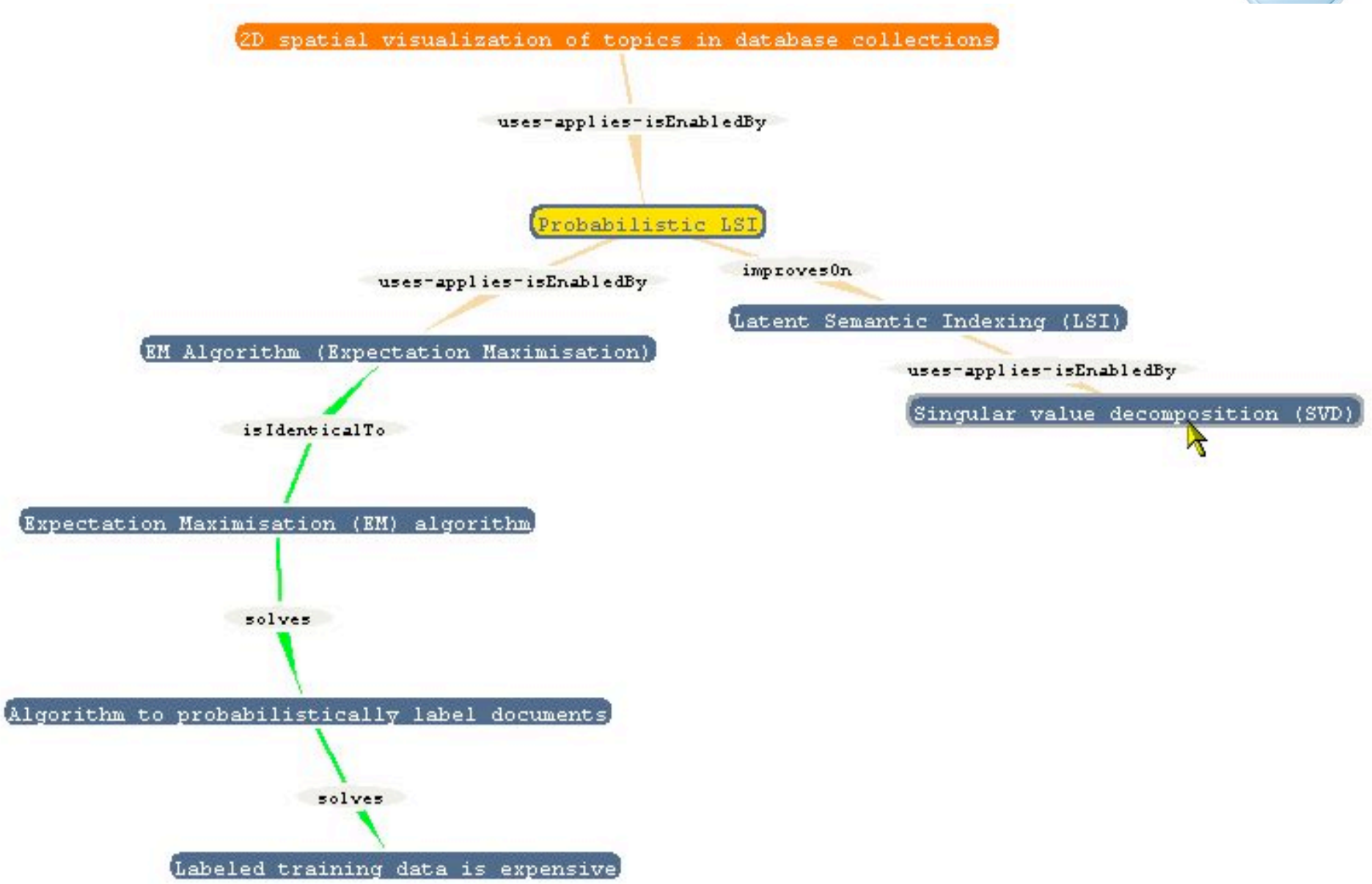


When multiple analysts annotate web documents via a server, they can generate a shared view of how they see the field, and where they agree/disagree

claimfinder.open.ac.uk

“Semantic Google Scholar”
KMi’s ClaimFinder

Lineage tree (the roots of a concept)

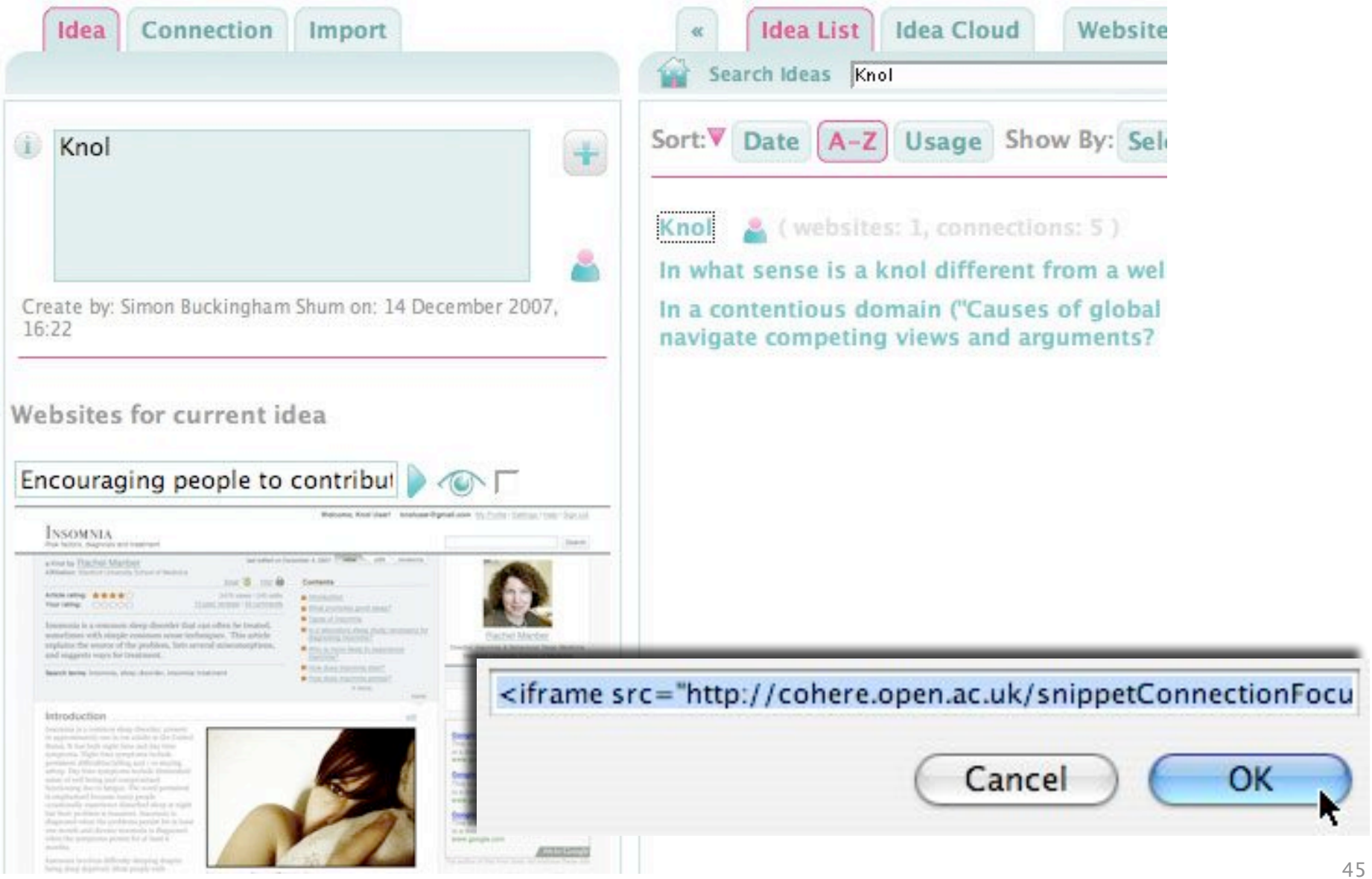


Adding Web 2.0 functionality to an open platform for mapping concepts and arguments

Cohere: http://cohereweb.net

<demo>

Cohere: creating a new Idea for Google's "Knol", linked to a website



Cohere: embedding an Idea in a blog

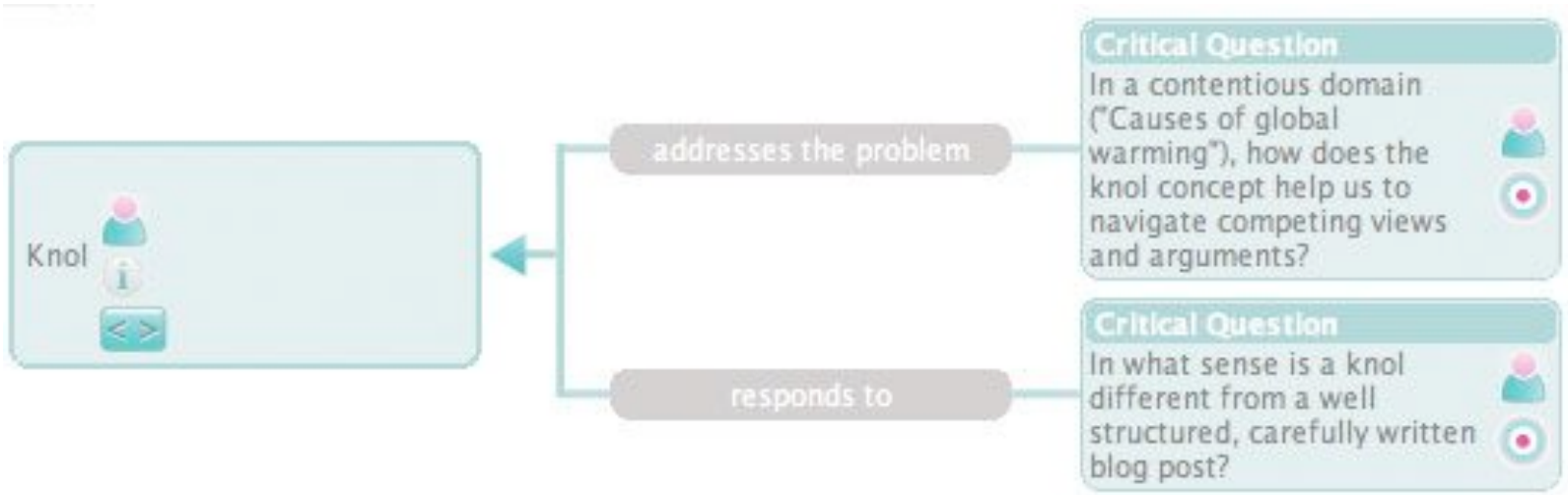
Google blog proposes the “knol” concept

posted by sbs in December 14th, 2007 | Edit
in contested-knowledge, sensemaking

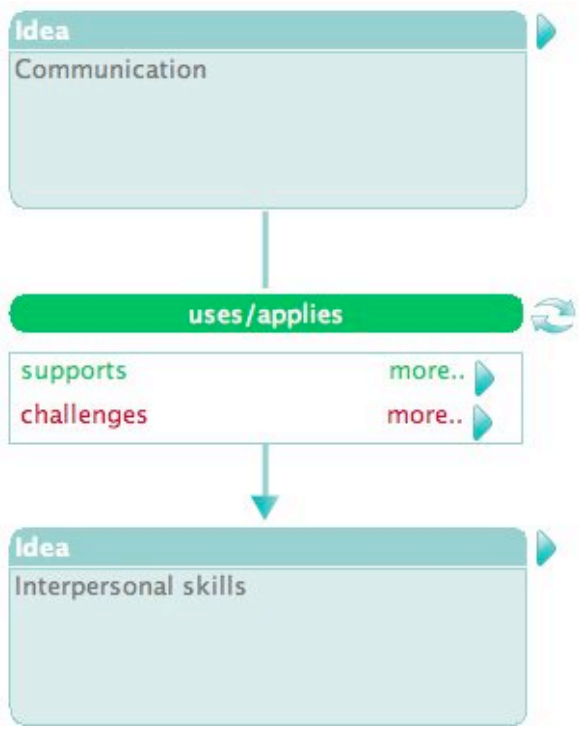
In yesterday’s Google blog post, VP Engineering Udi Manber proposes the knol, which we have duly registered in Cohere as an Idea:

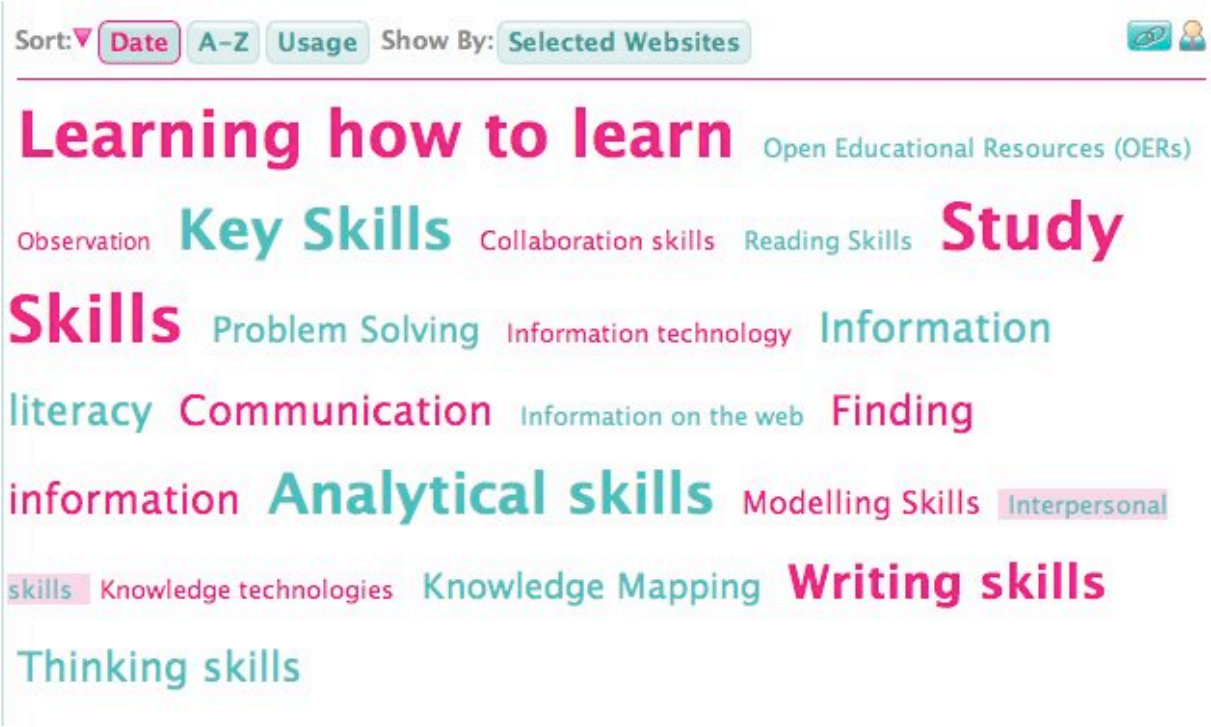
> “A knol on a particular topic is meant to be the first thing someone who searches for this topic for the first time will want to read. The goal is for knols to cover all topics, from scientific concepts, to medical information, from geographical and historical, to entertainment, from product information, to how-to, fix-it

Cohere: raising issues about Google's "Knol" Idea



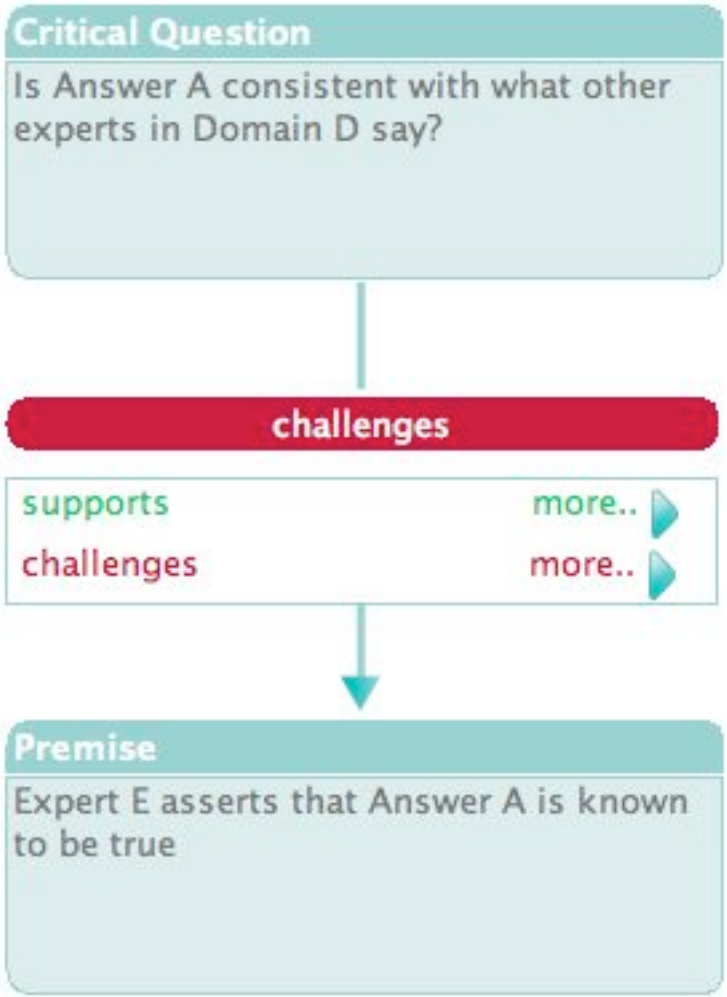
Cohere: from tag clouds to idea webs

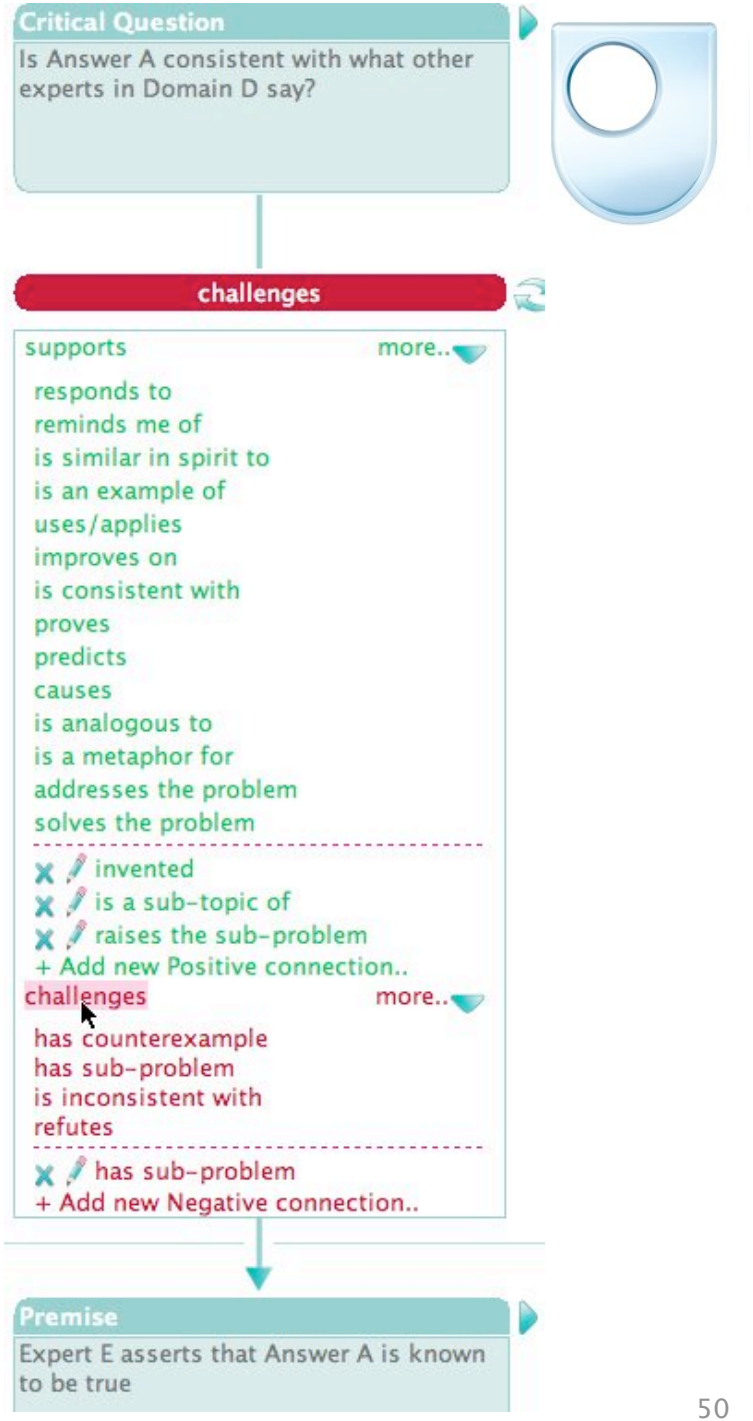




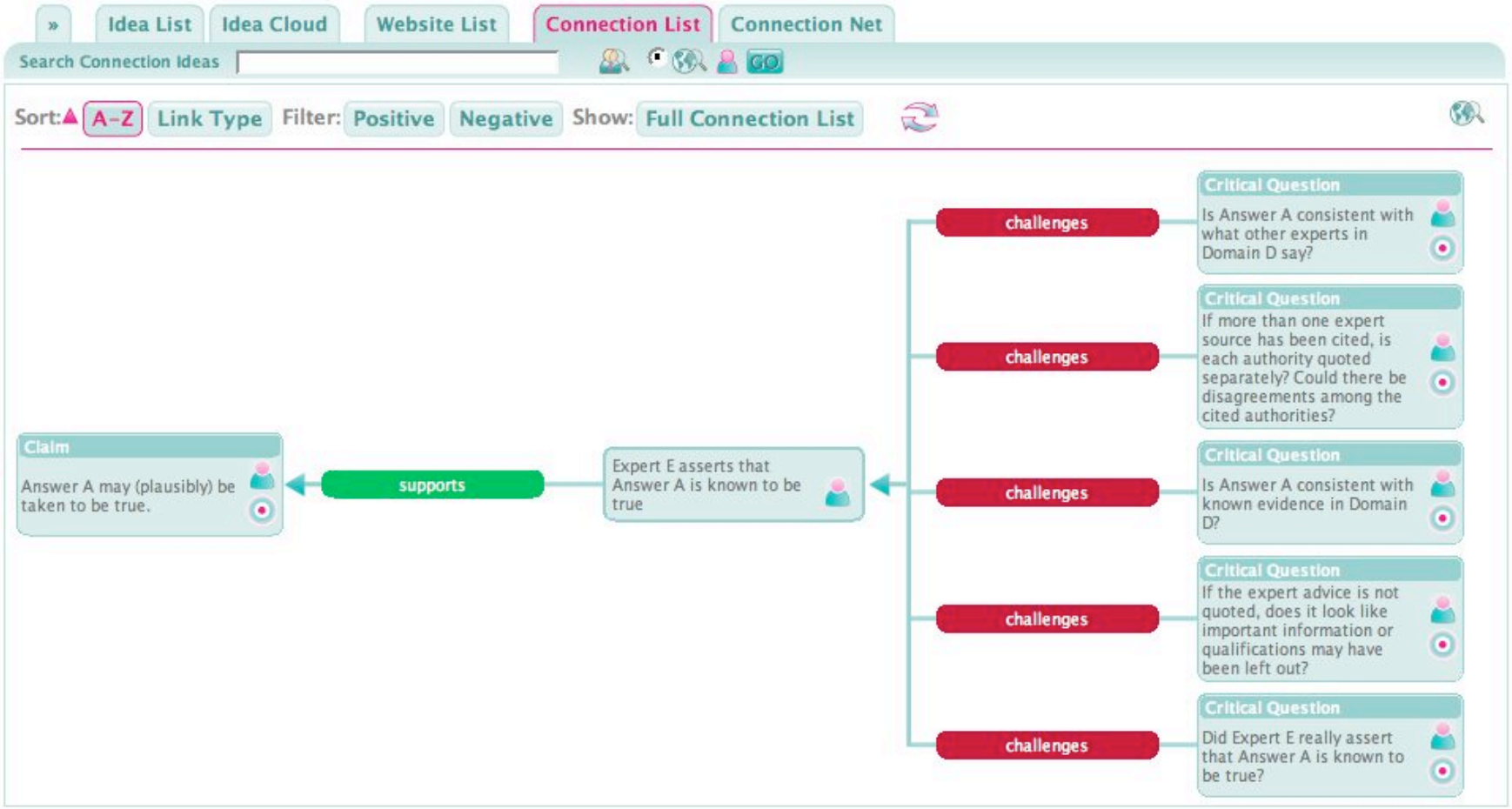
Cohere: all incoming and outgoing links from a focal Idea

Cohere: extensible connection language doesn't lock users into one ontology

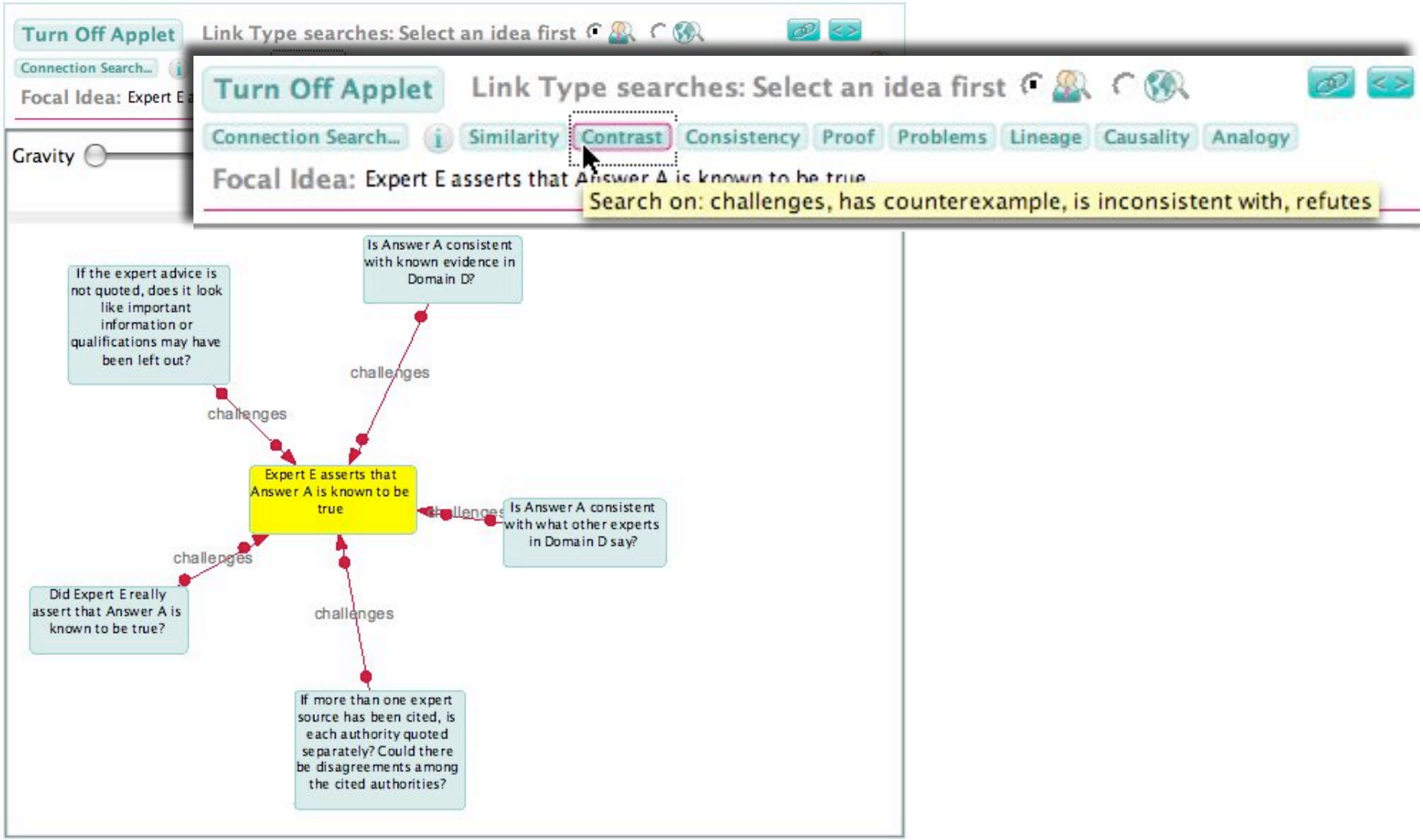




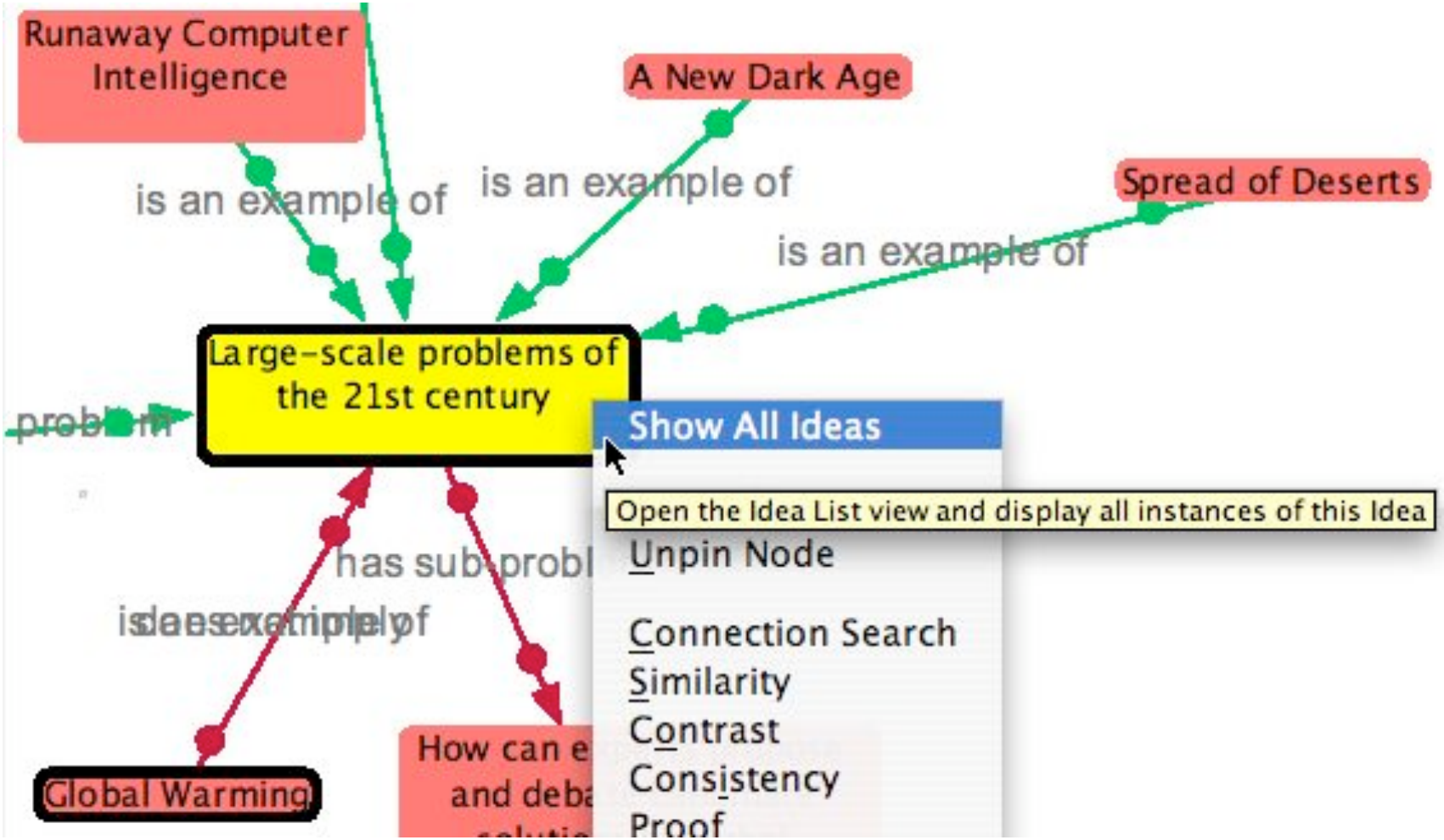
Cohere: Argument from Expert Opinion with Critical Questions



Cohere: semantically filtering a focal Idea by “contrasting” connections

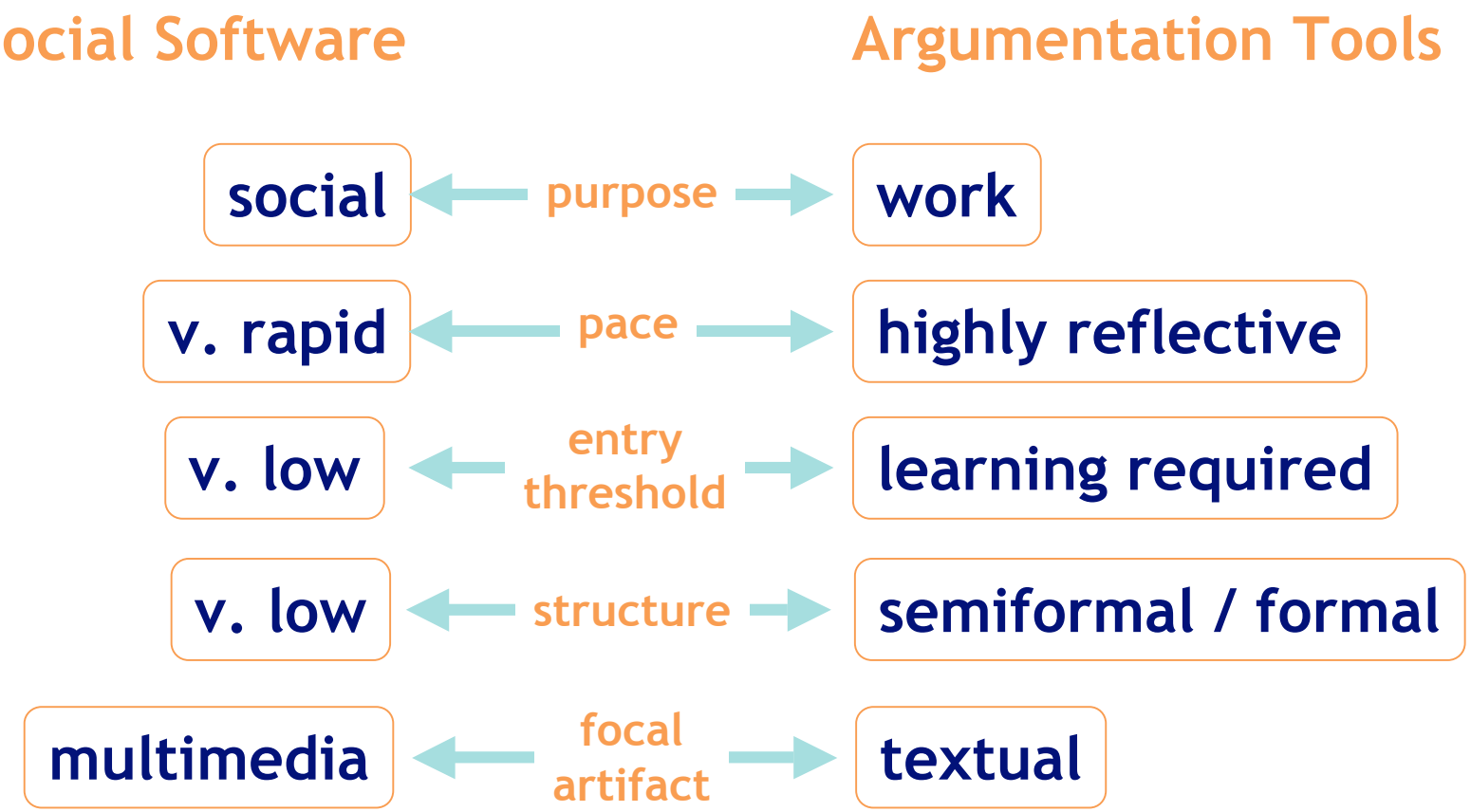


Cohere: a mashup visualization merging different connections around a common Idea



Cohere: homepage integrates People, Ideas and Connections

Social Software vs Argumentation?



Acknowledgements

Compendium Project:

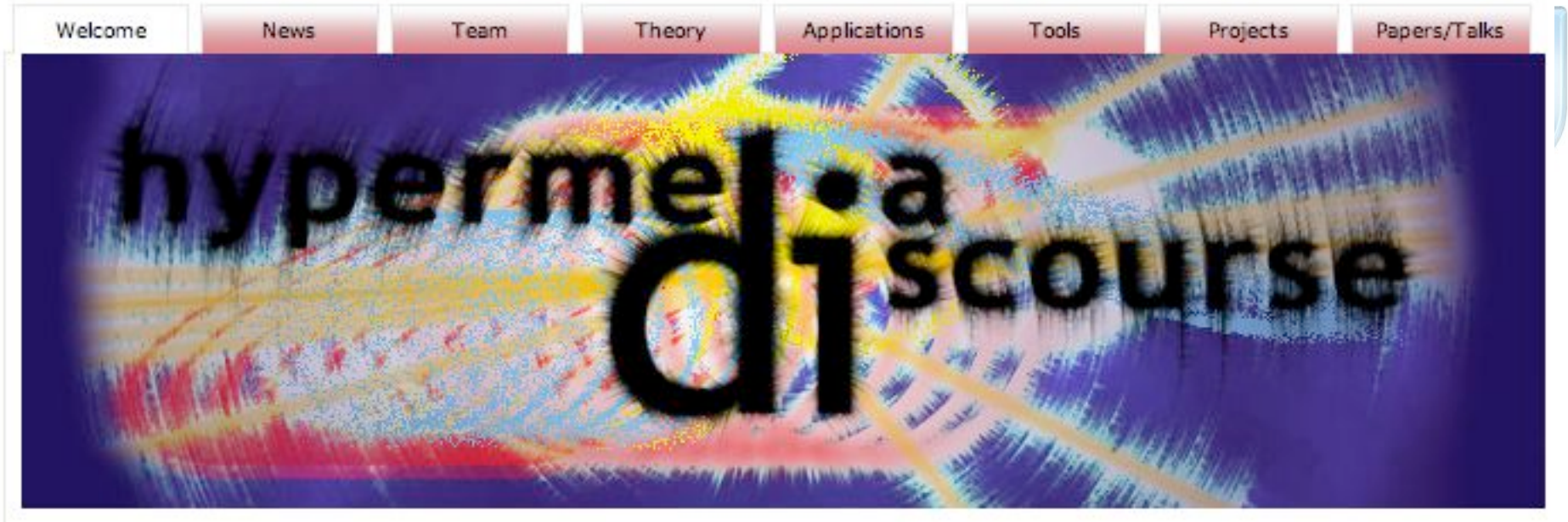
Al Selvin (Verizon/Open U.)
Maarten Sierhuis (NASA)
Jeff Conklin (CogNexus Inst.)
Michelle Bachler (Open U.)

Scholarly Ontologies Project:

Victoria Uren
Gangmin Li
Clara Mancini
Neil Benn
Bertrand Sereno
John Domingue
Enrico Motta

Funding gratefully acknowledged:

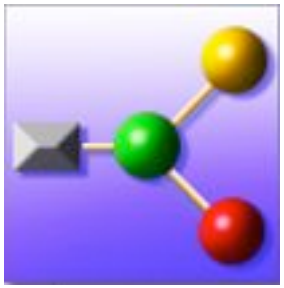
JISC
EPSRC
E·S·R·C ECONOMIC & SOCIAL RESEARCH COUNCIL
e-Science
NCeSS National Centre for e-Social Science
The William and Flora Hewlett Foundation



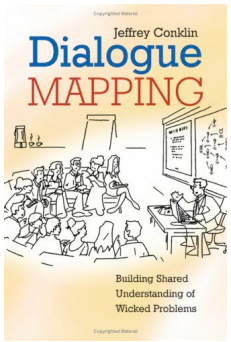
Hypermedia Discourse project:

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

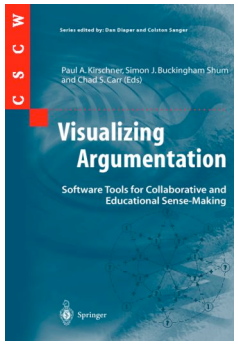
www.kmi.open.ac.uk/projects/hyperdiscourse



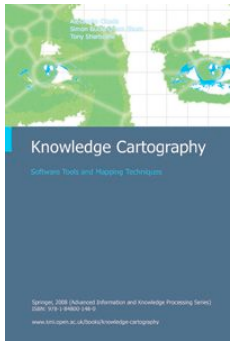
Compendium Institute
www.CompendiumInstitute.org



Dialogue Mapping
www.cognexus.org



Visualizing Argumentation
www.VisualizingArgumentation.info



Knowledge
Cartography