Strategies for Realizing the Semantic Web

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Current Status

• **Research Community**
  – Large international and interdisciplinary effort
  – Major funding
    • DARPA
    • EU FP6
    • UK eScience Program
    • ...
  – Activity still growing
    • Witness size of this joint meeting!
Current Status

• **Research Community** (cont)
  – Impressive progress w.r.t. language and infrastructure
  – Still very few convincing applications (of semantics + web)
    • Distributed data integration applications
      – Relatively little (declarative) semantics
    • Ontology applications
      – Relatively little web
Current Status

- **Industry**
  - Good level of participation from small, medium and large enterprises
    - E.g., >50 members of WebOnt WG, many from industry
    - Several (startup) vendors of SW technology
    - But still no participation from “you know who”
  - Deployment of applications lagging some way behind
    - Activity often confined to research departments
Current Status

- **Other organizations**
  - W3C obviously deserves particular mention
  - Interest from other standardisation bodies and consortia
    - E.g., Gene Ontology consortium
- **Public**
  - Some good press coverage
  - But few know what it is (and most have never heard of it)
Strategies (for making it happen)

• **Tools**
  – What do we mean by “tools”?
  – Need components that make it easier to build SW applications
    • Parsers, reasoners, APIs, storage/persistence, query engines
• **Content**
  – More (and better) ontologies
    • Tools (and methodologies) are essential
  – More semantic markup of web content
    • Seeding with automated markup may be necessary
Strategies (for making it happen)

• **Keep it simple** (for now)
  – Applications in restricted (highly motivated) domains/communities
  – BASIC integration of web information sources
  – Web/Grid service matchmaking
  – Semantic Google

• **We need to Demonstrate** added value of SW technology
Research Topics

• Ongoing language development and standardisation
  – OWL 1.0 is a good start
  – Extensions in OWL 1.1
  – Rules (extension of OWL)
  – Other extensions up to (and beyond?) Full FOL

• Reasoning
  – Already hard for OWL
  – Will be undecidable for OWL+rules (or plus almost anything!)
  – Reasoning techniques for these languages?
    • FO theorem provers
    • Hybrid reasoners (e.g., tableaux+rules)
    • Cooperating incomplete reasoners
Research Topics

• **Scalability**
  - Reasoning (obviously)
  - Ontology Development (tools, methodologies)
  - Querying (reasoning over instance data)
  - Annotation tools (semi/fully-automated)

• **Applications**
  - That are realistic and achievable
  - That exploit both semantics and web