

EGU2020-20708

<https://doi.org/10.5194/egusphere-egu2020-20708>

EGU General Assembly 2020

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ENVRI knowledge base: A community knowledge base for research, innovation and society

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The Horizon 2020 ENVRI-FAIR project brings together 14 European environmental research infrastructures (ENVRI) to develop solutions to improve the FAIRness of their data and services, and eventually to connect the ENVRI community with the European Open Science Cloud (EOSC). It is thus essential to share the reusable solutions while RIs are tackling common challenges in improving their FAIRness, and to continually assess the FAIRness of ENVRI (meta)data services as they are developed.

The FAIRness assessment is, however, far from trivial. On the one hand, the task relies on gathering the required information from RIs, e.g. information about the metadata and data repositories operated by RIs, the kind of metadata standards repositories implement, the use of persistent identifier systems. Such information is gathered using questionnaires whose processing can be time-consuming. On the other hand, to enable efficient querying, processing and analysis, the information needs to be machine-actionable and curated in a knowledge base.

Besides acting as a general resource to learn about RIs, the ENVRI knowledge base (KB) supports RI managers in identifying current gaps in their RI's implementation of the FAIR Data Principles. For instance, a RI manager can interrogate the KB to discover whether a data repository of the RI uses a persistent identifier service or if the repository is certified according to some scheme. Having identified a gap, the KB can support the RI manager in exploring the solutions implemented by other RIs.

By linking questionnaire information to training resources, the KB also supports the discovery of materials that provide hands-on demonstrations for how state-of-the-art technologies can be used and implemented to address FAIR requirements. For instance, if a RI manager discovers that the metadata of one of the RI's repositories does not include machine-readable provenance, the ENVRI KB can inform the manager about available training material demonstrating how the PROV Ontology can be used to implement machine-readable provenance in systems. Such demonstrators can be highly actionable as they can be implemented in Jupyter and executed with services such as mybinder. Thus, the KB can seamlessly integrate the state of FAIR implementation in RIs with actionable training material and is therefore a resource that is expected to contribute substantially to improving ENVRI FAIRness.

The ENVRI KB is implemented using the W3C Recommendations developed within the Semantic Web Activity, specifically RDF, OWL, and SPARQL. To effectively expose its content to RI communities, ranging from scientists to managers, and other stakeholders, the ENVRI-FAIR KB will need a customisable user interface for context-aware information discovery, visualisation, and content update. The current prototype can be accessed: kb.oil-e.net.