Chapter 2.7
Web-Based Collaboration and Decision Making Support:
A Multi-Disciplinary Approach

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ABSTRACT

Arguing that a varying level of formality needs to be offered in systems supporting argumentative collaboration, this article proposes an incremental formalization approach that has been adopted in the development of CoPe_it!, a Web-based tool that complies with collaborative principles and practices, and provides members of communities engaged in argumentative discussions and decision making processes with the appropriate means to collaborate towards the solution of diverse issues. According to the proposed approach, incremental formalization can be achieved through the consideration of alternative projections of a collaborative workspace.

INTRODUCTION

Designing software systems that can adequately address users' needs to express, share, interpret, and reason about knowledge during a session of argumentative collaboration has been a major research and development activity for more than 20 years (de Moor & Aakhus, 2006). Designing, building, and experimenting with specialized argumentation and decision rationale support systems have resulted to a series of argument visualization approaches. Technologies supporting argumentative collaboration usually provide the means for discussion structuring, sharing of documents, and user administration. They support argumentative collaboration at various levels and have been tested through diverse user groups and contexts. Furthermore, they aim at

exploring argumentation as a means to establish a common ground between diverse stakeholders, to understand positions on issues, to surface assumptions and criteria, and to collectively construct consensus (Jonassen & Carr, 2000).

When engaged in the use of these technologies, through a software system supporting argumentative collaboration, users have to follow a specific formalism. More specifically, their interaction is regulated by procedures that prescribe and –at the same time –constrain their work. This may refer to both the system-supported actions a user may perform (types of discourse or collaboration acts), and the system-supported types of argumentative collaboration objects (e.g., one has to strictly characterize an object as an idea or a position). In many cases, users have also to fine-tune, align, amend or even fully change their usual way of collaborating in order to be able to exploit the system's features and functionalities. Acknowledging that the above are necessary towards making the system interpret and reason about human actions (and the associated resources), thus offering advanced computational services, there is much evidence that sophisticated approaches and techniques often resulted to failures (Shipman & McCall, 1994). This is often due to the extra time and effort that users need to spend in order to get acquainted with the system, the associated disruption of the users' usual workflow (Fischer, Lemke, McCall, & Morch, 1991), as well as to the "error prone and difficult to correct when done wrong" character and the prematurely imposing structure of formal approaches (Halasz, 1988).

As a consequence, we argue that a varying level of formality should be considered. This variation may either be imposed by the nature of the task at hand (e.g., decision making, joint deliberation, persuasion, inquiry, negotiation, conflict resolution), the particular context of the collaboration (e.g., legal reasoning, medical decision making, public policy), or the group of people who collaborate each time (i.e., how comfortable people feel with the use of a certain technology or

formalism). The above advocate an incremental formalization approach, which has been adopted in the development of CoPe_it!, a Web-based tool that is able to support argumentative collaboration at various levels of formality (http://copeit.cti.gr). CoPe_it! complies with collaborative principles and practices, and provides members of communities engaged in argumentative discussions and decision making processes with the appropriate means to collaborate towards the solution of diverse issues. Representative settings where the tool would be useful include medical collaboration towards making a decision about the appropriate treatment of a patient, public policy making involving a wide community, collaboration among students in the context of their project work, organization-wide collaboration for the consideration and elaboration of the organization's objectives, Web-based collaboration to enhance individual and group learning on an issue of common interest, and so forth.

According to the proposed approach, incremental formalization can be achieved through the consideration of alternative *projections* (i.e., particular representations) of a collaborative workspace, as well as through mechanisms supporting the switching from one projection to another. This article focuses on the presentation of this approach. More specifically, Section 2 comments on a series of background issues related to reasoning and visualization, as well as on related work. Section 3 presents our overall approach, illustrates two representative examples of different formality level and sketches the procedure of switching among alternative projections of a particular workspace. Finally, Section 4 discusses advantages and limitations of the proposed approach and outlines future work directions.

BACKGROUND ISSUES

The representation and facilitation of argumentative discourses being held in diverse collaborative

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