

# 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 ..

## Research ... Semantic Web in Use

... report on implementation in progress...

- Víctor Penela, Guillermo Álvaro, Carlos Ruiz, ... Córdoba, Francesco Michelangelo Castagnone, José Manuel Gómez ... and Jesús Contreras: *Knowledge Management System*
- Feroz Farazi, Vincenzo Maltese, Fausto Giunchiglia and Alexander Ivanyukovich: *Semantic geographical catalogue for semantic search*
- Grigori Babitski, Simon Bergweiler, Olaf Grebner, Daniel Oberle, Heiko Paulheim and Florian Probst: *SoKNOS - Using Semantic Technologies in Disaster Management Software*
- Ulf Noyer, Dirk Beckmann and Frank Köster: *Semantic Technologies for Describing Measurement Data in Databases*
- Stefan Farfeleder, Thomas ... and ... Omoronyia and Herbert Zojir: *Ontology-Driven Guidance for Requirement Engineering*
- Nikos Loutas, Deirdre Le ... antinos Tarabanis: *The Semantic Public Service Portal (S-PSP)*

... functional prototype...

... approach with preliminary evaluation ...

... proof of concept ...

- ... onas Laitinen ... - A Semantic Portal for Open Linked Datasets
- ... ero Hyvönen ... Names and ... onomies on the Semantic Web -- Managing the Change in Scientific Conceptualization
- Yongchun Xu, Nenad Stojanovic, Miljana Stojanovic, Darko ... and ... der: An approach for the more efficient energy consumption based on real-time situational awareness

... prototype on the web...

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

... 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

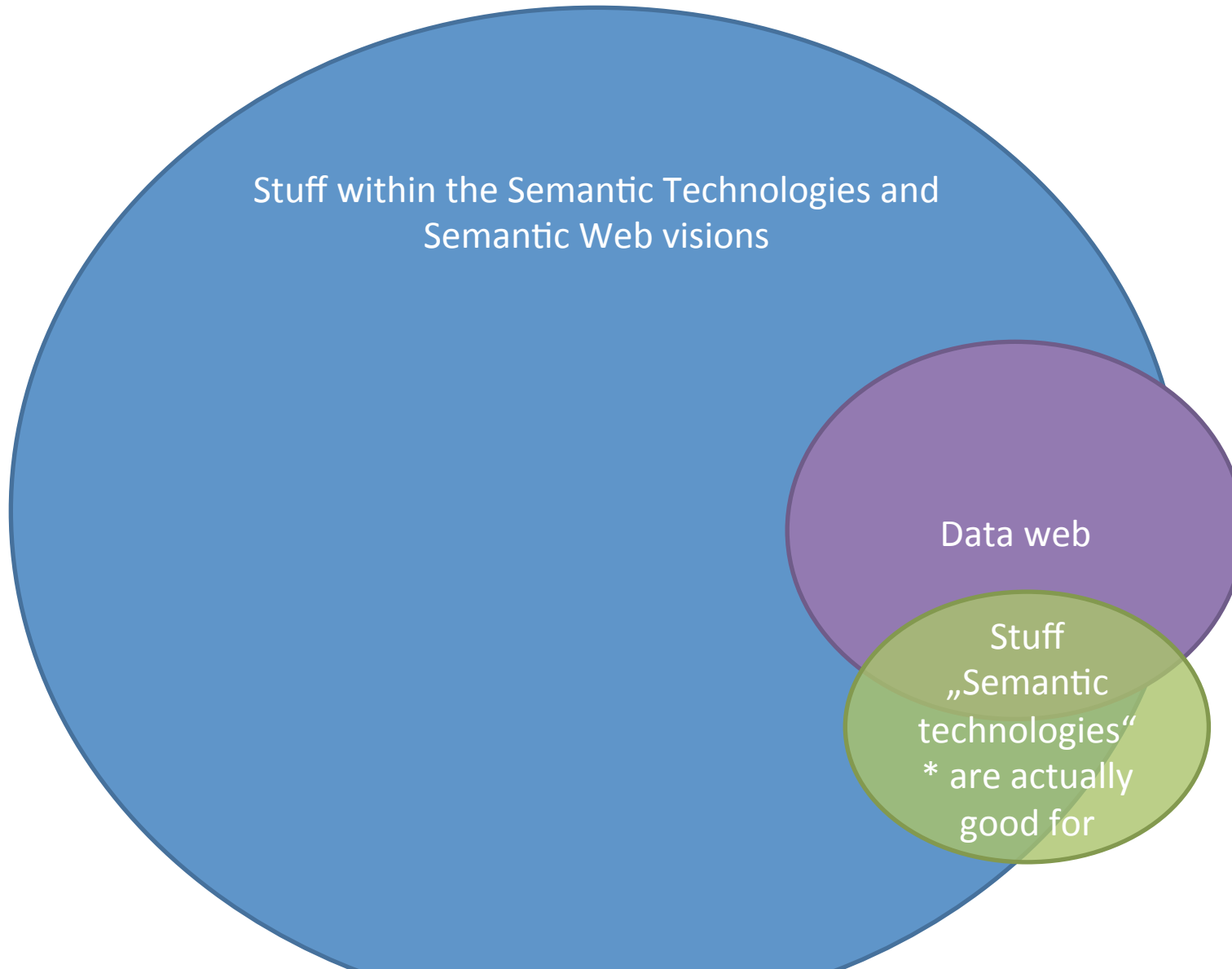
- Managing a complex representation of a device's or user's context
  - E.g. for Ambient Assisted Living & Adaptable user interfaces
  - Challenge is to integrate data from many sensors, to deduce information from that and to detect and act on predefined situations
- Negative Experience:
  - Missing (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



\*: here meant:  
RDF, RDFS, OWL

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# ,Underlying Principles' / Core Ideas

- **Complex Databases:** pushing the boundaries 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 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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