

Open infrastructures – innovation exploitation

Why do we need e-Infrastructures in building a successful Digital Single Market?

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E-infrastructures have been long recognized as a “crucial asset underpinning European research and innovation policies”¹ and will play a major role in realizing the objectives of the Digital Single Market, boosting innovation and enabling the digital economy.

Open science, data access and reuse: e-Infrastructures are a key driver of the open science agenda. By providing the tools to support digital research and embracing open access policies, they enable scientific enquiry to be freely shared and made public for scrutiny and re-use. Through their geographically distributed nature, e-Infrastructures also facilitate the free movement of data across borders and the development of new services to harness the value of research data coming from multiple scientific fields and countries.

Innovation: e-Infrastructures are innovation catalyzers. By providing opportunities for disciplines from across the spectrum to share data and cross-fertilize ideas, e-Infrastructures encourage innovation and integration of new knowledge from research communities, as well as the vision of open and participatory data-intensive research. They provide common platforms on which users can develop and test new tools, at the same time ensuring some coordination in the development of these solutions. They also allow for public-private forms of partnerships with industry and SMEs which can act either as users or service providers, reaping the fruit of public investment and turning it into growth. Their distributed nature allows innovation to burst, leveraging local partnerships to achieve wider outreach and deployment in an agile way.

Synergies & economies of scale: e-Infrastructures allow for a more efficient use of IT equipment and investment through the creation of a horizontal layer of generic services shared across research infrastructures, instead of having multiple solutions designed in silos. By providing generic services to existing research communities, e-Infrastructures also enable these communities to focus a greater part of their IT effort and investment on services that are discipline-specific, while relying on a robust underlying generic infrastructure thus helping the community keep pace with the accelerated generation of data.

How to leverage the existing European e-Infrastructure basis?

Open Science is a key driver, not only of scientific progress, but also of economic and societal innovation. To harness its full value and reap the fruits of public and private investment, Europe needs to foster an open, collaborative platform for the management, analysis, sharing, reuse and preservation of research data on which innovative services can be developed and delivered. For this, Europe can build on decades of public investment in scientific infrastructures—experimental facilities, networking, high-performance and high-throughput computing, cloud services, scientific software and institutional and community data repositories—by connecting national and international infrastructures and services.

Challenges remain, but they are more ones of policy than technology, of agreement between resource providers, of adoption of common approaches and policies. By involving all the relevant stakeholders who support today’s research—funding agencies, policy makers, research infrastructures, e-Infrastructures, libraries, data providers and service providers—we can significantly impact the way research is done in

¹ European Commission. 2009. ICT Infrastructures for e-Science, COM (2009) 108, p. 2. <http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=CELEX:52009DC0108:EN:NOT>

Europe and will put European research at the forefront of Open Science globally. This is how we can ensure the Digital Single Market fully exploits the potential of innovation through open data and e-Infrastructures.

What actions need to be taken?

Building trust between stakeholders

- Research and ICT need to work together, creating trust in building user-driven services that all stakeholders can commit to.
- We need interactions between Research Infrastructures and e-Infrastructures.
- We need a code of conduct for service providers, establishing common principles agreed upon among all service providers and co-designed with the users.

Promoting interoperability through integration

- Building on the existing e-Infrastructures, we need to implement actions that ensure technical interoperability between all e-Infrastructure components.
- We need to make sure that researchers have seamless access to various distributed resources they need to use in their research.
- We need to build a sustainable horizontal layer of common services.

Fostering free flow of research data across borders and disciplines

- We need a policy framework that supports rather than regulates open science: new ways of exploiting data will boost innovation, startups and jobs.
- We need legislation that supports open science: boosting European competitiveness through research will not happen without modernizing the copyright legislation to enable text and data mining.

Dr. Kimmo Koski has been the Managing Director of the Finnish IT center for science, CSC since August 2004. Prior to his present position, Koski spent 4.5 years in Nokia Research Center and Nokia Technology Platform. Earlier work experience includes 10 years at CSC in various positions and a one-year visiting period in CERN in Switzerland. Koski received his doctorate from Helsinki University of Technology in January 1996. His dissertation was on Metacomputing Technology. During recent years Koski has been active in building European HPC and data infrastructure through chair and vice-chair positions in major EU initiatives, such as PRACE (supercomputing) and EUDAT (data infrastructures). He has also actively participated in data center development including the establishment of the eco-efficient CSC datacenter located in a former paper-mill in Kajaani. In addition to European positions, Koski has been active in building the Nordic collaboration including steering group position in Nordic e-Infrastructure Collaboration (NeIC)..