EGI Input H2020 WP 2018-2010 Consultation

13 May 2016

This document reflects the view on priorities for the e-infrastructure funding programme in H2020 2018-2020 according to the input from the EGI Council, EGI Executive Board and the EGI Community at large.

TABLE OF CONTENT

CHALLENGE 1. Continual support to the operations and maintenance of the service fabric enabling the federation of national e-infrastructures

The e-Infrastructure "commons" services allow the world-wide federation of national and regional e-Infrastructures and are the European "e-Infrastructure backbone" that allows access across national borders, and allow harmonization at European level of ICT service. They are an essential pillar to build the vision of the Open Science Commons. These services need to be of high quality to meet the user expectations. They also need to be persistent and evolve according to the needs of the emerging RIs. They need to be modular in order to be used to federate heterogeneous ICT services like cloud, data management services, data archives, data processing, etc.

Issues:

·   National funding agencies invest in ICT infrastructures primarily intended for national research communities. Incentives are needed at policy and technical level to open up access to national infrastructures for international research groups. Pan-European infrastructures completely rely on the sustainability of system of services that allow their federation at European and international level.

EGI recommends the implementation of a long-term framework (technical and organizational) that ensures the persistency and continued operations of the e-Infrastructure "commons" services and their continuous technical development. Costs should be shared according to an agreed model among all relevant stakeholders: the demand side (user-communities where applicable, and infrastructure operators), the supply side (the service providers), and the funding agencies (member states and the EC). For the efficiency of costs, e-Infrastructures should coordinate the strategy development, operations and share services where applicable.

For a continuous development of the e-infrastructure commons, the "open calls" (or equivalent instrument) is a good mechanism to engage research communities for the definition of new case studies and define/co-develop new capabilities.

EXPECTED IMPACT.
- Alignment of national e-infrastructure strategies
- Persistent backbone of coordinated e-Infrastructure commons services allowing the coordinated federated access to national e-Infrastructures and RIs.

CHALLENGE 2. Operate a federated ecosystem of integrated user and service authentication and authorization services to avoid fragmentation

e-infrastructures have to deal with international user communities with users connected by many different institutions. Distributed user communities accessing federated and distributed service providers need a functional and reliable Authorization and Authentication Infrastructure. Most of the e-infrastructures are providing AAI-like services to their communities, or are in the process of developing such services, often replicating the work already done by other federations..

Building on the results of WP 2016-17 and previous WPs, EGI recommends that an AAI commons infrastructure is implemented and operated providing:
1.   A federation of attribute authorities operated for the user communities to independently maintain the additional attributes necessary to organise the access to the services by the members of their community, integrating with their community-specific information that is released by the respective identity providers. Such attribute authorities must be operated with a guaranteed service level, in terms of security and incident response, to fulfill the policies of the service providers and the European and national laws. The cost of the operation of these services is not negligible and can be reduced with a common provision for all the e-infrastructures.

2. Credential translation services. E-infrastructures use different credential technologies to authenticate users, credential translation services make the credential owned by the users usable in all the e-infrastructures, without the need to request a new credential. These services also spare the e-infrastructures from dealing directly with new types of identity providers increasing the agility to adapt of new requirements.

3. Homeless users IdP. Many projects/infrastructures manage an identity provider where users without credentials can register to access the services. Again this is a very simple requirement, basically without differences among different communities, and still requires a non-negligible effort to be operated fulfilling all the needed operational and legal requirements. A federation of few distributed IdP for this use case can be operated for all the communities and e-infrastructures

EXPECTED IMPACT
- Removing barriers of access to e-Infrastructure services
- All users have access to identity provisioning services
- Credentials are portable across the providers within the e-Infrastructure commons☐
- Managing authentication/authorisation is more user-friendly and adapt to the different levels of assurance needed for the various types of services

CHALLENGE 3. Service provisioning for international research collaborations and RIs

The Research Infrastructures on the ESFRI roadmap are important drivers of the technical advancement of the services provided by the e-Infrastructures, but stronger collaboration is needed between e-Infrastructures and RIs to reach a landscape in which e-Infrastructure services are co-designed and provided in a tailored way for Research Infrastructures and international research communities.

Collaboration between ESFRI and e-Infrastructures is currently sparse and is at different levels of maturity in different countries. The level of involvement of e-infrastructures in INFRADEV-4 proposals in WP 2014-15 is expected to be limited, and insufficient to ensure sufficient level of collaboration.

Issues:
- Lack of trust and coordination between e-Infrastructures and RIs
- Lack of clarity of service offerings to RIs and new communities
- Lack of integrated thinking in RIs concerning uptake and establishment of ICT services
- High-barrier access to e-Infrastructure services by RIs
- Lack of capacity in e-Infrastructures to serve the large number of emerging RIs and new communities

EGI recommends the establishment of "integrating activities" at the European level, involving e-Infrastructures and Research Infrastructures, to

1. interlink e-Infrastructure and RI services and requirements
2. foster the adoption of common interfaces and standards for service interoperability and management, certification of compliance
3. develop joint service strategy and maintain a common service catalogue
4. co-develop new services and customize existing ones,
5. provide low-barrier, harmonised access to e-Infrastructures,

EXPECTED IMPACT
·   Unlocking access to national resources thanks to the expanded networking activity between of e-Infrastructures and RIs
.   Improved clarity and findability of services
·   Availability of e-Infrastructure services for the long-tail of science for users in countries where no national support or roadmap is available, and in general opening up of access to RI and e-infrastructure services to users in other countries that have no service offer nationally.
·   Intensified transnational access to e-infrastructure services international research collaborations and RIs.
·   Removed fragmentation between e-Infrastructures and ESFRI.
.   More efficient usage of resources and funding for service design, development and provisioning in the integrated landscape of e-Infrastructures and RIs.

CHALLENGE 4. Develop skills and human networks through a network of Competency Centres involving expert users, technology providers and service providers

There is an increased need of technical support and education coming from international research communities and different target groups (the long-tail of science, Research Infrastructures, international collaborations and projects, SMEs and industry). These needs are many and diverse and require dedicated effort. In addition, the start of the implementation phase of many Research Infrastructure requires additional support effort to ensure effective knowledge sharing, co-design and reuse of the state-of-the-art technologies and services from e-Infrastructures. Training material that is available on-line needs to be certified and updated, and needs to be available and updated over time. Support activities are today often offered in a fragmented way - with different organizations involved, through different funding programmes, and via non-coordinated projects.

EGI recommends the creation of a network of competency centres providing support, federating distributed skills and knowhow from different stakeholders. The network of centres would be build with a holistic approach to allow e-infrastructure to work together on a combined offering of training and technical support including advanced computing and cloud computing, data management and stewardship services, digital preservation, data management for open access, security (AAI), consultancy and certification on federated service management. Each competence centre can be specialised for a specific scientific disciplinary area, or 'community or practice' and develop and offer training and consultancy services within this context. Having

these centres organised into a network would ensure information and knowledge flow among disciplines, among communities.

EXPECTED IMPACT
·   A larger number of target groups are offered training, data science competencies, technical increased adoption of e-Infrastructure services,
·   All user communities regardless of size have equal opportunities of access to training (long-tail of science, international collaborations, RIs)
·   Lowered barriers in knowledge transfer through one user-facing user support technical front-desk.

CHALLENGE 5. Public European federated cloud and data platform for sharing and scalable access, use and reuse of open and big data and analytics software, providing services for research, higher education and innovators

e-Infrastructures should have a prominent role in promoting innovation by giving access to big research data and open data through a federated cloud infrastructure, that should be open for access to higher education, SMEs and industry to foster the exploitation of these digital assets, and should provide an environment for experimentation and development of innovative applications.

EGI recommends
·   *Use of federated cloud services to foster data science education and professional training*
.   *Selection and adoption of cloud standards for federated hybrid cloud provisioning to different user groups*
.   *Opening of available data, from Government, publicly funded agencies like satellite data and the Copernicus initiative, Science (Open Access and Open Data initiatives), starting from public and managed access data that is commercially viable and/or has great impact on excellent research.*
·   *Legal consultancy for the adoption of contractual and privacy regulations in compliance with the European Data protection directives*
.   *Development of policies for engagement of e-Infrastructures and publicly funded agencies to foster collaboration and innovation in the exploitation of Big Data*
.   *Development of security and access control mechanisms to enhance trust and a culture of data sharing*
·   *Definition of facilitated access policies to this experimental cloud infrastructure for promoting innovation, start-ups and collaboration with the commercial sector.*
·   *Business development including all stakeholders: data providers and the support of data curation, e-Infrastructure providers and research data consumers.*

EXPECTED IMPACT

· Contribution of e-Infrastructures to innovation in Europe
· Publishing and re-use of open data is promoted
. Interaction between publicly funded infrastructure and public agencies and innovative actors is strenghthened
· Data stewardship and its costs can be recovered
· Strengthened collaboration with research initiatives and the commercial sector

CHALLENGE 6. Knowledge transfer and service provisioning for SMEs and industry

SMEs are local, thus wide reach to SMEs can be difficult and very effort intensive. Policies for provisioning of publicly funded services to the commercial sector vary greatly depending on national and institutional regulations.

Leveraging the results of previous work programmes, EGI welcomes the EC initiative in helping e-Infrastructure to develop a network of business relationships with the private sector. The activities that are beneficial include:
· *developing a network with organizations at a European and national level (e.g. Innovation clusters) that allow to reach out many SMEs, organize workshops, create awareness of demand and offer*
· *harmonize policies for commercial exploitation of e-Infrastructure services*
. *joint effort in outreach and marketing to Industry and SMEs*
· *training and education tailored to the needs of SMEs and industry*
· *offering of infrastructure services for research and innovation to create an "innovation space" where SMEs can find open data, computing resource for data re-use, computation and storage services, develop and test innovative services*
. *providing scientific and business innovation support, connecting SMEs with cutting-edge research and helping SMEs go to market*
· *performing market surveys to identify the services with greater exploitation potential and creating a market of services available through the pay for use scheme*

EXPECTED IMPACT
· e-Infrastructures provide innovation spaces for the development of the "big data value chain"
· SMEs and industry benefit from know-how available in the public sector; the barriers for commercial use of e-Infrastructure services are lowered; increased innovation and value generation
· Knowledge transfer to foster innovation in the private sector and development of a pay for use market of on-demand services for SMEs and industry
· Foster innovation and development of a market for e-Infrastructure services
. Foster collaboration among scientific research domain and innovative actors, creating a wider innovation community adding researchers, web-entrepreneurs, startups, SMEs, investors and corporates from different sectors and geographies

.   Exposing startups/SMEs to new markets, cultures and business opportunities

CHALLENGE 7. Continued development of infrastructure platforms and community platforms

Technical products that enable the creation of a pan-European e-Infrastructure platform need to keep abreast of technological development to ensure continued innovation in e-Infrastructure services.

In parallel to this, multidisciplinary research requires data integration of third-party core data resources for downstream analysis and thematic services that provide easy to use environments coupling tools, pipelines, data and analytics services through virtual research environments (VREs). VREs enable the creation of communities of practice, their development and operation needs to be operated and maintained for the benefit of the long tail of science.

EGI recommends that a virtuous cycle of Virtual Research Environments are created, supported and matured into long-term models that ensure the further development of platform-driven and user-driven innovation for enabling excellent science and multidisciplinary research.

EXPECTED IMPACT
.   Innovative e-Infrastructure services
.   Fit-for-purpose tools for the long tail of science and international collaborations that enable the delivery of thematic services
.   Sharing of virtual appliances and community platforms supporting Open Science
.   Increasing number of VREs with long-term operations.

CHALLENGE 8. International e-Infrastructure cooperation to support international research projects and communities

e-infrastructures operating at international level lack a framework for coordinating their efforts in supporting international user communities, this creates a risk of duplication and missed opportunities. Interoperability and federation are discussed in ad-hoc ways to address the needs of specific user groups.

EGI recommends EC support to increase international e-Infrastructure cooperation in activities like outreach, technical support to new emerging international user groups, standardization and interoperability and federation models.

EXPECTED IMPACT
.   Increased international cooperation
.   Increased functional and non-functional interoperability
.   Coordinated efforts in user outreach