Ontological Commitment

One day Chuang Tzu and a friend were walking by a river. "Look at the fish swimming about," said Chuang Tzu. "They are really enjoying themselves."

"You are not a fish," replied the friend, "So you can't truly know that they are enjoying themselves."

"You are not me," said Chuang Tzu. "So how do you know that I do not know that the fish are enjoying themselves?"

It is not possible (or desirable) to convince every person using software agents to standardize on particular ontologies, so ontologies can also be defined to "translate" between two ontologies that describe similar underlying concepts. For example, a postal code is equivalent to a zip code. Agents can make an "ontological commitment," which is a statement that it acts as if it follows a particular ontology, even if it follows a different model internally. For example, an appointment manager may communicate with a restaurant reservation system by committing to the reservation ontology (i.e., using the reservation markup tags) even though internally the appointment manager knows operates under its own ontology.

XML Semantics

XML has opened the door for software agents by separating content from presentation, freeing the software from deciphering layout, but XML alone cannot accomplish the scenario just described. XML defines the organization of data, but says nothing about what the data means.

Two examples:

```xml
<item>
  <subitem1 property1="Tolkien, J.R.R." property2="Silmarillion, The" property3="123456"/>
  <subitem2 property1="Decker, Stefan" property1="Sintek, Michael" property2="Semantic Web" property3="www.semanticweb.org"/>
</item>

<bibliography>
  <webpage author="Decker, Stefan" author="Sintek, Michael" title="Semantic Web" URL="www.semantic.web.org"/>
</bibliography>
```

Is meaning gained in moving from the first to the second example? A human would say the second example is more informative, but for a machine, the information content is equivalent.

Ontologies

What are ontologies?

"An ontology is a specification of a conceptualization."

A slightly more helpful definition may be that an ontology is a description of relationships between ideas. An XML Document Type Definition is a kind of ontology, but it is a very restrictive one, limited mostly to "parent-of," "child-of," and "attribute-of" relationships.

A complete ontology could include any arbitrary relationships, which might include "isa-kind-of," "belong," or even something modeling more specific ideas like "is-salad-of" or "manufactured-by."

Using a richer set of relationships, a generalized software agent can be given an ontology that represents the static behavior of programs like the flight scheduler with the flexibility to perform other tasks using the same code given only new ontology data. Ontologies are described using a markup called RDF, which will be discussed later.

The Big Picture

A diagram showing the relationship between various semantic web concepts, including ontologies, XML, and the Big Picture.