Joint Committee Rules Update:
Open Issues
Solicited Feedback; “Warning Label”

Presentation for Rules sessions of DAML PI Meeting,

Benjamin Grosof*
MIT Sloan School of Management
bgrosof@mit.edu http://www.mit.edu/~bgrosof/

Thanks to Mike Dean* for agenda suggestions.
* co-leads of DAML Rules effort

10/17/2003 by Benjamin Grosof  copyrights reserved
OUTLINE OF SLIDES

• “Warning Label” for OWL Rules
  – Directions for extending expressiveness

• Key Issues for Feedback

• Prioritization of Next Steps

• ***Highlights of Actual Discussion***
Venn Diagram: Expressive Overlaps among KR’s

First-Order Logic

Description Logic

Horn Logic Programs

Rules

Lite

Description Logic Programs

Logic Programs

(Negation As Failure)

(Procedural Attachments)

2 Extensibility Paths:
- Towards LP
- Towards DL, FOL

10/17/2003 by Benjamin Grosof, copyrights reserved
“Warning Label” for OWL Rules:
Usage Suggestions -- Interoperability and Extensibility Cautions

• It may be desirable to restrict expressiveness of rules, for:
  – interoperability, reusability, extensibility, scaleability, implementation

• A useful restriction: **named classes** only
  – Rules avoid direct complex class descriptions; instead refer to OWL
  – Maximizes interoperability with currently commercially important (CCI) rule systems and RuleML
  – Maximizes interoperability of ontology knowledge with OWL-speaking systems
“Warning Label” for OWL Rules cont.’d

Usage Suggestions -- Interoperability and Extensibility Cautions

• It may also be desirable to restrict expressiveness of OWL class definitions.

• A useful restriction: Description Logic Programs (DLP)
  – avoids, e.g., existential/disjunction in rule consequent
  – enables extensibility to procedural attachments cf. CCI rules and RuleML
  – enables extensibility to nonmonotonic reasoning (negation-as-failure, prioritized conflict handling) cf. CCI rules and RuleML
  – guarantees computational tractability of complete rule+ontology inferencing
  – enables completeness in combining OWL Rules KB + CCI/RuleML rules KB

• The full KR of OWL Rules draft (= Horn FOL ∪ OWL) is not well studied
  – Need to use full FOL theorem-prover, for time being

• For more: Joint Committee archives http://www.daml.org/committee → archives
Venn Diagram: Expressive Overlaps among KR’s

- First-Order Logic
- Description Logic
- Horn Logic Programs

2 Extensibility Paths:
- Towards LP
- Towards DL, FOL

Logic Programs

Rules Lite

Description Logic Programs

Description Logic

(Negation As Failure)

(Procedural Attachments)
Key Decisions: Soliciting Feedback

- current "Lite" subset: Horn, Datalog, binary predicates, …
- integration with OWL: syntax, semantics
- semantics: DL vs. LP, "warning label"
- syntax: which are (most) useful:
  - non-RDF XML representation of rules
  - OWL XML Presentation Syntax
  - RuleML subset syntax: in XML, in RDF
- explicit equality: desirable (some hair in LP)
- language naming:
Prioritization of Next Steps: Technical

- human-consumption string syntax
- built-ins, procedural attachments for querying/sensing
- modules
- n-ary predicates: slotted/unordered, ordered
- logical functions
- negation-as-failure
- prioritized conflict handling (default reasoning)
- procedural attachments for actions/effecting
- extensions towards FOL / Simple Common Logic
- ...

10/17/2003 by Benjamin Grosof  copyrights reserved
Prioritization of Next Steps: Process

- Requirements and feedback from relevant communities/sources:
  - Semantic Web Services: OWL-S; SWSI Lang., Arch., Industrial Partners
  - Rules-related standards efforts and industry/companies:
    - via RuleML, SCL, W3, OMG, Java communities
  - OWL'ers: DAML'ers, …
  - Others: W3 staff, DAML-Security, DB (SQL, Xquery), RDF Query, …

- Use cases, application scenarios

- *Wanted:* volunteers to implement and use
Discussion Agenda

• What are some requirements you think are important?
• What do you think about the key decision issues?
***Highlights of Actual Discussion***

- Be ecumenical wrt extending expressiveness
  - Situated Courteous LP & FOL/DL
  - experiment with needs
  - Horn case as strong-consensus, common
- Unified syntax; that integrates nicely with RDF, OWL
- Use cases use cases use cases test test test test
  - Wide variety; including Semantic Web Services
- Tools tools tools
  - CCI/RuleML engines, FOL engines (Inferencing)
  - Translation; Authoring