

# Presentation Topic 11: Open and linked data

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# What is Linked Open Data?

# Introduction

- Linked and Open Data -Two related concepts that are increasingly important in our data centric society.
- Our aim of this presentation is to explain what Open data and Linked Data are, and examine their implementations.
- Also, we will examine arguments for and against open data, and put our own argument forward for it.

# Definitions (Open Data)

- *“Open data is data that can be freely used, reused and redistributed by anyone - subject only, at most, to the requirement to attribute and share alike.” [1]*
- Open data is not a specific implementation or method of accessing data – instead, it is an idea of exactly how it should be used and redistributed.

# Definitions (Linked Data)

- *"The Semantic Web isn't just about putting data on the web. It is about making links, so that a person or machine can explore the web of data. With linked data, when you have some of it, you can find other, related, data. "[2]*
- Linked Data is a specific implementation of data, which aims to make it more useful by making it easier for a user to quickly access more relevant data.

# Background

- Open Data - A general movement towards greater and easier data access, important for academic study and scientific research (Mertonian science)
- Linked Data - Term coined by Tim Berners Lee to describe a hypothetical next step for the WWW, currently various examples of implementation using the RDF and URI specifications laid out by the World Wide Web Consortium
- Both concepts are closely linked; linked data technology can be used to access newly open data with greater ease

# Implications



# Implications by sector

Business



# Implications by sector

Business

Personal



# Implications by sector

Business

Personal



Government

# Implications by sector

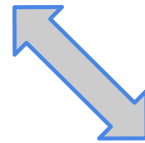
Business

Personal



Government

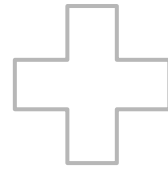
Academic



# Business

I don't want to lose my  
competitive advantage.

£16 Billion



UK Economy

# Personal

How about my private data?

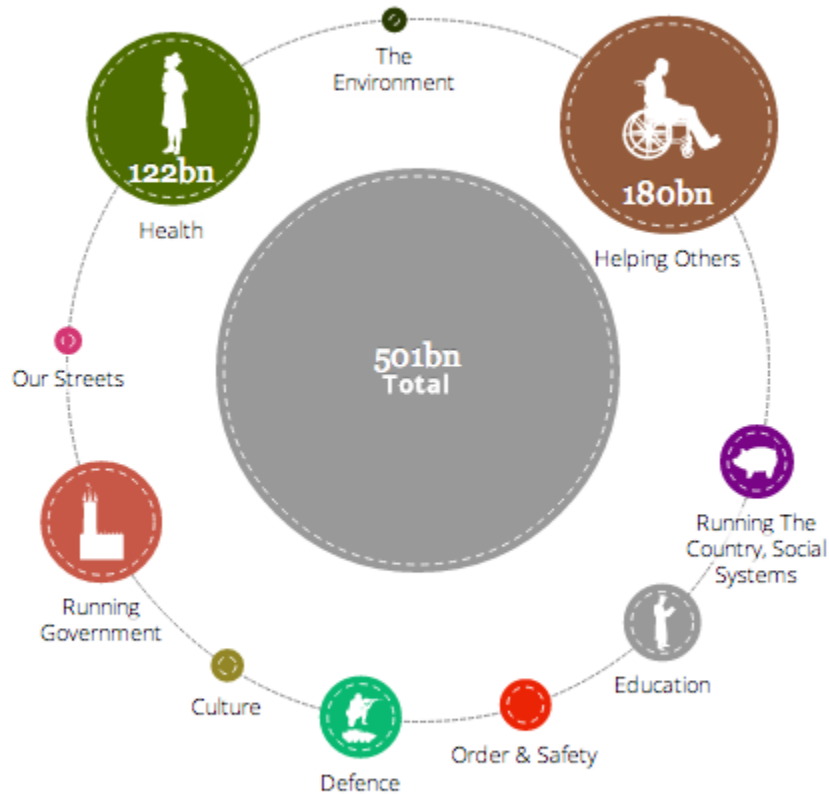
# Government

Is the government really doing  
a good job?

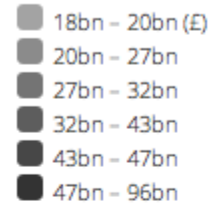


# WHERE DOES MY MONEY GO?

Showing you where your taxes get spent



Expenditure on Total



# Academic

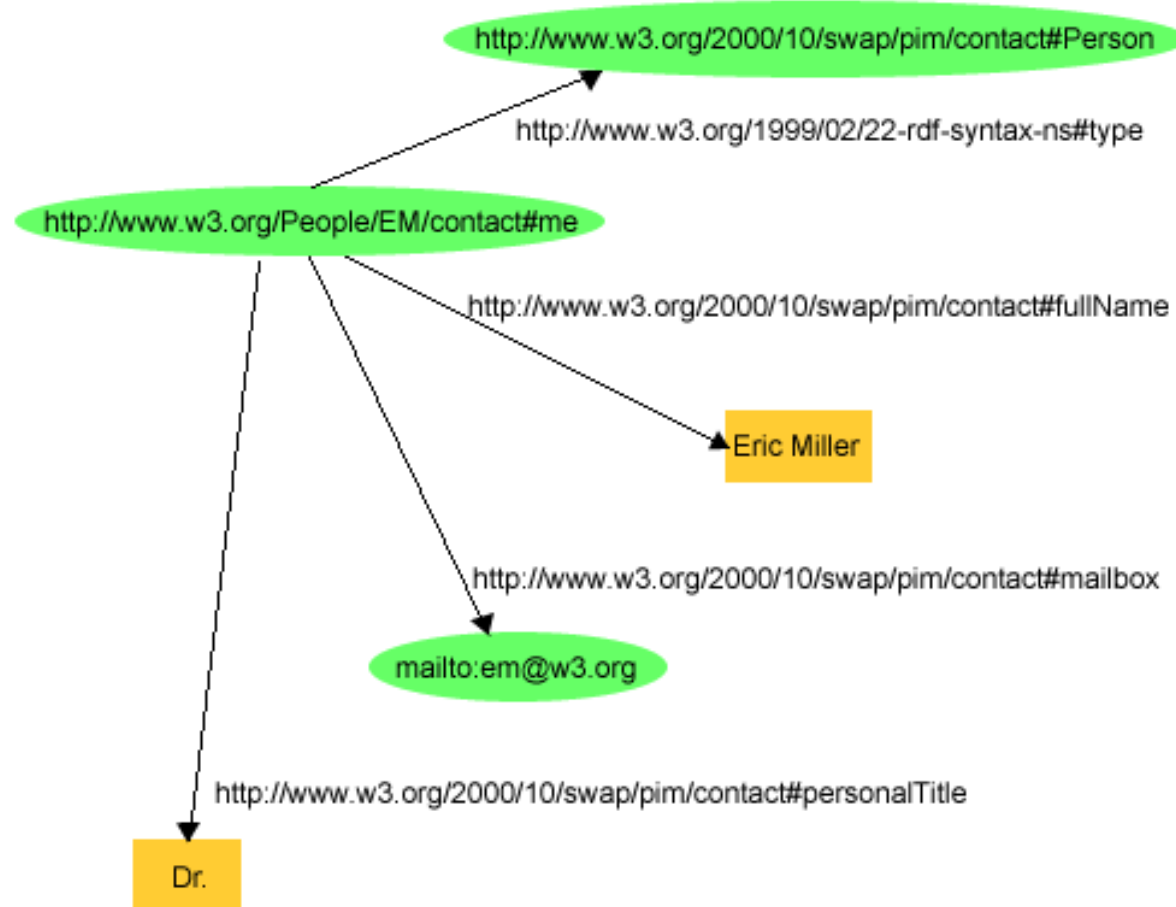
Scholarly applications

# Implementation

# The technical side of linked data

- Presenting data in a *machine-parsable form*, but also maintain links between *data sets*.
- Generally represented by triples in the format:  
<source object> <relationship> <target object>
- Rules of these representations depend on implementation.

# Data as a graph!



# RDF

- Uses XML as major format - good for machine interaction.
- N-Triples/Turtle/N3 for human readability.
- Designed to represent data such as:

***"Crafting a rich and personal blending learning environment: an institutional case study from a STEM perspective" has author Su White'***

# RDF/N-Triples

<<http://eprints.soton.ac.uk/id/eprint/346929>>

<<http://www.loc.gov/loc/terms/relators/AUT>>

<<http://eprints.soton.ac.uk/id/person/ext-44780>> .

# RDF/XML

```
<rdf:Description rdf:about="http://eprints.  
soton.ac.uk/id/eprint/346929">
```

```
<nsx:AUT xmlns:nsx='http://www.loc.gov/loc.  
terms/relators/' rdf:resource="&epid;  
person/ext-44780" />
```



# SPARQL

- **SPARQL Protocol and RDF Query Language**
- Query language for RDF data
- Federated Query support
  - Send the same query to more SPARQL endpoints
  - Process and gather all the results
- Implementations: Jena, 4store, OpenAnzo, AllegroGraph, Seasme etc.

# The Web seen by a human

John Smith

Date of Birth: 3 Jan. 1980

Occupation: Programmer at Some-  
Company



# The Web seen by a machine

Some title

some text some text

some text some text some text

some text



# Solution: Semantic Web

- Collaborative movement led by W3C
- Promotes common data formats on the web
- E.g.: having a standard way of describing a person on the web
- Machines (including search engines) will be able to *understand* the data on the web.
- Is a web of data.

# Semantic web (projects/solutions)

- **Microformats** (HTML attributes *class, rel, rev*); e.g.: hCard, hProduct, hCalendar
- **RDFa - W3C Recommendation** (HTML attributes *vocab, property, rel, rev etc.*); adds complex metadata to (x)HTML and XML documents.
- **Microdata (Schema.org) - Collaboration** between **Google, Yahoo! and Microsoft**. Aims to provide a single way of describing data on the web, supported by all major search engines.

# Conclusions

- Open data can help make businesses more efficient and profitable, and academic work more insightful. Linked data can help make an open data society possible.
- Use of standardised formats such as RDF can make implementing linked data on a large scale easy.

# References

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<http://wheredoesmymoneygo.org/>