My View of the Semantic Web

• Web (content) was built for humans
  • human interpretation is needed to accomplish tasks on the Web
  • automation is difficult (esp. automating unforeseen situations)
  • we need “machine-friendly” content
    • information w/ accessible formal semantics
    • allow machines to reason about information

• Motivation & Drivers
  • origins are in metadata
  • initial goal: Enabling automation
  • short term goal: Interoperability
  • long term goal: Make computers work on our behalf
    • (instead of using them like tools)
    • remove humans from the loop
What Should We Do Next?

• Now forget that we are talking about the Web...

• Modern PC applications are essentially just repositories for information (typically) in proprietary formats
  • combining or sharing information across application boundaries is impossible or difficult at best
  • any two applications can be engineered to enable information exchange, but we cannot anticipate all possible “pairings”

• In addition to the explicitly represented information, these systems hold a lot of implicit information
  • implicit information is largely inaccessible to current applications

Implicit → Explicit

• e.g., your calendar may indicate that you have a flight reservation from Boston to London
  • implying that if you take the flight, you will then be in London
  • this information may be more useful (say, for meeting planning)

• Use of reasoning (= logical inference) will allow us to access the implicit information

• What do we need?
  • ubiquitous reasoning services
  • ontologies for all kinds of “common” concepts & information, e.g.
    • PIM data
    • geographical and organizational concepts (and instances)
    • classification of information (e.g., photo content)
Mobile Computing & Ubiquitous Computing

- Mobile Computing: “awkward” usage situations
  - needs information in “raw” form (on or off the Web)
  - (current Web information content is “rendering-oriented”)
  - presentation to be decided dynamically based on context

- Ubiquitous Computing: an interoperability nightmare
  - many devices to be dynamically connected & re-connected
  - must be able to handle unanticipated “encounters” of devices
  - Semantic Web Services: uniform representation of functionality?

- Generally, systems must work on behalf of users
  - (forget the use of applications/devices as tools)
  - autonomous agents, multi-agent systems are a good fit
  - more generally, we need many AI technologies