

# ***The Semantic Web: Rehash or Research Goldmine?***

**John Mylopoulos  
University of Toronto**

**CoopIS'01, Trento, Italy  
September 5-7, 2001**



# *The Semantic Web...*

- A call to start worrying about *processing* all these data that have accumulated on the web, instead of thinking them only as fit for human consumption...*and...*
- ...A constraint that this processing is to be *semantic*, i.e., respects the meaning of the information that is being captured by web-based data.

**Footnote:** We are talking about “real world” semantics here, not “abstract machine” semantics.

# ***This Call Comes as a BIG Surprise...***

- We have been building (information) systems for almost 50 years which manage and process large amounts of data...
- Semantics have played a relatively minor role during (system) design time (to minimize up-front costs), and no role at all during run time (to improve performance).

## ***What has changed??***

# ***System Use: From Local to Global***

- Traditional systems have been crafted with particular users and uses in mind; at run time, semantics (i.e., interpretation of the data and the operation supported by the system) are delegated to the environment of the system, while the system itself concentrated on performance.
- Can't do that anymore!!! Web-based systems will have to be open in the users and uses they support.

***Hence the need for semantics to be accommodated, both at design- and run-time.***

# *General Idea for a Solution*

- Use **semantic models** to capture (aspects of) the meaning of web-based data.
- Semantic models have been used since the 70s in various forms in AI, Databases, Software Engineering and other areas of Computer Science.
- There is going to be great variability in research approaches, depending on who is supposed to build these semantic models (human/system/both) and who uses them (human/system/both.)

# ***Research Issues***

- Theories of (denotational) semantics which don't assume a global model (... "local model semantics".)
- Open, dynamically evolvable architectures for web-based systems, agent-based systems, etc.
- Scalable technologies for managing semantically-rich data and metadata (e.g., schemas, schema mappings, ontologies,...)
- Methodologies and tools for building, integrating, reengineering, and maintaining web-based systems, ontologies, multi-agent systems and more.
- Information extraction techniques for text, pictures,...
- Cognitive Science theories for building and using semantic models.

## *...an After-thought...*

- We couldn't deal with semantics *and* run-time performance in any of the technologies used in practice, so we gave up on semantics.

## *What makes us think we can do it now?*

*It may well be that at the end of the day,  
the Semantic Web will remain a(nother) holy grail  
for researchers, while industry and practitioners  
revert to the old practice of worrying about  
performance and up-front costs,  
at the expense of semantics.*