Strawman for SWSL: SCLP Rules + Ontologies to Describe E-Services

Benjamin Grosof
MIT Sloan School of Management
Information Technologies group
http://ebusiness.mit.edu/bgrosof

Slides presented at SWSL telecon May 6, 2004
http://www.swsi.org
Outline of Presentation

• Intro: Review the “NO Procedural Process Model” proposal and discussion from Oct. 2003 SWSI F2F (see separate text file)
• Rest is Further Thinking and clarification
  – KR Approach
  – What we’ll be able to do with it
  – Strategy for combining/extending it with other approaches
Outline of Proposed KR Approach

• LP Rules as core of near-term Knowledge-based Service Descriptions
  – + Procedural Attachments: Effectors, Sensors, Events
  – + DLP Ontologies
  – + OO default inheritance, e.g., using Courteous Inheritance
    • Model C++, Java, C#, UML
  – + Hilog/F-Logic-y “meta-”logical expressiveness
    • Close relationship to Flora, via underlying LP representation

• Other Aspects / Extensions – less immediately:
  – FOL
    • Constraints
    • (DL – DLP)
    • ? What else needed?
  – Procedural Process Models
    • ? Which model? Concurrent Transaction Logic? (Am open-minded.)
    • Best guess: Start with capabilities of BPEL, WS Choreography design
    • ? What will be the “extension points” of the KR / Process Model?
Goals wrt Key SWS Tasks

- The point of SWS is knowledge reuse
  - Especially the Knowledge-based service descriptions

- ... Across the Key Tasks in our Requirements:
  - Advertising/Discovery/Matchmaking; Contracts (selection, negotiation); Enactment, Composition; Monitoring, problem resolution, exception handling; Verification; Trust/Security/Privacy Policies

- Underlying: Hypothetical Reasoning
Where Rules + Ontologies alone are useful

- LP Rules + ~DL Ontologies alone are useful -- enough to be worthwhile -- in almost all of the main Tasks areas, with reuse between Tasks as well as between Applications:
  - ADM: partial contracts, subsumption
    - E.g., see papers from WWW-2003 EC session
  - Contracts/selection/negotiation: pricing, policies, contingent provisions
    - E.g., cf. SweetDeal approach
  - Monitoring, problem resolution, exception handling
    - E.g., cf. SweetDeal approach
  - Enactment
    - Via procedural attachments, esp. effectors, events
  - Composition: e.g., via composing service-description knowledge bases by union’ing their rules/ontologies
  - Trust Policies:
    - Most major practical approaches are rule-based already:
      - RBAC, XACML, P3P, etc.
  - Underlying: Hypothetical Reasoning
    - A major strength of Rule-based KR