



The Standards People

# IoT Conference 2023

## Deploying Semantic Technologies in Practice – a Gap Analysis

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- AIOTI and Semantic Interoperability Expert/Focus Group
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# AIOTI - Alliance for IoT and Edge Computing Innovation

**Vision:** We drive on behalf of our members **business, policy, standardisation, research and innovation development** in the **IoT and Edge Computing** and other converging technologies across the Digital Value Chain to support European digitisation and competitiveness.

**Website:** <https://aioti.eu/>

**Groups:** Digital for Green, Distributed Ledger Technologies, Innovation Ecosystems, Policy and Strategies, Research and Partnership, **Standardization** Testbeds, Urban Society (horizontal groups)  
Agriculture, Buildings, Energy, Health, Manufacturing, Mobility and Logistics (vertical groups)

# Semantic Interoperability Expert Group: What do we do?



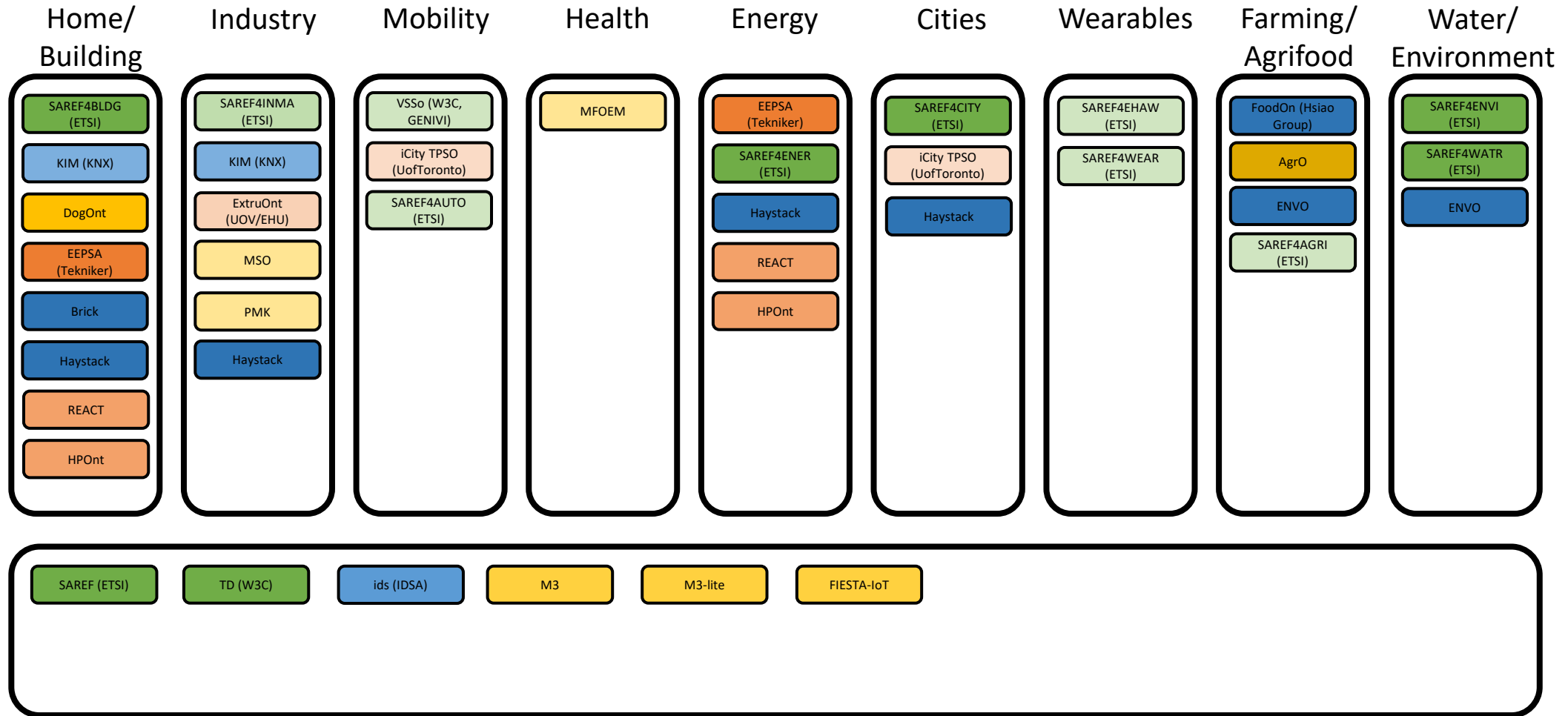
- Value of IoT grows with available information
- Explicit agreement on semantics (= meaning) is vital to the success of IoT  
→ **Semantic Interoperability**

→ **Support adoption of semantic technologies**

## ◆ **Three Whitepapers:**

- **Semantic Interoperability** for the Web of Things: <http://tinyurl.com/58k93m4f>
- Semantic IoT Solutions: A **Developer Perspective**: <http://tinyurl.com/2p97rhtc>
- Towards **Semantic Interoperability Standards** based on Ontologies:  
<http://tinyurl.com/5hx79y5r>

# Ontology Landscape (Online)



Generic IoT (Horizontal)



## What should we do next?

What is missing?

What are the gaps?

→ Ask our target group!

*Focus: Current use of Ontologies*

# Survey: Usage of Ontologies

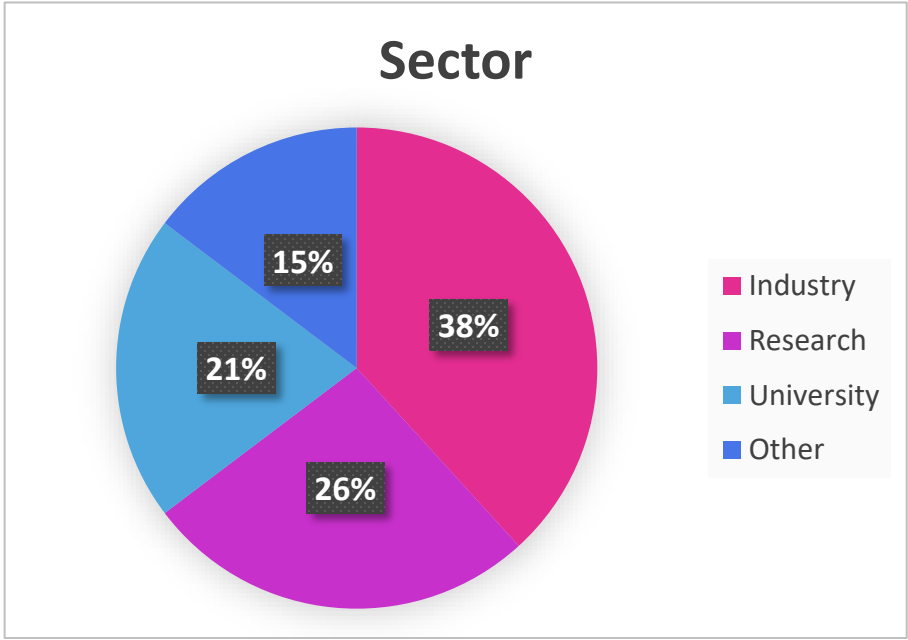
- Target Group(s):
  - AIOTI members
  - Standardization & Industry Organizations
- Survey Structure
  - Background
  - Experience with ontologies
  - Tools for working with ontologies
  - Integration with existing data and products
  - Ranking of aspects according to importance

# Background

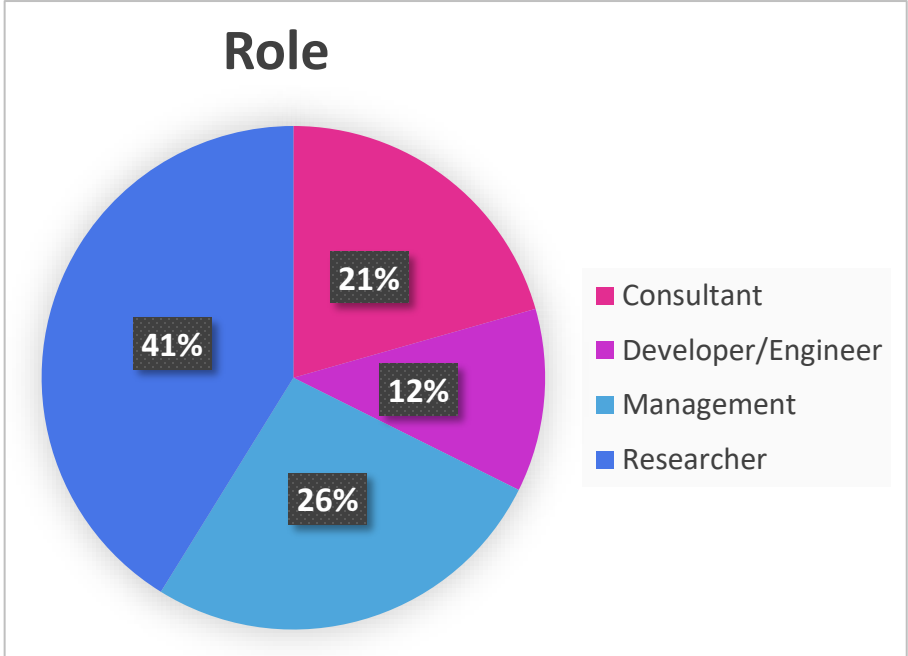
- Which sector(s) do you belong to?

- What is your main role?

AIOTI Survey: 16 participants  
 Standards /Ind.: 18 participants  
**Total: 34 participants**



Adapted Sector	
Industry	13
Research	9
University	7
Other	5

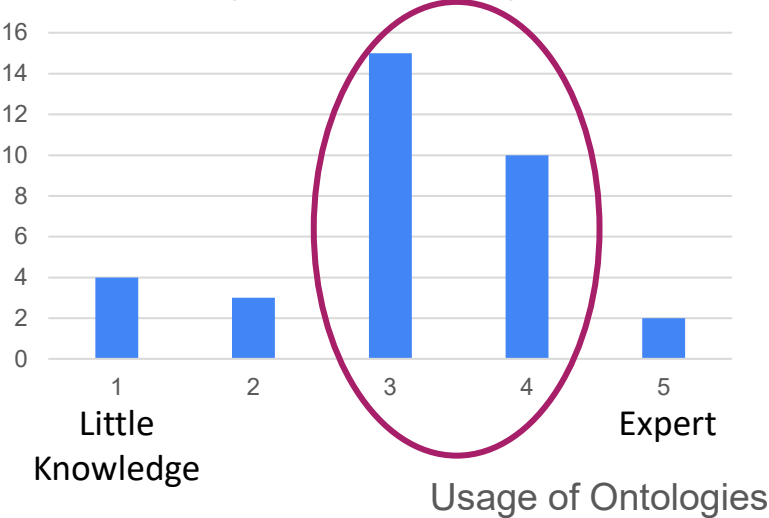


Adapted Role	
Consultant	7
Developer/Engineer	4
Management	9
Researcher	14

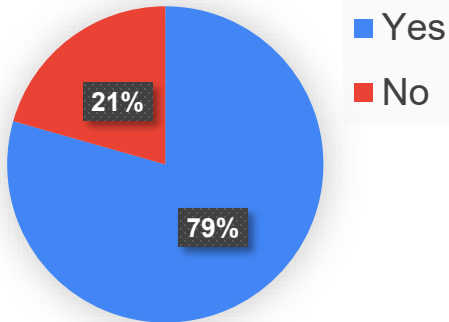


# Experience with Ontologies

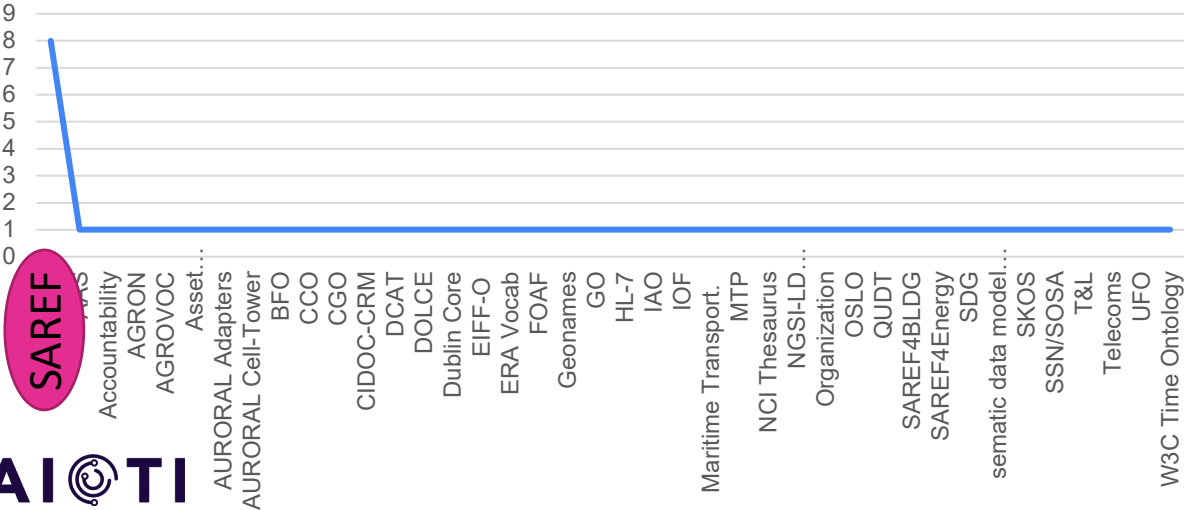
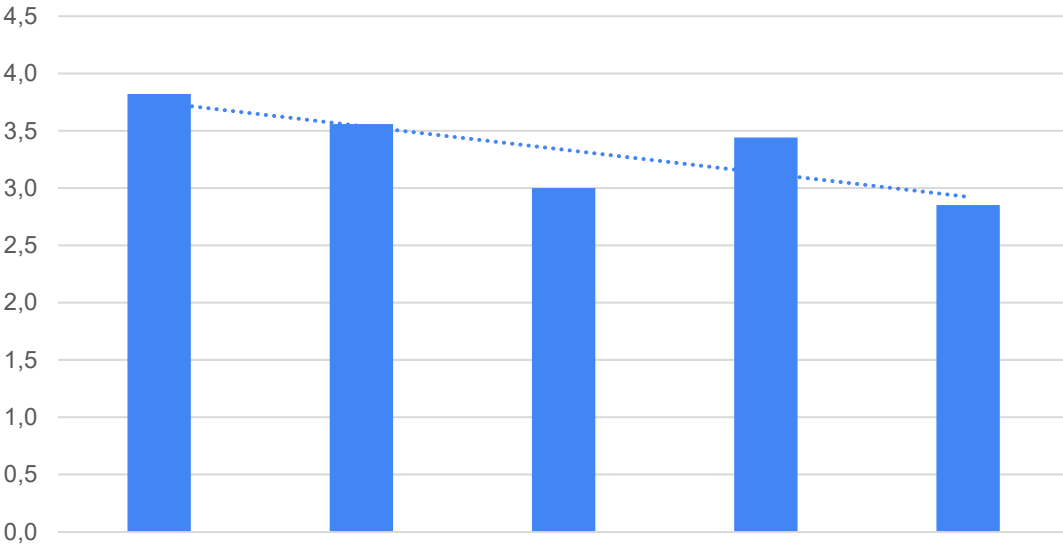
Expertise Regarding Ontologies (self-assessment)



I Have Used an Ontology



Confidence with respect to Ontology Tasks



I know how to get familiar with an ontology

I know how to navigate small ontologies

I know how to navigate large ontologies

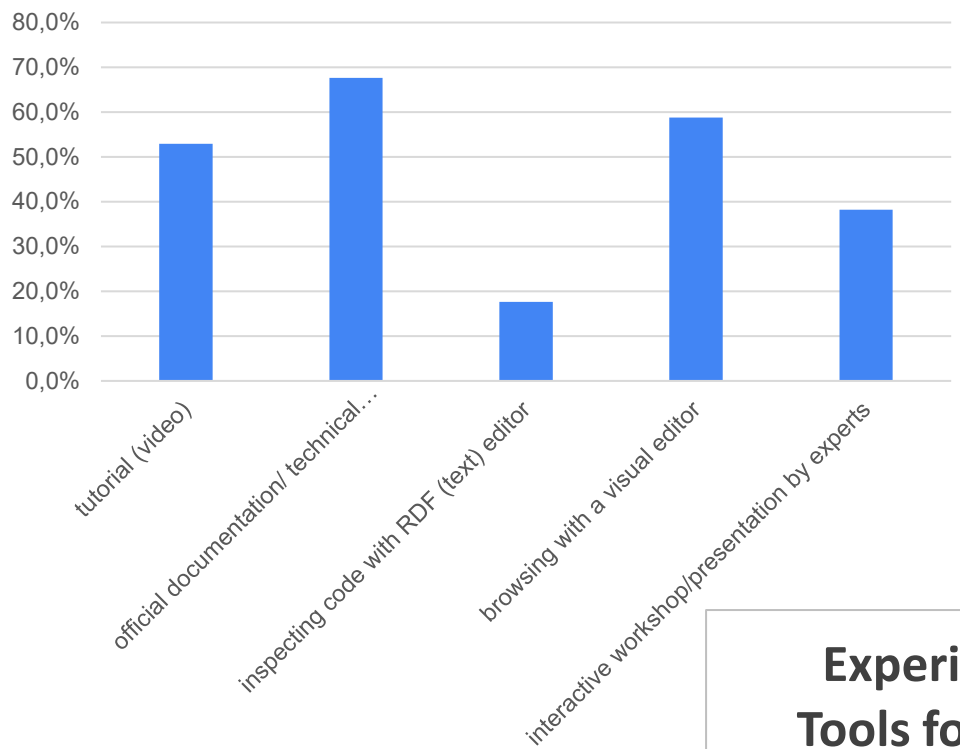
I know how to find the concepts I need

I know how to use concepts from different ontologies together

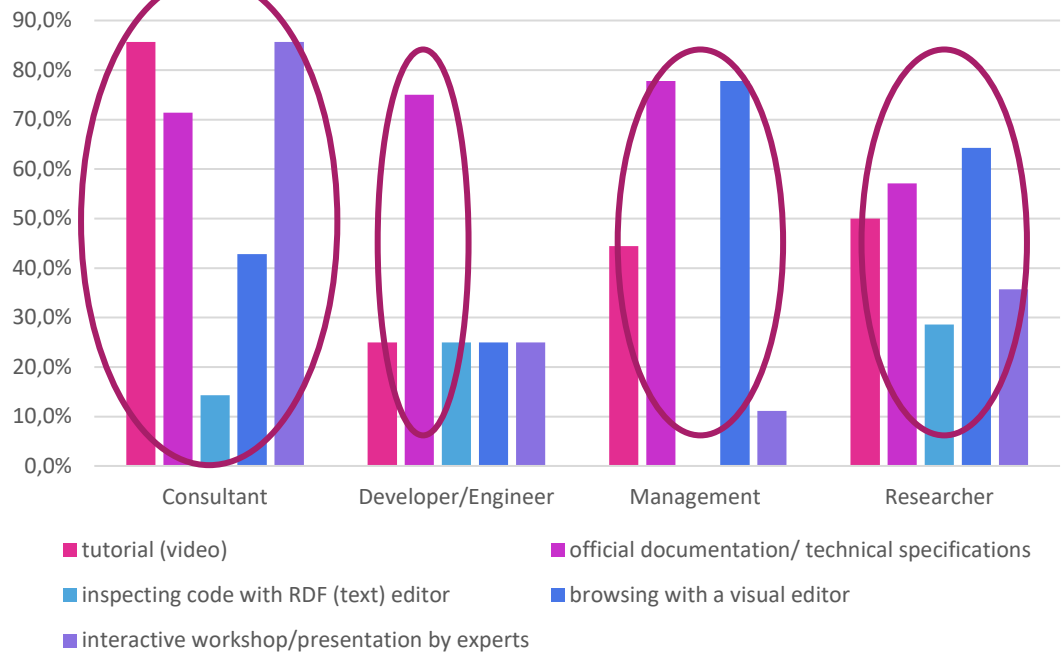
- 1 – strongly disagree
- 2 – disagree
- 3 – neutral
- 4 – agree
- 5 – strongly agree

# Tools for Ontologies

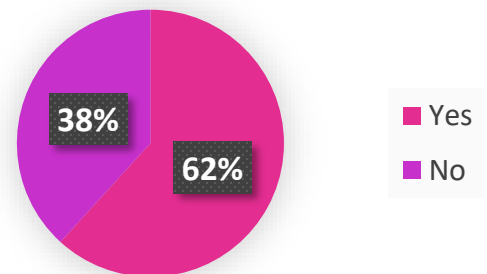
Preferred Way to Get Familiar with an Ontology



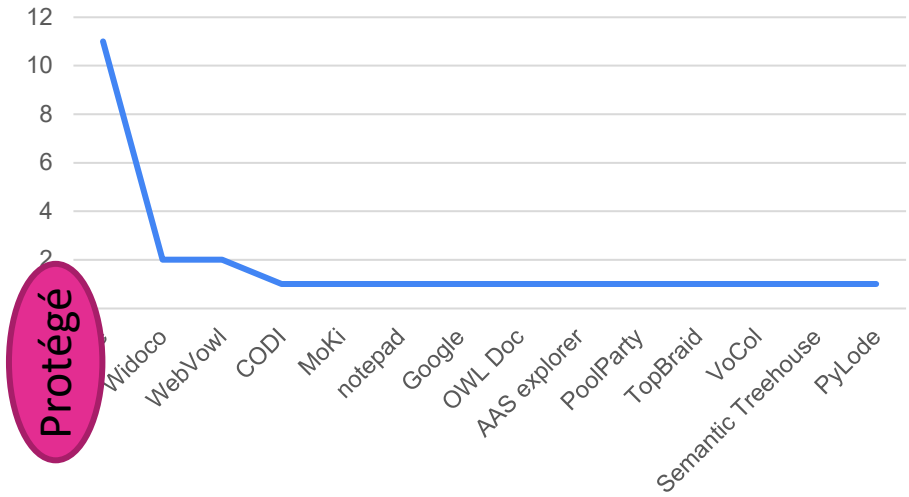
Preferred Way by Role



Experience with Tools for Browsing Ontologies

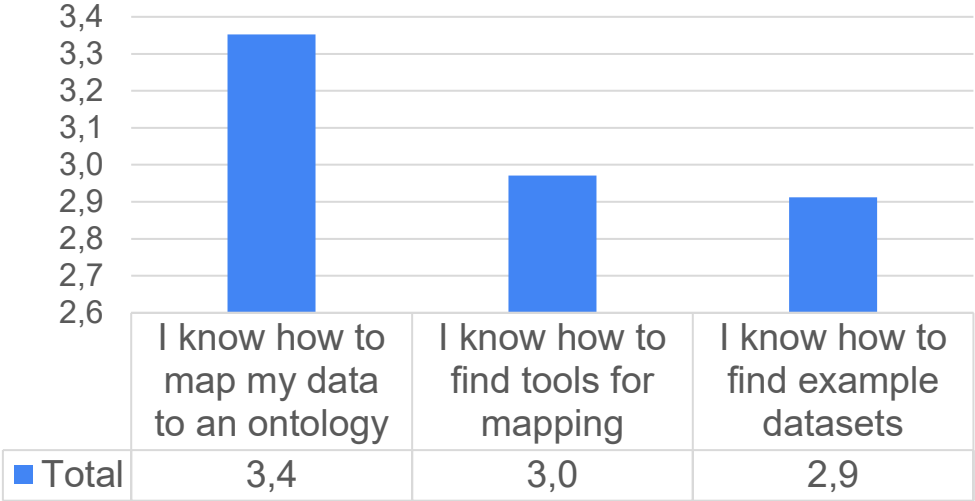


Experience with Ontology Tools

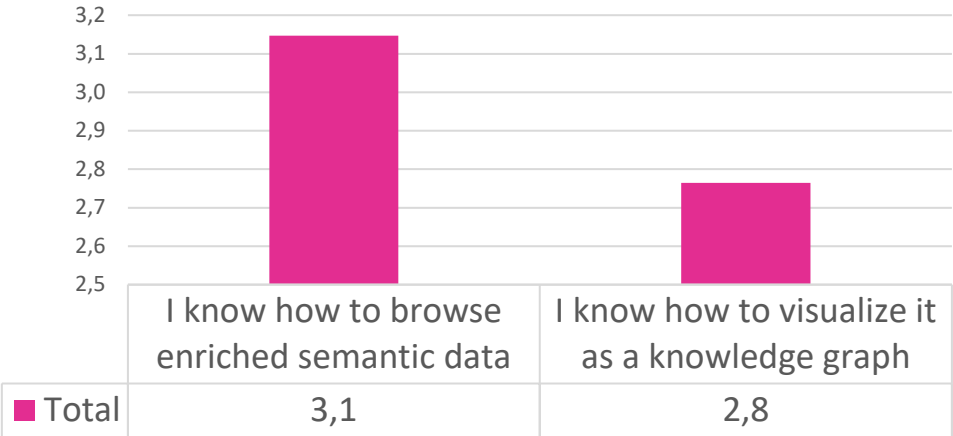


# Integration with Data and Products

Mapping data to ontology concepts, Average

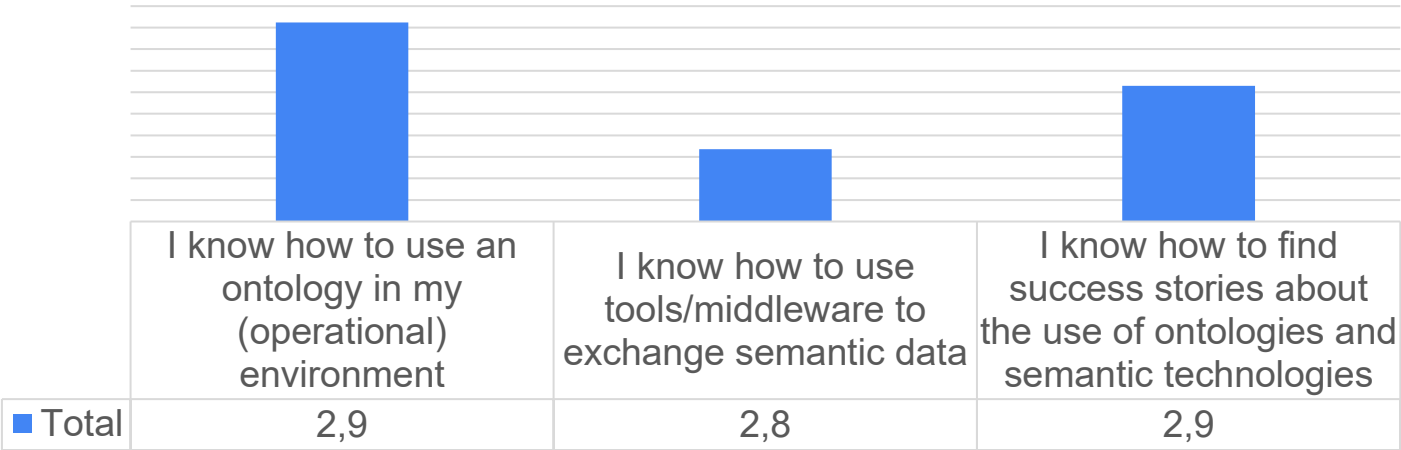


Browsing and visualizing semantic data - Average



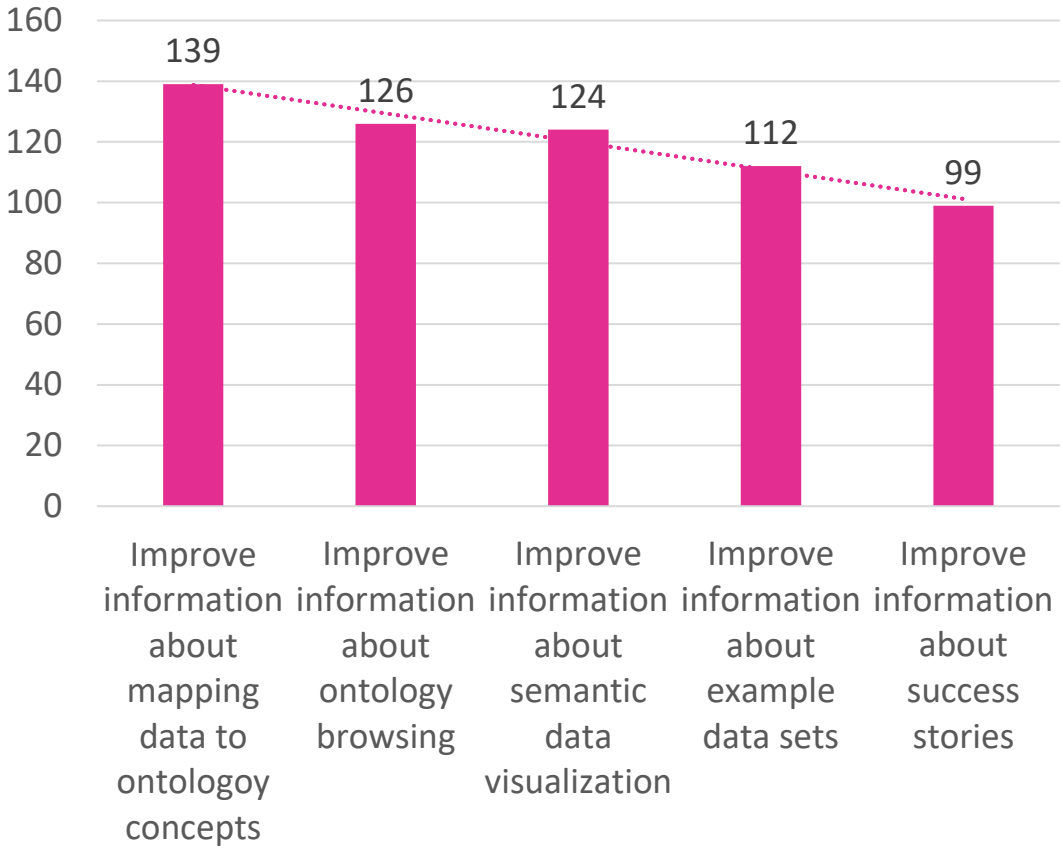
1 – strongly disagree  
 2 – disagree  
 3 – neutral  
 4 – agree  
 5 – strongly agree

Applying an ontology and exchanging semantic data in practice, Average



# Ranking of Aspects

Importance



Importance by Role



# Conclusions (1)

- **Across all roles there is some experience regarding ontologies, but – on average – anything regarding knowledge, tasks and tools is considered close to “neutral”.**
- **The more difficult the task is (large ontology, integration of different ontologies), the less confident people are.**
- **Both ontologies used (with exception of SAREF) and tools (with exception of Protégé) seem to be part of a “very long tail”.**

# Validation of Conclusions → Switch to Mentimeter

- 1) Do you agree with the ranking resulting from the survey? Yes/No
- 2) What would your own ranking be?
- 3) Do you see other aspects that should be prioritized?