Knowledge Cartography for Controversies: The Iraq Debate

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Abstract. In analysing controversies and debates—which would include reviewing a literature in order to plan research, or assessing intelligence to formulate policy—there is no one worldview which can be mapped, for instance as a single, coherent concept map. The cartographic challenge is to show which facts are agreed and contested, and the different kinds of narrative links that use facts as evidence to define the nature of the problem, what to do about it, and why. We will use the debate around the invasion of Iraq to demonstrate the methodology of using a knowledge mapping tool to extract key ideas from source materials, in order to classify and connect them within and across a set of perspectives of interest to the analyst. We reflect on the value that this approach adds, and how it relates to other argument mapping approaches.

1. Introduction

In analysing controversies and debates—which would include reviewing a literature in order to plan research, or assessing intelligence to formulate policy—there is no one worldview which can be mapped, for instance as a single, coherent concept map (Chapter X). The cartographic challenge is to show which facts are agreed and contested, and the different kinds of narrative links that use facts as evidence to define the nature of the problem, what to do about it, and why. What support can we offer analysts for untangling this web, in order to provide helpful aerial views?

We will use the debate around the invasion of Iraq as a vehicle to demonstrate the methodology of using a knowledge mapping tool to extract key ideas from source materials, in order to classify and connect them within and across a set of perspectives of interest to the analyst.[1]

Our interest is in the support that knowledge cartography can provide to different stakeholders, for instance, to enhance public understanding and engagement with policy deliberations, or to provide specific groups of analysts (from students, to

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[1]   Hypertext maps from this analysis: www.kmi.open.ac.uk/projects/compendium/iraq

advocacy groups, to governments) in their struggle to manage the deluge of new information generated every day, and the historical sources that set the context.

The specific hypothesis we set out to explore in this case study was that knowledge mapping tools could help as an analyst's tool for making sense of published contributions to the Iraq debate:

- for a given source article: mapping tools should help to clarify (at some level of granularity, dependent on the analyst) the contributions it claims to make and its argumentative structure

- for the 'gestalt' of the whole corpus: mapping tools should help to clarify the cross-connections and emerging themes which one would expect someone with a grasp of the debate (as expressed in the articles) to have, and communicate clearly.

We therefore introduce and reflect on:

- the product: a set of hypertextually linked knowledge maps of the Iraq debate, accessible via a specialist hypermedia tool, and via the Web

- the methodology: how this artifact was constructed

- analytical support: how well the tools assisted the analyst

- reading support: how well the tools assist the reader

First we set the context of the mapping exercise, introducing the debate and source materials. We then describe the methodology used to convert these into hypertextual maps of interconnected ideas, which are illustrated. We consider the extent to which we achieved our objectives, and the limitations of this exercise, which lead to open questions for further investigation.

2. The Iraq Debate

The 2003 invasion of Iraq is one of the most heated and complex public policy debates in recent times, with innumerable arguments on the legality, morality and prudence of the war being aired and analysed in politics, academia and all quarters of the media. The issues are self-evidently complex, and the modes of argumentation deployed varied in type and quality. Non-one can claim to have mastered all angles on the issues, and the media reminds us daily of the chilling human cost of different policies.

The specific aim of this knowledge mapping exercise was to create an integrated overview of the debate as represented by a corpus of 25 articles written by leading commentators from different backgrounds. They were either in favour of, relatively

neutral on, or opposed to the invasion of Iraq and the toppling of Saddam Hussein.[2] The initial reference for the analysis was the paper "One war, many theories" by Michael Cohen (2005). He reviews the fundamental positions of pro-war and anti-war commentators, and distills from these some themes and questions. Cohen asks "How can we do justice to the multiplicity of positions on the war?", and proposes three concepts to organise the body of arguments:

- *Power*, defined as the capacity to produced intended effects

- *Degree of institutionalisation*, or the degree to which certain values and procedures stemming from them are embodied in a regulatory environment (impacting the role of organizations such as the UN)

- *Legitimacy*, the moral virtues of a certain act or value such that it finds affinities across a broadly defined populace or societal grouping

   We used these themes as part of our organising structure since we were not experts in this field, but were able to follow his analysis, and could investigate what value a knowledge mapping tool could contribute to understanding and navigating the corpus when viewed through Cohen's analytic lens. As detailed below, we focused on two issues as a mini-template to organize the ideas:

- What were the causes of the Iraq invasion?

- What are the consequences of the war?

3. Knowledge Mapping Tool

Compendium is a hypermedia concept mapping tool, details of which are presented in Chapter X.[3] It embodies, and extends, Horst Rittel's IBIS language for deliberation (Issue-Based Information System) as proposed to support the 'argumentative design' approach to complex societal dilemmas (Rittel, 1972). The mapping dimension that translates IBIS moves (raising Issues, Positions and Arguments) into a hypertext network of semantically classified nodes and links is based on *graphical-IBIS* (gIBIS: Conklin and Begeman, 1988). The methodological aspects to Compendium's use are threefold:

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[2] This case study was conducted as part of *GlobalArgument.net*, a project we initiated in 2005 as a vehicle for systematically comparing computer-supported argumentation tools through argumentation experiments: participants agree on a topic for debate, a set of source documents from which everyone will work, and a schedule for modelling, publishing and analysing the outputs. We are grateful to Peter Baldwin, co-founder of GlobalArgument.net, and Michael Cohen for collating these articles. http://kmi.open.ac.uk/projects/GlobalArgument.net

[3] Available from: Compendium Institute: http://www.CompendumInstitute.org

1. *Dialogue Mapping* (Conklin, 2006) which provides ways for a facilitator to map discussions in meetings (physical or online) in real time as gIBIS networks, on a shared display. We adapted this to analyse written contributions to an asynchronous discussion in the media.

2. *Conversational Modelling*, a model-driven extension to Dialogue Mapping (Selvin, 1999), for the systematic analysis of a problem by exploiting the tool's 'T3' features: Templates, Transclusions and Tags (see below, and Chapter X).

3. *Concept Mapping*, as developed by Novak (Chapter X) was used to the extent that we tagged relationships with whatever label seemed appropriate, extending the IBIS notation.

4. Mapping Methodology

As history reminds us, where boundaries are drawn in maps, and what is included, omitted or highlighted can be controversial. Like any symbolic representation, maps are not neutral, but are systematic ways to simplify the world in order to help focus attention on specific phenomena—in the hope that in the process, one has not oversimplified. Making explicit one's mapping methodology, particularly in the nascent field of knowledge cartography where there are few shared conventions one can take for granted, illuminates how to read the map appropriately, how to account for its limitations, and how to repeat the mapping exercise on the same or other worlds.

As with any cartographic project, we were aiming to create a consistent visual language. Moreover, since we were creating interactive, hypermedia maps, we also needed to create a set of interaction design conventions (Figure 1). These evolved through the analysis, and were summarized in the opening map to assist the reader.
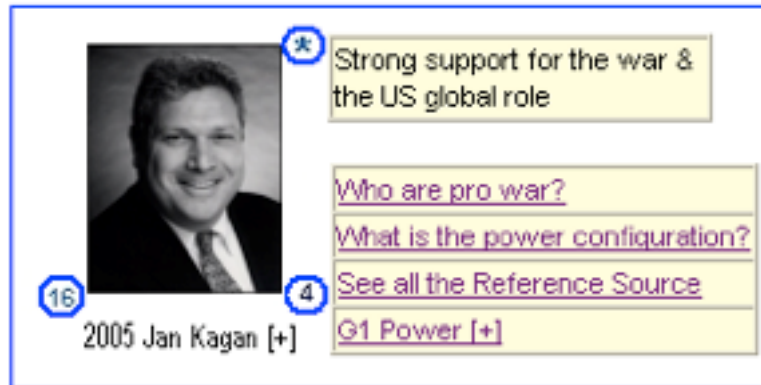
Figure 1: Explanation of how to read and navigate nodes in maps. The map icon (blue) show comments(*), number of connections to other maps (4) and total of nodes in the map (16). The node map (pink) show tags and number of connections to other maps (4).

We started by defining a top level node tagging scheme based on (i) Cohen's framework of *Power, Institutions, and Norms*m abd (ii) our Issue-template focused on *Causes and Consequences* of the war. Over the course of the exercise, as in any qualitative data analysis process, the tag-based coding scheme evolved as we engaged with the material, classifying and reclassifying it until the tag scheme was applied consistently (Table 1).

Macro Themes (from Cohen)	Specialisation into Tags		
C: Causes	C1: Weapons	C2: Terrorism	C3: Security
E: Effects	E1: Violence	E2: US Occupation	E3: Reconstruction
I: Institution	I1: United Nations	I2: Disarmament	
N: Norms	N1: Legitimacy	N2: Preemption	N3: Freedom
P: Power	P1: Control	P2: Democracy	P3: Oil

Table 2: Specialisation of top level themes into a set of classification codes used to 'tag' nodes in the Iraq Debate maps.

An article map for each of the 25 documents was constructed. Text fragments were dragged and dropped frrom the article into Compendium, classifying, linking and tagging each node (Figure 2).
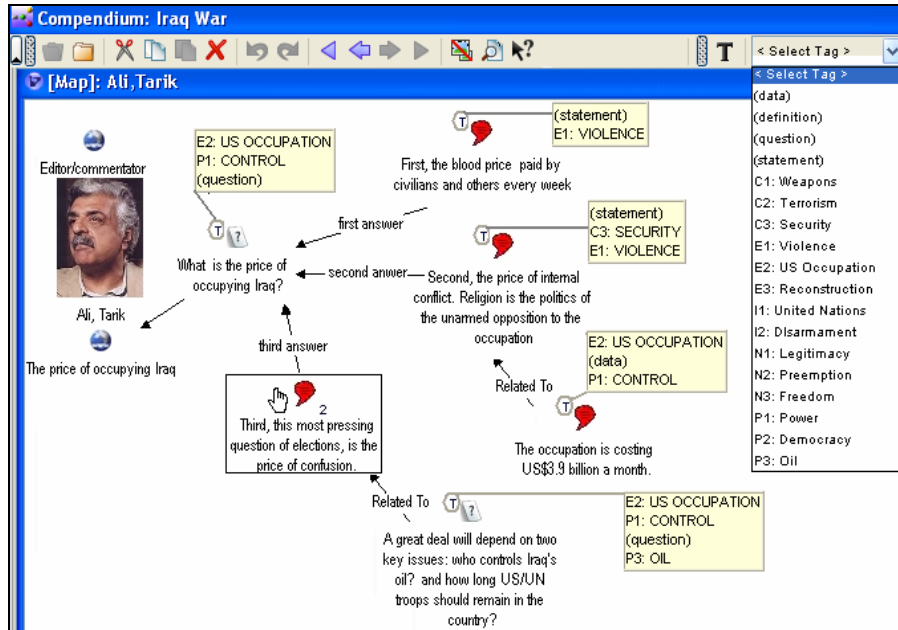
Figure 2: Fragment of the article map for *"The price of occupying Iraq"* (Tariq, 2004) showing the tagging of nodes (tags are displayed on a mouse-rollover, but are shown for illustration)

The discipline of using IBIS focuses attention on clarifying what the issue is at stake, and specific ways of addressing this, with their respective pros and cons. Isenmann and Reuter (1997) describe 5 steps to structure arguments using IBIS:

1. Identifying issues, positions and arguments
2. Activating external knowledge sources, select data, statistics, concepts,
3. Creating relations
4. Navigating through the knowledge network
5. Reorganizing the issues network

However, these steps are not linear (e.g. relations may be made before sourcing related data. Moreover, in documents (as in speech), not all of these elements are either explicit, or occur in that order. Authors do not always start with focused questions. They may start with the main proposition, concept or data; and questions can arise during the document. It is the analyst's task to convert the prose into a map that shows the core issue(s), possible responses to them, and argumentation for and against them, drawing on data. We discuss later the variable levels of reconstruction that the analyst may bring to this mapping.

We are now in a position to construct gestalt maps that connect the article maps. First, we cluster authors classified by Cohen as for and against the war (e.g. Figure 3).
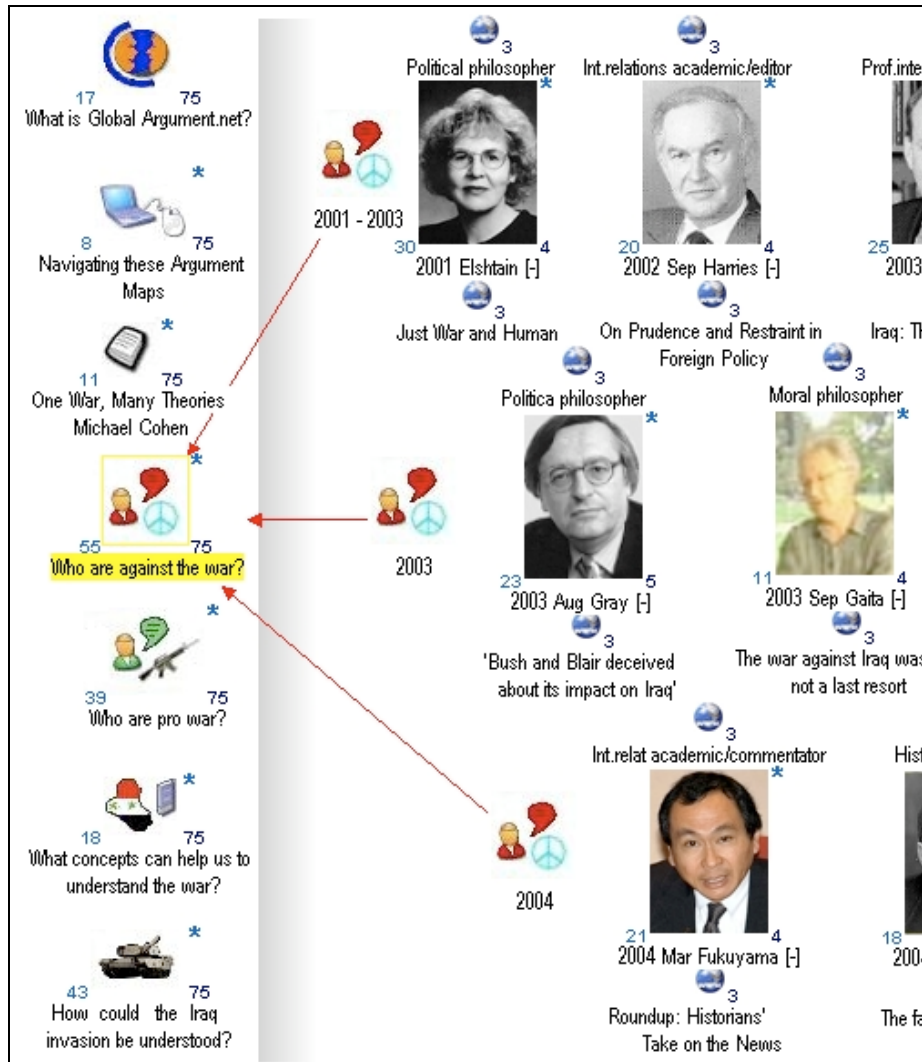

Figure 3: Part of a top level navigation map to anti-war article maps.

Next, we create gestalt maps to show connections across article maps around themes of interest: causes and effects of the war, and around Cohen's organising themes. For instance, in order to create a map of *Pro-War* proponents on the theme of *Power*, we filter the database using Compendium's search tool to extract nodes tagged with *Pro-War* and the three types of *Power* tag (Figure 4).
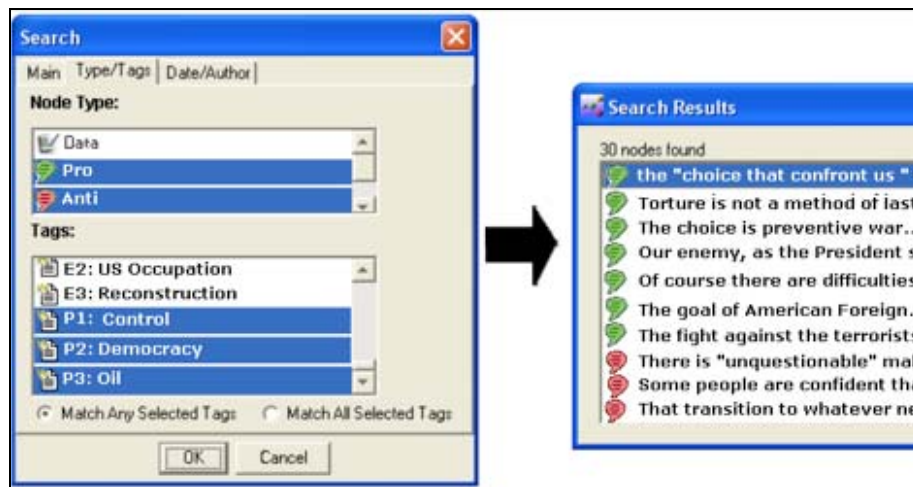
Figure 4: Harvesting all nodes in Compendium through a search on specific node type(s) + tag(s): "Find pro-war and anti-war positions with tags *P1: control*, *P2: democracy* and *P3: Oil*.

Once extracted from the database by a search, the nodes are pasted into a new map, and structured (Figure 5).
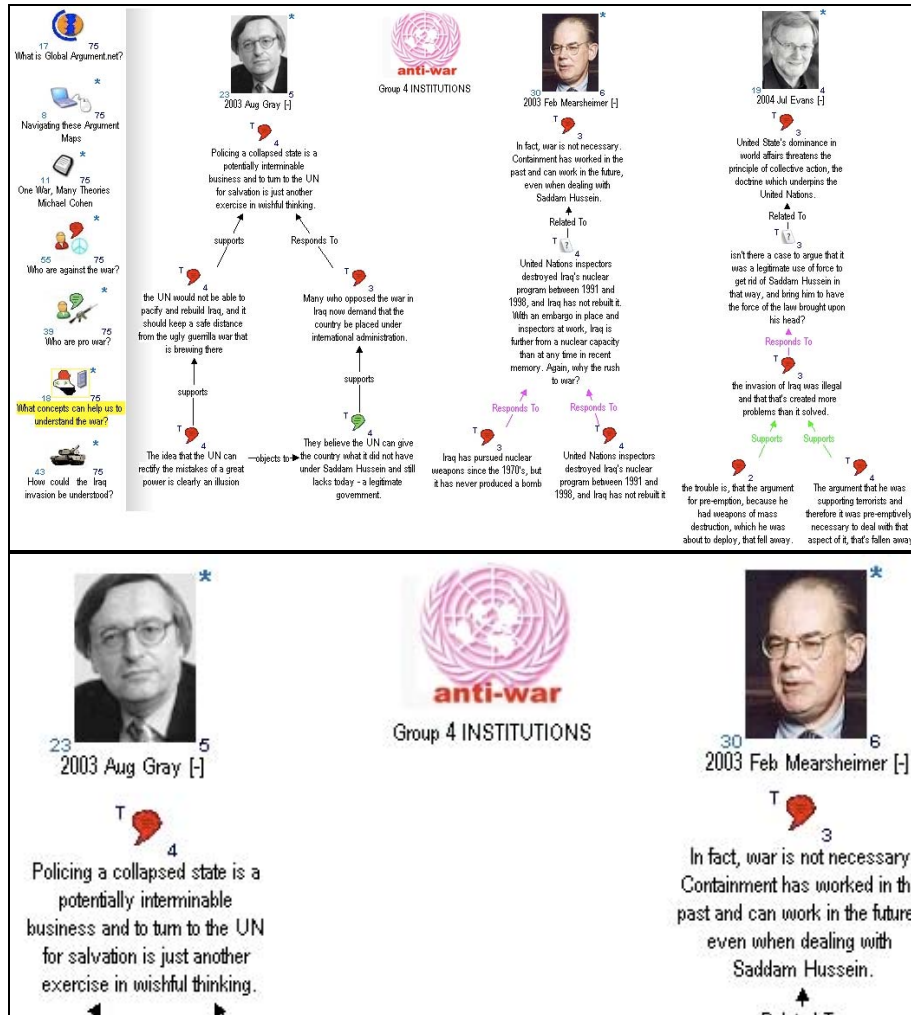
Figure 5: (Top) Overview and (bottom) zoomed in fragment of a gestalt map across articles, with nodes tagged *Anti-War* and *Role of Institutions*

Finally, we organised gestalt maps around the question *How could the Iraq invasion be understood?*, in which we use issues around the war's causes and effects, and Cohen's Norms (ethics), Institutions and Power configurations (Figure 6).
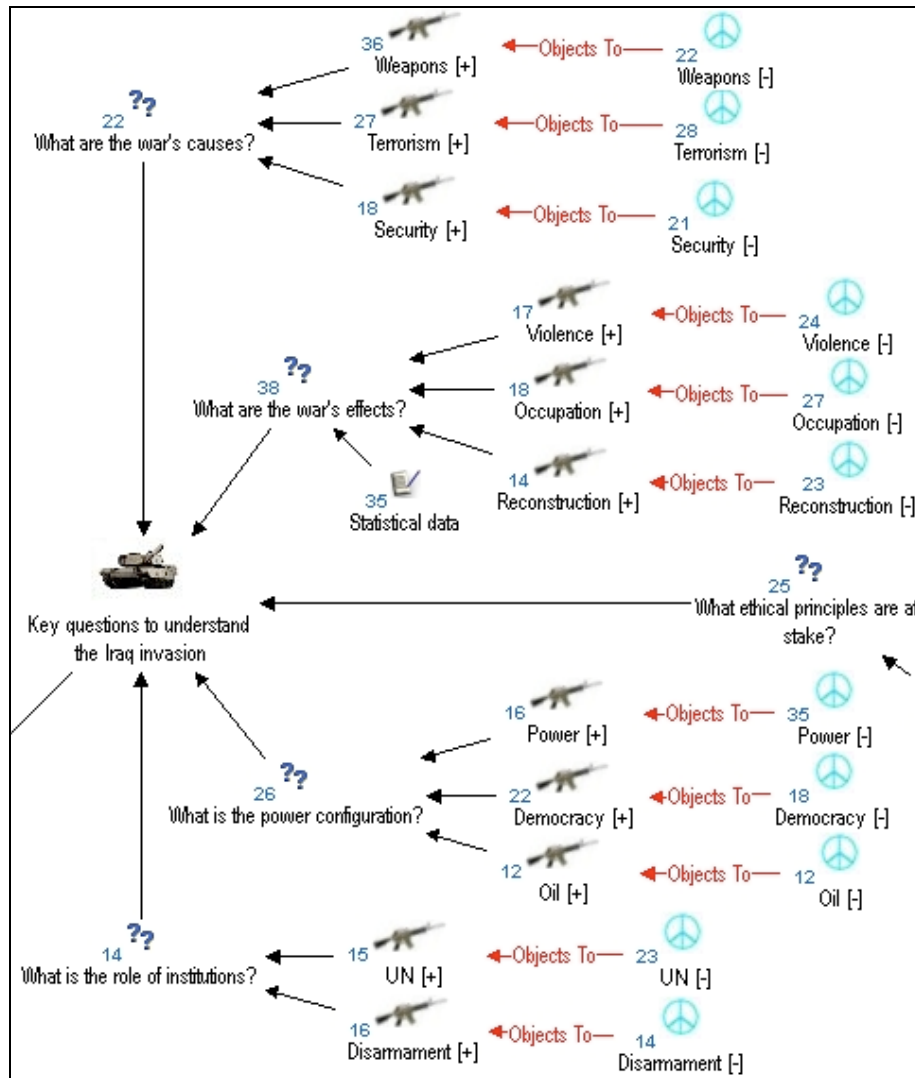
Figure 6: Gestalt map around the question *How could the Iraq invasion be understood?*

Thus, *What are the war's effects?* is answered by pro- and anti-war contributions tagged *E1: Violence; E2: Occupation* and *E3: Reconstruction*, while the issue *What ethical principles are at stake?* shows the different interpretations of this question by different writers (part of which is shown in Figure 7).
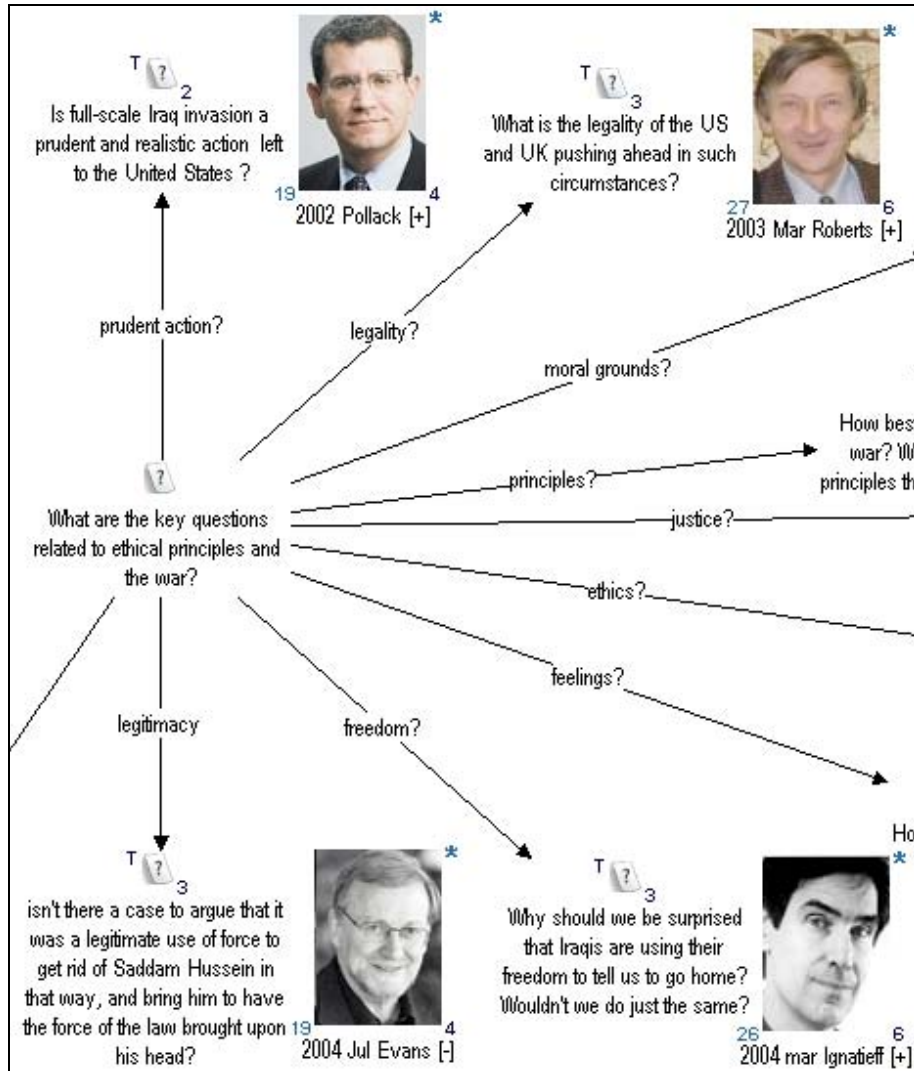
Figure 7: A fragment of the gestalt map: *What ethical principles are at stake?*

5. Knowledge Mapping's Contribution

We turn now to consider the value of mapping a corpus in this way. What does one gain from constructing, and reading, hypertext maps of this sort? What do they offer beyond a conventional stack of annotated, printed articles, electronic notes on a digital version, or a set of tagged, bookmarked websites? Knowledge maps should

add complementary value to the narrative richness of prose and the 'marginalia' of direct physical/digital annotation.

In our view these knowledge maps have valuable *notational* properties (the visual language, whether on screen or paper) combined with *interactive* properties (the particularities of mapping within a specific software environment), a distinction made in various ways by Green (1989), Suthers (Chapter X) and many other diagrammatic reasoning researchers. We would highlight the following distinctive attributes for analysts and readers:

- **From text string to visualised, database object.** When we extract key sentences from articles, we collate them not merely as text strings (e.g. in a wordprocessor) but convert them into addressable nodes that can be spatially positioned, assigned an icon, linked, tagged, have other nodes placed inside them (if we make them a Map or List container node), and tracked by the system as they are pasted into multiple views. This is similar to qualitative data analysis tools for transcript analysis, but via a much stronger visual interaction paradigm.

- **From implicit to explicit structure.** As argued by many other proponents of visual modelling and argument mapping, there is value in making explicit and inspectable previously implicit structure in a piece of prose, if meaningful patterns can be perceived directly. One can immediately see the presence of different Issues, Positions and Arguments for/against, the presence of tags, the 'weight' of a map (how many nodes inside it), and the level of node transclusion. The power of visual patterns increases with the systematicity of the map layout, which derives from greater formality in the modelling process—a theme to which we return below. Although we started from Cohen's principles, the mapping's contribution to grasping the *gestalt* of the debate rests on how we model *connections* between individual maps of articles. We are making an interpretive move that goes beyond Cohen's analysis when we extract a quote, and classify, transclude, tag or link it as a node, since this changes the shape of the digital space along one or more dimensions.

- **Multiple perspectives.** The new finer granularity of chunking ideas as nodes, combined with tagging of important facets, makes possible the easy extraction of different node clusters for the creation of gestalt maps that convey different dimensions to the controversy.

6. Improving the Rigour of Controversy Mapping

6.1 Granularity of analysis vs. cognitive effort

As this book demonstrates, there are numerous approaches to mapping ideas. Focusing specifically on argument mapping, the work with *Araucaria* (Chapter X) and *Rationale* (Chapter X) is most relevant. Both of these visual languages promote a fine-grained analysis of statements, that requires extensive "normative reconstruction" (van Eemeren, et al. 1993) of the spoken/written sources being analysed, into more rational structures that complete the premises, warrants and moves that are invariably implicit, or missing, in normal speech/prose. In *Rationale*, the analyst teases apart the moves into a hierachical tree, ensuring that the claim being made does not "pull any rabbits out of the hat", to use their memorable phrase. In *Araucaria*, the analyst's attention is directed to identify the argumentation scheme that is being deployed, so that they can assess the argument's completeness with respect to the canonical visual pattern. In time, analysts learn to see these patterns without even explicitly mapping them, an explanation that the *Rationale* team use to explain their improved critical thinking results (van Gelder, 2003) and which lies at the heart of Conklin's (2006) Dialogue Mapping training to teach facilitators to hear—and make visible—the 'deep structure' of contributions to discussions.

As with any structured modelling methodology, the point of investing this effort is to add rigour to the analysis. However, there is a cost/benefit tradeoff: mastering this intellectual discipline is a new literacy that takes effort—literally, "Lots of Argument Mapping Practice" (Chapter X). In our view, the knowledge mapping of the Iraq Debate, whilst still requiring intellectual discipline and close reading, required less cognitive effort than detailed *Araucaria/Rationale* style argument analysis, to effect construction of a network with some valuable affordances. Nothing comes for free, of course. If IBIS-centric knowledge mapping is a rapid technique offering greater expressive *breadth* (anything can be captured in IBIS), it sacrifices *depth*. We help the analyst (especially the novice analyst, or a newcomer to the controversy) to bridge the cognitive formalization gulf in order to move from prose/speech to a network model, and thus offering a gentler learning curve. The tradeoff is that the arguments were not scrutinised as closely, hence the need to integrate finer grained argument mapping as deemed appropriate.

6.2 Who is the analyst and what is their objective?

Although tools have different affordances, no tool is deterministic, guaranteeing a good job: tools can be used rigorously or opportunistically, and fluently or awkwardly. The maturity of the analyst wielding the tool is critical. Rider and Thomason (Chapter X) discuss students' construction of poor argument maps. Conklin's (2006) work is devoted to improving the value added by Dialogue Mappers, and Selvin's work in Chapter X strives for frameworks that can cover fluency in collaborative knowledge cartography more broadly.

We can identify three factors that shape the knowledge maps. Firstly, our *task orientation* in this exercise was to map the contributions of the selected articles, with relatively little effort devoted to overlaying our own views—most nodes are grounded in quotes from the source articles. This was the first iteration, which could have been followed by further cycles where the analyst's own critique was added. Secondly, the quality of maps is unquestionably a function of the mapper's *subject matter expertise*: the analyst (Okada) was not an Iraq expert but playing the role of a student seeking to learn about the controversy. Thirdly, is *cartographic expertise* (tool plus language): she was learning to use both Compendium and IBIS, never having used them to analyse texts before, and never having used Conversational Modelling with its systematic use of tagging and translusion for information management. As such, this is a realistic use case scenario illustrating the kind of results one might get in an early knowledge mapping exercise with newcomers to the target domain and the mapping tool.

6.3 Going deeper

Taking the current analysis as a first iteration, how could the next be more incisive? We would provide more 'scaffolding' through the use of visual templates that interrogate more systematically an individual's viewpoint, or the state of the debate overall:

- **Dialogue Mapping template.** Conklin (2006) identifies seven issue types that we were using implicitly throughout the analysis in both article and gestalt maps, but which could be used more consciously and systematically to ensure balanced coverage of the whole debate (Figure 8)
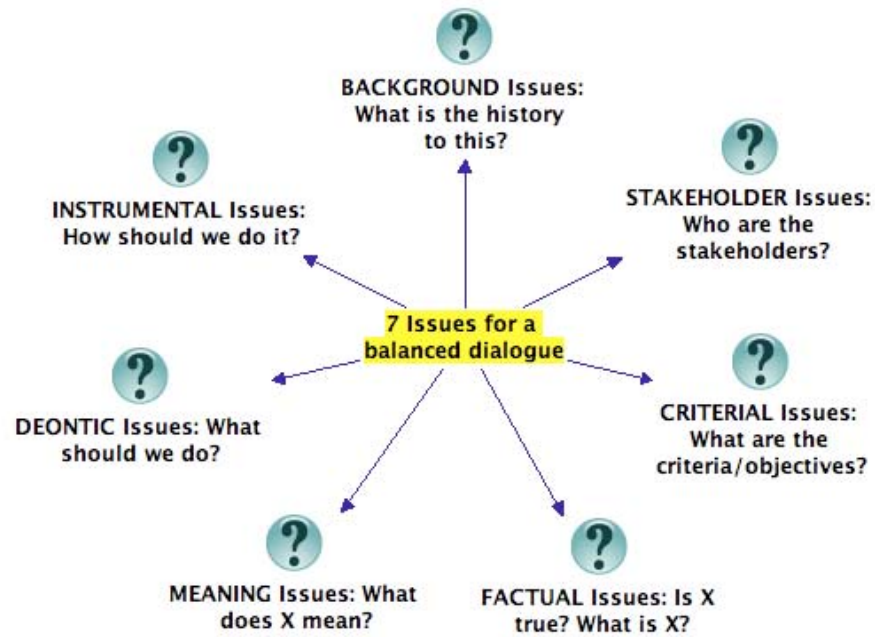
Figure 8: Seven different kinds of Issue, each of which leads to different kinds of conversation (Conklin, 2006).

- **Expose the argumentation substructure.** We can build on the work of our argument mapping colleagues, as introduced above, by integrating aspects of their visual languages into the Issue-centric deliberation scheme at the heart of our approach. As shown in IBIS, we can link two nodes with a *supports* or *challenges* link, but this does not illuminate the sub-structure of the argumentation. What kind of argument is being made, and is this fallacious, or incomplete? When mapping another controversy, we have shown how *supports/challenges* links in a *Rationale*-like argument tree in Compendium, can be further expanded to show the argumentation scheme (Figures 9 and 10).
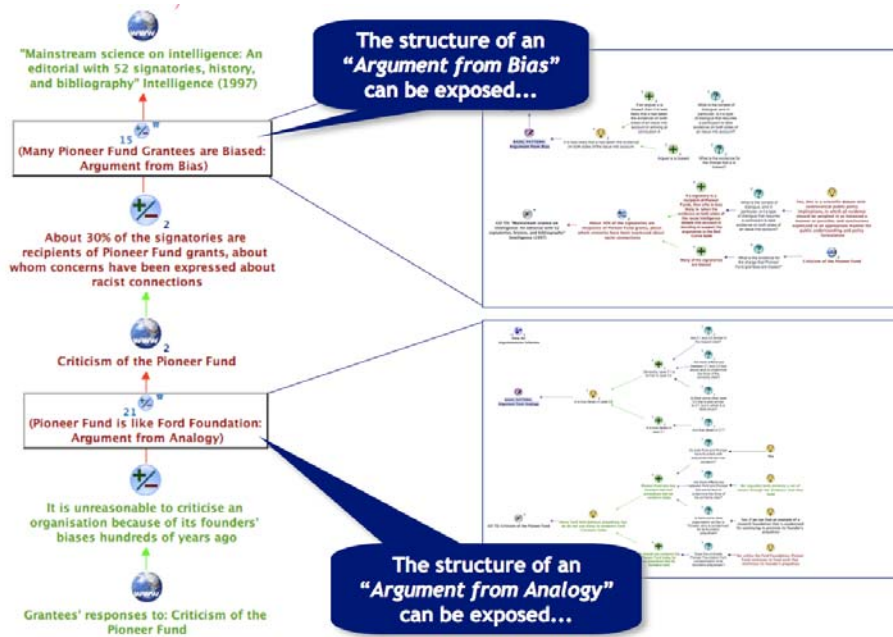
Figure 9: Schematic overview, showing how the argumentative moves in a chain of nodes (left) can have a sub-structure behind them reflecting the argumentation scheme (right). See Figure 10 for detailed view.[4]

Figure 10: The template for an Argument by Analogy, showing premises and relevant Critical Questions (top), instantiated with respect to the controversy (bottom).

7. Conclusions and Future Work

In this chapter we sought to demonstrate how knowledge mapping can scaffold the analysis of controversies and debates, using the Iraq Debate as an example. Our work continues on a number of fronts. Firstly, the maps have not yet been empirically evaluated with independent readers, so while we have proven the modelling methodology and implemented the maps technically, claims about the interactions between different views, users and tasks remain cautious. Readers can access the maps themselves to form their own opinions of course.

Secondly, we are developing Web-centric mapping tools that will make it simpler than at present for multiple analysts to contribute. This builds on and extends the

tools developed in the Scholarly Ontologies project (Buckingham Shum, et al. 2007).

Thirdly, we are integrating Compendium with other collaborative e-learning tools, such as the *FlashMeeting* Web-video conferencing tool (Okada, et al. 2007) and the *Moodle* virtual learning environment (OpenLearn, 2007).

Finally, while we are certainly interested in improving information management, sharpening critical thinking and promoting sound argumentation, at the same time, these are only part of the story if knowledge mapping tools are to go beyond fostering critical analysis (albeit a worthy end in its own right), and provide support for *shaping*, not just analysing, the hardest kinds of policy deliberations. Those who are engaged in conflict resolution in the most strife-ridden communities and countries (not to mention the less extreme dynamics within our organisations), remind us that the key to making true progress is to establish the context for open dialogue in which stakeholders learn to listen to each other properly, and co-construct new realities (Isaacs, 1999; Kahane, 2004).

This chapter has focused somewhat on the rational, critical analysis of information and argument connections (see also Ohl's Chapter X). However, the approach we are developing emphasises a simple visual language that can be used effectively in real time to capture and reflect back a wide variety of deliberative moves, with its roots in facilitating dialogue that is owned by all stakeholders (Conklin, 2006; Selvin, et al., 2002; Papadopoulos, 2004 Selvin, Chapter X). The vision of our ongoing *Hypermedia Discourse* research programme [5] is to create knowledge cartography tools and practices that integrate heart and mind. We need both critical thinking and open listening as we strive collectively to make sense of, and act on, the complexities and controversies now facing us.

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[5] Hypermedia Discourse project: http://kmi.open.ac.uk/projects/hyperdiscourse

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