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Sustainable access to data, products, services and software from the European seismological Research Infrastructures: the EPOS TCS Seismology

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Easy, efficient and comprehensive access to data, data products, scientific services and scientific software is a key ingredient in enabling research at the frontiers of science. Organizing this access across the European Research Infrastructures in the field of seismology, so that it best serves user needs, takes advantage of state-of-the-art ICT solutions, provides cross-domain interoperability, and is organizationally and financially sustainable in the long term, is the core challenge of the implementation phase of the Thematic Core Service (TCS) Seismology within the EPOS-IP project.

Building upon the existing European-level infrastructures ORFEUS for seismological waveforms, EMSC for seismological products, and EFEHR for seismological hazard and risk information, and implementing a pilot Computational Earth Science service starting from the results of the VERCE project, the work within the EPOS-IP project focuses on improving and extending the existing services, aligning them with global developments, to at the end produce a well coordinated framework that is technically, organizationally, and financially integrated with the EPOS architecture. This framework needs to respect the roles and responsibilities of the underlying national research infrastructures that are the data owners and main providers of data and products, and allow for active input and feedback from the (scientific) user community. At the same time, it needs to remain flexible enough to cope with unavoidable challenges in the availability of resources and dynamics of contributors.

The technical work during the next years is organized in four areas:
- constructing the next generation software architecture for the European Integrated (waveform) Data Archive EIDA, developing advanced metadata and station information services, fully integrate strong motion waveforms and derived parametric engineering-domain data, and advancing the integration of mobile (temporary) networks and OBS deployments in EIDA;

- further development and expansion of services to access seismological products of scientific interest as provided by the community by implementing a common collection and development (IT) platform, improvements in the earthquake information services e.g. by introducing more robust quality indicators and diversifying collection and dissemination mechanisms, as well as improving historical earthquake data services;

- development of a comprehensive suite of earthquake hazard products, tools, and services harmonized on the European level and available through a common access platform, encompassing information on seismic sources, seismogenic faults, ground-motion prediction equations, geotechnical information, and strong-motion recordings in buildings, together with an interface to earthquake risk;

- a portal implementation of computational seismology tools and services, specifically for seismic waveform propagation in complex 3D media following the results of the VERCE project, and initiating the inclusion of further suitable codes on that portal in discussion with the community, forming the basis of EPOS computational earth science infrastructure.

This will be accompanied by development and implementation of integrated and interoperable metadata structures, adequate and referencable persistent identifiers, and appropriate user access and authorization mechanisms.

Here we present further detail on the work plan with the attempt to foster interaction with the target user community on the spectrum of services as well as on feedback mechanisms and governance.