

Preface

These proceedings present a collection of high level demonstrations of usage of XML-based rule modelling standards (such as SWRL, RIF, RuleML, CAM, SBVR, etc.). The goal of the RuleML Challenge 2010 is to highlight the most advanced applications of rule-based systems - initiatives that reach beyond the state of the art, yet are close to the concrete needs of the market. The different scenarios presented give an overview of the most relevant outcomes from several outstanding research groups applied to concrete use cases stressing four main current topics:

1. **Trust and Validation:** rules asserted inside information systems to convey authority and trustworthiness. Validation of the rules with respect to such properties (see Paschke A. et. al.) is the core of the application, and policy definition for privacy is clearly an emerging issue in all contexts (see Mühleisen H. et. al.).
2. **Reasoning and Semantic Web:** the Semantic Web layer cake provides a visual representation of the strong connection between the logic layer and the ontological formalization of the knowledge. The rule formalization domain is mature enough to justify effort in filling the gap between existing information structures on the Net (e.g. Linked Data, Ontologies, etc.) and the rules that exploit definitions and properties of the existing categories (e.g. people, roles, events, geo-spatial objects, etc.). Several results are emerging, such as the SILK project (see Grosz B. et. al.) or RIF extensions for exploiting the features introduced by OWL 2.0 (see Winkler D. et. al., and Falkowski M. et. al.).
3. **Rules Extraction and Data Mining:** text is the preferred digital channel for the expression and storage of facts (e.g. contracts, law, financial information, etc.). Representing this knowledge with an adequate rule-oriented formalization often strongly affects the user applications in the logic domain. Using parsers, data mining (see Kliegr T. et. al.) or natural language processing techniques to improve the extraction of the knowledge surely helps to develop semi-automatic tools to support both the domain expert, in modelling rules effectively, and the end user, in formulating queries with better accuracy. Marinos A. et. al., and Kamada A. et. al. demonstrate how it is possible to use SBVR combined with parsers for recognising the existence of rules within business texts. This approach could powerfully support the dissemination of rule modelling methodologies in popular *off-the-shelf* applications due to the reduction of many time-consuming activities.
4. **Visual Interfaces for Rules:** the interface is also a crucial area for investment of effort, in order to increase popularity of rule-based systems in the Web 2.0 era. Cooperation, integration, participation, reuse of existing information are possible only if the user interface is able to provide robust and easy interaction approaches for modelling rules, querying the rule base (possibly with natural language awareness) and for obtaining sound explanations of the results (Grosz B. et. al.). User-friendly interfaces are also adopted for customising the policies of the engine (see Chen L., and Leusse P. et. al.) and to make it more flexible.

From this scenario we can deduce some considerations:

1. **XML standards** for rules are widely used (four papers use RIF, three use SWRL, two use SBVR, one uses PMML, two papers use SILK) to guarantee interchange, interoperability, neutrality from the application, connection with the ontology layer and for exploiting Web 2.0 technologies. Interesting extensions of the main standards arise from the community for extending their logic expressiveness (e.g. *higher order logic*, *defeasible logic*, etc.) and their expressiveness (e.g. SILK).
2. **Natural language processing** and text analysis fill the gap between text and rules representation. This works towards reducing the time-consuming activities and the human errors in creating and using rules.
3. **Visual Tools**, oriented to end-users as well as to knowledge engineers, are a key point for a widespread deployment of logic and rule-base systems within *off-the-shelf* applications. Graphical rendering of the rules is an interesting emerging feature for managing the modelling, the validation and the queries on rules.
4. **Hybrid reasoners** open an interesting scenario about the possibility of managing different logic theories (description logic, hyper logic, non-monotonic logic), OWL/RDF-based knowledge, and the integration with existing semantic data collections (e.g. Linked Data) available on the Web. Interoperability between different rule engines (e.g. Drools, Jess, OOjDrew, Prova, etc.) is another important goal to address in future applications.

Finally **temporal** and **geospatial** information are new dimensions with strong implications for rule modelling, especially if we have applications integrated with maps (e.g. Google map), localisation of the objects (e.g. Latitude), temporal conditions (e.g. IPR terms, change management constraints). Mobile and geo-aware applications are evermore increasing and, by having XML representations that manage these parameters with simple solutions, we could open new interesting scenarios in applications. Even though these subjects have been suggested as topics for this year's challenge, only few demonstrations provided solutions that managed in an integrated way events, spatial locations, and rules. Yet we believe that we have helped to stimulate the discussion and the attention of the community on this direction for further and future works.

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