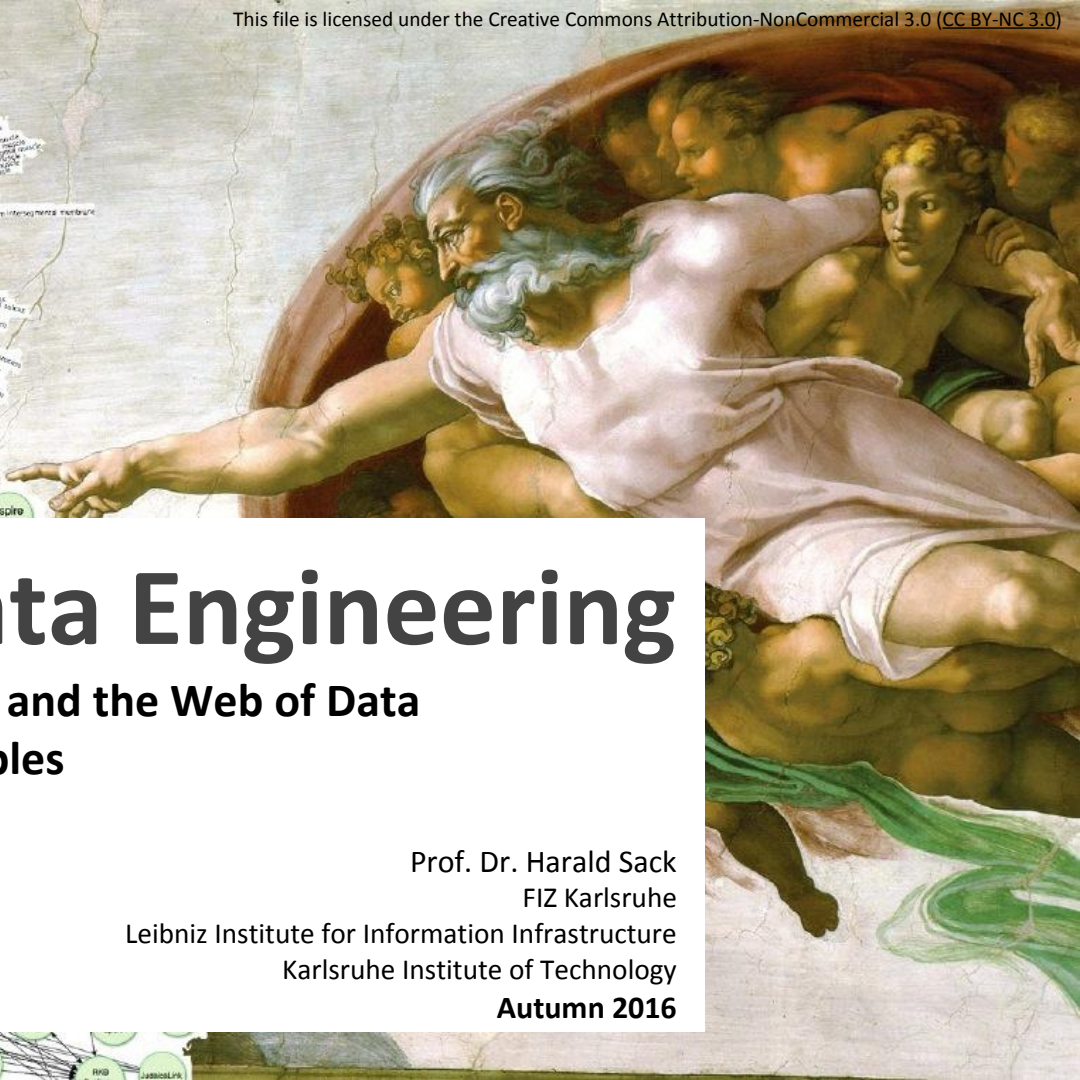




Lecture 1: Linked Data and the Web of Data



Karlsruher Institut für Technologie



Leibniz Institute for Information Infrastructure

Leibniz Institute for Information Infrastructure
Karlsruhe Institute of Technology
Autumn 2016

Autumn 2016

The Web of Data and how we make use of it

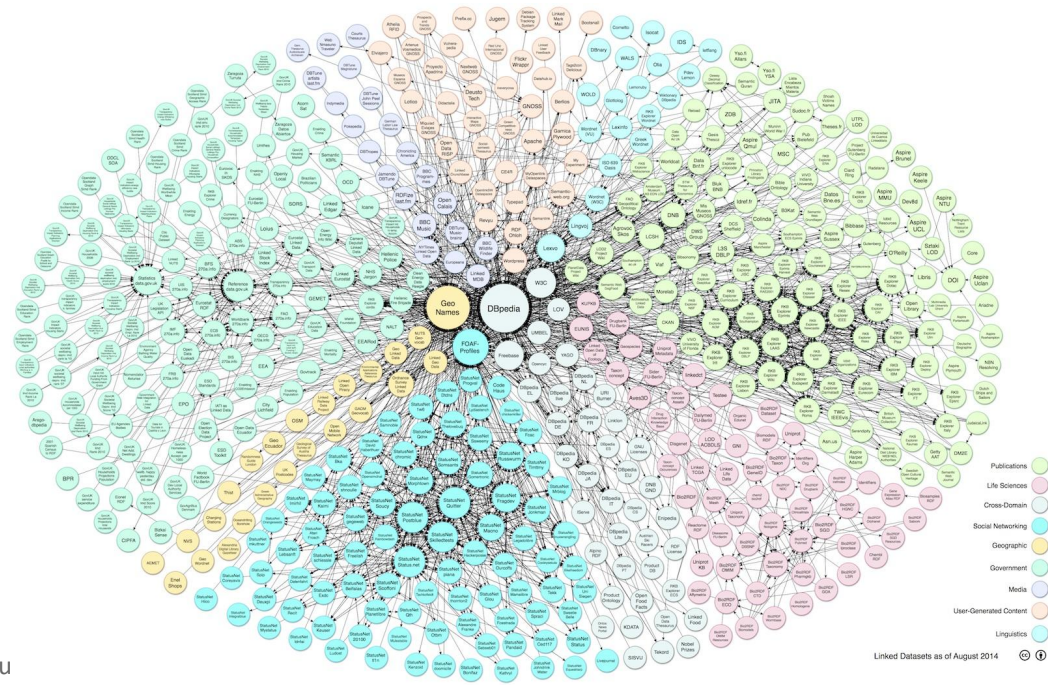
Linked Data

- Linked Open Data (LOD) denote publicly available (RDF) Data in the Web, identified via URI and accessible via HTTP. Linked data link to other data via URI.

The Web of Data

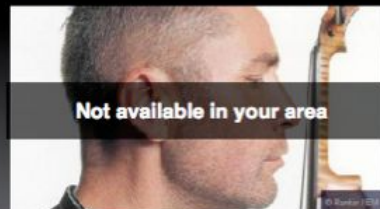
- 9,960 datasets
- >149 billion facts
- >800 million links
(Aug. 2016)

<http://stats.lod2.eu/>
<http://lod-cloud.net/>



Johann Sebastian Bach

Born 21 März 1685. Died 28 Juli 1750.



Not available in your area



BBC PROMS

Nigel Kennedy And His Band Play Bach

At the late night Prom, Nigel Kennedy and his band play arrangements of pieces by Bach.

JOHANN SEBASTIAN BACH 1 of 11

Featured on BBC MUSIC SHOWCASE



Biography

Born in the German town of Eisenach, J. S. Bach was a chorister then violinist before taking his first organ post at Arnstadt while still a teenager. It was in Weimar, as court organist from 1708, that Bach began to produce mostly cantatas, and wrote many of his great organ works, as well as some transcriptions of concertos by Vivaldi.

In 1717 Prince Leopold offered him the position of Kapellmeister at Cöthen, where he wrote the Brandenburg Concertos, the four Orchestral Suites and the violin concertos, and married his second wife Anna Magdalena, who bore 13 children. Bach's fearsome duties in his final job, as Kantor of the Thomasschule in Leipzig from 1723 until his death, involved teaching Latin and Music, choir-training, and writing and directing music for the services.

Nevertheless he managed also to write the Mass in B minor, the six choral Motets, The Art of Fugue, The Musical Offering and Goldberg Variations during this time. His inventive contrapuntalism became unfashionable soon after his death until the early 19th century, since when his reputation has remained unquestioned.

Profile © Edward Ehesaria

Links & Information

LINKS

Biography at jsbach.org and pbs.org/national/education/jsbach.html
Wikipedia article on Johann Sebastian Bach
IMDb at imdb.com/name/nm0001925
Last.fm page on Johann Sebastian Bach
Discogs at discogs.com/artist/Johann-Sebastian-Bach
MusicBrainz entry on Johann Sebastian Bach

PERSONAL RELATIONSHIPS

Parent of Johann Christoph Friedrich Bach, Johann Christian Bach, Wilhelm Friedemann Bach and Carl Philipp Emanuel Bach

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Watch and listen to exclusive music clips

Clips From Latest Album Review



Keyboard Concertos (piano:
Alexandre Tharaud)

- 1 Concerto for keyboard and orchestra BWV1054 in D minor - I Allegro
- 2 Concerto for keyboard and orchestra BWV1054 in D minor - II Adagio

Played By

Since December 2006



Broadcast
BBC Radio 3



Desert Island Discs
BBC Radio 4



In Tune
BBC Radio 3

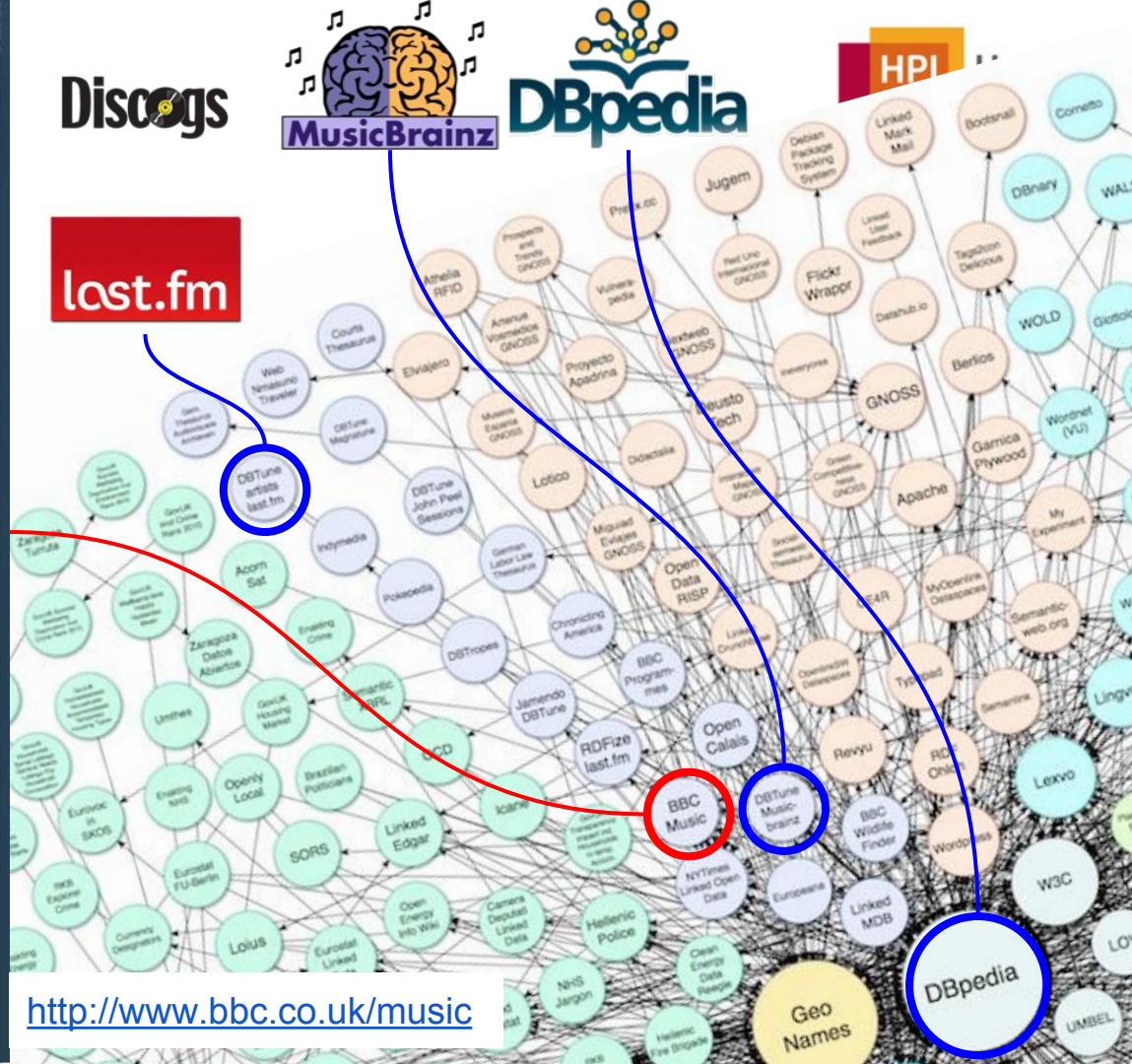


The Early Music Show
BBC Radio 3

Discogs



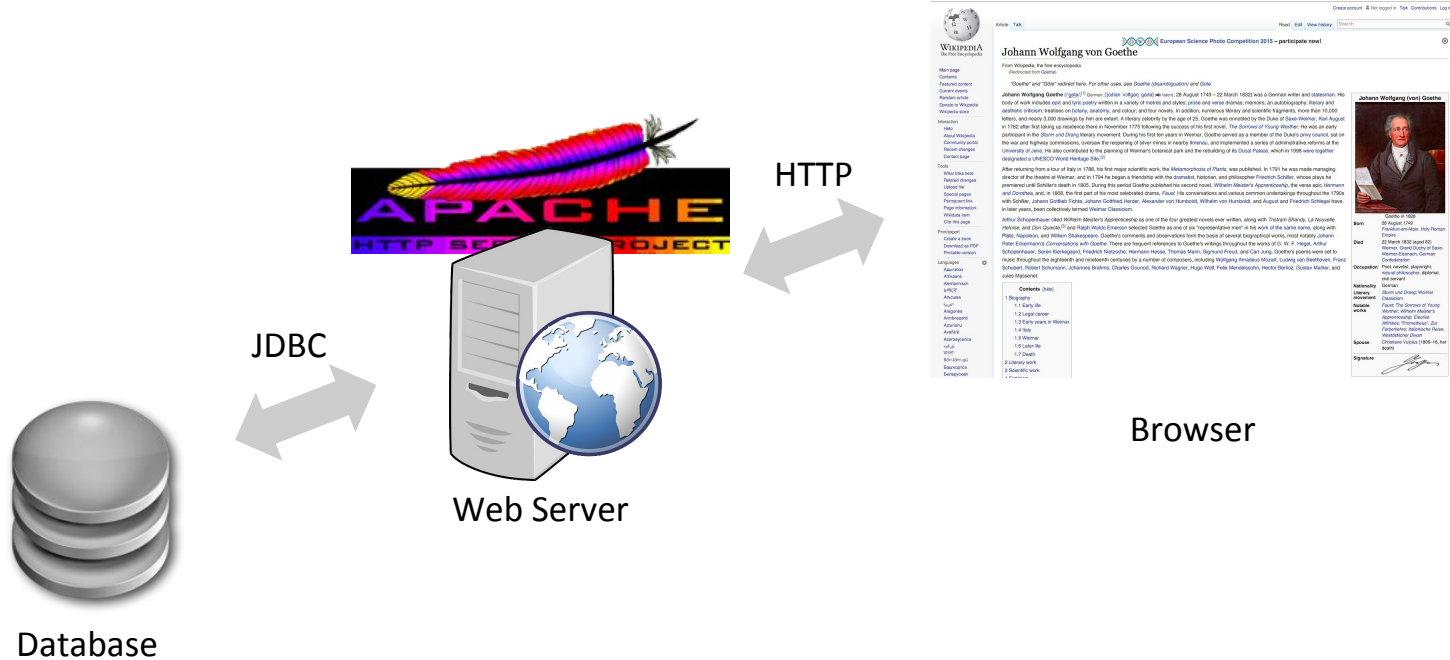
lost.fm



<http://www.bbc.co.uk/music>

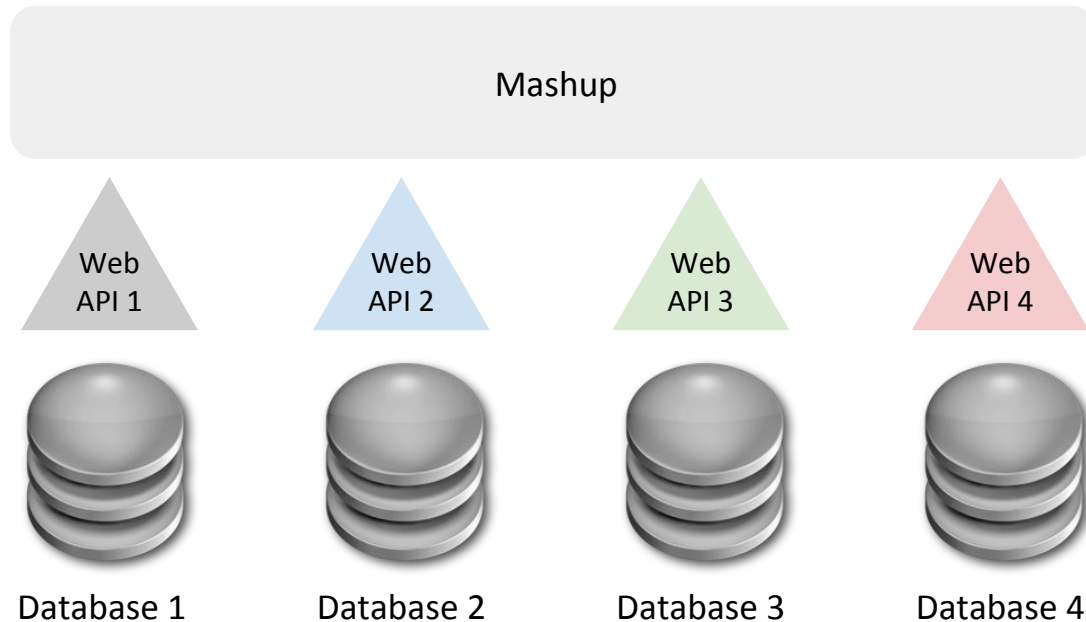
How to get Data from the (traditional) Web?

- Data can only be found on the Web, if it is available at some website



How to get Data from the (traditional) Web?

- There is a number of different (proprietary) **Web APIs**, data exchange formats, and **Mashups** on top of that



In the Web today...

- Data is locked up in **small data islands**
- Other applications usually cannot access this data...

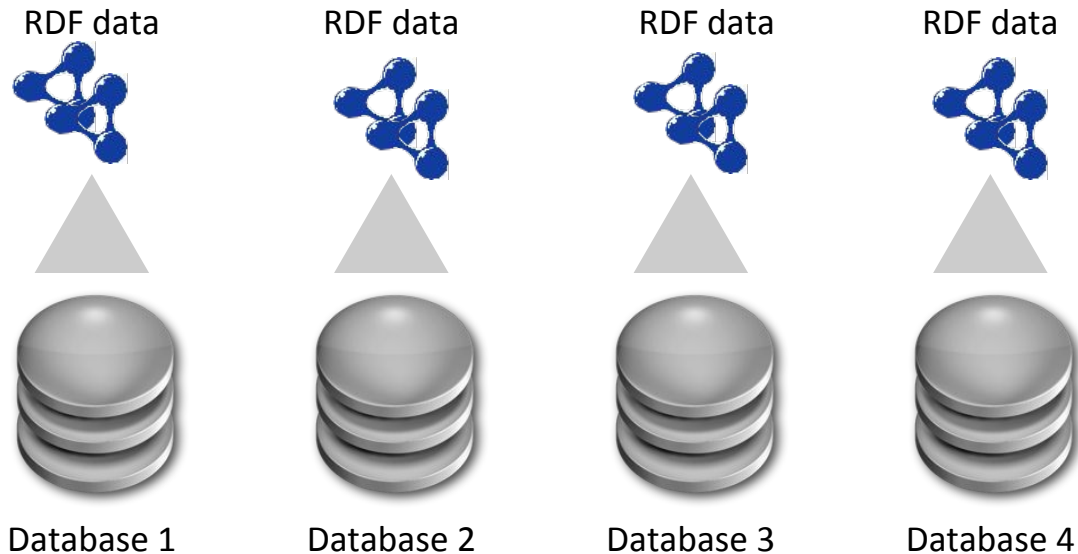


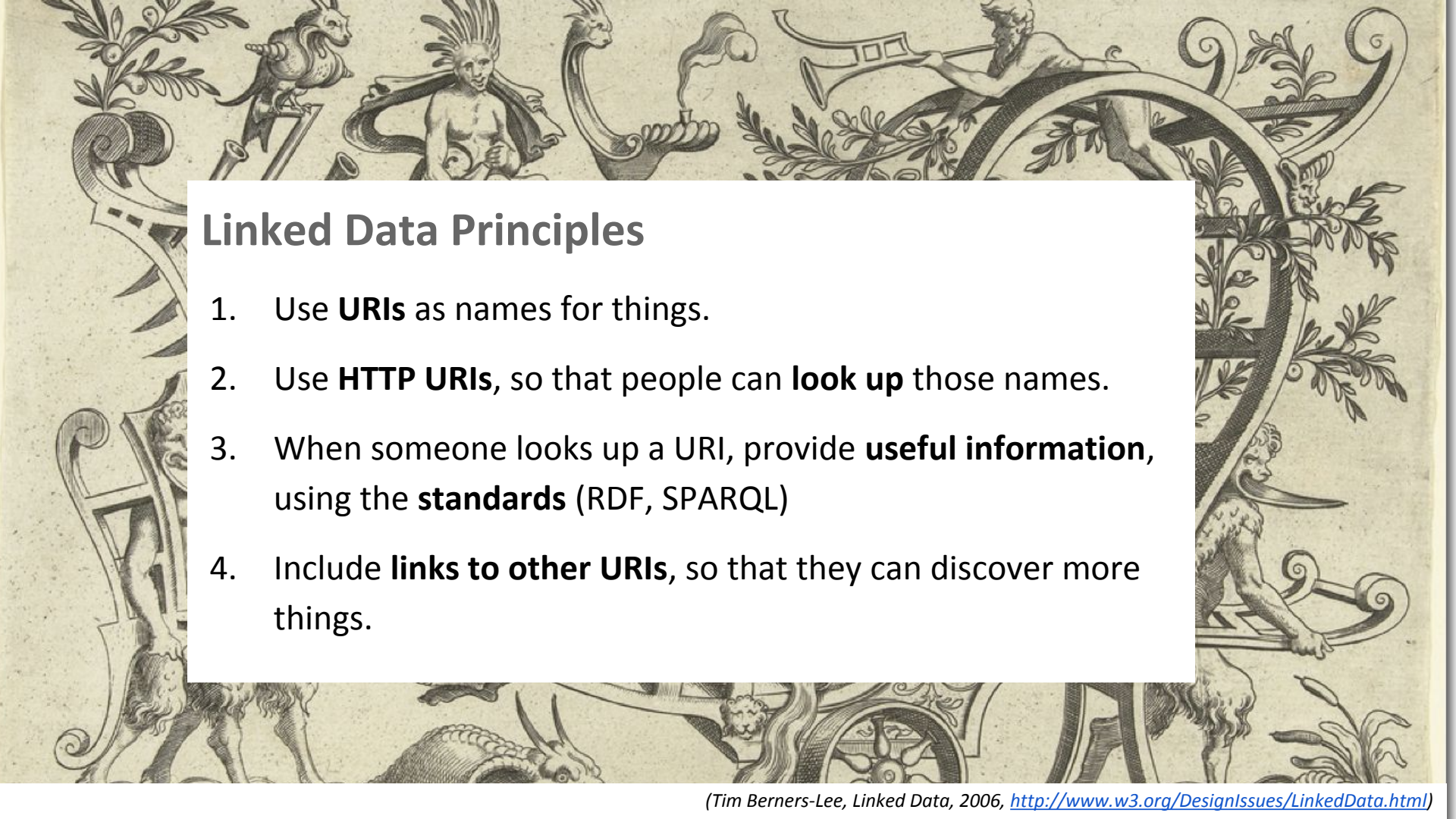


How to get rid of Closed Data Islands?

- **Apply Linked Data technology**

- to publish (structured) data on the web
- to draw connections from one data source to data from other data sources



The background of the slide is a detailed, sepia-toned illustration. It features a variety of figures and symbols: a unicorn-like creature on the left, a figure with a large feathered headdress in the center, a hand holding a smoking pipe, a figure playing a trumpet, and a figure with a long, curved horn. The scene is framed by elaborate, swirling acanthus leaves and scrolls.

Linked Data Principles

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.

The Benefit of using Linked Data at BBC Music Website

- Information is dynamically aggregated from external, publicly available data (Wikipedia, MusicBrainz, Last.FM, Discogs,...)
- no Screen Scraping
- no specialized API
- all data available as Linked Open Data
- data access via simple HTTP Request
- data is always up-to-date without manual interaction

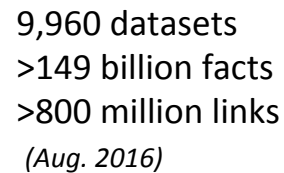
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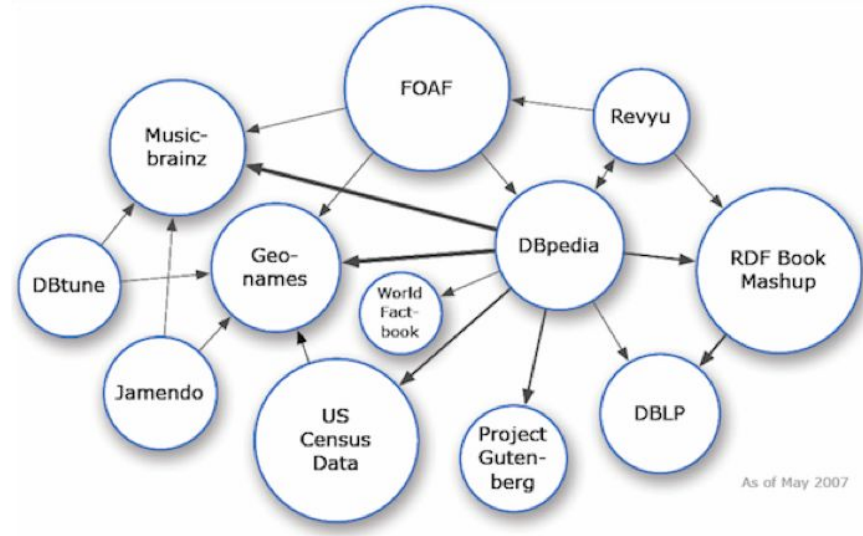
Radio 3

Island Discs
Radio 4

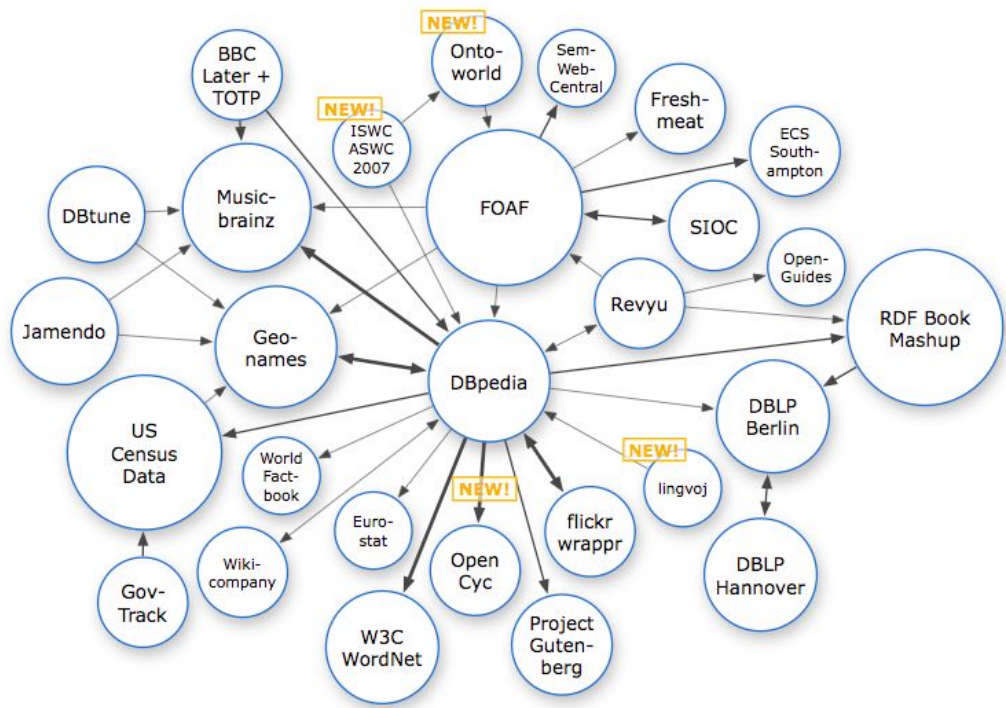
Radio 3



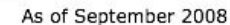
The Development of the Web of Data



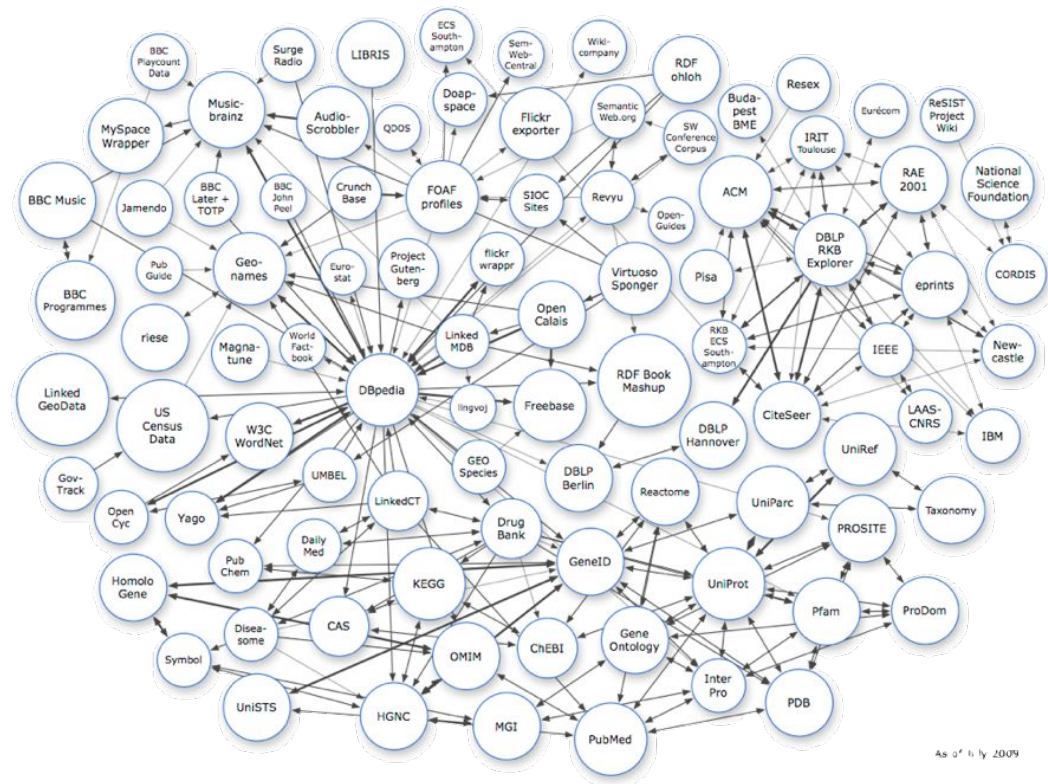
The Development of the Web of Data



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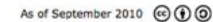


The Development of the Web of Data

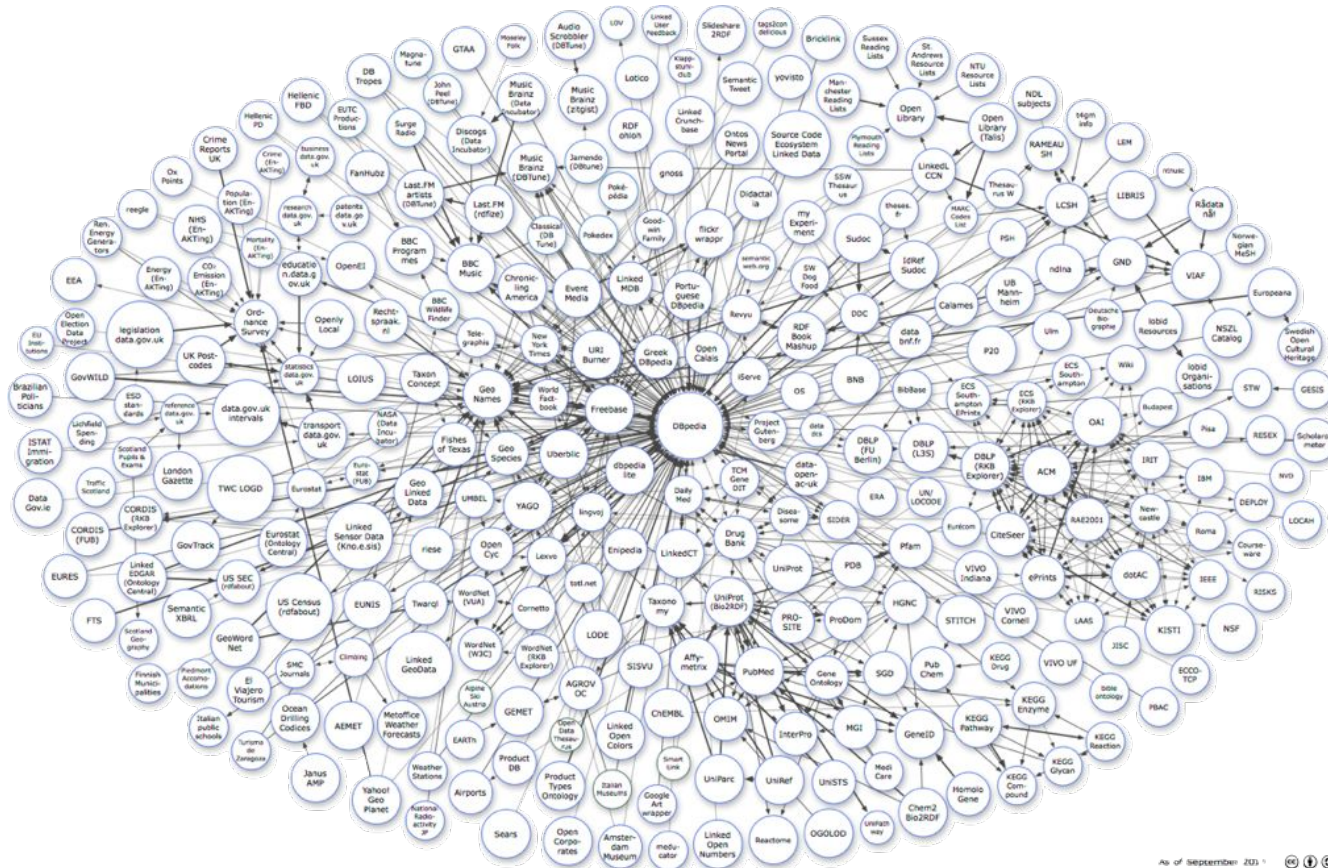


As of July 2009

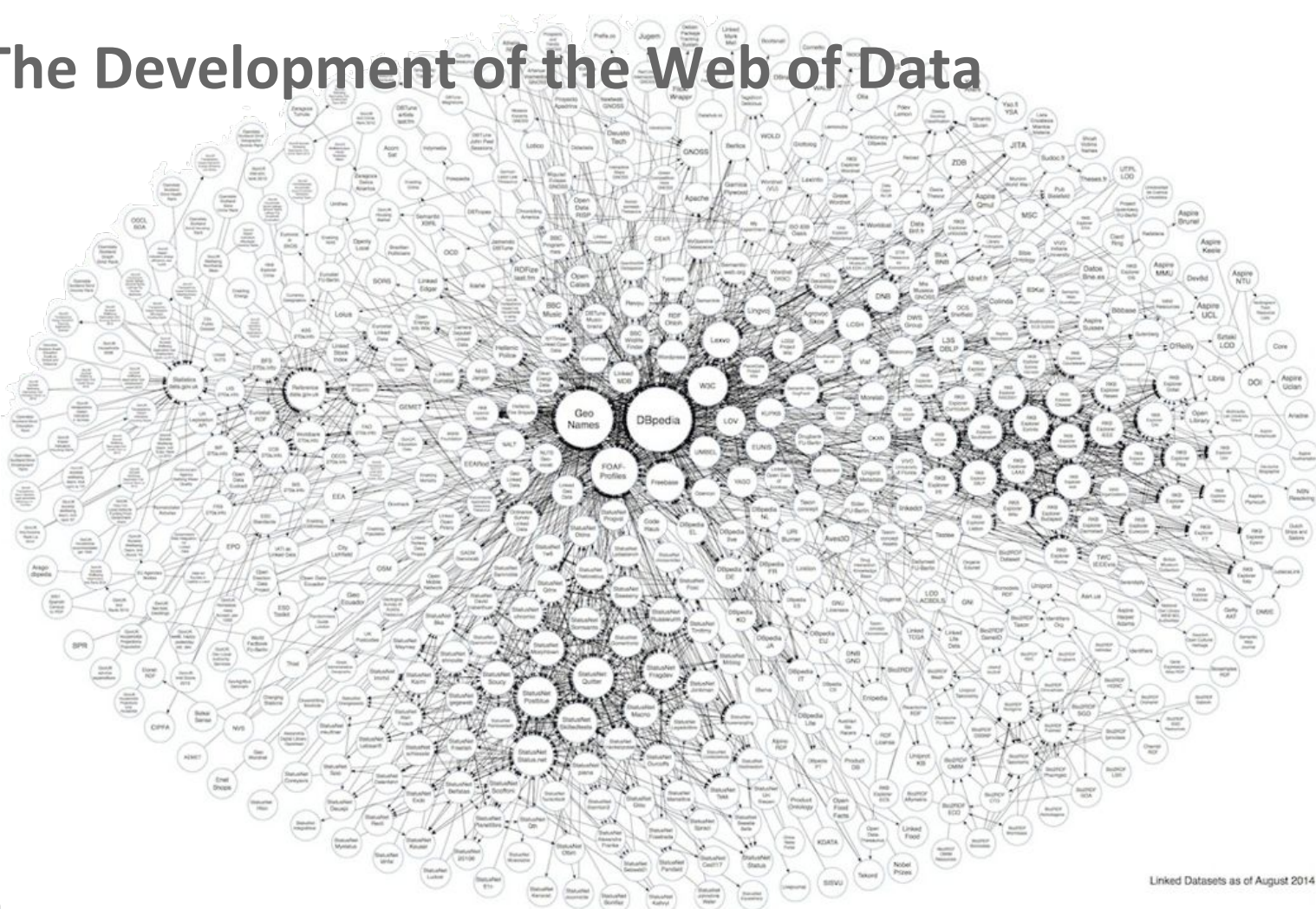
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The Development of the Web of Data



Linked Open Data

- Public Linked Data resources in the Web, licensed as Creative Common CC-BY
- Tim Berners-Lee's 5-Star Criteria for Linked Open Data
 - ★ Available on the web (whatever format) but with an **open licence**, to be Open Data
 - ★★ Available as **machine-readable structured data**
(e.g. excel instead of image scan of a table)
 - ★★★ as (2) plus **non-proprietary format** (e.g. CSV instead of excel)
 - ★★★★ All the above plus: use **open standards from W3C**
(RDF and SPARQL) to identify things, so that people can point at your stuff
 - ★★★★★ All the above, plus: **link your data to other people's data** to provide context



Next: 06 - How to Name Things - URIs

OpenHPI - Course Linked Data Engineering - Lecture 1: Linked Data and the Web of Data