Module 2: What is European Open Science Cloud?

Introduction

To this day, European researchers are using different infrastructures, such as data repositories and services to manage them. These research infrastructures are not always open to other users or interoperable. For this reason, a lot of data is difficult to find or impossible to access, and there is limited integration of cross-disciplinary data. As a result, a lot of funding and energy is wasted in providing infrastructures and services that tend to be costly, inefficient, and difficult to use.

The European Open Science Cloud (EOSC) is about resolving these issues by unleashing the full potential of European research and science, and building a data and knowledge economy for all. Funded through the Horizon 2020 initiative, with 40 countries involved, the EOSC offers 1.7 million European researchers and 70 million students and professionals in science, technology, the humanities and social sciences a virtual environment with open and seamless services for storage, management, analysis and re-use of research data.

Tangible benefits

Thanks to the EOSC, researchers will soon have a range of innovative services just a few clicks away, sparing them buying expensive machines or hiring technicians. As a one-stop-shop, the EOSC will be the place for researchers to manage the flow of data throughout the entire process that it undergoes from the first touchpoint to the last. They will also be able to upload their data or work with the existing data in a much more integrated and simplified way.

The EOSC will also open opportunities to use and reuse cross-disciplinary data more effectively. While humans are good at working with cross-disciplinary data, artificial intelligence and supercomputing offer even more in terms of finding new insights and making groundbreaking discoveries. For instance, different to today's common practice, in future PhD theses, algorithms will generate results with students describing them.

The arrival of the EOSC is inevitable. We must change the way European infrastructures are working now to be competitive. Currently, these infrastructures operate in separate research silos and are poorly coordinated. Thanks to virtual working environments, researchers will be able to run simulations and perform experiments, taking advantage of the multiple EOSC services and infrastructures at hand.

A lot of effort is being put into building the EOSC with Open Science in mind. For instance, services offered through the EOSC can be seen as microservices and micro data, or as Lego pieces, so that researchers can build on existing data, and create new data.

Challenges

Like any other services, the EOSC faces some challenges. Developing common standards and guidelines for a shared virtual working environment and the infrastructures to support it, is

an ongoing process. So, the key challenge is to convince service providers to align their services with the EOSC. Naturally, adjusting and adapting their existing services means more investment and resources will be needed. For researchers, the EOSC will also entail significant changes to how they do research. To make use of the EOSC, they will need to train themselves and be encouraged to use the services as part of routine.

Data and knowledge economy

Not only researchers will reap the benefits from the EOSC. Work is being done to create a European data economy composed of research data and related services. This new economy is expected to generate billions of euros in the near future, raising national budgets and boosting economies. The data industry will be just like any industry, say the automobile or IT industry. That's why so many member states are working hard to create their national infrastructures to be ready to take this opportunity, and to be able to compete with other countries.

End user comes first

Creating awareness and engaging in capacity building around the EOSC, while demonstrating the tangible value for the end user, is key. To be successful and embraced by the public and researchers, the EOSC needs to be straightforward and deliver value to the end user, just like any other service on the market. Therefore, the EOSC is envisioned to become a seamless and integrated set of infrastructures and services for better science; easy to use and free for all researchers and relevant stakeholders.