

Linked Data

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Why

What

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Publishing data

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Conclusion

Why?

- ▶ Web until recently only available in form of HTML pages.
- ▶ Not understandable for machines
- ▶ Linked Data helps machines understand content of web

What?

Difference: Hyperlink - Linked Data

- ▶ Hyperlink is just a pointer to an other web resource
 - ▶ No additional information for machines
 - ▶ Their use is solely to reference to an other document
- ▶ Machines can understand Linked Data
 - ▶ Due to RDF!

RDF

Resource Description Framework:

- ▶ Family of Standards to describe data
- ▶ Understandable by machines
- ▶ A lot more powerful than to just describe links
- ▶ Consisting of triples:

([Subject],[Predicate],[Object])

Normal Hyperlink (e.g. on a personal homepage):

```
<a href="http://uibk.ac.at/">University of Innsbruck</a>
```

University of Innsbruck

Humans struggle to see a something meaningful just from this link,
machines have no clue!

What a machine should be able to read is (maybe), "Felix studies at the University of Innsbruck", as RDF triple:

- ▶ Subject: Felix
- ▶ Predicate: studies at
- ▶ Object: University of Innsbruck

RDF triples need precisely defined resources to describe content:

- ▶ Subject: $\langle \text{http} : // \text{example.com} / \text{FelixErlacher} \rangle$
- ▶ Predicate: $\langle \text{http} : // \text{purl.org} / \text{dc} / \text{elements} / 1.1 / \text{studiesIn} \rangle$
- ▶ Object:
 $\langle \text{http} : // \text{semanticweb.org} / \text{wiki} / \text{University_of_Innsbruck} \rangle$

Linked Data Rules

by Tim Berners-Lee

1. Use URIs as names for things
2. Use HTTP URIs so that people can look up those names
3. When someone looks up a URI, provide useful information, using the standards (RDF, SPARQL)
4. Include links to other URIs, so that they can discover more things

Publishing steps

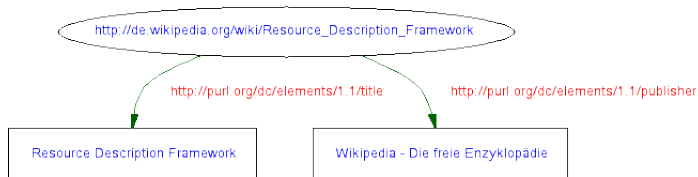
1. Assign URIs to the entities described by the data set and provide for dereferencing these URIs over the HTTP protocol into RDF representations.
2. Set RDF links to other data sources on the Web, so that clients can navigate the Web of Data as a whole by following RDF links.
3. Provide metadata about published data, so that clients can assess the quality of published data and choose between different means of access.

Publishing data

Small amount of data (few hundred triples):

- ▶ Use static RDF file

```
<?xml version="1.0" encoding="UTF-8" ?>
<rdf:RDF xmlns:rdf="http://www.w3.org/1999/02/22-rdf-syntax-ns#"
  xmlns:dc="http://purl.org/dc/elements/1.1/">
  <rdf:Description rdf:about="http://de.wikipedia.org/wiki/Resource_Description_Framework">
    <dc:title>Resource Description Framework</dc:title>
    <dc:publisher>Wikipedia - Die freie Enzyklopedie</dc:publisher>
  </rdf:Description>
</rdf:RDF>
```

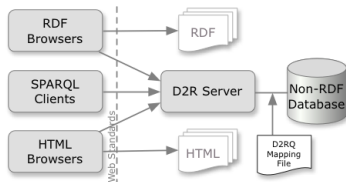


Huge amount of data. Very likely already in a Database

- ▶ Use tool to provide a view on that DB!

Example: D2R Server

- ▶ creates (customizable) mapping from DB into RDF
- ▶ all requests get rewritten in SQL
- ▶ This enables RDF and HTML browsers to navigate content of DB



Browsing data

- ▶ Normal search engines only go through HTML data
- ▶ Special search engines that go through RDF triples
- ▶ One Prototype would be the *Semantic Web Search Engine*

<http://swse.deri.org/>

Conclusion

- ▶ Although quite an old idea it has become very modern in last few years
- ▶ Linked Data practices are carried out by many data providers (LOD Cloud)
- ▶ Web of Linked Data will never be complete!

Thanks for your attention!

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