

e-Infrastructure Commons

The term e-Infrastructure Commons was initially presented in the e-IRG Roadmap 2012¹. According to Wikipedia “Commons” refers to the “resources accessible to all members of a society, including natural materials such as air, water, and a habitable earth”. e-IRG uses the metaphor of the Commons for the e-Infrastructure resources and related services, which among others refer to networking, computing, storage, data and software, along with digital tools and collaboration opportunities. In the e-IRG Roadmap 2012, e-IRG outlines Europe’s need for a single “e-Infrastructure Commons” for knowledge, innovation and science. The e-Infrastructure Commons is the political, technological, and administrative framework for an easy and cost-effective shared use of distributed electronic resources across Europe. **The e-Infrastructure Commons can be defined as an integrated living ecosystem of resources and services that is open, user friendly and accessible to European researchers and scientists, and continuously adapts to the changing requirements of research and science.** The e-IRG Roadmap presents the principles of the framework needed for such an e-Infrastructure Commons.

The internal drivers for the Commons are complementary developments in the different e-Infrastructure components and will result from their various strategic visions. In 2020, the leading edge users of data and their service providers will have met the challenges set in the “Riding the Wave” and “Data Harvest” reports, to develop an international framework for how different research institutes, universities, governments, companies and individuals would interact with their data systems, the so-called Collaborative Data Infrastructure. Further work should lead to the implementation of the central concepts of **a digital science ecosystem, including necessary digital tools and services to discover data and access services with appropriate search facilities, registries and a marketplace, as well as further integrating data sets and manage scientific workflows.**

Breaking through the limitations of today’s separate e-Infrastructure components, services and governance, an “e-Infrastructure Commons” should liberate scientists from the often complex and distracting business of moving, storing and processing data. They need services that are coherent, managed and above all integrated so that they can get on with the business of research and science. However, we must be careful to not become constrained and stifle innovation in the development, provision and use of these services. The idea that there will be just “one way” of supplying or using any service through an “efficient” mandated or “voluntary” monopoly, has to be avoided. It is important that e-Infrastructure providers are encouraged to be open and competitive and above all not “institutionalised”. Having easy and integrated access to a portfolio of services is the way to go. Allowing e-Infrastructures to evolve is important: open competition, collaboration, but also technological bypassing and new distribution concepts of service belong to the 2020 vision as well.

An e-Infrastructure Commons can only be established through a joint and truly common strategic effort between user communities and the organisations involved in the development and operation of e-Infrastructures, both at the national and at the European

¹ http://www.e-irg.eu/images/stories/publ/e-irg_roadmap_2012-final.pdf

level. Striving for a common strategic vision should not become a barrier to continuing innovation and ambition of each of the individual (existing) services as a certain degree of competition helps to ensure high-quality and effective service provision. Many of the barriers towards realising European e-Infrastructure Commons 2020 are structural and organisational, rather than technical, however, heavy involvement is needed from the user communities to ensure alignment between user needs and the developing of the e-Infrastructure. The implementation of such a Commons requires well-defined roles among stakeholders (like user communities, providers of operational services, governments and the EC) and a high degree of collaboration and standardization. The Commons must be flexible and able to change to fulfil the needs by all users of European e-Infrastructures.

e-IRG has made a recommendation towards major e-Infrastructure service providers (namely the GEANT Association, EGI.eu and PRACE AISBL, as well as the emerging data infrastructures, EUDAT and OpenAIRE) that they should think about their role in reference to the three core functions - strategy setting, service provisioning, and innovation- and position themselves accordingly for participation in the foreseen e-Infrastructure Commons 2020.

The e-IRG White Paper 2013² refers to the **key requirements for a future e-Infrastructure Commons ecosystem, which are the integration of e-Infrastructure services and the full interoperability of the underlying e-Infrastructures**. It further outlines the roadblocks and issues on the road to more effective integration of services:

- Lack of “visibility” of e-Infrastructure services, but high awareness by users of borders, interfaces, and technologies of the individual components
- Lack of business models based on secure and sustainable funding streams for the use and innovation of e-Infrastructures
- Integration aspects with private users and private suppliers as a consequence of Horizon2020
- The lack of coherence from the user communities, beyond the well-organized examples, such as CERN and EBI
- Hurdles to access and usage of e-Infrastructures
- Legal issues

According to the White Paper 2013, to achieve this goal of integrated services towards the users, several issues need to be considered:

1. First of all the **users need to become much more directly involved in strategy, coordination and innovation activities in each of the e-Infrastructure components**.
2. Further on **user communities need to be prepared and empowered to pay for e-Infrastructure services**. Only then they will be able to select the best possible providers, including commercial providers. This will not only improve quality and cost for the research users, but also facilitate timely dissemination of innovative services towards a much bigger user base of the society at large. Obviously corresponding business models need to be developed.

² http://www.e-irg.eu/images/stories/dissemination/white-paper_2013.pdf

3. **e-IRG facilitates a platform for strategy alignment and coordination between the various e-Infrastructure components to allow for a sound evolution of the e-Infrastructure ecosystem.** Core functions include:

- a. **Community building, high-level strategy and coordination in Europe:** there is need for user communities to have a voice, set a strategy and come closer to e-Infrastructure providers. Not only the large, advanced and well-organised ones, but also the long tail of science.
- b. **Service provision:** there is a need for a flexible, open, and competitive approach to national, European, and global service provision; with advanced collaboration among the interested public and commercial service providers.
- c. **Innovation:** there is a need for implementation of major innovation projects through the best consortia including e-Infrastructure suppliers, industry, users and academia with a dedicated management structure comprising the partners per project.

A single e-Infrastructure umbrella forum for strategy setting in Europe can thus be developed, coordinated by e-IRG, with sufficient user participation for community building, high-level strategy and coordination for the entire e-Infrastructure. This umbrella-forum should be clearly separated from operational responsibilities.