Standardization in Business Rules and new tools supporting these standards

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Abstract

Standardization in the field of the Business Rules Approach requires a new type of software tool that supports the use of natural language for input, yet internally uses a model that is consistent with formal logics such as First Order Predicate Logic, allowing formal output to be used in automated systems. SBVR is a new OMG standard that supports the use of natural language and a formal model, and RuleXpress is a new software tool we present that supports this standard.

1 Business Rules Standardization

The Business Rules Approach (BRA) is a knowledge representation method to state business logic in a declarative fashion. Although there have been several 'best practices' for the BRA, the need for a standard metamodel for rules to support rule interchange came as the field grew [1]. Consequently, the standards consortium OMG put out a Request For Proposal for a standard to model business rules.

There were some key features required of the standard. A first requirement was the possibility to specify Business Rules in natural language. Second, the underlying meaning of the Business Rules needed to be mappable to formal logics such as First Order Predicate Logic. Finally it needed to be Computation Independent: the standard needs to fit within the OMG's Model Driven Architecture (MDA).

The Semantics of Business Vocabulary and Business Rules (SBVR) is the standard that came out of this RFP [2], and is now in the OMG's finalization stage. It is a unique standard as it is the first standard to combine concepts from computational linguistics, conceptual modelling, and predicate logic. The inter-disciplinairy tone of the standard requires new software tools to support it. An example rule expression in SBVR would be *"A rental must have at most three additional drivers."*. In this expression underlined word phrases indicate concepts defined in the SBVR vocabulary. The meaning of the other word phrases as given by SBVR (such as 'at most') can be used to map the expression to a statement in formal logics.

The SBVR standard is in several ways strongly related to the semantic web approach. For an overview of the relation between the BRA and the semantic web we refer the reader to [5].

2 Software Tools for SBVR

2.1 User Groups

The new SBVR standard recognizes the fact that technical systems require formal specifications of the logic by which their processes run. It also recognizes the fact that owners of this logic typically don't have the knowledge to state this logic in a formal way. RuleXpress helps owners of business logic (i.e. business experts) to capture and manage declarative knowledge about processes in natural language, and helps them improve this knowledge so that it may be used in technical systems.

RuleXpress is used by several multinationals that deal with a large amount of internal- and government regulations. Within these organizations typical users of RuleXpress are non-technical (i.e. no computer programmers).

2.2 System

The most important features of RuleXpress can be split according to Input, Use and Output. Input in RuleXpress can be done through importing from a Microsoft Excel file, or via knowledge elicitation techniques to capture business logic from experts. Then RuleXpress allows users to manage terminology, facts, rules, rule sets and decision tables using natural language expressions. Finally, RuleXpress can output a vocabulary, fact model and ruleset in human-readable reports (HTML or PDF), or machine processable XML.

RuleXpress is different from other tools for modelling and knowledge management as it tries to avoid putting constraints on the way users define their vocabulary and rules. For example a rule statement in RuleXpress is any natural language expression the user enters. To help the user structure the expressions used for the vocabulary and rules, RuleXpress analyzes potential quality problems in the natural language expressions and explains how the user might improve these expressions.

Note also that RuleXpress is different from Business Rules Engines (BREs) as the tool doesn't aim to execute the rules. However, output of RuleXpress may very well be used as specifications for a BRE implementation.

A demonstration of the system will take about 15 to 30 minutes.

2.3 Development of RuleXpress

RuleXpress is developed by RuleArts, a joint venture of the Dutch company LibRT[1] and the US company Business Rules Solutions. RuleXpress is a Microsoft Windows .NET application, and will run on any pc with Windows 2000 or Windows XP with the .NET framework installed.

RuleXpress is usually installed on a server, and each user has a client installation on his or her pc. The vocabulary and rules are kept in a master repository in a database on the server, and each user checks out his or her own copy of the repository to a private database. These change management features support multiple users working on the same vocabulary and rules at the same time. At regular intervals a change manager will receive all changes from users. RuleXpress analyzes the changes and allows the change manager to solve any conflicts. After all changes are applied to the master repository, users will receive a new copy of this repository. RuleXpress currently supports Oracle, Microsoft SQL, and Microsoft Access databases.

3 Final Thoughts

After a business has captured and effectively manages its Business Rules in RuleXpress, the formalized logic behind these Business Rules may be used in automated systems. We encourage initiatives that will use the formalized logic, like automated systems such as Business Rules Engines that make Business Rules executable, and semantic web services that query and use the semantic data underlying the Business Rules.

References

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[1] LibRT is a Dutch company that has adopted AI technology in their software since they were founded in 1998, see [3, 4] for BNAIC submissions on their previous product VALENS.