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**NESSI-Grid**



⇒ **NESSI-Grid**  
**Vision and Strategic Research Agenda**



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**Introduction & Methodology**

**Vision & Scenarios**

**Challenges**

**Market & Business Indicators**

**Community Involvement**

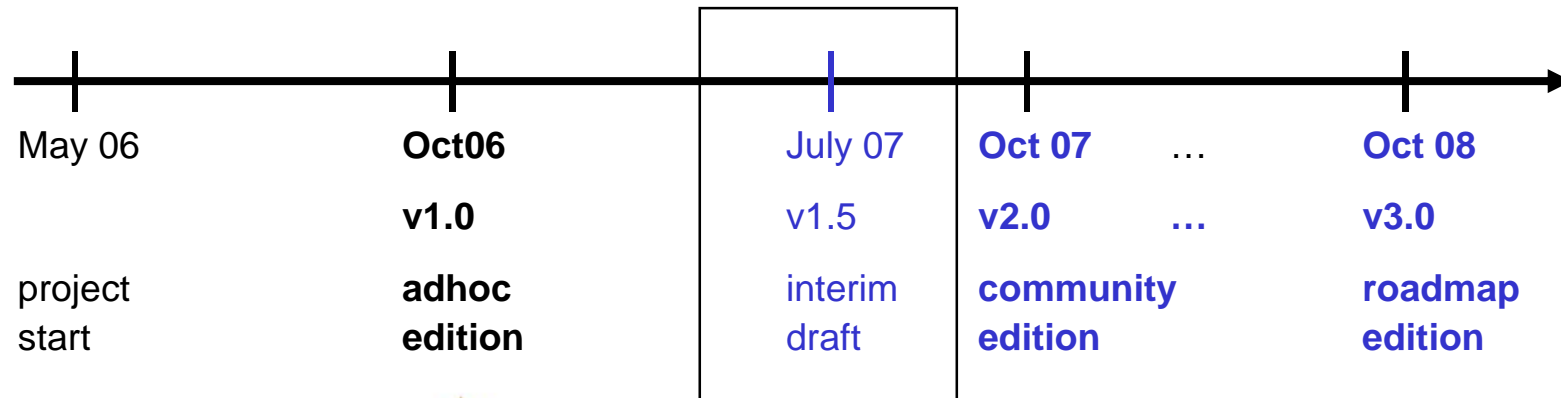
## Goal: A Vision & SRA for

- a grid-like service-oriented infrastructures for business environments and business applications
- leverage vision and technologies of Grid community

## Context: NESSI

- vision of a service-oriented economy
- NESSI scenarios & architecture

## Timeline



### Contributors

- **NESSI-Grid consortium: Telefonica, ATOS, BT, IBM, Nokia Siemens Networks, Thales, INRIA, Engineering, SAP**
- **Ricardo Jimenez-Peris (UPM): Editor-in-chief**
- **Ignacio Martín Llorente (UCM): Grid Community Liaison Coordinator for SOI-NWG**
- **Participants from**
  - **SOI NWG meetings (December 06, June 07)**
  - **NESSI SRA working group (ongoing)**
  - **NESSI-Grid workshops (July 06, September 06)**

## Targeted stakeholders

### Market stakeholders (industry, public sector, academia)

- get a vision of future IT infrastructures & their related business scenarios
- current technologies/challenges
- specific business impact

### Researchers

- get guidance for industry-relevant research topics

### Policy makers & regulatory bodies

- get an understanding of possible areas of influence and anticipated market impact

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## Business Grids

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**the adaptive service-oriented utility infrastructure  
for business applications**

- will become the general ICT backbone in future economies**
- thus achieving profound economic impact**

### **Business Grids - the major ICT infrastructure for the following scenarios:**

- 1. Business Grids - the future ICT backbone for enterprise solutions.**
- 2. Business Grids - support hosting scenarios for small and medium sized enterprises.**

### **By evolving inter-working between administrative domains (supported as part of the infrastructure)**

- 3. Business Grids - the ICT-infrastructure to support service-oriented economies**
- eventually support the emergence of new types of applications.



### ICT layers of existing business solutions

Applications (e.g. collaborative business processes)
Business logic (e.g. business web services)
Middleware (e.g. application server)
Infrastructure (e.g. OS, hardware)

### Business Grids

- target the infrastructure & middleware layer
- solutions might also span across several ICT layers
- follow the paradigm of a Service Oriented Knowledge Utility (SOKU)

### Business Grids follow the SOKU paradigm (service-oriented knowledge utility), i.e.

- are service-oriented
  - dynamic allocation and assembly of resources via infrastructure services
- are knowledge-assisted
  - translating high-level business requirements to infrastructure requirements and infrastructure capabilities vice versa
- act as utility
  - immediately available, dependable usage, predictable

but

- overall SOKU vision goes far beyond infrastructure problems

eScience Grids	Business Grids
<ul style="list-style-type: none"><li>■ focus on specific application areas</li></ul>	<ul style="list-style-type: none"><li>■ general purpose infrastructure for arbitrary business applications</li></ul>
<ul style="list-style-type: none"><li>■ to provide shared access to specialised high performance computing resources or datasets</li></ul>	<ul style="list-style-type: none"><li>■ aimed at providing business flexibility efficiently</li></ul>
<ul style="list-style-type: none"><li>■ independently executing, mostly idempotent batch jobs</li><li>■ jobs often transform immutable flat files</li></ul>	<ul style="list-style-type: none"><li>■ applications involve complex technology stack (e.g. application servers, co-existing applications); often interactive or session-based</li><li>■ jobs heavily use transactional data</li></ul>

### Principles behind this SRA

- *research issues to be derived from business scenarios*
- pragmatic approach
  - starting from today's business challenges
  - stepwise evolution towards long-term vision

### Approach

- provide basic model how resources relate to administrative domains
  - single enterprise, departmental enterprise, virtual organizations
- describe business scenarios via basic model
- specify business requirements
- derive research challenges

## Short-term business scenarios

- *Enterprise*
  - core scenario for traditional infrastructures
- *Hierarchical Enterprise*
  - includes notion of enterprise policy hierarchies
- *Hosting*
  - *special case of enterprise & virtual organisation*

### *Mid- to long-term scenarios*

- *Extended enterprise*
  - includes devices beyond the traditional backend (pervasive, sensors, ...)
- *Dynamic Outsourcing*
  - *dynamic migration of IT resources between administrative domains*
- *Mergers & acquisitions*
  - merge of previously separated administrative domains
- Virtual organizations
  - multi-party (at least 3) collaboration and resource/service sharing
- Business value networks
  - complex chains including multiple providers/administrative domains
- Mega Services
  - services to millions of customers across the globe

## Functional & Commercial Issues

- functional requirements; commercial context of operations

## Dependability

- trustworthiness of a computing system (availability, reliability and safety)

## Security

- separated because of paramount importance in business interactions

## Performance

- system performance and resource usage (efficient, predictable, accountable)

## Interoperability

- inter-working with other systems including legacy systems

## Manageability

- system management & maintenance (easy, transparent, low-cost)

## Governance

- specification and assurance of requirements and policies at various levels

## Flexibility

- capability to react on/implement changed business requirements

## Sustainability

- ability to meet environmental criteria

### Enterprise

- one administrative domain; IT resources centrally managed

### Applied SOKU vision

- IT resources provided as service
- Transparent mapping of business requirements into IT capabilities and vice versa
- operation as utility
- IT becomes an enabler for agile businesses

### Requirements

- Functional & commercial: running IT as a business with reliable & secure management of business data
- Dependability: adjustable availability, balanced with economic costs; autonomic behaviour
- Security: security policies on infrastructure level

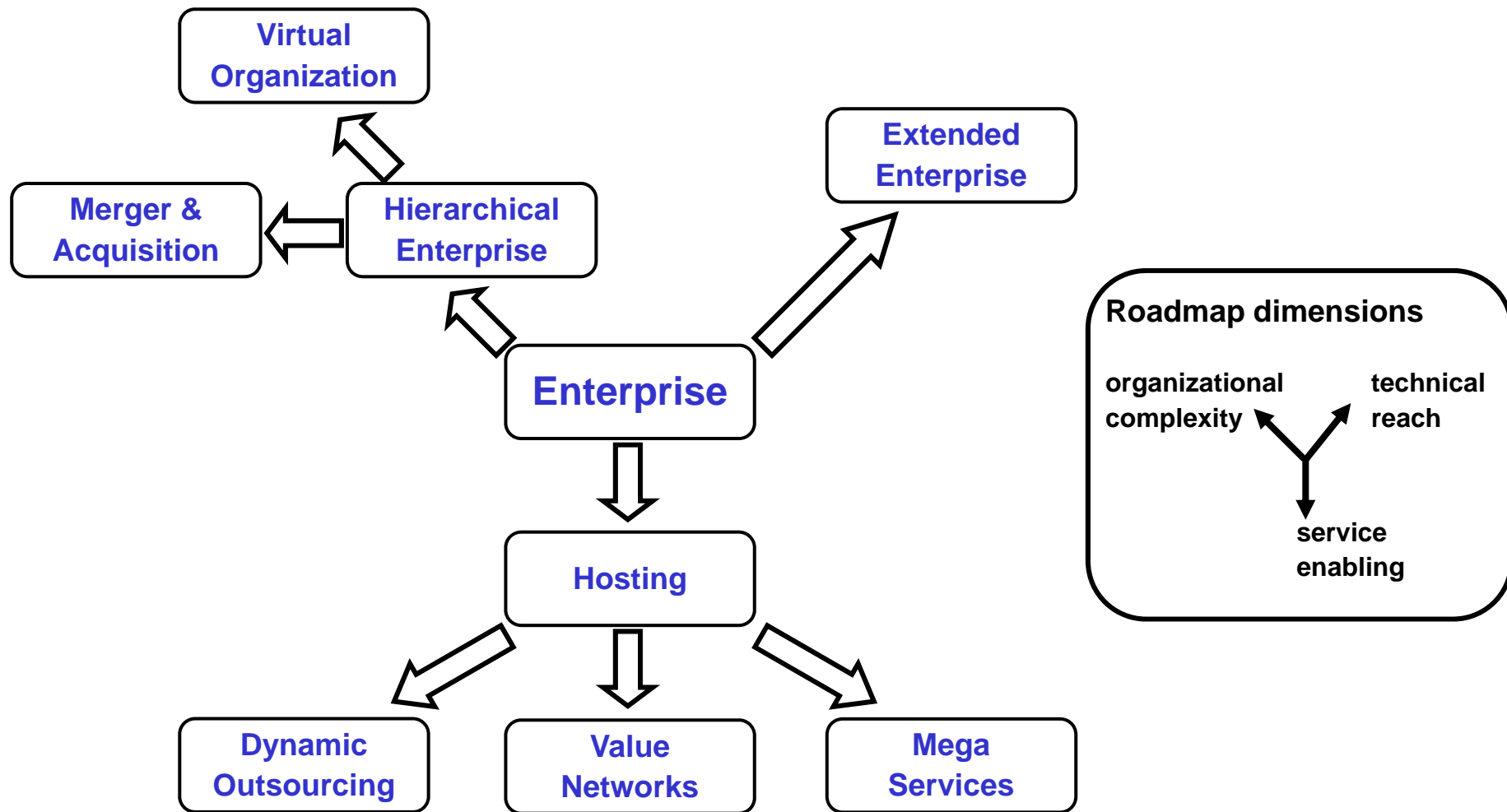


### Enterprise ...

#### Requirements ...

- **Performance:** predictable & accountable
- **Interoperability:** applicable to arbitrary business applications; standards for interoperability
- **Manageability:** homogeneous, low-cost, secure, easy and transparent management
- **Governance:** transparent translation of business requirements and policies
- **Flexibility:** flexible changes of business processes and applications
- **Sustainability:** supporting “green operations”

# Roadmap of business scenarios



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### Methodology

- challenges derived from
  - business scenarios
  - technology trends
  - socio-economic trends
- structured according to assessment categories
  - functional & commercial
  - dependability, security, performance, interoperability, manageability, governance, flexibility
  - fundamental, overarching challenges (derived from business/technology trends)
- traceability
  - established at the granularity of business scenarios & assessment categories

### 3 key challenges for short-term scenarios (enterprise, hierarchical enterprise, hosting)

#### **KC1: Harmonizing traditional grid and virtualization technologies**

- truly interoperable core infrastructures that combine the best of both worlds
- providing strong support for typical business applications while inherently reflecting different organizational structures

#### **KC2: Automated translation of high-level requirements and policies to the infrastructure level**

- relate business value of SLAs & policies to infrastructure properties
- managing IT as a business

#### **KC3: Automated SLA and policy enforcement at infrastructure level**

- reliable and reproducible enforcement
- automation contributes to cost reduction and responsiveness

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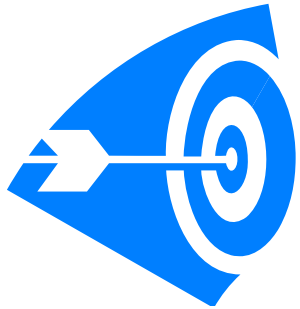
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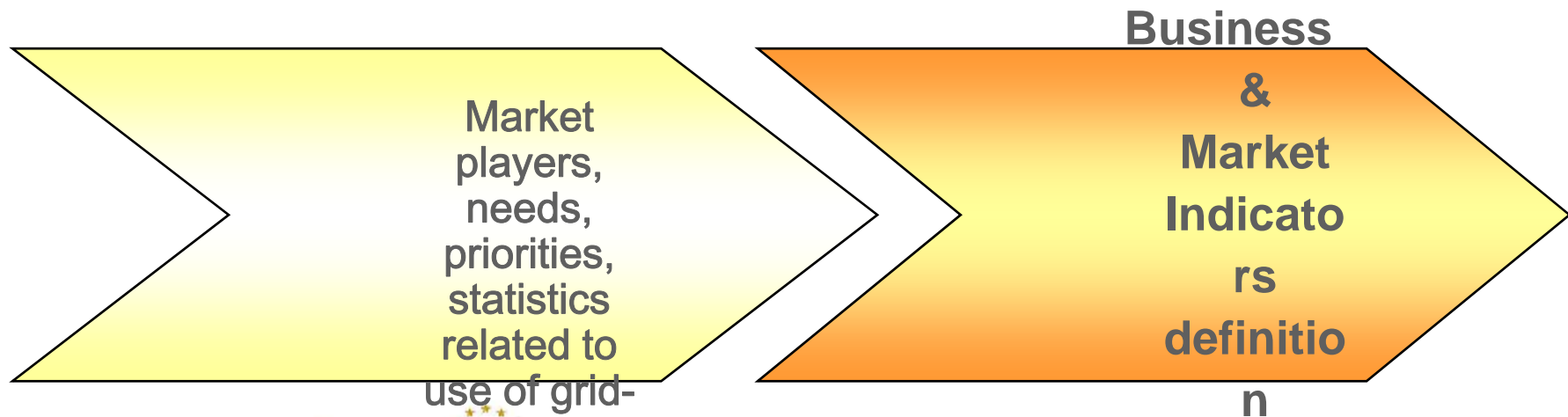


## Objectives



- to define a collection of market and business indicators, related to the Grid field, that:
  - help monitoring the impact of SRA implementation.
    - Use of Grid technologies by target market players
  - help defining the SRA challenges and roadmap

Target market  
Methodology  
definition



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**Involve the community in the edition of the next versions of the SRA for business grids**



**Scope of Research and Development in Business Grids**  
Adaptive service oriented infrastructures to support arbitrary business applications: service computing, utility computing, virtualization, SLAs...



**Instruments for Participation in SRA**  
Open Discussions in SOI-NWG meetings on NESSI-Grid SRA  
Open Participation Process

## Definition of the Relevant Members of the Community

### Grid Experts

- individuals from Industry, Research and Academia with relevant expertise in the Grid Area

### Research Projects

- projects focused on the development of Grid systems and services for business applications

### Infrastructures

- Grid infrastructures supporting applications from the industrial sector and providing a framework in which companies can move ahead with the adoption of Grid technologies

### Middleware Solutions

- Grid technologies providing the technology components required to integrate a Grid solution for business applications

### Grid Experts

- Individual Contribution Model => Form to comment on the SRA (Forms are included in NESSI-Grid SRA document)

### Research Projects

- Research Project Contribution Model => Survey to extract relevant information

### Infrastructures

- Infrastructure Contribution Model => Survey to extract relevant information (SRA page 66)

### Middleware Solutions

- Middleware Solution Contribution Model => Survey to extract relevant information

**The participation is open to any individual or group of interest, without having to register as member of NESSI**

**Valuable contributions will be acknowledged in the SRA**

2007						2008									
Jul	Aug	Sep	Oct	Nov	Dic	Jan	Feb	Mar	Apr	May	Jun	Juy	Aug	Sep	Oct
Contribution to the Second Version of SRA															
												Contribution to the Third Version of SRA			

## Phase A: Design and Development of the Process

- June 21: Open discussion of the draft
- July 5: Incorporation of definitive process in the SRA
- July 15: Release of the draft of second SRA version

## Phase B: Call for Contribution

- July 15 – October 10: Submission period

## Phase C: Analysis of Contributions

- October 1 – October 15: Evaluation and analysis of contributions
- October 31: Release of the second SRA version

### SOI-NWG mailing list

- [wg-service-oriented-infrastructure@nessi-europe.eu](mailto:wg-service-oriented-infrastructure@nessi-europe.eu)
- open discussion on the contents of the SRA
- updates in the SOI-NWG web page

### SOI-NWG web page

- <http://www.soi-nwg.org/>
- describes the open process
- distribution of the SRA and workshop presentations
- dedicated Wiki area

### HERE at EGEE'07

- Contact Ignacio M. Llorente - [llorente@dacya.ucm.es](mailto:llorente@dacya.ucm.es) before October 5, contributions sent with **deadline October 10**

Thank you 

**Thank you!**