

Challenge 2: Convert requirements (e.g. regulatory rules) into executable semantic rule statements

Current State Assessment

What is the current state of research and development

- Rulelog, now in the public domain, is the basis of Flora-2 and SILK, and appears to be the most advanced rule language for this purpose
- Rules can also be semantically described in a variety of legacy languages similar to logic programs in expressiveness – such as RIF -BLD, -Core, -PRD (not fully semantic); OWL-RL; SPARQL, SQL; ISO Prolog – or in first order logic: Common Logic, SBVR, and OWL-DL.
- Important open source rule engines include Flora-2 (Rulelog), JBoss (production rules) and XSB (Prolog). Flora-2 runs on top of XSB.
- Potential collaborative environments include RuleML, XBRL, W3C, Oasis, OMG

Technical Capability Requirements

What are the most important technical capabilities that must be developed

- Sufficient expressive power of rule languages, incl. defeasibility (i.e., exceptions)
- Computational scalability
- Ease of use of knowledge interchange translation methods
- Ease of interoperability with business model and software/data environment
- Commercial viability of advanced tools
- Ease of evolving knowledge, and of describing change in world as well as knowledge
- Semantics that are clean and well lighted

Obstacles and Constraints

What are the core issues, obstacles and constraints to overcome

- Legacy rule systems are expressively limited: they use subsets of logic programs (or of first order logic)
- Production rules dominant in business rules sector are often crufty semantically
- Lower cost commercial knowledge acquisition, and friendlier overall UI's are needed, to bring down the cost of developing and working with rule based systems
- The probabilistic aspect of business rules poses severe challenges in computational scalability and knowledge acquisition/explanation

Near Term, Actionable Deliverables and Timeframes

- 1: Proof of concepts in Rulelog, leveraging Flora-2 integration with FIBO, that go beyond OWL 2 DL or SWRL: date arithmetic for bond terms, regulatory rules from RegW, possibly other complex risk management
- 2: Explore use of SBVR, e.g., in RegW as middle step in above