Why this Implementation Network (IN)?

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#INsGOFAIR19
#GOInterIN

Background: Disconnected Data Silos

- Fragmentation of research data landscape:
  - highly disciplinary and disconnected
  - heterogeneous data storage
  - heterogeneous and often unstandardized metadata and vocabularies
  - lack of cross-disciplinary and interconnected systems

"Data silos are bad news for everyone."

[https://www.information-age.com/breaking-down-data-silos-123481841/]

- Problematic when it comes to searching and linking research data across community borders in the context of multidisciplinary research
- Cross-domain interoperability: key element to facilitate data integration across community/repository boundaries

Use Case

Linking survey data to spatial data (DFG project SoRa)

http://www.sora-projekt.de/

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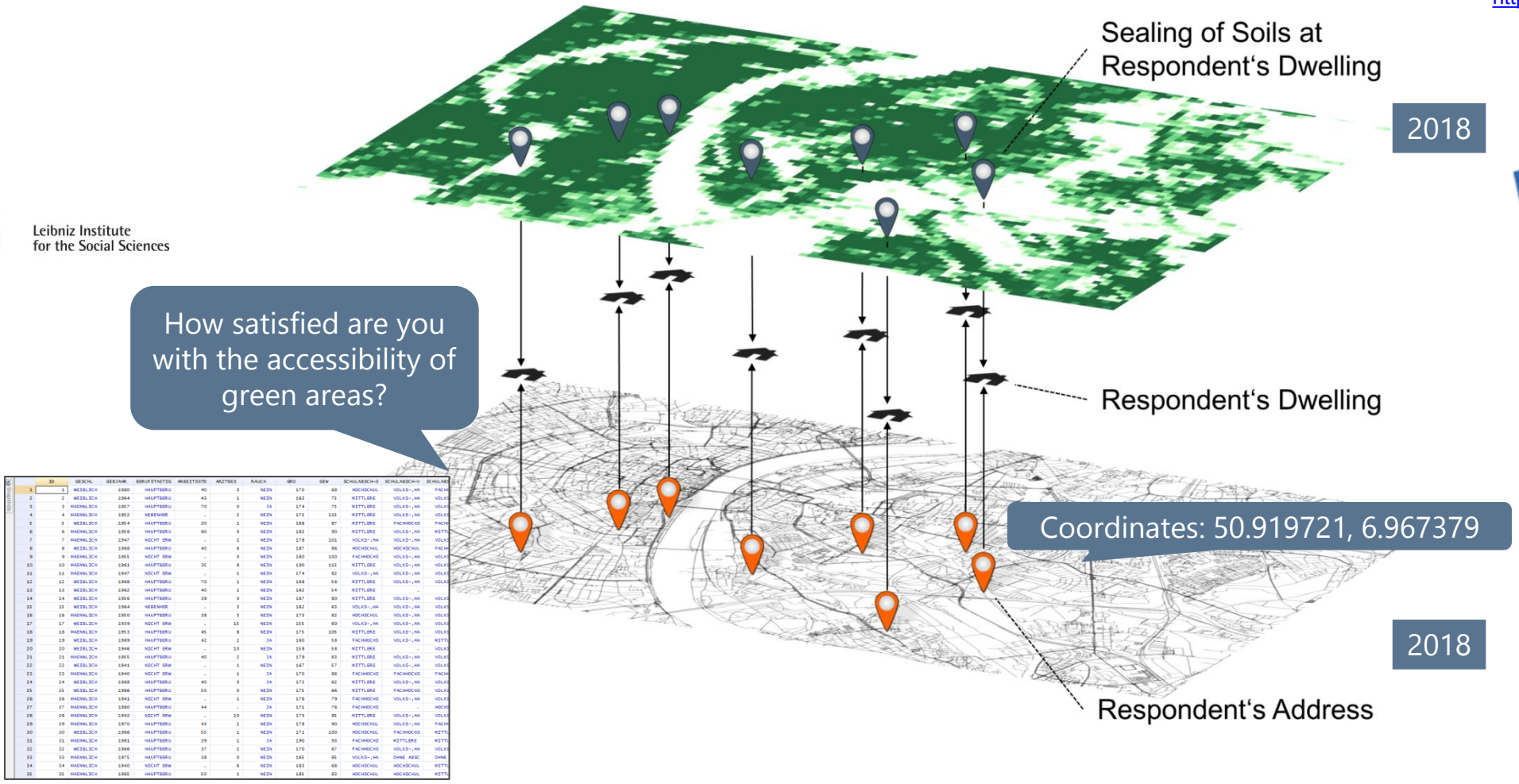


Key Challenges of Implementing Interoperablity

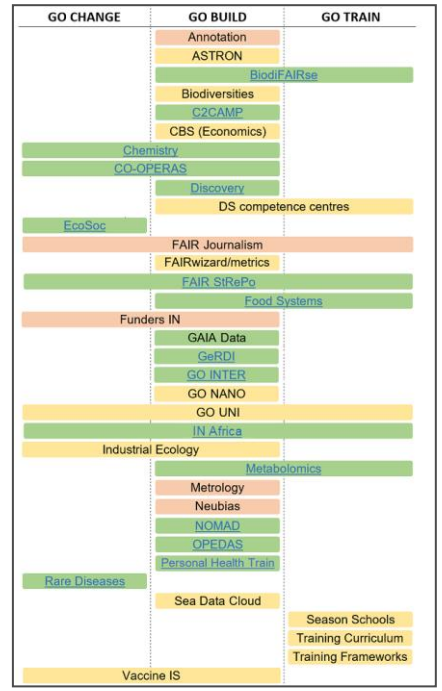
Dagstuhl Perspectives Workshop on „Implementing FAIR Data Infrastructures“ (2018)

Challenge	How to address
Many different layers of interoperability: ranging from encoding up to structural and semantic specification of data	(Cross-)domain specific use cases exploring interoperability could help to better understand these differences
Various metadata standards, data formats, data encoding methods, representation languages; no format validation	Use of standards, semantic technologies for data transformation; registries of schemas and vocabularies; Digital Object concept (RDA) for data organization
Different vocabularies to describe data; semantic interpretation varies substantially	Ontologies lookup services, ontology crosswalks, smart ontology mapping, tools for semantic annotations
Lack of means to link digital objects with operations suitable for their type	Mechanisms to link types of Digital Objects with operations (RDA data type registry)

[Manola/Mutschke/Scherp/Tochtermann/Wittenburg (2019): Implementing FAIR Data Infrastructures. Dagstuhl Perspectives Workshop 18472]

Further issues that have motivated the IN

- Lack of reference infrastructures
  - that fully implement the “*I*” of the FAIR principles
  - that may serves as a guideline for data provider to make their data FAIR
- Disparate communities:
  - open data world (W3C) vs research data world (RDA, DDI)
  - GO Inter as a contribution to close the gap
- Lack of measures to assess interoperability
  - new IN coming up: FAIRwizard/metrics
- Lack of cross-cutting INs:
  - Most INs domain-specific
  - cross-disciplinary perspective strongly required



Objectives of the IN

- To provide a cross-domain interoperability framework consisting of methods, **tools and guidelines for implementing and assessing semantic interoperability** of research data across discipline borders (by building upon existing standards)
- To develop and evaluate reference implementations of interoperability for **real-world cross-domain research uses cases** by broadly applying existing standards, vocabularies and semantics technologies
- To engage with other GO FAIR Implementation Networks and related initiatives to **disseminate and exchange best practice solutions** for cross-domain interoperability
- **Overall goal: to contribute to the establishment of cross-domain infrastructures that build on open standards**

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Main Tasks

- Define **execution plan & roadmap**
- **Review** of existing **technologies and standards**
- Explore **cross-domain use cases** to better understand interoperability
- Provide **mapping services** that guide data providers in bringing (meta)data into common representation formats and in mapping their data to existing vocabularies
- Provide **ontologies lookup services** as gatekeepers across different standards and vocabularies
- Provide **methods for qualified linking and annotating** by broadly applying semantic technologies (ontology crosswalks, cross-ontology linking, use of foundational ontologies)
- Create semantically rich **cross-domain research knowledge graphs** supporting cross-community data search and analysis
- Apply existing or provide **novel measures and gradational maturity models** for assessing cross-domain interoperability (see fairmetrics.org and fairsfair.eu)
- Develop and evaluate **reference implementations** for real-world use cases
- Publish **guidelines** for implementing and assessing cross-domain interoperability

Guiding (Research) Questions

How to operationalize interoperability in a way that facilitates data integration across community boundaries (while at the same time capturing the meaning of data)?

- How can a semantic layer look like that tam the semantic disconnects?
  - Metadata templates (see CEDAR), Mapping services, Ontology services
- How can a data access layer look like that encapsulate the specific data organization level?
  - Digitial Object Interface Protocol (RDA)
- How can linked data best be represented to finally integrate knowledge delivery?
  - Open Research Knowledge Graphs
- How to measure interoperability?
- How should future RDIs look like?

Goal of the workshop

- Review of the Manifesto
- Clarify open issues
- Identify action points
- Identify WGs on action points
- Specify an agenda until end of 2020 (and beyond)
- Specify the mode of operation of the IN
- Identify next steps (until end of the year)

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Thank you!

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