

Grid Computing in Germany and the Quest for Sustainability

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Karlsruhe Institute of Technology (North Campus)



Steinbuch Centre for Computing (SCC)

EDG: (research)

„DataGrid is a project funded by European Union. The objective is to build the next generation computing infrastructure providing intensive computation and analysis of shared large-scale databases, from hundreds of TeraBytes to PetaBytes, across widely distributed scientific communities.”

EGEE: (deployment)

„The **EGEE** project brings together experts from more than 50 countries with the common aim of building on recent advances in Grid technology and developing a service Grid infrastructure which is available to scientists 24 hours-a-day. “

EGI: (sustainability) → convergence ???

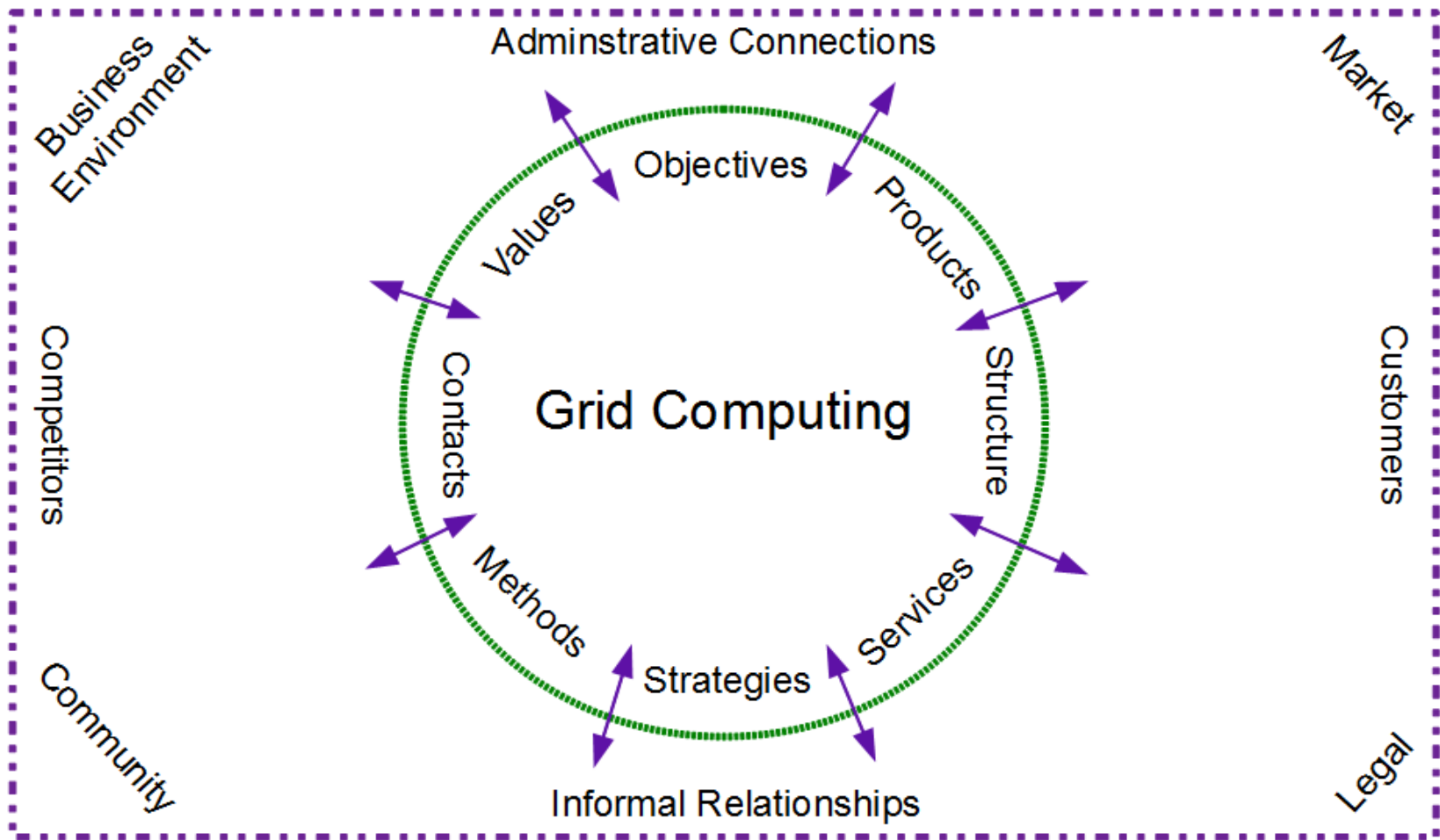
„**EGI.eu** is a foundation established under Dutch law to create and maintain a pan-European Grid Infrastructure (EGI) in collaboration with National Grid Initiatives (NGIs) and European International Research Organisations (EIROs), to guarantee the long-term availability of a generic e-infrastructure for all European research communities and their international collaborators. “

- In Germany:
 - A very diverse set of Grid initiatives
- NGI-DE is the German branch of EGI
 - Partner: KIT (coordination), BADW-LRZ, FZJ, DESY, LUH-RRZN, DFN, FhG, D-Grid GmbH
 - Supported particularly by Gauß-Allianz e.V.
 - Association of large academic compute centers in Germany
 - Has the potential for sustainable deployment of HPC and Grid services

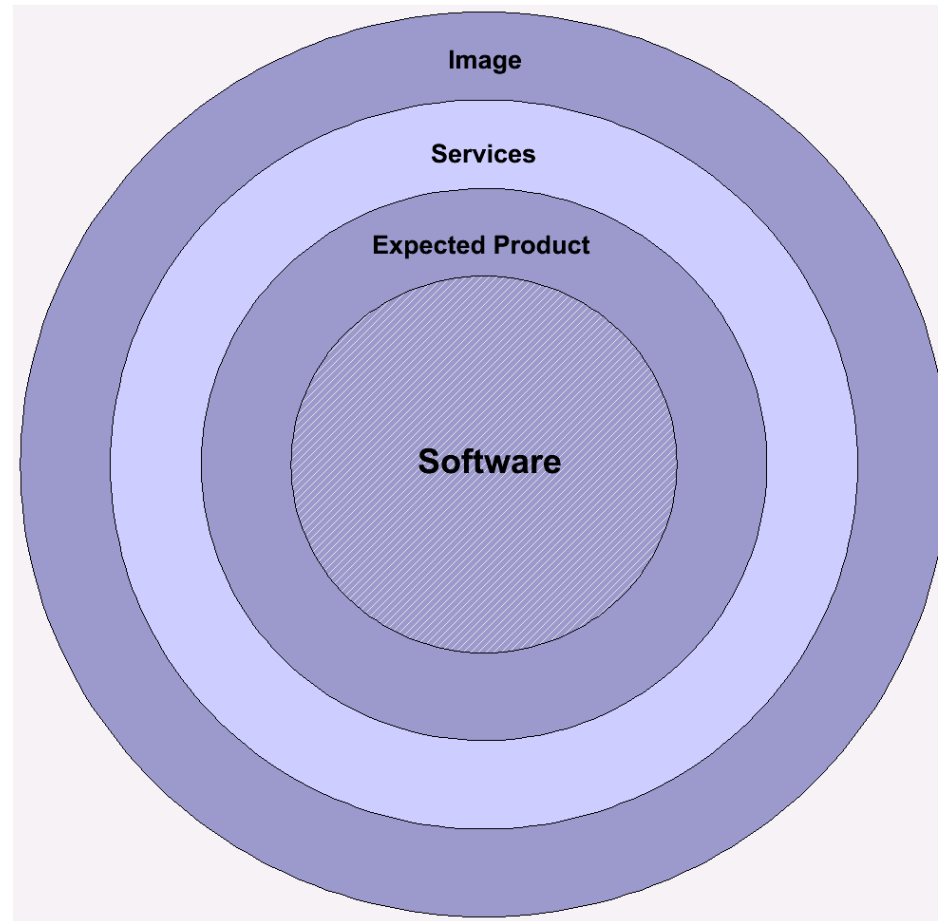
- DGI-2: The „D-Grid Integrationsprojekt“
 - Maintenance and running of the services and infrastructure used by D-Grid communities in 2011/12
 - Adaption of services to requirements, structures and processes of the European Grid Infrastructure (EGI), with the aim of maintaining and establishing interoperability with other European Grid providers
 - Laying the foundations for a sustainable Grid infrastructure as of the end of 2012

- AstroGrid
 - Collaborative research environment for astronomy
- C3-Grid
 - Collaborative Climate Community and Processing Grid
- In-Grid
 - In-Grid will enable engineering projects for Grid-based application and efficient use of common compute and software resources
- Gap-SLC
 - Usage of short-lived certificates in portal-based Grids
- Many more, **very diverse**, past and current projects
 - **Not „just“ High-Energy Physics**

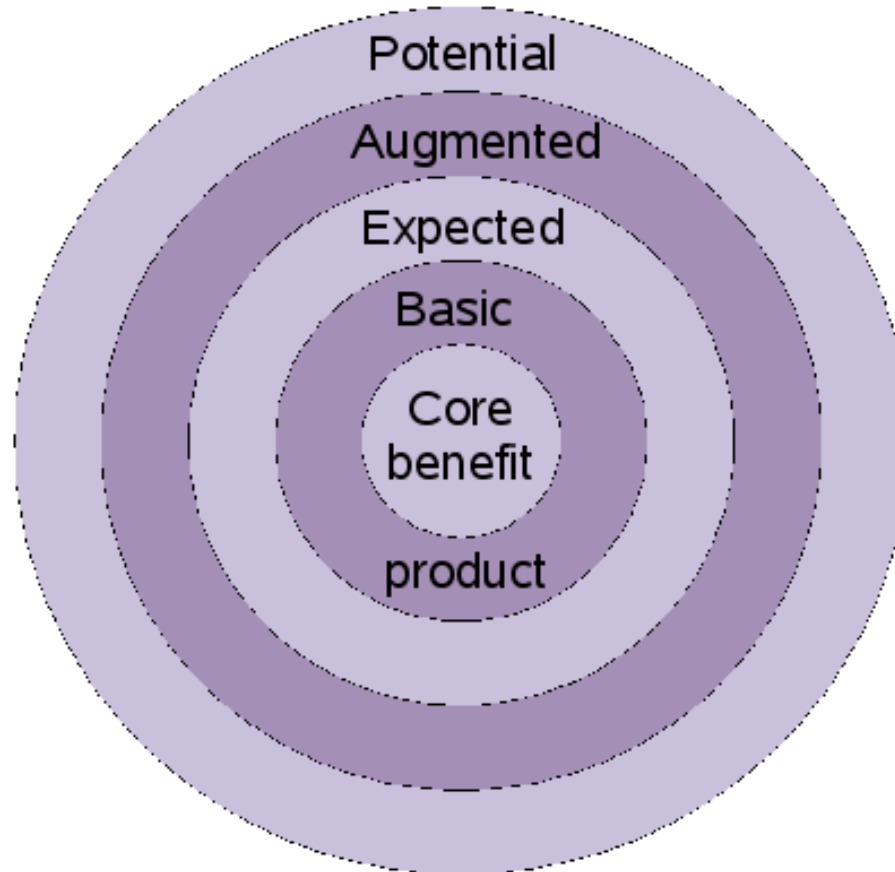
- In the context of DGI-2, currently three middlewares are supported
 - Globus
 - Unicore → convergence ???
 - gLite
- There are services built around these
 - Either in a national or in an international context
- Participating partners provide huge amounts of computing power
- Users have a very diverse set of use-cases and expectations
- Grid „products“ need to cater for these



Adapted from MBA thesis „Open Source and Business: A Contradiction in Terms?“ / Dr. R. Berlich



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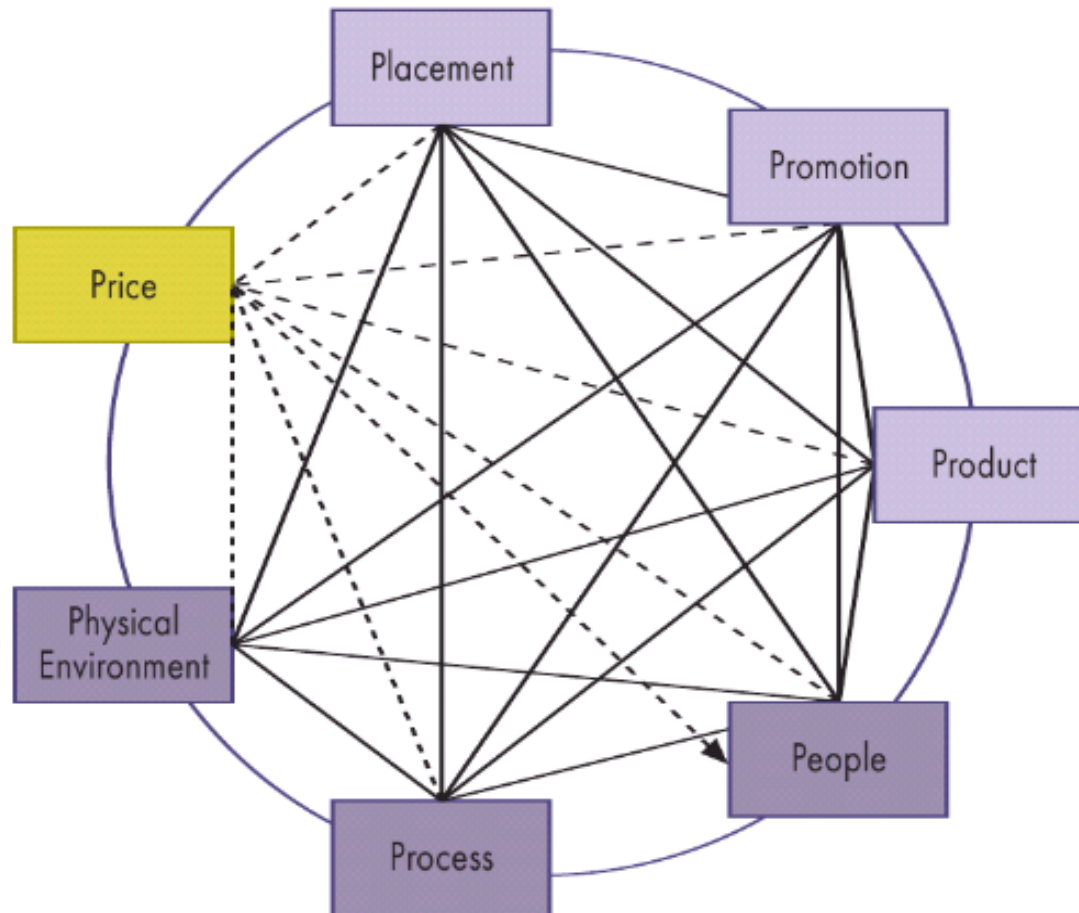
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- DGI-2 partners already run and maintain numerous IT-services, such as networks, HPC-systemes and storage for local, regional, national and international Users
 - This is the foundation on which sustainability can be built
 - Sustainability is more an **integration** than a building effort
 - Central Grid services will become part of the standard offers of participating institutions
- **Need to find suitable „business-models“ around it**
 - Active discussion in the context of EGI and NGI-DE
 - Open Source as *one* incubator
 - Cannot give a recipy

- Taking a „business plan“ approach, central questions need to be asked
 - What is the actual product we are „selling“ and on which we want to base sustainable operation ?
 - Probably the answer is different for each NGI and even each sub-community
 - What is our core product ?
 - Provision of computing resources ?
 - Is the available user base large enough to actually support sustainability ?
 - If not, what do we do in terms of business development ?
 - Where do we want to be in 1, 2, 5 years from now ?
 - What do we *want* to be sustainable ?

- Sustainability means
 - Ensuring the long-term availability of Infrastructure
 - Hardware
 - Software
 - Services
 - Know-How
- Means of ensuring sustainability include
 - Binding man-power and knowledge
 - Identifying funding schemes
 - Identifying new user communities and usage scenarios
- **But in the end:**
 - **We can pay our own bills and maintain our market position**

- Groundwork
 - Need to understand the term Grid Computing in a wider scope
 - **It is the deployment scenarios and applications that define what Grid Computing means**
 - No matter what Grid Computing will be called in 20 years, its deployment scenarios will remain
- Need to build business model on deployment scenarios
 - ***Collaboration as one of Grid's biggest strengths***



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- Grid Computing (in Germany and internationally) has a sizeable user base and uses established technologies
- Grid deployment scenarios will remain (under whatever name), and there already exists a strong foundation for sustainable operation, through the participating organizations
- Sustainability needs to be organized in the form of a business plan, or else ...
- And there are many open questions that remain in this field
- **However: We don't start from scratch. Sustainability is more an „integration“ than a „building“ effort**

Question~~?~~! Questions!

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