A Proposal for a W3C XG on Uncertainty Reasoning for the World Wide Web

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Uncertainty Reasoning for the Semantic Web Workshop

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Agenda

- Why is uncertainty reasoning needed?
- Thoughts on W3C XG as a step to standard representation

Why Consider Uncertainty

- Semantic Web envisions
  - effortless cooperation between humans and computers
  - seamless interoperability and information exchange among web applications
  - rapid and accurate identification and invocation of appropriate Web services
- However,
  - Different applications have different ontologies, different semantics, and different knowledge and data stores
  - Legacy applications are usually only partially documented, may rely on tacit usage conventions that even proficient users do not fully understand or appreciate
  - Data that must be exchanged in the context of the Semantic Web is often fraught with uncertainty

OWL is Not Enough

- OWL provides the means for annotating ontologies with uncertainty information
  - Numeric uncertainty measures
  - Much of the necessary structural information
- However,
  - No established foundation for form and content of representation
  - Each developer must come up with his/her own set of OWL constructs for representing uncertainty
- Ancillary issues
  - What representation(s) best support uncertainty in likely Web scenarios
  - How to trade representational power vs. simplicity
  - How to ensure consistency of probabilistic representational models and ontologies, etc.

W3C Incubator - A Possible Way to Move Forward

- W3C Incubator Activity (http://www.w3.org/2005/Incubator/#About)
- Fosters rapid development of new Web-related concepts
- Targets concepts not (or not yet) clear candidates as Web standards
  - New, potentially *foundational technologies*
  - *Web-Based Applications* built upon Web infrastructure
- Intended benefits
  - Rapid start of work in an Incubator Group (XG)
  - Lightweight process
  - Rapid finish to produce an XG Report in under one year
  - Smooth transition to the W3C Recommendation Track, if desired and approved
  - Use of W3C infrastructure (mailing lists, communications tools, Web site) and consensus-building within W3C culture

Requirements for W3C Incubator

- Three or more W3C Members sponsor an XG charter
  - No commitment beyond endorsing idea
  - Non-sponsoring organizations or individuals can join XG
- Length of charter no more than one year
- W3C Team evaluation within two weeks
  - Sufficient number of sponsors
  - Appropriate scope
  - Required charter elements, e.g. IPR declarations

Uncertainty Reasoning as W3C Incubator?

- **Uncertainty Reasoning for the WWW (URW3)**
  - Explore and better define the challenges of reasoning with and representing uncertain information for Semantic Web
  - Identify where the combination of semantics and uncertainty can further the Web Services
- **Possible chartered activities**
  - Identify and describe situations on a Web scale for which uncertainty reasoning would significantly increase the potential for extracting useful information
  - Identify methodologies that can be applied to these situations and the fundamentals of a standardized representation that could serve as the basis for information exchange necessary for these methodologies to be effectively used

Next Steps

- Next session of this workshop begins to look at use cases
- Determine at end of session whether there is interest in going forward