

Interoperability of Virtual Organizations on Complex Semantic Grid

InteliGrid project: lessons learned and future work

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Cracow Grid Workshop 2007, 15-17 October 2007, Cracow, Poland



InteliGrid overview

- vision and context
- architecture
- results

Lessons learned and future work

- grid technology
- semantic technologies
- technology adoption: push vs. pull
- business models
- Conclusions

Content



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Relative influence level of a decision



PM4D Final Report, CIFE Technical Report Number 143, Martin Fischer and Calvin Kam, October 2002

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InteliGrid project: lessons learned and future work

Source:





Source:

M. Hannus & P. Silen, "Islands of Automation", http://cic.vtt.fi/hannus/islands/, 1987, (updated by M. Hannus, 2002)

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Grid

www.InteliGrid.com



Buildig Information Model (BIM)

www.InteliGrid.com

- Addresses the following core assumptions about the building process:
 - Design evolves from the "fuzzy" to the specific.
 - Design is an iterative process.
 - Multiple design variations are created in the early phases of a project.
 - Architects do not want limitations either in the form or the size of the design.
 - Architects would like to spend more time designing and less time documenting.
 - Communication is an essential component of the design process.

Is supported by many software vendors

Interoperability issues

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SMART integration ...





... enables SMART actions ..





.. and different use cases.



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InteliGrid context

European large scale engineering industries

- huge number of experts
- a wide range of software and hardware resources
- dynamic virtual organization
- secure information sharing
- Engineering domains
 - construction
 - automotive
 - shipbuilding

InteliGrid is providing information infrastructure

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InteliGrid technologies



Generic end-user scenario





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Legend:

Domain and Business specific plugins and extensions

Security, AAA and data protection InteliGrid mechanisms

Core InteliGrid middleware services and tools



InteliGrid results

Semantic grid architecture







InteliGrid results

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Semantic grid architecture Ontology framework





InteliGrid results

- Semantic grid architecture
- Ontology framework
- Service
 - OGSA-DAI extensions: WebDAV, PMD, security
 - Open DRMAA Service Provider
 - Ontology services: gridspace, VO, services, resources, business process objects



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- Clients
 - Ontology management

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- Document management

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Grid enabled applications

- EDMmodelServer™
- SOFISTIK



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Technology

- Combining multiple cutting edge technologies
- Stability / standardisation
- Service-oriented architecture
- Ontologies
- Interoperability on data level



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 - End-users involved in technology/system development
 - End-user understanding and acceptance



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- Realization lessons, exploitation, end-user acceptance
 - Collaboration infrastructures
 - Plug-and-play environment
 - Registration of resources
 - Pushing technology

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Requirements: "5S Grid"

security

- industry eager to move to a ground-up secure environment
- simplicity
 - must work seamlessly with current client applications and operating systems

stability & standards

- a need for stable long-term specifications
- scalable service orientation
 - well accepted and known
- semantics
 - must support rich, domain specific semantics



Problems: "5S Grid"

- security
 - dynamic security polices, legal issues
- simplicity
 - SME companies, many without IT departments, push vs. pull
- stability & standards
 - WS vs. Grid services, interoperability
- scalable service orientation
 - see above
- semantics
 - standardisation of domain specific ontologies, taxonomies, classifications, ...



Problems: "5S Grid"

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