Chapter VII
Towards Organizational Self–Awareness:
An Initial Architecture and Ontology

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ABSTRACT

Human beings are, by nature, self-aware beings. This capacity lets us know who we are, how we do things, and what we (and others) are doing at any particular moment. In organizations, self-awareness is an essential prerequisite for effective action, decision-making, and learning processes. However, it must be built and maintained by continuous interactions among their members. This chapter lays out the foundations of a comprehensive high-level modeling framework as a means for enhancing organizational self-awareness. The modeling framework encompasses an architecture and ontology, which puts together human, social, and organizational approaches with modeling frameworks coming from the computer sciences and IS/IT fields. The proposed approach is illustrated with two example applications which use the finer-grained concepts of the framework. An analysis of the implications of this approach and issues to be addressed is provided.
INTRODUCTION

The challenge of today’s organizations is to develop capabilities of continuous sensing, learning, and adjusting to the dynamics of their environments (Magalhães, 2004). An essential requirement of these capabilities entails developing organizations’ self-awareness. Human consciousness gives subjects the capacity of self-awareness. Self-aware beings know who they are, how they do things, and what they (and others) are doing at any particular moment. Whereas this capacity is innate in individuals, organizational self-awareness must be built and maintained by continuous interactions among their members.

From our point of view, enterprise models are an essential communication tool in supporting and enhancing organizations’ self-awareness. Organizational modeling has a long tradition in organizational and management sciences. In these fields, the main goal is to provide ways of thinking about the organization and to produce management principles and theories based on these ways of thinking. These models, described in natural language and with a high level of abstraction, are limited to human use and lead to different interpretations. The information systems (IS) and artificial intelligence (AI) fields have also addressed organizational modeling activities. These models are commonly referred as enterprise architectures (EA) or enterprise ontologies. They have been mainly used as communication tools (Shekerman, 2004) to facilitate the design and implementation of business applications. Consequently, both EA and enterprise ontologies are described using more formal syntax and semantics, enabling its processing by automated agents and reducing inconsistent interpretations. However, these enterprise representations are restricted to concerns relevant for participants and stakeholders of systems development. Moreover, most of these representations are based on static, mechanistic, and deterministic views of the organization.

Modeling the organization for its self-awareness is a more challenging task. It requires integrating approaches coming from organizational and IS fields, to capture: (1) an organization’s structural and dynamic aspects, (2) routines and decision-making processes, and (3) its formal and informal sides. Moreover, it entails capturing an organization’s evolution. All these aspects must be captured from different viewpoints and levels of details. Means for mapping between different aspects, viewpoints, and levels of details must also be provided.

A first step in achieving this end is the definition of a conceptual framework to address the aforementioned issues. Departing from an ontological position that regards organizations as complex and adaptive sociotechnical systems, in this chapter we describe and illustrate a three-layered architecture which encompasses a set of different, but inter-related concepts. This basic architecture can be applied at several levels of detail of the organization and aims at providing a comprehensive and semiformal modeling framework, which enables a complementary usage of approaches of the IS field and organizational sciences.

The remaining portions of this chapter are structured as follows; the second section describes the theoretical background supporting the proposed framework, followed by sections summarizing related work on agent and enterprise modeling, describing the framework, and summarizing two examples applications illustrating the finer-grained concepts of the framework. In the final two sections, we give our conclusions and future directions.

THEORETICAL BACKGROUND

Organizations as Resultant of the Agency-Structure Duality

The approach proposed in this chapter is based on a view of organization as a sociotechnical entity, which self-realisizes in the permanent action and interaction of its component parts. This view of organization is the outcome of a number of intellectual influences, namely organizational constructionism (Giddens, 1984), autopoiesis (Maturana & Varela, 1980), organizational intelligence (March, 1999), organizational complexity (Tsoukas, 2005), and organizational evolu-