

# A Framework for Using FAIR Vocabularies in Every-Day Data

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## Abstract

Semantics, i.e. terms and their meaning, can be shared, agreed upon, and used in data to make such data more FAIR, especially in terms of interoperability and reusability. The currently most often used technology for machine-actionable vocabularies of semantic terms are RDF-based ontologies (RDF = the W3C Resource Description Framework). But while the RDF has been around for about 20 years, there is still no broadly known tooling for using ontology terms during routine data entry and design.

To address this problem, we are implementing a data development framework that builds on semantic vocabularies as one of its core elements. This framework will provide a graphical interface where users can build their data (structures) in the form of knowledge graphs, i.e. nodes and edges that correspond to semantic vocabulary terms plus “raw values” (e.g. strings or numbers). This graph data editor will also support tables and forms as more compact graph elements for entity and attribute lists respectively.

In the editor, users will also get development support much like in IDEs (integrated development environments) for programming languages, e.g. by showing vocabulary term annotations on hover, auto-completing graph elements expected with specific terms, or suggesting existing terms and data structures when users are creating their own.

These support features together with the graph data editor will be embedded in the before mentioned data development framework. Within this framework an organization can choose desired ID services (e.g. ORCID, DOI, or in-house databases), set common vocabularies (e.g. QUDT [1] for units or BFO [2] as a top-level ontology), and have a central knowledge graph that all members can contribute to. (Groups of) users will be able to build their own graph data sets using git+GitLab for provenance and project management together with the organization’s ID services and vocabularies.

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## References

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2. Arp, Robert, Barry Smith, and Andrew D. Spear, Building Ontologies With Basic Formal Ontology (Cambridge, MA, 2015; online edn, MIT Press Scholarship Online, 19 May 2016), DOI: [10.7551/mitpress/9780262527811.001.0001](https://doi.org/10.7551/mitpress/9780262527811.001.0001) , accessed: 27 July 2023.