Chapter 12

Modelling Business Rules Using Defeasible Logic

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INTRODUCTION

We can define business rules as statements that are used by a body or an organization to run their activities. Some of these rules are drafted by the body itself, others are rules that have been drafted by an external body but it will have an effect on the organization. Some business rules are documented explicitly, others are used implicitly.

Globalization of business and increased competition cause frequent changes in business rules. New rules are added, old rules are modified or retracted. For example, to compete with its rivals, a bank should adjust its interest rate, launch new services etc. In this situation that is very hard to keep the rules consistency, there is the chance that some rule violate the other. Dealing with conflicting business rules is an important aim of our work. In addition there are also situations where a manager should take a decision although not all relevant information is known. He/she must be able to draw conclusions even if the available evidence is insufficient to guarantee their correctness. Obviously, such conclusions are risky and may be invalidated in the light of new, more accurate information. This situation is referred to as reasoning with incomplete information.

The aim of our work is to support the modelling, analysis and evolution of business rules using a formal language. Advantages of modeling business rules
include: (1) executable sets of business rules (or prototypes) become available; (2) maintainability; and (3) formal validation of desirable properties and discovery of errors. The foundation of our work is nonmonotonic reasoning which provides formal techniques for reasoning with conflicting and incomplete information. Some applications of nonmonotonic reasoning to regulations have already been reported (Morgenstern, 1997; Prakken, 1997; Ong & Lee, 1993). But so far the success has been rather limited, mainly due to computational limitations and lack of support for natural representation of business rules.

In our work we have chosen to use defeasible logic (Nute, 1988), a nonmonotonic reasoning system based on rules and priorities. One of the main reasons for our choice of defeasible logic is its low computational complexity. We intend to implement a decision support system based on business rules to support decision makers. Aside from that, this intelligent system can help the policy modifier to find possible conflicts between rules if he tries to add new regulation or to modify existing regulations or business rules.

This chapter is organized as follows. The next section describes problems we have identified with modeling regulations and business rules. The third section outlines defeasible logic. The fourth section explains advantages of defeasible logic in solving the problems outlined in the second section. Finally, the fifth section discusses current and future work.

ON THE FORMALIZATION OF BUSINESS RULES

At this stage of our project, we have collected a comprehensive list of problems that are could be encountered when one tries to formalize business rules. These are (1) the problems in representing business rules into formal, precise and implementable language and (2) the problems in formalizing the conflict resolution mechanism or how to mimic people capability in taking decision.

Representation Problem

In the effort to formalize a rule system in the machine-readable form, the first step men should be to gather the knowledge and to analyze the rules. This step is very important, because we should expressed the knowledge explicitly in the form that can be understand by the system. Some problems have been identified in the effort to represent business rules are:

• Vagueness
• Open-ended / Incomplete List
• Syntactic Complexity
• Expressiveness / Naturalness of Expression
• Reference Rules
• Inheritance
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