

Chapter 5

Communicating Reasoning and Dialectics

ABSTRACT

In this chapter, we consider the part that the communication of reasoning plays in contributing to the actions of reasoning communities. Communications distinguish group processes from individual processes and will introduce factors that enhance performance as well as factors that inhibit performance.

INTRODUCTION

The term “dialectic” has its origins in the philosophy of Plato, as the logical method of philosophy in the Socratic dialectical method of cross-examination. It is usually understood as an exchange of propositions (theses) and counter-propositions (antitheses) resulting in a synthesis of the opposing assertions, or at least a qualitative progression in the direction of the dialogue. The aim of the dialectical method is to try to resolve disagreement through rational discussion.

Motivated by a desire to organise communication within multi-agent systems, McBurney, Parsons, and Wooldridge (2002) specify a Dialectical System as consisting of:

1. A set of topics of discussion;
2. The syntax for a set of defined locutions concerning these topics;
3. A set of rules which govern the utterance of these locutions;
4. A set of rules which establish what commitments, if any, participants create by the utterance of each locution;
5. A set of rules governing the circumstances under which the dialogue terminates.

There seems to be a natural tendency for individuals to adopt a dialectical approach to the discussion of issues. When the number of individuals involved in the discussion becomes greater than two, it is often difficult to track discussion.

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In its most liberal form the discussion can become chaotic, but often it is the case that there is a polarization between two large subgroups which can lose the advantages of having a diverse and rich contribution, capturing the diversity present in the group. Van de Ven and Delbecq (1971) found that groups where each group member generates ideas alone without interacting with other members were significantly superior to interacting groups. These results were based on three measures of performance: the number of unique ideas generated per person, the mean total number of ideas, and the quality of the ideas. Furthermore, in Electronic Brainstorming Systems (EBS) research, individuals working alone have been found to be as productive (in terms of the number of unique ideas) as EBS groups where individuals interact with each other (Hymes & Olson, 1992; Pinsonneault, Barki, Gallupe, & Hoppen, 1999). The lesson for communication within groups between individuals is that, in general, it is more effective for individuals to work alone in the generation of their ideas and reasoning before there is engagement with the wider group.

We have argued in Chapter 2 for the advancement of a more structured approach to reasoning within a reasoning community. In terms of communication, we envisage that individuals may engage in:

- Inter-individual reasoning communication;
- Communication of reasoning to the pool; and
- Communication of reasoning to the community based on their knowledge of the reasoning pool.

These levels of communication can pertain to the tasks that are associated with individual reasoning described in Chapter 3: fact finding or information seeking, inquiring, organising, or structuring and making claims or arguments. In considering these three levels of communication we shall concentrate in this chapter first on the communication and reasoning that goes into developing the structured pool of reasons and then on how individual communication based on the pool structure proceeds. Inter-individual reasoning communication can involve information seeking dialogue, inquiry, narrative, persuasion, and deliberation, however based on the studies by van de Ven, Hymes and Pinsonneault we shall not concentrate on communication between individuals at an early stage but assume that individuals largely work alone in developing their individual reasoning.

The layout of arguments advanced by Toulmin (1958) has been enormously influential, however most studies that have applied the structure in computer-based systems have ultimately modified the original layout. In Stranieri et al. (2001) the variations are explained by drawing a distinction between argument models that are dialectical (in that their focus is to represent the exchange of views between participants) and those that are non-dialectical. Non-dialectical models use argumentation concepts to structure and organize knowledge and do not represent an exchange or discussion.

The Generic/Actual Argument Model (GAAM) described in the previous chapter is advanced as a non-adversarial, non-dialectical model for organizing knowledge within a community so that decisions can be effectively made in a transparent fashion and various elements of the decision may be supported by machine or human inference. The GAAM is a two-level model comprising generic arguments and actual arguments. Generic arguments provide a template that organizes all arguments plausibly advanced within a discourse. Actual arguments represent positions that discourse participants hold.

The Generic/Actual argument model has been applied to the development of numerous knowledge-based systems as illustrated throughout this text. In communities where there are multiple decision makers or the framework is used as the basis of deliberation for discussion on an issue,
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