Chapter IX

Systemic Semiotics as a Basis for an Agent-Oriented Conceptual Modeling Methodology

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Abstract

The authors demonstrate how systemic semiotics, an approach that combines a semiotic model of language called systemic functional linguistics with selected concepts from social semiotics, can be applied to create agent-oriented information systems in which social processes can be elicited from stakeholders, specified by designers, and embedded into actual agent-based systems. The utility of systemic semiotics applied to agent-oriented conceptual modeling is demonstrated by developing a real-world system to address the problem of registering and training volunteers in an emergency service organization. The experience of developing this system then was used to propose an experimental agent-oriented conceptual modeling methodology that uses the same theory and concepts for describing the artefacts and the processes of agent-oriented systems development.
Introduction

All social systems—material and virtual, persistent and transient—are constituted in and by the effects and processes associated with all forms of meaning. As a consequence, semiotic approaches are appropriate for studying organizations, work, and technologies in general. We approach the processes and effects of the circulation of meaning in organizations, and those associated with the use and development of supporting technologies, from a broadly social semiotic perspective. Social semiotics is not simply an applied semiotics, more than simply a semiotic of things social (Kress, 1988; Hodge & Kress, 1988), but rather a particular orientation to the theory and practice of semiotics that attempts to move “beyond its idealistic foundations as the ‘science of signs’ … to a social and political intervention in these [organizational] practices as practices” (Thibault, 1991, p. 3). It is, therefore, a theory commensurate with the aims of an information systems discipline and practice that by definition seeks to understand and intervene in all forms of organizational meaning.

In this chapter, we utilize approach systems development practices in organizations (in this case, those associated with agent-oriented conceptual modeling (AOCM)) using a recognized social semiotic approach called systemic semiotics. This approach combines elements from two compatible theories. It utilizes specific concepts from social semiotic theory, particularly the concepts of discourse, subjectivity, and text as developed by Bakhtin (Todorov, 1984), Althusser (1971), and Foucault (Rabinow, 1986) to provide a basis for intervention into organizational meanings. It also utilizes systemic functional linguistics (SFL) developed by Michael Halliday (1985) and colleagues (see, i.e., Hasan, 1985, and Martin, 1992). SFL is a semiotic and functional model of language concerned with the communicative and social aspects of language use. It is also a contextual model of language because SFL has an explicit theory of context based on work of Malinowski (1923). It was Malinowski (1923) who first identified that an immediate situational environment (context of situation) was needed in order to form adequate descriptions of communication (texts) and, importantly, that there is also a broader cultural milieu (context of culture) against which these specific situations and communications occur that also plays an important part in interpreting their meanings (see Halliday & Hasan, 1985, pp. 5-10 for a detailed account of the development of context in systemic accounts of language). Systemic semiotics has been successfully applied to understanding systems in organizational contexts (Clarke, 2000, 2001a, 2002, 2003) including issues of systems use and renegotiation, system similarity, and diachronic change.

In this section, we explain why the application of unorthodox semiotic theory can be helpful in understanding systems in general, and the differences between social and technical systems in particular distinguish between the artefacts and processes of systems development and describe the structure of this chapter.

Social and Technical Systems

Many traditional information systems development practices attempt to create descriptions that reduce the social to the technical or that describe this relationship in terms of simple mutuality; for example, technologies are occasionally described as being shaped by the social. Yet, understanding how systems can be of use and how they are meaningful for
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