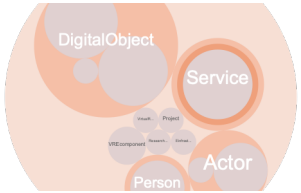
LifeWatch ERIC e-Science for NIS research workshop | 20-21 May 2021

An event organised within the framework of the LifeWatch ERIC Internal Joint Initiative and with the support of the ENVRI-FAIR project

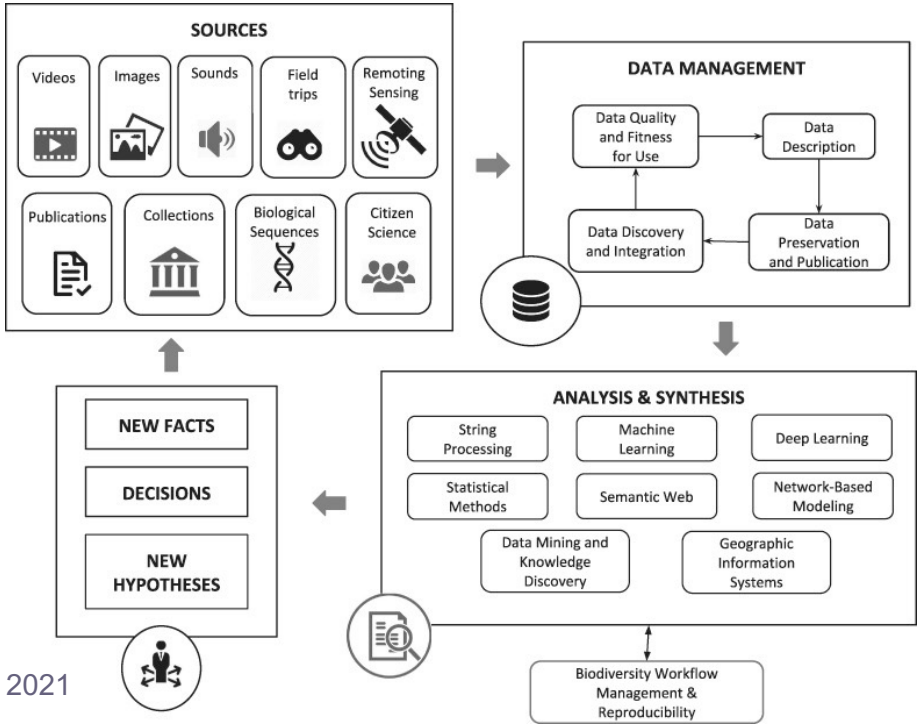
Semantics and Ontologies related technologies



Ilaria Rosati | Italian National Research Council, LifeWatch Italy
Nicola Fiore | LifeWatch ERIC SERVICE CENTRE

Background

Biodiversity and ecosystems data life cycle



Gadelha et al., 2021

Researchers need to effectively discover relevant resources and appropriately integrate these within their research.

Data, Tools & Services:

- Estremely heterogeneous
- Highly dispersed
- Lack or not appropriated documentation

Background

Metadata such as the Ecological Metadata Language or ISO 19115 are important steps for improving the ability to discover, access and re-use of e-science resources but for combining them from different sources there is a need for agreed language to make sure the meaning of data is clear and explicit.

The use of semantic resources (vocabularies & ontologies), giving well defined meaning and understanding, ensure the exchange of information among machines and people.

Formal ONTOLOGIES for capturing the semantics of Ecological Resources

ECOPORTAL

A web-based application for supporting the community in the the creation, management, mapping and alignment of semantic resources in the ecological domain.

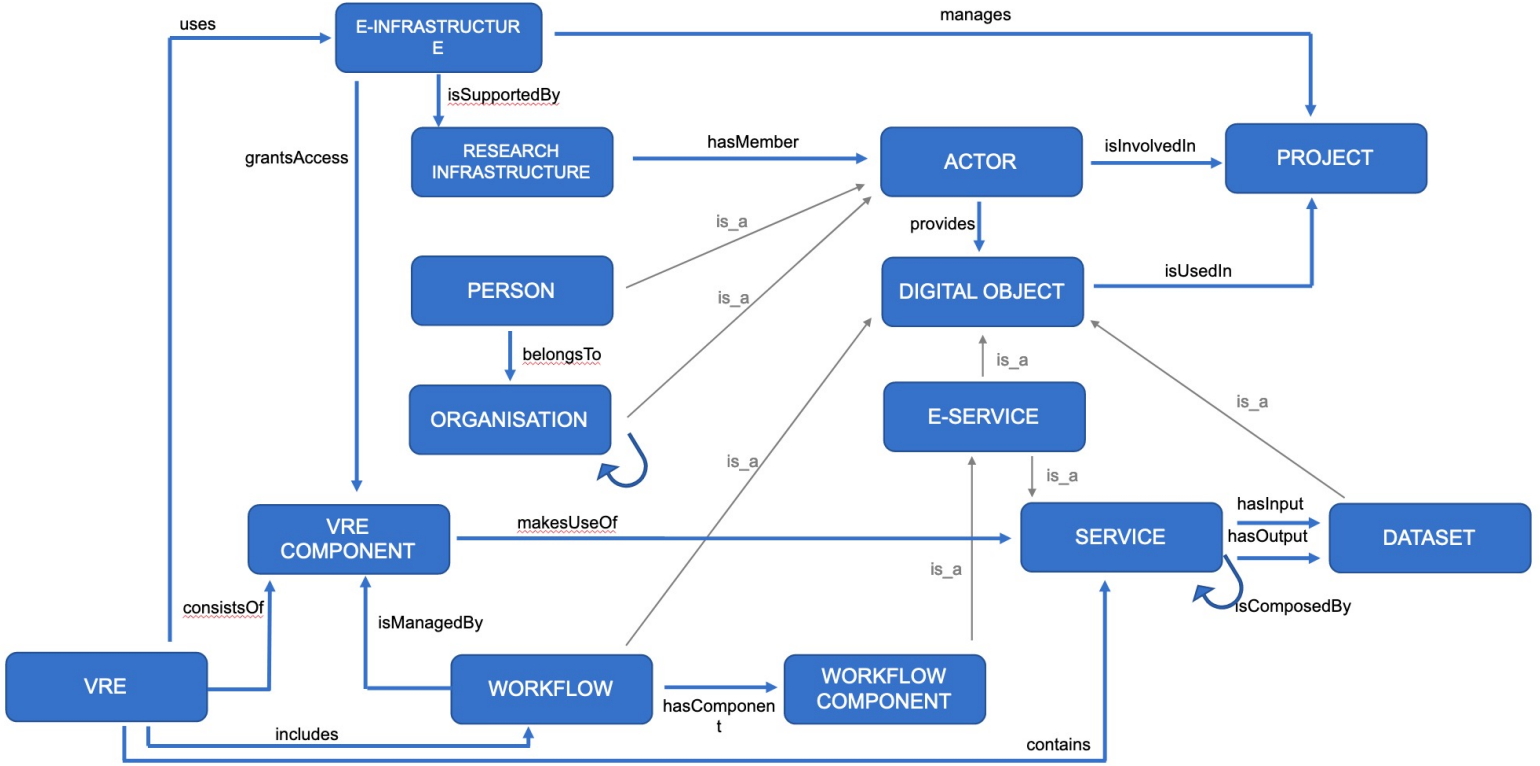
http://ecoportal.lifewatch.eu/

UPPER ONTOLOGY

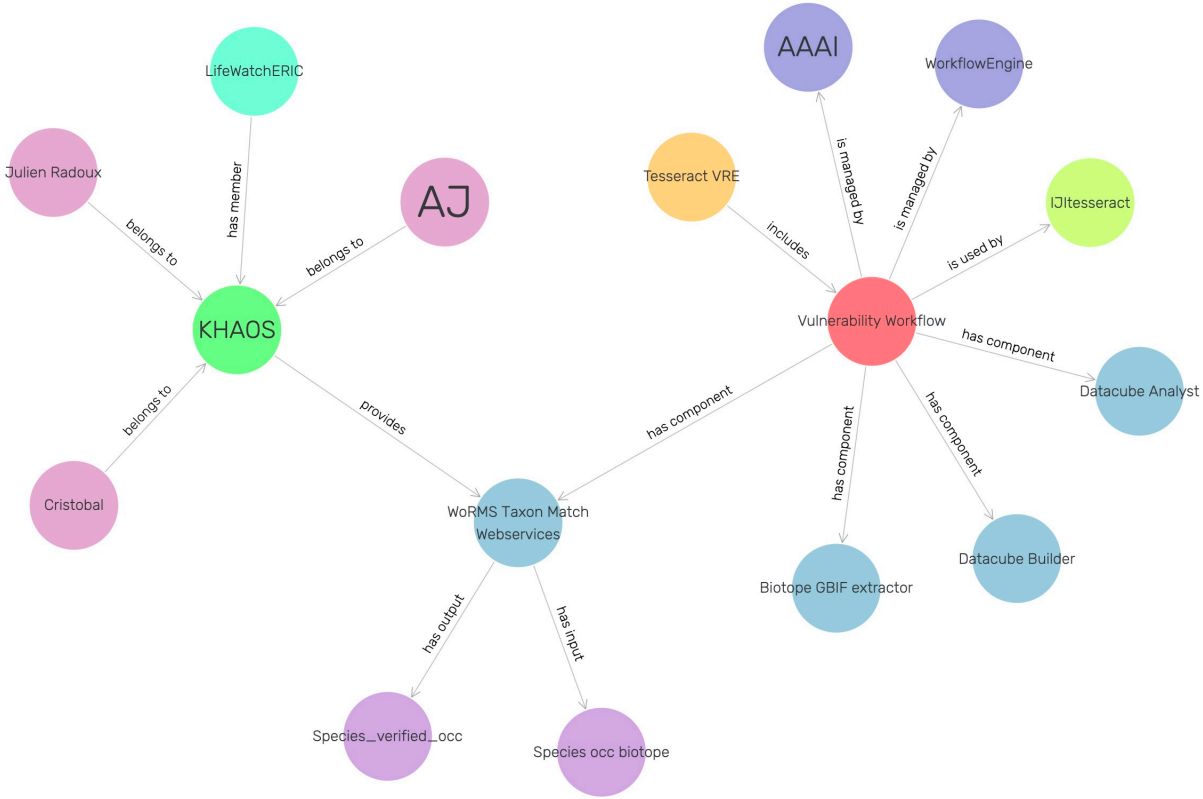
In information science, an **upper ontology** (also known as a **top-level ontology**, **upper model**, or **foundation ontology**) is an ontology which consists of very general terms (such as "object", "property", "relation") that are common across all the Research Infrastructure domains.

The main goal of an upper ontology is to support broad semantic interoperability among a large number of domain-specific ontologies focusing on services, people, data and infrastructure by providing a common starting point for the formulation of definitions.

L.UP.O. – LifeWatch ERIC UPper Ontology



Vulnerability Workflow – Implementation of L.UP.O.



HOW TO USE L.UP.O – QUERYING

```
PREFIX :↔

SELECT ?actor ?p ?component ?contactAt WHERE {
    :VulnerabilityWorkflow rdf:type :Workflow .
    :VulnerabilityWorkflow :hasComponent ?o.
    ?entity rdf:type ?type.
    ?type rdfs:subClassOf :Actor.
    ?entity rdfs:label ?actor.
    ?provides rdf:type owl:ObjectProperty.
    ?provides rdfs:label "provides"@en.
    ?entity ?provides ?o.
    ?provides rdfs:label ?p.
    ?o rdfs:label ?component.
    ?entity :contactAt ?contactAt.
}
```

Submit | Clear | Include inferred: ☑ | Save results as... | Results count: 3 (Done in 401 millisec)

actor	p	component	contactAt
"Julien Radoux"@en	"provides"@en	"Biotope GBIF extractor"@en	"julien.radoux@uclouvain.be"@en
"KHAOS"@en	"provides"@en	"WoRMS Taxon Match Webservices"@en	"jose.aldana@lifewatch.eu"@en
"Heliana Teixeira"@en	"provides"@en	"Biotope GBIF extractor"@en	"heliana.teixeira@ua.pt"@en

HOW TO USE L.UP.O – EXPLORATION

Demo Live

HOW TO USE L.UP.O – NEXT STEPS

- Development of tools for
  - authomatic **triplification** (RDF) of LifeWatch ERIC Metadata Catalogue entries
  - user-friendly **network exploration** and **querying**
  - **reasoning** (e.g. for automatic workflow component configuration, for inference, etc.)

- **Integration** of the semantic tools in the **LifeWatch TESSERACT** User Interface

Thanks for your attention!

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Thanks to all the WG D of TESSERACT team for LUpO.

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