

Enhanced Data Interoperability: Leveraging the Ontology Lookup Service (OLS), and the Ontology Xref Service (OxO)



Challenge

- By 2025, global data creation is projected to grow to more than 180 zettabytes.
- Tackling the journey from raw data to extracting information, developing knowledge, and ultimately applying it in practical applications requires significant effort and expertise to ensure data accessibility.
- Making sense of data and transforming it into meaningful information is a formidable challenge that requires effective utilization of both semantics and ontology to annotate and describe concepts using controlled terminology or ontology standards.
- With ontology, data can be enriched by adding semantics, enabling them to become interoperable and ready to be served back to society and improve the interoperability of information-based R&D activities.
- As the data volume increases, ontologies are constantly evolving, making this approach laborious and difficult to maintain.

Keywords

- # Semantics
- # Interoperability
- # Data visualisation
- # Domain mapping
- # Knowledge recruitment
- # Diseases
- # Phenotypes
- # Information
- # Biomedicine
- # Agritech

Technology (TRL9)

Using open-source ontology services and redeveloping them not only saves time and cost but also proves more efficient than creating local ontology services anew. The Ontology Lookup Service¹ (OLS) is a repository for biological and biomedical ontologies that aims to provide a single point of access to the latest ontology versions. It hosts more than 280 ontologies in a single place. OLS is accessible through its [website](#) as well as programmatically via the OLS API.

To find mappings (or cross-references) between terms from different ontologies, vocabularies and coding standards, we developed the Ontology Xref Service² (OxO). OxO aims to provide simple and convenient access to cross-references and imports mappings from a variety of sources, including the OLS and a subset of mappings provided by the Unified Medical Language System (UMLS). OxO enables you to explore the neighbourhood of a mapping using its distance controller. It also gives you the ability to map related or similar concepts, which is essential for integrating data across multiple ontologies in a given domain. OxO enables interoperability between knowledge resources.

OLS and OxO are constantly developed and maintained by the Samples, Phenotypes and Ontologies Team (SPOT) at EMBL-EBI. The two programs show great versatility as they are broadly applicable and deployable across domains, and they can be easily assembled in a modular workflow.

In addition, the SPOT team provides professional training on OLS and OxO, among other tools. Additionally, they offer education on general topics such as software development and increasing the adoption of processes and products.

Internal EMBLEM Reference

2024-014

Key Inventors

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Applications

- **Pharmacology:** Cross-ontology data integration and exchange / Access to up-to-date ontologies / Methods to produce better semantic products / Ontology-based data integration and analysis / Unifying representation of disease and phenotype from existing public ontologies / Data management and integration / Cross-referencing and mapping of standards/ Facilitating interoperability between knowledge resources / Support for accurate and consistent information exchange, ...
- **Agritech:** Integration of data across multiple ontologies / Enhancing interoperability and data exchange / Cross-referencing and mapping of agricultural terms and concepts / Supporting data-driven decision-making / Development of tailored methods for data integration and management, ...
- **Research:** Ontology-based data integration and analysis / Neighbourhood exploration and mapping of related concepts / Integration of data across multiple ontologies, ...

Software



Benefits

- Facilitate decision-making
- Provide access to diverse data sources across domains
- Streamline and enhance workflow efficiency
- Interoperable: seamlessly integrate with other systems or platforms
- User-friendly
- Easy local setup

Further Reading

[1] Jupp, Simon et al. "A new Ontology Lookup Service at EMBL-EBI." *Workshop on Semantic Web Applications and Tools for Life Sciences (2015)*.

[2] Jupp, Simon et al. "OxO - A Gravy of Ontology Mapping Extracts." *International Conference on Biomedical Ontology (2017)*.

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Intellectual Property

- Know-how based
- Copyright

Commercial Opportunity

We propose a comprehensive toolkit that empowers individuals to conduct queries, perform mapping, and seamlessly integrate open standards into their workflows.

Contact us for a quote. Our services are available to everyone, and we offer special rates for academics and SMEs.

Seeking:

- Development partner
- Commercial partner
- Licensing

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