

FAIR DIGITAL OBJECTS FORUM

Open FDO Workshop

The EPOS Research Infrastructure

Practical Challenges in Creating an Integrated Dataspace

Daniele Bailo, Jan Michálek (EPOS ERIC)

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This is the link to participate in the online workshop:

<https://us02web.zoom.us/j/3159778742?pwd=QlZPTHU5bWVYNUZHUStaYnNQThhSUT09>

The FDO Forum is happy that Daniele Bailo and Jan Michalák from the EPOS ERIC Research Infrastructure will share their experiences in building a European wide infrastructure that amongst others is working on creating an integrated dataspace for researchers in the field of solid earth science and discuss with us about future perspectives of data infrastructure development.

Motivation

The FDO Forum (FDOF) has as the major topic to develop the FDO specifications and foster their implementation to help enabling the creation of a unified and joint dataspace which should facilitate data sharing and reuse to the benefits of the researchers. Taking a naïve viewpoint, one would assume that for people responsible for the building of “research or data infrastructures (RDI)” FDOs would immediately be welcomed as the standard that would solve all integration problems. Of course, this is not the case. Not surprisingly, the many technological challenges that need to be overcome to stepwise improve data accessibility and reuse bind much person power and require long-term agendas, so that the responsible persons are very careful in jumping on new “technology waves”. Architecture designs which account for the FDO and that are enough general and abstract to allow the RDI implementation in different scenarios, are required. This endeavour has been pursued in research infrastructures such as EPOS, which are highly distributed, with many partners all over Europe and beyond, all of them having their individual technology stack, policies and processes, requiring a lot of synchronisation effort to make new steps. In addition, the available funds for RDI and thus the availability of technological experts are limited.

EPOS is an excellent example to understand the challenges in improving data sharing and reuse in detail. Therefore, this workshop is a very good opportunity to understand the practical challenges and the architectural approach in research infrastructure building and the achieved results in detail on the one hand, and discuss possible future developments on the other hand.

Background

The EPOS project (European Plate Observing System) started in 2009 as one of the first projects in the European ESFRI Program to create a “research infrastructure” to facilitate the work in seismology, vulcanology, geodesy, geodynamics, geomagnetism, and geology across Europe and beyond. Building such a research infrastructure has many different aspects, one of the most important is to create an integrated dataspace and some data services to make data driven science much more efficient. The core challenges along this way were

- to identify potential partners in Europe who are generating and collecting relevant data in solid earth science and build trust relationships,
- to understand the existing solutions within the repositories and already existing sub-communities which built their own dataspace,
- to design an interoperable, scalable and adaptable architecture, accounting for the heterogeneity of data, services, and software from the many available repositories in Europe
- to implement such architecture with a co-development approach across a community of more than 500 experts including scientist, technical people, decision makers and others
- to define a common shell for the RI including a metadata portal to help unlocking much relevant data which is hidden in private servers and idiosyncratic user interfaces,

Speakers



Daniele Bailo (M), born in 1978 in Rome, Italy, holds a graduate degree in Computer Science and Engineering and a Ph.D. in Material Science. His early research (2005–2011) at the Istituto di Struttura della Materia (ISM) - CNR focused on the development of Virtual X-Ray Spectrometry Laboratories, significantly contributing to studies on plastic solar cells, the main topic of his PhD thesis.

Since 2011, Daniele has played a strategic role in the European Plate Observing System (EPOS) at the Istituto Nazionale di Geofisica e Vulcanologia (INGV). As an IT Officer, he has been a key actor in designing and implementing the EPOS Data Infrastructure, coordinating IT strategies, and fostering interoperability across European Research Infrastructures. His work has been instrumental in advancing metadata standards, Virtual Research Environments (VREs), and FAIR/Open Science principles within the geoscience community. His research interests include e-infrastructure management, system interoperability, AI for Geosciences, Generative AI, and Open Science. He is an active contributor to European projects, serves on advisory boards as an ICT specialist, and has authored numerous peer-reviewed scientific publications. His expertise spans system integration, AI-driven research infrastructures, and geoscience data management.



Jan Michálek (M), born in 1982 in former Czechoslovakia, graduated from Applied Geophysics at Charles University in Prague in 2006 and completed his PhD. in seismology (focus on source parameters of small earthquakes) in 2014 while working at Institute of Geophysics of the Czech Academy of Sciences. After that he relocated to University of Bergen, Norway for postdoctoral studies in seismology and since 2016 joined EPOS-related projects there, mostly assisting coordination of integration of individual scientific communities into the EPOS central system and continuing leadership in this role for the several last years. His goal is not only to

connect existing services into the EPOS platform but also to create useful cross-disciplinary case

studies and explore the integration of new tools for enhancing the research and understanding of our planet.

References

Much material can be found on the EPOS website: <https://www.epos-eu.org/>

Responsible

Christine Kirkpatrick, Dimitris Koureas, Sven Bingert, George Strawn, Peter Wittenburg
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