

Participatory Hypermedia Construction via Sharable Interfaces?

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The research problem

Teams in many domains (e.g. design, government, science, mission operations) devote a lot of energy to making sense of the world, that is, constructing plausible narratives about the significance of events for their particular mission. Our work concerns the use of various forms of visualization to promote *participatory hypermedia construction (PHC)* in support of this work, including educational resources, activity plans, deliberations over issues, models of problems, and argumentation networks. We are interested to characterise the process of how participants in collective sensemaking around a problem come to engage deeply and effectively in the co-construction of visual models, and the role of the practitioner/facilitator in this process. We are drawing on the work of Dewey, Schön and Wright & McCarthy, to develop an account of PHC that foregrounds the construction of coherent narrative, and the sensemaking and improvisation that is provoked when narrative breaks down.ⁱ⁻ⁱⁱ

Our research platform is the *Compendium* hypermedia mapping tool, which has an active user community [www.CompendiumInstitute.org].ⁱⁱⁱ Figure 1 illustrates the key interface elements: [1] Drag and drop nodes from the palette, in order to [2] capture key issues, ideas, arguments and decisions. [3] Relevant media resources/websites can be linked into this discussion. [4] A digit superimposed on a node shows how many views it is in. [5] Nodes can be tagged using a folksonomy or methodology to enable social bookmarking as well as interoperability with agents and other datasets or services. Compendium is designed to facilitate interoperability with other tools, as demonstrated in a number of case studies in Science and emergency response.

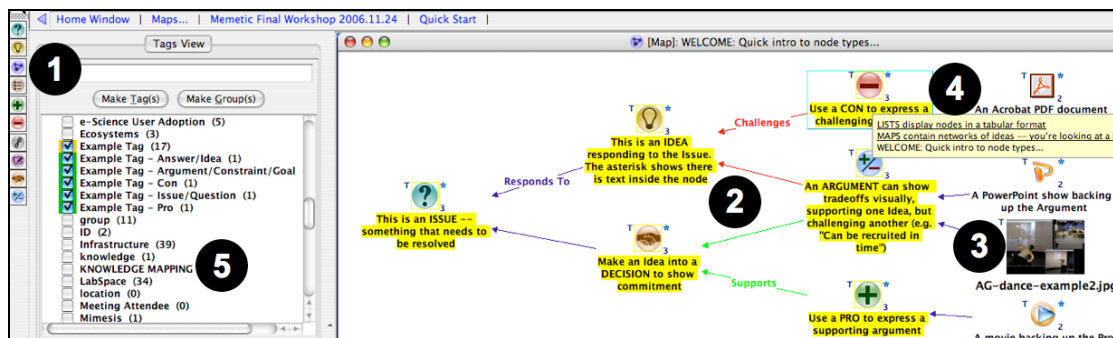


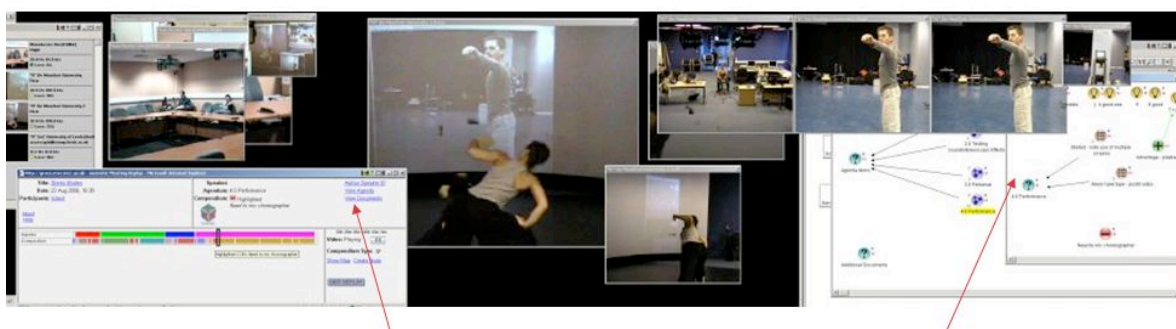
Figure 1: Compendium's default visual language, IBIS (Issue-Based Information System) for capturing deliberation and argumentation. User-defined icon and link/structure palettes are used to extend the visual language to support different kinds of conversational modelling.

From single to multi-screen displays

For technical reasons, most uses of Compendium have been restricted to single-screen projections/shared screens over the internet, this being the only widely available infrastructure for most users. However, in research projects we have been deploying Compendium in the context of large displays, which moves us towards the topic of this workshop (Figures 2-3).



Figure 2: Use of Compendium with planning tools and information visualizations in support of Personnel Recovery Cells, deliberating over how to recover hostages or isolated personnel in conflict scenarios (Co-OPR Project: www.aiai.ed.ac.uk/project/co-opr)



Interactive timelines linking to Compendium annotations on the video

Compendium maps

Figure 3: A multi-site dance performance^{iv} over the Access Grid videoconferencing system, using Compendium and other tools to support replay, reflection and evaluation via wall-size displays. (See JISC Memetic project: www.memetic-yrc.net)

Roles for sharable interfaces in promoting user engagement?

A particular phenomenon that we find as a group comes to truly engage with a shared representation is that they want to handle it themselves, rather than have the nodes on the screen mediated via the designated mapper. While we can set up multi-user access to a shared project so that co-located or distributed participants can use their mice, the emergence of what this workshop is terming *Sharable Interfaces* opens up new possibilities for direct, parallel manipulation of the display via touchscreens such as SmartBoards and dedicated tabletop displays.

We would like to investigate whether sharable interfaces could better support the behaviour that we observe with engaged, co-located participants, who often leap up from their seats in order to gesture around the display, or point and gesture from their seats, using laser pointers if provided. We would also like to investigate whether sharable interfaces could mimic, or even augment, the affordances of tangible media such as photos which we use in leadership development contexts, when we ask participants to select and discuss images to help open up discussions (Figure 4).^v Image-sharing applications on multi-touch tabletop displays could potentially mediate this digitally, and enable distributed engagement in such exercises via a more naturalistic mode of interaction.

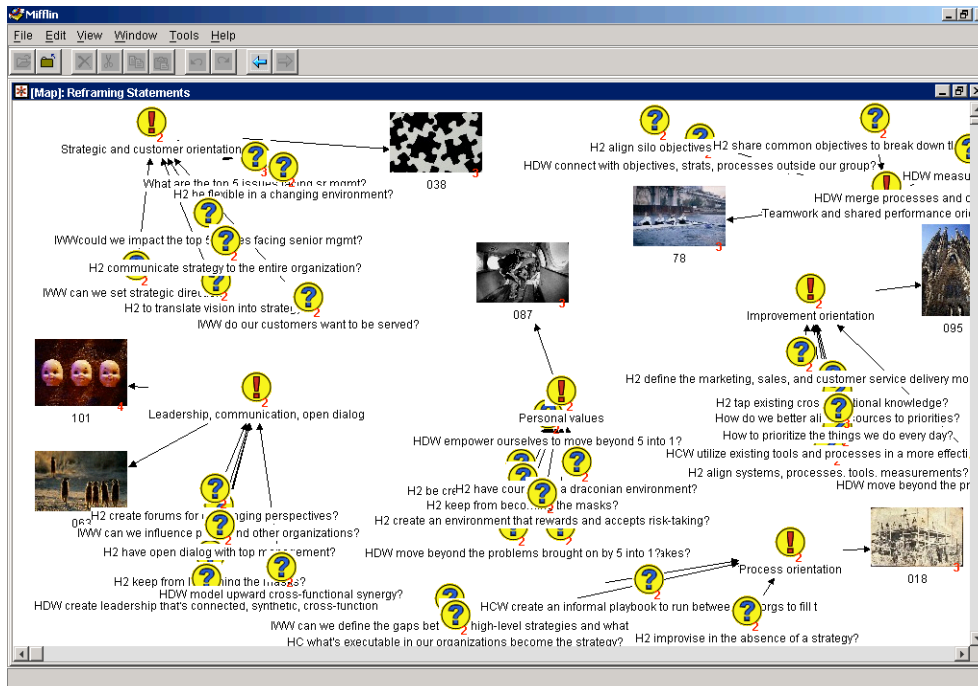


Figure 4: Use of the Visual Explorer methodology with Compendium: A4 printed images are used to describe organizational dilemmas to a group, which lead to discussions that are captured in Compendium, linking the image thumbnails to the issues and ideas that are read into the images.

In conclusion, the sphere of tools covered by the Shareable Interfaces concept seems to us to open up intriguing new possibilities for group interaction with, and around, the kinds of visual modelling representations with which have been working:

- How could shareable interfaces enhance the construction of shared narrative around visual models for wicked problems? For instance, do more intuitive user interfaces lower the adoption barriers for stakeholders to engage more deeply with the representations? Do such interfaces smooth editor-turndaking or communication of work to others? When there is a rupture in the expected course of events (such as unexpected misunderstandings or ambiguities) do the affordances of shareable interfaces enable make particular kinds of sensemaking improvisations?
- How might visual modelling languages, of the sort illustrated above, complement tangible interface objects and other modalities being experimented with in the sharable interfaces community?

We welcome the opportunity to discuss these issues with colleagues.

ⁱ Selvin, A. (2003). Fostering Collective Intelligence: Helping Groups Use Visualized Argumentation. In: *Visualizing Argumentation*, P.A. Kirschner, S. Buckingham Shum, and C. Carr, Editors. Springer-Verlag: London

ⁱⁱ Selvin, A. (2005). Aesthetic and Ethical Implications of Participatory Hypermedia Practice. *Technical Report KMI-05-17*, Knowledge Media Institute, Open University, UK

ⁱⁱⁱ Buckingham Shum, S. *et al.* (2006). Hypermedia Support for Argumentation-Based Rationale: 15 Years on from gIBIS and QOC. In: Dutoit, A. *et al.* (Eds.): *Rationale Management in Software Engineering*. Springer-Verlag: Berlin, pp. 111-132

^{iv} Bailey, H. and Turner, M. *Stereo-bodies: Improvisation and Choreography within the Access Grid*. JISC VRE CSAGE Project, 2006

^v Selvin, A., *et al.* (2002). Knowledge Art: Visual Sensemaking Using Combined *Compendium* and *Visual Explorer* Methodologies. *The Art of Management and Organisation Conference*, August 2002, Kings College London