A business model approach for a sustainable grid infrastructure in Germany

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Background
• operates the central services of the D-Grid infrastructure requested and needed by the user communities until the end of 2012

• adapts these services to fit the requirements, processes and structures of EGI

• prepares the sustainable operation of the infrastructure and the central services after 2012
Reliable access to and collaborative usage of federated computing resources for and by science and academia

(and maybe later also industry if we can find a way to fit it together)
Business Model – Basics
Assumptions of the business model

- An „enterprise“ (legal entity) runs central services for resource providers and user communities
- Acquiring resources is not the responsibility of the enterprise
- The enterprise coordinates the access to the resources
- Funding for the enterprise must be solid
- There will be no in kind contributions
Enterprise

Resource Centres

VOs

Resource usage

pay for the provider-products of the enterprise

pay for VO-products of the enterprise
Why pay?

• VOs
  – Because the services offered by the enterprise enable regional, national and international collaboration
  – Cost reduction through joint usage of common services

• Resource providers
  – Tasked to do so by their user communities or funders
  – Enabling external usage of their resources
  – Common services across various VOs
• The legal entity can take different forms
  – In the scientific field a public trust or a non-profit organisation is a common legal form
  – In the commercial sector a limited liability Company is a common legal form
  – A third alternative could be the enterprise being a division of an already existing legal entity
Comparison of legal forms

<table>
<thead>
<tr>
<th>LLC</th>
<th>Non-profit organisation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Favoured by legal expert assessment</td>
<td>Membership for resource providers easily possible</td>
</tr>
<tr>
<td>Profit oriented</td>
<td>Supportive society</td>
</tr>
<tr>
<td>Extension towards commercial services easy – this enables synergies</td>
<td>„non-profit“ is quite restrictive</td>
</tr>
<tr>
<td>State subsidies for start-up companies could be tapped</td>
<td>Membership fees tax-exempt</td>
</tr>
<tr>
<td>Offering services to the public Possible cost reduction</td>
<td>Price of services defined on the basis of the share of the overall cost</td>
</tr>
</tbody>
</table>
Business Model - Mechanics
Definition of roles

- Role definition with detailed cost estimations
  - Technical staff
    - Level-1-Technician (Help desk, webmaster, ...) [*]
    - Level-2-Technician (Servers, Grid services,...) [*]
    - Level-3- and Security-Technician [*]
  - Management
    - Managing director [*]
    - Business development; Product development [-]
    - Distribution, Customer relationship [-]
  - Assistance
    - Secretariat [0,5]
    - Customer relationship [-]
    - Administration [0,5]
• Basic services:
  – Common services:
    • Operation and access to central services
      – NGI-DE Helpdesk Portal, GRRS, VOMRS, GOCDB
    • Optional: EGI Membership
  – For resource providers
    • Site certification
    • Maintenance of provider data
    • Security scans
  – For VOs
    • Operation of VO service infrastructure
    • Maintenance of VO data
Arbeitsweise: Produktdefinitionen

• Estimation of the effort needed
  – Which roles are needed for which timeframe
  – e.g. „Running of VO service infrastructure“

<table>
<thead>
<tr>
<th>Per unit man-power usage</th>
<th>Effort per VO per Month</th>
</tr>
</thead>
<tbody>
<tr>
<td>Man-days Level-1 Technician</td>
<td>1,5</td>
</tr>
<tr>
<td>Man-days Level-2 Technician</td>
<td>0,5</td>
</tr>
<tr>
<td>Man-days Level-3 Technician</td>
<td>0</td>
</tr>
<tr>
<td>Man-days Security Expert</td>
<td>0</td>
</tr>
<tr>
<td>Man-days Principal Consultant</td>
<td>0</td>
</tr>
<tr>
<td>Man-days Administrative+Secretary</td>
<td>0</td>
</tr>
</tbody>
</table>

– Operation of the infrastructure
– Software and Hardware upgrades

• Estimation of the „product“ units needed

  – Cost estimation → earnings
  – Fraction of the overall cost → expenditure
  – Estimation of the staff needed (how many, when)
Costs and earnings

- Analysis of the costs
  - For the operation of an office
  - For staff not directly working on operation of services

- Together with the costs for running the services this gives an estimation of the overall cost of the enterprise

- The earnings are the sum of the fees by all the participants (VOs an RP) or from the number of products units sold.

- On the whole this gives us a detailed model of the enterprise, which can be used to make predictions on the sustainability.
Three Scenarios

- **Growth**, Stagnation, Degradation
- Growth also entails increase of # of EGI memberships

**Number of VOs per year**

<table>
<thead>
<tr>
<th>Year</th>
<th>2013</th>
<th>2014</th>
<th>2015</th>
<th>2016</th>
<th>2017</th>
</tr>
</thead>
<tbody>
<tr>
<td>VOs</td>
<td>10</td>
<td>12</td>
<td>14</td>
<td>16</td>
<td>18</td>
</tr>
</tbody>
</table>

**Number of resource providers per year**

<table>
<thead>
<tr>
<th>Year</th>
<th>2013</th>
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<th>2016</th>
<th>2017</th>
</tr>
</thead>
<tbody>
<tr>
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<td>12</td>
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<td>16</td>
<td>18</td>
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</tbody>
</table>
Scenarios

- Three scenarios
  - Growth, Stagnation, **Degradation**
  - Degr. also entails a decline in the # of EGI memberships

**Number of resource providers per year**

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<tr>
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<th>2014</th>
<th>2015</th>
<th>2016</th>
<th>2017</th>
</tr>
</thead>
<tbody>
<tr>
<td>Value</td>
<td>9</td>
<td>8</td>
<td>7</td>
<td>6</td>
<td>5</td>
</tr>
</tbody>
</table>

**Number of VOs per year**

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</table>
• Growth

Number of employees

- Employees with sellable time
- Employees without sellable time
• Degradation

Number of employees

- Employees with sellable time
- Employees without sellable time
• Growth

Costs in 1000 €

<table>
<thead>
<tr>
<th>Year</th>
<th>Costs of employees with sellable time</th>
<th>Costs of employees without sellable time</th>
<th>General Business Costs</th>
</tr>
</thead>
<tbody>
<tr>
<td>2013</td>
<td>350.0</td>
<td>150.0</td>
<td>100.0</td>
</tr>
<tr>
<td>2014</td>
<td>350.0</td>
<td>150.0</td>
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<td>150.0</td>
<td>100.0</td>
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<td>2017</td>
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<td>200.0</td>
<td>100.0</td>
</tr>
</tbody>
</table>
• Degradation

Costs in 1000 €

- Costs of employees with sellable time
- Costs of employees without sellable time
- General Business Costs
Contributions

- Growth

Cost of services per VO in 1000 €

Cost of services per RP in 1000 €
• Degradation

**Cost of services per VO in 1000 €**

- 2013: w/o EGI ~ 25, incl. EGI ~ 35
- 2014: w/o EGI ~ 30, incl. EGI ~ 40
- 2015: w/o EGI ~ 35, incl. EGI ~ 45
- 2016: w/o EGI ~ 40, incl. EGI ~ 50
- 2017: w/o EGI ~ 45, incl. EGI ~ 55

**Cost of services per RP in 1000 €**

- 2013: w/o EGI ~ 10, incl. EGI ~ 15
- 2014: w/o EGI ~ 15, incl. EGI ~ 20
- 2015: w/o EGI ~ 20, incl. EGI ~ 25
- 2016: w/o EGI ~ 25, incl. EGI ~ 30
- 2017: w/o EGI ~ 30, incl. EGI ~ 35
Summary

- The calculations shown only take into account the essential central services.

- Additional services can be added as separate products:
  - The money earned with these services could reduce the fees for the participants.

- The biggest factor in the fees is the number of staff:
  - Staff working on the charged for services dominate this.

- The fees per participant are significantly lower than the cost for 1FTE.

- Everyone would benefit from additional participants.
谢谢