

W3C Semantic Web for Health Care and Life Sciences Interest Group  
Scientific Discourse task group  
<http://esw.w3.org/topic/HCLSIG/SWANSIOC>



The Open University

# Supporting Sensemaking by Modelling Discourse as Hypermedia Networks

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<http://people.kmi.open.ac.uk/sbs>  
<http://compendium.open.ac.uk/institute>  
<http://projects.kmi.open.ac.uk/scholonto>  
<http://projects.kmi.open.ac.uk/hyperdiscourse>

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

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**ScholOnto: EPSRC Distributed Information Management Programme (GR/N35885/01: 2001-2004)**

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# Semantic scholarly publishing: our first statement of the challenge (1999)

<http://kmi.open.ac.uk/publications/techreport/kmi-99-07>

*Proceedings of ECDL'99: Third European Conference on Research and Advanced Technology for Digital Libraries, Paris, France, September 22-24, 1999* <[www-rocq.inria.fr/EuroDL99](http://www-rocq.inria.fr/EuroDL99)>. Springer-Verlag Lecture Notes in Computer Science (Eds.) Serge Abiteboul and Anne-Marie Vercoustre.

## **Representing Scholarly Claims in Internet Digital Libraries: A Knowledge Modelling Approach**

Simon Buckingham Shum, Enrico Motta and John Domingue

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<http://kmi.open.ac.uk/projects/scholonto/>

**Abstract.** This paper is concerned with tracking and interpreting scholarly documents in distributed research communities. We argue that current approaches to document description, and current technological infrastructures particularly over the World Wide Web, provide poor support for these tasks. We describe the design of a digital library server which will enable authors to submit a summary of the contributions they claim their documents makes, and its relations to the literature. We describe a knowledge-based Web environment to support the emergence of such a community-constructed semantic hypertext, and the services it could provide to assist the interpretation of an idea or document in the context of its literature. The discussion considers in detail how the approach addresses usability issues associated with knowledge structuring environments.



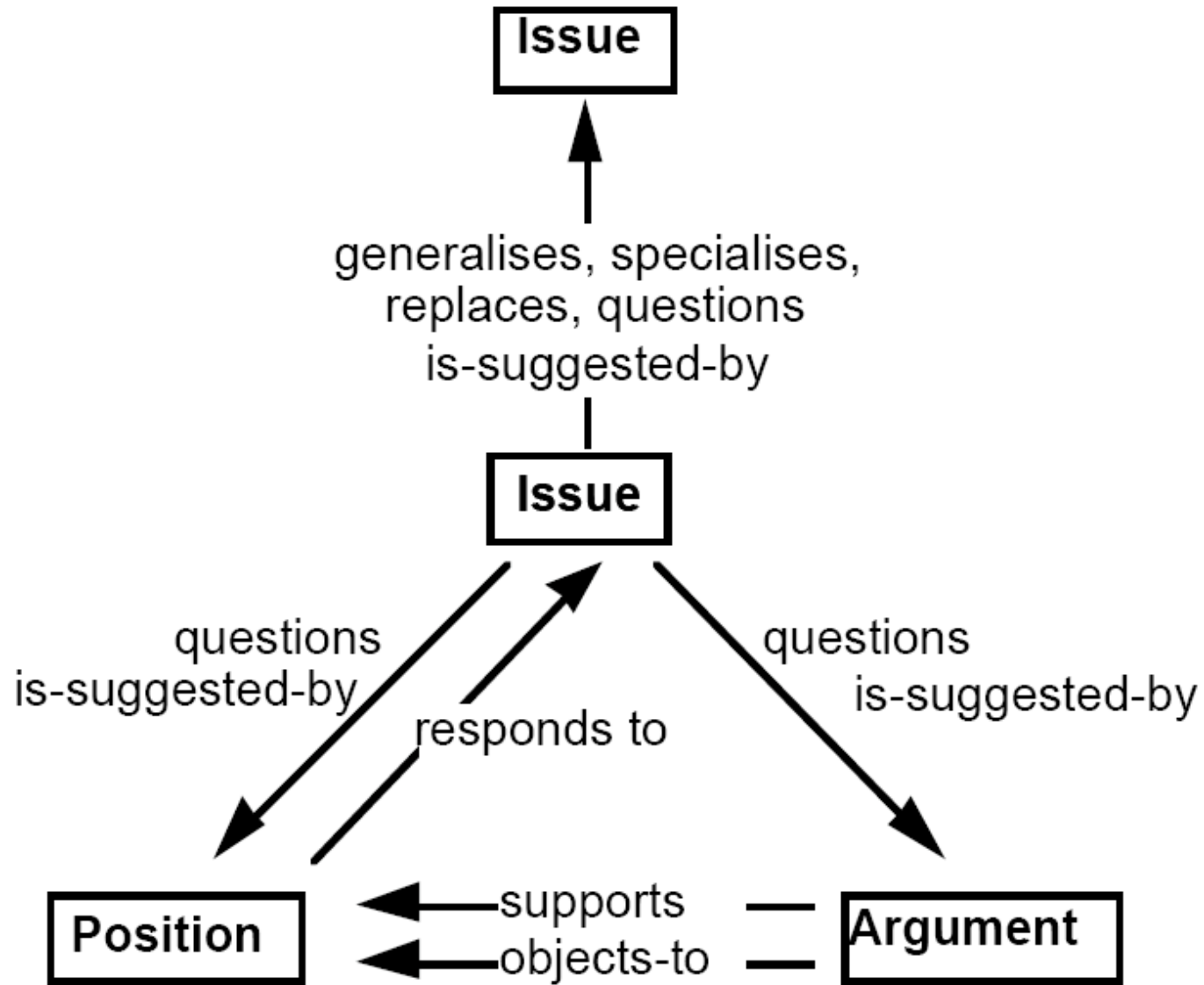
# The question we used to ask in 2001 at the start of the ScholOnto project

- In 2010, will we still be publishing scientific results primarily as prose papers, or will a complementary infrastructure emerge that exploits the power of the social, semantic web to model the literature as a network of claims and arguments?



# modelling schemes: IBIS

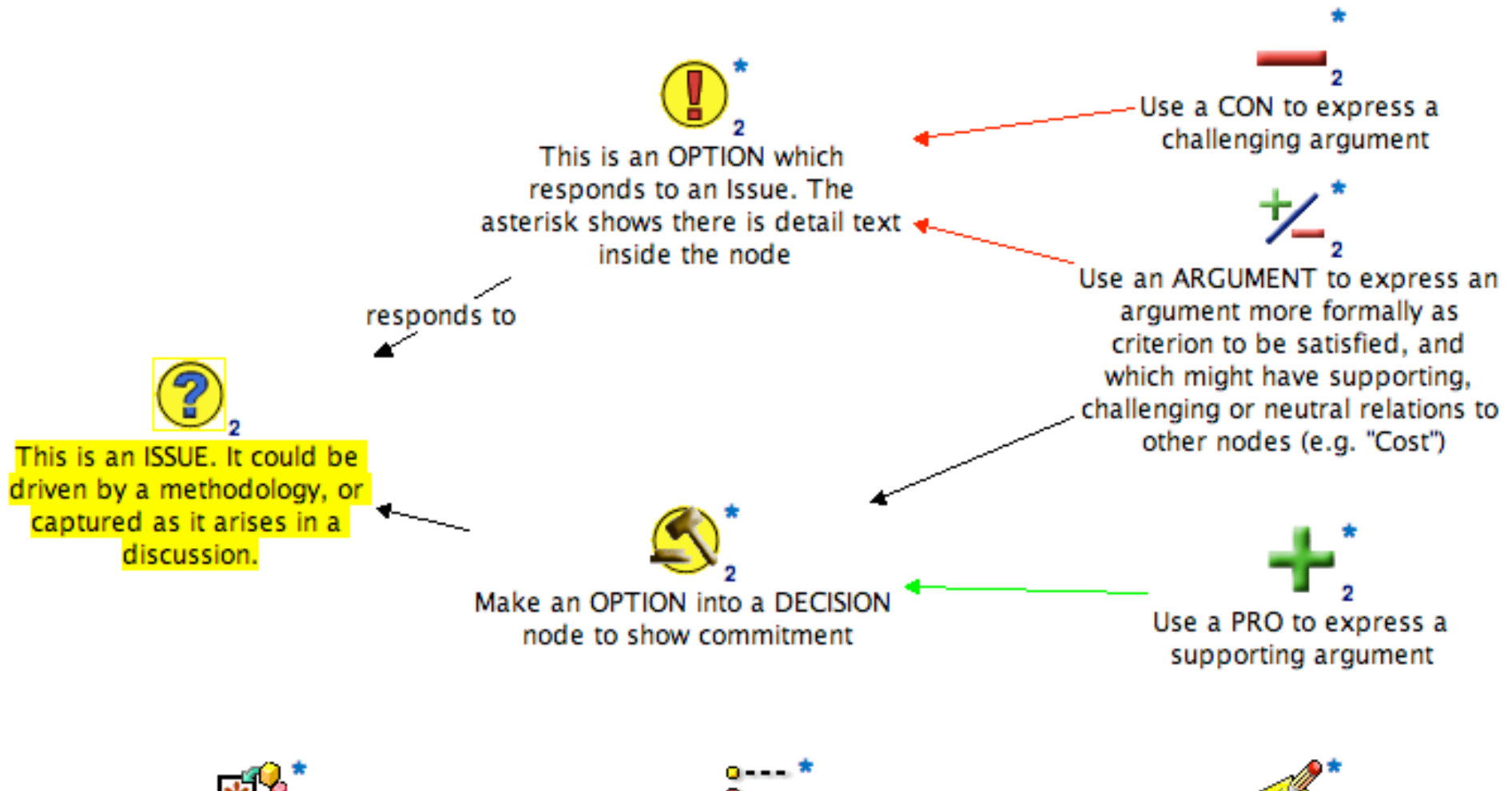
# Rittel's IBIS: Issue-Based Information System



# Compendium: *customisable, collaborative, hypermedia IBIS mapping*



[Map]: Extended IBIS in Compendium



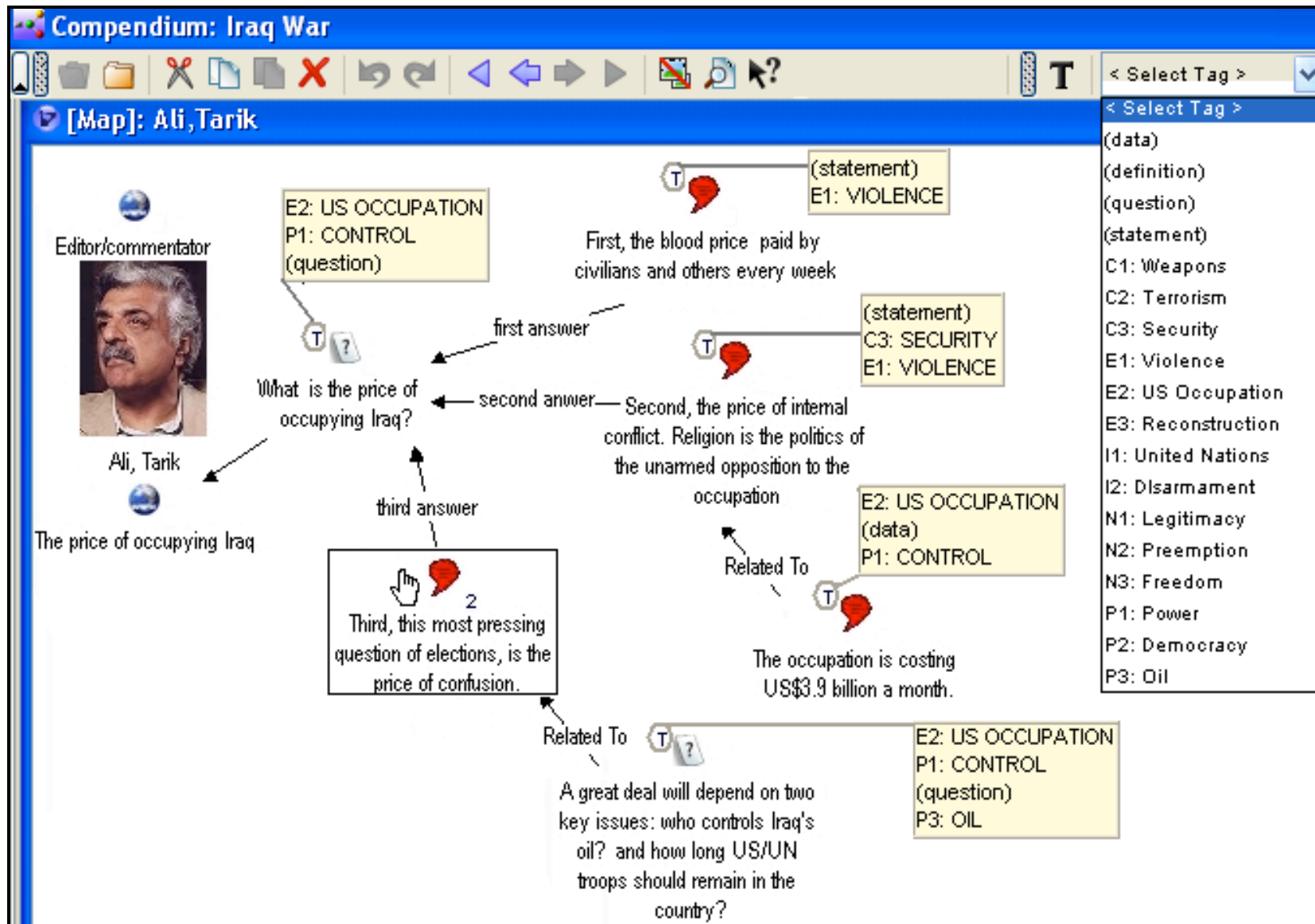
Buckingham Shum, S., Selvin, A., Sierhuis, M., Conklin, J., Haley, C. and Nuseibeh, B. (2006). Hypermedia Support for Argumentation-Based Rationale: 15 Years on from gIBIS and QOC. In: *Rationale Management in Software Engineering* (Eds.) A.H. Dutoit, R. McCall, I. Mistrik, and B. Paech. Springer-Verlag: Berlin. <http://oro.open.ac.uk/3032>

show the network structure --  
such as this example

but display them in a list/table

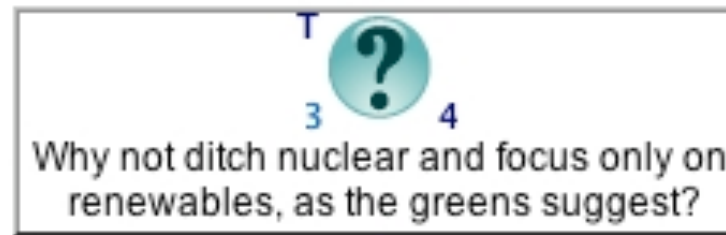
comments

# IBIS mapping of Iraq debate





# Mapping a nuclear power debate on a blog



Responds To



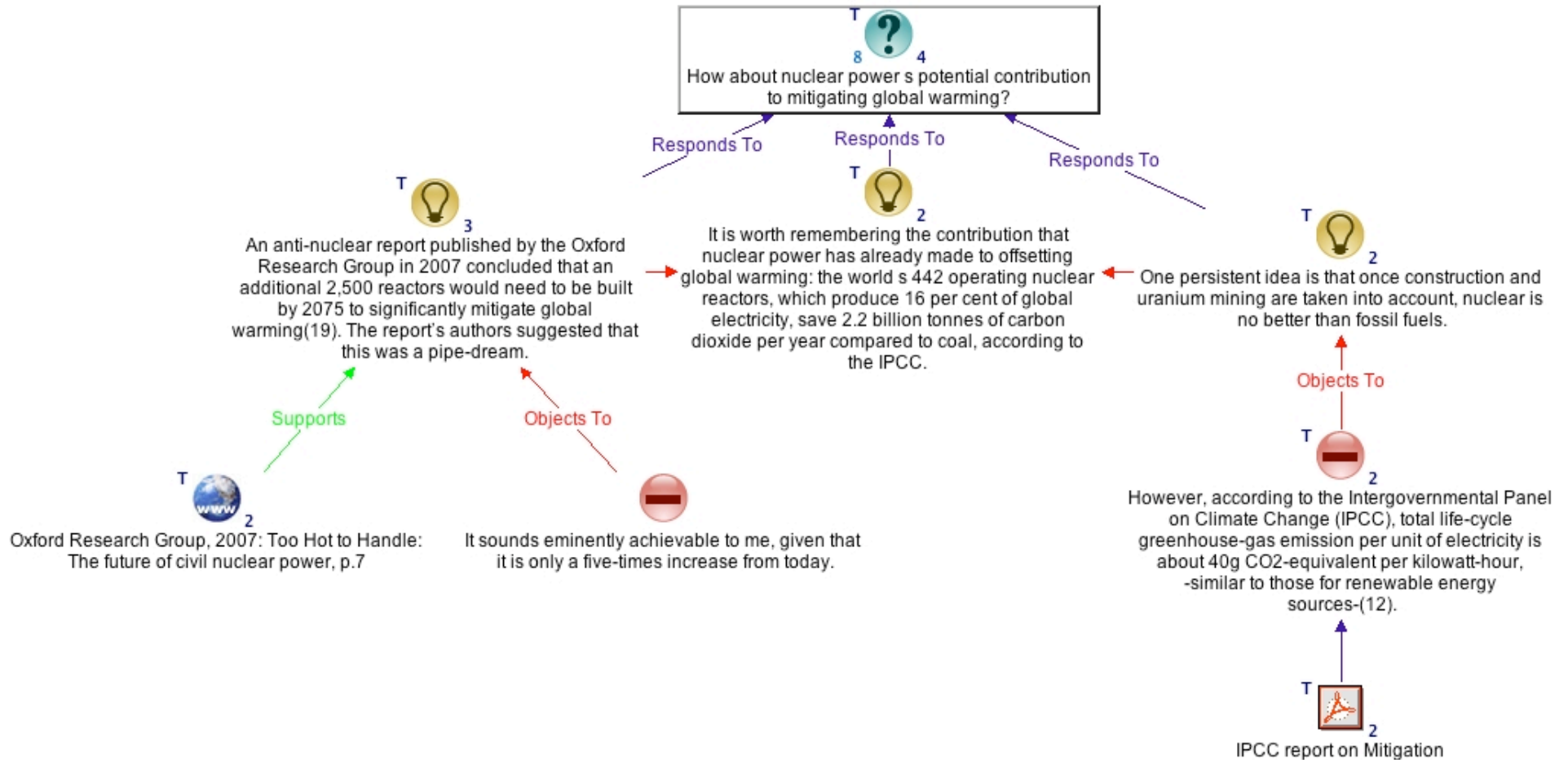
MacKay calculates that even if we covered the windiest 10 per cent of the UK with wind turbines, put solar panels on all south-facing roofs, implemented strong energy efficiency measures across the economy, built offshore wind turbines across an area of sea two-thirds the size of Wales, and fully exploited every other conceivable source of renewables (including wave and tidal power), energy production would still not match current consumption(13).

Supports

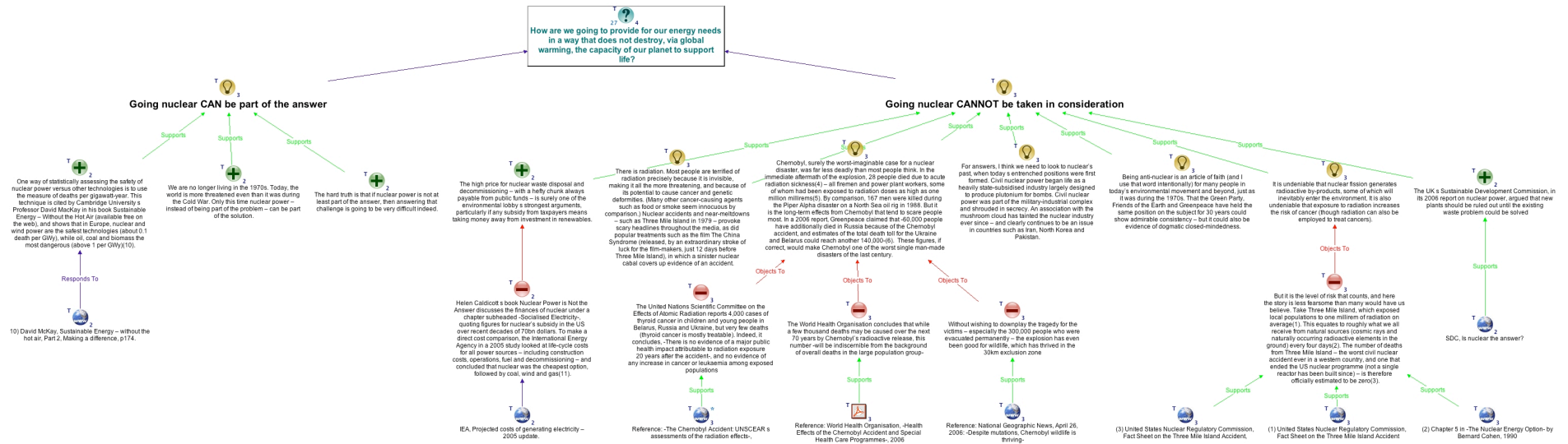


David McKay-Sustainable Energy – without the hot air..pdf

# Mapping a nuclear power debate on a blog



# Mapping a nuclear power debate on a blog





# Latest developments

- **IBIS RDF Schema (Danny Ayers)**

<http://www.schemaweb.info/webservices/rest/GetRDFByID.aspx?id=4>

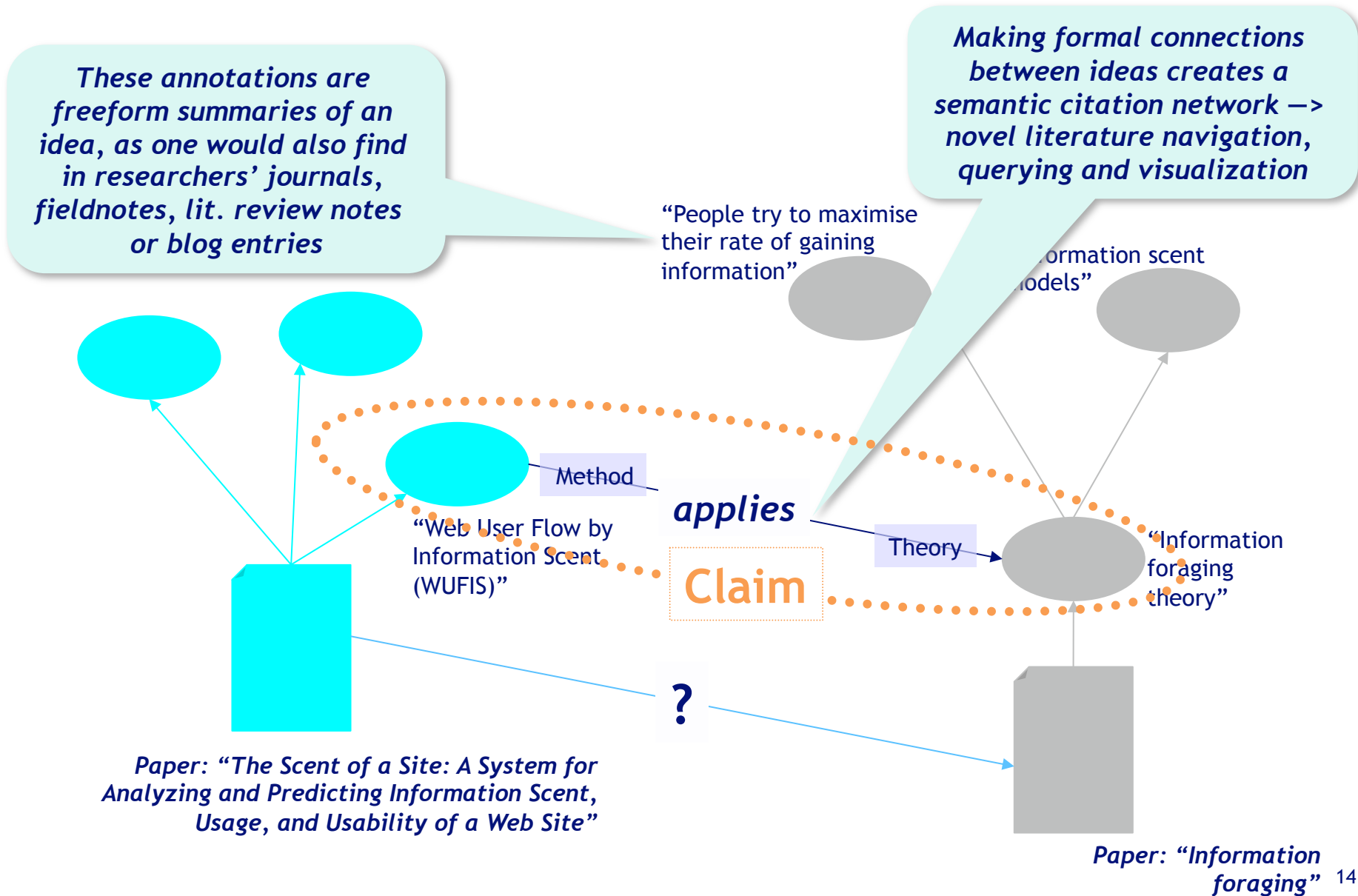
- **Work now under way to integrate the leading IBIS deliberation tools: see the ESSENCE project**

<http://events.kmi.open.ac.uk/essence/tools>



# modelling schemes: ScholOnto

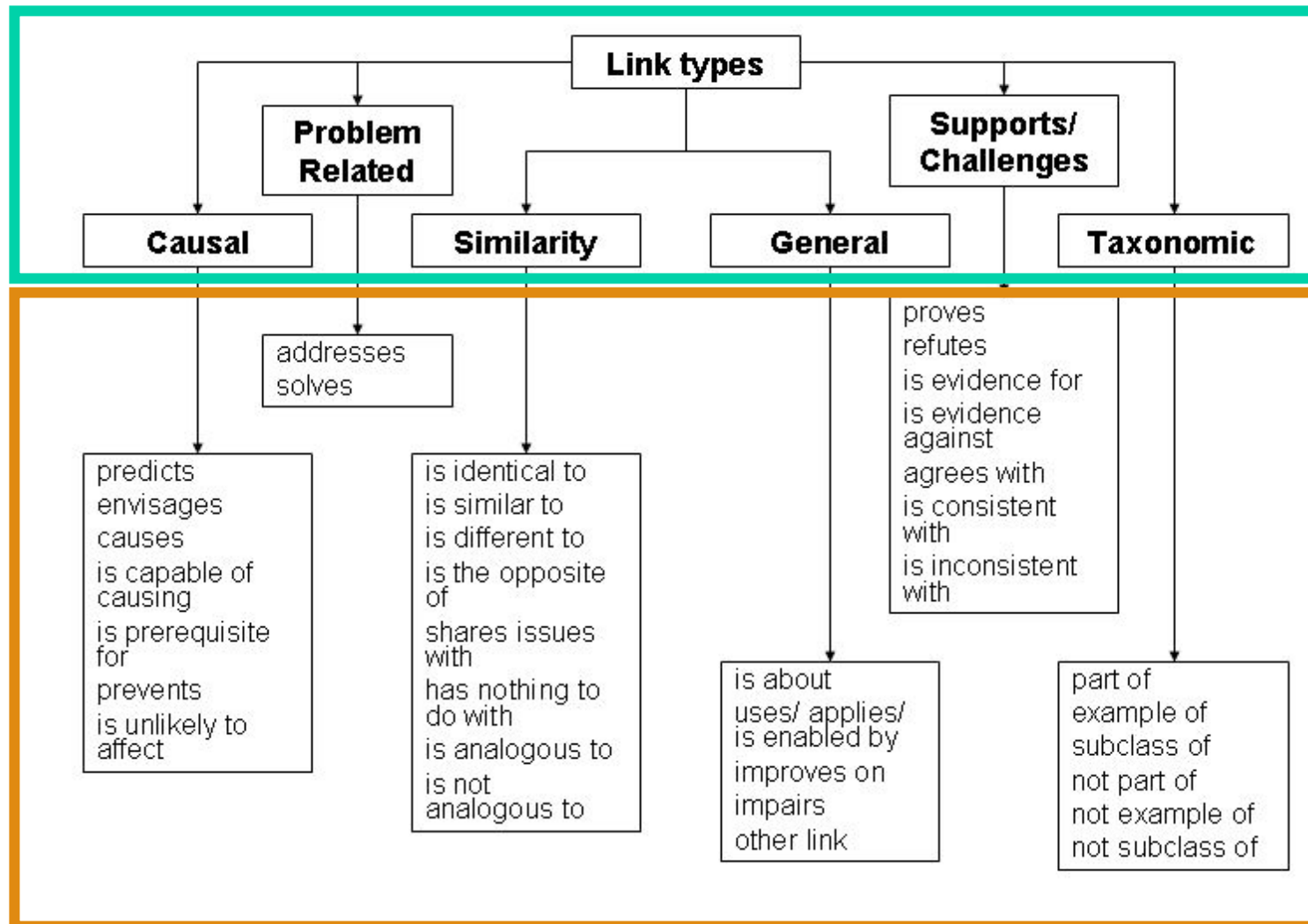
# Scientific document annotation model

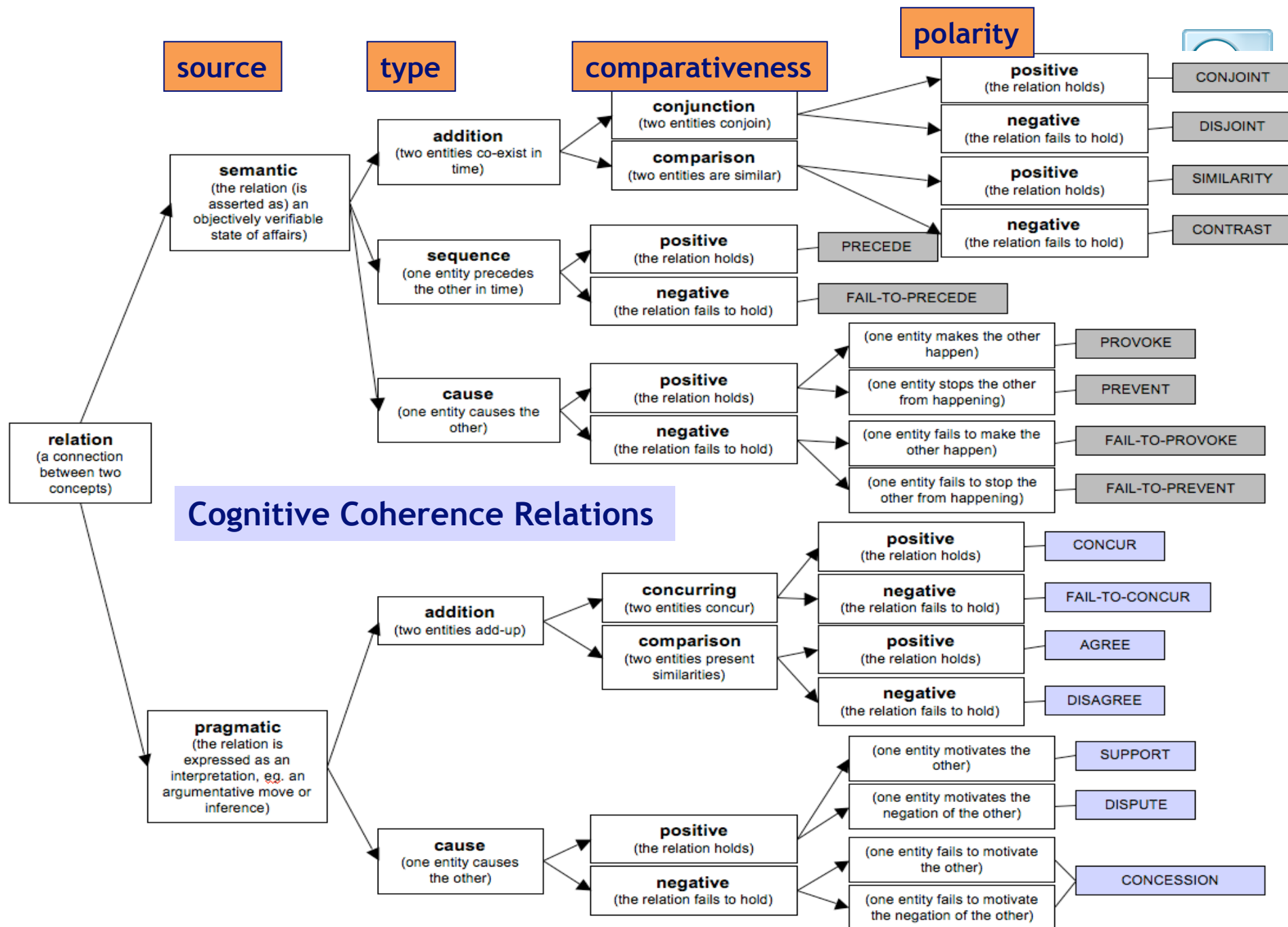




# ScholOnto schema

Connecting freeform tags with **naturalistic connections** (“dialects”) grounded in a **formal set of relations** (from semiotics and coherence relations)









# Semantic Web formats

- **ScholOnto RDF Schema:**

<http://projects.kmi.open.ac.uk/scholonto/resources/Scholonto2.rdfs>

- **Cohere API serves: RDF, XML, JSON**

[http://cohere.open.ac.uk/help/code-doc/Cohere-API/\\_apilib.php.html](http://cohere.open.ac.uk/help/code-doc/Cohere-API/_apilib.php.html)

- **Cohere accepts RDF uploads:**

<http://cohere.open.ac.uk/help/rdf.php>



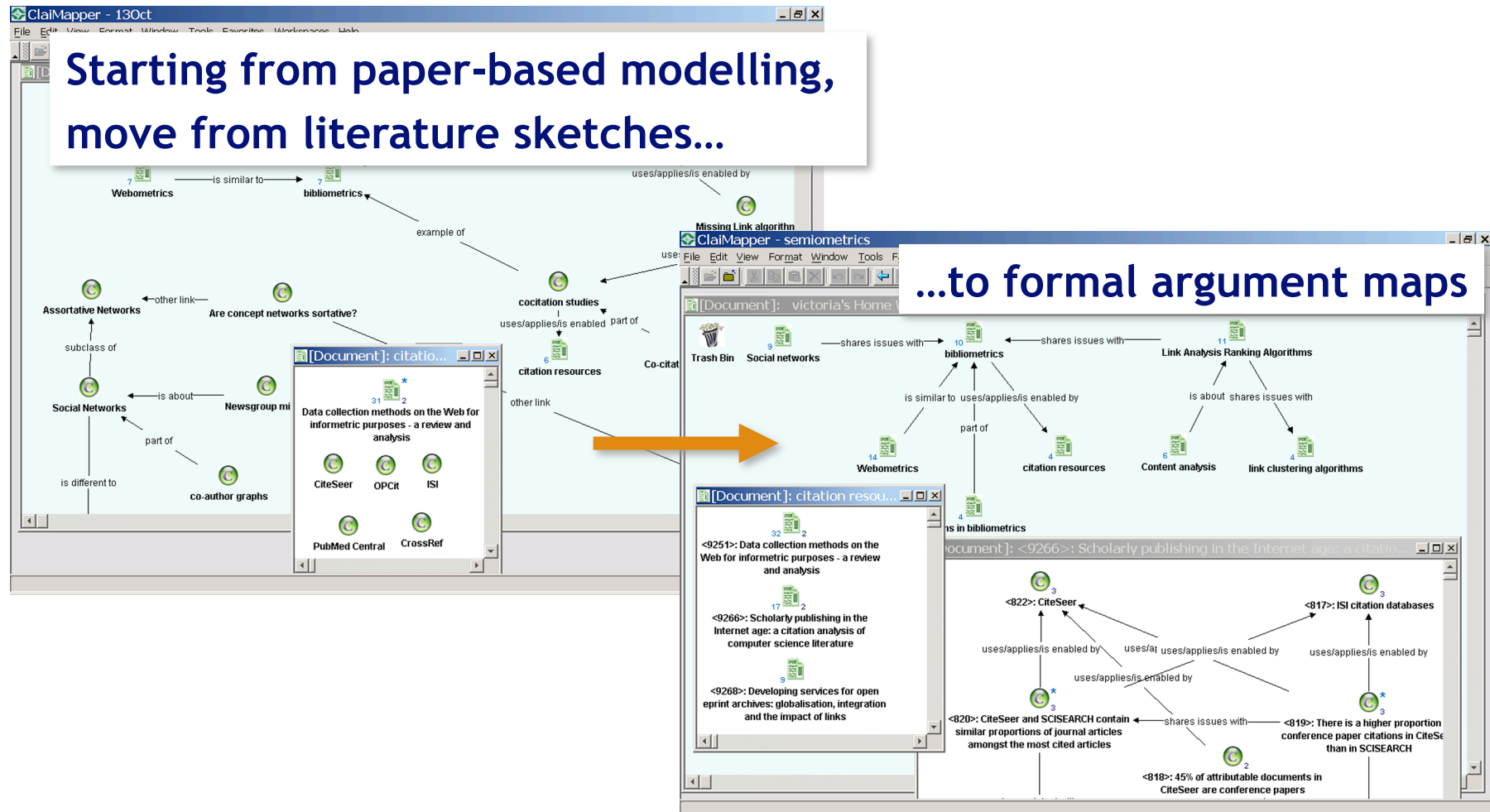
# discourse annotation and search tools

# Interaction design for lit. visualization

## From paper prototype to semiformal mapping tool



- The ClaiMapper tool





# The ClaimSpotter annotation tool

- Web 2.0-style tagging with optional community/system tag recommendations

1. Document selection

2. Text annotation

3. Relationship selection

4. Document title

5. Text annotation

6. Copy in... section

7. Relationship selection

8. Text annotation

Document: **Trusting Information Sources One Citizen at a Time**  
Yolanda Gil, Varun Ratnakar.

**ABSTRACT**

This paper describes an approach to derive assessments about information sources based on individual feedback about the sources. We describe TRELIS, a system that helps users annotate their analysis of alternative information sources that can be contradictory and incomplete. As the user makes a decision on which sources to dismiss and which to believe in making a final decision, TRELIS captures the derivation of the decision in a semantic markup. TRELIS then uses these annotations to derive an assessment of the source based on the annotations of many individuals. Our work builds on the Semantic Web and presents a tool that helps users create annotations that are in a mix of formal and human language, and exploits the formal representations to derive measures of trust in the content of Web resources and their original source.

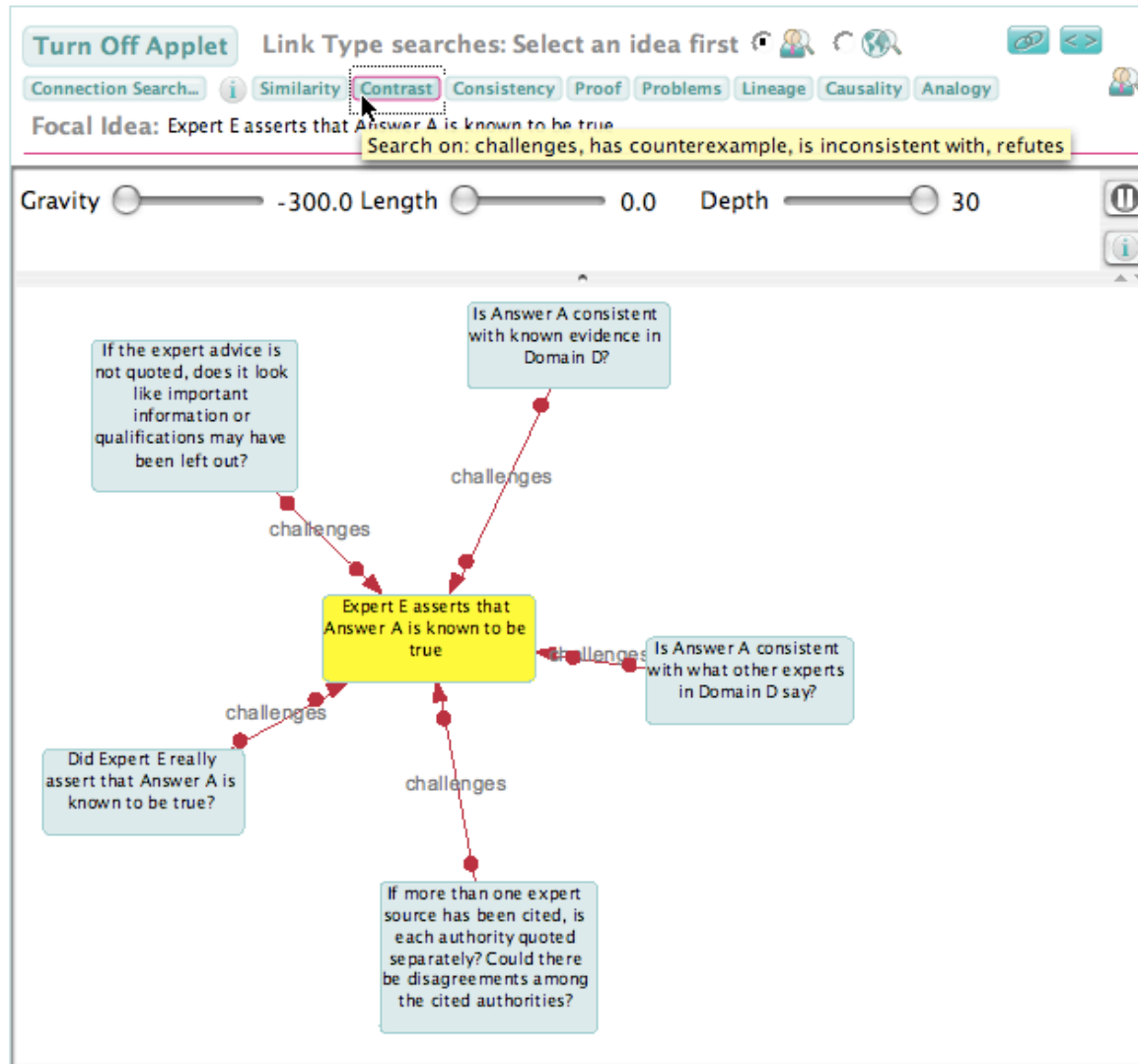
**INTRODUCTION**

The Semantic Web can be described as a substrate to support advanced functions computer-human, comp and reasoning about the are being proposed for 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

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, 16<sup>th</sup> Int. World Wide Web Conference, Banff, Canada; 8-12 May 2007.



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



Buckingham Shum, Simon (2008). Cohere: Towards Web 2.0 Argumentation. In: Proc. COMMA'08: 2nd International Conference on Computational Models of Argument, 28-30 May 2008, Toulouse, France. IOS Press [PrePrint: <http://oro.open.ac.uk/10421>]



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

The screenshot displays the Cohere applet interface. At the top, there is a 'Turn Off Applet' button and a search bar with the text 'Link Type searches: Select an idea first'. Below this, a row of buttons includes 'Connection Search...', 'Similarity', 'Contrast', 'Consistency', 'Proof', 'Problems', 'Lineage', 'Causality', and 'Analogy'. The 'Contrast' button is highlighted with a dashed box and a mouse cursor. The 'Focal Idea' is 'Expert E asserts that Answer A is known to be true', and the search criteria are 'challenges, has counterexample, is inconsistent with, refutes'. Below the search bar are sliders for 'Gravity' (set to -300.0), 'Length' (set to 0.0), and 'Depth' (set to 30). The main area shows a network diagram with nodes and edges. One node is 'the expert advice is not quoted, does it look like important information or qualifications may have been left out?', and another is 'Expert E asserts that Answer A is known to be true'. They are connected by a 'challenges' edge. Another node is 'Is Answer A consistent with known evidence in Domain D?', connected to the 'Expert E' node by a 'challenges' edge.

Turn Off Applet Link Type searches: Select an idea first

Connection Search... Similarity **Contrast** Consistency Proof Problems Lineage Causality Analogy

Focal Idea: Expert E asserts that Answer A is known to be true













Search on: challenges, has counterexample, is inconsistent with, refutes









# “What papers contrast with this paper?”



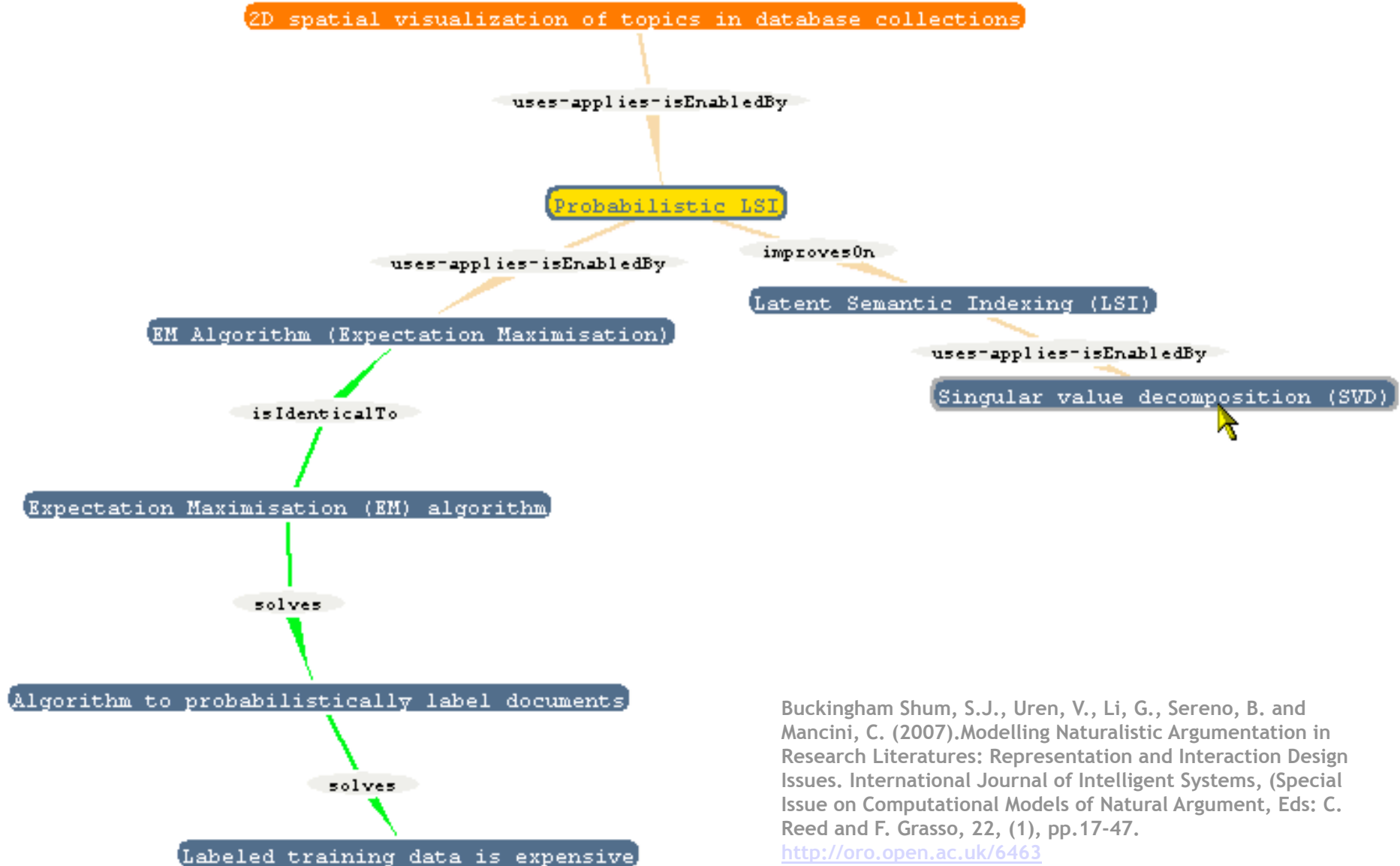
1. Extract concepts for this document
2. Trace concepts on which they build
3. Trace concepts challenging this set
4. Show root documents

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

# “What is the lineage of this idea?”



Buckingham Shum, S.J., Uren, V., Li, G., Sereno, B. and Mancini, C. (2007). Modelling Naturalistic Argumentation in Research Literatures: Representation and Interaction Design Issues. International Journal of Intelligent Systems, (Special Issue on Computational Models of Natural Argument, Eds: C. Reed and F. Grasso, 22, (1), pp.17-47. <http://oro.open.ac.uk/6463>





# Latest developments

## Neil Benn's Doctoral Dissertation, KMi:

**“Modelling Scholarly Debate: Conceptual Foundations for Knowledge Domain Analysis Technology” (under revision)**

<http://people.kmi.open.ac.uk/sbs/2009/07/modelling-scholarly-debate-neil-benn-phd>

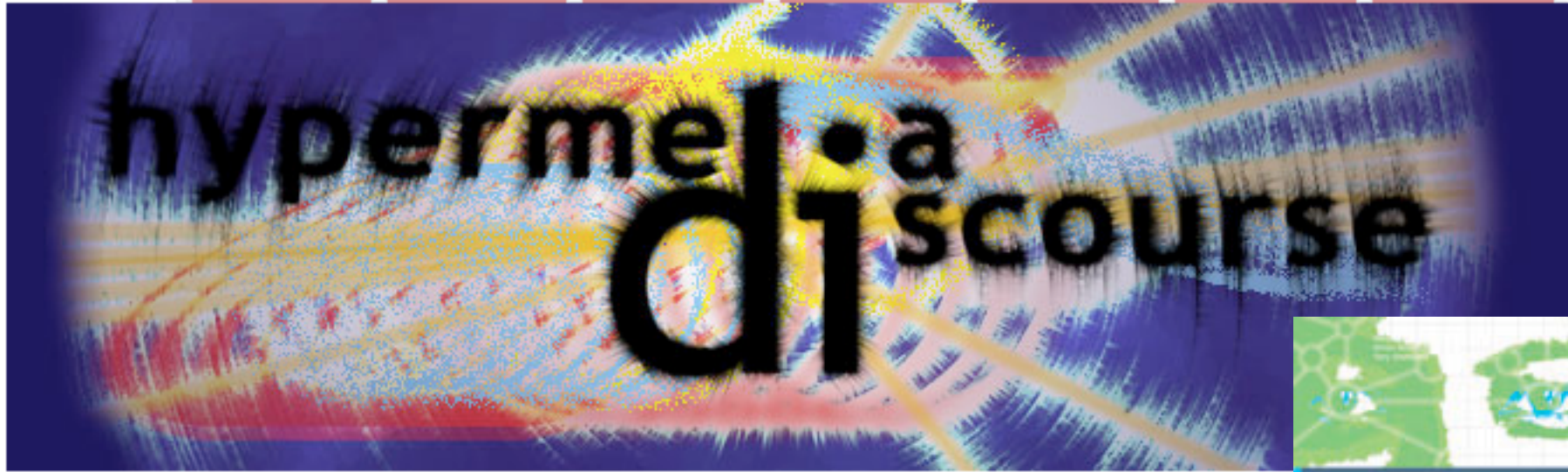
Benn, N., Buckingham Shum, S. Domingue, J. and Mancini, C. (2008). Ontological Foundations for Scholarly Debate Mapping Technology. 2nd International Conference on Computational Models of Argument (COMMA '08), 28-30 May, 2008, Toulouse, France. IOS Press. <http://oro.open.ac.uk/11939>

**Embedding discourse relationships into SocialLearn, a social media platform for learning and sensemaking:**

[www.open.ac.uk/sociallearn](http://www.open.ac.uk/sociallearn)

**and in Open Learning Network, a social media platform for building the evidence base in an emerging field:**

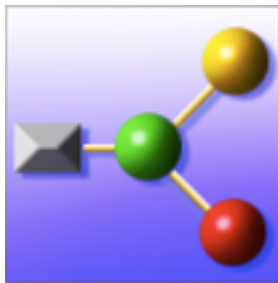
[www.olnet.org](http://www.olnet.org)



<http://projects.kmi.open.ac.uk/hyperdiscourse>



Knowledge Cartography



Compendium Institute

cohere 

