

The IEML Perspective: IEML and Topic Maps

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 A way of modeling things to be viewed, which: Can be formalized (structure, rules) Can be individualized (many different perspectives possible) Can be used to generate customized views

The Problem with Ontologies

- Ontology: "an exhaustive and rigorous conceptual schema within a given domain"... [Wiki Encyclopedia]
- Misleading: there are several ways to describe information.
- Pragmatic attitude: regardless of how information was originally created, we need to see it a certain way for certain specific purposes. And... there is a multitude of different ways to look at information.
- An ontology is no more no less than one particular way to look at information...



- Interoperability is for **systems**
- Integration is for **humans**
- Interoperability supposes all bottlenecks have been resolved.
- Integration supposes it's possible to bridge whatever is useful, regardless of what it is.
- Interoperability and Integration are two opposite processes.



- "Semantic" Interoperability, the "Semantic" Web, presuppose a notion of Semantic that is to Semantics what Artificial intelligence is to intelligence. The problem is that the word "Artificial" is missing.
- "Semantic" Integration relies on the notion that semantic describes the meaning, the understanding of something.

Semantic Interoperability: One World

- When systems are able to interoperate, the (unique) ontology on which they operate must be pretty well defined. This is a closed world, an information island.
- There can be an archipelago of information islands.
- On each island, everything needs to be pretty well defined.

Semantic Integration: Bridge between worlds

- Semantic Integration: Grouping information about shared subjects.
- The definition of what delimits a subject is a matter of perspective.
 - In one perspective, two information items may be considered the same subjects.
 - In another perspective, the same two information items remain distinct.

Talking About Perspectives

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- Several layers:
 - Thing Subject Proxy Interpretation Perspective View



- A thing is considered to exist in the universe, independently of any observer.
- It has no name, no description. It simply is.
- We can't talk about it as such.
- It's not interesting per se.



- A subject is an understanding of a thing.
- It is the process of conceptualizing the thing.
- It is pure meaning. It's where the semantic universe begins.

This definition of subject is different from the one that is currently given by the Topic Maps Standard

("Any thing whatsoever, regardless of whether it exists or has any other specific characteristics, about which anything whatsoever may be asserted by any means whatsoever.")



- A subject is expressed via a proxy.
- A proxy can be a name, a text, an oral phrase, a picture, a file, a URI.
- A proxy is an information object that can be processed according to rules.
- Various technologies can be used: linguistic analysis, computer processing, etc.
- A given set of proxies is called a "subject map".



- Process of creating an expression for a subject, i.e. Of giving a proxy for a subject.
- There are plenty of different ways to interpret a subject, therefore there are plenty of different ways to create a proxy for a given subject.
- The context in which a subject is given a proxy to represent it is alreay defining a given perspective.



- A perspective is a bias in which the universe is seen that determines the expressions that are uttered to describe it.
- Examples of perspectives include: Classification schemas (taxonomies)
 Database schemas/XML schemas
 Topic Map Data Model
 Ontology
- Within a perspective, the expression of proxies representing subjects is naturally "subjective".



- Rules to which proxies must comply within a given perspective are called "Subject Map Patterns"
- Subject Map Patterns express how subjects are being identified (i.e., distinguished from each other), how subjects can be derived from existing ones, what happens to the properties of proxies after they get merged, etc.



- The reason for using perspectives is to provide views.
- A view is a set of proxies treated as a unit.
- A view is highly customized to represent a variety of user needs.
- One set of subjects can give rise to multiple views (parallel to "One source, several outputs)

Semantic Integration and the Topic Maps Reference Model

- Semantic Integration is the process by which several proxies for the same subject get resolved to one proxy. Integrated views are made under pre-defined perspectives.
- The subject-centric approach defined by the TMRM looks like a good technical solution for dealing with multiple information perspectives.



- Top-Down work for information islands.
- Interoperability requires top-down
- Integration using customized perspectives can be used for bottom-up approaches.

Use Cases for Multiple Perspectives

- Organizations need to cooperate, while maintaining their independence.
- Cooperation between state-based agencies and federal agencies
- Etc.



- Maps are views that result from perspectives. Perspective can be explicit but are often implicit.
- Maps are examples of Topic Maps. Symbols used are graphical rather than XML.
- Several maps describing the same territory will be compared.
- We will discuss merging of information coming from these various maps.
- Heuristic and Pragmatic point of view (What for?)



Financial District as of Sept 10, 2001



- Sightseeings
- Commented itineraries in tourist guide
- Was published a few days after Sept. 11, 2001
- Shows Subway stops

City Guide, New York, Carol von Pressentin Wrigh, Stuart Miller and Sharon Seitz, A.&C Black Limited/W.W. Norton & Co. Inc., 3rd ed., 2002



Downtown Tourist Map



Downtown New York, Downtown Alliance, www.DowntownNY.com, 2/02





Usages

Driving (Main thoroughfares, one-way streets, Parking garages) Address (Street Names, Numbers, Zip Codes, Neighborhoods) Walking (Blocks, Street Names, Parks, Official **Buildings**) **Near Public Transportation?**

New York City 5 Borough Pocket Atlas, Hagstrom, 2001.

Subway Rider Perspective



 Usages: Riding Subway Routes Rush/Non-rush hours Transfers Express/Local Police Stations Elevators/Escalators Ferries

The Map, MTA Metropolitan Transportation Authority, May 2005 Edition





- Merged Perspective
- Entrance to each subway station
- Transfer available
- Subway routes marked at each station

Explore Chinatown New York City. www.ExploreChinatown.com, 2005.



- IEML: Make semantic addressable through Semantic space.
- Subject Maps: Provide Subject Space with rules on how to make subject addressable.
- Subject Maps: Allow definition of boundless number and variety of such subject address spaces...
- ...and correspondences between them



- Subject space defined by s/t map provides additional functions to IEML.
 - Multiple definitions/multiple terms.
 - Identification rules
 - Merging rules
 - Conferral rules

Usefulness of Subject/Topic Map for IEML

- Infrastructure for which IEML is a superstructure
- Can provide a layer for building IEML meta-compilers
- Will help make various applications built on IEML interoperable.
- Where do the numbers come from?

