Chapter III

Integrated Goal, Data and Process Modeling: From TEMPORA to Model-Generated Work-Places

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Abstract

In organizations, goals and rules on different levels ranging from visions, to strategies, tactics, and operational goals have been expressed for a long time. In the IS-field, the interest on goals and rules has come from two directions. A) Business goals for use in requirements specification. B) Rule-based (expert) systems, focusing on automation of rule-execution. We were already 15 years ago involved in an EU-project Tempora together with Benkt Wangler and others where we tried to combine these worlds. Although able to produce interesting prototypes, the approaches we used then proved to be difficult to

scale to an industrial setting. 15 years later we are involved in taking these approaches to a new level. We will in this paper present our approach to combining goal, data, resource and process modeling, in the support of the development and user-led evolution of what we term Model-generated Work-places (MGWP), with an emphasis on the use of goal and rule-modeling in combination with process modeling. A case study extending an ongoing industrial trial of production rule systems is provided to illustrate some of the benefits of the approach.

Introduction

Goal-oriented modeling focuses on goals and rules. A *rule* is something which influences the actions of a set of actors. A rule is either a rule of necessity or a deontic rule (Wieringa, 1989). A rule of necessity is a rule that must always be satisfied. A deontic rule is a rule which is only socially agreed among a set of persons and organizations. A deontic rule can thus be violated without redefining the terms in the rule. A deontic rule can be classified as being an obligation, a recommendation, permission, a discouragement, or a prohibition (Krogstie and Sindre, 1996).

The general structure of a rule is

"if *condition* then *expression*"

where *condition* is descriptive, indicating the scope of the rule by designating the conditions in which the rule apply, and the *expression* is prescriptive. According to Twining & Miers (1982) any rule, however expressed, can be analyzed and restated as a compound conditional statement of this form.

Representing knowledge by means of rules is not a novel idea. According to (Davis & King, 1977), production systems were first proposed as a general computational mechanism by Post in 1943. Today, goals and rules are used for knowledge representation in a wide variety of applications.

Several advantages have been experienced with a declarative, rule-based approach to information systems modeling (Krogstie and Sindre, 1996):

- Problem-orientation. The representation of business rules declaratively is independent of what they are used for and how they will be implemented. With an explicit specification of assumptions, rules, and constraints, the analyst has freedom from technical considerations to reason about application problems. This freedom is even more