E-Infrastructure Commons

INTEGRATED SERVICES VIA INTEROPERABLE E-INFRASTRUCTURES

Arjen van Rijn, e-IRG workshop, Vilnius 4-5 November 2013

SURF

Definitions

e-Infrastructure

An environment to share research and educational resources (e.g. network, computers, storage, software, data) so that these resources can easily be accessed and used by academia, researchers and scientists as required.

e-Infrastructure services

- Access to high-performance computing (supercomputing) and high-throughput computing;
- Access to high end storage for ever increasingly large data sets;
- Advanced networking services to connect computing and storage resources to users and instruments;
- Middleware components to enable the seamless use of the above services, including authentication and authorisation;
- Generic services for research, providing support for research workflows using combinations of the above (virtual research environments)

The objective

Integrated services via interoperable e-Infrastructures

Needed from a users' point of view:

- focus on doing business of science
- avoid spending effort on the requirements to access various services
- increasing importance of
  - (international) research collaboration
  - IT intensive research
  - use of Big Data

Barriers and limitations

National level

- e-Infrastructures evolved along different functional, geographic, and type-of-user dimensions
- often separate organizations for computing, networking, and other e-Infrastructure services
- different funding and governance models

European level

- multiple organizations and projects; difficult to navigate

Issues

- insufficient coordination and integration of existing e-Infrastructures services;
- *legal* issues, created by disparate legal frameworks in different countries;
- limitations on the use of e-Infrastructures by private research;
- lack of “visibility” of e-Infrastructure services,
- high awareness by users of borders, interfaces, and technologies of individual components;
- lack of sustainable funding streams for the use and innovation of e-Infrastructures;
- limited integration with commercial service providers;
- lack of coherence from (most of) the user communities;

Proposed approach

To establish an e-Infrastructure Commons …

- through a joint strategic effort between users and primary strategic actors and suppliers, to attain an ecosystem in which …
- providers have the freedom to innovate and …
- users enjoy the freedom to choose the services they need from a mix of public e-Infrastructure and commercial services

With a clear separation of roles:

1. **Community building, high-level strategy and coordination in Europe:** for each type of e-Infrastructure service, a single coordinating organization with a *central role for user communities*.
2. **Service provision:** flexible, open, and competitive approach to national, European, and global service provision, with collaboration among interested public and commercial service providers.
3. **Innovation:** through major projects in the best consortia including e-Infrastructure suppliers, industry, users and academia .

Role for e-IRG!

Need for an e-Infrastructure umbrella forum

- for community building, high-level strategy setting and coordination for the *entire* e-Infrastructure, where …

- user communities and strategy and coordination bodies for the different parts of the European e-Infrastructure *work together* on a common strategy and …

- address common issues:
  - increasing the *visibility* of e-Infrastructures;
  - making e-Infrastructures relevant to a *wider user base*;
  - resolving the *Digital (e-Infrastructure) Divide*;
  - eliminating *legal and political roadblocks* for exploitation and innovation of e-Infrastructures;
  - promoting the use of sustainable *business models* for e-Infrastructures
  - promoting effective structures for *governance and finance* giving users of all sizes a suitable role;
  - enabling *standardisation* for delivery of end-to-end services across multiple domains and resource types;
  - enabling the development of uniform, federated *authentication and authorisation* mechanisms.

Recommendations (1)

User communities

- Drive the long term *strategy* for their e-Infrastructure needs;
- Use their *purchasing power* to stimulate the development of suitable, effective e-Infrastructure services;
- Participate in the *innovation* of e-Infrastructure services;
- Contribute to *standards*;

European organizations of e-Infrastructures

- Join forces and share their common challenges towards serving the European user communities, *avoiding duplication of efforts* in:
  - Outreach to and involvement of user communities;
  - Services registry, discovery and provisioning;
  - Financial, legal, business development and procurement;

Recommendations (2)

National governments

- Provide a *basic funding* level for their national e-Infrastructure, in particular devoted to its continuous innovation;
- *Empower and fund* their national user communities for the use of e-Infrastructure services, enabling them to influence the development of the national e-Infrastructure;
- Remove existing national regulatory or political constraints for accessing publicly funded e-Infrastructures for private research and public-private research ventures;
- Provide input for the strategy setting and coordination bodies for their national e-Infrastructures;
- Encourage the actors in their national e-Infrastructures to collaborate and join forces with their counterparts in other countries and at EU level

Recommendations (3)

EU: strengthen the actions of the national governments by:

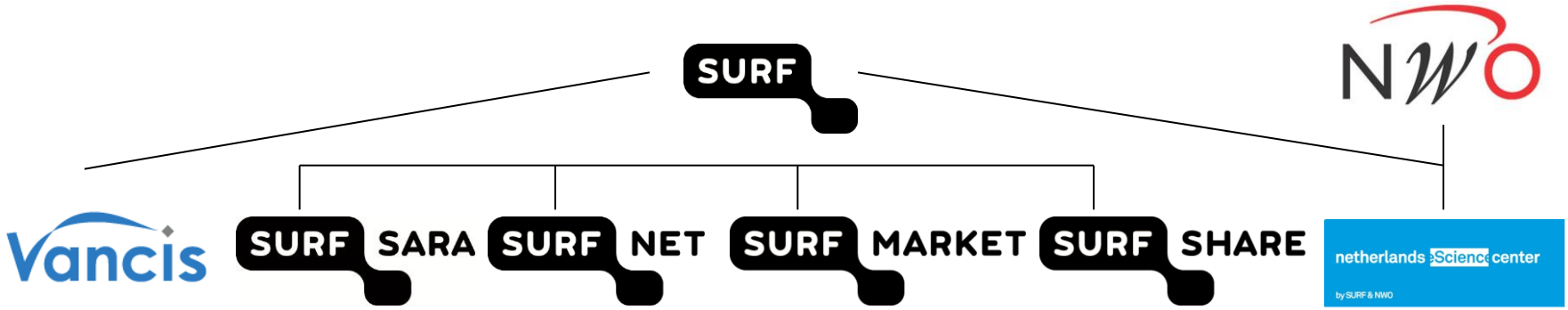
- Establishing a European harmonised framework for the funding of e-Infrastructure innovation;
- Encouraging a sustainable e-Infrastructure offering in Europe through innovation programs (Horizon 2020)
- *Empowering and funding* European user communities, such as the ESFRI projects, to influence the development and use of transnational access to the e-Infrastructure;
- Enabling and promoting the use of Structural Funds for e-Infrastructure development in less favoured areas;
- Providing input for the European strategy setting and coordination bodies and their umbrella forum;
- Striving towards harmonisation to avoid conflicts with existing regulations for a.o. state aid or competition rules;
- Providing clear guidelines for ‘regulation proof’ participation of private research in the use of e-Infrastructure services;

So this is all very nice, but ….

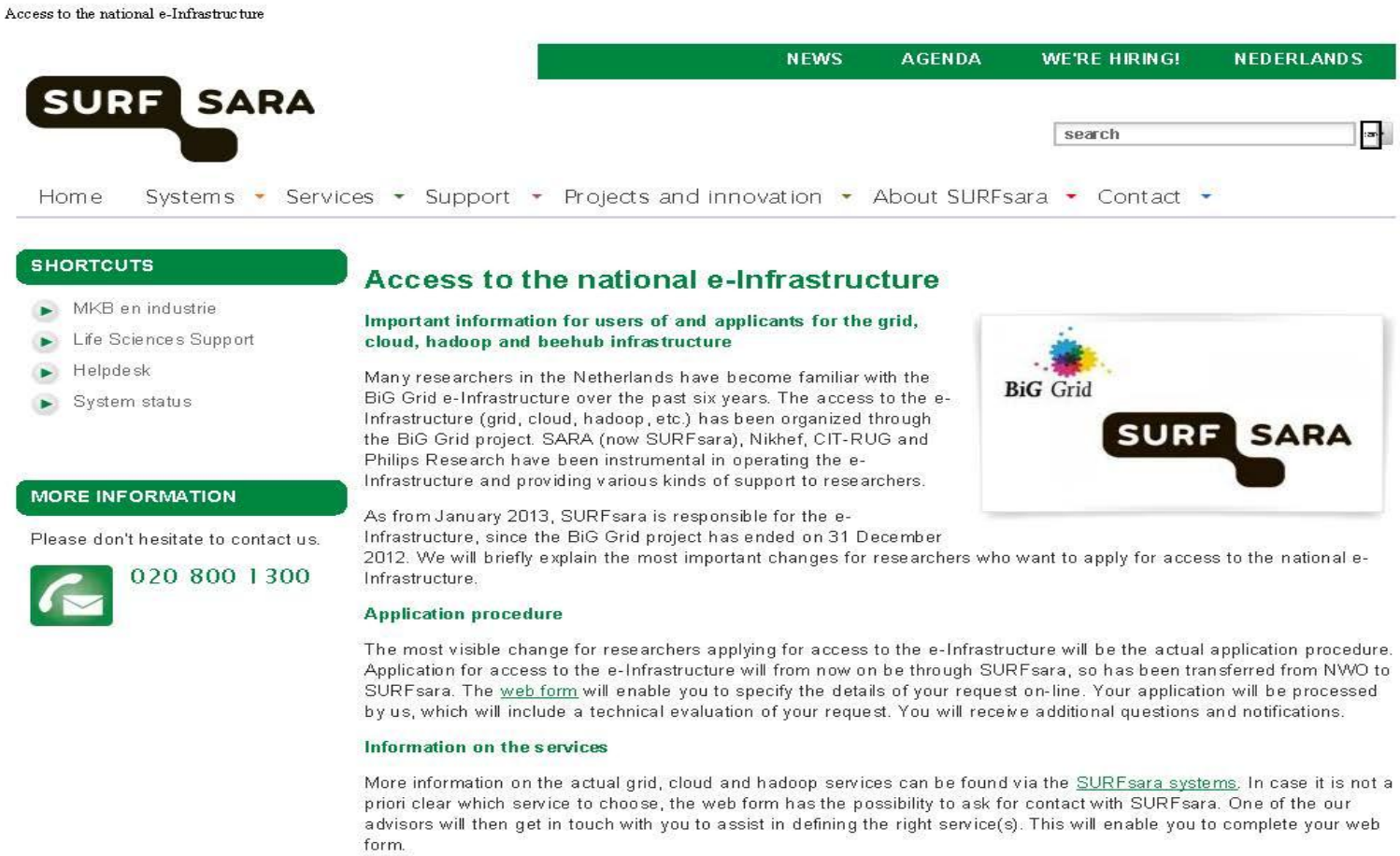
Practice what you preach?

The Dutch context

- e-Infrastructure recognized as essential part of Dutch research landscape (i.e. on the national Roadmap of RIs).
- Structural funding (~ 30 M€/year) available for all components of the e-infrastructure, coordinated by SURF (capability computing, capacity computing and storage, networking, eScience Center).
- Merger SURF – SARA, accomplished, per 1 January 2013.



One stop shop?



A good start, but we're not there yet …

Integration of services?

Some examples

- Biomedical imaging: data from two locations (Rotterdam, Leiden) made available via static light paths, processed on SURFsara's HPC cloud and visualised in Delft via a dynamic light path; one of the winners of the Enlighten Your Research (*EYR*) competition;

- BBMRI-NL: third Regenboog project ("*A nation-wide functional genomics infrastructure enabling mechanistic insights into complex disease phenotypes*"): sequencing data via dynamic light path to SURFsara, processed on the grid, output further analyzed on the HPC Cloud;

- **… still requires quite some dedicated effort …**

Empowering users?

Well, here's something to improve …

- NWO (Dutch national science foundation) website:
  - only HPC (supercomputing) directly accessible under funding instruments;
  - National e-infrastructure not advertized very clearly, e.g. no reference to e-infrastructure in the various investment funding schemes;
- e-Infrastructure is on national 'large RI' Roadmap but did not get funding from it; co-funding for e-infrastructure therefore has to come through granted proposals from user communities;
- No clear implementation (yet) of user community involvement in the SURF family governance;
- Business models and pricing of services: users (at least at the institutional level) quite accustomed to this for networking, but less so for the computing and data area;

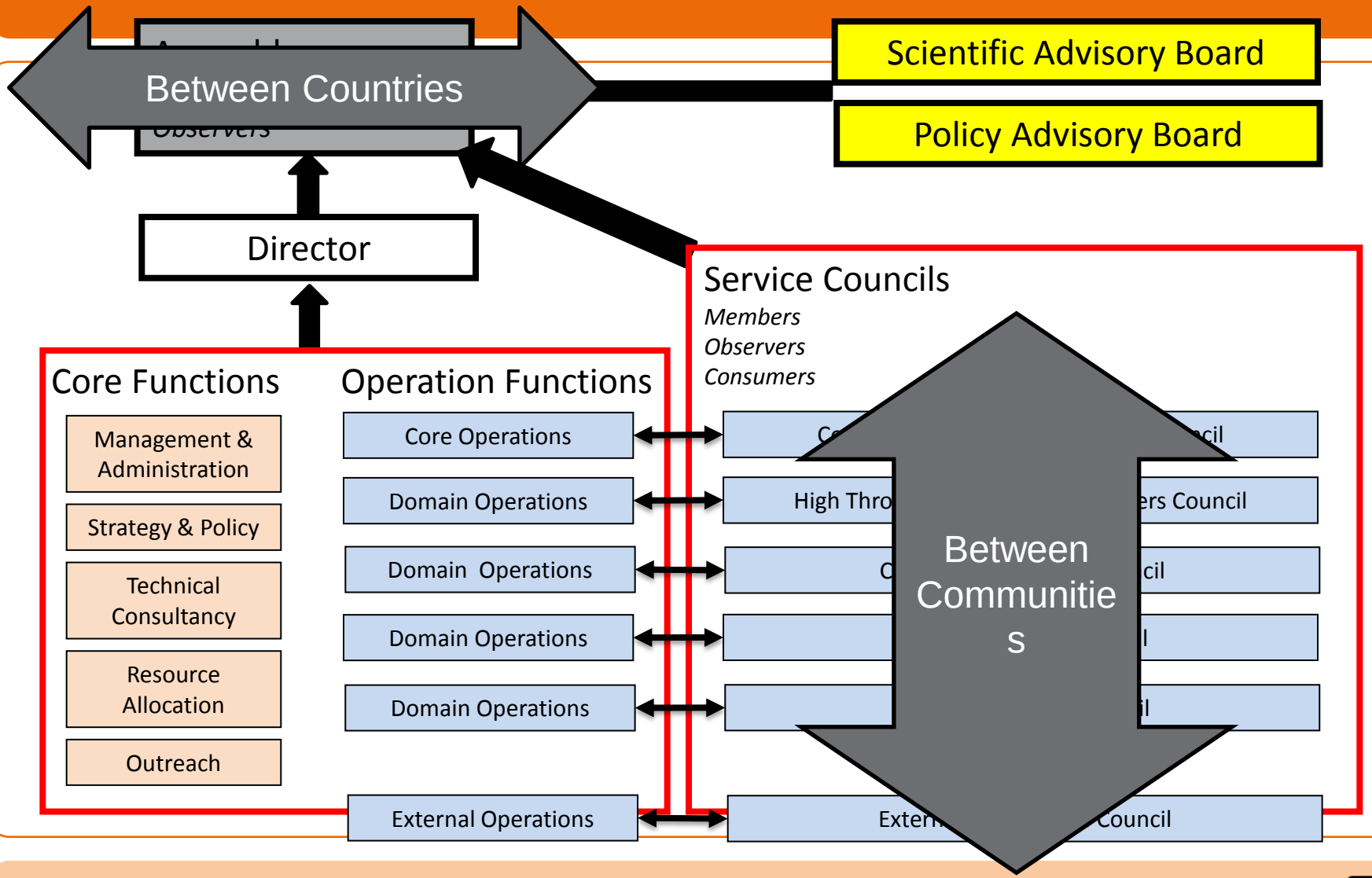
…. I would be interested in best practice examples from others …

By the way … what happened to the idea of a DRI ERIC …?

(next slide courtesy of Steven Newhouse, e-IRG delegate meeting, Amsterdam, December 2012)

DRI ERIC

(https://documents.egi.eu/document/1339)



DRI ERIC

From the EGI InSPIRE June 2013 review report (Jacques Demotes, Mariell Juhlin, **Steve Robertshaw**, Leandro Navarro):

D2.11 EGI.EU TRANSITION PLAN TO E R I C

The thought process described in the discussion contained here, to justify the DRI ERIC is a highly valuable output of EGI-InSPIRE. The strategic thought processes are abundantly clear, very precise, structurally sound, objectively scoped, and ambitiously aimed. From an external point of view, the pursuit of this objective (in all of its detail) is possibly the best possible outcome for the Capacities Area in all of FP7.

Thank you.

ERIC: business model

- **Routine operation funded by consumers**
  - Directly by Research Infrastructures;
    Buying integrated service provision;
  - Indirectly by Researchers in the ERA;
    National funding ensures core integrated services;
  - Directly by the European Commission;
    For providing integrated services;

- **Innovation from within the community**
  - Bottom up innovation publicly funded or bought;
  - Innovation deployed when consumers need it;