IOTWeek

Dublin — June 20-23, 2022

Usability & Scalability of Knowledge Graphs

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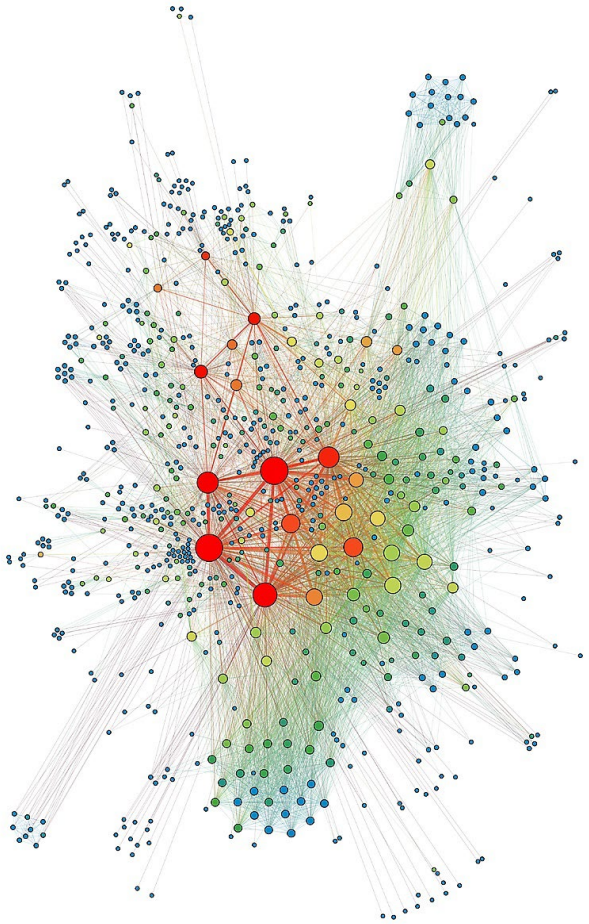
GLOBAL VISION:

IoT TODAY AND BEYOND

IOTForum

Visualising Knowledge Graphs



Courtesy of UPM's Ontology Engineering Group

- Knowledge graphs combine models (i.e. ontologies) and the data they describe
- Large knowledge graphs can become awkward to browse, query and update
- With graphical views, there is a confusing amount of detail when you zoom out, and a lack of context when you zoom in
- A picture isn't always worth a thousand words!
- **How can we improve the usability of large knowledge graphs?**

Potential Ideas and Challenges

- Some ideas of interest include:
  - Higher level representations and higher level query languages based upon common design patterns,
  - the means to generate dynamic views for contexts of interest,
  - and the means to structure large knowledge graphs in terms of overlapping smaller contextualised graphs
- A related challenge is that different communities (e.g. enterprise business units and departments) will often have different mindsets, vocabularies and requirements
- What about the need for versioning?

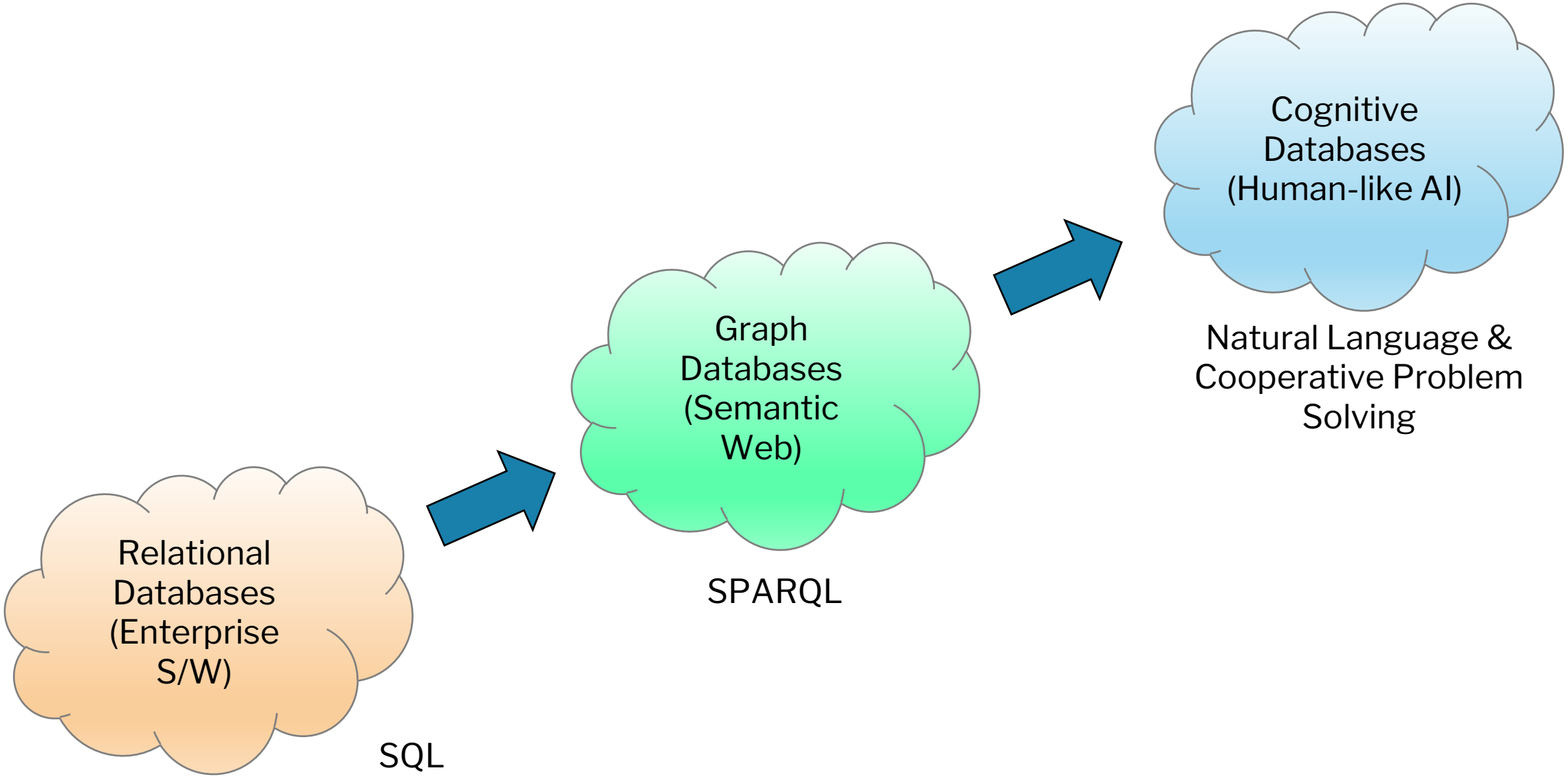
Managing Diversity & Leveraging Familiarity

- How can we allow for this diversity whilst ensuring effective management of shared enterprise wide models, master data, and associated core vocabularies?
- How can we build on what people are already familiar with, e.g. “knowledge sheets” as an evolutionary step up from today’s spreadsheets, along with live access to distributed knowledge graphs?
- What about using natural language?

What about Reasoning?

- Knowledge is about reasoning with information, i.e. structured labelled data
- But today's implementations embed application logic within the application code
- This makes it costly to update – getting in the way of agility
- How can we make it easier to reason with knowledge graphs?
- Moreover, how can we reason with imperfect knowledge subject to uncertainty, incompleteness and inconsistencies?
- Traditional logic can't cope, and statistical inference may be impractical, as it is difficult to compile the required statistics
- We need to switch to cognitive databases that mimic the cortex

Evolution in action



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Thank you!
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