Using CoPe_it! in data-intensive collaboration

This document demonstrates the applicability of CoPe_it! in a real, data-intensive debate that took place at the 5663rd Meeting of the United Nations Security Council (UNSC). An accurate representation of this debate has been incrementally built in CoPe_it! by using its minutes (the official press release is available at: http://www.un.org/News/Press/docs/2007/sc9000.doc.htm). Additional data sources, corresponding to previous debates and information that is strongly related to the issue at hand, have been uploaded and appropriately linked in the corresponding workspace.

The context of this debate is as follows: United Kingdom, holding the presidency of the UNSC for April 2007, raised the issue of whether climate change has an impact on peace and security. Over fifty delegates from the UN Member States collaborated by expressing their points of view through various statements and arguments of legal, environmental, scientific and political content. Some delegates welcomed the initiative, while others expressed their doubts on the mandate of the UNSC to discuss such issues. Some arguments were in favor or against an idea or a previously asserted argument. In some cases, delegates were speaking on behalf of more than one member states (cases of geographically, politically or economically related states). Last but not least, delegates often referred to diverse sources of massive and complicated data such as data on territorial changes and maps, meteorological data, facts and figures related to energy resources, data concerning international agreements and protocols, financial data of different nature and complexity, records of similar debates conducted inside and outside UNSC, etc.

In the following, we sketch an emulation of the above debate through CoPe_it! to show the tool's capabilities in tackling such data-intensive collaboration settings. The particular emulation was conducted in an asynchronous way, among geographically dispersed participants (taking the roles and using the wording of the real delegates). The layout of the tool's informal projection is shown in Figure 1. The left hand side bar enables participants to open a new browser, search for related information, and be aware of other online members of their community. Participants may easily create and upload various types of data and knowledge items (a predefined set of item types is given; participants may enrich this set by defining additional ones). These can be either dedicated item types such as ideas (depicted as light bulbs), notes and comments, or existing multimedia resources. Ideas stand for items that deserve further exploitation; they may correspond to an alternative solution to the issue under consideration and they usually trigger the evolution of the collaboration. Notes are generally considered as items expressing one's knowledge about the overall issue, an already asserted idea or note. Finally, comments are items that usually express less strong statements; they are uploaded to express some explanatory text or point to some potentially useful information. Knowledge item types may change upon the evolution of the collaboration (e.g. a user that has asserted a particular comment may elaborate it further and change its type to an idea). All the above items can be interrelated. When interrelating items, participants may select the color of the connecting arrow and provide a legend describing the interrelationship they conceive. These legends are intentionally arbitrary. CoPe_it! enables participants to spatially arrange the uploaded items and organize them in a meaningful way.

Figure 1 corresponds to an early instance of the collaborative workspace created for the needs of our example. As shown, some stakeholders have contributed so far by uploading on the workspace some useful resources (including a video), proposing two concrete ideas, and interrelating one idea with four additional items.

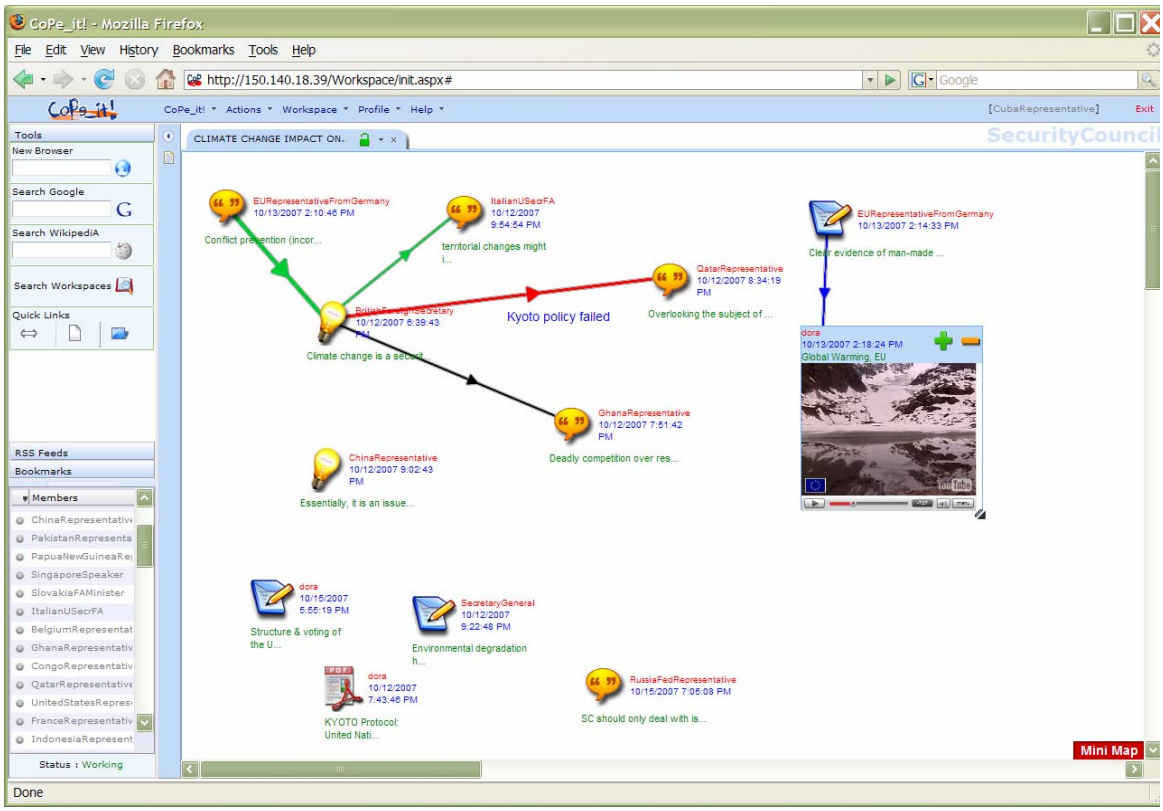

Fig. 1. An early instance of the collaboration.

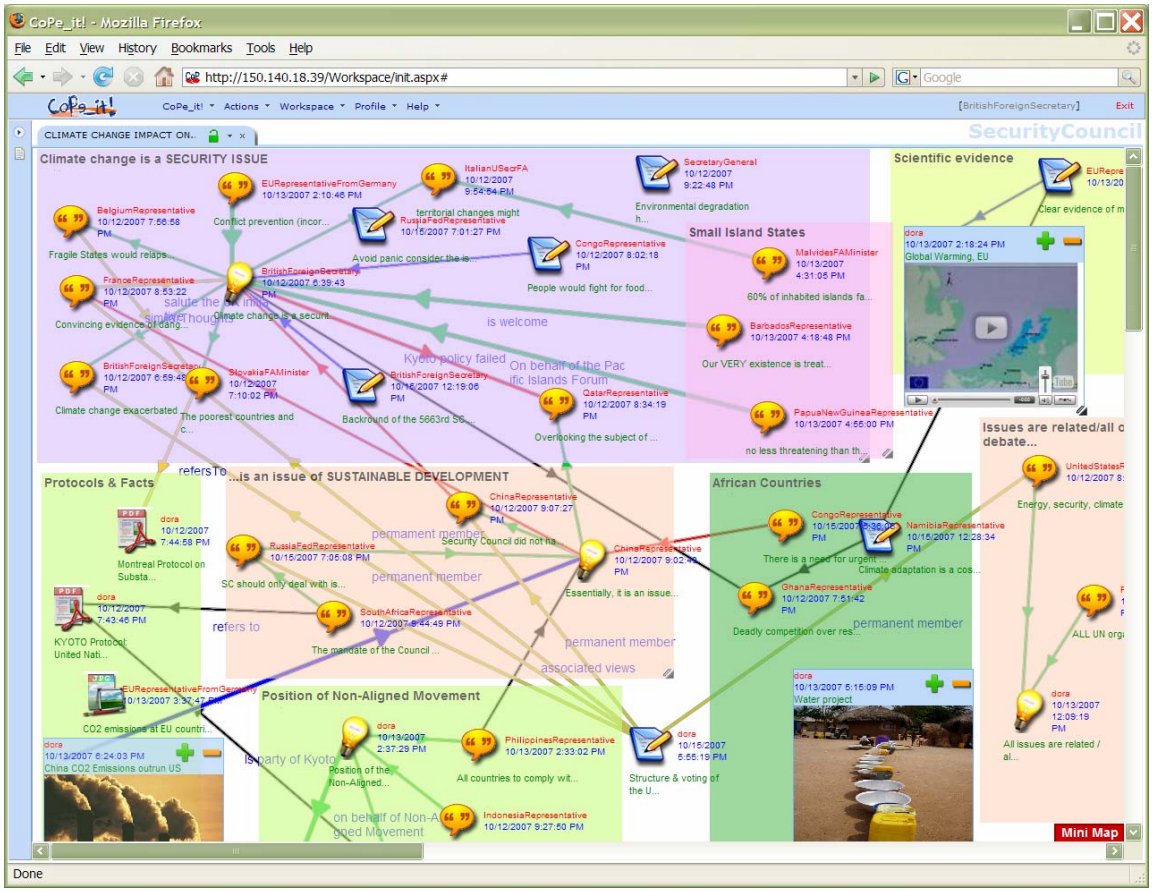

Fig. 2. A data-intensive instance of the collaboration.

Figure 2 illustrates a second instance of the collaborative workspace under consideration (the left-hand side bar is closed for visualization purposes). As shown, this is a highly data-intensive instance where many delegates have been contributed their ideas and positions. Four ideas are now expressed, which are highly interconnected with multiple data and knowledge artifacts. More multimedia resources, particularly relevant to some items, have been also uploaded. Beyond coloring of the arrows that interrelate knowledge items (in the example given, green arrows declare support, red ones declare opposition, whereas the other colors just denote an unjustified relation), another visual cue that appears in Figure 2 concerns the colored rectangles that have been created by participants to cluster related items. Other visual cues bear additional semantics (e.g. the thickness of an edge may express how strongly an item objects another one). The spatial arrangement of the collaboration artifacts aid users have a neat and quick view of the alternative ideas considered so far as well as the underlying argumentation. Since the process of gathering and sharing resources about the particular debate is unstructured, highly dynamic and thus rapidly evolving, this projection provides an appropriate environment to support collaboration at this stage. The aim is to bring the session to a point where main trends crystallize. Filtered views may be of additional help towards this direction*. Figure 3 illustrates a view that has been produced after a participant's request to visualize the workspace shown in Figure 2 according to some filtering. In the particular instance, a participant requested to visualize only the ideas expressed so far together with all the related argumentation in favor and against them.

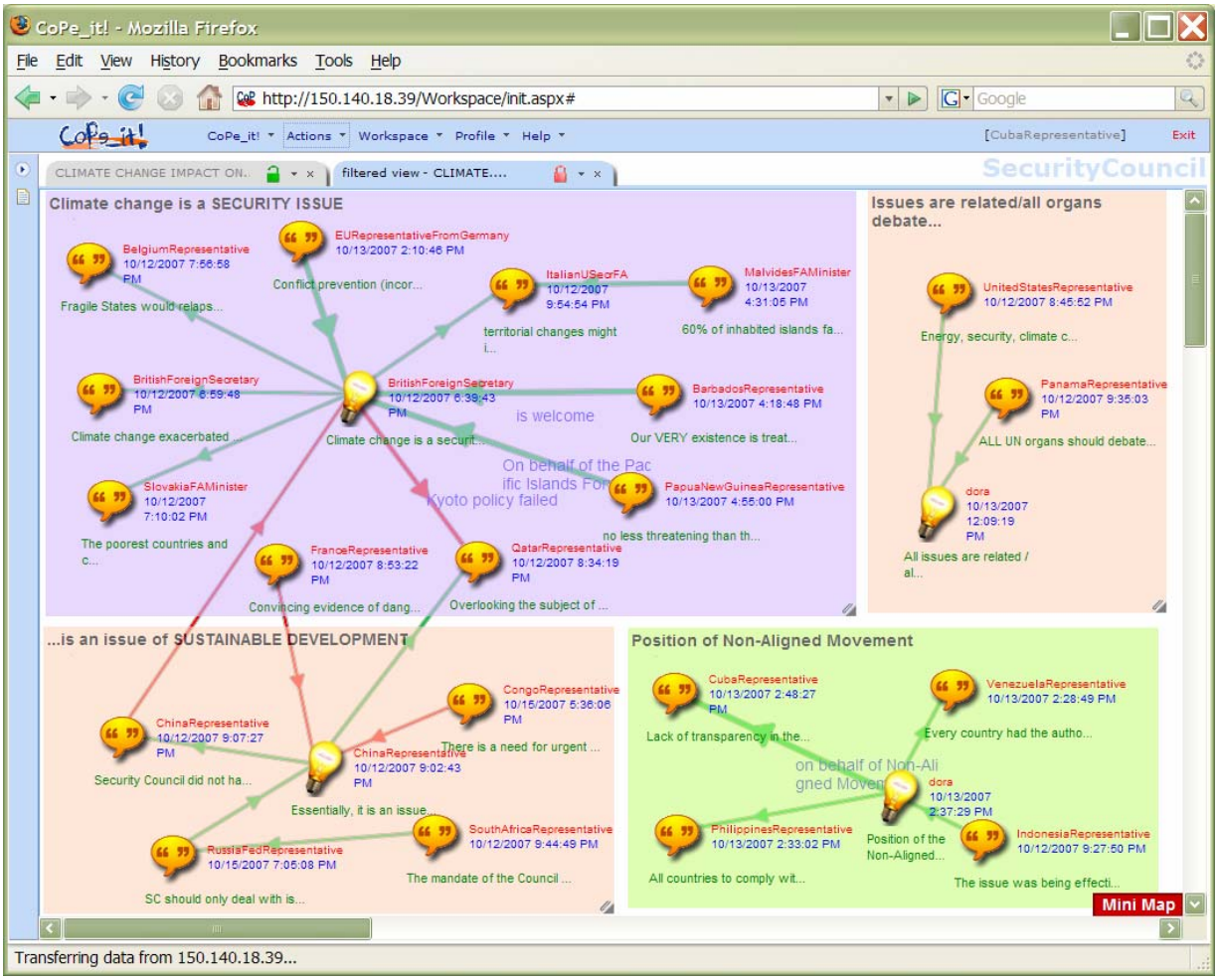

Fig. 3. A filtered view.

* Filtered views are not supported in version 2.1 of CoPe_it!

Some contexts necessitate a further elaboration of the knowledge items considered so far, and exploitation of additional functionalities such as formal argumentation and reasoning mechanisms. A formal projection in CoPe_it! is able to cover such needs by providing a fixed set of discourse element and relationship types, with predetermined, system-interpretable semantics. Further elaborating our example, let us assume that the collaboration has reached a point where a switch to a more formal projection is needed. This implies that selected knowledge items' and relationships' types have to be transformed. The above are determined by the underlying visualization and reasoning model of the formal projection (this process can be semi- or fully automated).

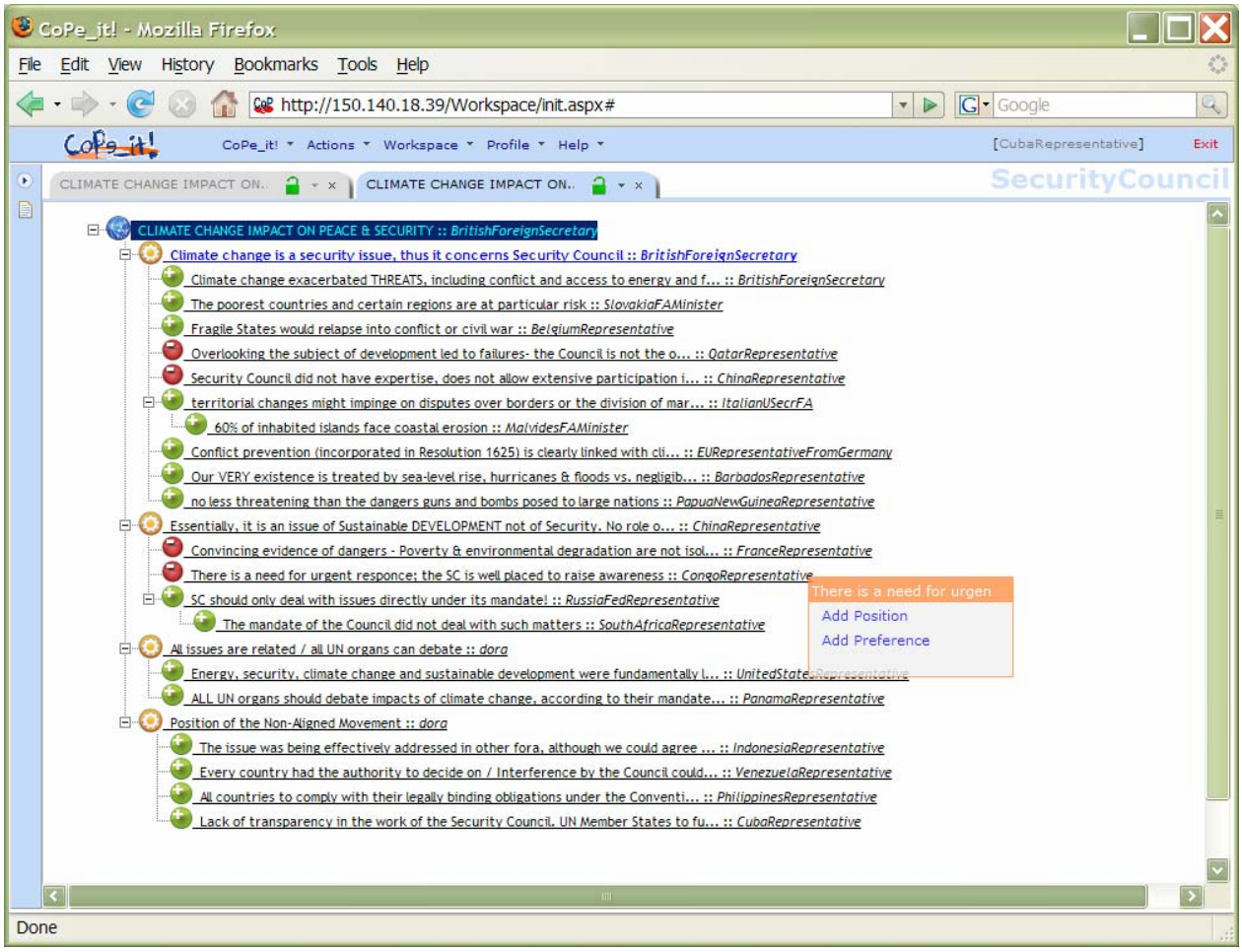

Fig. 4. An instance of the formal projection of the collaboration.

An instance of the workspace's formal projection (corresponding to both the data-intensive view of Figure 2 and the filtered view of Figure 3) is shown in Figure 4. This projection adopts an IBIS-like formalism (item types supported are issues, alternatives and positions) and provides a structured language for argumentative discourse together with a mechanism for the evaluation of alternatives. More specifically, the ideas appearing in the informal projection have been transformed to alternatives (alternatives correspond to solutions to the issue under consideration). Other knowledge items have been transformed to positions in favor or against exploiting the coloring and the legends of the interrelating arrows. Additional reasoning can be performed through the expression of preferences, which provide participants with a qualitative way to weigh reasons for and against the selection of an alternative. Further to the argumentation-based structuring of a collaborative session, this projection integrates a reasoning and scoring mechanism that determines the status of each discourse entry (according to broadly accepted argumentation rules), the ultimate aim being to keep users aware of

the most prominent alternative[†] (in the instance of Figure 4, the alternative "Climate change is a security issue, thus it concerns Security Council" wins; this can be changed in another instance of the collaboration, depending on the underlying argumentation).

Collaboration through CoPe_it! may continue at the informal projection, where users are able to exploit a richer set of features and functionalities. Alternative projections of a collaboration workspace should be considered jointly, in that a switch from one to the other can further facilitate the argumentative collaboration process. Moreover, a particular collaboration context may be better handled through a less or more formal projection. One may also consider the case where decrease of formality is desirable. For instance, while collaboration proceeds through a formal projection, some discourse elements need to be further justified, refined and elucidated. It is at this point that the collaboration session could switch to a more informal view in order to provide participants with the appropriate environment to better shape their minds.

[†] For a detailed description of these mechanisms, see: N. Karacapilidis and D. Papadias, "Computer supported argumentation and collaborative decision making: The HERMES System", Information Systems, vol. 26, no 4, 2001, pp. 259-277.