METAMORPHOSES - SQL TO RDF MAPPING FOR SEMANTIC WEB

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ABSTRACT

The Semantic Web is an initiative that tries to add more structure and computer understandable meaning to the data on the web. This extension of current web should enable computers and people to work in better cooperation. We propose our own concept of generating of Semantic Web content. RDF metadata are generated directly from database, according to given ontology. Presented model called METAmorphoses is two layer schema of mapping SQL to RDF, focused on usability.

PROBLEM OVERVIEW

SQL to RDF mapping (Fig 1)

- Automatic, fast, cheap and still up-to-date RDF
- Request for RDF translated to SQL query
- Resultset translated to RDF and sent as response
- Translation is based on mapping document

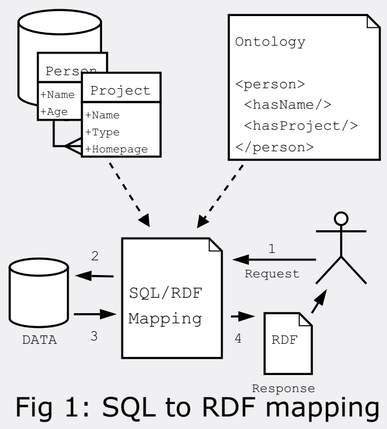


Fig 1: SQL to RDF mapping

Our presumptions

- Data are stored in relational database
- Metadata format is specified by an ontology

OUR PROPOSAL - TWO LAYER MAPPING

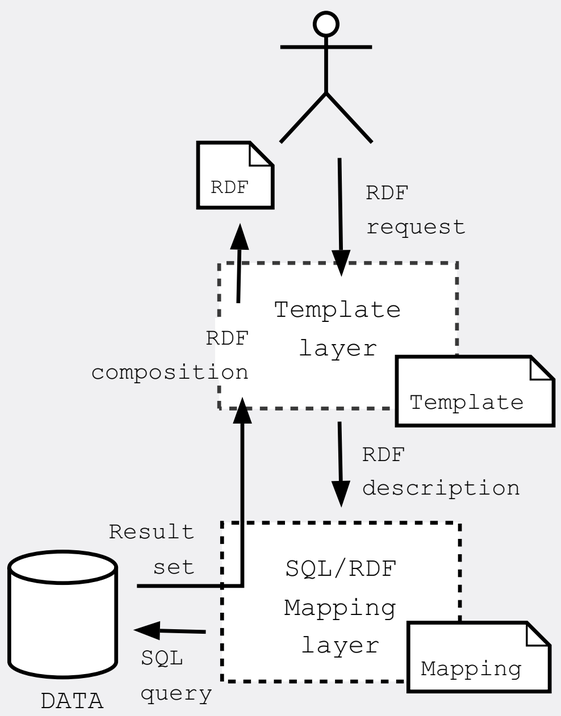


Fig 2: Two layer mapping

Mapping layer

- Mapping from SQL structure to an ontology
- Preserves consistency of generated RDF
- Defines tags for template layer

Template layer

- Used by Semantic web presentation programmer
- Uses tags defined in mapping layer
- Produces RDF instances according to mapping layer

Mapping process (fig 2)

- Request for RDF is received, template is selected
- Template calls mapping that composes DBS query
- Response is generated by template layer

CONCLUSION

Two layer mapping model is:

- **Suitable** for data-intensive Semantic web presentations
- ***Reliable:*** Preserves consistency of RDF according to ontology
- ***Flexible:*** Capable to capture any ontology
- ***Simple for use:*** Programmer needn't know ontologies

REAL APPLICATION

METAmorphoses processor

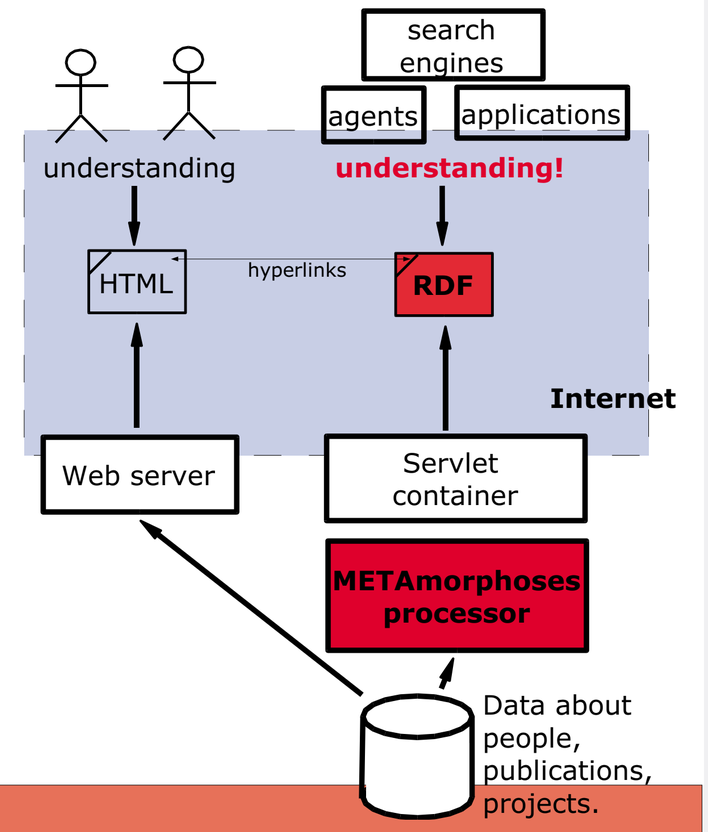
As a test for our concept we have implemented *METAmorphoses processor.* The pocessor is written in Java and it's architecture is based on *METAmorphoses* model.

Overview of our use case

We have used *METAmorphoses processor* to generate Semantic Web presentation of our department as an extension to HTML website.

Methodology

- Database contains data about people, publications and projects at the department.
- RDF is generated from these data by *METAmorphoses processor.*
- Format of RDF is specified by our department ontology.
- RDF metadata are published by Java servlet.
- RDF metadata are linked to classical HTML presentation that is suitable for people.



Results

Dynamical, fast,
up-to-date and cheap
Semantic Web presentation contains
information about all entities of department.

Link
www.cgg.cvut.cz/~svihlm1/metamorphoses/

REFERENCES

1. Berners-Lee, T., Hendler, J., Lassila, O.: The Semantic Web. Scientific American, May 2001; **2.** Resource Description Framework (RDF). August 2004, http://www.w3.org/RDF/; **3.** Handschuh, S., Staab, S., Volz, R.: On Deep Annotation. WWW 2003, ACM Press, 2003