

Business Grids

—
the adaptive utility
infrastructure for business
applications

SYSTEMATIC THOUGHT LEADERSHIP FOR INNOVATIVE BUSINESS



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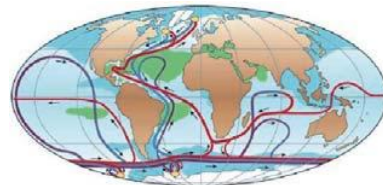
Forum Virtualisierung & Grid Computing
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1. **Grid computing is successful.**
2. But does not suit business applications.
3. Emerging trends call for new infrastructure approaches.
4. Business scenarios have to be clarified.
5. There are big challenges ahead.
6. Summary

Grid computing is successful... ... in Science and Industry



Real-time flood monitoring



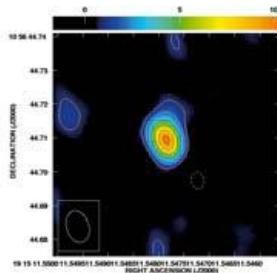
Environment: global warming

High-Tech



Energy

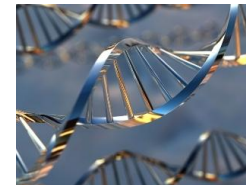
Radio astronomy



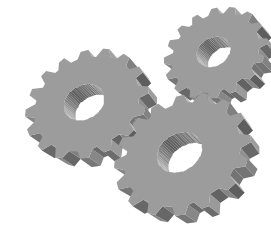
Health: acute inflammation and cholesterol



Bio-Informatics



Automotive



Manufacturing

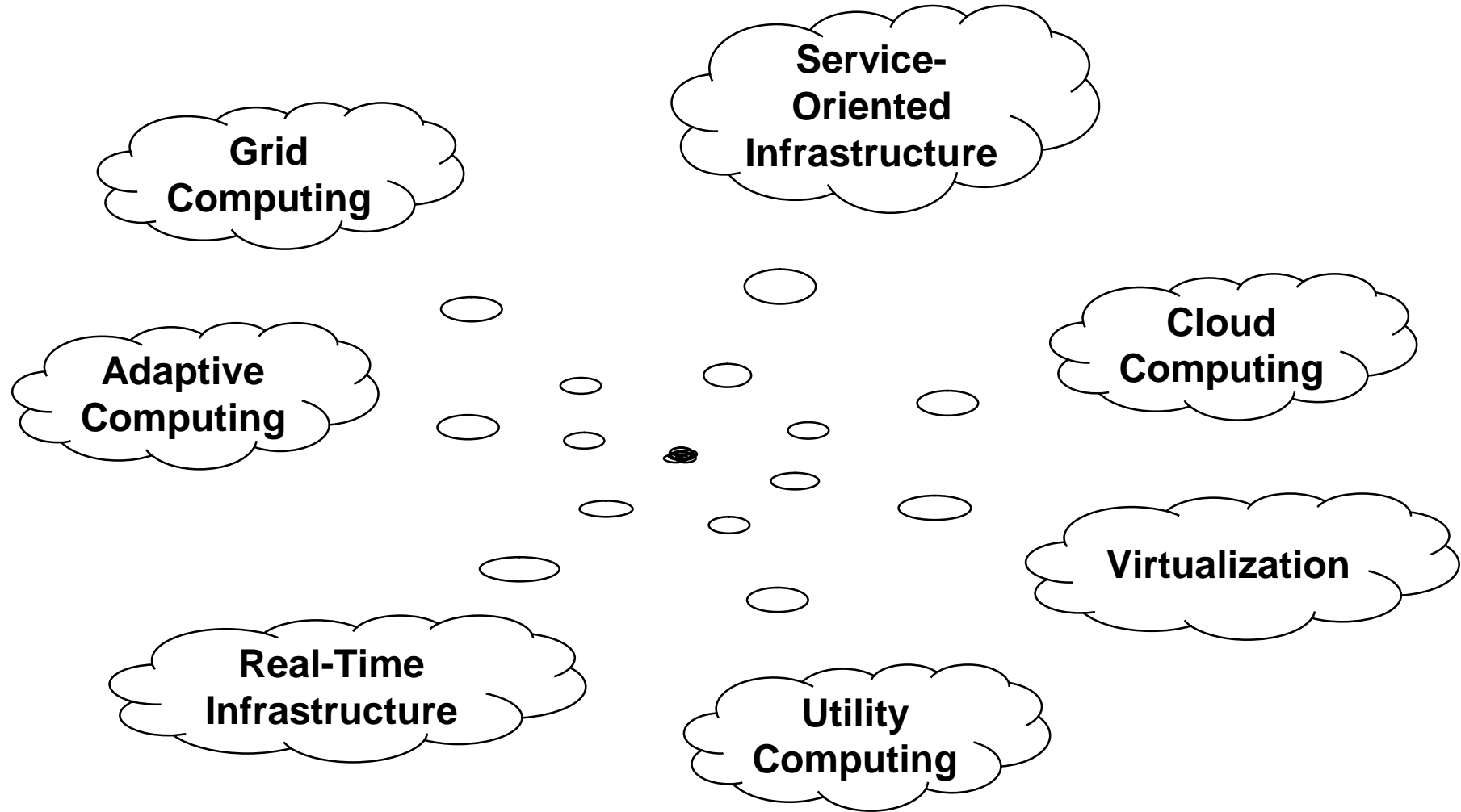
But does not suit business applications



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

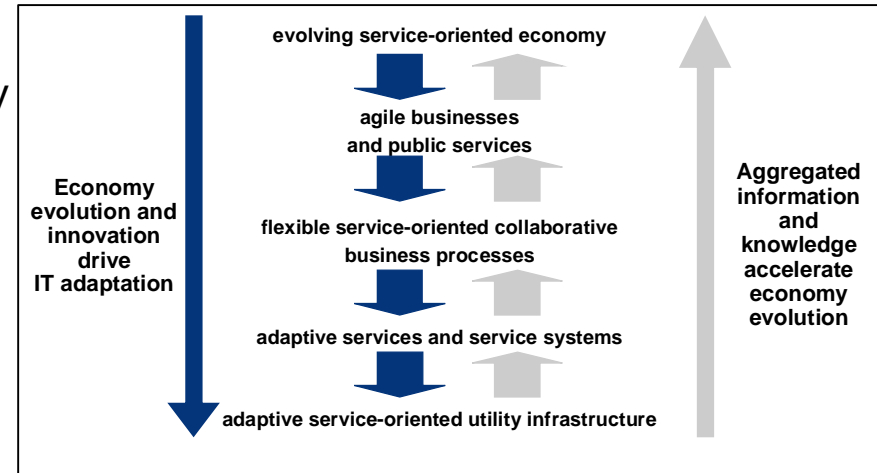
► **poor adoption for business applications**

3. Emerging trends: Related concepts? Is there a common trend?



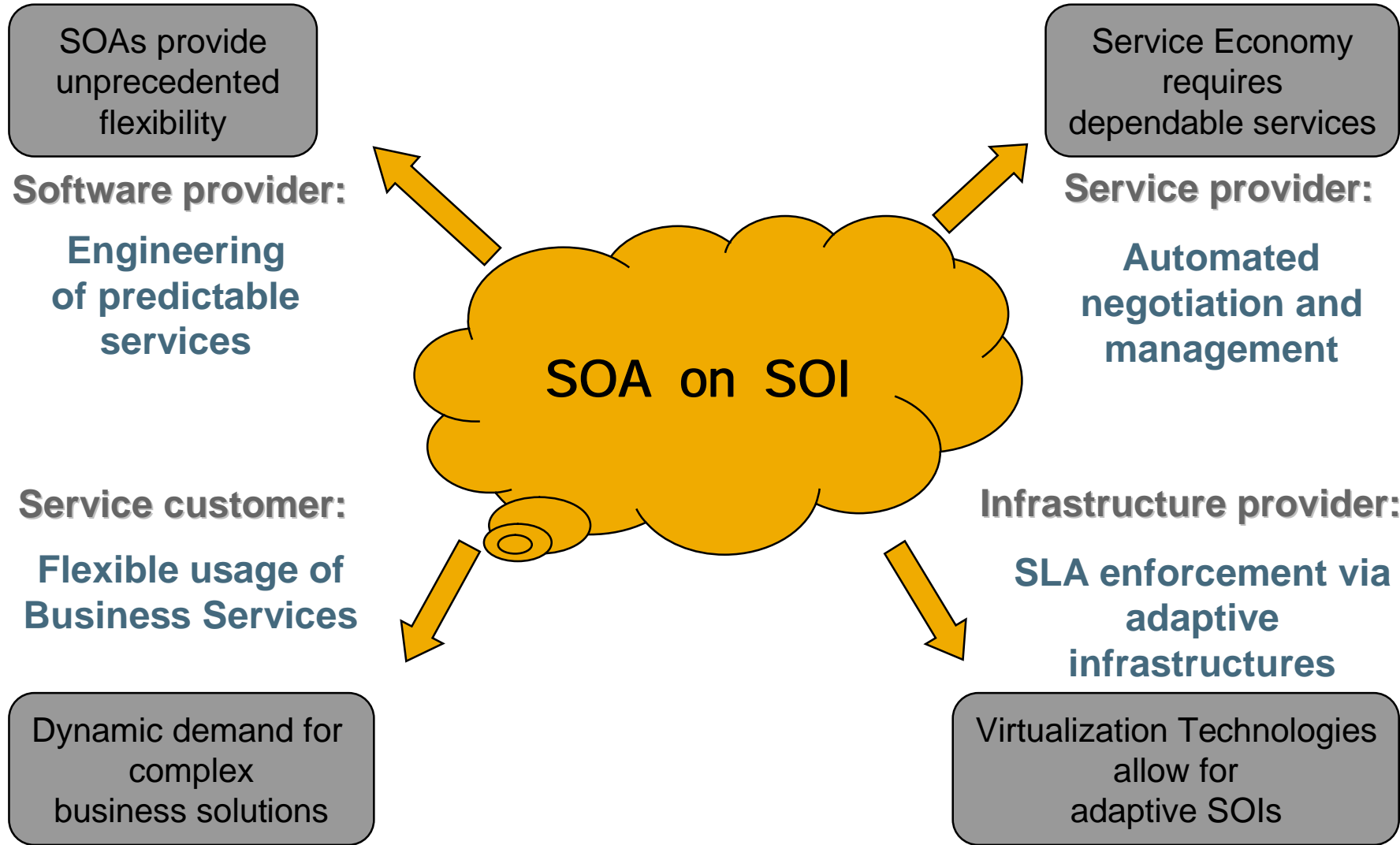
Business trends

- ongoing shift towards service-oriented economy
- agility becomes major competitive factor
- IT becomes a driver



IT trends

- service-orientation reaches global scale
- virtualization technologies allow for flexible resource management
- model-driven technologies address whole system lifecycle





Vision

- A service-oriented utility infrastructure for running adaptive Enterprise Applications in a dependable, efficient and transparent way

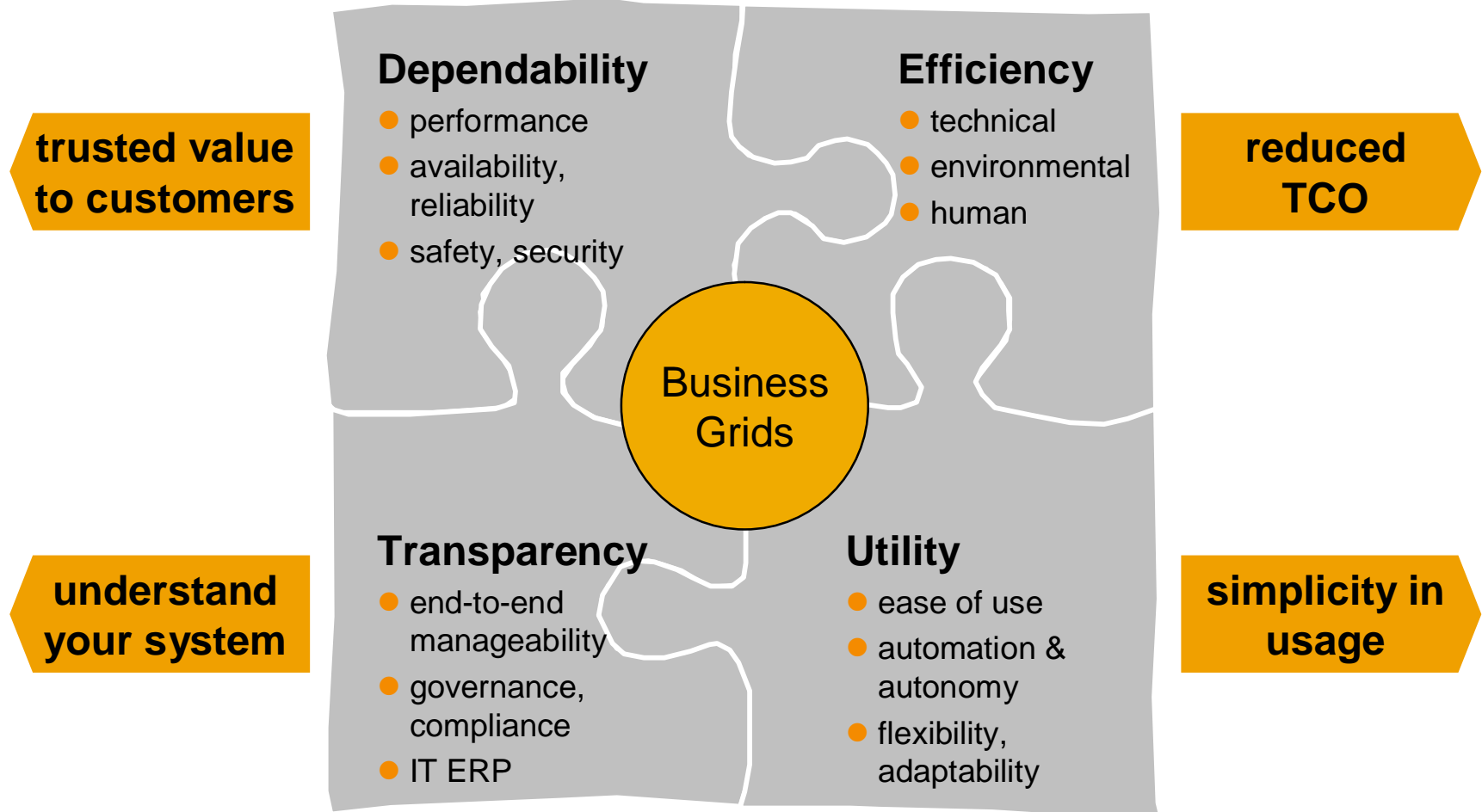
Mission

- Combine Grid, Utility, Enterprise Computing with Model Driven Software Engineering and advanced IT Management Approaches to run service-oriented architectures on system infrastructures with increased flexibility, dependable quality of service and minimized TCO

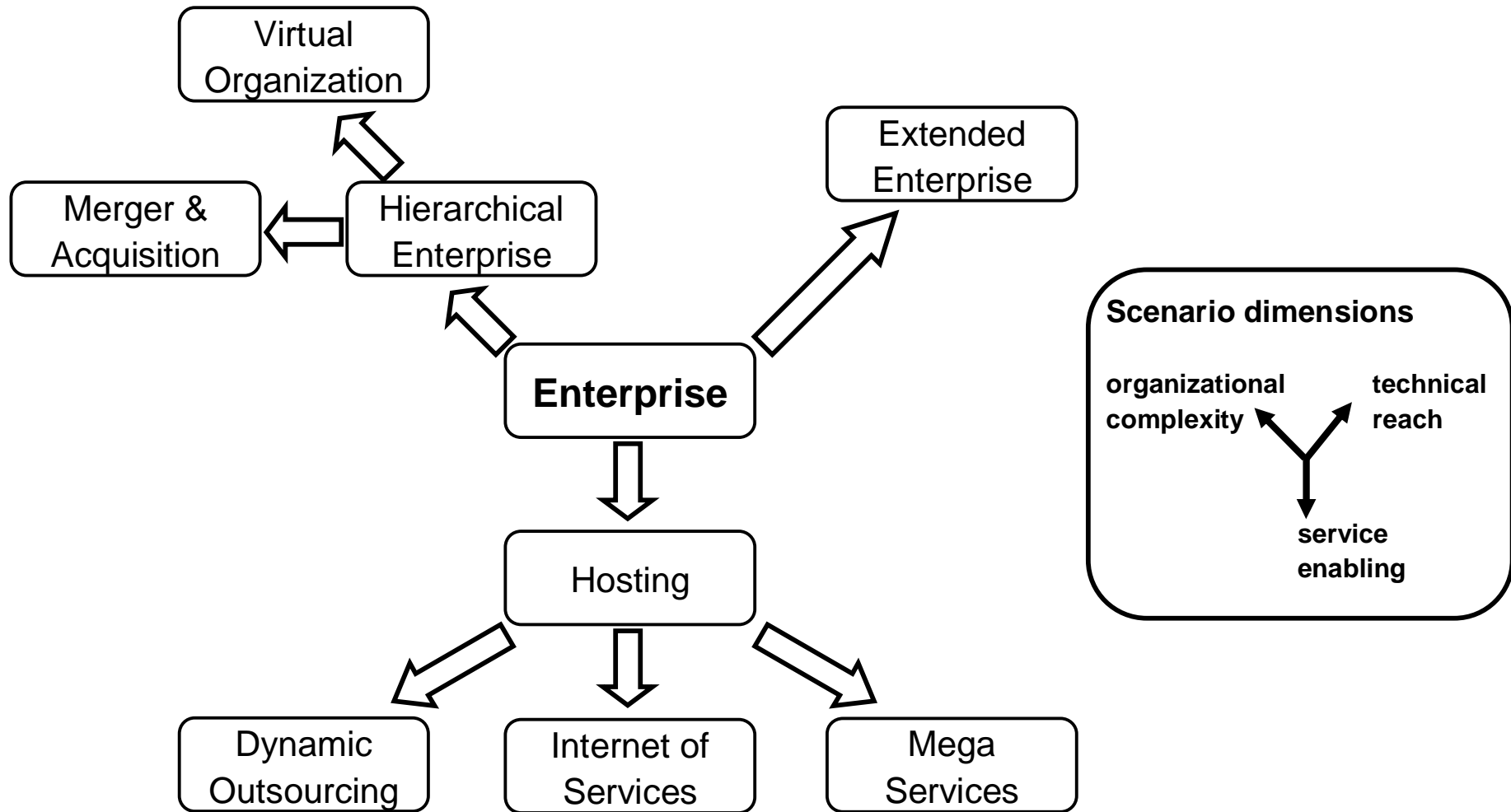
Co-invented under SSA NESSI-Grid

- ATOS Origin, BT, Engineering, IBM, INRIA, NOKIA-Siemens, SAP, Telefonica, Thales

Business Grids: Goals & Values



Business Scenarios (from NESSI-Grid)

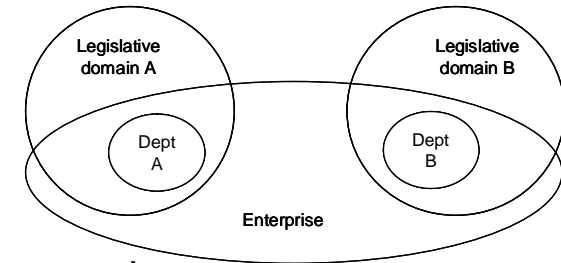


Enterprise

- setup: one administrative domain; IT resources managed by a data centre
- vision: 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
 - 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”

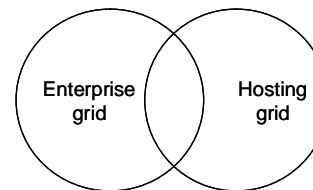
Hierarchical Enterprise

- setup: hierarchy of administrative domains
- vision: automated reflection of enterprise policy hierarchies in IT infrastructure
- requirements: smooth interlinking of central and local IT management issues



Hosting

- 2 overlapping administrative domains
- quality-driven system management according to SLAs (negotiation, provisioning, ...)
- cost reduction via mass automation and secure resource sharing across tenants
- SLA management, on-demand provisioning, security & isolation



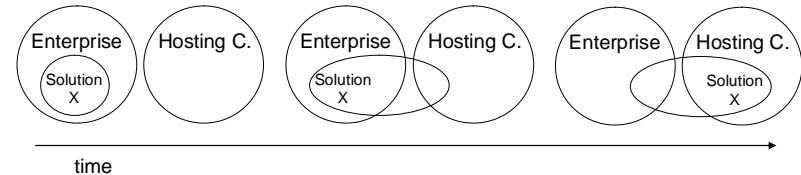
Extended Enterprise

- including pervasive devices and sensors/actors
- increased real-world and real-time awareness (both globally, and locally) supporting enterprise flexibility
- intelligent resource management, disconnected operations, dynamic reconfiguration



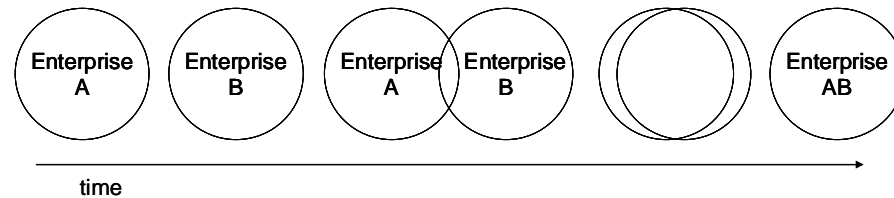
Dynamic Outsourcing

- dynamic migration from in-house IT to external provider and vice versa
- flexibility for organizations' IT not being locked by previous IT decisions
- automated and life migration process



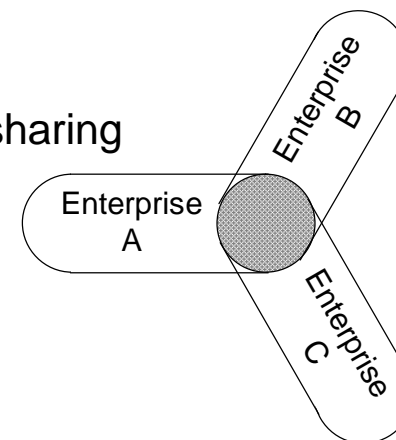
Mergers & Acquisitions

- smooth merge of previously separated administrative domains
- lower technical hurdles for restructuring of companies according to economic needs
- transparent, possibly step-wise merging of resources, services, and processes



Virtual Organizations

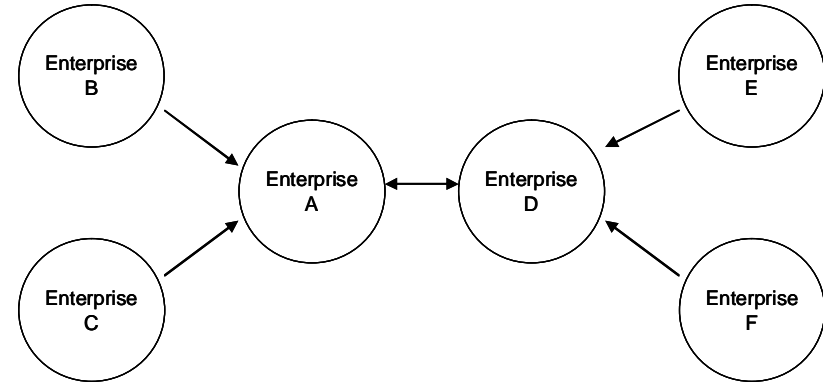
- multi-party (at least 3) collaboration and resource/service sharing
- simplified VO-lifecycle due to infrastructure support
- VO-policy enforcement at infrastructure level; isolation





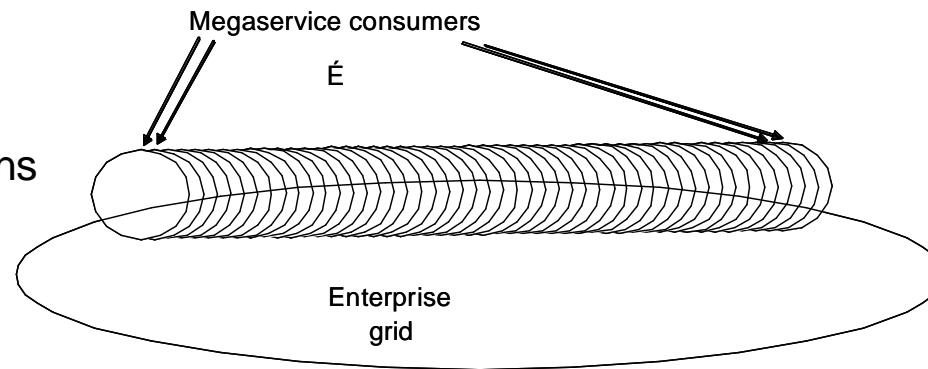
Internet of Services

- complex, flexible chains including multiple providers/administrative domains
- simplified formation of business value chains will increase economies agility
- transparent management (accounting, monitoring, SLAs, etc.)



Mega Services

- services to millions of customers across the globe
- seamless, highly dynamic scaling without limits
- complete automation; respecting legislative restrictions



New system architectures

- harmonize & advance SOA, SOI, multi-tier, federated and Internet scale
- support all kinds of business models, applications and emerging HW env.
- provide transparent and integrated access for all relevant stakeholders

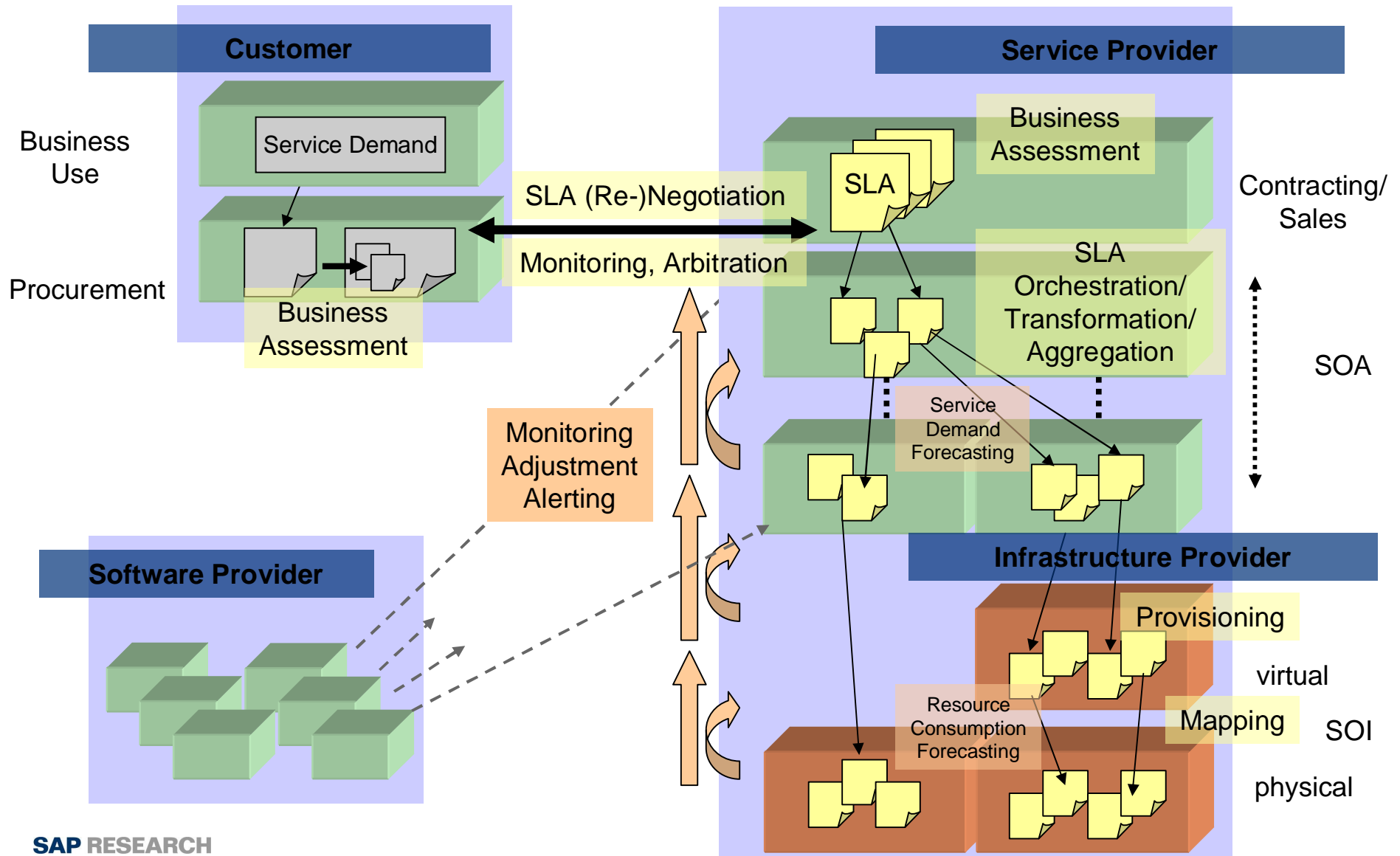
Advanced system lifecycle approaches

- support transparent knowledge tracking, feedback loops, prediction and simulation from engineering to decommissioning
- clear separation of concerns between different stakeholders (Biz vs. IT, ...)
- adhering to overarching sustainability req. for full variety of Biz scenarios

Advanced infrastructure technologies in terms of

- hardware (energy efficient, flexible allocation, virtualization ...)
- middleware (new multi-tier system design, flexible storage systems, harmonized virtualization on all layers)
- related programming models (parallel programming, multi-core)

SLA@SOI (EU FP7 project)



Takeaways

- Traditional Grid systems are not designed for business applications
- Next-generation infrastructures must reconcile dependability, efficiency, transparency and utility
- The future is there

Further details on NESSI-Grid SRA (Strategic Research Agenda)

- <http://www.soi-nwg.org/doku.php?id=sra:description>

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