A personal look at the future of Semantic Technologies

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Summary

1. The future of Semantic Technologies does not belong to the current Semantic Web technology stack
2. It may belong to the principles underlying it
3. For that there are still many relevant and exciting topics
A word about myself

• Working with Semantic Technologies since 2001 in public and industry funded project in different roles in Rudis FZI group (and at Ontoprise)
• Since 2010 head of interdisciplinary research division IPE at FZI
... framework is proposed...

... report on implementation in progress...

... functional prototype...

... approach with preliminary evaluation...

... proof of concept...

... outline architecture... realistic example...

... prototype on the web...

... prototypic implementation...

... use case is described...
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Use Case 1- Social Semantic Tagging & Collaborative Ontology Engineering

• Negative Experience:
  – Social / Quantitative data (it matters whether a statement has been made once or ten times) not well representable.
  – World is not ternary (e.g. <user,tag,resource,time>), hence often awkward to represent and query
  – Statement metadata (creator, visibility, timestamp) awkward to manage
  – Open World schema semantics hard to grasp for users (SKOS rescued as here) and frequent source of programming errors
Use Case 2 – Semantic Context Management

• Managing a complex representation of a device’s or user’s context
  – E.g. for Ambient Assisted Living & Adaptable user interfaces
  – Challenge is to integrate data from many sensors, to deduce information from that and to detect and act on predefined situations

• Negative Experience:
  – Missing (classical) schema language to specify contracts between different components involved in managing the context information (and between triple store and object oriented world)
  – Awkward to deal with uncertainty
  – OWL not well suited to formalize the needed reasoning
Use Case 3 – Enterprise Information Integration

• Creating a long term plan to tackle an enterprise’s eternal information integration challenges

• Negative Experience:
  – (Currently SW tools & concepts not mature enough to seriously propose this to companies)
  – Mapping arbitrary RDBs and XMLs to RDF often results in awkward representations and unclear benefit
  – OWL does not help in any way I can see
Why

Stuff within the Semantic Technologies and Semantic Web visions

*: here meant: RDF, RDFS, OWL
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'Underlying Principles' / Core Ideas

• **Complex Databases**: pushing the boundaries of complex information processing in databases

• **(Partly) Domain Knowledge Agnostic Systems**: Taking domain knowledge out of code and db schema and make it changeable at runtime

• **Collaborative Domain Knowledge**: Make formal domain knowledge models editable, shareable and linkable

• Using **Web Like Data Integration** to tackle very large data integration problems
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Future Topics?

• **Complex Databases**: pushing the boundaries of complex information processing in databases
  – In CEP / Stream Processing
  – Elastic, distributed, in memory, multi-tenancy, everything in (business) real time, big data, schemaless and No(t only) SQL
Future Topics?

• Using Web Like Data Integration to tackle very large data integration problems
  – An Entire Enterprise
  – All the laws of a state (or the EU)
  – An entire scientific field
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