Knowledge Graph

R. Vorburger
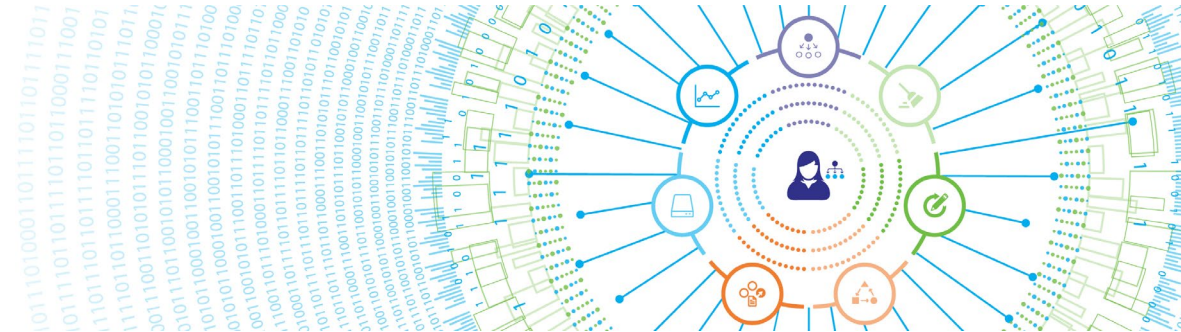
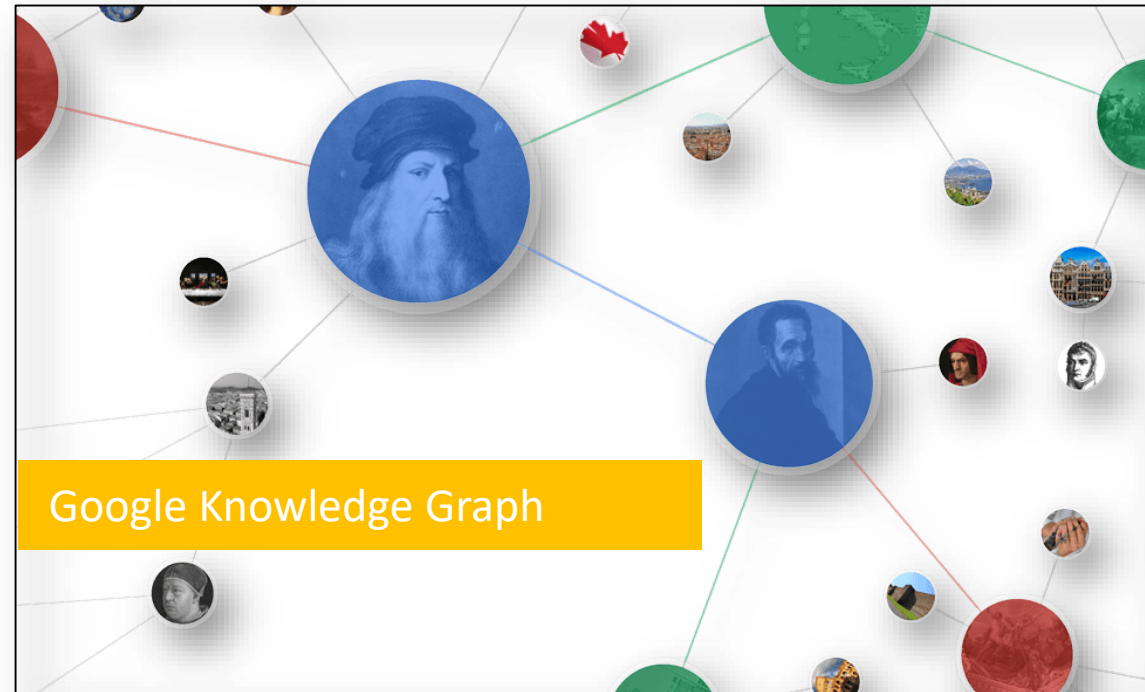# Content

- «The» Knowledge Graph

- In general

Content

- «The» Knowledge Graph

- In general

Google Knowledge Graph
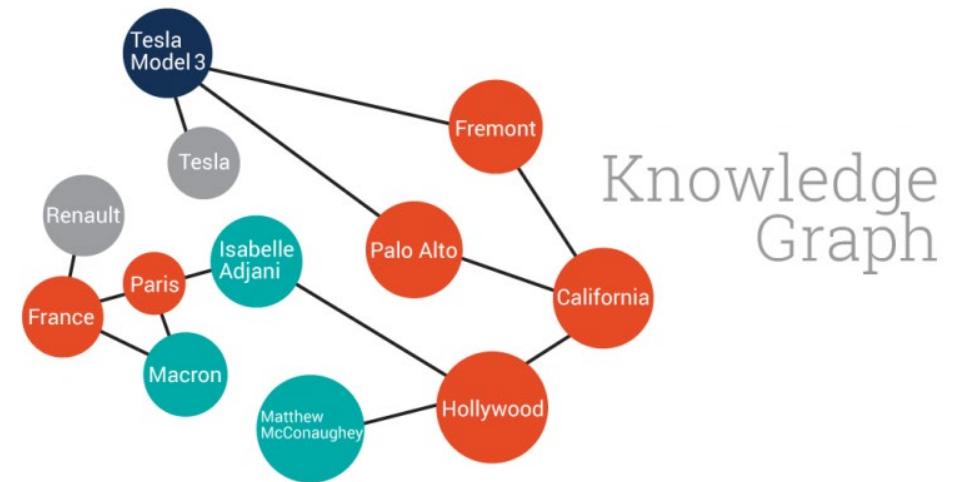
«The» Knowledge Graph

Google Knowledge Graph

The *Knowledge Graph* is a knowledge base used by Google and its services to enhance its search engine's results with information gathered from a variety of sources.

Main sources: Wikidata and Wikipedia

Information is presented in an infobox

Content

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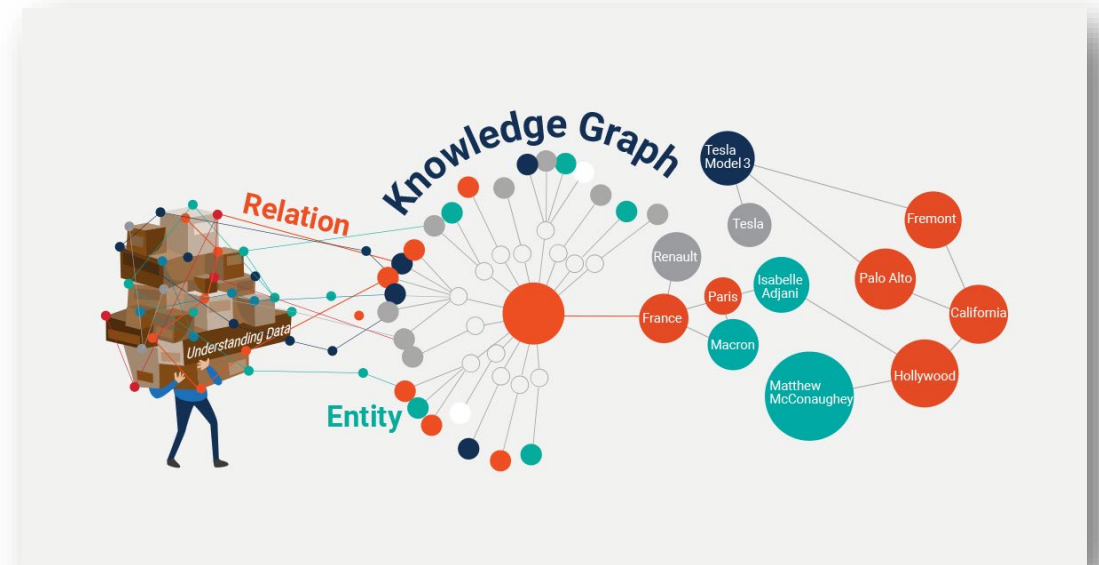
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Knowledge Graph

Knowledge graphs combine characteristics of several data management paradigms and can be understood as a:

- **Database**
  because the data can be queried via structured queries
- **Graph**
  because it can be analyzed as any other network data structure
- **Knowledge base**
  because the data in it bears formal semantics, which can be used to interpret the data and infer new facts.

A knowledge graph acquires and integrates information into an ontology and applies a reasoner to derive new knowledge.

(Lisa Ehrlinger and Wolfram Wöß – University of Linz in Austria)

In general

Purpose of a Knowledge Graph

A knowledge graph is not only a set of datapoints linked by relations that describes a domain, for instance a business, an organization, or a field of study, but also allows to describe new relations using data science.

Graph Data Science Algorithms

A subset of data science algorithms that come from network science, Graph Algorithms enable reasoning about **network structure**
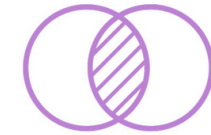
Community Detection
Detects group clustering or partition options

Centrality (Importance)
Determines the importance of distinct nodes in the network

Similarity
Evaluates how alike nodes are

Heuristic Link Prediction
Estimates the likelihood of nodes forming a relationship
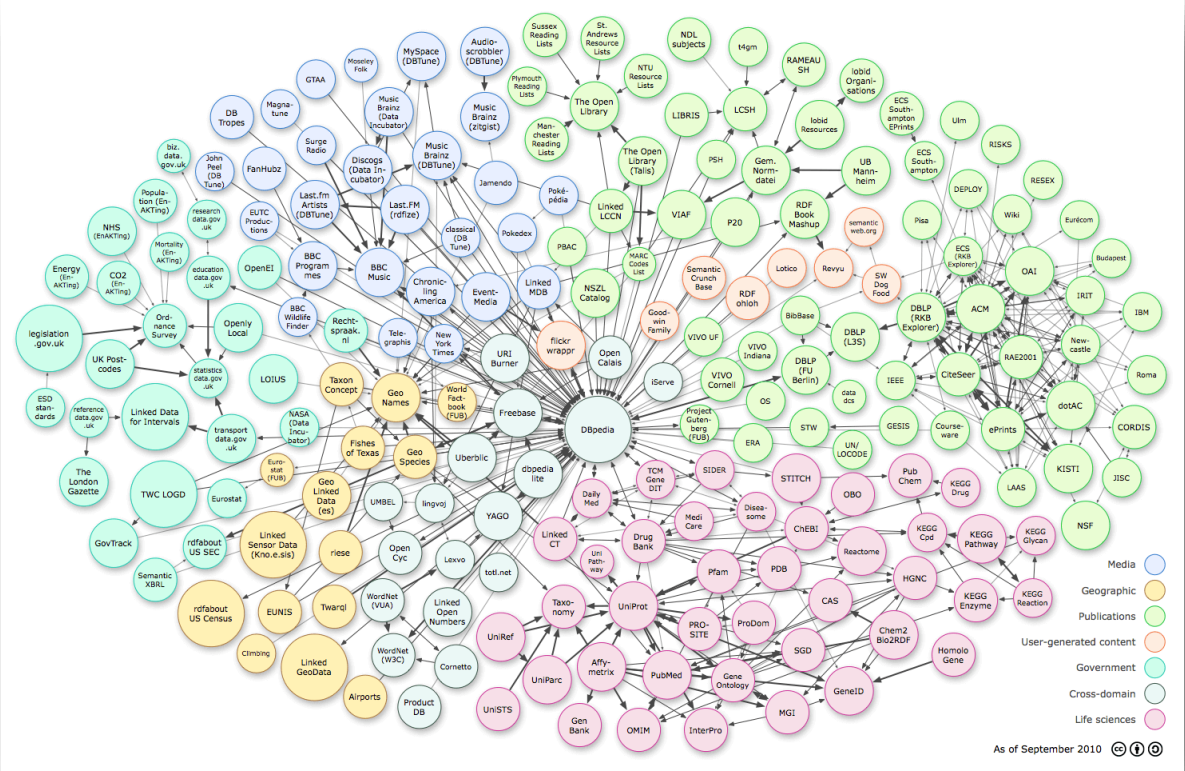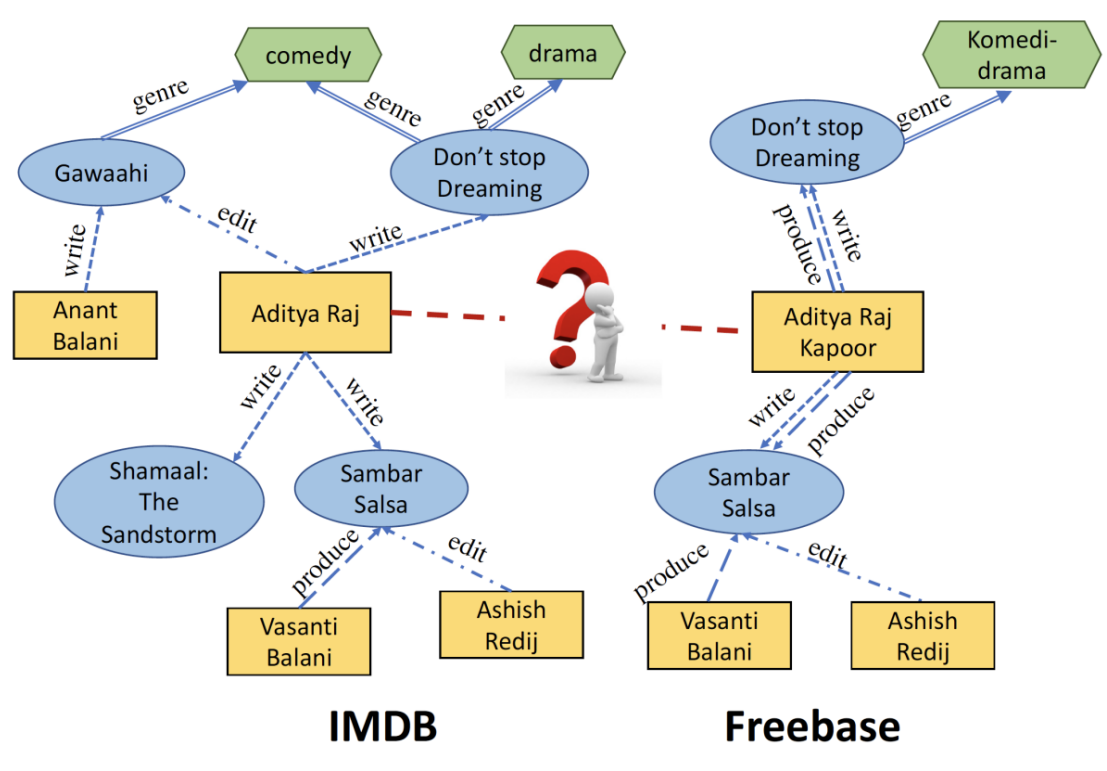
Pathfinding & Search
Finds optimal paths; evaluates route availability, quality

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Combining Knowledge Graphs

There is high potential and power in combining knowledge graphs to an even bigger knowledge graph.

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R. Vorburger