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**