

Chapter 3.12

Awareness Mechanisms for Web-Based Argumentative Collaboration

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ABSTRACT

Much research has been performed on how computer-based technologies might facilitate awareness among cooperating actors. However, existing approaches in providing awareness services prove to be inadequate in data-intensive instances of argumentative collaboration. Moreover, they fail to address the needs of dynamic, Web-based communities. In this context, this article presents a list of awareness mechanisms that have been integrated in an innovative Web-based collaboration support tool, where the ultimate aim is to satisfy the requirements associated with the above remarks. The proposed mechanisms are described and elaborated with respect to various awareness types reported in the literature.

INTRODUCTION

The concept of awareness has been extensively elaborated in the field of computer-supported collaborative work (CSCW) (Carroll, Rosson, Convertino, & Ganoe, 2006; Schmidt, 2002). In this context, awareness can be defined as an understanding of the activities of others, which provides a context for one's own activity (Dourish & Bellotti, 1992). Much research has been performed on how computer-based technologies might facilitate awareness among cooperating actors (i.e., members of a community). An important body of this work attempts to develop computational environments based on event propagation mechanisms for collecting, disseminating, and integrating information concerning collaborative activities

(Schmidt, 2002). Generally speaking, awareness of past and current actions in such shared environments and over shared artifacts influences and guides actors' decisions and courses of action. It allows them to have a general perception of the community's activities, progress, and problems, as well as to have a perception about their progress compared to others. Some awareness-related services, offered by these environments, could also aid actors to find potential collaborators for exchanging diverse types of artifacts (which can serve as an instrument to generate and sustain awareness themselves) or asking for help.

However, powerful awareness mechanisms are rather rare in argumentative collaboration environments. Moreover, existing approaches in providing awareness services prove to be inadequate in data-intensive situations (Carroll et al., 2006). Collaboration settings are often associated with huge, ever-increasing amounts of multiple types of data, obtained from diverse sources that often have a low signal-to-noise ratio for addressing the problem at hand. In turn, these data may vary in terms of subjectivity, ranging from individual opinions and estimations to broadly accepted practices and indisputable measurements and scientific results. Their types can be of diverse level as far as human understanding and machine interpretation are concerned. They can be put forward by people having diverse or even conflicting interests. At the same time, the associated data are in most cases interconnected in a vague or explicit way. Data and their interconnections often reveal social networks and social interactions of different patterns.

These ideas about data bring up the need for innovative software tools that offer the appropriate awareness services in order to make it easier for actors and communities to capture, represent, and process big and complex volumes of data and knowledge during argumentative collaboration. Such services should shift in focus from the collection and representation of information to its meaningful assessment and utilization with

the ultimate aim to facilitate and augment collaborative sense making. This can be seen as a special type of social computing where various computations concerning the associated context and group's behavior need to be supported.

In line with the above, this article presents a list of awareness mechanisms that have been integrated in a Web-based tool, namely CoPe_it! (<http://copeit.cti.gr>), that supports data-intensive argumentative collaboration. In the following sections, we sketch our overall approach and motivation, make a distinction of various awareness types, describe the proposed mechanisms and services in detail, and conclude with some preliminary evaluation results and future work directions.

Awareness in Argumentative Collaboration Environments

While awareness is critical in CSCW, it is a rather unexplored domain in the context of argumentative collaboration environments. Although many tools exist to support online discussion and deliberation, which range from simple discussion forums found on the Web to sophisticated and formal argumentation and decision support systems (Karacapilidis & Papadias, 2001), these do not consider awareness mechanisms as a focal point. Such mechanisms are usually considered a complementary (i.e., not a core) functionality of solutions addressing collaboration needs. The majority of these tools provide only simple awareness mechanisms that include user presence indicators and information related to the source of individual resources (i.e., who admitted a resource and when).

One reason that these tools do not employ more sophisticated awareness mechanisms is related to the way these tools support the underlying collaboration. In particular, the majority of argumentative collaboration approaches enable only asynchronous collaboration between participants and limit the number of allowed discourse moves during the collaboration. In discussion forums, for

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