GO FAIR Implementation Network on Cross-Domain Interoperability of Heterogeneous Research Data (GO Inter)

*Peter Mutschke (GESIS)*

GO FAIR Workshop, 15 May 2019, GESIS, Cologne
Domain-specific, disconnected “data silos” most crucial obstacle to Open Science

Widely accepted standards for data representation and linking (see the W3C/RDA standards)

But: data in these silos often described using heterogeneous and often unstandardized metadata and vocabularies which cannot be easily linked with each other

Makes interoperability, discovery and reuse of research data across community borders challenging tasks

Key challenge: complexities of interoperability, whose different layers, ranging from encoding up to structural and semantic specifications of data, are yet to be fully understood

Reference models that guide data providers in how best to represent their data in ways that capture the meaning of the data across study/community borders without information loss extremely rare

Lack of understanding about how best to navigate between different levels of granularity provided in data documentation schemes and how to map between different Knowledge Organisation Systems

Reference models need to be generic enough to be adaptable to different scientific domains, especially when it comes to linking data from different communities
• 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

• To develop and evaluate reference implementations of interoperability for real-world cross-domain research uses case 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
Complete the execution plan & roadmap as part of the process becoming a GO FAIR Implementation Network (within in 6 months after approval)

Review of existing technologies and standards as well as past and ongoing initiatives and projects which address the interoperability aspect of the FAIR principles

Explore cross-domain use cases to better understand differences of interoperability, in particular the different layers of interoperability

Provide assistance services that guide data providers in bringing (meta)data into common representation formats and schemes (such as schema.org, DCAT), in mapping their data to existing vocabularies and in making data available via standard protocols

Provide an ontologies lookup service that work as a gatekeeper across different standards and domains and overcomes incongruences between different vocabularies

Provide models and methods for qualified linking and annotating cross-domain research data by broadly applying existing technologies from the Semantic Web community, such as ontology crosswalks (e.g. LOV), smart ontology mapping, ontology alignment and existing Linked Data compliant semantic annotation services (e.g. B2NOTE)
GO Inter - Primary Tasks (cont.)

- Create semantically rich cross-domain research knowledge graphs that may better support cross-community data search and analysis
- Explore the use of foundational ontologies (namely Unified Foundational Ontology) for providing deep semantic meaning of data and thus improved means for interoperability
- Mechanisms to link Digital Objects with operations suitable for their type (RDA data type registry)
- 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 that link data from different communities, by applying
  - common Web (W3C) standards and technologies
  - solutions proposed by RDA, such as the Digital Object Interface Protocol (DOIP)
- Publish guidelines for implementing and assessing cross-domain interoperability
- Share results with the GO-FAIR community and other related initiatives and networks through common workshops
GO Inter - Consortium

IN contact person: Peter Mutschke (GESIS)

Current Members:
- Atif Latif, Leibniz Information Centre for Economics (ZBW), Kiel, Germany
- Marc Rittberger, German Institute for International Educational Research (DIPF), Frankfurt, Germany
- Gotthard Meinel, Leibniz Institute of Ecological Urban and Regional Development (IOER), Dresden, Germany
- Michael Bosnjak, Leibniz Institute for Psychology Information (ZPID), Trier, Germany
- York Sure-Vetter, Karlsruhe Institute of Technology (KIT), Karlsruhe, Germany
- Andrea Scharnhorst, Kathleen Gregory, Data Archiving and Networked Services (DANS), Den Haag, The Netherlands
- Robert Pergl, Czech Technical University in Prague (CTU), Czech Republic
- Yann le Franc, e-Science Data Factory, Paris, France
- Giancarlo Guizzardi, Free University of Bozen-Bolzano
- Tiago Prince Sales - University of Trento
- Michel Dumontier, Ricardo de Miranda Azevedo, Vincent Emonet, Maastricht University, The Netherlands
- Sören Auer, TIB Hannover, Germany
- Oscar Corcho, Maria Poveda, Madrid University, Spain
- Richard P. Smiraglia, University of Wisconsin-Milwaukee, USA
GO Inter - Use Case Driven

Linking survey data to spatial data (DFG project SoRa)

Sealing of Soils at Respondent’s Dwelling

Coordinates: 50.919721, 6.967379

2018

How satisfied are you with the accessibility of green areas?

Respondent’s Dwelling

Respondent’s Address

Coordinates: 50.919721, 6.967379

2018

http://www.sora-projekt.de/
Thank you!